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TECHNICAL MEMORANDUM

SUMMARY OF NASA AIRCRAFT (NC-130) DATA COLLECTED FOR THE AGRICULTURAL SOIL MOISTURE EXPERIMENT (ASME) DURING 1978

By

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PREFACE

This document was prepared by Lockheed Electronics Company, Systems and Services Division, Houston, Texas, for the Earth Observations Division of the Space and Life Sciences Directorate at the Lyndon B. Johnson Space Center under contract NAS 9-15800, job order 73-155.

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1. INTRODUCTION

During the period from July 18 to August 9, 1978, the NC-130 aircraft of the National Aeronautics and Space Administration (NASA) conducted a total of seven data-gathering flights over a test site near Colby, Kansas, as part of a project to develop algorithms for determining soil moisture from remotely sensed data.[1] At or near the time of overpass, field teams collected extensive ground-truth data for selected fields under the NC-130 flightpath. For some of these fields, active and passive microwave data were obtained from sensors or trucks.

This document catalogs the details of the data collected by the sensors in the aircraft, including times and tape numbers. The ground truth and truck data will be described elsewhere.

2. THE NC-130 DATA COLLECTION FLIGHTS

Figure 1 shows the test site, the fields where ground truth was taken, and the seven NC-130 flight lines. The flight lines were always flown in the same direction as shown by the arrows. The appendix gives the sensor configuration on the aircraft.

Table 1 summarizes the seven flights. It gives the dates, times, and altitudes flown, along with some details of the type of data obtained from each sensor. Each altitude flown consists of one or more sequences; each sequence consisting of a certain number of flight lines in a certain order. Three sequences were used; they consisted of the following flight lines:

Sequence	Flight lines
1	4, 3, 7, 1, 5, 6, 2
2	4, 3, 7, 1, 5
3	3, 7, 1, 5, 6, 2

[1] Described in Project Support Plan OA-0387, JSC-10562.

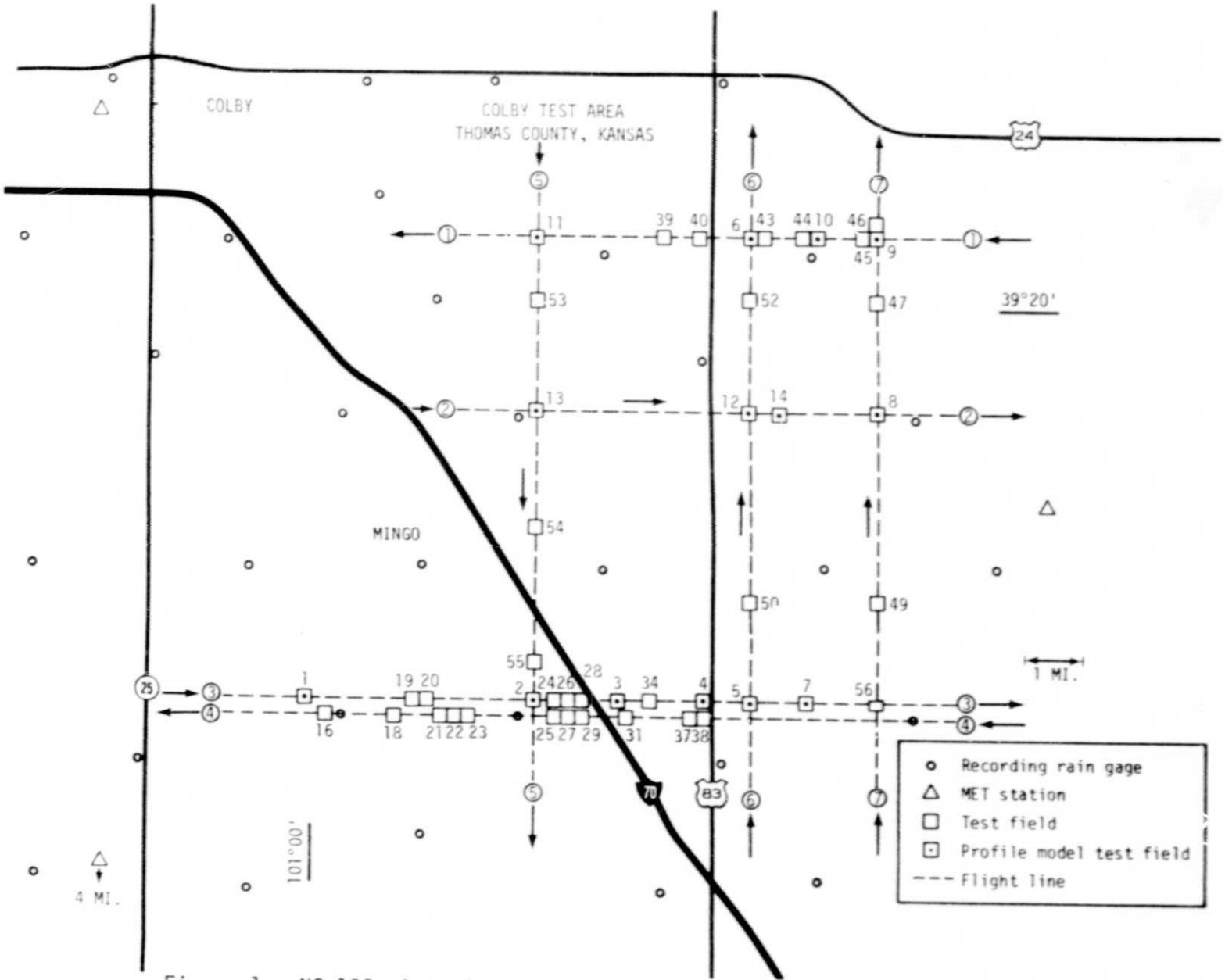

Figure 1.— NC-130 aircraft flight lines and test field locations for the Colby, Kansas, test site.

TABLE 1.— ASME NC-130 AIRCRAFT SENSOR DATA COLLECTION SUMMARY SHEET — 1978

Flt. no.		Date	Site (e)	Camera data			PRT-5 (a)	NMS (a)	PMIS (10.69 GHz) (a)	Passive radiometers (MPMR)			Active scatterometers				A/C avg. alt. (ft)
Data	A/C			Zeiss	AMPS	HASS				K-band (e)	C-band (5.0 GHz)	L-band (1.42 GHz)	P-band (0.4 GHz)	L-band (1.6 GHz)	C-band (4.76 GHz)	K-band (13.3 GHz) (a)	
4	6	7-18 (199)	Colby	CIR[b]	-	-	X	X	X	-	-	-	-	-	-	-	8000
				CIR	B/W[c] and B/WIR[d]	-	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
5	7	7-20 (201)	Colby	CIR	--	-	X	X	X	-	-	-	-	-	-	-	8000
				CIR	B/W and B/WIR	-	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
6	8	7-21 (202)	Colby	CIR	B/W and B/WIR	-	X	X	X	-	-	-	-	-	-	-	8000
				Color	B/W and B/WIR	-	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
12	8	7-21 (202)	Yuma, Colo.	CIR	B/W and B/WIR	-	X	X	-	-	-	-	-	-	-	-	400
7	9	7-22 (203)	Colby	Color and B/W	B/W and B/WIR	-	X	X	X	1500 0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
8	25	8-8 (220)	Colby	CIR	B/W and B/WIR	CIR	X	X	X	-	-	-	-	-	-	-	8000
				CIR and B/W	B/W and B/WIR	CIR	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
9	26	8-9 (221)	Colby	CIR	B/W and B/WIR	-	X	X	X	-	-	-	-	-	-	-	7000
				B/W and CIR	B/W and B/WIR	CIR	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000
13	26	8-9 (221)	Yuma, Colo.	CIR	B/W and B/WIR	-	X	X	X	-	-	-	-	-	-	-	450
10	28	[f]8-11 (223)	Colby	B/W	-	-	X	X	X	0° & 40°	0° & 40°	0° & 40° H & V	H & V	H & V	H & V	X	1500 1000

[a] X indicates "sensor on."

[b] CIR = Color infrared film.

[c] B/W = Black-and-white negative film.

[d] B/WIR = black and white infrared film.

[e] K refers to K, Ka, and Ku. K is 22.05 GHz, Ka is 37.0 GHz, and Ku is 18.0 GHz.

[f] Pre-dawn flight.

During this mission, some data were taken for another project at a site near Yuma, Colorado. Since the data are included with the Colby data, they are identified in the tables in this report.

Table 2 gives the data acquired by flight line and sequence. A line separates different sequences. The meaning of the column headings is as follows.

Alt. = The assigned altitude.

A/P = Active or passive sequence

L = Flight line number (see fig. 1)

R = Run number to identify a particular run over a flight line. Run numbers were assigned in the original plan, and R referred to the R*th* run that day over the line. However, because the actual flights sometimes were not in the planned order, the R's are not always in consecutive order.

GMT = Greenwich mean time in hours, minutes, and seconds for the start of the flight line.

A, B, C, D = Tape recorder designation. The numbers are the last three digits of the tape number. The prefix is L05-0-005.

