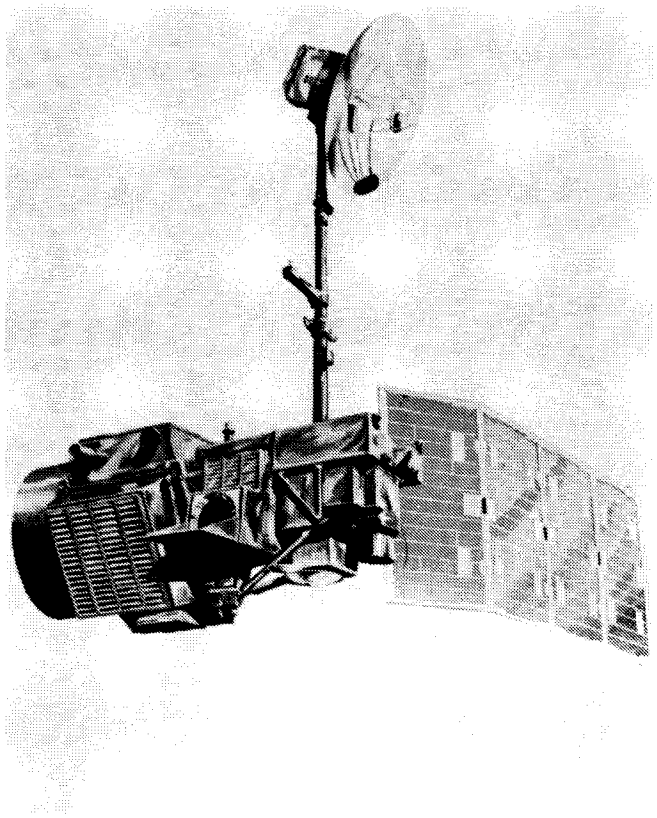
NEWSLETTER

LANDSAT-4 POWER RATIONED FOR MSS OPERATIONS



Connections between 2 of the 4 solar panels and the main spacecraft modules on Landsat-4 have now failed completely, reducing the available onboard power by 50%. Analysis of the failure has revealed that the fault is due to temperature stresses on the flexible cables which connect the panels to the spacecraft power supply. Intermittent operation of the power system began in March, with power supplied by the two outboard panels being successively affected. The fault was typified by power losses from the outer panels occurring about 30 minutes after the spacecraft's leaving the Earth shadow on each orbit. Repositioning of the panels by ground controllers to alleviate the stresses on the cables at best delayed their subsequent failure.

In February the spacecraft's X-band transmitter for the Thematic Mapper downlink failed and acquisition of TM test data ceased. Landsat-4 has a second (Ku-band) link for TM data designed to operate with the Tracking and Data Relay Satellite System (TDRS), but the failure of the first satellite in the series (TDRS-A) to achieve correct orbit after launch from Shuttle Mission 6 has delayed the testing of the link and further acquisition of TM data. TDRS controllers after a great deal of orbital adjustment are now satisfied with the geostationery satellite's position and performance, and tests involving relay transmissions of both MSS and TM data were successfully completed on the 12 August. However, the power budget now forced on Landsat-4 operations as a result of the power cable failures will further limit access to TM data. Concurrent operation of the Thematic Mapper and the Multi Spectral Scanner is not now feasible for extended periods, and NOAA's stated policy is that it will support MSS data in preference to TM - MSS being the most widely supported system on the ground.

There have also been problems in controlling all the systems mounted on the multimission frame of the spacecraft. Problems with loading the spacecraft command table into the onboard computers have resulted in loss of acquisition on some paths. The primary computer in the command module is now out of service, and operations are being carried out using the backup unit — leaving no operating margin in the event of further failures.

These events have caused NOAA to request the launch of the standby spacecraft, Landsat-D'. NOAA have advised that launch of D' is unlikely before March 1984 — in addition to the modifications necessary to avoid repetition of the failures on the current spacecraft, NOAA require launching funds for the standby unit. The earliest date at which NOAA can receive funding authorization for a supplementary budget submission to cover the launch costs, is in January 1984 or sometime early in the 1984 calendar year. In the meantime the engineering analyses of the power cable failures indicate that the links to the inboard solar panels are subject to similar thermal stresses, but of lower degree than the

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Newsletter

Welcome to the new **quarterly** format for the *ALS Newsletter*. As you will note in the editorial statement, contributions from the user community are considered to be an integral part of this publication. The changes we have made, and the publication timetable we have set, are designed to make the *ALS Newsletter* a better vehicle for communicating your information to others in the remote sensing community. So if you have an article you would like published, and it's of interest to the user community, then the Editor would be pleased to hear from you. Suitable arrangements will be made for reserving authors' copyright where required.

