

# FLIGHT SUMMARY REPORT

**Flight #:** 91-037  
**Date:** 7 December 1990  
**Sensor Package:** Wild-Heerbrug RC-10  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Texas

**Investigator(s):** Handley, U.S. Fish & Wildlife  
**Flight Request:** 90R254

**Aircraft #:** 708  
**Julian Date:** 341

## SENSOR DATA

|                       |  |       |
|-----------------------|--|-------|
| <b>Accession #:</b>   | 04173                                      | ----- |
| <b>Sensor ID #:</b>   | 034  | 101   |
| <b>Sensor Type:</b>   | RC-10                                      | TMS   |
| <b>Focal Length:</b>  | 12"<br>304.66 mm                           | ----- |
| <b>Film Type:</b>     | High Definition<br>Aerochrome IR<br>SQ-131 | ----- |
| <b>Filtration:</b>    | cc.10B                                     | ----- |
| <b>Spectral Band:</b> | 510-900 nm                                 | ----- |
| <b>f Stop:</b>        | 4  | ----- |
| <b>Shutter Speed:</b> | 1/100                                      | ----- |
| <b># of Frames:</b>   | 131  | ----- |
| <b>% Overlap:</b>     | 60   | ----- |
| <b>Quality:</b>       | Excellent                                  | ----- |
| <b>Remarks:</b>       |  |       |

## 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.

### 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, <math>\mu\text{m}</math></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)             |

**NOTE:** Information on data tape format, logical record format, and scanner calibration data may be obtained from the NASA-Ames Aircraft Data Facility at (415) 604-6252 or FTS 464-6252.

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 91-037**

Accession # 04173

Sensor # 034

| Check Points | Frame Numbers | Time (GMT-hr, min, sec) |          | Altitude, MSL feet/meters | Cloud Cover/Remarks                               |
|--------------|---------------|-------------------------|----------|---------------------------|---|
|              |               | START                   | END      |                           |   |
| A - B        | 1738-1746     | 17:03:01                | 17:06:16 | 65000/19800               | Clear   |
| C - D        | 1747-1758     | 17:11:25                | 17:16:33 | "                         | Clear; oblique (frame 1758)                       |
| D - E        | 1759-1765     | 17:16:56                | 17:19:20 | "                         | Clear; oblique (frame 1765)                       |
| E - F        | 1766-1777     | 17:19:31                | 17:23:58 | "                         | Clear; oblique (frame 1777); smeared (frame 1769) |
| F - G        | 1778-1788     | 17:24:00                | 17:28:34 | "                         | Clear   |
| H - I        | 1789-1793     | 17:48:50                | 17:50:20 | "                         | Clear   |
| J - K        | 1794-1806     | 17:57:20                | 18:02:33 | "                         | Clear   |
| L - M        | 1807-1816     | 18:12:32                | 18:16:01 | "                         | Clear   |
| N - O        | 1817-1826     | 18:27:21                | 18:31:12 | "                         | 30-40% cumulus                                    |
| P - Q        | 1827-1832     | 18:42:03                | 18:44:21 | "                         | 10% cumulus                                       |

