

FLIGHT SUMMARY REPORT

Flight #: 91-007
Date: 16 October 1990
Sensor Package: Advanced Microwave Precipitation Radiometer (AMPR)
Lightning Instrumentation Package (LIP)
Multispectral Atmospheric Mapping Sensor (MAMS)
Wild-Heerbrug RC-10
Area(s) Covered: Florida

Investigator(s): Spencer, NASA-MSFC

Aircraft #: 706

Flight Request: 90T248

Julian Date: 289

SENSOR DATA

Accession #:	-----	-----	-----	04149
Sensor ID #:	105	106	080	076
Sensor Type:	AMPR	LIP	MAMS	RC-10
Focal Length:	-----	-----	-----	12" 304.89 mm
Film Type:	-----	-----	-----	Aerial Color SO-242
Filtration:	-----	-----	-----	None
Spectral Band:	-----	-----	-----	400-700 nm
f Stop:	-----	-----	-----	4
Shutter Speed:	-----	-----	-----	1/200
# of Frames:	-----	-----	-----	349
% Overlap:	-----	-----	-----	60
Quality:	-----	-----	-----	Good
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 sensors used for data collection during this flight.

Multispectral Atmospheric Mapping Sensor

The Multispectral Atmospheric Mapping Sensor (MAMS) is a modified Daedalus Scanner flown aboard the ER-2 aircraft. It is designed to study weather related phenomena including storm system structure, cloud-top temperatures, and upper atmosphere water vapor. The scanner retains the eight silicon-detector channels in the visible/near-infrared region found on the Daedalus Thematic Mapper Simulator, with the addition of four channels in the thermal infrared relating to specific water vapor features. The specific bands are as follows:

<u>Daedalus Channel</u>	<u>Wavelength, μm</u>
1	LSBs for Channels 9-12
2	0.45 - 0.52
3	0.52 - 0.60
4	0.57 - 0.67
5	0.60 - 0.73
6	0.65 - 0.83
7	0.72 - 0.99
8	0.83 - 1.05
9	3.55 - 3.93 low range
10	3.55 - 3.93 high range
11	10.3 - 12.1
12	12.5 - 12.8

Sensor specifications are as follows:

IFOV:	5.0 mrad
Ground Resolution:	325 feet (99 meters) at 65,000 feet
Total Scan Angle:	86°
Swath Width:	20 nmi (37 km) at 65,000 feet
Pixels/Scan Line:	716
Scan Rate:	6.25 scans/second
Ground Speed:	400 kts (206 m/second)
Digitization:	8-bit channels 2-8 10-bit channels 9-12

The data will not be archived at EROS Data Center because this is an experimental system with low spatial resolution and unique spectral characteristics. As all scenes will be primarily cloud-covered there would be little terrestrial application for the data. Further information concerning the data can be obtained from principal investigator, Gregory S. Wilson, Atmospheric Effects Branch, George C. Marshall Space Flight Center, National Aeronautics and Space Administration, Marshall Space Flight Center, Alabama 35812-5001.

Advanced Microwave Precipitation Radiometer

The Advanced Microwave Precipitation Radiometer (AMPR) is a scanning passive microwave radiometer operating at frequencies of 10, 19, 37, and 85 GHz. The AMPR is configured to fit into the Q-bay of the ER-2 and scans cross-track +/- 45° to the left and right of nadir. The instrument's principle use is for gathering microwave image data of cloud water and precipitation primarily over the ocean. Some data collected also will be used for studies of vegetation, ground moisture, sea surface state, and snow cover. The AMPR is sponsored by Dr. Roy W. Spencer, NASA/MSFC, ES43, Huntsville, Alabama 35812, FTS 824-1686.

