

FLIGHT SUMMARY REPORT

Flight #: 92-014
Date: 21 October 1991
Sensor Package: Thematic Mapper Simulator (TMS)
Hycon HR-732
Area(s) Covered: Oakland Fire Assessment

Investigator(s): Pilot Proficiency

Aircraft #: 706

Flight Request: 92X001

Julian Date: 294

SENSOR DATA

Accession #:	----	04363
Sensor ID #:	074	018
Sensor Type:	TMS	HR-732
Focal Length:	----	24" 609.6 mm
Film Type:	----	High Definition Aerochrome IR SO-131
Filtration:	----	cc.20B
Spectral Band:	----	510-900 nm
f Stop:	----	8
Shutter Speed:	----	1/75
# of Frames:	----	229
% 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.

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:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, μm</u>
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. 92-014**

Accession # 04363

Sensor # 018

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Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0007	19:35:43	19:37:12	30000/9150	Clear; oblique (frames 0006-0007); frames acquired during ascent
B - C	0008-0043	19:37:27	19:46:11	32000 to 52000 9756 to 15855	10-40% strato-cumulus, over fire (frames 0011-0019); frames acquired during ascent
C - D	0044-0049	19:46:26	19:47:40	53000/16158	Oblique frames in turn
D - E	0050-0068	19:47:55	19:52:24	54000 to 60000 16460 to 18300	Clear; frames acquired during ascent
E - F	0069-0078	19:52:39	19:54:53	60000/18300	Clear; oblique frames in turn
F - G	0079-0085	19:55:08	19:56:37	62000/18902	Clear
G - H	0086-0089	19:56:52	19:57:37	63000/19207	Clear; oblique frames in turn
H - I	0090-0101	19:57:52	20:00:35	63000/19207	Clear
I - J	0102-0104	20:00:50	20:01:20	64000/19512	Clear; oblique frames in turn

