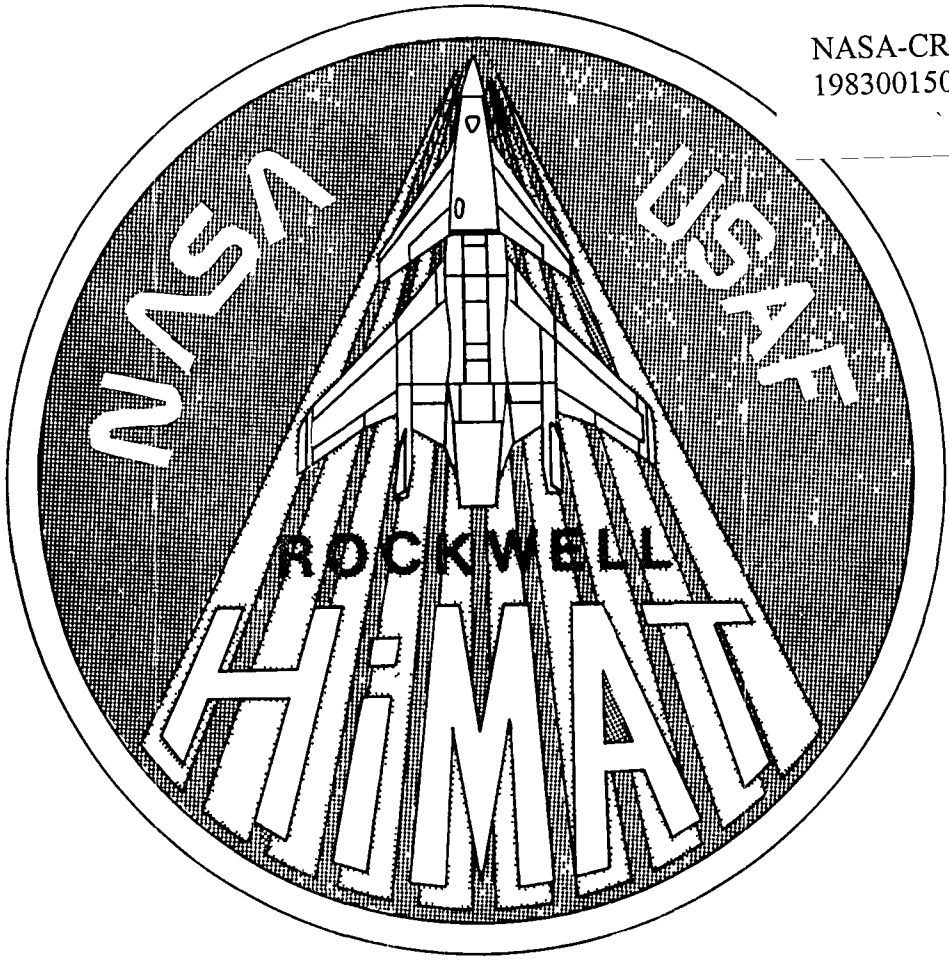
HiMAT

HIGHLY MANEUVERABLE AIRCRAFT TECHNOLOGY



Flight Report

NF02075

APPROVED:

NASA DFRC PROGRAM MANAGER

FLIGHT NO. H1-9-17

FLIGHT DATE Dec 22, 1981

CONTENTS

HiMAT

Flight Summary

Flight H1-9-17 **Date** 12-22-81

OBJECTIVES

The primary objective of this flight was flight verification of a new primary flight control system, designed to control the unstable HiMAT aircraft. Other objectives included the initial flight demonstration of a Maneuver Autopilot (M.A.P.) in the level cruise mode and the gathering of a limited amount of airspeed calibration data.

TEST CONDITIONS

MACH	ALTITUDE	MANEUVER	COMPLETED
.70	40K	Maneuver Autopilot Cruise Point	YES
.70 → .93	40K	Flight Control System Pulses	YES
.90 → .70	40K	Wind Up Turn at 1.5G	YES
.50	25K	Maneuver Auto Pilot Cruise Point	YES
.50 → .935	25K	Flight Control System Pulses	YES
.935	25K	Series of Flutter Pulses	YES
.885	25K	8g Wind up Turn	YES
.90 → .50	25K	A/S Cal Deceleration under M.A.P. Control	YES
.68	15K	Maneuver Auto Pilot Cruise Point	YES
.68 → .40	15K	Flight Control System Pulses	YES

RESULTS

1. The launch was successfully completed with the aircraft stabilizing out at 5° nose down.
2. The maneuver autopilot worked well with some minor longitudinal oscillations at .9/25K and .5/15K.
3. The handling qualities of the aircraft up and away were slightly better than expected as the new flight control system appeared to work very well.
4. A smooth approach to Runway 15 was accomplished, dispite a direct crosswind of 7 to 12 knots.

Flight Summary

Flight H1-9-17

FLIGHT OPERATION

HiMAT PILOT ISHMAEL
HiMAT FTE COOPER

NASA 1 MCMURTRY

NASA 008 FULTON
MALLICK
OBRIEN

NASA 824 ENEVOLDSON/YOUNG

CHASE DANA/RYAN (PHOTO)

AMB TEMP (°F) 50
AMB PRES (IN Hg) 27.69
WIND VEL (KNTS) 7
WIND DIR (DEG) 210

B-52 TAKEOFF TIME 0746

HiMAT LAUNCH TIME 0818
LAUNCH ALTITUDE (FT) 45,000
LAUNCH WEIGHT (LBS) 3450
LAUNCH c.g.(IN. /%c) 133.68/-1.11

MACHmax 0.940
Vmax (KCAS) 410.
ALTITUDEmax (FT) 45,000
qmax (psf) 505.
LOAD FACTORMAX (g) 7.5
LANDING RUNWAY 15
LANDING TIME 08:53
LANDING WEIGHT (LBS) 2974
SLIDE OUT DISTANCE (FT) 3430
LANDING CROSSWINDS (KNTS) 7

FLIGHT TIME 00:36 **HRS**
FLIGHT ALOFT TIME 1:06 **HRS**
TOTAL A/V 1 **FLT TIME** 4:42 **HRS**
TOTAL A/V 1 **ALOFT TIME** 18:54 **HRS**

PALLET S/N 002
COMPUTER S/N 002

HiMAT CONFIGURATION

VEHICLE A/V 1 **NASA** 870

ENGINE (J85-GE-21A) S/N 657
LEADING EDGES Maneuver
INTERNAL BALLAST 38.2 pounds

GROUND BASE SOFTWARE RELEASE
V73A HMT 19U
V73B HMT B11
V77 10

ON BOARD SOFTWARE RELEASE
PRIMARY HPR 24
BACK UP HBU 24

HiMAT

Project Management Report

Flight H1 9-17 December 22, 1981

This was the first flight of vehicle #1 since December, 1980. It was also the first flight with the relaxed static stability (RSS) control system and aft c.g. location. The exceptional smoothness and 100% accomplishment of the flight plan demonstrated completeness of preparation and high professionalism of the project team. The control pulses at various Mach, altitude conditions to validate systems performance were extremely close to the predicted responses. These results lend a great deal of confidence that the RSS flight control development is now complete and ready to support flights with negative RSS.

The next flight is planned for mid January with the c.g. located about -5%$\bar{c}$. All nose ballast will be removed and approximately 50lbs of ballast installed in the forward section of the engine tail cone. Flight 11 objectives are to verify the RSS flight control operation and performance in the most aft c.g location. A second flight in January will then be conducted to demonstrate the sustained transonic maneuver performance using "rocking horse" maneuver.

Paul C. Loschke
HiMAT Project Manager

HiMAT

Discrepancy List

Flight H1-9-17

H-81-433 Flameout flashing with normal engine operation.

Status: Open, noise on the rpm signal appears to be causing the false indication. AV-1 will continue to fly with this problem until a new on board release is installed.

H-81-434 Loss of sync on OBC downlink.

Status: Open, cause is still unknown. This problem does not occur frequently, therefore troubleshooting will be postponed.

H-81-435 Battery voltage sagged below 24 volts.

Status: Hold-T, New flight batteries will be installed for the next flight.

HiMAT

Pilot/FTE Comments

Flight H1-9-17

PILOT

The launch transients were insignificant. At 40,000 feet, the vehicle was easier to control than the simulator. The maneuver auto-pilot held altitude with fewer oscillations than expected. Engine response was slow but adequate for the one hundredth Mach increases required by the flight card. Longitudinal control for the 1-1/2 G windup turn (WUT) to α limiter was precise with little tendency to overshoot as long as trim was used to bias stick forces.

Descent to 25,000 feet was rapidly accomplished with very little airspeed overshoot. The ground cockpit appeared to suffer from numerous telemetry drop outs.

All maneuvers at 25,000 feet were satisfactory except for the 8 G WUT. The afterburner was slow and unpredictable to light and I could not monitor load factor Mach and altitude sufficiently to obtain the point.

The approach and landing were satisfactory. Gear extention transients were less than the other flight control system. Longitudinal axis control is less sensitive to small inputs. The vehicle appears to be less PIO prone in both axes. The cross wind definitely affects vehicle bank excursions of about 10^{o}-15^{o}. I strongly recommend no more than the current cross wind limit. The vehicle is very predictable and positive longitudinally during the flare.

Stephen D. Ishmael
Aerospace Research Pilot

Pilot/FTE Comments

Flight HI-9-17

FTE

The ground portion of the check list went very well. Only one anomaly was noted, and that being the flameout and abort light were constantly blinking. This however, was deemed not a problem due to the fact that all the engine parameters were at nominal values. The decision was made to continue the mission, with a very strong emphasis placed on the master caution/warning panel so as to pickup any problems which might develop with the engine.

The wind was of constant concern. On B-52 taxi, the ground winds were being called at 7 knots, gusting to 11 knots on a direct crosswind to the only available runway, 15. They remained at this level throughout the mission.

The launch was very much like the simulation prediction, with the aircraft final attitude being 5° nose down at 7° angle of attack.

The Maneuver Autopilot (M.A.P) held altitude extremely well with a variation being on the order of one count of data. This included data obtained during a deceleration at 25,000 feet from .9 Mach number to .5 Mach number. The one problem which we had with it was a longitudinal oscillation of ± 1g at .5 Mach and 15,000 feet. This also occured at 25,000 feet and Mach numbers between .70 and .90. This was easily corrected by increasing the longitudinal feed-back gains from a position of 3 to 4 on the CSMC panel.

A very good deceleration for airspeed calibration purposes was performed at 25,000 feet from .9 Mach to .5 Mach. This was under the M.A.P. control.

The landing approach was flown with the gear down over a cloud back, therefore a very steep final approach path was flown. A smooth touchdown was accomplished at 150 knots and 8½° angle of attack on runway 15.

James M Cooper

James M. Cooper
Flight Test Engineer

HiMAT

Vehicle Operation Report

Flight H1-9-17

December 21, 1981

Operations

This mission was first attempted on December 17th. It was halted due to suspected loss of generator gearbox oil. The engine accessory gearbox seal was intact but the generator gearbox seal (generator end) was deformed. An interference was also found between the gearbox female spline and the generator drive shaft. Repairs were made and the flight was rescheduled.

The Day-of-Flight procedures were completed satisfactorily. One hold was necessary to complete telemetry acquisition. A taxiway radar beacon position check was accomplished. The mission went well from bomber takeoff to landing. Anomalies noted were minor while airborne. These included an intermittent main burner flameout light indication, several onboard computer generated TM dropouts and a fuel quantity reset. Afterburner lights were not consistent and are discussed in the propulsion system section.

The main landing gear extended before the nose landing gear with the left gear first. Subsequent hydraulic system purging resulted in satisfactory operations. A TV and radar beacon dropout occurred after engine shutdown. Investigation revealed a flight battery voltage drop to 21.5 volts at switch-over. No trips to backup occurred during the flight.

The landing slideout was 3430 feet.

The launch weight was 3450 pounds and the landing weight was 2974 pounds.

Cyrus C. Cassells Jr.

Cyrus C. Cassells, Jr.
Operations Engineer

Vehicle Operation Report

Flight H1-9-17

FLIGHT CONTROL SYSTEM OPERATION

The ninth HiMAT vehicle number 1 flight occurred December 21, 1981. This report summarizes the flight control system performance and pilot comments to specific questions related to his ability in the accomplishment of particular flight tasks.

Relaxed Static Stability Control Systems

This was the first HiMAT flight which incorporated the relaxed static stability control systems. The primary control system (PCS) is an entirely new system designed specifically for the relaxed static stability portion of the HiMAT test program. The backup control system (BCS) was reconfigured for the RSS portion of the test program.

The vehicle was ballasted to an average center-of-gravity location of approximately FRS 134.26 which would not result in an actual static instability on this flight. The vehicle will be ballasted to a center-of-gravity of FRS 136.9 or approximately 5% $\bar{c}$ aft for flight 10.

Prelaunch Operation

No anomalies were noted during prelaunch checks. All systems functioned as desired.

Primary Control System Operation

1. The entire flight was flown in PCS, there were no transfers to BCS. System gain settings, at the pilot's station, for this flight were 3,3,3 for pitch, roll, and yaw respectively except during some of the PCS pulses.

To continuously monitor PCS performance during the flight, transparent overlays of both lateral-directional and longitudinal PCS pulses done in the iron bird simulation were used at the stability and control stripchart location. This was the first HiMAT flight that this technique was used for real time quantative stability and control evaluation. This method worked quite well and greatly augmented the real time evaluation of the new PCS. The comparison of the longitudinal pulses was excellent while the comparison of the lateral-directional pulses was fair to good.

Generally speaking the new PCS functioned very well if not beyond expectation. All PCS objectives were achieved and the system is considered cleared for the more aft center-of-gravity configuration.

Maneuver Autopilot (MAP)

The maneuver autopilot was engaged and evaluated at four straight and level flight conditions: .7/40K, .5/25K, .9 <-> .5/25K, and .68/15K. During the first two maneuvers the maneuver autopilot captured the target conditions rapidly (within 4 seconds after engagement) and held that condition to within ± 50 ft. The performance of the maneuver autopilot was excellent and without problem.

The third maneuver was a level deceleration. During the first part of the maneuver, there appears to be a limit cycle problem which damps out rapidly approximately 30 seconds after MAP engagement. It is not clear if this is a "capture-condition problem" made worse by the limited longitudinal authority or a problem caused by the lack of longitudinal gain scheduling (as a function of dynamic pressure). However, the damping occurred without intervention from the flight crew.

The fourth maneuver resulted in a limit cycle that was eliminated by increasing the primary control system gains from "3-3-3" to "4-4-4". This phenomenon was more clearly the result of no longitudinal gain scheduling.

Pilot Quentionnaire

A pilot questionnaire was prepared for specific items in the test card. The pilot was requested to use the Cooper-Harper rating scale as the basis for his comments.

Pilot Comments

I. Up and Away Flight

Comment on ability to control aircraft.

(a) Longitudinally - F_S are relatively high, trim is imperative in order to avoid fatigue.

(b) Lateral-directionally - appears to be satisfactory.

Rate ability to control and maintain

(a) Airspeed - heavy compensation required.

(b) Altitude - moderate compenstion required.

(c) Angle of attack and/or g - difficult but satisfactory.

(d) Bank angle - satisfactory.

Comments relative to stick characteristics.

(a) Longitudinal sensitivity - high but required to avoid PIO.

(b) Lateral sensitivity - satisfactory.

(c) Stick harmony - better than before.

(d) Compare simulation with flight - A/C is better damped.

II. WUT to 1.5g and 8g

Comment and rate ability to achieve and maintain desired "g" - 1.5g satisfactory, 8g impossible because A/B light unpredictability.

Comment on longitudinal sensitivity - must trim most forces off stick to preserve some sensitivity.

Comment and rate lateral control and ability to achieve and maintain desired bank angle - good, well damped - visual task only => similar to ATARI game, not particularly similar to actual aircraft control.

III. Automatic Control Pulses

Qualitative comments and comparison with simulation of control pulses.

(a) Longitudinal - good except for canard inputs; they are very large in A/C.

(b) Lateral-directional - closely correlated maybe a little larger in A/C than SIM.

IV. Maneuver Autopilot

Qualitative comments and comparison with simulation of MAP.

(a) Ability hold Mach No. - good except it wouldn't capture 0.51 IMN.

(b) Ability to hold altitude - excellent.

(c) Transients on entering or exiting MAP - satisfactory.

(d) Transients during MAP operation - none observed.

V. Landing Approach

General comments on landing approach - good longitudinally, fair laterally - very sensitive to wind and gusts.

Comment on gear transient - minimal.

At what altitude/airspeed was transfer from ADI to TV made? - N/A due to avoiding clouds on approach.

Comment and rate task prior to and following transfer to TV.

(a) Longitudinal - extensive compensation but "durable".

(b) Lateral-directional - severe compensation. Very PIO prone but avoidable if no rudder used and very small inputs.

Comment and rate ability to flare the aircraft - Extensive compensation required not to over control (inherent in TV landing task).

Comment on control stick characteristics such as sensitivity, harmony, etc. and compare with simulation where applicable. - Not comparable in any significant way to SIM. Harmony appears better than before F_S high but I think that I would over control without high F_S.

VI. General Pilot Comments

"A very difficult way to obtain flight test data, from pilot workload point of view".

Robert W. Kempel

Vehicle Operation Report

Flight H1-9-17

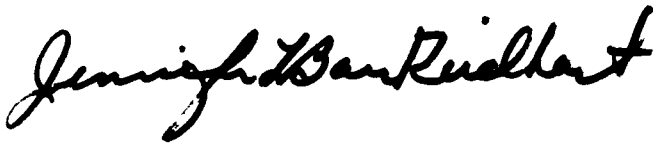
PROPULSION SECTION

Accomplishments: There were no research requirements on the propulsion system for this flight. During the captive portion of the flight, the afterburner was tested at 25,000 feet during the climbout and operated satisfactorily. However, during test point 20 (8'g' wind-up-turn), the afterburner lit eight seconds after the throttle was in the afterburner range. It should be noted that the afterburner sequencing has been slow primarily as a result of the IPCS logic not being optimized in this area. This has been recognized by the project office and will be corrected when time is available. It is not known if the afterburner anomoly on this flight is related to the IPCS logic or is a throttle actuator rigging problem, and is being investigated.

Anomolies: The anomolies noted during this flight were the afterburner lights (see above) and an engine flameout indication, which was intermittent, when there was no flameout. The engine flameout anomoly will be corrected when more information is available.

Configuration: The propulsion system was operational in all modes from idle to maximum afterburning power settings.

Anomolies Carried Forward: None



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Ground Facilities Report

Flight H1-9-17

ATR REPORT

ATR facilities operation was normal during the flight, except that fuel quantity (QUAN) as computed in the real time program reset at about 08:45:58. Fuel quantity as computed in the RPV facility (FL) remained operational. The exact cause of the reset is unknown.

Setup for the control room displays is attached, Pages VI-2 thru VI-8.

Paul Harney
Test Information Engineer

RPRV LAB REPORT

The RPRV Lab configuration was verified by pre-flight procedures with no anomalies reported, There were no lab discrepancies during the flight and no DR's written.

