



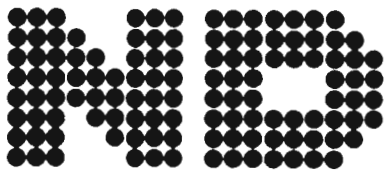
Norsk Data

# NEWS

No. 3, 1981







# NEWS

No. 3, 1981

Published by Norsk Data A.S  
Jerikoveien 20, Oslo 10  
Tel. (02) 30 90 30

## EDITORS

Bjørn Boberg  
Trond Håberget

Printed by  
Aktietrykkeriet - Oslo

## CONTENTS

The stockprice development at Norsk Data .....	2
What are the plans of ND Comtec? .....	3
Sarpsborg Arbeiderblad: From foundry type direct to computerized offset production	4
Rogaland County Research Foundation .....	7
KemaData .....	10
Computer technology for the office of the future. By Tor Olav Steine, Norsk Data .....	12
«News» .....	14

## COVER



Effective production of newspapers at Sarpsborg Arbeiderblad by the help of advanced equipment from ND Comtec. (Photo: D. Rørslett/Presse & Informasjon).

## The stockprice development at Norsk Data

At the end of April 1981, Norsk Data had 1160 stockholders. The stocks are listed on the Oslo Stock Exchange, and there is currently an application on file to have the stocks listed on the London Stock Exchange. The value of a share of Norsk Data has risen from NOK 33,— in January, 1980 to an all-time high of NOK 800,— in May, 1981. This sharp rise in value is related to the company's profitable operations in 1980, together with an expansion of the stock capital.

At the annual stockholders meeting of April 27, 1981 it was decided to double stock capital from NOK 22.76 to NOK 45.52 million, with the issue of one new free share for each old share. Further, the stock capital will be increased by fifty percent during the summer of 1981 — to NOK 68.28 million by payments from stockholders.

Nearly 600 of the company's 800 employees are stockholders, representing seventeen percent of the stock capital. During the past few years, Norsk Data has had a much stronger growth than is usual for the rest of Norwegian industry, and the purpose of the application for listing on the London Stock Exchange is to strengthen the firm's capital financing possibilities in the future.

## After the merger of Comtec and Nortext:

# What are the plans of ND Comtec?

Norsk Data is expanding at a tremendous rate — also in the area of word processing equipment for the printing industry.

Following the merger of Comtec and ND Nortext in January 1981, the new company ND Comtec — a division of Norsk Data — has increased several times the number of its employees and its prospects of establishing a considerably broader market both in and outside Scandinavia.

ND-News asks Lars Petter Skou, the Manager of ND Comtec:

— This kind of expansion imposes major responsibilities. What are your plans for the future?

— First of all we intend to consolidate our position. As a result of the merger, ND Comtec has a new and far larger organization and a combination of products which will have to be coordinated. This cannot of course be done overnight, and therefore we intend to expand our markets and our products at a controlled rate.

ND Comtec wants to gain a strong foothold in already established markets, such as Norway, Sweden, Denmark, Finland, West Germany, Austria, Switzerland and Italy — we have no plans to expand beyond these countries in the short term.

In the longer term it is our not-so-modest aim to become Europe's largest supplier of computer based production systems for the printing industry.

— How do you intend to do this, in all modesty?

— Backed by Norsk Data, new products and an expansion of the existing markets of the former Comtec and Nortext.

— You mention new products, which ones?

— For 1981 it is chiefly Nortext II, a new word processing system for newspapers and printers, with better performance and operation. Then I should mention the screen terminal



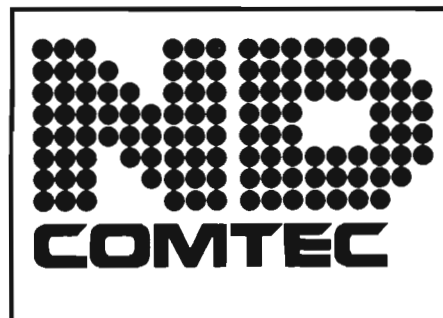
Lars Petter Skou, manager of ND Comtec, sitting by the new TET (Text-Editing-Terminal). (Photo: D. Rørslett/Presse & Informasjon).

TET (Text - Editing - Terminal) based on the new Tandberg screen TDV 2200, then new word processing systems for the production of mathematical equations, systems for receiving and invoicing advertisements and a subscription and distribution system

for newspapers. Among other novelties that will be launched in 1981 I mention editorial word systems connected to copysearch-systems (newspaper cuttings) and a book makeup system for printing establishments. We are also working on new connection types for still more advanced terminals.

— How have the finances developed after the merger?

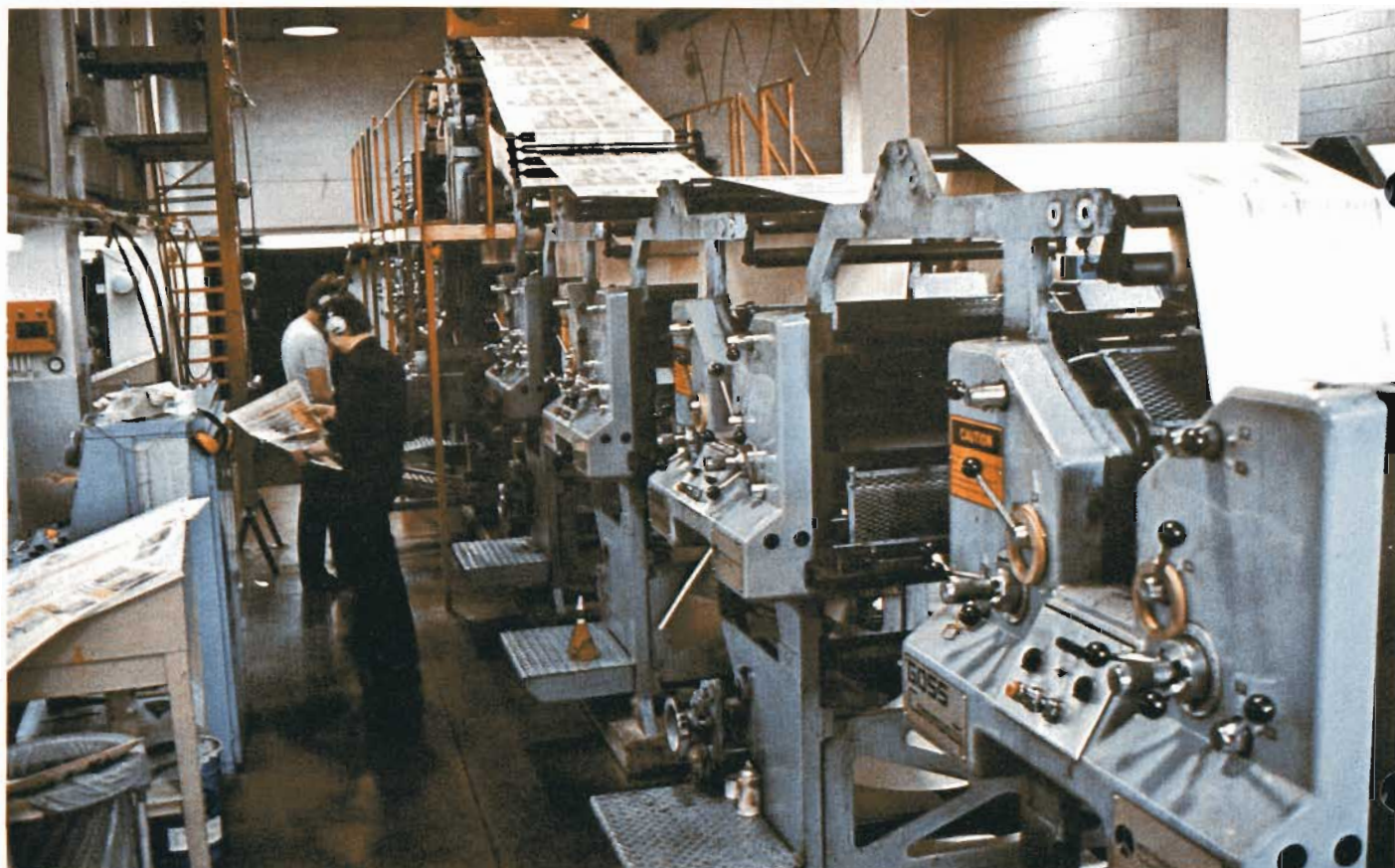
— Developments so far are very positive. The organization is working well in all markets. I am particularly satisfied with our continued ability to take good care of Comtec's former customers. Orders received so far this year are above the budgeted figure. We are quite satisfied, says Lars Petter Skou of ND Comtec.





