

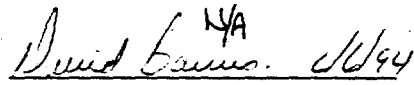
# ENGINEERING CHANGE NOTICE

1. ECN **196862**

Page 1 of 2

Proj.  
ECN

<b>2. ECN Category (mark one)</b> Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	<b>3. Originator's Name, Organization, MSIN, and Telephone No.</b> DG Spurling, IRM/ISS/C&WMSS, R1-01, 3-2969  <b>5. Project Title/No./Work Order No.</b> TMACS/N46G1  <b>8. Document Numbers Changed by this ECN (includes sheet no. and rev.)</b> WHC-SD-WM-TRP-105, Rev 54 <sup>XC</sup> WHC-SD-WM-TRP-106, Rev 54 <sup>9/24/94</sup> WHC-SD-WM-TRP-107, Rev 54 WHC-SD-WM-TRP-108, Rev 43 WHC-SD-WM-TRP-109, Rev 43 WHC-SD-WM-TRP-111, Rev 54 WHC-SD-WM-TRP-112, Rev 54 WHC-SD-WM-TRP-113, Rev 43 WHC-SD-WM-TRP-114, Rev 54	<b>4. Date</b> 5/31/94  <b>6. Bldg./Sys./Fac. No.</b> 2750E/TMACS/200E  <b>9. Related ECN No(s).</b> ECN 196863 EDT 159986 EDT 600611  <b>7. Impact Level</b> Approval Designer 0  <b>10. Related PO No.</b>
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<b>11a. Modification Work</b> <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	<b>11b. Work Package No.</b> N46G1 N/A	<b>11c. Modification Work Complete</b> <div style="text-align: center;">                   N/A                  Cog. Engineer Signature &amp; Date             </div>	<b>11d. Restored to Original Condition (Temp. or Standby ECN only)</b> N/A Cog. Engineer Signature & Date
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**12. Description of Change**  
 Several Tank Farm Surveillance System (TFSS) Change Requests were incorporated into TMACS Software Release 4.0. The major software functions added in this release are initial implementation of Liquid Level monitoring and "Panalarm" alarm processing.

The results of this software test are documented in each Test Report, and summarized in Test Procedure 10 (WHC-SD-WM-TRP-113).

<b>13a. Justification (mark one)</b>	Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>
As-Found <input type="checkbox"/>	Facilitate Const. <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

**13b. Justification Details**  
 TMACS software development and release guidelines are governed under WHC-IP-0842, Section 12.2, Tank Farm Surveillance System Configuration Control Board, and WHC-SD-WM-CSCM-019, TMACS Software Configuration Management Plan

<b>14. Distribution (include name, MSIN, and no. of copies)</b> See Distribution Sheet	RELEASE STAMP <div style="border: 2px solid black; padding: 5px; width: fit-content; margin: auto;">                     OFFICIAL RELEASE                       BY WHC                      DATE <b>AUG 25 1994</b>                      STA 4                 </div>
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## **DISCLAIMER**

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1. ECN (use no. from pg. 1)

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<b>15. Design Verification Required</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>16. Cost Impact</b> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center; border: none;"><b>ENGINEERING</b></td> <td style="border: none;"></td> <td style="text-align: center; border: none;"><b>CONSTRUCTION</b></td> </tr> <tr> <td style="border: none;">Additional <input type="checkbox"/> \$</td> <td style="border: none;"></td> <td style="border: none;">Additional <input type="checkbox"/> \$</td> </tr> <tr> <td style="border: none;">Savings <input type="checkbox"/> \$</td> <td style="border: none;"></td> <td style="border: none;">Savings <input type="checkbox"/> \$</td> </tr> </table>	<b>ENGINEERING</b>		<b>CONSTRUCTION</b>	Additional <input type="checkbox"/> \$		Additional <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$		Savings <input type="checkbox"/> \$	<b>17. Schedule Impact (days)</b> Improvement <input type="checkbox"/> Delay <input type="checkbox"/>
<b>ENGINEERING</b>		<b>CONSTRUCTION</b>									
Additional <input type="checkbox"/> \$		Additional <input type="checkbox"/> \$									
Savings <input type="checkbox"/> \$		Savings <input type="checkbox"/> \$									

