

acres news

Australian Centre for Remote Sensing

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ACRES THEMATIC MAPPER DATA PRODUCTS

Landsat Thematic Mapper data products, on computer tape and photographic media, are available now.

The TM sensor records seven spectral bands in the visible, near infrared, middle infrared and thermal infrared regions of the electromagnetic spectrum. These bands, either individually or in combination, can provide valuable information on the occurrence and condition of features on the Earth's surface. In addition, the spatial resolution of 30 metre pixels (for 6 of the 7 bands) provides more detailed images in comparison to the Multispectral Scanner.

Details of processing options available for TM data products can be found inside.



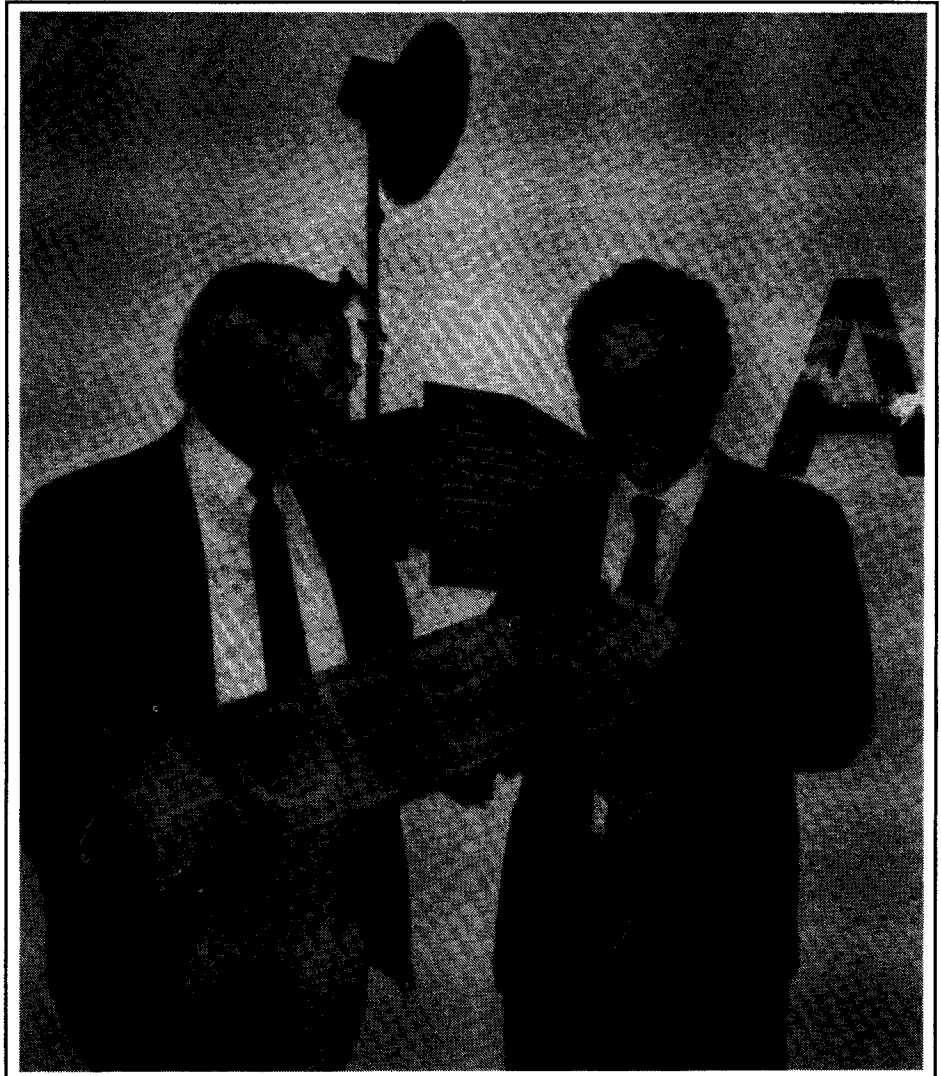
DON GRAY RETIRES

Don Gray retired from his position as Manager of AUSLIG's Remote Sensing Unit on the 8th November. (SEE INSIDE FOR THE DON GRAY STORY)



CARL McMASTER - THE NEW REMOTE SENSING UNIT MANAGER

Carl McMaster (Director, ACRES) succeeds Don Gray as the Manager of AUSLIG's Remote Sensing Unit. Carl first came to ACRES as Deputy Director in 1986.



Don Gray (left) presents the key to the door of ACRES to Carl McMaster, the new Remote Sensing Unit Manager

Carl's enthusiasm and knowledge regarding the operation of ACRES and the remote sensing 'industry' generally, has been of great benefit to the or-

ganisation. These qualities will be needed in the years ahead, with new satellites and sensors, new processing techniques and the search for new markets by ACRES in its role as Australia's major earth resources satellite data reception and processing facility.