**CAMERA FLIGHT LINE DATA**  
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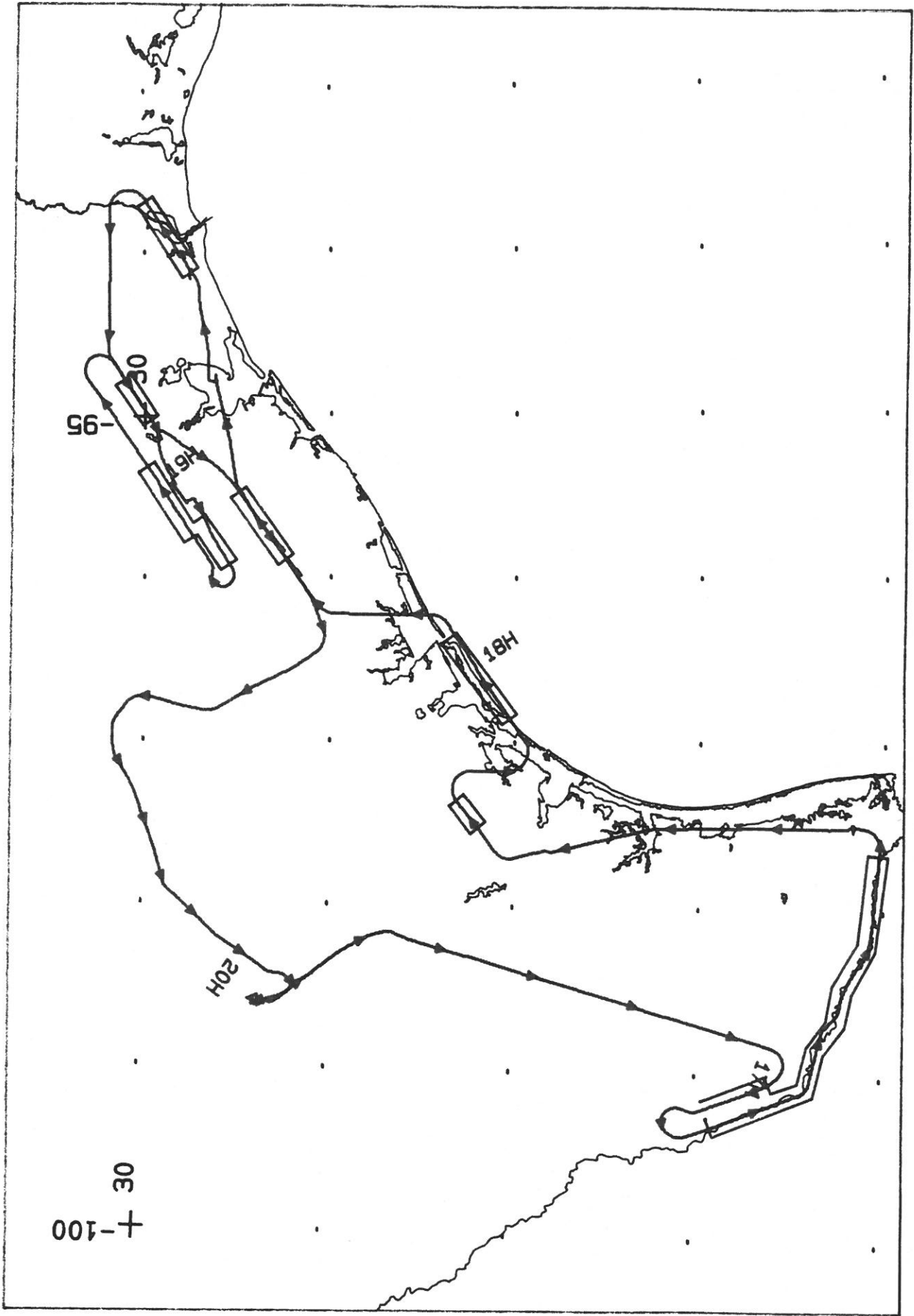
| Check Points | Frame Numbers | Time (GMT-hr, min, sec) |          | Altitude, MSL<br>feet/meters | Cloud Cover/Remarks |
|--------------|---------------|-------------------------|----------|------------------------------|---------------------|
|              |               | START                   | END      |                              |                     |
| R - S        | 1833-1839     | 18:50:33                | 18:52:56 | 65000/19800                  | Clear               |
| T - U        | 1840-1849     | 18:57:29                | 19:01:22 | "                            | Clear               |
| P - Q        | 1850-1855     | 19:09:47                | 19:12:05 | "                            | 10% cumulus         |
| M - L        | 1856-1868     | 19:17:38                | 19:22:47 | "                            | Clear               |

# SCANNER FLIGHT LINE DATA

## FLIGHT NO. 91-037

DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 91-037

| Check Points | A c t u a l<br>t i m e<br>(GMT)<br>b e g i n e n d | A c t u a l<br>s c a n l i n e<br>b e g i n e n d | A l t i t u d e<br>f e e t / m e t e r | S c a n<br>S p e e d<br>(f p s) | t o t a l<br>G o d<br>s c a n l i n e s | t o t a l<br>I n t e r p o l a t e d<br>s c a n l i n e s | t o t a l<br>R e p e a t e d<br>s c a n l i n e s |
|--------------|--|---|--|---------------------------------|---|---|---|
| A-B          | 17:02:49.0 17:06:12.0                              | 24555 26654                                       | 65000/19812                            | 12.50                           | 2098                                    | 0   | 2   |
| C-G          | 17:11:16.0 17:28:32.0                              | 29802 40517                                       | 65000/19812                            | 12.50                           | 10711                                   | 0   | 5   |
| H-I          | 17:48:38.0 17:50:19.0                              | 53016 54062                                       | 65000/19812                            | 12.50                           | 1047                                    | 0   | 0   |
| J-K          | 17:57: 8.0 18:02:34.0                              | 58297 61684                                       | 65000/19812                            | 12.50                           | 3388                                    | 0   | 0   |
| L-M          | 18:12: 0.0 18:16: 3.0                              | 67542 70655                                       | 65000/19812                            | 12.50                           | 2520                                    | 0   | 4   |
| N-O          | 18:27: 9.0 18:31:15.0                              | 76968 79516                                       | 65000/19812                            | 12.50                           | 2549                                    | 0   | 0   |
| P-Q          | 18:41:51.0 18:44:18.0                              | 86109 87630                                       | 65000/19812                            | 12.50                           | 1522                                    | 0   | 0   |
| R-S          | 18:50:21.0 18:52:52.0                              | 91398 92959                                       | 65000/19812                            | 12.50                           | 1572                                    | 0   | 0   |
| T-U          | 18:57:16.0 19:01:18.0                              | 95695 98203                                       | 65000/19812                            | 12.50                           | 2509                                    | 0   | 0   |
| P-Q          | 19:07:35.0 19:12: 2.0                              | 103352 104874                                     | 65000/19812                            | 12.50                           | 1523                                    | 0   | 0   |
| M            | 19:17:27.0 19:19: 8.0                              | 108242 109288                                     | 65000/19812                            | 12.50                           | 1047                                    | 0   | 0   |
| L            | 19:19:57.0 19:21:29.0                              | 109804 110753                                     | 65000/19812                            | 12.50                           | 940                                     | 0   | 10  |