CAMERA FLIGHT LINE DATA
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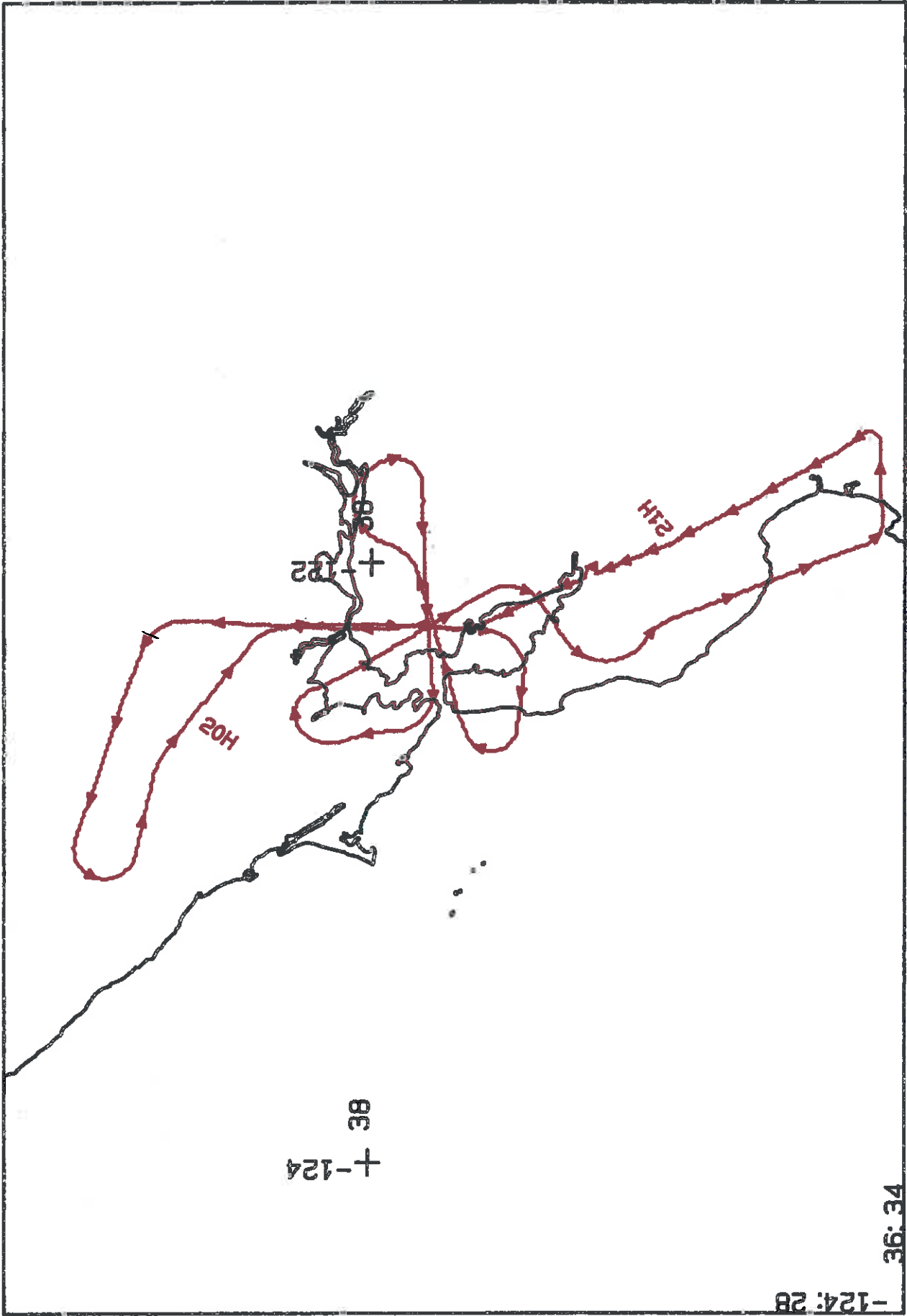
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
J - K	0105-0123	20:01:35	20:06:02	65000/19800	10-30% strato-cumulus, over fire (frames 0116-0120)
K - L	0124-0130	20:06:17	20:07:46	"	Clear
L - M	0131-0135	20:08:01	20:09:00	"	10-50% strato-cumulus
N - O	0136-0146	20:11:57	20:14:25	"	10-50% strato-cumulus (frames 0136-0143)
O - P	0147-0166	20:14:40	20:19:20	"	Clear; oblique frames in turn
P - Q	0167-0186	20:19:35	20:24:15	"	10-30% strato-cumulus (frames 0181-0186)
R - S	0187-0199	20:31:00	20:33:56	"	10-30% strato-cumulus (frames 0190-0197)
S - T	0200-0223	20:34:10	20:39:48	"	10-50% strato-cumulus (frames 0212-0220); oblique frames in turns
T - U	0224-0229	20:40:02	20:41:16	60000 to 55000 18300 to 16750	Clear; frames acquired during descent