1990 PRICE REVIEW

ACRES 1990 Landsat prices review will be deferred until the middle of the year with the exception of the image catalogue and multiple print prices, which will be increased by 15% with effect from the 1st January.

ANTENNA PROBLEMS SOLVED

On October 19th X band data reception from Landsat 5 ceased. (October 18th was the last "good" pass). Between then and October 31st no archived TM data exists.

ACRES technician, Bill Howard, was sent to Alice Springs to perform emergency repairs on the malfunctioning antenna component. This was accomplished and, as of November 1st, partial reception was restored. It is anticipated that the 'work around' solution will keep the antenna functioning until its upgrade is completed around January next year.

ACRES CHRISTMAS MESSAGE

This is the last edition of ACRES News for 1989. The next edition will be produced in the first quarter of next year.

The management and staff of the Australian Centre for Remote Sensing (Canberra and Alice Springs Facilities) wish all our Distributors, Reference Centres, clients and colleagues the compliments of the season and a prosperous new year.

ACRES DISTRIBUTOR AND REFERENCE CENTRE WORKSHOP

A workshop is being held on the 12-14th December for ACRES Distributors and Reference Centres and selected AUSLIG staff.

The primary aim of the workshop will be to train image sales counter staff in

the ordering of Landsat TM, SPOT and NOAA-AVHRR image products on the new computerised order entry system.

Subjects covered will be data types and characteristics, processing options and operation of the 'on-line' catalogue and ordering procedures. A Users' Manual will be issued to participants of the course.

Reference Centres will be relating their activities in technology transfer operations.

MANAGER'S MESSAGE

Elsewhere in this newsletter you will read of Don Gray's retirement after a lifetime in Australia's aerospace business.

During Don's tenure at ACRES the technology has matured and satellite remote sensing data is today accepted as cost effective tool in the management and development of our environment and resources.

Our challenge is to ensure that Australia continues to benefit from the technology by making available the most appropriate data products to our user community at affordable prices.

Landsat TM data, particularly the geocoded products, are proving very popular and ACRES are developing NOAA-AVHRR products. We expect to be receiving SPOT data at Alice Springs in early 1990, and in the meantime we are continuing as a SPOT Image Distributor.

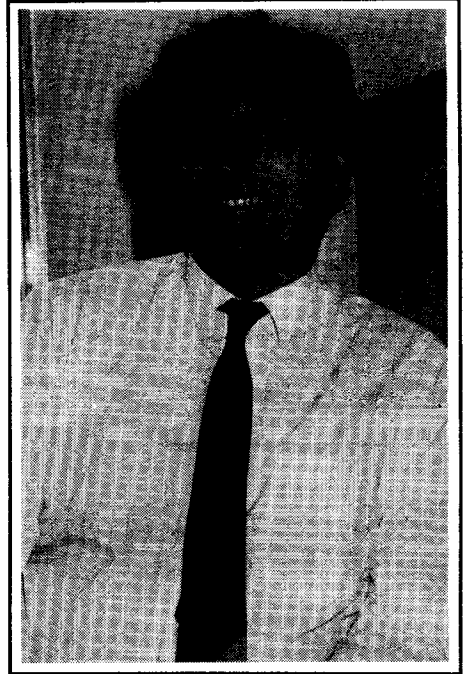
COSSA are close the finalising the MOS-1 processing arrangements for delivery of products to the Investigators. ACRES began to receive additional MOS-1 data from November for three months, by arrangement with COSSA.

Following my promotion to Don's position Paul Wise, who heads AUSLIG's Remote Sensing Applications Section will act as ACRES Director pending its permanent filling.

STEVE DOVEY LEAVES FOR THE PHILIPPINES

Steve Dovey left ACRES after 10 year's service on the 24th November.

Steve was originally involved in the applications of ACRES data but later specialised in ground station production management.



Steve Dovey

It is in his capacity as ground station product expert that Steve has been contracted by BHP Engineering to assist in the setting up of NOAA-AVHRR Processing Centre in the PHILIPPINES. His contract term will be three years.

We wish him well in carrying out his overseas contract and hope that the experience will be an enjoyable one for the whole Dovey family.

SPOT OF THE ANTARCTIC

LARSEMAN HILLS IMAGE MAP PUBLISHED

During the Antarctic Summer of 1987/88 the French SPOT satellite, in response to program requests from AUSLIG's Special Services Unit, acquired imagery of a number of areas in the Antarctic. This data is now being used to produce an up to date series of line and image maps of priority areas for use by Antarctic exploration teams this coming summer.