Nicholas Kantartzis

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********** STRIPCHART NO. 1 **********

	1	2	3	4	5	6	7	8
SYS DEFN	2-1- 4- 1	- - -	- - -	1-1- 10- 1	1-1- 19- 1	1-1- 20- 1	1-1- 33- 1	1-1- 6- 1
PARAMETR	LONG STK POS.	ELEVATOR POS.	SYM ELEVON POS	PITCH RATE-ABC	ANGLE OF ATTACK	CG. ACCL.NZ-ABC	PITCH ANGLE	LH WT ACCL AFT
PARMID	DEP	DE	DVS	Q	ALPHAL	AN	ANP	ACLW
COMMENT		(DEL + DER)/2	(DVL + DVR)/2					UPDATE SAF ETM
RANGE	5.0, -5.0	-25.0, 30.0	-25.0, 30.0	25.0, -25.0	20.0, -5.0	9.0, -1.0	50.0, -50.0	12.5, -12.5
UNITS	DEG	DEG	DEG	DEG/SEC	DEG	G	DEG	G
TRDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT	N/A , N/A	N/A , N/A	N/A , N/A	1276 , 0650	0635 , 1577	1467 , 0736	1216 , 0562	1170 , 0635
DAC NBR	64	96	97	0	1	3	7	1
SOURCE	SEL	SEL	SEL	RAW	RAW	RAW	RAW	RAW

********** STRIPCHART NO. 2 **********

	1	2	3	4	5	6	7	8
SYS DEFN	2-1- 3- 1	- - -	2-1- 5- 1	- - -	1-1- 5- 1	1-1- 12- 1	1-1- 23- 1	1-1- 29- 1
PARAMETR	LAT STK POS	ASSYM ELEVON POS	RUDDER PEDL POS	RUDDER POS.	ROLL RATE	YAW RATE	ANGLE- SIDESLIP	ROLL ANGLE
PARMID	DAP	DVA	DAP	DR	P	YRYFINE	BETA	ATR
COMMENT		(DVL - DVR)		(DRL + DRR)/2				
RANGE	-5.0, 5.0	-100.0, 100.0	5.0, -5.0	5.0, -5.0	-50.0, 50.0	-10.0, 10.0	5.0, -5.0	-100.0, 100.0
UNITS	DEG	DEG		DEG	DEG/SEC	DEG/SEC	DEG	DEG
TRDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	0633 , 1147	0051 , 1640	0642 , 1102	0342 , 1433
DAC NBR	65	98	66	99	5	6	7	8
SOURCE	SEL	SEL	SEL	SEL	RAW	RAW	RAW	RAW

********** STRIPCHART NO. 3 **********

	1	2	3	4	5	6	7	8
SYS DEFN	2-1- 27- 1	1-1- 26- 1	1-1- 24- 1	2-1- 23- 1	1-1- 24- 2	1-1- 26- 2	- - -	- - -
PARAMETR	DRC	LH RUDDER POS	RH RUDDER POS		LH ELEVON	RH ELEVON		AILERON POS.
PARMID	UPLNK13	DRL	DRR	DVAC	DVL	DVR	DAC	DA
COMMENT				UPLNK21-UPLNK12			(UPLNK22)(-2)	(DAL - DAR)
RANGE	5.0, -5.0	5.0, -5.0	5.0, -5.0	50.0, -50.0	30.0, -20.0	30.0, -20.0	50.0, -50.0	50.0, -50.0
UNITS	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG
TRDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT	N/A , N/A	1320 , 0436	0429 , 1322	N/A , N/A	0666 , 1000	1737 , 0976	N/A , N/A	N/A , N/A
DAC NBR	121	9	10	100	11	12	101	102
SOURCE	SEL	RAW	RAW	SEL	RAW	RAW	SEL	SEL

********** STRIPCHART NO. 4 **********

	1	2	3	4	5	6	7	8
SYS DEFN	- - -	- - -	2-1- 34- 1	- - -	2-1- 28- 1	- - -	2-1- 39- 1	1-1- 25- 1
PARAMETR		DVS	DEC	DE	DSBC	DSB	DTHRC	CG. ACCL.NY-ABC
PARMID	DVSC	DVS	UPLNK21	DE	UPLNK14	SPDB	UPLNK24	ANY
COMMENT						(DRR - DRL)/2		
RANGE	30.0, -25.0	30.0, -25.0	30.0, -25.0	30.0, -25.0	5.0, -5.0	5.0, -5.0	120.0, 0.0	2.5, -2.5
UNITS	DEG	DEG	DEG	DEG	DEG	DEG	DEG	G
TRDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	1500 , 0300
DAC NBR	193	67	122	68	123	124	124	13
SOURCE	SEL	SEL	SEL	SEL	SEL	SEL	SEL	RAW

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********** STRIPCHART NO. 5 **********

	1	2	3	4	5	6	7	8
SYS DESN	1-1- 3- 2	1-1- 26- 1	1-1- 32- 1	1-1- 32- 1	- - -	- - -	- - -	- - -
PARAMETR	LH RUDDER HN	LH RUDDER POS	LH TBOUM LATSHR	LH TBOUM LATBND	LH TBOIM LATTRO	WING STA31 SHR	WING STA31 BND	WING TIP BND
PARMID	SG5	DAL	VLBX	BLBX	TLB	VIWB	BIWB	BWTP
COMMENT		UPDATE	SG7 -SG8+SG9	SG7 -SG8+SG9				
RANGE	1073.0 , 3.0	-10.0, 10.0	-3000., 3000.	-75000., 75000.	-25000., 25000.	-2500., 2500.	-50000., 150000.	-5000., 15000.
UNITS	COUNTS	DEG	LBS	IN-LBS	IN-LBS	LBS	IN-LBS	IN-LBS
TNDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
DCTL CNT	1777 , 0000	0113 , 1652	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A
DAC NBR	1	9	106	107	108	109	110	111
SOURCE	RAW	RAW	SEL	SEL	SEL	SEL	SEL	SEL

********** STRIPCHART NO. 6 **********

	1	2	3	4	5	6	7	8
SYS DESN	1-1- 18- 1	1-1- 19- 1	- - -	- - -	- - -	1-1- 34- 2	1-1- 34- 2	1-1- 34- 2
PARAMETR	NORMAL ACCEL	ANGLE ATTACK	WING STA 1 SHR	WING STA 1 BND	WING STA 1 TRO	CAND STA 1 SHR	CAND STA 1 BND	CAND STA 1 TRO
PARMID	ACCGIF	ALPHAL	VOWP	BOWP	TOWP	VCON	BCON	TCON
COMMENT		REVERSE	SG20	SG20	SG20	SG39	SG39	SG39
RANGE	-1.0, 9.0	-5.0, 25.0	-3000., 27000.	-25000., 85000.	-90000., 210000.	-400., 1600.	-10000., 40000.	-2000., 8000.
UNITS	G	DEG	LBS	IN-LBS	IN-LBS	LBS	IN-LBS	IN-LBS
TNDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
DCTL CNT	3577 , 1265	1577 , 0635	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A
DAC NBR	14	1	112	113	114	115	116	117
SOURCE	RAW	RAW	SEL	SEL	SEL	SEL	SEL	SEL

********** STRIPCHART NO. 7 **********

	1	2	3	4	5	6	7	8
SYS DESN	1-1- 33- 1	1-1- 8- 1	- - -	1-1- 18- 4	1-1- 29- 3	1-1- 29- 2	- - -	1-1- 29- 4
PARAMETR	PITCH ANGLE	PITCH RATE FT	SYN ELEVN POS	CG ACCL NZ FT	STATIC PRESS	FREESTREAM DIFF	PRESSURE RATIO	RADAR ALTITUDE
PARMID	ANP	ARPF	DVS	ACCGNF	ALT	AS	PR	ALTR
COMMENT	UPDATE			UPDATE				
RANGE	30.0, -20.0	25.0, -25.0	10.0, -10.0	5.0, -5.0	22000., 0.0	1000.0, 0.0	1.0, 0.0	50000., 0.0
UNITS	DEG	DEG/SEC	DEG	G	PSFA	PSFD		FT
TNDENT	0 , 0	0 , 0	0 , 0	0 , 0	5 , 5	0 , 5	0 , 0	0 , 0
DCTL CNT	1125 , 0707	1172 , 0573	N/A , N/A	1071 , 0403	1641 , 0141	1255 , 0404	N/A , N/A	7012 , 0777
DAC NBR	2	34	68	14	16	17	118	18
SOURCE	RAW	RAW	SEL	RAW	RAW	RAW	SEL	RAW

********** STRIPCHART NO. 8 **********

	1	2	3	4	5	6	7	8
SYS DESN	1-1- 29- 1	1-1- 4- 1	- - -	- - -	1-1- 9- 1	1-1- 14- 1	2-1- 14- 1	1-1- 41- 1
PARAMETR	ROLL ANGLE	ACCL RATE FT	DIFF ELEVON POS	RUDDER POS	YAW RATE FT	CG ACCL NY FT	ALTITUDE RATE	THROTTLE POS
PARMID	ATR	ARRF	DVA	DR	ARYF	ACLGTF	HDOT	ITP
COMMENT	UPDATE							
RANGE	50.0, -50.0	50.0, -50.0	10.0, -10.0	2.5, -2.5	10.0, -10.0	0.5, -0.5	6000.0, -6000.0	100.0, 0.0
UNITS	DEG	DEG/SEC	DEG	DEG	DEG/SEC	G	FT	DEG
TNDENT	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
DCTL CNT	1215 , 0560	1134 , 0624	N/A , N/A	N/A , N/A	1052 , 0706	1061 , 0701	N/A , N/A	1620 , 1000
DAC NBR	8	15	69	70	19	23	71	21
SOURCE	RAW	RAW	SEL	SEL	RAW	RAW	SEL	RAW

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********** STRIPCHART NO. 9 **********

	1	2	3	4	5	6	7	8
SYS DESN*	- - -	- - -	1-1- 42- 2	1-1- 42- 3	1-1- 29- 4	1-1- 3- 1	- - -	- - -
PARAMETR*	AGC DNLNK REC 1	AGC DNLNK REC 2	S/S TRANS NO. 1	S/S TRANS NO. 2	RADAR ALTITUDE	L/H PRIM ELEVON	OCDR 1 INT LOSS	PRIMARY MODE
PARMID *	AGC1	AGC2	SS1	SS2	ALTR	LPMS	DIIF	DMRC
COMMENT *			LOWER ANTENNA	UPPER ANTENNA	REPEAT		GOOD FAIL	R/U PRT
RANGE *	,	,	-50.0, -100.0	-50.0, -100.0	9000.0, 0.0	-10.0, 10.0	0.0, 1.0	0.0, 1.0
UNITS *			DBM	DBM	FT	VOLTS		
INDENT *	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT*	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	0012 , 0777	0664 , 1674	N/A , N/A	N/A , N/A
DAC NBR *			85	86	48	38	87	120
SOURCE *	SEL	SEL	SEL	SEL	RAW	RAW	SEL	SEL

********** STRIPCHART NO. 10 **********

	1	2	3	4	5	6	7	8
SYS DESN*	1-1- 35- 4	1-1- 35- 7	1-1- 35- 8	1-1- 28- 3	1-1- 37- 3	1-1- 33- 4	1-1- 37- 4	1-1- 41- 1
PARAMETR*	COMP INLET PTOT	COMP DISC PTOT	TURB DISC PSTAT	INLET GV POS	ENGINE RUTOR	ENG EXH GAS TMP	EXH NOZ EXIT AR	THROTTLE POS
PARMID *	P2	PCDT	P5	AGV	RPM	TXG	ENXA	ITP
COMMENT *								UPDATE
RANGE *	50.0 , 0.0	150.0 , 0.0	50.0 , 0.0	50.0 , 0.0	110.0 , 0.0	1[illegible].0 , 0.0	206.[illegible] , 1[illegible]	12[illegible] , [illegible]
UNITS *	PSIA	PSIA	PSIA	DEG	PERCENT	DEG C	IN2	DEG
INDENT *	0 , 0	0 , 0	0 , 0	5 , 0	0 , 10	0 , 0	5 , 0	5 , 0
TOTL CNT*	1662 , 0772	1670 , 0772	1664 , 0772	1436 , 0267	1670 , 1133	1341 , 1030	1714 , 0777	1660 , 1[illegible]
DAC NBR *	22	23	24	25	26	27	28	2[illegible]
SOURCE *	RAW	RAW	RAW	RAW	RAW	RAW	RAW	RAW

********** STRIPCHART NO. 11 **********

	1	2	3	4	5	6	7	8
SYS DESN*	1-1- 33- 2	1-1- 48- 12	1-1- 48- 13	1-1- 48- 14	1-1- 30- 2	1-1- 30- 1	1-1- 38- 1	1-1- 38- 2
PARAMETR*	FREE AIR TEMP	CONDEV P5 - 6	CONDEV P5 - 7	CONDEV P6 TOTAL	ENG FUEL FLOW	A/B FUEL FLOW	A/B PILOT FF	FUEL DUMP FF
PARMID *	XFAT	CD1	CD2	CD3	FFE	FFAB	FFABP	FFFD
COMMENT *								
RANGE *	-50.0, 250.0	5.0 , 0.0	15.0 , 0.0	60.0 , 0.0	10.0 , 0.0	20.0 , 0.0	1.0 , 0.0	3.0 , 0.0
UNITS *	DEG C	PSID	PSID	PSIA	GAL/MIN	GAL/MIN	GAL/MIN	GAL/MIN
INDENT *	0 , 15	0 , 0	1 , 0	10 , 0	0 , 0	5 , 0	0 , 0	0 , 0
TOTL CNT*	0652 , 1673	1266 , 0732	1620 , 0742	1623 , 1031	1665 , 0771	1613 , 0772	1641 , 0774	1247 , 0771
DAC NBR *	30	31	32	33	39	35	36	37
SOURCE *	RAW	RAW	RAW	RAW	RAW	RAW	RAW	RAW

********** STRIPCHART NO. 15 **********

	1	2	3	4	5	6	7	8
SYS DESN*	1-1- 29- 1	1-1- 33- 1	1-1- 37- 1	2-1- 47- 1	1-1- 29- 4	1-1- 19- 1	1-1- 23- 1	1-1- 41- 2
PARAMETR*	ROLL ANGLE	PITCH ANGLE	YAW ANGLE	GYRO ERECT OFF	RADAR ALTITUDE	ANGLE OF ATTACK	ANGLE SIDESLIP	ATT.GYRO F STAT
PARMID *	ATR	ANP	ATY	U1V4815	ALTR	ALPHAL	BETA	D4287
COMMENT *				DW11 CUMPL		L/H ACTIVE		DR2 BIT P
RANGE *	-180.0, 180.0	-90.0, 90.0	-180.0, 180.0	1.0, 0.0	0.0, 5000.0	-10.0, 40.0	-30.0, 30.0	0.0, 1.0
UNITS *	DEGS	DEGS	DEGS	OFF/ERT	FEET	DEGS	DEGS	OK/BYPG
INDENT *	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0	0 , 0
TOTL CNT*	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A
DAC NBR *	74	75	76	77	78	79	80	81
SOURCE *	SEL	SEL	SEL	SEL	SEL	SEL	SEL	SEL

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********** STRIPCHART NO. 16 **********

	1	2	3	4
SYS OPEN*	1-1- 41- 2	1-1- 41- 2	2-1- 54- 1	1-1- 37- 2
PARAMETR*	RADAR ALT TEST	RADAR ALT STAT	GYRO ERECT	AUTO GYRO ERECT
PARMID *	DW285	DW286	U2W4813	AGYRO
COMMENT *	BIT 6	BIT 7	BIT 7	BIT 7
RANGE *	0.0, 1.0	0.0, 1.0	0.0, 1.0	0.0, 1.0
UNITS *	OK/NOGO	REL/UNR	ERT/OFF	OFF/ERT
TNDENT *	0 , 0	0 , 0	0 , 0	0 , 0
DCTL CNT*	N/A , N/A	N/A , N/A	N/A , N/A	N/A , N/A
DAC NBR *	82	83	84	89
SOURCE *	SEL	SEL	SEL	SEL

********** STRIPCHART NO. 14 **********

	8
SYS OPEN*	1-1- 32- 6
PARAMETR*	R/H ROR HNG MNT
PARMID *	SG6
COMMENT *	FROM TM TO SAF
RANGE *	1.0, 1022.0
UNITS *	COUNTS
TNDENT *	0 , 0
DCTL CNT*	3931 , 1776
DAC NBR *	4
SOURCE *	RAW

******** XYPLOT NO. 1 ********

	X	Y
SYS OPEN	1-1- 24- 2	1-1- 19- 1
PARAMETR	ELEV PTCH CNTRL	ANGLE OF ATTACK
PARMID	DVS	ALPHAL
COMMENT	DVL +DVR) /2	REVERSE
RANGE	28.0, -10.0	-5.0, 20.0
UNITS	DEGS	DEG
TNDENT	0 , 0	0 , 0
DCTL CNT	N/A , N/A	1577 , 3635
DAC NBR	119	1
SOURCE	SEL	RAW

********** DISCRETE WORD DISPLAY NO. 4 DAC NO. 139 **********

	1	2	3	4	5	6	7	8
SYS OPEN*	1-1- 45- 1	1-1- 45- 1	2-1- 44- 1	2-1- 43- 1	1-1- 45- 1	1-1- 41- 2	2-1- 43- 1	2-1- 43- 1
PARAMETR*	GS	LAND	ATT RATE	GEAR	ORBIT	PADREL	CLIMB	DIVE
PARMID-W*	DJ1	DJ1	DW10	DW09	DJ1	DJ2	DW09	DW09
PARMID-B*	DW181		U1W3816	U1W1813		DW286	U1W2811	U1W2812
COMMENT *	ON=BACKUP	ON=LAND	ON=RATE	ON=DOWN	ON=ORBIT	ON=UNREL	ON=CLIMB	ON=DIVE
ON-VALUE*	1.	4.	1.	1.	2.	1.	0.	0.
LOGIC *				COMP		COMP	COMP	COMP
LT COLOR*	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

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********** DISCRETE WORD DISPLAY NO. 4 DAC NO. 139 **********

	9	10	11	12
SYS DFFN*	2-1- 43- 1	2-1- 43- 1	2-1- 44- 1	2-1- 44- 1
PARAMETR*	LTURN	RTURN	SPDINC	SPDDEC
PARMTD-W*	DW09	DW09	DW10	DW10
PARMTD-B*	U1W2814	U1W2813	U1W2815	U1W2816
COMMENT *	ON=LTURN	ON=RTURN	ON=SPDINC	ON=SPDDEC
ON-VALUE*	0.	0.	0.	0.
LOGIC *	COMP	COMP	COMP	COMP
LT COLOR*	GREEN	GREEN	GREEN	GREEN

********** DISCRETE WORD DISPLAY NO. 5 DAC NO. 140 **********

	1	2	3	4	5	6	7	8
SYS DFFN*	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3
PARAMETR*	IPCS FAILURES	BURNER FLAMEOUT	PRIM. EGT SNSOR	BKUP. EGT SNSOR	PRIM. TJT. TEMP	BKUP. TGT. TEMP	ENG OIL PRES LO	ENG OIL PRES HI
PARMTD-W*	D04	D04	D04	D04	D04	D04	D04	D04
PARMTD-B*		DW481						
COMMENT *	BITS 4-8 (31)	ON=FLAMEOUT	BITS 4-8 (16)	BITS 4-8 (17)	BITS 4-8 (20)	BITS 4-8 (21)	BITS 4-8 (28)	BITS 4-8 (29)
ON-VALUE*	1.	1.	1.	1.	1.	1.	1.	1.
LOGIC *								
LT COLOR*	YELLOW	RED	YELLOW	YELLOW	YELLOW	YELLOW	RED	RED

********** DISCRETE WORD DISPLAY NO. 6 DAC NO. 141 **********

	1	2	3	4	5	6	7	8
SYS DFFN*	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 41- 3	1-1- 45- 1
PARAMETR*	PRIM THROTTLE	NOZZLE FEEDBACK	ENG. ROTOR SPED	COMP INLET PRES	COMP DSCHG PRES	TURB DSCHG PRES	ENG FIRE STATUS	MAINSYS
PARMTD-W*	D04	D04	D04	D04	D04	D04	D04	D01
PARMTD-B*							DW482	DW180
COMMENT *	BITS 4-8 (23)	BITS 4-8 (25)	BITS 4-8 (27)	BITS 4-8 (19)	BITS 4-8 (18)	BITS 4-8 (26)		
ON-VALUE*	1.	1.	1.	1.	1.	1.	ON=F/DHT	ON=NORM
LOGIC *								COMP
LT COLOR*	RED	RED	RED	YELLOW	YELLOW	YELLOW	AMBER	AMBER

********** DISCRETE WORD DISPLAY NO. 8 DAC NO. 143 **********

	1	2
SYS DFFN*	1-1- 35- 2	1-1- 35- 3
PARAMETR*	FT.TERM SYS ARM	FT.TERM SY SAFE
PARMTD-W*	FTS2	FTS3
PARMTD-B*		
COMMENT *	ARM = GT. 895	SAFE= GT. 895
ON-VALUE*	ON=ARM	ON=SAFE
LOGIC *		
LT COLOR*	RED	GREEN

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                       **********  METER  **********
                   1
SYS DSGN* 1-1-   35-    1 *
PARAMETR*FTS SIG. STREN *
PARMTD  *    FT,1        *
COMMENT *                *
RANGE   *  -23.0, -108.0*
UNITS   *    DBM         *
ENDPNT  *  0   ,    0    *
CTL CNT*  N/A   ,   N/A  *
DEC NBR *      73        *
SOURCE  *      SEL       *


CRTPAGE1
     SYSTEMS                 AERO                  FUEL                  ELEC

 BAYTEMP,0             ALPHA,1               QUAN,0                GENV,1
 STIKTMP,0             BETA,1                MAINFLOW,0            GENBV,1
 ULCS1,0               MACH,3                ABFLOW,0              BATIV,1
 ULCS2,0               KCAS,0                ABPFLOW,0             BATTPV,1
 FTCS,1                HP,3                  DUMPFLOW,0            BUST/S,0
 FTS1,0                ALTR,0                TOTALFF,0
 ASYMM,0               QBAR,0                FTEMP,1               VAC26,1
 DEC1BAD,0             NZC,2                                       VDC,,2
 DEC2BAD,0             NZF,2
                       PHI,1
      RPRV LAB                                   ENGINE                HYDR

 QBAR2,0               RFAT,1                EGT,1                 PRIPRES,0
 VCAS,1                                      RPM,0                 BUPRES,0
 AMPH,3                HYDBAYTP,0            NOZAREA,1
 H,0                   PUMPTEMP,0            PLA,1
 FL,0                                        FPRIME,1


CRTPAGE2
      ENGINE                              THERMOCOUPLES

  EGT,1                 TC1,0                 TC7,0                 PUMPTEMP,0
  RPM,0                 TC2,0                 TC8,0                 TC14,0
  NOZAREA,1             TC3,0                 TC9,0                 TC15,0
  PLA,1                 TC4,0                 CONDEVIP,0            TC16,0
  QUAN,0                TC5,0                 HYDBAYTP,0            TC17,0
  MAINFLOW,0            TC6,0                 TC12,0                TCOREF,0
  ABFLOW
  ABPFLOW,0
  DUMPFLOW,0
  TOTALFF,0
                                 AERO              SURFACE POS

