FLIGHT SUMMARY REPORT

Flight #: 92-011

Date: 11 October 1991

Sensor Package: Thematic Mapper Simulator (TMS)
Wild-Heerbrug RC-10
Dual Hycon HR-732

Area(s) Covered: Central California

Investigator(s): Pilot Proficiency **Aircraft #:** 706

Flight Request: 92X001 **Julian Date:** 284

SENSOR DATA

Accession #:	-----	04355	04356	04357
Sensor ID #:	074	026	018	019
Sensor Type:	TMS	RC-10	HR-732	HR-732
Focal Length:	-----	12" 304.97 mm	24" 609.6 mm	24" 609.6 mm
Film Type:	-----	High Definition Aerochrome IR SO-131	High Definition Aerochrome IR SO-131	Aerial Color SO-242
Filtration:	-----	cc.10B	cc.20B	None
Spectral Band:	-----	510-900 nm	510-900 nm	400-700 nm
f Stop:	-----	4	8	8
Shutter Speed:	-----	1/125	1/75	1/75
# of Frames:	-----	48	67	67
% Overlap:	-----	60	60	60
Quality:	Very good	Excellent	Excellent	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.

Thematic Mapper Simulator

The Daedalus Thematic Mapper Simulator (TMS) is a 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, *μm*
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:	1.25 mrad
Ground Resolution:	81 feet (25 meters) at 65,000 feet
Total Scan Angle:	43°
Swath Width:	8.4 nmi (15.6 km) at 65,000 feet
Pixels/Scan Line:	716
Scan Rate:	12.5 scans/second
Ground Speed:	400 kts (206 m/second)

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 Systems

Various camera systems and films are used for photographic data collection. Film types include high definition color infrared, natural color, and black and white emulsions. Available photographic systems are as follows:

- Wild-Heerbrug RC-10 metric mapping camera
  - 9 x 9 inch film format
  - 6 inch focal length lens provides area coverage of 16 x 16 nautical miles from 65,000 feet
  - 12 inch focal length lens provides area coverage of 8 x 8 nautical miles from 65,000 feet
- Hycon HR-732 large scale mapping camera
  - 9 x 18 inch film format
  - 24 inch focal length lens provides area coverage of 4 x 8 nautical miles from 65,000 feet

- IRIS II Panoramic camera
  - 4.5 x 34.7 inch film format
  - 24 inch focal length lens
  - 90 degree field of view provides area coverage of 2 x 21.4 nautical miles from 65,000 feet

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for NASA-Ames aircraft acquired photographic and digital imagery. For information regarding photography and digital data (including areas of coverage, products, and product costs) contact EROS Data Center, Customer Services, Sioux Falls, South Dakota 57198 (Telephone: (605) 594-6151).

Additional information regarding ER-2 acquired photographic and digital data is available through the Aircraft Data Facility at Ames Research Center. For specific information regarding flight documentation, sensor parameters, and areas of coverage contact the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: (415) 604-6252).

CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-011

Accession # 04355

Sensor # 026

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	9269-9294	18:28:40	18:40:41	65000/19800	10-100% cumulus and cirrus (frames 9269-9275); 10-100% cirro-cumulus (frames 9283-9294)
C - D	9295-9300	18:44:26	18:46:49	"	90-100% cirro-cumulus (frames 9295-9300)
F - G	9301-9316	19:07:12	19:14:14	"	10-30% cirro-cumulus (frames 9301-9306); 10-80% cirro-cumulus (frames 9314-9316)

CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-011

Accession # 04356

Sensor # 018

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0041	18:28:06	18:37:59	65000/19800	10-30% cumulus and cirrus (frames 0001-0009); water mark (frames 0011-0012); 10-60% cirrus and cumulus (frames 0026-0041)
F - G	0042-0067	19:05:52	19:11:44	"	10-20% cirrus and cumulus (frames 0042-0051)

CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-011

Accession # 04357

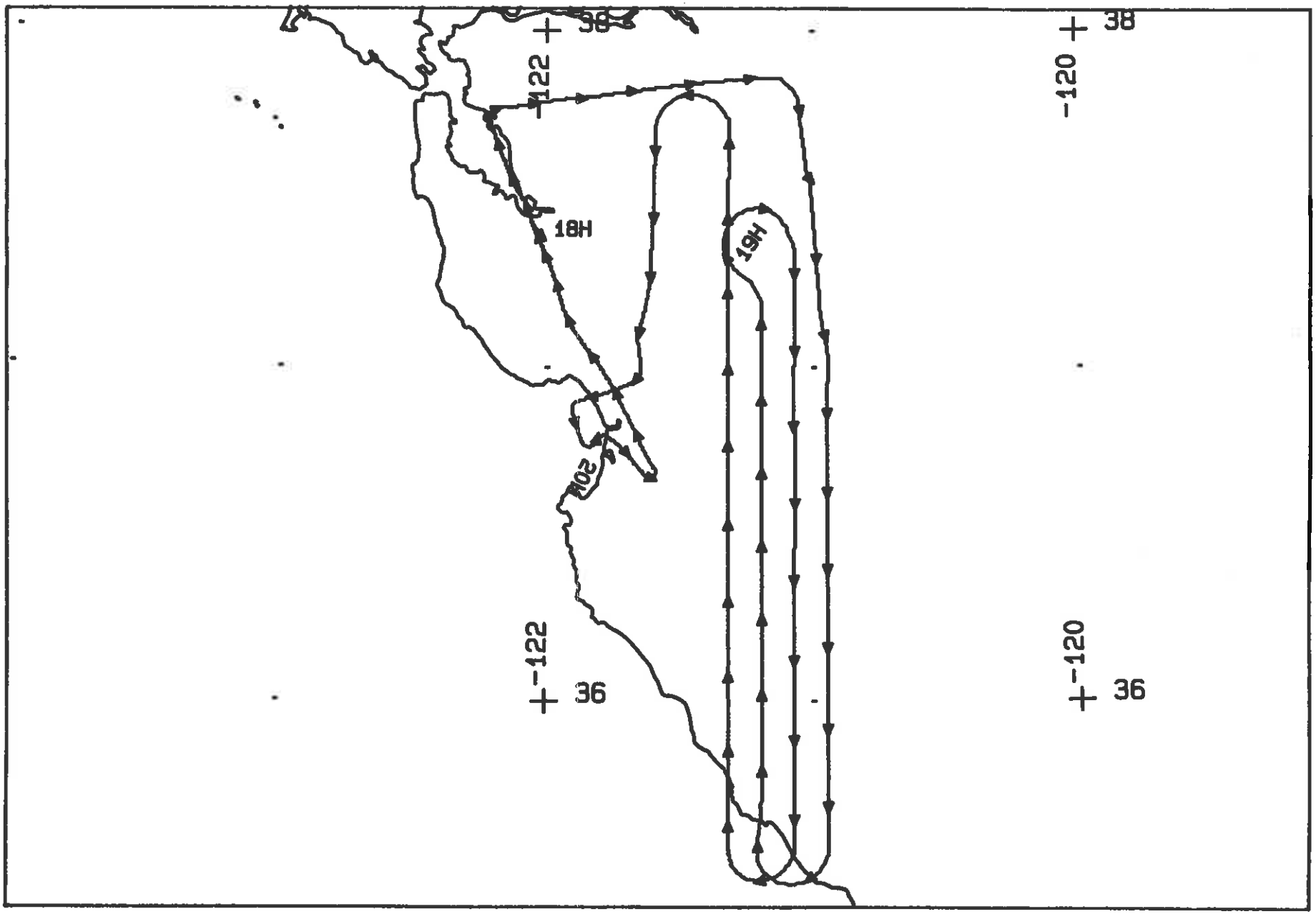
Sensor # 019

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0041	18:29:00	18:38:54	65000/19800	10-30% cumulus and cirrus (frames 0001-0011); 10-50% cumulus and cirrus (frames 0026-0041)
F - G	0042-0067	19:06:32	19:12:38	"	10-20% cumulus and cirrus (frames 0042-0067)

