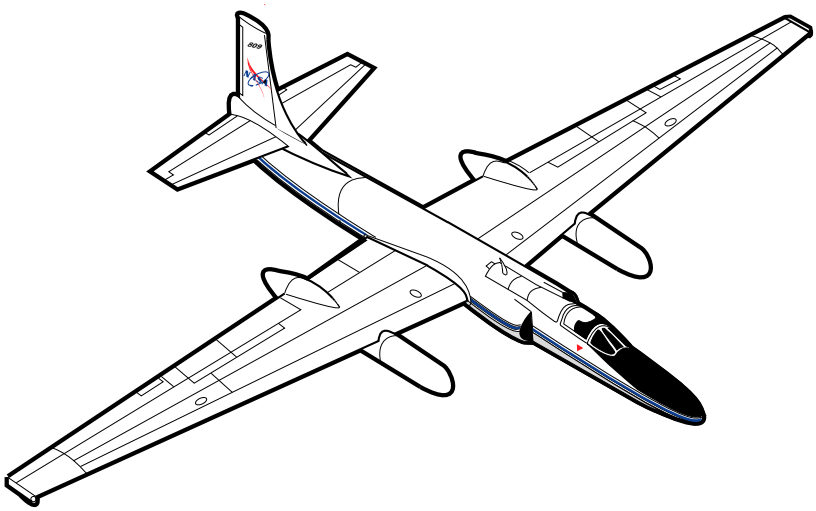
AIRBORNE SCIENCE PROGRAM

SAFARI 2000

August 11 to September 27, 2000

Flight Summary Report

Volume II



National Aeronautics and
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Moffett Field, California 94035-1000

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Edwards, California 93523

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SAFARI 2000 Aerial Photography

Flight Summary Report
13 August to 25 September 2000

VOLUME II CONTENTS

Airborne Science Program

The Airborne Science Program 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.

MODIS Airborne Simulator

The MODIS Airborne Simulator (MAS) is a modified Daedalus multispectral scanner configured to replicate the capabilities of the Moderate-Resolution Imaging Spectrometer (MODIS), an instrument to be orbited on an EOS platform. MODIS is designed for the measurement of biological and physical processes and atmospheric temperature sounding. The MODIS Airborne Simulator records fifty 16-bit channels of multispectral data and is configured as follows:

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
1	0.4649	0.0397	0.4451-0.4848
2	0.5494	0.0417	0.5285-0.5703
3	0.6550	0.0511	0.6294-0.6805
4	0.7024	0.0415	0.6816-0.7231
5	0.7431	0.0420	0.7221-0.7641
6	0.8248	0.0427	0.8034-0.8461
7	0.8667	0.0414	0.8460-0.8874
8	0.9072	0.0409	0.8867-0.9276
9	0.9476	0.0397	0.9277-0.9674
10	1.6422	0.0519	1.6163-1.6682
11	1.6975	0.0505	1.6722-1.7228
12	1.7499	0.0506	1.7245-1.7752
13	1.8014	0.0491	1.7768-1.8259
14	1.8548	0.0489	1.8303-1.8792
15	1.9044	0.0487	1.8801-1.9288
16	1.9553	0.0483	1.9312-1.9794
17	2.0048	0.0487	1.9804-2.0291
18	2.0551	0.0484	2.0309-2.0793
19	2.1037	0.0486	2.0794-2.1280

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
26	3.1192	0.1616	3.0384-3.2000
27	3.2809	0.1486	3.2066-3.3552
28	3.4330	0.1617	3.3521-3.5138
29	3.5940	0.1539	3.5170-3.6709
30	3.7449	0.1449	3.6724-3.8174
31	3.9069	0.1602	3.8267-3.9870
32	4.0707	0.1554	3.9929-4.1484
33	4.1699	0.0669	4.1365-4.2034
34	4.4029	0.1255	4.3401-4.4656
35	4.5404	0.1512	4.4648-4.6160
36	4.6979	0.1591	4.6184-4.7775
37	4.8536	0.1516	4.7778-4.9294
38	5.0033	0.1468	4.9298-5.0767
39	5.1588	0.1400	5.0888-5.2288
40	5.3075	0.1327	5.2412-5.3738
41	5.3977	0.0755	5.3590-5.4365
42	8.5366	0.3950	8.3391-8.7341
43	9.7224	0.5365	9.4541-9.9906
44	10.5071	0.4579	10.278-10.736

20	2.1532	0.0483	2.1291-2.1774
21	2.2019	0.0481	2.1779-2.2259
22	2.2522	0.0486	2.2278-2.2675
23	2.3021	0.0487	2.2777-2.3265
24	2.3512	0.0476	2.3274-2.3750
25	2.4005	0.0483	2.3764-2.4246

45	11.0119	0.4710	10.776-11.247
46	11.9863	0.4196	11.776-12.196
47	12.9013	0.3763	12.713-13.089
48	13.2702	0.4584	13.041-13.500
49	13.8075	0.5347	13.540-14.075
50	14.2395	0.3775	14.051-14.428

NOTE: Bandpass centers approximate

Sensor/Aircraft Parameters:

Spectral Bands:	50 (digitized to 16-bit resolution)
IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meter at 65,000 feet)
Swath Width:	22.9 mi/19.9 nmi (36 km)
Total Scan Angle:	85.92^{o}
Pixels/Scan Line:	716
Scan Rate:	6.25 scans/second
Ground Speed:	400 kts (206 m/second)
Roll Correction:	Plus or minus 3.5 degrees (approx.)

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

Cloud Lidar System

The Cloud Lidar System (CLS) is flown on the ER-2 to conduct cloud radiation and severe storm field experiments. Designed to operate at high altitudes in order to obtain measurements above the highest clouds, the instrument provides the true height of cloud boundaries and the

density structure of less dense clouds. The height structure of cirrus, cloud top density and multiple cloud layers may also be profiled. System specifications are as follows:

Transmitter	
Laser Type:	Nd:YAG I,II
Wavelength:	1064, 532 nm
Pulse Energy:	90, 30 mJ
PRF:	10 Hz
Beamwidth:	1 mrad
Data Acquisition:	Measurements at 20m intervals at 200 m/sec aircraft speed
Receiver	
Diameter:	0.15 m
Beamwidth:	1.4 mrad
Polarization:	v & h
Data System	
Range Resolution:	7.5 m
Number of Channels: 4	
Samples per Channel:	3310
Record Capacity:	8 hours

For additional information regarding this instrument contact Dr. James Spinhirne, NASA-Goddard Space Flight Center, Code 917, Greenbelt, MD 20771.

Scanning High-Resolution Interferometer Sounder

The Scanning High-Resolution Interferometer Sounder (S-HIS) is a scanning MWIR to LWIR interferometer obtaining 2 km resolution with 36 kilometer swath width. S-HIS measures upwelling infrared spectral radiance at the aircraft altitude with high absolute accuracy using a passive Michelson interferometer and precision onboard blackbody calibration sources. The instrument has a single nadir staring field of view with observed spectra obtained every six seconds. The spectra cover the range 16.6 microns to 3.3 microns with a spectral resolution of 0.3 to 0.5 cm-1. The primary use of the instrument is as an atmospheric sounder of temperature and water vapor. The spectra also contain important information on trace gases and surface properties. The S-HIS was developed by the University of Wisconsin at Madison and is a prototype instrument for advanced infrared satellite sounders. For information on the Scanning HIS and HIS instruments refer to these web pages:

http://cimss.ssec.wisc.edu/wintex/instruments.html
http://cimss.ssec.wisc.edu/his/hishome.html

Airborne Multi-angle Imaging SpectroRadiometer

The Airborne MISR (AirMISR) is currently flown aboard the ER-2 to facilitate the development and test the capabilities of the satellite MISR before it is launched in orbit in 1999. The spaceborne Multi-angle Imaging SpectroRadiometer (MISR) is a new type of instrument, designed to view the Earth with cameras pointed in nine different directions. MISR is being built for NASA by the Jet Propulsion Laboratory in Pasadena, California. MISR is one of five instruments scheduled to be launched into polar orbit aboard the first Earth Observing System spacecraft (EOS-AM1) in June 1999, as part of NASA's Mission to Planet Earth. The spacecraft will fly in a "sun-synchronous" orbit, designed so that it crosses the equator every

98 minutes, always at 10:30 a.m. local time, as the Earth rotates below. As the instrument flies overhead, each piece of the Earth's surface below is successively imaged by the nine cameras comprising the MISR system, in each of four wavelengths (blue, green, red, and near-infrared).

In addition to improving our understanding of scattering of sunlight in the Earth environment, MISR data can also distinguish different types of clouds, particles, and surfaces. Specifically, MISR will monitor the monthly, seasonal, and long-term trends in:

- The amount and type of atmospheric particles (aerosols), including those formed by natural sources and by human activities
- The amounts, types, and heights of clouds
- The distribution of land surface cover, including vegetation canopy structure

To accomplish its scientific objectives, the MISR instrument will measure the Earth's brightness in four spectral bands, at each of nine look angles spread out in the forward and aft directions along the flight path. Spatial samples are acquired every 275 meters. Over a period of seven minutes, a 360 km wide swath of Earth comes into view at all nine angles. Special attention has been paid to providing highly accurate absolute and relative calibration, using on-board hardware consisting of deployable solar diffuser plates and several types of photodiodes. To complement the on-board calibration effort, a validation program of *in situ* measurements is planned, involving field instruments, one of which is the "PARABOLA III", which automatically scans the sky and ground at many angles. The aircraft camera, AirMISR will continue to operate on the ER-2 also as a complement to the orbiting MISR. Global coverage with the satellite MISR will be acquired about once in nine days at the equator; the nominal mission lifetime is six years.

Further information regarding MISR is available on the following web page: http:www-misr.jpl.nasa.gov

Data Availability

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for Airborne Science Program aircraft acquired photographic and digital imagery. The photographic archive consists of photography acquired by the program from 1971 to April 1996. 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).

As of April 1996 the EROS Data Center no longer receives an archive copy of newly acquired Airborne Science Program photography. Original photography is archived with the Airborne Sensor Facility at Ames Research Center. A user copy of the photography is provided to the principal investigators for each flight. Principal investigators are cited on the first page of their respective flight summary reports. For information regarding photography acquired from April 1996 to the present contact the Airborne Sensor Facility as follows:

Flight Documentation and Data Archive Searches

The following is the web site for flight documentation as published by the Airborne Sensor Facility at NASA Ames Research Center: http://asapdata.arc.nasa.gov/er-2fsr.html

Additional information regarding flight documentation to include data archive searches, data availability, sensor parameters, and areas of coverage may be obtained from the following: Airborne Sensor Facility, MS 240-6, NASA Ames Research Center, Moffett Field, CA 94035-1000, Telephone: 650.604.6252 (FAX 650.604.4987).

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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 camera system used for data collection during this flight.

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. The camera system used during the SAFARI deployment is described as follows:

- Wild-Heerbrugg RC-10 metric mapping camera
  - 9 x 9 inch film format
  - 12 inch focal length lens provides area coverage of 8 x 8 nautical miles from 65,000 feet
  - Approximate photographic scale of 1:65 000 with 12 inch lens

Data Availability

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for Airborne Science Program aircraft acquired photographic and digital imagery. The photographic archive consists of photography acquired by the program from 1971 to April 1996. 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).

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SAFARI 2000

The Southern African Regional Science Initiative - SAFARI 2000 - is an international science initiative aimed at developing a better understanding of the southern African earth-atmosphere-human system. Initial plans for SAFARI 2000 were developed in June and July 1998 at workshops involving scientists from southern Africa, the United States and Europe. These plans have been refined at subsequent workshops held in the United States and Southern Africa, in May and July 1999, respectively.

The goal of SAFARI 2000 is to identify and understand the relationships between the physical, chemical, biological and anthropogenic processes that underlie the biogeophysical and biogeochemical systems of southern Africa. Particular emphasis will be placed upon biogenic, pyrogenic and anthropogenic emissions, their characterization and quantification, their transport and transformations in the atmosphere, their influence on regional climate and meteorology, their eventual deposition, and the effects of this deposition on ecosystems. To accomplish this, participants will:

- integrate remote sensing, computational modeling, airborne sampling and ground-based studies;
- link the biological, physical and chemical components of the regional ecosystems by integrating them within the semi-closed atmospheric gyre persistent over the region;
- combine the expertise and knowledge base of regional and international scientists.

SAFARI 2000 builds upon the success of the Southern African Fire-Atmosphere Research Initiative in 1992 (SAFARI-92). SAFARI-92 showed that a) it is feasible to characterize, quantify and validate estimates of regional emissions, and b) critical gaps remain in our understanding of the fate and impacts of the emissions on the functioning of the regional land-atmosphere systems.

Programmatically, SAFARI 2000 is an organizational umbrella designed to maximize the overall efficiency and effectiveness of a group of various environmental studies occurring between 1999 to 2001. The studies range from those still in their foundational stage to those which are long-term monitoring efforts.

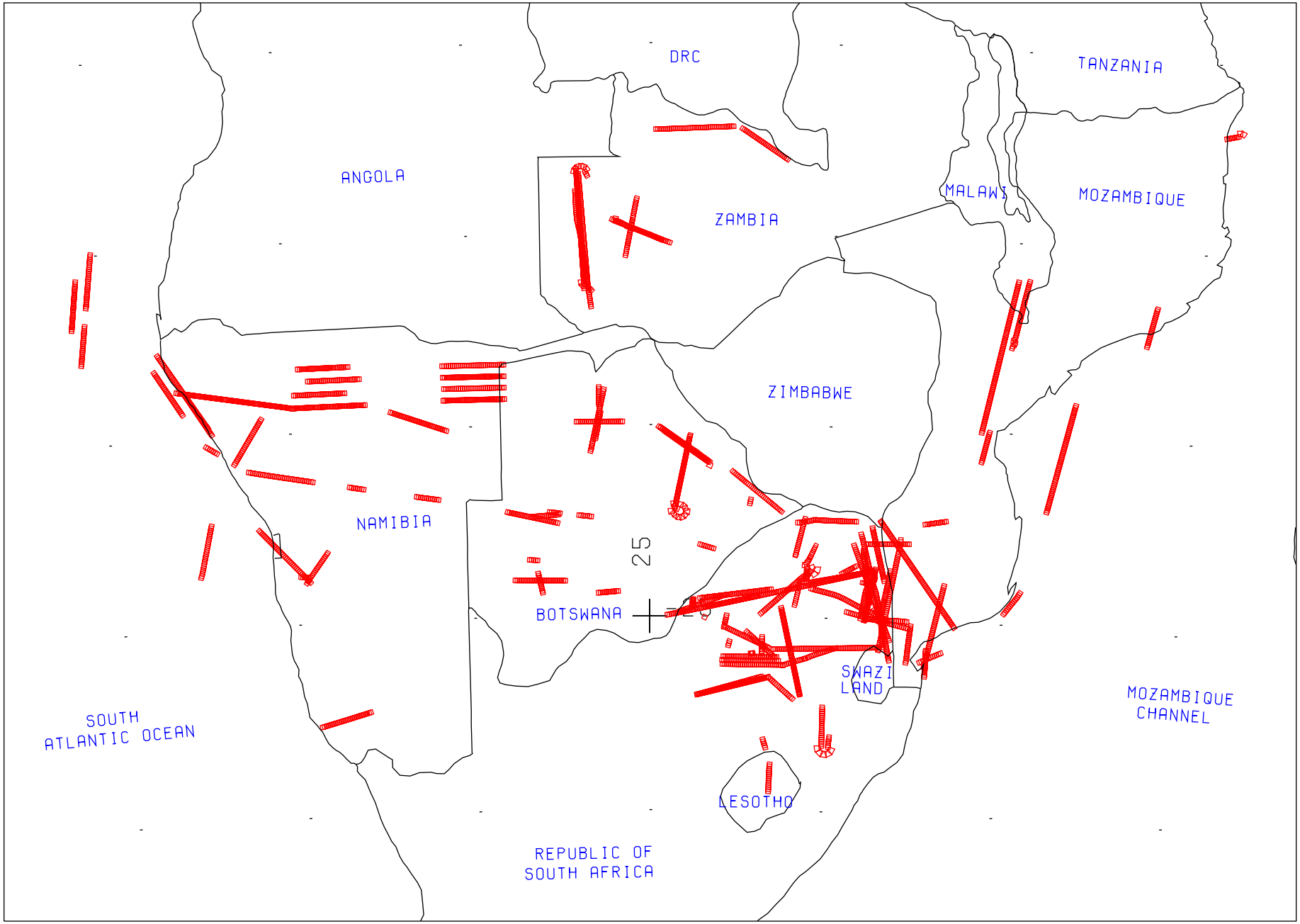
SAFARI 2000 encompasses the following science elements: terrestrial ecology and land processes; land cover and land use change; aerosols; trace gases; clouds and radiation; hydrology; and modeling. These elements will be studied using ground and airborne measurements complemented by remote sensing observations from a new generation of earth observation satellites, including NASA's Terra, Aqua (formerly PM), Earth Observing-1 (EO-1), Vegetation Canopy LIDAR (VCL), Landsat 7 and TRMM platforms, as well as the European ENVISAT and POLDER II satellites. Data from existing sensors, e.g., NOAA polar orbiters (AVHRR) and METEOSAT, will likewise be employed. In turn, ground- and aircraft-based measurements from SAFARI 2000 will help validate the remotely sensed satellite observations.

Each successive campaign is expected to both draw increased international participation and to increase in the scope of scientific questions addressed. The campaigns will allow scientists to leverage their modeling efforts upon existing ground-based and atmospheric monitoring networks, as well as new airborne and remote sensing measurements. Ground-based efforts will be co-ordinated to maximize sampling effectiveness and efficiency, as well as facilitate collaboration and data synthesis. Meteorological and remote sensing

measurements will be collected throughout the initiative. The international science networks supporting efforts in the region (e.g., those of IGBP and START) will help broaden African scientific involvement.

Results from SAFARI 2000 are expected to contribute to the development of improved policies and practices affecting the environment. They should also help local officials gain insight into global change on a regional scale and understand potential impacts from global change international environmental treaties. Regional scientists will benefit through heightened recognition, enhanced capacity, and the transfer of technology. The relevance of the scientific results will be discussed through a series of workshops. One such workshop, the Policy Dialogue Workshop on Ecological Impacts of Trans-boundary Air Pollution in Southern Africa, organized by the Air Pollution Impacts Network for Africa (APINA), has already been held. SAFARI 2000 has an open internal and external data sharing policy. Information will be disseminated regionally and internationally via the internet as well as through the distribution of CD-ROMS and magnetic tapes. We anticipate that a long-term data archive will be developed such that data and models can serve the community well into the 21st century.

This summary was extracted from the SAFARI 2000 website at the following URL: http://safari.gecp.virginia.edu/abstract/index.asp



SAFARI AUGUST - SEPTEMBER 2000 COLOR INFRARED COVERAGE SUMMARIZED IN FSR VOLUMES I AND II

FLIGHT SUMMARY REPORT

Flight Number:	00-156
Calendar/Julian Date:	04 September 2000 • 248
Sensor Package:	Wild Heerbrugg RC-10 Scanning High Resolution Interferometer Sounder (S-HIS) MODIS Airborne Simulator (MAS) Cloud Lidar Scanner (CLS) Mopitt Airborne Simulator (Mopitt-A) Solar Spectral Flux Radiometer (SSFR) Leonardo Airborne Simulator (LAS)
Area(s) Covered:	Republic of South Africa/Botswana
Aircraft #:	809

SENSOR DATA

Accession #:	05549	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	152	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Good	-----	-----	-----	-----

Remarks:

Accession #:	-----
Sensor ID #:	131
Sensor Type:	SSFR
Focal Length:	-----
Film Type:	-----
Filtration:	-----
Spectral Band:	-----
f Stop:	-----
Shutter Speed:	-----
# of Frames:	-----
% Overlap:	-----
Quality:	-----
Remarks:	

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 4 Sep 2000
NASA FLIGHT NUMBER 00-156

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	08:29:14	-22.158	28.460	59.2	66.8	306.85	08:56:00	-22.150	28.447	59.2	66.8	10000
2	08:56:01	-20.437	25.871	52.8	63.7	306.41	09:02:18	-20.429	25.858	52.8	63.7	2353
3	09:08:42	-19.880	25.026	50.0	61.7	124.86	09:26:01	-19.888	25.039	50.0	61.7	6470
4	09:32:04	-21.114	26.927	45.8	56.4	299.84	09:50:54	-21.107	26.913	45.8	56.3	7029
5	09:51:23	-19.920	25.014	41.4	53.0	277.52	10:12:43	-19.918	24.998	41.4	52.9	7963
6	10:14:02	-20.009	22.344	37.5	46.6	173.26	10:40:49	-20.023	22.346	37.5	46.6	10000
7	10:40:49	-22.958	23.046	35.7	35.2	167.81	10:50:11	-22.972	23.050	35.6	35.2	3496
8	10:51:01	-24.058	23.381	35.4	30.5	113.47	11:11:30	-24.063	23.396	35.4	30.5	7647
9	11:11:44	-24.713	25.834	33.9	21.8	91.22	11:38:31	-24.713	25.850	33.9	21.8	10000
10	11:38:31	-24.177	29.026	31.7	10.2	81.68	11:56:47	-24.175	29.041	31.7	10.1	6818