## Strong local newspaper - Sarpsborg Arbeiderblad:

# From foundry type direct to computerized offset production



A modern offset printing press makes up an essential part of Sarpsborg Arbeiderblad's undertakings.

Many local newspapers in Norway are small and financially ailing. Sarpsborg Arbeiderblad — SA — is one of the exceptions which confirms that it is possible to operate a local paper profitably, *without* any kind of government support.

The No. 1 paper in the Sarpsborg region, SA, is published daily in 15,000 copies (therefore no government support). The publishers built a new house in 1976, printing three newspapers daily (Østfold-Posten and Demokraten besides SA) in a total of 30,000 copies. Furthermore, Sarpsborg Arbeiderblad took five years ago the

step direct from foundry typesetting to Nortext computerized word processing and offset newspaper production. A transition which is not only unique in the Norwegian press, but which in fact took only one week to complete, including evening classes working with computer screens, training in the operation of the computer system and the running-in of a new offset press.

### COOPERATION AND COMPUTER TECHNOLOGY YIELD RESULTS

Ever since it was started in 1929, SA

has overcome its problems by special exertion and cooperation. From the moment the «Newspaper Committee» decided to start operations until the newspaper was on the street, it took for example only two months, and this at the very beginning of the recession of the 1930s.

Already in the first years the operation returned a profit, and thanks to the assistance of the Labour Party press central fund, SA was able gradually to purchase increasingly modern equipment — and thus improve the business. Cooperation in the Labour Party press is today an increasingly impor-



Specialized screen terminals are used for text-editing.

tant factor in the development of the individual paper and the party press in general. When SA built its new house in 1976 and made the sudden switch to computerized offset newspaper production, various Labour Party organizations backed it technically and financially.

The head of SA's technical department, Asbjørn Helmer Olsen, says however that the fairly smooth switch to offset production was due primarily to the team spirit and efforts of the employees themselves. None of the typesetters or printers had any practical experience with offset, none had

worked with offset reproduction before and none knew about computerized typesetting. But a one-week touch typing course at the Labour Party Training Center and a corresponding short computer training program at Norsk Data in the evenings gave the necessary basic qualifications.

**ND EQUIPMENT HIGHLY RELIABLE — THE ECONOMY OF THE «SINGLE-SYSTEM» FOR SMALL NEWSPAPERS?**

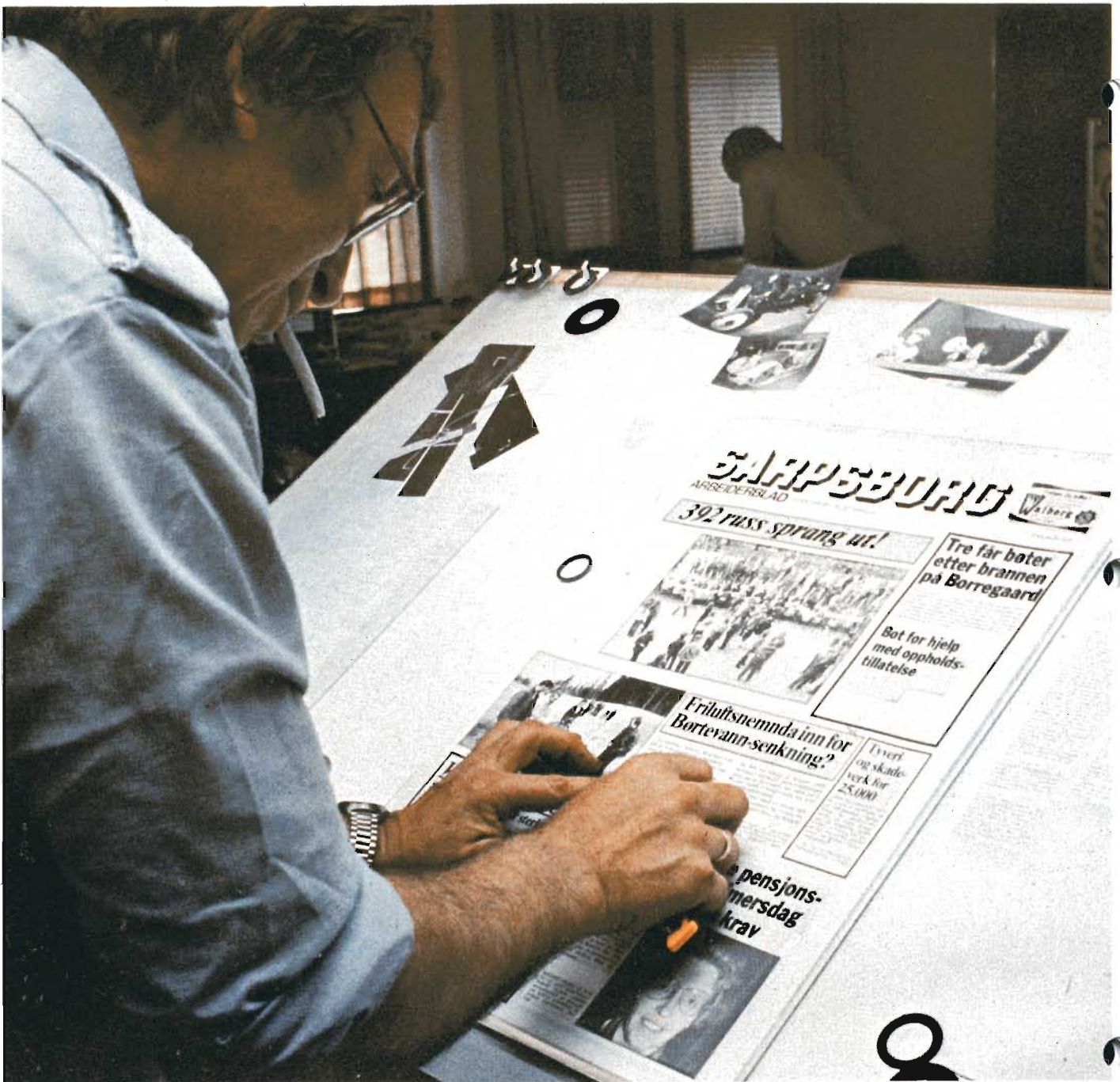
The transition to computerized offset was so smooth that Sarpborg Ar-

