FLIGHT SUMMARY REPORT

Flight Number: 95-039

Calendar/Julian Date: 21 December 1994 • 355

Sensor Package: Wild-Heerbrug. RC-10
ER-2 Doppler Radar (EDOP)

Area(s) Covered: Central California

Investigator(s): Heymsfield, GSFC **Aircraft #:** 706

SENSOR DATA

Accession #:	04847	-----
Sensor ID #:	034	116
Sensor Type:	RC-10	EDOP
Focal Length:	12" 304.66 mm	-----
Film Type:	Aerochrome IR SO-060	-----
Filtration:	Wratten 12	-----
Spectral Band:	510-900 nm	-----
f Stop:	8	-----
Shutter Speed:	1/100	-----
# of Frames:	63	-----
% 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(s) and camera(s) used for data collection during this flight.

ER-2 Doppler Radar

The ER-2 Doppler Radar (EDOP) is an X-band (9.6 GHz) Doppler radar located in the nose of the aircraft. EDOP has two 0.76 meter diameter antennas. One antenna is nadir pointing with pitch stabilization and the other is forward pointing. EDOP will map high resolution time-height sections of reflectivity, vertical hydrometeor velocity, and vertical air motion (when the hydrometeor fallspeed and aircraft motions are removed). The forward beam will measure the linear depolarization ratio (LDR) which provides useful information on orientation of the hydrometeors, hydrometeor phase, and size. For additional information regarding EDOP contact Gerald Heymsfield, NASA Goddard Space Flight Center, Code 912, Goddard Space Flight Center, Greenbelt, MD 21077 (Telephone 301-286-4661). EDOP system specifications are as follows:

Center Frequency	9.6 GHz
Peak Power	20 kW
Duty Cycle	.01 max.
Pulse Length	.25, 1.0 ms
Antenna Diameter	.76 m
Antenna Beamwidth	2.9°
First Side-lobe Level	<-30 dB
Cross Polarization Level	<-38 dB
Receiver Dynamic Range	110 dB
Number of Doppler Channels	2
Number of Log Reflectivity Channels	3
Nadir Beam:	
Transmit Polarization	Horizontal
Received Polarization	Copolarized
Forward Beam:	
Transmit Polarization	Vertical
Received Polarization	Copolarized and Cross-polarized

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.

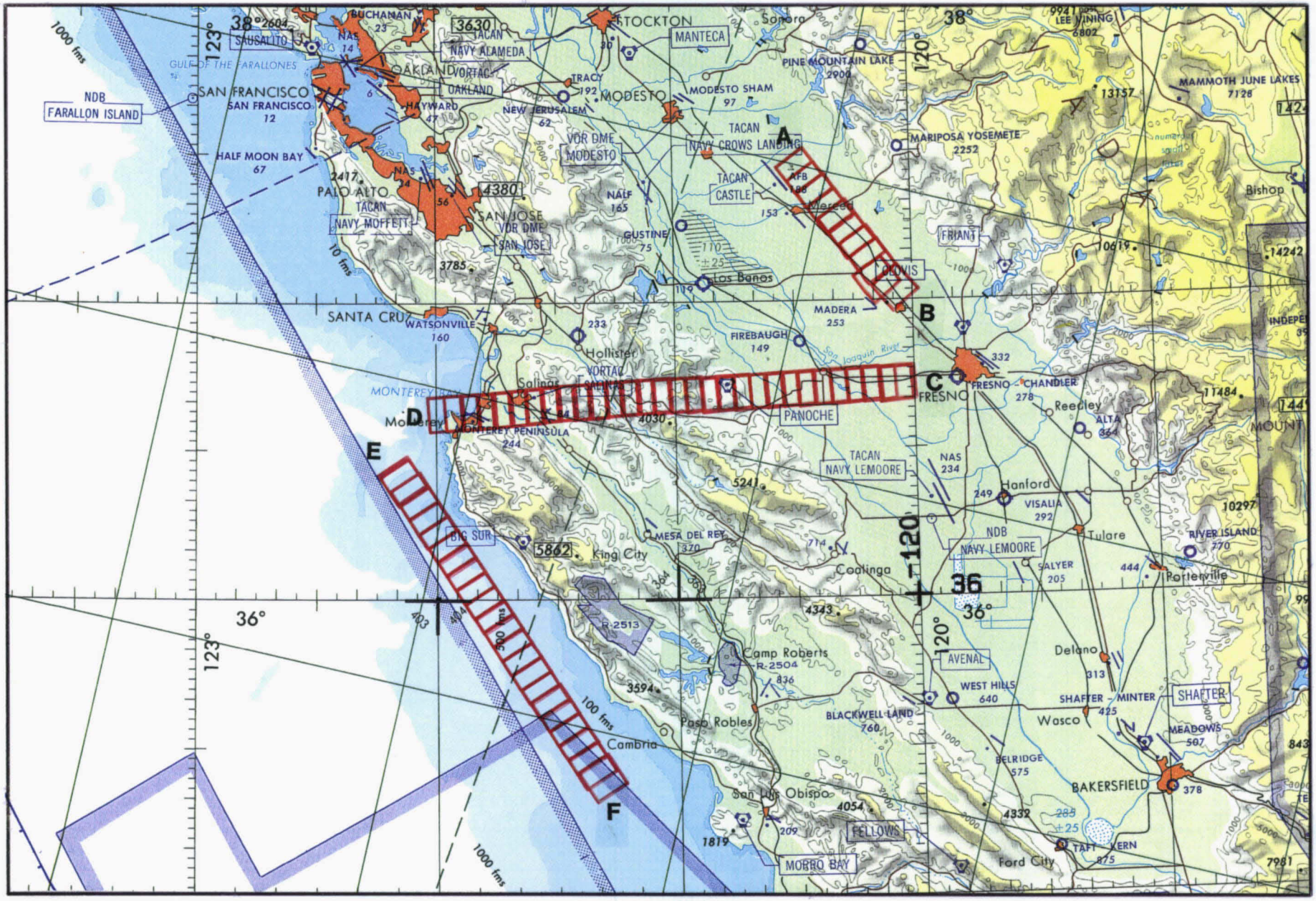
CAMERA FLIGHT LINE DATA
FLIGHT NO. 95-039

Accession # 04847

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	9074-9083	20:28:04	20:32:25	58810/17925	100% strato-cumulus; oblique (frame 9082)
C - D	9084-9113	20:36:24	20:50:02	59987/18284	90-100% strato-cumulus (frames 9084-9094); 40-70% strato-cumulus (frames 9095-9097); 10% strato-cumulus (frame 9098)
E - F	9114-9136	20:53:07	21:03:21	61609/18778	Clear

FLIGHT 95-039 21 DECEMBER 1994 A/C 706 RC-10 / EDOP



FLIGHT 95-039 21 DECEMBER 1994 A/C 706 RC-10 JNC 43