

FLIGHT SUMMARY REPORT

Flight Number: 97-123
Calendar/Julian Date: 14 July 1997 • 195
Sensor Package: Wild Heerbrugg RC-10
Airborne Visible and Infrared Imaging
Spectrometer (AVIRIS)
Thermal Mapper Simulator (TMS)
Area(s) Covered: Lake Tahoe/Yellowstone National Park

Investigator(s): Kruse, Analytical Imaging & Geophysics **Aircraft #:** 706

SENSOR DATA

Accession #:	05217	----	----
Sensor ID #:	034	099	074
Sensor Type:	RC-10	AVIRIS	TMS
Focal Length:	12" 304.66 mm	----	----
Film Type:	Aerochrome IR SO-134	----	----
Filtration:	Wratten 12	----	----
Spectral Band:	510-900 nm	----	----
f Stop:	11	----	----
Shutter Speed:	1/300	----	----
# of Frames:	92	----	----
% Overlap:	60	----	----
Quality:	Excellent	----	----
Remarks:	Subtract 20 seconds for correct GMT		

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.

Airborne Visible and Infrared Imaging Spectrometer

The Airborne Visible and Infrared Imaging Spectrometer (AVIRIS) is the second in the series of imaging spectrometer instruments developed at the Jet Propulsion Laboratory (JPL) for earth remote sensing. This instrument uses scanning optics and four spectrometers to image a 614 pixel swath simultaneously in 224 contiguous spectral bands (0.4-2.4 μm).

AVIRIS parameters are as follows:

IFOV:	1 mrad
Ground Resolution:	66 feet (20 meters) at 65,000 feet
Total Scan Angle:	30°
Swath Width:	5.7 nmi (10.6 km) at 65,000 feet
Spectral Coverage:	0.41-2.45 μm
Pixels/Scan Line:	614
Number of Spectral Bands:	224
Digitization:	10-bits
Data Rate:	17 MBPS

<u>Spectrometer</u>	<u>Wavelength Range</u>	<u>Number of Bands</u>	<u>Sampling Interval</u>
1	0.41 - 0.70 μm	31	9.4 nm
2	0.68 - 1.27 μm	63	9.4 nm
3	1.25 - 1.86 μm	63	9.7 nm
4	1.84 - 2.45 μm	63	9.7 nm

All AVIRIS data is decommutated and archived at JPL and not currently available for public distribution. For further information contact Rob Green at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 183-501, Pasadena, California 91109-8099.

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, mm</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: 650-604-6252).