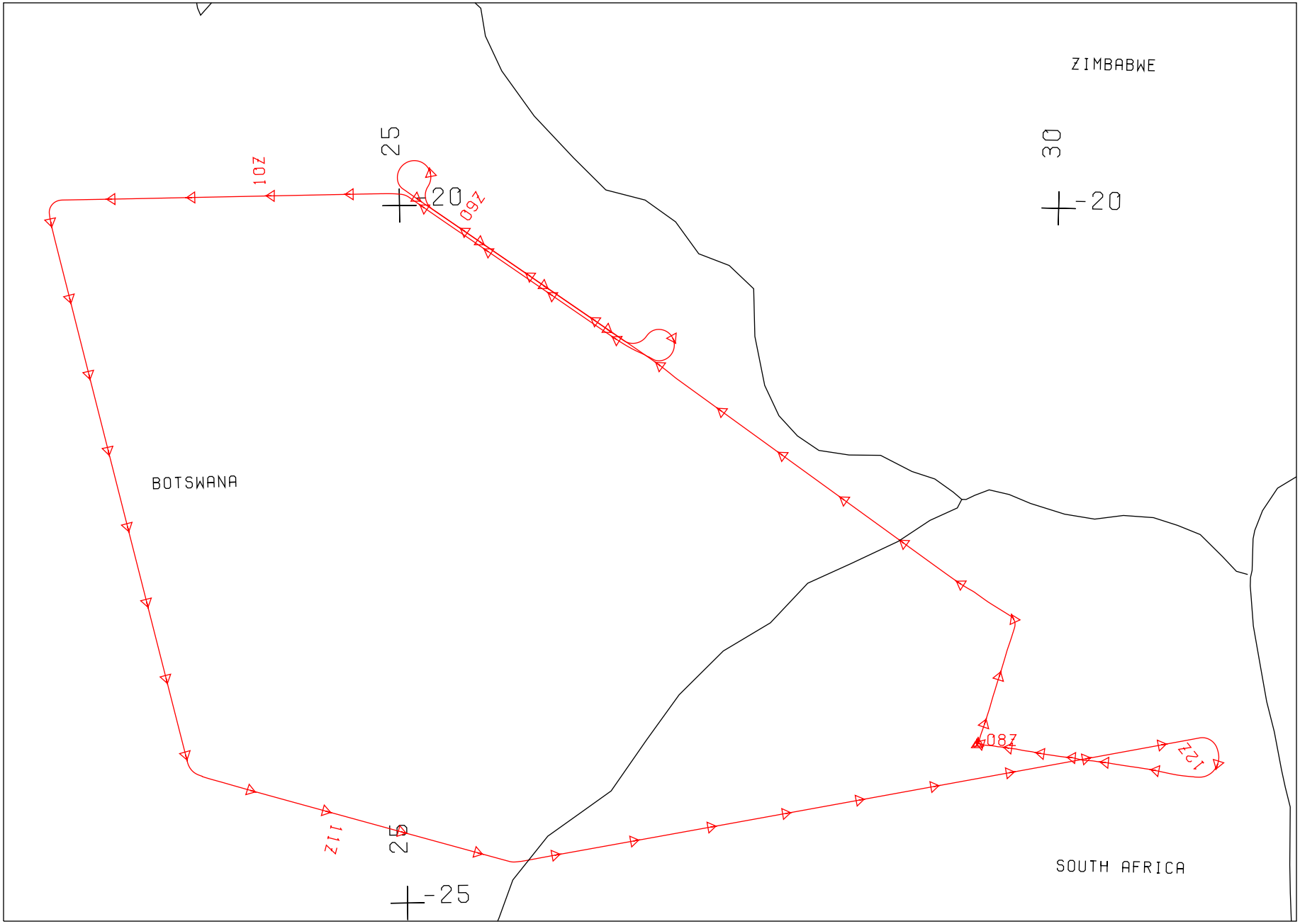
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-156

Accession # 05549

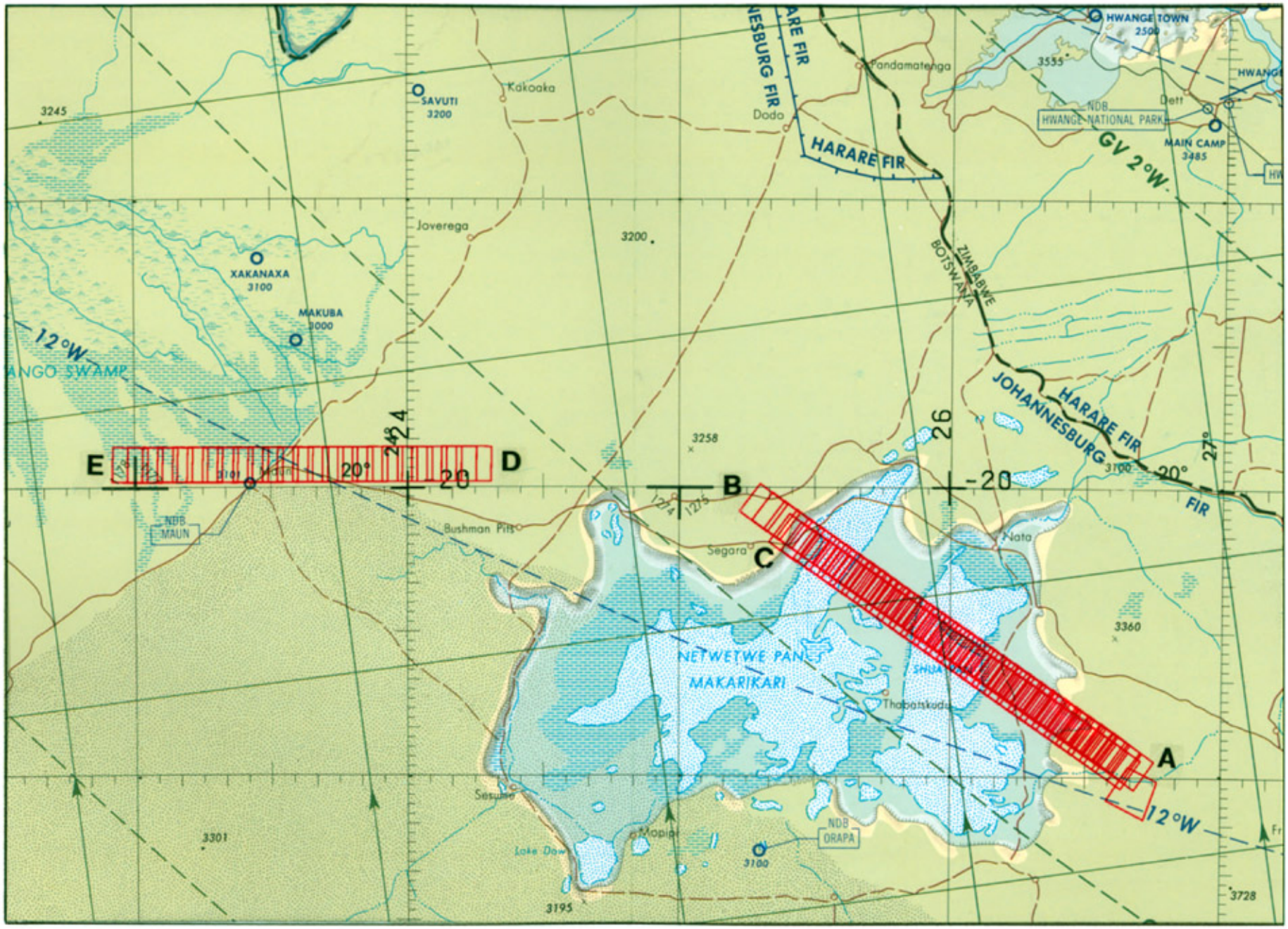
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	4960-4989	8:48:26	9:01:38	65200/19880	Haze throughout
C - A	4990-5015	9:14:48	9:26:10	65900/20090	Haze throughout; frame 5015 oblique
A - C	5016-5043	9:34:55	9:47:13	66200/20180	Haze throughout
D - E	5044-5067	9:57:50	10:08:17	66500/20270	Haze throughout; 10-40% cumulus, frames 5045-5048; 10-50% cumulus, frames 5058-5061; processing residue, frames 5049-5050; frames 5068-5088 destroyed in processor
F - G	5089-5119	11:42:43	11:56:24	65900/20090	20-30% cumulus, frames 5089-5090 and 5096-5119; processing damage, frames 5093--5115
G - H	5120-5129	11:56:51	12:00:58	63900/19480	Oblique frames, 40-50% cumulus; emulsion damage, frames 5126, 5128, 5129
H - I	5130-5132	12:01:25	12:02:20	58800/17930	40% cumulus; emulsion damage, frames 5130-5132

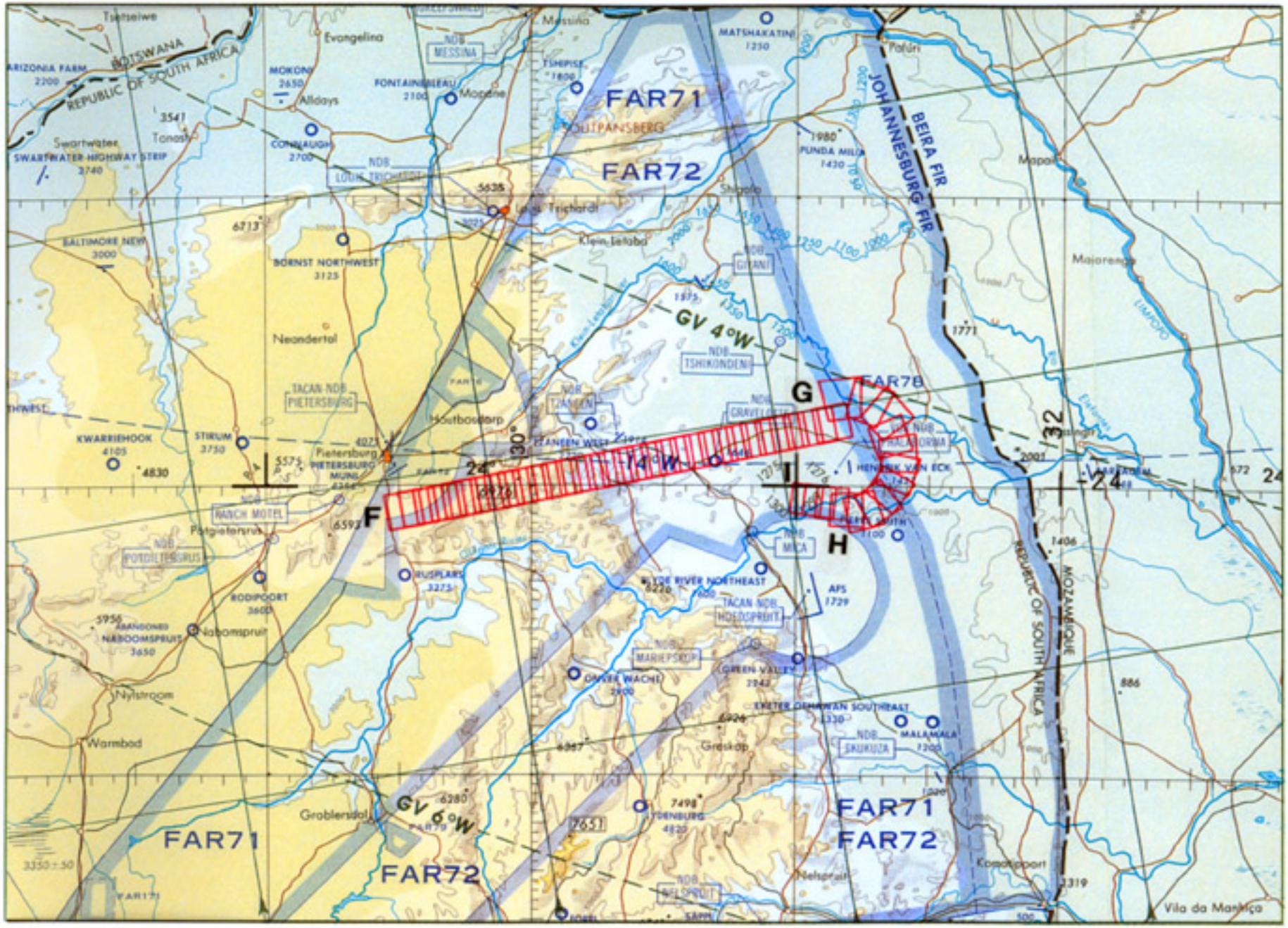
Date incorrect in camera data block



FLIGHT 00-156 4 SEPTEMBER 2000 A/C 809 SAFARI



FLIGHT 00-156 4 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-156 4 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-157

Calendar/Julian Date: 06 September 2000 • 250

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Airborne Multi-angle Imaging Spectroradiometer (AirMISR)
Solar Spectral Flux Radiometer (SSFR)

Area(s) Covered: Zambia

Aircraft #: 809

SENSOR DATA

Accession #:	05550	-----	-----	-----	-----
Sensor ID #:	034	-----	-----	-----	-----
Sensor Type:	RC-10	108	083	113	129
Focal Length:	12” 304.66 mm	MAS	S-HIS	CLS	Mopitt
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	282	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----	-----
Sensor ID #:	120	131
Sensor Type:	AirMISR	SSFR
Focal Length:	-----	-----
Film Type:	-----	-----
Filtration:	-----	-----
Spectral Band:	-----	-----
f Stop:	-----	-----
Shutter Speed:	-----	-----
# of Frames:	-----	-----
% Overlap:	-----	-----
Quality:	-----	-----
Remarks:		

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 5 Sep 2000
NASA FLIGHT NUMBER 00-157

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:14:05	-21.703	28.034	81.0	107.4	317.28	07:40:51	-21.695	28.025	81.0	107.4	10000
2	07:40:51	-19.379	25.951	80.0	114.0	323.39	08:07:38	-19.365	25.938	80.0	114.1	10000
3	08:07:38	-17.007	23.909	79.1	120.7	317.72	08:14:23	-16.995	23.897	79.1	120.8	2522
4	08:14:59	-16.396	23.328	78.8	122.6	357.75	08:41:29	-16.382	23.327	78.8	122.6	9904
5	08:46:36	-13.213	23.030	77.8	130.6	175.62	09:14:22	-13.228	23.031	77.8	130.6	10369
6	09:19:46	-16.448	23.227	76.9	138.9	357.36	09:46:30	-16.433	23.226	76.9	139.0	9991
7	09:49:14	-13.341	23.256	76.2	146.4	149.38	10:02:03	-13.354	23.264	76.2	146.5	4793
8	10:02:43	-14.613	23.972	76.0	149.9	114.95	10:15:43	-14.619	23.987	76.0	149.9	4793
9	10:21:00	-15.232	25.564	75.6	154.6	291.41	10:34:33	-15.226	25.550	75.6	154.6	5065
10	10:34:46	-14.635	24.085	75.4	158.1	280.83	10:42:07	-14.632	24.070	75.4	158.1	2743
11	10:44:12	-14.742	23.138	75.3	160.5	178.92	10:58:05	-14.756	23.138	75.3	160.5	5189
12	10:58:46	-16.304	23.247	75.1	164.2	135.99	11:25:31	-16.314	23.258	75.1	164.3	10000
13	11:25:32	-18.578	25.051	74.9	171.1	149.69	11:46:17	-18.592	25.059	74.9	171.2	7756
14	11:46:19	-20.500	26.266	74.8	176.5	148.00	12:13:05	-20.512	26.274	74.8	176.5	10000
15	12:13:05	-23.058	27.665	74.8	183.4	154.24	12:22:59	-23.071	27.672	74.8	183.4	3701

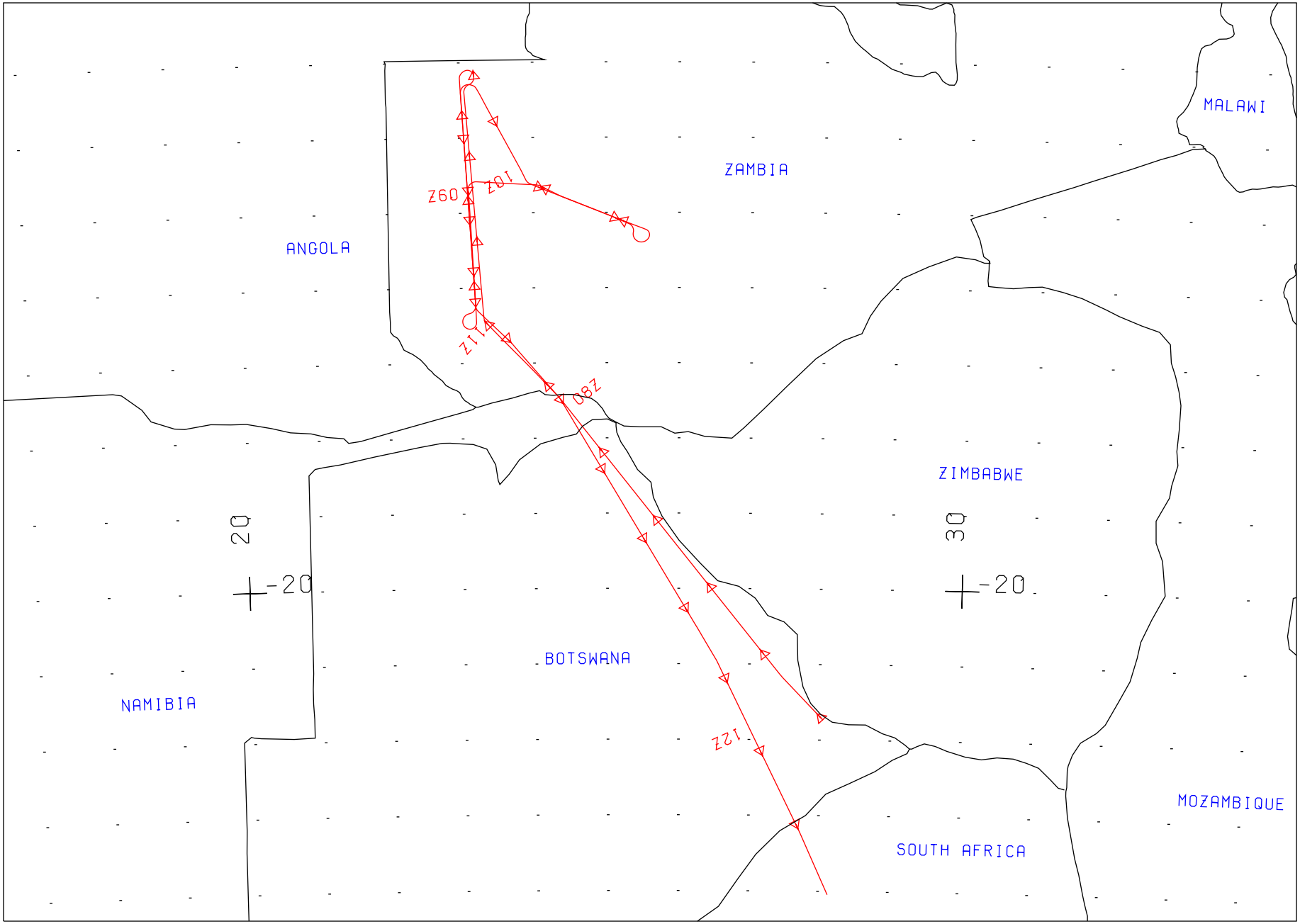
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-157

Accession # 05550

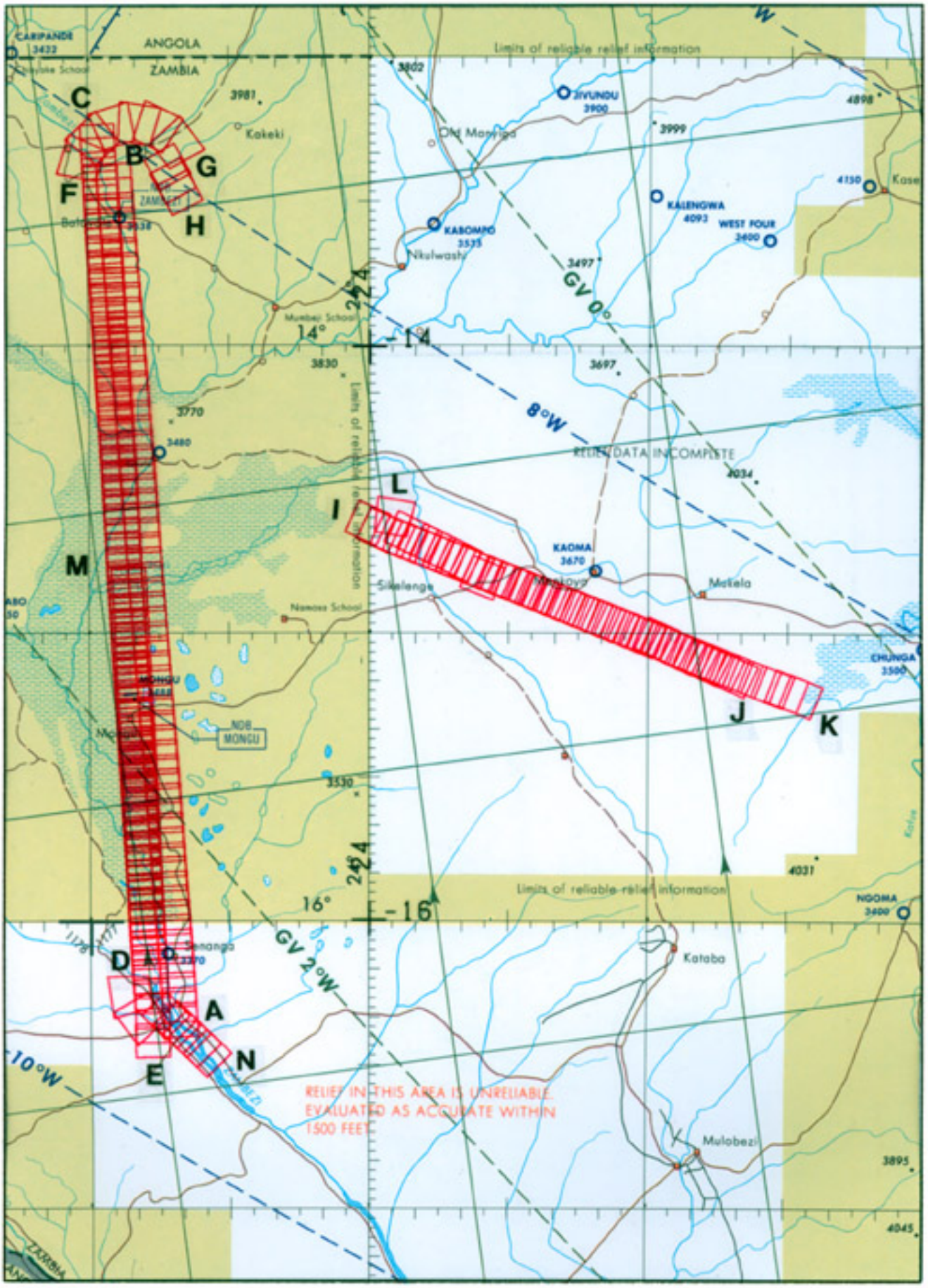
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	5148-5205	8:15:25	8:41:18	65600/20000	Clear
C - D	5206-5265	8:47:14	9:14:04	65900/20090	Smoke, frames 5238-5240
E - F	5266-5324	9:20:01	9:46:24	65400/19940	Smoke, frames 5293-5297
F - G	5325-5330	9:46:51	9:49:08	65700/20030	Oblique frames
B - H	5331-5333	9:49:35	9:50:30	65600/20000	Haze throughout
I - J	5334-5362	10:02:53	10:15:34	65800/20060	Smoke, frames 5344-5347, 5353-5356, 5361-5362
K - L	5363-5393	10:21:12	10:34:49	65300/19910	Smoke, frames 5366-5370, 5374-5375, 5381-5386; frame 5393 oblique
M - D	5394-5423	10:45:04	10:58:12	65400/19940	Haze throughout; frame 5423 oblique
D - N	5424-5429	10:58:39	11:00:55	65600/20000	Haze throughout; frame 5424 oblique

Date incorrect in camera data block



FLIGHT 00-157 6 SEPTEMBER 2000 A/C 809 SAFARI (NAV DATA FROM RS232 FEED TO MAS)



