

# FLIGHT SUMMARY REPORT

**Flight Number:** 95-136  
**Calendar/Julian Date:** 24 July 1995 • 205  
**Sensor Package:** Dual Wild Heerbrugg RC-10  
Hycon HR-732  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Payette National Forest, Idaho

**Investigator(s):** Greer, USDA Forest Service

**Aircraft #:** 706

## SENSOR DATA

<b>Accession #:</b>	04960	04961	04962
<b>Sensor ID #:</b>	034	076	020
<b>Sensor Type:</b>	RC-10	RC-10	HR-732
<b>Focal Length:</b>	12" 304.66 mm	12" 304.89 mm	24" 609 mm
<b>Film Type:</b>	Aerochrome IR SO-060	Panatomic X Aerographic II 2412	Aerochrome IR SO-134
<b>Filtration:</b>	Wratten 12	Wratten 12	Wratten 12
<b>Spectral Band:</b>	510-900 nm	510-700 nm	510-900 nm
<b>f Stop:</b>	11	11	14.2
<b>Shutter Speed:</b>	1/250	1/175	1/250
<b># of Frames:</b>	166	173	311
<b>% Overlap:</b>	60	60	60
<b>Quality:</b>	Excellent	Fair	Excellent
<b>Remarks:</b>	Camera clock offset 12.5 seconds from navigation data	Camera clock offset 3.9 seconds from navigation data	Camera clock offset 3.3 seconds from navigation data

**SENSOR DATA continued**

**Flight Number: 95-136**

**Accession #:** -----  
**Sensor ID #:** 074  
**Sensor Type:** TMS  
**Focal Length:** -----  
**Film Type:** -----  
**Filtration:** -----  
**Spectral Band:** -----  
**f Stop:** -----  
**Shutter Speed:** -----  
**# of Frames:** -----  
**% Overlap:** -----  
**Quality:** -----  
**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(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. 95-136**

Accession # 04960  
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	7851-7864	18:25:22	18:31:29	64279/19592	Minor-10% cumulus (frames 7851, 7854-7855 and 7859-7864)
C - D	7865-7875	18:34:59	18:39:42	64200/19568	Minor cumulus (frames 7865-7866)
E - F	7876-7889	18:43:35	18:49:43	64236/19579	Minor-20% cumulus (frames 7885-7889)
G - H	7890-7902	18:52:47	18:58:26	64392/19627	Minor-10% cumulus (frames 7890-7892, and 7897-7899)
I - J	7903-7911	19:02:25	19:06:11	64578/19683	Minor-10% cumulus (frames 7903-7910)
K - L	7912-7920	19:12:50	19:16:35	64444/19643	Minor-10% cumulus (frames 7914-7915 and 7920)
M - N	7921-7934	19:21:13	19:27:19	64879/19775	Minor-10% cumulus (frames 7928-7934)
O - P	7935-7948	19:30:55	19:37:02	64871/19773	Minor-30% cumulus (frames 7935-7942); 10% cumulus (frames 7947-7948)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-136**

Accession # 04960

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
Q - R	7949-7962	19:42:01	19:48:08	65336/19914	Minor cumulus (frame 7949); minor-20% cumulus (frames 7958-7962)
S - T	7963-7976	19:52:18	19:58:24	65400/19934	Minor-10% cumulus (frames 7963-7966, 7968-7970)
U - V	7977-7990	20:04:04	20:10:10	65664/20014	Minor-20% cumulus (frames 7980-7990)
W - X	7991-7997	20:13:54	20:16:43	65786/20052	Minor-10% cumulus (frames 7991-7995)
Y - Z	7998-8016	20:28:10	20:36:36	66100/20147	Minor-20% cumulus (frames 7998-8006)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-136**