  FTEMP,1               ALPHA,1               DA,1
  STAB,0                BETA,1                DV,,1
  COMB,0                MDIF,3                DE,1
  NOZOR,0               KCAS,0                DVA,1
                        QBAR,0                DRL,1
                        HP,0                  DRR,1
                        NZF,2
                        PHI,1
                        RFAT,0
```

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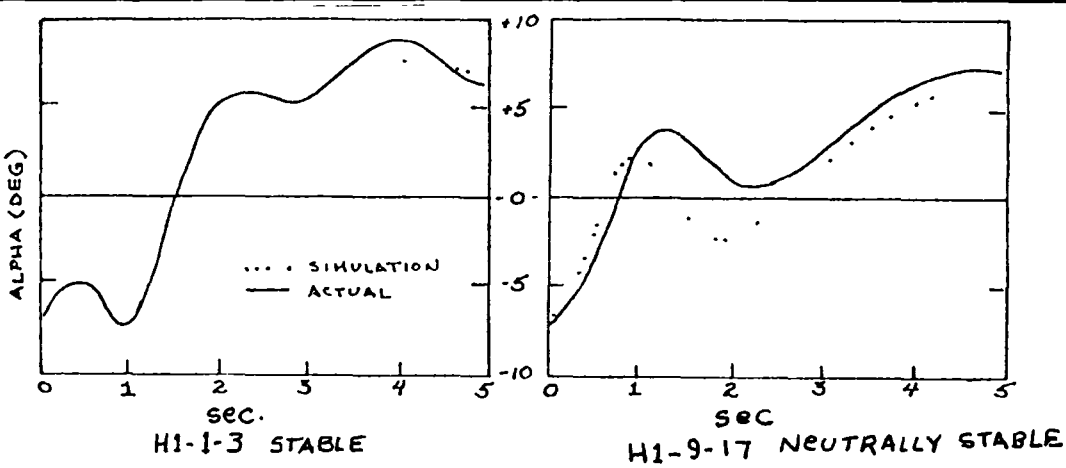
HTMAT HARD COPY REQUIREMENTS

HC-01-01	3 COPIES	(1.0 SPS) NEIL MATHENY, LARRY FELT AND IRENE (AMEX)									
ASI NAME	*MINF,3	*HP,0	*KCAS,1	*NZF,3	*ALPHA,1	*BETA,1	*ANP,1	*PHI,1	*DVS,1	*DVA,1	*
USERNAME	*MACH	*HP	*KCAS	*ACCGNF	*ALPHA	*BETA	*ANP	*AFR	*DVS	*DVA	*
HC-02-01	1 COPY	(1.0 SPS) JENNY BAER									
ASI NAME	*MINF,3	*HP,0	*PLA,1	*NOZAREA,1	*EGT,0	*RPM,1	*PCDT,1	*ENGFLOW,1	*TTMP,1	*FPRIME,0	*
USERNAME	*MACH	*HP	*ITP	*ENXA	*EGT	*RPM	*PLDT	*FFE	*TTMP	*FPRIME	*
HC-02-02	1 COPY	(1.0 SPS) JENNY BAER									
ASI NAME	*PLA,1	*NOZAREA,1	*TC2,0	*TC5,0	*TC6,0	*TC7,0	*TC8,0	*TC9,0	*TC10,0	*	
USERNAME	*ITP	*ENXA	*TC2	*TC5	*TC6	*TC7	*TC8	*TC9	*TC10	*	
HC-02-03	1 COPY	(1.0 SPS) JENNY BAER									
ASI NAME	*CD1,3	*CD2,3	*CD3,3	*TCH8,0	*TC13,0	*TC14,0	*TC15,0	*TC16,0	*TC17,0	*TCOREF,0	*
USERNAME	*PT5LS5	*PT5LS6	*PS6	*TCH8	*TC13	*TC14	*TC15	*TC16	*TC17	*TCOREF	*
HC-03-01	1 COPY	(1.0 SPS) AL MYERS									
ASI NAME	*MINF,3	*MI,3	*AMCH,3	*KCAS,1	*VCAS,1	*QBARC,1	*QBAR2,1	*HP,0	*H,0	*PSIC,3	*
USERNAME	*MACH	*MI	*AMACH	*KCAS	*VCAS	*QBAR	*QBAR2	*HP	*H	*PSIC	*
HC*04*01	COPIES 1	SPS 1	SPENCER SHEETS								
ASI NAME	*ULS,1,9	*ULS52,0	*AGYRO,0	*DEC1BAD,0	*DEC2BAD,0	*QUAN,0	*TOTALFF,0	*BATTV,1	*BATTBV,1	*BUSTS,0	*
USERNAME	*	*	*	*	*	*	*	*	*	*	*

HiMAT

Engineering Analysis Report

Flight H1-9-17



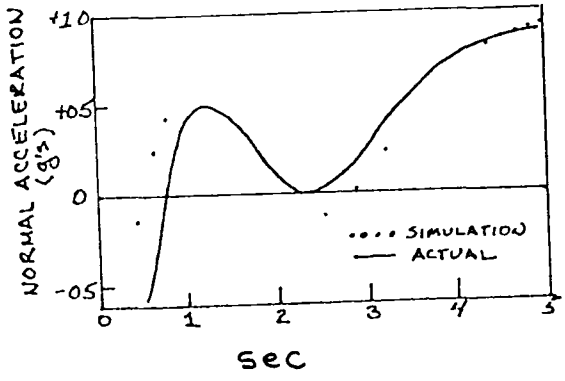
LAUNCH DYNAMICS

Shown above are angle of attack time histories of preflight simulation and actual flight data on air vehicle 1, for both the stable and the neutrally stable configurations. Data for this flight provided the first opportunity to compare the launch dynamics simulation two "different" (due to flight control and c.g. position mods) vehicles in the same aerodynamic flow field.

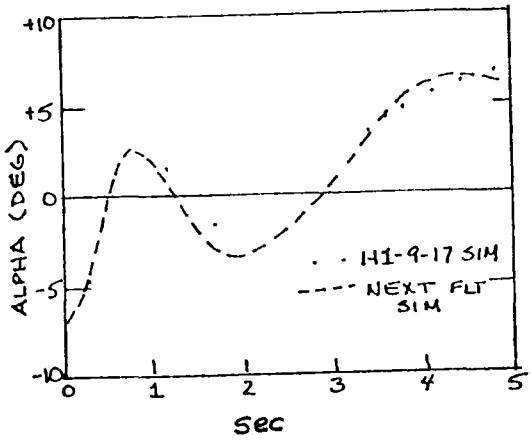
Two observations can be made from this side by side comparison. First, in both cases, the general nature of the transient response is an initial pitch up, followed by a hesitation or reverse motion, and ending with a steady progression toward the level flight alpha of approximately 7°. The close correlation of the predicted and simulated time histories for each flight and particularly for the unstable configuration tends to provide increased confidence in the launch dynamics simulation model and should reduce the extent of the sensitivity analysis required to qualify additional control system and c.g. location for launch.

The second observation concerns specific difference in the responses between the two control system/ballast configuration. For the stable configuration, the vehicle remained at less than negative 5° alpha for more than 1 second after launch. This resulted in a nose low attitude, culminating is a stabilized high rate of descent. For the neutrally stable configuration, however, angle of attack increases rapidly immediately following launch. This is due, in part, to the influence of the negative alpha limiter which restricts negative alpha commands to -3°. This reduces the time that neutrally stable configuration is below -5° to about only a quarter of that exhibited with the stable control system. This manifests itself in a reduced pitch down at launch and a much flatter steady state trajectory after release.

Some consideration was given to removing or opening the limits of the negative alpha limiter during the launch sequence becuase it does contribute to the magnitude of the initial pitch up. The negative alpha limiter also locks out both the launch mode program and the pilot stick inputs until alpha increases above -3^{o} from the initial condition at launch of -7^{o}. This was not done H1-9-17 because of time and because simulation showed that nose down trim offsets, less than hardover, could depart the vehicle at this c.g. position. Based on the post-flight comparison of the data this decision appears to be substantiated and the negative alpha limiter should not be modified.



Correlation of simulation and free flight normal acceleration data for this launch was also excellent, and provides a good cue for the pilot as to when emergency nose down control inputs might be required in order to prevent a collision with the B-52 Carrier Aircraft. The rule of thumb should be that, "If normal acceleration increases to 1 "G" or greater during the first five seconds of launch, forward stick is required by the pilot to reduce the load factor to less than 1 "G".



Engineering Analysis Report

Flight H1-9-17

Launch history data for the next flight (a more aft c.g, condition) shows very little change indication that no major dynamics observed on this flight are more likely a function of the control system modification than effects associated with the change in c.g. location.

Robert G. Nosco

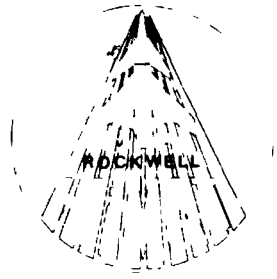
AERODYNAMIC STABILITY AND CONTROL

Control pulse data were obtained throughout the flight envelope at trim flight conditions. A windup turn was performed at a Mach number of 0.9 and at 25,000 feet altitude to an angle of attack of 13 degrees.

There were no aerodynamic anomalies noted on this flight.

Neil Matheny

HiMAT



Appendix A - Flight Details

Flight H1-9-17 December 21, 1981

NOTE: Event times were noted during the flight and are not adjusted to precise recorded event times.

Event	Time
Control room manned	06:35:00
HiMAT engine start	06:58:00
B-52 left engine start	07:09:52
Lakebed winds - 7.5 cross, 8.5 gust	07:15:30
B-52 taxi	07:24:04
Radar Calib with B-52	07:26:40
B-52 take-off	07:46:04
Radar altimeter ck ok	07:47:06
Begin L-25 cks	07:51:39
Engine flameout indication	07:54:00
A/B cks at 25K ft	07:55:58
Begin L-12 cks	08:03:32
Lakebed winds 8.5 to 10Kts cross	08:08:08
Begin L-5 cks	08:11:22
Begin L-3 cks	08:14:57
Begin L-2 cks	08:15:18
L-60 sec call	08:16:40
Launch	08:17:40
Start item 3-MAP cks	08:19:19
Start item 4-.7M pulses	08:20:07
Start item 5-.8M pulses	08:20:38
Start item 6-.85M pulses	08:21:07
Start item 7-.90M pulses	08:21:47
Start item 8-.93M pulses	08:23:15
Start item 9- left WUT	08:23:47
At α limiter	08:24:36
Start item 10	08:25:03
Light turbulence	08:27:31
Start item 11-MAP cks	08:29:18
Start item 12-.5M pulses	08:31:33
Start item 13-.6M pulses	08:32:05
Start item 14-.7M pulses	08:32:43
Start item 15-.8M pulses	08:34:03
Start item 16-.85M pulses	08:34:26
Start item 17-.90M pulses	08:34:55
Start item 18-.935M flutter pulses	08:35:33
Start item 19-.935M pulses	08:36:00
Start item 20-8-g WUT (fuel dump on)	08:36:32
Start item 21-MAP decel	08:39:42
Start item 22-Decent to 15K	08:41:20
MAP ck - pitch oscillations observed	08:42:54
Gains to 444, oscillations damped	08:43:22
Start item 23-.68M pulses	08:43:38

HiMAT

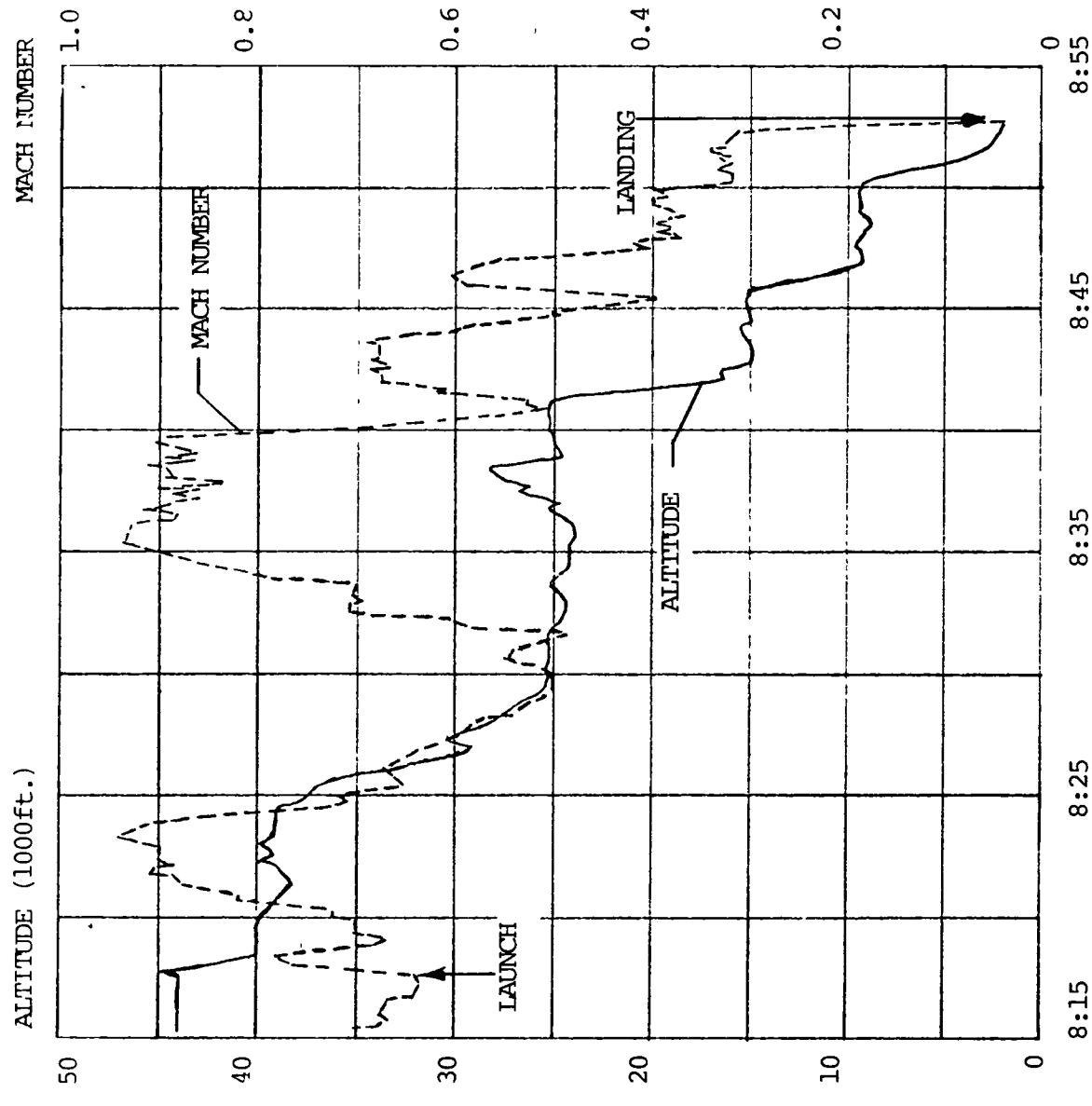
Appendix A - Flight Details

Flight H1-9-17 December 21, 1981 (cont.)

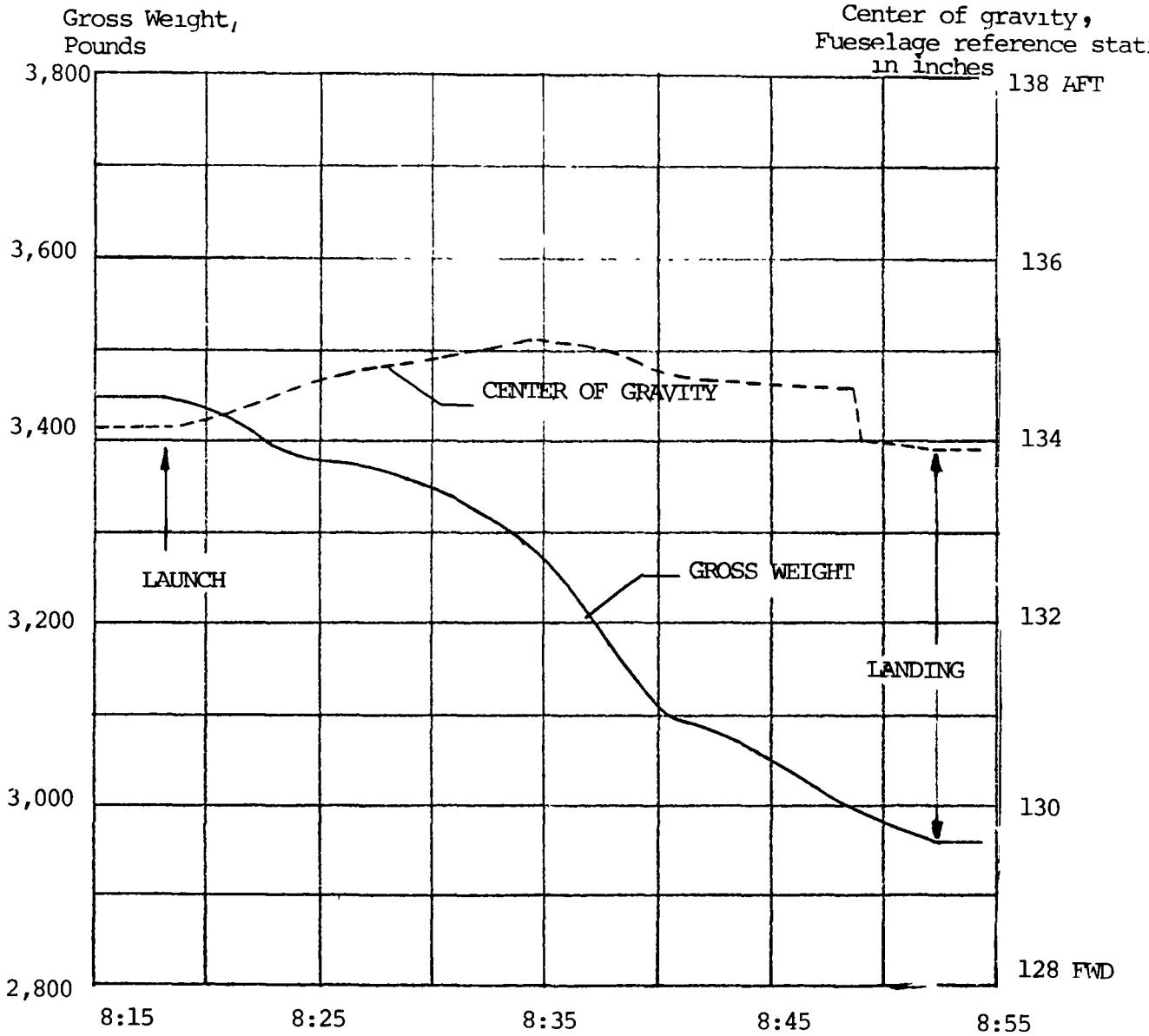
Start item 24-.6M pulses	08:44:10
Start item 25-.5M pulses	08:44:46
Start item 26-.4M pulses	08:45:20
RTB	08:45:35
Lakebed winds - 7-12 Kts cross	08:45:50
Gear down	08:47:47
Touch down	08:52:30
Full stop	08:52:52

Appendix A - Flight Details

Flight H1-9-17



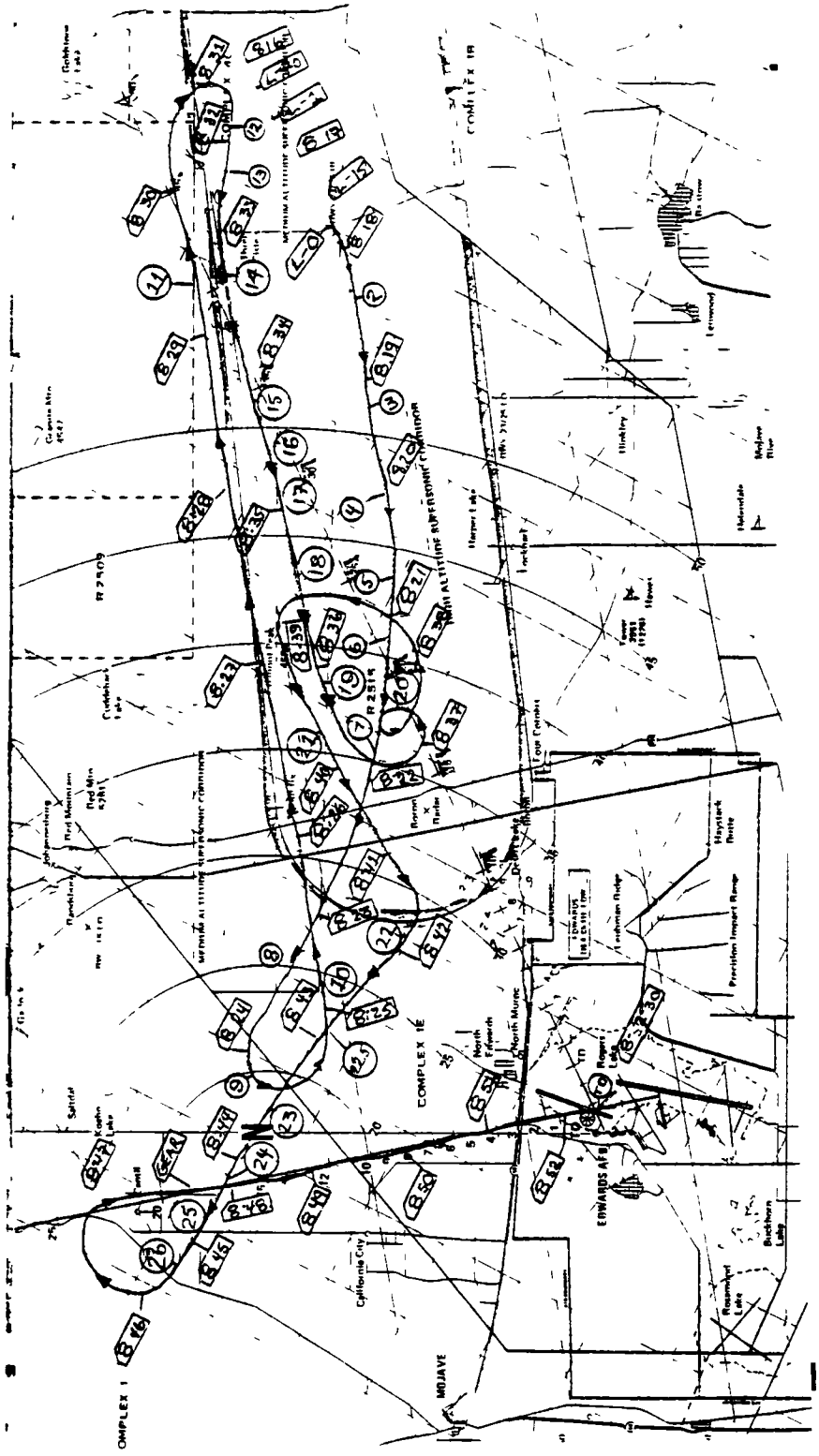
ALTITUDE AND MACH NUMBER TIME HISTORY



TIME HISTORY OF VEHICLE GROSS WEIGHT AND CENTER OF GRAVITY LOCATION

Appendix A - Flight Details

Flight H1-9-17



HIMAT FLIGHT RADAR TRACK

Appendix A - Flight Details

Flight #1-9-17

HiMAT FLIGHT PLAN

FLIGHT NO. HI-9-17 REQUEST DATE 11-9-81 FLIGHT DATE 12-21-81

REV ORIGINAL

NOTE: CHECK MARK INDICATES ITEM COMPLETED IN FLIGHT.

ITEM	ALT	MACH	Vc	$\bar{q}$	EVENT		GAINS PULSE	PITCH	ROLL	YAW
✓ 1	45K	68	180	100	LAUNCH			3	3	3
✓ 2	45K ↓ 40K	68 ↓ 70	180 ↓ 210	134	DESCENT			3	3	3
✓ 3	40K	70	210	134	M A P CHECKOUT		4	3 4	3 4	3 4
✓ 4	40K	70	210	134	FLIGHT CONTROL PULSES		4	3	3	3
✓ 5	40K	80	242	175	FLIGHT CONTROL PULSES		4	3	3	3
✓ 6	40K	85	260	198	FLIGHT CONTROL PULSES		4	3	3	3
✓ 7	40K	90	278	222	FLIGHT CONTROL PULSES (FULL SET)	LONGITUDINAL LATERAL	4	1 3	3 1	3 1
✓ 8	40K	93	288	237	FLIGHT CONTROL PULSES		4	3	3	3
✓ 9	40K	90 ↘ 70	278 ↘ 210	222 ↘ 134	AUT 1 5g (on a Limiter at .70 Mach)		4	3	3	3
✓ 10	40K ↓ 25K	70 ↓ 50	210 ↓ 206	134 ↓ 137	DESCENT		4	3	3	3

Appendix A - Flight Details

Flight H1-9-17

HIMAT FLIGHT PLAN

FLIGHT NO. III-9-17 REQUEST DATE 11-9-81 FLIGHT DATE 12-21-81

REV ORIGINAL

ITEM	ALT	MACH	V	$\bar{q}$	EVENT		GAINS PULSE	PITCH	ROLL	YAW
✓ 11	25K	.50	206	137	M A P CHECKOUT		4	3 4	3 4	3 4
✓ 12	25K	50	206	137	FLIGHT CONTROL PULSES		4	3	3	3
✓ 13	25K	.60	248	197	FLIGHT CONTROL PULSES		4	3	3	3
✓ 14	25K	.70	282	269	FLIGHT CONTROL PULSES (FULL SET)	LONGITUDINAL LATERAL	4	1 3	3 1	3 1
✓ 15	25K	80	337	351	FLIGHT CONTROL PULSES		4	3	3	3
✓ 16	25K	85	360	397	FLIGHT CONTROL PULSES		4	3	3	3
✓ 17	25K	90	385	445	FLIGHT CONTROL PULSES			3	3	3
✓ 18	25K	925	400	445	FLUTTER SERIES PULSES		4	3	3	3
✓ 19	25K	935	400	475	FLIGHT CONTROL PULSES		4	3	3	3
✓ 20	25K	.885	385	445	WUT 8g		4	3	3	3
✓ 21	25K	93 ↓ 51	400 ↓ 210	475 ↓ 143	A/S DECELERATION (M A P CONTROLLED)		4	3	3	3

Appendix A - Flight Details

Flight HI-9-17

HIMAT FLIGHT PLAN

3 of 3

FLIGHT NO. HI-9-17 REQUEST DATE 11-9-81 FLIGHT DATE 12-21-81

REV ORIGINAL

ITEM	ALT	MACH	Vc	q̄	EVENT		GAINS PULSE	PITCH	ROLL	YAW
✓ 22	25K ↓ 15K	51 ↓ 68	210 ↓ 350	143 ↓ 386	DESCENT		4	3	3	3
✓ 22 5	15K	68	350	386	M A P CHECKOUT		4	3 4	3 4	3 4
✓ 23	15K	68	350	386	FLIGHT CONTROL PULSES		4	3	3	3
✓ 24	15K	60	304	300	FLIGHT CONTROL PULSES		4	3	3	3
✓ 25	15K	50	242	209	FLIGHT CONTROL PULSES		4	3	3	3
✓ 26	15K	40	200	133	FLIGHT CONTROL PULSES		4	3	3	3
✓ 27	15K	48	240	193	GEAR			3	3	3
✓ 28					LAND			3	3	3

NASA National Aeronautics and Space Administration
Hugh L. Dryden Flight Research Center

TEST/ AIRCRAFT INITIAL SCHEDULE

Sunrise - 0644

FLIGHT/TEST NO	AIRCRAFT TYPE	TAIL NO	DATE
H1-9-17	HiMAT	870	11/10/81

OPERATIONS DATA

1 FLIGHT DATE 21/ Dec 81
2 PILOT DANA/COOPER
3 CONTROL ROOM MANNING 0625
4 PILOT ENTRY TIME LPO:550 :B-52/104: 0625
5 TAKE OFF/LAUNCH TIME 0725/0800
6 ESTIMATED FLIGHT DURATION 1+08
7 OPERATIONAL AREA WX4,WX4A,WX1,WX1B/38K-42K,WR15/0-40K WROZN /38K-45K
8 PIRA
9 ESTIMATED LANDING TIME 0833
10 ALTITUDE (MAX) 45K
11 MACH NUMBER (RANGE) →0.95
12 RADIATION CHECK TIME 0550

13 OTHER Sterile Airspace in area bounded by Refueling Track , ouve R2515 from FL230→270.
14 BRIEFINGS - TECH 1500 1 Dec CR1
CREW 1500 9 Dec CR1
15 FLIGHT TEST OBJECTIVES Primary Flight Control System Checkout, A/S Cal.
16 CONTROLLER MrMurtry EXT 201
17 PROJECT ENGINEER ~~Arnaiz~~ EXT 770
18 INSTRUMENTATION ENGINEER Lawhead EXT 474
19 OPERATIONS ENGINEER Cassells EXT 271
20 COMP & SIM ENGINEER Harney EXT 514

AFFTC SUPPORT REQUIREMENTS

- ☐ CHASE AIRCRAFT
- ☐ HELICOPTER
- ☒ FIRE EQUIPMENT Dryden Ramp(9B-52) at 0615→0730;Lakebed RWAY 23 @ 0800→0845 with Dryden Vehicles.
- ☐ AMBULANCE
- ☐ CRASH EQUIPMENT
- ☐ FLIGHT SURGEON
- ☒ RADAR TRACKING (FPS 16) ALT ____ TIME 0700
- ☒ PLOTTING BOARD MAP ____ ☐ DATA PROCESSED ____
- ☐ ASKANIA
- ☐ PRESSURE SUIT SUPPORT
- ☒ WEATHER BALLOON TYPE ☒ RADIOSONE ☐ REFLECTOR
  MAXIMUM ALTITUDE 45000
  RELEASE TIME 0430
- ☐ PHOTO COVERAGE
- ☐ REFUELING TRACK
- ☐ NORTH DATS ☒ OTHER RADAR TRACK #1-F104; #2-HiMAT

NASA DFRC SUPPORT REQUIREMENTS

- ☒ CHASE AIRCRAFT 824 or 825 (both preflighted) and 821
- ☐ PRESSURE SUIT VAN
- ☐ BIOMED INSTRUMENTATION
- ☒ PHOTO COVERAGE Airborn movies form 821
- ☒ RPRV FACILITY
- ☒ NASA 9 TIME 0530 LOCATION ~~B-52/Dryden Ramp~~

DFRC 243(4 80)

NASA AERODYNAMIC TEST RANGE SUPPORT REQUIREMENTS

RADAR REQUIREMENTS

☒ AN/FPS 16 ☐ SKIN

☐ BEACON _____ INTERROGATE FREQ 5585.

BEACON DELAY 2.50μ RESPONSE FREQ 5660

INTERROGATION CODE/SPACING _____

TRACKING DATA REQUIREMENTS

☐ MAP 1 (SCALE OR TYPE) 498/4811 10K/1K

☐ MAP 2 (SCALE OR TYPE) 4820 (Pen #1-HiMAT #2-Chase)

☐ MAPS FURNISHED BY ENGINEERING Cooper x-770

ALTITUDE SCALE _____ FT/IN 4820 FPS 16 Pen#1- #34

MAP DISPOSITION _____ FPS 16 Pen#2- #38/41

COMMUNICATIONS

	TYPE	LOCAL ATR	ELY STATION	RETENTION OF VOICE TAPES
☒ UHF	PRI	☒ 395.1	☐	☒ 60 days
	SEC	☒ 286.8	☐	☒ 30 days
	GUARD	☐	☐	☐
VHF	PRI	☒ 135.825	☐	☒ 60 days
	SEC	☐	☐	☐
HF	PRI	☐	☐	☐
	SEC	☐	☐	☐
		☐ AM	☐ USB	☐ LSB

☒ OPERATIONAL RADIOS ☒ CONTROL ROOM TIME 0525

☐ PILOT'S OFFICE TIME 0525

☐ ENGEG POSITIONS TIME 0525

☐ GROUND VOICE RECORDINGS _____

☐ PILOT RESCUE BEACON PRI 243.0 mHz SEC 282.8MHz

GLIDESLOPE APPROACH

☐ G/S APPROACH RWY _____ PROFILE NO _____ ☐ 11x17 PLOT

VIDEO REQUIREMENTS

CAMERA	VIDEO TAPES	IRIG TIME	AUDIO
☒ LONG RANGE OPTICS	☒	☒	☐
☐ INSTRUMENT CAMERA	☐	☐	☐
☐ PLOTTING BOARD	☐	☐	☐
☒ TRIPLEX	☒	☒	☒
☒ RADAR CAMERA	☐	☐	☐
☒ COCKPIT VIDEO	☒	☒	☒
☐ MOBILE VAN	☐	☐	☐
☒ AIRBORNE	☒	☒	☒

☒ RETENTION PERIOD FOR VIDEO TAPES End of FY '82

DATA REQUIREMENTS

☒ CYBER 7328 ☒ CALIBRATED TAPE FILE

☒ V73 TRACK DATA ☒ FORMATTED TAPE ☒ PRINTOUT

☒ SEL 8600 _____

TELEMETRY REQUIREMENTS

☒ REAL TIME DISPLAYS HiMAT setup + SAF

☐ TLM FREQS 1 1441.5 2 1452

3 1480.5 4 4680

OTHER SUPPORT REQUIREMENTS

