FLIGHT SUMMARY REPORT

Flight #: 90-057

Date: 04 March 1990

Sensor Package: Wild-Heerbrug RC-10
Airborne Visible and Infrared Imaging Spectrometer (AVIRIS)
Thematic Mapper Simulator (TMS)
Thermal Infrared Multispectral Scanner (TIMS)

Area(s) Covered: Gainsville and Tampa Bay, Florida

Investigator(s): Peterson and Curran, NASA-Ames
Carder, University of South Florida

Aircraft #: 709

Flight Request: 90L208 and 90C203

Julian Date: 063

SENSOR DATA

Accession #:	04000	-----	-----	-----
Sensor ID #:	076	099	074	086
Sensor Type:	RC-10	AVIRIS	TMS	TIMS
Focal Length:	12" 304.89 mm	-----	-----	-----
Film Type:	High Definition Aerochrome IR SO-131	-----	-----	-----
Filtration:	cc.10B	-----	-----	-----
Spectral Band:	510-900 nm	-----	-----	-----
f Stop:	4	-----	-----	-----
Shutter Speed:	1/200	-----	-----	-----
# of Frames:	70	-----	-----	-----
% Overlap:	60	-----	-----	-----
Quality:	Excellent	-----	-----	-----

Remarks:

Airborne Science and Applications Program

The Airborne Science and Applications Program (ASAP) is supported by three ER-2 high altitude Earth Resources Survey aircraft. These aircraft are operated by the High Altitude Missions Branch at NASA-Ames Research Center, Moffett Field, California. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and *in situ* data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor used for data collection during this flight.

Airborne Visible and Infrared Imaging Spectrometer

The Airborne Visible and Infrared Imaging Spectrometer (AVIRIS) is the second in the series of imaging spectrometer instruments developed at the Jet Propulsion Laboratory (JPL) for earth remote sensing. This instrument uses scanning optics and a four-line arrays of detectors to image a 614 pixel swath simultaneously in 224 contiguous spectral bands (0.4-2.4 *um*).

AVIRIS parameters are as follows:

IFOV:	1 mrad
GIFOV (at 20 km):	20 m
FOV:	30°
GFOV (at 20 km):	11 km
Spectral Coverage:	0.41 - 2.45 *um*
Number of Spectral Bands:	224
Digitization:	10 Bits
Data Rate:	17 MBPS

Spectrometer	Wavelength Range	Number of Bands	Sampling Interval
1	0.41 - 0.70 *um*	31	9.4 nm
2	0.68 - 1.27 *um*	63	9.4 nm
3	1.25 - 1.86 *um*	63	9.7 nm
4	1.84 - 2.45 *um*	63	9.7 nm

All AVIRIS data is decommutated and archived at JPL and not currently available for public distribution. For further information contact Rob Greene at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 11-116, Pasadena, California 91109-8099.

Thematic Mapper Simulator

The Daedalus Thematic Mapper Simulator (TMS) is a high altitude multispectral scanner flown aboard the ER-2 aircraft which simulates spatial and spectral characteristics of the seven Landsat-D Thematic Mapper bands. The specific bands are as follows:

Daedalus Channel	TM Band	Wavelength, *um*
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.76 - 0.90
8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 14.0 low gain
12	6	8.5 - 14.0 high gain

Sensor/aircraft parameters are as follows:

IFOV:	1.3 mr
Ground Resolution:	91 feet (28 meters at 70,000 feet)
Total Scan Angle:	43^{o}
Swath Width:	9.0 nmi (16.6 km at 70,000 feet)
Pixels/Scan Line:	716 (750 following rectification)
Scan Rate:	12.5 scans/second
Ground Speed:	400 kts (206 m/second)

Thermal Infrared Multispectral Scanner

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 *um* to 12.2 *um* region.

