

FLIGHT SUMMARY REPORT

Flight #: 92-159
Date: 19 September 1992
Sensor Package: Dual Wild-Heerbrug RC-10
Dual Hycon HR-732
Thematic Mapper Simulator (TMS)

Area(s) Covered: Hawaiian Islands

Investigator(s): Masumoto, State of Hawaii

Aircraft #: 708

Flight Request: 2XZ2040

Julian Date: 263

SENSOR DATA

Accession #:	04463	04464	04465
Sensor ID #:	034	026	038
Sensor Type:	RC-10	RC-10	HR-732
Focal Length:	12" 304.66 mm	12" 304.97 mm	24" 609.6 mm
Film Type:	High Definition Aerochrome IR SO-131	Aerial Color SO-242	High Definition Aerochrome IR SO-131
Filtration:	cc.10B	None	cc.30B
Spectral Band:	510-900 nm	400-700 nm	510-900 nm
f Stop:	4	4	8
Shutter Speed:	1/150	1/200	1/75
# of Frames:	67	65	131
% Overlap:	60	60	60
Quality:	Excellent	Excellent	Excellent
Remarks:	24.83 sec. off- set between clock and nav data		

SENSOR DATA continued

Accession #:	4466	-----
Sensor ID #:	039	101
Sensor Type:	HR-732	TMS
Focal Length:	24" 609.6 mm	-----
Film Type:	High Definition Aerial Film 3414	-----
Filtration:	Wratten-12	-----
Spectral Band:	510-700 nm	-----
f Stop:	8	-----
Shutter Speed:	1/75	-----
# of Frames:	101	-----
% Overlap:	60	-----
Quality:	Excellent	Excellent
Remarks:		

Hurricane Iniki

On September 11, 1992 Hurricane Iniki swept through the Hawaiian Islands causing extensive damage to residential and commercial structures, agricultural crops, and natural vegetation. In response to this disaster, NASA deployed a high altitude ER-2 aircraft to Barbers Point NAS on the island of Oahu. From that operational base the ER-2 flew nine missions from September 16 to October 1 for purposes of acquiring high resolution photography and digital imaging of the devastated areas. These disaster assessment flights are summarized in this volume.

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 and camera system(s) 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, μm</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)

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.

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-Heerbrug 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: (415) 604-6252).

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-159**

Accession # 04463

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	6548-6555	19:25:00	19:28:22	57000/17300	Minor-80% cumulus and strato-cumulus
C - D	6556-6563	19:33:23	19:36:45	61000/18600	Minor-60% cumulus
E - F	6564-6568	19:41:02	19:42:57	62000/18900	Minor scattered cumulus (frames 6566-6568)
G - H	6569-6576	19:49:39	19:53:00	60000/18300	10-60% cumulus and strato-cumulus
I - J	6577-6584	19:56:59	20:00:20	"	Minor-30% scattered cumulus
K - L	6585-6590	20:06:47	20:09:09	"	Minor-20% scattered cumulus
A - B	6591-6598	20:22:23	20:25:42	"	20-70% cumulus and strato-cumulus
M - N	6599-6607	20:43:02	20:46:48	"	10-30% scattered cumulus
O - P	6608-6614	20:51:18	20:54:08	"	10-60% scattered-cumulus; minor processing scratch (frame 6614)

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-159**

Accession # 04464

Sensor # 026

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	1881-1888	19:24:36	19:28:01	57000/17300	Minor-80% cumulus and strato-cumulus
C - D	1889-1896	19:32:59	19:36:23	61000/18600	Minor-60% cumulus
E - F	1897-1901	19:40:38	19:42:35	62000/18900	Minor scattered cumulus (frames 1899-1901)
G - H	1902-1909	19:49:15	19:52:38	60000/18300	10-60% cumulus and strato-cumulus
I - J	1910-1916	19:56:35	19:59:29	"	Minor-30% scattered cumulus
K - L	1917-1922	20:06:22	20:08:46	"	Minor-20% scattered cumulus
A - B	1923-1929	20:21:59	20:24:50	"	20-70% cumulus and strato-cumulus
M - N	1930-1938	20:42:37	20:46:23	"	10-30% scattered cumulus
O - P	1939-1945	20:50:54	20:53:43	"	10-60% scattered-cumulus