1. HiMAT 21/23 MAP + RWAY 23X-h plot in RPRV Fac.
2. Flight Termination System -421 MHz.
3. NASA 15-Dryden ramp at 0530.

Flight H1-9-17

HiMAT

Appendix B - Mission Rules

Flight H1-9-17

GO-NO-GO RULES

No research instrumentation was required for launch of the vehicle.

Appendix B - Mission Rules

Flight_____

HiMAT MISSION RULES

Revision F May 1, 1981

1. Key personnel on intercom and/or mission frequency.

   NASA 1
   008
   NASA 21
   NASA Command Chase
   Systems/Ops MCWP ENGR
   SPORT
   RAPCON (EDDIE Approach)
   NASA 23 (when required)

2. HiMAT Landing/Recovery Area - Lakebed Runways 25, 23, or 15 as pre-briefed.

3. HiMAT work area - generally North and East of Rogers Dry Lake in R-2515 including complexes I, IV, and IB. Specifically, the work area will be the Edwards refueling track. The mission specific work areas will be pre-briefed. Maximum allowable range from the Triplex antenna will be 60 nautical miles during free flight.

4. Standard MARSA separation and radio advisories will be provided during captive flight. During free-flight of the HiMAT vehicle block altitude separation will be provided by RAPCON.

5. Supersonic flight will be performed only in specific supersonic corridors and areas specifically cleared by EAFB outside those corridors.

6. B-52 limits will be those published in the B-52 #008 FACT Sheet and the Flight Manual. The captive configuration will be limited to 250 KIAS to 37,000 feet and then 0.82 Mach to 50,000 feet per B-52 #008 FACT Sheet.

7. A. Maximum Mach number will be 0.95 with the "stable" flight control system.

   B. The vehicle will not intentionally be flown into the alpha inhibitor without previously briefing the maneuver at a technical review.

   C. The load limit on the vehicles shall be as follows:

      At 3055 lbs gross weight,

Subsonic <450 $\bar{q}$	10g
Subsonic >450 q	8g
Supersonic	4g

      N_z may become slightly negative during launch, and for a period not to exceed 2 seconds/minute to obtain research data.

D. β will be minimized, but in no case exceed $-5° \leq \beta \leq 5°$.

E. Minimum A/S - 185 KIAS, except launch and engine inoperative.

F. Engine limitations per HiMAT FACT Sheet. DO NOT select afterburner while mated below 10,000 feet altitude or above 240 KIAS.

8. Systems/OPS ENGR on Master Caution and Warning Panel in Control Room (backup MCWP in RPRV Facility).

A. Provides assessment of vehicle status at request of NASA 1 or NASA 21.

B. Provides detailed pre-determined procedures (crews have abbreviated checklists).

9. NASA 1 has mission control throughout the flight and will be the center for all communications between the RPRV pilot station and the following:

A. Control Room Systems Engineers
B. B-52 Carrier Aircraft
C. TF-104G Command Chase, except as stated in Item 10 below.
D. FAA
E. Tower
F. AFFTC/SPORT
G. Safety/Photo Chase
H. Pacer Chase except as stated in Item 10 below.

10. The Pacer Chase pilot and NASA 21 will coordinate the data gathering portion of the HiMAT flights through direct radio communications. This will be pre-briefed during crew briefs.

11. All energy management (portion of flight from abort or the initial point in landing sequence to touchdown), including TF-104G controlled landings will be accomplished from the RPRV Cockpit area. The flight test engineer will be responsible for these calls to the respective vehicle controller.

12. NASA 1 will have two (2) maps: 4820 and 4811. On 4820, one pen will be tracking HiMAT and the second pen NASA Command Chase. NASA Command Chase X-Y data will be from SPORT via landline. On 4811, one pen will be tracking HiMAT X-Y position from approximately 6 to 8 NM out on final approach. The second pen will plot HiMAT Y-h using one of two scales for altitude - 10,000 feet and 1000 feet per inch. The HI RANGE CRT will be active showing the following data:

HiMAT A/S (True = G/S + Wind)
Altitude
Heading
Altitude Rate (fps)

13. SPORT Radar Support

    A. Primary FPS-16 Radar on HiMAT
    B. Secondary FPS-16 Radar desirable but not mandatory on NASA Command Chase (Data to NASA control room).
    C. At the request of NASA 1 or NASA Command Chase, provide vector info - NASA Command Chase to HiMAT.

14. Cockpit info required:

    A. MILGO with MOD 4820/4811 - radar data source selectable.
    B. X-Y Plot of X-h to touchdown.

15. The stability augmentation system shall not be turned off in any axis at flight conditions at which the stability of the vehicle is known to be neutral or unstable in that axis or at flight conditions that might result in unplanned entry into a neutral or unstable flight condition.

16. Launch Conditions:

    A. Location - see attached Table I.
    B. Heading - see attached Table I.
    C. Altitude - see attached Table I.
    D. MACH/Airspeed - see attached Table I.
    E. HiMAT Throttle - IDLE
    F. IPCS Stability Mode - HIGH
    G. Full Fuel - 660 #JP-5
    H. Ground winds $\leq$ 12 KTS with crosswind component $\leq$ 7 KTS.
    I. NASA Command Chase Fuel $\geq$ 3500 #
    J. No pilot inputs for first three (3) seconds after launch.
    K. No lightning or thunderstorms in area.
    L. VMC from launch to landing.
    M. Pre-established GO/NO-GO criteria must be met. (See Item #36)

17. BINGO (RTB) Fuel - 200 lbs (15% + MINIMUM, Go-around Gear Down). A timeline will be established and criteria is pre-briefed.

18. ~~NASA~~ 21 will take immediate action based on cockpit annunciation lites. Detailed failure evaluation will be provided by the Systems/OPS engineer per item #8 above.

19. ABORT Lite - Immediate RTB with minimum troubleshooting from cockpit. No attempt will be made to return to PCS if BCS reversion has occurred. One exception to this rule is that if the reversion was caused by a nuisance trip and can positively be identified as such, the pilot may select PCS and RTB in this mode. In the event the pilot does not return to PCS, DPM may be selected, if available.

20. Engine Failure - An attempt will be made to stay in PCS if primary electrical system and hydraulics system stay on line. Engine-out airspeed will be limited to 300 KIAS (DPM). PCS will be used to conserve battery power until the 15 NM ARC is reached, if possible. At this time, DPM (if unavailable, BCS) will be selected and the final approach will be flown at a nominal 240 KIAS with a minimum of 165 KIAS. Gear will be deployed in the last 100 feet prior to touchdown. Nominal BCS approach airspeed will be 215 KIAS, with gear deployment also in the last 100 feet.

    Three (3) engine starts may be attempted if flight conditions are within re-lite envelope. After engine start, an electrical buss re-tie may be attempted if cleared by NASA 1. Switch to PCS may be made, followed by a resumption of the mission if the cause of the engine flameout can be positively identified and further problems are not expected to jeopardize the mission. A normal PCS approach to landing may be accomplished.

21. Electrical failure - In the event of a primary electrical system failure indication resulting in a split electrical buss, no attempt will be made to re-tie the electrical buss. The pilot will RTB using the BCS or if available, the DPM when the buss is split. One exception to this rule is that if the failure was a nuisance failure and can be positively identified as such, the pilot can re-tie the buss after insuring the generator is operating. Also if the buss split is due to the generator coming off line after an engine failure, the pilot may reset the generator and then re-tie the buss following an engine restart. If the bus is re-tied the pilot may select PCS, if available. With these two exceptions, the mission may be continued.

22. Radar Altimeter Not Reliable - Continue approach using pressure altitude in PCS, DPM, or BCS, in that order.

23. If impact is going to occur off the lakebed and if the gear is up, a gear up landing will be attempted.

24. Gear Failure To Deploy - Make nominal approach to the HiMAT runway and expect gear deployment at any time after command is given. Land gear up at an airspeed not to exceed 8° AOA. Pilot may elect to touchdown below ~~185~~ KIAS, but should not exceed 8° AOA.

25. In the event of a NASA Radar data loss, SPORT Data will be used at NASA by NASA 1 and/or FTE.

26. In the event of a total NASA power outage, SPORT will upon request, vector NASA Command Chase to HiMAT and then both to a recovery on the HiMAT runway.

27. NASA Command Chase Emergency - HiMAT RTB ASAP from ground if able. If not, during NASA Command Chase RTB fly HiMAT to PIRA (vector) and select orbit. Allow HiMAT to orbit PIRA and continue to reacquire from ground cockpit. If re-acquisition is not possible, allow to impact after fuel exhaustion and/or a flight termination signal issued.

28. Switch Control to NASA Command Chase - A switch of HiMAT control from NASA 21 to NASA Command Chase will be made if any of the following conditions exist:

    A. Loss of Uplink
    B. Pre-briefed
    C. NASA 21 discretion.

29. If NASA Command Chase has control and then loses control and NASA 21 cannot gain control (NASA Command Chase TX off), then all uplink TX should be shut down to allow HiMAT to enter loss of signal recovery mode which will command orbit. After orbit is entered a continued coordinated effort to re-acquire should be made from both NASA 21 and NASA Command Chase. At fuel exhaustion, HiMAT should be allowed to impact the ground or a flight termination signal should be issued, depending on ground position. This effort will be coordinated by NASA 1 through FAA and AFFTC Range Safety.

30. Go-Around - In the event of an emergency inside the 5NM point on a final approach or NASA 21/FTE, NASA 1, or NASA Command Chase do not like the situation, a go-around may be called out over UHF Mission Frequency. The go-around will be made to the right (left for Runway 15) to 4,000 feet MSL and a downwind will be established for a second approach. Approximately 110# JP-5 is required for a gear down go-around. A wide pattern will be flown if fuel, ground track and the flight control mode will allow for one.

31. It is highly desirable for the Project Pilot to fly the PA-30 RPRV within five days of a HiMAT flight. The Project Pilot will make at least two (2) approaches to the planned HiMAT Lakebed Runway.

32. The following ground rules govern the use of the flight termination system:

    A. The system will be used when there are both loss of control and the vehicle is departing the restricted area.

    B. The major considerations at time of use are the impact area of parts and the position of chase aircraft relative to HiMAT.

    C. The final authority for use of the system rests with the Director of Flight Operations and Support.

    D. The arm and fire switches will be guarded until termination is initiated.

33. The aircraft and flight termination battery status will be determined before taxi (after FTS operational check) and before launch.

    Before Taxi:

    A. Aircraft Battery Voltage
       > 31 volts

    B. FTS Battery Voltage
       $\geq$ 28 volts

    Before Launch:

    A. Aircraft Battery Voltage
       > 31 volts

    B. FTS Battery may be
       < 28 volts

    NOTE: Tests may require slight revision of indicated voltages.

34. If PIRA (Runway 25) is used, ABORT at PIRA window closure minus ten (10) minutes if the last data item in flight plan is incomplete.

35. A MISSION ABORT can be declared at any time at the discretion of the Director of Flight Operations and Support.

36. R.F. DATA LINK AGC LEVELS: (Re-evaluate after each flight)

    A. UPLINK

    - ACCEPTABLE (> - 70 dbm) - Continue mission
    - MARGINAL (-70 to -90 dbm) - Expect loss of ground control and auto-switch to BACKUP. Reduce radar/TM range.
    - UNACCEPTABLE (< -90 dbm) - Probable loss of ground control and auto-switch to BACKUP. Reduce radar/TM range.

    B. DOWNLINK

    - ACCEPTABLE (> 20 db above noise level) - Continue mission
    - MARGINAL (20 to 10 db above noise level) - Expect TM dropouts, loss of cockpit instruments. Reduce radar/TM range.
    - UNACCEPTABLE (< 10 db above noise level) - Probable loss of TM data. Reduce radar/TM range.

37. GO/NO-GO list - ABORT if any of the following exist:

A. INSTRUMENTATION -

The GO/No-GO instrumentation list will be presented and discussed before each flight, preferably at the Technical Briefing.

B. MCWP - Primary panel in control room is not operational and/or does not indicate all HiMAT systems go.

C. COCKPIT INSTRUMENTS AND FUNCTIONS - Malfunction in:

- Radar altimeter
- Vertical velocity indicator
- Altimeter
- Mach
- Airspeed
- Angle of attack
- ADI with ILS
- EGT
- RPM
- Fuel flow
- Fuel quantity
- Sideslip
- All surface positions
- All annunciators
- MILGO X-Y plot
- X-h plot

D. CONTROL ROOM - if any of the following malfunction: radar data, communication system, or any other item which NASA 1 required for mission support.

E. Unplanned switch to BACKUP during captive and PCS can not be reselected.

F. HIGH FUEL level light (MCWP) is OFF at launch point. A captive ABORT should occur at 200 lbs. fuel remaining onboard HiMAT.

~~G.~~ 008 has an emergency prior to launch.

H. Both UPLINKS are MARGINAL or UNACCEPTABLE (< -70 dbm). If both UPLINKS are MARGINAL or UNACCEPTABLE, DO NOT LAUNCH.

