GRAVITY PROBE B

PROCEDURE FOR

GMA VERIFICATION

(PTP) MSS 3.2.7 FUNCTIONAL TEST OF THE FLIGHT GMA

Procedure No. P*0920 Rev. A*

1/24/10

Prepared by: *D. Meriwether*

Approvals:

Program Responsibility	Signature	Date
D. Meriwether Test Author		
C. Gray GMA REE		
R. Brumley Payload Technical Manager		
R. Pressberg GP-B Quality Assurance		

NOTES:
   Level of QA required during performance of this procedure:
   _X_ Stanford QA Representative
   ___ Government QA Representative

1) The Flight GMA has no valve state indicators.
2) The E-Mock GMA has valve state monitors, indicating an open or closed position. This configuration will allow a confirmation that the ECU EU / ECU3 Test Set correctly commands the valves intended.
3) The MSS 3.2.7 software was created and intended to be used with the previous GMA. The valve commands used in 3.2.7 operate different valves in the E-Mock GMA, as well as the Flight GMA.
4) There shall be Flight Hardware used during this test.

Revision Record:

Rev	Rev Date	ECO #	Summary Description
A	9/10/02	1383	Updated to account for leaky valve V21

Acronyms and Abbreviations:

Acronym / Abbreviation	Meaning
ECU Monitor Mnemonics	
BE_XXXXX_XXXXXX	Binary Word Monitor
CE_XXXXX_XXXXXX	Current Monitor
DE_XXXXX_XXXXXX	Digital Word Monitor
TE_XXXXX_XXXXXX	Temperature Monitor
TE_XXXXX_X**GT**XXX	GRT TYPE Thermometer
TE_XXXXX_X**PT**XXX	PRT TYPE Thermometer
TE_XXXXX_X**ST**XXX	SDT TYPE Thermometer
TE_XXXXX_XXXXX**D**	Dewer located Thermometer
TE_XXXXX_XXXXX**P**	Probe located Thermometer
TE_XXXXX_XXXXX**Q**	Quartz Block located Thermometer
VE_XXXXX_XXXXXX	Voltage Monitor
AC	Alternate Current
Closed Loop	Hardware Controlled
Command	Software response indicating command sent
Current	Commanded Heater Amperage
DC	Direct Current
Open Loop	Software Controlled
Power	UV Lamp Power Supply readout
Pressure	GMA Pressure Sensor readout
Range	UV Lamp Power Hi Lo Range readout
Signal	UV Lamp Intensity readout
Temperature	Thermometer readout
Voltage	Commanded Heater Voltage

CCCA	Command & Control Computer Assembly
CSTOL	Colorado Spacecraft Test and Operations Language
ECU	Experimental Control Unit
EPS	Electrical Power Subsystem
FEU	Flight Equivalent Unit
FSW	Flight Software
FTP	file transfer protocol
GMA	Gas Management Assembly
GP–B	Gravity Probe B
ICD	Interface Control Document
MOC	Mission Operations Center

MSS	Mission Support Software
OASIS–CC	Operations and Science Instrument Support – Command and Control
ONR	Office of Naval Research
PDU	Power Distribution Unit
QA	Quality Assurance
RTC	Real–Time Commands
SPC	Stored Program Commands
TCP/IP	Transmission Control Protocol over Internet Protocol
Tlm	Telemetry
UPS	Uninteruptable Power System
VAC	Volts AC

Table of Contents

A   **Scope**

This procedure operates and verifies the functionality of the Flight GMA using the ECU3 Test Set and MSS 3.2.7S. The ECU EU is initialized and it's internal monitors limit checked. ALL GMA monitors are recorded initially and upon change. The Flight GMA Heaters are then turned on and off. All GMA valves are configured into the pre-launch configuration, then closed then each GMA valve is cycled open and closed. Each possible Gas flow path is then tested, the GMA Temperature sensors are monitored and checked, the GMA Pressure sensors are monitored and checked, and finally, . All GMA valves are again configured into the pre-launch configuration. The translation between the MSS 3.2.7 valve commanded, the actual E-Mock valve operated & the MSS 3.2.7 telemetry monitor effected is contained in section B