The *Newsletter* currently has about 1,000 readers, and if any one of you has some constructive thoughts on its purpose and presentation, then we would welcome your comments.

Don Gray
Station Director

outboard ones because of their position. It is considered very likely that the remaining two cables will also fail within the operational lifespan of the spacecraft — temperature sensor fluctuations that were precursors of cable failures to the outer panels have already been noted by ground controllers on the third panel. If a third panel fails, the resulting power budget would severely curtail routine spacecraft operations; if failure occurs before launch of D' then MSS acquisitions would almost certainly be limited.

Aviation Week and Space Technology reports that in the event of further failure, consideration would be given to decelerating the spacecraft into a lower orbit and leaving it there in safe-hold mode. This would permit retrieval, and possible repair and refuelling by a polar orbiting shuttle mission, the first of which is due in late 1984.

Meanwhile, Landsat 2's operational life has been terminated with the spacecraft being put into a non-recoverable shutdown mode. Landsat 3 is to be maintained until at least 30 September for access by urgent request only — the MSS data is seriously degraded due to multiplexer problems.

International News

New ground facilities

Following the signing of a memorandum of understanding between the People's Republic of China and the United States Administration under President Carter on the provision of a Landsat facility, contract negotiations were successfully completed this year with a U.S. systems supplier. Systems and Applied Sciences Corp and its subcontractors successfully competed with General Electric for supply of the complete US$10-12M facility including installation, and the training of operations personnel. The Corporation had previously completed a contract with China involving development of metereological satellite ground station computing facilities.

The Landsat ground station will be located at the already identified Beijing site, with the receiver placed about 100km outside the urban area. The receiving station and the data processing facility will be able to handle both S-band Multispectral Scanner data, and X-band Thematic Mapper data.

In Bangladesh, the Centre for Space Research and Remote Sensing began operations at the beginning of the year with its newly delivered VIZIR Image Processing System from the French company, Societe Europeanne de Propulsion (SEP). The Bangladesh Centre's data processing facility — located in Dacca — forms part of its ground station with capabilities for receiving and processing data from the French SPOT system, due for launch in late 1984. In the meantime, staff at the Centre are working with Landsat MSS data, and are able to use TM data when it becomes generally available.

In addition to computer-assisted image interpretation, the Image Processing System provides for digitising of both photographic materials and topographic reference maps allowing integration of other information in the System also allows for reproduction of composite maps, as well as the production of standard photo images.

Since installation the system has been used as a cost-effective means of producing land use and land development maps in the absence of any previous systematic mapping of the area. This has been achieved by compiling carefully scaled photo mosaics of the entire country from spectrally classified Landsat images. Geometrically precision rectified temporal image series have also been used to map soil deposition in the delta wetlands of the Ganges and Brahmaputra rivers, and to monitor wetland stabilisation by mangrove plantations. Monitoring of interior arid zones and thematic mapping of cultivation are other segments of a remote sensing programme aimed at rationalising agriculture and optimising land use, in an effort to achieve some of Bangladesh's immediate economic objectives.

— Aviation Week & Space Technology, SEP 5 no. 7

U.S. evaluation of private control for civil remote sensing satellites

The United States Department of Commerce and the U.S. Congress are currently following up the policy developed by the U.S. Administration on transfer of Landsat and U.S. owned meterorological satellites to the private sector.

The Department of Commerce has established a Source Evaluation Board whose primary task is to seek proposals from private interests on the transfer of Landsat, the geo-stationary or the polar-orbit weather satellites, or some combination of these systems — together with the ground station and data processing facilities. An assessment of the current U.S. market for Landsat data puts its value at about US$10M, while operating and maintenance costs for the system are currently running at over US$20M. As a result, it is expected that potential bidders will be seeking to combine proposals on the weather satellites with proposals to take over Landsat, to offset the costs involved in operating the Landsat system. The Evaluation Board first has to compile a suitable schedule for such a transfer, while seeking advice on the policy matters involved from supporting committees. It is anticipated that the Board will invite potential bidders to submit their proposals in November, with formal bids expected during the first quarter of 1984. The bids submitted will then be evaluated, and the findings of the Source Evaluation Board reported to the U.S. Secretary of Commerce.

