Vol 1 No 2 April 1981

NEWSLETTER

FLOOD OF ORDERS

Since our first newsletter in November 1980, when ALS had been "commercial" for only a few weeks, the response has been overwhelming. So much so that current delivery for photographic imagery is now over 22 weeks, and for computer compatible tapes (CCT's) about five weeks (early April).

The flood of orders is a healthy sign that the decision to establish the Station was well justified. Every effort is being made to extend the hours of operation and to achieve efficiencies which will result in elimination of the back-log and a timely response to user community requirements for data.

SPACECRAFT STATUS

On 20 March, LANDSAT 2 use had to be curtailed due to a reduction of solar power array efficiency. As an immediate measure coverage was restricted to about 30 scenes per orbit. NASA is investigating the problem, and is refining the satellite power budget to optimize coverage. More favourable insolation conditions will prevail by August, at which time restrictions in the Australian coverage area are likely to be lifted.

Scenes presently affected are in paths 103 to 126. Not all scenes in the block are affected. However, Indonesia, Papua New Guinea and up to five north coast mainland scenes are generally lost.

Compensating for this, the LANDSAT 3 Multi Spectral Scanner (MSS) on-board digitizer has recovered, opening the possibility of using that instrument for some coverage. Unfortunately, LANDSAT 3 still suffers from line start anomaly and an as-yet inexplicable "swathe slip". Nonetheless ALS will attempt to use LANDSAT 3 to cover the eliminated areas.

Both spacecraft have exceeded their one-year design life, LANDSAT 2 having been launched on 22 January 1975 and LANDSAT 3 on 5 March 1978; both have been in and out of operation during the past year or so.

Since ALS commenced receiving data in October 1979, spacecraft status has been:

Until 5 November 1979	LANDSAT 2. Operational use suspended.
From 5 November 1979	LANDSAT 3 designated prime spacecraft for worldwide MSS operations.
26 November 1979	LANDSAT 3 suffering horizon scanner glitches.
7 February 1980	LANDSAT 3 exhibiting increased line-start anomaly (LSA).
5 May 1980	LANDSAT 2 revived using magnetic attitude control mode.
7 June 1980	LANDSAT 3 MSS scan monitor switched from source A to B. Significant LSA decrease.
7 July 1980	LANDSAT 2 reactivated as prime spacecraft for Australia.
12 July 1980	LANDSAT 3 retired as prime spacecraft for Australia.
1 August 1980	LANDSAT 2 re-designated prime spacecraft worldwide.
18 December 1980	LANDSAT 3 MSS operations cancelled due to "non-recoverable" failure.
25 March 1981	LANDSAT 2 MSS operations curtailed due to reduced solar power availability.
	LANDSAT 3. Recovery of MSS digitizer. Spacecraft again operational.

SOUTH AFRICA LANDSAT STATION

On 1 December 1980 the first Landsat ground station in Africa became operational in Johannesburg. It is capable of covering most of Africa south of the Equator.

At present the ALS has no details of their regular coverage or distribution arrangements; interested users may contact:

Mr R. W. Vice
Director
National Institute for Telecommunications Research (NITR)
South African Council for Scientific and Industrial Research
PO Box 395
PRETORIA 0001 SOUTH AFRICA

WORLDWIDE STATIONS

In November 1980 there were thirteen earth stations in operation in Brazil, Canada (2), Japan, Italy, India, Argentina, Australia, USA (3), Sweden and South Africa, with Thailand (1982) and the People's Republic of China (1983) due to commence. Several other stations were in the planning stage.

All stations co-operate as contact points for each other, and ALS maintains order data for most overseas stations and EROS Data Center (EDC) worldwide scenes. EDC also consolidates worldwide acquisitions into the worldwide catalogue on a regular basis.

ALS will be pleased to send you price lists and ordering data as and when available.

