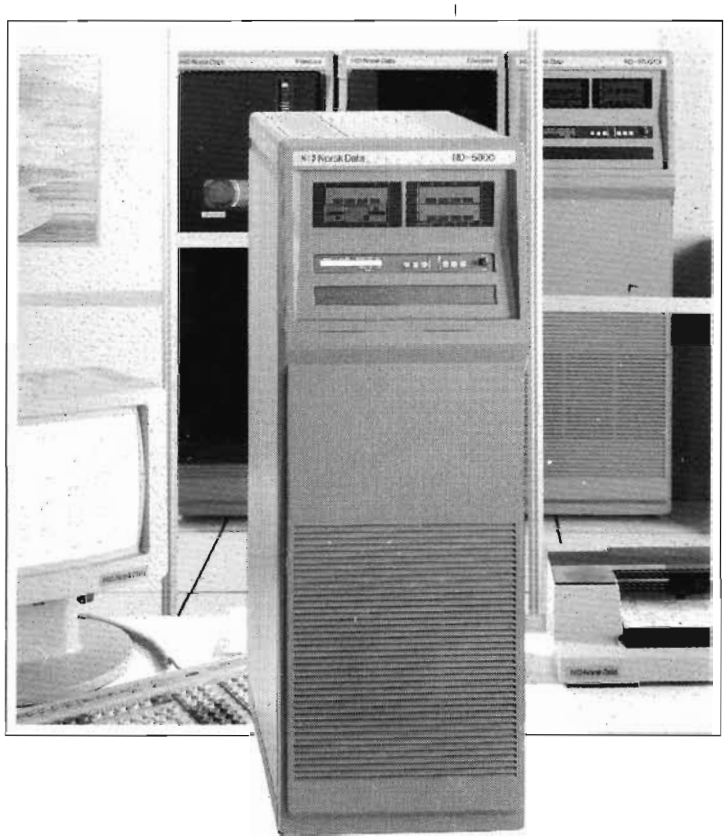
SALES INFORMATION DOCUMENT

# ND-5000 SERIES

## HIGH-END COMPUTER SYSTEMS FROM NORSK DATA



Norsk Data

COMPANY CONFIDENTIAL

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# 1. INTRODUCTION

With the introduction of the ND-5000 series Norsk Data is adding a new and more powerful performance dimension to our 32-bit computer family. This wide range of computers gives us the oppurtunity to offer our customers unbeatable solutions in combination with our NOTIS, DIALOGUE and COSMOS products. The introduction of ND-5700, ND-5800 and ND-5900 will reinforce Norsk Datas established position as the price/performance winner !

## 1.1 Overview

The ND-5000 series are major and important products for ND and for our markets. The ND-5000 series strengthen the ND-SAFE concept, by offering compatibility and extension to our 32-bit range of computers. The new technology employed in ND-5000 provides a more compact design and higher speed which in turn gives us the advantage of extending the current 32-bit range in the high end. This allows us to be more price/performance competitive and cover most basic market needs.

The ND-5000 series represent a range of 32-bit systems offered in a standard system packaging. These systems will be general purpose 32-bit systems, attractive for all our present markets and they will also open up new business opportunities in areas that demand more performance. We believe that the ND-5000 series system range will increase the sales of 32-bit systems and accelerate orders for other systems in the ND family.

## 1.2 Features and benefits

When presenting a product feature it is important to relate it to the actual sales situation. So whenever you present ND-5000 features you should tie it up to customer benefits.

The following features/benefits could be important to your customers and prospects, whether they are extending their use of present ND-installations or considering ND-systems for new applications :

1) The ND-5000 systems consist of the ND-5000 CPU, ND-110/CX I/O processor, the memory system and the mass-storage units. The physical implementation of the CPU is completly different from earlier systems, while the logical architecture of the ND-5000 series is the same as the ND-500 series. The instruction set of the ND-5000 CPU is the same as for the ND-500 CPU. This means that the system is compatible with the ND-500 range and runs the same software.

Benefits for the user :

-protects invested time
-one operating system
-SW compatibility
-HW compatibility
-low risk with proven I/O system
-wide communication possibilities
-easy to operate

2) ND-5700 has approximately the same CPU performance as the ND-570/CX and the ND-5800 has approximately twice the CPU performance of the ND-570/CX. Hence the ND-570/CX will be replaced by the ND-5700. ND-5900 Model 2, 3 and 4 have respectively two, three and four times the performance of the ND-5800. This is due to the multi CPU configuration where two, three and four ND-5000 CPUs are connected to the shared memory system.

Benefits for the user :

-faster job turnaround
-capacity for running new applications
-support for more users
-good price/performance
-room for growth

3) The ND-5000 CPU employes the CMOS gate array technology. This technology provides higher CPU speed and more compact packaging of the system. Compact packaging and buildt in HW diagnostic makes service easier and faster.

Benefits for the user :

-high mips/$m^2$ (eight times the ND-570/CX in one cabinett!)
-lower maintenance costs
-high reliability
-high quality
-low life time costs

## 2. SYSTEM DESCRIPTION

### 2.1 System Configuration

ND-5700 :
- ND-5700 CPU
- 110/CX
- Floppy drive 1.2 MB
- Controller for external disks
- Console
- 8 MByte shared memory
- 2 MByte Local Memory
- Sintran and utilities

ND-5800 :
- ND-5800 CPU
- 110/CX
- Floppy drive 1.2 MB
- Controller for external disks
- Console
- 16 MByte shared memory
- 4 MByte Local Memory
- Sintran and utilities

ND-5900 :
Model 2
- 2 x ND-5800 CPU
- 110/CX
- Floppy drive 1.2 MB
- Controller for external disks
- Console
- 16 MByte shared memory
- 4 MByte Local Memory
- Sintran and utilities

