GRAVITY PROBE B

PROCEDURE FOR

GSE CERTIFICATION

CONNECT TM&A TO SMD

P0789 Rev. -

10 January 2001

Prepared by: *B. Clarke*

Approvals:

Program Responsibility	Signature	Date
B. Clarke Test Engineer		
D. Murray Cryogenic Engineer		
M. Taber Payload Test Director		
R. Whelan GP-B System Engineering		
D. Ross GP-B Quality Assurance		
B. Muhlfelder GP-B Payload Technical Manager		

NOTES:
Level of QA required during performance of this procedure:
__X__ Stanford QA Representative
____ Government QA Representative
All redlines must be approved by QA

Revision Record:

Rev	Rev Date	ECO #	Summary Description

Acronyms and Abbreviations:

Acronym / Abbreviation	**Meaning**
TM&A	Temperature Monitor and Alarm
SMD	Science Mission Dewar

Table of Contents

A Scope

This procedure is used to connect the Temperature Monitor and Alarm system (TM&A) to the Science Mission Dewar (SMD).

B Requirements Verification

B.1 Requirements Cross-Reference

None.

B.2 Expected Data for verification per requirement

None.

C Configuration Requirements

SMD/Payload GSE cables P800, P801, P804 and the ENDEVCO readout cables are disconnected from connectors P1, P5, P2 and the ENDEVCO heads respectively.

D Hardware Required

D.1 Commercial test equipment

Manufacturer	Model	Serial Number	Calibr. Exp. Date

D.2 Mechanical/Electrical Special test equipment

Description	Part No.	Rev. no.	Serial No.	Certification Date

D.3 Tools

Description	No. Req'd

D.4 Expendables

Description	Quantity

E Software Required

E.1 Flight Software

Flight Software Name	Version No.
MSS (Mission Support Software)	
SUS (Start Up Software)	
BSS (Boot Strap Software)	
OSS (Operating System Software)	
SSW (SQUID/ST Support Software)	
GSW (GSS Support Software)	

E.2 CSTOL Scripts

CSTOL Script Name	Version No.

E.3 SPC Scripts

SPC Script Name	Version No.

E.4 Test Support Software

Test Software Name	Version No.
Labview Data Acquisition	6.0

F **Procedures Required**

Procedure Name	Procedure No.
CERTIFICATION OF THE TM&A	P0775

G **Equipment Pretest Requirements**

Equipment	Serial No.	Test Required	Proc. No.	Test Performed	
				Date	By

H **Personnel Requirements**

Test Leader

The Test Leader shall be Mike Taber, Dave Murray or Bruce Clarke. He has overall responsibility for the implementation of this procedure.

Other Personnel

All personnel participating in this procedure shall work under the direction of the Test Leader who shall determine whether the person is qualified. Different people will likely be designated at different times. For this procedure, participating engineers are expected to be (at various times) Mike Taber, Dave Murray, Tom Welsh, Jim Maddocks and Bruce Clarke.

The QA program office shall be notified 24 hours prior to the start of this procedure. A Quality Assurance Representative designated by D. Ross shall review any discrepancy noted during this procedure, and approve its disposition.

I **Safety Requirements**

Extreme care must be taken to avoid accidentally bumping the Probe or damaging the connectors. Connectors should be inspected for bent pins and/or debris prior to mating. Connector savers or equivalent adapters shall be used to protect the connector pins from damage during the measurements. A properly grounded ESD wrist strap must be worn while mating to or de-mating from Probe connectors. **All mate/demates involving flight connectors shall be logged.**

J **General Instructions**

J.1 Redlines can be initiated by the Test Leader or their designate and must be approved by QA.

J.2 Any nonconformance or test anomaly should be reported by a Discrepancy Report. Refer to the Quality Plan, P0108, for guidance. Do not alter or break test configuration if a test failure occurs; notify quality assurance.