beiderblad was able at the same time to increase its circulation and double the number of pages, besides undertaking the production of two other newspapers.

SA is a self-financing local newspaper with annual revenues of NOK 30 million which will increase with additional printing business next year, 115 full-time employees of whom 32 in the technical department, 25 in the editorial and the rest in the administration including sales and advertising departments. In addition, its distribution personnel numbers 200.

The newspaper is still using its Nor-





A front-page of Sarpsborg Arbeiderblad under production.

text I system with a single Nord 10 (80K) dating from the autumn of 1976. Besides the control unit, the system consists of one punched tape reader for recording copy from the perforators, four screen terminals for correcting and adjusting the copy, two on-line photosetters and two printers for proof and editing respectively. The system is connected directly with the principal news agencies.

Helmer Olsen is very satisfied with the ease of operation of the system and the reliability of the CPU. The very few breakdowns that have occurred have been due to voltage drops or lightning

leading to short-circuiting and burnt cards.

Today the capacity of the word processing system and photosetting system is over-burdened, because SA receives from the news agencies a stream of information which has to be continuously stored in addition to SA's own editorial copy. The problem is solved by keeping the storage time to a minimum — everything that can be run out on floppy disks or deleted is withdrawn as rapidly as possible.

Helmer Olsen says that the long term solution is a dual system and photosetter with greater capacity (this last unit has already been ordered). But

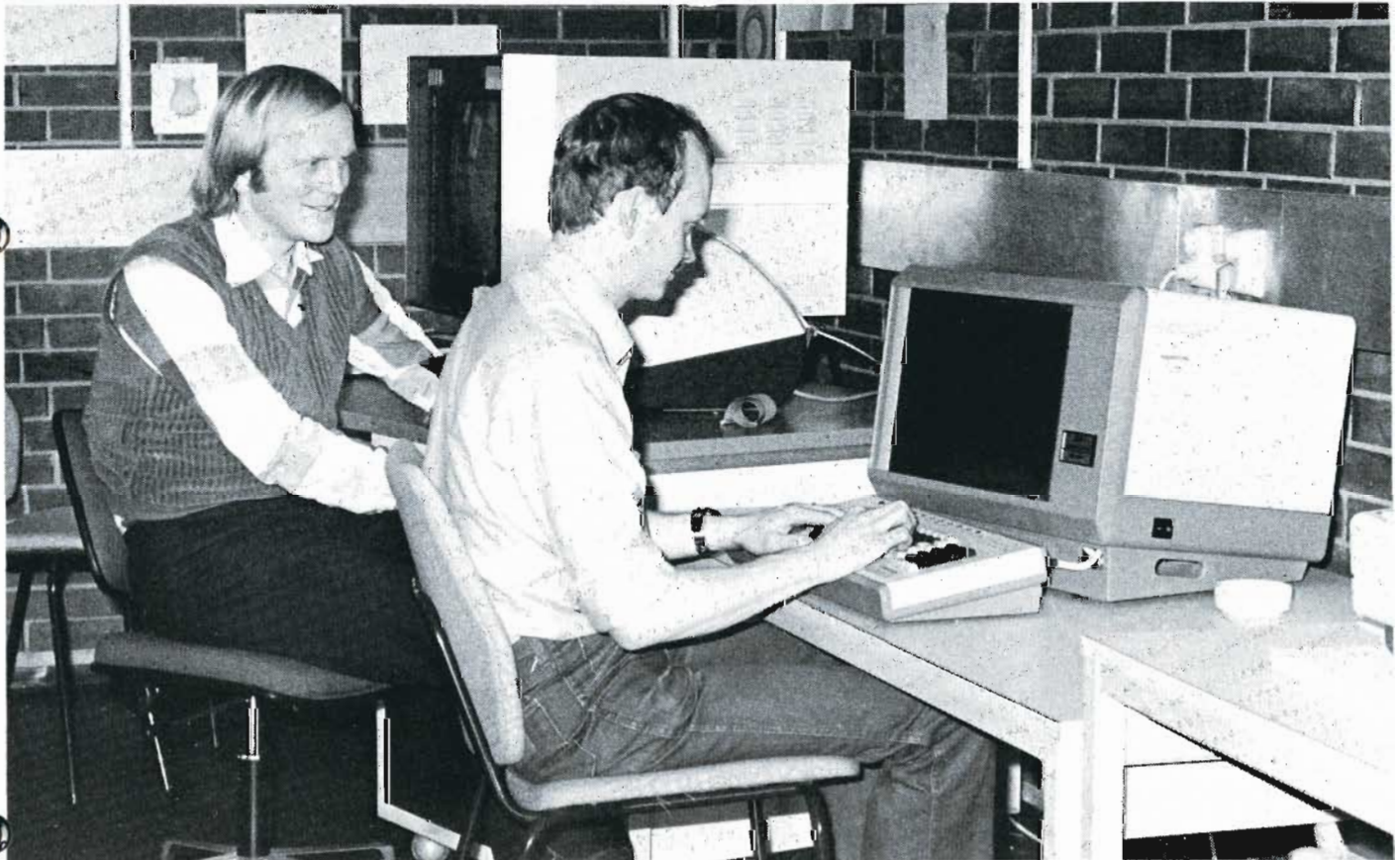
he adds that for SA the system of one CPU has made economic sense. This should be noted by other small local newspapers with modest typesetting needs, he says.