CAMERA FLIGHT LINE DATA
FLIGHT NO. 97-123

Accession # 05217

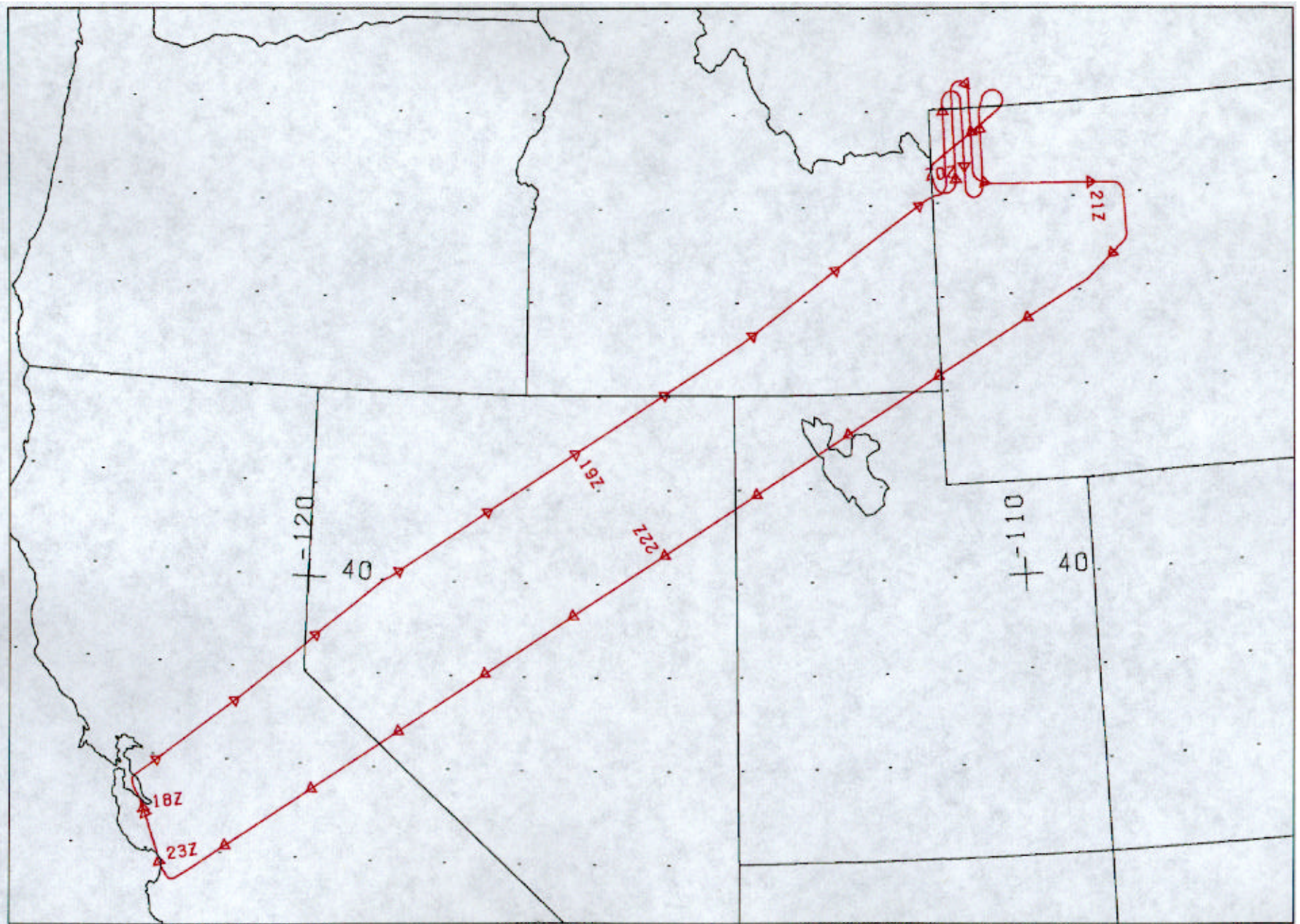
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	4714-4716	18:28:47	18:29:21	61633/18786	Clear
C - D	4717-4732	19:44:04	19:51:07	65225/19881	Clear
E - F	4733-4739	19:56:49	19:59:38	65033/19822	Minor-10% cumulus
F - G	4742-4743	20:01:03	20:01:31	65033/19822	10-20% cumulus
H - I	4744-4755	20:06:52	20:11:47	65058/19830	10-30% cumulus (frames 4744-4745 and 4748-4755)
J - K	4756-4772	20:17:27	20:24:46	65200/19873	Minor-30% cumulus (frames 4756-4763)
L - M	4773-4786	20:31:36	20:37:18	65050/19827	10% cumulus (frames 4785-4786)
N - O	4787-4801	20:42:27	20:48:37	65413/19938	Minor-20% cumulus (frames 4791-4801)
P - Q	4802-4807	21:05:00	21:07:20	64950/19797	Clear
NOTE: FRAMES 4740-4741 DAMAGED AND REMOVED					

DAEDALUS FLIGHT DATA
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Check Points	A c t u a l		A c t u a l		Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines
	t i m e b e g i n	(GMT) e n d	b e g i n	e n d					
A-B	18:28:47	18:29:21	29877	30302	62000/18898	12.5	426	0	0
C-D	19:43:57	19:50:49	86249	91399	65000/19812	12.5	5151	0	0
E-F	19:55:49	19:59:38	95149	98011	65000/19812	12.5	2863	0	0
F-G	20:01:03	20:01:31	99074	99423	65000/19812	12.5	350	0	0
H-I	20:06:52	20:11:47	103436	107123	65000/19812	12.5	3688	0	0
J-K	20:17:27	20:24:46	111373	116860	65000/19812	12.5	5488	0	0
L-M	20:31:36	20:37:18	121985	126260	65000/19812	12.5	4276	0	0
N-O	20:42:27	20:48:37	130122	134747	65000/19812	12.5	4626	0	0
P-Q	21:05:00	21:07:20	147033	148783	65000/19812	12.5	1751	0	0