**18. Change Impact Review:** Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	<input type="checkbox"/>	Seismic/Stress Analysis	<input type="checkbox"/>	Tank Calibration Manual	<input type="checkbox"/>
Functional Design Criteria	<input type="checkbox"/>	Stress/Design Report	<input type="checkbox"/>	Health Physics Procedure	<input type="checkbox"/>
Operating Specification	<input type="checkbox"/>	Interface Control Drawing	<input type="checkbox"/>	Spares Multiple Unit Listing	<input type="checkbox"/>
Criticality Specification	<input type="checkbox"/>	Calibration Procedure	<input type="checkbox"/>	Test Procedures/Specification	<input type="checkbox"/>
Conceptual Design Report	<input type="checkbox"/>	Installation Procedure	<input type="checkbox"/>	Component Index	<input type="checkbox"/>
Equipment Spec.	<input type="checkbox"/>	Maintenance Procedure	<input type="checkbox"/>	ASME Coded Item	<input type="checkbox"/>
Const. Spec.	<input type="checkbox"/>	Engineering Procedure	<input type="checkbox"/>	Human Factor Consideration	<input type="checkbox"/>
Procurement Spec.	<input type="checkbox"/>	Operating Instruction	<input type="checkbox"/>	Computer Software	<input checked="" type="checkbox"/>
Vendor information	<input type="checkbox"/>	Operating Procedure	<input type="checkbox"/>	Electric Circuit Schedule	<input type="checkbox"/>
OM Manual	<input type="checkbox"/>	Operational Safety Requirement	<input type="checkbox"/>	ICRS Procedure	<input type="checkbox"/>
FSAR/SAR	<input type="checkbox"/>	IEFD Drawing	<input type="checkbox"/>	Process Control Manual/Plan	<input type="checkbox"/>
Safety Equipment List	<input type="checkbox"/>	Cell Arrangement Drawing	<input type="checkbox"/>	Process Flow Chart	<input type="checkbox"/>
Radiation Work Permit	<input type="checkbox"/>	Essential Material Specification	<input type="checkbox"/>	Purchase Requisition	<input type="checkbox"/>
Environmental Impact Statement	<input type="checkbox"/>	Fac. Proc. Samp. Schedule	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Report	<input type="checkbox"/>	Inspection Plan	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Permit	<input type="checkbox"/>	Inventory Adjustment Request	<input type="checkbox"/>		<input type="checkbox"/>

**19. Other Affected Documents:** (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
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**20. Approvals**

	Signature	Date		Signature	Date
<b>OPERATIONS AND ENGINEERING</b>			<b>ARCHITECT-ENGINEER</b>		
Cog Engineer [DA Barnes]	<i>David Barnes</i>	6/2/94	PE		
Cog. Mgr. [JS Schofield]	<i>John Schofield</i>	6/1/94	QA		
QA [JA Warren]	<i>J.A. Warren</i>	6/7/94	Safety		
Safety		N/A	Design		
Security		N/A	Environ.		
Environ.		N/A	Other		
Projects/Programs		N/A			
Tank Waste Remediation System		N/A			
Facilities Operations [R Nil]		6/16/94	<b>DEPARTMENT OF ENERGY</b>	N/A	
Restoration & Remediation		N/A	Signature or Letter No.		
Operations & Support Services		N/A			
IRM/ISS/C&MSS [RB Bass]	<i>RB Bass</i>	6/6/94	<b>ADDITIONAL</b>	N/A	
IRM/ISS/C&MSS [DG Spurling]	<i>DG Spurling</i>	6/6/93			
Other		N/A			
		N/A			

**RELEASE AUTHORIZATION**

**Document Number:** WHC-SD-WM-TRP-113, REV 4

**Document Title:** TMACS TEST PROCEDURE TP009: ACROMAG DRIVER

**Release Date:** 8/25/94

\* \* \* \* \*

**This document was reviewed following the  
procedures described in WHC-CM-3-4 and is:**

**APPROVED FOR PUBLIC RELEASE**

\* \* \* \* \*

**WHC Information Release Administration Specialist:**



Kara Broz

(Signature)

8/25/94

(Date)

<b>SUPPORTING DOCUMENT</b>		1. Total Pages 12
2. Title TMACS Test Procedure TP009: Acromag Driver	3. Number WHC-SD-WM-TRP-113	4. Rev No. 4
5. Key Words Software, Test Procedure, Tank Monitor and Control System, TMACS Software Project  <b>APPROVED FOR PUBLIC RELEASE</b> <i>EMB 8/25/94</i>	6. Author Name: SJ Washburn <i>Steven J Washburn</i> Signature Organization/Charge Code 62610/N46G1	
7. Abstract The TMACS Software Project Test Procedures translate the project's acceptance criteria into test steps. Software releases are certified when the affected Test Procedures are successfully performed and the customers authorize installation of these changes.  This Test Procedure tests the TMACS Acromag Software Driver (Bridge Code).		
<del>8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.</del>  <del>PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.</del>  DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.		10. RELEASE STAMP  <div style="border: 1px solid black; padding: 5px; text-align: center;"> OFFICIAL RELEASE <b>13</b>  BY WHC  DATE <b>AUG 25 1994</b>  <i>STA 4</i> </div>
9. Impact Level Q		