B   **Old GMA Versus New GMA Software & Valve Translation Matrix:**

GMA Valve Name	Ops State	MSS 3.2.7 Name	Cmd State	Telemetry Name	Results State
V1	Open	SV1	Open	SV1	Open
V1	Closed	SV1	Closed	SV1	Closed
V1 - alternate	Open	CV5	Open	SV1	Open
V1 - alternate	Closed	CV5	Closed	SV1	Closed
V2	Open	SV2	Open	SV2	Open
V2	Closed	SV2	Closed	SV2	Closed
V2 - alternate	Open	CV4	Open	SV2	Open
V2 - alternate	Closed	CV4	Closed	SV2	Closed
V3	Open	SV3	Open	SV3	Open
V3	Closed	SV3	Closed	SV3	Closed
V4	Open	SV4	Open	SV4	Open
V4	Closed	SV4	Closed	SV4	Closed
V5	Open	SV5	Open	SV5	Open
V5	Closed	SV5	Closed	SV5	Closed
V6	Open	SV6	Open	SV6	Open
V6	Closed	SV6	Closed	SV6	Closed
V7	Open	CV1	Open	CV1	Open
V7	Closed	CV1	Closed	CV1	Closed
V8	Open	SV7	Closed	SV19	Open
V8	Closed	SV10	Closed	SV19	Closed
V9	Open	SV8	Open	SV8	Open
V9	Closed	SV8	Closed	SV8	Closed
V10	Open	SV9	Open	SV9	Open
V10	Closed	SV9	Closed	SV9	Closed
V11	Open	SV7	Open	SV7	Open
V11	Closed	SV10	Open	SV7	Closed
V12	Open	CV1A	Open	CV1A	Open
V12	Closed	CV1A	Closed	CV1A	Closed
V13	Open	SV11	Open	SV11	Open
V13	Closed	SV11	Closed	SV11	Closed
V14	Open	SV12	Open	SV12	Open
V14	Closed	SV12	Closed	SV12	Closed
V15	Open	SV13	Open	SV13	Open
V15	Closed	SV16	Open	SV13	Closed
GMA Valve	Ops	MSS 3.2.7	Cmd	Telemetry	Results

Name	State	Name	State	Name	State
V16	Open	CV2A	Open	CV2A	Open
V16	Closed	CV2A	Closed	CV2A	Closed
V17	Open	SV14	Open	SV14	Open
V17	Closed	SV14	Closed	SV14	Closed
V18	Open	SV15	Open	SV15	Open
V18	Closed	SV15	Closed	SV15	Closed
V19	Open	CV2	Open	CV2	Open
V19	Closed	CV2	Closed	CV2	Closed
V20	Open	SV13	Closed	SV16	Open
V20	Closed	SV16	Closed	SV16	Closed
V21	Open	SV17	Open	SV17	Open
V21	Closed	SV17	Closed	SV17	Closed
V22	Open	SV18	Open	SV18	Open
V22	Closed	SV18	Closed	SV18	Closed
V23	Open	SV19	Open	SV10	Open
V23	Closed	SV23	Open	SV10	Closed
V24	Open	CV3A	Open	CV3A	Open
V24	Closed	CV3A	Closed	CV3A	Closed
V25	Open	SV20	Open	SV20	Open
V25	Closed	SV20	Closed	SV20	Closed
V26	Open	SV21	Open	SV23	Open
V26	Closed	SV21	Closed	SV23	Closed
V27	Open	CV3	Open	CV3	Open
V27	Closed	CV3	Closed	CV3	Closed
V28	Open	SV19	Closed	SV21	Open
V28	Closed	SV23	Closed	SV21	Closed
V29	Open	SV22	Open	SV22	Open
V29	Closed	SV22	Closed	SV22	Closed
V30	Open	SV24	Open	SV24	Open
V30	Closed	SV24	Closed	SV24	Closed

C   **Requirements Verification**

   C.1   Requirements Cross Reference

         C.1.1   Moog GMA Functional Test

   C.2   Expected Data for Verification per requirement

      C.2.1   All Limits passed as specified within CSTOL procedure.