Channel	Wavelength, *um*	NET
1	8.2 - 8.6	$< 0.3^{o}$ C
2	8.6 - 9.0	$< 0.3^{o}$ C
3	9.0 - 9.4	$< 0.3^{o}$ C
4	9.4 - 10.2	$< 0.3^{o}$ C
5	10.2 - 11.2	$< 0.3^{o}$ C
6	11.2 - 12.2	$< 0.3^{o}$ C

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meters) at 65,000 feet
Total Scan Angle:	76.56^{o}
Swath Width:	16.9 nmi (31.3 km
Pixels/Scan Line:	638
Scan Rate:	7.3 (scans/second)
Ground Speed:	400 kts. (206 m/second)

NOTE: Information on data tape format, logical record format, and scanner calibration data may be obtained from the NASA-Ames Aircraft Data Facility at (415) 604-6252 or FTS 464-6252.

CAMERA FLIGHT LINE DATA
FLIGHT NO. 90-057

Accession # 04000

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0419-0425	18:45:04	18:47:47	65000/19800	10% minor cumulus (frames 0419-0421)
A - B	0426-0433	19:03:25	19:06:12	"	10% minor cumulus (frames 0426-0432)
A - B	0434-0441	19:15:13	19:18:01	"	10% minor cumulus (frames 0434-0436, 0439-0440)
A - B	0442-0449	19:27:22	19:30:09	"	10% minor cumulus (frames 0442-0446)
C - D	0450-0452	20:04:00	20:04:32	"	10% minor cumulus (frames 0450-0452)
C - E	0453-0470	20:10:57	20:18:14	"	10% minor cumulus (frames 0453-0454, 0470)
F - G	0471-0488	20:33:01	20:40:18	"	10% minor cumulus (frames 0471-0472)