The eleventh meeting of the LANDSAT Ground Station Operators Working Group (LGSOWG) will be hosted in Australia for the first time by ALS and the Department of Science and Technology, in May. Among discussions will be the entry of new LANDSAT stations into the worldwide data ordering network.

REMOTE SENSING TRAINING IN INDONESIA

From M. Jean-Paul Malingreau

A Centre for training in Remote Sensing and Integrated Surveys has been in operation at the Gadjah Mada University (Yogyakarta, Central Java) since 1976. The Centre is a joint project between the Indonesian Coordinating Agency for Surveying and Mapping (BAKOSURTANAL) and the Faculty of Geography of the University. It is also assisted by a grant from the Ford Foundation.

The eight-month training is addressed to medium level government employees coming from all over Indonesia, who are in some way involved in activities dealing with resource inventories and regional development. A large variety of air-photographs, LANDSAT images and side looking airborne radar documents are used for training. The main topics covered during the period deal with the applications of remote sensing techniques in geomorphology, soils, hydrology, rural land use, forestry, cartography, land evaluation and integrated surveys.

A DIPIX LCT-11 digital analyser will be put into operation at the Centre in May 1981 and training will then begin on LANDSAT digital data analysis.

For further information concerning the Centre and its activities (training, research, air-photo/image collection etc), please contact Dr Sutanto, Director, Center for Training in Remote Sensing, Faculty of Geography, Universitas Gadjah Mada, Yogyakarta, Indonesia.

MSS HIGH GAIN MODE

A section of the user community is interested in data from our coastal waters, particularly the Great Barrier Reef area, southern NSW/eastern Victoria/Tasmania/Bass Strait area, and the North West shelf.

Sometimes the MSS data can give more information about ocean reflectance changes that can be related to other oceanographic properties, and it may well be that high gain would increase the performance of data to a level where it could be routinely used.

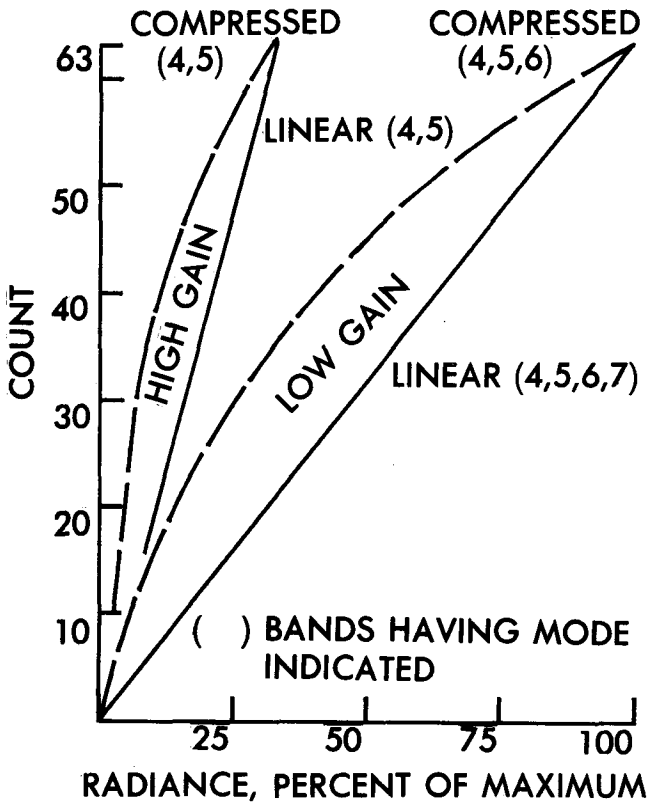
Although the switchover from low gain to high gain poses no technical or operating problems, it does cause the loss of data for the previous and subsequent scenes, which is a potential problem for non-users of the high gain mode. For example, a switch to high gain mode for Path 93 Rows 85 and 86 on 2 October 1980 resulted in data of little use in Rows 84 and 87.

ANALOGUE SENSOR SIGNAL PROCESSING

Provision is made for linear amplification or nonlinear amplification, which can be selected by commands to the spacecraft.