ND-5900 :
Model 3
- 3 x ND-5800 CPU
- 110/CX
- Floppy drive 1.2 MB
- Controller for external disks
- Console
- 16 MByte shared memory
- 4 MByte Local Memory
- Sintran and utilities

ND-5900 :
Model 4
- 4 x ND-5800 CPU
- 110/CX
- Floppy drive 1.2 MB
- Controller for external disks
- Console
- 16 MByte shared memory
- 4 MByte Local Memory
- Sintran and utilities

## 2.2 Models/Upgrading paths

| System type | ND-5700 | ND-5800 | ND-5900 Model 2 | ND-5900 Model 3 | ND-5900 Model 4 |
|---|---|---|---|---|---|
| Relative CPU perform. | 1 | 2 | 4 | 6 | 8 |
| Performance (WMIPS) | - | - | - | - | - |
| Max. # W.S. | 256 | 256 | 256 | 256 | 256 |
| Memory size shared/local | 8/2 | 16/4 | 16/4 | 16/4 | 16/4 |
| Max. memory (MByte) | 512 | 512 | 512 | 512 | 512 |
| Cache size<br>Data (KB)<br>Instr.(KB)<br>Total size | <br>64<br>320<br>384 | <br>64<br>320<br>384 | <br>2 x 64<br>2 x 320<br>768 | <br>3 x 64<br>3 x 320<br>1152 | <br>4 x 64<br>4 x 320<br>1536 |
| Max. disk size (MByte) | 29 | 29 | 29 | 29 | 29 |
| Disk types | external | external | external | external | external |

## 2.3 Structure list

### 2.3.1 ND-5700

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5700 | | ND-5700 System, 10 MByte memory, 384 KByte Cache | |
| | 110172 | ND-5000 brown/beige cabinet with Power, Operator panel, 1.2 MB Floppy drive, ND-100 and MF Bus crate | 1 |
| | 11nnnn | ND-5700 Basic CPU, containing Floating point HW 64 + 320 KByte Cache | 1 |
| | 103870 | 4 MB MOS memory for MF Bus system | 2 |
| | 110169 | MF Bus controller/octobus | 1 |
| | 103830 | 32 bit port for MF Bus | 1 |
| | 110100 | ND-110/CX CPU and MMS | 1 |

| | | |
|---|---|---|
| | 32 bit floating | |
| 103170 | Controller for 5 1/4" Streamer and Floppy Disk drive | 1 |
| 106320 | Disk controller ECC 15MHz,ND-100 | 1 |
| 106400 | MF Bus driver and octobus interface for ND-100 | 1 |
| 103890 | 2 MB MOS memory for ND-100 | 1 |
| 103380IN | Console terminal with printer-interface and buffer. | 1 |
| 103290 | Console stand for ND-103380 | 1 |
| 110090 | Matrix printer EPSON LX-80 | 1 |

| | SOFTWARE: | Qty. |
|---|---|---|
| 210576 | SINTRAN III/VSX Operating syst. for ND-500/5000 | 1 |
| 210049 | ND spooling system | 1 |
| 210335 | Symbolic debugger for ND-500/5000 | 1 |
| 210333 | ND-500/5000 Monitor | 1 |
| 210319 | Linkage Loader for ND-500/5000 | 1 |
| 210315 | Accounting system for SINTRAN-III E version or later | 1 |
| 210337 | Back-up system for SINTRAN-III | 1 |
| 210375 | TELEFIX files for user sites | 1 |
| 211123 | ND-5000 u-program | 1 |
| 210697 | ND-500/5000 Swapper | 1 |
| 211124 | ND-5000 micro test program | 1 |
| 210628 | SINTRAN III VSE/VSX utility programs | 1 |
| 210005 | Subsystem package - 32 bit format | 1 |
| 210400 | Subsystem package II, includes MAC, QED, NPL | 1 |
| 210511 | Exception handling system | 1 |
| 210534 | Job Execution Control | 1 |
| 210634 | Memory-to-floppy dump(MEMTOF-100) | 1 |
| 210518 | User-environment for ND-100 | 1 |
| 210130 | X-MESSAGE (Single system) | 1 |
| 210721 | BRF-LINKER for ND-100 | 1 |
| 211067 | Mass Storage Utilities | 1 |

### 2.3.2 ND-5800

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5800 | | ND-5800 System, 20 MByte memory, 384 KByte Cache | |
| | 110172 | ND-5000 brown/beige cabinet with Power, Operator panel, 1.2 MB Floppy drive, ND-100 and MF Bus crate | 1 |
| | 110170 | ND-5800 Basic CPU, containing Floating point HW 64 + 320 KByte Cache | 1 |
| | 103870 | 4 MB MOS memory for MF Bus system | 4 |
| | 110169 | MF Bus controller/octobus | 1 |

| | | |
|---|---|---|
| 103830 | 32 bit port for MF Bus | 1 |
| 110100 | ND-110/CX CPU and MMS 32 bit floating | 1 |
| 103170 | Controller for 5 1/4" Streamer and Floppy Disk drive | 1 |
| 106320 | Disk controller ECC 15MHz,ND-100 | 1 |
| 106400 | MF Bus driver and octobus interface for ND-100 | 1 |
| 103890 | 2 MB MOS memory for ND-100 | 2 |
| 103380IN | Console terminal with printer-interface and buffer. | 1 |
| 103290 | Console stand for ND-103380 | 1 |
| 110090 | Matrix printer EPSON LX-80 | 1 |

SOFTWARE:

See the ND-5700 structure.

