


STS-27 GNC POST FLIGHT REPORT

  
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STS-27 GNC POST FLIGHT REPORT  
U N C L A S S I F I E D

VEHICLE: OV104/Atlantis (3rd flight)  
LAUNCH DATE/TIME: Friday, 12/02/88, 8:30 am CST  
LANDING DATE: Tuesday, 12/06/88  
LAST FLIGHT: STS-61B, November 1985

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## SYSTEMS

### Prelaunch Issues

#### Stuck Rudder Pedal Prelaunch Problem

Prior to the launch of STS-27 KSC reported a rudder pedal problem on OV-103 that could be a potential problem for OV-104. During testing on OV-103 neither the CDR's nor the PLT's rudder pedals would move. They believed the problem occurred when a pulldown communications panel in the middeck area, near the region below the rudder pedal mechanism, was stowed with one of the crew escape pole stowage straps caught behind the panel. This may have caused structural deformation of the rudder pedal linkages causing the rudder pedals to jam when they were deflected. As a precaution, words were added to the deorbit procedures for the crew to check that the escape pole stowage straps were free from any panels. KSC listed the problem as an unexplained anomaly.

#### Prelaunch TACAN Anomaly

During the prelaunch NAV AIDS powerup, TACAN 1 did not lock onto the KCS ground station when it was initially selected. The prelaunch flow has channel 90X selected to test the TACANs for blanking pulse failures. After checking the AGCs, the KSC station was selected and TACANS 2 and 3 locked on quickly. However, TACAN 1 continued to search in both range and bearing. After several minutes, one of the astronaut support personnel power cycled the unit. After regaining power, it locked in bearing and shortly thereafter it locked in range. Performance of the TACAN was nominal during prelaunch and ascent operations. Forty-degree bearing glitches were noted on this unit during both days of prelaunch operations. TACAN 1 passed self-test with no anomalies during the sensors self-test of Part 2 of the on-orbit FCS Checkout. All three TACAN's performed normally during entry.

### IMU Performance

#### IMU 2 I-Load Discrepancy

During the STS-27 Terminal Countdown Demonstration Test (TCDT), the Ascent team reported their IMU MOC computations indicated that IMU 2 (SN-018) had a relative misalignment of  $0.15^\circ$ . However, IRAMS did not indicate this misalignment. After researching the problem, an error was found in the final software release micro-fiche. The IMU I-loads CGMS\_RGAO and CGMS\_RGPO in the software micro-fiche did not match the values presented in the STS-27 IMU Preflight Report for IMU 2.

Before every flight, the GNC operators build the roll-to-roll transformation matrices using the values provided in the micro-fiche to make the IMU MOC relative computations work correctly. The incorrect I-load values for IMU 2 made it appear to be misaligned by  $.013^\circ$ , which accounts for the error seen during the TCDT. The prelaunch Planning team confirmed with the Mission Evaluation Room (MER) IMU operators that the I-loads in the flight software were the correct values as per Release Authorization for Shuttle Software (RASS) 27.34.



## Star Tracker Performance

### -Y Star Tracker Self-Test Behavior

Star tracker serial number 8 was located in the -Y position. During tracker activation and testing in post insertion, this tracker failed two consecutive self-tests. No star present indication was observed during the test. The tracker was subsequently used for the first IMU alignment. Data indicated that the tracker was performing nominally. Further research revealed that the self-test behavior was nominal for SN 8 and should have been expected. GNC SCP 3.2.25 documents a known problem with this tracker in that the BITE star is not within the one degree offset search window. The hardware test times out before the tracker can acquire the bite star in the full-field mode. The self-test conducted during prelaunch operations passed because the LPS commands offset search about the specific BITE star location applicable to SN 8. The on-orbit test fails because the flight software has only one offset search location that can be command. Unfortunately, the one degree square window can not be positioned to include all BITE stars on all trackers.

GNC should have been aware of serial number 8's self-test problem and informed the crew preflight to expect a failure. Actions will be taken to ensure this is done for future flights of this star tracker. However, even for those units which exhibit known anomalies, all self-test failures will be analyzed to insure no other system failure is present.