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-159**

Accession # 04465

Sensor # 038

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0016	19:24:41	19:28:10	57000/17300	Minor-90% cumulus and strato-cumulus
C - D	0017-0032	19:33:05	19:36:33	61000/18600	Minor-60% cumulus
E - F	0033-0042	19:40:44	19:42:48	62000/18900	Minor scattered cumulus (frames 0037-0042)
G - H	0043-0058	19:49:21	19:52:46	60000/18300	10-60% cumulus and strato-cumulus
I - J	0059-0073	19:56:41	19:59:52	"	Minor-30% cumulus; minor emulsion abrasion (frames 0067-0068)
K - L	0074-0085	20:06:28	20:08:57	"	Minor-20% scattered cumulus (frames 0075-0084)
A - B	0086-0101	20:22:05	20:25:28	"	10-90% cumulus and strato-cumulus
M - N	0102-0117	20:42:43	20:46:05	"	10-40% scattered cumulus; minor emulsion abrasion (frame 0111)
O - P	0118-0131	20:51:00	20:53:55	"	Minor-80% scattered-cumulus

CAMERA FLIGHT LINE DATA
FLIGHT NO. 92-159

Accession # 04466

Sensor # 039

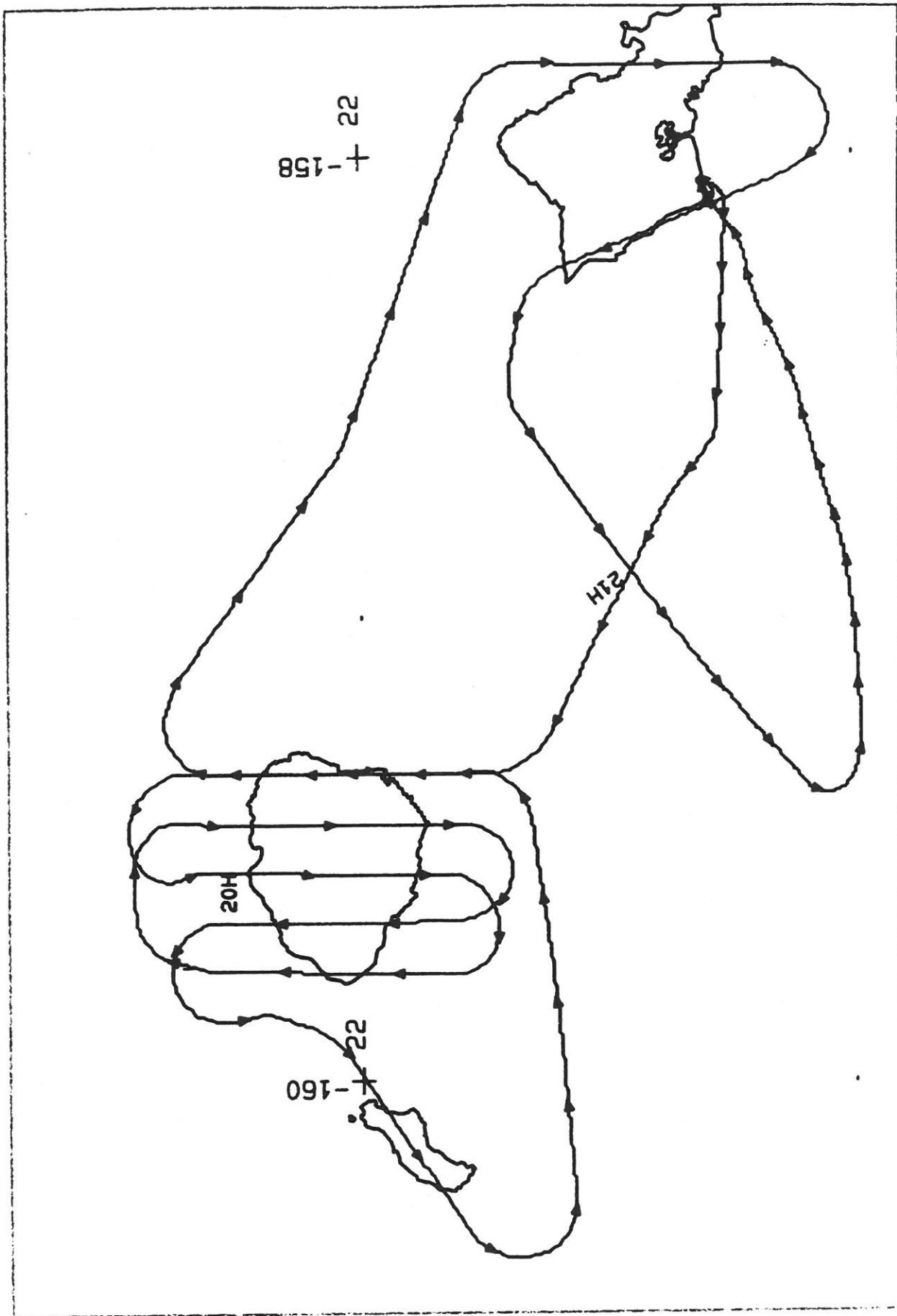
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		START	END		
A - B	0001-0016	19:24:42	19:28:11	57000/17300	Minor-90% cumulus and strato-cumulus
C - D	0017-0032	19:33:06	19:36:34	61000/18600	Minor-60% cumulus
E - F	0033-0042	19:40:45	19:42:48	62000/18900	Minor scattered cumulus (frames 0037-0042)
G - H	0043-0058	19:49:20	19:52:47	60000/18300	10-60% cumulus and strato-cumulus
I - J	0059-0073	19:56:42	19:59:53	"	Minor-30% cumulus
K - L	0074-0085	20:06:28	20:08:58	"	Minor-20% scattered cumulus (frames 0075-0084)
A - B	0086-0101	20:22:05	20:25:28	"	10-90% cumulus and strato-cumulus