### 2.3.3 ND-5900 Model 2

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5902 | | ND-5900 Mod. 2 System, 20 MByte memory 768 KByte Cache | |
| | 110172 | ND-5000 brown/beige cabinet with Power, Operator panel, 1.2 MB Floppy drive, ND-100 and MF Bus crate | 1 |
| | 110170 | ND-5800 Basic CPU, containing Floating point HW 64 + 320 KByte Cache | 2 |
| | 103870 | 4 MB MOS memory for MF Bus system | 4 |
| | 110169 | MF Bus controller/octobus | 1 |
| | 103830 | 32 bit port for MF Bus | 1 |
| | 110100 | ND-110/CX CPU and MMS 32 bit floating | 1 |
| | 103170 | Controller for 5 1/4" Streamer and Floppy Disk drive | 1 |
| | 106320 | Disk controller ECC 15MHz,ND-100 | 1 |
| | 106400 | MF Bus driver and octobus interface for ND-100 | 1 |
| | 103890 | 2 MB MOS memory for ND-100 | 2 |
| | 103380IN | Console terminal with printer-interface and buffer. | 1 |
| | 103290 | Console stand for ND-103380 | 1 |
| | 110090 | Matrix printer EPSON LX-80 | 1 |

SOFTWARE:

See the ND-5700 structure.

### 2.3.4 ND-5900 Model 3

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5903 | | ND-5900 Mod. 3 System, 20 MByte memory, 1152 KByte Cache | |
| | 110172 | ND-5000 brown/beige cabinet with Power, Operator panel, 1.2 MB Floppy drive, ND-100 and MF Bus crate | 1 |
| | 110170 | ND-5800 Basic CPU, containing Floating point HW 64 + 320 KByte Cache | 3 |
| | 103870 | 4 MB MOS memory for MF Bus system | 4 |
| | 110169 | MF Bus controller/octobus | 1 |
| | 103830 | 32 bit port for MF Bus | 1 |
| | 110100 | ND-110/CX CPU and MMS 32 bit floating | 1 |
| | 103170 | Controller for 5 1/4" Streamer and Floppy Disk drive | 1 |
| | 106320 | Disk controller ECC 15MHz,ND-100 | 1 |
| | 106400 | MF Bus driver and octobus interface for ND-100 | 1 |
| | 103890 | 2 MB MOS memory for ND-100 | 2 |
| | 103380IN | Console terminal with printer-interface and buffer. | 1 |
| | 103290 | Console stand for ND-103380 | 1 |
| | 110090 | Matrix printer EPSON LX-80 | 1 |
| | | SOFTWARE: | |
| | | See the ND-5700 structure. | |

### 2.3.5 ND-5900 Model 4

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5904 | | ND-5900 Mod. 4 System, 20 MByte memory, 1536 KByte Cache | |
| | 110172 | ND-5000 brown/beige cabinet with Power, Operator panel, 1.2 MB Floppy drive, ND-100 and MF Bus crate | 1 |
| | 110170 | ND-5800 Basic CPU, containing Floating point HW 64 + 320 KByte Cache | 4 |
| | 103870 | 4 MB MOS memory for MF Bus system | 4 |
| | 110169 | MF Bus controller/octobus | 1 |
| | 103830 | 32 bit port for MF Bus | 1 |

| | | |
|---|---|---|
| 110100 | ND-110/CX CPU and MMS 32 bit floating | 1 |
| 103170 | Controller for 5 1/4" Streamer and Floppy Disk drive | 1 |
| 106320 | Disk controller ECC 15MHz,ND-100 | 1 |
| 106400 | MF Bus driver and octobus interface for ND-100 | 1 |
| 103890 | 2 MB MOS memory for ND-100 | 2 |
| 103380IN | Console terminal with printer-interface and buffer. | 1 |
| 103290 | Console stand for ND-103380 | 1 |
| 110090 | Matrix printer EPSON LX-80 | 1 |

SOFTWARE:

See the ND-5700 structure.

### 2.3.6 Extra I/O DMA channels

| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5085 | | Extra I/O DMA channel ( the first unit ) Consist of : | |
| | 10nnnn | ND-100/ND-500 cabinet w/power, brown/beige 11 mod. | 1 |
| | 103880 | Multiport memory system V driver from N-100 | 1 |
| | 103830 | Multiport Memory system V, 32 bit port | 1 |
| | 103900 | Multiport memory system IV, bus controller | 1 |
| | 103920 | Multiport memory system IV, rack with 2 banks (2 x 10 positions) | 1 |
| | 103950 | Multiport IV driver (Bus master) | 1 |

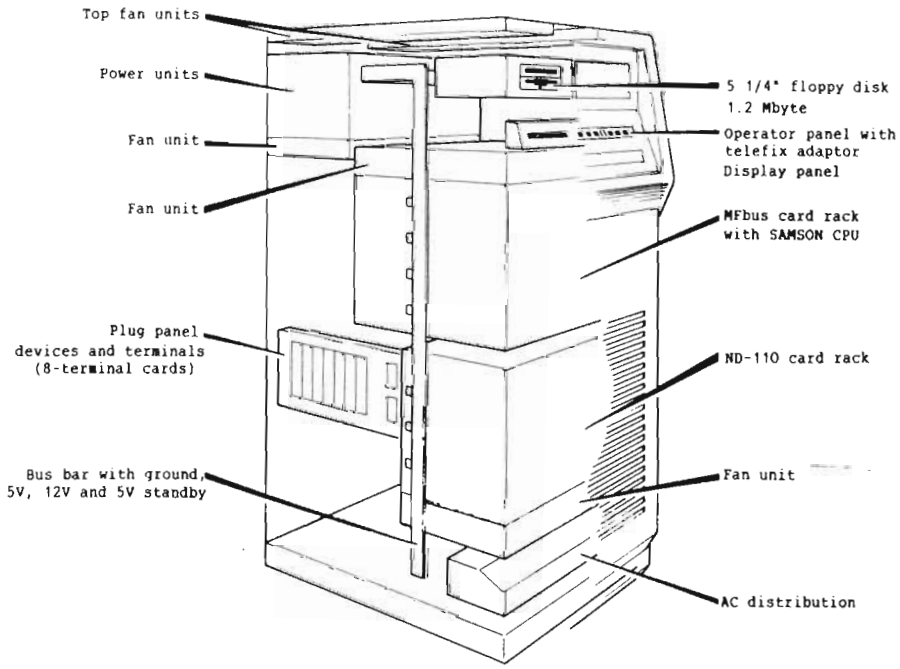
| System | ND-no. | Description | Qty. |
|---|---|---|---|
| 5086 | | Extra I/O DMA channel ( second unit ) Consist of : | |
| | 103880 | Multiport Memory system V driver from ND-100 | 1 |
| | 103830 | Multiport Memory system V, 32 bit port | 1 |
| | 103900 | Multiport memory system IV, bus controller | 1 |