During June and July, the U.S. Congress has been conducting hearings on the subject of the transfer with a view to forming its own opinion on the proposals. Among the witnesses appearing before the Congressional hearings were representatives from groups that have carried out recent studies on the transfer — including the U.S. National Academy of Public Administration, and the Earth Satellite Corporation.

— Landsat Data Users Notes no. 27, Nature no. 5290.

Australian News

Successful short course at the Centre for Remote Sensing, UNSW

Staff at the University of NSW Centre recently conducted a two part short course covering Principles of Remote Sensing, and Image Enhancement and Classification. Course leaders were: Dr Bruce Forster, Senior Lecturer in the School of Surveying; Dr Tony Milne, Lecturer in the the School of Geography; and Dr John Richards, Senior Lecturer in the School of Electrical Engineering and Computer Science. The course, which was held at the Centre during six days and one evening, ranged over topics from the definition and physics of electromagnetic radiation quantities and spectral signatures, to detailed techniques of photointerpretive and digital analysis.

At the end of the course, the students were presented with a complete image classification methodology, and asked to apply this to a representative sample image using the image processing facilities at the Centre. The tutorial groups into which the twenty students were divided for this task approached the problem with varying degrees of ambition, resulting in varying degrees of success with the exercise. The most ambitious group, using the Centre's powerful DIPIX system, produced the least conclusive result — but learned valuable lessons about the structure and features of such machines, and the need for a thorough understanding of the processing techniques involved.

All those enrolled in the Course had some previous contact with Landsat imagery or remote sensing techniques — most of the students were concerned with thematic mapping, temporal monitoring, or environmental uses, with only three involved in geological applications. All agreed that the course had something to offer their particular discipline; and there was unanimous agreement that the presentation of the course material set an excellent standard.

News from DAF

These are the first in a series of notes from the ALS Data Acquisition Facility at Alice Springs. After a general introduction we will — in later issues — give more detailed information on operations at DAF, which we feel will be of benefit to all Landsat users.

The Facility staff pride themselves on high reliability — downtime is very low considering the seven days per week data recording load. The Station operates normal shifts on weekdays, with weekend satellite passes scheduled on an overtime basis allocated amongst the staff. (The Station staff comprises five technical and one part-time clerical person). All equipment on the Station has full back-up, and data tapes are checked through twice before despatch via air courier to arrive at the Data Processing Facility the following morning. The rare downtime that does occur can usually be attributed to power failures. The heavy flooding in March this year left Alice Springs without power for some thirty hours.

The DAF occupies office space and operates a Browse Facility in the CSIRO Wildlife and Rangelands Research Building adjacent to the site. The CSIRO is a significant user of Landsat imagery, and close co-operation with the DAF staff has evolved through social events, as well as through professional activities.

Visitors to the Data Acquisition Facility are welcome. So far, nationally, visits have ranged from school students and Scouts to Members of Parliament — and have included interest groups such as Bushfire Control Council delegates, and officers from Water Resources and National Mapping agencies. International visitors include Joe Kerwin (a Skylab astronaut); a French Scientific and Cultural Committee (of senators); FAO representatives from Libya; geography research students from Poland; and groups from the UK, Canada and Japan. A visit to DAF followed by a visit to CSIRO gives an excellent overview of Landsat, from data collection to ultimate use.

Our experience is that there is a general lack of knowledge by visitors of the full capabilities of Landsat. So, if you are visiting Alice Springs, the Station is easily accessible — only eight kilometres from town. A guided tour takes about an hour, and there is an audio-visual presentation to be viewed. A phone call to the Officer-in-Charge is all that is needed.

Warren Serone

One of the people responsible for the smooth operation of the DAF is technician, Warren Serone. Warren was born in the Northern New South Wales town of Lismore, and received his education from the local schools. He was a keen sportsman while at school, and played both rugby football and cricket. After matriculating in 1962, Warren joined the NSW State Department of Agriculture, working as a field assistant with the Cattle Tick Research Station at Wollongbar, near Lismore.

In 1965, Warren Serone was conscripted into the Army under the National Service Scheme — and in 1968 entered the Air Force. During this time he met and married his wife Dawn. Warren's engagement with the Air Force was for a six year term, over which he received intensive training and extensive experience as a telecommunications technician, while based at Laverton in Victoria, and Glenbrook in NSW.

After completing his military service, Warren worked on the maintenance of photo-typesetters for Cumberland Newspapers. In his spare time he converted a bus into a mobile home, with the objective of touring Australia. He and his family set out on this venture in 1976, but were forced to abandon the trip because of illness after travelling as far as Northern Queensland.

