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Technical Note

THE NEW COMPUTER SYSTEM OF THE RESEARCH INSTITUTE OF ATMOSPHERICS

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A large computer, ACOS 600 of NEC, was installed in January 1977, which took the place of the old one worked for nine years. The new system was introduced to be used to collect and process all the observed data at the Institute and also at distant sub-observatories of the Institute as far as 1000 km. It was also demanded to have flexible accessibilities for various forms of input data files and numerous abilities of expression for output data files. The block diagram of the system is shown in the Figure. It is composed of the main system and three subsystems. Three data-acquisition and communication subsystems are linked to the main system.

The main system is consisted of a central processor unit with cycle time of 1.2 micro sec per 8 bytes, internal memory of 768 kilo bytes, mass storage of four 100-mega-byte magnetic disks, four 9-track 800/1600-bytes-per-inch magnetic-tape transports, a front-end network processor which interfaces the main system and remote stations and terminals, a graphic subsystem, an AD-converter/digital-input subsystem, a line printer of 700 lines/min, a card reader of 1050 cards/min, a paper tape reader of 1000 characters/min, and a paper tape punch of 150 characters/min.

Users can interact with the computer by means of one of CRT graphic display terminals, CRT alphanumeric terminals or one of sets of keyboard and printer, supported by real-time languages or conversational remote-batch languages.

The processor of the graphic subsystem controls the digital plotter, which covers a sheet of paper less than 600 mm x 800 mm with 0.05 mm resolution and it also allows the user to communicate interactively with the 19-inch refresh-type color monitor by means of six control devices, which are an alphanumeric keyboard, 16 lighted func-

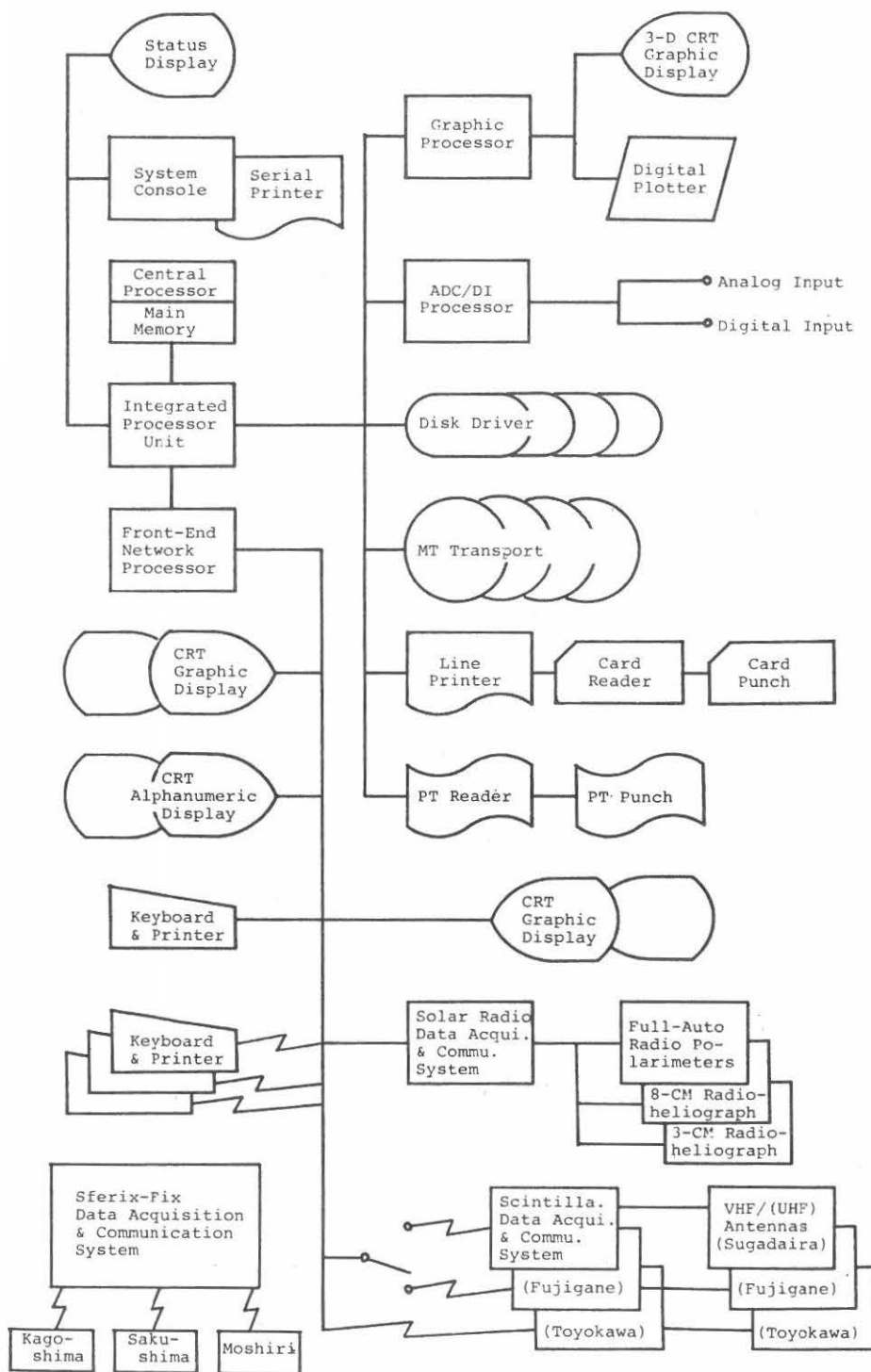
tion switches, a data tablet, a joystick, control dials, and a light pen. Three dimensional transformation of the displayed picture on the color monitor is done on real time by the 3D coordinates transformation generator.

Analog or digital input of data is possible by means of ADC/DI processor at maximum rates of 100 kHz/16 channels and 1 kHz x 8 channels respectively. The buffer size of disk file is 8 mega data and 2 mega data respectively.

Solar radio data obtained by Full-automatic radio polarimeters, 8-cm radioheliograph, and 3-cm radioheliograph are transmitted from the observing site to the host computer as a real-time job through data communication lines, when the host computer is on. An off-line back-up system is also working during the observing time.

Solar wind data by radio star scintillation observation are collected and recorded on a digital tape at three separate stations. these data are gathered to the host computer through public telephone lines during off-observing time and they are processed to obtain solar wind velocities and other information.

Spheric-fix data by triangulation direction-finding network are also gathered from three distant stations to Toyokawa by an off-line system through our own telemetry line and through radio links or public telephone lines. The transmitted data are stored on cassette-magnetic tapes(CMT) and then they are loaded on a CMT handler of ACOS system to be processed.



Block Diagram of the Computer System