Accession # 04961

Sensor # 076

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Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	4371-4385	18:25:13	18:31:38	65000/19800	Minor-10% cumulus (frames 4371-4372; 4375-4376; 4379-4385)
C - D	4386-4397	18:34:50	18:39:47	"	Minor cumulus (frames 4386-4387)
E - F	4398-4411	18:43:26	19:49:21	"	Minor-20% cumulus (frames 4407-4411)
G - H	4412-4425	18:52:38	18:58:33	"	Minor-10% cumulus (frames 4412-4414; 4420-4921)
I - J	4426-4435	19:02:16	19:06:14	"	Minor-10% cumulus (frames 4426-4434)
K - L	4436-4445	19:12:40	19:16:39	"	Minor-10% cumulus (frames 4439-4440; 4445)
M - N	4446-4459	19:21:03	19:26:58	"	Minor-10% cumulus (frames 7928-7934)
O - P	4460-4473	19:30:46	19:36:41	"	Minor-10% cumulus (frames 4454-4459)
Q - R	4474-4487	19:41:51	19:47:47	"	Minor-30% cumulus (frames 4460-4468; 10% cumulus (frames 4472-4473))

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-136**

Accession # 04961  
Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
S - T	4488-4502	19:52:08	19:58:32	65000/19800	Minor-10% cumulus (frames 4488-4492; 4494-4495)
U - V	4503-4516	20:03:54	20:09:49	"	Minor-20% cumulus (frames 4507-4516)
W - X	4517-4524	20:13:44	20:16:45	"	Minor-10% cumulus (frames 4517-4521)
Y - Z	4525-4543	20:28:00	20:36:20	"	Minor-20% cumulus (frames 4525-4533)



**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-136**

Accession # 04962

Sensor # 020

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Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0026	18:25:19	18:31:25	65000/19800	Minor-10% cumulus (frames 0001; 0007-0008; 0016-0019; 0023-0025) light struck (frame 0001)
C - D	0027-0047	18:34:49	18:39:42	"	Minor cumulus (frame 0027)
E - F	0048-0073	18:43:36	18:49:41	"	Minor-10% cumulus (frames 0065-0070; 10-20% cumulus (frames 0072-0073)
G - H	0074-0098	18:52:36	18:58:27	"	Minor-10% cumulus (frames 0074-0077; 0089-0091; 0095)
I - J	0099-0115	19:02:21	19:06:15	"	Minor-10% cumulus (frames 0099-0105; 0109-0112)
K - L	0116-0132	19:12:49	19:16:43	"	Minor-10% cumulus (frames 0119-0121; 0127-0128; 0131-0132)
M - N	0133-0158	19:21:06	19:27:11	"	Minor-10% cumulus (frames 0148-0149; 0151-0156)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-136**

