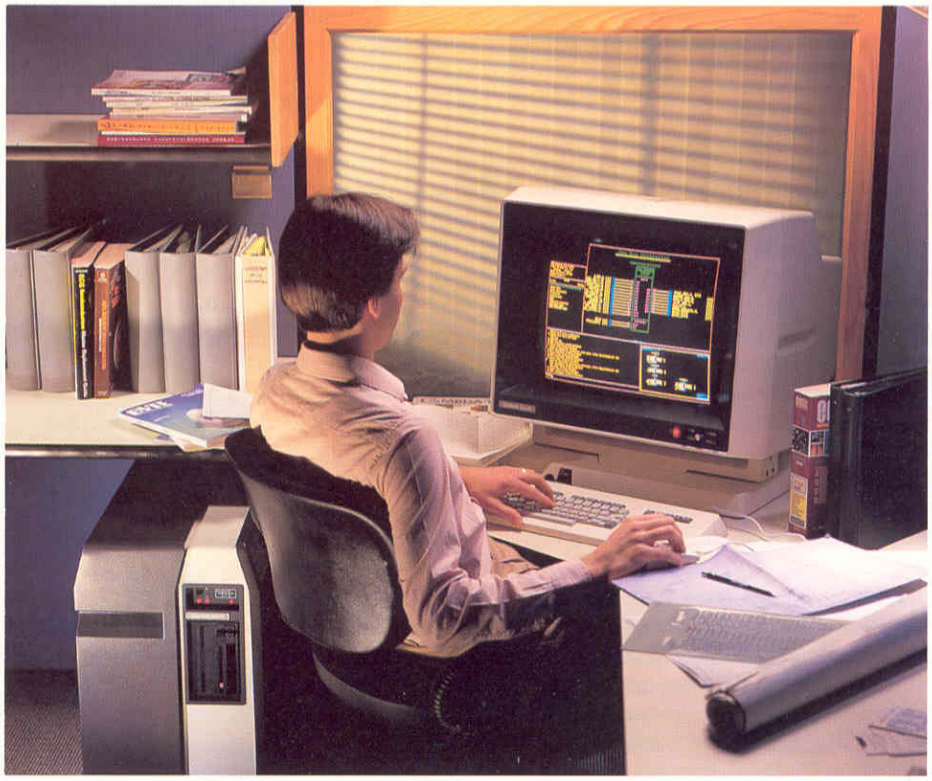
DN570 Product Brief

apollo



Description

Apollo's DN570 sets a new standard for truly integrated low-cost color graphics workstations. The DN570 combines sophisticated graphics capabilities with the powerful 16MHz MC68020 microprocessor and the MC68881 floating point coprocessor. This integrated solution lets technical Work Groups enjoy the high productivity of the DOMAIN® computing environment while performing demanding graphics-intensive applications. The DN570 graphics workstation is completely compatible with the entire DOMAIN Product Family.

Features

- Integrated 16MHz MC68020 processor and MC68881 floating point coprocessor
- Up to 24 concurrent processes; 64M bytes virtual address space per process
- 2M or 3M bytes main memory, expandable to 16M bytes
- Integrated VLSI graphics processor
- Dedicated video memory with 8 color planes allowing 256 simultaneous colors from a palette of over 16 million
- Up to 40K 2-D integer transformed, clipped vectors per sec.
- High performance floating point coprocessor accelerator (FPX™) option
- 60Hz non-interlaced 15 in., non-glare, tilt and swivel monitor
- Flicker-free 19 in., non-glare, tilt and swivel monitor
- High resolution, 1024 x 800, bit-mapped display
- Integrated 12M bit/sec. local area network
- 5¼ in. 86M, 190M and dual 190M byte Winchester disk options

- ¼ in. 60M byte streaming tape drive option
- Four-slot IEEE 796 MULTIBUS™ adaptor option
- Low-profile detachable keyboard with programmable keypad and optional mouse
- Two RS232C ports

Benefits

- Integrated CPU and graphics processors yield high levels of predictable performance
- Tight integration of hardware and software enhances sharing of information and resources
- Ability to concurrently run several large applications
- Task-oriented, multiwindow environment
- Fits comfortably into the technical work group's office environment
- Compatible with entire DOMAIN Product Family
- Worldwide service and support

Advanced Functionality

The DN570 provides flicker-free color graphics and a true multiwindow, multitasking environment that allows up to 24 concurrent processes with up to 64M byte of virtual address space per process. The DN570 accommodates 2 or 3M bytes of main memory (expandable to 16M bytes). The DN570 comes standard with 8 planes of dedicated display memory, allowing the display of as many as 256 colors simultaneously. This makes the DN570 an outstanding choice for graphics- and computation-intensive applications.