Lightning Instrument Package

The Lightning Instrument Package (LIP) comprises a set of optical and electrical sensors with a wide range of temporal, spatial, and spectral resolution to observe lightning and investigate electrical environments within and above thunderstorms. The instruments provide measurements of the air conductivity and vertical electric field above thunderstorms and provide estimates of the storm electric currents. In addition, LIP will detect total storm lightning and differentiate between intracloud and cloud-to-ground discharges. This data will be used in studies of lightning/storm structure and lightning precipitation relationships. The LIP is sponsored by Dr. Richard Blakeslee, NASA/MSFC, ES43, Huntsville, Alabama 35812, FTS 824-1651.

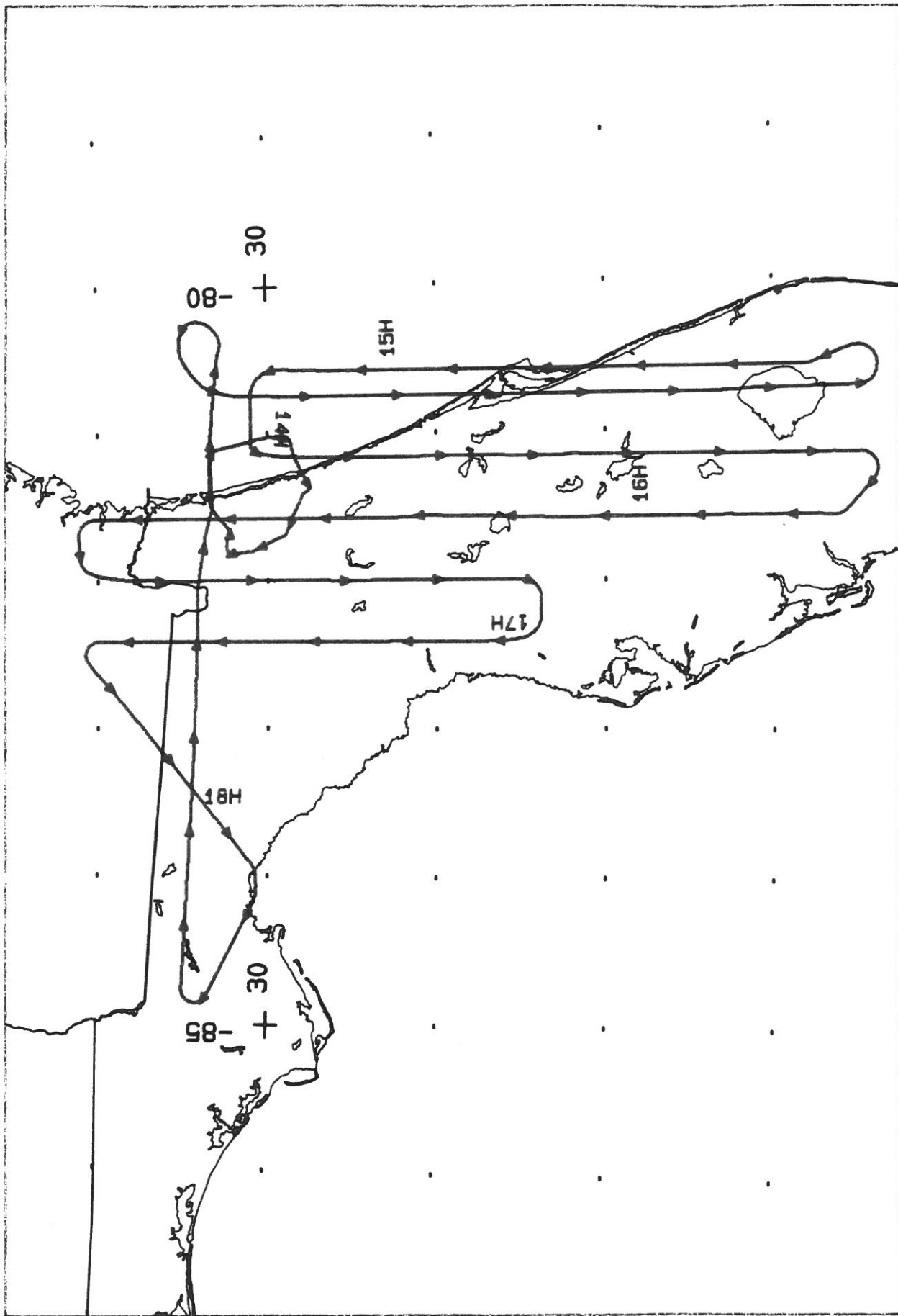
NOTE: Information on data tape format, logical record format, and scanner calibration data may be obtained from the NASA-Ames Aircraft Data Facility at (415) 604-6252 or FTS 464-6252.