Accession # 04962

Sensor # 020

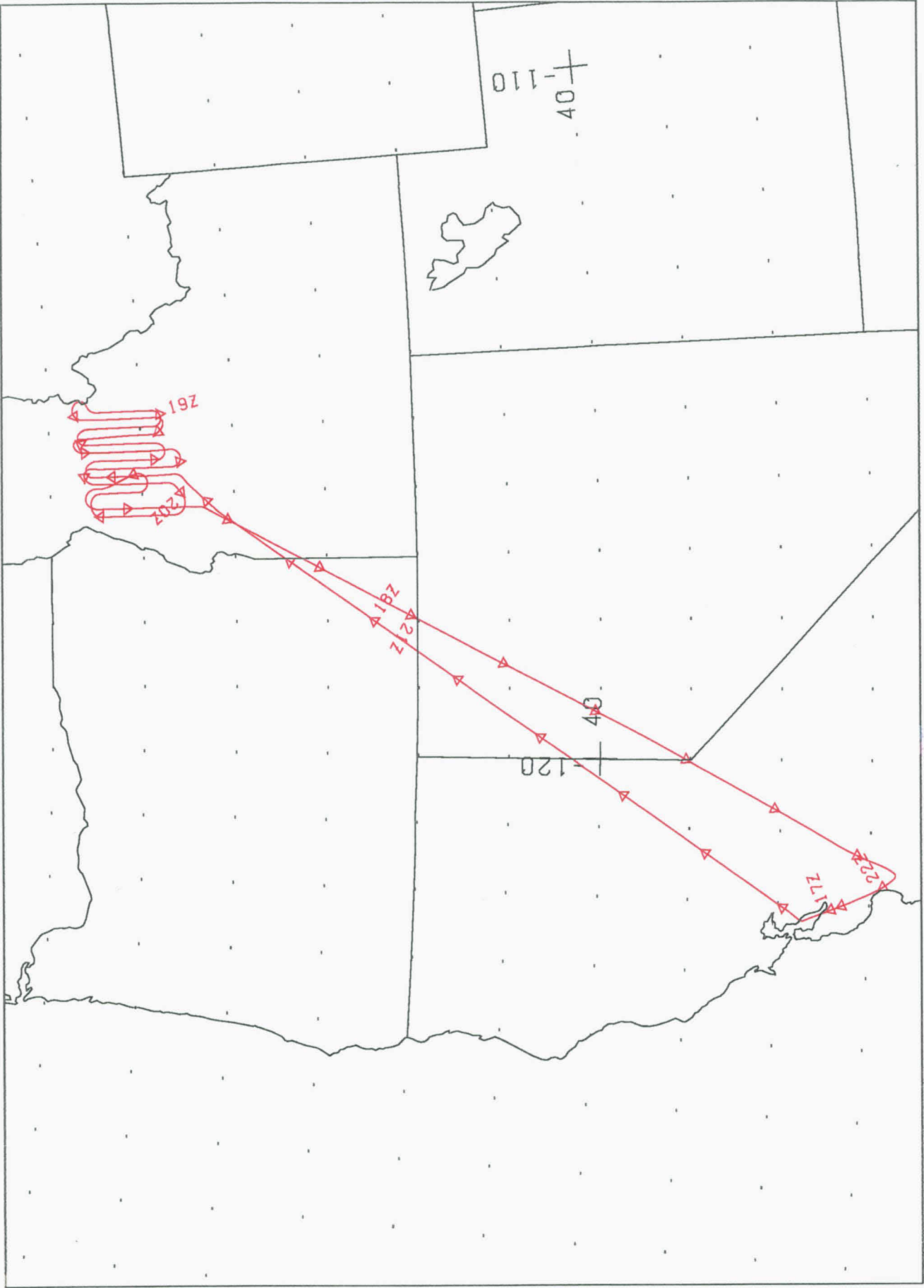
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
O - P	0159-0184	19:30:50	19:36:55	65000/19800	Minor-30% cumulus (frames 0159-0167); minor cumulus (frames 0171-0173); minor- 20% cumulus (frames 0181-0184)
Q - R	0185-0209	19:42:02	19:47:52	"	Minor-30% cumulus (frames 0202-0209)
S - T	0210-0235	19:52:15	19:58:20	"	Minor-10% cumulus (frames 0211-0215; 0219-0222)
U - V	0236-0261	20:03:55	20:10:00	"	10-20% cumulus (frames 0243-0261)
W - X	0262-0274	20:13:54	20:16:49	"	Minor-10% cumulus (frames 0262-0268; 0273-0274)
Y - Z	0275-0311	20:28:01	20:37:46	"	Minor-20% cumulus (frames 0275-0290)