I. DOWNLINK is MARGINAL or UNACCEPTABLE (< 20 db above noise level). If downlink is MARGINAL or UNACCEPTABLE, DO NOT LAUNCH.

J. TV is UNACCEPTABLE to Project Pilot.

K. LAUNCH CONDITIONS - see Item 16 above.

38. Flight plans will be prepared with a total range of less than 600 kilometers (375 nm).

39. In the event significant flutter or structural oscillations are encountered, NASA 23 (Spectral Analysis Facility) will call, "TERMINATE, TERMINATE," over the mission frequency. The HiMAT Pilot will take the following immediate action.

- If the flight condition is near one (1) "g"

1. THROTTLE - IDLE

2. INCREASE LOAD FACTOR TO 2.0 TO 2.5 g's. (PERFORM LEVEL OR CLIMBING TURN)

3. SPEEDBRAKES - OUT

4. DECEL TO 0.8 MACH NUMBER ABOVE 30,000 FT. AND 300 KIAS AT OR BELOW 30,000 FT.

- If the flight condition is at elevated load factors (greater than one "g")

1. THROTTLE - IDLE

2. DECREASE LOAD FACTOR TO 0.8 TO 1.0 g's

3. SPEEDBRAKES - OUT

4. DECEL TO 0.8 MACH NUMBER ABOVE 30,000 FT. AND 300 KIAS AT OR ABOVE 30,000 FT.

40. The Project Manager with assistance of other key personnel will decide whether to ABORT the prime research mission, or continue the flight using the alternate flight profile if pre-briefed.

HiMAT

Appendix C - Instrumentation/Flidab

Flight H1-9-17

All instrumentation functioned normally and the Flidab was created after a few minor problems.

The Flidab creation notice and the interval start and stop times are shown on page X-2.

The instrumentation parameter list is shown on pages X-3 thru X-17.

Paul Harney
Test Information Engineer

FLIDAB CREATION NOTICE

TIME INTERVAL RECORDS

VEHICLE..... HIM1
FLT..... 009 A
FLIGHT CODE..... HIM1009
FLIGHT DATE..... 12/21/81
CREATION DATE..... 12/31/81
NOTIFICATION DATE..... 12/31/81
PROCEDURE NAME..... HIM1F009A
MODIFY DECK NAME..... HIM1423
PARTITIONS..... 2

Sys 1 : 59.05
Sys 2 : 95. 29
Sys 3 : 30.16

INTERVAL START TIME	INTERVAL END TIME
8-16-40- 0	8-26-45-999

VEHICLE..... HIM1
FLT..... 009 B
FLIGHT CODE..... HIM1009
FLIGHT DATE..... 12/21/81
CREATION DATE..... 01/12/82
NOTIFICATION DATE..... 01/12/82
PROCEDURE NAME..... HIM1F009B
MODIFY DECK NAME..... HIM1424
PARTITIONS..... 6

To Comp Sys 1 : 56.9

INTERVAL START TIME	INTERVAL END TIME
7-49- 0-216	7-51-29-997
7-55-59-999	7-56-59-997
8-25-26- 0	8-52-51-999

TODAY: 81/12/15.

FLIGHT INSTRUMENTATION PARAMETER LIST
REV: DATE: 0/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO. 009
SCHED FLT DATE: 12/17/81
TM FREQ: 5252.41 MHZ S/N
PCM SYS/COM NO. 1-10 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PROJ INSTR ENGR: AROEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 50
FR/DATA CY: 16
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 49 , 50 ,

TM SYS NO.	PARMID	CALID	PARAMETER NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAME WORD POS	FRAME NO.	SAMPLE RATE	COMP ALG	REF PRESS PARMID	VM/TM KP PARMID	FILTER FREQ	FILTER CR	DAT TYP CCD
1	I1I0000	261 00 001	SUBFRAME ID					1		220	40000					
2	P9MS	261 00 002	B*MODEL STATUS - R/H PRIM	105/12/80	-10	+10	VOLTS	2		220	40000					
3	LPMS	261 00 003	B*MODEL STATUS - L/H PRIM	105/12/80	-10	+10	VOLTS	3		220	40000					
4	ARRF	261 00 004	C*ROLL RATE - FTIS	105/12/80	-250	+247	DEG/SEC	4		220	40000					
5	P	261 00 005	A*ROLL RATE - ABC	104/15/80	-250	+250	DEG/SEC	5		220	40000					
6	RSMS	261 00 006	B*MODEL STATUS - R/H SEC	105/12/80	-10	+10	VOLTS	6		220	40000					
7	LMS	261 00 007	B*MODEL STATUS - L/H SEC	105/12/80	-10	+10	VOLTS	7		220	40000					
8	ARRF	261 00 008	C*PITCH RATE - FTIS	105/12/80	-134	+99	DEG/SEC	8		220	40000					6
9	ARRF	261 00 009	D*YAW RATE-COARSE-FTIS	11/17/80	-100	+100	DEG/SEC	9		220	40000					6
10	P	261 00 010	A*PITCH RATE - ABC	104/15/80	-100	+100	DEG/SEC	10		220	40000					
11	SMMN	261 00 011	SYS 1 LOW LEV MON--514 DEC--				COUNTS	11		220	40000					
12	ARYFINE	261 00 012	A*SENSITIVE YAW RATE -- FTIS	11/17/80	-10	+10	DEG/SEC	12		220	40000					
13	ACCGLF	261 00 013	C*C.G. ACCL. LONGITUDINAL - FTIS	105/12/80	-9	+5	G	13		220	40000					6
14	ACCGTF	261 00 014	F*C.G. ACCL. TRANSVERSE - FTIS	12/07/81	-5	+5	G	14		220	40000					6
15	P	261 00 015	A*YAW RATE - ABC	104/15/80	-100	+100	DEG/SEC	15		220	40000					
16	TPR2C	261 00 016	STAT. PRESS. NO. 2 - COARSE				PSFA	16		220	40000					
17	TPR2F	261 00 017	A*STAT. PRESS. NO. 2 - FINE	11/19/81	0	135	PSFA	17		220	40000					
18	ACCGNF	261 00 018	E*C.G. ACCL. NORMAL - FTIS	12/07/81	-1	+14	G	18		220	40000					6
19	ALPHAL	261 00 019	B*ANGLE OF ATTACK L/H (ACTIVE)	105/12/80	-10	+40	DEG	19		220	40000					6
20	AN	261 00 020	A*C.G. ACCL. NORMAL - ABC	104/15/80	-8	+14	G	20		220	40000					6
21	ALPHAR	261 00 021	A*ANGLE OF ATTACK R/H(MONITOR)	11/20/81	-10	+40	DEG	21		220	40000					
22	DYNPRL	261 00 022	D*DYN. PRESS. RATE NO. 1		-.55	+.55	PSI/SEC	22		220	40000					
23	BETA	261 00 023	D*ANGLE OF SIDESLIP	105/12/80	-30	+32	DEG	23		220	40000					6
24	LF0019	261 00 024	SUBFRAME 1					24	0	220	40000					6
25	ANY	261 00 025	A*C.G. ACCL. LATERAL ABC	104/15/80	-3	+3	G	25		220	40000					6
26	LF002	261 00 026	SUBFRAME 2					26	0	220	40000					
27	LF003	261 00 027	SUBFRAME 3					27	0	220	40000					
28	LF004	261 00 028	SUBFRAME 4					28	0	220	40000					
29	LF005	261 00 029	SUBFRAME 5					29	0	220	40000					
30	LF006	261 00 030	SUBFRAME 6					30	0	220	40000					
31	LF007	261 00 031	SUBFRAME 7					31	0	220	40000					
32	LF008	261 00 032	SUBFRAME 8					32	0	220	40000					
33	LF009	261 00 033	SUBFRAME 9					33	0	220	40000					
34	LF010	261 00 034	SUBFRAME 10					34	0	220	40000					
35	LF011	261 00 035	SUBFRAME 11					35	0	220	40000					
36	LF012	261 00 036	SUBFRAME 12					36	0	220	40000					
37	LF013	261 00 037	SUBFRAME 13					37	0	220	40000					
38	LF014	261 00 038	SUBFRAME 14					38	0	220	40000					
39	LF015	261 00 039	SUBFRAME 15					39	0	220	40000					
40	LF016	261 00 040	SUBFRAME 16					40	0	220	40000					
41	LF017	261 00 041	SUBFRAME 17					41	0	220	40000					
42	LF018	261 00 042	SUBFRAME 18					42	0	220	40000					
43	LF019	261 00 043	SUBFRAME 19					43	0	220	40000					
44	LF020	261 00 044	SUBFRAME 20					44	0	220	40000					
45	LF021	261 00 045	SUBFRAME 21					45	0	220	40000					
46	LF022	261 00 046	SUBFRAME 22					46	0	220	40000					
47	LF023	261 00 047	SUBFRAME 23					47	0	220	40000					
48	LF024	261 00 048	SUBFRAME 24					48	0	220	40000					
49	MFS1000	261 00 049	SYNC WD 1 1755 OCT 1005 DEC					49		220	40000					
50	MFS2000	261 00 050	SYNC WD 2 1240 OCT 544 DEC					50		220	40000					

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 3 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO. 999
SCHED FLT DATE: 12/17/81
TM FREQ: U52L41 MHZ S/N
PCM SYS/COM NO. 1-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 50
FR/DATA CY 16
FBT=BIT1-MSB
MAIN FRAME SYNC WORDS: 49 , 50 ,

TTY NO. SYS	PARMID	CALID	PARAMETER NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP RATE	COMP ALG	REF PRESS PARMID	VR/TM KP PARMID	FILTER FBEQ	DAT TYP DR
95	DRR	261 31 024	D*R/H RUDDER POSITION	11/20/81	-11	+11	DEG	24	1	55 4000					61
97	DVL	261 32 024	E*L/H ELEVON POSITION	09/22/80	-40	+30	DEG	24	2	55 4000					61
53	NULL	261 03 024	E *					24	3	55 2000					
54	RUMPDT	261 34 024	E*STATIC PRESS RATE #2	11/20/81	-.075	+.075	PSIA/SEC	24	4	55 4000					61
55	DRL	261 01 026	E*L/H RUDDER POSITION	09/22/80	-12	+19	DEG	26	1	55 4000					61
56	DVR	261 02 026	G*R/H ELEVON POSITION	11/20/81	-19	+30	DEG	26	2	55 4000					61
57	DCR	261 03 026	E*R/H CANARD POSITION	11/20/81	-20	+29	DEG	26	3	55 4000					61
58	NULL	261 04 026	E *					26	4	55 2000					
59	NULL	261 01 027	E *					27	1	55 2000					
60	DEL	261 02 027	E*L/H ELEVATOR POSITION	11/20/81	-30	+30	DEG	27	2	55 4000					61
61	PSRATE	261 03 027	B*STATIC PRESS RATE #1	05/12/80	-.75	+.75	PSIA/SEC	27	3	55 4000					61
62	NULL	261 04 027	B *					27	4	55 2000					
63	NULL	261 01 028	B *L/H AILERON POSITION					28	1	55 4000					61
64	DCR	261 02 028	C* R/H ELEVATOR POSITION	11/20/81	-35	+30	DEG	28	2	55 4000					61
65	TGV	261 03 028	C*INLET GUIDE VANE POSITION	11/ /81	0	+45	DEG	28	3	55 4000					61
66	NULL	261 04 028	B *					28	4	55 2000					61
67	ATR	261 01 029	D*ROLL ANGLE	04/27/79	-180.	+180.	DEG	29	1	55 4000					61
68	QS	261 02 029	C*FREE STREAM DIFF. PRESSURE	05/12/80	-2	+1487	PSFD	29	2	55 4000					61
69	ALT	261 03 029	D*FREE STREAM STATIC PRESS	11/23/81	100	2000	PSFA	29	3	55 4000					61
70	ALTR	261 04 029	B*RADAR ALTITUDE	06/27/80	0	5000	FT	29	4	55 4000					61
71	FFAB	261 01 030	D*AFTERBURNER FUEL FLOW	05/12/80	0	20	GAL/MIN	30	1	27.5 4000					61
72	FFF	261 02 030	D*ENGINE MAIN FUEL FLOW	05/12/80	0	10	GAL/MIN	30	2	27.5 4000					61
73	NULL	261 03 030	*					30	3	27.5 2000					61
74	NULL	261 04 030	*					30	4	27.5 2000					61
75	SG34	261 05 030	*L/H IB WING VRT BDG B.S. 140				LB	30	5	27.5 4000					61
76	BTSBV	261 06 030	D*BTS BATT VOLTAGE	11/24/81	0	35	VDC	30	6	27.5 4000					61
77	SG19	261 07 030	*L/H WING TIP VERTICAL BENDING				LB	30	7	27.5 4000					61
78	SG20S	261 08 030	*L/H O.W. FWD VRT BENDING				LB	30	8	27.5 4000					61
79	SG21S	261 01 031	*L/H O.W. AFT VRT BENDING				LB	31	1	27.5 4000					61
80	SG22	261 02 031	*L/H O.W. FWD SPAR VERT SHEAR				LB	31	2	27.5 4000					61
81	SG23	261 03 031	*L/H O.W. AFT SPAR VERT SHEAR				LB	31	3	27.5 4000					61
82	SG24	261 04 031	*L/H O.W. MIDCHORD TORSION				LB	31	4	27.5 4000					61
83	SG36S	261 05 031	*L/H IB WING VRT SHR B.S. 159.5				LB	31	5	27.5 4000					61
84	SG37S	261 06 031	*L/H IB WING VRT SHR B.S. 150				LB	31	6	27.5 4000					61
85	NULL	261 07 031	*					31	7	27.5 2000					61
86	NULL	261 08 031	*					31	8	27.5 2000					61
87	SG7	261 01 032	*L/H TAIL BOOM LATERAL BNDG				LB	32	1	27.5 4000					61
88	NULL	261 02 032	*L/H TAIL BOOM LATERAL SHEAR				LB	32	2	27.5 2000					6
89	SG9	261 03 032	*L/H TAIL BOOM LATERAL SHR.				LB	32	3	27.5 4000					61
90	NULL	261 04 032	*L/H TAIL BOOM VERTICAL BNDG				LB	32	4	27.5 2000					61
91	SG11	261 05 032	*L/H TAIL BOOM VERT SHR.				LB	32	5	27.5 4000					61
92	SGA	261 06 032	*R/H RUDDER HINGE MOMENT				LB	32	6	27.5 4000					61
93	SG12	261 07 032	*R/H TAIL BOOM LATERAL BNDG				LB	32	7	27.5 4000					61
94	NULL	261 08 032	*R/H TAIL BOOM UPPER LAT SHR.				LB	32	8	27.5 2000					61
95	ANP	261 01 033	D*PITCH ANGLE	04/27/79	-90.	+90.	DEG	33	1	55 4000					61
96	RSAT	261 02 033	A*FREE AIRSTREAM TEMP (TOTAL)	11/06/81	-77	+189	DEG C	33	2	55 4000					61
97	TAB	261 03 033	D*TEMP - AVIONICS BAY	06/23/79	-50	+200	DEG F	33	3	55 4000					61
98	TYG	261 04 033	D*ENGINE EXHAUST GAS TEMP	05/22/78	-2.1	+2833	DEG C	33	4	55 4000					61

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 4 OF COPY 3

REV: DATE: 8/ 4/ 0

VEHICLE: HIMAT AV-1
FLT NO.: 009
SCHED FLT DATE: 12/17/81
TM FREQ: U52L41 MHZ S/N
PCM SYS/COM NO. 1-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 6...

PROJ INSTR ENGR: ARDEN O. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 12
WORDS/FRAME: 50
FR/DATA CY: 10
FRT=BTII=MSR
MAIN FRAME SYNC WORDS: 49 , 80 ,

MJ.MI PARMID SYS	CALID	NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP COMP RATE	ALG	REF PRESS PARMID	VM/TM KP PARMID	FILTER FREQ	FILTER CODE	DAT TYP CCD
999 SG33S	261 01 034	*L/H IB WING VRT BDG B.S. 150				LB	34	1	27.5	4000				6	
1331 SG39	261 02 034	*L/H CNRD VRT SHR FWD SPR MDSPN				LB	34	2	27.5	4000				6	
1911 SG40	261 03 034	*L/H CNRD VRT SHR AFT SPR MDSPN				LB	34	3	27.5	4000				6	
1921 SG42	261 04 034	*L/H CNRD VRT BDG MIDSPAN				LB	34	4	27.5	4000				6	
1931 SG27	261 05 034	*L/H WING ROOT VERT BNDG. 159.5				LB	34	5	27.5	4000				6	
1341 SG35S	261 06 034	*L/H WING TB VRT SHR B.S. 172.5				LB	34	6	27.5	4000				6	
1351 SG31S	261 07 034	*L/H IB WING VRT BDG B.S. 172.5				LB	34	7	27.5	4000				6	
1951 SG32	261 08 034	*L/H IB WING VRT BDG B.S. 159.5				LB	34	8	27.5	4000				6	
1371 FTS1	261 01 035 O**FLT TERM RLC/DEC SIG STRENG.H		10/01/80	-110	-32	DBM	35	1	27.5	4000				6	
1381 FTS2	261 02 035 O**FLT TERM SAFE IND		11/24/81	0	35	VDC	35	2	27.5	4000				6	
1391 FTS3	261 03 035 O**FLT TERM ARM IND		11/24/81	0	35	VDC	35	3	27.5	4000				6	
1131 P2	261 04 035 A**COMPRESSOR INLET TOTAL PRESS.		05/12/80	0	50	PSIA	35	4	27.5	4000				6	
1141 MDCW	261 05 035 A**I.B.U. COMPUTER WORKLOAD		05/12/80	0	100	VDC	35	5	27.5	4000				6	
1151 PCW	261 06 035 A**PRI. COMPUTER WORKLOAD		05/12/80	0	100	VDC	35	6	27.5	4000				6	
1161 P3DT	261 07 035 A**COMPRESSOR DISCH. TOTAL PRESS.		05/12/80	0	150	PSIA	35	7	27.5	4000				6	
1171 P5	261 08 035 A**TURBINE DISC. STATIC PRESS.		05/12/80	0	50	PSIA	35	8	27.5	4000				6	
1181 TCRBSK	261 01 036 A**RATE BAY SKIN TEMP		05/13/80	0	500	DEG F	36	1	27.5	4000				6	
1191 TCRBAR	261 02 036 A* RATE BAY AIR TEMP		05/13/80	0	500	DEG F	36	2	27.5	4000				6	
1201 VBATT	261 03 036 A**TRANSITION BATT. VOLT.		05/12/80	20	35	VDC	36	3	27.5	4000				6	
1211 BATTV	261 04 036 A**BATTERY BUS VOLT.		05/12/80	20	35	VDC	36	4	27.5	4000				6	
1221 BATTV	261 05 036 A**BATTERY VOLT.		05/12/80	20	35	VDC	36	5	27.5	4000				6	
1231 GENBV	261 06 036 A**GENERATOR BUS VOLT.		05/12/80	20	35	VDC	36	6	27.5	4000				6	
1241 GENV	261 07 036 A**GENERATOR VOLT.		05/12/80	20	35	VDC	36	7	27.5	4000				6	
1251 BTS	261 08 036 A**BUS TIED/SPLIT		05/12/80	20	35	VDC	36	8	27.5	4000				6	
1261 HTY	261 01 037 O**HEADING ANGLE		04/27/79	-180	+180	DEG	37	1	55	4000				6	
1271 RPS	261 02 037 *STATUS WORD 8						37	2	55	4000				6	
1281 RPM	261 03 037 O**ENGINE RPM		06/25/78	15	110	PERCENT	37	3	55	4000				6	
1291 ENXA	261 04 037 A**EXHAUST NOZZLE EXIT AREA		09/21/79	105.02	206.5	IN2	37	4	55	4000				6	
