


SMEX FAST
MECHANICAL INTEGRATION PROCEDURES FOR
MAGNETIC CONTAMINATION CONTROL

FAST-PROC-027

July 22, 1993

**SMEX FAST MECHANICAL INTEGRATION PROCEDURES FOR MAGNETIC
CONTAMINATION CONTROL**

Prepared By:

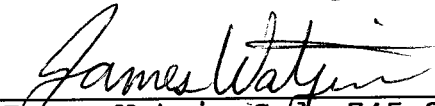

Dave Everett Code 743.1
FAST Electrical Systems Engineer

8/9/93
Date

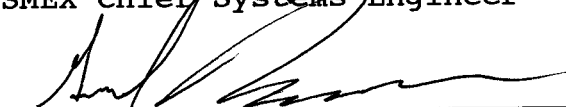
Approved By:


Tim Gehringer Code 740.4
FAST Mission Manager


8/10/93
Date


James Watzin Code 745.2
SMEX Chief Systems Engineer

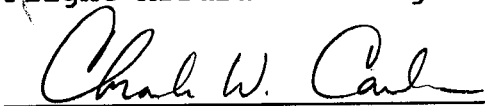
8/10/93
Date


Giulio Rosanova Code 741.3
FAST Mechanical Lead Engineer

8/11/93
Date


Ron Kolecki Code 740.4 303
Flight Assurance Manager

7/26/93
Date


Dr. Charles Carlson, UCB
FAST Principal Investigator

8/18/93
Date

SCOPE

This document describes the procedures necessary to prevent magnetization of the FAST spacecraft structure during assembly. These procedures are based on the SMEX FAST I&T MAGNETIC CLEANLINESS REQUIREMENTS (FAST-SPEC-023); please read it--it is only 1½ pages long. Procedures similar to these will be followed during flight I&T, but the test equipment will be different.

WORK AREA

The structure shall be assembled in a magnetically clean area. A magnetically clean area is an area where no magnetic fields exceed 3 Gauss. This level is low enough that any magnetic materials present will not be excessively magnetized. The gaussmeter shall be used to screen the test area. A normal room will generally be magnetically clean as long as all permanent magnets are removed.

All tools brought into the work area shall be screened and degaussed using the gaussmeter and degausser.

Any metal objects brought into the work area, including paper clips, jewelry, belt buckles, and other personal metal objects, shall be screened using the gaussmeter. Be sure to check your pockets!

All flight hardware shall be kept at least 3 meters away from the degaussing station. The degausser generates very large magnetic fields.

Under NO circumstance shall ANY MAGNET be brought near flight hardware, tools, or the work area. If any tools are exposed to a magnet, that tool and any tools near it shall be screened and degaussed. If any flight hardware is exposed to a magnet, the FAST Electrical System Engineer and the Flight Assurance Representative shall be notified immediately.

SCREENING PROCEDURE

Screening is performed with the RFL Industries Model 902 Gaussmeter. The following procedure shall be followed.

Zero the meter:

STEP 1: Plug the PT-70 probe into the gaussmeter.

STEP 2: Turn FINE control to mid-rotation position.

STEP 3: Press ON/20K button. Allow 15 second warmup.

STEP 4: Place probe in zero-field chamber. The end of the probe should be at least 3 cm into the chamber, but not touching any walls. The probe can rest on the opening of the chamber.

STEP 5: Adjust OFFSET knob until reading is within ± 0.05 .

STEP 6: Press 2K button.

STEP 7: Zero the display using the COARSE control.

STEP 8: Press the 200 button.

STEP 9: Zero the display using the FINE control.

The gaussmeter is now zeroed and ready to measure. The display is in Gauss with resolution to 0.1 Gauss.

STEP 10: Remove the probe from the chamber and move it around slowly. The reading on the meter should vary between about -0.5 and +0.5 Gauss (corresponding to the magnetic field of the earth).

STEP 11: Lay the flat side of the probe on the surface of the item being tested. The probe measures fields perpendicular to the flat surface, and the most sensitive part is within 2 mm of the end. Move the probe to different places on the item. Pay particular attention to parts which will interface directly to flight hardware (such as the tips of screwdrivers). Avoid applying pressure to the probe tip, and avoid scraping it. If any regions show more than 1 Gauss, spend a little extra time looking for a higher reading on the tool.

STEP 12: If any reading on an item exceeds 2.9 Gauss (3 Gauss specification minus meter accuracy), degauss the item and screen it again.