FLIGHT 00-157 6 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 66

FLIGHT SUMMARY REPORT

Flight Number:	00-158
Calendar/Julian Date:	07 September 2000 • 251
Sensor Package:	Wild Heerbrugg RC-10 Scanning High Resolution Interferometer Sounder (S-HIS) MODIS Airborne Simulator (MAS) Cloud Lidar Scanner (CLS) Mopitt Airborne Simulator (Mopitt-A) Airborne Multi-angle Imaging Spectroradiometer (AirMISR) Solar Spectral Flux Radiometer (SSFR)
Area(s) Covered:	Republic of South Africa
Aircraft #:	809

SENSOR DATA

Accession #:	05551	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	152	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----	-----
Sensor ID #:	120	131
Sensor Type:	AirMISR	SSFR
Focal Length:	-----	-----
Film Type:	-----	-----
Filtration:	-----	-----
Spectral Band:	-----	-----
f Stop:	-----	-----
Shutter Speed:	-----	-----
# of Frames:	-----	-----
% Overlap:	-----	-----
Quality:	-----	-----

Remarks:

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 7 Sep 2000
NASA FLIGHT NUMBER 00-158

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:56:38	-23.988	29.706	66.4	71.5	66.96	08:11:24	-23.982	29.720	66.4	71.4	5517
2	08:12:52	-23.417	31.471	62.6	69.6	193.61	08:29:05	-23.431	31.468	62.6	69.5	6054
3	08:34:15	-25.418	31.060	58.9	65.3	1.35	08:50:58	-25.403	31.060	58.9	65.2	6246
4	08:56:28	-23.313	31.475	53.4	62.8	184.87	09:13:53	-23.327	31.473	53.4	62.7	6503
5	09:18:49	-25.333	31.516	50.1	57.0	17.17	09:34:10	-25.318	31.520	50.0	57.0	5737
6	09:36:47	-23.536	32.085	45.7	54.4	156.04	10:03:34	-23.548	32.092	45.7	54.4	10000
7	10:03:34	-26.348	33.004	42.8	45.4	163.11	10:18:47	-26.362	33.008	42.8	45.3	5683
8	10:21:14	-27.967	33.723	41.4	38.9	15.27	10:48:01	-27.952	33.727	41.3	38.9	10000
9	10:48:02	-24.940	34.330	35.4	32.0	12.37	10:56:06	-24.925	34.333	35.4	32.0	3015
10	11:11:06	-23.598	32.784	31.6	23.7	282.37	11:17:28	-23.595	32.767	31.6	23.6	2382
11	11:18:52	-23.543	31.855	31.0	20.2	186.62	11:34:38	-23.558	31.853	31.0	20.1	5888
12	11:35:57	-25.381	31.384	31.6	11.5	276.03	11:38:18	-25.379	31.368	31.6	11.4	880
13	11:41:22	-25.035	31.009	31.2	9.0	12.54	11:55:27	-25.020	31.012	31.2	8.9	5256
14	11:57:48	-23.424	31.131	29.2	1.1	191.54	12:13:09	-23.438	31.128	29.2	1.0	5732
15	12:16:03	-25.213	31.018	31.4	352.3	48.33	12:18:39	-25.203	31.030	31.4	352.3	974
16	12:19:35	-24.933	31.302	31.1	350.5	354.26	12:35:03	-24.918	31.300	31.1	350.5	5775
17	12:37:28	-23.112	30.813	30.2	341.2	221.18	12:46:33	-23.123	30.803	30.3	341.2	3390
18	12:47:41	-24.025	29.997	32.0	337.2	174.03	12:57:58	-24.040	29.997	32.1	337.1	3838

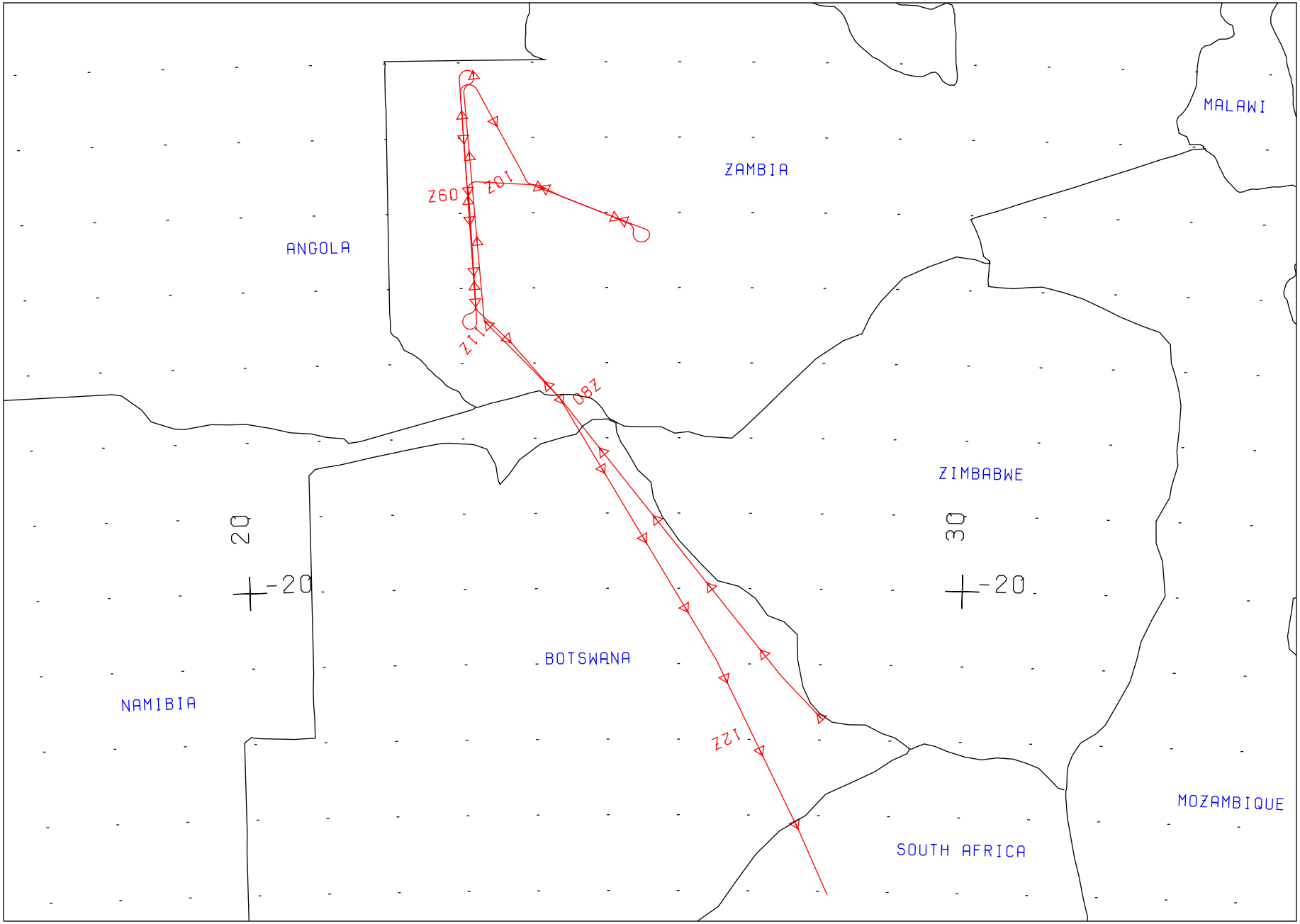
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-158

Accession # 05551

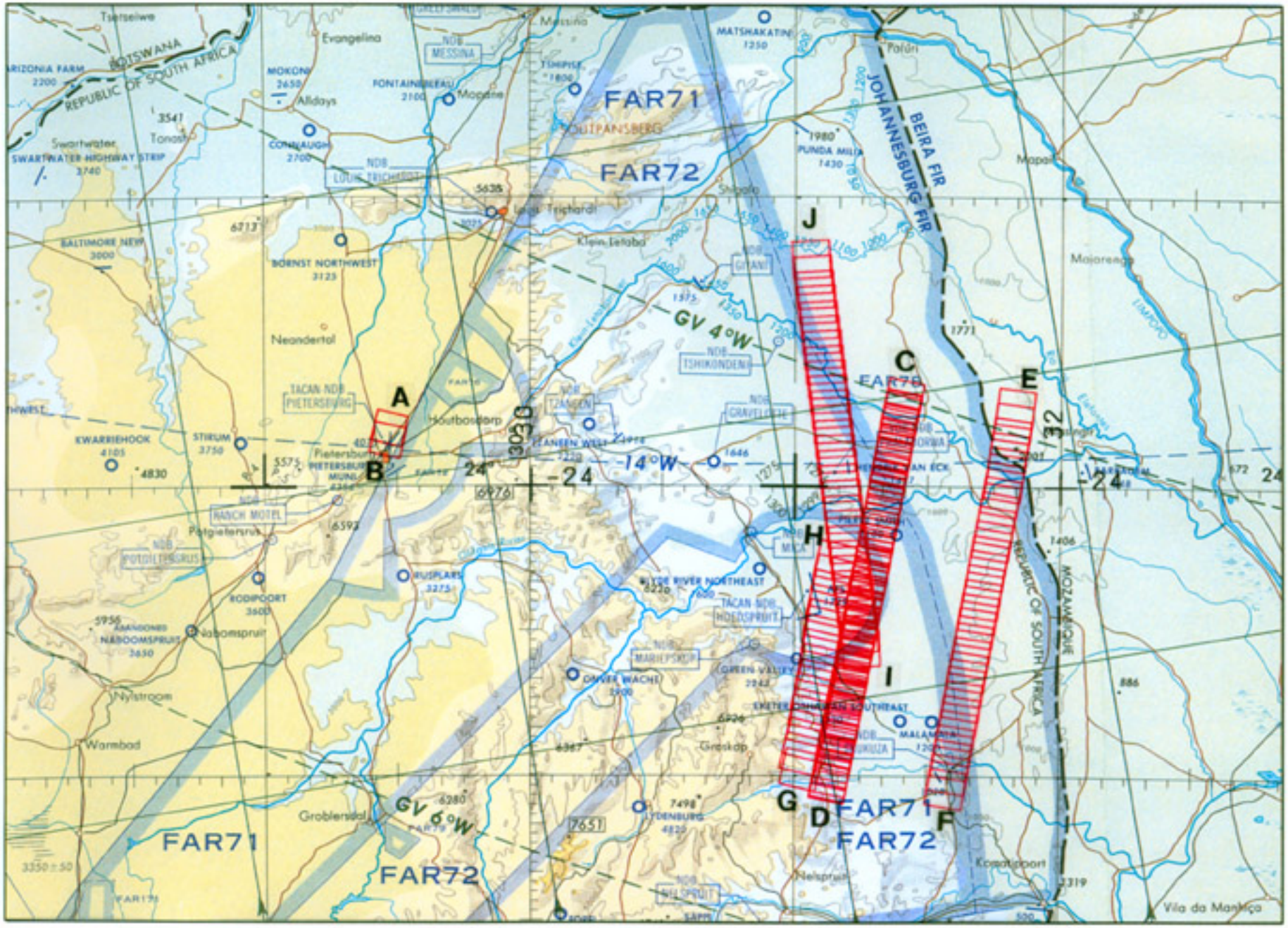
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	5445-5446	7:52:46	7:53:14	58600/17870	Clear; Pietersburg Gateway International Airport
C - D	5447-5473	8:15:44	8:27:35	65400/19940	Smoke, frames 5458-5461
D - C	5474-5500	8:37:47	8:49:37	65700/20030	Smoke, frames 5486-5490
C - D	5501-5527	9:00:20	9:12:09	66300/20210	Smoke, frames 5512-5515
E - F	5528-5554	11:20:28	11:32:17	68700/20940	Minor-10% cumulus, frames 5531-5549; smoke, frame 5554
G - H	5555-5569	11:41:51	11:48:14	68900/21010	Smoke, frrame 5569
I - J	5570-5596	12:22:51	12:34:41	69600/21220	Clear

Date incorrect in camera data block



FLIGHT 00-157 6 SEPTEMBER 2000 A/C 809 SAFARI (NAV DATA FROM RS232 FEED TO MAS)



FLIGHT 00-158 7 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-160

Calendar/Julian Date: 11 September 2000 • 255

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Solar Spectral Flux Radiometer (SSFR)
Leonardo Airborne Simulator (LAS)

Area(s) Covered: Republic of South Africa/Namibia/Botswana

Aircraft #: 809

SENSOR DATA

Accession #:	05552	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	162	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----	-----
Sensor ID #:	131	130
Sensor Type:	SSFR	LAS
Focal Length:	-----	-----
Film Type:	-----	-----
Filtration:	-----	-----
Spectral Band:	-----	-----
f Stop:	-----	-----
Shutter Speed:	-----	-----
# of Frames:	-----	-----
% Overlap:	-----	-----
Quality:	-----	-----
Remarks:		

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 11 Sep 2000
NASA FLIGHT NUMBER 00-160

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	06:52:28	-24.457	27.106	79.9	80.5	252.42	07:19:15	-24.461	27.092	79.9	80.5	10000
2	07:19:15	-25.413	24.077	74.2	77.2	253.62	07:46:01	-25.418	24.061	74.1	77.2	10000
3	07:46:01	-26.315	20.962	68.5	73.5	252.66	08:12:48	-26.319	20.947	68.5	73.5	10000
4	08:12:48	-27.142	17.784	63.1	69.3	255.48	08:40:32	-27.146	17.768	63.1	69.3	10354
5	08:41:16	-27.896	14.383	57.6	64.2	298.50	09:08:03	-27.889	14.369	57.6	64.2	10000
6	09:08:03	-26.046	11.772	51.5	60.3	309.62	09:11:08	-26.037	11.760	51.4	60.3	1148
7	09:12:08	-25.729	11.433	50.6	59.7	5.26	09:38:54	-25.714	11.434	50.6	59.6	10000
8	09:38:54	-22.819	12.115	43.9	56.2	14.23	10:06:27	-22.804	12.119	43.8	56.2	10289
9	10:07:07	-19.770	12.780	36.7	52.1	339.21	10:28:17	-19.756	12.773	36.7	52.1	7911
10	10:32:10	-17.886	11.206	31.1	46.3	149.65	10:54:04	-17.899	11.213	31.1	46.2	8181
11	10:54:22	-20.006	12.497	29.2	35.2	164.84	11:03:15	-20.021	12.500	29.2	35.2	3316
12	11:03:44	-21.039	12.661	28.9	30.0	137.57	11:30:30	-21.050	12.671	28.9	30.0	10000
13	11:30:30	-23.248	14.747	28.6	15.5	139.56	11:38:39	-23.259	14.758	28.6	15.4	3043
14	11:42:45	-23.933	15.268	28.6	9.0	35.98	11:51:48	-23.921	15.278	28.6	8.9	3382
15	11:52:46	-23.098	16.026	27.6	3.9	94.87	12:19:32	-23.099	16.042	27.6	3.8	10000
16	12:19:32	-23.371	19.340	28.2	349.6	95.15	12:46:17	-23.372	19.356	28.2	349.6	10000
17	12:46:17	-23.569	22.675	30.2	336.5	94.98	13:13:03	-23.570	22.691	30.2	336.5	10000
18	13:13:03	-23.692	25.935	33.3	325.3	94.01	13:30:36	-23.692	25.951	33.3	325.2	6559
19	13:30:57	-23.800	28.113	35.9	318.9	88.30	13:49:00	-23.799	28.130	35.9	318.8	6742
20	13:49:02	-23.154	29.685	38.2	312.4	3.29	14:03:36	-23.141	29.686	38.2	312.3	5441

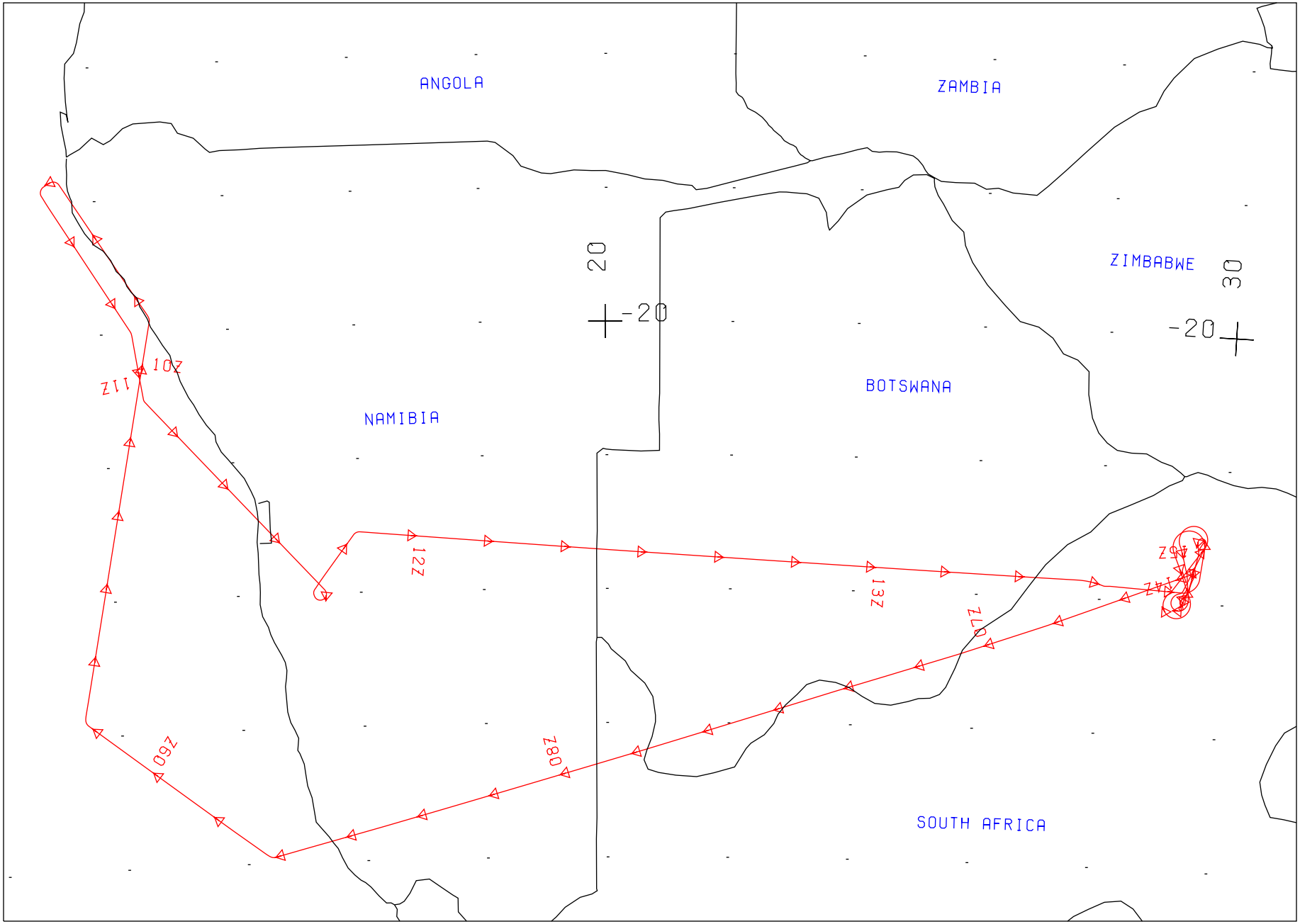
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-160

Accession # 05552

Sensor # 034

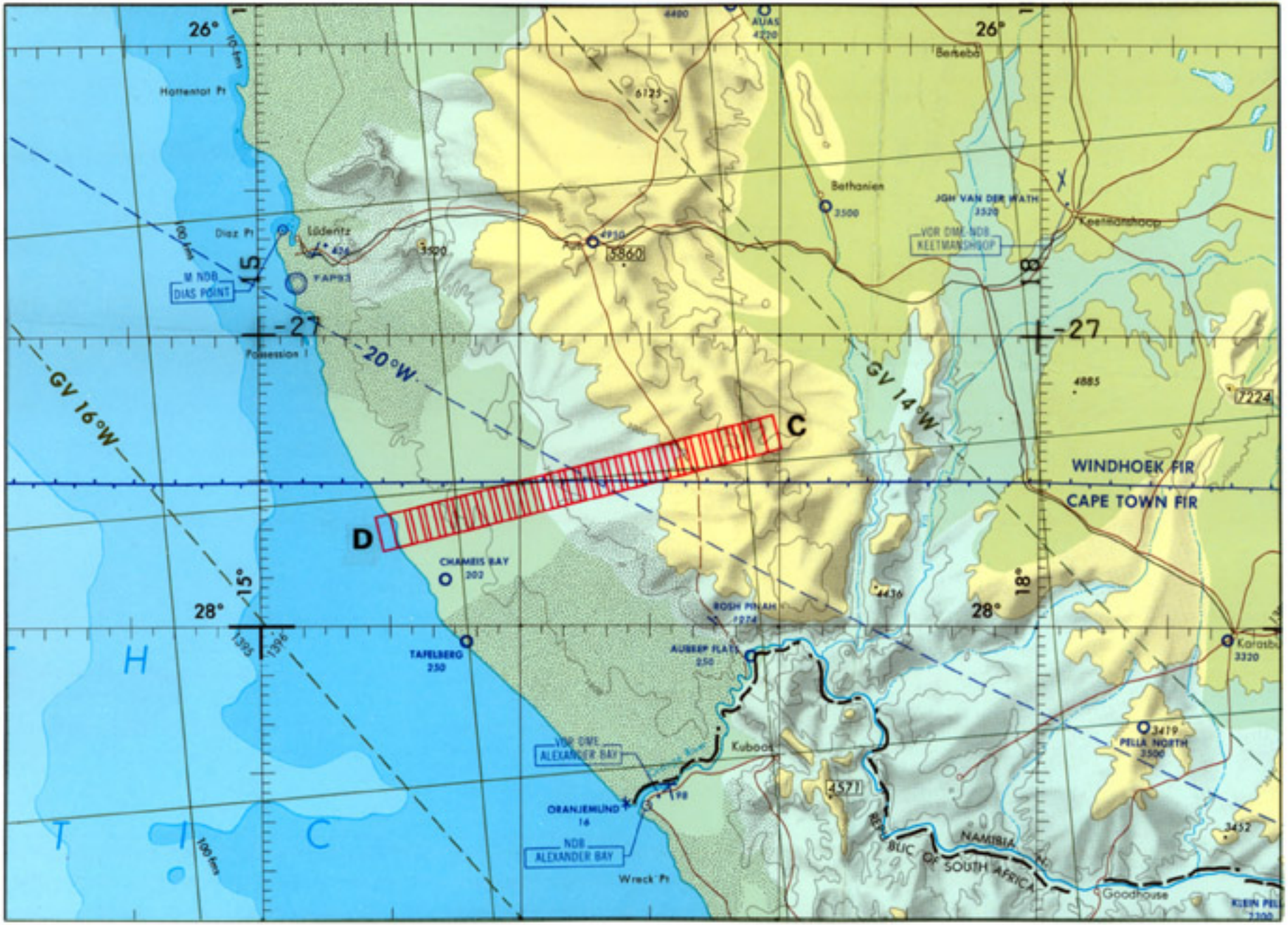
Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	5606-5631	6:52:01	7:03:26	62100/18930	Smoke, frames 5622-5626
C - D	5632-5658	8:19:54	8:31:42	64900/19790	10-50% cumulus, frames 5636-5646
E - F	5659-5704	10:07:37	10:28:01	65000/19820	50-100% coastal stratus
G - H	5705-5742	11:21:30	11:38:15	62500/19060	10-50% thin stratus, frames 5712-5717; emulsion hole, frame 5715
I - J	5743-5762	11:42:57	11:51:34	61400/18720	Clear
K - L	5763-5767	12:37:46	12:39:34	62400/19020	Clear

