FLIGHT SUMMARY REPORT

Flight Number: 93-115

Calendar/Julian Date: 11 August 1993 • 223

Sensor Package: Hycon HR-732
Thematic Mapper Simulator (TMS)

Area(s) Covered: Napa Valley, California

Investigator(s): Salute, NASA-ARC **Aircraft #:** 709

SENSOR DATA

Accession #:	04616	-----
Sensor ID #:	009	074
Sensor Type:	HR-732	TMS
Focal Length:	24" 609.6 mm	-----
Film Type:	High Definition Aerochrome IR SO-131	-----
Filtration:	cc.10B	-----
Spectral Band:	510-900 nm	-----
f Stop:	8	-----
Shutter Speed:	1/75	-----
# of Frames:	31	-----
% Overlap:	60	-----
Quality:	Excellent	Good
Remarks:	Camera clock offset 2.4 seconds from navigation data	

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(s) and camera(s) 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)

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. 93-115

Accession # 04616

Sensor # 009

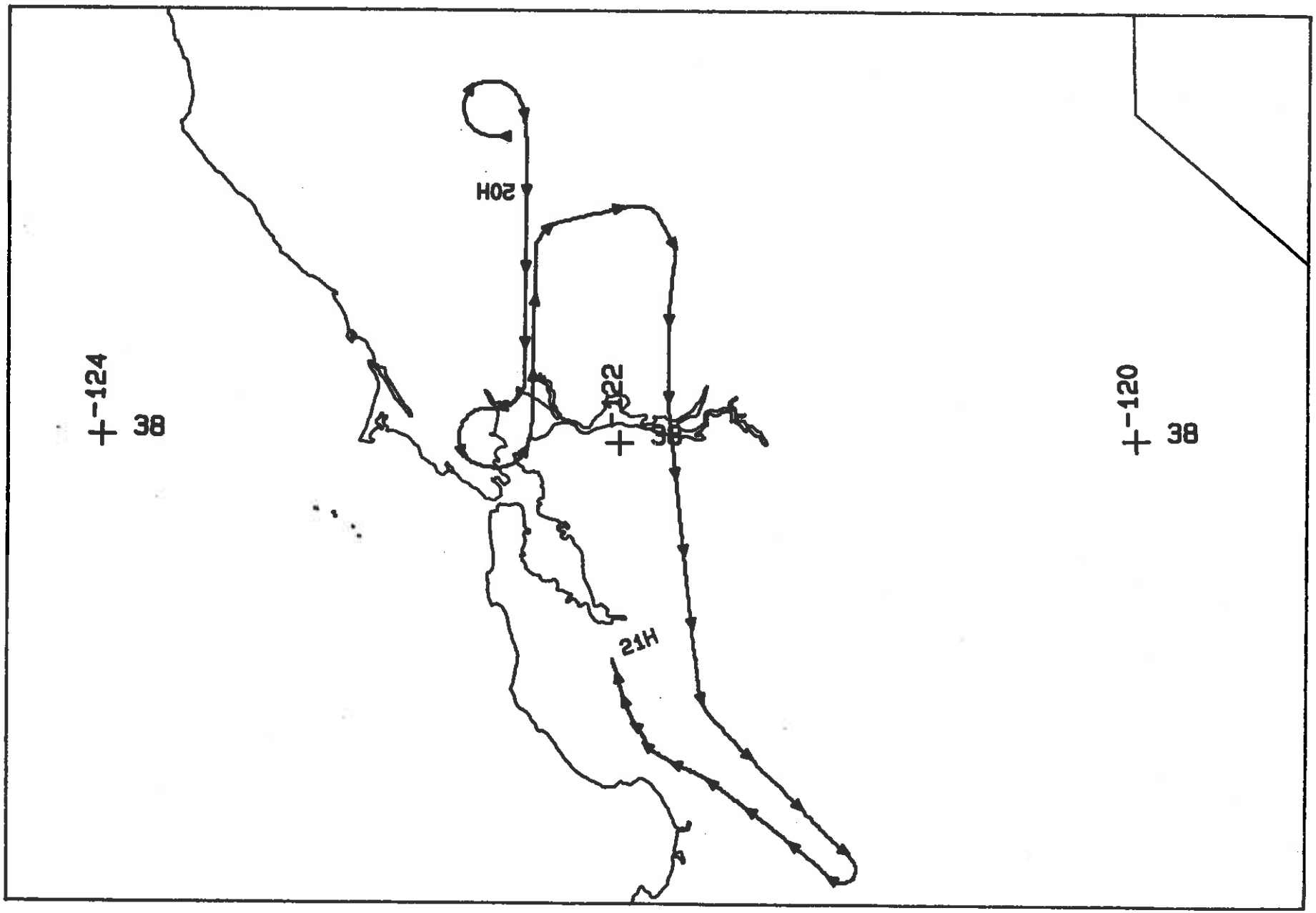
Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
B - C	0001-0013	20:02:18	20:05:06	65000/19800	10-20% cumulus (frames 0001-0002 and 0005-0013); light struck (frame 0012)
D - E	0014-0028	20:12:13	20:15:39	"	Minor-10% cumulus (frames 0017-0028)
H - I	0029-0031	20:21:29	20:21:44	"	Minor-10% cumulus

