G
70.4
F58

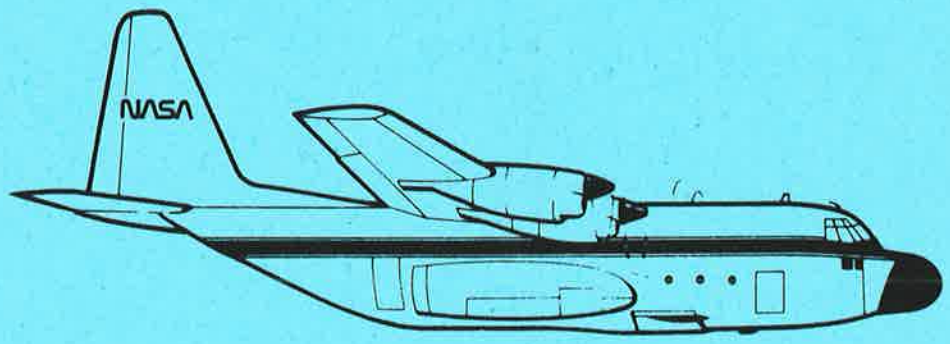
Airborne Instrumentation Research Project

Flight Summary Report

Flight No. 86-004-02

Date 29 April 1986

FSR-



NASA
National Aeronautics and
Space Administration

Ames Research Center
Moffett Field, California 94035

Airborne Missions and Applications Division

FLIGHT SUMMARY REPORT

Flight No: 86-004-02

Date: 29 April 1986

Julian Date: 119

Sensor Package: Dual Zeiss Cameras;
NS001 Mulstispectral Scanner

Aircraft No: 707

Purpose of Flight: #1092 Support
Requestor: Lawless

Area(s) Covered: Casmalia, California

SENSOR DATA

Accession No:	03569	03570	---
Sensor ID No:	077	085	072
Sensor Type:	Zeiss	Zeiss	NS001
Focal Length:	6" 153.40mm	12" 305.11mm	---
Film Type:	Aerochrome Infrared, 2443	SO-397	---
Filtration:	Wratten-12	None	---
Spectral Band:	510-900nm	400-700nm	see write-up
f Stop:	unknown	unknown	---
Shutter Speed:	unknown	unknown	---
No. of Frames:	24	25	---
% Overlap:	60	10	---
Quality:	Good	Excellent	---
Remarks:	---	---	---

FLIGHT SUMMARY

86-004-02

This flight was flown in support of Flight Request #1092 (Lawless NASA/ARC) under the FY 1986 Airborne Instrumentation Research Program (AIRP) plan. NS001 multispectral scanner and Zeiss photography were acquired over Casmalia, California in support of UC Santa Barbara.

The area flown was cloud-free. The Zeiss 12-inch camera data was flown with the same intervelometer setting as the 6-inch camera resulting in 10% forward overlap. No other camera or processing malfunctions were noted and the quality of the data is rated good.

NSØØ1 Multispectral Scanner

The NSØØ1 Multispectral Scanner used on the C-130B aircraft contains the seven Landsat-D Thematic Mapper bands plus a band from 1.0 to 1.3 micrometers. The specific bands are:

Band	Spectral bandwidth, um
1	0.45 - 0.52
2	0.52 - 0.60
3	0.63 - 0.69
4	0.76 - 0.90
5	1.00 - 1.30
6	1.55 - 1.75
7	2.08 - 2.35
8	10.4 - 12.5

Sensor specifications are:

IFOV	2.5 mrad
Total scan angle	100°
Pixels/scan line	699

The format of the flight data consists of 838 8-bit words per frame (data for one wavelength band throughout a scan line). Of these, 699 are the video information and the remainder are information on Greenwich time, scan line number, calibration lamp voltage and current, blackbody temperatures, etc.

Computer compatible tapes (CCTs) are produced from the flight tapes, and consist of header information followed by scanner video data.