GS = Ground speed (in knots) minus 100 knots.

DR = Drift of aircraft (in degrees), left or right.

TH = True heading (in degrees).

RA = Radar altimeter reading in thousands of feet.

KR, CR, LR = K-band, C-band, and L-band radiometer look angles and polarizations. The K-band is actually three bands — K, Ka, and Ku. The numbers are look angles in degrees. H indicates horizontal polarization; V, vertical polarization.

PS, LS, CS, KS = P-band, L-band, C-band, and K-band scatterometers. H and V refer to horizontal and vertical polarization. X indicates "sensor on."

PMIS = Passive Microwave Imaging System. X indicates "sensor on."

PRT = PRT-5 passive radiometer; M = mid-range; H = high range.

MMS = Modular multispectral scanner. The numbers indicate the scan rate.

TABLE 2.- DATA ACQUIRED BY FLIGHT LINE AND SEQUENCE

(a) Data flight 4 – July 18 (Julian day 199).

Alt.	A/P	L	N	GMT	Tape recorder				QC	LR	TH	GA	LR	CR	LR	PS	LS	CS	KS	PMIS	PRT	HMS	Z	AMPS	H	KZ
					A	B	C	D																		
0	A	3	6	17:00:45	348			349	92	2,2 L	90	0,00								X	M	76	X			
0	A	7	6	17:00:25	348			349	77	5,7 R	352	0,20								X	M	75	X			
0	A	1	6	17:76:20	348			349	60	0,1 L	286	0,19								X	M	74	X			
0	A	5	6	17:23:30	348			349	72	2,3 L	101	0,19								X	M	75	X			
0	A	6	3	17:29:20	348			349	74	4,2 R	354	0,17								X	M	75	X			
0	A	2	3	17:36:20	348			349	63	0,6 L	89	0,10								X	M	76	X			
1,5	A	4	1	17:57:20	348	350	351	349	64	6,0 L	275	1,43		0		H	H	H	X		M	72	X	X		
1,5	A	3	1	18:04:20	348	350	351	349	61	8,5 R	83	1,56		0		H	H	H	X		M	72	X	X		
1,5	A	7	1	18:15:45	348	350	351	349	48	1,0 L	1	1,39		0		H	H	H	X		M	63	X	X		
1,5	A	1	1	18:21:55	348	350	351	349	53	9,1 L	203	1,51		0		H	H	H	X		M	74	X	X		
1,5	A	5	1	18:27:45	348	350	351	349	62	4,3 R	176	1,44		0		H	H	H	X		M	79	X	X		
1,5	A	6	1	18:41:25	348	350	351	349	34	3,5 L	3	1,39		0		H	H	H	X		M	63	X	X		
1,5	A	2	1	18:49:50	348	350	351	349	50	7,5 R	84	1,40		0		H	H	H	X		M	67	X	X		
1,5	A	4	2	18:59:30	352	350	351	349	70	2,4 L	273	1,47		40		V	V	V	X		M	74	X			
1,5	A	3	2	19:06:20	352	350	351	349	46	6,1 R	83	1,29		40		V	V	V	X		M	67	X			
1,5	A	7	2	19:14:20	352	350	351	353	39	3,0 L	5	1,39		40		V	V	V	X		M	65	X			
1,5	A	1	2	19:28:45	352	354	355	353	69	5,4 L	275	1,53		40		V	V	V	X		M	76	X			
1,5	A	5	2	19:34:40	352	354	355	353	67	6,0 R	177	1,38		40		V	V	V	X		M	76	X			
1,5	P	4	3	19:46:25	352	354		353	63	4,7 L	273	1,51	0		0 H				X	X	M	74	X			X
1,5	P	3	3	19:53:00	352	354		353	43	7,9 R	83	1,38	0		0 H				X	X	M	67	X			X
1,5	P	7	3	20:00:14	352	354		353	41	2,4 L	4	1,40	0		0 H				X	X	M	63	X			X
1,5	P	1	3	20:06:50	352	354		353	69	4,3 L	276	1,57	0		0 H				X	X	M	76	X			X
1,5	P	5	3	20:13:35	352	354		353	66	4,7 R	174	1,50	0		0 H				X	X	M	76	X			X
1,5	P	6	2	20:19:35	352	354		353	50	3,2 L	1	1,54	0		0 H				X	X	M	65	X			X
1,5	P	2	2	20:28:55	352	354		353	39	3,4 R	84	1,46	0		0 H				X	X	M	67	X			X
1	P	4	4	20:46:45	356	358		353	67	3,9 L	276	,99	40		40 H				X	X	M	80	X			X
1	P	3	4	20:53:30	356	358		357	46	5,2 R	83	,94	40		40 H				X	X	M	60	X			X
1	P	7	4	21:02:30	356	358		357	34	3,7 L	1	,96	40		40 H				X	X	M	80	X			X
1	P	1	4	21:08:10	356	358		357	62	6,0 L	278	1,00	40		40 H				X	X	M	80	X			X
1	P	5	4	21:13:30	356	358		357	71	4,3 R	175	,96	40		40 H				X	X	M	80	X			X
1	P	4	5	21:22:30	356	358		357	69	4,7 L	280	1,00	40		40 V				X	X	M	81	X			X
1	P	3	5	21:28:50	356	358		357	52	4,1 R	87	,98	40		40 V				X	X	M	62	X			X
1	P	7	5	21:40:35	356	358		357	40	5,4 L	2	1,00	40		40 V				X	X	M	80	X			X
1	P	1	5	21:46:50	356	358		357	59	0,7 L	274	1,00	40		40 V				X	X	M	80	X			X
1	P	5	5	21:52:35	356	358		357	60	2,4 R	177	,99	40		40 V				X	X	M	80	X			X

TABLE 2.– Continued.

(b) Data flight 5 – July 20 (Julian day 201).

Alt.	A/F	L	R	GMT	Tape recorder A	B	C	D	GS	DR	TH	RA	KR	CR	LR	PS	LS	CS	KS	PMIS	PRT	MMS	Z	AMPS	H	KZ
1	P	4	4	16:05:40	359	360		362	63	4.7 L	276	.85	40°		40° H				X	X	M	80	X			
1	P	3	4	16:12:10	359	360		362	43	3.8 L	95	.93	40°		40° H				X	X	M	80	X			
1	P	7	4	16:19:30	359	360		362	47	5.2 L	7	1.00	40°		40° H				X	X	M	80	X			
1	P	1	4	16:25:00	359	360		362	58	1.2 L	269	1.09	40°		40° H				X	X	M	80	X			
1	P	5	4	16:29:40	359	360		362	51	1.6 R	172	1.03	40°		40° H				X	X	M	80	X			
1	P	4	5	16:39:20	359	360		362	59	1.7 L	272	1.01	40°		40° V				X	X	M	80	X			
1	P	3	5	16:45:30	359	360		362	39	2.3 L	92	.94	40°		40° V				X	X	M	80	X			
1	P	7	5	16:51:50	359	360		362	55	5.8 L	16	1.09	40°		40° V				X	X	M	80	X			
1	P	1	5	16:57:10	359	360		362	71	0.5 L	269	1.14	40°		40° V				X	X	M	80	X			
1	P	5	5	17:01:59	359	360		362	45	4.4 R	169	1.04	40°		40° V				X	X	M	70	X			
1.5	P	4	3	17:13:55	359	360		363	68	0	269	1.37	0°		0° H				X	X	M	76	X			
1.5	P	3	3	17:20:55	359	360		363	37	3.7 L	92	1.23	0°		0° H				X	X	M	61	X			
1.5	P	7	3	17:28:10	359	360		363	52	3.6 L	5	1.39	0°		0° H				X	X	M	61	X			
1.5	P	1	3	17:35:00	359	360		363	64	2.6 R	267	1.48	0°		0° H				X	X	M	74	X			
1.5	P	1	7	17:47:45	364	365		363	62	1.0 R	267	1.50	0°		0° H				X	X	M	74	X			
1.5	P	5	3	17:53:20	364	365		363	45	3.5 R	177	1.39	0°		0° H				X	X	M	65	X			
1.5	P	6	2	17:59:15	364	365		363	51	3.8 L	4	1.32	0°		0° H				X	X	M	65	X			
1.5	P	2	2	18:12:55	364	365		363	40	3.3 L	92	1.33	0°		0° H				X	X	M	63	X			
1.5	A	4	1	18:22:10		A B	D R	T E D																		
1.5	A	4	1	18:25:54	364	365	361	363	55	5.4 R	267	1.50		0°		H	H	H	X		M	72	X	X			
1.5	A	3	1	18:32:20	364	365	361	363	34	3.4 L	92	1.25		0°		H	H	H	X		M	61	X	X			
1.5	A	7	1	18:44:15	364	365	361	363	53	7.7 L	18	1.39		0°		H	H	H	X		M	67	X	X			
1.5	A	1	1	18:57:25	364	365	361	366	61	2.5 R	267	1.45		0°		H	H	H	X		M	72	X	X			
1.5	A	5	1	19:03:50	364	365	361	366	54	3.5 R	177	1.59		0°		H	H	H	X		M	70	X	X			
1.5	A	6	1	19:16:40	364	365	361	366	66	0.8 L	0	1.49		0°		H	H	H	X		M	72	X	X			
1.5	A	2	1	19:25:15	364	365	361	366	60	0.8 R	94	1.40		0°		H	H	H	X		M	70	X	X			
1.5	A	4	2	19:32:45	364	365	361	366	67	3.9 R	765	1.55		40°		V	V	V	X		M	74	X				
1.5	A	3	2	19:38:35	364	365	361	366	53	3.6 L	95	1.48		40°		V	V	V	X		M	70	X				
1.5	A	7	2	19:44:25	364	365	361	366	59	4.2 L	5	1.41		40°		V	V	V	X		M	70	X				
1.5	A	1	2	19:52:15	364	367	361	366	68	5.1 R	266	1.42		40°		V	V	V	X		M	76	X				
1.5	A	5	2	19:57:50	364	367	361	366	54	3.6 R	175	1.55		40°		V	V	V	X		M	70	X				
1.5	A	7	7	20:05:35	368	367	361	366	77	1.9 L	0	1.49		40°		V	V	V	X		M	76	X				
1.5	A	5	7	20:11:50	368	367	361	366	40	4.0 R	175	1.48		40°		V	V	V	X		M	60	X				
8	A	3	6	20:27:40	368			369	82	5.3 L	90	8.03								X	M	13	X			
8	A	7	6	20:36:49	368			369	79	6.3 R	344	7.85								X	M	15	X			
8	A	1	6	20:45:10	368			369	57	4.9 R	259	8.06								X	M	13	X			
8	A	5	6	20:52:25	368			369	59	5.7 L	180	7.96								X	M	13	X			
8	A	6	3	20:58:35	368			369	96	2.2 H	4	7.80								X	M	15	X			
8	A	2	3	21:06:50	368			369	92	3.0 L	107	7.81								X	M	16	X			