The recently published Larsemann Hills Image Map represents the first image map produced by AUSLIG using a combination of image processing/enhancement, cartographic and photolithographic processes.

The SPOT digital data on computer compatible tape (CCT) was input to AUSLIG's Remote Sensing Application's ARIES III image analysis system. Ground control points on WGS84 datum within the appropriate UTM zone were identified in the image.



An example of the Larseman Hills image map

These points were used to create a first order mapping polynomial which related the ground control to the image co-ordinates (line and pixel). A first order polynomial merely rotates and translates the image to fit the ground control rather than distorting it by "rubber sheeting".

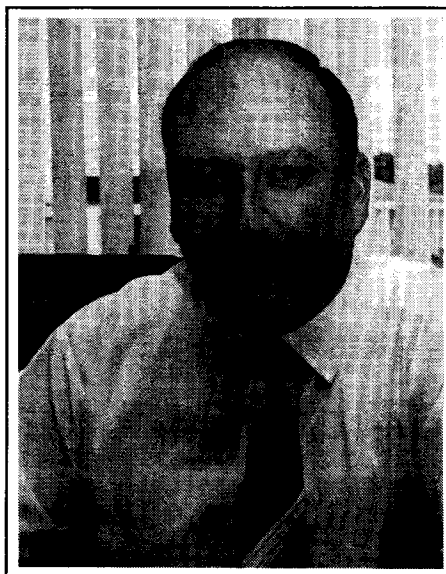
Following resampling by the cubic convolution algorithm the image was digitally enhanced to make rock areas more readily distinguishable from the snow/ice and sea-water, while retaining some detail in the inland snow/ice areas. The computer enhanced digital data was then written to colour negative film at the Australian Centre for Remote Sensing, using an Optronics film writer with a 50 micron aperture at a scale of 1:200 000.

The contact film positive produced was subsequently colour separated into four colours on a SCITEX 350 Response colour scanner with an output resolution of 150 dots to the inch. Major feature names were added using drop out techniques in dark areas for clarity by the Cartographic Services Unit.

The map has been supplied to the Antarctic Division with the printed bulk map stock being stored flat and untrimmed so that a line map can be printed on the reverse side when it is subsequently prepared from stereoscopic

SPOT panchromatic 10 metre imagery.

Although pleased with the result AUSLIG is continuing to develop the product process to optimise the resolution of the imagery for future printed maps.



"Paul Wise, Director of the Remote Sensing Applications area, currently acting Director of ACRES"

DON GRAY - FORTY YEARS OF PUBLIC SERVICE

In a career spanning 40 years of Public Service, Don Gray retired on 8 November 1989 to begin a new life as a Pensioner and Consultant.

Don started work in 1949 at the age of 15 as an apprentice in the Royal Australian Airforce. He was commissioned in 1954 and in the ensuing years worked on secondment to the British Ministry of Aviation on surface to ground guided weapons trials at Woomera, following which he was attached to a number of flight-wings being responsible for the maintenance of radio, radar, electrical and instruments systems at various airforce bases.

He resigned his commission in October 1963 to take up a position of Senior Engineer at Island Lagoon Deep Space Tracking Station, Woomera, responsible for the Operation and Maintenance of the antenna receiver and transmitting system.

From October 1966 to June 1967 Don was the Deputy Station Director of Tidbinbilla Deep Space Tracking Station which at that time was involved in the Apollo manned flight lunar mission.

In June 1967 he was appointed Station Director of Tidbinbilla and became responsible for the management of the tracking station for NASA engaged in unmaned lunar and planetary exploration, and support to the prime Australian manned flight network tracking station at Honeysuckle Creek during the Apollo mission.

Following Tidbinbilla Don was appointed Station Director of Honeysuckle Creek in 1969 where he was involved again with NASA in the Apollo Skylab and Apollo-Soyuz manned flight missions, and subsequently in deep space planetary exploration.

It was during his time at Honeysuckle Creek that Don was awarded two NASA Group Achievement Awards:

- for exceptional support to the success of the US Apollo program;
- for professional and unique dedication to the US space program.

From Tidbinbilla Don was appointed the Director in February 1978 of the soon to be established Australian Landsat Station (ALS).

From the early beginnings of the ALS in a small office in the Benjamin Offices basement Don with the assistance of three people established and built the

first Australian commercial centre for remotely sensed earth resource satellite data.

It has since grown from those days (including two upgrades) to its present structure known as the Australian Centre for Remote Sensing (ACRES) to reflect the expanded role of remote sensing of earth resources in Australia.

In no small part Don has been responsible for guiding and transforming remote sensing and the Centre into a commercial enterprise with a world wide reputation for excellence.

To Don, we at ACRES thank you and wish you all the very best for the future and whatever lies beyond.

Good luck, Don!