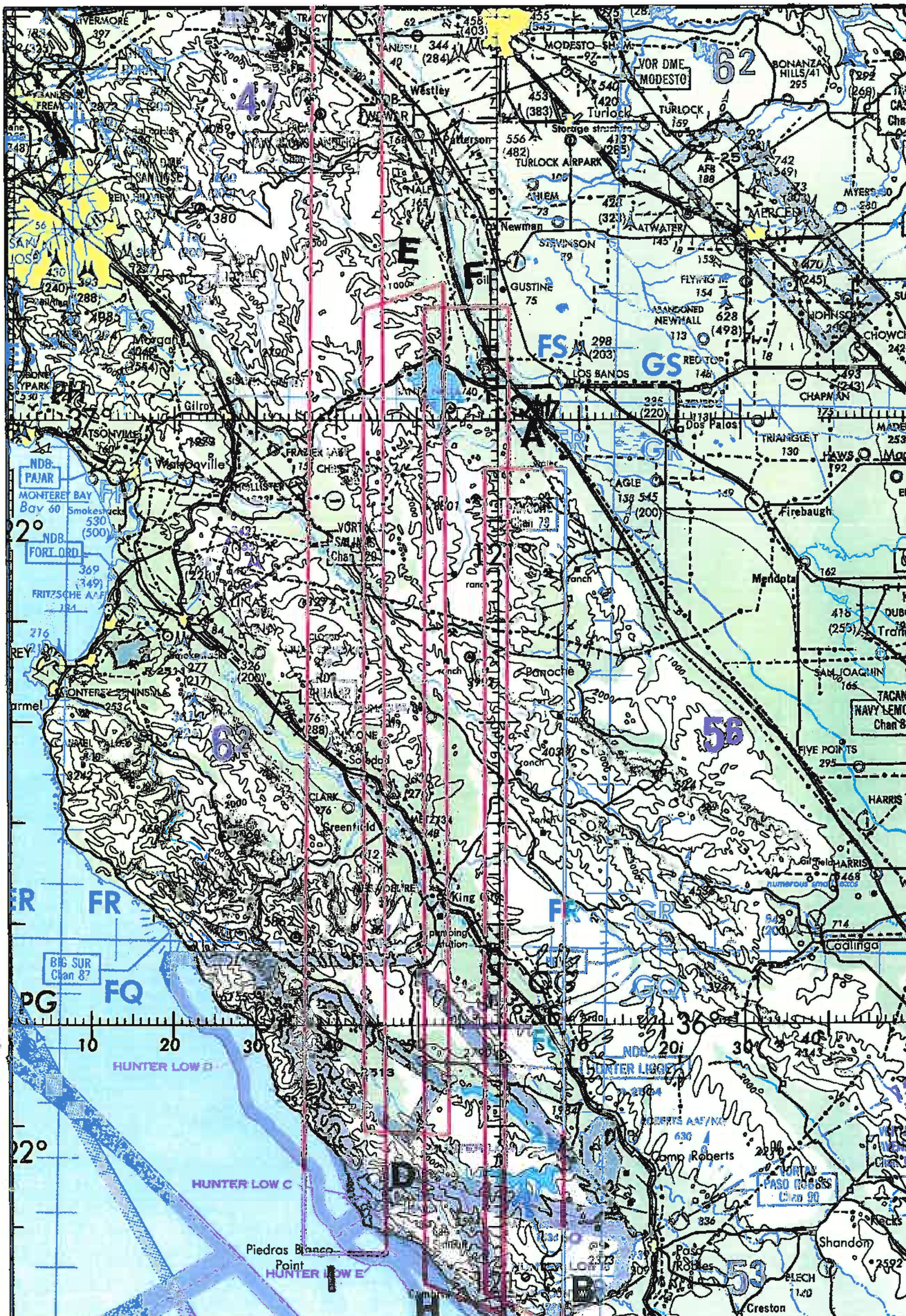
SCANNER FLIGHT LINE DATA
FLIGHT NO. 92-011

