

# FLIGHT SUMMARY REPORT

**Flight Number:** 95-143  
**Calendar/Julian Date:** 13 July 1995 • 194  
**Sensor Package:** Wild Heerbrugg RC-10 (6" and 12")  
Dual Hycon HR-732  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Central Valley, CA

**Investigator(s):** Penberth, California Dept. of Conservation      **Aircraft #:** 706

## SENSOR DATA

<b>Accession #:</b>	04945	04946	04947
<b>Sensor ID #:</b>	031	039	020
<b>Sensor Type:</b>	RC-10	HR-732	HR-732
<b>Focal Length:</b>	6" 153.05 mm	24" 609 mm	24" 609 mm
<b>Film Type:</b>	Aerochrome IR SO-060	Aerochrome IR SO-134	Aerochrome IR SO-134
<b>Filtration:</b>	Wratten 12 + 2.2 AV	Wratten 12	Wratten 12
<b>Spectral Band:</b>	510-900 nm	510-900 nm	510-900 nm
<b>f Stop:</b>	8	14.2	14.2
<b>Shutter Speed:</b>	1/225	1/250	1/250
<b># of Frames:</b>	176	23	23
<b>% Overlap:</b>	60	60	60
<b>Quality:</b>	Excellent	Excellent	Excellent
<b>Remarks:</b>	Camera clock offset 9.3 seconds from navigation data	Camera clock offset 2.2 seconds from navigation data	

## SENSOR DATA continued

Flight Number: 95-143

<b>Accession #:</b>	04948	-----
<b>Sensor ID #:</b>	026	074
<b>Sensor Type:</b>	RC-10	TMS
<b>Focal Length:</b>	12" 304.97 mm	-----
<b>Film Type:</b>	Panatomic X Aerographic II 2412	-----
<b>Filtration:</b>	Wratten 12	-----
<b>Spectral Band:</b>	510-700 nm	-----
<b>f Stop:</b>	8	-----
<b>Shutter Speed:</b>	1/275	-----
<b># of Frames:</b>	15	-----
<b>% Overlap:</b>	60	-----
<b>Quality:</b>	Good	Good
<b>Remarks:</b>	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:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, <math>\mu\text{m}</math></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)

## 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-Heerbrugg 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. 95-143**

Accession # 04945

Sensor # 031

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	7479-7486	17:31:34	17:38:18	62725/19119	Clear
C - D	7487-7498	17:41:27	17:52:01	63117/19238	Clear
E - F	7499-7513	17:55:21	18:08:43	62913/19176	Clear
G - H	7514-7533	18:14:01	18:32:05	63360/19312	Clear
I - J	7534-7555	18:36:04	18:55:57	62945/19186	Clear
K - L	7556-7581	18:59:53	19:23:29	62992/19200	Clear
M - N	7582-7588	19:30:24	19:36:02	63171/19255	Clear
O - P	7589-7594	19:39:14	19:43:56	63117/19238	Clear
M - Q	7595-7623	19:47:41	20:13:59	62838/19153	Clear
R - O	7624-7647	20:17:30	20:39:05	62904/19173	Clear
S - G	7648-7654	21:01:33	21:07:08	62414/19024	Clear

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-143**

**Accession # 04946**

**Sensor # 039**

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0023	17:32:08	17:37:32	62848/19156	Clear; light leak (frame 0001)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-143**

**Accession # 04947**

**Sensor # 020**

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0023	17:32:10	17:37:34	65000/19800	Clear

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-143**

**Accession # 04948**

**Sensor # 026**

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	7160-7174	17:30:50	17:37:28	65000/19800	Clear

