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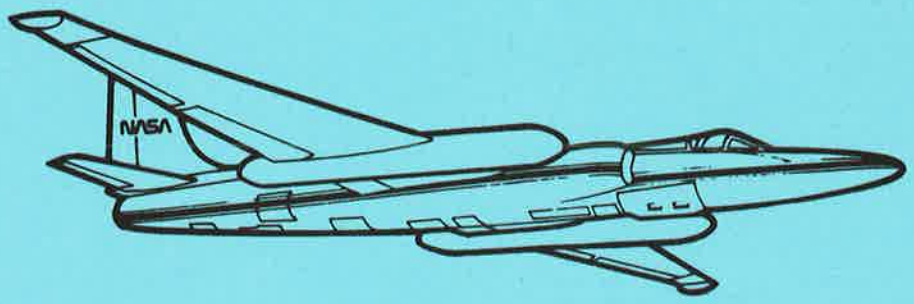
# SCIENCE AND APPLICATIONS AIRCRAFT DIVISION

## AIRBORNE SCIENCE AND APPLICATIONS PROGRAM




# ER-2
# FLIGHT SUMMARY REPORT

NASA
National Aeronautics and
Space Administration

**Ames Research Center**
Moffett Field, California 94035-1000

**Aircraft Data Facility**
**NASA-Ames Research Center**
**Mail Stop 240-6**
**Moffett Field, California 94035-1000**
**(415) 604-6252 • FTS 464-6252**

# FLIGHT SUMMARY REPORT

**Flight #:** 90-113

**Date:** 23 July 1990

**Sensor Package:** Wild-Heerbrug RC-10
Airborne Visible and Infrared Imaging Spectrometer (AVIRIS)

**Area(s) Covered:** Southern California Desert and Nevada

**Investigator(s):** Green, Jet Propulsion Laboratory **Aircraft #:** 709

**Flight Request:** 90L209 **Julian Date:** 204

## SENSOR DATA

| | | |
|---|---|---|
| **Accession #:** | 04073 | ----- |
| **Sensor ID #:** | 031 | 099 |
| **Sensor Type:** | RC-10 | AVIRIS |
| **Focal Length:** | 6"<br>153.05 mm | ----- |
| **Film Type:** | High Definition<br>Aerochrome IR<br>SO-131 | ----- |
| **Filtration:** | cc.10B | ----- |
| **Spectral Band:** | 510-900 nm | ----- |
| **f Stop:** | 4 | ----- |
| **Shutter Speed:** | 1/100 | ----- |
| **# of Frames:** | 45 | ----- |
| **% 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 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 a four-line arrays of detectors to image a 614 pixel swath simultaneously in 224 contiguous spectral bands (0.4-2.4 *um*).

AVIRIS parameters are as follows:

| | |
|---|---|
| IFOV: | 1 mrad |
| GIFOV (at 20 km): | 20 m |
| FOV: | 30° |
| GFOV (at 20 km): | 11 km |
| Spectral Coverage: | 0.41 - 2.45 *um* |
| Number of Spectral Bands: | 224 |
| Digitization: | 10 Bits |
| Data Rate: | 17 MBPS |

| Spectrometer | Wavelength Range | Number of Bands | Sampling Interval |
|---|---|---|---|
| 1 | 0.41 - 0.70 *um* | 31 | 9.4 nm |
| 2 | 0.68 - 1.27 *um* | 63 | 9.4 nm |
| 3 | 1.25 - 1.86 *um* | 63 | 9.7 nm |
| 4 | 1.84 - 2.45 *um* | 63 | 9.7 nm |