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 92-011

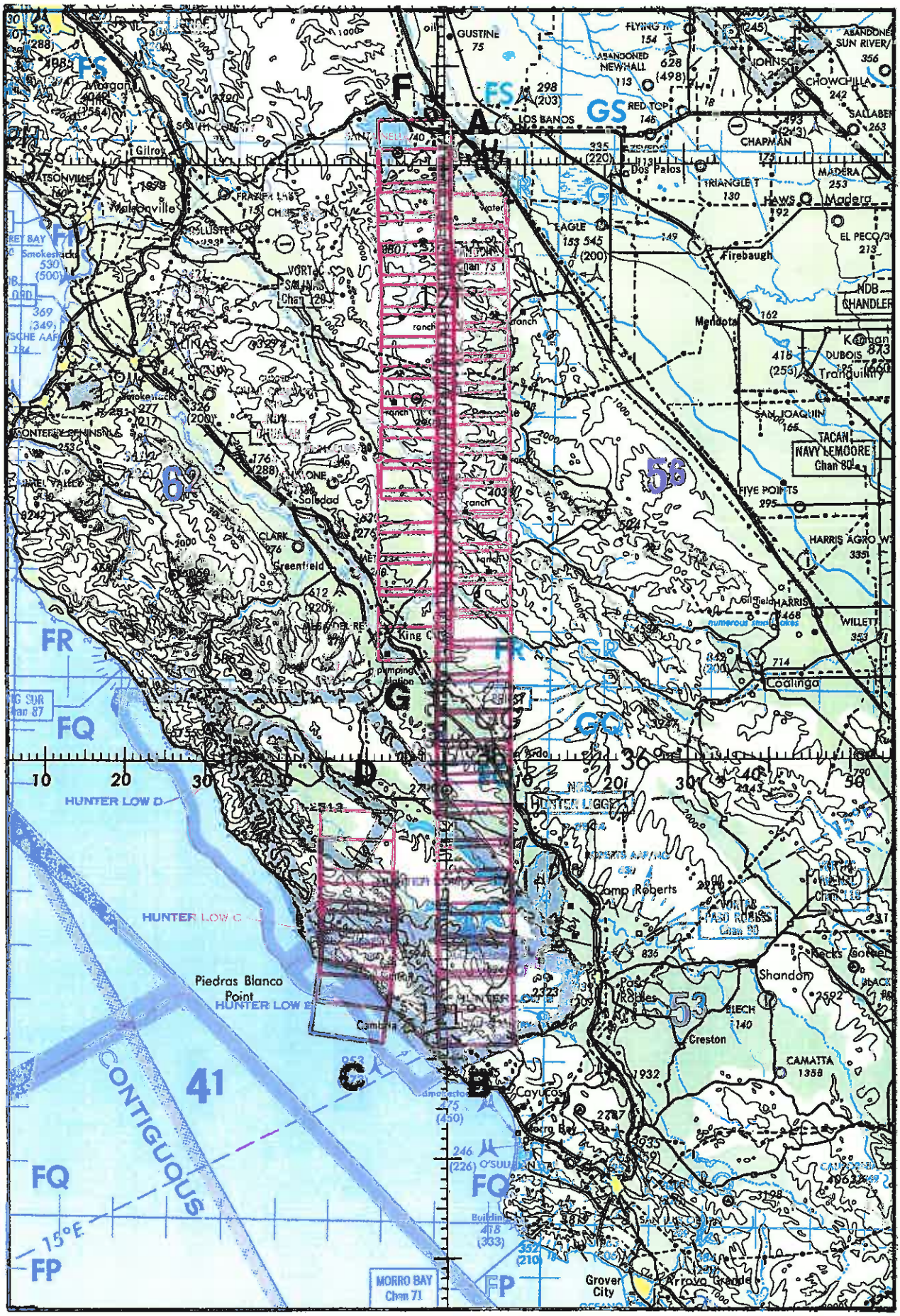
Check Points	Actual Time (GMT) Begin	Actual Time (GMT) End	Actual Scanline Begin	Actual Scanline End	Altitude feet/meter	Scan Speed (rps)	Total Good Scanlines	Total Interpolated Scanlines	Total Repeated Scanlines
A-B	18:28:58	18:41:15	28703	37914	65000/19812	12.50	9201	0	11
D-E	18:46:20	18:59:10	41729	51358	65000/19812	12.50	9601	0	29
F-H	19:05:35	19:20:06	56168	67057	65000/19812	12.50	10878	0	12
I-J	19:23:17	19:42:42	69444	84007	65000/19812	12.50	14535	0	29