D   **Configuration Requirements**

D.1   The ECU3 Test set shall be connected to the ECU EU via a 1553 data bus, a timing signal (10 Hz) and a 28.0 Volt power supply. Ref: Figure 1, ECU EU Test Set Interconnect diagram

D.2   The ECU Power Supply shall be the sole provider of Heater Power to ECU controlled GMA Heaters. Ref: Figure 1, ECU Test Set Interconnect diagram

D.3   The Aft ECU shall be attached via cables to the GMA. Ref: Drawing 5856124, Payload Cable Interconnect Diagram

D.4   Flight hardware required

Description	Part No.	Finite Lifetime Object	No. Req'd
Flight GMA	8A02681		1

D.5   Commercial test equipment

Manufacturer	Model	Serial Number
SUN Workstation (Test Set)	Ultra 2	941H2436

D.6   Mechanical/Electrical Special test equipment

Description	Part No.
Timing & Interrupt Test Supply	001

D.7   Tools

Description	No. Req'd
8 mm tape drive	1

D.8   Expendables

Description	Quantity
8 mm tape	1

E   **Software Required**

    E.1   Flight Software

Flight Software Name	Version No.
MSS (Mission Support Software)	3.2.7S

    E.2   CSTOL Scripts

CSTOL Script Name	Version No.
ecu_seg.prc	V 1.3 : 08/09/01
ecu_unsg.prc	V 1.1 : 01/31/01
ecumisc_br.prc	V 1.1 : 01/15/99
fmt_ecu32a.prc	V 1.7 : 02/07/01
gmatemp_br.prc	V 1.1 : 02/10/99
gma1_br.prc	V 1.1 : 02/06/99
gma2_br.prc	V 1.1 : 02/11/99
gma3_br.prc	V 1.1 : 02/11/99
gma_flight.prc	V 1.6 : 09/12/02/18/02

    E.3   SPC Scripts

SPC Script Name	Version No.
N/A	

    E.4   Test Support Software

Test Software Name	Version No.
Oasis (Operating System Software)	V 2.4.5
Framex (front end software)	Framexs

F   **Procedures Required**

Procedure Name	Procedure No.
(PTP) ECU EU Functional Test of the Flight GMA	P0920

G   **Equipment Pretest Requirements**

Equipment	Serial No.	Test Required	Proc. No.	Test Performed Date	By
ECU EU	8A01313-ECU GSE	Certification	gma_moog.prc	2/7/01	HDM
E-Mock GMA	1	Certification	S-Doc S0621	1/5/02	KB

H   **Personnel Requirements**

H.1   As a general requirement, all operations involving flight equipment require at least two persons at all times.

H.2   The test leader for this procedure is Dave Meriwether <Cell *650-725-9332* >, or his appointed representative.

H.3   The GMA REE is Chris Gray <Cell *650-996-5070* >. The GMA REE is responsible for all GMA tests, and will therefore schedule appropriate times for the performance of this procedure.

H.4   The Test Director for all Gyro Spin Up activities conducted in FIST Ops is Rob Brumley <Cell *650-245-1746* >, or his appointed representative.

H.5   The Stanford Quality Assurance representative is Dorrene Ross <Beeper *650-317-7922, 1283969* > or her appointed representative.

H.6   The Office of Naval Research representative is Abe Sabbag < Sabbaga@onr.navy.mil> or his appointed representative.

H.7   The following personnel are qualified to perform this procedure using the FIST Ops test set:

H.7.1   Dave Meriwether <Cell 650-725-9332>

H.7.2   Thomas Wai <Phone 650-354-5644>

H.7.3   Styrmir Sigurjonsson <Pager 845-1625>

H.7.4   Rick Stephenson <Phone 724-3002>

I   **Safety Requirements**

I.1   Standard safety practices to ensure safety of personnel and prevent damage to equipment shall be observed during performance of this test.

I.2   Read the CARD's[1] appropriate to ECU GMA Operations before running this test.