BULK

The bulk category consists of processing that offers stages of radiometric corrections based on calibration tables derived from the known performance parameters of the sensor. The stages of geometric corrections offered are based on a model of the satellite orbital characteristics and the Earth Surface geometric parameters.

ACRES THEMATIC MAPPER PRODUCTS

ACRES Thematic Mapper data products are available in both digital and photographic format.

The new range of data sheets necessary to describe the Thematic Mapper sensor, data products, processing and prices are available for distribution.

PROCESSING OPTIONS

ACRES Thematic Mapper data products are available in a range of various processing levels to suit the needs of the user. Processing involves two basic types of corrections:

- a) radiometric (brightness) corrections.
- b) Geometric (geometry, location) corrections.

ACRES processing system is structured in the following manner. There are three basic categories for processing of data products:

- 1) BULK
- 2) GEOREFERENCED
- 3) GEOCODED

Within categories 2 and 3 there are two sub-types:

- 1) SYSTEMATIC ... using a spacecraft model
- 2) PRECISION ... using ground control points in addition to the spacecraft model

GEOREFERENCED

The georeferenced processing category involves the radiometric and geometric correction stages as well as a further stage of performing two-dimensional resampling to a map projection (note that initially, only the AMG projection will be offered). This level provides users with imagery where ground feature locational accuracy will be comparable to a map in the same projection and at the same scale.

Locational accuracy is offered at 2 stages;

- systematic - resampling data to a map projection, and
- precision - resampling data to a map projection using ground control points (derived from 1:100 000 scale topographic maps).

Georeferenced data remains aligned to the satellite data grid and retains the 30 metre pixel size of TM bands 1, 2, 3, 4, 5, and 7.

GEOCODED

Geocoding involves performing radiometric and geometric corrections, as in the preceding categories, and resampling to a map projection using new pixel sizes that allow for the overlay of various sensor data at various time intervals, at a given map location. The resampled data is rotated and aligned to the map projection (i.e. placed on the SAME GRID).

In the same way as georeferenced data two stages of processing are offered:

- systematic which involves both radiometric and geometric corrections, two-dimensional resampling to 25 metre pixel size PLUS rotation to align the satellite data grid to a map projection.
- precision as for systematic with the additional option of increased locational accuracy using ground control points (derived from 1:100 000 scale topographic maps).

(NOTE: GEOCODED DATA PRODUCTS ARE SOLD ONLY BY AUSLIG 1:100 000 SCALE MAP SHEET AREAS.)

ACRES Landsat Thematic Mapper data products are offered at 11 processing levels. These are numbered 00 to 10. Some levels are not available. This is also the case with the TM thermal infrared band, Band 6 (due to temporary processing problems). The data pricing structure allows users to pay for only what they need, i.e. for one, two, three, four, five, six (and later seven) bands.

ACRES DATA SHEET 1.3 DESCRIBES ACRES TM PRODUCT AND PROCESSING OPTIONS. DATA SHEET 1.4 LISTS TM DIGITAL AND PHOTOGRAPHIC DATA PRODUCT PRICES. THESE ARE AVAILABLE UPON REQUEST.

ACRES IMAGE WRITING SERVICE

ACRES offers an image writing service where digital data supplied on computer compatible tape (CCT) is written onto high quality colour or black and white film. Any data which conforms to the standard (see Data Sheet 3.0) can be imaged (i.e. not restricted to Landsat data).

The resulting film products are negatives from which the customer can produce any number of copies. These negatives come in two sizes: 210 mm wide by 230 mm high (A4 size) or 240 mm wide by 230 mm high (the frame size of the FIRE film recorder). The ACRES logo, annotation and quality control grey scale take up space, so the usable image areas are 200 mm wide by 200 mm high and 230 mm wide respectively. From this negative a range of photographic products can be produced including:

Contact Transparencies
Contact Prints
Enlargement Prints
(up to 1.2 m x 1.2 m)

ACRES DATA SHEET 3.0 DESCRIBES AVAILABLE APERTURE SIZES AND OTHER TECHNICAL INFORMATION AS WELL AS CURRENT PRICES (NEW PRICES ARE APPLICABLE FROM 1.8.89).



ROBERT DENIZE IS BACK

Robert Denize returned to ACRES to the same position (Senior Engineer) as he occupied before he left the organisation back in 1985.

Robert left ACRES to take up a position as Satellite Advisor to the Saudi Arabian Meteorological Services. In 1986 he became involved with the setting up and commissioning of the Saudi Arabian SPOT, NOAA and Landsat ground station.

After travelling extensively for a year in 1987-1988 he returned to Australia where he spent time at the Department of Defence before returning to ACRES this year.



LTWG REPORT

Robert Denize attended the Landsat Technical Working Group held in Singapore on October 16-20 Meeting as ACRES representative.