Signal compression, via four-segment, quasi-logarithmic amplifiers, is generally employed to improve the signal-to-noise ratio in bands 4, 5, and 6. By compressing high radiance level signals, the quantization noise more nearly matches photomultiplier noise. Band 7 signals, derived from silicon photodiodes, are never compressed because equivalent load resistor noise is best matched by linear quantization. The available ground commandable analogue processing options are illustrated. In the high gain mode applied to bands 4 and 5, amplifier gain is increased by a nominal factor of 3. This increase allows greater use of system dynamic range for those scenes producing low sensor irradiance.

There are two signal compression amplifiers in the spacecraft. One is used to process sensor data from bands 4 and 6, and the second is used exclusively for band 5 data. In subsequent processing, decompression of the signals is performed using separate decompression tables for bands 4 and 6 and for band 5. Calibration-wedge signals from each band are decompressed through the same tables before data calibration.



MSS digital output count as a function of radiance, compressed and linear modes

ALS PHOTO PRODUCT FORMATS

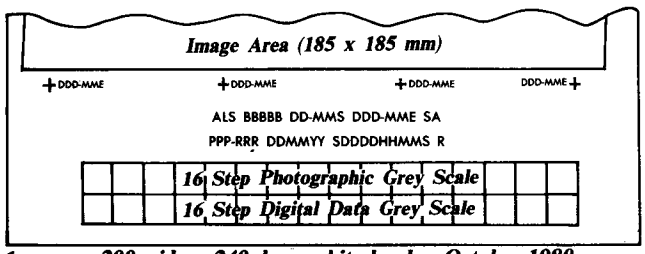
Since ALS commenced commercial operations in October 1980, photo-products have undergone successive modifications to improve clarity and speed production. The sketches illustrate and explain format details.

1. Used during October-November 1980. Written on "10x10" film (trimmed to 200mm x 240mm). The image area is surrounded by geographical grid ticks — only the southern border is illustrated. Ticks are derived from nominal orbit parameters, and should be used as a guide only. Format — Degrees and Minutes East (or South). Two lines of identification follow:
   Receiving Station (in this case **ALS**), Band (five are provided for — colour of numeral-block indicates image colour attributed to that band), nominal scene centre (Degrees and Minutes of South latitude and East longitude), Sun Angle (degrees).
   Path, Row (Worldwide Reference System), Day Month Year of acquisition, Satellite Days since launch and Hours Minutes Seconds (tens only) of acquisition in GMT, Resampling method (Cubic Convolution, Nearest Neighbour, Linear).
   Two 16 step grey scales are included. The upper scale is written as equal steps from black to white for densitometry in the photo lab. The lower scale represents the range of

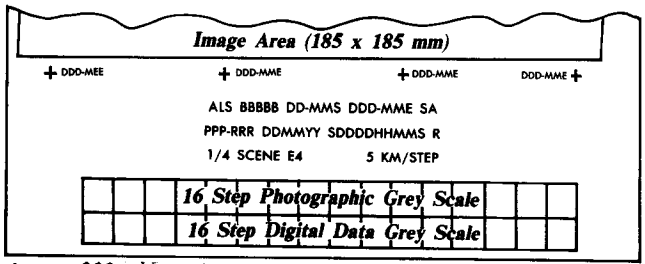
resampled density values in the image. It is useful for checking images to be mosaiced, when each image should exhibit similar density and colour steps.