TABLE 2.– Continued.

(c) Data flight 6/12 – July 21 (Julian day 202).

Alt.	A/P	L	R	GMT	Tape recorder A	Tape recorder B	Tape recorder C	Tape recorder D	GS	DR	TH	RA	KR	CR	LR	PS	LS	CS	KS	PMIS	PRT	MMS	Z	AMPS	H	KZ
1.5	A	4	1	15:55:00	370	371	372	373	52	8.2 L	263	1.49		0		H	H	H	X		M	67	X			
1.5	A	3	1	16:03:00	370	371	372	373	50	3.0 L	93	1.33		0		H	H	H	X		M	67	X			
1.5	A	7	1	16:10:50	370	371	372	373	62	5.7 R	356	1.49		0		H	H	H	X		M	69	X			
1.5	A	1	1	16:17:55	370	371	372	373	52	7.0 R	259	1.59		0		H	H	H	X		M	69	X			
1.5	A	5	1	16:24:55	370	371	372	373	51	2.9 L	181	1.50		0		H	H	H	X		M	67	X			
1.5	A	6	1	16:30:45	370	371	372	373	54	4.3 R	355	1.39		0		H	H	H	X		M	67	X			
1.5	A	2	1	16:39:35	370	371	372	373	48	2.4 L	94	1.43		0		H	H	H	X		M	67	X			
1.5	A	4	2	16:46:15	370	371	372	373	45	7.7 R	258	1.54		40		V	V	V	X		M	67	X			
1.5	A	3	2	16:54:35	370	371	372	373	52	3.1 L	93	1.35		40		V	V	V	X		M	67	X			
1.5	A	7	2	17:02:10	370	371	372	373	56	6.4 R	354	1.29		40		V	V	V	X		M	67	X			
1.5	A	1	2	17:09:20	370	371	372	373	48	8.6 R	263	1.54		40		V	V	V	X		M	67	X			
1.5	A	5	2	17:16:35	370	371	372	374	40	1.6 R	180	1.48		40		V	V	V	X		M	67	X			
1.5	P	4	3	17:29:45	370	371		374	49	8.4 R	263	1.44	0°		0° H				X	X	M	67	X			
1.5	P	3	3	17:45:05	376	375		374	46	2.3 L	95	1.49	0°		0° H				X	X	M	67	X			
1.5	P	7	3	17:53:15	376	375		374	47	3.3 R	356	1.43	0°		0° H				X	X	M	67	X			
1.5	P	1	3	18:01:00	376	375		374	53	4.2 R	266	1.53	0°		0° H				X	X	M	67	X			
1.5	P	5	3	18:09:15	376	375		374	49	1.1 L	179	1.48	0°		0° H				X	X	M	67	X			
1.5	P	6	2	18:15:35	376	375		374	49	1.9 R	01	1.39	0°		0° H				X	X	M	67	X			
1.5	P	2	2	18:25:00	376	375		374	50	1.7 L	89	1.50	0°		0° H				X	X	M	67	X			
1	P	4	4	18:31:50	376	375		374	42	2.4 R	270	.97	40°		40° H				X	X	M	80	X			
1	P	3	4	18:39:35	376	375		374	50	2.6 R	85	.94	40°		40 H				X	X	M	80	X			
1	P	7	4	18:47:00	376	375		374	52	0.5 R	354	.95	40°		40 H				X	X	M	80	X			
1	P	1	4	18:54:00	376	375		377	51	1.1 R	272	1.01	40°		40 H				X	X	M	80	X			
1	P	5	4	19:00:05	376	375		377	57	1.1 L	184	.96	40°		40 H				X	X	–	80	X			
1	P	4	5	19:08:45	376	375		377	46	1.7 L	272	1.00	40°		40 V				X	X	M	80	X			
1	P	3	5	19:22:55	376	378		377	51	5.2 R	85	.97	40°		40 V				X	X	M	80	X			
1	P	7	5[1]	19:29:50	376	378		377	47	0	01	.99	40°		40 V				X	X	M	80	X			
1	P	1	5	19:39:15	379	378		377	49	3.4 L	272	.92	40°		40 V				X	X	M	80	X			
1	P	5	5	19:45:20	379	378		377	53	2.2 R	179	.97	40°		40 V				X	X	M	80	X			
1	P	7	7	19:51:45	379	378		377	41	0	359	1.04	40°		40 V				X	X	M	80	X			
8	A	1	6[2]	20:04:05	379			377	69	9.3 R	256	7.89								X	M	28	X	X		
8	A	3	6	20:15:45	379			377	91	8.1 L	101	7.92								X	M	32	X	X		
Yuma, Colo.		2	1	20:52:04	379			377	31	7.3 R	83	.42									M	80	X	X		
		3	1	20:55:20	379			377	32	6.6 R	85	.40									M	80	X	X		
		1	1	20:58:30	379			377	39	0	84	.41									M	80	X	X		
		1	2	21:02:10	379			377	37	3.2 R	90	.41									M	80	X	X		

[1]"A" recorder off, rerun as line 7-7.
[2]PRT-5 and TAT late.

TABLE 2.– Continued.

(d) Data flight 7 – July 22 (Julian day 203).

