FAST-TEV- 084

-7599

SPACECRAFT MAGNETIC CALIBRATION TEST

FOR THE

FAST SPACECRAFT

ATTITUDE CONTROL AND STABILIZATION BRANCH, CODE 745

NASA GODDARD SPACE FLIGHT CENTER

JUNE 1994

Test Performed by: _____

_____

_____

Date: _____

Completion Date: _____

Signature Page

ared By: Thomas H. Quinn 745.2
ACS Test Engineer — 6/20/94 Date

Approved By: Mary S. Walker
Mary Walker 745
ACS Lead Engineer — 6/20/94 Date

Mary S. Walker for
L. Shiftlett, Code 745
FAST Magnetometer Engineer — 6/20/94 Date

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R. Kolecki, Code 303
FAST Flight Assurance Manager — 6-20-94 Date

REVISION PAGE

sion	DATE	DESCRIPTION

TABLE OF CONTENTS (OUTLINE):

1. INTRODUCTION

Spacecraft Magnetic Calibration Test for the FAST spacecraft

1. INTRODUCTION

1.1 Purpose

The purpose of this procedure is to verify the magnetics on the FAST spacecraft.

1.2 Scope

This procedure defines setup prerequisites, supplementary documentation, equipment, and personnel requirements for the FAST magnetic calibration test.

1.3 General

1.3.1 Subsystem Definition

The Magnetic Control subsystem consists of the following components:

a. Magnetometer
b. Spin and Prec coils
c. MUE

1.4 General Description of the Mag Cal test

This procedure describes the sequence for performing a magnetic calibration test for FAST.

5.1 S/C perm/deperm
5.2 MAG scale factor test
5.3 MAG trim determination
5.4 MAG phasing
5.5 Dipole Moment/Phasing Verification
5.6 Verification of the trim resistor de-contamination matrix
5.7 Bdot Verification

1.5 Changes to These Procedures

Necessary changes to these procedures found just prior to or during performance of the procedures shall be red-lined on the official copy of the procedure which is maintained by the ACS engineer performing the test. Deviations to procedures shall be red-lined in the official copy and summarized at the end of this procedure. The ACS lead engineer and the QA representative will initial and date all changes.

1.6 Reporting of Problems

Problems, anomalies, or failures discovered during execution of this procedure shall be entered on a FAST Spacecraft Discrepancy Report.

SUPPORT

Supplementary Documents

The latest issue of the following supplementary documents contain information relevent to this procedure.

a. FAST MUEGSE Interface Drawing
b. FAST Harness Drawing
c. FAST Magnetic Trim box Schematics

2.2 Special Tools and Equipment

In addition to general tools and equipment, the following types of tools and equipment are required for this procedure:

Item	Make/Model/Serial Number	Calibration Due date
FAST MAG TRIM BOX & CABLES		
Multimeter #1		
Multimeter #2		
Multimeter #3		
Multimeter #4		
Multimeter #5		
Multimeter #6		
+/- 10 V POWER SUPPLY		
Frequency Analyzer		
Chart Recorder 2 or more chn		
METER		
Test MAGNET FAST		
Break Out Boxes		
Digital Storage Oscilloscope		

2.3 Personnel

2.3.1 QA

NOTIFY QA REPRESENTATIVE 24 HOURS BEFORE BEGINNING THIS PROCEDURE.

2.3.2 Responsible Engineer

The engineer responsible for the Magnetic Calibration test will be Mary Walker, or their designated representative.

2.3.3 Other Required Pesonnel

The following personnel are required:

a. Subsystem Representative for ACS
b. Quality Assurance Representative

2.3.4 On-Call Personnel

The following personnel will be on-call during the test.

a. ACS Lead Engineer
b. MUEGSE Engineer

3. SPECIAL CONSIDERATIONS

3.1 Connector Savers and Flight Connector Mate and Demate

Connector savers for the magcal test are N/A.
Flight connector mating and demating must be performed by an Electrical Technician. If during the course of any test or test setup a connector mate or demate is required, a person authorized for connector mate and demate must be contacted to perform the operation.

3.2 ESD Considerations

All persons within one meter of the spacecraft must be properly grounded.

3.3 MAGNETIC CONSIDERATIONS

All special equipment and tools being used in close proximity to the S/C must be checked for magnetic cleanliness. If a specific tool necessary for this procedure violates the FAST I & T magnetic specification a substitute tool shall be used.

CLEANLINESS

All materials and tools used for this procedure must be washed with alcohol and wiped down with clean cotton wipes before taken into the clean room. Procedures must be printed on clean room paper. Cables to be run from outside the clean room into the clean room should be completely washed down, taken inside the clean room, then fed out of the clean room.

4. N/A

5. FUNCTIONAL/ELECTRICAL PROCEDURES

5.1 S/C Perm/Deperm

5.1.1 GSE and S/C setup

5.1.1.1 Place s/c on facility cart (stainless steel cart has magnetic wheels) (s/c mag boom lined up (coarsely) with tracks for facility cart). S/C ACS X axis lined up with the facility EAST/WEST axis.

VERIFY_____

.2 s/c mag boom in stowed position

VERIFY_____

5.1.1.3 Position cart in center of test cell

VERIFY_____

5.1.1.4 Position test magnetometers (facility)

VERIFY_____

.1.5 Zero out field

VERIFY_____

5.1.2 Functional testing

5.1.2.1 Measure residual dipole on s/c using facility magnetometers
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

VERIFY_____

5.1.2.2 Connect GSE (all - ASE, trim box- stowed comp, deployed comp, and ACS test connectors, MUEGSE to ASE, I&T GSE to ASE, battery GSE, battery air conditioning)

VERIFY_____

.3 Measure residual dipole on s/c (with all gse connected- s/c off) if large dipole, investigate and deperm if necessary

Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

VERIFY_____

5.1.2.4 Power on s/c via SPWRUP- configure as listed below:

perform procedure written by Darrell Mitchell

(go through combinations checking dipole after each configuration - shunting current, charging battery, illuminating arrays, if field interference- systematic shutdown of s/c and gse)

VERIFY_____

5.1.2.5 Measure ability of spin and precession coils to place a perm on the spacecraft. Make measurements listed below. Run coils at +L7, -L7, and L0.