### Star Tracker Performance during High Rate Maneuvers

Due to thermal concerns, twice during the mission the orbiter was in a passive thermal control (PTC) roll maneuver. This is commonly known as "barbecue" mode. The roll rate was  $.4^\circ/\text{second}$ . The orbiter remained in PTC for several hours. During this time several stars of opportunity were acquired. The torquing angles indicated that the star trackers performed consistently well.

The star tracker specifications state that the trackers can track a star with full accuracy while the orbiter is maneuvering at a rate of up to  $.2^\circ/\text{second}$ . Also stated in the specifications is that the trackers can track a star with degraded accuracy while the orbiter is maneuvering at a rate of up to  $.5^\circ/\text{second}$ . No degradation was noticed during the  $.4^\circ/\text{second}$  maneuver. In fact, one set of the torquing angles acquired during PTC were used to align the IMUs.

## COAS Performance

### Star Visability in Daylight

Concerns of performing COAS operations while in an orbit that does not allow the Sun to set, prompted the flight controllers to ask the crew to attempt to view nav star 24 and the planet Jupiter during a daylight pass to see if they were discernible enough to use for COAS sightings. The crew reported that they were both visible, as was most of the Orion constellation, as long as the Sun was not in the field of view. When the Sun was in the field of view the sunlight reflecting off of the filmy forward windows rendered star identification impossible. During the test, the Sun was approximately 170° from star 24 and Jupiter. This gives us a good indication that COAS calibrations and alignments could be performed using some stars and planets in daylight as long as the bodies are of sufficient brightness and located away from the Sun (exact angular separation requirement is not defined).

### COAS Calibration

The COAS was calibrated in both the +X (forward) station and the -Z (aft) station to gather the necessary flight data needed to generate the most accurate COAS I-loads for future flights. During the calibration of the +X station, 4 marks were taken with 1 update and 1 verification mark. The calibration of the -Z station consisted of 5 marks taken with 1 update and 1 verification mark. The resulting line-of-site change from the I-load location for both stations was, as expected, very large. The line-of-site has never been close to the I-load value. The shift was different from previous flights (51J and 61B) also. This is due to the recollimation of the COAS to the vehicle. All of the calibration data is included in the Appendix B of this report.



## FACILITY

### **Configuration Management Error**

A DR was written against the Host Configuration Management Library. A copy of our GMENU program was uploaded to the CM library several months ago. It was downloaded afterwards, and worked fine. We downloaded all of our programs immediately before the flight, to ensure a clean load, and found that GMENU did not run perfectly. The errors were subtle, but they were definitely errors. We downloaded the program several times, and got identical errors each time we tried to run it. Finally, we asked the CM librarian to re-upload the program from a backup floppy disk. Afterward, we downloaded the program one more time, and the errors were gone.

The inescapable conclusion is that the GMENU program was altered slightly in the secure CM library. In this case, the errors were noticeable. In other cases, we might not be so fortunate. If these changes were restricted to constants in an equation, we might not discover the errors for a long time. We signed up for WEX on the understanding that it would guarantee that the programs we ran during flight would be exactly the same programs we certified before flight. Obviously, this is not the case.

### **NRT Multi-cal Problem**

A DR was written against the NRT system, because certain parameters had different values in NRT data retrievals than they had on MOC hardcopies from the same period. The parameters in question were "multi-cals", meaning that the calibration curves for those parameters were dependent on the values of other parameters. The specific GNC parameters with multi-cals are the ADI attitude and rate errors. The MOC automatically performs the appropriate swapping of calibration curves. Unfortunately, NRT does not do this automatically unless the appropriate scaling switch parameter is requested at the same time (Refer to Lessons Learned section). The DR was closed since the NRT system is working as the requirements specify.

GNC FLIGHT TEAM SUPPORT

**Ascent/Entry/Orbit 1**

GNC - Steve Elsner  
Sensors - Phil Perkins  
Control - Heather Mitchell  
Orbit Support - Heather Mitchell  
OJT: James Webb, Stan Schaefer, Dave Miller, Mark Severance  
IRAMS Support - Mark Severance

**Orbit 2**

GNC - Linda Patterson  
Support - Ken Bain  
OJT: Brad Schoenbauer, John Shannon

**Planning**

GNC - Eddie Trlica  
Support - Stewart Cobb  
OJT: LeRoy Cain

STS-27 FLIGHT CREW

CDR - Cdr. Robert L. Gibson  
PLT - Lt. Col. Guy S. Gardner  
MS1 - Col. Richard M. Mullane  
MS2 - Lt. Col. Jerry L. Ross  
MS3 - Col. William M. Shepherd

TRAINING ISSUES

None.