A change of direction was evident at this meeting. There was emphasis on the importance of data continuity through the Landsat 6/7 era. In future, LTWG will focus on Landsat 6 operations and issues, with diminished emphasis on Landsats 4 and 5.

The Group also agreed to a recommendation that Landsat data's commercial aspects not be excluded from the LTWG agenda. The introduction of new products should be included as part of country reports.

As an information item under the LGSOWG Meeting presentation, EOSAT confirmed that the Landsat 6 draft MOU annex will be distributed to all ground stations before the end of 1989.



SECOND MOMO MEETING REPORT

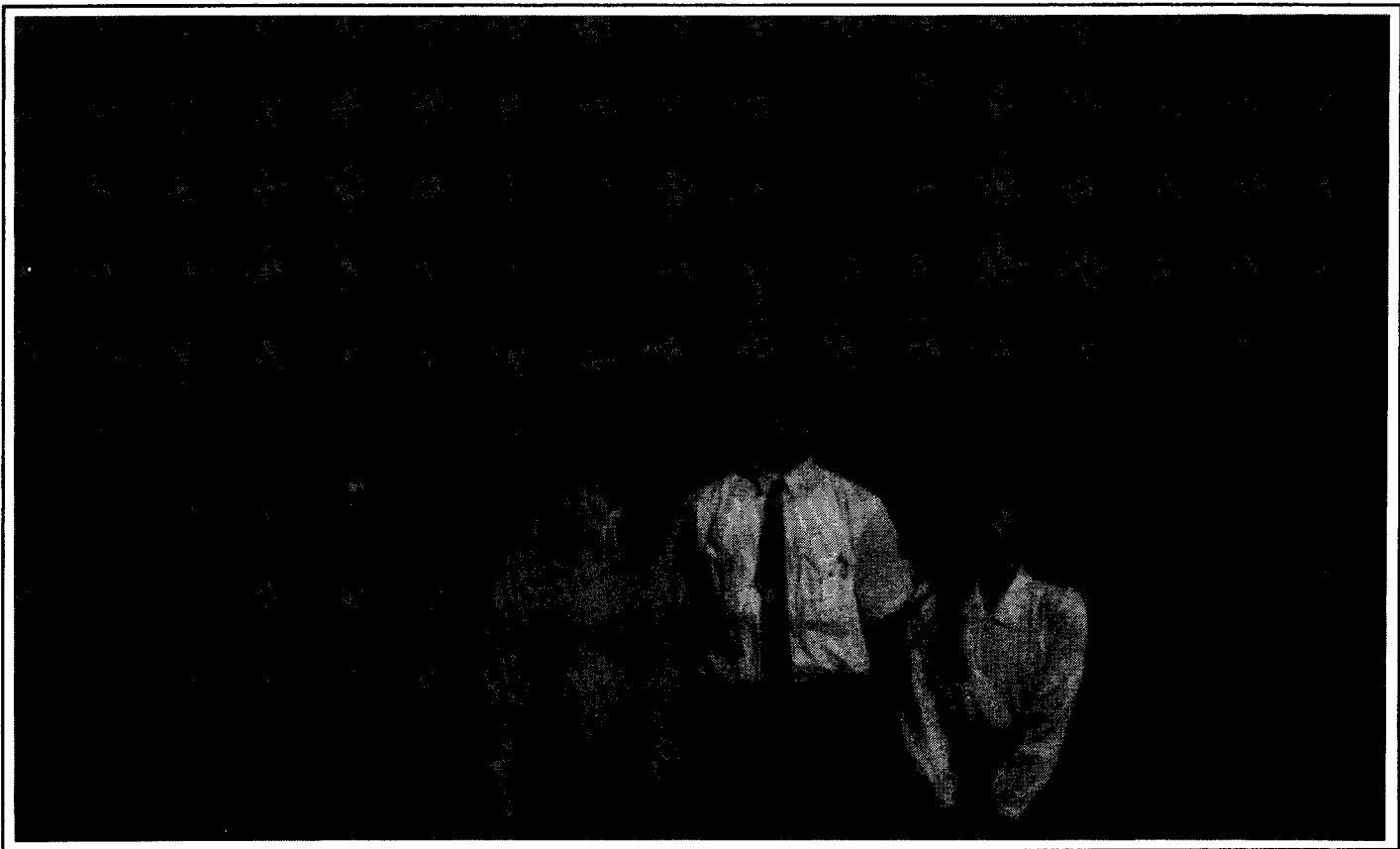
Robert Denize, ACRES Senior Engineer, was Australia's representative at this meeting.

The Second MOS-1 Management and Operations Group was held in the Tokai Space Information Centre at Kumamoto, Japan.