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 91-007**

Accession # 04149

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	4130-4192	14:02:57	14:32:24	65000/19800	10-100% cumulus and haze (frames 4133-4192)
C - D	4193-4222	14:44:54	14:58:28	"	20-100% cumulus (frames 4193-4222)
E - F	4223-4292	15:13:26	15:45:26	"	10-100% cumulus (frames 4233-4255); 10-70% cumulus (frames 4258-4292)
G - H	4293-4364	15:58:09	16:30:48	"	10-90% cumulus (frames 4293-4335)
I - J	4365-4413	16:36:23	16:58:16	"	10-70% cumulus (frames 4391-4413)
K - L	4414-4462	17:03:35	17:25:24	"	10-80% cumulus (frames 4414-4436)
M - N	4463-4476	17:43:27	17:49:01	"	Clear
O	4477-4478	18:16:08	18:16:19	"	Clear; St. Johns River at Jacksonville

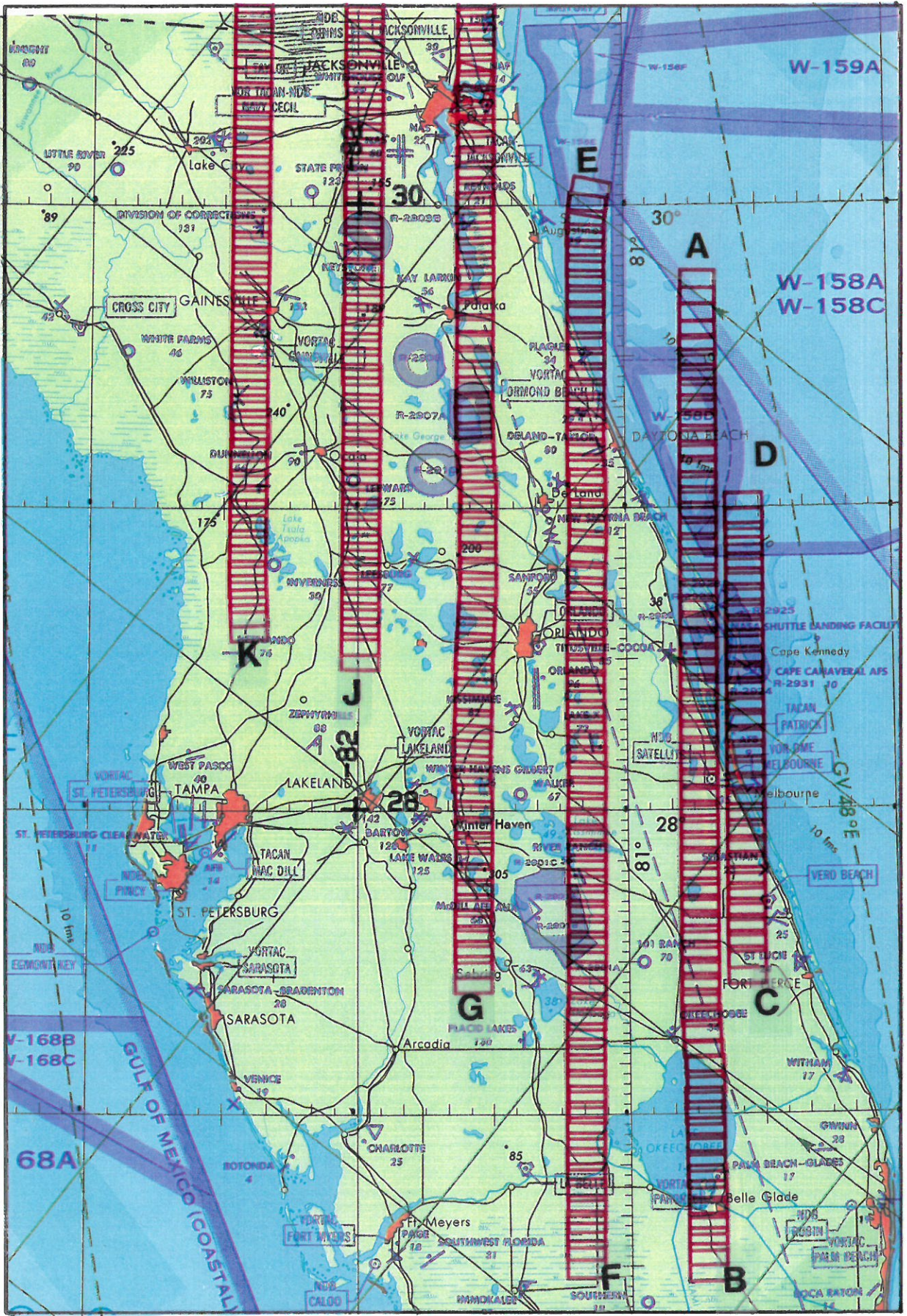


AMPR / LIP / MANS / RC-10

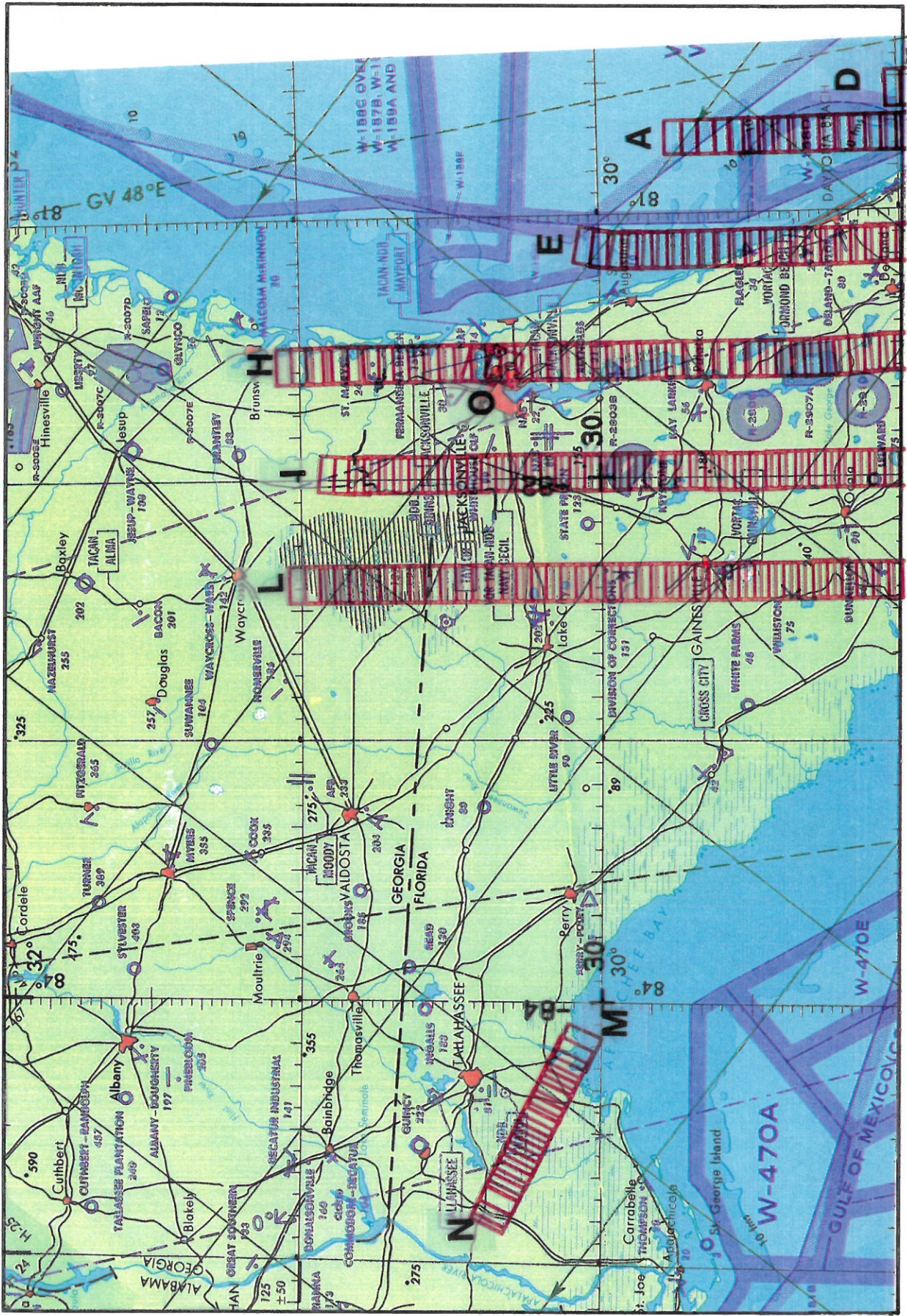
A/C 706

16 October 1990

FLIGHT 91-007



FLIGHT 91-007 16 October 1990 A/C 706 AMFR / LIP / MANS / RC-10 Accession # 04149 JNC 45



FLIGHT 91-007 16 October 1990 A/C 706 AMFR / LIP / MANS / RC-10 Accession # 04149 JNC 45

FLIGHT SUMMARY REPORT

Flight #: 91-008
Date: 18 October 1990
Sensor Package: Advanced Microwave Precipitation Radiometer (AMPR)
Lightning Instrumentation Package (LIP)
Multispectral Atmospheric Mapping Sensor (MAMS)
Wild-Heerbrug RC-10
Area(s) Covered: Western Florida

Investigator(s): Spencer, NASA-MSFC **Aircraft #:** 706
Flight Request: 90T248 **Julian Date:** 291

SENSOR DATA

Accession #:	-----	-----	-----	04150
Sensor ID #:	105	106	080	076
Sensor Type:	AMPR	LIP	MAMS	RC-10
Focal Length:	-----	-----	-----	12" 304.89 mm
Film Type:	-----	-----	-----	Aerial Color SO-242
Filtration:	-----	-----	-----	None
Spectral Band:	-----	-----	-----	400-700 nm
f Stop:	-----	-----	-----	4
Shutter Speed:	-----	-----	-----	1/300
# of Frames:	-----	-----	-----	46
% Overlap:	-----	-----	-----	30
Quality:	-----	-----	-----	Good
Remarks:				