TMS SCANNER FLIGHT LINE DATA

FLIGHT NO. 90-057

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 90-057

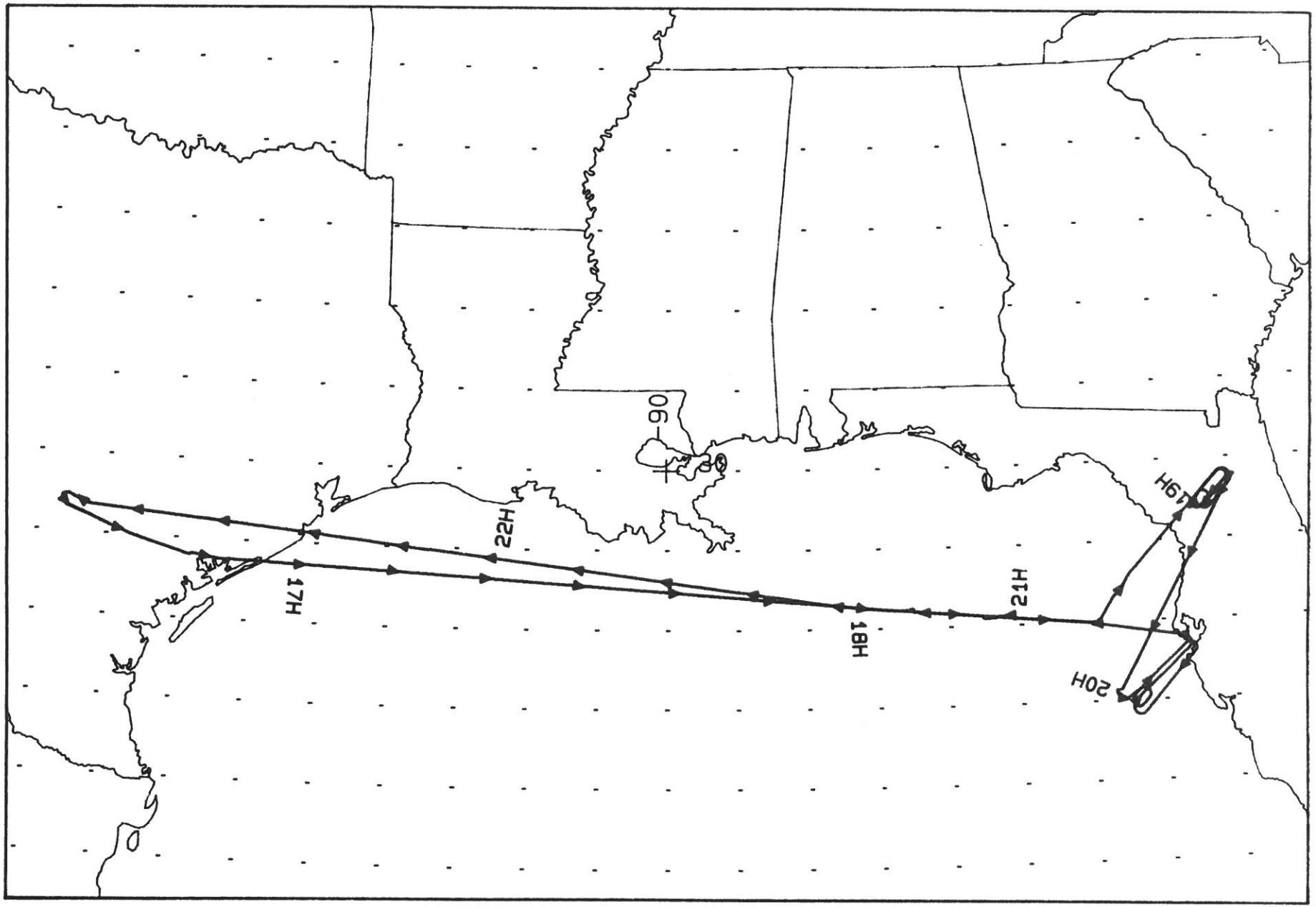
Check Points	Actual time (GMT) begin	end	Actual scanline begin	end	Altitude feet/meter	Scan Speed (rps)	total Good scanlines	total Interpolated scanlines	total Repeated scanlines
A-B	18:43:53.0	18:46:59.0	105020	107370	65000/19812	12.50	2327	0	24
C-D	19:02:18.0	19:05:30.0	118964	121391	65000/19812	12.50	2312	0	116
E-F	19:14: 6.0	19:17: 2.0	127901	130121	65000/19812	12.50	2165	0	56
G-H	19:26:15.0	19:29:16.0	137087	139372	65000/19812	12.50	2248	0	38
I-J	20:02:53.0	20:03:28.0	164813	165255	65000/19812	12.50	423	0	20
K-L	20:09:50.0	20:17: 4.0	170072	175546	65000/19812	12.50	5115	0	360
M-N	20:31:54.0	20:39:15.0	186783	192336	65000/19812	12.50	4811	1	742

TIMS SCANNER FLIGHT LINE DATA

FLIGHT NO. 90-057

TIMS FLIGHT DATA
FLIGHT NUMBER: 90-057

Check Points	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
A-B	18:43:53.Ø	18:46:59.Ø	6Ø99Ø	62356	65ØØØ/19812	7.3Ø	1364	Ø	3
C-D	19:Ø2:17.Ø	19:Ø5:3Ø.Ø	69Ø67	7Ø478	65ØØØ/19812	7.3Ø	1412	Ø	Ø
E-F	19:14: 6.Ø	19:17: 3.Ø	74246	75539	65ØØØ/19812	7.3Ø	1286	Ø	8
G-H	19:26:14.Ø	19:29:16.Ø	7957Ø	8Ø9ØØ	65ØØØ/19812	7.3Ø	1331	Ø	Ø
I-J	2Ø:Ø2:53.Ø	2Ø:Ø3:28.Ø	95642	959ØØ	65ØØØ/19812	7.3Ø	259	Ø	Ø
K-L	2Ø:Ø9:5Ø.Ø	2Ø:17: 4.Ø	98687	1Ø1864	65ØØØ/19812	7.3Ø	317Ø	Ø	8
M-N	2Ø:31:54.Ø	2Ø:39: 9.Ø	1Ø8369	111547	65ØØØ/19812	7.3Ø	3179	Ø	Ø