Robert presented a report from COSSA on Australia's MOS-1 reception and recording status.

The meeting consisted of mostly Japanese scientists, with Australian, Canadian, European and USA representatives present. Canada reported that MOS-1 data products had been sent out to Principal Investigators and reports were being returned on their results. These are being assessed.

MOS-1 is now in extended life with 2 years of propellant left. MOS-1B, exactly the same as MOS-1, is due for launch in February, 1990.



Robert Denize with two secretaries from the meeting visiting Mt Aso, an active volcano on Kyushu island, Japan

JOHN HORN VISITS EROS DATA CENTER

John Horn, ACRES Photographic Specialist, paid a two day working visit to Eros Data Center at Sioux Falls, South Dakota, USA.

EDC is the principal Landsat data processing facility in the United States and products are distributed under arrangement with EOSAT, the operator of the Landsat Programme.

The location of EDC being 25km from Sioux Falls is a surprise to many visitors.

Of primary interest were the EROS production techniques. A MacDonald Dettwiler FIRE-240 Image Writer is used for image output. Initially, problems were also experienced with static discharge on black and white film (see ACRES Photolab News) however this was overcome by writing both colour and monochrome imagery onto the same colour film type. The film type used was an older generation unmasked colour air survey film which is developed in the now rare Kodak C22 process.

The production areas of the Center are huge, however EDC is not only responsible for the production of images from satellite data, but also holds a vast archive of aerial photography, and uses much of its production capacity in supplying products from this archive.

PHOTOLAB NEWS

During the past 5 months Photolab staff have been processing an increasing amount of TM imagery in addition to the usual MSS and image writing service negs and prints. Many superb and very spectacular scenes have been generated, some of which are geocoded, intended to match other data types on the same map grid.

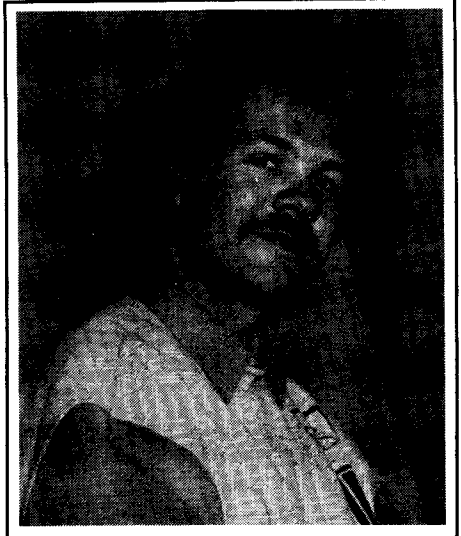
Test imagery for the production of catalogue microfiche for NOAA-AVHRR and Landsat 5 TM data has also recently been processed.

Static electricity discharge affecting black and white negative film production is continuing to cause concern and is currently under investigation. Hopefully this problem will be eliminated in the very near future.

Renovations to the Photolab administration area, to accommodate the Remote Sensing Applications personnel, are well under way. This work should be completed by the new year.

With the advent of an increasing requirement and interest in precision and geometrically accurate enlargements, particularly for mapping purposes, the purchase of a new large format horizontal enlarger is under consideration. This enlarger will replace the ageing DeVere 108 which has many limitations. Modifications to our vertical vacuum easel to provide adjustable orientation with respect to the horizontal enlarger are also planned.

Lindsay Piggott (Photolab, User Services) has departed ACRES for greener pastures down Batemans Bay way after nine years. We wish Lindsay and his family all the best in his future ventures.



Paul Gardner, programmer, ACRES Computer Section

COMPUTER LAB NEWS

ACRES officially began processing customer orders on its upgraded computer system (for Landsat TM, SPOT and NOAA-AVHRR data) on Tuesday 1st August 1989. Since then, hundreds of high quality image products have been generated by the ACRES Computer Lab on state-of-the-art equipment.

No new computer system is installed without teething problems, of course, but to date most of these have been overcome. In the 3 months since system testing and operator training finished, ACRES has received orders for Landsat TM and NOAA-AVHRR products totalling \$200,000.

Since the last issue of ACRES News, there has been only one change to the staffing of the Computer Section. This means that on-going training and production experience of the personnel base continues uninterrupted. The section now comprises 5 computer operators, 3 programmers, 3 technicians and 2 engineers as well as a new trainee operator (see below).

Due to the demand for precision georeferenced and geocoded image products (which required skilled manual marking of ground control points from maps), ACRES has employed an extra person Danielle Baker, to assist in this area.