TMS SCANNER FLIGHT LINE DATA

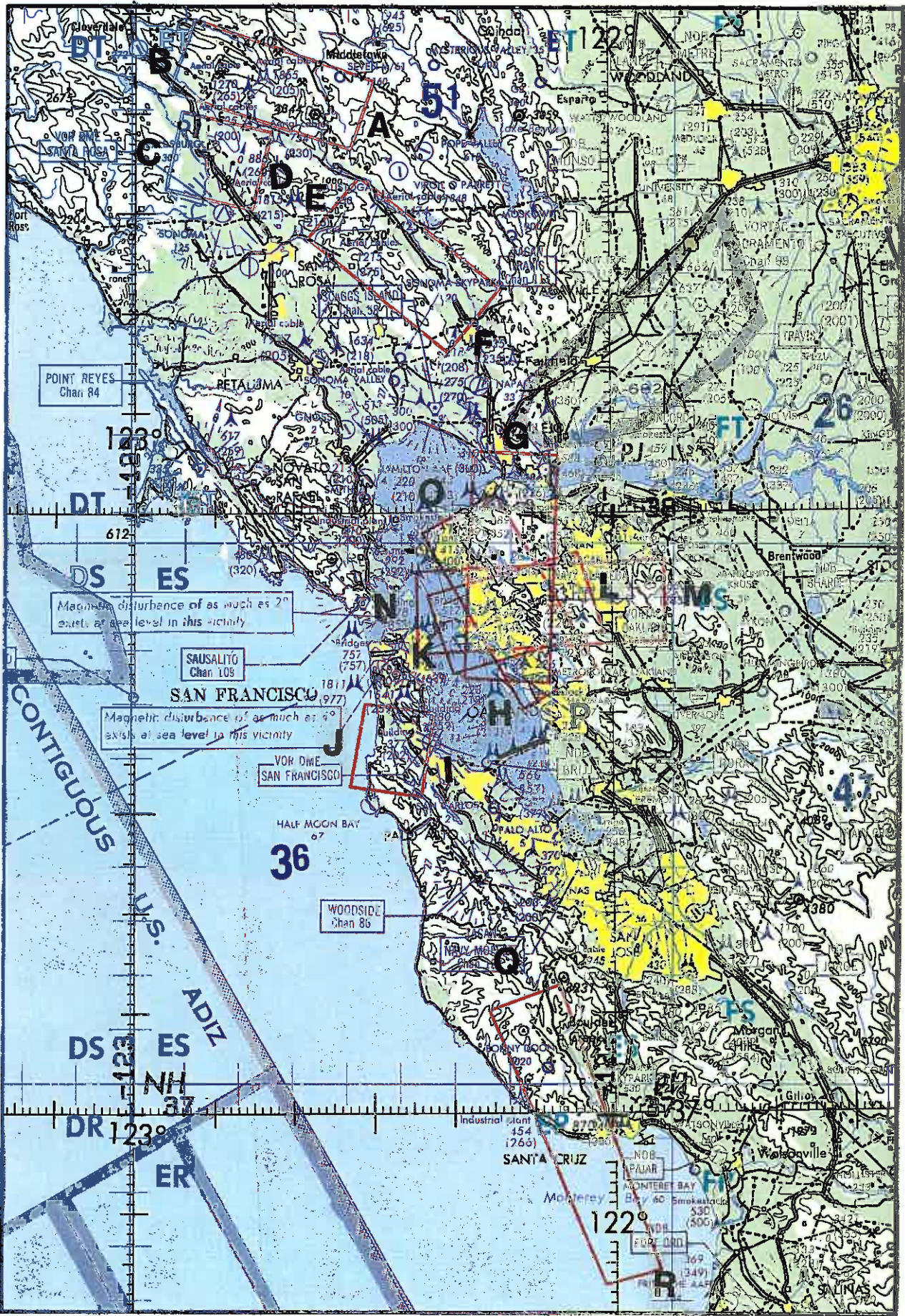
FLIGHT NO. 92-014

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 92-014

Check Points	A c t u a l t i m e b e g i n e n d (GMT)	A c t u a l s c a n l i n e b e g i n e n d	A l t i t u d e f e e t / m e t e r	Scan S p e e d (rps)	t o t a l G o o d s c a n l i n e s	t o t a l I n t e r p o l a t e d s c a n l i n e s	t o t a l R e p e a t e d s c a n l i n e s
a-b	19:51:14.0 19:54:10.0	56593 58793	65000/19812	12.50	2201	0	0
c-d	19:56:58.0 19:58:18.0	60893 61893	65000/19812	12.50	1001	0	0
e-f	19:59:30.0 20:02:10.0	62796 64796	65000/19812	12.50	2001	0	0
g-h	20:04:18.0 20:07:38.0	66396 68896	65000/19812	12.50	2501	0	0
i-j	20:09:30.0 20:10:35.0	70298 71101	65000/19812	12.50	801	0	3
k-l	20:13:58.0 20:16:15.0	73639 76366	65000/19812	12.50	1701	0	16
m-n	20:22:24.0 20:26:09.0	79964 82775	65000/19812	12.50	2801	0	11
o-p	20:32:47.0 20:35:43.0	87755 89959	65000/19812	12.50	2201	0	4
q-r	20:41:44.0 20:46:32.0	94467 98072	60000/18288	12.50	3601	0	5



FLIGHT 92-014 21 OCTOBER 1991 TMS / NR-732 OAKLAND FIRE A/C 706
 OVERLAY FOR MNUSA LAMBERT CONFORMAL PROJECTION: SP1 = 30.3 SP2 = 38.4 CM = -122.3 ROTATED BY 0.0
 19:30:20 TO 21:07:30 UT SCALE = 1:1.59E+06 TIME TICS EVERY 2.00 MINUTES