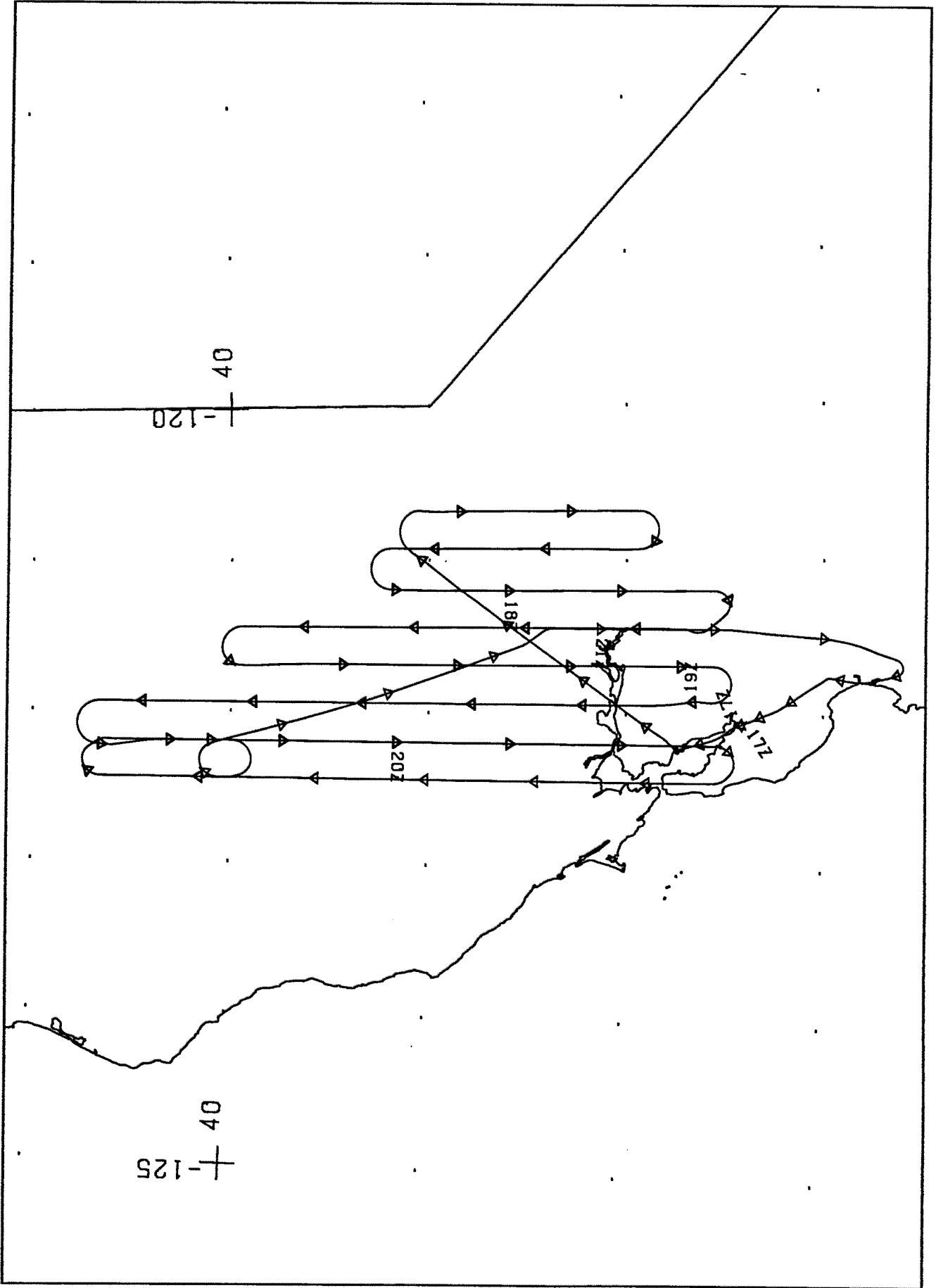


# TMS SCANNER FLIGHT LINE DATA

## FLIGHT NO. 95-143

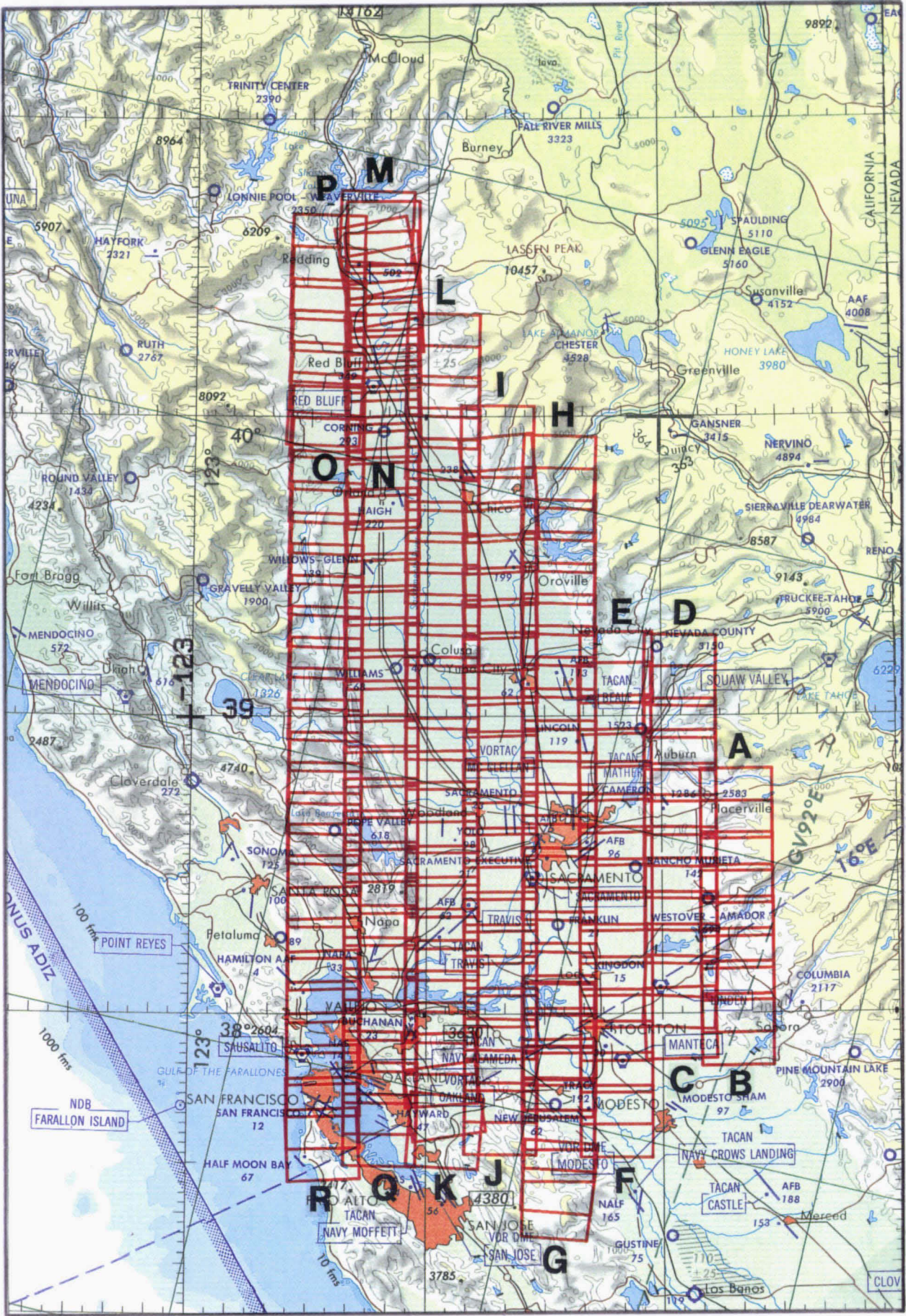
DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 95-143

Check Points	A c t u a l t i m e b e g i n e n d	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	S c a n S p e e d ( r p s )	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	17:38:43.0 17:38: 7.0	29868 35412	65000/19812	12.50	5545	0	0
C-D	17:41: 9.0 17:52: 6.0	37689 45906	65000/19812	12.50	8217	1	0
E-F	17:55: 9.0 18:09:16.0	48183 58776	65000/19812	12.50	10594	0	0
G-H	18:13:14.0 18:32:54.0	61746 76497	65000/19812	12.50	14751	1	0
I-J	18:36:28.0 18:56:32.0	79170 94218	65000/19812	12.50	15049	0	0
K-L	19:00:29.0 19:24: 6.0	97179 114900	65000/19812	12.50	17720	0	2
M-N	19:30:58.0 19:32: 9.0	120048 120939	65000/19812	12.50	892	0	0
O-P	19:39: 1.0 19:44:26.0	126087 130146	65000/19812	12.50	4060	0	0
M-Q	19:47:28.0 20:14:24.0	132423 152619	65000/19812	12.50	20196	1	0
R-O	20:17:10.0 20:39:29.0	154698 171429	65000/19812	12.50	16731	1	0
S-G	21:00:44.0 21:07:20.0	187368 192318	65000/19812	12.50	4950	1	0



FLIGHT 95-143      13 JULY 1995      A/C 706      DUAL RC-10 / DUAL HR-732 / TMS





JNC 43

RC-10 / TMS / (F.C.F DUAL HR-732 and RC-10 BM)

A/C 706

13 JULY 1995

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