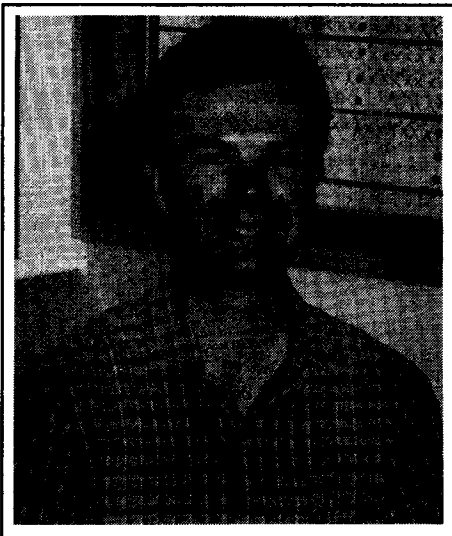
ACRES Photolab team, from left to right: Mike Pasfield, John Horn, Kristen Ritchard, Anton Albina, Joe Kucharski and Steve Adler

TM DATA NOTICE

Priority 1 & 2 is not available.
Priority 3 only.

DEGRADED DATA

28/3/89 - 15/5/89 (inclusive).
Due to substantially degraded data, all entries for these TM dates will be deleted from the catalogue, but the tapes will be retained.



Nick Spencer, programmer, ACRES Computer Section

sector, will attend this conference.

The Conference is convened by the Australian Bureau of Agricultural and Resource Economics and the Bureau of Mineral Resources.

The trade exhibition will feature products and services, including information technology, important for efficient operation for our commodity industries.

For information on registration contact:

The National Agricultural and Resources Outlook Conference

GPO Box 1563
CANBERRA ACT 2601
Phone (008) 026120 or (062) 469652



SPOT DISTRIBUTORS' TRAINING COURSE

This SPOT Training Course was held in Toulouse, France, from the 18th to the 29th September 1989.

The course was set out into 5 major topics. These were: the SPOT system, project management, applications, SPOT marketing and visits.

The SPOT system covered a general overview of the organisation and the satellite. Definitions of products and the programming of the satellite, identifying possible conflicts, were explained.

Project management was aimed at encouraging SPOT distributors to initiate and manage projects, incorporating SPOT data, in joint ventures with other organisations.



THE NATIONAL AGRICULTURAL AND RESOURCES OUTLOOK CONFERENCE

30 January - 1st February 1990, Canberra, ACT.

This is an important conference providing a forum for the economic, scientific and commercial issues vital to Australia's commodity industries.

Over 1200 delegates from corporate agribusiness, farming organisations, rural finance and now, for the first time, the non-renewable resources

USER SERVICES NEWS

Production

As part of ACRES recent upgrade, a complete order entry and production control computer system was installed for the processing of TM and future data from satellites such as SPOT. All TM orders are processed via this system. Sandy Browne has been gaining expertise in using the system during the past 3 months and soon all User Services personnel will be fully trained.

TM orders have flooded in. With the learning curve for the new system initially at a low point, turnaround times were slow. Now procedures seem to be slipping into place and ACRES has an average turn around time of 3 weeks for

BULK and SYSTEMATIC product orders. Any products which require marking ground control points (GCP's) will take longer.

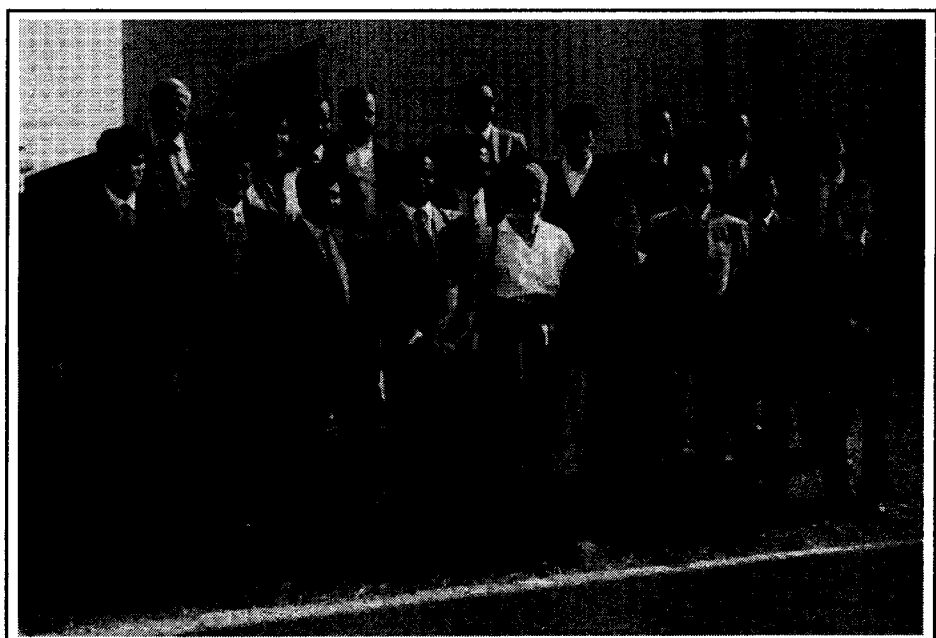
However we are implementing pass processing techniques which will lessen the GCP marking task and improve delivery times.