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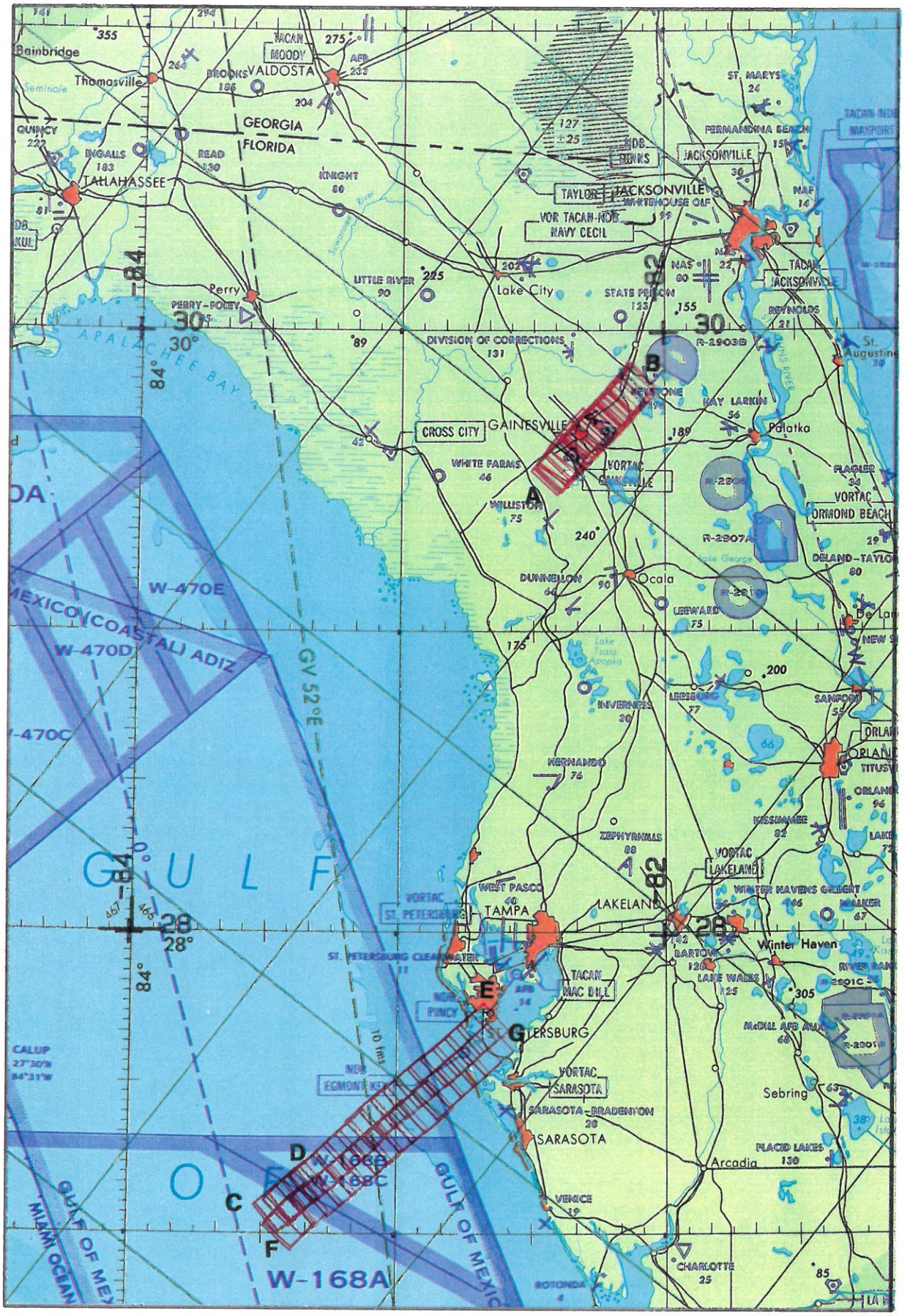

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