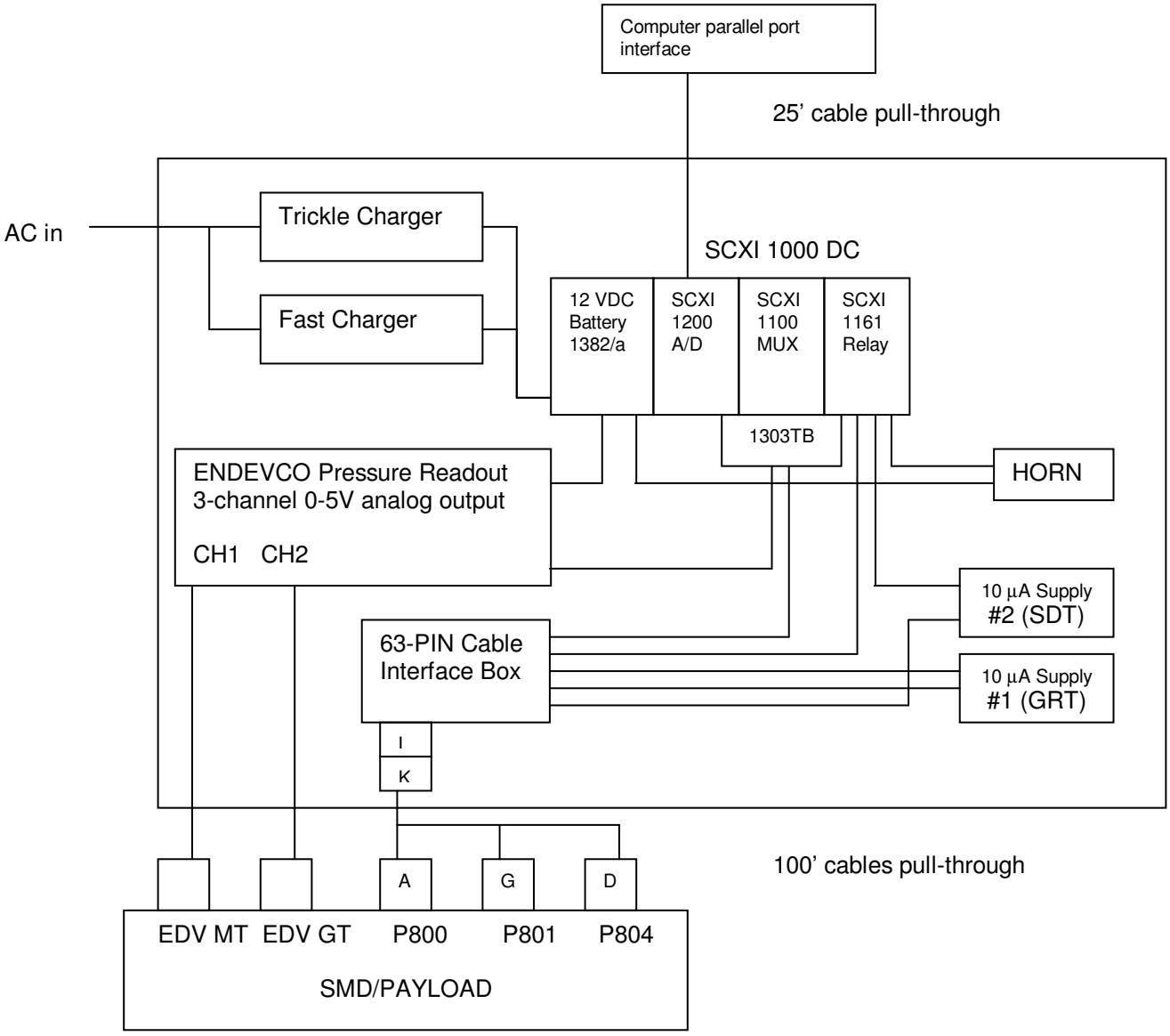
J.3 Only the Test Leader has the authority to exit/terminate this test or to perform a retest.

K **References and Applicable Documents**

L **Operations**

TM&A Configuration

The figure below shows the set-up of the TM&A as it is intended to be used on the SMD/PAYLOAD. The cable connections to the SMD/PAYLOAD are K/A-D-G (K = 63-pin female, A, D and G = 66-pin female) and two 5-conductor ENDEVCO cables (male/female, 9-pin D-style connector).



L.1 Ensure that P0775 – CERTIFICATION OF THE TM&A or P0789 – CONNECT TM&A TO SMD has been completed successfully within the last 120 hours. Enter the date of completion and Op. Order Number here.

Date _____ Op Order Number

L.2 Ensure that the 1382/a battery has enough charge to run the components of the TM&A. If needed, half an hour on the fast charger should provide enough charge to run this procedure. An overnight charge on the trickle charger will fully charge the battery.

L.3 Check that all the TM&A components are powered down and that the horn is switched off.

AC in	unplugged
SCXI DC 1000	OFF
ENDEVCO	OFF
10µA #1 (GRT)	OFF
10µA #1 (SDT)	OFF
Laptop Computer	OFF
Horn defeat	ON

L.4 Check that SMD/Payload GSE cables P800, P801, P804 and the ENDEVCO readout cables are disconnected from connectors P1, P5, P2 and the ENDEVCO heads respectively.

L.5 Connect the TM&A cables to the SMD and to the ENDEVCO heads. Connect the laptop computer interface to the SCXI chassis.

L.5.1 Cable K/A-D-G connects to the interface box (connector K to L) and to the SMD (A to P800, G to P801, D to P804).

L.5.2 Connect the main tank and guard tank ENDEVCO cables to the ENDEVCO heads using the cables EDV MT and EDV GT.

L.5.3 Connect the parallel port of the laptop computer to the SCXI 1200 using the parallel interface cable.

L.6 Power on all the TM&A components in the following order and activate the horn circuit.

SCXI DC 1000	ON	_____
ENDEVCO	ON	
10µA #1 (GRT)	ON	
10µA #1 (SDT)	ON	
Laptop Computer	ON	
Horn defeat	OFF	

L.7 Boot the laptop computer and start the 'TM&A' program.

Task completed.