Finally Asbjørn Helmer Olsen mentions that SA will be procuring new Tandberg TDV terminals for word editing, and that he has great expectations to ND Comtec's new Nortext II system: new operating routines, greater efficiency and capacity, simplified erasing of copy and an improved advertisement sorting system.



**ND machines used for many major research projects**

## **Rogaland County Research Foundation**



**Tore K. Alfsen and Kjell Eide of the computer department at Rogalandsforskning by one of the ND-terminals.**

The Rogaland County Research Foundation was established 1973 by the County of Rogaland. Its purpose is to conduct, promote and coordinate research in Rogaland County. The research will center on the county's social, industrial and cultural life and will employ the professional competence available in the county.

The Reserach Foundation is located in the Ullandhaug Regional College on the outskirts of Stavanger. It cooperates closely with the college in the form of a fruitful exchange of human competence and technical equipment. By undertaking projects for major industrial clients, such as

the oil companies, the Foundation develops a competence which can benefit also smaller local industry.

The 70 employees of the Foundation form now four groups: one for petroleum research, one for data processing, one for industrial automation and one for social subjects. The petroleum research is in turn split into two fields: reservoir simulation on one hand and drilling and production on the other.

### **ND COMPUTERS FOR ASSIGNMENTS IN MANY AREAS**

When ND-news recently visited the

Rogaland County Reserach Foundation, we were met by Mr Tore K. Alfsen, head of the data processing department. At present the organization has available an NORD-10, and NORD-10/S, an NORD-50 and an ND-100, quite a gathering of ND machines in the buildings at Ullandhaug. The data processing department is of course the major user of the ND computers' capacity, which is however also widely used by the group studying oil reservoirs. The department for industrial automation employs mainly micro-machines. For the social subjects, a good deal of statistics are run on the ND computers, and the sec-

retarial staff of the Foundation use the NOTIS word processing system in their work.

As for the respective applications of the ND-computers, the general arrangement at present is that the ND-100 is allocated for student use, the NORD-50 and NORD-10/S are used in the project work, while the older NORD-10 handles communications. The main lines of communication run between the ND machines, besides which a line goes to Rogaland Data's big IBM 3033.

#### **DATA PROCESSING DEPARTMENT**

The department for data processing has at present nine employees, split into three units for information systems, graphic data processing and computer systems respectively.

The work on projects comprising interactive information systems involves information analysis, system specification and development of interactive, database oriented information systems, mainly for technical applications. For this purpose the group employs Norsk Data's SIBAS.

The group which employs graphic data processing as their main area are studying graphic equipment, technologies for graphic presentation and the development of systems centering on graphic presentation.

Computer systems indicate the area of responsibility of the group which studies programming techniques, system evaluation and the development of machine-related systems, e.g. system software, microprocessor programs and control programs.

#### **SOME OF THE PROJECTS**

The Foundation's staff are very active in many areas, and it is not easy to pick out any individual projects which

deserve special mention among all the activities at Ullandhaug.

#### **GOVERNMENT PROPERTY REGISTER**

The Ministry for the Environment has financed projects to develop a prototype computer system for the registration, storage, processing and presentation of property-related information of interest in government planning and administration. By means of this system the users may, in direct communication with the system, obtain presentations of map data and conventional data for desired areas and on desired subjects in graphic and/or verbal form.

#### **SYSTEM FOR DATA REGISTRATION**

On assignment from Norsk Data, the Rogaland County Research Foundation is developing a special system for data registration. It is based on Norsk Data's screen handling systems and database handling and is designed for use as the standard system for the ND-100 machines.

#### **PROJECTS IN COOPERATION WITH THE NORWEGIAN PETROLEUM DIRECTORATE**

A computer system for processing and presentation of data from daily drilling reports has been developed. The system permits search for information by different criteria, comparison of plans with actual developments, and various kinds of analyses. Another assignment calls for the development of a system to process the monthly production reports from the North Sea. After being interpreted

and corrected the reports are to be entered in a database from which the users can take out reports and individual data on screen and/or paper.

Geological and seismic information from the North Sea has to be stored in easily accessible form. Through a project for an interactive computer system such information on the continental shelf can be presented on screen or in the form of lists or graphic images. The entered data are digitalized well-logs, data from seismic surveys, geological information and interpretation data. Prototypes of these newly developed systems are now going to be tested in the Norwegian Petroleum Directorate.

#### **RESERVOIR SIMULATION**

Simulators are being increasingly used for studies of complex processes. In this type of reservoir simulation, the effects of various production strategies can be studied.

Previously, this kind of reservoir simulation could be carried out only in the largest computers. The Rogaland County Research Foundation has pioneered the development of simulation techniques in minicomputers, which can simulate parts of the reservoir and also undertake major field studies. In cooperation with Phillips Petroleum, the Foundation is for example simulating water injection in an oil field to study its effects.