Alt.	A/P	L	R	GMT	Tape recorder				GS	DR	TH	RA	KR	CR	LR	PS	LS	CS	KS	PMIS	PRT	MMS	Z	AMPS	H	KZ
					A	B	C	D																		
1	P	4	4	16:01:55	380	381			48	7.1 L	277	1.00	40°		40° H				X	X*	M	-	X			
1	P	4	7	16:18:15	380	38.		383	48	6.1 L	276	1.13	40°		40 H				X	X	M	80	X			
1	P	3	4	16:32:10	380	381		383	54	7.2 R	79	1.00	40°		40 H				X	X	M	80	X			
1	P	7	4	16:40:10	380	381		383	46	2.7 R	359	1.07	40°		40 H				X	X	M	80	X			
1	P	1	4	16:46:45	380	381		383	41	6.7 L	276	1.11	40°		40 H				X	X	M	80	X			
1	P	5	4	16:54:50	380	381		383	59	3.3 L	186	.93	40°		40 H				X	X	M	80	X			
1	P	4	5	17:03:25	380	381		383	49	6.6 L	277	1.06	40°		40 V				X	X	M	80	X			
1	P	3	5	17:11:40	380	381		383	52	6.8 R	82	.88	40°		40 V				X	X	M	80	X			
1	P	7	5	17:19:10	380	381		383	40	1.2 R	35	1.07	40°		40 V				X	X	M	80	X			
1	P	1	5	17:27:00	380	381		384	50	7.7 L	270	1.11	40°		40 V				X	X	M	80	X			
1	P	5	5	17:33:30	380	381		384	55	4.2 L	186	.93	40°		40° V				X	X	M	80	X			
1.5	P	4	3	17:42:15	380	381		384	44	5.9 L	280	1.54	0°		0° H				X	X	M	67	X			
1.5	P	3	3	17:50:50	380	381		384	54	7.0 R	82	1.46	0°		0 H				X	X	M	67	X			
1.5	P	7	3	18:02:00	385	386		384	42	5.0 R	354	1.57	0°		0 H				X	X	M	67	X			
1.5	P	1	3	18:09:10	385	386		384	53	6.9 L	276	1.5	0°		0 H				X	X	M	67	X			
1.5	P	5	3	18:15:35	385	386		384	60	2.4 L	105	1.45	0°		0 H				X	X	M	70	X			
1.5	P	6	2	18:21:55	385	386		384	38	3.4 R	355	1.5	0°		0 H				X	X	M	70	X			
1.5	P	2	2	18:31:00	385	386		384	45	7.7 R	81	1.48	0°		0° H				X	X	M	67	X			
1.5	A	4	1	18:40:35	385	386	382	384	51	6.3 L	280	1.59		0°		H	H	H	X		M	67	X			
1.5	A	3	1	18:47:55	385	386	382	387	51	5.0 R	84	1.39		0°		H	H	H	X		M	67	X			
1.5	A	7	1	18:55:25	385	386	382	387	43	1.2 R	360	1.14		0°		H	H	H	X		M	67	X			
1.5	A	1	1	19:02:20	385	386	382	387	53	6.1 L	278	1.58		0°		H	H	H	X		M	67	X			
1.5	A	5	1	19:08:30	385	386	382	387	60	0.6 L	101	1.50		0°		H	H	H	X		M	67	X			
1.5	A	6	1	19:15:00	385	386	382	387	48	0.7 R	358	1.66		0°		H	H	H	X		M	67	X			
1.5	A	2	1	19:23:30	385	386	382	387	52	6.9 R	85	1.52		0°		H	H	H	X		M	67	X			
1.5	A	4	2	19:33:00	385	386	382	387	50	9.4 L	278	1.57		40°		V	V	V	X		M	67	X	X		
1.5	A	3	2	19:40:35	385	386	382	387	54	7.0 R	85	1.45		40°		V	V	V	X		M	67	X	X		
1.5	A	7	2	19:47:55	388	389	382	387	42	1.5 L	5	1.49		40°		V	V	V	X		M	67	X	X		
1.5	A	1	2	19:59:50	388	389	382	387	50	4.7 L	276	1.50		40°		V	V	V	X		M	67	X	X		
1.5	A	5	2	20:06:30	388	389	382	387	52	2.2 R	180	1.47		40°		V	V	V	X		M	60	X	X		

*PMIS not noted on Instrument Summary Inflight Log.

TABLE 2.– Continued.

(e) Data flight 8 – August 8 (Julian day 220).

Alt.	A/P	L	R	GMT	Tape recorder				GS	DR	TH	RA	KR	CR	LR	PS	LS	CS	KS	PMIS	PRT	MMS	Z	AMPS	H	KZ
					A	B	C	D																		
8	A	3	6	18:11:15	415			418	60	3.4 R	87	7.87								X	M	14	X	X	X	
8	A	7	6	18:19:10	415			416	65	5.1 L	358	8.07								X	M	15	X	X	X	
8	A	1	6	18:27:15	415			418	89	2.2 L	269	7.98								X	M	15	X	X	X	
8	A	5	6	18:34:15	415			418	82	2.8 R	176	7.87								X	M	15	X	X	X	
8	A	6	3	18:39:45	415			418	60	4.9 L	8	8.15								X	M	15	X	X	X	
8	A	2	3	18:49:30	415			418	53	4.0 R	82	8.07								X	M	15	X	X	X	
1.5	P	4	3	19:01:40	415	416		418	51	5.8 R	269	1.54	0°		0° H				X	X	H	67			X	
1.5	P	3	3	19:09:40	415	416		418	50	1.7 L	95	1.35	0°		0° H				X	X	H	67			X	
1.5	P	7	3	19:17:20	415	416		418	44	3.0 L	6	1.39	0°		0° H				X	X	H	67			X	
1.5	P	1	3	19:25:20	415	416		418	53	3.2 R	270	1.40	0°		0° H				X	X	H	67			X	
1.5	P	5	3	19:31:50	415	416		416	54	2.9 R	178	1.60	0°		0° H				X	X	H	67			X	
1.5	P	6	2	19:38:15	415	416		418	47	3.2 L	4	1.42	0°		0° H				X	X	H	67			X	
1.5	P	2	2	19:52:50	419	420		418	47	0.9 L	92	1.54	0°		0° H				X	X	H	67			X	
1	P	4	4	20:00:50	419	420		418	54	3.6 R	266	1.01	40°		40° H				X	X	M	80			X	
1	P	3	4	20:09:00	419	420		422	49	1.4 L	92	1.05	40°		40° H				X	X	M	80			X	
1	P	7	4	20:15:40	419	420		422	48	5.9 L	9	.93	40°		40° H						M	80			X	
1	P	1	4	20:23:15	419	420		422	46	4.9 R	267	.99	40°		40° H				X	X	M	80			X	
1	P	5	4	20:31:15	419	420		422	50	3.4 R	177	1.09	40°		40°				X	X	M	80			X	
1	P	4	5	20:39:25	419	420		422	50	2.2 R	268	.90	40°		40° V				X	X	H	80			X	
1	P	3	5	20:46:35	419	420		422	53	3.1 L	95	1.00	40°		40° V				X	X	H	80			X	
1	P	7	5	20:53:25	419	420		422	50	5.3 L	6	.96	40°		40° V				X	X	H	80			X	
1	P	1	5	21:00:45	419	420		422	45	5.7 R	266	.99	40°		40° V				X	X	H	80			X	
1	P	5	5	21:06:40	419	420		422	51	2.4 R	180	1.00	40°		40° V				X	X	H	80			X	
1.5	A	4	1	21:19:15	421	423	417	424	49	3.0 R	267	1.48		0°		H	H	H	X		H	80			X	
1.5	A	3	1	21:27:20	421	423	417	424	41	0.6 R	91	1.49		0°		H	H	H	X		H	80			X	
1.5	A	7	1	21:34:10	421	423	417	424	58	3.7 L	10	1.48		0°		H	H	H	X		M	80			X	
1.5	A	1	1	21:41:55	421	423	417	424	53	4.9 R	264	1.48		0°		H	H	H	X		M	80			X	
1.5	A	5	1	21:48:30	421	423	417	424	47	2.8 R	178	1.56		0°		H	H	H	X		M	80			X	
1.5	A	6	1	21:54:25	421	423	417	424	47	6.2 L	4	1.57		0°		H	H	H	X		M	80			X	
1.5	A	2	1	22:04:05	421	423	417	424	56	0.1 L	93	1.51		0°		H	H	H	X		M	67			X	
1.5	A	4	2	22:13:30	421	423	417	424	54	1.7 R	268	1.48		40°		V	V	V	X		M	67			X	
1.5	A	3	2	22:21:00	421	423	417	424	51	0.9 R	90	1.49		40°		V	V	V	X		M	67			X	
1.5	A	7	2	22:29:05	421	423	417	425	49	5.5 L	4	1.43		40°		V	V	V	X		M	67			X	
1.5	A	1	2	22:36:15	421	423	417	425	47	4.2 R	265	1.48		40°		V	V	V	X		M	67			X	
1.5	A	5	2	22:41:55	421	423	417	425	56	4.8 R	178	1.47		40°		V	V	V	X		M	67			X	

TABLE 2.– Continued.

(f) Data flight 9/13 – August 9 (Julian day 221).