The compact, 15-inch, color, 60Hz, non-interlaced display features both tilt and swivel. Its small footprint makes it ideal for the technical professional's desktop. A non-glare filter eliminates the need for special lighting. Apollo also offers the DN570 with a 19-inch, high-resolution color display. Apollo's low-profile, detachable keyboard comes standard with a programmable keypad and has available an optional mouse.

The DN570 supports two powerful operating systems designed for sharing: the UNIX™ and AEGIS™ operating systems. And the DN570 is fully compatible with the other members of the DOMAIN Product Family.

Advanced System Architecture

The DN570 features modular design and construction. Three integrated modules – Processor/Graphics, Mass Storage, and MULTIBUS modules – fit neatly into one system unit. Modules feature separate fans and power supplies that lend themselves to high reliability and ease of servicing. The DN570 is well suited for original equipment manufacturers and system builders.

Processor/Graphics Module

Processor

The DN570's processor section contains Motorola's advanced 32-bit VLSI MC68020 processor that includes a full 32-bit CPU with 16 registers and a 256 byte instruction cache. The MC68020 features 3-stage pipeline processing that allows concurrent execution of up to three instructions. The processor module lets the DN570 support up to 24 concurrent processes with up to 64M byte of address space per process.

The DN570 includes the MC68881 floating point coprocessor as standard equipment. The MC68881 performs floating point operations according to the IEEE 754 standard for binary floating point arithmetic. It features an advanced CPU, eight 80-bit registers, three 32-bit control registers, and a coprocessor interface to the MC68020.

The CPU directly addresses either 2M or 3M bytes of memory through an onboard Memory Management Unit (MMU). The MMU is designed to support demand paging requirements from the disk or access to or from the high performance DOMAIN System network. This feature allows the DOMAIN System to provide transparent file access around the network, greatly enhancing the sharing of information and graphical data.

The DN570 is expandable to 8M, 12M, and 16M byte ECC memory configurations. Also available on the expanded memory systems is an optional high performance floating point coprocessor accelerator (FPX™) that transparently increases performance by a factor of up to three over the MC68881.

The processor module also contains Apollo's standard network interface and two RS232C ports.

Graphics

The graphics section is the key to the DN570's virtual memory graphics capabilities; it includes a display processor and dedicated display memory.

The display processor supports the DN570's 60Hz 15-inch, and flicker free 19-inch, 1024 x 800, color displays that feature both tilt and swivel, and a non-glare filter that eliminates the need for special lighting. The processor includes a high performance drawing processor, and an 8 x 24 bit color lookup table (LUT). It accepts commands from applications, processes the data in the display processor and reads and writes to the display memory. The display processor performs basic raster op drawing and fill operations. In addition, it performs high-level functions such as 2-D integer transforms and clipping.

The DN570 provides bit-block transfer, area fills, and vector generation at high speeds for the extremely fast manipulation of complex images. Vector generation is at a rate in excess of 1.6M pixels/sec. Triangle fills are performed at over 25M pixels/sec.

The display memory is an integral part of the display processor and is functionally divided into eight planes, each with a physical size of 1024 x 1024 and allows the simultaneous display of up to 256 colors.

The display memory module also features eight custom gate arrays that perform bit-block transfers of rectangular region at a rate of 16M pixels/sec. and raster operations at rates up to 10 million pixels per second. These raster-ops allow each plane of the source area of display memory to be combined with each plane of the destination area in any one of the sixteen Boolean operations.

Mass Storage Module

The DN570's 5¼ in. 86M byte, 190M byte, and dual 190M byte Winchester disk, and ¼ in. 60M byte streaming cartridge tape drive provide local mass storage and convenient, high-speed backup. A single controller supports both the tape and disk units and uses industry standard interfaces to allow

for the easy integration of larger capacity devices as they become available. The Mass Storage Module uses an 8088 microprocessor, and contains a VME interface and DMA control logic, a battery-backed clock/calendar device, and a separate power supply and fan.

MULTIBUS Module

The DN570's optional MULTIBUS module contains a 4-slot MULTIBUS peripheral adaptor, power supply, and fans. Apollo provides a variety of peripherals for the MULTIBUS adaptor; in addition, users can add devices as appropriate for their applications. Apollo's GP/IO software lets application programmers write drivers in high level languages for MULTIBUS devices.