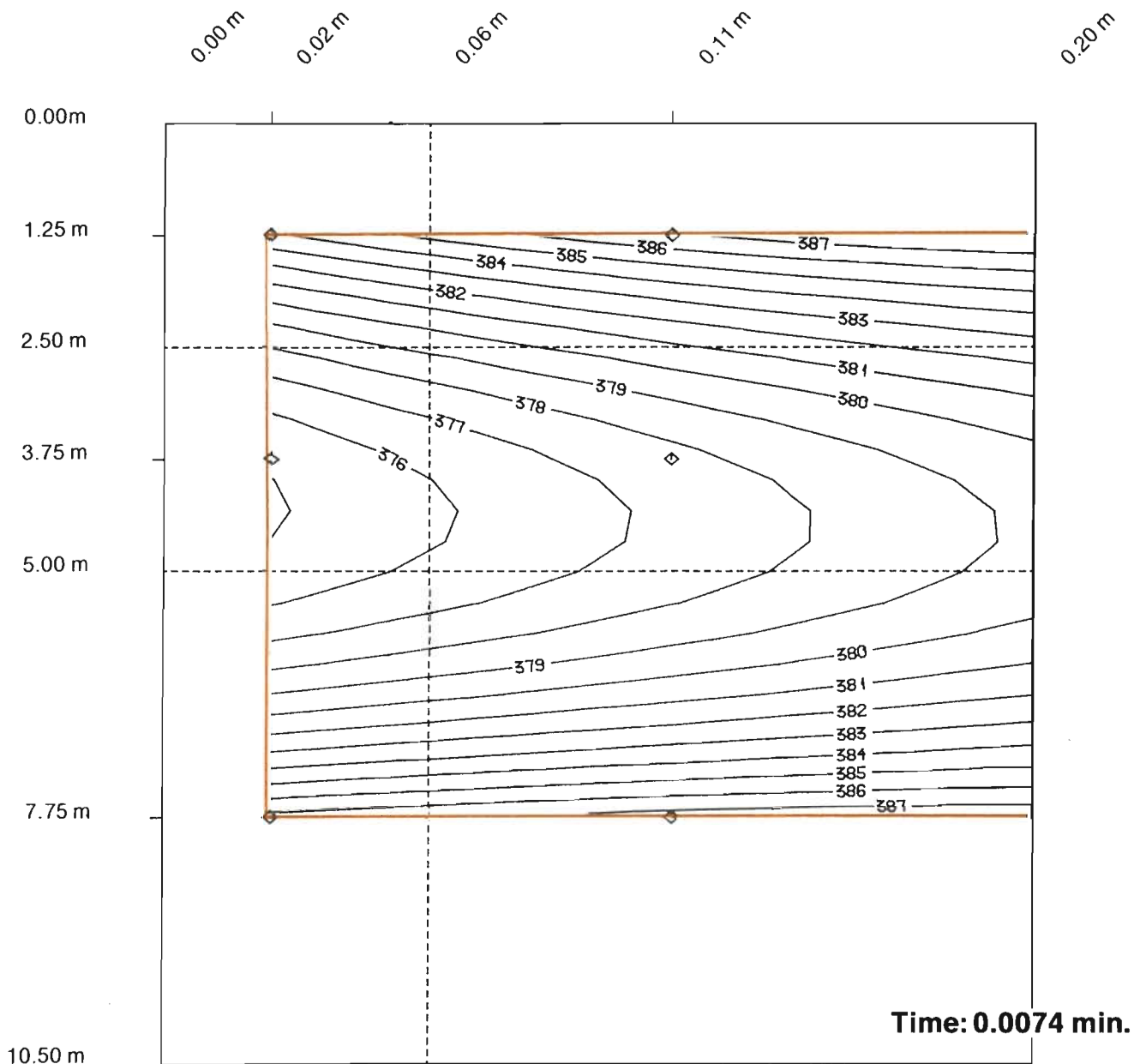
#### **NEW ND-500 ON ITS WAY**

The Foundation has already ordered an ND-500 for delivery in the late summer of 1981. The research staff are looking forward to taking delivery of the machine, as they are increasingly in need of computer power to handle the many projects and assignments that are waiting to be solved.



# Iso-curves, oil pressure (bar).

# Numeric well-test simulator.



Time: 0.0074 min.

The drawing shows an example of a numerical well test simulator produced by computer. The curves are drawn through points at different depths with equal oil pressure.

# In-house company for data processing services

KemaNobel is Sweden's largest group of companies in the chemical sector. The company has operations in some 20 countries, and has around 7,500 employees. In 1979 the group's turnover amounted to SEK 3.2 billion. The activities are concentrated in three principal fields:

- heavy basic chemicals for a variety of industries, including pulp and plastics
- advanced performance chemicals, and
- consumer goods, principally household chemical products.

Performance chemicals are products which perform a specific function in a process, e.g. adhesives for joining materials, or explosives for rock-blasting. These products are often supplied as components in a total system which includes know-how and service.

KemaNobel has a decentralized organizational structure in which development and profitability are key objectives. The business activities are divided among a number of companies and divisions, each of which has its own profit responsibility.

The business units are co-ordinated and controlled by the group chief executive, Ove Sundberg, who is supported by a staff of specialists in business development, finance, financing and other areas of business management.

The companies and divisions in the group are served by a number of common specialist services organized in Group Central Services. These include, for example, laboratories, library, data processing and systems development.

Data processing and systems development are provided by the wholly-owned subsidiary KemaData. Göran Carlsson, managing director of KemaData, is also the group's head of data processing.

It is many years ago now since the headline «Computers have come to stay» first appeared.

But to many people data processing

technology still seems rather terrifying and mysterious. Some of them are quite simply afraid that computers will take over their jobs. This is true of private individuals as well as trade unions.

Dispensing the fog of ignorance and mystery that surrounds the idea of data processing ought to be one of the data processing industry's principal tasks in the nineteen-eighties.

This can be done by decentralized data processing power and involving the actual users of the system in particular at an early stage. KemaData which is responsible for the development of data processing systems and the processing of data gathered in the KemaNobel group, is also moving in the direction of decentralized data processing.

KemaData has the further function of developing, selling and serving decentralized data processing systems within the group and its associate companies. Eventually these new systems will be based upon ND-100 mini-computers from Norsk Data.

KemaData have developed complete mini-computer systems for order, processing, inventory control and purchasing. So far five such systems are in operation.

The system that is now operating in Ljungaverk, Stockvik, Stenungsund and Stidsvig, is called MARIA — MATERIAL — a purchasing administration system, which has replaced the company's already computerized inventory control and bookkeeping system. Plans are to transfer the MARIA system onto the ND-100.

Decentralized computer power, as in the MARIA system, calls for a high level of training and involvement on the part of the people who will be the final users of the system. It is very important, in the view of KemaData, that the final user is brought in from the very start when a new computer system is being developed and tested. Developing and installing systems is one thing, they say, but adapting the systems and work procedures to the people who will have to use them is quite a different kettle of fish.

This was what they bore in mind when they selected their computer supplier. In the opinion of KemaData, it is a matter of utilizing the fact that the cost of computer hardware has come down to such a level that it is perfectly feasible to build up sufficient computer capacity to make it possible to adapt the systems to the people/users instead of the people to the computers.

The MARIA system is based on the idea of decentralization, and on the willingness to distribute computer power to the final user. MARIA can handle inventory control, order processing and print outs, delivery follow-up, and invoice checking.

All communication with the computer is by means of a visual display terminal, and the system is built up around a mainframe computer in Stockvik that serves Stockviksverken and Ljungaverk, one in Stenungsund and one in Stidsvig. The information produced by the MARIA system, which is to be processed in an accounting system, is transmitted to KemaData in Stockholm via the public telephone network.

Centrally KemaData has installed a large mainframe computer.

The purpose of installing the MARIA system is for it to improve the company's earnings by providing better and faster information about material status. This in turn means that less capital is tied up in inventories and less risk of possible breakdowns in the processes. In addition, the system makes it possible to cut the number of manual tasks, and also create the conditions where staffing levels can be reduced.

KemaData believes in having several computers. And preferably with a large number of mini-computers for further decentralization and adaption to the users of computer power. In a few years there will be computers installed at most workplaces in the group. They will handle all types of procedure, from administration to various kinds of process control.