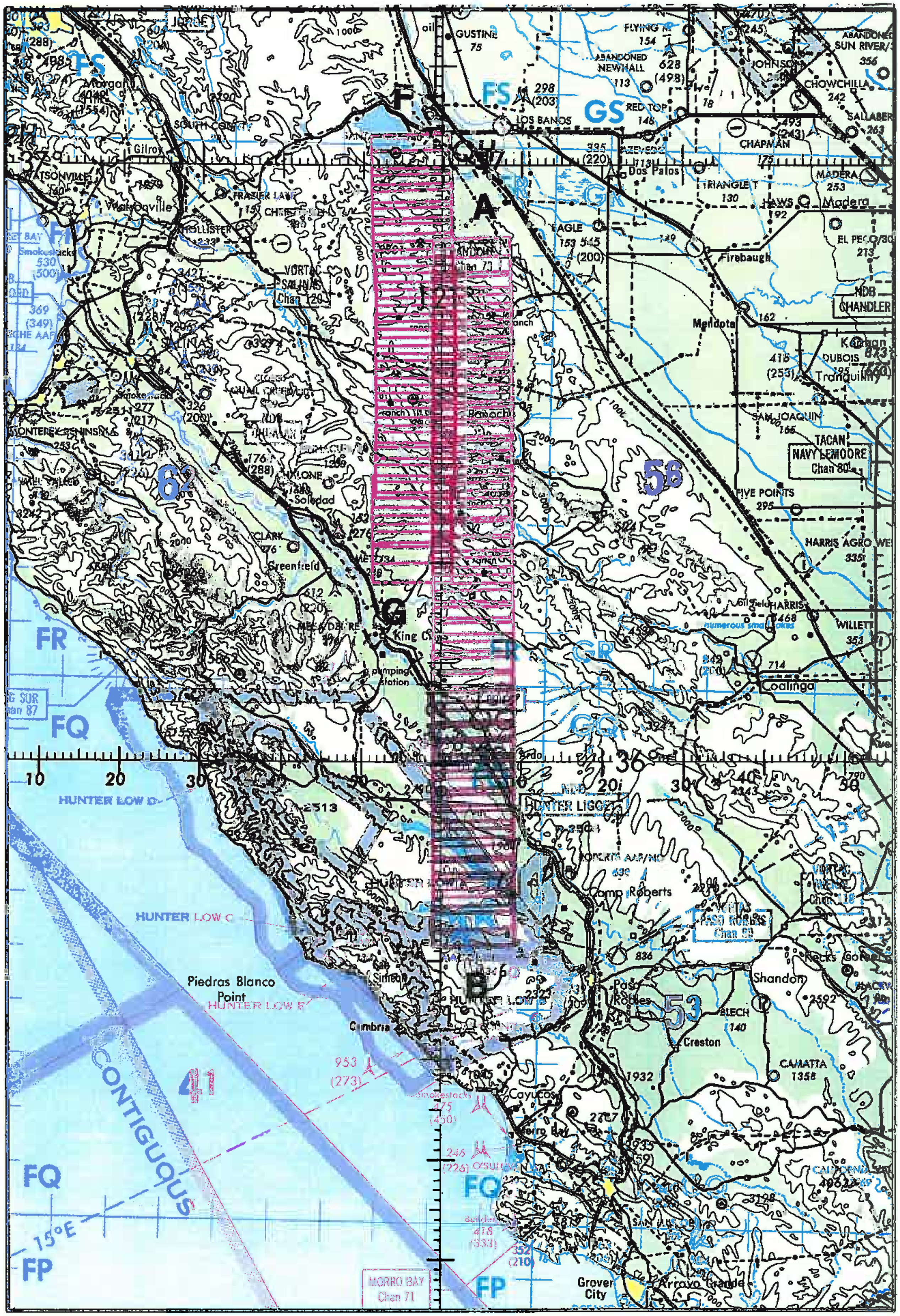
FLIGHT 92-011 11 October 1991 A/C 706 TMS



FLIGHT 92-011 A/C 706 11 October 1991 Thematic Mapper Simulator (TMS) ONC G-18



FLIGHT 92-011 11 October 1991 A/C 706 RC-10 (SO-131) ONC B-18 Accession # 04335



FLIGHT 92-011 11 October 1991 A/C 706 Duel HR-732 (90-131) # 04356 (90-242) # 04357 ONC G-18