Date incorrect in camera data block



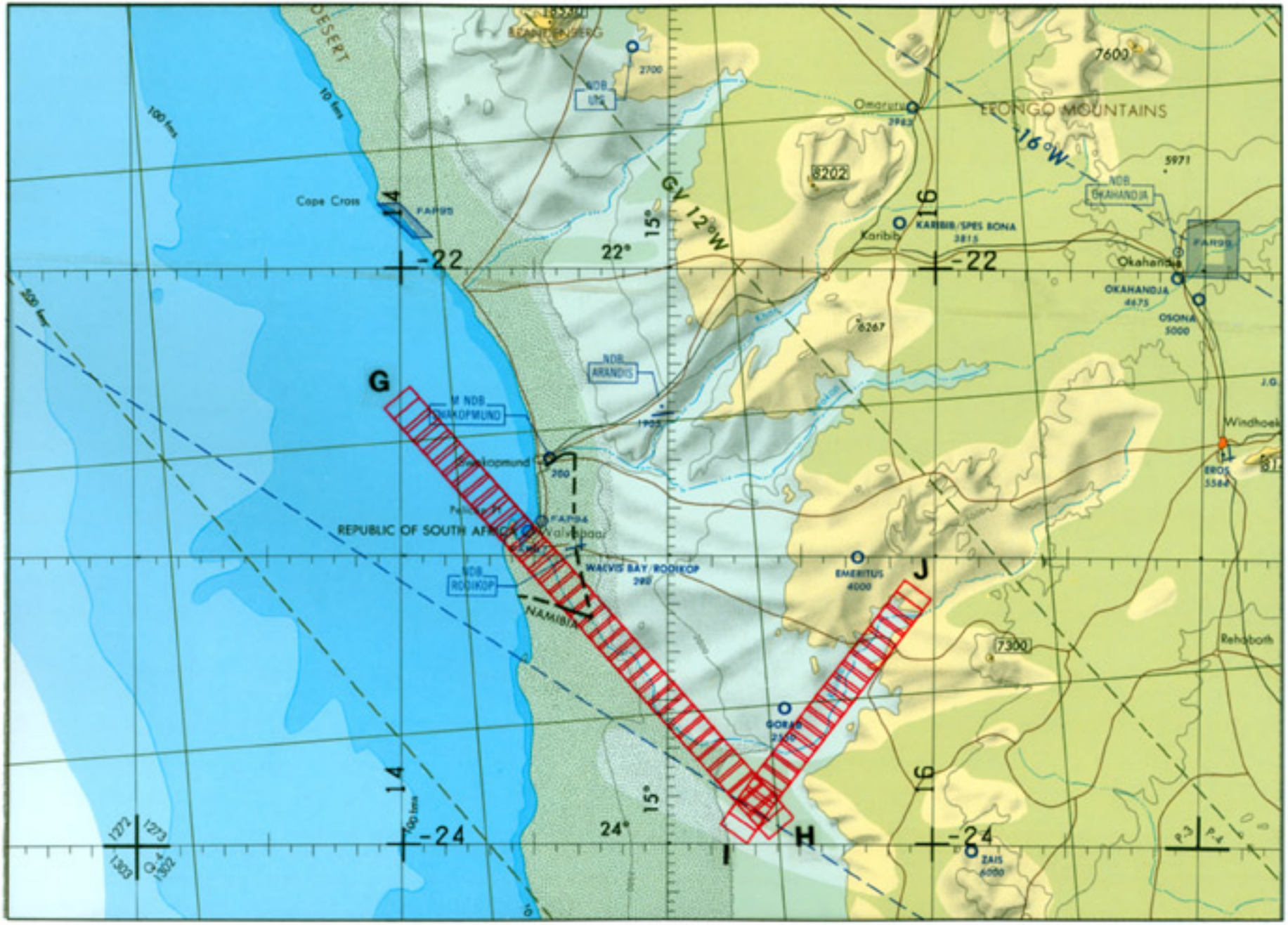
FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 SAFARI

FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

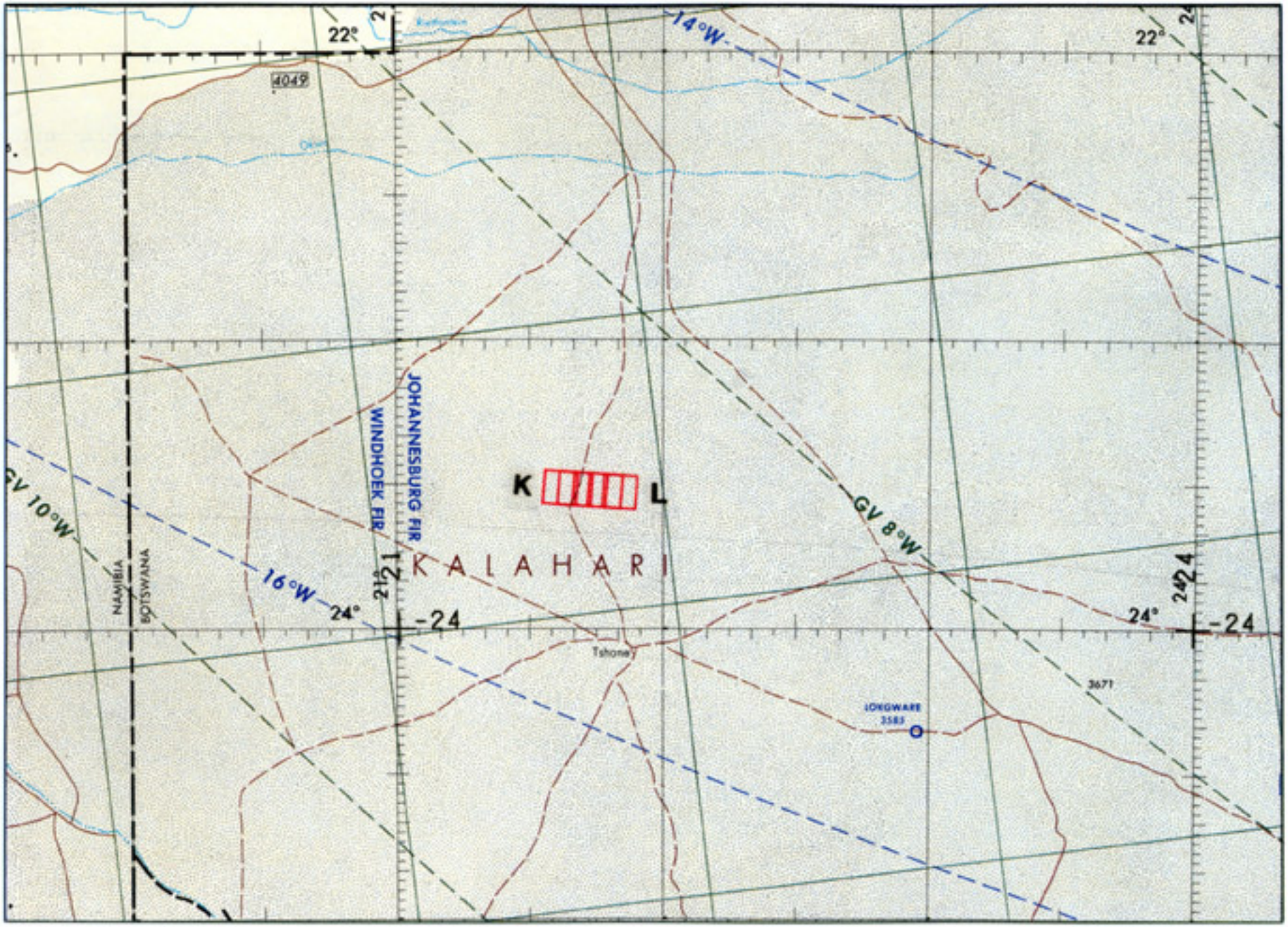


FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-160 11 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-175

Calendar/Julian Date: 13 September 2000 • 257

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Airborne Multi-angle Imaging Spectroradiometer (AirMISR)
Solar Spectral Flux Radiometer (SSFR)

Area(s) Covered: Namibia/Botswana

Aircraft #: 809

SENSOR DATA

Accession #:	05553	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	248	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----	-----
Sensor ID #:	120	131
Sensor Type:	AirMISR	SSFR
Focal Length:	-----	-----
Film Type:	-----	-----
Filtration:	-----	-----
Spectral Band:	-----	-----
f Stop:	-----	-----
Shutter Speed:	-----	-----
# of Frames:	-----	-----
% Overlap:	-----	-----
Quality:	-----	-----
Remarks:		

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 13 Sep 2000
NASA FLIGHT NUMBER 00-175

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:12:46	-23.405	27.003	74.8	79.2	262.64	07:16:07	-23.408	26.988	74.8	79.2	1249
2	07:25:16	-23.643	25.570	72.1	77.7	261.66	07:52:02	-23.645	25.555	72.1	77.7	10000
3	07:52:02	-24.063	22.308	66.2	74.3	273.80	08:18:48	-24.063	22.292	66.2	74.3	10000
4	08:18:48	-24.021	19.113	60.4	70.7	274.80	08:45:35	-24.020	19.098	60.4	70.7	10000
5	08:45:35	-23.813	15.903	54.6	66.7	274.21	09:12:22	-23.812	15.888	54.6	66.7	10000
6	09:12:22	-23.540	12.706	48.9	62.1	274.19	09:17:16	-23.539	12.691	48.9	62.1	1830
7	09:20:48	-23.677	12.295	47.4	60.2	10.69	09:49:27	-23.662	12.299	47.4	60.2	10700
8	09:50:23	-20.394	13.154	39.8	56.7	333.27	10:17:10	-20.382	13.146	39.7	56.7	10000
9	10:17:10	-17.820	11.563	33.1	52.4	332.41	10:19:20	-17.808	11.555	33.1	52.4	811
10	10:32:56	-18.725	11.708	31.0	46.0	150.92	10:56:10	-18.737	11.716	30.9	45.9	8678
11	10:57:59	-20.955	13.268	28.9	33.5	39.22	11:24:46	-20.943	13.278	28.9	33.5	10002
12	11:25:36	-18.324	15.115	23.6	21.9	78.85	11:43:37	-18.322	15.130	23.6	21.8	6730
13	11:47:30	-18.646	17.229	22.3	8.3	266.74	12:05:28	-18.648	17.214	22.3	8.2	6712
14	12:09:34	-18.998	15.084	22.8	353.8	94.11	12:27:39	-18.999	15.100	22.8	353.7	6754
15	12:28:26	-19.027	17.293	23.7	342.1	133.83	12:55:13	-19.038	17.304	23.7	342.0	10000
16	12:55:13	-21.102	19.591	28.2	329.7	136.33	13:09:30	-21.112	19.602	28.2	329.7	5334
17	13:09:52	-22.215	20.854	31.0	324.4	112.36	13:36:39	-22.220	20.869	31.0	324.4	10000
18	13:36:39	-22.892	24.008	35.5	315.3	104.96	14:03:26	-22.895	24.024	35.5	315.2	10000
19	14:03:26	-23.509	27.217	40.5	308.0	101.90	14:06:20	-23.512	27.233	40.5	307.9	1085

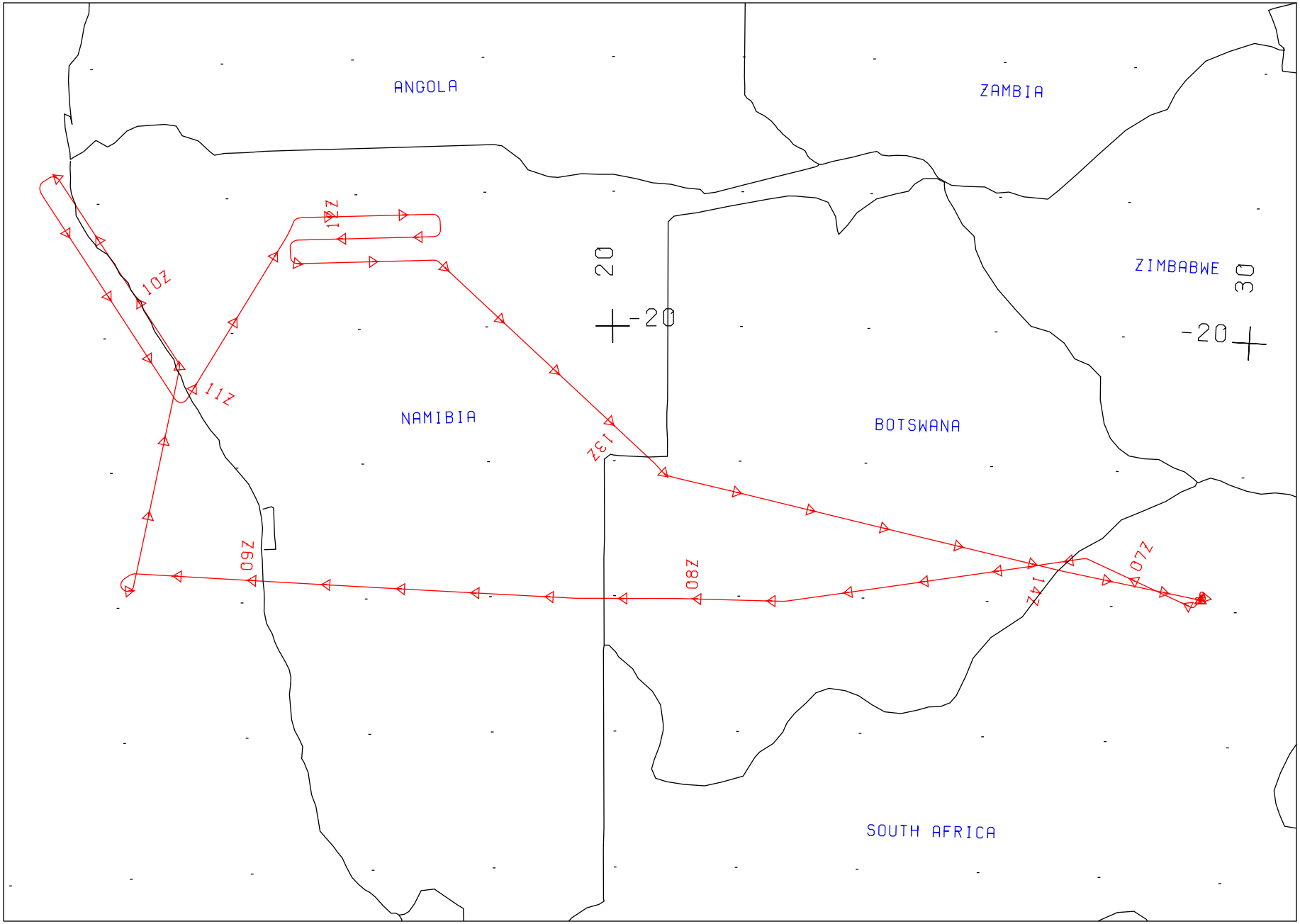
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-175

Accession # 05553

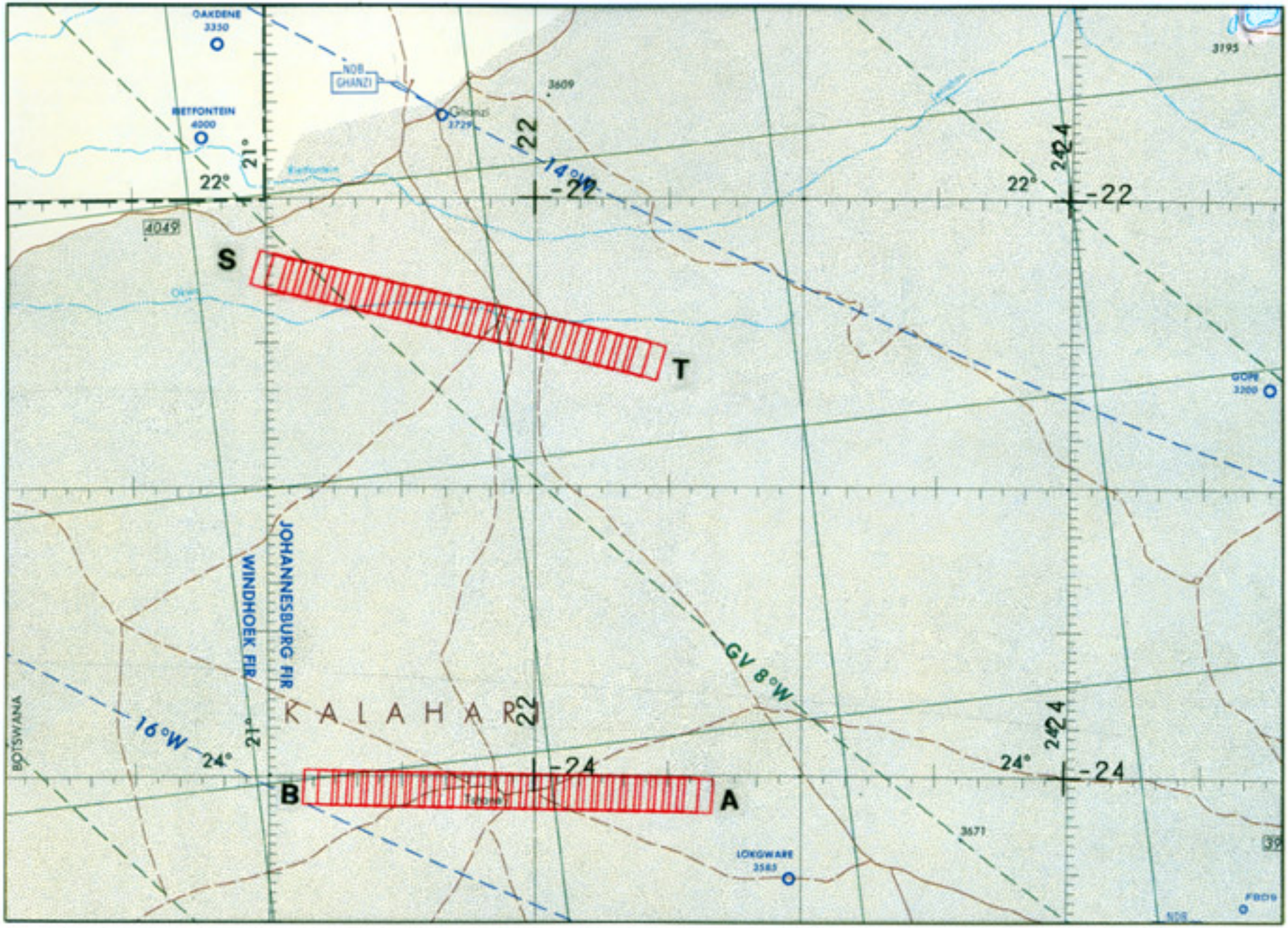
Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	5780-5806	7:49:30	8:01:18	64600/19700	Clear
C - D	5807-5811	8:50:19	8:52:07	64600/19700	20% cirrus, frame 5811
E - F	5812-5838	9:21:20	9:33:07	64400/19630	40-100% cumulus
G - H	5839-5865	9:55:27	10:07:15	65100/19850	90-100% stratus; processing residue, frame 5864
I - J	5866-5892	10:27:27	10:39:15	65200/19880	50-100% stratus
K - L	5893-5919	11:00:27	11:12:15	65600/20000	10-80% cumulus, frames 5893-5898
M - N	5920-5946	11:27:27	11:39:16	66300/20210	Clear
O - P	5947-5973	11:49:27	12:01:17	65300/19910	Clear
Q - R	5974-6000	12:10:27	12:22:17	65500/19970	Smoke, frames 5978-5980
S - T	6001-6027	13:11:18	13:23:06	66100/20150	Minor cumulus, frames 6006-6007, 6009-6011, 6024-6026; emulsion hole, frame 6005