The areas that KemaNobel has so far computerized in the administrative





**System analysts Kerstin Nyegårdh, Rune Fagerberg and Lars Karlsson at work by a screen terminal.**

field are order processing and purchasing/stores. In the future they could consider systems for machinery maintenance, production reporting, and some aspects of bookkeeping and payroll systems. After all, progress in data processing is moving so fast that tomorrow it will be quite feasible to use computers to simplify and improve procedures which it would currently be neither cost-effective or technically possible to computerize. When KemaNobel first took up the idea of installing a mini-computer based stores system it turned out to be both technically and economically impossible to implement. But now they have done it. The difference was six years' progress in data processing technology.

While developing its mini-computer systems, KemaNobel has made it a policy to increase the level of staff and final user influence. They have used decision-making groups, working groups and reference groups. Everybody involved got down to the problems and helped to solve them in close collaboration. It is important in this situation that everybody speaks

the same language.

Now they have moved a long way from the days when the systems designer locked himself in his room and developed a system which the user first saw when it was installed. By then it was high time to try to rectify the deficiencies in the system. Deficiencies like those can largely be eliminated with a training and decision-making program of the type KemaNobel used. Admittedly, they won't ever be completely eliminated, but if the final users of the system are involved from the very start a great many benefits can be achieved.

The major benefit at KemaNobel is that the often considerable practical experience of the user has been incorporated in the system and improved it. Another major benefit is that the users were prepared for the installation in good time and as a result of having contributed to the actual development work they felt themselves to share some of the responsibility and credit.

Currently a new system is being developed by KemaData, for use by

Casco, a member of the KemaNobel group. This system is also based on computers from Norsk Data, and in this case too it was decided to bring in the final users at an early stage in the planning.

Casco will use ND computers, and one of KemaNobel's basic conditions when selecting a supplier was that it should be simple to expand and reorganize the system should the need arise.

A «model» work-station has been constructed for training and system-testing. Various physical layouts for the work-station are here being tested as well as alternative systems designs. Final users can also be trained here and they can, at the same time, make constructive proposals for adapting the system and the work-station layout.

This is one step towards the final goal, which is for computers to be an integrated component, not only in people's jobs but also in their everyday lives. In this way the fog of mystery can be dispersed and fear of computers will become a superstition of the past.



# Computer technology for the office of the future



## OFFICE AUTOMATION AND INFORMATION PROCESSING

The concept of office automation seems at present to be generally related to equipment for word production, while the anticipation of reducing expenses seems to centre on efficiency measures and staff layoffs.

Office automation should be released from this kind of association, because the actual purpose is to provide the office functions with a new set of aids which *may* improve efficiency and productivity, but which may also help to *improve the working environment and the quality* of what we do.

These aids include systems for word processing as well as for more traditional data processing, which we can combine under the concept of information processing.

Information systems can be grouped by four main functions:

- Feeding the information
- Storage and retrieval of information
- Transfer of information
- Personal administration

Office systems of the future will involve direct access to all these functions from every work station.

We shall now look into the meaning of these key words, and the gains that can be attained when we look at office automation in an overall technical context.

## INFORMATION FEEDING

This function involves systems to facilitate entry and correction of words or data from a keyboard. Among traditional systems we have data entry systems, word processing systems, and dedicated online systems.

Several functions here can be automated, and lead to substantial savings and improved quality. Examples of automatic functions are validity control of entered data, automatic

page and chapter separation in a word processing system or verification against the database of data that are entered in an on-line system.

In such cases there is no doubt that gains can be anticipated in terms of productivity, quality and welfare.

The increase in productivity is debatable as long as the work involves simple letters or documents. At the Office Automation Conference in Atlanta, Georgia, in March 1980, it was claimed by some participants that a combination of ordinary typewriters, OCR equipment and WP equipment was the most efficient combination (the letters were written on ordinary typewriters and thereafter transferred to WP equipment via OCR machines for proof-reading!). There is, however, no doubt that productivity can be raised if one can benefit from functions such as standardization of letters, automatic preparation of contents and index, automatic chapter and page numbering, etc.

Improved quality can in particular be expected in connection with larger documents which are often altered. Examples of such documents are offers, specifications and memos. The improvement is an indirect result of the low threshold for carrying out even extensive changes in the documents. The quality is thus not impaired by any reluctance to make changes which could improve the appearance of the documents. The importance of this to the company's image can hardly be exaggerated.

The low alteration threshold and the automatic functions moreover release the secretaries from trivial work, making them more satisfied. Often the executive prefers to make the changes himself.

## INFORMATION STORAGE AND RETRIEVAL

When the word processing systems

arrived, attention centred on the reduction and improved efficiency of the efforts involved in the actual typing, while other functions were regarded as secondary or could not be performed by the supplied equipment.

The need to store the fed information is smaller where only letter writing is involved, unless it is desirable also to include the filing function, or prepare a broad range of standards for letters, offers, etc.

The opportunities for storage and retrieval in the pure word processing systems are therefore often limited to simple file systems, sometimes combined with personal files in the form of diskettes.

Functions involved in handling files as this is customarily understood by office staff, such as indexed references, organized by case, date, etc., are on the other hand still inadequately covered.

In order to derive full benefit from information fed into an office system, the information must be simply and quickly retrievable. Where the information is common to a company, a group, or an institution this can best be achieved by central or regional storage in a computer. During entry and correction, however, it is desirable to have local access to the information, and it is therefore often desirable also to have a combination of local and central/regional files.

This means that local branches or offices will have to employ some form of communication in order to gain access to information which is stored centrally or regionally.

Redundant storage obviates this problem, but introduces new problems where there is a great deal of movement in the stored information. This is the classical problem of distributed information storage.

Information retrieval also frequently implies database systems or systems



for extracting and compiling information. Such functions are comprised by query languages and report generators. By means of a query language one can in an easily understandable manner enter requests against a database, and extract data organized by columns, alphabetically or by values (e.g.: list alphabetically all employees in the sales department with wages over \$20,000). This can be taken out as a written report, if desirable together with calculations, so that average wages, total wages, the sales they represent, etc., can be computed automatically and listed separately. Such systems do not require programming in the usual sense, and variants are available that can very easily be learnt by ordinary office personnel.

The large profit potential here lies in the possibility of rapid access to stored information, set up in the desired context and selection.