RECORD OF REVISION

(1) Document Number

WHC-SD-WM-TRP-113

Page 1

(2) Title

Tank Monitor And Control System (TMACS) Software Project, Release 4.0  
Test Procedure TP009, Acromag Driver

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cg. Engr.	(6) Cg. Mgr.	Date
0	(7) Software Release 0.0 Release Testing Released under EDT 159986, 10/15/92			
1	Software Release 1.0 Release Testing Released under ECN 196866, 1/31/93			
2	Software Release 2.0 Release Testing Released under ECN 196864, 10/1/93			
3	Software Release 3.0 Release Testing Released under ECN 196863, 1/15/94			
4 RS	Software Release 4.0 Release Testing Released under ECN 196862, 5/31/94	<i>D. James 6/6/94</i>	<i>John Schmitt 6/6/94</i>	

TANK MONITOR AND CONTROL SYSTEM

(TMACS)

SOFTWARE PROJECT

TEST PROCEDURE TP009:

ACROMAG DRIVER

Robert B. Bass  
Steven J. Washburn

IRM Chemical & Waste Management  
Software Support

SIGN OFF:

<i>P. C. Scaief</i>		<i>6-7-94</i>
CC Scaief TMACS Program Engineer	signature	Date
<i>DAVID BARNES</i>	<i>David Barnes</i>	<i>5/26/94</i>
DA Barnes TMACS Cognizant Engineer	signature	Date
<i>John Freer</i>	<i>[Signature]</i>	<i>5/26/94</i>
WJ Jones IRM Software V&V	signature	Date
<i>Dave Spurling</i>	<i>Dave Spurling</i>	<i>5/26/94</i>
DG Spurling TMACS Project Manager	signature	Date
<i>RB Bass</i>	<i>RB Bass</i>	<i>6/3/94</i>
RB Bass IRM Manager	signature	Date

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## 1.0 TEST ITEMS

This Test Procedure addresses the testing of the functionality of the TMACS Acromag driver software in conjunction with a new bridge for the Panalarm Annunciator system. The features to be tested are given in the test case below:

Table 1. Test Cases

5.1 Acromag Bridge Interaction with Panalarm Bridge . . . . .	5
5.1.1 Acromag Bridge Communication . . . . .	5
5.1.2 Test Interaction with Panalarm Bridge . . . . .	6

## 2.0 ACCEPTANCE CRITERIA AND REQUIREMENTS

The acceptance criteria for this Test Procedure are taken from Section 9.0 of the TMACS Software Upgrade Project: Acceptance Criteria (see Appendix A).

### Functions Not Currently Provided:

- 9.2.3 Add capability to change the polling rate of an ACROMAG station in the ACROMAG bridge code. (Change Request 92-025)
- 9.3.2 Implement a menu-driven interface for configuring the ACROMAG stations. (Change Request 92-026)
- 9.3.3 Implement a method to store, modify, and download complete ACROMAG station configurations. (Change Request 92-027)
- 9.5 Implement the capability to send command strings to ACROMAG stations. (Change Request 92-028)

## 3.0 TESTER INFORMATION

The TMACS system is an application built using the G2 Real-Time Expert System. The instructions for using the mouse, mouse buttons, and keyboard are given below.

The majority of user control of the system involves pointing at objects on the computer screen using the POINTER. The pointer is an arrow that is pointing to the upper left of the screen. When a user moves the mouse, the pointer moves on the screen.

The G2 system treats the left and right mouse buttons as if they were a single button. Whenever the use of a mouse button is required the user is free to use either of these buttons.



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The following terms are used to describe actions performed with the mouse:

- To **MOVE** the pointer, slide the mouse with no buttons pressed.
- To **POINT** to a push-button or object, move the pointer to the appropriate place on the screen.
- To **CLICK** on an object, first move your mouse so that the screen pointer rests on the object. Then, press the mouse button and release immediately without moving the mouse.
- To **DRAG** an object with the mouse, first move the mouse so that the screen pointer rests on the object. Then, press the mouse button and move the mouse without releasing the button. The object moves along with the screen pointer as you move the mouse. Release the button when the object is in the desired place. To drag a window in TMACS place the mouse in a blank area around the margin of the window and drag. (Note: the drag function is not provided for all windows.)