TMS SCANNER FLIGHT LINE DATA

FLIGHT NO. 92-159

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 92-159

Check Points	A c t u a l t i m e b e g i n e n d	A c t u a l s c a n l i n e b e g i n e n d	A l t i t u d e f e e t / m e t e r	Scan S p e e d (r p s)	t o t a l G o o d s c a n l i n e s	t o t a l I n t e r p o l a t e d s c a n l i n e s	t o t a l R e p e a t e d s c a n l i n e s
A-B	19:24:4.0 19:28:53.0	21835 25451	57000/17373	12.50	3601	0	16
C-D	19:32:38.0 19:36:39.0	28259 31269	61000/18592	12.50	3001	0	10
E-F	19:39:44.0 19:43:44.0	33577 36581	62000/18897	12.50	3001	0	4
G-H	19:48:17.0 19:53:15.0	39999 43711	60000/18288	12.50	3701	0	12
I-J	19:56:11.0 20:00:12.0	45915 48925	60000/18288	12.50	3001	0	10
K-L	20:05:33.0 20:09:1.0	52937 55545	60000/18288	12.50	2601	0	8
A-B	20:21:45.0 20:25:45.0	65089 68095	60000/18288	12.50	3000	1	6
M-N	20:42:29.0 20:46:46.0	80650 83864	60000/18288	12.50	3201	0	14
O-P	20:49:59.0 20:53:52.0	86272 89179	60000/18288	12.50	2901	0	7