## 2.4 Physical layout cabinet/card-crate

The ND-5000 system cabinet is identical to an ND-500 cabinet, except for the card racks. This cabinet has an ND-100 card rack and a Multi Function Bus (MFB) card rack. The ND-5000 CPU is placed in the MFB card rack together with the MFB system cards. In general the cabinet includes :

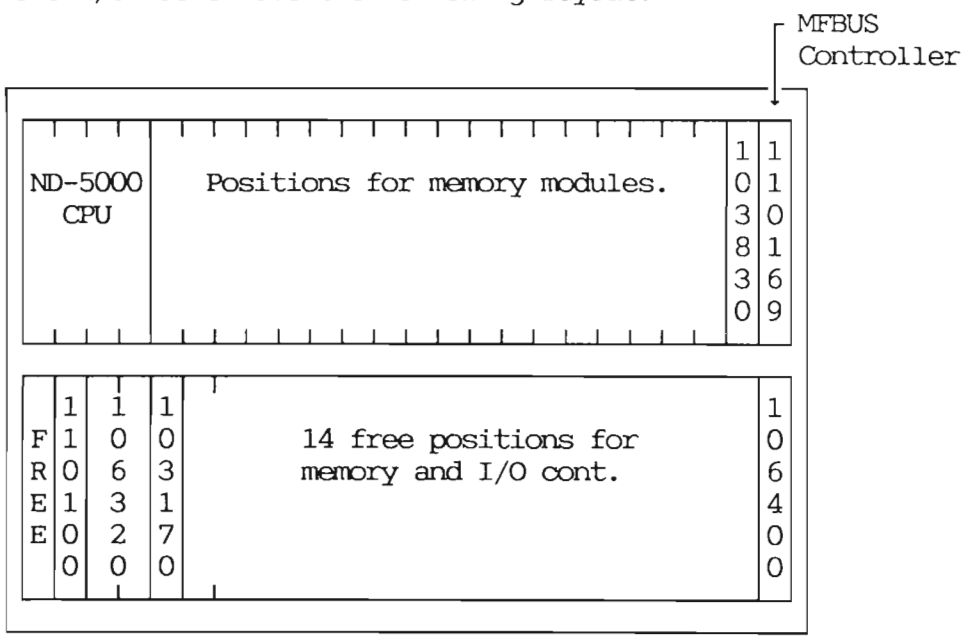
-One CPU and memory card rack (24 positions, 4 for ND-5000)
-One ND-100 card rack (20 positions)
-One floppy disk drive
-Operater panel ( the same as in the ND-500 series )

The standard ND-5000 system will only be delivered in a single-cabinet version. An I/O and memory expansion cabinet can be added if more interfaces are required.




ND-5000 CABINET

The CPU and I/O racks have the following layout:

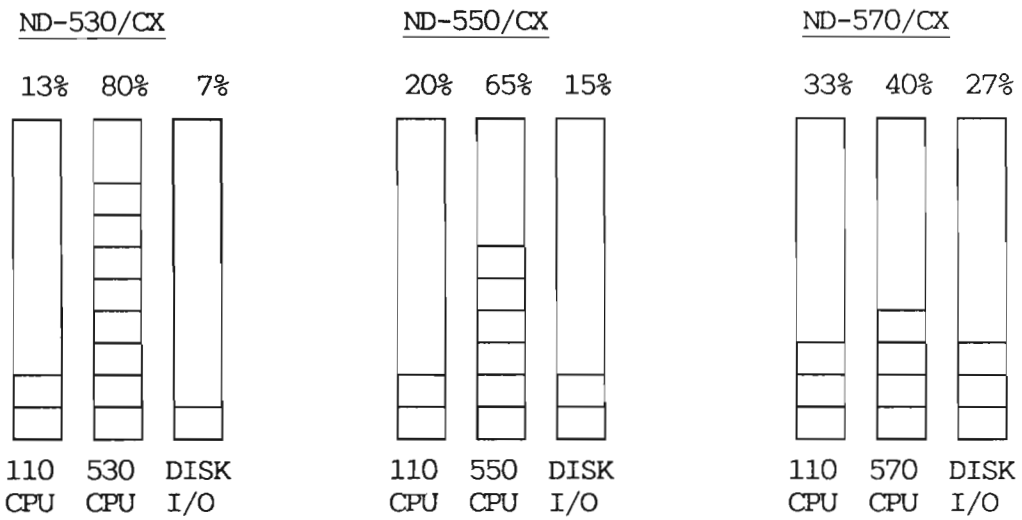


# 3. PERFORMANCE FIGURES

## 3.1 Typical ADP/OA job-mix

Given here is a mix of Sibas (1/3), Notis-WP (1/3) and Cobol/Fortran program development (1/3).

This picture gives an idea of how the three most important HW-resources are loaded:




This clearly shows that for the low-end 500-systems, the 500-CPU is the bottleneck.

If a lot of communications is run, the 110/CX part of the system will be more heavily loaded, and may become the bottleneck.

A 570-system today is in pretty good balance, as we can see. To improve the throughput (transactions/second) of a 570-system significantly, it is not sufficient merely to increase the speed of the 500-CPU (ND-5000).

