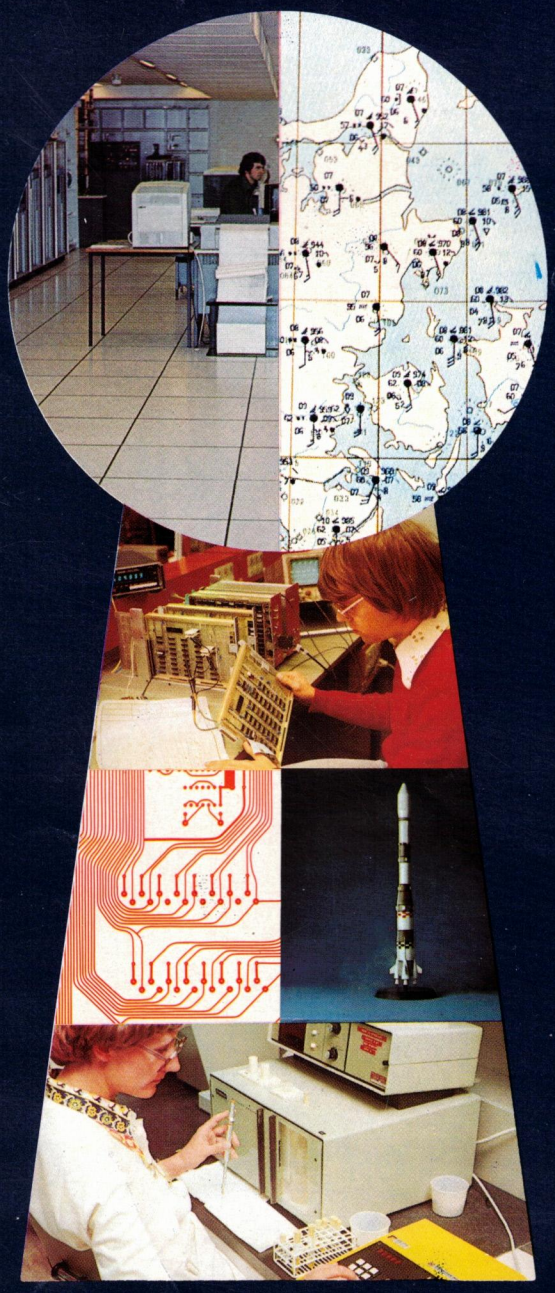
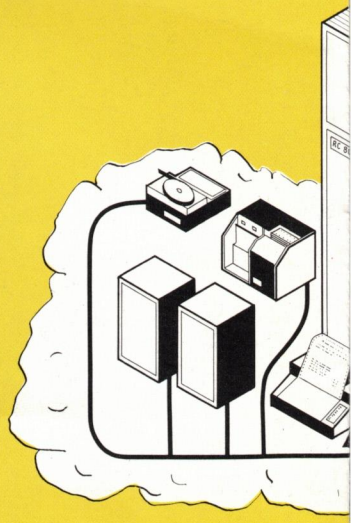
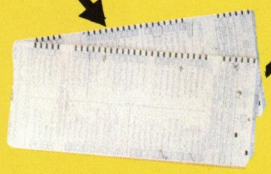
CLINICAL CHEMICAL LABORATORY DATA HANDLING SYSTEM