ACRES Customer Image Writing Service has a present average turn around time of less than one week.

Landsat MSS orders have dropped in numbers and are moving through the system within approximately 2 weeks.



Ana Gadzic, User Services Officer



The attendees at the SPOT Distributors' Training Course. Rosalie Booth (ACRES) is at the centre front row

GEOIMAGE BECOMES AN ACRES DISTRIBUTOR

GEOIMAGE, specialists in image processing and non-renewable resource remote sensing applications have been added to the list of ACRES Distributors.

This is a small but dynamic consulting company run by Robert Walker and Sylvia Michael who previously spent 8 years working in the image processing laboratory of the Carpentaria Exploration Division of Mount Isa Mines.

Contact details:
GEOIMAGE Pty Ltd,
PO Box 395,
Upper Mt Gravatt, QLD, 4122
Phone: (07) 343 2194
Fax: (07) 353 7974

RESOURCE INDUSTRY ASSOCIATES, ANOTHER ADDITION TO THE ACRES NETWORK

This is a small innovative company run by Terry Boyd, a surveyor with considerable experience in processing and interpreting land information data.

Sales of TM data through this company have been considerable highlighting the efficient service provided to their clients.

Contact details:
Resource Industry Associates,
832 High Street
EAST KEW VIC 3102
Phone: (03) 810 9503
Fax: (03) 859 7062

MAPPING AND MONITORING TECHNOLOGY, ACRES TOWNSVILLE, QLD, DISTRIBUTOR

Here is another small but highly successful consultancy run by Dr Debbie Kuchler (ex. CSIRO) located in Townsville, North Queensland.

Full microfiche catalogue and image ordering facilities are available from their offices. In addition value-added

processing and image interpretation services are also available.

Contact details:

Mapping and Monitoring Technology Pty. Ltd.

37 Tulley Street
TOWNSVILLE QLD 4810
Phone: (077) 75 1334
Fax: (077) 71 6626

UPDATE ON THE 5TH AUSTRALASIAN REMOTE SENSING CONFERENCE

The Conference theme is "Operational Remote Sensing for Developing and Managing Earth Resources".

Dates: October 8-12, 1990
Location: Perth, WA.
Conference Secretariat:
Remote Sensing Applications Centre
PO Box 1215
WEST PERTH WA 6005
Phone: (09) 323 1520
Fax: (09) 321 8576
International Fax: prefix (619)

The 5th Conference in the series is co-sponsored by the Remote Sensing Association of Australia, the CSIRO, and the Western Australian Department of Land Administration. The Conference agenda has been arranged to encourage a wide variety of presentations through keynote addresses, paper presentations, poster sessions and detailed workshops. Already the Conference has attracted numerous exhibitors, ranging from commercial and technical companies to display by state consortia, CSIRO and individual consultants.

In addition to specialist workshops on remote sensing techniques, COSSA will bring CSIRO's F27 Fokker Research Aircraft to the Conference together with the Ocean Colour Scanner and the Side Looking airborne Radar systems, providing first hand information on Australia's research activities. Technical tours of local facilities are scheduled including Geoscan (the Geoscan Multispectral Scanner).

The organising committee have recognised the particular needs of students and are offering considerable Conference registration discounts and travel packages through the various tertiary institutions. Students are encouraged to take advantage of this offer to participate in the Conference.

The venue, Observation City Resort Hotel has excellent facilities, offering large exhibition areas, conference pres-

entation suites and smaller meeting rooms. Attractive accommodation packages at the venue and surrounding hotels are being negotiated and will be announced in a second Conference flyer.

The call for papers to be submitted for selection has been extended to 15th January 1990. In addition, the submitted abstract should be 2 pages in length.

The deadline for author kits is 28th February 1990 and final papers are to be submitted on or before the 31st May 1990.

CURRENT RESEARCH

The Australian Commonwealth Department of Primary Industries and Energy - Bureau of Rural Resources, currently has two remote sensing studies underway.

- 1) AN ASSESSMENT OF THE USE OF REMOTE SENSING TECHNIQUES IN LAND DEGRADATION STUDIES
- 2) REMOTE SENSING FOR AGRICULTURAL PRODUCTION AND RESOURCE MANAGEMENT IN AUSTRALIA

ACRES NEWS is published by the PR Unit of the Department of Administrative Services for the AUSTRALIAN CENTRE FOR REMOTE SENSING

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