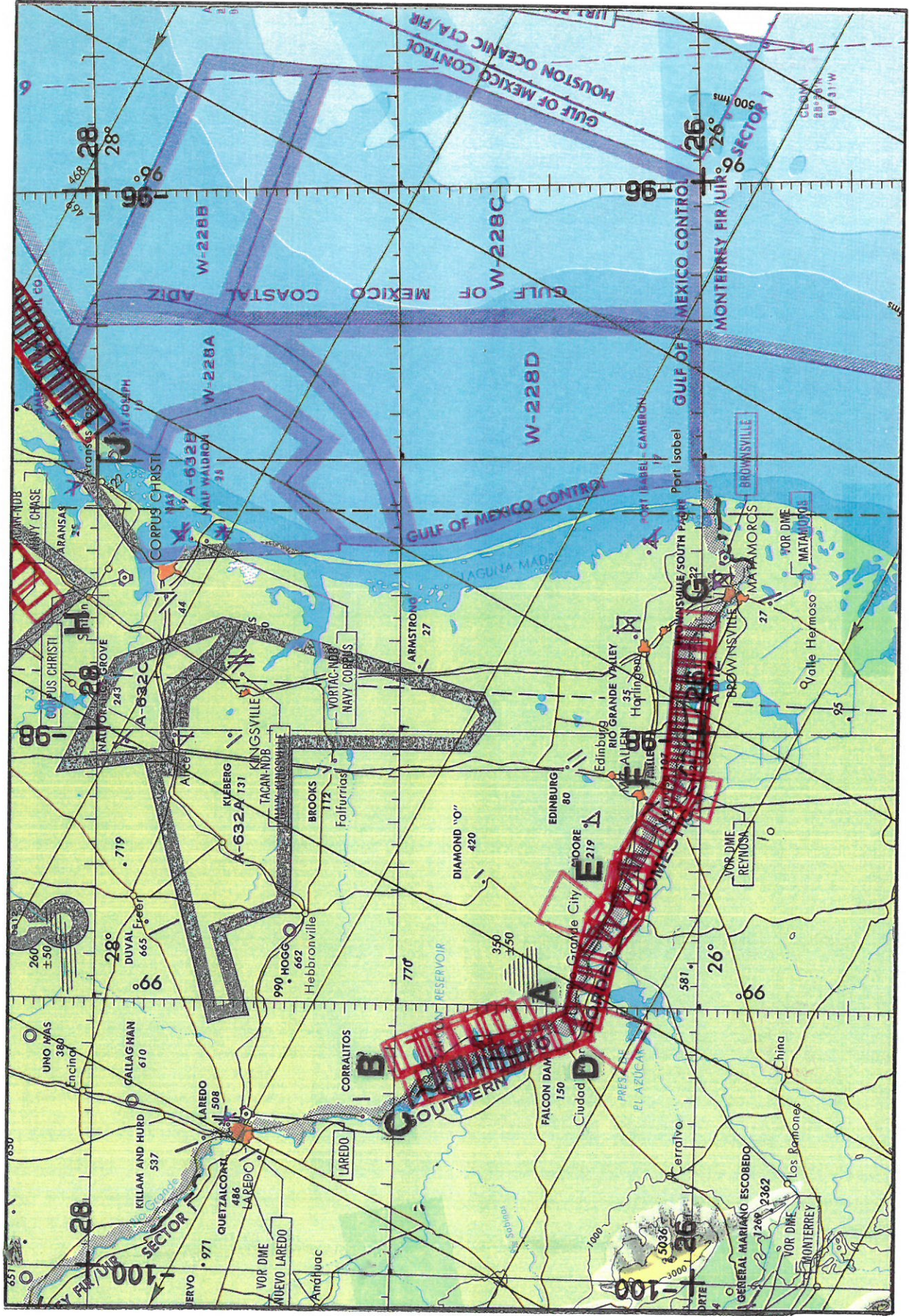


FLIGHT 91-037

7 December 1990

A/C 708

TMS / RC-10



FLIGHT 91-097

7 December 1990

A/C 708

FC-10 / TMS

Accession # 04173

JNC 44

