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 con-figuration. 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 configura-tion can be provided within the budget of users.

UNSURPLUSED CAPABILITIES

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. Applica-
tion 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 interpretat-
  ion.

The system can also process images for medical care, biology
and close range photography, etc. Special software is avail-
able 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 compari-
son, 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,
argriculture, mining, forestry, petroleum, environmental
protection, urban and rural planning, highway, industrial
and city planning. The DIPNET 880 and 881 systems can accom-
modate 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 theormal 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 walk-through 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 foriour 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,
polynomal and boundle adjustment method (with or without
DEM data). Image maps, ortho-image maps or map coding
from remote sensing images by correlation, digital mosaic
and retgistration. 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, attribidion ,
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.

Introducion 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 out-
standing 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 re-
search 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 map-
ping, 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, Informa-
tion of Surveying and Mapping and one sizeable
experimental workshop. In addition, the Information De-
partment 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 equiped 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 market-
ing 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 System on 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 develop-
ment 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 sophiscated 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 Manufact-
uring 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.

For further information please contact :

MEDAS
Manufacturing Engineered Design and Service (HK) Co. Ltd.
Suite 1901 Tung Wai Commercial Building
109-111 Gloucester Road
Wanchai, Hong Kong
Tel   : 5-8921868
Telex   : 89425 INFIN HX
Fax   : 5-8919093
Contact : Mr Holon S.W. Wong
           Managing Director

RISM
Research Institute of Surveying   and Mapping
16, Bei Tai Ping Lu
the Western Suburbs
Beijing 100039 , China
Tel   : 81-0170
Cable   : 3261
Contact : Mr Yang Ming Hui
           Sr. Engineer