NOTE: Channel 2 Failed - No Data Available

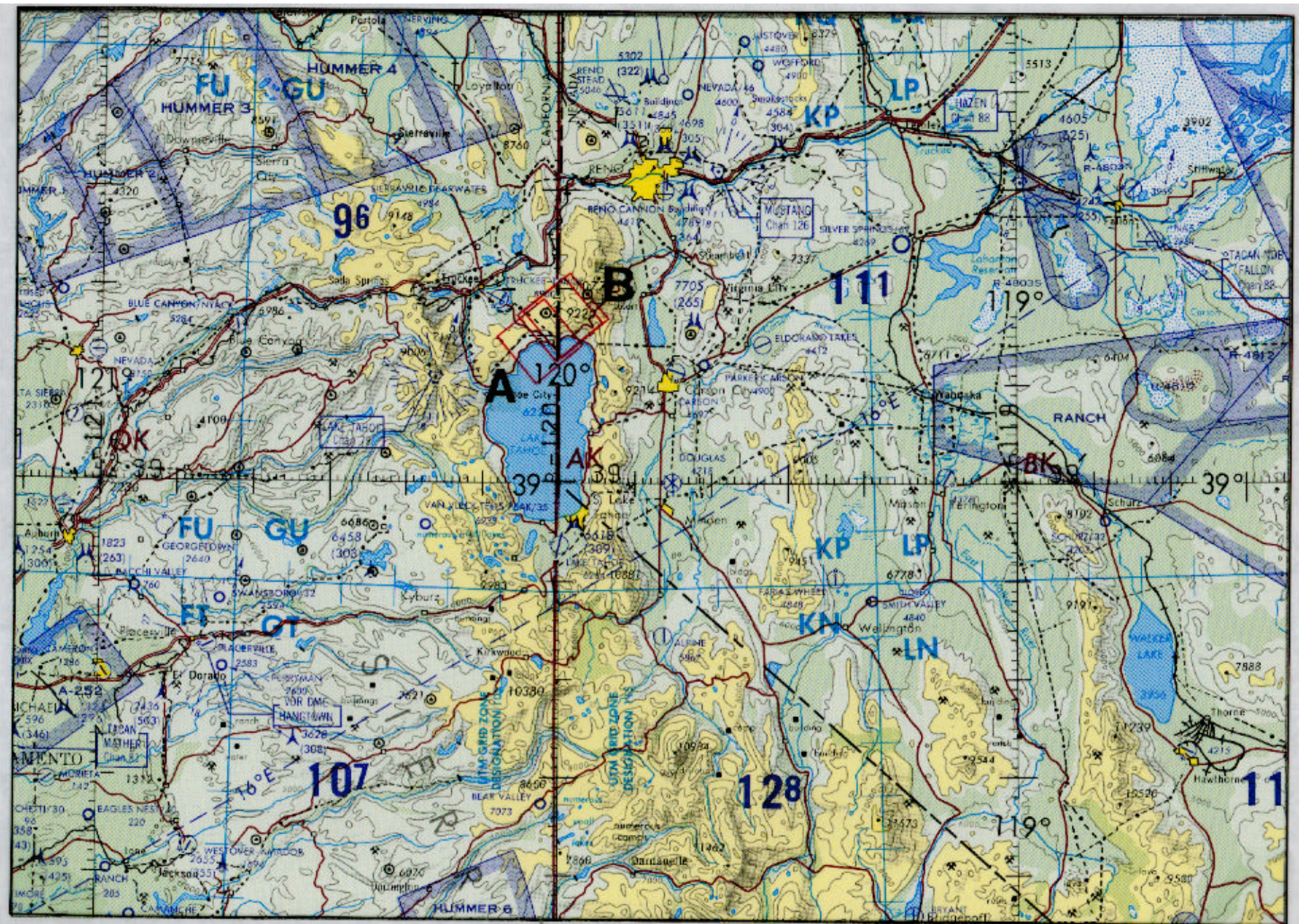


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