FDF CHANGES

None.

FLIGHT RULE CHANGES

None.

LCC CHANGES

None.

MISCELLANEOUS

L-1 Day Briefing is attached in appendix C.  
Anomaly Log is attached in appendix D.

## LESSONS LEARNED

### Star Tracker Failure History

GNC should be aware of the self-test history of each star tracker unit. Preflight we should plan to brief the crew of any expect self-test failures.

### ADI NRT Requests

Remember when requesting NRT ADI attitude and rate errors to include the appropriate attitude and rate scale switch parameters so that the correct calibration curve will be used.

### EVENT TIMES

Event	GMT	MET
-----		
First launch attempt		
OPS 9 to 1 Transition:	336:12:21:40	N/A
OPS 1 to 9 Transition:	336:14:04:00	N/A
Second launch attempt		
OPS 9 to 1 Transition:	337:12:20:35	N/A
T-9:00 and Counting:	337:14:20:17	N/A
T-0:31 and Counting:	337:14:30:03	N/A
Liftoff:	337:14:30:34	000:00:00
MECO:	337:14:39:08	000:08:34
OMS 2:	337:15:12:38	000:42:35
OPS 1 to 2 Transition:	337:15:41:09	001:10:35
OPS 2 to 8 Transition:	340:16:47:34	003:02:17:00
OPS 2 to 3 Transition:	341:20:27:56	004:05:57:22
D/O Burn:	341:22:29:34	004:07:59:00
Hydraulic Repress:	341:22:54:01	004:08:23:27
Touchdown	341:23:36:07	004:09:05:33
OPS 3 to 9 Transition:	341:23:45:41	004:09:15:07
SSME Repositioning:	341:23:47:50	004:09:17:16

### AERO DATA

Outer glide slope GMT	341:23:35:00
EAS at main gear touchdown	198.37 fps
Hdot at main gear TD	-1.03 fps
TD pitch angle	8.49 deg
Pitch rate at nose gear TD	-3.00 deg
Max Nz on HAC	1.43 g
Speedbrake retract altitude	4009 ft



**Appendix A: IMU On-Orbit Performance Data**

Table 1: IMU gyro biases and compensations

BIAS OR COMPENSATION	MET DD:HH:MM	IMU 1			IMU 2			IMU 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Prelaunch	—	-1.279	+0.571	+0.583	-0.751	-0.420	+0.815	-0.075	-0.964	+1.113
1st Comp.	00:12:15	—	+0.020	+0.033	—	—	+0.040	—	—	+0.016
Intermediate	—	-1.279	+0.591	+0.616	-0.751	-0.420	+0.855	-0.075	-0.964	+1.129
2nd Comp.	04:02:43	—	-0.01	-0.01	-0.02	—	—	+0.01	—	-0.01
Final	—	-1.279	+0.581	+0.606	-0.771	-0.420	+0.855	-0.065	-0.964	+1.119

Table 2: IMU accelerometer biases and compensations

BIAS OR COMPENSATION	MET DD:HH:MM	IMU 1			IMU 2			IMU 3		
		X	Y	Z	X	Y	Z	X	Y	Z
Prelaunch	—	+802	-872	-10229	-1340	+5006	-4997	+4505	+1323	-828
Compensation	00:12:15	—	—	—	—	+30	—	—	—	-42
Final	—	802	-872	-10229	-1340	+5036	-4997	+4505	+1323	-870



Table 3: IMU 1 predicted and actual compensations

COMPENSATION	Accelerometers			Gyros		
	X	Y	Z	X	Y	Z
Predicted	+23.8	-5.0	+25.7	+0.0043	+0.0163	+0.0230
Actual	0.0	0.0	0.0	0.0	+0.010	+0.023

Table 4: IMU 3 predicted and actual compensations

COMPENSATION	Accelerometers			Gyros		
	X	Y	Z	X	Y	Z
Predicted	+7.3	-1.8	-14.9	+0.0173	-0.0146	+0.0331
Actual	0.0	0.0	-42.0	+0.010	0.0	+0.006