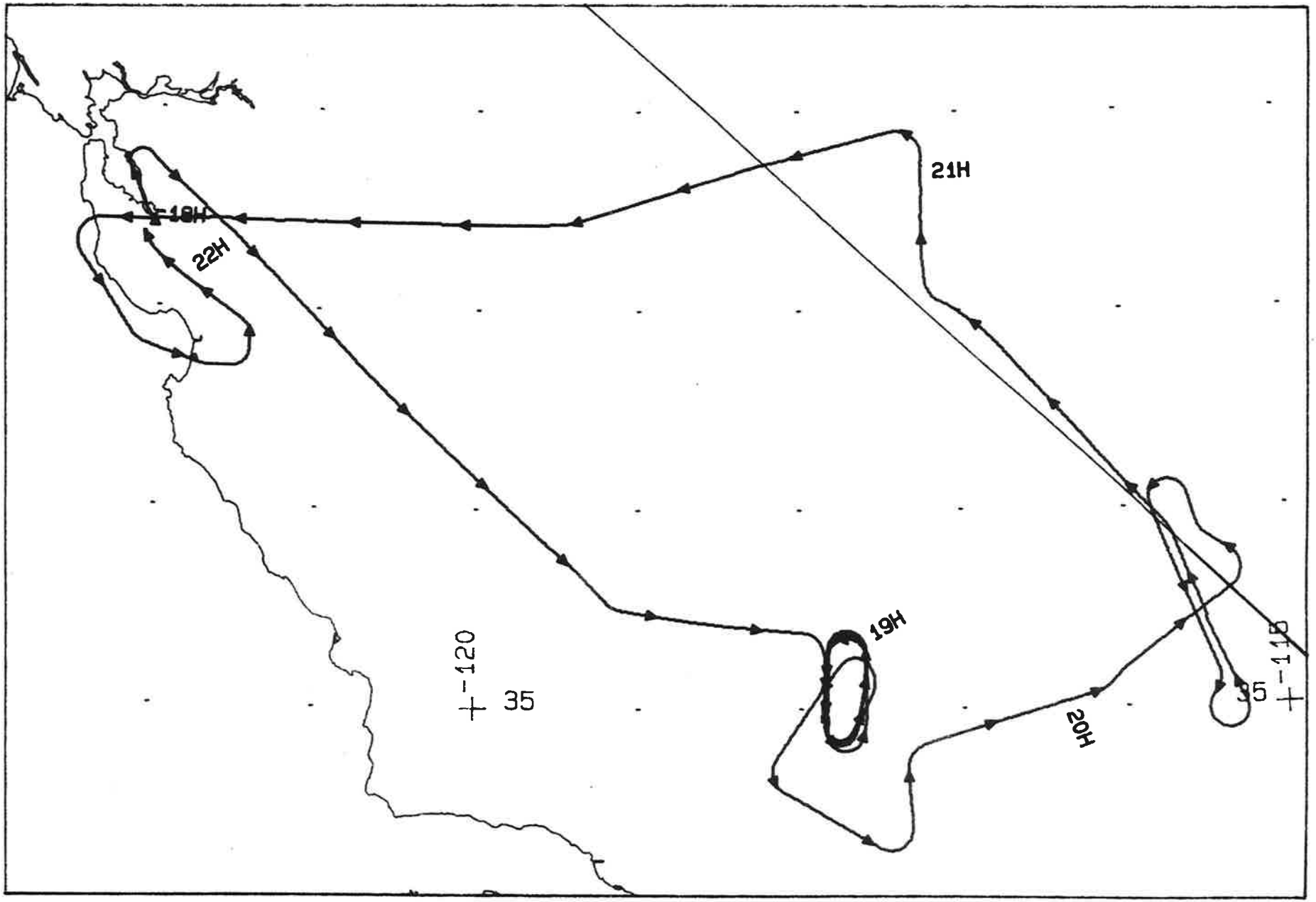
All AVIRIS data is decommutated and archived at JPL and not currently available for public distribution. For further information contact Rob Greene at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 11-116, Pasadena, California 91109-8099.

