

FLIGHT SUMMARY REPORT

Flight Number: 93-177
Calendar/Julian Date: 28 September 1993 • 271
Sensor Package: Wild-Heerbrug RC-10
 Dual Hycon HR-732
 Aerosol Particulate Sampler (APS)
Area(s) Covered: Rio Grande National Forest

Investigator(s): Ishikawa, USFS

Aircraft #: 708

SENSOR DATA

Accession #:	04640	04641	04642	----
Sensor ID #:	076	020	039	024
Sensor Type:	RC-10	HR-732	HR-732	APS
Focal Length:	12" 304.89 mm	24" 609 mm	24" 609 mm	----
Film Type:	High Definition Aerochrome IR SO-131	High Definition Aerochrome IR SO-131	High Definition Aerochrome IR SO-131	----
Filtration:	cc.10B	None	None	----
Spectral Band:	510-900 nm	510-900 nm	510-900 nm	----
f Stop:	4	8	8	----
Shutter Speed:	1/125	1/75	1/75	----
# of Frames:	149	250	21	----
% Overlap:	60	60	60	----
Quality:	Excellent	Excellent	Excellent	----
Remarks:	Camera clock offset 7.8 minutes from navigation data	Camera clock offset 5.8 seconds from navigation data	Camera clock offset .46 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.

Aerosol Particulate Sampler

The Aerosol Particulate Sampler (APS) has been developed and is operated by Dr. Guy Ferry of the NASA-Ames Research Experiments Branch. The sampler is a non-imaging sensor designed to gather high altitude dust particles for laboratory research.

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).

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). Additional information regarding ER-2 acquired photographic and digital data is also available through the Aircraft Data Facility.

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 93-177**

Accession # 04640

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	6813-6823	17:15:00	17:19:37	65000/19800	Clear
C - D	6824-6825	17:25:29	17:25:57	"	Clear
E - F	6826-6833	17:30:06	17:33:20	"	Clear
G - H	6834-6835	17:40:46	17:41:13	"	Clear
I - J	6836-6863	17:44:45	17:57:17	"	Clear
K - L	6864-6867	18:03:17	18:04:40	"	Clear
M - N	6868-6880	18:07:05	18:12:39	"	Clear
O - P	6881-6884	18:20:03	18:21:26	"	Clear
Q - R	6885-6890	18:30:49	18:33:08	"	Clear
S - T	6891-6893	18:36:02	18:36:58	"	Clear
U - V	6894-6903	18:41:23	18:45:33	"	10% cumulus (frame 6903)

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 93-177**

Accession # 04640

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
W - X	6904-6912	18:49:31	18:53:14	65000/19800	Clear
Y - Z	6913-6919	18:56:47	18:59:34	"	Minor cumulus (frame 6919)
1 - 2	6920-6927	19:07:21	19:10:35	"	10% cumulus (frame 6920)
3 - 4	6928-6936	19:14:44	19:18:27	"	Minor cumulus (frames 6934-6935)
5 - 7	6937-6950	19:22:54	19:28:55	"	10% cumulus (frames 6940-6941)
7 - 5	6951-6961	19:37:21	19:41:58	"	10-20% cumulus (frames 6959-6961)

NOTE: NUMEROUS SMALL EMULSION ABRASIONS THROUGHOUT ROLL 04640

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 93-177**

Accession # 04641

Sensor # 020

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0021	17:22:52	17:27:42	65000/19800	Clear
C - D	0022-0025	17:33:14	17:33:58	"	Clear
E - F	0026-0040	17:37:49	17:41:12	"	Clear
G - H	0041-0044	17:48:26	17:49:09	"	Clear
I - J	0045-0098	17:52:32	18:05:19	"	Clear
K - L	0099-0105	18:11:06	18:12:33	"	Clear
M - N	0106-0128	18:14:59	18:20:17	"	Clear
O - P	0129-0136	18:27:45	18:29:27	"	Clear
Q - R	0137-0147	18:38:37	18:41:02	"	Clear
S - T	0148-0152	18:43:56	18:44:54	"	Clear
U - V	0153-0170	18:49:15	18:53:21	"	Minor-10% cumulus (frames 0169-0170)

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 93-177**

Accession # 04641

Sensor # 020

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
W - X	0171-0187	18:57:12	19:01:04	65000/19800	Clear
Y - Z	0188-0200	19:04:27	19:07:21	"	Clear
1 - 2	0201-0214	19:15:04	19:18:12	"	10% cumulus (frame 0201)
3 - 4	0215-0230	19:22:33	19:26:10	"	Minor cumulus (frames 0226-0227)
5 - 6	0231-0250	19:30:45	19:35:21	"	Minor-20% cumulus (frames 0234-0238); minor cumulus (frame 0250); stepwedge overprint (frames 0249-0250)