Completed by: _____
Witnessed by: _____
Date: _____
Time: _____

TM&A CABLING

		A	K	L		1303	1161	other
Device	**function**	**P800/P1**			**L jumpers**			
T22D	-	-	1	1		GND		
top lead	V+	6	2	2		CH0+		
bag /a	V-	12	3	3		CH0-		
	-	-	4	4	10	GND		
GRT	I+	1	5	5			NO(0)	
	I-	5	6	6	11			
T23D	shield	-	7	7		GND		
top lead	V+	28	8	8		CH1+		
bag /b	V-	29	9	9		CH1-		
	shield	-	10	10	34			
GRT	I+	19	11	11	6			
	I-	20	12	12	35			
T09D	shield	-	13	13		GND		
main tank	V+	16	14	14		CH2+		
bottom	V-	23	15	15		CH2-		
	shield	-	16	16		GND		
SDT	I+	9	17	17			NO(1)	
	I-	15	18	18				10uA(-) SDT
T15D	shield	-	19	19		GND		
guard tank /a	V+	7	20	20		CH3+		
	V-	8	21	21		CH3-		
SDT	shield	-	22	22		GND		
	I+	2	23	23			NO(2)	
	I-	3	24	24				10uA(-) SDT
T24D	shield	-	25	25		GND		
fill valve V13	V+	11	26	26		CH4+		
	V-	18	27	27		CH4-		
SDT	shield	-	28	28		GND		
	I+	4	29	29			NO(3)	
	I-	10	30	30				10uA(-) SDT
		D	K	L		1303	1161	other
Device	**function**	**P804/P5**			**L jumpers**			
T20D	-	-	31	31		GND		
top lead bag	V+	35	32	32		CH5+		
/c	V-	36	33	33		CH5-		
	-	-	34	34	40			
GRT	I+	26	35	35	12			
	I-	27	36	36	41			
T21D	shield	-	37	37		GND		
top lead bag	V+	16	38	38		CH6+		
/d	V-	23	39	39		CH6-		
	shield	-	40	40	46			
GRT	I+	9	41	41	36			
	I-	15	42	42	47			
		D	K	L		1303	1161	other
Device	**function**	**P801/P2**			**L jumpers**			
T01D	-	-	43	43		GND		
station 200 /a	V+	16	44	44		CH7+		
	V-	23	45	45		CH7-		
GRT	-	-	46	46	52			
	I+	9	47	47	42			
	I-	15	48	48	53			
T10D	shield	-	49	49		GND		
MT top /a	V+	62	50	50		CH8+		
	V-	63	51	51		CH8-		

GRT	shield	-	52	52	46			
	I+	56	53	53	48			
	I-	57	54	54				10uA(-) GRT
T05D	shield	-	55	55		GND		
VCS-1 Bottom	V+	28	56	56		CH9+		
	V-	29	57	57		CH9-		
SDT	shield	-	58	58		GND		
	I+	19	59	59			NO(4)	
	I-	20	60	60				10uA(-) SDT
T08D	shield	-	61	61		GND		
HEX-4	V+	34	62	62		CH10+	NO(5)	
	V-	43	63	63		CH10-		10uA(-) SDT
SDT	shield	-						
	I+	17						
	I-	25						

ENDEVCO and Spare A/D CHANNELS

		1303			**1303**
spare 63-pin	**ENDEVCO**		**spare 63-pin**	**ENDEVCO**	
	CH1-pin	CH11+	24		GND
	CH1-shield	CH11-	25		CH22+
		GND	26		CH22-
	CH2-pin	CH12+	27		GND
	CH2-shield	CH12-	28		CH23+
		GND	29		CH23-
	CH3-pin	CH13+	30		GND
	CH3-shield	CH13-	31		CH24+
		GND	32		CH24-
1		CH14+	33		GND
2		CH14-	34		CH25+
3		GND	35		CH25-
4		CH15+	36		GND
5		CH15-	37		CH26+
6		GND	38		CH26-
7		CH16+	39		GND
8		CH16-	40		CH27+
9		GND	41		CH27-
10		CH17+	42		GND
11		CH17-	43		CH28+
12		GND	44		CH28-
13		CH18+	45		GND
14		CH18-	46		CH29+
15		GND	47		CH29-
16		CH19+	48		GND
17		CH19-	49		CH30+
18		GND	50		CH30-
19		CH20+	51		GND
20		CH20-	52		CH31+
21		GND	53		CH31-
22		CH21+	54		GND
23		CH21-			

CURRENT SOURCE AND BATTERY TO 1161 RELAY

1161		**10 uA GRT**	**10uA SDT**	**12VDC**
	1161 jumper			
NC(0)				
COM(0)		10 uA (+)		
NO(0)				
NC(1)				
COM(1)	COM(2)		10 uA (+)	
NO(1)				
NC(2)				
COM(2)	COM(3)			
NO(2)				
NC(3)				
COM(3)	COM(4)			
NO(3)				
NC(4)				
COM(4)	COM(5)			
NO(4)				
NC(5)				
COM(5)	COM(4)			
NO(5)				
NC(6)				
COM(6)				
NO(6)				
NC(7)				
COM(7)				12 V (+)
NO(7)				

ENDEVCO CABLES

pin #	function	color
4		white
5		green
7		red
8		black
9	shield	none

Sensor end = female 9-pin D-style
Readout end = male 9=pin D-style