I.3   All connectors used will have connector savers attached. Protect all electrical connections and/or Connector Savers with ESD dust caps when the connectors are not mated.

I.4   Ensure that power is removed from cable assemblies before connecting and disconnecting cable connections.

I.5   Grounded wrist straps are to be worn prior to removal of connector caps or covers and during cable mating/demating operations.

I.6   Examine all mating connections before attempting to mate them. Remove any foreign particles. Look for any damaged pins or sockets. Do not force the coupling action if excessive resistance is encountered. Ensure that key ways are aligned.

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[1] Constraints and Restrictions Document

J   General Instructions

   J.1   Test operators shall read this procedure in its entirety and resolve any apparent
              ambiguities prior to beginning this test.

   J.2   This procedure operates the GMA system for the GP-B satellite. Knowledge of the GMA,
              caution in its operation and attention to displayed information must be exercised at all
              times during these operations or Hardware damaged may result.

   J.3   This procedure shall be conducted on a formal basis to its latest approved and released
              Version.

   J.4   Tests will be conducted under the environmental conditions existing in the Moog Inc.

   J.5   This procedure operates Flight Hardware.

   J.6   In order to expedite test operations, unless specifically noted, the sequence in which
              major sections or subsections are preformed may be altered at the discretion of the GMA
              REE or his representative.

   J.7   Upon completion of the test, all data on the ECU3 Ops test set under the /opt/usr6/lab
              and sub-directories shall be transferred to the data archive on the Payload Server. Upon
              confirmation that the FIST Ops test set data has been successfully archived, the data in
              the /opt/usr6/lab/bridge, /snaps, /messages and /oasis_raw_data directories may be
              deleted.

K   **References and Applicable Documents**

   K.1   SCIT-01 System Design, Verification, Integration & Test Plans

   K.2   SCSE 06 Command and Telemetry Handbook, App B sw_cmd 3.2.5

   K.3   SCSE 16 SECTION 9, Flight Software Design Specification, External Interface Detailed
              Design, Version Fg

   K.4   PLSE-12, Science Payload Specification, Version 4.3

   K.5   MSS3.2.7_Report_Excel.xls; GMA Telemetry Monitor List

   K.6   ECU Drawings

Date Initiated _____

Time Initiated _____

L   **Operations:**

L.1   ECU Test Set Initialization:

L.1.1   Connect the ECU3 Test Set to the ECU EU. Ref: Operating Instructions for ECU Spacecraft Emulator.

L.1.2   Start the MSS 3.2.7 FUNCTIONAL TEST OF THE FLIGHT GMA CSTOL procedure:

WARNING: This procedure will leave the GMA Valves Open at times and thus shall not be used on the Flight GMA once it's connected to the Flight Probe and the GMA Gas bottles are under pressure.

CSTOL ACTIONS:

L.1.2.1   TYPE Go to start gma_flight.prc.

L.1.2.2   Oasis Binary and Message File recording started

L.1.2.3   Load ECU telemetry format (nominal Format ID: F3250ECU32A).

L.1.2.4   Display and Record upon change the ECU state monitors.

L.2   Flight ECU Initialization:

L.2.1.1   Command on the ECU Processing.

CSTOL HOLD

L.2.1.2   Power on the ECU Power Supply

CSTOL ACTIONS:

L.2.1.3   TYPE Go to Initialize and check that all ECU Heaters are Off.

CSTOL HOLD

L.2.1.4   Power on the ECU Heater Power Supply

CSTOL ACTIONS:

L.2.1.5   TYPE Go to limit check internal ECU state monitors.

L.2.1.6   Check for and record timing signal presence.

L.2.1.7   Limit check ECU state and locked ADC monitor (DE_Ecu_Status) as displayed in ECU_Critical_1 (nominal = 10000000).

L.2.1.8   Limit check Rollover Counter status ($BE\_Failure\_A, BE\_Failure\_B$) as displayed in FSW_SM_DI_10hz_1 (nominal = false).

L.2.1.9   Limit check Active ECU Side ($BC\_1553\_A\_B\_Sel$) in VES_IoDirectiVe1 (nominal = Side_A).

