FLIGHT SUMMARY REPORT

Flight Number: 97-005-02

Calendar/Julian Date: 13 June 1997 • 164

Sensor Package: Thermal Infrared Multispectral Scanner (TIMS)

Area(s) Covered: Lake Mead, NV

Investigator(s): Realmuto, JPL

Aircraft #: 799
Department of Energy
Cessna Citation

SENSOR DATA

Accession #: ----
Sensor ID #: 086
Sensor Type: TIMS
Focal Length: ----
Film Type: ----
Filtration: ----
Spectral Band: ----
f Stop: ----
Shutter Speed: ----
# of Frames: ----
% Overlap: ----
Quality: Good

Remarks:
**Airborne Science and Applications Program**

The Airborne Science Branch at NASA’s Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. 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.

**Department of Energy Remote Sensing Laboratory**

The NASA Airborne Science and Applications Program at Ames Research Center contracted with the Department of Energy Remote Sensing Laboratory (RSL) in Las Vegas, Nevada to fly the RSL Multispectral Scanner (MSS) and the NASA Thermal Infrared Multispectral Scanner (TIMS) over the desert southwest. The scanners were flown on the DOE Cessna Citation.

The Cessna Citation is a low and medium altitude, moderate speed aircraft. It can operate from 4,000 to 35,000 feet above sea level at speeds between 135 and 225 knots. There are two instrument ports in the aircraft. The RSL 1268 Multispectral Scanner was mounted over the aft port and the NASA Thermal Infrared Multispectral Scanner was mounted over the forward port.

**Thermal Infrared Multispectral Scanner**

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 mm to 12.2 mm region.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Wavelength, mm</th>
<th>NET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.2 - 8.6</td>
<td>&lt; 0.3° C</td>
</tr>
<tr>
<td>2</td>
<td>8.6 - 9.0</td>
<td>&lt; 0.3° C</td>
</tr>
<tr>
<td>3</td>
<td>9.0 - 9.4</td>
<td>&lt; 0.3° C</td>
</tr>
<tr>
<td>4</td>
<td>9.4 - 10.2</td>
<td>&lt; 0.3° C</td>
</tr>
<tr>
<td>5</td>
<td>10.2 - 11.2</td>
<td>&lt; 0.3° C</td>
</tr>
<tr>
<td>6</td>
<td>11.2 - 12.2</td>
<td>&lt; 0.3° C</td>
</tr>
</tbody>
</table>

Sensor/aircraft parameters are as follows:
IFOV: 2.5 mrad
Ground Resolution: 163 feet (50 meters) at 65,000 feet
Total Scan Angle: 76.56°
Swath Width: 16.9 nmi (31.3 km) at 65,000 feet
Pixels/Scan Line: 638
Scan Rate: 7.3 (scans/second)
Ground Speed: 400 kts. (206 m/second)

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).
<table>
<thead>
<tr>
<th>Site Line Run</th>
<th>Actual time (GMT)</th>
<th>Actual scanline begin</th>
<th>Actual scanline end</th>
<th>Altitude feet/meter</th>
<th>Speed (rps)</th>
<th>Scan total scanlines</th>
<th>Good Interpolated scanlines</th>
<th>Repeated scanlines</th>
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</thead>
<tbody>
<tr>
<td>1. 710 1 1</td>
<td>21:25:30.0 21:28:54.4</td>
<td>38613</td>
<td>43724</td>
<td>5100/1554</td>
<td>25.00</td>
<td>5110</td>
<td>0</td>
<td>2</td>
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<tr>
<td>2. 710 3 1</td>
<td>21:39:10.0 21:41:14.0</td>
<td>45231</td>
<td>48332</td>
<td>5500/1676</td>
<td>25.00</td>
<td>3100</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Site 710 Lake Mead Nevada