If the G2 screen becomes unreadable or objects overwrite each other the screen can be redrawn by typing Control-C. (Hold down the "Control" key while typing the letter C).

#### 4.0 PRE-TEST INSPECTION AND SETUP REQUIREMENTS

This Test Procedure uses G2 software developed for production use, and can be identified in three parts as "/home/G2/TMACS/prod/TMACS\_Release\_x\_x.KB" (where x\_x refers to the current revision number, with only one file in the directory matching the template), "/home/G2/BRIDGE/acromag\_brg" (Acromag bridge), "/home/G2/BRIDGE/PANALM/panalm\_brg" (Panalarm bridge) and "/home/G2/BRIDGE/printer\_brg" (alarm printer bridge).

This Test Procedure is performed by:

- Communication with a local Acromag station,
- Communication with a local Panalarm cabinet,

It is assumed that at least an 8 port serial multiplexor is attached to the "Slave" workstation and that the Acromag can function through each of its ports.

To set this test up the Test Administrator must perform the following steps:

1. Make sure the TMACS Slave workstation which runs the Acromag bridge software is connected to local Acromag unit corresponding to port 5 of the serial multiplexor.

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2. Start the Acromag bridge from a Unix command tool on the TMACS Slave workstation. To do this you must go to the directory "/home/G2/BRIDGE/ACROMAG" and enter the command "acromag\_brg 22205".
3. Make sure the TMACS Slave workstation which runs the Panalarm bridge software is connected to a local Panalarm cabinet corresponding to port 7 of the serial multiplexor.
3. Start the Panalarm bridge from a Unix command tool on the TMACS Slave workstation. To do this you must go to the directory "/home/G2/BRIDGE/PANALM" and enter the command "panalm\_brg 23007".

5.0 TEST STEPS WITH EXPECTED RESULTS

STEP	DESCRIPTION	VERIFY
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5.1 Acromag Bridge Interaction with Panalarm Bridge

5.1.1 Acromag Bridge Communication

1	<p>Have the Test Administrator set up the test for <u>Acromag emulation mode</u>. When the Port 5 emulator and Acromag driver are running, enable the display of send and received commands on the emulator. Verify that <u>commands received</u> by the Acromag emulator from the Acromag bridge is in the form of ASCII hexadecimal digits and ASCII characters:</p> <p style="text-align: center;">[SS][CC]RH[MMMM]#[XX]</p> <p>where [SS] is a 2 hexadecimal digit station number, [CC] is a 2 hex digit starting channel number, "RH" is the Acromag command "Read Hex", [MMMM] is the 4 hex digit channel mask, # is the checksum delimiter, and [XX] is the two hex digit checksum value of the command.</p> <p>Verify that <u>command responses</u> from the Acromag emulators to the Acromag bridge is in the form of ASCII hexadecimal digits and ASCII characters given below:</p> <p style="text-align: center;">[A/R][SS][CC]:[NNNN]...#[XX]</p> <p>where [A/R] is the character "A" or "R" for accept or reject of command received, [SS] and [CC] are the station and channel, [NNNN]... is a string of four hexadecimal ASCII digits representing the value for each channel selected by the channel mask, and [XX] is the two digit hexadecimal checksum value of the command response.</p>	<p>JRF</p> <p>JRF</p> <p>JRF</p>
2	<p>Once communication has been verified between the emulator software and TMACS bring up the ACROMAG-ROOT workspace. Then click on the development ports button followed by the Test Port 05 button. You should then see the subworkspace of ACROMAG-TEST-PORT-05. On this workspace you will see the BX analogs and BY analogs. Click on both buttons to bring up their respective Acromag station objects. Observe one of the stations for several minutes and see that it does not expire for more than a second.</p>	<p>JRF</p>

STEP	DESCRIPTION	VERIFY
<b>5.1.2 Test Interaction with Panalarm Bridge</b>		
3	Pause G2 and have the Test Administrator start the Panalarm Bridge running. Resume G2 again when this is completed and the Acromag Bridge should also resume running. Verify that the Panalarm bridge is running properly by observing data coming across the PC serial analyzer and that the Panalarm interface status is 2.	JK
4	Verify that each Acromag station object is still receiving data by examining the data expiration attribute and the table of attributes for that object. The expiration times should not expire for more than a second.	JK