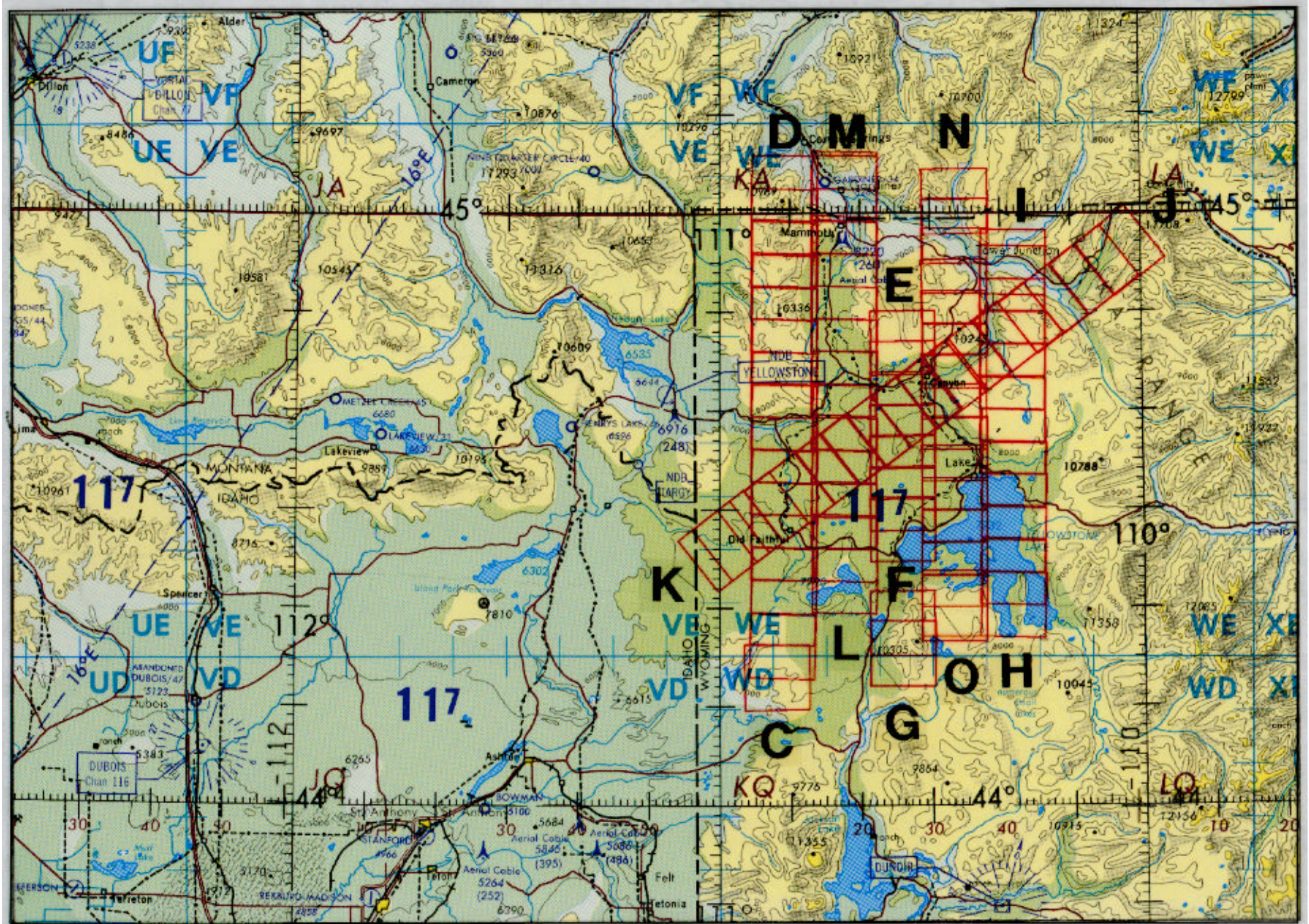
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RC-10 / AVIRIS / TMS