Patient Ward

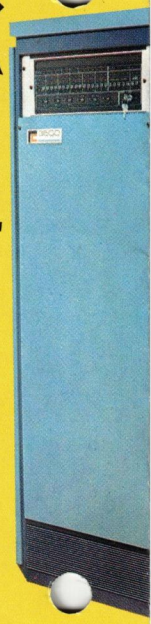
Sample Taking

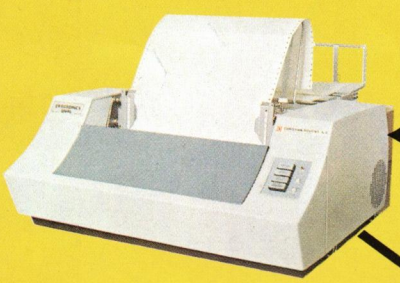


Requests via Marksense Cards or Display Terminals

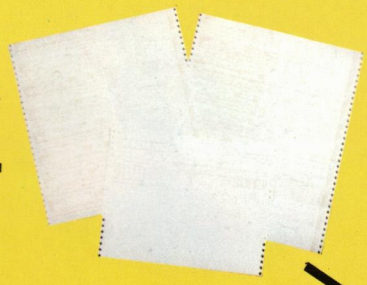
Requests for Analyses

Approved Results and Comments

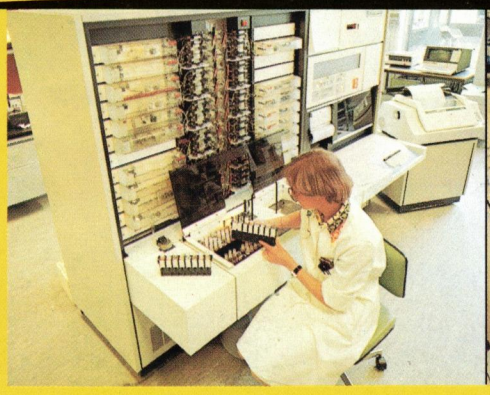




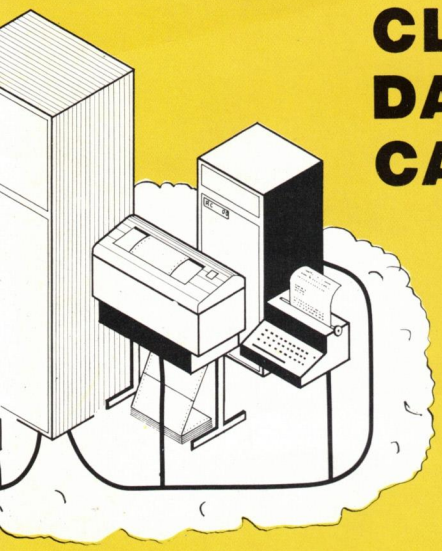
Lists for:
- Sample Taking
- Work Plans
- Emergency Requests