When an attempt at running a coal-trucking business proved unsuccessful, Warren decided to accept a post as technician at the Landsat Data Acquisition Facility. He moved to Alice Springs in September 1979, just prior to the commencement of data acquisition at the Station. With his wife and children — Michelle, Adrian, Amy and Katie — Warren has settled comfortably into the Northern Territory lifestyle, where he has become a keen jogger, and his spare-time activities include being Secretary to the Rotary Club of Stuart.

Technical Notes

Landsat images produced from colour negative masters

After performing experiments using Kodak SO 200 colour negative film in Photowrite image-makers, ALS photographic staff sought comments on the resultant products from colour image users. The users showed an 85% preference for imagery produced from direct negative masters over that produced from positive film masters. As a result, Kodak Australia has agreed to supply ALS with SO 200 colour negative material cut to Station specifications, and the decision was made that from the 1st April 1983 all Landsat-4 imagery would be generated using SO 200. What does this mean to you the user? It means a superior customer product. Superior in colour rendition, granularity and resolution.

Colour rendition has been improved by the negation of high intensity reciprocity effects. The blue haze which was evident in some of the earlier Landsat imagery no longer appears. The following comparison tables show how granularity and resolution are improved:

Film Type	RMS Granularity Value	Graininess Classification
SO200 (neg)	8	extremely fine
SO278 (pos)	13	very fine

		LINES PER MM CONTRAST	
ITEM	FILM TYPE	1.6:1	1000:1
1	SO200	40	80
2	SO278	50	125
3	VERICOLOR INTERNEG	50	100

Degradation through generators:
Lines per mm = 1/RF = 1/RN + 1/RP

Where . . .
R : resolution, F : final, N : negative,
P : positive.

e.g.

items 2 + 3 =
1/125 + 1/100 = 55.5 to negative

item 1 ..... = 80 to negative

The direct negative system means, of course, that photo image users' Landsat-4 products are one generation closer to the photo master. The end result is that for production to the negative stage of photo image processing, the direct negative system is superior to the positive master system in every respect.

Tony Chiles
Photographic Specialist

New Product Annotation

The annotation on Non-Standard framed scenes has in the past read **PPP-NS** where **PPP**=path number and **NS** stands for Non-Standard. A modification to this system has resulted in a new annotation which conveys more information about scene centres for Non-Standard products.

The new annotation is of the form **PPP-RRa** where **PPP**=path number, **RR**=row number of the *standard* frame, and **a**=alphabetic character . . . [A, B, C, E, F, G]. **a** is derived from the standard sub-scene grid overlay used by ALS, and indicates the deviation (in seconds) of the new frame centre time from the old frame centre time — as in the table below.

For CCT's the header block containing the row information will now read **aRRR** for Non-Standard frames instead of the original **NS**, where **a**, **RRR** and **NS** have the meanings already described.

Character	Deviation
A	—10 secs (68km North)
B	— 7 secs (47km North)
C	— 3 secs (20km North)
(D)	0 Standard Frame
E	+ 3 secs (20km South)
F	+ 7 secs (47km South)
G	+10 secs (68km South)

Improved framing accuracy with Landsat-4

Framing is the process by which a particular sequence of Landsat data may be identified as belonging to a particular area of the ground along the track of the spacecraft. Naturally, to be able to do this we need to know the exact position and orientation of the spacecraft at any point in time.

Prior to Landsat-4, this was achieved with a specification of the orbit known as **Brouwer Mean Orbital Elements** or BMOE's. These data define the size, shape and orientation of the orbital ellipse and pin down the satellite's position on the ellipse, and how the ellipse is slowly moving (precessing). Using the BMOE data, telexed to ALS daily by NOAA, errors in framing of up to 70km could occur occasionally.

Landsat-4 allows for a much more accurate method of modelling the path of the satellite. NOAA maintain a model of the orbit which includes the effects of gross irregularities in the shape of the earth. The amount of data involved precludes using telex, instead it is transmitted by the satellite itself. The position and speed of the satellite is computed from the model by its on board computer, and transmitted every four seconds. This allows ALS to plot much more accurately the satellite's position.

Using the transmitted data in this way the positioning error of Landsat scenes now seldom exceeds 5km of Path.

Neither of these techniques, however, take into account the direction in which the satellite is pointing, they simply assume that it is pointing straight down, and scanning at right angles to its own path. To obtain better accuracy it is necessary to employ **Ground Control Points** (GCP's): small identifiable details, such as road intersections with precisely known latitudes and longitudes. This permits a pitch-roll-yaw correction to be applied and accuracies of better than 250 metres are achieved.