CSTOL HOLD:

L.2.1.10 Review the ECU_Critical_1 display and confirm that both ECU Rollover Counters (`DE_Roll_Cntr__A`, `DE_Roll_Cntr__B`) are in synch and incrementing

L.2.1.11 Review the Startlab xterm window and check for any new errors.

L.2.1.12 Review the Startlab window and check for errors (BC_SEND BC RECEIVE)

CSTOL ACTIONS:

L.2.1.13 Type Go to limit check ECU Calibration, I/O, Gain & Reference monitors[2]

L.2.2 GMA Heater Operation

L.2.2.1 Display and Record upon change the GMA Heater monitors. [3]

L.2.2.2 Type Go to turn on the Side A GMA Heater

L.2.2.2.1 Limit check GMA Heater command confirmation

L.2.2.3 Type Go to turn off the Side A GMA Heater

L.2.2.3.1 Limit check GMA Heater command confirmation

L.2.2.4 Type Go to turn on the Side B GMA Heater

L.2.2.4.1 Limit check GMA Heater command confirmation

L.2.2.5 Type Go to turn off the Side B GMA Heater

L.2.2.5.1 Limit check GMA Heater command confirmation

L.2.3 GMA Valve Initialization

L.2.3.1 Display and Record upon change the GMA Valve monitors. [3]

L.2.3.2 Close Valves V1, V2, V3, V4, V5, V6, V9, V10, V13, V14, V17, V18, V19, V22, V25, V26, V29, V30

L.2.3.3 Open Valves V7, V8, V11, V12, V15, V16, V21, V20, V23, V24, V27, V28

L.2.3.3.1 Limit check Valve status

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[2] Ref: ECU3.2.7Report_Excel.xls, ECU Initialization Monitor's & Limits
[3] Ref: ECU3.2.7Report_Excel.xls, GMA Telemetry