1301 FFAB	261 01 038 O**A/B PILOT BURNER FLOW		09/08/81	0	1	GAL/MIN	38	1	27.5	4000				6	
1311 FFSB	261 02 038 B**FUEL DUMP FLOW		05/12/80	0	5	GAL/MIN	38	2	27.5	4000				6	
1321 PLY	261 03 038 O**LONG. ACCEL. - PALLET		11/24/81	-1	+1	G	38	3	27.5	4000				6	
1331 PLY	261 04 038 O**LAT. ACCEL. - PALLET		11/24/81	-1	+1	G	38	4	27.5	4000				6	
1341 PLZ	261 05 038 O**NORM. ACCEL. - PALLET		11/24/81	-3	+9	G	38	5	27.5	4000				6	
1351 FUELTP	261 06 038 A**FUEL TEMP		05/13/80	-70	+300	DEG F	38	6	27.5	4000				6	
1361 TCREF	261 07 038 A**TC REF OVEN TEMP		05/13/80	+32	+175	DEG F	38	7	27.5	4000				6	
1381 TC1	261 08 038 A**COMPRESSOR CASE 15.6 AFT 1130		05/13/80	0	900	DEG F	38	8	27.5	4000				6	
1391 TC2	261 01 039 A**COMPRESSOR CASE 15.6 AFT 4130		05/13/80	0	900	DEG F	39	1	27.5	4000				6	
1401 TC3	261 02 039 A**COMPRESSOR CASE 15.6 AFT 7130		05/13/80	0	900	DEG F	39	2	27.5	4000				6	
1411 TC4	261 03 039 A**COMPRESSOR CASE 15.6 AFT 10130		05/13/80	0	900	DEG F	39	3	27.5	4000				6	
1331 TC5	261 04 039 A**COMPRESSOR CASE 19.3 AFT 1130		05/13/80	0	900	DEG F	39	4	27.5	4000				6	
1321 TC6	261 05 039 A**COMPRESSOR CASE 19.3 AFT 4130		05/13/80	0	900	DEG F	39	5	27.5	4000				6	
1431 TC7	261 06 039 A**COMPRESSOR CASE 19.3 AFT 7130		05/13/80	0	900	DEG F	39	6	27.5	4000				6	
1441 TC8	261 07 039 A**COMPRESSOR CASE 19.3 AFT 10130		05/13/80	0	900	DEG F	39	7	27.5	4000				6	
1421 TC9	261 08 039 A**JUNCTION BOX MOUNT TEMP.		05/13/80	0	500	DEG F	39	8	27.5	4000				6	
1431 TC10	261 01 040 A**CONDEV BAY TEMP.		05/13/80	0	500	DEG F	40	1	27.5	4000				6	
1441 TC11	261 02 040 B**HYD BAY TEMP		05/13/80	0	500	DEG F	40	2	27.5	4000				6	
1451 TC12	261 03 040 A**LUBE TANK OUTER SURFACE		05/13/80	0	500	DEG F	40	3	27.5	4000				6	
1461 TC13	261 04 040 A**HYD PUMP CASE TEMP.		05/13/80	0	500	DEG F	40	4	27.5	4000				6	

TODAY: 81/12/19. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 5 OF COPY 3

REV: DATE: 8/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO.: 009
SCHED FLT DATE: 12/17/81
TM FREQ: U2cL41 MHZ S/N
PCM SYS/COM NO. 1-9& FIRMAT NO. 1
PCM SYS MODEL: VECTOR 6..

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 16
WORDS/FRAME: 50
FR/DATA CY: 16
FR=0,T1=MSB
MAIN FRAME SYNC WORDS: 49 , 50 ,

MEAS SYS	PARAMETER NAME	VALID	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAME WORD POS	FRAME NO.	SAMPLE RATE	CONV ALG	REF PRESS PARMID	VMUX MP PARMID	FILTER FREQ	FILTER ORDER	DATA TYPE CODE
147 TC13	NOZZLE RING TEMP 12:00	261 05 040	A*	05/13/80	0	450	DEG F	40	5	27.5	14000				61
148 TC14	NUZZLE LVDT TEMP	261 06 040	A*	05/13/80	0	750	DEG F	42	6	27.5	14000				61
149 TC16	12-AFT A/B FLANGE 1 00	261 07 040	A*	05/13/80	0	1350	DEG F	43	7	27.5	14000				61
150 TC17	12-AFT A/B FLANGE 6:00	261 08 040	A*	05/13/80	0	1350	DEG F	40	8	27.5	14000				61
151 ITP	THROTTLE POSITION	261 01 041	A*	09/21/79	0	116	DEG	41	1	55	14000				61
152 D02	STATUS WORD 2	261 02 041						41	2	55	14000				
153 D03	STATUS WORD 4	261 03 041						41	3	55	14000				
154 D04	STATUS WORD 6	261 04 041						41	4	55	14000				
155 PX01	WING/CANARD AIRFLOW REF PRESS.	261 01 042	A*	05/13/80	0	14	PSIA	42	1	14	14000				6
156 SS1	SIGNAL STRENGTH 1	261 02 042	L*	09/23/80	-110	-30	DBM	42	2	14	14000				61
157 SS2	SIGNAL STRENGTH 2	261 03 042	D*	12/12/80	-110	-30	DBM	42	3	14	14000				61
158 VM28	VOLTAGE MONITOR +28VDC PWR	261 04 042	A*	05/13/80	25	30	VDC	42	4	14	4000				61
159 VM05	VOLTAGE MONITOR +5 VDC REG PWR	261 05 042	A*	10/07/80	0	5.5	VDC	42	5	14	14000				61
160 VAC	VOLTAGE MONITOR 26VAC PWR	261 06 042	D*	08/25/80	0	+27	VAC	42	6	14	14000				61
161 RS1A	ROSETTE STRAIN GAGE	261 07 042						42	7	14.4	14000				
162 RS1B	ROSETTE STRAIN GAGE	261 08 042						42	8	14.4	14000				
163 RS1C	ROSETTE STRAIN GAGE	261 09 042						42	9	14.4	14000				
164 RS2A	ROSETTE STRAIN GAGE	261 10 042						42	10	14.4	4000				
165 RS2B	ROSETTE STRAIN GAGE	261 11 042						42	11	14.4	14000				
166 RS2C	ROSETTE STRAIN GAGE	261 12 042						42	12	14.4	14000				
167 RS3A	ROSETTE STRAIN GAGE	261 13 042						42	13	14.4	14000				
168 RS3B	ROSETTE STRAIN GAGE	261 14 042						42	14	14.4	14000				
169 RS3C	ROSETTE STRAIN GAGE	261 15 042						42	15	14.4	14000				
170 RS4A	ROSETTE STRAIN GAGE	261 16 042						42	16	14.4	4000				
171 PX047	WING SURFACE PRES. 12% ROW3-UP	261 01 043		-10.	+10.	PSID	43	1	14	20000	PXDR	VDC5			61
172 PX048	WING SURFACE PRES. 20% ROW3-LW	261 02 043		-10.	+10.	PSID	43	2	14	20000	PXDR	VDC5			61
173 PX049	WING SURFACE PRES. 20% ROW3-UP	261 03 043		-3.5	+3.5	PSID	43	3	14	20000	PXDR	VDC5			61
174 PX050	WING SURFACE PRES. 20% ROW3-LW	261 04 043		-3.5	+3.5	PSID	43	4	14	20000	PXDR	VDC5			61
175 PX051	WING SURFACE PRES. 35% ROW3-UP	261 05 043		-3.5	+3.5	PSID	43	5	14	20000	PXDR	VDC5			61
176 PX052	WING SURFACE PRES. 35% ROW3-LW	261 06 043		-3.5	+3.5	PSID	43	6	14	20000	PXDR	VDC5			61
177 PX053	WING SURFACE PRES. 50% ROW3-UP	261 07 043		-3.5	+3.5	PSID	43	7	14	20000	PXDR	VDC5			61
178 PX054	WING SURFACE PRES. 50% ROW3-LW	261 08 043		-3.5	+3.5	PSID	43	8	14	20000	PXDR	VDC5			61
179 PX055	WING SURFACE PRES. 70% ROW3-UP	261 09 043		-3.5	+3.5	PSID	43	9	14	20000	PXDR	VDC5			61
180 PX056	WING SURFACE PRES. 70% ROW3-LW	261 10 043		-3.5	+3.5	PSID	43	10	14	20000	PXDR	VDC5			61
181 RS4B	ROSETTE STRAIN GAGE	261 11 043					43	11	14.4	4000					
182 RS4C	ROSETTE STRAIN GAGE	261 12 043					43	12	14.4	14000					
183 RS5A	ROSETTE STRAIN GAGE	261 13 043					43	13	14.4	14000					
184 RS5B	ROSETTE STRAIN GAGE	261 14 043					43	14	14.4	4000					
185 RS5C	ROSETTE STRAIN GAGE	261 15 043					43	15	14.4	14000					
186 RS6A	ROSETTE STRAIN GAGE	261 16 043					43	16	14.4	14000					
187 RS6B	ROSETTE STRAIN GAGE	261 01 044					44	1	14.4	4000					
188 RS6C	ROSETTE STRAIN GAGE	261 02 044					44	2	14.4	14000					
189 RS7A	ROSETTE STRAIN GAGE	261 03 044					44	3	14.4	14000					
190 RS7B	ROSETTE STRAIN GAGE	261 04 044					44	4	14.4	14000					
191 PX057	WING SURFACE PRES. 35% ROW4-UP	261 05 044		-3.5	+3.5	PSID	44	5	14	20000	PXDR	VDC5			61
192 PX058	WING SURFACE PRES. 35% ROW4-LW	261 06 044		-3.5	+3.5	PSID	44	6	14	20000	PXDR	VDC5			61
193 PX059	WING SURFACE PRES. 50% ROW4-UP	261 07 044		-3.5	+3.5	PSID	44	7	14	20000	PXDR	VDC5			61
194 PX060	WING SURFACE PRES. 50% ROW4-LW	261 08 044		-3.5	+3.5	PSID	44	8	14	20000	PXDR	VDC5			61

TODAY: 01/12/19. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 6 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO. 009
SCHED FLT DATE: 12/17/81
TM FREQ: U22L41 MHZ S/N
PCM SYS/COM NO: 1-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 50
FR/DATA CY: 16
FBT=BIT1=MSB
MAIN FRAME SYNC WORD: 49 , 50 ,

TM SYS NO.	PARMID	CALID	PARAMETER NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAME WORD	FRAME NO.	SAMP RATE	COMP ALG	PCM PRESS	VM/TM KP	FILTER FREQ	FILTER BW	DATA TYPE CODE
195	PX071	261 09 044	WING SURFACE PRES. 71% ROW4-UP		-3.5	+3.5	PSID	44	9	14 2000	PXDR	VDC5				6
196	PX072	261 10 044	WING SURFACE PRES. 7U% ROW4-LW		-3.5	+3.5	PSID	44	10	14 2000	PXDR	VDC5				6
197	PX073	261 11 044	WING SURFACE PRES. 85% ROW4-UP		-3.5	+3.5	PSID	44	11	14 2000	PXDR	VDC5				6
198	PX074	261 12 044	WING SURFACE PRES. 85% ROW4-LW		-3.5	+3.5	PSID	44	12	14 2000	PXDR	VDC5				6
199	PX075	261 13 044	WING SURFACE PRES. 97% ROW4-UP		-3.5	+3.5	PSID	44	13	14 2000	PXDR	VDC5				6
200	PX076	261 14 044	WING SURFACE PRES. 97% ROW4-LW		-3.5	+3.5	PSID	44	14	14 2000	PXDR	VDC5				6
201	PS7C	261 15 044	ROSETTE STRAIN GAGE					44	15	14.4						
202	PS84	261 16 044	ROSETTE STRAIN GAGE					44	16	14.4	4000					
203	PX01	261 01 045	STATUS WORD 1					45	1	55 4						
204	PX03	261 02 045	STATUS WORD 3					45	2	55	4000					
205	PX05	261 03 045	STATUS WORD 5					45	3	55	4000					
206	PX07	261 04 045	STATUS WORD 7					45	4	55	4000					
207	PS89	261 01 046	ROSETTE STRAIN GAGE					46	1	14.4	4000					
208	PS8C	261 02 046	ROSETTE STRAIN GAGE					46	2	14.4	4000					
209	PX05	261 03 046	WING SURFACE PRES. 10% ROW1-UP		-3.5	+3.5	PSID	46	3	14		PXDR	VDC5			6
210	PX06	261 04 046	WING SURFACE PRES. 10% ROW1-LW		-3.5	+3.5	PSID	46	4	14 2000		PXDR	VDC5			6
211	PX07	261 05 046	WING SURFACE PRES. 25% ROW1-UP		-3.5	+3.5	PSID	46	5	14 2000		PXDR	VDC5			6
212	PX09	261 06 046	WING SURFACE PRES. 25% ROW1-LW		-3.5	+3.5	PSID	46	6	14	2000	PXDR	VDC5			6
213	PX0A	261 07 046	WING SURFACE PRES. 25% ROW1-UP		-3.5	+3.5	PSID	46	7	14	2000	PXDR	VDC5			6
214	PX0B	261 08 046	WING SURFACE PRES. 25% ROW1-LW		-3.5	+3.5	PSID	46	8	14	2000	PXDR	VDC5			6
215	PX0D	261 09 046	WING SURFACE PRES. 35% ROW1-UP		-3.5	+3.5	PSID	46	9	14	2000	PXDR	VDC5			6
216	PX0E	261 10 046	WING SURFACE PRES. 35% ROW1-LW		-3.5	+3.5	PSID	46	10	14	2000	PXDR	VDC5			6
217	PX0F	261 11 046	WING SURFACE PRES. 49% ROW1-UP		-3.5	+3.5	PSID	46	11	14	2000	PXDR	VDC5			6
218	PX10	261 12 046	WING SURFACE PRES. 49% ROW1-LW		-3.5	+3.5	PSID	46	12	14	2000	PXDR	VDC5			6
219	PX11	261 13 046	WING SURFACE PRES. 63% ROW1-UP		-3.5	+3.5	PSID	46	13	14	2000	PXDR	VDC5			6
220	PX12	261 14 046	WING SURFACE PRES. 63% ROW1-LW		-3.5	+3.5	PSID	46	14	14	2000	PXDR	VDC5			6
221	PX13	261 15 046	WING SURFACE PRES. 78% ROW1-UP		-3.5	+3.5	PSID	46	15	14	2000	PXDR	VDC5			6
222	PX14	261 16 046	WING SURFACE PRES. 78% ROW1-LW		-3.5	+3.5	PSID	46	16	14	2000	PXDR	VDC5			6
223	PX091	261 01 047	WING SURFACE PRES. 85% ROW1-UP		-3.5	+3.5	PSID	47	1	14	2000	PXDR	VDC5			6
224	PX092	261 02 047	WING SURFACE PRES. 85% ROW1-LW		-3.5	+3.5	PSID	47	2	14	2000	PXDR	VDC5			6
225	PX097	261 03 047	CANARD SURF. PRES. 0% ROW6-UP		-3.5	+3.5	PSID	47	3	14	2000	PXDR	VDC5			6
226	PX099	261 04 047	CANARD SURF. PRES. 0% ROW6-UP		-3.5	+3.5	PSID	47	4	14	2000	PXDR	VDC5			6
227	PX023	261 05 047	WING SURFACE PRES. 98% ROW1-UP		-3.5	+3.5	PSID	47	5	14	2000	PXDR	VDC5			6
228	PX024	261 06 047	WING SURFACE PRES. 98% ROW1-LW		-3.5	+3.5	PSID	47	6	14	2000	PXDR	VDC5			6
229	PX0191	261 07 047	CANARD SURF. PRES. 60% ROW6-UP		-3.5	+3.5	PSID	47	7	14	2000	PXDR	VDC5			6
230	PX028	261 08 047	WING SURFACE PRES. 5% ROW2-UP		-10.	+10.	PSID	47	8	14	2000	PXDR	VDC5			6
231	PX026	261 09 047	WING SURFACE PRES. 5% ROW2-LW		-10.	+10.	PSID	47	9	14	2000	PXDR	VDC5			6
232	PX027	261 10 047	WING SURFACE PRES. 12% ROW2-UP		-3.	+10.	PSID	47	10	14	2000	PXDR	VDC5			6
233	PX0103	261 11 047	CANARD SURF. PRES. 8% ROW6-UP		-3.5	+3.5	PSID	47	11	14	2000	PXDR	VDC5			6
234	PX02A	261 12 047	WING SURFACE PRES. 12% ROW2-LW		-10.	+10.	PSID	47	12	14	2000	PXDR	VDC5			6
235	PX029	261 13 047	WING SURFACE PRES. 17% ROW2-UP		-3.5	+3.5	PSID	47	13	14	2000	PXDR	VDC5			6
236	PX030	261 14 047	WING SURFACE PRES. 17% ROW2-LW		-3.5	+3.5	PSID	47	14	14	2000	PXDR	VDC5			6
237	PX035	261 15 047	CANARD SURF. PRES. 46% ROW6-UP		-3.5	+3.5	PSID	47	15	14	2000	PXDR	VDC5			6
238	PX036	261 16 047	CANARD SURF. PRES. 47% ROW6-LW		-3.5	+3.5	PSID	47	16	14	2000	PXDR	VDC5			6
239	PX032	261 01 048	WING SURFACE PRES. 26% ROW2-LW		-3.5	+3.5	PSID	48	1	14	2000	PXDR	VDC5			6
240	PX033	261 02 048	WING SURFACE PRES. 30% ROW2-UP		-3.5	+3.5	PSID	48	2	14	2000	PXDR	VDC5			6
241	PX031	261 03 048	WING SURFACE PRES. 2.% ROW2-UP		-3.5	+3.5	PSID	48	3	14	2000	PXDR	VDC5			6
242	PX034	261 04 048	WING SURFACE PRES. 30% ROW2-LW		-3.5	+3.5	PSID	48	4	14	2000	PXDR	VDC5			6

TODAY: 81/12/15.

FLIGHT INSTRUMENTATION PARAMETER LIST
REV: DATE: 0/ 0/ 0

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VEHICLE: HIMAT AV-1
FLT NO. 009
SCHED FLT DATE: 12/17/81
TM FREQ: U52L41 MHZ S/N
PCM SYS/ROM NO. 1-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 50
FR/DATA CY: 16
FMT-PIT1-MSB

MAIN FRAME SYNC WORDS 49 , 50 ,

TM NO. SYS	PARM ID	CAL ID	PARAMETER NAME	CALIBRATED DATE	RANGE LOW	RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP RATE	COMP ALG	REF PRESS P.ERID	VP/TM KP PARMID	FILTER FREQ	FILTER DB	DAT TYP CCD
241	PX035	261 35 048	WING SURFACE PRES. 50% ROW2-UP		-3.5	+3.5	PSID	48	5	14	20[illegible]	PXDR	VDC5	-		6
244	PX036	261 36 048	WING SURFACE PRES. 50% ROW2-LW		-3.5	+3.5	PSID	48	6	14	2[illegible]	PXDR	VDC5		-	5
245	PX090	261 07 048	CANARD SURF. PRES. 5% ROW2-UP		-10.	+10.	PSID	49	7	14	2000	PXDR	VDC5			6
246	PX091	261 08 048	CANARD SURF. PRES. 10% ROW6-UP		-10.	+10.	PSID	48	8	14	2000	PXDR	VDC5			6
247	PX093	261 09 048	CANARD SURF. PRES. 15% ROW6-UP		-3.5	+3.5	PSID	48	9	14	2000	PXDR	VDC5			6
248	PX094	261 10 048	CANARD SURF. PRES. 15% ROW6-LW		-3.5	+3.5	PSID	48	10	14	2000	PXDR	VDC5			6
249	PX095	261 11 048	CANARD SURF. PRES. 90% ROW6-UP		-3.5	+3.5	PSID	48	11	14	2000	PXDR	VDC5			6
250	C01	261 12 048	C PT5-PS6	05/13/80	0	5	PSID	48	12	14.4	4000					
251	C02	261 13 048	C PT5-PS7	05/13/80	0	15	PSID	48	13	14.4	4000					
252	C03	261 14 048	C PS6	05/13/80	0	50	PSIA	48	14	14.4	4000					
253	NULL	261 15 048						48	15	13	2000					
254	NULL	261 16 048						48	16	13	2000					

TODAY: 81/12/15.

FLIGHT INSTRUMENTATION PARAMETER LIST
REV: DATE: 0/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO. 019
SCHED FLT DATE: 12/17/81
TM FREQ: U52L41 MHZ S/N
PCM SYS/COM NO. 1-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 6C0

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 50
FR/DATA CY: 16
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 49 , 50 ,

ITEM NO. SYS	PARAMETER MEASMNT ID	PARM ID	PARAMETER NAME	DIGITAL WORD INFORMATION: WORD POSN	FRAME NO.	BIT NO.	BIT DESIGNATION 0	BIT DESIGNATION 1	PARAMETERS AFFECTED / REMARKS	ITEM NO. SEQ
152	DV280	D02	B.U. ACCEL	41	2	1	GOOD	FAIL		1
152	DV281	D02	B.U. RATE GYRO	41	2	2	GOOD	FAIL		2
152	DV282	D02	PRIME ACCEL	41	2	3	GOOD	FAIL		3
152	DV283	D02	STATIC PRESSURE STATUS	41	2	4	GOOD	FAIL		4
152	DV284	D02	DIFF. PRESSURE STATUS	41	2	5	GOOD	FAIL		5