2. Used from November 1980 to March 1981. Written on "10x10" film. The only variation is the additional third line of text, specifying the digital scene magnification, sub-centre and scale represented by each step on the grey scales:
   Full Scene 10 km per step
   1/4 Scene (2 x digital enlargement) 5 km per step
   1/16 Scene (4 x digital enlargement) 2.5 km per step

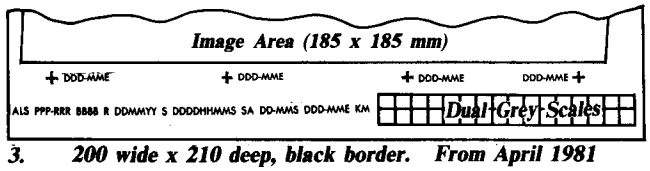
3. Used from March 1981. Written on "10x10" film trimmed to 200mm x 210mm but re-formatted to reduce both scanning time and "on time" of the light source, which retrogresses with use. The first improvement is achieved by reducing overall written size, the other with the black border. The image area remains unchanged, but four corner registration marks are brought nearer the image. Geographical tick marks remain unaltered.
   A single line of identification is used:
   Receiving Station (in this instance **ALS**), **P**ath **R**ow (in Worldwide Reference System), **B**and (four are provided for — colour of numeral indicates image colour attributed to that band), **R**esampling method, **D**ay **M**onth **Y**ear of acquisition, **S**atellite **D**ays since launch and **H**ours **M**inutes **S**econds (tens only) of acquisition in GMT, **S**un **A**ngle, nominal scene centre (**D**egrees and **M**inutes of **S**outh latitude and **E**ast longitude), **KM** scale length of whole grey scale in kilometres.
   The dual grey scales are identical in contents and purpose, being condensed to save space.



1. 200 wide x 240 deep, white border. October 1980-November 1980



2. 200 wide x 240 deep, white border. November 1980-March 1981



3. 200 wide x 210 deep, black border. From April 1981

Styles of ALS photo formats

NEW DISTRIBUTORS APPOINTED

Two new distributors have been appointed for ALS products in Melbourne and Sydney. The firms have longstanding experience as image interpreters and image reproducers respectively:

Technical & Field Surveys Pty Ltd
250-256 Pacific Highway
CROWS NEST NSW 2065
Tel: (02) 4383700

Air Photographs Pty Ltd
620-624 Burwood Road
AUBURN VIC 3123
Tel: (03) 821966

Both firms have been involved with LANDSAT imagery for some years, Technical & Field Surveys having experience with LANDSAT data and information supply and Air Photographs being an experienced photo laboratory offering skilled reprocessing.

NATIONAL DIRECTORY

Remote Sensing in Australia

A handy source of information about groups and individuals engaged in remote sensing is published by the Remote Sensing Association of Australia (RSAA), available for $7.00 plus postage from:

The Executive Secretary, Mr Keith A. Emery
C/- Soil Conservation Service of NSW
Box R201
ROYAL EXCHANGE NSW 2000

The current edition was published in 1980 and re-publication during 1981 is planned.

YOU CAN HELP

You can help to make the Directory more useful — put your organisation's details into the next issue. Contact the Directory Editor for a questionnaire:

Mr Rod Squire
C/- Forestry Commission of NSW
Box 2667 GPO
SYDNEY NSW 2001

Updated entries are also published in the RSAA "Newsletter".

LANDSAT '81

The Second Australian Remote Sensing Conference 30 August — 5 September 1981, Canberra

LANDSAT '81 is not only to do with the LANDSAT satellite series, but with all space remote sensing. A full technical and social programme is planned, and a good response to calls for technical papers and pre-registration has been received already.

More papers are wanted and **your** attendance is also sought. The previous LANDSAT '79 evoked wide interest, and two years later the use of space remote sensing has literally "taken off" in Australia.

The conference will feature parallel sessions on renewable and non-renewable resources together with plenary and keynote sessions of interest to all.

If you wish further information, to pre-register or present a paper, please contact:

LANDSAT '81
The Australian Academy of Science
PO Box 783
CANBERRA CITY ACT 2601
AUSTRALIA

THE ALS NEWSLETTER

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There is no subscription charge; individuals and organisations wishing to receive the "Newsletter" should contact the Promotion Officer at our ACT address, to whom comments, corrections, brief contributions and other enquiries should be directed.

AUSTRALIAN LANDSAT STATION

"NEWSLETTER"

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