Complete Set of Graphics Tools

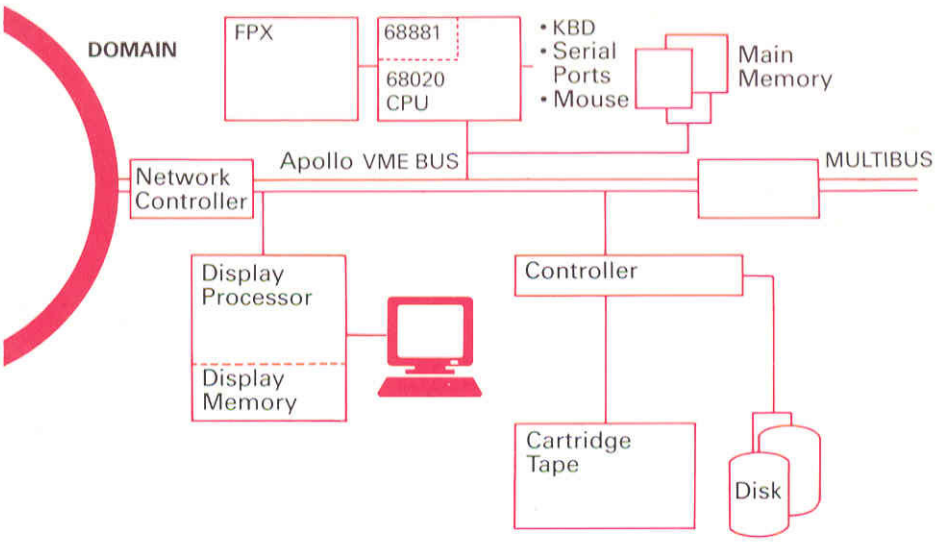
Apollo offers the software developer the most comprehensive set of graphics tools in the industry today.

Apollo's DOMAIN Graphics Resource (DGR™) is a complete graphics toolkit that provides a flexible environment to support the varied and demanding range of sophisticated graphics applications.

DGR includes the DOMAIN Display Manager, which lets users divide the screen into true multiwindow work areas that provide simultaneous activities that can dramatically increase productivity.

The Graphics Metafiles Resource (GMR™) takes full advantage of the high degree of integration offered by the DN570. GMR provides a comprehensive set of 3-D and 2-D graphics functions and is based on ANSI's proposed standard, the Programmers Hierarchial Interactive Graphics System (PHIGS).

GMR creates permanent files containing hierarchically-structured graphics data. These files can exist on remote nodes and be demand-paged into the virtual memory of the process accessing them for editing or viewing. GMR supports multiple viewports, automatically rescaling to Display Manager windows.



The DN570's Integrated Architecture. The DN570 features a modular architecture that integrates high-performance graphics into the computing environment. The Graphics/Processor, Mass Storage, and MULTIBUS modules communicate at bus speeds with each other and with the DOMAIN System network. This total integration provides the highest levels of functionality and performance.

The DOMAIN/DIALOGUE™ User Interface Design and Management System helps applications developers build sophisticated, menu-driven and pointer-oriented user interfaces. GMR is tightly integrated with the DOMAIN/DIALOGUE software.

The Graphics Primitives Resource (GPR™) is a rich set of graphics I/O functions, and is fully integrated with the DOMAIN Display Manager. This procedural interface allows graphics functions to be performed without generating metafiles. GPR lets applications take full advantage of the hardware features of the DN570.

The Graphics Services Routines (GSR™) are an integral component of Apollo's Open Architecture Program. Actual low-level graphics intructions sets (and the routines to support their use) are made available to OEMs, qualified Third Parties, and sophisticated end users to permit performance tuning on their products.

DOMAIN/CORE™ is a complete set of SIGGRAPH CORE functions for 2-D and 3-D graphics applications. DOMAIN/CORE provides the portability and ease-of-use of the proposed CORE standard.

The DOMAIN 4014 emulator lets the DN570 workstations emulate the Tektronix 4014 graphics terminal and lets users access the wide range of 4014 applications running on remote mainframes and superminis.

Also available are a number of implementations of the Graphical Kernel System (GKS) approved by the ISO, from such popular vendors as Precision Visuals, Template, GTS-GRAL, and NOVA Graphics.

Two Powerful Operating Systems

The DOMAIN System is built from the ground up for sharing, and provides two transparent network-wide virtual memory operating systems. The DN570's powerful operating systems maximize the integrated computing environment.

DOMAIN/IX™ is Apollo's twin port of the two most popular standards of the UNIX operating system: Berkeley 4.2 and System V Release 2. Users can run applications in either operating system, or both simultaneously, from a single workstation. DOMAIN/IX provides users all the benefits of the UNIX standards integrated into a distributed processing environment.

The AEGIS operating system provides a true multiwindow, multitasking environment and a distributed file system that lets users transparently share data and resources.