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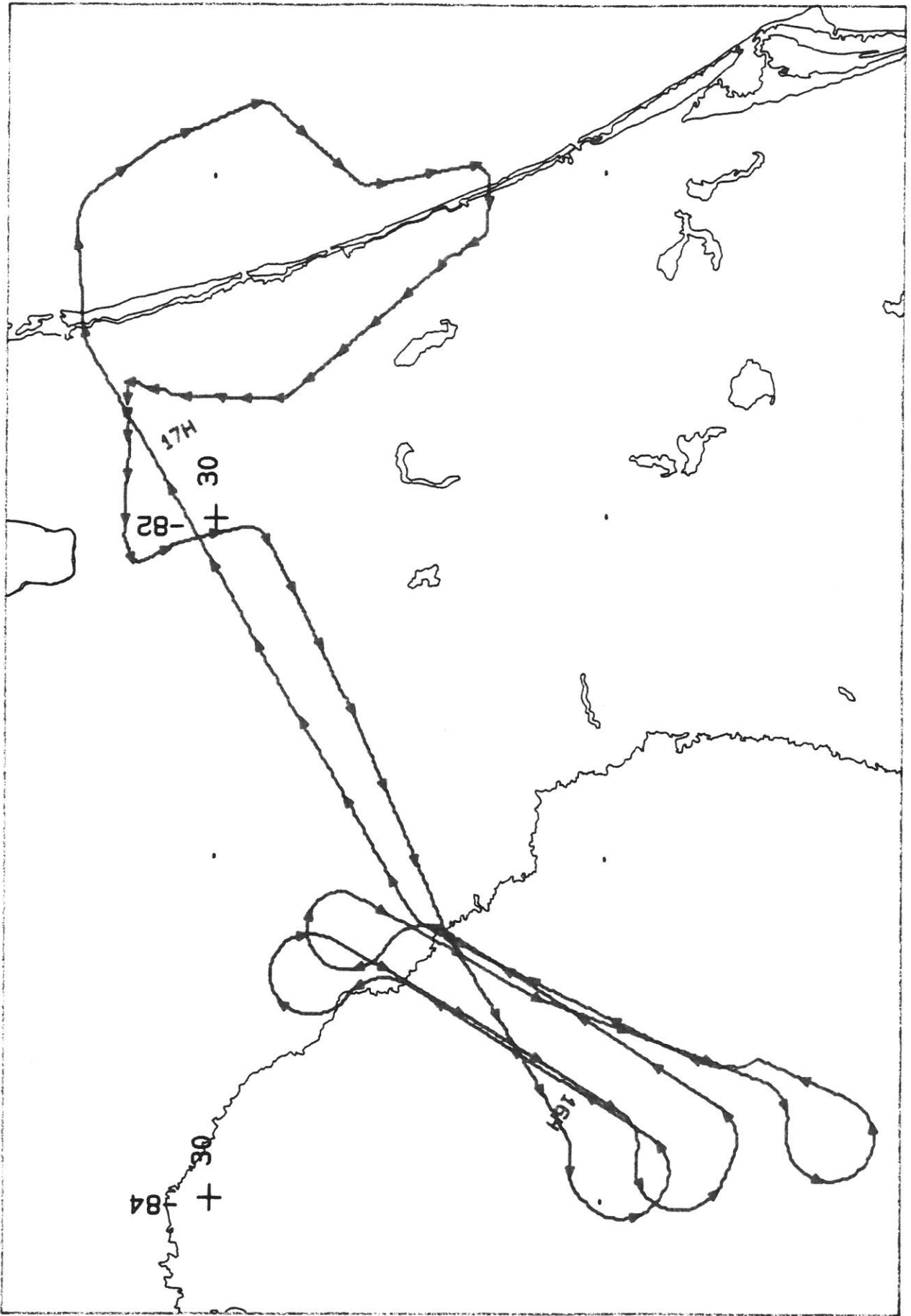
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FLIGHT NO. 91-008

Accession # 04150

Sensor # 076

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		START	END		
A - B	4483-4488	15:44:22	15:48:04	65000/19800	100% cloud cover
B - C	4489-4496	15:56:57	16:02:05	"	100% cloud cover
D - E	4497-4506	16:09:36	16:16:09	"	100% cloud cover
F - G	4507-4518	16:24:07	16:32:06	"	100% cloud cover
G - E	4519-4528	16:40:43	16:47:12	"	100% cloud cover