Alt.	A/P	L	R	GMT	Tape recorder A	B	C	D	GS	DR	TH	RA	KR	CR	LR	PS	LS	CS	KS	PMIS	PRT	MMS	Z	AMPS	H	KZ
1.5	A	4	1	15:45:00	426	427	428	429	41	1.2 R	266	1.30		0°		H	H	H	X		M	67			X	
1.5	A	3	1	15:52:05	426	427	428	429	53	2.7 L	94	1.45		0°		H	H	H	X		M	67			X	
1.5	A	7	1	15:59:10	426	427	428	429	65	0.3 L	7	1.46		0°		H	H	H	X		M	67			X	
1.5	A	1	1	16:05:50	426	427	428	429	56	0.7 R	271	1.53		0°		H	H	H	X		M	67			X	
1.5	A	5	1	16:13:35	426	427	428	429	51	0.8 R	177	1.48		0°		H	H	H	X		M	67			X	
1.5	A	6	1	16:19:40	426	427	428	429	53	0.9 R	351	1.45		0°		H	H	H	X		M	67			X	
1.5	A	2	1	16:28:45	426	427	428	429	51	0	90	1.43		0°		H	H	H	X		M	67			X	
1.5	A	4	2	16:35:45	426	427	428	429	49	2.3 R	265	1.49		40°		V	V	V	X		M	67			X	
1.5	A	3	2	15:43:20	426	427	428	429	48	0	91	1.49		40°		V	V	V	X		M	67			X	
1.5	A	7	2	16:50:45	426	427	428	429	57	0.4 L	6	1.40		40°		V	V	V	X		M	67			X	
1.5	A	1	2	16:58:25	426	427	428	430	50	2.6 R	270	1.57		40°		V	V	V	X		M	67			X	
1.5	A	5	2	17:05:15	426	427	428	430	56	2.4 R	180	1.49		40°		V	V	V	X		M	67			X	
1.5	P	4	3	17:21:50	431	427		430	49	1.3 L	267	1.48	0°		0° H				X	X	M	67			X	
1.5	P	3	3	17:33:45	431	432		430	49	3.4 L	91	1.5	0°		0° H				X	X	M	67			X	
1.5	P	7	3	17:41:55	431	432		430	52	2.0 L	3	1.47	0°		0° H				X	X	M	67			X	
1.5	P	1	3	17:49:05	431	432		430	50	2.0 R	268	1.56	0°		0° H				X	X	M	67			X	
1.5	P	5	3	17:57:05	431	432		430	44	1.7 R	179	1.49	0°		0° H				X	X	M	67			X	
1.5	P	6	2	18:03:05	431	432		430	49	1.5 L	3	1.49	0°		0° H				X	X	M	67			X	
1.5	P	2	2	18:12:30	431	432		430	43	3.0 L	94	1.47	0°		0° H				X	X	M	67			X	
1	P	4	4	18:19:50	431	432		430	49	2.1 R	268	1.06	40°		40° H				X	X	M	80			X	
1	P	3	4	18:29:10	431	432		433	52	1.5 L	93	.93	40°		40° H				X	X	M	80			X	
1	P	7	4	18:37:40	431	432		433	49	1.3 L	4	.94	40°		40° H				X	X	M	80			X	
1	P	1	4[1]	18:44:45	431	432		433	55	1.4 R	268	1.08	40°		40° H				X	X	M	80				
1	P	5	4[1]	18:51:40	431	432		433	52	1.5 R	179	.96	40°		40° H				X	X	M	80				
1	P	1	5	19:12:25	434	432		433	47	0.6 L	271	.96	40°		40° V				X	X	M	80	X			
1	P	3	5	19:20:30	434	432		433	47	0.4 L	90	1.05	40°		40° V				X	X	M	80	X			
1	P	7	5	19:32:45	434	435		433	49	2.8 L	1.2	1.14	40°		40° V				X	X	M	80	X			
1	P	1	5	19:39:55	434	435		433	52	4.5 R	269	1.01	40°		40° V				X	X	M	80	X			
1	P	5	5	19:51:05	434	435		436	48	3.0 R	180	1.0	40°		40° V				X	X	M	80	X			
7	A	3	6	20:05:40	434			436	66	2.2 L	93	7.2								X	M	30	X	X		
7	A	7	6	20:13:50	424			436	78	1.4 L	17	6.9								X	M	30	X	X		
7	A	1	6	20:20:15	434			436	79	0	270	7.0								X	M	30	X	X		
Yuma, Colo.		2	1	20:49:20	434			436	40	2.9 L	93	.45									M	80	X	X		
		1	1	20:53:35	434			436	33	1.8 L	90	.52									M	80	X	X		
		3	2	20:57:20	434			436	34	4.0 L	96	.45									M	80	X	X		
		3	1	21:01:35	434			436	39	3.2 L	91	.45									M	80	X	X		

[1]No photographic coverage.

TABLE 2.– Concluded.

(g) Data flight 10 – August 11 (Julian day 223).

Alt.	A/P	L	R	GMT	Tape recorder A	Tape recorder B	Tape recorder C	Tape recorder D	GS	DR	TH	RA	AR	CR	LA	PS	LS	CS	XS	PMIS	PRT	RHS	Z	GMTS	H	KZ
1	P	4	2[1]	09:15:35	437	438		440	55	7.6 R	263	1.03	40°		40° N				X	X	M	80				
1	P	3	2[1]	09:25:35	437	438		440	59	7.6 L	98	.94	40°		40° N				X	X	M	80				
1	P	7	2[1]	09:35:20	437	438		440	72	4.1 R	355	.93	40°		40° N				X	X	M	80				
1	P	1	2[1]	09:44:35	437	438		440	51	7.3 R	261	1.14	40°		40° N				X	X	M	80				
1	P	5	2[1]	09:53:35	437	438		440	51	3.6 L	177	1.04	40°		40° N				X	X	M	80				
1	P	4	3[1]	10:06:35	437	438		440	47	7.3 R	262	.99	40°		40° V				X	X	M	80				
1.5	P	4	1[1]	10:34:55	437	438		441	46	6.5 R	259	1.54	0°		0° N				X	X	M	67				
1.5	P	3	1[1]	10:43:20	437	438		441	63	4.2 L	91	1.44	0°		0° N				X	X	M	67				
1.5	P	7	1[1]	10:52:35	437	438		441	62	3.1 R	359	1.38	0°		0° N				X	X	M	74				
1.5	P	1	1[1]	11:00:40	437	438		441	59	2.8 R	260	1.58	0°		0° N				X	X	M	67				
1.5	P	5	1[1]	11:07:20	437	438		441	42	5.1 L	170	1.45	0°		0° N				X	X	M	67				
1.5	P	6	1[1]	11:16:55	442	443		441	63	2.6 R	358	1.50	0°		0° N				X	X	M	67				
1.5	P	2	1[1]	11:30:50	442	443		441	55	5.6 L	94	1.44	0°		0° N				X	X	M	67				
1.5	A	4	4	11:50:40	442	443	439	441	46	5.1 R	263	1.50		0°		N	N	N	X		M	67	X			
1.5	A	3	4	11:57:25	442	443	439	441	51	1.9 L	92	1.45		0°		N	N	N	X		M	67	X			
1.5	A	7	4	12:05:50	442	443	439	444	56	1.9 L	358	1.53		0°		N	N	N	X		M	67	X			
1.5	A	1	4	12:12:25	442	443	439	444	46	0 R	254	1.64		0°		N	N	N	X		M	67	X			
1.5	A	5	4	12:20:10	442	443	439	444	52	3.3 L	181	1.53		0°		N	N	N	X		M	67	X			
1.5	A	6	2	12:26:10	442	443	439	444	52	3.5 R	353	1.53		0°		N	N	N	X		M	67	X			
1.5	A	2	2	12:36:20	442	443	439	444	51	0	91	1.45		0°		N	N	N	X		M	67	X			
1.5	A	4	5	12:50:15	442	443	439	444	38	4.6 R	266	1.44		40°		V	V	V	X		M	67	X			
1.5	A	3	5	12:57:01	442	443	439	444	54	2.4 L	93	1.33		40°		V	V	V	X		M	67	X			
1.5	A	7	5	13:03:20	442	443	439	444	65	0	2	1.47		40°		V	V	V	X		M	67	X			
1.5	A	1	5	13:10:15	442	443	439	444	45	3.9 R	273	1.58		40°		V	V	V	X		M	63	X			
1.5	A	5	5	13:19:05	442	445	439	444	50	1.6 L	181	1.53		40°		V	V	V	X		N	67	X			

[1]No camera data – predawn passes.

Z = Zeiss camera (6-inch lens). X indicates "camera on."

AMPS = AMPS camera (six-camera system). X indicates "camera on."

H = Hasselblad camera. X indicates "camera on."

KZ = K-band zenith radiometer (MFMR). X indicates "Radiometer on."

The four data tape recorders referred to as A, B, C, and D were used in the following manner:[2]

Data flt. no.	Sensor			
	Recorder A (PMIS, PRT-5, all radiometers, NERDAS, TAT)	Recorder B (K-band and C-band scatterometer)	Recorder C (P-band and L-band scatterometer)	Recorder D (MMS)
4	348, 352, 356	350, 354, 358	351, 355	349, 353, 357
5	359, 364, 368	360, 365, 367	361	362, 363, 366, 369
6	370, 376, 379	371, 375, 378	372	373, 374. 377
7	380, 385, 388	381, 386, 389	382	383, 384, 387
8	415, 419, 421	416, 420, 423	417	418, 422, 424, 425
9	426, 431, 434	427, 432, 435	428	429, 430, 433, 436
10	437, 442	438, 443, 445	439	440, 441, 444

In addition to the data shown in table 2, a complete set of data from the NASA Earth Resources Data Annotation System (NERDAS) was available for all runs, and the outside temperature (called total air temperature in the flight log) was available for all runs except run 4 of flight line 5 of data flight 6.

Table 3 catalogs the film data taken. It is arranged in the same sequence as table 2 and gives magazine (roll) number and frame numbers for each run over each flight line. In addition, it gives both the start and stop times for each run.

[2]The numbers in the following table are the last three digits of the raw data tape numbers. The prefix is L05-0-005.