PROGRAM  
IMUDFTEFFECTIVE  
01/14/85SCP  
3.2.4STS-27 UNCOMPENSATED DRIFT RATES  
(LAUNCH GMT WAS 337:14:30:34)

TIME (MET)	IMU 1 (SN 14)			IMU 2 (SN 18)			IMU 3 (SN 12)		
	X	Y	Z	X	Y	Z	X	Y	Z
a 0: 2:45: 0	-.019	.038	-.004	-.012	.003	.002	-.002	-.018	.004
0:10:15: 0	-.004	.023	.036	-.007	-.000	.039	.001	-.000	.014
a 0:10:55: 0	-.004	.020	.033	-.011	.000	.044	.005	-.001	.016
a 1: 1:39: 0	.007	-.017	-.026	-.009	.012	-.005	.011	-.005	-.025
1: 6:30: 0	.001	-.015	.016	-.012	-.009	.005	.014	-.005	-.008
1: 8:55: 0	.005	-.009	.014	-.011	-.010	.012	.010	-.002	-.002
a 1:12:38: 0	.002	-.009	.014	-.010	-.008	.007	.007	-.003	.002
2: 5: 8: 0	.009	.000	.010	-.012	.000	.010	.012	-.005	.010
a 2: 8:55: 0	.006	-.003	.002	-.013	.000	.006	.011	-.003	.004
2:12: 3: 0	-.002	-.012	.013	-.020	.012	.022	.014	-.011	.013
2:12:12: 0	-.002	-.010	.005	-.025	.006	.021	.010	-.003	.004
2:12:22: 0	-.004	.004	.007	-.017	.007	.020	.010	-.002	.001
2:12:59: 0	-.002	-.006	.007	-.017	.004	.018	.014	-.005	.011
2:13:20: 0	.001	-.007	.010	-.018	.003	.022	.017	-.005	.012
2:13:41: 0	-.002	-.007	.007	-.016	-.003	.027	.012	-.004	.012
2:13:42: 0	-.001	-.009	.009	-.017	-.002	.021	.011	-.003	.014
a 3: 0:33: 0	.003	-.017	-.016	-.016	.007	-.001	.017	-.000	-.018
3: 3:40: 0	.001	-.010	-.031	-.020	.005	.028	.023	-.007	-.031
3: 8: 7: 0	.004	-.014	-.026	-.019	.013	-.003	.025	.001	-.033
3: 8: 9: 0	.002	-.015	-.026	-.016	.013	-.005	.024	.001	-.032
3: 9:19: 0	.003	-.019	-.022	-.014	.010	.004	.023	-.001	-.029
3:10: 6: 0	.002	-.022	-.019	-.015	.011	.005	.023	-.000	-.026
3:10: 8: 0	.002	-.022	-.015	-.016	.010	.004	.021	.002	-.028
3:10:10: 0	.002	-.022	-.015	-.017	.011	.005	.023	.002	-.029

'a' indicates that an alignment was performed near this time

A-6



PROGRAM  
IMUDFTEFFECTIVE  
01/14/85SCP  
3.2.4STS-27 UNCOMPENSATED DRIFT RATES  
(continued)

TIME (MET)	IMU 1 (SN 14)			IMU 2 (SN 18)			IMU 3 (SN 12)		
	X	Y	Z	X	Y	Z	X	Y	Z
a 3:11: 4: 0	.001	-.023	-.015	-.014	.012	.007	.022	-.000	-.025
3:23:10: 0	-.001	-.022	-.026	-.018	.012	-.012	.018	.004	-.029
a 4: 0:56:47	.001	-.023	-.027	-.018	.014	-.011	.019	.005	-.024
4: 2:17: 0	-.001	-.027	.011	.006	.007	.026	.014	.016	-.009
4: 3:37: 0	-.007	-.025	.021	.016	.010	.029	.003	.009	.010
a 4: 5: 6: 0	-.014	-.020	.001	-.005	.010	.010	.011	-.001	-.006