NOTE: NUMEROUS SMALL EMULSION ABRASIONS THROUGHOUT ROLL 04641

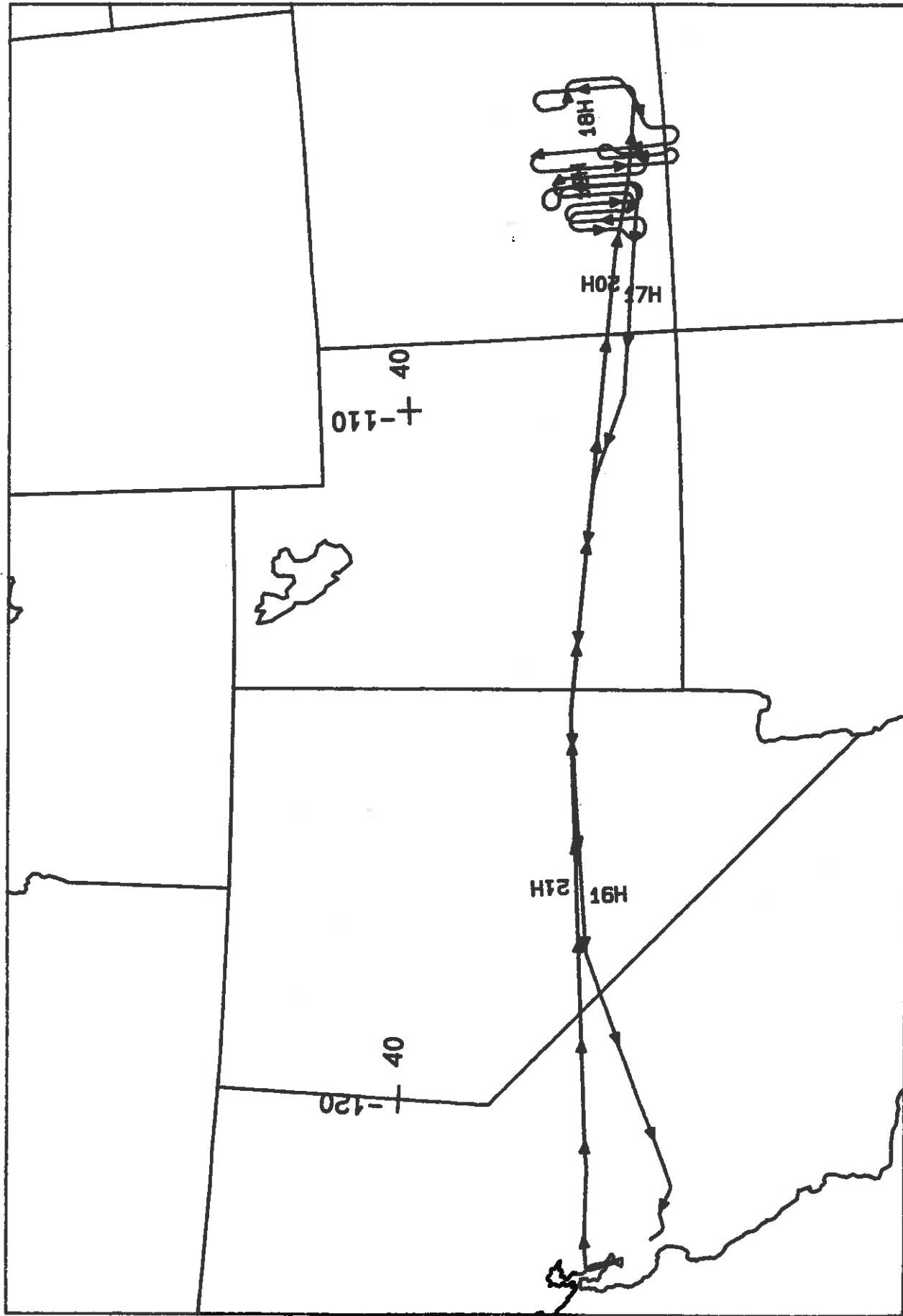
**CAMERA FLIGHT LINE DATA
FLIGHT NO. 93-177**

Accession # 04642

Sensor # 039

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
7 - 5	0001-0021	19:45:21	19:50:11	65000/19800	Very minor cumulus (frames 0003-0004); 10-20% cumulus (frames 0016-0020)

APS ON/OFF TIME 15:42:00/21:12:00



RC-10 / DUAL HR-732

A/C 708

28 SEPTEMBER 1963

FLIGHT 93-177

