

# ND 500/CX MODELL 21 COMPUTER SYSTEM

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ND-5371, ND-5571, ND-5671, ND-5771  
ND-530/CX, ND-550/CX, ND-560/CX, ND-570/CX



# ND-500/CX Model 21 COMPUTER SYSTEMS

## Introduction

Norsk Data's 500/CX Model 21 series of computers is one of the most advanced 32-bit super minicomputer systems available. It accommodates exceedingly large programs and data areas, and fulfills the requirements imposed by most ADP and technical/scientific applications. Because of the new, faster I/O processor, ND-110/CX, the computer has a higher overall system performance and better system throughput.

## Features

- Single-cabinet configuration
- Advanced instruction repertoire
- Multiport memory system
- SINTRAN III operating system
- Multiprogramming capacity
- Highly advanced processor technology
- 4-10 MB memory
- BCD Arithmetic
- New and faster I/O processor, ND-110/CX

## Product description

The ND-500/CX Model 21 series consists of the ND-530/CX, ND-550/CX, ND-560/CX and ND-570/CX. Each successive system is more powerful than the preceding. They can all be upgraded, to obtain higher performance.

All the Model 21 machines are housed in one cabinet. They are based on the ND-500/2 32-bit CPU, and include the Multiport V Memory System, the ND-110/CX Front-End Processor (ND-100/CX in 530/CX system), the I/O System and the SINTRAN III operating system.

These systems include an SMD controller, a 1.2 MB floppy-disk unit with controller and a console hardcopy terminal. Any disk system from 70 MB and up may be added, in accordance with the configuration rules.

Operator interaction with the computer is facilitated by the Control Panel indicators. The panel consists of status indicators, a security lock, and indicators that show CPU and cache memory utilisation. The Telefix adaptor is also built in, plus a printer outlet for hardcopy output of Telefix communication.

The individual characteristics of each system within the Model 21 series are given below:

### ND-530/CX Model 21 (ND 5371)

- 4 MB memory
- ND-110/CX I/O processor

### ND-550/CX Model 21 (ND 5571)

- microcoded array processing functions
- 4 Mb memory
- ND-110/CX I/O processor

### ND-560/CX Model 21 (ND 5671)

- microcoded array processing functions
- 6 Mb memory
- 16 Kb of cache memory
- ND-110/CX I/O processor

### ND-570/CX Model 21 (ND 5771)

- microcoded array processing functions
- 10 Mb memory
- 32 Kb of cache memory
- ND-110/CX I/O processor

Common to all Model 21 systems are the following:

- FAST TTL and LSI processor technology, providing a basic cycle time of 120 nanoseconds.
- Full BCD arithmetic and conversion processor providing high-speed COBOL programming. In addition, it provides 32-bit single-precision floating-point operations with a 23-bit mantissa and a 9-bit exponent. For 64-bit operations, the mantissa is 55 bits long.
- An array-processor instruction set that speeds up common array-processing operations from a factor of 4 to 8 (not available on the 530/CX).
- Byte-oriented instruction sets which are tailored for high-level program execution efficiency such as FORTRAN DO loops and COBOL string handling.
- A memory management system which allows each user an address space of up to 4.3 gigabytes for programs, and up to 4.3 gigabytes for data. This allows large files to be accessed as if they were arrays. Thus, the hardware memory management system accesses data rather than the more resource-consuming file system.
- The 32-bit CPU, which may be shared by many programs via the virtual memory system and the SINTRAN III Operating System. Context-switching routines are implemented in the microcode.
- A multiport memory system which allows shared and direct access to the CPU, the Front-End Processing unit, the DMA devices and the communication links (MEGALINK, HDLC).
- The Operating System – Norsk Data's interactive, terminal-oriented SINTRAN III. It allows many programs, written in different languages, to be executed simultaneously. Real-time tasks, local and remote batch jobs, and other forms of data communication may also run concurrently with the timesharing users.
- SINTRAN III version K allows for larger system configurations, and specially a larger number of terminals.

# ND-500/CX Model 21 COMPUTER SYSTEMS

## Expansion possibilities

There are 13 free I/O slots in the basic system for peripheral controllers and interfaces. Any of the ND-100 system peripherals may be attached.

Of each system's memory, 2 megabytes are local for the ND-110/CX Front-End Processing Unit. The remaining memory is common to both the ND-500 CPU and the Front-End Processing Unit. The maximum shared memory size for the Model 21 series is 8 megabytes, using 4 megabyte modules.

If there is a need for more memory or I/O interfaces, one of two expansion systems may be used. The I/O Expansion Cabinet (ND-5083) or the Memory and I/O Expansion Cabinet (ND-5084) will provide 18 extra I/O positions.

## Software

All of the Model 21 systems are delivered with the following software:

- SINTRAN III Operating System, including the ND-500 Monitor, Linkage-Loader and Symbolic Debugger
- Accounting System
- ND Backup System
- Test and Verification Programs
- SINTRAN III Utility Programs
- Subsystem Package
- ND Spooling System
- ND-500 Microcode, Multiuser
- Exception Handling
- User Environment
- Xmessage for SINTRAN III

Additionally, the following software is available:

## Communications

- COSMOS, for communication between ND systems
- X.25 Network Option for PSS, TRANSPAC, DATAPAC, DATEX-P and other public networks
- X.29 PAD for terminal control through the X.25 Network
- X.29 SERVER for serving incoming PADs
- X.21 for accessing circuit switched networks, e.g., the Nordic Public Data Network
- SNA for 3270 and RJE

## Remote Job Entry Terminal Emulators and Terminal Concentrators

- IBM HASP-II
- IBM 2780/3780
- IBM 3270
- HONEYWELL GRTS-II
- HONEYWELL VIP-II
- CDC 200 User Terminal-Multidrop
- UNIVAC DCT-2000
- UNIVAC NTR
- UNIVAC UTS-400

## Compilers and Programming Languages

- C
- PASCAL
- SIMULA
- ADA
- COBOL
- FORTRAN ANSI 77
- BASIC
- APL

## Databases

- SIBAS Codasyl Database System
- ISAM Indexed Sequential File Access System

## Editors, Word Processing and Information Processing

- PED Fullscreen Program Editor
- NOTIS-WP Word Processor Software
- NOTIS-IR Information Storage and Retrieval System
- NOTIS-RG Report Generator
- NOTIS-CALC Spreadsheet System
- NOTIS-QL Query-By-Example Database Query and Update System
- FOCUS Screen-Handling System
- NOTIS-BG Business Graphics System
- NOTIS-ID Electronic Mail

## Administrative Data Processing Tools

- FOCUS Screen-Handling System
- UNIQUE High-level Application Specification Tool
- ABM Applications Building and Maintenance for COBOL/FORTRAN
- MERCUR Financial Modeling

## Technical specifications

The following dimensions apply to the CPU cabinet and its contents:

Height:	1.69 meters
Depth:	0.95 meters
Width:	0.60 meters
Weight:	approx. 180-250 kg
Operating temperature:	+ 16°C to + 30°C
Power consumption:	3500 watt max 230 volts ac 50 Hertz 1%

## Documentation and related material

ND-500 Reference Manual .....	ND-05.009 EN
ND-500 Hardware Description .....	ND-05.011 EN
ND-500 Micro Programming Guide .....	ND-05.012 EN
ND-500 Single Precision Array Processing Functions .....	ND-05.013 EN
ND-500 Hardware Maintenance .....	ND-30.014 EN
ND-500 Loader/Monitor .....	ND-60.136 EN

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