'a' indicates that an alignment was performed near this time

## STS-27 UPLINKED IMU GYRO BIAS/COMPENSATIONS

TIME (MET)	IMU 1			IMU 2			IMU 3		
	X	Y	Z	X	Y	Z	X	Y	Z
INITIAL	-1.279	.571	.583	-.751	-.420	.815	-.075	-.964	1.113
0:12:15: 0	-1.279	.591	.616	-.751	-.420	.855	-.075	-.964	1.129
4: 2:43: 0	-1.279	.581	.606	-.771	-.420	.855	-.065	-.964	1.119

A-7

UNCLASSIFIED

Appendix B: COAS Calibration Data



UNCLASSIFIED

PROGRAM  
COAS

EFFECTIVE  
01/18/83

SCP  
3.2.22

The tables to follow contain information concerning the on-orbit calibration of the +X COAS for STS-27 (OV104) on 12/5/88. The GMT and MET of the cal were 340:15:20 and 3: 0:58 respectively. (The vectors in this first table are NON-UNITIZED)

VECTOR		HEX VALUE	DECIMAL VALUE
I-LOAD	X	40FB,C4BA	+.98347055912
	Y	3E8B,26A9	+.00212327600
	Z	C02E,59A7	-.18105548620
MARK # 1	X	40FB,F3B7	+.98418754339
	Y	BF18,02CC	-.00586204231
	Z	C02D,51E7	-.17703098059
MARK # 2	X	40FC,00A0	+.98438453674
	Y	BF15,A42C	-.00528351963
	Z	C02D,0B1B	-.17595070601
MARK # 3	X	40FC,0664	+.98447251320
	Y	BF15,0BD7	-.00513824448
	Z	C02C,EB17	-.17546218634
MARK # 4	X	40FB,FD17	+.98433059454
	Y	BF17,F7CB	-.00585154817
	Z	C02D,1DAD	-.17623406649
MARK # 5	X	40FB,FC28	+.98431634903
	Y	BF15,7F19	-.00524816290
	Z	C02D,2429	-.17633301020