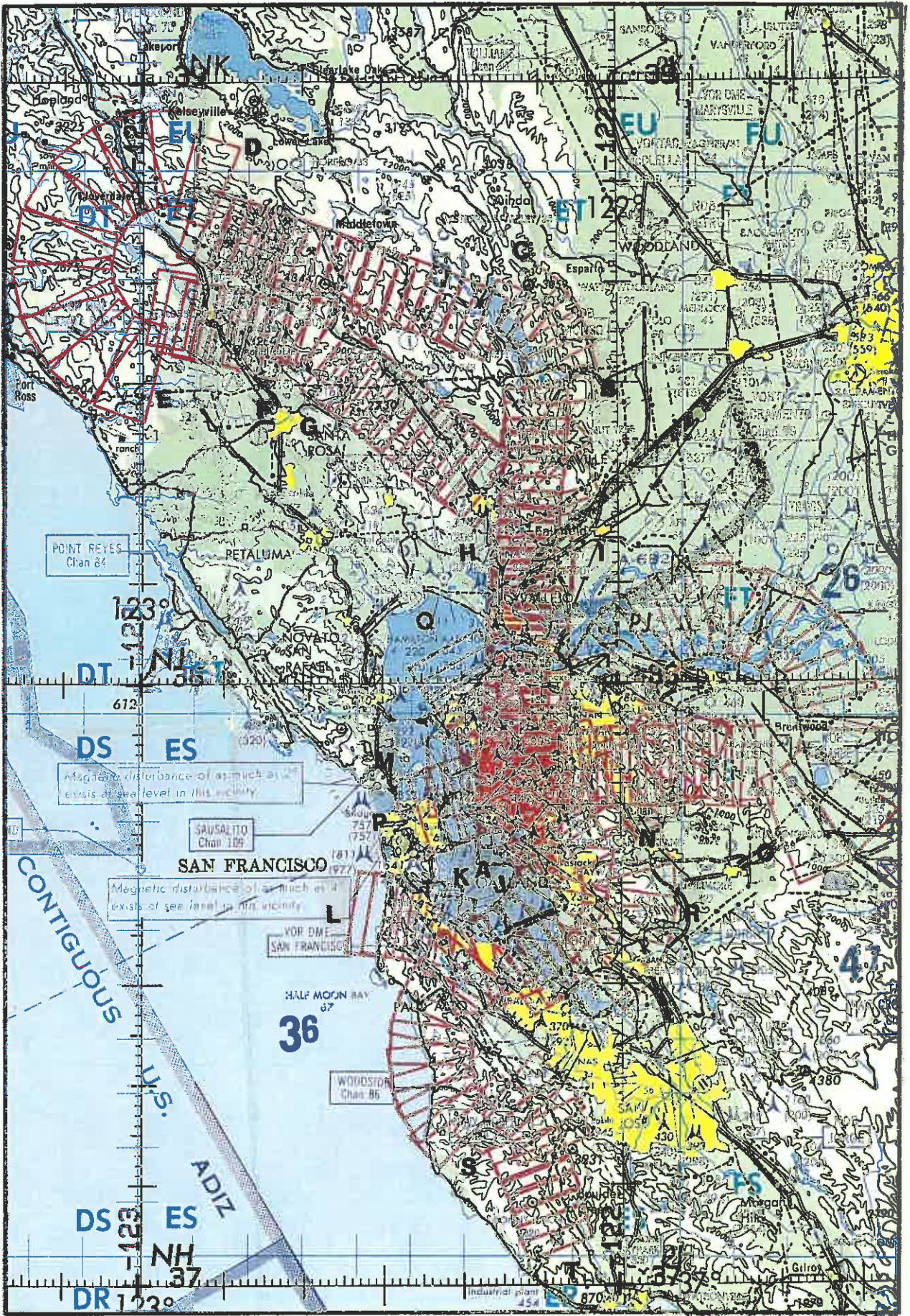
CNC 6-42

Thematic Mapper Simulator

A/G 706

21 October 1981

FLIGHT 92-014



FLIGHT 82-014 21 October 1991 A/C 706 TMS / HA-732 80-131 Accession # 04363 ONC 6-16