# CAMERA FLIGHT LINE DATA
# FLIGHT NO. 90-113

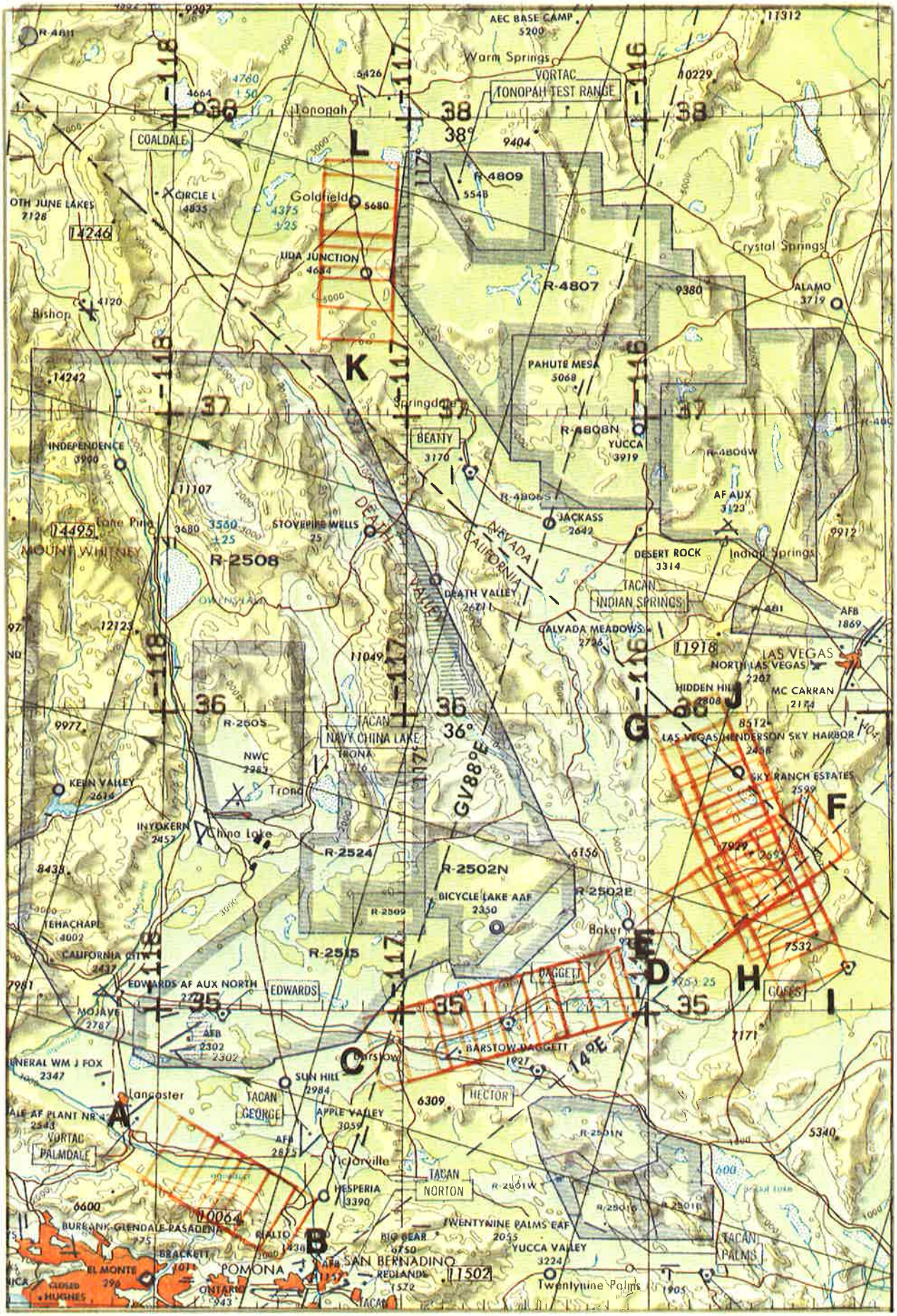
**Accession #** 04073

**Sensor #** 031

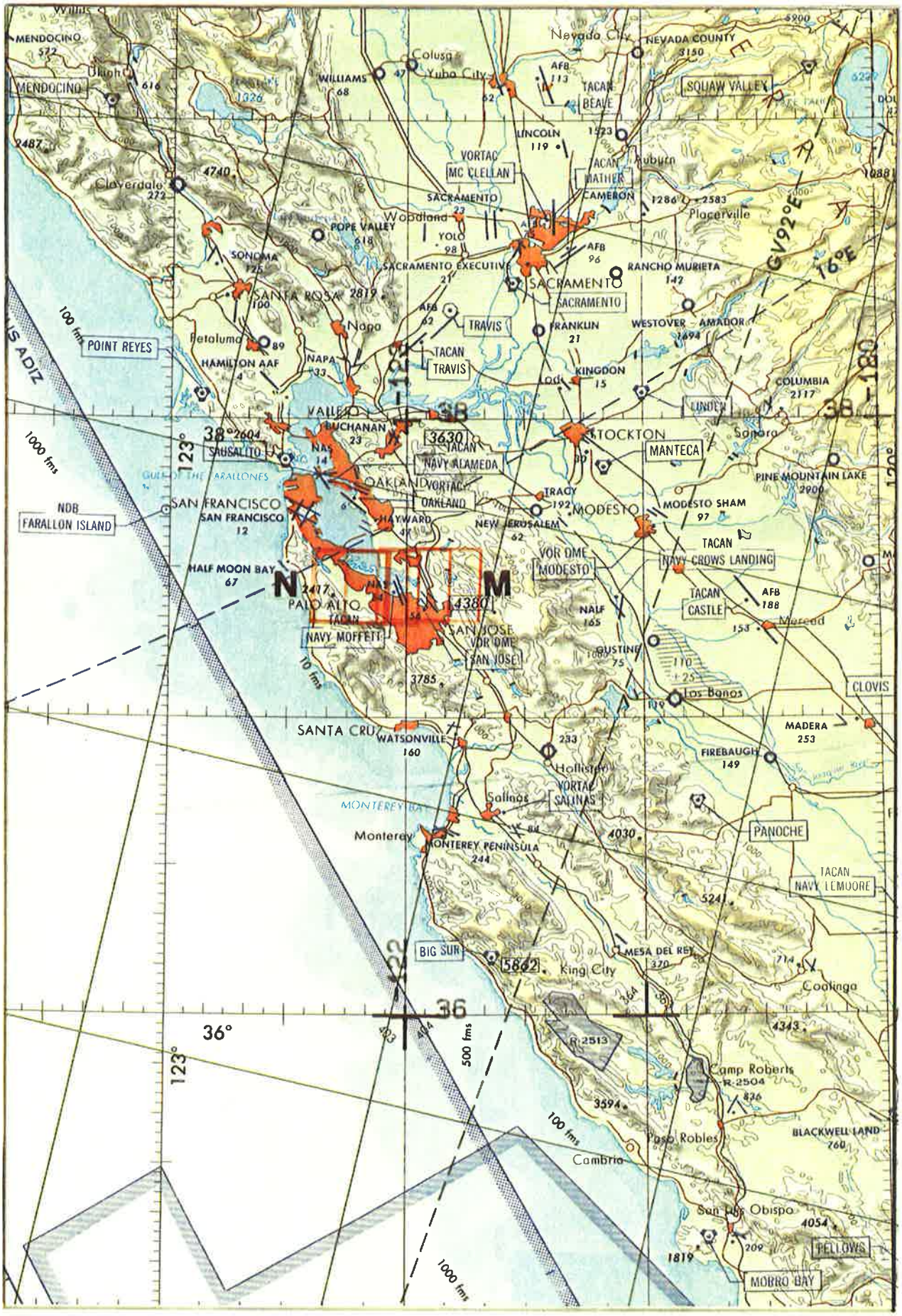
| Check Points | Frame Numbers | Time (GMT-hr, min, sec) | | Altitude, MSL feet/meters | Cloud Cover/Remarks |
|---|---|---|---|---|---|
| | | START | END | | |
| A - B | 2215-2219 | 19:45:36 | 19:49:06 | 65000/19800 | 10% cumulus (frames 2217-2219) |
| C - D | 2220-2227 | 19:57:42 | 20:03:33 | " | 10% scattered cumulus (frames 2223-2224) |
| E - F | 2228-2233 | 20:07:31 | 20:11:38 | " | 10% scattered cumulus (frames 2231-2233) |
| G - H | 2234-2241 | 20:20:58 | 20:26:48 | " | 10% scattered cumulus (frames 2240-2241) |
| I - J | 2242-2249 | 20:35:15 | 20:41:21 | " | Minor-10% scattered cumulus (frames 2242-2246) |
| K - L | 2250-2254 | 20:59:36 | 21:02:51 | " | Clear |
| M - N | 2255-2259 | 21:37:21 | 21:40:14 | " | 20% strato cumulus (frames 2258-2259) |