B-1

UNCLASSIFIED

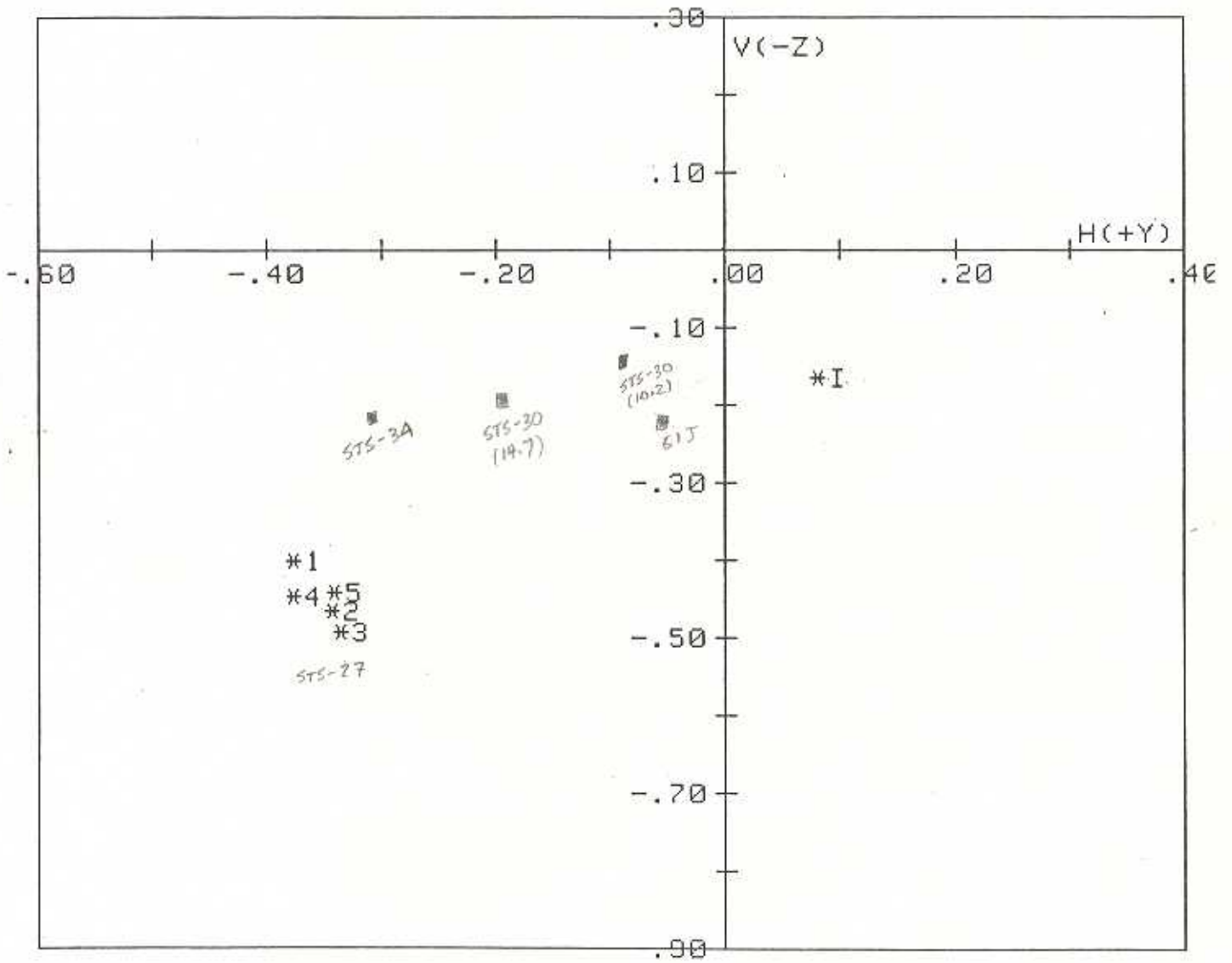
PROGRAM  
COAS

EFFECTIVE  
01/18/83

SCP  
3.2.22

FORWARD (+X) COAS CALIBRATION

STS-27 0V104 12/5/88



This a plot of the H and V angles for all vectors  
Values are in degrees; vehicle body axes in parentheses

AWC B-4  
UNCLASSIFIED

The tables to follow contain information concerning the on-orbit calibration of the -Z COAS for STS-27 (OV104) on 12/03/88. The GMT and MET of the cal were 338:16:20 and 1: 1:20 respectively. (The vectors in this first table are NON-UNITIZED)