When precise geometric accuracy is required, ALS can also re-digitise GCP's from the finished photographic product as a final quality assessment of the precision of placing Landsat images on the ground.

Radiometric calibration

With the installation of the new Landsat-4 software came a new radiometric calibration for CCT's. Although not that different from the old program, a complete synopsis is presented here for those not familiar with the original system. The discussion is confined to tapes of the Band Interleaved by Line (BIL) format, since most of the tapes produced by ALS are of this type.

The radiometric correction process can be conveniently divided into three stages:

(a) Choice of a reference detector in each band and determination of the correction necessary to place the data from this detector on an absolute scale;
(b) Calculation of relative differences between all other detectors in each band and the reference detector;
(c) Provision and use of lookup tables which incorporate information from (a) and (b).

Choice of the Reference Detector

The reference detector for each band should satisfy just two requirements: firstly, it should be stable; secondly, output for a given irradiance should be consistent. All the detectors on Landsats 2 and 3, and so far all the detectors on Landsat 4, have met these requirements (making the choice somewhat arbitrary).

Absolute Calibration of the Reference Detector

Absolute calibration consists of a determination of the co-efficients necessary to convert from the expected linear relationship between scene radiance and reference detector response, to the desired response by means of the linear equation:

$$R = \frac{1}{b}(V - a)$$

where . . .
R : scene radiance
V : pixel value
b : detector gain
a : detector offset

To determine values for **a** and **b** the onboard detector calibration system is used where a light source of known radiance is used to illuminate the detectors through a variable wedge density filter.

These calibration values are checked against the pre-launch response values supplied by NASA, which characterise the wedge at six selected, repeatable positions. Using the detector response at those positions of the calibration wedge the detector gain and offset can be determined.

Relative Correction of all Detectors within a Band

For many purposes the relative correction of all the detectors within a band is more important than the absolute calibration. The absolute calibration is only important when Landsat MSS radiances are being compared with radiance quantities from ground or airborne sensors, or when quantitative comparisons are being made between Landsat data obtained on two or more different dates.

Errors in the relative calibration within a band cause so-called radiometric striping, or banding in an image. These stripes are not only very noticeable to the human eye, they can — under digital enhancement or classification procedures — cause gross artifacts in the processed data, if they are not removed.

There are several approaches to the problem of balancing sensor response in scene data. The method in use at ALS removes the relative differences among the (six) detectors in a single band by operating on information from the scene itself. To do this, scene statistics are used to calculate the mean and standard deviation of the response for each detector. The assumption is then made that the number of pixels in a full Landsat scene is statistically large enough that the distributions of scene radiances will have nearly the same mean and standard deviation for all detectors in a single band. Any difference in these distribution parameters over all six detectors will then be due to differences only in detector response. So the gains and offsets of different sensors can be corrected by matching their response mean and standard deviation over the whole scene to that of the reference detector.

Steve Dovey
Applications Specialist

With the increasing interest being shown in the application of satellite imagery to oceanography in Australia, this partial bibliography has been prepared as a reference base for marine scientists and others. Other workers in the field are invited to complete it by noting any omissions and contributing their own lists to the *Newsletter*.

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New Developements

Thematic mapper tests point to improved image analysis

Investigators analysing test images transmitted from the Landsat-4 Thematic Mapper have stated that the resolution and spectral capabilities demonstrated by the new instrument are so improved over MSS data, that routine use of the TM capability will result in new and broader applications for satellite remote sensing.

In the period between launch (16 July '82) and failure of the onboard X-band transmitter in February this year, TM images were acquired when the satellite was in range of the Goddard Space Flight Centre or the Prince Albert Landsat Station in Western Canada. (The resulting test images are all within Canada or the U.S., since the TDRS System is needed to acquire out-of-range scenes). The test images have been provided to a thirty-two member team, representing the user community in the U.K. and France as well as Canada and the U.S., for assessment.

In addition to the 30 metre pixel size on the ground, the increase in the number of quantisation levels (256 intensities) for the detector outputs has reportedly improved spatial resolution in the images to the point where zonation in soils due to moisture content is detectable — as well as improving the visibility and aiding in the interpretation of cultural features such as rural buildings. The ability to detect construction detail within urban areas should broaden the potential for using Landsat in urban classification work, according to representatives of the assessment team.