NS001
User Tape
Logical Record Format

16-BIT WORD NUMBER	CONTENTS OF WORD
1-25	Channel Scanline Housekeeping Information
1	Data Frame Status 0 Good frame 10 Interpolated data 20 Repeated data 30 Zero-fill for data
2	Radiance Per Count Calibration Values . Visible channel (1-7) flight calibration values modified for gain as follows: integer, tens of nanowatts per square centimeter per micron per steradian per count. . Thermal channel is not used.
3-4	Scanline Count (32-bit integer)
5	Black Body 1 Thermistor Count
6	Black Body 2 Thermistor Count
7	Black Body 1 Thermal Reference Temperature (degrees C X 100)
8	Black Body 2 Thermal Reference Temperature (degrees C X 100)
9	Scan Speed (X 100)
10	GMT Hours
11	GMT Minutes
12	GMT Seconds (X 10)
13	Demagnification Value (X 100)
14	Total Air Temperature (TAT) Degrees Celcius X 10
15	Gain Value (X 1000) . Visible channel (1-7) gain value is defined as as 1000 times (word 24 minus word 19) divided by (the laboratory value of reference lamp less tare). . Thermal channel (8) is not used.
16	Channel Number
17-18	Time (GMT) Expressed as a 7-digit number HHMMSST (32-bit integer)
19	Black Body 1 Radiance Count
20	Black Body 2 Radiance Count
21	Reference Lamp Voltage
22	Reference Lamp Current
23	Reference Lamp State (16 bits 000000000ab00000) a=1 means reference lamp selected as visible high-level calibration source b=0 means lamp has degraded below predetermined level of 12.8V b=1 means lamp has not degraded below predetermined level
24	Reference Lamp Radiance Count
25	Precision Radiation Thermometer (PRT-5) Degrees Celcius X 10

NS001 SCANNER DATA TAPE FORMAT

The Applications Aircraft Data Management Facility converts scanner data recorded on 14-track high-density tape to standard 9-track computer-compatible tapes (CCT) for the user. Density of CCTs can be 6250, 1600, or 800 bpi, depending on the user's preference. The logical record length is fixed at 750 8-bit bytes for raw data and 1004 bytes for geometrically corrected data. The first 50 bytes for all records are house-keeping information; the next 699 (or 953 for geometrically corrected data) are digitized pixel data. A single "filler" byte is added at the end of each logical record to maintain even-numbered lengths.

All channels for a particular flight segment are written in a single tape file in line-interleaved format, as follows:

record 1 = scanline 1, channel 1
record 2 = scanline 1, channel 2
record 3 = scanline 1, channel 3
•
•
•
record 8 = scanline 1, channel 8
record 9 = scanline 2, channel 1
etc.