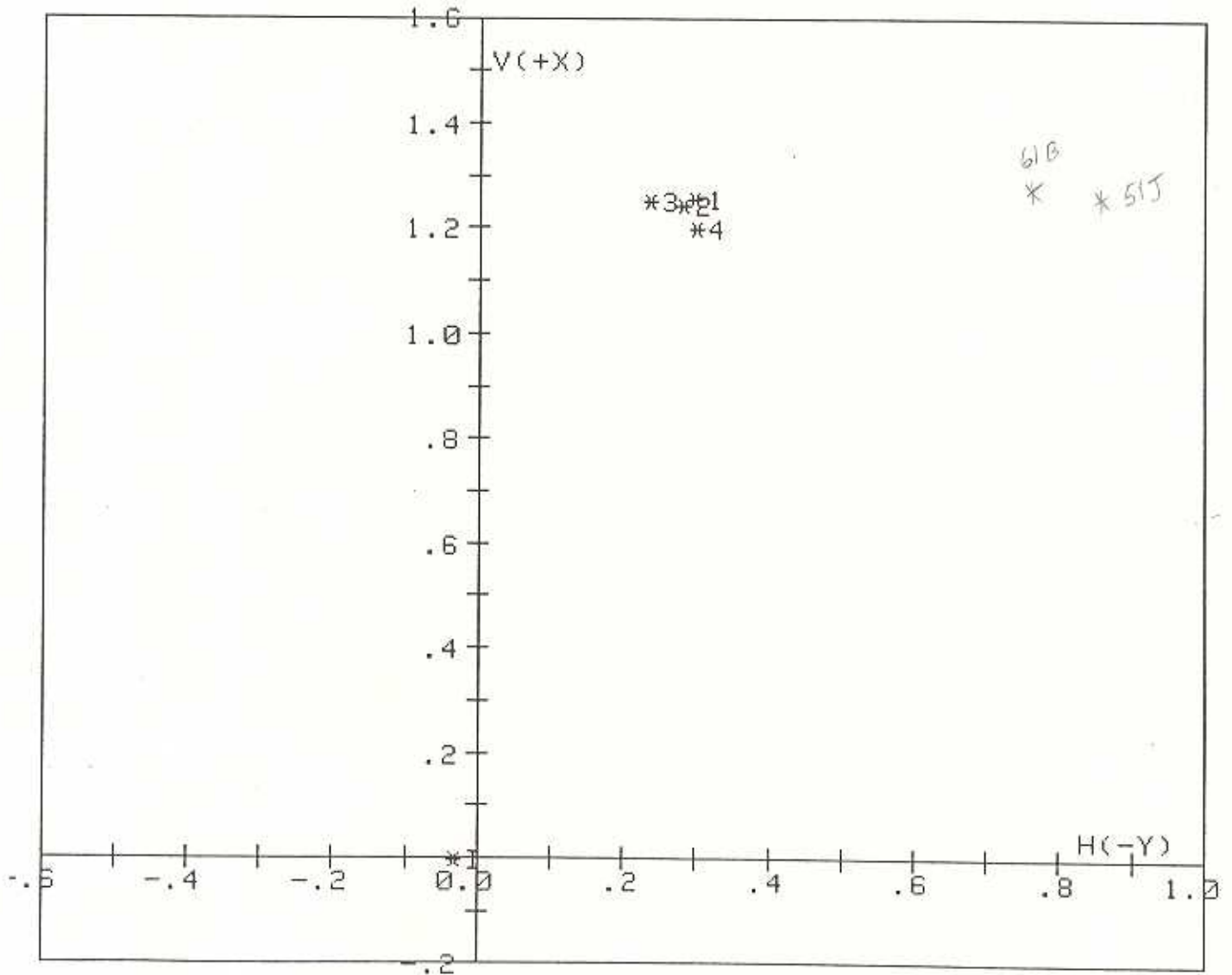
VECTOR		HEX VALUE	DECIMAL VALUE
I-LOAD	X	C02F,1770	-.18395137787
	Y	0000,0000	+0.000000000000
	Z	C0FB,A1A5	-.98293524981
MARK # 1	X	C029,912F	-.16237157583
	Y	BF17,365D	-.00566707924
	Z	C0FC,993A	-.98671305180
MARK # 2	X	C029,9BF4	-.16253590584
	Y	BF16,22B4	-.00540418923
	Z	C0FC,978D	-.98668748140
MARK # 3	X	C029,93AC	-.16240954399
	Y	BF13,05C5	-.00464417413
	Z	C0FC,992E	-.98671233654
MARK # 4	X	C029,D0D0	-.16334247589
	Y	BF17,87EE	-.00574486703
	Z	C0FC,8EB2	-.98655235767

-Z Coas Cal  
FD Ø 2



AFT (-2) COAS CALIBRATION

STS-27 OV104 12/03/88



This a plot of the H and V angles for all vectors  
Values are in degrees; vehicle body axes in parentheses