The effect of the ND-5800 CPU in this example is that the 500 CPU-load would drop from 40% to about 20% (assuming a factor 2 faster), and the 110/CX CPU would be the new system bottleneck at 33% utilization.

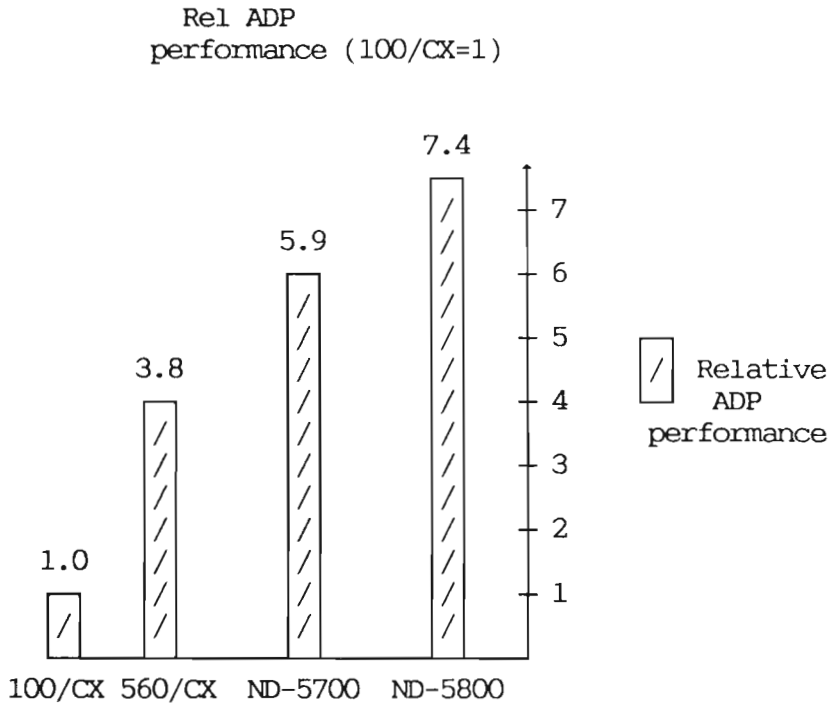
The system capacity increase would then be 40% / 33% = 1.21 (21%). A slightly different way of calculating gives a 26 - 27 % capacity increase. The conclusion is:

With current SW versions will ND-5800 give our ADP/OA users in the order of 25 % more performance than a 570/CX.

However future SW versions will reduce the CPU-load on the ND-100 part of the system, and those who use large databases will strongly benefit from the new version of SIBAS planned to be released in 3.Q. 1987.

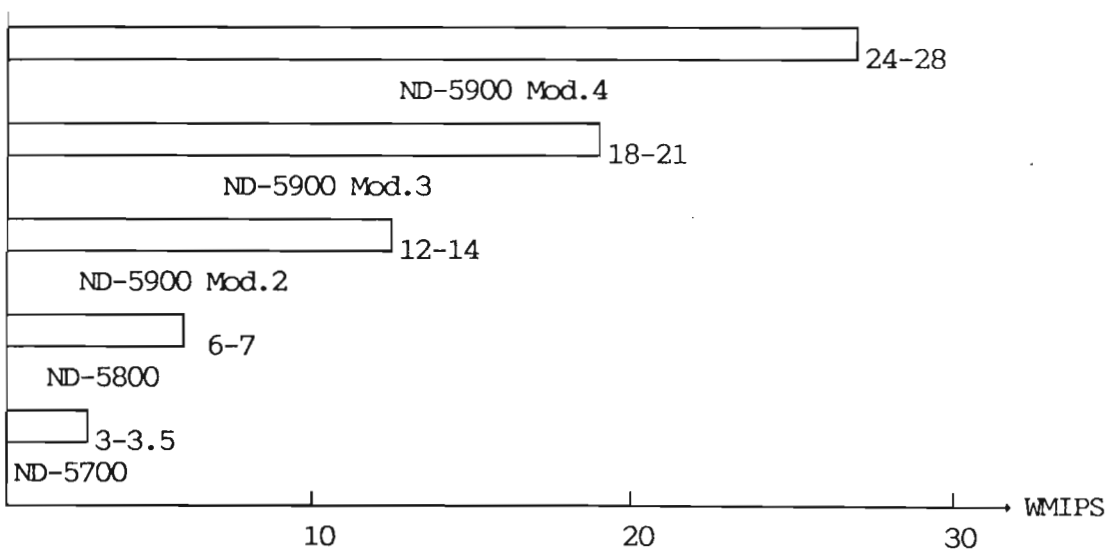
## 3.2 Relative ADP

In the following diagram the expected relative performance of the various models of the ND-5000 series when running a mix of typical ADP jobs is given. The ND-100/CX processor is used as reference.




## 3.3 Whetstone ratings

These are the expected Whetstone ratings without optimized Fortran.




ND-5900 should be used in connection with CPU-heavy environment such as: compilation, text formatting, calculations. SIBAS may run in all CPU´s and SINTRAN will have a CPU scheduler so that the users don´t

have to choose the CPU.

### 3.4 Numbers of users supported

The following table shows the number of users supported on each machine when running typical ADP/OA applications. The figures are not the maximum number of physically connected terminals, but rather the number of users running simultaneously on each system with acceptable response time.