Date incorrect in camera data block

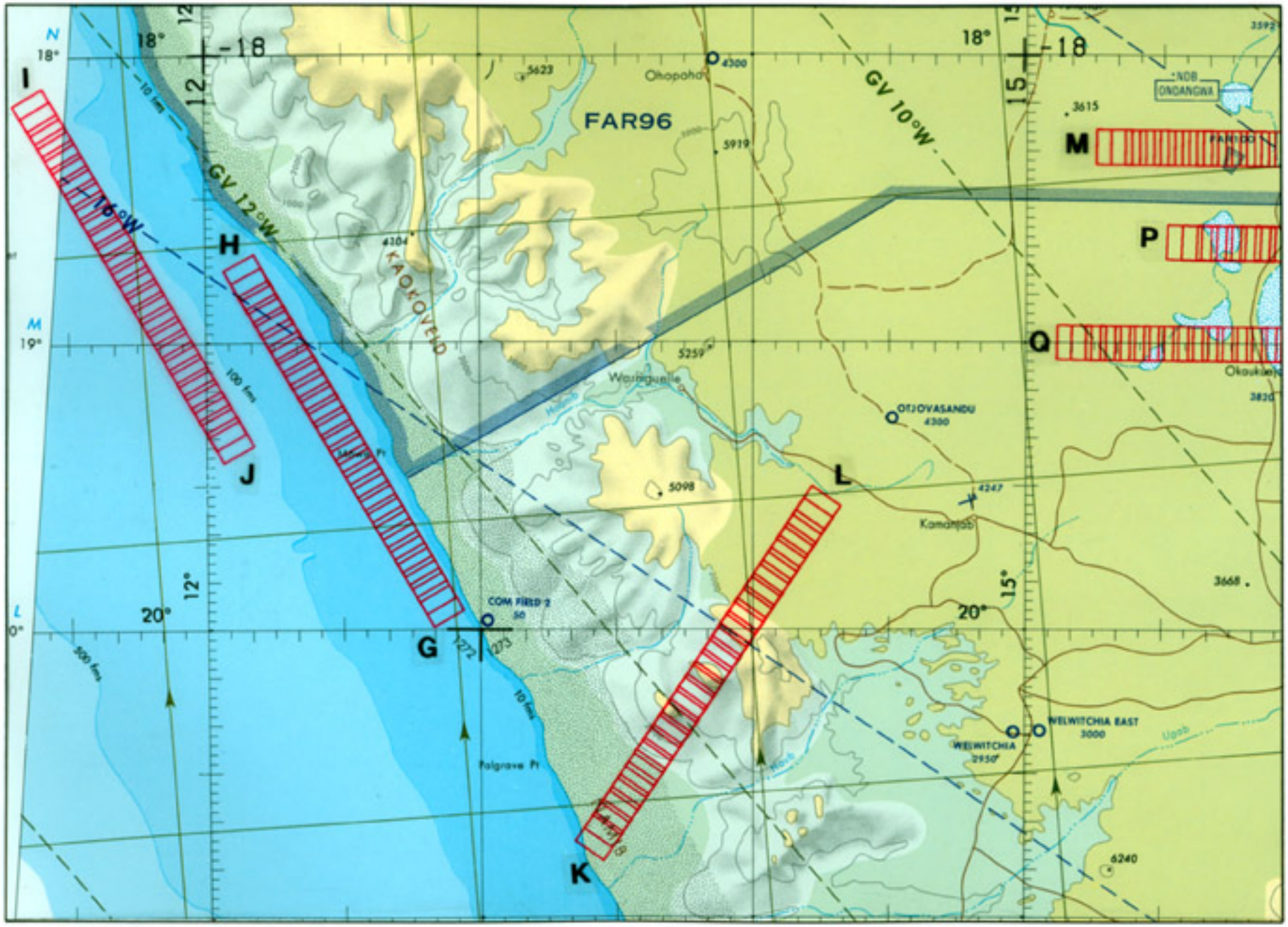


FLIGHT 00-175 13 SEPTEMBER 2000 A/C 809 SAFARI

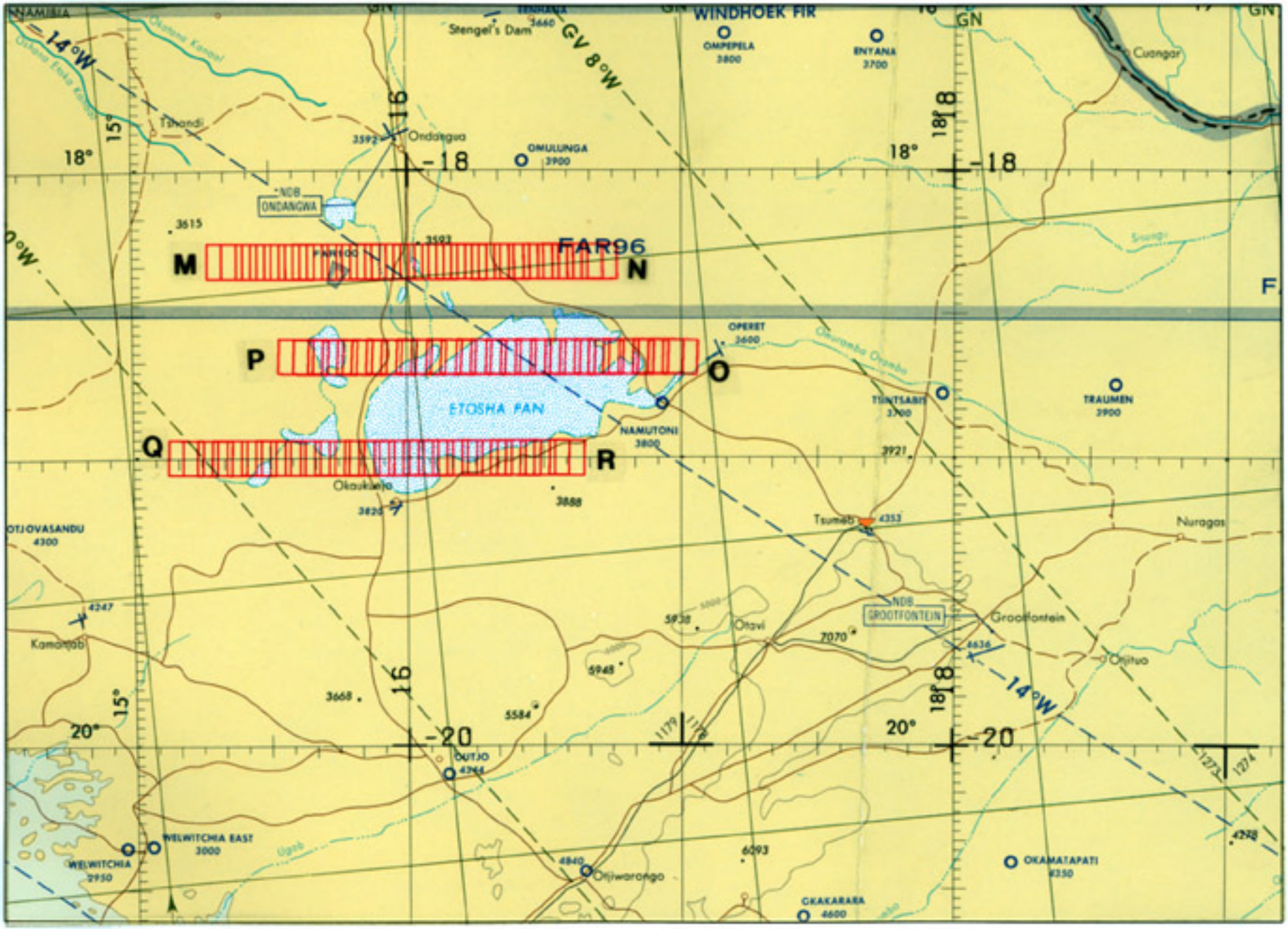


FLIGHT 00-175 13 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT 00-175 13 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-175 13 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-175 13 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-176

Calendar/Julian Date: 14 September 2000 • 258

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Airborne Multi-angle Imaging Spectroradiometer (AirMISR)
Solar Spectral Flux Radiometer (SSFR)
Leonardo Airborne Simulator (LAS)

Area(s) Covered: Namibia/Botswana

Aircraft #: 809

SENSOR DATA

Accession #:	05554	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	292	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----	-----	-----
Sensor ID #:	120	131	130
Sensor Type:	AirMISR	SSFR	LAS
Focal Length:	-----	-----	-----
Film Type:	-----	-----	-----
Filtration:	-----	-----	-----
Spectral Band:	-----	-----	-----
f Stop:	-----	-----	-----
Shutter Speed:	-----	-----	-----
# of Frames:	-----	-----	-----
% Overlap:	-----	-----	-----
Quality:	-----	-----	-----
Remarks:			

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 14 Sep 2000
NASA FLIGHT NUMBER 00-176

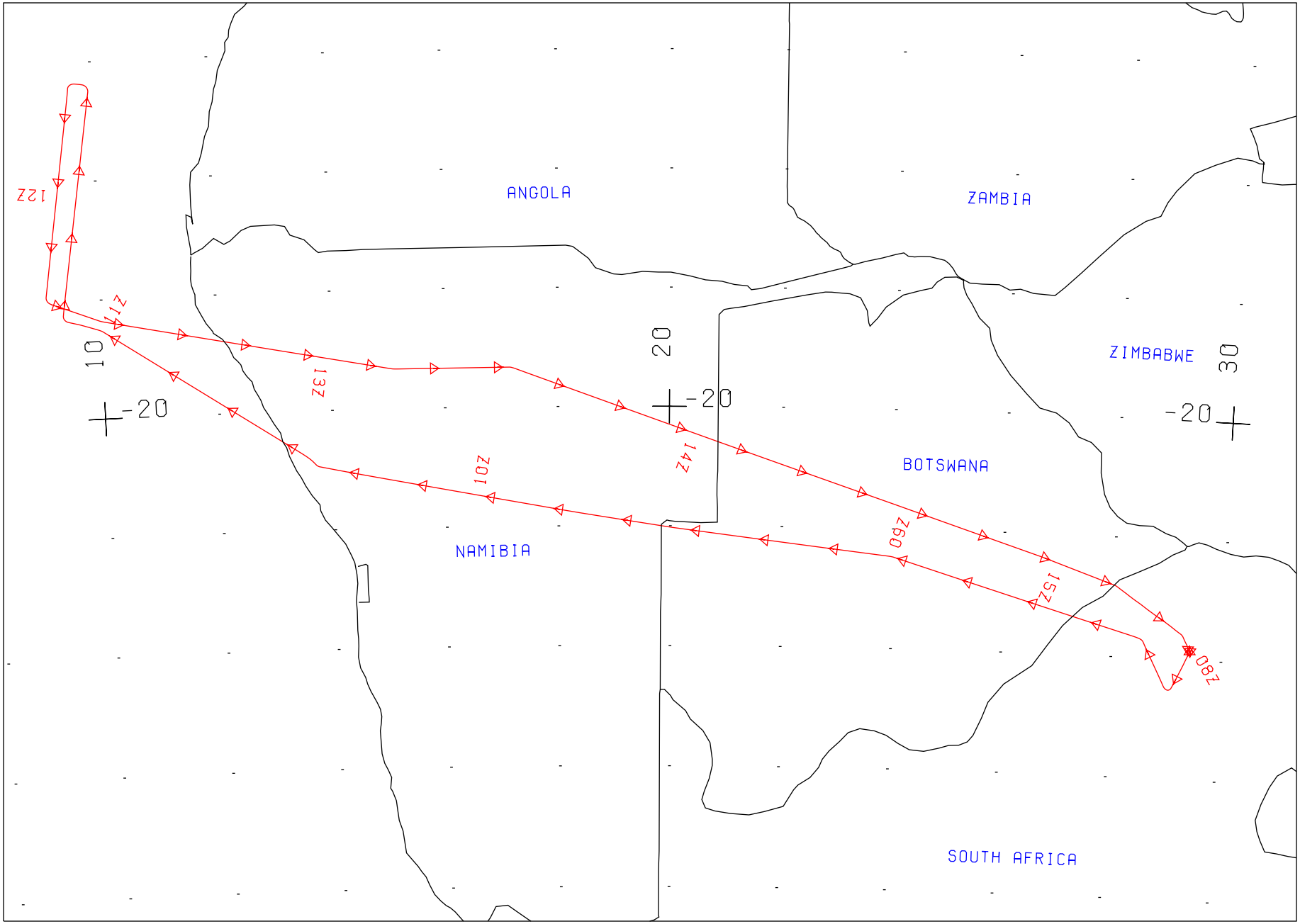
	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	08:28:43	-23.481	27.771	57.9	69.9	285.62	08:55:29	-23.477	27.756	57.8	69.9	10000
2	08:55:29	-22.634	24.615	51.8	66.3	288.80	09:22:15	-22.630	24.600	51.8	66.3	10000
3	09:22:16	-22.176	21.308	46.1	61.7	279.54	09:49:02	-22.174	21.292	46.0	61.7	10000
4	09:49:02	-21.720	18.016	40.5	56.3	281.61	10:15:48	-21.717	18.000	40.5	56.2	10000
5	10:15:49	-21.136	14.758	35.2	49.6	282.51	10:23:58	-21.133	14.742	35.1	49.6	3044
6	10:24:29	-20.912	13.716	33.5	47.1	315.18	10:51:16	-20.901	13.704	33.5	47.0	10000
7	10:51:16	-19.154	10.985	27.9	39.1	306.97	11:00:45	-19.146	10.972	27.9	39.0	3547
8	11:00:50	-18.533	10.022	26.0	35.5	303.78	11:05:55	-18.526	10.008	26.0	35.5	1899
9	11:07:13	-18.239	9.348	25.1	32.5	11.18	11:33:59	-18.224	9.350	25.0	32.5	10000
10	11:33:59	-15.227	9.851	19.5	19.8	12.92	11:40:23	-15.211	9.854	19.5	19.7	2393
11	11:44:19	-14.439	9.626	18.0	12.7	181.85	12:11:05	-14.454	9.624	18.0	12.6	10000
12	12:11:05	-17.333	9.158	20.6	352.1	188.39	12:16:20	-17.347	9.156	20.7	352.0	1963
13	12:17:24	-18.013	9.110	21.7	348.2	126.11	12:44:10	-18.021	9.123	21.7	348.1	10000
14	12:44:10	-18.766	12.026	24.6	332.6	102.11	13:10:55	-18.768	12.040	24.6	332.6	10000
15	13:10:56	-19.309	14.978	28.5	320.4	100.57	13:30:23	-19.311	14.993	28.5	320.4	7269
16	13:30:32	-19.334	17.187	31.7	313.0	98.52	13:57:17	-19.337	17.202	31.7	313.0	10000
17	13:57:18	-20.325	20.076	37.2	306.0	108.63	14:24:03	-20.330	20.090	37.2	306.0	10000
18	14:24:03	-21.262	22.975	42.9	300.5	108.73	14:50:49	-21.267	22.989	43.0	300.4	10000
19	14:50:49	-22.155	25.908	48.8	295.9	107.94	15:08:14	-22.159	25.923	48.9	295.8	6509

CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-176

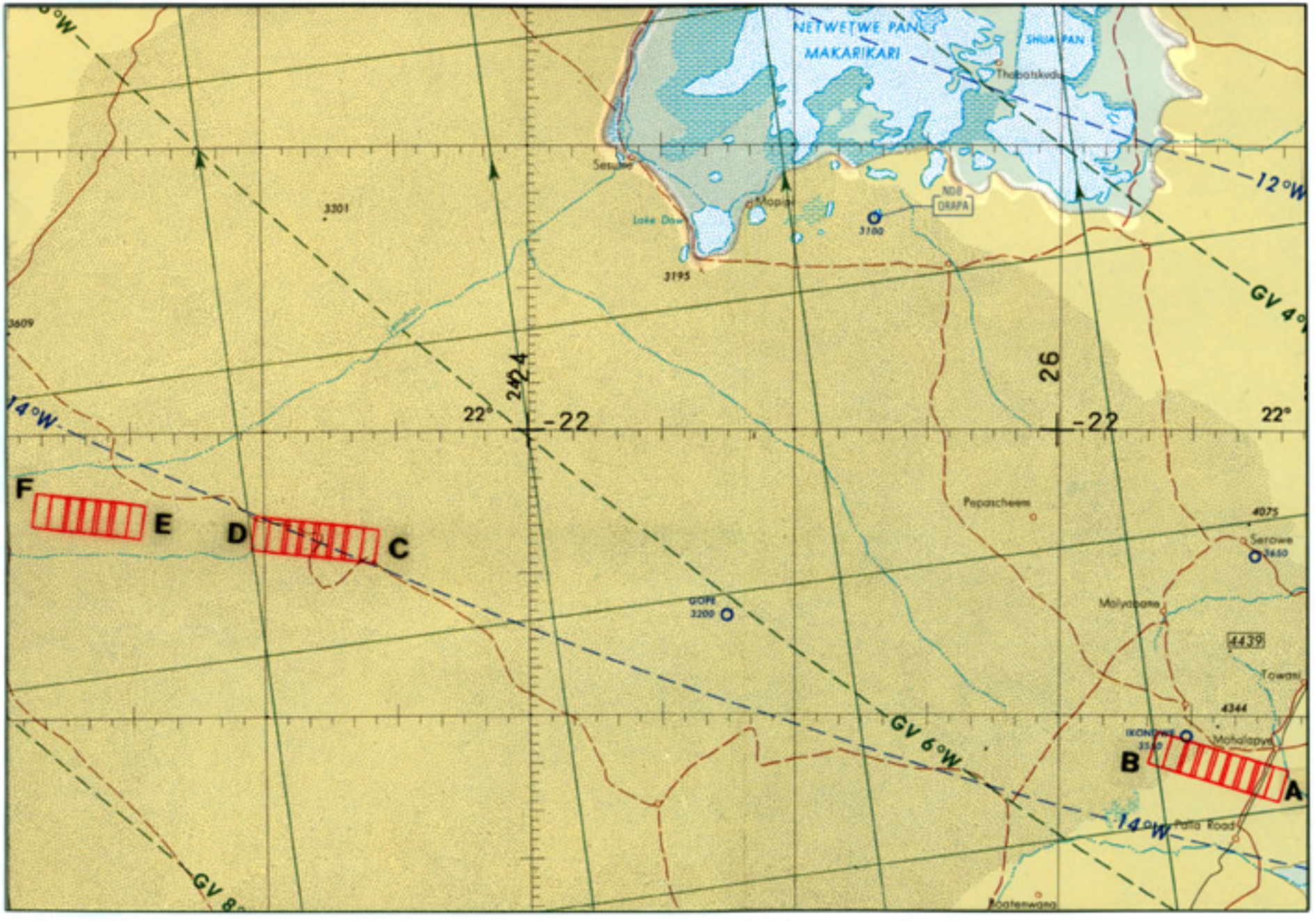
Accession # 05554

Sensor # 034

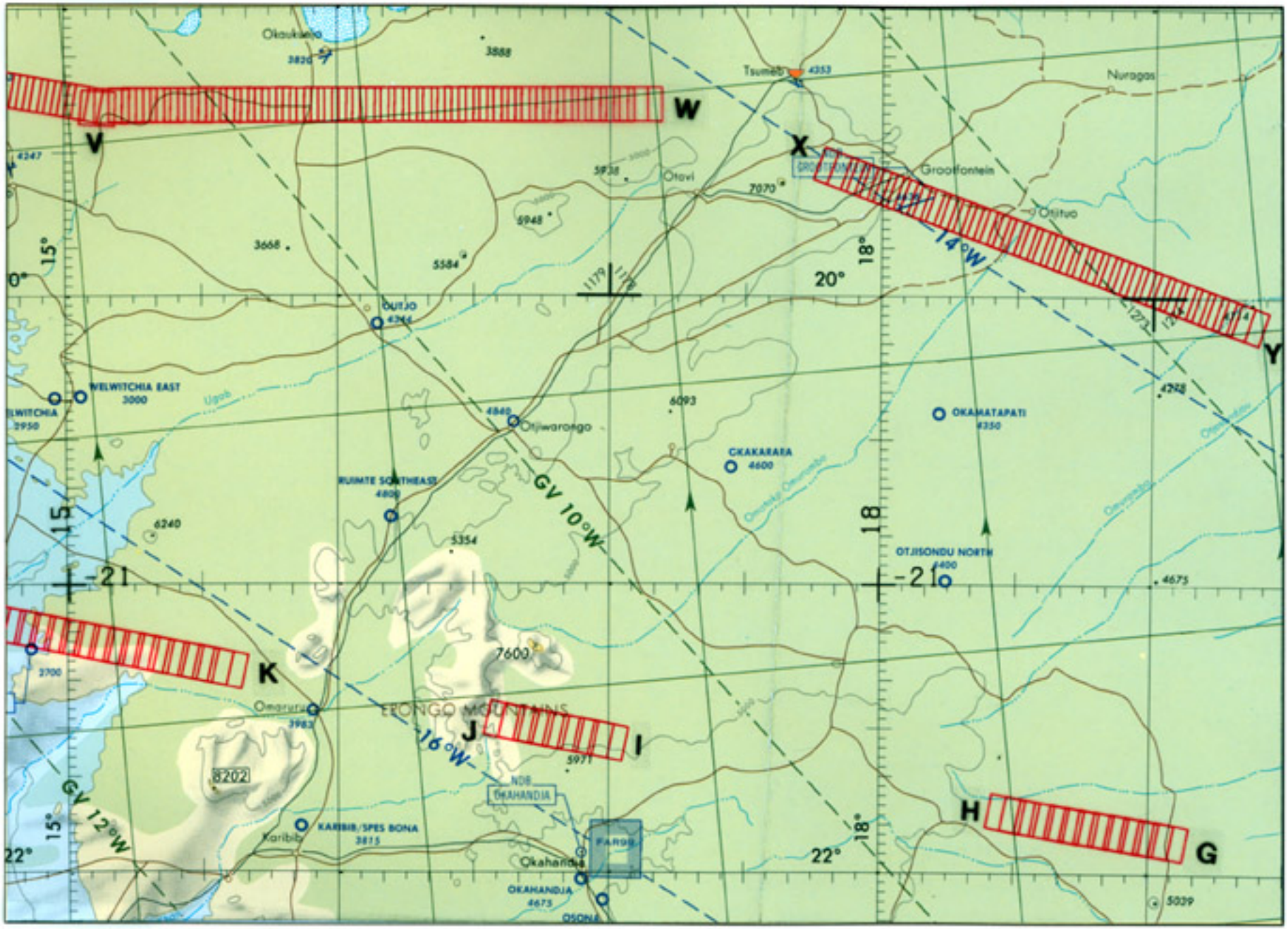
Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
V - W	6259-6297	13:12:40	13:30:03	65200/19880	10-30% cumulus, frames 6259-6265 and 6267-6271; 10-40% cumulus, frames 6275-6286
X - Y	6298-6329	13:36:34	13:50:42	65200/19880	Clear
Date incorrect in camera data block					



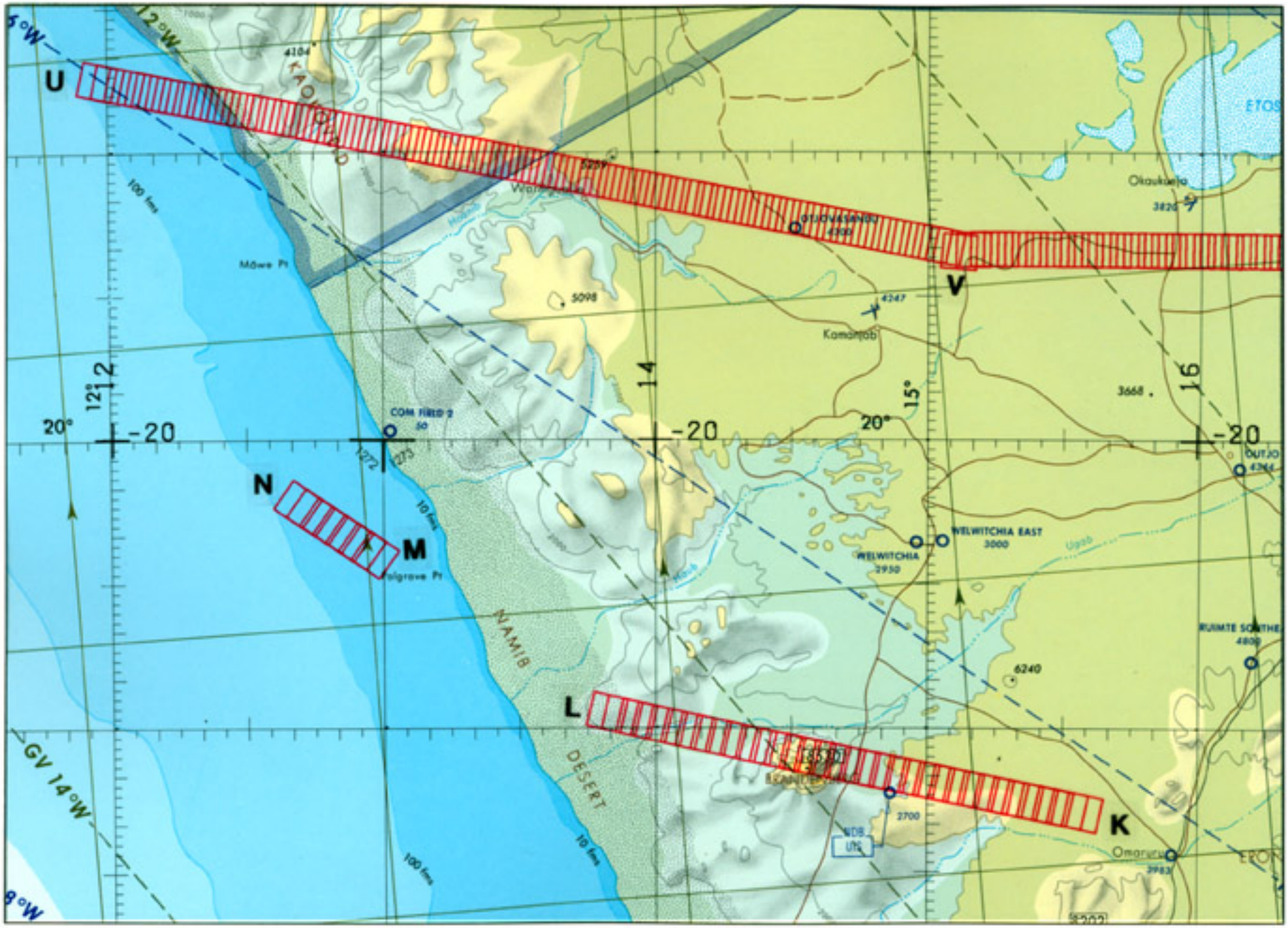
FLIGHT 00-176 14 SEPTEMBER 2000 A/C 809 SAFARI