152	DV285	D02	RADAR ALT. SELF TEST	41	2	6	GOOD	FAIL		6
152	DV285	D02	RADAR ALT. STATUS	41	2	7	UNREL	REL		7
152	DV287	D02	ATTITUDE GYRO RANGE STATUS	41	2	8	NORM	FAIL	BEYOND NORMAL RANGE IS >90 DEG	8
152	DV288	D02	B.U. STAT OR DYNAM PRESS RATE	41	2	9	GOOD	FAIL		9
152	DV289	D02	PRIME RATE GYRO	41	2	10	GOOD	FAIL		10
153	DV480	D04	JET NOZZLE OVERRIDE STATUS	41	3	1	NORM	OVRRD		11
153	DV481	D04	MAIN BURNER STATUS	41	3	2	BURN	OUT		12
153	DV482	D04	ENGINE FIRE/OVERHEAT STATUS	41	3	3	NORM	F/OHT		13
153	DV483	D04	ABORT MISSION/CNTR. DEGRD. SIG	41	3	4	SYSGO	A/DGR		14
153	DV484	D04	ABORT/CONTROL DEGRADED CODE	41	3	5	0	1	CAUSE CODE BITS 5,6,7 & 8	15
153	DV485	D04	ABORT/CONTROL DEGRADED CODE	41	3	6	0	1	CAUSE CODE BITS 5,6,7 & 8	16
153	DV486	D04	ABORT/CONTROL DEGRADED CODE	41	3	7	0	1	CAUSE CODE BITS 5,6,7 & 8	17
153	DV487	D04	ABORT/CONTROL DEGRADED CODE	41	3	8	0	1	CAUSE CODE BITS 5,6,7 & 8	18
153	DV488	D04	IGNITERS STATUS	41	3	9	OFF	ON		19
153	DV489	D04	ENGINE SHUTDOWN COMMAND STATUS	41	3	10	RUN	OFF		20
154	D2THH	D06	RECEIVER #2 IN USE	41	4	1	NORM	ACTIV		21
154	DV681	D06	DECODER #1 RELIABILITY STATUS	41	4	2	REL	NOREL		22
154	DV682	D06	DECODER #2 RELIABILITY STATUS	41	4	3	REL	NOREL		23
154	DV683	D06	DISCRETE DIFFERENCE STATUS	41	4	4	NODET	DETEC		24
154	DV684	D06	DISCRETE DIFF. CODE	41	4	5	0	1		25
154	DV685	D06	DISCRETE DIFF. CODE	41	4	6	0	1	DIFF. CODE BITS 6,7,8,9 & 10	26
154	DV686	D06	DISCRETE DIFF. CODE	41	4	7	0	1	DIFF. CODE BITS 6,7,8,9 & 10	27
154	DV687	D06	DISCRETE DIFF. CODE	41	4	8	0	1	DIFF. CODE BITS 6,7,8,9 & 10	28
154	DV688	D06	DISCRETE DIFF. CODE	41	4	9	0	1	DIFF. CODE BITS 6,7,8,9 & 10	29
154	DV689	D06	DISCRETE DIFF. CODE	41	4	10	0	1	DIFF. CODE BITS 6,7,8,9 & 10	30
293	DV180	D01	NORMAL OPERATION	45	1	1	BU	PRIM		31
293	DV181	D01	BACKUP OPERATION	45	1	2	PRIM	BU		32
293	DV182	D01	MODE DESIGNATION CODE	45	1	3	0	1	MODE DESIG. CODE BITS 3,4 & 5	33
293	DV183	D01	MODE DESIGNATION CODE	45	1	4	0	1	MODE DESIG. CODE BITS 3,4 & 5	34
293	DV184	D01	MODE DESIGNATION CODE	45	1	5	0	1	MODE DESIG. CODE BITS 3,4 & 5	35
293	DV185	D01	LOW FUEL LEVEL STATUS	45	1	6	NOLOW	LOW		36
293	DV186	D01	FULL FUEL STATUS	45	1	7	NOFUL	FULL		37
293	DV187	D01	LANYARD SEP	45	1	8	MATED	SEP		38
293	DV188	D01	SMOKE GENERATOR STATUS	45	1	9	OFF	ON		39
293	DV189	D01	PRIMARY RETURN RECOMMENDATION	45	1	10	OK	NORET		40
294	DV380	D03	PRIM. HYDRAULIC PRESS	45	2	1	GOOD	FAIL		41
294	DV381	D03	PRIM. RESERVOIR	45	2	2	GOOD	LOW		42
294	DV382	D03	PRIM. COMPUTER FAIL	45	2	3	GOOD	FAIL		43
294	DV383	D03	PRIM. ACTUATOR ELECTRONICS	45	2	4	GOOD	FAIL		44
294	DV384	D03	PRIM. LOOP CANARDS	45	2	5	GOOD	FAIL		45
294	DV385	D03	PRIM. LOOP AILERONS	45	2	6	GOOD	FAIL		46
294	DV386	D03	PRIM. LOOP ELEVATORS	45	2	7	GOOD	FAIL		47
294	DV387	D03	B.U. COMMANDED VIA UPLINK	45	2	8	PRIM	BU		48

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 9 OF COPY 3

REV: DATE: 07/ 3/ 0

VEHICLE: HIMAT AV-1 PCM BIT RATE: 110 KHZ

FLT NO. 079 PROJ INSTR ENGR: ARDEN D. LAWHEAD BITS/WORD: 10

SCHED FLT DATE: 12/17/81 WORDS/FRAME: 50

TM FREQ: U32L41 MHZ S/N FR/DATA CY: 16

PCM SYS/COM NO. 1-01 FORMAT NO. 1 FBT=BIT1=MSB

PCM SYS MODEL: VECTOR 600 MAIN FRAME SYNC WORDS: 49 , 50 ,

ITEM NO.	PARAMETER			DIGITAL WORD IDENTIFICATION					PARAMETERS AFFECTED	ITEM NO.
				FRAME WORD POSN	FRAME NO.	BIT NO.	BIT DESIGNATION 0	BIT DESIGNATION 1	REMARKS	
294	DW399	D03	PRIM UPLINK	45	2	9	GOOD	FAIL		49
294	DW398	D03	BATTERY ARM STATUS	45	2	10	NOARM	ARM		50
295	DW580	D05	GEN. BUS VOLT. ALERT STATUS	45	3	1	NORM	ALERT		51
295	DW581	D05	GEN. BUS VOLT LOW	45	3	2	NORM	LOW		52
295	DW582	D05	BATTERY VOLT. GRTR THAN 31V	45	3	3	FALSE	TRUE		53
295	DW583	D05	BATTERY ON/OFF-LINE STATUS	45	3	4	OFF	ON		54
295	DW584	D05	UMBILICAL SEPARATION	45	3	5	MATED	SEP		55
295	DW585	D05	LOCKED FOR LAUNCH	45	3	6	OP	LOCK		56
295	DW586	D05	B.U. 28 VDC PWR ON FAIL	45	3	7	GOOD	FAIL		57
295	DW587	D05	B.U. COMP./PWER MONITOR	45	3	8	PASS	FAIL		58
295	DW588	D05	B.U. COMP. WATCHDOG TIMER	45	3	9	GOOD	FAIL		59
295	DW589	D05	PRIM. S/D FAIL	45	3	10	GOOD	FAIL		60
296	DW791	D07	INTERCOM FAIL	45	4	1	GOOD	FAIL		61
296	DW791	D07	B.U. COMP. UPLINK	45	4	2	GOOD	FAIL		62
296	DW792	D07	SEC. THRTL. AMP. IN USE	45	4	3	FALSE	TRUE		63
296	DW793	D07	B.U. COMP. PROBLEM	45	4	4	GOOD	FAIL		64
296	DW794	D07	PRIM, LOOP ELEVON	45	4	5	GOOD	FAIL		65
296	DW795	D07	PRIM, LOOP RUDDER	45	4	6	GOOD	FAIL		66
296	DW796	D07	SEC, LOOP ELEVON	45	4	7	GOOD	FAIL		67
296	DW797	D07	SEC, LOOP RUDDER	45	4	8	GOOD	FAIL		68
296	DW798	D07	SEC. PRESSURE	45	4	9	NORM	LOW		69
296	DW799	D07	SEC, RESERVOIR LOW	45	4	10	NORM	LOW		70
126	D0981	D08	PRIM, DUPLEX ACTUATOR STATUS	37	2	1	ACTIV	BYPAS		71
126	D0981	D08		37	2	2				72
126	D0982	D08	SEC, GEAR SOLENOID	37	2	3	UP	DOWN		73
126	D0983	D08	PRIM, GEAR SOLENOID	37	2	4	UP	DOWN		74
126	D0984	D08	IGNITOR COMMAND SENSE	37	2	5	NOSEN	SENSE		75
126	D01F	D08	DECODER #2 INTER FAIL	37	2	6	GOOD	FAIL		76
126	D17F	D08	DECODER #1 INTER FAIL	37	2	7	GOOD	FAIL		77
126	AGYR1	D08	AUTO GYRO ERECT	37	2	8	OFF	ERECT		78
126	D0985	D08	DEGRADED PRIM. RW MODE SELECTED	37	2	9	NODPM	DPM		79
126	R1I1	D08	RECEIVER #1 IN USE	37	2	10	NORM	ACTIV		80

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 10 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: RPRV FACILITY HIMAT AV-1
FLT NO. 009 PROJ INSTR ENGR: ARDEN D. LAVHEAD
SCHED FLT DATE: 12/17/81
FM FREQ: MHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-778

PCM BIT RATE: 160 KHZ
BITS/WORD: 16
WORDS/FRAME: 80
FR/DATA CY: 1
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

TM SYS	PARM NO.	CALID	PARAMETER NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP RATE	COMP ALG	REF PPESS PARMID	VR/TP KP PARMID	FILTER FREQ	FILTER DB	DAT TYP CCC
1	[illegible]	262	30 031 A*:LONG. STICK POST.(STK. COMPT.)	10/17/79	-4.5	+4.5	IN	1		200	4000			40	6	
2	[illegible]	262	30 032 A*:LONG. STICK POST.(POT.)	10/17/79	-4.5	+4.5	IN	2		200	4000			40	6	
3	[illegible]	262	00 003 A*:LAT. STICK POST.(STK. COMPT.)	10/17/79	-4.25	+4.25	IN	3		200	4000			40	6	
4	[illegible]	262	30 034 A*:LAT. STICK POST.(POT.)	10/17/79	-4.25	+4.25	IN	4		200	4000			40	6	
5	[illegible]	262	30 035 A*:RUDDER PEDAL POST.(STK. COMPT)	10/17/79	-3.5	+3.5	IN	5		200	4000			40	6	
6	[illegible]	262	00 036 A*:RUDDER PEDAL POST.(POT.)	10/17/79	-3.5	+3.5	IN	6		200	4000			40	6	
7	[illegible]	262	30 037 B*:THROTTLE POST.	10/17/79	0	120	DEG	7		200	4000			40	6	
8	[illegible]	262	30 038 :TEST SIGNAL INPUT					8		200	4000			40	6	
9	[illegible]	262	00 009 B*:AIRSPEED-CALIBRATED	06/24/81	0	690	KTS	9		200	4000			40	6	
10	[illegible]	262	00 010 C*:MACH NUMBER	06/24/81	0	1	MACH	10		200	4000			40	6	
11	[illegible]	262	30 011 B*:DYNAMIC PRESSURE	06/24/81	0	200	PSF	11		[illegible]				40	6	
12	[illegible]	262	00 012 B*:ALTITUDE	06/24/81	0	60000	FT	12		200	4000			40	6	
13	[illegible]	262	30 013 C*:FUEL LEVEL	06/12/79	0	700	LBS	13		200	4000			40	6	
14	[illegible]	262	30 014 A*:ALTITUDE RATE	06/12/79	-6000	+6000	FT/MIN	14		200	4000			40	6	
15	[illegible]	262	00 015 :					15		200	2000			40	6	
16	[illegible]	262	00 016 0* TOTAL FUEL FLOW	06/12/79	0	10000	LB/HR	16		200	4000			40	6	
17	[illegible]	262	30 017 0*:RPM COMMAND	06/12/79	50	100	PRCNT	17		[illegible]	4000			40	6	
18	[illegible]	262	00 018 :DAC 13					18		200	2000			40	6	
19	[illegible]	262	30 019 :					19		200	2000			40	6	
20	[illegible]	262	30 020 :					20		200	2000			40	6	
21	[illegible]	262	00 021 :					21		200	2000			40	6	
22	[illegible]	262	00 022 :					22		200	2000			40	6	
23	UPLNK11	262	30 023 0*:DVLC	04/12/79			COUNTS	23		200	4000			40	6	
24	UPLNK12	262	00 024 0*:DVRC	04/12/79			COUNTS	24		200	4000			40	6	
25	[illegible]	262	00 025 :					25		[illegible]				40	6	
26	[illegible]	262	00 026 :					26		200	2000			40	6	
27	UPLNK13	262	00 027 0*:DRC	04/12/79			COUNTS	27		200	4000			40	6	
28	UPLNK14	262	30 028 0*:DS8C	04/12/79			COUNTS	28		[illegible]				40	6	
29	[illegible]	262	00 029 :					29		200	2000			40	6	
30	[illegible]	262	00 030 :					30		200	2000			40	6	
31	[illegible]	262	30 031 :					31		[illegible]				40	6	
32	DV17	262	00 032 :DIGITAL WD. 17					32		200	4000			40	6	
33	DV18	262	00 033 :DIGITAL WD. 18					33		200	4000			40	6	
34	UPLNK21	262	30 034 0*:DEC	04/12/79			COUNTS	34		[illegible]				40	6	
35	UPLNK22	262	30 035 0*:DAAC	04/12/79			COUNTS	35		200	4000			40	6	
36	DV19	262	30 036 :DIGITAL WD. 19					36		200	4000			40	6	
37	DV20	262	30 037 :DIGITAL WD. 20					37		200	4000			40	6	
38	UPLNK23	262	00 038 0*:DCRC	04/12/79			COUNTS	38		200	4000			40	6	
39	UPLNK24	262	30 039 0*:DTHRC	04/12/79			COUNTS	39		200	4000			40	6	
40	NULL	262	00 040 :					40		200	2000			40	6	
41	DV21	262	00 041 :DIGITAL WD. 21					41		[illegible]				40	6	
42	DV22	262	00 042 :DIGITAL WD. 22					42		[illegible]				40	6	
43	DV09	262	00 043 :DIGITAL WD. 09					43		[illegible]				40	6	
44	DV10	262	00 044 :DIGITAL WD. 10					44		200	4000			40	6	
45	DV23	262	30 045 :DIGITAL WD. 23					45		[illegible]				40	6	
46	DV24	262	00 046 :DIGITAL WD. 24					46		200	4000			40	6	
47	DV11	262	30 047 :DIGITAL WD. 11					47		200	4000			40	6	
48	DV12	262	00 048 :DIGITAL WD. 12					48		[illegible]				40	6	

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 11 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: PRV FACILITY HAMAT AV-1
FLT NO. 009 PROJ INSTR ENGR: ARDEN D. LAWHEAD
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-778

PCM BIT RATE: 160 KHZ
BITS/WORD: 10
WDS/DS/FRAME: 80
FP/DATA CY: 1
FBT=BIT1-MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

TM SYS: NO.	PARMTD	CALID	PARAMETER NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAME WORD POS	FRAME NO.	SAMP RATE	CONF ALG	REF PRESS PARMID	VM/TM KP PARMID	FILTER FREQ	FILTER DB	DAT TYP CCD
49	NULL	262 00 049	DAC 11					49		200	2000			40	6	
50	NULL	262 00 050	DAC 12					50		200	2000			40	6	
51	NULL	262 00 051	DAC 13					51		200	2000			40	6	
52	NULL	262 00 052	DAC 14					52		200	2000			40	6	
53	NULL	262 00 053	DAC 15					53		200	2000			40	6	
54	DV13	262 00 054	DIGITAL WD. 13					54		200	4000					
55	DV14	262 00 055	DIGITAL WD. 14					55		200	4000					
56	NULL	262 00 056						56		200	2000			40	6	
57	NULL	262 00 057						57		200	2000			40	6	
58	DV15	262 00 058	DIGITAL WD. 15					58		200	4000					
59	DV16	262 00 059	DIGITAL WD. 16					59		200	4000					
60	NULL	262 00 060						60		200	2000			40	6	
61	NULL	262 00 061						61		200	2000			40	6	
62	NULL	262 00 062						62		200	2000			40	6	
63	NULL	262 00 063						63		200	2000			40	6	
64	NULL	262 00 064						64		200	2000			40	6	
65	NULL	262 00 065						65		200	2000			40	6	
66	NULL	262 00 066						66		200	2000			40	6	
67	NULL	262 00 067						67		200	2000			40	6	
68	NULL	262 00 068						68		200	2000			40	6	
69	NULL	262 00 069						69		200	2000			40	6	
70	NULL	262 00 070						70		200	2000			40	6	
71	NULL	262 00 071						71		200	2000			40	6	
72	ECG	262 00 072	E.C.G.					72		200	4000			40	6	
73	NULL	262 00 073						73		200	2000			40	6	
74	NULL	262 00 074						74		200	2000			40	6	
75	NULL	262 00 075						75		200	2000			40	6	
76	NULL	262 00 076						76		200	2000			40	6	
77	NULL	262 00 077						77		200	2000			40	6	
78	MFS1***	262 00 078	SYNC WD 1 0007 OCT 7 DEC					78		200	4000			40	6	
79	MFS2***	262 00 079	SYNC WD 2 0312 OCT 202 DEC					79		200	4000			40	6	
80	MFS3***	262 00 080	SYNC WD 3 1276 OCT 702 DEC					80		200	4000			40	6	

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 12 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: RPRV FACILITY HIMAT AV-1
FLT NO. J09
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-778

PROJ INSTR ENGR: ANDEN D. LAWHEAD

PCM BIT RATE: 160 KHZ
BITS/WORD: 16
WORDS/FRAME: 80
FR/DATA CY 1
FBT=BIT1-MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

ITEM NO.	PARAMETER NAME	DIGITAL WORD INFORMATION: FRAME WORD	FRAME NO.	BIT NO.	BIT DESIGNATION: 0	1	PARAMETERS AFFECTED	REMARKS	ITEM NO. SEQ
43	U1V2911 DW09 ENG. OPERATION	43		1	ON	OFF			1
43	U1V2912 DW09 IGNITOR	43		2	ON	OFF			2
43	U1V2913 DW09 GEAR	43		3	DOWN	UP			3
43	U1V2914 DW09 CONTROL MODE	43		4	COMBT	NORM			4
43	U1V2915 DW09 ENG. STABILITY	43		5	HIGH	NORM			5
43	U1V2916 DW09 NOZZLE	43		6	OVERD	NORM			6
43	U1V3911 DW09 CLIMB	43		7	CLIMB	OFF			7
43	U1V3912 DW09 DESCEND	43		8	DESND	OFF			8
43	U1V3913 DW09 BANK RT.	43		9	RIGHT	OFF			9
43	U1V3914 DW09 BANK LT.	43		10	LEFT	OFF			10
44	U1V3915 DW10 SPEED INCREASE	44		1	INC	OFF			11
44	U1V3916 DW10 SPEED DECREASE	44		2	DEC	OFF			12
44	U1V4911 DW10 LANDING	44		3	LNDG	STBY			13
44	U1V4912 DW10 ORBIT	44		4	EXORB	ORB			14
44	U1V4913 DW10 BUSS TIE	44		5	RESET	OFF			15
44	U1V4914 DW10 BACK-UP	44		6	SEL	OFF			16
44	U1V4915 DW10 SMOKE GEN	44		7	ON	OFF			17
44	U1V4916 DW10 ROLL MODE	44		8	RATE	ATT			18
44	U1V4911 DW10 RECEIVER MODE	44		9	MAN	OFF			19
44	U1V4912 DW10 RECEIVER SELECT	44		10	PRI	SEC			20
47	U1V4913 DW11 DECODER DISCRETE	47		1	SELCT	OFF			21
47	U1V4914 DW11 DECODER SELECT	47		2	#1	#2			22
47	U1V4915 DW11 GYRO	47		3	ERECT	OFF			23
47	U1V4916 DW11 GENERATOR	47		4	RESET	OFF			24
47	U2V1911 DW11 ENG. OPERATION	47		5	ON	OFF			25
47	U2V1912 DW11 IGNITOR	47		6	ON	OFF			26
47	U2V1913 DW11 GEAR	47		7	DOWN	UP			27
47	U2V1914 DW11 CONTROL MODE	47		8	COMBT	NORM			28
47	U2V1915 DW11 ENG. STABILITY	47		9	HIGH	NORM			29
47	U2V1916 DW11 NOZZLE	47		10	OVERD	NORM			30
48	U2V2911 DW12 CLIMB	48		1	CLIMB	OFF			31
48	U2V2912 DW12 DESCEND	48		2	DESND	OFF			32
48	U2V2913 DW12 BANK RT.	48		3	RIGHT	OFF			33
48	U2V2914 DW12 BANK LT.	48		4	LEFT	OFF			34
48	U2V2915 DW12 SPEED INCREASE	48		5	INC	OFF			35