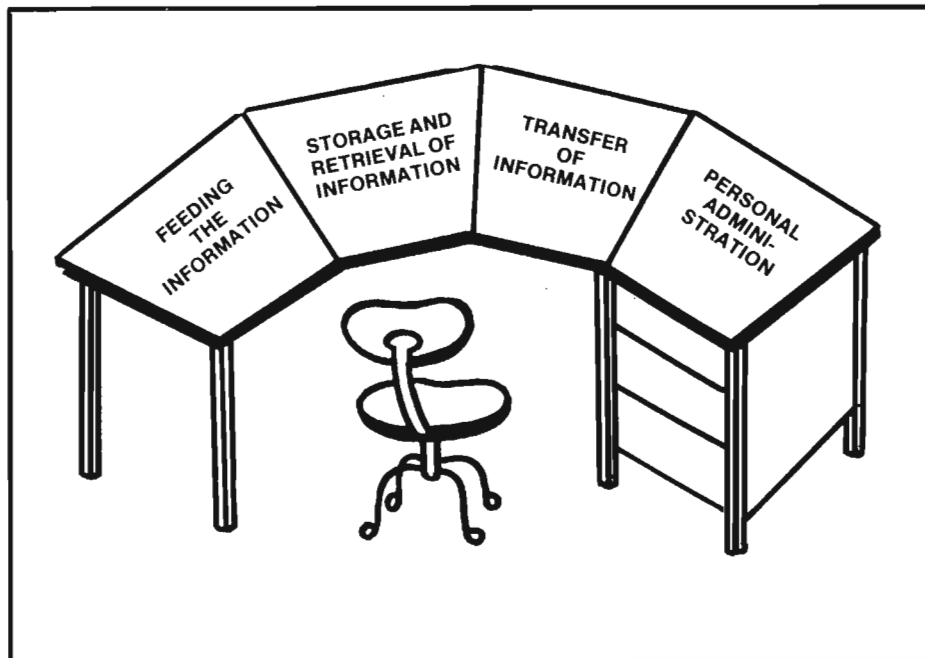
Examples of information retrieval and combination:

- Make a list of all letters mailed in the period 1 January to 1 April to Datatheft Inc.
- Retrieve the documents in the energy file that contain the words «oil» and «Volvo».
- Produce the annual budget by including relevant data from the department's local registers, and combine them with the report files «Budget 80», «Comments to budget», and «Boss' remarks».

It is still too early to see the full consequences of making internal information so easily available to office staff and managers at all levels, but it seems obvious that it ought to result in better service and an improved basis for making decisions.

## INFORMATION TRANSFER

In connection with office automation systems we have in mind transcripts



on printers for later manual transfer, automatic transmission by electronic mail, or transfer by special technology such as facsimile.

When written on printers the printouts will be organized in queues, and it should be possible to manipulate and reorganize such queues as required at any time.

When the information is distributed by an internal electronic mail system, the sender may write the message at a suitable time, whereas the receiver can read the message later — when it suits *him*. Messages may be sent within an installation, and to other installations via external data lines.

The benefits of electronic mail systems can perhaps best be summarized by a statement made at the above mentioned Office Automation Conference: A possible explanation why companies operating electronic mail systems were reluctant to talk

about their experiences was that they wanted to keep the advantage they had gained over their competitors by using such a system!

The users of systems of electronic mail and non-simultaneous teleconferences via computers who *want* to talk about their experiences express a fairly clear judgement: The firm or institution obtains an obvious improvement in the quality and volume of information distribution and opinion exchanges, while saving time and energy. An example of the utilization of nonsimultaneous teleconferences is found where large firms with branches in different time zones now can send messages to their associates several time zones away «without having to wait until 3 in the afternoon».

## PERSONAL ADMINISTRATION

Personal administration can be consi-

# «News»

derably facilitated when every employee has access to computer equipment — either direct from his or her work station or indirect via a secretary.

This makes it possible to update or access a meeting calendar, lists of agreements, vacation lists, telephone lists, in and out trays, etc.

In order e.g. to arrange a meeting between busy people, the computer system can consult the participants' personal calendars, and report back the earliest possible time for a meeting where all of them can be present, and then make the appointment by electronic mail. Why not connect such systems direct to the ticket and hotel reservation systems, so that conference of widely dispersed people can be easily convened?

## GENERAL PROPERTIES OF OFFICE SYSTEMS

If office automation systems are to comprise such far ranging functions as those described here, ordinary office staff and managers must be able to use them. Systems with simple functions can be made for simple use, but as the range of functions increases it becomes more difficult to ensure simplified use. This is a paradox which the system designers will have to take into account, and where they may have difficulty in finding good solutions.

The best solution probably is to present the systems with a low user threshold for the simplest functions, while enabling the personnel to attempt new functions once a basic repertory has been mastered.

A condition for doing so is that all the functions have the same or similar interface against the user, so that the functions appear as part of a total philosophy.

It is also essential that the systems

are available in the language to which the users are accustomed, if appropriate with the addition of a separate terminology. What some may call a «register» is to others a «file», or a «database».

Such requirements have previously been made only to customized systems, but are now emerging also in respect of general systems, and represent thus a major challenge to system suppliers.

## EFFECTS OF AUTOMATIC OFFICE SYSTEM

What then are the effects that may be anticipated from the automation of office functions?

The literature is beginning to be filled with forecasts about the social and economic consequences of the increasing use of computers for an ever broader range of purposes.

We who work in the computer industry have a responsibility to prevent the realization of the most negative predictions. We must prevent people from feeling manipulated by machines, from feeling that their work is becoming more sterile, and that personal communications between people are becoming more difficult.

We can prevent this by concentrating on applying office automation as a means of improving the working environment by suppressing trivial routines and offering strong aids for office routines. This must, however, not be done at the expense of jobs or job content. Instead of concentrating exclusively on efficiency measures, we must use the systems to improve the quality of what we do at all levels of the organization. As a by-product, this will undoubtedly also bring about a more efficient and effective operation.

The new information systems carry the potential of achieving such improvements.

## NORSK DATA COMPUTER CHOSEN FOR THE NEW COMPUTER CENTRE AT HULL COLLEGE OF HIGHER EDUCATION

The new Computer Centre at Hull College of Higher Education has installed a minicomputer from Norsk Data to provide batch and multi-access facilities for the 8000 full and part-time students at the college.

The new Computer Centre with its ND minicomputer, was officially opened 23rd February 1981 by the Chairman of the College Governors, Mr. J. H. Hooper, a prominent local industrialist.

At the heart of the Centre's facilities is an ND-100 minicomputer with 1Mbyte main memory, 2kbyte cache, and two 90Mbyte disk drives. The computer can be accessed by up to 32 simultaneous users, as well as processing batch work. A large number of terminals is distributed around the three sites in Hull occupied by the college, and connected to the Computer Centre via multiplexed fixed lines, or individually by dial-up lines.

The multi-access facilities are used mainly for computer assisted learning, as an integral part of the college's courses in business, science, engineering, art and design, architecture, humanities, teacher education, social studies and nautical subjects. The batch processing is mainly for part-time students at the college, and for the benefit of local schools running lower level computer studies courses. The Computer Centre will also provide data processing services for resource allocation, financial planning and other aspects of the College's general administration.

