DATA ACQUISITION AND PROCESSING SYSTEMS

Computer Networks

During the year, possibilities were considered of using industrial electronic units and SU-produced optic cables in the network ETHERNET, the product of the DEC firm. In result, three electronic units and three types of optic cables were selected. They were tested by including them into the local network for a month. Their parameters have turned out to be no worse than analogous western units have.

Work continued on the development of the SONET LAN network:

- the "C" language procedures library was organized to enable remote access to files (this library is the basis for the realization of computer-aided distribution systems on the SONET-2 network hardware base).

Central Processor Computers

The Central Processor formed of the PDP-11/70 complex and two μVAX-II computers worked satisfactorily during the entire period of LNP reactors' scheduled operation time in the reported year. Our main concern was the lack of spare disks packs for 300 Mbyte drivers, as they might cause instability in Processer's performance. As the PDP-11/70 is aging fast both physically and morally, an urgent need is felt to substitute the aged for new, more perfect and reliable media of physical data archivization to be included into the ETHERNET or into the μVAX-II complex. To pursue the aim we continued developing terminal network of the PDP-11/70 and the μVAX-II.1991 works on the organization of electronic mail have brought new life to the JINET network of the JINR.

Physical Instrumentation

In 1990-1991, works were going on to convert LNP physical instruments to PC/XT, AT-aided ones and to develope further the software for some physical instruments already operated with PC's. The first phase of the TEKST project started work for the experiment.The DIFRAN and SPN-1 were switched on to the PC/AT-268. The instruments NERA-PR, SNIM-2, DN-2, DPP, NSVR, KDSOG have been modified. Works have been accomplished on arranging the lay-out for experiments with UCN. Preparatory work is going for the assembly of the HRFD on beam line 5 of the IBR-2.

To improve IBR-2 neutron beams additional systems for choppers phasing were mounted on beam line 5 (for the HRFD) and on beam line 7 (for the NERA-PR).

On IBR-30 beam-lines there were:

- accomplished works on the switching on to PC's and modification of the POLYANA and POISK lay-outs;
- put into operation the DN-3;

- put into operation the PC/AT-386 + CAMAC complex for the investigation of (n, 2γ) reactions.

Electronic Systems and Units

Hardware and software for thermostats control were developed, including:
- the CAMAC microprocessor controller;
- the programmable temperature regulator with keyboard control;
- the commutator for linking the terminal with automated microprocessor systems;
- to serve experiments on the DN-2 and DPP and to manufacture HTSC samples.

A fast electronics complex was created for the multisection plutonium chamber for experiments on the study of (n, γ, f) reactions.

A set of new CAMAC units have been developed, including:
- the 16-input unit for time spectra coding with extra functional capabilities;
- the on-off automated unit for the measuring module;
- the detector number coding unit;
- spectrometric ADC's for 1K and 8K channels with a frequency of 200 MHz.

Software

Work continued on the development of SONET-2 software for interactive access of a PC subscriber to directories and service files.

A programme has been developed for the analysis and processing of one-dimensional spectra on PC in a graphic mode. The programme is mainly dedicated to processing (per channel, per group) of the data from fission and transmission experiments. The programme performs addition, subtraction, multiplication, etc., of one-dimensional spectra and background generation according to different models specific for a given experiment.

In 1991 work has been accomplished on the development and upgrading of PC-aided measurement systems:
- for the spectrometers SNIM-2, DIFRAN, POISK, POLYANA;
- for the spectrometers TEKST and SPN-1 (software first phase);
- for the spectrometers DN-2 and DN-3 (for mechanical devices control);
- for the spectrometers NERA-PR and KDSOG-M (initial phase).