PRAKLA-SEISMOS INFORMATION No.37

PRAKLA-SEISMOS

Computer Center Hannover



- **1961** Since 1961, when PRAKLA-SEISMOS installed a **National Elliott 803** computer in their first digital data center for geophysical purposes, the computer capacity was continually enlarged. An extensive library of data processing programs was developed, covering all disciplines of geophysics, such as gravimetry, magnetometry, seismics and engineering.
- **1966** Full scale seismic data processing started 1966 with the installation of a **Control Data 3300** computer system and the development of a special PRAKLA-SEISMOS software package DSY. As the volume of work increased continuously, on average one additional CD 3300 per year was installed.
- **1971** The installation of a **Control Data 6600** in 1971 was a milestone for the PRAKLA-SEISMOS computer center. The new computer was 10 times more effective than the CD 3300 and, with a special geophysical language GEOPLAN –, the seismic software-package was completely reorganized.
- **1975** Many of the algorithms were transposed for the **PDP 11/45** computers, which replaced the CD 3300 computers mainly for preprocessing.
- **1977** As the demand for energy and natural resources increased sharply during the 70's PRAKLA-SEISMOS added more and more hardware and software from pocket calculators and table computers to trailer-mounted PDP-11-systems and to the advanced **CYBER 175** computer system.
- **1981** Installation of a **CYBER 750** as main system for batch and interactive processing and a **VAX 11/780** system, with Digicons software package DISCO for application in Europe and abroad.
- 1982 Start of operations with trailer-mounted VAX 11/780 system. In November PRAKLA-SEISMOS moved to the new headquarters. The outstanding addition to the computer center complex: the Vector Computer CYBER 205.
- 1983 Installation of: DATAPLAN – the new control software GEOSYS – the new geophysical processing system Computer network systems Interactive graphic work stations.

This brochure is to inform our clients about the advanced hardware operating in our computer center in Hannover.

Front page:

main computer room

[•] the new computer center (in front of the main office building)



CYBER-mainframe and disc drives

Control panel for power supply, aircondi-

Highly sophisticated algorithms are a prerequisite for seismic signal processing, but in addition data organization (reformatting, sorting, copying, storage, quality control) is also an enormous task for a geophysical data center.

The new building in Hannover offers an excellent base for large-scale computer operations (see also front page).

Various computer systems are installed which can operate as a network or are directly accessible using a terminal switching system.





DATAPLAN – the organization concept of the PRAKLA-SEISMOS Data Center

The technical conditions for the realization of DATAPLAN are integrated processing and communication systems which are interconnected by computer networks, such as LCN (Loosely Coupled Network) or DECNET, and terminal connections. This computer group consists of CDC-CYBER 205, 750 and 175 and DEC VAX 11/780, PDP 11/45 and 11/34 computers. These are the target computers for batch processing.

The user communicates in an interactive mode via terminal with the command center of the group. The command center is a VAX 11/780 operating with the DATAPLAN system.

Clear separation in batch and interactive processing enables not only a high data throughput but also high flexibility for the user.



The most important components of DATAPLAN are:

Massdata - Entry

Job creation: interactive job generation can be realized by the user via video terminal

- with the modern processing language GEOPOL designed for the new system GEOSYS running on the CYBER 205 or
 - by using the language GEOPLAN to run on the CYBER 175/750 or
 - with the languages **PREPROC**, **PLOT** and labelling programms of the SSP-11 System to run on the PDP 11 computers.

Job-organisation with the subparts:

- Compilation and administration of job queues
- Submitting jobs to the target computers
- Order preparation
- Job status monitoring
- Job preparation for operating
- Statistical functions
- Tape administration
- Special programs

By logging into HMS (the Hierarchic Menu System) the user has access to all DATAPLAN components and subparts via terminal.







CDC-CYBER 205 Computer System floor plan

Todays super computers play an important role in the exploration business. A 3-D seismic survey involves millions of data to which sequences of complicated mathematical operations must be applied. In the PRAKLA-SEISMOS Data center this computing capacity is available on the CONTROL DATA CYBER 205 Vector processor. Fast arithmetic logic, fast memory and the vector processing facilities allow up to 400 million floating point operations per second.

Most of the algorithms used for seismic data processing can be adapted to vector processing, even recursive methods as used in 3-D processing.

The CYBER 205 Vector processor is connected via high-speedchannels to special disc and tape drives as well as to the front-endprocessor.



Vector Pipeline Concept



Graphic application programs and systems run on several host computers using special graphic software or device independent graphic utilities (e.g. UNIRAS) resulting in a graphic data base.

For convenient viewing of results and interactive manipulation of data several graphic work stations are in use, e.g. TEKTRONIX 40XX and RAMTEK 9460.

RAMTEK 9460 is a sophisticated colour graphic system in high speed/high resolution raster technology. One system can serve up to 3 independent work stations.

Extensive local intelligence allows the user to download and manipulate sub-pictures to relieve the host computer from graphic burden.

A camera system records photographic colour hard copies using a variety of film media.

Examples for interactive graphic processing are analysis interpretation, modelling and mapping.

Final plots can be produced using several plotter systems:

The KPU, a high resolution photographic drum plotter, is a result of PRAKLA-SEISMOS development.

High quality CALCOMP flat-bed and drum plotters are available.

Colour plots can be produced on the APPLICON Ink Jet plotter.

VERSATEC electrostatic plotters work on and off-line for high-speed plotting.





Plotter room with CALCOMP flat-bed plotter and APPLICON Colour Plotter



Operator consoles with PDP 11/34 driving several KPU plotters



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