TMS SCANNER FLIGHT LINE DATA

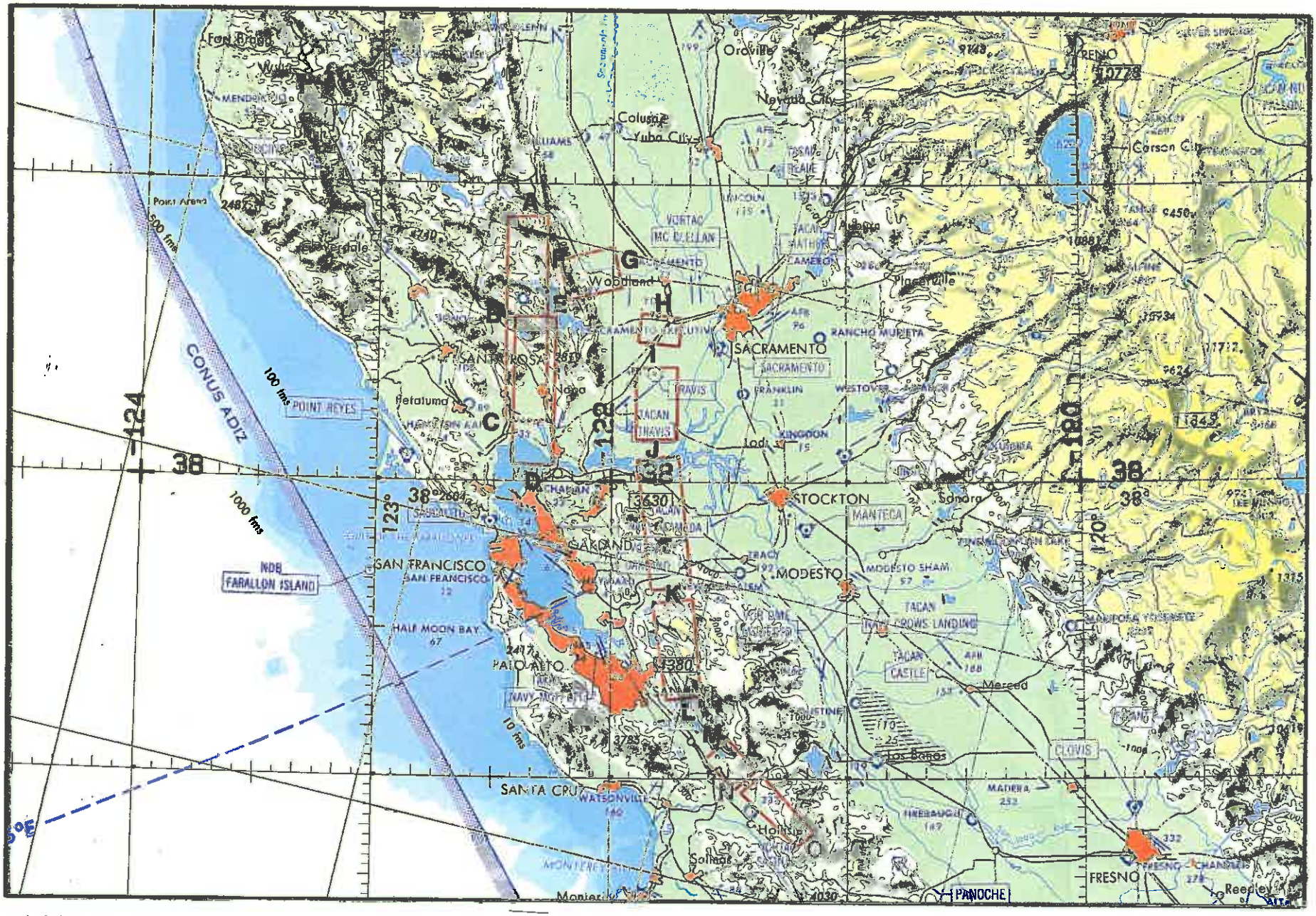
FLIGHT NO. 93-115

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 93-115

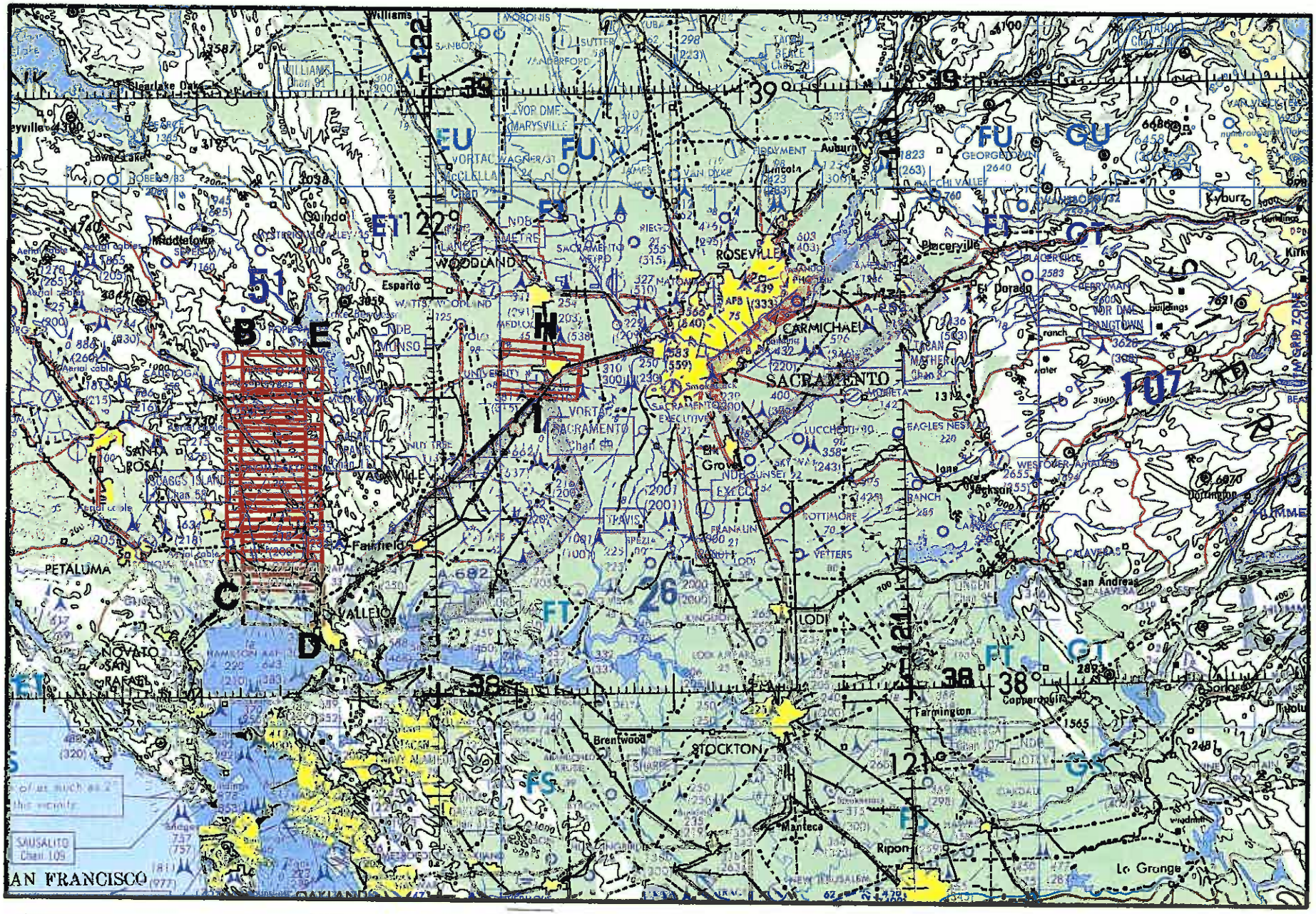
Check Points	Actual time (GMT) begin	end	Actual scanline begin	end	Altitude feet/meter	Scan Speed (rps)	total Good scanlines	total Interpolated scanlines	total Repeated scanlines
A-C	19:59:10.0	20:05:22.0	29006	34659	65000/19812	12.50	4634	0	0
D-E	20:11:19.0	20:15:48.0	38114	41480	65000/19812	12.50	3367	0	0
F-G	20:17:23.0	20:19: 6.0	42668	43955	65000/19812	12.50	1287	1	0
H-I	20:21:21.0	20:22:16.0	45638	46331	65000/19812	12.50	694	0	0
I-J	20:22:56.0	20:25:10.0	46826	48507	65000/19812	12.50	1684	0	0
J-K	20:25:42.0	20:29:40.0	48905	51875	65000/19812	12.50	2971	0	0
K-L	20:30: 3.0	20:33: 6.0	52172	54449	54000/16459	12.50	2278	0	0
M-N	20:35: 4.0	20:36:24.0	55934	56924	46000/14020	12.50	991	0	0
N-O	20:36:39.0	20:37:10.0	57122	57004	40000/12192	12.50	1082	0	0



FLIGHT 93-115 11 AUGUST 1993 A/C 709 HR-732 / TMS



FLIGHT 93-115 11 AUGUST 1993 A/C 709 TMB JNC 43



FLIGHT 93-115 11 AUGUST 1993 A/C 709 HR-732 ONC G-18