FLIGHT 90-113 23 July 1990 A/C 709 AVIRIS / RC-10 AVIRIS Engineering Flight




NC-43 Accession # 0473 AVRIS 28 July 90 FLIGHT 90-113


MENDOCINO
Ukiah
Willits
WILLIAMS
Colusa
Yuba City
Nevada City
NEVADA COUNTY
SQUAW VALLEY
TACAN BEALE
LINCOLN
Auburn
VORTAC MC CLELLAN
TACAN MATHER
CAMERON
SACRAMENTO
Woodland
YOLO
Placerville
POPE VALLEY
SONOMA
SACRAMENTO EXECUTIVE
RANCHO MURIETA
SACRAMENTO
SANTA ROSA
Napa
TRAVIS
FRANKLIN
WESTOVER - AMADOR
Petaluma
HAMILTON AAF
NAPA
TACAN TRAVIS
Lodi
KINGDON
COLUMBIA
LINDEN
POINT REYES
VALLEJO
BUCHANAN
STOCKTON
Sonora
SAUSALITO
NAS
TACAN NAVY ALAMEDA
MANTECA
PINE MOUNTAIN LAKE
OAKLAND
VORTAC OAKLAND
TRACY
MODESTO
MODESTO SHAM
SAN FRANCISCO
HAYWARD
NEW JERUSALEM
NDB FARALLON ISLAND
VOR DME MODESTO
TACAN NAVY CROWS LANDING
HALF MOON BAY
PALO ALTO
TACAN NAVY MOFFETT
NALF
TACAN CASTLE
AFB
Merced
SAN JOSE VOR DME SAN JOSE
GUSTINE
Los Banos
CLOVIS
SANTA CRUZ
WATSONVILLE
MADERA
FIREBAUGH
Hollister
VORTAC SALINAS
Salinas
MONTEREY BAY
PANOCHE
Monterey
MONTEREY PENINSULA
TACAN NAVY LEMOORE
BIG SUR
MESA DEL REY
King City
Coalinga
R-2513
Camp Roberts R-2504
Paso Robles
BLACKWELL LAND
Cambria
San Luis Obispo
PELLOWS
MORRO BAY
ADIZ
100 fms
1000 fms
500 fms
10 fms
123°
38°
36°
N
M
FLIGHT 90-113 23 July 90 AVIRIS Accession # 04072 JNC-43