ONC G-18



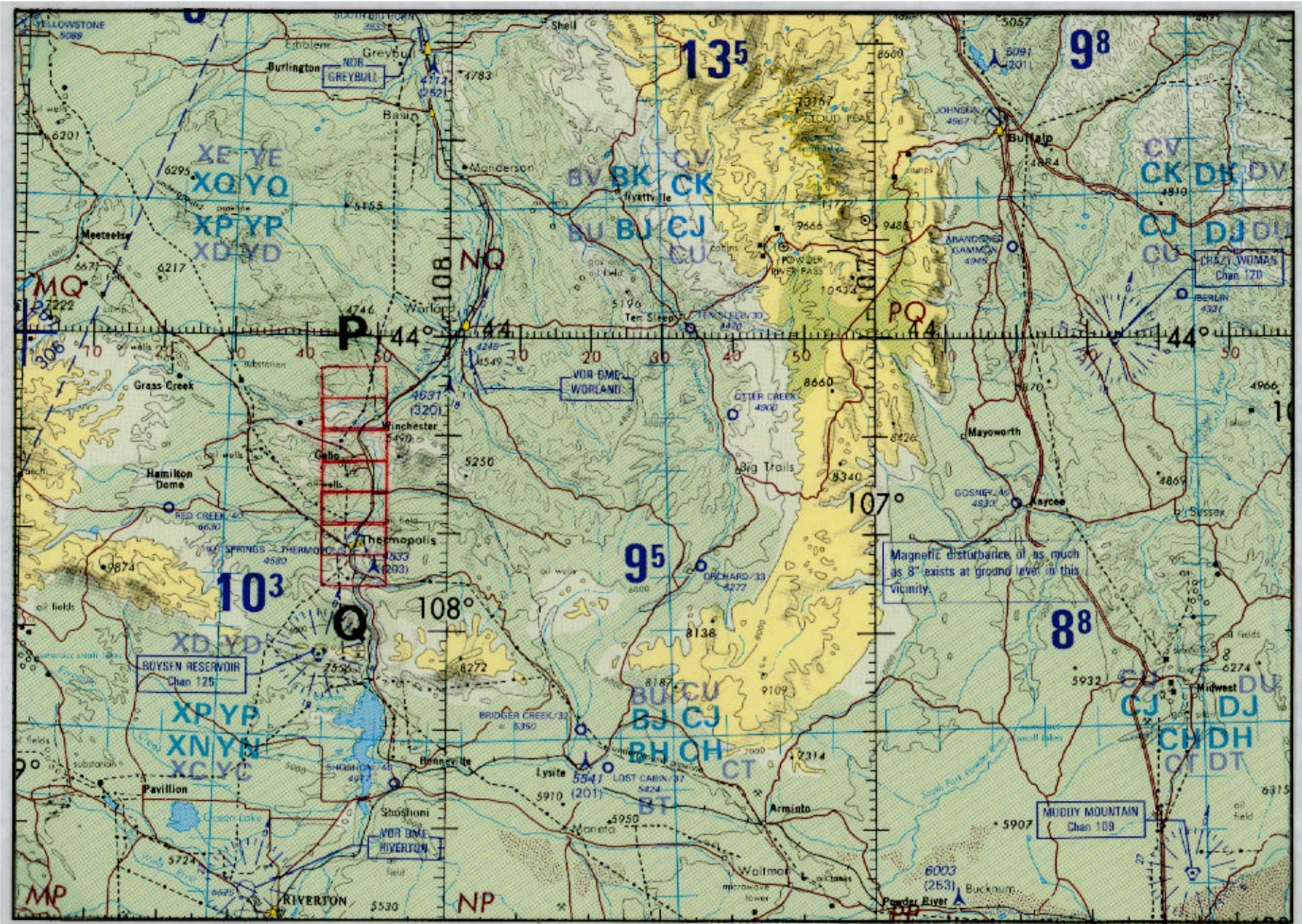
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RC-10 / AVIRIS / TMS

ONC F-16



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RC-10 / AVIRIS / TMS

ONC F-17