L.2.4   GMA Valve Checkout

L.2.4.1   Close all GMA Valves {V1-V30}

L.2.4.2   Command Open & then Closed each GMA Valve {V1-V30}

L.2.5   Gas Flow Path Test

L.2.5.1   Gyro 1A

L.2.5.1.1 Open V7, Open V9, Open V5, Open V1

L.2.5.1.2 Check Flow

L.2.5.1.3 Close V5, Open V3

L.2.5.1.4 Check Flow

L.2.5.1.5 Close V3, Close V1, Open V4, Open V2

L.2.5.1.6 Check Flow

L.2.5.1.7 Close V4, Open V6

L.2.5.1.8 Check Flow

L.2.5.1.9 Close V6, Close V2, Open V2, Open V6

L.2.5.1.10 Check Flow

L.2.5.1.11 Close V9

L.2.5.1.12 Check Flow

L.2.5.1.13 Open V9, Close V7

L.2.5.1.14 Check Flow

L.2.5.2   Gyro 1B

L.2.5.2.1 Open V8

L.2.5.2.2 Check Flow

L.2.5.2.3 Close V9, Open V10

L.2.5.2.4 Check Flow

L.2.5.2.5 Close V8

L.2.5.2.6 Check Flow

L.2.5.2.7 Close V10

L.2.5.3   Gyro 2A

  L.2.5.3.1 Open V11

  L.2.5.3.2 Check Flow

  L.2.5.3.3 Open V13

  L.2.5.3.4 Check Flow

  L.2.5.3.5 Close V11

  L.2.5.3.6 Check Flow

  L.2.5.3.7 Close V13

L.2.5.4   Gyro 2B

  L.2.5.4.1 Open V12

  L.2.5.4.2 Check Flow

  L.2.5.4.3 Open V14

  L.2.5.4.4 Check Flow

  L.2.5.4.5 Close V12

  L.2.5.4.6 Check Flow

  L.2.5.4.7 Close V14

L.2.5.5   Gyro 3A

  L.2.5.5.1 Open V15

  L.2.5.5.2 Check Flow

  L.2.5.5.3 Open V17

  L.2.5.5.4 Check Flow

  L.2.5.5.5 Close V15

  L.2.5.5.6 Check Flow

  L.2.5.5.7 Close V17

L.2.5.6   Gyro 3B

     L.2.5.6.1 Open V16

     L.2.5.6.2 Check Flow

     L.2.5.6.3 Open V18

     L.2.5.6.4 Check Flow

     L.2.5.6.5 Close V16

     L.2.5.6.6 Check Flow

     L.2.5.6.7 Close V18

L.2.5.7   Gyro 4A

     L.2.5.7.1 Open V19

     L.2.5.7.2 Check Flow

     L.2.5.7.3 Open V21

     L.2.5.7.4 Check Flow

     L.2.5.7.5 Close V19

     L.2.5.7.6 Check Flow

     L.2.5.7.7 Close V21

L.2.5.8   Gyro 4B

     L.2.5.8.1 Open V20

     L.2.5.8.2 Check Flow

     L.2.5.8.3 Open V22

     L.2.5.8.4 Check Flow

     L.2.5.8.5 Close V20

     L.2.5.8.6 Check Flow

     L.2.5.8.7 Close V22

L.2.5.9   FluxA

    L.2.5.9.1 Open V27

    L.2.5.9.2 Check Flow

    L.2.5.9.3 Open V29

    L.2.5.9.4 Check Flow

    L.2.5.9.5 Close V27

    L.2.5.9.6 Check Flow

    L.2.5.9.7 Close V29

L.2.5.10   Flux B

    L.2.5.10.1 Open V28

    L.2.5.10.2 Check Flow

    L.2.5.10.3 Open V30

    L.2.5.10.4 Check Flow

    L.2.5.10.5 Close V28

    L.2.5.10.6 Check Flow

    L.2.5.10.7 Close V30

L.2.5.11   Gyro 1B2

    L.2.5.11.1 Close V6, Open V10, Open V8, Open V4

    L.2.5.11.2 Check Flow

    L.2.5.11.3 Close V8, Close V10

L.2.5.12   Gyro 2A2

    L.2.5.12.1 Open V13, Open V11

    L.2.5.12.2 Check Flow

    L.2.5.12.3 Close V11, Close V13

L.2.5.13   Gyro 2B2

    L.2.5.13.1 Open V14, Open V12

    L.2.5.13.2 Check Flow

    L.2.5.13.3 Close V12, Close V14

L.2.5.14 Gyro 3A2

L.2.5.14.1 Open V17, Open V15

L.2.5.14.2 Check Flow

L.2.5.14.3 Close V15, Close V17

L.2.5.15 Gyro 3B2

L.2.5.15.1 Open V18, Open V16

L.2.5.15.2 Check Flow

L.2.5.15.3 Close V16, Close V18

L.2.5.16 Gyro 4A2

L.2.5.16.1 Open V21, Open V19

L.2.5.16.2 Check Flow

L.2.5.16.3 Close V19, Close V21

L.2.5.17 Gyro 4B2

L.2.5.17.1 Open V22, Open V20

L.2.5.17.2 Check Flow

L.2.5.17.3 Close V20, Close V22

L.2.5.18 Flux A2

L.2.5.18.1 Open V23, Open V25

L.2.5.18.2 Check Flow

L.2.5.18.3 Close V23, Close V25

L.2.5.19 Flux B2

L.2.5.19.1 Open V24, Open V26

L.2.5.19.2 Check Flow

L.2.5.19.3 Close V24, Close V26

L.2.5.20 Evacuate GMA

L.2.5.20.1 Close V2, Open V6, Open V4, Open V5, Open V3, Open V27, Open V28, Open V29, Open V30