**6.0 REFERENCES**

*Series 4000 Ascii Communication Mode Programmer's Reference Manual, Manual No. 8500-228, Acromag Incorporated, Wixom, Michigan 1990.*

**7.0 ATTACHMENTS**

- Acceptance Sheet
- Exception Sheets
- Data/Verification Sheet
- Test Log

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### EXCEPTION SHEET

TEST PROCEDURE NUMBER: TP009 STEP#: None DATE: 5/26/94

**DESCRIPTION:**

None

**RESOLUTION:**

DATE RESOLVED: \_\_\_\_\_

**APPROVAL:**

<u>PAT SCANLAN Pat Scanlan</u>	<u>5/26/94</u>
TMACS Software Test Procedure Tester	Date
<u>John Freer</u>	<u>5/26/94</u>
TMACS Software Test Procedure Witness	Date
<u>Steven J Washburn</u>	<u>5/26/94</u>
SJ Washburn, TMACS Test Procedure Software Engineer	Date
<u>Dave Spurling</u>	<u>5/26/94</u>
DG Spurling, TMACS Software Project Manager	Date

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### ACCEPTANCE SHEET

TEST PROCEDURE NUMBER: TP009

DATE: 5/26/94

ORGANIZATION NAME: Chem & Waste Mgmt S/W SPT.

ORG#: 62610

EXCEPTION SHEETS FOR THIS TEST PROCEDURE:

TESTER	WITNESS	STEP	DATE	RESOLVED
<u>None</u>				

COMMENTS:

All of the test steps of this test procedure have been tested and exception sheets for this test procedure have been resolved.

APPROVAL:

<u>PAT SCANLAN Patrick Scanlan</u>	<u>5/26/94</u>
TMACS Software Test Procedure Tester	Date
<u>John Freed</u>	<u>5/26/94</u>
TMACS Software Test Procedure Witness	Date
<u>Steven J Washburn</u>	<u>5/26/94</u>
SJ Washburn, TMACS Test Procedure Software Engineer	Date
<u>Dave Spurling</u>	<u>5/26/94</u>
DG Spurling, TMACS Software Project Manager	Date
<u>C.C. Scaief</u>	<u>6-7-94</u>
CC Scaief, TMACS Program Engineer	Date

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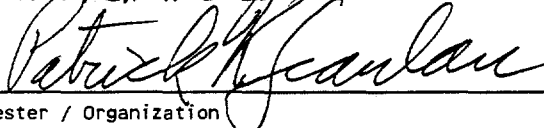
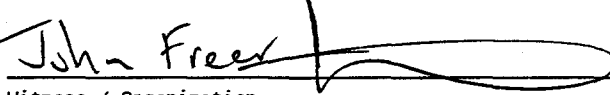
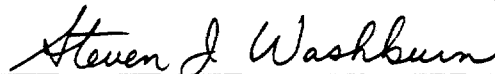
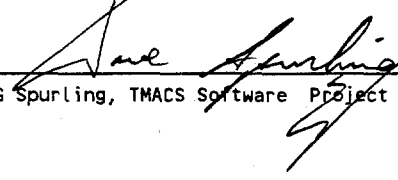
### DATA/VERIFICATION SHEET

This Sheet provides a record of Personnel who are involved in testing, data recording, verifying, and evaluating the Test Procedure. This form needs to be completed before a formal test is begun.

**DIRECTIONS:**

Print the name, sign, initial, and date the below lines of the participants.

TEST PROCEDURE NUMBER: TP009

<p><i>PATRICK K. SCANLAN</i>  </p> <p>Tester / Organization</p>	<p><i>PKS 5/26/94</i></p> <p>Initials      Date</p>
<p><i>John Freer</i>  </p> <p>Witness / Organization</p>	<p><i>JNF 5/26/94</i></p> <p>Initials      Date</p>
<p><i>Steven J Washburn</i>  </p> <p>SJ Washburn, TMACS Test Procedure Software Engineer</p>	<p><i>sgw 5/26/94</i></p> <p>Initials      Date</p>
<p><i>Dave Spurling</i>  </p> <p>DG Spurling, TMACS Software Project Manager</p>	<p><i>DA 5/26/94</i></p> <p>Initials      Date</p>
<p>Name / Organization</p>	<p>Initials      Date</p>
<p>Name / Organization</p>	<p>Initials      Date</p>
<p>Name / Organization</p>	<p>Initials      Date</p>

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**TEST LOG**

TEST PROCEDURE NUMBER: TP009

Date: 5/26/94

TESTER: Patrick McCarroll

WITNESS: John Fievert

**TEST LOG NOTES:**

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**COMMENTS:**

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