Appendix C: L-1 Day Briefing

Appendix D: Anomaly Log



ANOMALY COVER SHEET - STS-27  
December 14, 1988 1:50 pm

\*Denotes New Items

!Denotes Change

Position	Rev	Title
BSTR-01!	A	MPS LN2 MANIFOLD PRESSURE HIGHER THEN PREDICTED AFTER VACUUM INERTING/R. HALYARD
BSTR-02		RIGHT SSME TURBINE REDLINE SENSOR FAILURE/M. JENKINS
BSTR-03		MPS LH2 TOPPING VALVE ANOMALY/ R. HALYARD
DPS-01		MTU TOGGING BITE BITS/ B. JACKSON
EECOM-01		O2 FLOW SYS 1, 2 TRANSDUCER BIAS/ P. CERNA
EECOM-02		HUM SEP B FAILURE/D. WILLIAMS
EECOM-03		CABIN TEMP CNTLR 2 ANOMALY/ D. WILLIAMS
EECOM-04		FUEL CELL 2 ALTERNATE WATER FLOW/ R. BROWN
GNC-01		TACAN 1 PRELAUNCH LOCK-ON PROBLEM/ P. PERKINS
GNC-02	A	-Y STAR TRACKER SELF TEST FAILURE/ K. BAIN
INCO-01		TEMPORARY LOSS OF OPS 2 TELEMETRY/ D. BROWN
INCO-02	A	TAGS OHC JAM/ C. COUNTS
INCO-03		TAGS OHC STATUS CHANGE AT IMAGE START/C. COUNTS
INCO-04		MADS PCM 1 BITE/F. MACFARLANE
INCO-05!	B	KU-BAND CHANNEL 3 PROBLEM/ K. MCCRARY
INCO-06*		CCTV CAMERA "A" FOCUS WON'T DRIVE/
MMACS-01	A	APU # 1 GG BED TEMP XDCR BIAS/J. KLING
MMACS-02		APU 1 EGT 2/A. BACHNIK
MMACS-03		LEFT E7 DOOR RTL FAIL/ J. MEDFORD
MMACS-04	A	PAYLOAD BAY DOOR READY-TO-LATCH INDICATION/J. MEDFORD
MMACS-05	C	APU 2 GG FUEL/PUMP HEATER 13A FAILURE/ M. SCHWARTZ
MMACS-06!	A	KU BAND BOOM STOW ENABLE II INDICATION FAILURE/M. SCHWARTZ
MMACS-07*		HYDRAULIC ACCUMULATOR 2/J. MEDFORD
PROP-01		RIGHT RCS OXIDIZER HELIUM REGULATOR 'B' FAIL/W. POWERS
PROP-02*		LEFT OMS ENGINE PRESS VALVE COIL FAILURE/A. CECCACCI
GPO-01		SEE CLASSIFIED FILE
MCC-01		AG-1 CROSSTALK ON 2ND FLOOR FD LOOP/ M. MARSH
MCC-02	A	SEE CLASSIFIED FILE
MCC-03*		KU-BAND BOOM STOW ENABLE III INDICATION FAILURE/E. KLEIN
STDN-01		TLM DROPOUTS/J. SNYDER
STDN-02		TDR-E CHANNEL 2 K-BAND DUMPS/ M. MARSH
PYLD-01	B	SEE CLASSIFIED FILE

POSN	REV	APPROX GMT/MET DD:HH:MM	TITLE/AUTHOR	DESCRIPTION / IMPACT / RESOLUTION	INF LT	PN / LB	OR B	VEH #	FLT #	MEM #
GNC-01		337:09:42 / 000:00:00	TACAN 1 PRELAUNCH LOCK-ON PROBLEM/ P. PERKINS	DURING THE NAVAIDS ACTIVATION TACAN 1 DID NOT LOCK-ON TO THE KSC GROUND STATION (CHAN 59Y) AT SEQUENCE 16-0261 (S0007 VL2). TACAN 1 WAS POWER CYCLED AND SUBSEQUENTLY LOCKED ON WITH VALID RANGE AND BEARING DATA.  IMPACT: NONE, BUT TACAN IS SUSPECT.  PROBLEM TRACKING LIST NUMBER 17. KSC IPR 27RV-0448	CL	CN	NN	104	STSS-27	17
GNC-02	A	337:16:33 / 000:02:02	-Y STAR TRACKER SELF TEST FAILURE/ K. BAIN	THE -Y STAR TRACKER FAILED 2 CONSECUTIVE SELF TESTS. THE STAR TRACKER HAS A HISTORY OF FAILING SELF TESTS ON ORBIT DUE TO A POSITION PROBLEM WITH THE SELF TEST ARTIFICIAL STAR. THE SELF TEST REVEALED THAT ALL OTHER STAR TRACKER FUNCTIONS ARE NOMINAL. THE STAR TRACKER IS CURRENTLY OPERATING NOMINALLY.  IMPACT: NONE  RESOLUTION: THE OBSERVED PERFORMANCE IS NORMAL FOR THIS PARTICULAR STAR TRACKER UNIT. GNC WILL IMPLEMENT PROCEDURES TO ENSURE THAT THE CREW IS INFORMED PREFLIGHT OF THE NOMINAL BEHAVIOR OF STAR TRACKER SN 8.  NO FURTHER POST-FLIGHT ACTION REQUIRED.	CL	CN	NN	104	STSS-27	ENE

END OF ANOMALIES \*BOLDTYPE DENOTES CHANGES

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