DIPNET 800 SERIES IMAGE PROCESSING SYSTEM
FOR REMOTE SENSING CARTOGRAPHY

- An answer to low cost. Multi-function and efficient mapping
- Absolutely unparalleled by any other system built on mini or super-minicomputer

SYSTEM BACKGROUND

DIPNET 800 Series Image Processing System (Domain Image Processing Network) represented by MEDAS - Manufacturing Engineered Design and Service Hong Kong Co. Ltd. is the result of joint-development and cooperation by MEDAS and the Research Institute of Surveying and Mapping (RISM) under the Bureau of Surveying and Mapping, People's Republic of China.

DIPNET is a high performance, distributed system for remote sensing cartography. It is supported by 64-bit and 32-bit workstations of Apollo Computer Inc. U.S.A. which provides a twin operating system namely the DOMAIN/IX (UNIX) and AEGIS to meet the needs of multi-window, multi-task, distributing network communication and management. All graphic processing functions of CAD from Apollo Domain products are combined with advanced image display and processing techniques developed by RISM thus provides a complete, multi-function, efficient and low-cost image processing and networking system which can meet the requirements of users throughout the world.

FLEXIBILITY IN APPLICATION

To enable user selection from different applications, the DIPNET 800 series provides flexible choice in system configuration. Even a low-end single workstation can perform the same functions and speed as that supported by multiple-node network systems. It can be used in the applications of education, research and small-scale production of remote sensing and other image processing. Workstations of either color and monochrome from different DOMAIN category can form a network. It can be utilized as a pipeline of GIS data acquisition, processing and applications. Or to be used as a special workstation to handle maps of different scale, thematic and statistic mapping, geometric processing, multi-data image analysis, general image processing, land use data statistic and area calculation pipeline, etc.

The system can have image and graphic I/O equipment of various resolution, precision and speed, according to the unique requirements of the users. A base system configuration can be provided within the budget of users.
The DIPNET 800 series is a powerful and efficient system for image and graphic display, real-time processing system. It can be operated in either menu or command mode. Application software arranged in modules are available for users selection. On broad terms, it can perform all kinds of mathematic transformation, radiometric correction, geometric process of area and space remote sensing images. (e.g. Landsat image of U.S.A., SPOT image of France, MOS image of Japan, NOAA meteorology image and Chinese satellite image, etc.)

Its major performance includes:

- Producing image maps, orthographical image maps from digitized aero-image and high resolution space image.
- Updating maps.
- Classifying themes and statistic mapping.

Acquiring data from GIS.
- Processing data of GIS.
- Classifying and area measuring of land use.
- Dynamic monitoring resources of agriculture, forestry, water, etc.
- Engineering applications.
- Geological mapping and geological structure interpretation.

The system can also process images for medical care, biology and close range photography, etc. Special software is available as optional modules to meet specific user requirements.

DIPNET 800 series combines with Apollo DOMAIN network is far more superior than conventional image processing system built around super-minicomputers. From bench mark comparison, even a stand-alone DIPNET 880 workstation can out-performed the conventional system by 8 times yet its cost is only equivalent to 1/4 of any super-mini based system. In any developed nation, readily available data regarding land and mapping is always essential in order to assist design and forward planning tasks which relates in defence, agriculture, mining, forestry, petroleum, environmental protection, urban and rural planning, highway, industrial and city planning. The DIPNET 880 and 881 systems can accommodate all these tasks through its proven capability of image processing and vast system resources which include fast 64-bit and 32-bit processor, data base management system and a full complement of peripheral devices such as digitizers, CCD camera, scanners, color electrostatic plotters and thermal heat transfer printer/plotters. Not only it can bring about the true solution in remote sensing mapping but also serves as a vital tool for exploration in the nature of microorganism.
For any government mapping center or design and remote sensing institute, the DIPNET 800 series is an affordable investment to own a complete system which can accommodate orthographical image maps produced from satellites or aerophotography. In addition, other maps such as land management, road planning, utilities and cadastral can also be obtained from the system.

GIS is playing a major role in many advanced information systems today. To complement this, the DIPNET 800 series can provide a precision method for GIS data acquisition, update and analysis.

SYSTEM COMPONENTS

The DIPNET 800 series contain the following components:

Hardware

For stand-alone DIPNET 800:

Apollo DN3000 workstation
Multi-mode printer
Calcomp color thermal heat transfer printer/plotter
CCD camera digitizer

For DIPNET 881 network:

Apollo DN10000 Super computer network
Apollo DN4000 network
Apollo DN3000 network
Multi-mode printer
Enhanced disk storage up to 3 gegabytes capacity
1/2" industry standard magnetic tape unit 1600 bpi/6250 bpi
Calcomp digitizer
Calcomp color thermal heat transfer printer/plotter
CCD Camera digitizer

Hardware Options

CCD camera map digitizer workstation
Color laser recorder
Scanning drum digitizer
Digital-controlled plotter
Calcomp color/black and white electrostatic plotter

System Software

Unix Operating System
AEGIS Operating System
GPR 2-D graphic software
Image Display software
Image File management software
D3M Distributed Data Base Management System
FORTRAN 77 Language
C Language
PASCAL Language
LISP Language
Application Software

Supported by the system software, the programs, data and files are organized in a application-oriented manner. All application software are designed to offer abundant, complete image and graphic processing abilities:

Image Display Module:

Roaming can continuously be used to display the related parts of a complete image thus providing an animated walkthrough effect. Coordinates value and grey value of any pixel can be measured by the user. Total image or a part of the image can be zoomed at user's discretion. Likewise, statistic histogram of total or a part of a image can be displayed. Color table can be changed. The shape and color of the cursor can be set. True color can be displayed on a low level 8-bit plane display memory workstation. 24-bit color processing is also provided. Images and patterns can be overlaid. Connection can be made on image to image or image to graphic basis.

