Special

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ORANGE FIELD DAYS 1981

LANDSAT SYSTEM

The Landsat series of satellites have been launched by NASA in an orbit which covers the whole earth each eighteen days. The Australian Landsat Station operates a receiving station at Alice Springs to obtain data from every overpass of Australia. Data is recorded on tape, and shipped to the processing facility in Canberra, where images are reproduced photographically or on computer compatible tape.

ORBIT

Orbit is designed to be sun-synchronous, that is the satellite passes over each point at the same solar time each day. Due to seasonal changes, the sun's elevation changes from winter to summer, and therefore shadows vary in length.

The orbit is controlled so that the ground track remains within 70 km (maximum) of nominal values. Generally, the control is better than that. The spacecraft is stabilised by gyroscopes.

OVERLAP AND SIDELAP

Since the spacecraft passes from north to south, images are produced with overlap of about 12% at the north and south edges. Because the orbits are circular and converge from the Equator to the Poles, sidelap is variable from about 16% in northern Australia to 34% in Tasmania.

IMAGE FORMING

Each full scene is approximately 185 km by 185 km. It is formed of picture elements (called pixels) 79 metres by 79 metres on the ground. Pixels are formed when a scanning mirror in the spacecraft sweeps from west to east over an array of detectors, each of which is designed to measure reflectance in a single Band. As the spacecraft flies from north to south, the scanner covers a 185 km wide path on the ground as a continuous stream of data. The data is broken up into standard scenes based on the time when the spacecraft crosses the Equator.

IMAGE PRODUCTS

The Australian Landsat Station sells photographic or computer compatible tape products without restriction. Computer tapes contain all four bands, and are used by researchers or scientists to analyse data based on the spectral signature (the combination of reflectance values) of ground features.

Photographic products may be black and white single bands or combinations or three bands, each of which is printed in one of the primary colours (blue, green, red) on to colour film.

Colour composite imagery is the most easily interpreted of these choices. It has become conventional to use false colour similar to that produced by infra-red colour film.

Band 4 — visible green; printed blue.
Band 5 — visible red; printed green.
Band 7 — non-visible infra-red; printed red.

INTERPRETATION

Although some generalisations may be made there is a need to use other information (eg maps, statistical data, local knowledge) in the interpretation. Imagery should be chosen at a scale suitable for the purpose. Scenes can be "digitally" enlarged on the ALS computer if required — however, ALS should be consulted and preferably a marked-up Quick-look Print or large scale map of the area provided. The following are some general characteristics of false colour images

Red	: Growing vegetation; the brighter red the more vigorous the growth.
Maroon	: Mangroves.
Pink	: Sparse or drying vegetation.
Brown	: Scrub (lighter tones) or forest (dark red tones).
Green	: Red soil.
Black	: Recent fire scars, black soil, deep clear water.
White	: Salt flats, quartzite, beach sand, claypan, snow.
Blue/grey	: Dry crops, stubble, bare soil.
Blue	: Water (shallow or turbid, light; deep or clear darker with depth), urban areas (mid/light blue), industrial areas (mid-blue).

AVAILABILITY OF IMAGES

Landsat imagery is available without restriction, and may be ordered from ALS, State Government Map Sales offices and private distributors. There are three levels of priority delivery — 1 week, 3 weeks and 8 weeks (as at November 1981) for which different prices are charged. ALS maintains archives of imagery obtained each eighteen days since late 1979. Limited earlier imagery is available from ALS or EROS Data Center in the USA (ALS can provide information).

Please do not hesitate to contact ALS for further information:

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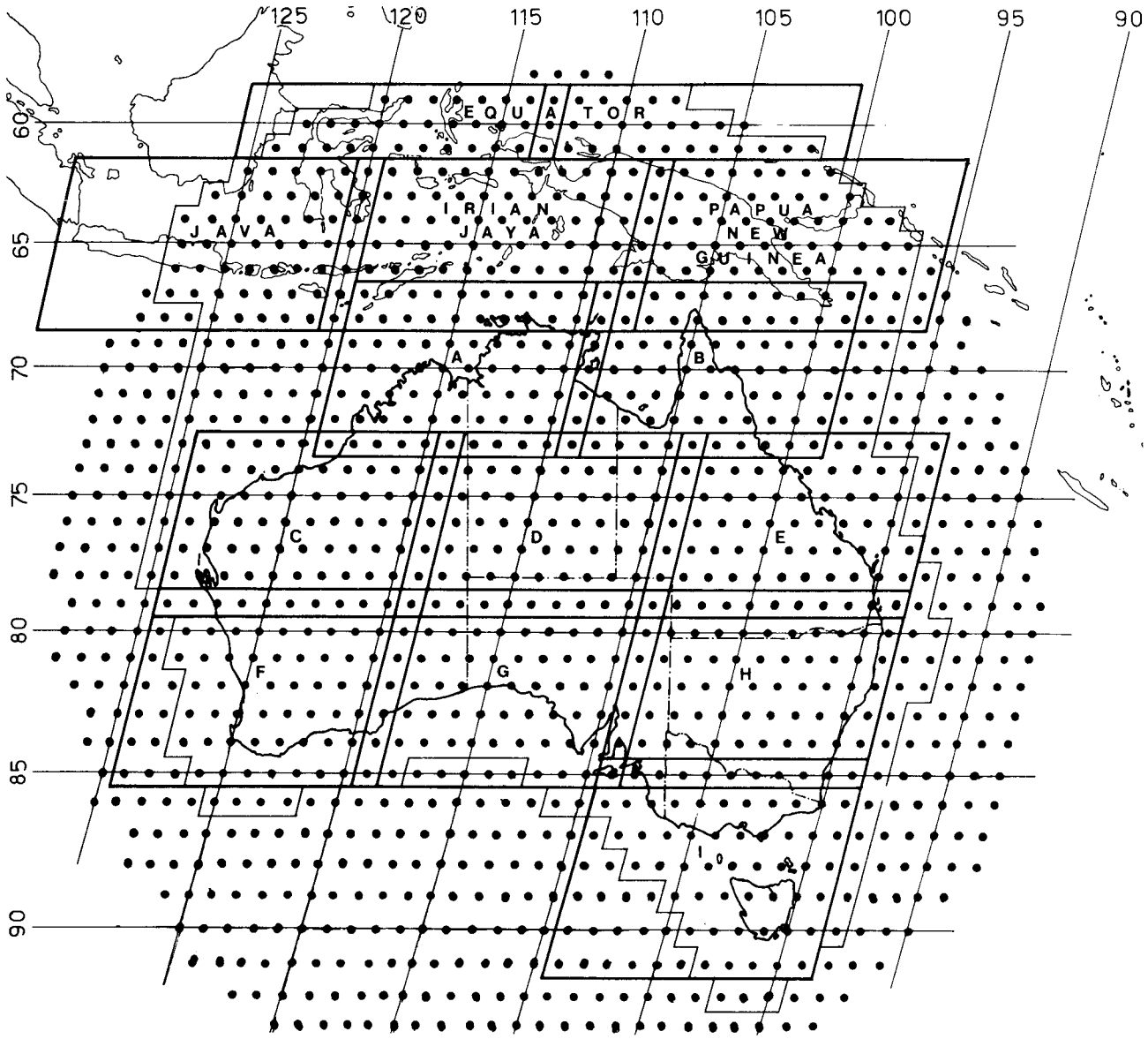
NEWSLETTER



Landsat 2 and 3 standard acquisition and micro-catalogue map. Microfiche outlines heavy, standard acquisition outlines light. Micro-catalogue names as shown.

SCENE IDENTIFICATION

Landsat scenes are identified by the Worldwide Reference System of Paths and Rows. The paths are the spacecraft orbits and on the same latitude around the earth.

Each dot on the map represents a scene centre, within range of the Alice Springs receiving station. As many are entirely over the ocean where little if any use can be made of them, regular acquisition is restricted to the area bonded by light lines.

CATALOGUES

Each scene is produced in a single band (Band 6 at present) as soon as the tape is received in Canberra, and black and white "Quick-look Prints" are made available for cloud assessment and scene boundary identification. Quick Look Prints are also reproduced on microfiche for distribution to subscribers and State distribution centres; these catalogues are available for public inspection at the latter. A total of thirteen microfiche cover Australia, Papua New Guinea and parts of Indonesia that are within range.