Do the following:

a. Configure the S/C to normal mode, instruments on-line, bat on-line, shunts on, nulled field

Send "/atorque enable"
Send "/ascontrol enable"
Send "/apcontrol enable"
Send "/aoloop enable"
Send "/ascoillev L7"
Send "/apcoillev L0"
Send "/aoloopmode pos "

VERIFY_____

b. spin +, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

c. Send "/ascoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

d. Send "/ascoillev L7"
Send "/aoloopmode neg "
spin -, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

e. Send "/ascoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

f. Send "/apcoillev L7"
Send "/apcoildir pos"
spin 0, prec + - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

g. Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

h. Send "/apcoillev L7"
Send "/apcoildir neg"
spin 0, prec - - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

i. Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

j. Send "/ascoillev L7"
Send "/apcoillev L7"
Send "/aoloopmode pos "
Send "/apcoildir pos"
spin +, prec + - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

k. Send "/ascoillev L0"
Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

L. Send "/ascoillev L7"
Send "/apcoillev L7"
Send "/aoloopmode neg "
Send "/apcoildir pos"
spin -, prec + - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

M. Send "/ascoillev L0"
Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

N. Send "/ascoillev L7"
Send "/apcoillev L7"
Send "/aoloopmode neg "
Send "/apcoildir neg"
spin -, prec - - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

O. Send "/ascoillev L0"
Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

P. Send "/ascoillev L7"
Send "/apcoillev L7"
Send "/aoloopmode pos "
Send "/apcoildir neg"
spin +, prec - - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Q. Send "/ascoillev L0"
Send "/apcoillev L0"
spin 0, prec 0 - verify dipole
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

R. if s/c determined to have ability to be permed via
spin and precession coils, take worst case from
perm found above, repeat, try to deperm using
s/c spin and precession coils, verify residual
dipole

Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

VERIFY_____

5.2 Magnetometer scale factor

S/C setup

5.2.1.1 Setup the following, use SPWRUP:

- muegse through umbilical, mag trim box through ACS test connector (loopback) and trim connectors, s/c on- normal mode, instr on, bat on-line, shunts on, coils off, nulled field, test magnetometer located near acs magnetometer (deployed)

  VERIFY_____

- start chgpktrate (0,8,3,S) (get raw mag data)

  VERIFY_____

- Deploy mag boom

  VERIFY_____

5.2.2 Scale Factor Procedure

5.2.2.1 Have facility generate a positive 50k gamma east field

5.2.2.2 Rotate s/c (on turntable) until voltages read at trim box correspond to a pos X (ACS) field reading (rotate until Y (ACS) voltage is < +/- 20 millivolts and X (ACS) reads pos.)

5.2.2.3 Turn off facility east/west field

5.2.2.4 Have facility generate a pos 50k gamma north field

5.2.2.5 Record voltages from trim box to check north/south to Y (ACS) alignment

VOLTAGE AT TRIM BOX

X (ACS) _____

Y (ACS) _____

Z (ACS) _____

YRED (ACS) _____

5.2.2.6 Have facility zero out field and record the following:

NULL FIELD READING
VOLTAGE AT TRIM BOX

X (ACS) _____

Y (ACS) _____

Z (ACS) _____

YRED (ACS) _____

5-2.2.7 Stimulate X(ACS) axis- stimulate -50k gamma to + 50kgamma East/West, increments 10k gamma record I&T raw mag, record voltages at trim box, (page snap TQACS)

For each of the following, set the field as shown and record the voltages as listed from the mag trim box and snap the page TQACS from the I&T GSE. Annotate the snaps with this procedure step number and the stimulated field.

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-50k E/W	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-40k E/W	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-30k E/W	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-20k E/W	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-10k E/W	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
0k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+10k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+20k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+30k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+40k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+50k E/W				
	E/W (fac)	N/S (fac)	Up/d(fac)	

_____ _____ _____ _____

5.2.2.8 Stimulate Y (ACS) and RED axis-stimulate -50k gamma to + 50k g North/ South, increments 10k gamma, record I&T raw mag, record voltages at trim box

For each of the following, set the field as shown and record the voltages as listed from the mag trim box and snap the page TQACS from the I&T GSE. Annotate the snaps with this procedure step number and the stimulated field.

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-50k N/S	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-40k N/S	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-30k N/S	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-20k N/S	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-10k N/S	_____	_____	_____	_____

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
0k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+10k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+20k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+30k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+40k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+50k N/S				

	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

5.2.2.9 Stimulate Z (ACS) axis- stimulate -50k gamma to + 50k gamma Up/Down, increments 10k gamma record I&T raw mag, record voltages at trim box, (page snap TQACS)

For each of the following, set the field as shown and record the voltages as listed from the mag trim box and snap the page TQACS from the I&T GSE. Annotate the snaps with this procedure step number and the stimulated field.

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-50k U/D	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-40k U/D	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-30k U/D	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-20k U/D	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
-10k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
0k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+10k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+20k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+30k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+40k U/D				
	E/W (fac)	N/S (fac)	Up/d(fac)	

FIELD	X(ACS)	Y(ACS)	Z(ACS)	RED
+50k U/D	_____	_____	_____	_____
	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	_____

5.3 Determine trim resistor contamination matrix

5.3.1 Setup- no trim plugs, muegse through umbilical, mag trim box through ACS test connector (loopback), s/c on- normal mode, instr on (in standby), bat on-line, shunts on, coils off, nulled field, test magnetometer located near acs magnetometer, deployed position, use SPWRUP,

VERIFY_____

start CHGPKTRATE (0,8,3,S) - proc to get ACS RAW mag data

VERIFY_____

5.3.2 Trim Procedure-

5.3.2.1 Verify trim box resistances set to open

5.3.2.2 Verify the deployed compensation network is selected. If not, send /AMAGCOMP DEPLOY

VERIFY_____

5.3.2.3 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____
COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____
FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)	
	_____	_____	_____	

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.4 Do the following:

Configure the S/C to normal mode, instruments on-line (standby), bat on-line, shunts on, nulled field
Send "/atorque enable"
Send "/ascontrol enable"
Send "/apcontrol enable"
Send "/aoloop enable"
Send "/ascoillev L7"
Send "/apcoillev L0"
Send "/aoloopmode pos "

VERIFY_____

5.3.2.5 Measure contamination through trim box via multimeters. Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.6 Null out contamination by dialing in resistances on the trim box, use hardline mag comp multimeters as feedback. Get compensated values to zero +/- TBD. Record below.