TABLE 3.-- SUMMARY SHEET SHOWING CAMERA FILM DATA BY DATA FLIGHT AND LINE-RUN FOR ASMF — SUMMER 1978

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
4	3-6	17:00:45-17:04:40	3	1-17	CIR							High altitude
	7-6	17:08:25-17:12:00	3	18-32	CIR							
	1-6	17:16:28-17:19:55	3	33-46	CIR							
	5-6	17:23:30-17:27:05	3	47-60	CIR							
	6-3	17:29:20-17:33:10	3	61-75	CIR							
	2-3	17:38:20-17:41:10	3	76-87	CIR							
	4-1	17:57:20-18:01:05	3	88-125	CIR	4-9	1-114	B/W B/WIR				
	3-1	18:04:20-18:08:30	3	126-167	CIR	4-9	115-240	↓				
	7-1	18:15:45-18:19:20	3	168-205	CIR	10-15	1-113					
	1-1	18:21:55-18:24:45	3	206-236	CIR	10-15	114-195					
	5-1	18:27:45-18:30:30	3	237-270	CIR	10-15	196-279					
	6-1	18:41:25-18:45:45	16	1-46	CIR	17-22	1-131					
	2-1	18:49:50-18:52:45	16	47-76	CIR	17-22	132-219					
	4-2	18:59:30-19:03:20	16	77-115	CIR							
	3-2	19:06:20-19:10:20	16	116-156	CIR							
	7-2	19:14:20-19:18:15	16	157-196	CIR							
	1-2	19:28:45-19:31:40	16	197-229	CIR							
	5-2	19:34:40-19:37:40	16	230-265	CIR							
	4-3	19:46:25-19:50:15	16	266-304	CIR							
	3-3	19:53:00-19:57:25	16	305-348	CIR							
	7-3	20:00:14-20:04:00	16	349-386	CIR							
	1-3	20:06:50-20:09:30	16	387-415	CIR							
	5-3	20:13:35-20:16:45	23	1-32	CIR							
	6-2	20:19:35-20:23:35	23	33-69	CIR							
	2-2	20:28:55-20:31:45	23	70-94	CIR							

TABLE 3.— Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
4	4-4	20:46:45-20:50:30	23	95-147	CIR							
	3-4	20:53:30-20:57:50	23	148-213	CIR							
	7-4	21:02:30-21:05:55	24	1-50	CIR							
	1-4	21:08:10-21:10:40	24	51-88	CIR							
	5-4	21:13:30-21:16:50	24	89-136	CIR							
	4-5	21:22:30-21:26:10	24	137-190	CIR							
	3-5	21:28:50-21:33:10	24	191-255	CIR							
	7-5	21:40:35-21:44:05	25	1-53	CIR							
	1-5	21:46:50-21:49:30	25	54-93	CIR							
	5-5	21:52:35-21:55:40	25	94-141	CIR							
5	4-4	16:05:40-16:09:20	26	1-56	CIR							
	3-4	16:12:10-16:16:25	26	57-121	CIR							
	7-4	16:19:30-16:22:45	26	122-171	CIR							
	1-4	16:25:00-16:27:35	26	172-210	CIR							
	5-4	16:29:40-16:33:00	26	211-261	CIR							
	4-5	16:39:20-16:42:45	27	1-52	CIR							
	3-5	16:45:30-16:49:40	27	53-116	CIR							
	7-5	16:51:50-16:55:00	27	117-164	CIR							
	1-5	16:57:10-16:59:50	27	165-205	CIR							
	5-5	17:01:59-17:05:20	27	206-256	CIR							
	4-3	17:13:55-17:17:30	28	1-36	CIR							
	3-3	17:20:55-17:25:05	28	37-78	CIR							
	7-3	17:28:10-17:31:25	28	79-111	CIR							
	1-3	17:35:00-17:37:50	28	112-141	CIR							
	1-7	17:47:45-17:50:35	28	142-170	CIR							
	5-3	17:53:20-17:57:10	28	171-209	CIR							
	6-2	17:59:15-18:03:00	28	210-247	CIR							
	2-2	18:12:55-18:16:05	29	3-34	CIR	(Frames 1 and 2 — No data)						

TABLE 3.— Continued

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
5	4-1	18:22:10-18:22:15	29	35-37	CIR	30-35	1-7	B/W & B/WIR	ABORTED			
	4-1	18:25:54-18:29:40	29	38-75	CIR	30-35	8-121	↓				
	3-1	18:32:20-18:36:50	29	76-121	CIR	30-35	122-257					
	7-1	18:44:15-18:47:45	29	122-157	CIR	36-40 plus 47	1-107					
	1-1	18:57:25-19:00:20	29	158-187	CIR	"	108-195					
	5-1	19:03:50-19:07:20	29	188-223	CIR	"	196-301					
	6-1	19:16:40-19:20:10	29	224-259	CIR	41-46	1-103					
	2-1	19:25:15-19:28:10	48	1-29	CIR	41-46	104-191					
	4-2	19:32:45-19:36:20	48	30-66	CIR							
	3-2	19:38:35-19:42:35	48	67-107	CIR							
	7-2	19:44:25-19:47:40	48	108-140	CIR							
	1-2	19:52:15-19:55:10	48	141-170	CIR							
	5-2	19:57:50-20:01:29	48	171-211	CIR							
	7-7	20:05:35-20:09:00	48	212-245	CIR							
	5-7	20:11:50-20:15:30	49	1-37	CIR							
	3-6	20:27:40-20:31:55	49	38-55	CIR							
	7-6	20:36:49-20:40:20	49	56-70	CIR							
	1-6	20:45:10-20:48:50	49	71-84	CIR							
	5-6	20:52:25-20:56:45	49	85-100	CIR							
	6-3	20:58:35-21:02:05	49	101-115	CIR							
	2-3	21:06:50-21:09:50	49	116-129	CIR							
6	4-1	15:55:00-15:59:10	50	1-42	Color							
	3-1	16:03:00-16:07:10	50	43-84	Color							
	7-1	16:10:50-16:13:55	50	85-116	Color							

TABLE 3.– Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
6	1-1	16:17:55-16:20:50	50	117-145	Color							
	5-1	16:24:50-16:28:15	50	146-179	Color							
	6-1	16:30:45-16:34:25	50	180-216	Color							
	2-1	16:39:35-16:42:25	50	217-245	Color							
	4-2	16:46:15-16:50:15	51	1-41	Color							
	3-2	16:54:35-16:58:50	51	42-84	Color							
	7-2	17:02:10-17:05:20	51	85-116	Color							
	1-2	17:09:20-17:12:30	51	117-148	Color							
	5-2	17:16:35-17:20:05	51	149-183	Color							
	4-3	17:29:45-17:34:05	51	184-227	Color							
	3-3	17:45:05-17:49:15	52	4-45	Color							
	7-3	17:53:15-17:56:35	52	46-79	Color							
	1-3	18:01:00-18:03:55	52	80-109	Color							
	5-3	18:09:15-18:12:45	52	110-145	Color							
	6-2	18:15:35-18:19:20	52	146-183	Color							
	2-2	18:25:00-18:27:50	52	184-212	Color							
	4-4	18:31:50-18:36:05	52	213-275	Color							
	3-4	18:39:35-18:43:45	53	1-63	Color							
	7-4	18:47:00-18:50:30	53	64-111	Color							
	1-4	18:54:00-18:57:15	53	112-149	Color							
	5-4	19:00:05-19:03:35	53	150-191	Color							
	4-5	19:08:45-19:12:50	53	192-253	Color							
	3-5	19:22:55-19:27:10	54	1-64	Color							
	7-5	19:29:50-19:33:20	54	65-117	Color							
	1-5	19:39:15-19:42:25	54	118-165	Color							
	5-5	19:45:20-19:48:50	54	166-218	Color							
	7-7	19:51:45-19:53:25	54	219-244	Color							

TABLE 3.– Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
6	1-6	20:04:05-20:06:35	49	136-147	CIR	55-60	1-37	B/W & B/WIR				High altitude
	3-6	20:15:45-20:19:10	49	148-162	CIR	55-60	38-89	↓				
12	2-1	20:52:04-20:52:32	49	168-175	CIR	55-60	97-111	↓				Yuma, Colorado
	3-1	20:55:20-20:55:55	49	176-185	CIR	55-60	112-129	↓				
	1-1	20:58:30-20:59:00	49	186-193	CIR	55-60	130-144	↓				
	1-2	21:02:10-21:02:45	49	194-202	CIR	55-60	145-162	↓				
7	4-4	16:01:55-16:06:05	No exposure - Camera doors not opened									
	4-7	16:18:15-16:22:35	61	64-119	Color							
	3-4	16:32:10-16:36:20	61	120-170	Color							
	7-4	16:40:10-16:43:50	61	171-215	Color							
	1-4	16:46:45-16:49:55	61	216-254	Color							
	5-4	16:54:50-16:58:05	62	1-48	B/W							
	4-5	17:03:25-17:07:40	62	49-113	B/W							
	3-5	17:11:40-17:15:40	62	114-174	B/W							
	7-5	17:19:10-17:23:10	62	175-224	B/W							
	1-5	17:27:00-17:30:15	62	225-264	B/W							
	5-5	17:33:30-17:36:50	62	265-314	B/W							
	4-3	17:42:15-17:46:40	62	315-353	B/W							
	3-3	17:50:50-17:55:05	62	354-390	B/W							
	7-3	18:02:00-18:05:45	62	391-422	B/W							
	1-3	18:09:10-18:12:15	62	423-453	B/W							
	5-3	18:15:35-18:18:55	62	454-482	B/W							
	6-2	18:21:55-18:25:55	62	483-518	B/W							
	2-2	18:31:00-18:34:05	62	519-545	B/W							
	4-1	18:40:35-18:44:55	63	1-38	B/W							
	3-1	18:47:55-18:52:10	63	39-80	B/W							