DN570 Hardware Features

- 32-bit VLSI CPU (integrated 16 MHz MC68020 processor and MC68881 floating point accelerator)
- 2M or 3M byte main memory; expandable to 16M byte
- Low-profile, detachable keyboard with programmable keypad and optional mouse
- 86M, 190M, and dual 190M byte disks for local storage
- FPX Hardware floating point coprocessor accelerator (available on expanded memory systems) for single and double precision operations
- Ergonomic Packaging
- Integral 12M bit/sec. network
- Two RS232C ports (up to 19.2k baud)

Color Display Features

- 15 in. diagonal, 60Hz color display monitor
- 19 in. diagonal flicker-free, color display monitor
- High resolution (1024 x 800 visible from 1024 x 1024 bit map)
- Standard 256 colors from a palette of over 16 million
- VLSI dedicated display processor
- Vector generation greater than 1.6M pixels/sec.
- Up to 40,000 2-D integer transformed, clipped vectors/sec.
- Bit-blts at over 16M pixels/sec.
- Sixteen logical raster-ops at up to 10M pixels/sec.
- Area fills at over 25M pixels/sec.
- RS343A RGB video output with composite sync on green

DN570 Peripheral Options

- 5¼ in. 86M byte, 190M or dual 190M byte Winchester disks
- ¼ in. 60M byte streaming tape cartridge
- Four-slot IEEE 796 MULTIBUS adaptor

The DOMAIN Network

- Baseband network in a ring topology
- Dual address packet with single token arbitration
- Up to 1000m between two nodes
- Transparent access to data, programs, and peripherals
- Gateway access to remote and foreign facilities/protocols

Software

STANDARD

- AEGIS, object-oriented operating system
- Multiple window management with cut and paste
- High level language debugger
- DOMAIN Graphics Resources: Display Manager, 2-D and 3-D GMR, GPR
- Power-on diagnostics

OPTIONAL

- DOMAIN/IX, Apollo's twin port of the UNIX standards: Berkeley 4.2 and System V Release 2
- FORTRAN 77, ISO Pascal, DOMAIN/C and DOMAIN/LISP support
- DOMAIN Graphics Resources: DOMAIN/DIALOGUE, DOMAIN/CORE, DOMAIN 4014 emulation, GSR, GKS (via third parties)
- D3M distributed data management
- DSEE Software Engineering Environment Package
- DPSS/MAIL™ Professional Productivity Tool
- More than 500 solutions-supplier applications packages

DN570 Specifications

Physical dimensions

Electronics Cell: height 62.2 cm (24.5 in.), width 34.3 cm (13.5 in.), depth 72.4 cm (28.5 in.)
Color Monitor: 15 inch display monitor – height 40.6 cm (16.0 in.), width 39.4 cm (15.5 in.), depth 41.9 cm (16.5 in.)
19 inch display monitor – height 53.3 cm (21.0 in.), width 56.4 cm (22.2 in.), depth 54.6 cm (21.5 in.)

Weight

Electronics Cell: Standalone – 45.4 kg (100 lb); No disk/tape – 45.4 kg (100 lb); Fully configured – 54.5 kg (120 lb)
Color Monitor: 15 inch – 25.0 kg (55.2 lb); 19 inch – 45.4 kg (100 lb); Low-profile keyboard – 2.2 kg (4.8 lb)

Power

Electronics Cell: *Minimum* – 120 VAC +10/–25%, 3.3A, 50/60 Hz ±1, 300 watts, 1020 BTU/hr., 220 VAC +20/–15%, 1.9A, 50/60 Hz ±1, 300 watts, 1020 BTU/hr
Maximum – 120 VAC +10/–25%, 10.0A, 50/60 Hz ±1, 875 watts, 3000 BTU/hr, 220 VAC +20/–15%, 5.4A, 50/60 Hz ±1, 875 watts, 3000 BTU/hr
Color Monitor: 15 inch – 90 to 132 VAC, 130 watts, 47-63 Hz, 180 to 264 VAC; 19 inch – 90 to 132 VAC, 150 watts, 47-63 Hz, 180 to 264 VAC

Operating Environment

Temperature: 15C to 32C (60F to 90F)
Humidity: 20% to 80% relative
Ceiling: 0-2.1 km (0-7000 ft)

The materials contained herein are summary in nature, subject to change, and intended for general information only. Details and specifications concerning the use and operation of Apollo products are available in the applicable technical manuals, available from local sales representatives.

Corporate Headquarters: Apollo Computer Inc., 330 Billerica Rd., Chelmsford, MA 01824, 617-256-6600, TWX: 710-343-6803, CABLE: APOLLOCO
European Headquarters: Apollo Computer, S.A., 108, Avenue Louis-Casai, P.O. Box 4086, 1215 Geneva, Switzerland (41-22) 98 57 88, TWX: 236 18 ch FAX: (41-22) 98 58 79

apollo

002402-202 1-86