Prior to the installation of the Norsk Data computer, Hull, was using an ageing ICL 1903 mainframe, backed up by links to Humberside County Council's Honeywell machine.

«Since the installation of the Norsk





Data computer, the processor utilisation has been very high — and people have found that using the system creates the desire to use it more» says David Joslin, Director of Computer Services. «We are now experiencing pressure from users to install additional terminals in laboratories and so on, rather than all concentrated in the terminal rooms on each site. We see this as a very encouraging trend, and in line with our own beliefs in the benefits of making computer power readily available to users as an integral part of their daily work.»

Norsk Data won the contract in competition with DEC, Harris, ICL and GEC, and was chosen on the basis of a technical evaluation, within a fixed budgetary limit.

### THE FIRST ND-500 COMPUTER TO NORWEGIAN CUSTOMER

The first delivery of Norsk Data's most powerful computer to a Norwegian customer took place in week 20 at the University of Oslo. The delivery marks the arrival of the «32-bit super mini» to a central place in ND's product line. During the next weeks, several more of the new machines will be delivered to Norwegian and European customers.

The first delivery of the 3rd genera-

tion of ND's 32-bit computers occurred in January. The customer was the nuclear research center (CERN) at Geneva, Switzerland, who now also has a second ND-500.

With the ND-500 computer, ND has entered a very competitive market which has been dominated by American suppliers. Tests of the new computer have up to now shown that it is especially competitive. Therefore, it is with well-founded optimism that Norsk Data now is taking a long step in the direction of achieving its objective: To become a significant supplier of Computer Systems for the European market.

### ND-500 FOR STRUCTURAL ENGINEERS

Bjerking Ingenjørsbyrå AB in Uppsala has as the first structural engineering firm in Sweden signed an agreement for an ND-500 system from Norsk Data.

The firm has long been a leader in the design of roof trusses of wood and has also previously employed computer systems from Norsk Data. An increasing use of steel structures requires more powerful computing capacity, for which reason the ND-500 system has been ordered.

The ND-500 system contains a 32-bit processor of very high performance. Besides technical applications, the

system is designed for demanding administrative assignments. The order is priced at about 1.3 MSEK.

### NEW SALES-OFFICE IN FRANCE.

Norsk Data France has opened a new sales office in Lyon. The opening follows the previously established sales offices in Ferney-Voltaire and Paris. The head of ND's new office is Mr. André Mestre, former head of Lyon-based Logabax.

André Mestre, head of ND's new Lyon office.





# Norsk Data

## NORWAY

### Oslo:

Norsk Data A.S  
Jerikoveien 20  
Postboks 4 — Lindeberg gård  
Oslo 10  
Tel.: 02-30 90 30  
Tlx.: 18661 nd n

### Bergen:

Norsk Data A.S  
Nesttunveien 109  
5050 Nesttun  
Tel.: 05-22 02 90

### Tromsø:

Norsk Data A.S  
Styrmannsveien 13  
Postboks 2113  
9014 Håpet  
Tel.: 083-71 766

### Sandnes:

Norsk Data A.S  
Oalsgaten 11  
Postboks 555  
4301 Sandnes  
Tel.: 04-66 55 44

## SWEDEN

### Stockholm:

ND Norsk Data AB  
Kanalvägen 3  
Box 2031  
194 02 Upplands Väsby  
Tel.: 0760-86 050  
Tlx.: 13528 nordata s

### Malmö:

ND Norsk Data AB  
Södra Tullgatan 3, 5 tr.  
21140 Malmö  
Tel.: 040-70 5 10

### Göteborg:

ND Norsk Data AB  
Klangfärgsgatan 11  
Box 9052  
421 09 Västra Frölunda  
Tel.: 031-29 93 50

## DENMARK

### Copenhagen:

Norsk Data ApS  
Øverødvej 5  
2840 Holte  
Tel.: 02-42 50 55  
Tlx.: 37725 nd dk

## GERMANY

### Wiesbaden:

Norsk Data Deutschland GmbH  
Abraham Lincoln-Strasse 30  
6200 Wiesbaden  
Tel.: (06 121) 764-1  
Tlx.: 418637o noda d

## FRANCE

### Ferney-Voltaire:

Norsk Data France  
«Le Brévent»  
Avenue du Jura  
01210 Ferney-Voltaire  
Tel.: 50-408576  
Tlx.: 385653 nordata fernv.

### Paris:

Norsk Data France  
120 Bureau de la Colline  
92213 Saint-Cloud Cedex  
Tel.: 1-6023366  
Tlx.: 201108 nd paris

### Lyon:

Norsk Data France  
1, rue des Quatre-Chapeaux  
69291 Lyon Cedex 1  
Tel.: (7) 837.41.77  
(7) 837.59.51

## UNITED KINGDOM

### Newbury:

Norsk Data Ltd.  
NORD House  
2-6 Pelican Lane  
Newbury  
Berkshire RG 13 1 NU  
Tel.: (0635) 3 1465  
Tlx.: 849819 norsk dg

## USA

### Boston:

Norsk Data N.A. Inc.  
65 William Street  
Wellesley, Mass. 02181  
Tel.: (617) 237 7945  
Tlx.: 921740 norsk well

## SWITZERLAND

### Lausanne:

Norsk Data (Switzerland) S.A.  
7, Chemin des Charmettes  
CH-1003 Lausanne

## NORWAY

### Oslo:

ND Comtec  
Jerikoveien 20  
Postboks 4 - Lindeberg gård  
Oslo 10  
Tel.: 02-30 90 30  
Tlx.: 18661 nd n

### Trondheim:

ND Comtec  
Haakon VII's gt. 7  
Postboks 78  
7001 Trondheim  
Tel.: 075-16 520  
Tlx.: 55580 comtec n

## SWEDEN

### Stockholm:

ND Comtec AB  
Kanalvägen 3  
Box 2031  
194 02 Upplands Väsby  
Tel.: 0760-84 100  
Tlx.: 13528 nordata s

### Stockholm:

ND Comtec AB  
Gårdsvägen 8  
171 52 Solna  
Tel.: 08-27 25 85  
Tlx.: 13706 swecom s

## DENMARK

### Odense:

ND Comtec ApS  
Klokkestøbervej 25  
5230 Odense M  
Tel.: 09-15 74 40  
Tlx.: 59680 comtec dk

### Copenhagen:

ND Comtec ApS  
Tempovej 7-11  
2750 Ballerup  
Tel.: 02-65 70 80

## GERMANY

### Düsseldorf:

ND Comtec GmbH  
Grafenberger Allee 241  
4000 Düsseldorf  
Tel.: 0211-66 63 88  
Tlx.: 8587277 comt d