Basic Image Processing Module:

Provides multiple formats in reading and writing of remote sensing data tape controls format transforming, windowing, tape file read/write processing functions.

To handle all types of effective processes and extraction, histogram statistic, ratio and KL, fast fourier transformation.

Selection of control points, rotation, zooming, coordinated transforming commands. Fast precision geometric correction of remote sensing image. Numeric mosaic, registration of images and maps or between images.

Classification of training and sampling, calculation of first order and second order matrix, maximum likelihood and fuzzy-set classification method and classification in optimization, etc.

Acquisition Of Digital Elevation Module:

Data acquisition and processing of map hand-tracking digitizing and scanning digitizing. Acquisition of digital elevation model by moving average method or finite elements interpolation method.

Display or graphic output of DEM showing different angle and scale. Calculation of section, slope, volume, earthwork.
Orthography And Map Coding Module:

Precision geometric correction by finite elements method, polynomial and bundle adjustment method (with or without DEM data). Image maps, ortho-image maps or map coding from remote sensing images by correlation, digital mosaic and registration. Acquisition and pre-processing of related control data and image data.

Validation program for checking of control points and precision.

Digitizing And Processing Of Map Elements Module:

With the software and techniques provided, digitizing, noise-extracting and refining can be made to geographical fundamental information on maps: administrative area, residential area, water, transport, land, plant, topography, etc. Screen editing, vector processing, attribution, calculation of 1-D and 2-D data, printing of reference points, characters, legends can also be made.

Map Updating And Thematic Mapping Module:

Transport lines, residential area, street districts, reservoirs, rivers, lakes, administrative area, place name can be drawn on the correct area or space remote images. Registration between surface feature and contour, adding legend and color can also be made with this module.

Introduction to:
Research Institute of Surveying and Mapping, State Bureau of Surveying and Mapping, China

Founded in 1959, Research Institute of Surveying and Mapping (RISM) is the nation's major research organisation of remote sensing surveying and mapping. It is authorized to confer master degrees to staff who has obtained outstanding technical achievement hence it is also regarded by the general public as the National Center for Remote Sensing Surveying and Mapping.

The main tasks of RISM includes: fundamental theory research of surveying and mapping, research on digital mapping, new methods and instruments for data processing of remote sensing techniques and resolving problems on economic construction, production of surveying and mapping, and related remote sensing applications.

There are more than 260 research engineers in RISM which includes 55 senior researchers. Since 1978, RISM has accomplished many key national research projects. Among them, 6 have won national awards and 12 have been given ministerial awards.
RISM has several departments. They are: Geodesy and Engineering Surveying, Photogrammetry and Remote Sensing, Cartography, Instrument of Surveying and Mapping, Geographic Information System, Geographic Name, Information of Surveying and Mapping and one sizeable experimental workshop. In addition, the Information Department of the National Remote Sensing Center, National Surveying and Mapping Information Network and Patent Office of Surveying and Mapping are also located within RISM.

There are special experimental laboratories attached in the major departments such as Satellite Doppler, PIPS Image Processing for Remote Sensing Cartography and Earth-view Image Processing, Digital Plotting, Photography, Map Compilation, Image Copying, Electronics, etc. and a Quality Assurance Testing Center for DEM. All of these are fully equipped with advanced equipment to carry out the tasks of precision measurement and test medium.

The introduction of DIPNET 800 series marks the first dynamic step of RISM in its joint-development and marketing of high-tech products in both the domestic market and international market. Under the assistance of MEDAS, RISM is planning to offer more solution-oriented products and services to the fast growing market of S.E. Asia.

Introduction to:
Manufacturing Engineered Design and Service (HK) Co. Ltd.
- MEDAS

A major builder of Apollo Computer Products. Incorporated in 1984 and backed by a group of software specialists with undisputed experience and track-record for solution-oriented CAD/CAM/CAE and Graphics related system development in the S.E.Asia computer industry. In addition to the join-development and marketing with RISM on its DIPNET 800 series Remote Sensing Surveying and Mapping Network System, MEDAS is also the appointed distributor for PALETTE, a sophisticated 3-D Plant Design System owned by Computer Power Group of Australia. The company has other development projects in China such as a Finger Print Analysis and Simulation System, a War Game Simulation System, a Seismic Processing System and a Machine Tool Design and Manufacturing System.

Apart from its head office in Hong Kong, the company has a branch office in Beijing which offer comprehensive after-sales service to its vast user base as well as a distribution network in S.E.Asia to serve its customers.
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