# TMS SCANNER FLIGHT LINE DATA

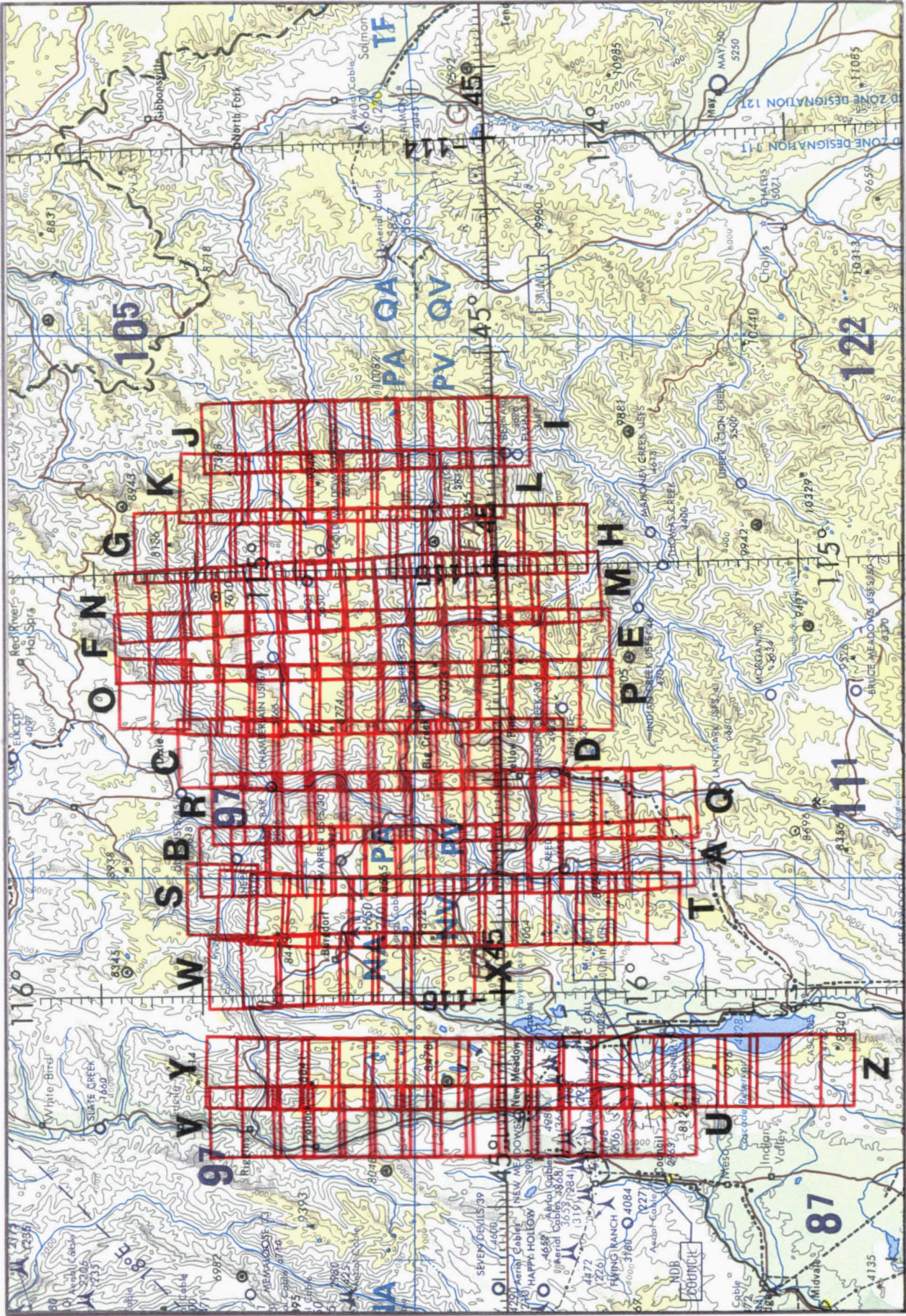
## FLIGHT NO. 95-136

DATA VALUES: FLIGHT DATA  
 FLIGHT NUMBER: 95-136

Check Points	A c t u a l t i m e (GMT)	A c t u a l s c a n l i n e b e g i n	A c t u a l e n d	A l t i t u d e (feet/feet)	Scan Speed (pps)	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	18:24:37.0	18:43:1.0	70463	74012	63000/19812	12.50	5845	0
C-D	18:34:39.0	18:40:26.0	77992	82348	65000/19812	12.50	4657	0
E-F	18:45:14.0	18:47:34.0	84427	87179	65000/19812	12.50	4752	1
G-H	18:52:13.0	18:58:33.0	91159	95911	65000/19812	12.50	4753	0
I-J	19:01:11.0	19:05:20.0	97891	101752	65000/19812	12.50	3962	0
K-L	19:11:29.0	19:18:5.0	105613	110563	65000/19812	12.50	4931	0
M-N	19:20:51.0	19:27:20.0	112642	117473	65000/19812	12.50	4952	0
O-P	19:30:36.0	19:36:58.0	119968	124720	65000/19812	12.50	4742	1
Q-R	19:41:19.0	19:47:33.0	127937	132757	65000/19812	12.50	4951	0
S-T	19:52:16.0	19:58:29.0	136204	140857	65000/19812	12.50	4654	0
U-V	20:03:19.0	20:10:0.0	144492	149492	65000/19812	12.50	5001	0
W-X	20:13:20.0	20:16:56.0	151992	154692	65000/19812	12.50	2701	0
Y-Z	20:27:47.0	20:37:1.0	162853	167763	65000/19812	12.50	6731	0



FLIGHT 95-136      24 JULY 1995      A/C 706      DUAL RC-10 / DUAL HR-732 / TMS



FLIGHT 95-136 24 JULY 1995 A/C 706 DUAL RC-10 / HR-752 / TMS ONC F-16