Finer division of the spectral bands imaged by the new instrument, particularly in the middle infrared region, has enabled the investigators to classify vegetation types based on the variability of the water mass in the foliage. This is particularly useful for resolving boundaries between crop types where pixels in the data inevitably overlap different, adjoining crops at field edges — giving rise to mixed picture elements (mixels). Vegetation analyses of TM data indicate a large reduction in the number of areas where mixels occur, including some ground cover regions where vegetation types are more closely intermingled. This result, coupled with the ability to detail soil structure, should provide a powerful tool for temporal monitoring.

Variability in soils and clays has been used by those involved in geologic assessments to highlight clay bearing deposits important to mineralisation. Band ratio-ing techniques and other forms of data manipulation, such as Principle Component transformations, have been used to great effect on the available TM images of geologically important areas. These techniques are rendered more powerful by the increased multispectral dimensionality of the data, and are expected to become more significant in broadened applications of satellite information for the petroleum and mining industries.

It is anticipated that more detailed results from analyses of TM data will be presented by some of the investigators at the coming Pecora VIII symposium to be held in Sioux Falls, South Dakota during October. The symposium will be hosted by NOAA, NASA, and the U.S. Geological Survey.

The Institute of Geological Sciences in the U.K. has received joint funding from the European Commission and the British Department of Industry for a three-year project involving the integration of satellite data with other information. The project is expected to result in new computer techniques which will provide composite 'signatures' for rock types up to 2,000 metres below the surface. Satellite data analysis of surface fractures will be combined with gravitational and magnetic field maps, and with chemical analysis data from surface soils and borehole loggings to produce indications of deep mineral deposits. Such a cost-effective technique would greatly reduce the expense associated with currently uneconomic exploration for mineralisation associated with older rock types, that have been overlaid by younger formations. It is reported that recent copper finds beneath sedimentary layers in South Australia relied on such techniques, and the initial use of Landsat data was an important factor in their discovery.

— Aviation Week & Space Technology, New Scientist

ALS Diary

NATIONAL REMOTE SENSING
AND APPLICATIONS ACTIVITIES
Landsat Imagery in the Classroom

Saturday 17 September, 1983; University of N.S.W. Kensington.

A one-day workshop for geography and science teachers covering the following topics: Introduction to Remote Sensing; the Landsat System; Overview of environmental applications; How to interpret Landsat Imagery; How to use satellite imagery in the classroom; Using Landsat to study the Sydney region. Sessions will be presented by Dr Tony Milne, and registration fee is $35 which includes notes and 35mm slides. Forms are available from:

Centre for Remote Sensing
University of N.S.W.
P.O. Box 1, Kensington NSW 2033
phone (02) 662 3002

Geological interpretation of aerial photographs and satellite images

Monday 17 — Friday 28 October, 1983; Australian Mineral Foundation, Adelaide.

AMF workshop course *261/83* presented over two weeks by Mr Carlo Maffi of BHP. The course is designed for geologists operating in both mineral and petroleum exploration companies and those involved in survey and engineering-geology with government instrumentalities. Topics covered range from physics of remote sensing with an introduction to photo and thermal infrared, side looking radar, and multiband imagery; to MSS data characteristics and digital processing, and systematic analysis of Landsat imagery — including image geometry, photo recognition and measurement of land forms, structural interpretation and lineament analysis. Case histories of mineral exploration applications will be examined, and over the 2 week period students will be involved in lectures, demonstrations and practical exercises on a wide variety of problems. Course fees are $1200 for AMF members, and $1450 for non-members — which includes luncheons and a course dinner. For further information contact:

The Director
Aust. Mineral Foundation
P.O. Box 97 Glenside, SA 5065

Urban and Regional Planning Information Systems Conference — URPIS II

Tuesday 22 November — Friday 25th November, 1983; Park Royal Hotel, Brisbane

Presented by the Australian urban and Regional Information Systems Association, this is an annual conference intended to create a forum for the dissemination of information on land planning, management, and census information — together with information acquisition and retrieval techniques. There is an accompanying technical exposition to present state-of-the-art information systems.

This years' conference theme is *Information Systems and the Community*, with keynote speakers from Canada and the U.S., as well as Australia. For full details contact:

AURISA
Conference Committee
GPO Box 1434
Brisbane Qld 4001

1st Australasian Conference on the Physics of Remote Sensing of Atmosphere and Ocean

Monday 13 February — Thursday 16 February, 1984; Melbourne

This conference is being sponsored by the Australian Academy of Science and the CSIRO to provide a forum for better communication between users in each field linked by the common vehicle of remote sensing. The aim is to demonstrate both the potential and the limitations of the available techniques, and to provide critical discussion of the physical principles involved. Each session will include a keynote talk by invited international speakers representing organisations such as NOAA, Arizona University, and CIRES-University of Colorado. Sessions are planned to cover: Satellite remote sensing; Optical remote sensing; Sonar; and Microwave remote sensing.