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

5.3.2.7 n/a

5.3.2.8 n/a

5.3.2.9 Send /AOLOOPMODE NEG. Verify correct neg spin coil current.
- verify correct decontamination. Record values listed below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

..10 n/a

5.3.2.11 Send /ASCOILLEV L0 and verify zero coil current.

VERIFY_____

5.3.2.12 Send /APCOILLEV L7 and /APCOILDIR POS and verify precession coil current.

VERIFY_____

5.3.2.13 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.14 Null out contamination by dialing in resistances on the trim box, use hardline mag comp multimeters as feedback. Get compensated values to zero +/- TBD. Record below.

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

5.3.2.15 n/a

5.3.2.16 n/a

5.3.2.17 Send /APCOILDIR NEG. Verify correct neg spin coil current.
- verify correct decontamination. Record values listed below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.18 Send /APCOILLEV LO and verify zero coil current.

VERIFY_____

5.3.2.19 Connect prec trim discovered above
Connect spin trim discovered above

VERIFY_____

5.3.2.20 Send /AOLOOPMODE POS

/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.3.2.21 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.22 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.3.2.23 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)

_____	_____	_____

COIL MONITORS	SPIN	PREC
_____	_____	

5.3.2.24 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.3.2.25 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
_____	_____	_____	_____	

COMPENSATED DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
_____	_____	_____	_____	

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
_____	_____	_____	

COIL MONITORS	SPIN	PREC
_____	_____	

5.3.2.26 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

27 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED

	_____	_____	_____	_____
COMPENSATED DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.2.27b. Open trim contamination switches for spin and precession. Measure the resistances selected for decontamination and record below.

R1PXRD _____

R1SXRD _____

R1PZD _____

R1SZD _____

R1PYD _____

R1SYD _____

R1PXD _____

R1SXD _____

R2PXRD _____

R2SXRD _____

R2PZD _____

R2SZD _____

R2PYD _____

R2SYD _____

R2PXD _____

R2SXD _____

5.3.2.28 Trim margin/magnetic stability test- Send the following:

command prec L0

command pos y commutation (deployed)
command pos z commutation (stowed)

/APCOILLEV LO
/AOLOOPMODE POSY

VERIFY_____

5.3.2.29 Slowly decrease the y-deployed, or z-stowed trim
resistance to about 20% less than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

5.3.2.30 Slowly increase the y-deployed, or z-stowed trim
resistance to about 20% greater than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

31 Trim margin/magnetic stability test- Send the following:
command neg y commutation (deployed)
command neg z commutation (stowed)

/AOLOOPMODE NEGY

5.3.2.32 Slowly decrease the y-deployed, or z-stowed trim
resistance to about 20% less than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

5.3.2.33 Slowly increase the y-deployed, or z-stowed trim
resistance to about 20% greater than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

.34 Shutdown the spacecraft using SPWRDOWN

VERIFY_____

5.3.2.35 Demate the P701-B connector from the spacecraft

VERIFY_____

5.3.2.36 Close the trim contamination switches for spin and precession. Measure the resistances selected for decontamination looking back through P701-B and record below.

R1PXRD _____

R1SXRD _____

R1PZD _____

R1SZD _____

R1PYD _____

R1SYD _____

R1PXD _____

R1SXD _____

R2PXRD _____

R2SXRD _____

R2PZD _____

R2SZD _____

R2PYD _____

R2SYD _____

R2PXD _____

R2SXD _____

5.3.3 Setup- no trim plugs, muegse through umbilical, mag trim box through ACS test connector (loopback), s/c on- normal mode, instr on (in standby), bat on-line, shunts on, coils off, nulled field, test magnetometer located near acs magnetometer, deployed position, use SPWRUP,

VERIFY_____

STOW THE MAG BOOM

VERIFY_____

start CHGPKTRATE (0,8,3,S) - proc to get ACS RAW mag data

VERIFY_____

5.3.4 Trim Procedure-

5.3.4.1 Verify trim box resistances set to open

VERIFY_____

5.3.4.2 Verify the deployed compensation network is selected. If not, send /AMAGCOMP STOW

VERIFY_____

5.3.4.3 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

SATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.4.4 Do the following:

Configure the S/C to normal mode, instruments on-line (standby), bat on-line, shunts on, nulled field
Send "/atorque enable"
Send "/ascontrol enable"
Send "/apcontrol enable"
Send "/aoloop enable"
Send "/ascoillev L7"
Send "/apcoillev L0"
Send "/aoloopmode pos "

VERIFY_____

.5 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

.6 Null out contamination by dialing in resistances on the trim box, use hardline mag comp multimeters as feedback. Get compensated values to zero +/- TBD. Record below.

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

5.3.4.7 n/a

5.3.4.8 n/a

5.3.4.9 Send /AOLOOPMODE NEG. Verify correct neg spin coil current.
- verify correct decontamination. Record values listed below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

MONITORS	SPIN	PREC
	_____	_____

5.3.4.10 n/a

5.3.4.11 Send /ASCOILLEV L0 and verify zero coil current.

VERIFY_____

5.3.4.12 Send /APCOILLEV L7 and /APCOILDIR POS and verify precession coil current.

VERIFY_____

5.3.4.13 Measure contamination through trim box via multimeters. Record below.

AG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.4.14 Null out contamination by dialing in resistances on the trim box, use hardline mag comp multimeters as feedback. Get compensated values to zero +/- TBD. Record below.

COMPENSATED ATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

5.3.4.15 n/a

5.3.4.16 n/a

5.3.4.17 Send /APCOILDIR NEG. Verify correct neg spin coil current.
- verify correct decontamination. Record values listed below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.4.18 Send /APCOILLEV L0 and verify zero coil current.

VERIFY_____

5.3.4.19 Connect spin trim discovered above

Connect prec trim discovered above

VERIFY_____

5.3.4.20 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.3.4.21 Measure contamination through trim box via multimeters.
Record below.

MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED
MAG DATA X(ACS) Y(ACS) Z(ACS) RED

_____ _____ _____ _____

FACILITY MAG DATA E/W (fac) N/S (fac) Up/d(fac)

_____ _____ _____

COIL MONITORS SPIN PREC

_____ _____

5.3.4.22 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.3.4.23 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA X(ACS) Y(ACS) Z(ACS) RED

_____ _____ _____ _____

COMPENSATED
MAG DATA X(ACS) Y(ACS) Z(ACS) RED

_____ _____ _____ _____

FACILITY MAG DATA E/W (fac) N/S (fac) Up/d(fac)

_____ _____ _____

COIL MONITORS SPIN PREC

_____ _____

24 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.3.4.25 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

.26 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.3.4.27 Measure contamination through trim box via multimeters.
Record below.