TABLE 3.– Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
7	7-1	18:55:25-18:59:15	63	81-110	B/W							
	1-1	19:02:20-19:05:20	63	111-134	B/W							
	5-1	19:08:30-19:11:50	63	135-166	B/W							
	6-1	19:15:00-19:18:45	63	167-196	B/W							
	2-1	19:23:30-19:26:30	63	197-222	B/W	55-60	166-255	B/W & B/WIR				
	4-2	19:33:00-19:37:10	63	223-254	B/W	64-69	1-127					
	3-2	19:40:35-19:44:50	63	255-290	B/W	64-69	128-256					
	7-2	19:52:55-19:56:40	63	291-319	B/W	70-75	1-114					
	1-2	19:59:50-20:03:00	63	320-343	B/W	70-75	118-211					
	5-2	20:06:30-20:09:50	63	344-372	B/W	70-75	212-312					
8	3-6	18:11:15-18:15:55	91	1-19	CIR	92-97	1-36		98	1-4	CIR	
	7-6	18:19:10-18:23:30	91	20-36	CIR	92-97	37-66		98	5-13	CIR	
	1-6	18:27:15-18:30:19	91	37-50	CIR	92-97	67-89		98	14-20	CIR	
	5-6	18:34:15-18:37:34	91	51-65	CIR	92-97	90-115		98	21-28	CIR	
	6-3	18:39:45-18:44:00	91	66-82	CIR	92-97	116-146		98	29-37	CIR	
	2-3	18:49:30-18:53:10	91	83-96	CIR	92-97	147-172		98	38-44	CIR	
	4-3	19:01:40-19:06:15							98	45-90	CIR	
	3-3	19:09:40-19:14:45							98	91-141	CIR	
	7-3	19:17:20-19:21:44							98	142-186	CIR	
	1-3	19:25:20-19:28:55							98	187-222	CIR	
	5-3	19:31:50-19:35:55							98	223-263	CIR	
	6-2	19:38:15-19:42:25							98	264-305	CIR	
	2-2	19:52:50-19:56:50							98	306-345	CIR	
	4-4	20:00:50-20:05:10							98	346-410	CIR	
	3-4	20:09:00-20:13:30							98	411-478	CIR	

TABLE 3.– Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
8	7-4	20:15:40-20:19:30							98	479-536	CIR	
	1-4	20:23:15-20:26:45							98	537-589	CIR	
	5-4	20:31:15-20:34:55							99	1-55	CIR	
	4-5	20:39:25-20:44:00							99	56-123	CIR	
	3-5	20:46:35-20:51:10							99	124-192	CIR	
	7-5	20:53:25-20:57:10							99	193-249	CIR	
	1-5	21:00:45-21:04:00							99	250-298	CIR	
	5-5	21:06:40-21:10:20							99	299-354	CIR	
	4-1	21:19:15-21:23:20	91	97-157	CIR				99	355-416	CIR	
	3-1	21:27:20-21:31:40	91	158-199	CIR				99	417-458	CIR	
	7-1	21:34:10-21:37:50	91	200-231	CIR				99	459-490	CIR	
	1-1	21:41:55-21:45:00	100	1-27	B/W				99	491-517	CIR	
	5-1	21:48:30-21:52:00	100	28-56	B/W				99	518-546	CIR	
	6-1	21:54:25-21:58:05	100	57-93	B/W				99	547-583	CIR	
	2-1	22:04:05-22:07:30	100	94-128	B/W				101	1-48	CIR	
	4-2	22:13:30-22:17:30							101	49-88	CIR	
	3-2	22:21:00-22:25:15							101	89-131	CIR	
	7-2	22:29:05-22:32:50							101	132-169	CIR	
	1-2	22:36:15-22:39:15							101	170-200	CIR	
	5-2	22:41:55-22:45:20							101	201-235	CIR	
9	4-1	15:45:00-15:49:25							101	240-284	CIR	
	3-1	15:52:05-15:56:45							101	285-331	CIR	
	7-1	15:59:10-16:03:10							101	332-372	CIR	
	1-1	16:05:50-16:09:20							101	373-408	CIR	
	5-1	16:13:35-16:17:10							101	409-444	CIR	
	6-1	16:19:40-16:23:30							101	445-483	CIR	
	2-1	16:28:45-16:32:15							101	484-519	CIR	

TABLE 3.– Continued.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
9	4-2	16:35:45-16:40:00							101	520-562	CIR	
	3-2	16:43:20-16:47:55							101	563-608	CIR	
	7-2	16:50:45-16:54:35							101	609-645	CIR	
	1-2	16:58:25-17:01:50							102	1-35	CIR	
	5-2	17:05:15-17:08:55							102	36-72	CIR	
	4-3	17:21:50-17:26:05							102	73-115	CIR	
	3-3	17:33:45-17:38:25							102	116-162	CIR	
	7-3	17:41:55-17:45:40							102	163-198	CIR	
	1-3	17:49:05-17:52:45							102	199-235	CIR	
	5-3	17:57:05-18:00:50							102	236-273	CIR	
	6-2	18:03:05-18:06:50							102	274-308	CIR	
	2-2	18:12:30-18:16:05							102	309-344	CIR	
	4-4	18:19:50-18:24:15							102	345-411	CIR	
	3-4	18:29:10-18:33:25							102	412-475	CIR	
	7-4	18:37:40-18:41:20	Hasselblad malfunctioned						102	476-506	CIR	
	1-4	18:44:45-18:47:55			No camera data							
	5-4	18:51:40-18:55:25			No camera data							
	4-5	19:12:25-19:16:30	100	132-193	B/W	(exposed as CIR film)						
	3-5	19:20:30-19:25:15	100	194-265	B/W	(exposed as CIR film)						
	7-5	19:32:45-19:36:25	103	1-56	CIR							
	1-5	19:39:55-19:43:10	103	57-105	CIR							
	5-5	19:51:05-19:55:05	104	1-61*	CIR							
	3-6	20:05:40-20:10:15	104	78-96	CIR	92-97	173-208	B/W & B/WIR				
	7-6	20:13:50-20:17:25	104	97-112	CIR	92-97	212-238	"				
	1-6	20:20:45-20:23:45	104	113-125	CIR		239-261	"				

*Frames 62-77 "extra pictures."

TABLE 3.— Concluded.

Data flt. no.	Line-run	Line-run start-stop time, GMT (hr:min:sec)	Camera									Remarks
			Zeiss			AMPS			Hasselblad			
			Mag. (roll)	Frame	Film type	Mag.	Frame	Film type	Mag.	Frame	Film type	
13	2-1	20:49:20-20:50:10	104	127-139	CIR	92-97	262-287					Yuma, Colorado
	1-1	20:53:35-20:54:15	104	140-150	CIR	92-97	288-309					
	1-2	20:57:20-20:58:15	104	151-164	CIR	92-97	310-314	(AMPS camera ran out of film.)				
	3-1	21:01:35-21:02:20	104	165-177	CIR							
10	4-2	09:15:35-09:21:15	Pre-dawn passes									
	3-2	09:25:35-09:31:05										
	7-2	09:35:20-09:39:20										
	1-2	09:44:35-09:49:00										
	5-2	09:53:35-09:58:45										
	4-3	10:08:35-10:14:05										
	4-1	10:34:55-10:39:40										
	3-1	10:43:20-10:48:30										
	7-1	10:52:35-10:56:05										
	1-1	11:00:40-11:04:00										
	5-1	11:07:20-11:11:31										
	6-1	11:16:55-11:20:40										
	2-1	11:30:50-11:34:00										
	4-4	11:50:40-11:55:10	105	1-53	B/W	(First 7 frames no filter used)						
	3-4	11:57:25-12:01:40	105	54-96	B/W							
	7-4	12:05:50-12:09:30	105	97-133	B/W							
	1-4	12:12:25-12:15:40	105	134-166	B/W							
	5-4	12:20:10-12:24:00	105	167-205	B/W							
	6-2	12:26:10-12:30:00	105	206-244	B/W							
	2-2	12:36:20-12:39:25	106	1-32	B/W							
	4-5	12:50:15-12:54:35	106	33-82	B/W							
	3-5	12:57:01-13:01:19	106	83-126	B/W							
	7-5	13:03:20-13:07:05	106	127-164	B/W							
	1-5	13:10:15-13:13:25	106	165-196	B/W							
	5-5	13:19:05-13:22:47	106	197-234	B/W							

APPENDIX

AIRCRAFT SENSOR CONFIGURATION AND COMPATIBILITY

APPENDIX

AIRCRAFT SENSOR CONFIGURATION AND COMPATIBILITY

Figures A-1 and A-2 show the configuration of the various sensors on the NC-130 aircraft. Table A-1 shows the compatibility matrix for the sensors on the NC-130. No entry indicates that the sensors are compatible; i.e., there is no known reason why the two sensors should not be operated simultaneously. Mechanical incompatibility occurs when only one of the two sensors can be mounted in its operating position. However, in all cases, changeover in flight from one sensor to another can be accomplished with little difficulty. The one case of electromagnetic incompatibility observed was due to out-of-band emission of the 1.6-GHz scatterometer at the L-band radiometer frequency of 1.4 GHz. This effect is expected because of the radiometer's high sensitivity.