FLIGHT 00-176 14 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-176 14 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-176 14 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT 00-176 14 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 66

FLIGHT SUMMARY REPORT

Flight Number: 00-177

Calendar/Julian Date: 17 September 2000 • 261

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Solar Spectral Flux Radiometer (SSFR)

Area(s) Covered: Republic of South Africa/Namibia/Botswana

Aircraft #: 809

SENSOR DATA

Accession #:	05555	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	350	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----
Sensor ID #:	131
Sensor Type:	SSFR
Focal Length:	-----
Film Type:	-----
Filtration:	-----
Spectral Band:	-----
f Stop:	-----
Shutter Speed:	-----
# of Frames:	-----
% Overlap:	-----
Quality:	-----
Remarks:	

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 16 Sep 2000
NASA FLIGHT NUMBER 00-177

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	06:58:35	-24.375	29.205	77.6	81.9	192.91	07:07:28	-24.390	29.201	77.5	81.9	3322
2	07:07:57	-25.443	28.930	75.6	80.6	170.16	07:22:08	-25.458	28.933	75.6	80.6	5303
3	07:24:40	-27.130	29.142	72.2	78.1	309.50	07:31:49	-27.121	29.130	72.2	78.1	2674
4	07:32:40	-26.564	28.409	70.4	77.3	262.91	07:49:50	-26.566	28.393	70.3	77.3	6414
5	07:51:05	-26.980	26.215	66.5	74.6	335.53	08:07:46	-26.967	26.208	66.5	74.6	6234
6	08:20:31	-24.179	24.895	59.3	71.9	337.15	08:47:17	-24.165	24.889	59.3	71.9	10000
7	08:47:17	-21.361	23.648	52.6	69.7	338.54	08:49:29	-21.347	23.642	52.5	69.7	823
8	08:52:08	-20.959	23.301	51.4	69.2	1.96	09:13:23	-20.944	23.301	51.4	69.2	7938
9	09:15:10	-18.471	23.735	45.4	67.7	274.47	09:41:57	-18.470	23.719	45.3	67.7	10000
10	09:41:57	-18.391	20.512	39.6	62.8	270.01	09:52:13	-18.391	20.496	39.5	62.7	3838
11	09:56:01	-18.689	19.252	36.9	58.9	92.20	10:11:52	-18.689	19.267	36.9	58.9	5918
12	10:15:34	-18.990	21.008	33.1	53.7	269.39	10:29:26	-18.990	20.992	33.1	53.6	5181
13	10:33:07	-19.288	19.257	30.3	47.2	90.67	10:49:37	-19.288	19.272	30.2	47.2	6165
14	10:49:55	-19.354	21.159	27.5	40.7	143.81	11:16:41	-19.366	21.168	27.5	40.6	10000
15	11:16:41	-21.760	22.928	26.1	25.3	145.47	11:43:28	-21.772	22.937	26.1	25.2	10000
16	11:43:28	-24.165	24.774	26.6	9.3	144.72	11:49:41	-24.177	24.783	26.6	9.2	2323
17	11:49:45	-24.750	25.171	26.9	5.7	151.46	11:52:04	-24.762	25.179	26.9	5.6	863
18	11:52:57	-24.973	25.442	27.2	3.9	82.69	12:19:43	-24.971	25.458	27.2	3.8	10000
19	12:19:43	-24.364	28.524	26.9	349.1	77.87	12:43:52	-24.361	28.539	26.9	349.0	9019

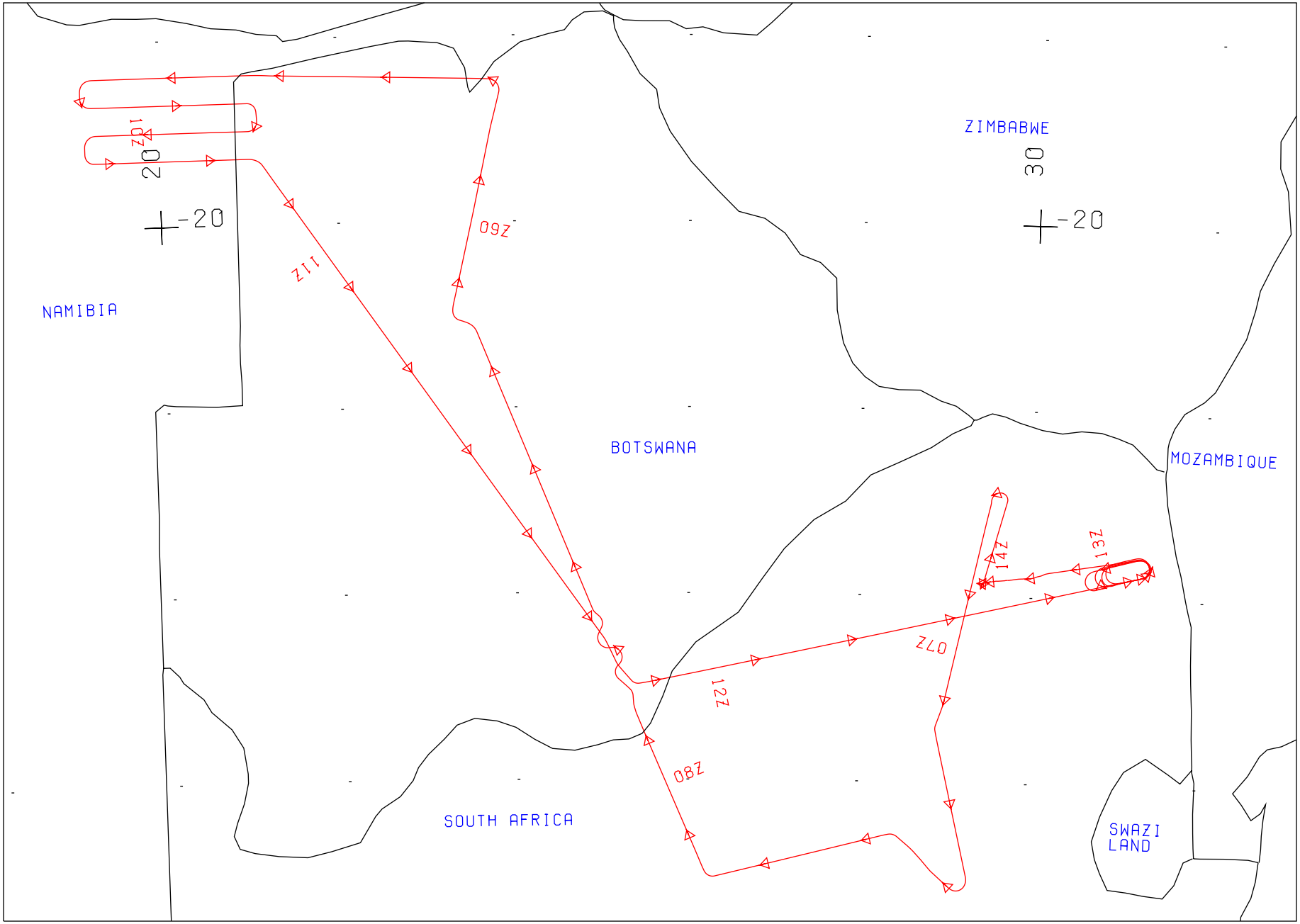
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-177

Accession # 05555

Sensor # 034

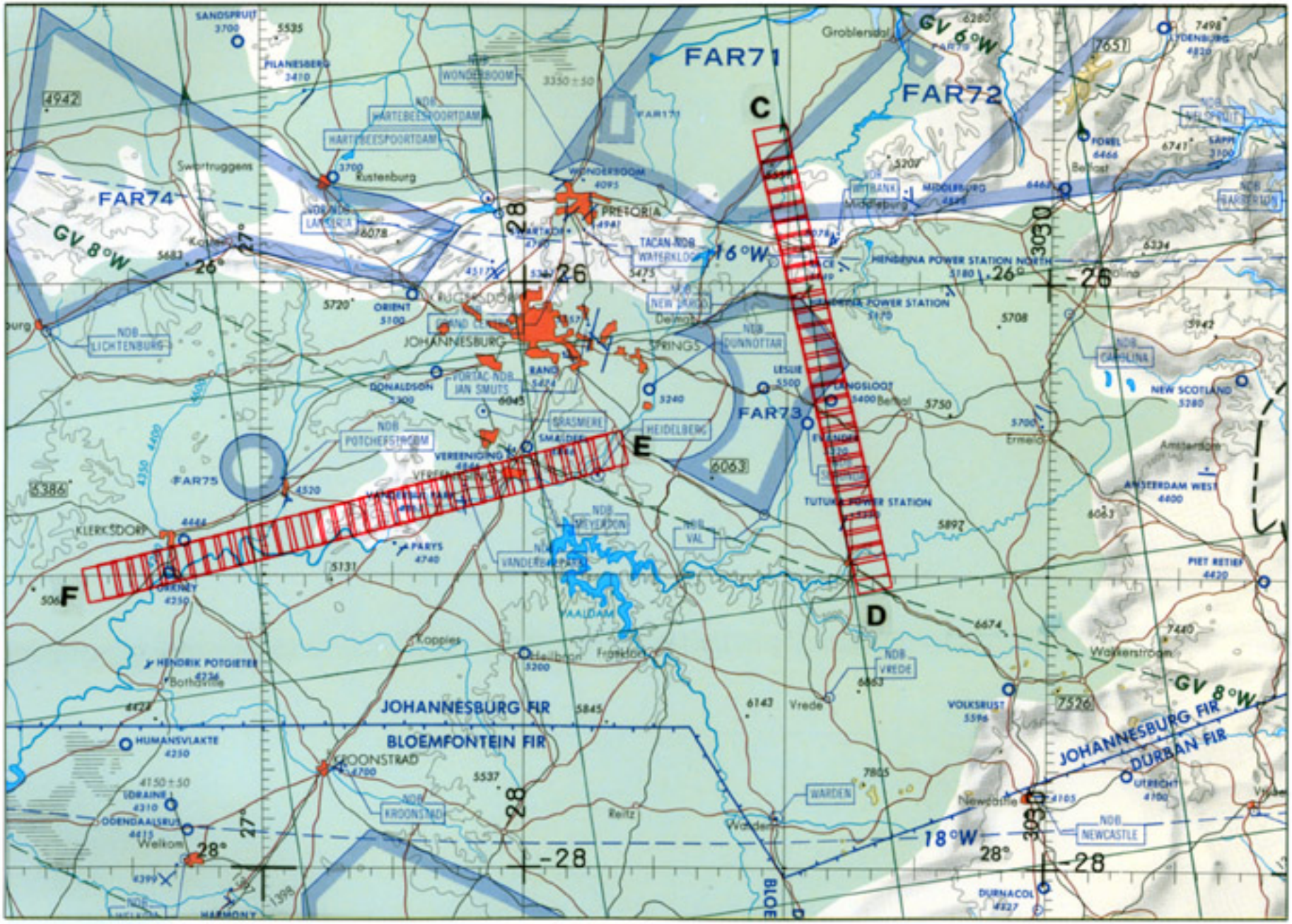
Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	6345-6357	6:55:40	7:01:12	60100/18320	40-100% cumulus
C - D	6358-6387	7:08:40	7:21:59	63700/19420	10-90% cirrus and cumulus
E - F	6388-6423	7:33:26	7:49:29	64200/19570	30-100% cumulus
G - H	6424-6456	8:54:38	9:09:13	65600/20000	Minor-10% cumulus, frames 6424-6431; 20-90% cumulus, frames 6436-6456
I - J	6457-6487	9:38:05	9:51:45	66200/20180	10-30% cumulus, frames 6457-6459
K - L	6488-6521	9:56:32	10:11:38	66600/20300	Clear
M - N	6522-6551	10:15:48	10:29:05	66500/20270	Clear
O - P	6552-6584	10:33:32	10:48:13	66900/20400	Clear
Q - R	6585-6694	11:53:35	12:43:35	65600/20000	10-90% cumulus frames 6613-6652 and 6663-6673; 10-20% cumulus, frames 6656-6661; 10-30% cumulus, frames 6676-6678; 10-50% cumulus, frames 6682-6693

Date incorrect in camera data block

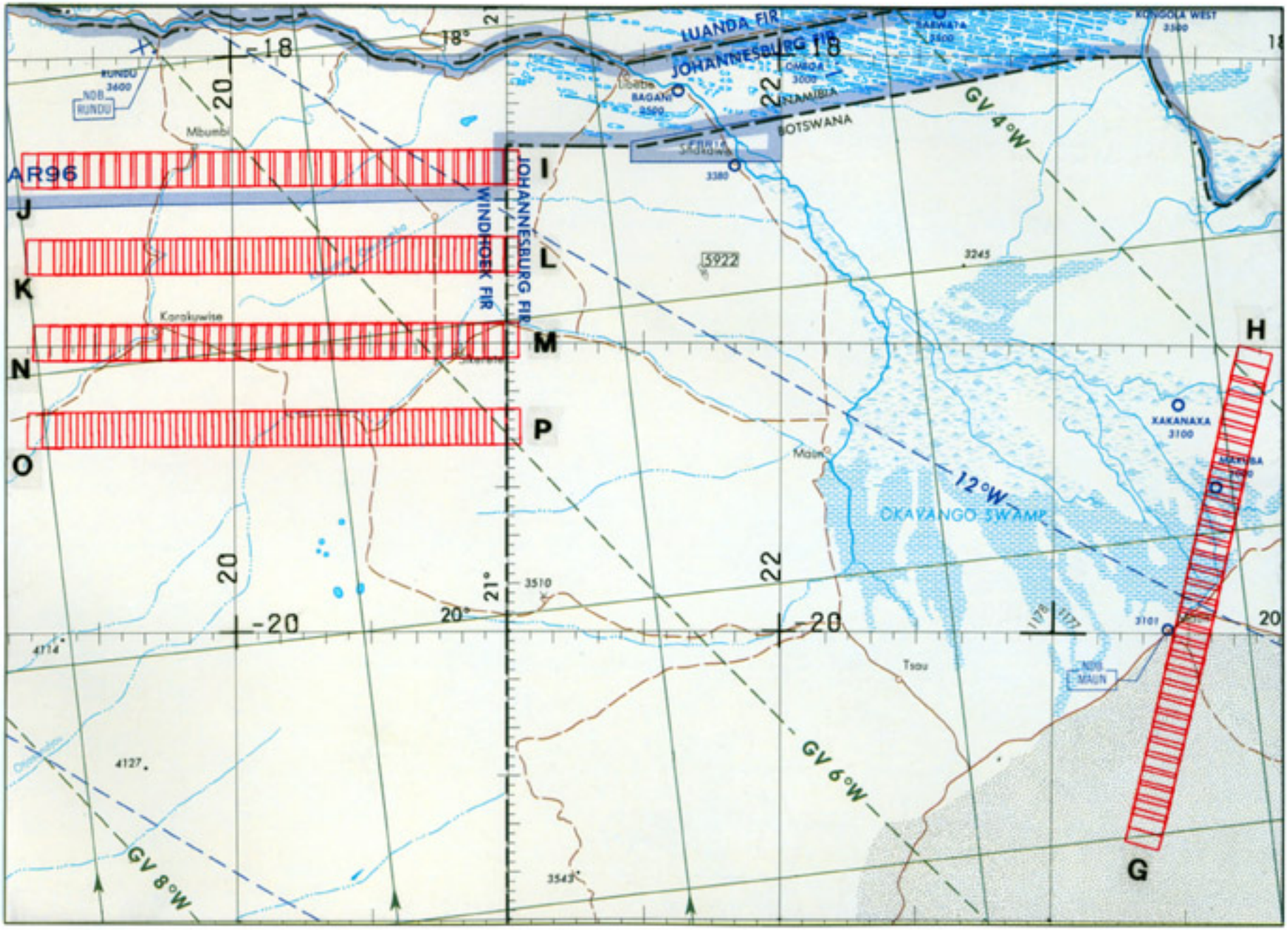


FLIGHT 00-177 17 SEPTEMBER 2000 A/C 809 SAFARI

FLIGHT 00-177　　17 SEPTEMBER 2000　　A/C 809　　RC-10 (CIR)　　JNC 81



FLIGHT 00-177 17 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-177 17 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-178

Calendar/Julian Date: 21 September 2000 • 265

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Solar Spectral Flux Radiometer (SSFR)

Area(s) Covered: Mozambique Channel

Aircraft #: 809

SENSOR DATA

Accession #:	05556	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	57	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----
Sensor ID #:	131
Sensor Type:	SSFR
Focal Length:	-----
Film Type:	-----
Filtration:	-----
Spectral Band:	-----
f Stop:	-----
Shutter Speed:	-----
# of Frames:	-----
% Overlap:	-----
Quality:	-----
Remarks:	

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 21 Sep 2000
NASA FLIGHT NUMBER 00-178

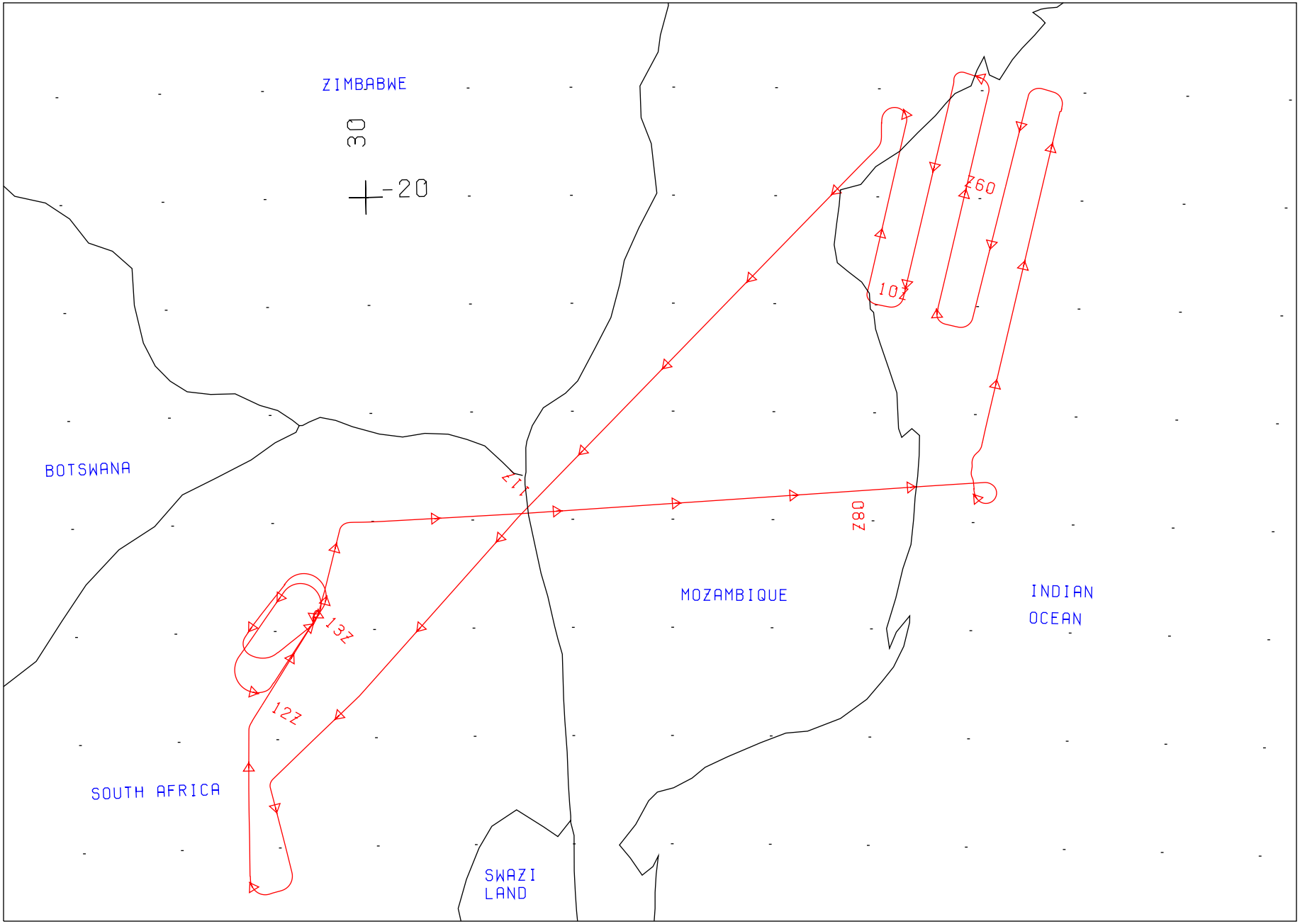
	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:28:47	-22.963	31.096	69.9	80.4	87.79	07:55:33	-22.962	31.112	69.8	80.4	10000
2	07:55:34	-22.767	34.282	63.8	77.4	85.93	08:11:12	-22.766	34.297	63.8	77.4	5841
3	08:19:43	-22.285	36.083	58.2	74.6	13.60	08:46:30	-22.271	36.086	58.2	74.6	10000
4	08:46:30	-19.343	36.738	51.4	73.0	14.29	08:48:33	-19.329	36.741	51.4	73.0	765
5	08:52:20	-19.040	36.463	50.0	72.5	189.89	09:11:10	-19.054	36.460	50.0	72.4	7033
6	09:15:00	-21.059	35.616	45.7	67.1	15.90	09:33:20	-21.044	35.619	45.7	67.1	6848
7	09:37:47	-18.946	35.733	39.9	65.0	190.58	09:56:01	-18.960	35.730	39.9	64.9	6806
8	09:59:50	-20.889	34.923	36.3	57.7	16.10	10:14:05	-20.875	34.926	36.3	57.6	5324
9	10:19:35	-19.526	35.019	31.7	53.9	213.10	10:46:21	-19.539	35.010	31.6	53.9	10000
10	10:46:22	-21.710	32.802	28.5	41.5	224.02	11:13:07	-21.720	32.791	28.5	41.4	10000
11	11:13:08	-23.869	30.594	26.8	26.8	222.51	11:32:05	-23.880	30.583	26.8	26.7	7084
12	11:32:52	-25.442	28.927	26.7	15.2	166.90	11:40:06	-25.456	28.930	26.7	15.1	2704
13	11:45:09	-26.295	28.702	27.0	8.2	358.07	11:57:42	-26.280	28.701	27.0	8.1	4691
14	11:58:05	-24.861	28.736	25.4	1.1	27.13	12:14:02	-24.848	28.744	25.4	1.0	5958
15	12:14:14	-23.663	29.089	24.3	351.3	218.36	12:25:33	-23.675	29.080	24.3	351.2	4229
16	12:26:10	-24.511	28.958	25.8	344.8	38.88	12:40:16	-24.499	28.967	25.8	344.8	5273

CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-178

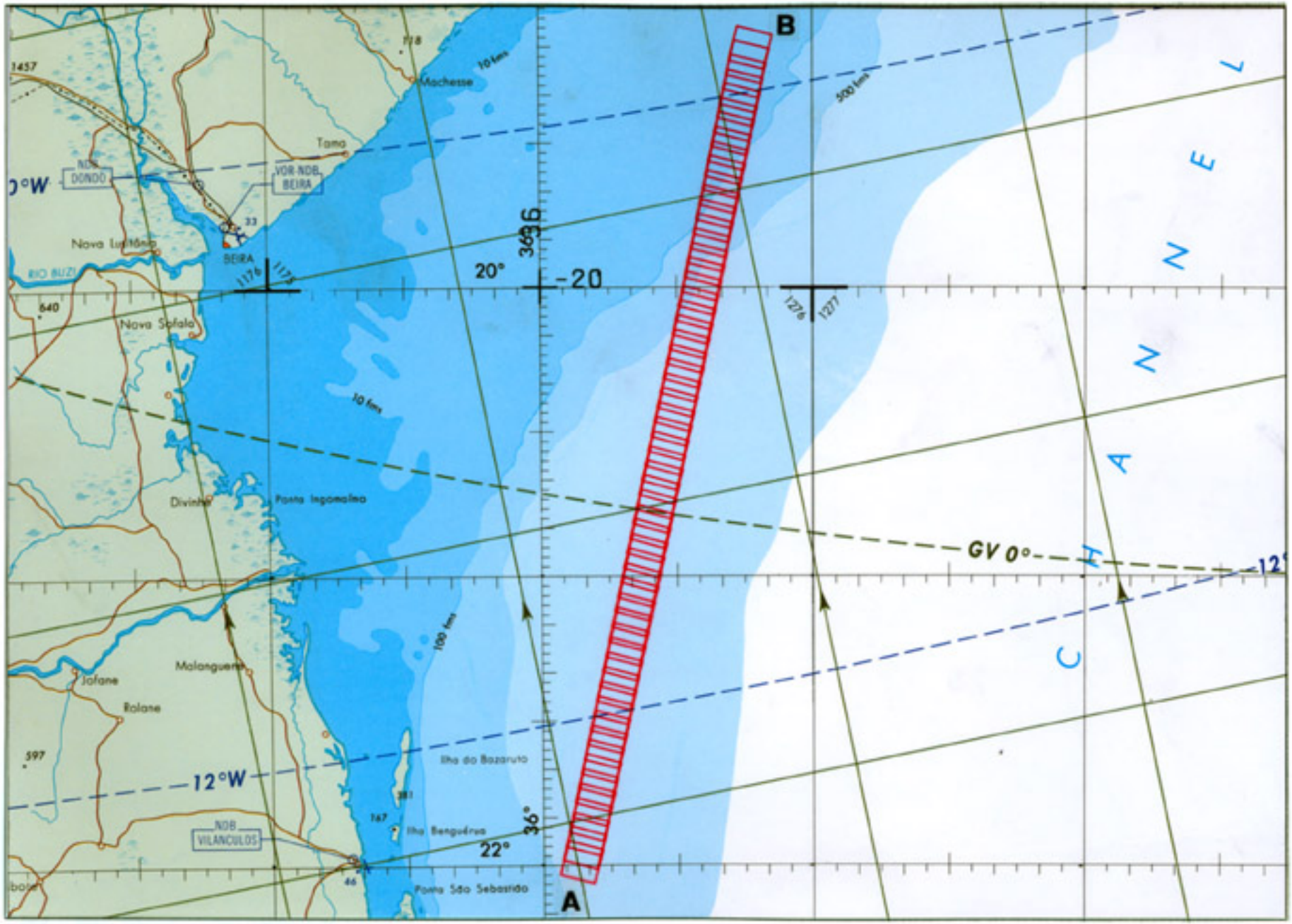
Accession # 05556

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	6711-6767	8:22:26	8:48:06	64200/19570	10-100% cumulus
Date incorrect in camera data block					



FLIGHT 00-178 21 SEPTEMBER 2000 A/C 809 SAFARI



FLIGHT 00-178 21 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number: 00-179

Calendar/Julian Date: 23 September 2000 • 267

Sensor Package: Wild Heerbrugg RC-10
Scanning High Resolution Interferometer Sounder (S-HIS)
MODIS Airborne Simulator (MAS)
Cloud Lidar Scanner (CLS)
Mopitt Airborne Simulator (Mopitt-A)
Solar Spectral Flux Radiometer (SSFR)

Area(s) Covered: Republic of South Africa/Mozambique/Lesotho

Aircraft #: 809

SENSOR DATA

Accession #:	05557	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/300	-----	-----	-----	-----
# of Frames:	141	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----

Remarks:

Accession #:	-----
Sensor ID #:	131
Sensor Type:	SSFR
Focal Length:	-----
Film Type:	-----
Filtration:	-----
Spectral Band:	-----
f Stop:	-----
Shutter Speed:	-----
# of Frames:	-----
% Overlap:	-----
Quality:	-----
Remarks:	

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 23 Sep 2000
NASA FLIGHT NUMBER 00-179

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:57:12	-24.638	30.350	63.5	77.0	94.11	08:15:19	-24.639	30.366	63.5	77.0	6764
2	08:19:27	-25.234	32.563	58.7	73.8	274.58	08:35:24	-25.232	32.546	58.7	73.8	5961
3	08:40:15	-24.899	30.358	54.2	70.7	108.26	08:57:31	-24.903	30.372	54.2	70.7	6445
4	08:59:20	-25.496	32.455	50.3	67.2	201.67	09:17:25	-25.510	32.448	50.3	67.1	6751
5	09:17:30	-27.302	31.318	47.4	62.2	214.53	09:44:17	-27.313	31.308	47.3	62.2	10000
6	09:44:17	-29.475	28.879	43.5	54.2	224.41	09:46:30	-29.486	28.867	43.5	54.2	827
7	09:48:42	-29.575	28.467	42.8	52.9	7.86	09:56:07	-29.560	28.469	42.8	52.8	2768
8	09:56:11	-28.710	28.487	41.0	51.7	342.17	10:01:29	-28.696	28.481	40.9	51.6	1977
9	10:02:32	-28.048	28.164	39.4	50.6	280.40	10:05:53	-28.046	28.146	39.4	50.5	1253
10	10:06:06	-27.988	27.696	38.8	49.6	290.60	10:19:16	-27.982	27.680	38.7	49.5	4921
11	10:21:26	-27.070	26.185	35.8	45.4	78.77	10:40:29	-27.066	26.200	35.8	45.4	7116
12	10:41:43	-26.592	28.560	32.4	38.7	137.72	10:49:31	-26.602	28.570	32.4	38.6	2911
13	10:51:40	-27.127	29.359	31.4	34.3	356.65	11:11:58	-27.112	29.357	31.4	34.3	7583
14	11:13:18	-24.683	28.813	27.0	26.5	54.87	11:36:12	-24.674	28.826	26.9	26.4	8556

CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-179

Accession # 05557

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	6772-6803	8:20:57	8:35:09	64100/19540	40-90% cumulus; processing residue, frames 6794-6795
C - D	6804-6817	9:49:22	9:55:17	65400/19940	10-40% cumulus; emulsion holes, frame 6809
E - F	6818-6822	9:59:12	10:01:02	65800/20060	30-40% cumulus
G - H	6823-6861	10:23:01	10:40:26	66400/20240	40-90% cumulus
I - J	6862-6903	10:52:55	11:11:45	66800/20370	10-90% cumulus; processing residue, frames 6870-6871
K - L	6904-6912	11:29:05	11:32:44	63600/19390	50-70% cumulus

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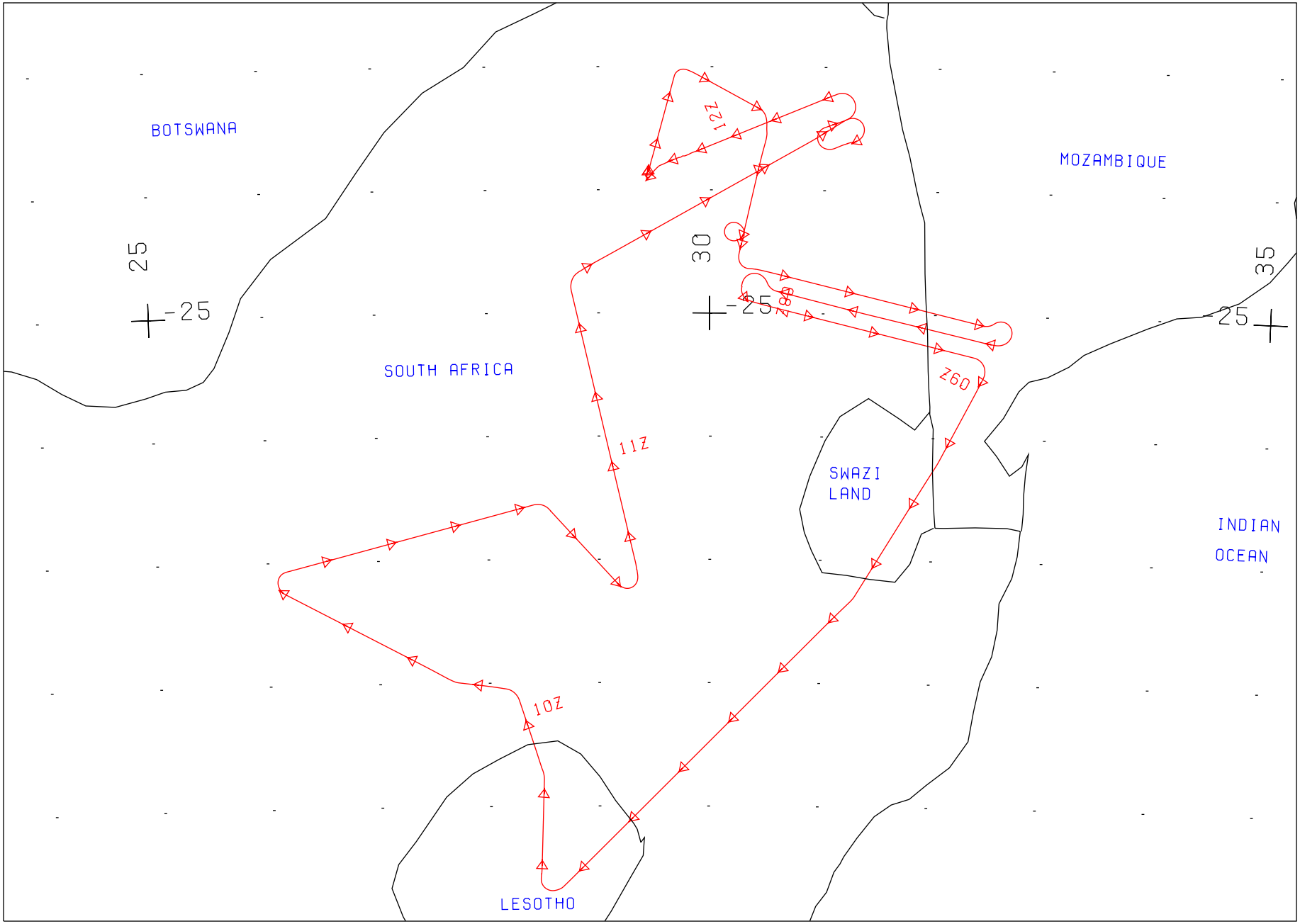
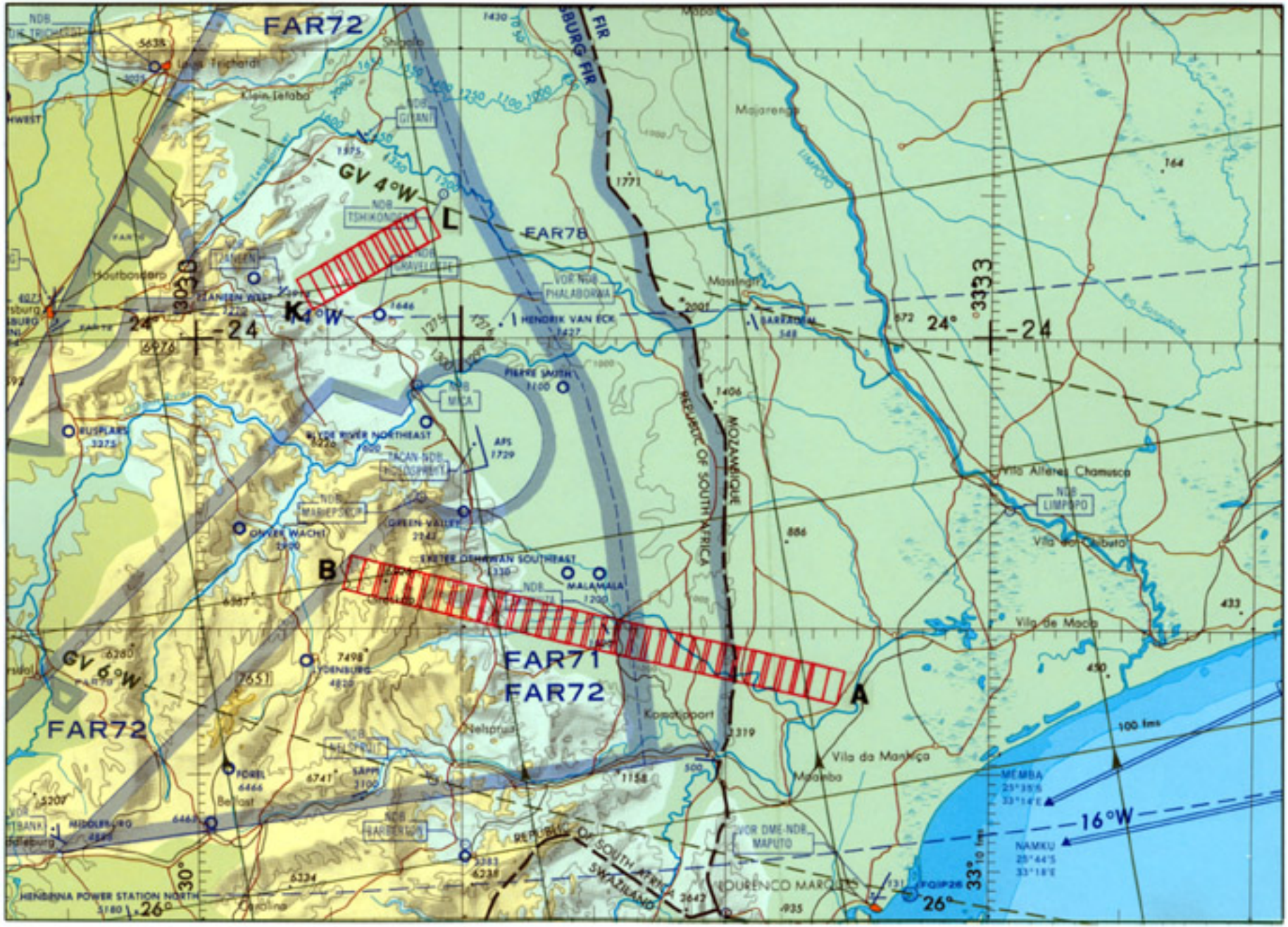
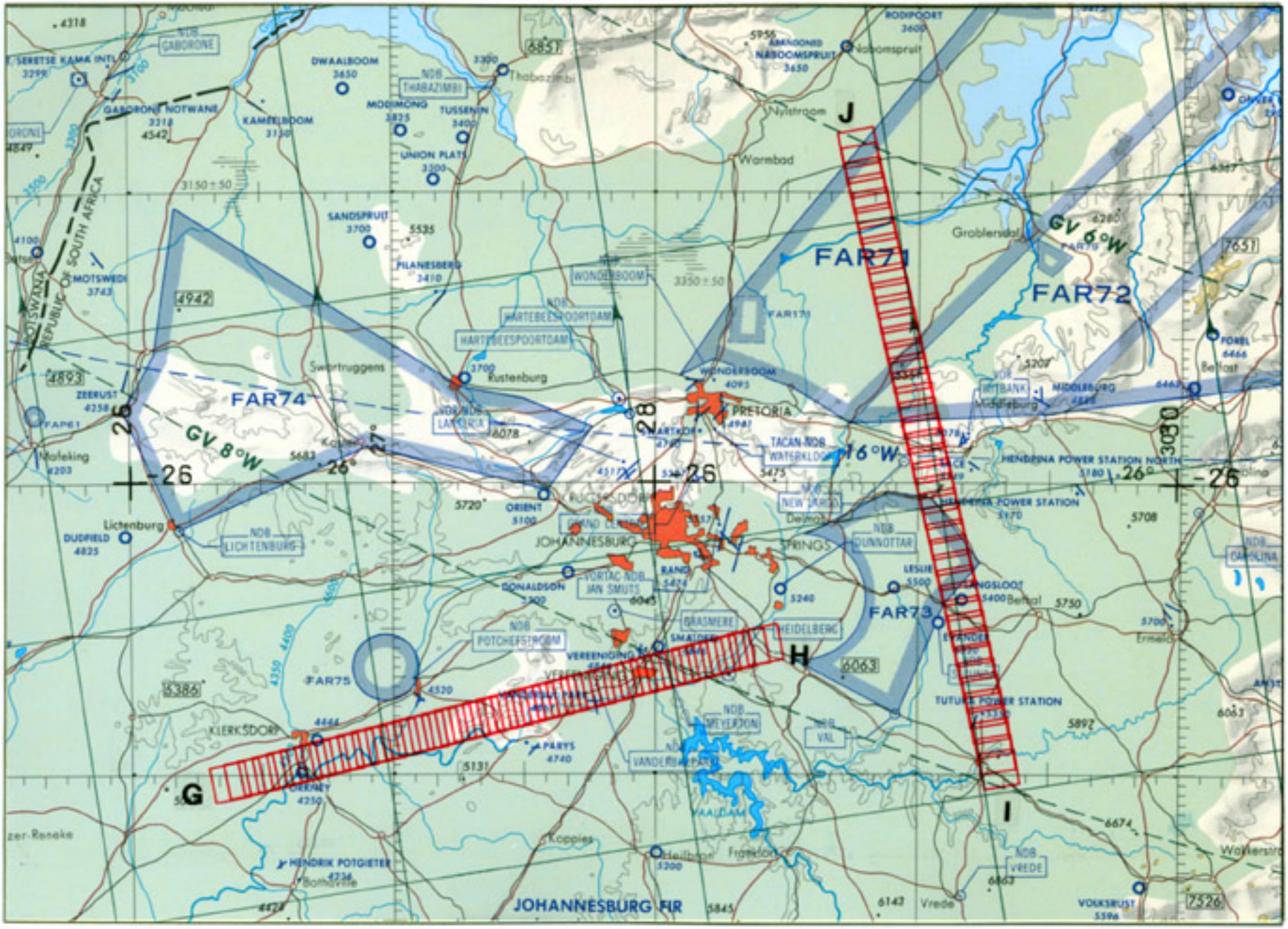


FLIGHT 00-179 23 SEPTEMBER 2000 A/C 809 SAFARI



FLIGHT 00-179 23 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT 00-179 23 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-179 23 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81

FLIGHT SUMMARY REPORT

Flight Number:	00-180
Calendar/Julian Date:	25 September 2000 • 269
Sensor Package:	Wild Heerbrugg RC-10 Scanning High Resolution Interferometer Sounder (S-HIS) MODIS Airborne Simulator (MAS) Cloud Lidar Scanner (CLS) Mopitt Airborne Simulator (Mopitt-A) Solar Spectral Flux Radiometer (SSFR)
Area(s) Covered:	Republic of South Africa/Mozambique/Malawi
Aircraft #:	809

SENSOR DATA

Accession #:	05558	-----	-----	-----	-----
Sensor ID #:	034	108	083	113	129
Sensor Type:	RC-10	MAS	S-HIS	CLS	Mopitt
Focal Length:	12” 304.66 mm	-----	-----	-----	-----
Film Type:	Aerochrome IR SO-134	-----	-----	-----	-----
Filtration:	Wratten 12	-----	-----	-----	-----
Spectral Band:	510-900nm	-----	-----	-----	-----
f Stop:	11	-----	-----	-----	-----
Shutter Speed:	1/350	-----	-----	-----	-----
# of Frames:	237	-----	-----	-----	-----
% Overlap:	60	-----	-----	-----	-----
Quality:	Excellent	-----	-----	-----	-----
Remarks:					

Accession #:	-----
Sensor ID #:	131
Sensor Type:	SSFR
Focal Length:	-----
Film Type:	-----
Filtration:	-----
Spectral Band:	-----
f Stop:	-----
Shutter Speed:	-----
# of Frames:	-----
% Overlap:	-----
Quality:	-----
Remarks:	

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 25 Sep 2000
NASA FLIGHT NUMBER 00-180