RAW MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

COIL MONITORS	SPIN	PREC
	_____	_____

5.3.4.27b. Open trim contamination switches for spin and precession. Measure the resistances selected for decontamination and record below.

R1PXR _____

R1SXR _____

R1PZ _____

R1SZ _____

R1PY _____

R1SY _____

R1PX _____

R1SX _____

R2PXR _____

R2SXR _____

R2PZ _____

R2SZ _____

R2PY _____

R2SY _____

R2PX _____

R2SX _____

5.3.4.28 Trim margin/magnetic stability test- Send the following:

command prec L0
command pos y commutation (deployed)
command pos z commutation (stowed)

/APCOILLEV L0
/AOLOOPMODE POSZ

VERIFY_____

5.3.4.29 Slowly decrease the y-deployed, or z-stowed trim resistance to about 20% less than the trim value watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

5.3.4.30 Slowly increase the y-deployed, or z-stowed trim
resistance to about 20% greater than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

5.3.4.31 Trim margin/magnetic stability test- Send the following:
command neg y commutation (deployed)
command neg z commutation (stowed)

/AOLOOPMODE NEGZ

VERIFY_____

5.3.4.32 Slowly decrease the y-deployed, or z-stowed trim
resistance to about 20% less than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

.33 Slowly increase the y-deployed, or z-stowed trim
resistance to about 20% greater than the trim value
watching for oscillations in the coil current

Record the resistance value at which oscillations (instabilities in the closed loop commutation) are first seen:

RESISTANCE:_____

5.3.4.34 Shutdown the spacecraft using SPWRDOWN

VERIFY_____

5.3.4.35 Demate the P701-A connector from the spacecraft

VERIFY_____

5.3.4.34 Close the trim contamination switches for spin and precession.
Measure the resistances selected for decontamination looking back through P701-A and record below.

R1PXR _____

R1SXR _____

R1PZ _____

R1SZ _____

R1PY _____

R1SY _____

R1PX _____

R1SX _____

R2PXR _____

R2SXR _____

R2PZ _____

R2SZ _____

R2PY _____

R2SY _____

R2PX _____

R2SX _____

5.4 Magnetometer Frequency Response

setup- no trim plugs, muegse through umbilical,
mag trim box through ACS test connector (loopback),
s/c on- normal mode, instr on, bat on-line,
shunts on, coils off, nulled field, test magnetometer
located near acs magnetometer, deployed

VERIFY_____

MAGNETOMETER BOOM MUST BE DEPLOYED

VERIFY_____

5.4.2 Procedure-

X(ACS)-axis - verify 3 db rolloff

5.4.2.1 Connect channel one of the chart recorder to the test magnetometer provided by the facility- East/West channel

VERIFY_____

5.4.2.2 Connect channel two of the chart recorder to the the trim box -X(ACS) channel

VERIFY_____

5.4.2.3 Connect channel one of the frequency analyzer to the test magnetometer provided by the facility- East/West channel

VERIFY_____

5.4.2.4 Connect channel two of the frequency analyzer to the trim box -X(ACS) channel

VERIFY_____

5.4.2.5 Have facility generate up (spin axis = pos s/c Z) rotating field at 0.5 to 100 RAD/SEC, 30k gamma

(note: the up/down axis will be the spin axis for the rotating field i.e. N/S, E/W fields will be driven with sine waves)

-facility should start at 0.5 RAD/SEC and slowly increase frequency until peak to peak amplitude of sine wave recorded at chart recorder of ACS magnetometer channel X drops by 3 db. At this point, the frequency of the input field should be recorded as the 3db corner frequency of the FAST magnetometer. Record below.
Annotate chart recorder plots with procedure step number, ACS channel, and facility magnetometer channel.

FREQUENCY:_____

-try to use frequency analyzer setting up channel 1 as source and comparing channel two vs. channel one to get bode plot (frequency plot) of magnetometer for both gain and phase. Record 3 db rolloff frequency from plots below.

FREQUENCY:_____

5.4.3 Procedure-

Y(ACS)-axis - verify 3 db rolloff

5.4.3.1 Connect channel one of the chart recorder to the test magnetometer provided by the facility- North/South channel

VERIFY_____

5.4.3.2 Connect channel two of the chart recorder to the the trim box -Y(ACS) channel

VERIFY_____

5.4.3.3 Connect channel one of the frequency analyzer to the test magnetometer provided by the facility- North/South channel

VERIFY_____

5.4.3.4 Connect channel two of the frequency analyzer to the trim box -Y(ACS) channel

VERIFY_____

5.4.3.5 Have facility generate up (spin axis = pos s/c Z) rotating field at

0.5 to 100 RAD/SEC, 30k gamma
(note: the up/down axis will be the spin axis for the rotating field i.e. N/S, E/W fields will be driven with sine waves)

-facility should start at 0.5 RAD/SEC and slowly increase frequency until peak to peak amplitude of sine wave recorded at chart recorder of ACS magnetometer channel Y drops by 3 db. At this point, the frequency of the input field should be recorded as the 3db corner frequency of the FAST magnetometer. Record below.
Annotate chart recorder plots with procedure step number, ACS channel, and facility magnetometer channel.

FREQUENCY:_____

-try to use frequency analyzer setting up channel 1 as source and comparing channel two vs. channel one to get bode plot (frequency plot) of magnetometer for both gain and phase. Record 3 db rolloff frequency from plots below.