The registration fee is $100, with 10% discount for early registrants. Further information is available from:

Conference Convenor
Dr C M R Platt
CSIRO Division of Atmospheric Research
Private Mail Bag No. 1,
Mordiallac Vic 3195

LANDSAT 84 — 3rd Australian Remote Sensing Conference

Sunday 21 May — Thursday 25 May, 1984; Gold Coast

The Conference will review the state of the art in remote sensing and discuss proposed developments in the field. Proposed topics include: Sensor platforms; Techniques and Applications; Geographic Information Systems and Mapping. Keynote papers in each session will be presented by invited international speakers; and in addition to presented session papers there will be poster papers, workshop sessions, technical exhibition and social activities. The Conference will be hosted by the Queensland Remote Sensing Committee. For details contact:

The Secretary
Landsat 84 Conference Committee
P.O. Box 234 Brisbane
North Quay, Qld 4000
phone (09) 224 6577

INTERNATIONAL SYMPOSIA

2nd International colloquium on spectral signatures of objects in remote sensing

12-16 September, 1983; Bordeaux, France

Sponsored by Centre National d'Etudes Spatiales (CNES) and the International Society of Photogrammetry and Remote Sensing. Colloquium topics cover: short wavelengths, thermal infrared, microwaves, combined spectral range measurements, new Earth observation satellite programmes. Intending participants should contact:

Colloquium Coordinator
INRA Laboratoire de Teledetection,
Domaine de l'Hermitage
Pierroton 33610 Cestas, France

Pecora VIII — Satellite Land Remote Sensing for the Eighties

4-7 October 1983; Sioux Falls, South Dakota, U.S.A.

This year's Pecora VIII symposium is sponsored by NASA, NOAA and the U.S. Geological Survey. The sponsors will all put forward their respective plans and policies for land remote sensing during the remainder of the decade. There will also be invited papers by principal investigators on results from Landsat 4; and other topics covered are integration of remote sensing data into geographic data bases, future operational satellites (SPOT, ERS-1 . . .) and future Shuttle experiments. Registration fee is US$95 and includes a bound volume of the proceedings, and tours of the EROS Data Centre. For complete information contact:

Pecora VIII Symposium
P.O. Box 80937
Sioux Falls, D D 57116 U.S.A.
phone (605) 594-6114

Auto-Carto Six — 6th International Symposium on Automated Cartography

16-21 October, 1983; Ottawa-Hull, Canada

The theme for the Symposium is the achievement and challenge of computer-assisted cartography. The programme covers topics on: integrated mapping systems; applications of computer-assisted mapping; analysis with computer-assisted maps; automated cartography research and development; education and training for automated cartography. There will be an extensive technical exhibition associated with the Symposium, and registration fee includes technical tours and social events. For registration details contact:

Auto-Carto Secretariat
Dept. of Geography
Carleton University
Ottawa, Ontario
Canada K1S 5B6

System Status

Spacecraft

Because of the problems with Landsat-4 noted in this issue, there are no accessions for some scheduled scene dates. Users are advised to check with the User Services Officer [(062) 524407] on availability before ordering Landsat-4 data.

Station

All systems at the Data Acquisition Facility are operational, and no data losses occurred as a result of ground station operations.

With the exception of a disc crash on the Processing Systems Computers, the Data Processing Facility has been fully operational. The disc drive involved was out of service during July, but after refitting and testing is now back on line. There was no effect on the turnaround of users' bulk product orders although some cataloguing operations were delayed over a short period.

For the technically minded, the crashed disc was a shared drive linked to both the Bulk Processing Systems (BPS) computer, and the Precision Processing Systems (PPS) computer. The shared disc space is a common file area for the BPS and PPS into the Precision System. There are alternative, but slower means of loading data into the PPS; since the image data catalogue data base is the only routine processing supported by the system, only these operations were affected by the failure.

User Services

All data cataloguing is up to date. Micro-Image Catalogue production is delayed by a few cycles due to fiche production problems with new processing equipment at the Government Printing Office.

There is currently no production backlog, and customer orders are being processed in minimum time for the respective priority levels.

An improved catalogue data base is now on line to User Services, and fast searches of scene information can be accomplished for phone enquiries. If you have your own acquisition map and calendar, and if you know the type of product you require, we suggest you speed up your enquiries by phoning the User Services Officer on (062) 524407.