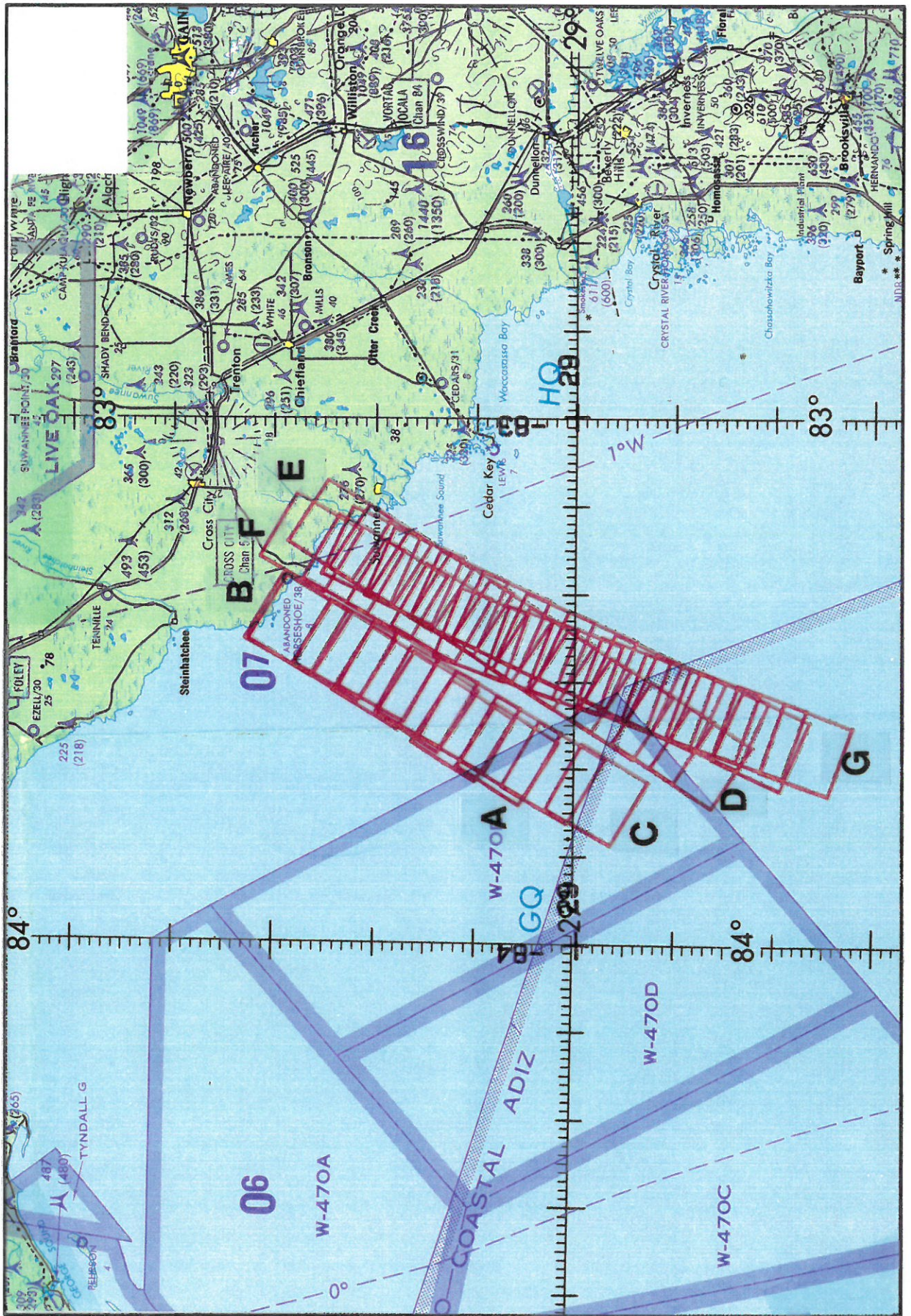


AMPR / LIP / MANS / RC-10

A/C 706

18 October 1990

FLIGHT 91-008



FLIGHT 91-008 18 October 1990 A/C 706 AMFR / LIP / MANS / RC-10 Accession # 04150 ONC H-25