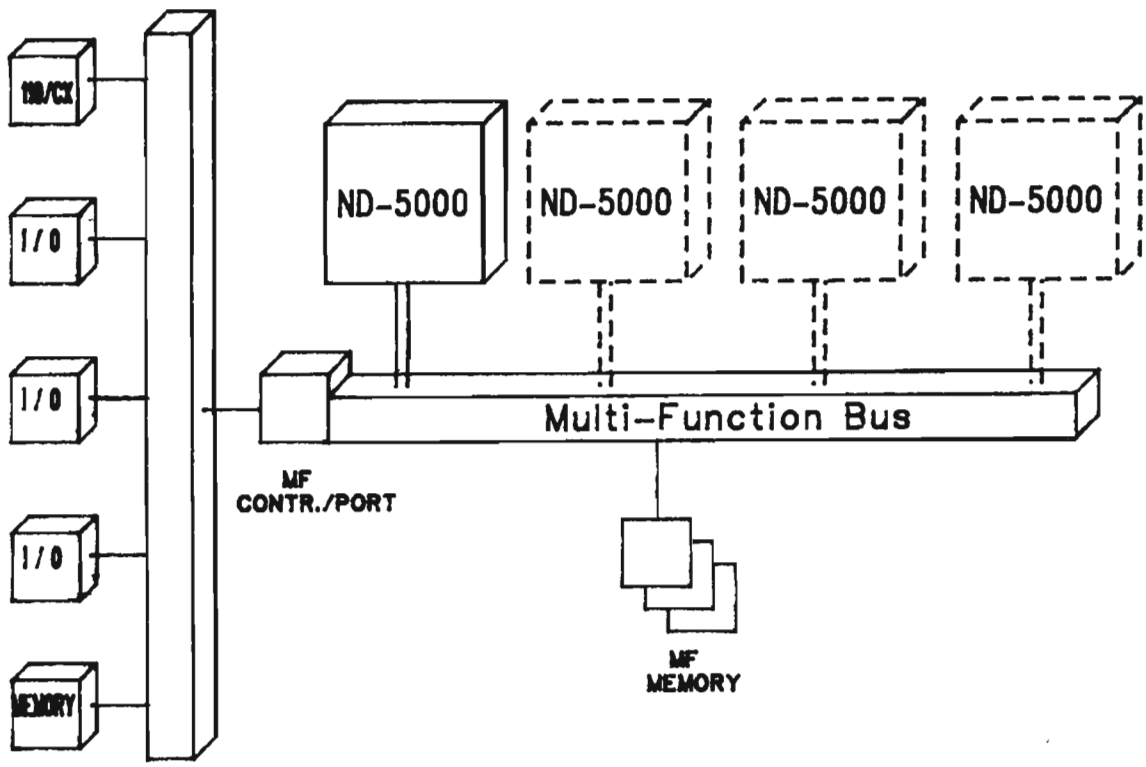
| System | ADP/OA | WMIPS | No. of users |
|---|---|---|---|
| 510/CX | 1.0 | 0.4 | 12-14 |
| 530/CX | 1.6 | 0.6 | 19-22 |
| 550/CX | 2.1 | 1.2 | 28-32 |
| 560/CX | 3.8 | 2.1 | 46-53 |
| 570/CX | 5.9 | 3.2 | 71-83 |
| 5700 | 6.2 | | 75-87 |
| 5800 | 7.4 | | 89-104 (25% more than 570/CX) |

## 4. SYSTEM ARCHITECTURE

ND-5000 series run the ND-500 instruction set and have the same logical architecture as ND-500 systems. The physical implementation of the ND-5000 CPU is completly different from earlier systems.

The memory system is now based on the 'Multi Function Bus System' (MF Bus system). It is basically the same as the MPM-5 system, but with some extra features to support the Octobus, the bus system for high speed system command transfer.

New technology is used in several areas. The ND-5000 has 11 gate-arrays ( semi custom VLSI ) and the RAM capacity is expanded 16 times on the same space. The power consumption is reduced by a factor of 5, due to extensive use of CMOS technology.



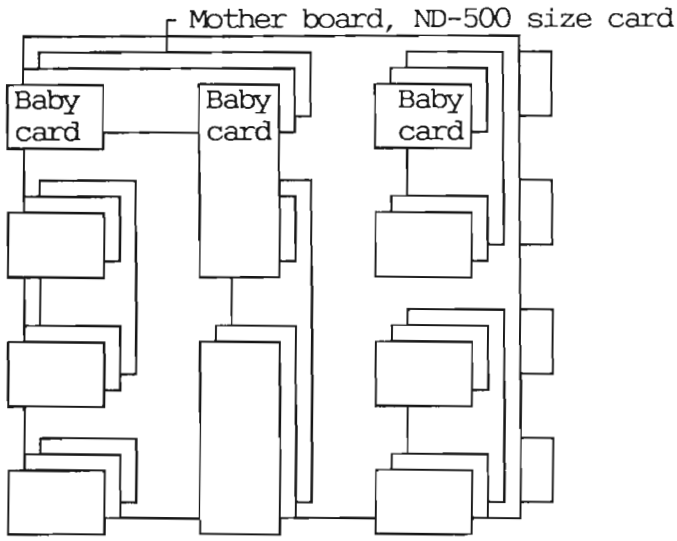

LOGICAL BLOCK DIAGRAM

### 4.1 CPU card layout

The gate array technology used in the ND-5000 CPU allows for more compact packaging of the system. The ND-5000 CPU consists of only one board (ND-500 size), called mother board and a series of small modules, called baby modules, that are placed on top of the mother board. The gate array chips are then placed on top of the baby modules. This new packaging allows for more compact systems and reduces the number of cabinets in a high-end system to one cabinet.

The ND-5000 CPU size is 1/6 of the ND-500 CPU and occupies four positions on a CPU rack.