FREQUENCY:_____

5.4.4 Procedure-

Y RED(ACS)-axis - verify 3 db rolloff

.1 Connect channel one of the chart recorder to the test magnetometer provided by the facility- North/South channel

VERIFY_____

5.4.4.2 Connect channel two of the chart recorder to the the trim box -Y RED(ACS) channel

VERIFY_____

5.4.4.3 Connect channel one of the frequency analyzer to the test magnetometer provided by the facility- North/South channel

VERIFY_____

5.4.4.4 Connect channel two of the frequency analyzer to the trim box -Y RED(ACS) channel

VERIFY_____

5.4.4.5 Have facility generate up (spin axis = pos s/c Z) rotating field at 0.5 to 100 RAD/SEC, 30k gamma
(note: the up/down axis will be the spin axis for the rotating field i.e. N/S, E/W fields will be driven with sine waves)

-facility should start at 0.5 RAD/SEC and slowly increase frequency until peak to peak amplitude of sine wave recorded at chart recorder of ACS magnetometer channel Y RED drops by 3 db. At this point, the frequency of the input field should be recorded as the 3db corner

frequency of the FAST magnetometer. Record below.
Annotate chart recorder plots with procedure step number, ACS channel, and facility magnetometer channel.

FREQUENCY:_____

-try to use frequency analyzer setting up channel 1 as source and comparing channel two vs. channel one to get bode plot (frequency plot) of magnetometer for both gain and phase. Record 3 db rolloff frequency from plots below.

FREQUENCY:_____

5.4.5 Procedure-

Z (ACS)-axis - verify 3 db rolloff

5.4.5.1 Connect channel one of the chart recorder to the test magnetometer provided by the facility- Up/down channel

VERIFY_____

5.4.5.2 Connect channel two of the chart recorder to the the trim box -Z(ACS) channel

VERIFY_____

.3 Connect channel one of the frequency analyzer to the test magnetometer provided by the facility- Up/Down channel

VERIFY_____

5.4.5.4 Connect channel two of the frequency analyzer to the trim box -Z(ACS) channel

VERIFY_____

5.4.5.5 Have facility generate EAST (spin axis = pos s/c X) rotating field at 0.5 to 100 RAD/SEC, 30k gamma
(note: the East/West axis will be the spin axis for the rotating field i.e. N/S, U/D fields will be driven with sine waves)

-facility should start at 0.5 RAD/SEC and slowly increase frequency until peak to peak amplitude of sine wave recorded at chart recorder of ACS magnetometer channel Z drops by 3 db. At this point, the frequency of the input field should be recorded as the 3db corner frequency of the FAST magnetometer. Record below.
Annotate chart recorder plots with procedure step number, ACS channel, and facility magnetometer channel.

FREQUENCY:_____

-try to use frequency analyzer setting up channel 1 as source and comparing channel two vs. channel one to get bode plot (frequency plot) of magnetometer for both gain and phase. Record 3 db rolloff

frequency from plots below.

FREQUENCY:_____

5.5 Magnetometer Phasing

spin field- verify correct spin phase determination both directions

5.5.1 setup- no trim plugs, muegse through umbilical,
mag trim box through ACS test connector (loopback),
s/c on- launch mode, instr off, bat on-line,
shunts on, coils off, nulled field, test magnetometer
located near acs magnetometer, stowed

VERIFY_____

STOW MAG BOOM

VERIFY_____

5.5.2 procedure-

5.5.2.1 Verify mag boom in stowed configuration

VERIFY_____

.2 Have facility provide pos (+Z -- up) rotating field - 30k gamma
at 5 RPM

VERIFY_____

5.5.2.3 Open seperation switches on ASE and verify ACS goes to initial
acquisition mode

VERIFY_____

5.5.2.4 Set EOD timer to 1 minute - /AEOD LIMIT = 60

VERIFY_____

5.5.2.5 Once ACS initial acq mode goes to state 3, Dump ACS packet containing
spin direction information "/mtlsendpkg appid = 12"

VERIFY_____

5.5.2.6 Record the following:

ASSNSCNTNEG _____

ASSNSCNTPOS _____

..7 Have facility provide neg (+Z -- down) rotating field - 30k gamma
at 5 RPM

VERIFY_____

5.5.2.8 Send the following to reset the ACS into its preset initial acq state
/mostselmode normal
/mostselmode initacq

VERIFY_____

5.5.2.9 Set EOD timer to 1 minute - /AEOD LIMIT = 60

VERIFY_____

5.5.2.10 Once ACS initial acq mode goes to state 3, Dump ACS packet containing spin direction information "/mtlsendpkg appid = 12"

VERIFY_____

5.5.2.11 Record the following:

ASSNSCNTNEG _____

ASSNSCNTPOS _____

5.5b verify correct commutation

5.5.3 setup- no trim plugs, muegse through umbilical,
mag trim box through ACS test connector (loopback),
s/c on- normal mode, instr on, bat on-line,
shunts on, coils enabled, nulled field, test magnetometer
located near acs magnetometer, deployed

VERIFY_____

DEPLOY MAG BOOM

VERIFY_____

5.5.4 procedure-

both commutation switches, both sources (4 comb)
(Z-inverted, Z-noninverted, Y-inverted, Y-noninverted)
Both directions mag stimulus, each condition

Locate facility test magnetometer near SPIN coil
to verify correct moment output phase of spin
commands

VERIFY_____

5.5.4.1 Send /amagcomp stowed
/aoloopmode negz
/aoloop enable
/atorque enable
/ascontrol enable
/ascoillev L6

VERIFY_____

5.5.4.2 Have facility generate an pos up/down field (up) (pos Z (acs))

VERIFY_____

5.5.4.3 Verify spin coil moment = neg E/W (WEST) or -X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.4 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.5 Have facility generate an neg up/down field (down) (neg Z (acs))

VERIFY_____

5.5.4.6 Verify spin coil moment = pos E/W (EAST) or +X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.7 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.8 Send /aoloopmode posz

VERIFY_____

5.5.4.9 Have facility generate an pos up/down field (up) (pos Z (acs))

VERIFY_____

5.5.4.10 Verify spin coil moment = pos E/W (EAST) or +X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.11 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.12 Have facility generate an neg up/down field (down) (neg Z (acs))

VERIFY_____

5.5.4.13 Verify spin coil moment = neg E/W (WEST) or -X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.14 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.15 Send /amagcomp deploy
/aoloopmode negy

VERIFY_____

5.5.4.16 Have facility generate an pos N/S field (N) (pos Y (acs))

VERIFY_____

5.5.4.17 Verify spin coil moment = neg E/W (WEST) or -X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

18 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.19 Have facility generate an neg N/S field (S) (neg Y (acs))

VERIFY_____

5.5.4.20 Verify spin coil moment = pos E/W (EAST) or +X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.21 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