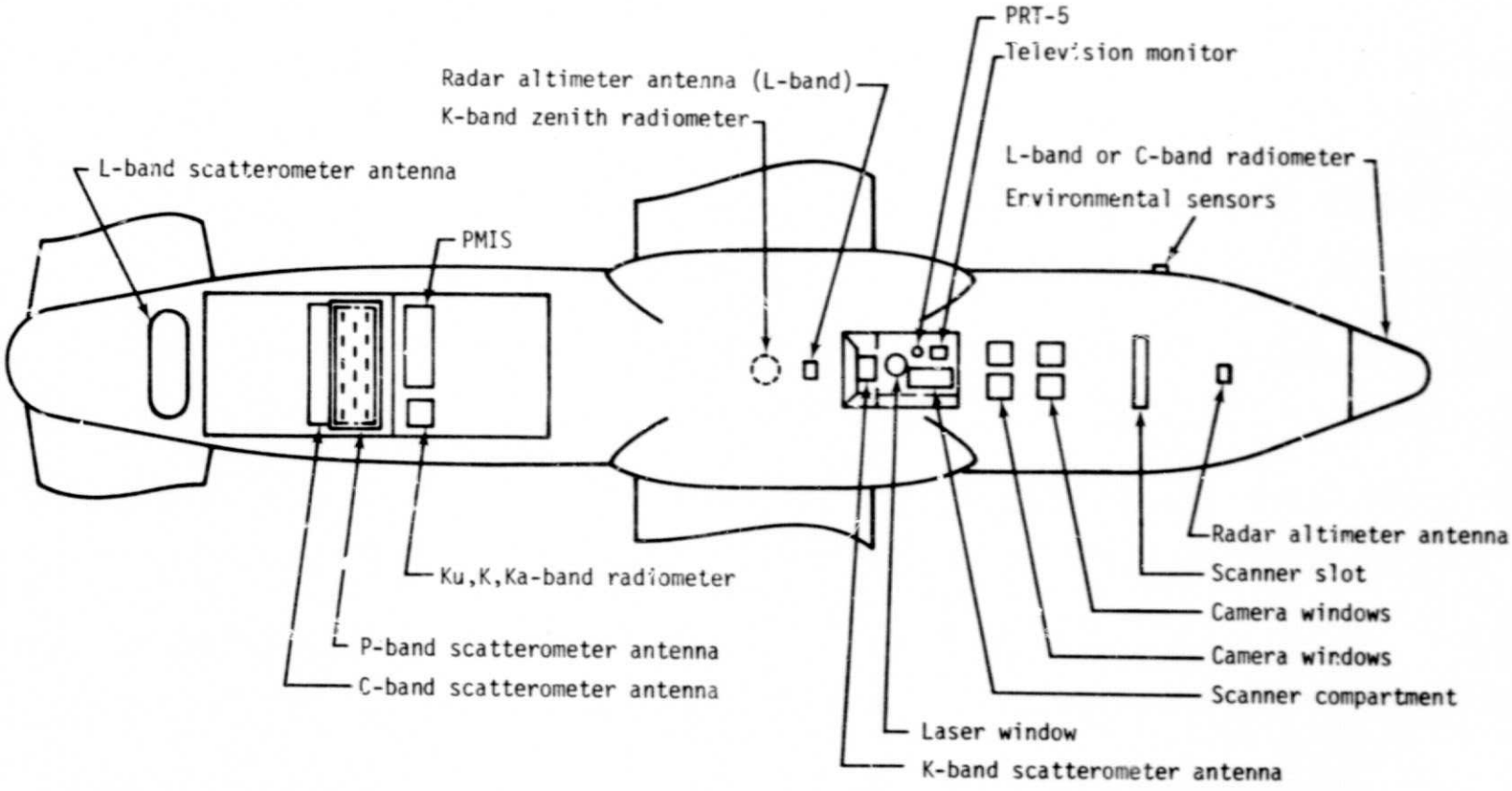

Figure A-1.— Bottom view of the NASA aircraft (NC-130).

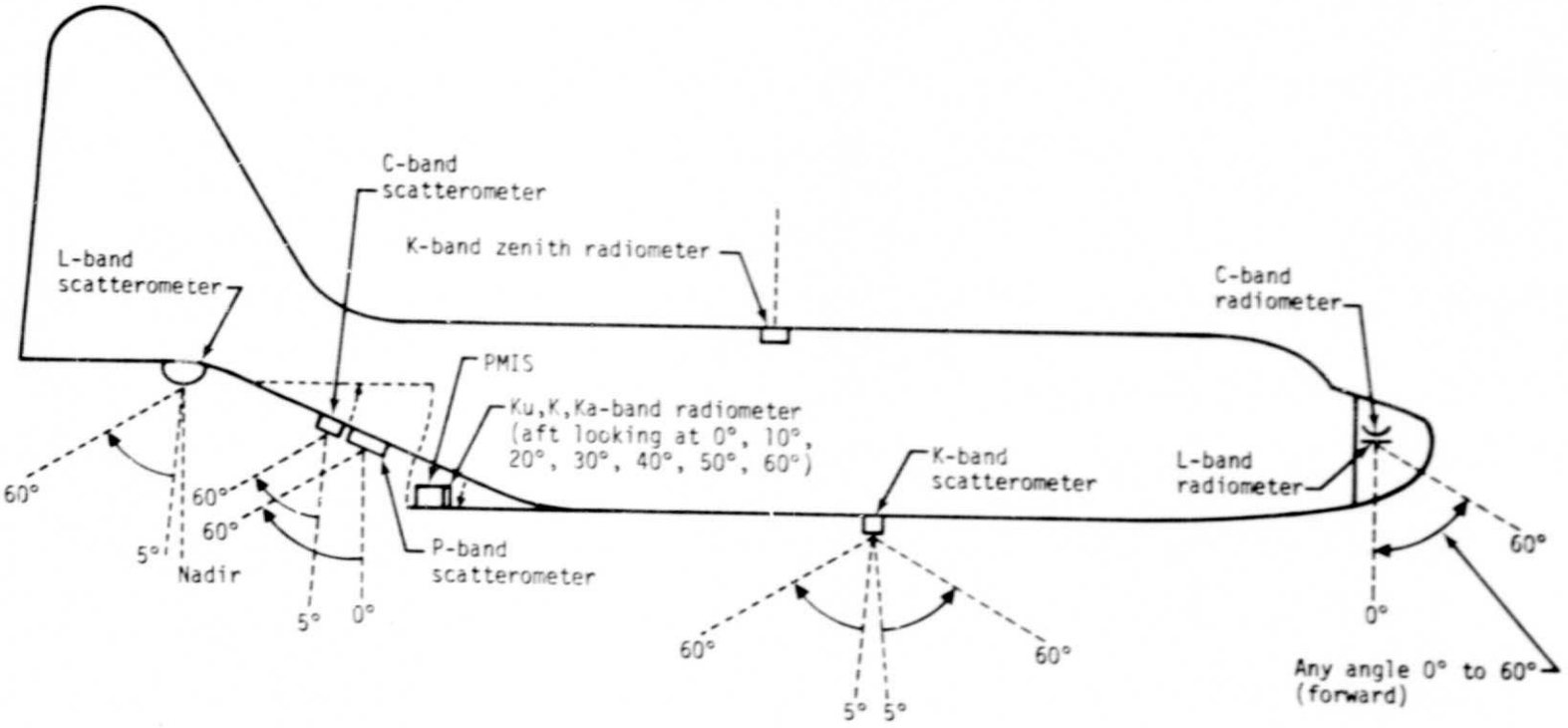

Figure A-2.— Side view of the NASA aircraft (NC-130).

TABLE A-1.— NC-130 MICROWAVE SENSOR OPERATIONAL COMPATIBILITY MATRIX

M = mechanical incompatibility; E = electromagnetic interference; no entry means that the instruments are compatible.

Sensor	PMIS	Ku, K, Ka radiometers	L-band radiometer	C-band radiometer	Zenith K-band radiometer	0.4-GHz scatterometer	1.6-GHz scatterometer	4.75-GHz scatterometer	13.3-GHz scatterometer
PMIS						M	M	M	
Ku, K, Ka radiometers						M	M	M	
L-band radiometer				M			E		
C-band radiometer			M						
Zenith K-band radiometer									
0.4-GHz scatterometer	M	M							
1.6-GHz scatterometer	M	M	E						
4.75-GHz scatterometer	M	M							
4.75-GHz scatterometer									
13.3-GHz scatterometer									