STEP 13: After each item, place the probe in the zero chamber and zero the reading using the FINE control. Then continue with STEP 10.

DEGAUSSING PROCEDURE

STEP 1: With the coil off and the item in your hand, move the tool through the coil to the far side.

STEP 2: Turn on the coil. The strongest magnetic field is inside the coil, aligned along its axis. This is a 60 Hz magnetic field.

STEP 3: Slowly draw the item into the center of the coil. Rotate the tool to expose different directions to the field.

STEP 4: Slowly move the item away from the coil until it is as far

away as you can reach.

STEP 5: Turn off the coil.

WAIVERS

All waivers require the approval of the FAST Electrical System Engineer and the Flight Assurance Representative.

SMALL EXPLORER (SMEX) DOCUMENTATION CONTROL FORM

ACTION CODE	NAME	MAIL CODE	ACTION CODE	NAME	MAIL CODE	ACTION CODE	NAME	MAIL CODE
_____	R. ALEMAN	740.4	_____	F. HUEGEL	743.3	_____	M. RODRIQUEZ/MDAC	724.4
_____	M. ANDERSON	745.2	_____	T. JACOBS	743.2	✓	G. ROSANOVA	741.3
_____	D. BAKER	690	_____	B. JOYCE	301	_____	P. SALERNO	743.1
_____	D. BERRY	512.1	_____	K. KEADLE-CALVERT	743.2	_____	R. SCHNURR	745.2
_____	D. BETZ	740.4	_____	J. KELLOGG	741.1	_____	B. SETTLES	743.3
_____	M. BLAU	743.3	✓	R. KOLECKI	740.4	_____	A. SHERMAN	700
_____	T. BUDNEY	745	_____	T. LAFOURCADE	743.1	_____	D. SHREWSBERRY	740
_____	J. BYRD	740.4	_____	S. LUCKERT/STX	740.4	_____	D. SILVA	470
_____	J. CATENA	740.4	_____	J. LYONS	734.4	_____	SMEXFOT/ATSC	740.4
_____	G. CHIN	693.1	_____	H. MALDONADO	737.3	_____	G. SNEIDERMAN	741.3
_____	C. CLAGETT	745.1	_____	S. MANNING/PARAMAX	740.4	_____	T. SPITZER	734.1
_____	SMEX CM	740.4	_____	L. MATAOSKY	470	_____	M. STEINER	743.1
_____	G. COOPER	743.1	_____	R. MENCIA/SWALES	724	✓	R. STONE	743
_____	T. CORRELL	745.2	_____	S. MEYERS	741	_____	S. STRAKA	724.4
_____	B. DEDALIS	302	_____	T. MICHAELIS	745.1	_____	T. TRENKLE/MMS	743.1
✓	D. EVERETT	743.1	_____	P. MULE	750.2	_____	M. WALKER	745.1
_____	B. FAFAUL	311.1	_____	Y. NGAN	737.3	✓	J. WATZIN	740.4
_____	L. FANTANO	724.1	_____	Q. NGUYEN	743.2	_____	R. WEAVER	740
_____	O. FIGUEROA	740.4	_____	D. OLNEY	745.1	_____	N. WILKINSON	740.4
_____	J. FIORA	740.4	_____	D. OLSEN/STX	740.4	_____	J. ZEMBOWER/INTER	740.4
_____	J. GALLEHER/HEI	740.4	_____	K. PARRISH	724.1	✓	C. Carlson	
_____	D. GATES/ATSC	740.4	_____	R. PATSCHKE	743.1	_____		
✓	T. GEHRINGER	740.4	_____	S. PATTON	741.1	_____		
_____	D. GILMAN/NASA HQ	SZD	_____	C. PETRUZZO	745	_____		
_____	T. GRUNER	745.2	_____	R. PFAFF	696	_____		
_____	K. HERSEY	737.1	_____	W. POWELL	822	_____		
_____	L. HILLIARD	740.4	_____	G. RAKOW	743.3	_____		
_____	T. HUBER	700	_____	M. REID	512.2	_____		

NUMBER OF ENCLOSURES OR ATTACHMENTS INCLUDED 1

SUBJECT:

*Mechanical Integration Procedures for
Magnetic Contamination Control
(FAST-PROC-027)*

COMMENTS:

*Please review the following document.
Submit any redlines to the CM
Office by August 6, 1993. COB.
Thank You*

Distributed by:

Smux/cm

Date:

7/26/93