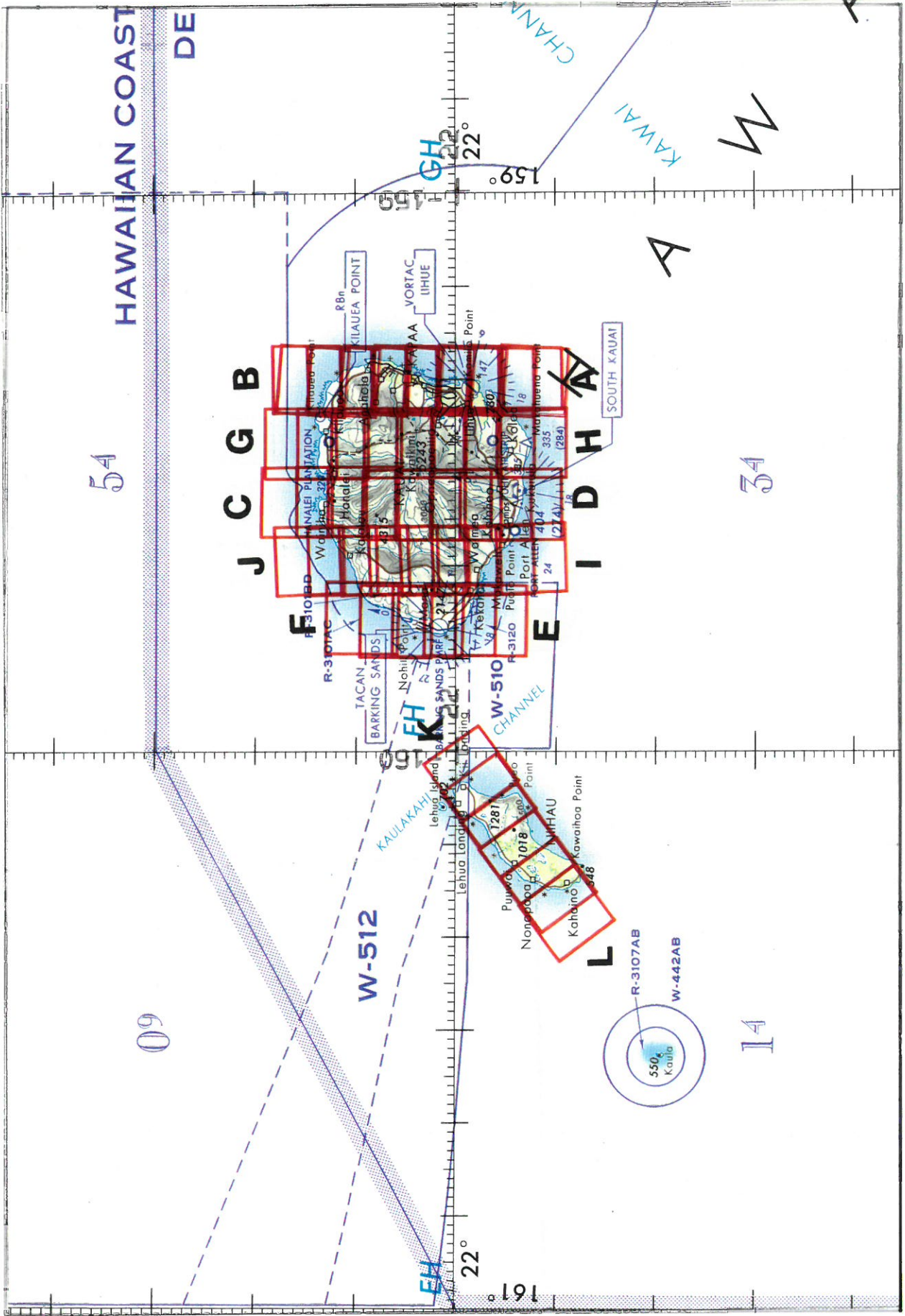


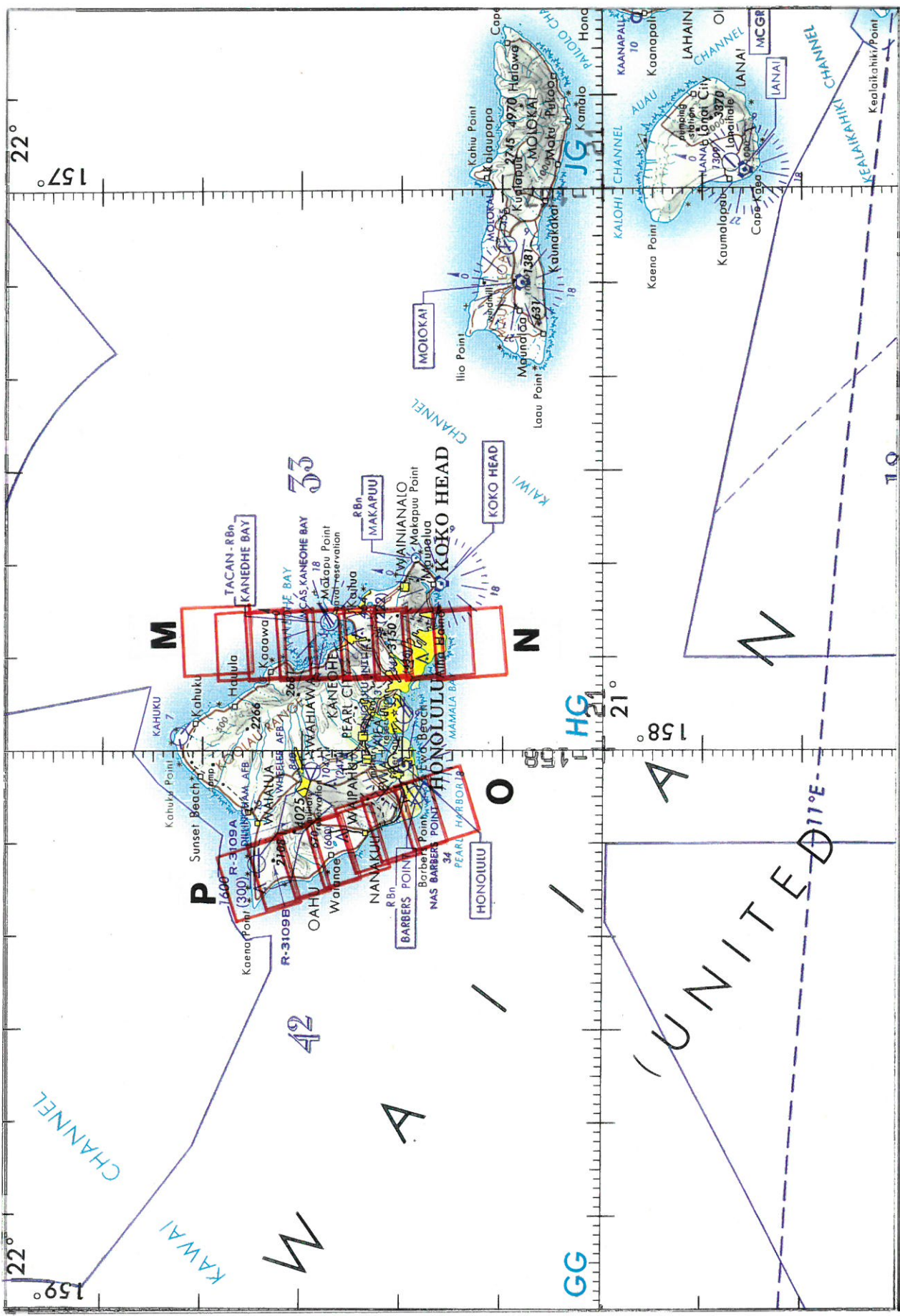
FLIGHT 92-159

19 September 1992

A/C 708

Dual HR-732 / Dual RC-10 / TMS





FLIGHT 92-159 19 SEPTEMBER 1992 A/C 708 DUAL RC-10 / DUAL HF-732 / TWS GNC J-19