Precision Products: Reference is made to precision processing techniques in this issue, and it is anticipated that ALS will be in a position to announce pricing for user access to precision processed products in the near future.

LANDSAT 84 CONFERENCE

Organisation of the *Landsat 84* Conference to be held in Queensland in May next year is running to schedule, with the Review Committee currently selecting papers for presentation at the Conference. Seventy proposed paper summaries were received by the Committee, in addition to fifteen poster paper proposals. Authors will be notified of acceptance during September. The Committee had hoped to receive more summaries for poster papers; these will consist of a five minute informal forum presentation in support of the posters, with the full text of the paper being published in the *Conference Proceedings.*

Conference subcommittees are also involved with the planning of social events for Conference participants, and with the planning of a technical expo and the canvassing of Conference sponsorship. Ten workshops have been planned, with topics covering most fields of interest.

Further details will be released in a 2nd Conference circular, due in November. So far, the national and international response to the 1st circular indicate that this Landsat conference will be the largest and most successful yet held in Australia. All enquiries concerning *Landsat 84* should be directed to:

The Secretary
LANDSAT 84 Conference Committee
PO Box 234
Brisbane, North Quay
Qld 4000

Australian Landsat Station

Contributions and comments from readers of the ALS Newsletter are always welcome. Contributed articles should be as brief as possible and indicate the general category of interest. Authors please append comment on the context of the article — and include a brief personal resume.

The ALS Newsletter is published and distributed free in the interests of information exchange within the ALS user community. Comment concerning ALS products, services, systems, and related remote sensing activities is the responsibility of the Australian Landsat Station and is subject to change with changes in operational status. Reference to other publications; to applications by users; to data interpretation, services and systems; and to research programs is made at the discretion of ALS, and is published in good faith.

Subscription applications from readers with an interest in remote sensing not already included on the ALS Newsletter distribution list are welcome. Readers with colleagues in the remote sensing field who do not receive the Newsletter are invited to forward applications on their behalf. Applications and address amendment forms are provided in the space below for convenience.

All correspondence should be addressed to:

'ALS NEWSLETTER'
PO Box 28
Belconnen A.C.T.
2616
Australia

ALS NEWSLETTER

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INTEREST: GENERAL ☐ PROFESSIONAL ☐
Please tick appropriate box.

APPLICATIONS: .....

.....

DATE: .....

Landsat Products

Processed satellite images and related products are available from the Australian Landsat Station. Bulk images are available as monochrome and colour photo transparencies, or photographic prints in various scale formats; and as image data on Computer Compatible Tapes (CCT's) for user manipulation. Precision images are available in the same forms with some user selected enhancements, or non-routine radiometric/geometric corrections.

Image and data catalogues are both available in microfiche form — detailed scene selection can be made with Quick-Look Prints. Catalogues may be viewed at State Browse Centres, at the ALS Data Acquisition Facility (DAF), and at the ALS Data Processing Facility (DPF). Acquisition calendars, satellite coverage diagrams, and product price lists are available free on request from the Australian Landsat Station — or from the Browse Centres listed below. Orders for Landsat products can also be made through these Centres.

CANBERRA
DPF & Browse Centre
14-16 Oatley Court
Belconnen ACT
Phone 062-51 5411
Telex AA 61510 LANSAT

SYDNEY
Map Sales
Lands Dept Building
23-33 Bridge St.,
Sydney NSW
Phone 02-20 579

MELBOURNE
Map Sales
Dept of Crown Lands & Surveys
2 Treasury Place, Melbourne
35 Spring St., Melbourne Vic
Phone 03-651 3024, 651 3029

HOBART
Tasmanian Govt
Publications Centre
134 Macquarie Street,
HOBART TAS
Phone 002-30 3382

ALICE SPRINGS
DAF & Browse Centre
Heath Road
Alice Springs NT
Phone 089-52 3353

DARWIN
Survey Mapping Division
Dept of Lands & Housing
Moonta House, Mitchell St.,
Darwin NT
Phone 089-89 7572

BRISBANE
Aerial Photography Section
Dept of Mapping & Surveying
11th Floor, Watkins Place
288 Edwards St.,
Brisbane QLD
Phone 07-224 7876

ADELAIDE
Mapping Branch
Dept of Lands
282 West Beach Rd.,
Netley SA
Phone 08-297 39999 (x 431)

PERTH
Central Map Agency
Dept of Lands and Surveys
Cathedral Avenue,
Perth WA
Phone 09-323 1349