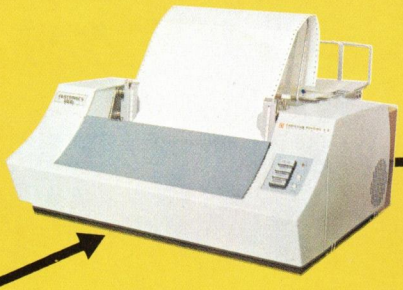
ID-Labels

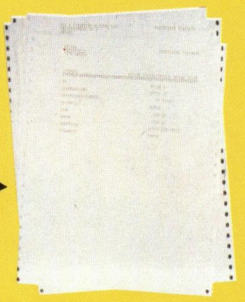


CLINICAL CHEMICAL LABORATORY DATA HANDLING SYSTEM CARMEN



Main Computer





Approved Results and Comments

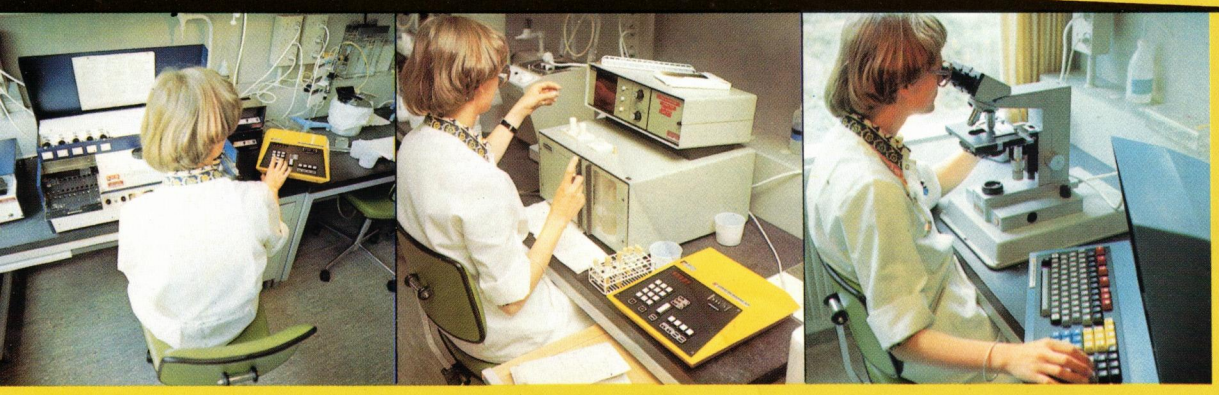
Local Communications Computer

Laboratory Lists for:
- Missing Results
- Production Results
- Production Statistics
- etc.

Instrument Results and Identifications from Laboratory

Checking and Correction of Results

Histograms and Approval of Results



FROM REQUESTS TO RESULTS

CARMEN accepts requests for analyses from display terminals, marksense card readers or on-line from other computer systems. Predefined groups of analyses may be requested combined.

CARMEN lists the requests sorted for different uses in sample taking lists and work plan lists. ID-labels for testtubes include optical readable bar-codes.

CARMEN receives data and identifications from fully automated equipment on-line, and from semiautomated equipment and manually operated instruments through special data entry units, lab-boxes. Furthermore data can be entered from display terminals via analysis-dependent screen-forms. The display keyboard can in special applications be used as a counting device.

CARMEN performs a large selection of corrections and calculations on the assembled blocks of raw instrument results - calibration, multiple determinations, drift, dilution etc.

CARMEN evaluates the results against a variety of equipment- and patient-dependent limits. On a screen-form irregularities are displayed and several possibilities are provided for immediate corrections of values and identifications, including recalculation of changed instrument results.

CARMEN displays result-histograms and other statistics in order to improve the basis of decision before approval.

CARMEN provides several ways of answer-handling. Final results are either printed out in the laboratory or transmitted to a hospital computer, if present. The amount of results in each answer depends on the requesting department according to previously specified criterias. Accumulated lists for each patient can be produced.

CARMEN provides daily print-outs of the production results for back-up purposes. Also various production-statistics are produced, and accuracy-controls are accumulated and printed.

CARMEN can at any time produce lists showing missing or double-produced results for any analysis.

CARMEN handles a range of priorities from routine to emergency. Urgent requests are supervised specially to ensure fast handling.

CARMEN can operate 24 hours a day. Special procedures may be provided for the night period.

LABORATORY SYSTEM CARMEN

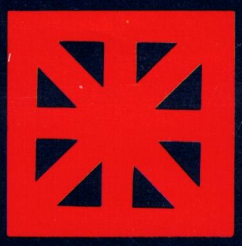
A flexible, modular data handling system, called CARMEN, for clinical chemical laboratories has been developed by Christian Rovsing A/S and A/S Regnecentralen in close cooperation with three Danish university hospitals in Aarhus, Copenhagen and Odense. The systems at the three hospital laboratories have considerably different functions, each one being tailored to the working methods of the particular laboratory. This adaption to local requirements is obtained by supplementing a common program system with the appropriate application programs selected from a large program library.

CARMEN is delivered as a turn-key system according to specifications set up between the hospital and Christian Rovsing A/S.

The hardware configuration of CARMEN is based upon a main computer (RC 8000) with a large disc (32,5 - 65 M bytes) and other peripheral units connected to a local communications computer (RC 3500) with laboratory terminals and on-line instrument connections. Most of the data handling and computations are done in the main computer. The communications computer performs data acquisition (analog and digital data), device handling (e. g. display terminals, laboratory data entry units and printers) and data checking and reduction at the lowest level.

If more hospital laboratories work together, e. g. in the same county, they may share the major part of the system, the main computer, and each laboratory needs only a local communications computer connected to the main computer. This will reduce the cost of the system for each laboratory, and still permit different systems.

CARMEN can handle large laboratories, e. g. with 800 requisitions a day, 25.000 results a day and 700 different analyses.



CHRISTIAN ROVSING A/S

46B, Marielundvej Dk-2730 Herlev Denmark
Phone: (02) 91 88 33 Telex: 35111 cr dk