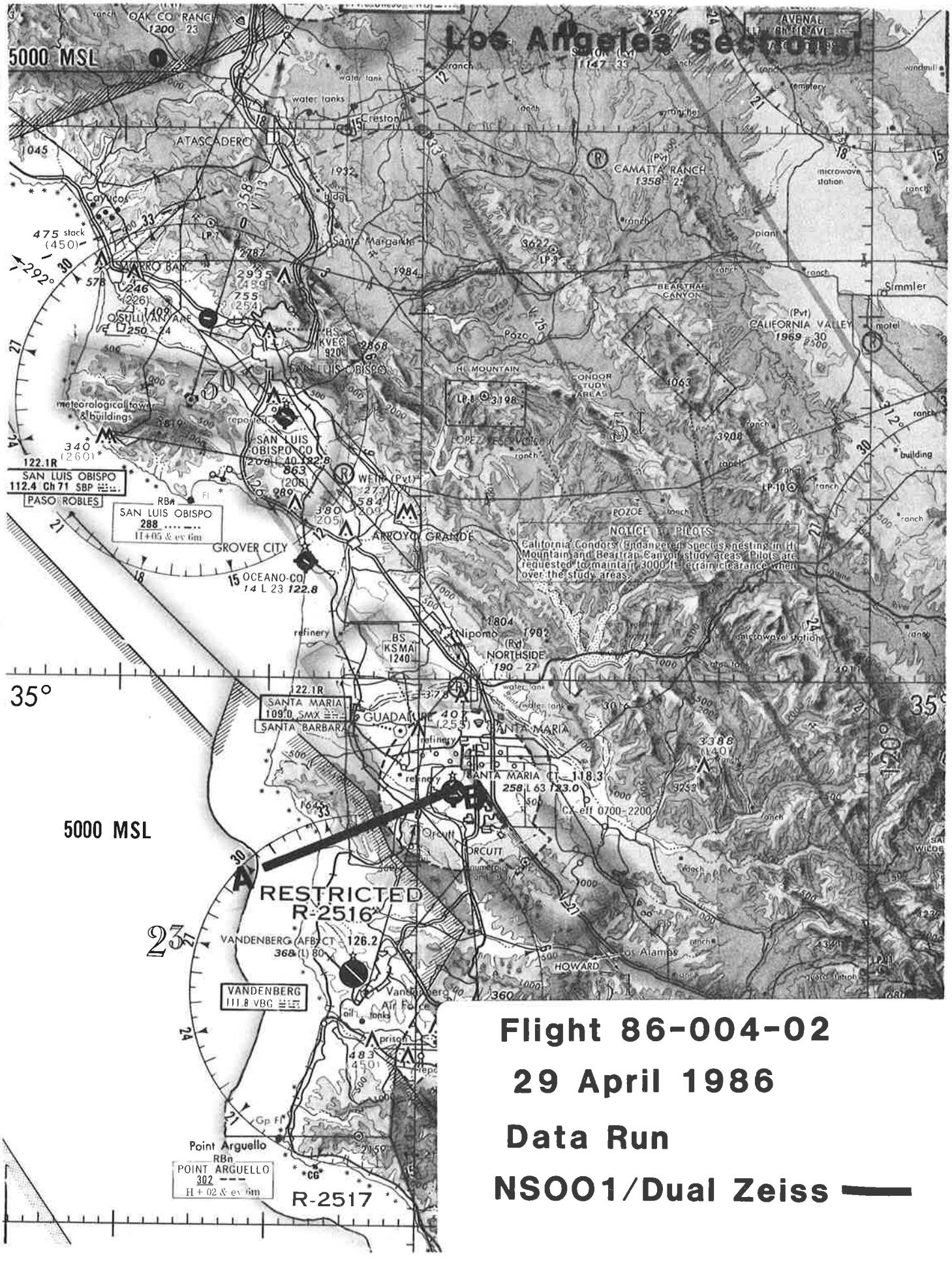
Users can request that tapes be blocked to contain all channels of a single scanline sequentially in one record. In such cases physical record length equals the number of channels multiplied by the logical record length (750 or 1004 bytes).

NSØØ1 FLIGHT DATA
FLIGHT NUMBER: 86-ØØ4-Ø2

Check Points	flightline number	Actual time (GMT) begin	Actual time (GMT) end	Actual scanline begin	Actual scanline end	Altitude feet/meter	Scan Speed (rps)	total Good scanlines	total Interpolated scanlines	total Repeated scanlines	total Zero-fill scanlines
A-B	1	19:Ø7:38.6	19:1Ø:49.7	26	5184	12ØØØ/ 3657	27.ØØ	5152	Ø	7	Ø
B-A	2	19:19:38.3	19:22:38.2	19457	24314	12ØØØ/ 3657	27.ØØ	4849	Ø	9	Ø

CAMERA FLIGHT LINE DATA
FLIGHT NO. 86-004-02

Sensor #	Check Points	Frame Numbers	Time (GMT—hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
			START	END		
077	A-B	002-015	19:02:18	19:10:33	12000/3659	clear
	B-A	016-025	19:19:45	19:22:25	"	clear
085	A-B	002-015	19:01:22	19:10:27	"	clear
	B-A	016-026	19:18:50	19:23:33	"	clear



Flight 86-004-02

29 April 1986

Data Run

NSO01/Dual Zeiss