?2 Send /aoloopmode posy

VERIFY_____

5.5.4.23 Have facility generate an pos N/S field (N) (pos Y (acs))

VERIFY_____

5.5.4.24 Verify spin coil moment = pos E/W (EAST) or +X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.25 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5.4.26 Have facility generate an neg N/S field (S) (neg Y (acs))

VERIFY_____

5.5.4.27 Verify spin coil moment = neg E/W (WEST) or -X (acs) using facility magnetometer located near SPIN coil

VERIFY_____

5.5.4.28 Record the spin coil current as seen in telemetry and via the MAG trim box below

ASPINCOILCURR (from I&T gse) _____

TRIM BOX SPIN COIL CURRENT _____

5.5c Coil moment/verification - open loop commanding spin and prec coils

5.5.5 setup- no trim plugs, muegse through umbilical,
mag trim box through ACS test connector (loopback),
s/c on- normal mode, instr on, bat on-line,
shunts on, coils enabled, nulled field, test magnetometer
located near acs magnetometer, deployed, open loop ena

VERIFY_____

NOTE: if facility requires mag boom to be stowed in order
to rotate the s/c and measure the dipole on the s/c,
stow the boom at this point

VERIFY_____

5.5.6 procedure- go through all of the coil commands and verify the
moments generated by the spacecraft

VERIFY_____

5.5.6.1 Send the following to the spacecraft:
/ascontrol enable
/apcontrol enable

/atorque enable
/aoloop enable
/apcoillev l0

VERIFY_____

5.5.6.2 Send the following to the spacecraft to configure the coils:
/aoloopmode pos
/ascoillev L7

VERIFY_____

5.5.6.3 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.4 Send the following to the spacecraft to configure the coils:

/ascoillev L6

VERIFY_____

5.5.6.5 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.6 Send the following to the spacecraft to configure the coils:

/ascoillev L5

VERIFY_____

5.5.6.7 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.8 Send the following to the spacecraft to configure the coils:

/ascoillev L4

VERIFY_____

5.5.6.9 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.10 Send the following to the spacecraft to configure the coils:

/ascoillev L3

VERIFY_____

5.5.6.11 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.12 Send the following to the spacecraft to configure the coils:

/ascoillev L2

VERIFY_____

5.5.6.13 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.14 Send the following to the spacecraft to configure the coils:

/ascoillev L1

VERIFY_____

5.5.6.15 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.16 Send the following to the spacecraft to configure the coils:

/ascoillev L0

VERIFY_____

5.5.6.17 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.18 Send the following to the spacecraft to configure the coils:

/aoloopmode neg (NEGATIVE SPIN)
/ascoillev L7

VERIFY_____

5.5.6.19 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

Up/Down

VERIFY_____

5.5.6.20 Send the following to the spacecraft to configure the coils:

/ascoillev L6

VERIFY_____

5.5.6.21 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

22 Send the following to the spacecraft to configure the coils:

/ascoillev L5

VERIFY_____

5.5.6.23 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

24 Send the following to the spacecraft to configure the coils:

/ascoillev L4

VERIFY_____

5.5.6.25 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.26 Send the following to the spacecraft to configure the coils:

/ascoillev L3

VERIFY_____

5.5.6.27 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.28 Send the following to the spacecraft to configure the coils:

/ascoillev L2

VERIFY_____

5.5.6.29 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.30 Send the following to the spacecraft to configure the coils:

/ascoillev L1

VERIFY_____

5.5.6.31 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.32 Send the following to the spacecraft to configure the coils:

/ascoillev L0

VERIFY_____

5.5.6.33 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.34 Send the following to the spacecraft to configure the coils:

/apcoildir pos (PRECESSION COIL POSITIVE)
/apcoillev L7

VERIFY_____

5.5.6.35 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.36 Send the following to the spacecraft to configure the coils:

/apcoillev L6

VERIFY_____

5.5.6.37 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.38 Send the following to the spacecraft to configure the coils:

/apcoillev L5

VERIFY_____

5.5.6.39 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____ .

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.40 Send the following to the spacecraft to configure the coils:

/apcoillev L4

VERIFY_____

5.5.6.41 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.42 Send the following to the spacecraft to configure the coils:

/apcoillev L3

VERIFY_____

5.5.6.43 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.44 Send the following to the spacecraft to configure the coils:

/apcoillev L2

VERIFY_____

5.5.6.45 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.46 Send the following to the spacecraft to configure the coils:

/apcoillev L1

VERIFY_____

5.5.6.47 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.48 Send the following to the spacecraft to configure the coils:

/apcoillev L0

VERIFY_____

5.5.6.49 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.50 Send the following to the spacecraft to configure the coils:

/apcoildir neg (NEGATIVE PRECESSION)
/apcoillev L7

VERIFY_____

5.5.6.51 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box) SPIN PREC

_____ _____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W N/S Up/Down

_____ _____ _____

Snap page 'TQACS' from the I&T gse and annotate with the

procedure step number.

VERIFY_____

.52 Send the following to the spacecraft to configure the coils:

/apcoillev L6

VERIFY_____

5.5.6.53 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

54 Send the following to the spacecraft to configure the coils:

/apcoillev L5

VERIFY_____

5.5.6.55 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

56 Send the following to the spacecraft to configure the coils:

/apcoillev L4

VERIFY_____

5.5.6.57 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.58 Send the following to the spacecraft to configure the coils:

/apcoillev L3

VERIFY_____

.59 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.60 Send the following to the spacecraft to configure the coils:

/apcoillev L2

VERIFY_____

61 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.62 Send the following to the spacecraft to configure the coils:

/apcoillev L1

VERIFY_____

5.5.6.63 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5.6.64 Send the following to the spacecraft to configure the coils:

/apcoillev L0

VERIFY_____

5.5.6.65 Measure analog trim offsets (at mag trim box). Record below.

COIL MONITORS (trim box)	SPIN	PREC
	_____	_____

Have facility measure dipole from spacecraft.
Annotate dipole reading from facility with procedure step number.
Record the Dipole moment from the facility's data sheet below.

E/W	N/S	Up/Down
_____	_____	_____

Snap page 'TQACS' from the I&T gse and annotate with the procedure step number.