	START OF FLIGHT LINE						END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN	SOLAR AZIM	SCAN LINES
1	07:29:08	-22.648	31.690	69.1	82.0	79.58	07:48:01	-22.645	31.705	69.1	82.0	7051
2	07:48:54	-22.227	33.918	64.5	80.0	27.76	08:15:40	-22.214	33.923	64.5	80.0	10000
3	08:15:40	-19.354	34.578	57.8	78.6	15.71	08:42:26	-19.341	34.582	57.8	78.6	10000
4	08:42:27	-16.517	35.209	51.0	77.5	13.72	09:09:13	-16.503	35.212	51.0	77.5	10000
5	09:09:13	-13.639	35.825	44.1	77.1	13.77	09:14:13	-13.625	35.827	44.0	77.1	1868
6	09:15:02	-13.023	35.994	42.6	76.9	64.35	09:41:48	-13.016	36.007	42.5	76.9	10000
7	09:41:48	-12.290	38.854	36.1	74.3	75.96	09:58:35	-12.287	38.869	36.0	74.3	6268
8	10:00:00	-11.884	40.795	31.7	72.2	162.07	10:26:46	-11.898	40.799	31.6	72.2	10000
9	10:27:47	-14.864	41.064	26.8	61.2	175.26	10:54:33	-14.878	41.065	26.8	61.1	10000
10	10:54:33	-17.631	39.543	23.0	46.1	208.69	11:21:19	-17.644	39.535	23.0	46.0	10000
11	11:21:19	-20.249	37.989	21.3	27.5	208.23	11:48:04	-20.262	37.981	21.3	27.4	10000
12	11:48:05	-22.876	36.352	21.9	8.0	209.61	12:07:35	-22.889	36.344	21.9	7.9	7290
13	12:09:57	-25.001	34.935	23.9	353.8	229.64	12:29:18	-25.011	34.922	23.9	353.8	7230
14	12:33:19	-26.150	32.361	26.3	340.9	358.85	12:42:43	-26.136	32.360	26.3	340.8	3513
15	12:44:06	-25.017	32.354	26.0	334.2	270.79	13:10:52	-25.017	32.336	26.0	334.1	10000
16	13:12:50	-24.736	28.745	29.5	320.6	162.03	13:10:52	-24.750	28.750	29.5	320.5	7928
17	13:36:28	-27.112	29.131	34.7	314.2	311.73	13:43:46	-27.102	29.118	34.7	314.1	2723
18	13:44:51	-26.533	28.278	35.7	310.8	249.67	14:00:13	-26.538	28.262	35.7	310.7	5741
19	14:02:04	-26.892	26.278	39.0	306.3	41.37	14:05:38	-26.880	26.288	39.1	306.3	1332
20	14:05:42	-26.576	26.569	39.5	305.0	45.55	14:21:10	-26.566	26.580	39.5	305.0	5777

CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-180

Accession # 05558

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
A - B	6925-6936	7:38:26	7:43:30	63400/19330	Clear
C - D	6937-6953	8:02:24	8:09:44	64400/19630	Minor-20% cumulus, frames 6951-6953; emulsion hole frame 6948
E - F	6954-6990	8:30:52	8:47:23	64800/19760	Smoke, frames 6956-6957, 6964-6965, 6974-6975; 10-40% cumulus, frames 6982-6989; frame 6958 oblique
G - H	6991-6999	9:55:33	9:59:11	65500/19970	30-80% cumulus; frames 6998-6999 oblique
I - J	7000-7013	12:01:10	12:07:05	65100/19850	10% cumulus, frames 7005-7007
K - L	7014-7025	12:24:09	12:29:10	65000/19820	Clear
M - N	7026-7045	12:33:55	12:42:37	65100/19850	Clear
N - O	7046-7066	12:44:13	12:53:24	65300/19910	Minor cumulus, frames 7050-7051; substantial smoke, frames 7059-7063; 10-20 % cumulus, frames 7064-7066
P - Q	7067-7112	13:13:06	13:33:45	65300/19910	10-20% cumulus, frames 7067-7071 and 7073-7080; 10-40% cumulus, frames 7082-7106

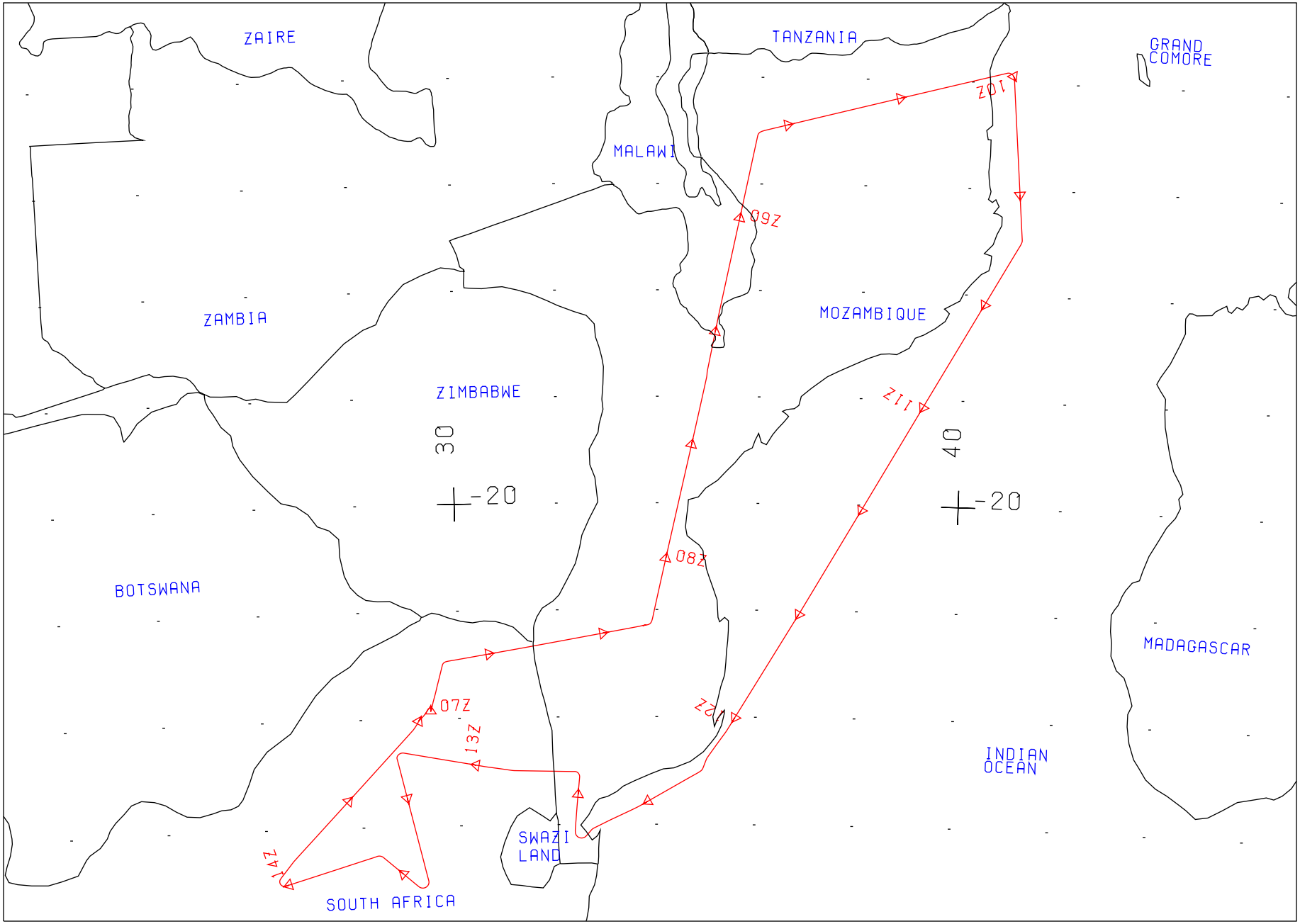
CAMERA FLIGHT LINE DATA
FLIGHT NO. 00-180

Accession # 05558

Sensor # 034

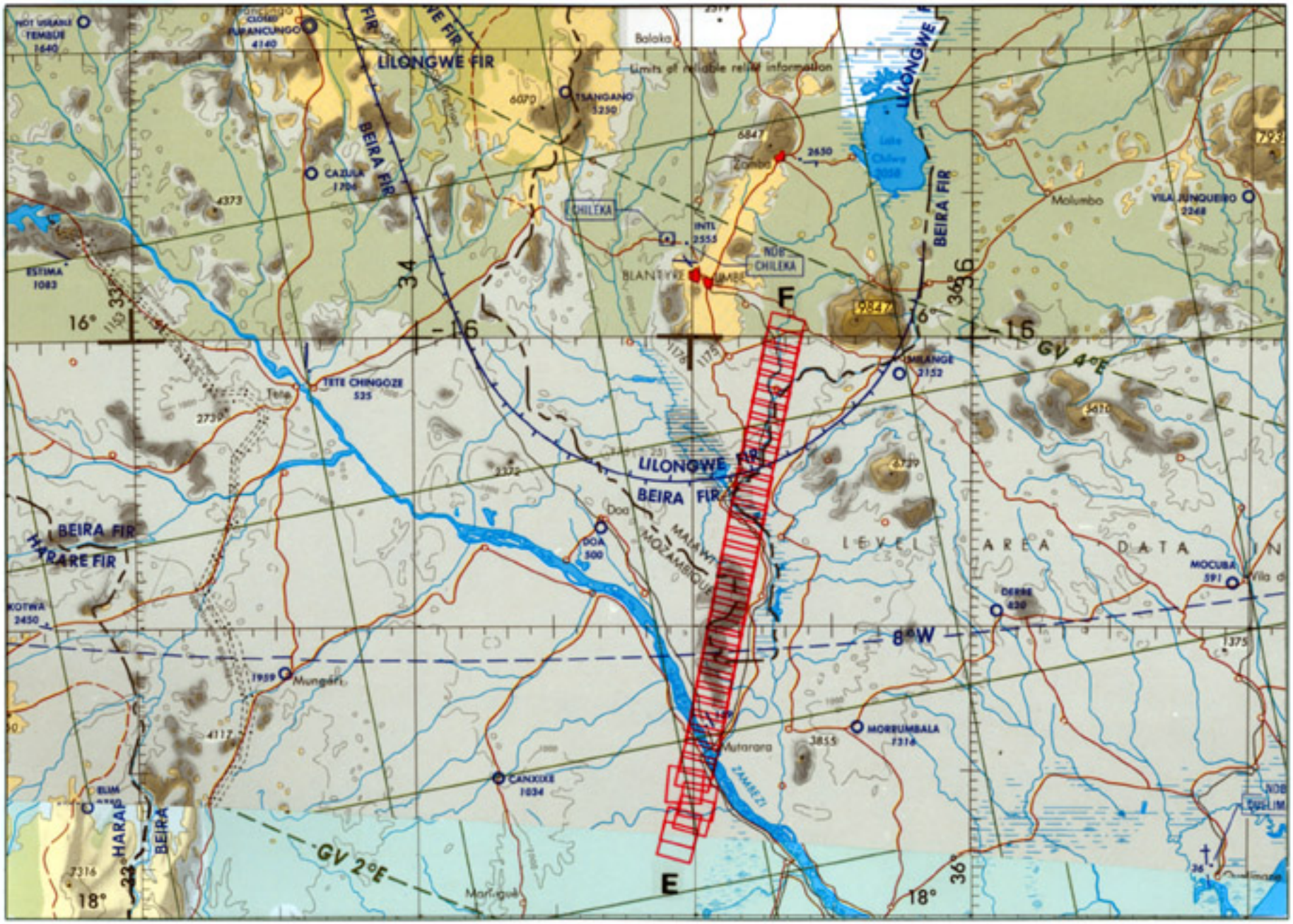
Check Points	Frame Numbers	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MSL feet/meters	Cloud Cover/Remarks
R - S	7113-7128	13:36:37	13:43:31	65000/19820	10% cumulus, frames 7113-7115; smoke, frames 7116-7118; minor-10% cumulus, frames 7123-7128; processing residue, frame 7117
S - T	7129-7161	13:45:22	14:00:06	65300/19910	Minor-30% cumulus, frames 7129-7143

Date incorrect in camera data block

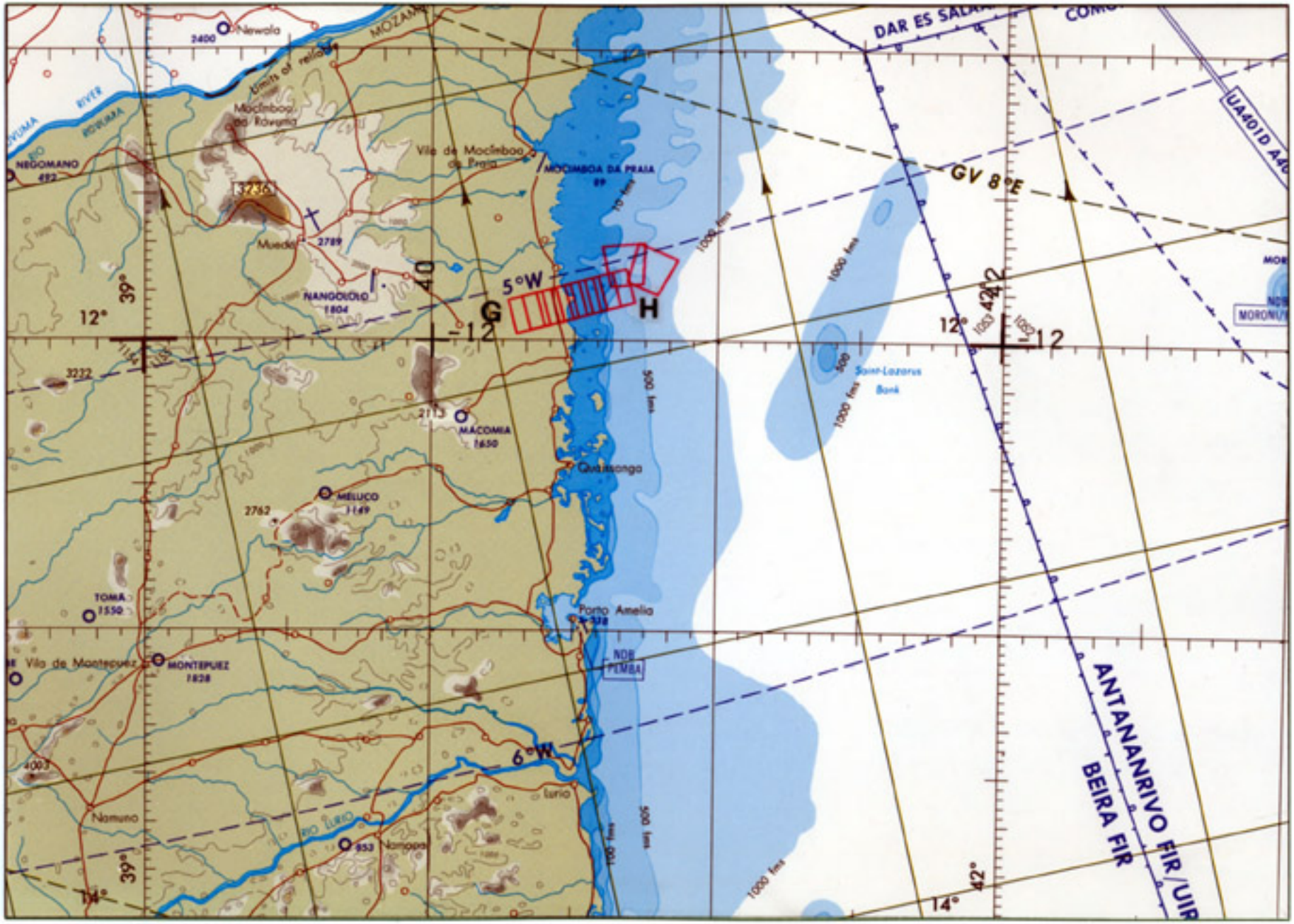


FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 SAFARI

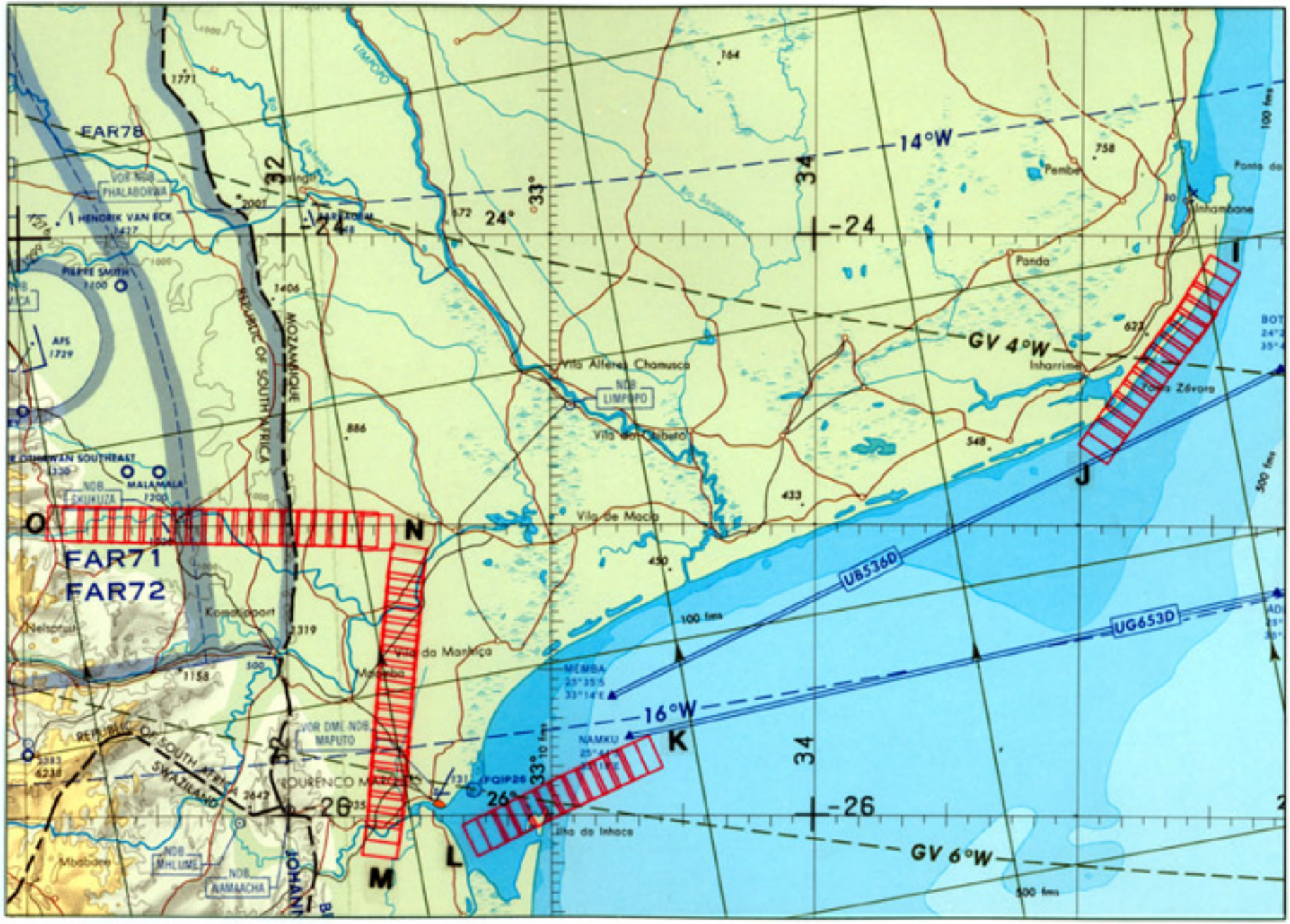
FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



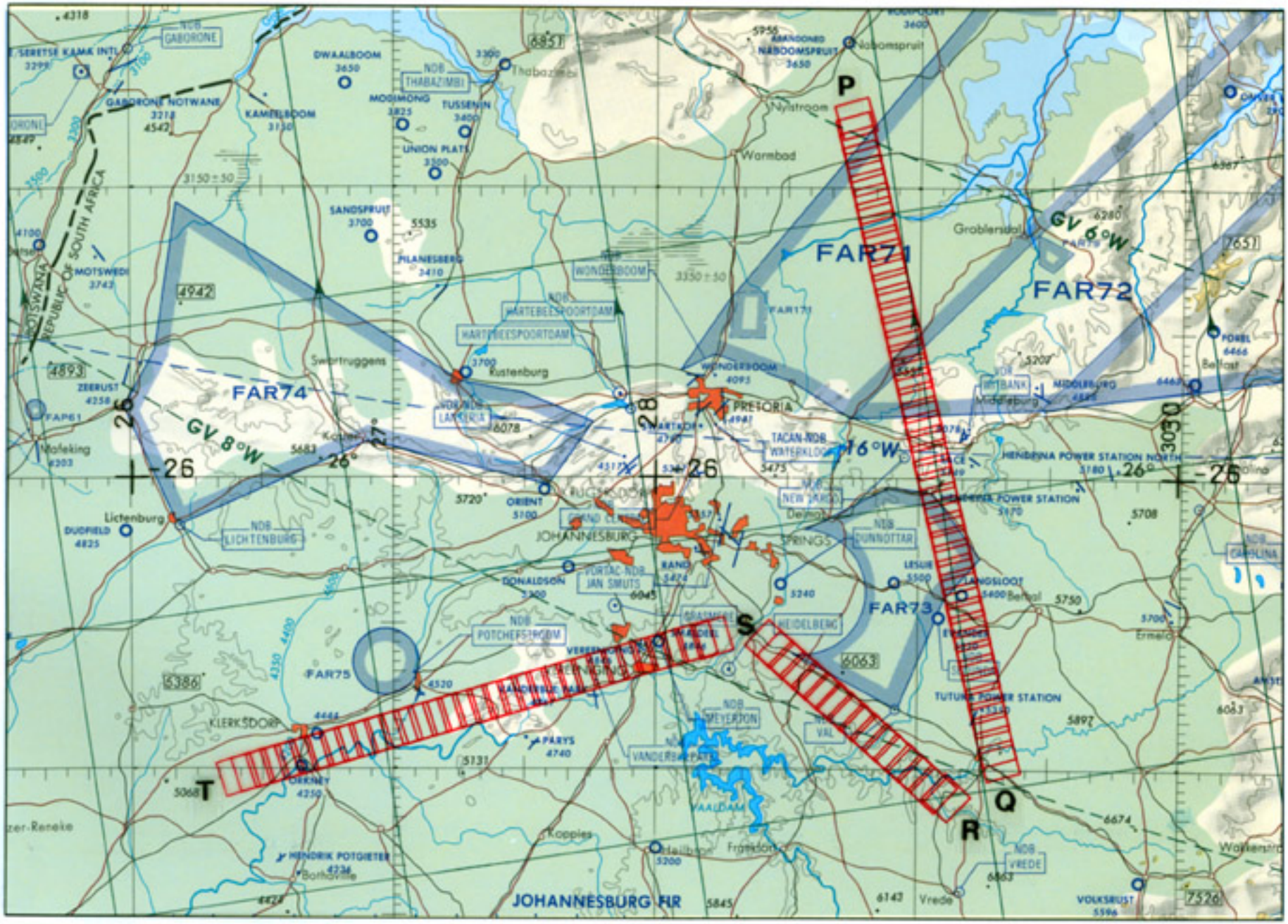
FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 67



FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 67



FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81



FLIGHT 00-180 25 SEPTEMBER 2000 A/C 809 RC-10 (CIR) JNC 81