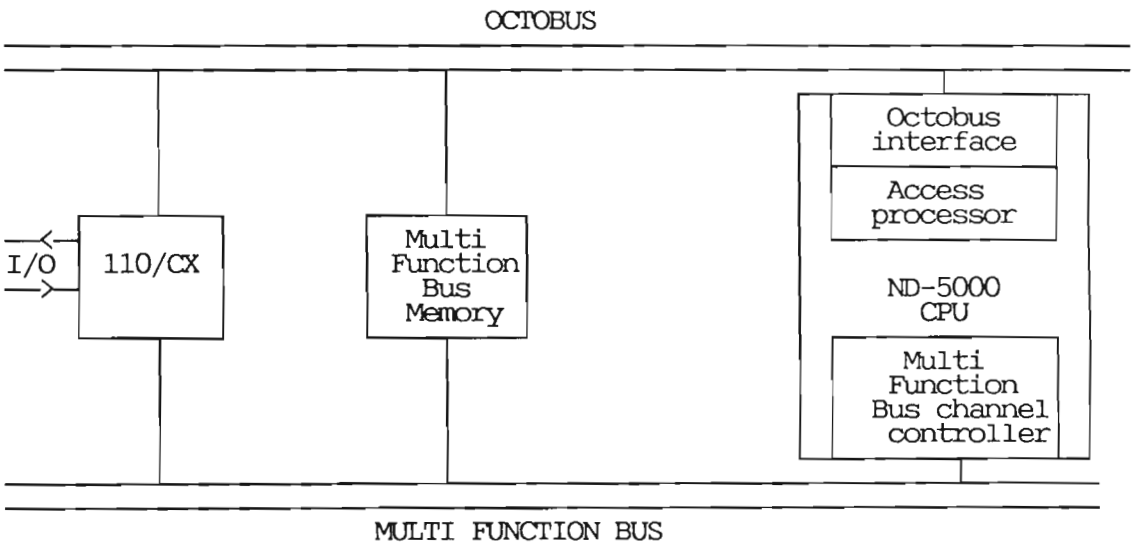
ND-5000 logical CPU card layout:




The microprogram is new compared to ND-500/1 and ND-500/2. There is larger RAM for microprogram expansion, can be extended to 64 Kwords. (standard is 16 Kwords)

## 4.2 Multi Function Bus System

The Multi Function Bus System is the follow-up to the MPM-5 system. MFB is basically the same as the MPM-5 system, but has some additional features for supporting the Octobus. Octobus is a new high-speed serial command bus used for efficient internal system signal/command transfer. The Octobus is physically implemented in the backwiring. Present MPM-5 memory modules can be used with the ND-5000 systems.




## 4.3 I/O processor

The ND-5000 series uses the well proven ND-110/CX CPU as I/O processor, providing our customers with a low risk I/O system. This means that present peripheral equipment can be connected to ND-5000 systems.

The ND-110/CX CPU also employs the same CMOS gate array technology which is implemented in the ND-5000 CPU.

## 5. COMPETETIVE POSITIONING

Here we have listed some of our major competitors.

| | HP - 3000 70 | HP- ** 3000 930 | HP- ** 3000 950 | VAX- 8200 | VAX- 8300 @ | VAX- 8500 | VAX- 8550 @ |
|---|---|---|---|---|---|---|---|
| Whetstone MIPS | 1.8 | 4.5 | 6.7 | 1.1 | 1.9 | 3 | 6.8 |
| Standard memory config. | 8 MByte | 16 MByte | | 8 MByte | 12 MByte | 20 Mbyte | 20 MByte |
| Memory range | | 16-24 MByte | | 8-24 MByte | 12-24 MByte | 20-80 MByte | 20-80 MByte |
| Maximum disk storage | | 9.7 | | 3.6 GByte | 1.8 GByte | 5.4 GByte | 7.2 GByte |
| Maximum numb.of W.S. | | 400 | | 64 | 64 | 200 | 320 |

| | PRIME 9750 | PRIME 9950 | PRIME 9955 | VAX- 8600 | VAX- 8650 @ | VAX- 8700 | VAX- 8800 @ |
|---|---|---|---|---|---|---|---|
| Whetstone MIPS | 1.7 | 2.5 | 4 | 4.4 | 6.8 | 6.8 | 11 |
| Standard memory config. | 2 MByte | 4 MByte | 16 MByte | 32 MByte | 16 MByte | 32 MByte | 32 MByte |
| Memory range | 2-8 MByte | 4-12 MByte | 4-16 MByte | 8-68 MByte | 16-68 MByte | 32-128 MByte | 32-128 MByte |
| Maximum disk storage | 10 Gbyte | 10 GByte | 10 GByte | 5.4 GByte | 5.4 GByte | 5.4 GByte | 7.2 GByte |
| Maximum numb.of W.S. | 254 | 254 | 254 | 256 | 256 | 320 | 256 |

| | IBM- 4381-12 | IBM- 4381-13 | IBM- 4381-14 | IBM*** 9373-20 | IBM*** 9373-40 | IBM*** 9373-60 | IBM*** 9373-90 |
|---|---|---|---|---|---|---|---|
| Whetstone MIPS | 2.7 | 3.5 | 6 | 0.5 | 0.5 | 1.3 | 2.6 |
| Standard memory config. | 8 MByte | 8 MByte | 16 MByte | 4 MByte | 8 Mbyte | 8 MByte | 8 MByte |
| Memory range | 8-32 MByte | 8-32 MByte | 16-32 MByte | 4-16 MByte | 8-16 MByte | 8-16 MByte | 8-16 MByte |
| Maximum disk storage | 1935 GByte | 2903 GByte | 5160 GByte | 6.5 GByte | 13.2 GByte | 13.2 GByte | 39.6 GByte |
| Maximum numb.of W.S. | 1024 | 1024 | 1024 | 64 | 192 | 192 | 384 |

| | WANG VS 100 | WANG VS 200 | ND-5700 | ND-5800 | ND-5900 Mod. 2 | ND-5900 Mod. 3 | ND-5900 Mod. 4 |
|---|---|---|---|---|---|---|---|
| Whetstone MIPS | 1.3 | 3.3 | 3-3.5 | 6-7 | 12-14 | 18-21 | 24-28 |
| Standard memory config. | 2 MByte | 8 MByte | 10 MByte | 20 MByte | 20 MByte | 20 MByte | 20 MByte |
| Memory range | 2-8 MByte | 4-16 MByte | 20-512* MByte | 20-512* MByte | 20-512* MByte | 20-512* MByte | 20-512* MByte |
| Maximum disk storage | 10 Gbyte | 20 GByte | 29 Gbyte | 29 GByte | 29 GByte | 29 GByte | 29 GByte |
| Maximum numb.of W.S. | 128 | 192 | 256 | 256 | 256 | 256 | 256 |

* With I/O Expansion Cabinet

** The HP SPECTRUM series, 930 and 950, are delayed and will not be available before 2H. 1987.

*** The IBM 9370 series will not be availale before 2-4 Q. 1987.

@ Not upgradeable.