VERIFY_____

5.5d Bdot verification test- record mag and filtered mag in seqprt, stimulate with rotating field at diff. frequencies

5.5.7 setup- no trim plugs, muegse through umbilical,
MUEGSE PLUGGED INTO ACS PATCH PLUG 708
s/c on- initial acq, instr off, bat on-line,
shunts on, coils enabled, nulled field, test magnetometer
located near acs magnetometer, stowed boom

VERIFY_____

5.5.8 procedure- set up rotating fields and verify bdot control

5.5.8.1 Have facility generate up (pos s/c Z) rotating field at
5 rpm, 30k gamma
(note: the up/down axis will be the spin axis for the rotating field i.e. N/S, E/W fields will be driven with sine waves)

VERIFY_____

2 Send the following
/mostselmode normal
/mostselmode initacq
/aeod limit = 60 (set EOD timer to 1 minute)
/asenssel mag

VERIFY_____

5.5.8.3 wait for initial acq state 3

VERIFY_____

5.5.8.4 Set 4ktlm filter table to transmit every pkt 12
via 'start chgpktrate (0,3,12,s)'

VERIFY_____

5.5.8.5 start seqprt (AMAGX,AMAGY,AMAGZ,ABZR,ABZF,APRECOILCURR)
via 'seqprt magcal,1 >> magcal.dat'

VERIFY_____

5.5.8.6 Verify correct spin sense determination (positive)
by check ASSCNTPOS and ASSCNTNEG

VERIFY_____

5.5.8.7 At Muegse, type
'spin period 5 pipper 1'
'sss angle + 45'

VERIFY_____

5.5.8.8 send /abdotangle angle= 40

VERIFY_____

5.5.8.9 Monitor data for 20 minutes (let seqprt fill at
0 Z (up/down) field)

VERIFY_____

5.5.8.10 Have facility generate + 20K gamma (up) field

VERIFY_____

5.5.8.11 Monitor data for 10 minutes (let seqprt fill at
+20k gamma Z (up/down) field)

VERIFY_____

5.5.8.12 Have facility generate - 20K gamma (down) field

VERIFY_____

5.5.8.13 Monitor data for 10 minutes (let seqprt fill at
-20k gamma Z (up/down) field)

VERIFY_____

.14 Have facility generate 0 gamma (up) field

VERIFY_____

5.5.8.15 Monitor data for 10 minutes (let seqprt fill at
0 Z (up/down) field)

VERIFY_____

5.5.8.16 Have facility generate oscillating up/down field
at 20k gamma peak to peak, 40 second period

VERIFY_____

5.5.8.17 Monitor data for 10 minutes (let seqprt fill at
oscillating Z (up/down) field)

VERIFY_____

5.5.8.18 Have facility generate oscillating up/down field
at 20k gamma peak to peak, 400 second period

VERIFY_____

5.5.8.19 Monitor data for 40 minutes (let seqprt fill at
oscillating Z (up/down) field)

VERIFY_____

5.5.8.20 Have facility generate oscillating up/down field

at 20k gamma peak to peak, 4000 second period

VERIFY_____

.21 Monitor data for 3.5 hours (let seqprt fill at
oscillating Z (up/down) field)

VERIFY_____

5.6 Verification of the trim resistor de-contamination matrix

5.6.1 Setup- FLIGHT TRIM PLUGS INSTALLED, muegse through umbilical, FLIGHT ACS PATCH PLUG INSTALLED
s/c on- normal mode, instr on (in standby), bat on-line, shunts on, coils off, nulled field, test magnetometer located near acs magnetometer, deployed position, use SPWRUP,

VERIFY_____

start CHGPKTRATE (0,8,3,S) - proc to get ACS RAW mag data

VERIFY_____

DEPLOY THE MAG BOOM

VERIFY_____

Trim Verification Procedure-

5.o.2.1 Verify Flight trim plugs installed in spacecraft

VERIFY_____

5.6.2.2 Verify the deployed compensation network is selected. If not, send /AMAGCOMP DEPLOY

VERIFY_____

5.6.2.3 Measure contamination for zero field.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.4 Do the following:

Configure the S/C to normal mode, instruments on-line (standby), bat on-line, shunts on, nulled field
Send "/atorque enable"
Send "/ascontrol enable"
Send "/apcontrol enable"
Send "/aoloop enable"
Send "/ascoillev L7"
Send "/apcoillev L0"
Send "/aoloopmode pos "

VERIFY_____

5.6.2.5 Measure contamination for zero field.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.6 Send /AOLOOPMODE NEG. Verify correct neg spin coil current.
- verify correct decontamination.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.7 Send /ASCOILLEV L0 and verify zero coil current.

VERIFY_____

5.6.2.8 Send /APCOILLEV L7 and /APCOILDIR POS and verify precession coil current.

VERIFY_____

5.6.2.9 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.10 Send /APCOILDIR NEG. Verify correct neg spin coil current.
- verify correct decontamination.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.11 Send /APCOILLEV L0 and verify zero coil current.

VERIFY_____

5.6.2.12 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.6.2.13 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.14 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.6.2.15 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.16 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.6.2.17 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.18 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.6.2.19 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.2.20 Send /AOLOOPMODE POSY

VERIFY_____

5.6.2.21 Verify the spin coil does not oscillate

VERIFY_____

5.o.2.22 Send /AOLOOPMODE NEGY

VERIFY_____

5.6.2.23 Verify the spin coil does not oscillate

VERIFY_____

5.6.3 Setup- FLIGHT TRIM PLUGS INSTALLED, muegse through umbilical, FLIGHT ACS PATCH PLUG INSTALLED
s/c on- normal mode, instr on (in standby), bat on-line, shunts on, coils off, nulled field, test magnetometer located near acs magnetometer, deployed position, use SPWRUP,

VERIFY_____

start CHGPKTRATE (0,8,3,S) - proc to get ACS RAW mag data

VERIFY_____

STOW THE MAG BOOM

VERIFY_____

5.6.4 Trim Verification Procedure- STOWED

.1 Verify Flight trim plugs installed in spacecraft

5.6.4.2 Verify the deployed compensation network is selected. If not,

send /AMAGCOMP STOW

VERIFY_____

.3 Measure contamination for zero field.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.4 Do the following:

Configure the S/C to normal mode, instruments on-line (standby), bat on-line, shunts on, nulled field
Send "/atorque enable"
Send "/ascontrol enable"
Send "/apcontrol enable"
Send "/aoloop enable"
Send "/ascoillev L7"
Send "/apcoillev L0"
Send "/aoloopmode pos "

VERIFY_____

5.6.4.5 Measure contamination for zero field.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

.6 Send /AOLOOPMODE NEG. Verify correct neg spin coil current.
- verify correct decontamination.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.7 Send /ASCOILLEV L0 and verify zero coil current.