48	U2V2916 DW12 SPEED DECREASE	48		6	DEC	OFF			36
48	U2V3911 DW12 LANDING	48		7	LNDG	STBY			37
48	U2V3912 DW12 ORBIT	48		8	EXORB	ORB			38
48	U2V3913 DW12 BUSS TIE	48		9	RESET	OFF			39
48	U2V3914 DW12 BACK-UP	48		10	SEL	OFF			40
32	CSID1 DW17	32		1	OFF	ON			41
32	CSID2 DW17	32		2	OFF	ON			42
32	CSID3 DW17	32		3	OFF	ON			43
32	CSID4 DW17	32		4	OFF	ON			44
32	CSID5 DW17	32		5	OFF	ON			45
32	CSID6 DW17	32		6	OFF	ON			46
32	CSID7 DW17	32		7	OFF	ON			47
32	CSID8 DW17	32		8	OFF	ON			48

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 13 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: APRV FACILITY HIMAT AV-1
FLT NO.: 009 PROJ INSTR ENGR: ARDEN D. LAVHEAD
SCHED FLT DATE: 12/17/81
TM FREQ: AHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-778

PCM BIT RATE: 16[illegible] KHZ
BITS/WORD: 10
WORDS/FRAME 80
FR/DATA CY: 1
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

ITEM NO. SYS	PARAMETER MNEMONIC	PARAMETER NAME	DIGITAL WORD INFORMATION: FRAME WORD POS	FRAME NO.	BIT NO.	BIT DESIGNATION 0	BIT DESIGNATION 1	PARAMETERS AFFECTED REMARKS	ITEM NO. SES
32	CSTD9	DW17	32		9	OFF	ON		49
32	CSTD10	DW17	32		10	OFF	ON		50
33	CSTD11	DW18	33		1	OFF	ON		51
33	CSTD12	DW18	33		2	OFF	ON		52
33	CSTD13	DW18	33		3	OFF	ON		53
33	CSTD14	DW18	33		4	OFF	ON		54
33	CSTD15	DW18	33		5	OFF	ON		55
33	CSTD16	DW18	33		6	OFF	ON		56
33	CSTD17	DW18	33		7	OFF	ON		57
33	CSTD18	DW18	33		8	OFF	ON		58
33	CSTD19	DW18	33		9	OFF	ON		59
33	CSTD20	DW18	33		10	OFF	ON		60
35	CSTD21	DW19	36		1	OFF	ON		61
35	CSTD22	DW19	36		2	OFF	ON		62
35	CSTD23	DW19	36		3	OFF	ON		63
35	CSTD24	DW19	36		4	OFF	ON		64
35	CSTD25	DW19	36		5	OFF	ON		65
35	CSTD26	DW19	36		6	OFF	ON		66
35	CSTD27	DW19	36		7	OFF	ON		67
35	CSTD28	DW19	36		8	OFF	ON		68
35	CSTD29	DW19	36		9	OFF	ON		69
35	CSTD30	DW19	36		10	OFF	ON		70
37	CSTD31	DW20	37		1	OFF	ON		71
37	CSTD32	DW20	37		2	OFF	ON		72
37	CSTD33	DW20	37		3	OFF	ON		73
37	CSTD34	DW20	37		4	OFF	ON		74
37	CSTD35	DW20	37		5	OFF	ON		75
37	CSTD36	DW20	37		6	OFF	ON		76
37	CSTD37	DW20	37		7	OFF	ON		77
37	CSTD38	DW20	37		8	OFF	ON		78
37	CSTD39	DW20	37		9	OFF	ON		79
37	CSTD40	DW20	37		10	OFF	ON		80
41	CSTD41	DW21	41		1	OFF	ON		81
41	CSTD42	DW21	41		2	OFF	ON		82
41	CSTD43	DW21	41		3	OFF	ON		83
41	CSTD44	DW21	41		4	OFF	ON		84
41	CSTD45	DW21	41		5	OFF	ON		85
41	CSTD46	DW21	41		6	OFF	ON		86
41	CSTD47	DW21	41		7	OFF	ON		87
41	CSTD48	DW21	41		8	OFF	ON		88
41	CSD01	DW21	41		9	OFF	ON		89
41	CSD02	DW21	41		10	OFF	ON		90
42	CSD03	DW22	42		1	OFF	ON		91
42	CSD04	DW22	42		2	OFF	ON		92
42	CSD05	DW22	42		3	OFF	ON		93
42	CSD06	DW22	42		4	OFF	ON		94
42	CSD07	DW22	42		5	OFF	ON		95
42	CSD08	DW22	42		6	OFF	ON		96

TODAY: 01/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 14 OF COPY 3
REV: DATE: 0/ 0/ 0

VEHICLE: RPRV FACILITY HIMAT AV-1
FLT NO. 039 PROJ INSTR ENGR: ARDEN D. LAWHEAD
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-778

PCM BIT RATE: 160 KHZ
BITS/WORD: 10
WORDS/FRAME: 80
FR/DATA CY: 1
FRT=BIT1=MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

ITEM NO. SYS	MEAS ID	PARM ID	PARAMETER NAME	DIGITAL WORD INFORMATION FRAME WORD POSN	FRAME NO.	BIT NO.	BIT DESIGNATION 0	BIT DESIGNATION 1	PARAMETERS AFFECTED REMARKS	ITEM NO. SEC
42	CS0009	DW22		42		7	OFF	ON		97
42	CS0010	DW22		42		8	OFF	ON		98
42	CS0011	DW22		42		9	OFF	ON		99
42	CS0012	DW22		42		10	OFF	ON		100
45	CS0013	DW23		45		1	OFF	ON		101
45	CS0014	DW23		45		2	OFF	ON		102
45	CS0015	DW23		45		3	OFF	ON		103
45	CS0016	DW23		45		4	OFF	ON		104
45	CS0017	DW23		45		5	OFF	ON		105
45	CS0018	DW23		45		6	OFF	ON		106
45	CS0019	DW23		45		7	OFF	ON		107
45	CS0020	DW23		45		8	OFF	ON		108
45	CS0021	DW23		45		9	OFF	ON		109
45	CS0022	DW23		45		10	OFF	ON		110
46	CS0023	DW24		46		1	OFF	ON		111
46	CS0024	DW24		46		2	OFF	ON		112
46	CS0025	DW24		46		3	OFF	ON		113
46	CS0026	DW24		46		4	OFF	ON		114
46	CS0027	DW24		46		5	OFF	ON		115
46	CS0028	DW24		46		6	OFF	ON		116
46	CS0029	DW24		46		7	OFF	ON		117
46	CS0030	DW24		46		8	OFF	ON		118
46	CS0031	DW24		46		9	OFF	ON		119
46	CS0032	DW24		46		10	OFF	ON		120
54	U2V3915	DW13	SMOKE GEN	54		1	ON	OFF		121
54	U2V3916	DW13	ROLL MODE	54		2	ATT	RATE		122
54	U2V4911	DW13	RECEIVER MODE	54		3	MAN	OFF		123
54	U2V4912	DW13	RECEIVER SELECT	54		4	PRI	SEC		124
54	U2V4913	DW13	DECODER DISCRETE	54		5	SELCT	OFF		125
54	U2V4914	DW13	DECODER SELECT	54		6	#1	#2		126
54	U2V4915	DW13	GYRO	54		7	ERECT	OFF		127
54	U2V4916	DW13	GENERATOR	54		8	RESET	OFF		128
54	CS0033	DW13		54		9	OFF	ON		129
54	CS0034	DW13		54		10	OFF	ON		130
55	CS0035	DW14		55		1	OFF	ON		131
55	CS0036	DW14		55		2	OFF	ON		132
55	CS0037	DW14		55		3	OFF	ON		133
55	CS0038	DW14		55		4	OFF	ON		134
55	CS0039	DW14		55		5	OFF	ON		135
55	CS0040	DW14		55		6	OFF	ON		136
55	CS0041	DW14		55		7	OFF	ON		137
55	CS0042	DW14		55		8	OFF	ON		138
55	CS0043	DW14		55		9	OFF	ON		139
55	CS0044	DW14		55		10	OFF	ON		140
58	CS0045	DW15		58		1	OFF	ON		141
58	CS0046	DW15		58		2	OFF	ON		142
58	CS0047	DW15		58		3	OFF	ON		143
58	CS0048	DW15		58		4	OFF	ON		144

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 15 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: RPRV FACILITY HIMAT AV-1
FLT NO.: 019 PROJ INSTR ENGR: ARDEN D. LAWHEAD
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 2-00 FORMAT NO. 1
PCM SYS MODEL: CT-770

PCM BIT RATE: 160 KHZ
BITS/WORD: 10
WORDS/FRAME: 80
FR/DATA CY: 1
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 78 , 79 , 80

DIGITAL WORD INFORMATION

TYPE SYS	PARAMETER MNEMO	PARMID	NAME	FRAME WORD POSN	FRAME NO.	BIT NO. 0	BIT NO. 1	BIT DESIGNATION	PARAMETERS AFFECTED REMARKS	ITEM NO. ITEM
99				58	5					145
99				58	6					146
99				58	7					147
99				58	8					148
99				58	9					149
99				58	10					150

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 16 OF COPY 3

REV: DATE: 0/ 0/ 0

VEHICLE: HIMAT AV-1
FLT NO.: 019 PROJ INSTR ENGR: ARDEN D. LAWHEAD
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 3-00 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 160
FR/DATA CY: 8
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 14 , 15 ,

TYPE SYS	PARAMETER MNEMO	PARMID	CALID	NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP RATE	COMP ALG	REF PRESS PARMID	VM/TM KP PARMID	FILTER FREQ	FILTER CODE	DAT TYP CCD
1	SF01****	263	00 001	SUBFRAME ID					1		1000	4000					
2	SFCLWT	263	00 002	VIB ACCEL - L/H WINGLET	12/15/81	-15	+15	G	2		1000	4000					
3	SFGL	263	00 003	LH CANARD HM					3		1000	4000					
4	SF0001	263	00 004	SUBFRAME 1					4	0	1000	4000					
5	SF0002	263	00 005	SUBFRAME 2					5	0	1000	4000					
6	SF0003	263	00 006	SUBFRAME 3					6	0	1000	4000					
7	SF0004	263	00 007	SUBFRAME 4					7	0	1000	4000					
8	SF0005	263	00 008	SUBFRAME 5					8	0	1000	4000					
9	SF0006	263	00 009	SUBFRAME 6					9	0	1000	4000					
10	SF0007	263	00 010	SUBFRAME 7					10	0	733	4000					
11	SF0008	263	00 011	SUBFRAME 8					11	0	733	4000					
12	SF0009	263	00 012	SUBFRAME 9					12	0	733	4000					
13	SF0010	263	00 013	SUBFRAME 10					13	0	733	4000					
14	MFS1****	263	00 014	SYNC WD 1**1753 OCT***1003 DEC					14	0	733	4000					
15	MFS2****	263	00 015	SYNC WD 2**1040 OCT*** 544 DEC					15	0	733	4000					

TODAY: 81/12/15. FLIGHT INSTRUMENTATION PARAMETER LIST PAGE 17 OF COPY 3

REV: DATE: 07/07/0

VEHICLE: HIMAT AV-1
FLT NO. 009
SCHED FLT DATE: 12/17/81
TM FREQ: MHZ S/N
PCM SYS/COM NO. 3-01 FORMAT NO. 1
PCM SYS MODEL: VECTOR 600

PROJ INSTR ENGR: ARDEN D. LAWHEAD

PCM BIT RATE: 110 KHZ
BITS/WORD: 10
WORDS/FRAME: 15
FR/DATA CY: 8
FBT=BIT1=MSB
MAIN FRAME SYNC WORDS: 14 , 15 ,

TM SYS NO.	PARMID	CALID	NAME	CALIBRATED DATE	CALIBRATED RANGE LOW	CALIBRATED RANGE HIGH	ENG UNITS	FRAM WORD POS	FRAME NO.	SAMP RATE	COMP ALG	REF PRESS	VM/TM KP PARMID	FILTER FREQ	FILTER CODE	DAT TYP CCD
16	FG2	263 01 014	LH ELEVATOR HM					4	1	500	4000					
17	FG15	263 02 004	LH ELEVON HM					4	2	500	4000					
18	FG4	263 01 005	LH AILERON HM					5	1	500	4000					
19	FG5	263 02 005	LH RUDDER HM					5	2	500	4000					
20	ACLW	263 01 006	C#:VIB ACCEL - L/H WINGTIP AFT	12/15/81	-50	+50	G	6	1	500	4000					
21	ACLCFP	263 02 006	C#:VIB ACCEL - R/H CANARD FLAP	12/15/81	-50	+50	G	6	2	500	4000					
22	ACLCFP	263 01 007	C#:VIB ACCEL - L/H CANARD FLAP	12/15/81	-50	+50	G	7	1	500	4000					
23	ACLC	263 02 007	C#:VIB ACC. - L/H CAN. TIP AFT	12/15/81	-15	+15	G	7	2	500	4000					
24	ACLV	263 01 008	C#:VIB ACC. - L/H VERTICAL TIP	12/15/81	-50	+50	G	8	1	500	4000					
25	ACRV	263 02 008	C#:VIB ACC. - R/H VERTICAL TIP	12/15/81	-50	+50	G	8	2	500	4000					
26	ACRW	263 01 009	C#:VIB ACCEL - R/H WINGTIP	12/15/81	-50	+50	G	9	1	500	4000					
27	ACRC	263 02 009	C#:VIB ACCEL - R/H CANARD TIP	12/15/81	-50	+50	G	9	2	500	4000					
28	PT123	263 01 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	1	92	4000	PXDR				6
29	PT125	263 02 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	2	92	4000	PXDR				6
30	PT95	263 03 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	3	92	4000	PXDR				6
31	PT96	263 04 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	4	92	4000	PXDR				A
32	PT97	263 05 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	5	92	4000	PXDR				6
33	PT98	263 06 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	6	92	4000	PXDR				6
34	PT99	263 07 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	7	92	4000	PXDR				6
35	PT100	263 08 010	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	10	8	92	4000	PXDR				6
36	PT101	263 01 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	1	92	4000	PXDR				6
37	PT102	263 02 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	2	92	4000	PXDR				6
38	PT103	263 03 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	3	92	4000	PXDR				6
39	PT104	263 04 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	4	92	4000	PXDR				6
40	PT105	263 05 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	5	92	4000	PXDR				6
41	PT106	263 06 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	6	92	4000	PXDR				6
42	PT99	263 07 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	7	92	4000	PXDR				6
43	PT99	263 08 011	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	11	8	92	4000	PXDR				6
44	PT91	263 01 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	1	92	4000	PXDR				6
45	PT92	263 02 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	2	92	4000	PXDR				6
46	PT93	263 03 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	3	92	4000	PXDR				6
47	PT94	263 04 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	4	92	4000	PXDR				6
48	PT109	263 05 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	5	92	4000	PXDR				6
49	PT111	263 06 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	6	92	4000	PXDR				6
50	PT112	263 07 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	7	92	4000	PXDR				6
51	PT113	263 08 012	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	12	8	92	4000	PXDR				6
52	PT116	263 01 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	1	92	4000	PXDR				
53	PT117	263 02 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	2	92	4000	PXDR				
54	PT118	263 03 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	3	92	4000	PXDR				
55	PT119	263 04 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	4	92	4000	PXDR				
56	PT120	263 05 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	5	92	4000	PXDR				
57	PT121	263 06 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	6	92	4000	PXDR				
58	PT122	263 07 013	UP:CANARD PRESS	04/15/80	-3.5	+3.5	PSID	13	7	92	4000	PXDR				
59	JOMON	263 08 013	SYS 3 LOW LEV MON--514 DEC--				COUNTS	13	8	92	4000					

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HiMAT FLIGHT OPERATION SUMMARY

FLT. NO.	FLIGHT DATE	COMMENTS
H1-X-1	Jul 11 '79	Planned captive, aborted after several problems
H1-X-2	Jul 20 '79	Planned captive, all objectives met
H1-1-3	Jul 27 '79	First flight A/V1, all objectives met, problem with TM receiver
H1-C-4	Dec 20 '79	Abort attempt for flight H1-2-4 due to flutter accelerometer
H1-2-5	Dec 21 '79	First data flight, cleared A/V to 0.9 Mach, 40K ft.
H1-3-6	Jan 15 '80	Cleared vehicle to 0.85 Mach, 25K ft., accomplished 4-g turn
H1-C-7	May 30 '80	Planned captive, systems check, Runway 15 evaluated
H1-C-8	Jun 24 '80	Planned captive, gear box and fuel quantity checked
H1-4-9	Jun 25 '80	Cleared A/V to 0.925 Mach, 25K ft., emergency eng. start in flt.
H1-5-10	Jul 8 '80	Decoder failed 5 min. into flt., RTB, gear up landing
H1-C-11	Sep 30 '80	Planned captive, main gear did not deploy in check
H1-C-12	Oct 10 '80	Planned captive, all objectives met
H1-6-13	Oct 28 '80	Attained approx. 7-g sustained, lateral-directional stab. problem
H1-C-14	Nov 26 '80	Abort attempt for Flt. H1-7-14 due to a battery failure in FTS
H1-7-15	Dec 3 '80	Gather stab. & cont. data to solve lat./direct. problem
H1-8-16	Dec 18 '80	Gather stab. & cont. data, evaluate ARI & lat. accel. feedback sys.
H2-C-1	Jun 25 '81	First captive of A/V 2 (veh. checkout),gear,A/B,and wing mat. prblms
H2-C-2	Jul 21 '81	Planned captive, all object. met. Set up for rapid turnaround
H2-1-3	Jul 24 '81	First flight A/V 2, all object. met (veh. checkout & airspeed cal.)
H2-2-4	Jul 30 '81	Airspeed cal. flt., aborted due to eng. prblm. First flt. for Ishmael
H2-3-5	Sep 18 '81	Airspeed cal. flt., major objects. met. Left rear skid extended mid-flt.
H2-4-6	Oct 20 '81	Gather stab. and cont. and airspeed data. Primary objectives met
H1-9-17	Dec 22 '81	Flt verif. of RSS contrl sys with neutrlly stable veh. All objctvs met.

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