## 6. MARKET POSSIBILITIES

The ND-5000 series provide sales opportunities for both existing customers and potential customers.

With regards to the existing customer-base there are in excess of 10 000 ND systems installed and considerably more users. For these customers, the ND-5000 series represent an upward growth- path for their existing applications. For ND the ND-5000 series represent a means of protecting our customer base from the competitors at the high end.

The ND-5000 systems give us the opportunity to approach our prospects with the price/performance winner in its class and they offer evidence of ND's commitment to the SAFE consept.

### 6.1 Features and benefits

The following points are meant as suggestions and ideas that should be considered and prepared in more detail related to the specific customer situation. Features marked with * denote new selling points, or selling points with increased strength.

If our assumptions are correct, the target group is clearly identifiable, hence a directly addressed campaign could be considered. We feel that by arranging a press-conference we can reach both the decision makers and those influencing the decision. The decision-makers could probably be reached by business magazines and newspapers, and the decision influencers by computer magazines and newspapers.

| Feature | Management<br>Decision makers. | Data-proffessionals<br>Influencing the decision. |
|---|---|---|
| * Price/Performance Winner. | Effective investment. | More performance on the same budget. |
| SW compatibility. | Investment protection. | Use present applications and third-party SW. |
| * Enhanced performance. | Better value for money and more productivity. | Faster job turnaround and/or more users. |
| Low power requirements. | Environmentally efficient. | Avoid major electrical and cooling requirements. |
| * ND-500 footprint. | Cost avoidance. | No new computer room. |
| * Availability | Painless. | Easy service and higher uptime. |
| Network system | Effective investement. | Easy growth and flexibility. |

| | | |
|---|---|---|
| 4. generation programming language. | Open new areas. | Independent and effective system-development. |
| It is from Norsk Data. | Reputable vendor. | Full service and support. |
| Member of the ND-SAFE concept. | Investment protection. | Flexible growth. |

## 6.2 Main areas of use

The following target-groups/markets are identified by their use of applications with a high need for CPU-power. Those target-groups/markets that use large databases will strongly benefit from the new version of SIBAS planned to be released in mid. 1987, still they will be able to run more users at present on the same database.

We also know that future SW will increase the "main" (5000) CPU-load due to the demand for increased functionality. Future SW will also reduce the CPU-load on the ND-100 part of the system, still it is important to notice that the ND-100 CPU must not be a bottleneck for the below mentioned target groups.

### 6.2.1 Industrial Market

Industry serial/mass production.

Typical number of connected users will be more than 100.
Typical appl. area :
- MPS
  (Material planning system, production planning)
- customer database
- orders, invoice, account ledgers
- pay-roll and accounts
- CAP( computer aided publishing )
- 4. generation tools

Industry / mechanical production.

Typical appl. area :
- CAD/CAM
- Finite Element Method
- MPS
- Project management
- 4. generation tools

### 6.2.2 Public Sector

Needs reliable systems with high up-time.

Typical users:
- travel agencies
- hospitals
  - MPS
- libraries
- other public service institutions

Typical appl. area : - information/service databases
- dial-up databases

### 6.2.3 Service industry

- "mail order companies"
- MPS
- order/invoice
- customer database
- budget-planning
- CAP

### 6.2.4 Bank/Finance/Insurance

- Information databases
- Decision support systems
- Economical models
- Technical acount

### 6.2.5 Research Market

- simulation
- mathematical and economical models
- program-development
- information databases
- artificial inteligence/expert systems

### 6.2.6 Defence Market

- simulation
- MPS
- information databases
- artificial inteligence/pattern recognition

### 6.2.7 Surveilance/process control

- road traffic
- railroad traffic
- air traffic
- power plants
- process control
- decision support

# 7. GENERAL INFORMATION

## 7.1 Release/Delivery times

Corporate External release is set for the 27. January 1987.

First delivery is expected in 2. quarter of 1987 ~~and then the ND-570/CX will be phased out.~~

## 7.2 Maintenance

The maintenance policy follows our "general" policy but it is important to impress the following :

"Telefix including the modem must be delivered and installed as part of the standard delivery, otherwise the customer cannot expect to receive the promised level of service and maintenance."

Better availability is obtained due to higher MTBF which in turn is a consequence of very low component count and compact packaging. Also we can expect less downtime due to:

- Accomodation of the CPU on one large module that can be quickly exchanged in the field.
- All modules are plugable including power supplies.
- Extremely good "on-board" trace facilities ensure availability of detailed information if an error situation should occur. This can easily be monitored/analized via Telefix to swiftly pinpoint the problem.

## 7.3 Material available

-Brochure
ND-5000 series

-Datasheet
ND-5000 Computer Systems

-Foils
Set of foils for ND-5000 series.

-Manuals
ND-500 Reference Manual
ND-5000 Hardware Description
ND-5000 Microprogram Guide
ND-5000 Microtest Program Description
ND-5000 Macrotest Program Description
ND-5000 Hardware Maintenance
ND-5000 Operator Guide

-Press Release
New High-End Series from Norsk Data

Corporate Marketing
December 1986


Otto Falch Hurtigtrykk