L.2.5.20.2 Check Flow

L.2.5.20.3 Close V6, Close V29, Close V30

L.2.6   GMA SDT Limit Check

L.2.6.1   Display and limit check each E-Mock GMA SDT

L.2.6.1.1 GMA_SDT1A, 1B, 2A, 2B, 3A, 3B

L.2.7   GMA Pressure Sensor Limit Check

L.2.7.1   Display and limit check each E-Mock GMA Pressure Sensor

L.2.7.2   GMA_SP1, SP2, SP3A, SP3B, SP4, SP5, SP6, SP7, SP8, SP9, CP1, CP2, CP3, CP4

L.2.8   GMA Valve Initialization

L.2.8.1   Close Valves V1, V2, V3, V4, V5, V6, V9, V10, V13, V14, V17, V18, V19, V22, V25, V26, V29, V30

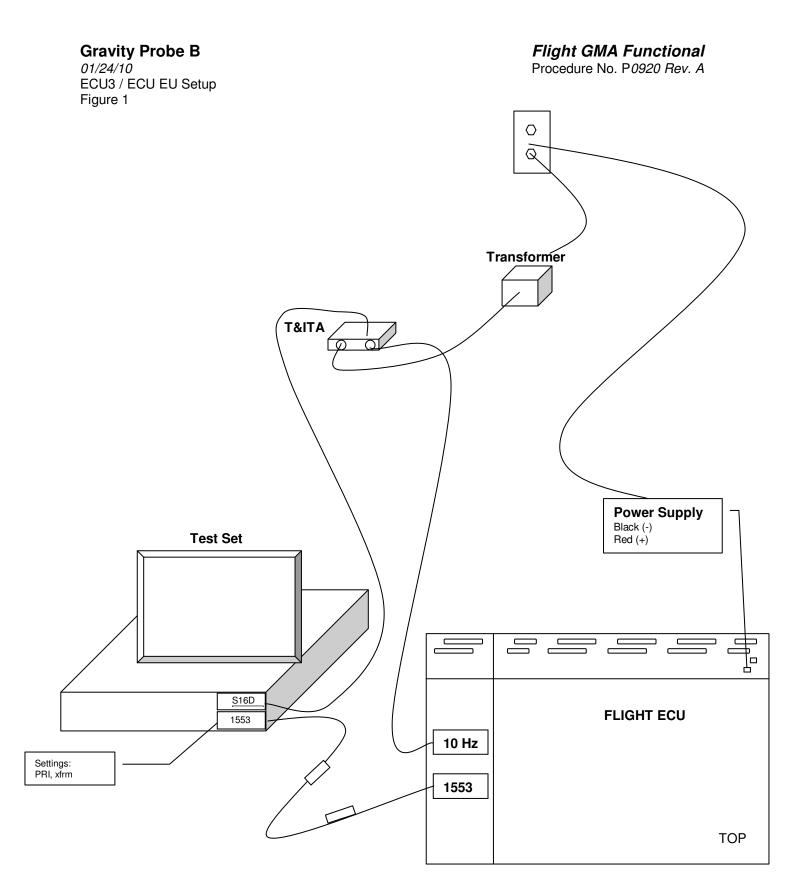L.2.8.2   Open Valves V7, V8, V11, V12, V15, V16, V21, V20, V23, V24, V27, V28

L.2.8.3   MSS 3.2.7 FUNCTIONAL TEST OF THE FLIGHT GMA CSTOL procedure completion

L.2.8.4   TYPE: GO to End MSS 3.2.7 FUNCTIONAL TEST OF THE FLIGHT GMA CSTOL procedure.

CSTOL ACTIONS:

L.2.8.5   Snap & Clear Monitors.

L.2.8.6   Command Off ECU.

L.2.8.7   Snap & Clear ECU Monitors.

L.2.8.8   End ECU Message File Recording.

L.2.8.9   End Bridge File Recording.

L.2.8.10   End Oasis Binary File Recording.

L.2.8.11   OPERATOR: Power down ECU power supply.

L.2.8.12   Test completed:

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

Quality Engineer: _____
Date: _____
Time: _____

Gravity Probe B
01/24/10
ECU3 / ECU EU Setup
Figure 1

Flight GMA Functional
Procedure No. P*0920 Rev. A*

Transformer

T&ITA

Power Supply
Black (-)
Red (+)

Test Set

S16D

1553

Settings:
PRI, xfrm

10 Hz

1553

FLIGHT ECU

TOP