VERIFY_____

5.6.4.8 Send /APCOILLEV L7 and /APCOILDIR POS and verify precession coil current.

VERIFY_____

5.6.4.9 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.10 Send /APCOILDIR NEG. Verify correct neg spin coil current.
- verify correct decontamination.
Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

11 Send /APCOILLEV L0 and verify zero coil current.

VERIFY_____

5.6.4.12 Send /AOLOOPMODE POS

/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.6.4.13 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.14 Send /AOLOOPMODE POS
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

5.6.4.15 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.16 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR NEG
/APCOILLEV L7

VERIFY_____

17 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.18 Send /AOLOOPMODE NEG
/ASCOILLEV L7
/APCOILDIR POS
/APCOILLEV L7

VERIFY_____

5.6.4.19 Snap TQACS from I&T gse and annotate with the procedure step number.

VERIFY_____

5.6.4.20 Send /AOLOOPMODE POSZ

VERIFY_____

5.6.4.21 Verify the spin coil does not oscillate

VERIFY_____

5.6.4.22 Send /AOLOOPMODE NEGZ

VERIFY_____

23 Verify the spin coil does not oscillate

VERIFY_____

5.7 Alignment of SSS to Magnetometer-

5.7.1 setup- no trim plugs, muegse through umbilical,
mag trim box through ACS test connector (loopback),
nulled field,
facility test magnetometer aligned to with .5 degrees
of facility mag coil survey lines

VERIFY_____

S/C OFF,

VERIFY_____

S/C on facility or stainless steel cart

VERIFY_____

MAG BOOM SHOULD BE STOWED

VERIFY_____

5.7.2 procedure- align the spacecraft then have facility command
3 different mag field vectors, read mag values to
back out mag alignment

5.7.2.1 line up S/C such that the mirror of the
SSS lines up with the surveyed East/West axis
of the magcal facility using the facility
theodolite to within 0.5 degrees (adjust rotation
about Z (spacecraft axis). SSS should be pointing
due East.

VERIFY_____

5.7.2.2 line up S/C such that the mirror of the
SSS lines up with the surveyed Up/Down axis
of the magcal facility using the facility
theodolite to within 0.5 degrees (adjust rotation
about X (spacecraft axis).

VERIFY_____

5.7.2.3 level the spacecraft such that the top of the spacecraft
(rotation about the Y (spacecraft axis)) is level
with respect to gravity. Place the level
on the spacecraft along the boom axis (S/C X axis).
Adjust with shims or deflation or inflation of
the S/C cart tires to get the spacecraft level.

VERIFY_____

5.7.2.4 power the s/c on using SPWRUP- normal mode, instr on,
bat on-line, shunts on, coils disabled,

VERIFY_____

5.7.2.5 Send the following:

/atorque disable
/ascontrol disable

VERIFY_____

..6 At the I&T gse, 'START CHGPKTRATE (0,3,8,S)' to receive raw magnetometer data

VERIFY_____

5.7.2.7 have the facility null out the earth's field if not done so already

VERIFY_____

5.7.2.8 Snap the page 'TQACS' and annotate with the procedure step number and the label 'null field stowed'

VERIFY_____

5.7.2.9 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____
COMPENSATED DATA BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.2.10 have the facility generate a pos E/W (east) 30k gamma field

VERIFY_____

5.7.2.11 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.2.12 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____
COMPENSATED MAG DATA	X(ACS)	Y(ACS)	Z(ACS)	RED

(TRIM BOX)

.ITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)

5.7.2.13 have the facility generate a neg E/W (west) 30k gamma field

VERIFY_____

5.7.2.14 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.2.15 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

NSATED ATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)

5.7.2.16 have the facility generate a pos N/S (north) 30k gamma field

VERIFY_____

5.7.2.17 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.2.18 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.2.19 have the facility generate a neg N/S (south) 30k gamma field

VERIFY_____

5.7.2.20 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.2.21 Measure analog trim offsets (at mag trim box). Record below.

AG DATA BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.2.22 have the facility generate a pos Up/D (up) 30k gamma field

VERIFY_____

5.7.2.23 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.2.24 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

NSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.2.25 have the facility generate a neg Up/D (neg) 30k gamma field

VERIFY_____

5.7.2.26 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

27 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.3 Deployed boom alignment

5.7.3.1 DEPLOY THE MAG BOOM. Be very careful so as not to move the spacecraft. If in doubt, use theodolite to re-verify correct alignment of facility to SSS.

VERIFY_____

.2 n/a

5.7.3.3 n/a

5.7.3.4 n/a

5.7.3.5 n/a

6 At the spacecraft, send "/amagcomp deploy"

5.7.3.7 have the facility null out the earth's field if not done so already

VERIFY_____

5.7.3.8 Snap the page 'TQACS' and annotate with the procedure step number and the label 'null field deployed'

VERIFY_____

5.7.3.9 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.3.10 have the facility generate a pos E/W (east) 30k gamma field

VERIFY_____

5.7.3.11 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.12 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED ATA BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.3.13 have the facility generate a neg E/W (west) 30k gamma field

VERIFY_____

5.7.3.14 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.15 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.3.16 have the facility generate a pos N/S (north) 30k gamma field

VERIFY_____

5.7.3.17 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.18 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

TY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)

5.7.3.19 have the facility generate a neg N/S (south) 30k gamma field

VERIFY_____

5.7.3.20 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.21 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

ISATED ATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)

5.7.3.22 have the facility generate a pos Up/D (up) 30k gamma field

VERIFY_____

5.7.3.23 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.24 Measure analog trim offsets (at mag trim box). Record below.

RAW MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____

5.7.3.25 have the facility generate a neg Up/D (neg) 30k gamma field

VERIFY_____

5.7.3.26 Snap the page 'TQACS' and annotate with the procedure step number and the commanded field.

VERIFY_____

5.7.3.27 Measure analog trim offsets (at mag trim box). Record below.

...G DATA BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

COMPENSATED MAG DATA (TRIM BOX)	X(ACS)	Y(ACS)	Z(ACS)	RED
	_____	_____	_____	_____

FACILITY MAG DATA	E/W (fac)	N/S (fac)	Up/d(fac)
	_____	_____	_____