DISTRIBUTION SHEET

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TMACS Software Release 4.1, Test Procedure Reports for TP001, TP002, TP003, TP005, TP009, TP010 / N46G1		ECN No. 608598

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
JJ BADDEN	S5-12		ECN w/ WHC-SD-WM-TRP-114 att.		
DA BARNES	R1-51		"		
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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 608598

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.		4. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	DG Spurling, IRM/ISS/C&WMSS, R1-01, 3-2969		8/29/94
	5. Project Title/No./Work Order No. TMACS/N46G1	6. Bldg./Sys./Fac. No. 2750E/TMACS/200E	7. Impact Level Q
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TRP-105, Rev 65 WHC-SD-WM-TRP-106, Rev 65 WHC-SD-WM-TRP-107, Rev 65 WHC-SD-WM-TRP-109, Rev 54 WHC-SD-WM-TRP-113, Rev 54 WHC-SD-WM-TRP-114, Rev 65	9. Related ECN No(s). ECN 196863 EDT 159986 EDT 600611 EDT 196862	10. Related PO No.

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N46G1	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

Four Tank Farm Surveillance System (TFSS) Change Requests were incorporated into TMACS Software Release 4.1. These include AN Farm sensor addition (temperature, pressure), C-106 instrument install (Enraf, pressure), Enraf installs (C-103,BX-106,T-102,T-107) and enhancements to the Acromag software driver.

The results of this software test are documented in each Test Report, and summarized in Test Procedure 10 (WHC-SD-WM-TRP-114).

13a. Justification (mark one)							
Criteria Change	[X]	Design Improvement	[]	Environmental	[]	As-Found	[]
Facilitate Const.	[]	Const. Error/Omission	[]	Design Error/Omission	[]		

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

14. Distribution (include name, MSIN, and no. of copies)

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A-6000-135 (01/93) WEF067

A-7900-013-1 (06/92)

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 608598

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

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

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

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog Engineer [DA Barnes]	8/31/94	PE	
Cog. Mgr. [JS Schofield]	8/31/94	QA	
QA [JA Warren]	08/31/94	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 [TW Bohan]	8/31/94	DEPARTMENT OF ENERGY N/A	
Restoration & Remediation	N/A	Signature or Letter No.	
Operations & Support Services	N/A		
IRM/ISS/C&WMSS [RB Bass]	8/31/94	ADDITIONAL N/A	
IRM/ISS/C&WMSS [DG Spurling]	8/30/94		
Other	N/A		
	N/A		

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-TRP-113, REV 5
Document Title:	TMACS TEST PROCEDURE TP009: ACROMAG DRIVER
Release Date:	9/1/94

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

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WHC Information Release Administration Specialist:

Kara Broz — 9/1/94

(Signature) — (Date)

SUPPORTING DOCUMENT

1. Total Pages 19

2. Title	3. Number	4. Rev No.
TMACS Test Procedure TP009: Acromag Driver	WHC-SD-WM-TRP-113	5

5. Key Words

Software, Test Procedure, Tank Monitor and Control System, TMACS Software Project

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KMB 9/1/94

6. Author

Name: SJ Washburn

Steven J Washburn

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).

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.

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9. Impact Level Q

10. RELEASE STAMP

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DATE SEP 01 1994

STA 4

RECORD OF REVISION	(1) Document Number WHC-SD-WM-TRP-113	Page 1

(2) Title

Tank Monitor And Control System (TMACS) Software Project, Release 4.1
Test Procedure TP009, Acromag Driver

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. 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	Software Release 4.0 Release Testing Released under ECN 196862, 5/31/94		
5 RS	Software Release 4.1 Release Testing Released under ECN 608598, 8/29/94	D Barnes 3/31/94	John Hoffman 5/31/94

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:

DAVID BARNES David Barnes. 8/24/94
DA Barnes TMACS Cognizant Engineer signature Date

J.A. Warren J.A. Warren 8/24/94
Software QA/V&V signature Date

Dave Spurling 8/24/94
DG Spurling TMACS Project Manager signature Date

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

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)

Functions Added in this Software Release:

Change Request 94-017: Modify the Acromag communications software to improve performance characteristics. Changes include:

1) No retry if station is down;
2) Only one retry if station was previously up.

Tested in Section 5.4.

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.

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), and "/home/G2/BRIDGE/printer_brg" (alarm printer bridge).

This Test Procedure is performed by:

- Communication with an Acromag emulator program,

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

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

1. Make sure all Acromag Station Objects in the knowledge base are using the same GSI interface and have unique station addresses.

2. Make sure the TMACS Slave workstation which runs the Acromag bridge software is connected to the Acromag emulator program through a port on the serial multiplexor on the workstation. In addition, make sure a serial analyzer is tied into the connection between the Acromag bridge and the Acromag emulator. (This is necessary to observe the data coming across the communication line).

3. 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 <port #>".

5.0 TEST STEPS WITH EXPECTED RESULTS

STEP	DESCRIPTION	VERIFY
	5.1 Acromag Bridge Communication	
1	Have the Test Administrator set up the test for Acromag emulation mode. Configuration for the Acromag Emulator is given in Appendix A. When the Acromag emulator and Acromag driver software are running, enable the display of send and received commands on the emulator. Verify that commands received by the Acromag emulator from the Acromag bridge are in the form of ASCII hexadecimal digits and ASCII characters: [SS][CC]RH[MMMM]#[XX] 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. Verify that command responses from the Acromag emulators to the Acromag bridge is in the form of ASCII hexadecimal digits and ASCII characters given below: [A/R][SS][CC]:[NNNN]...#[XX] 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.	9:58 Start JCB 8/25/94
2	Once communication has been verified between the Acromag emulator software and TMACS bridge interface bring up the ACROMAG-ROOT workspace. Then click on the development ports button followed by any one of the four test Port buttons. You should then see the subworkspace for that test port. On this workspace select the analog Acromag station to observe. Observe one of the stations for several minutes and verify that it does not expire for more than a second.	JCB 8/25/94

STEP	DESCRIPTION	VERIFY
	5.2 Test Checksum Errors	
3	Pause G2 and have the Test Administrator set up the Acromag Emulator Configuration Parameters as given in Appendix B, section 1.0, for testing a single checksum error. Resume G2 again when this is completed and the emulator should also resume running.	JeB 8/25/94
4	Start the Acromag Emulator with display of received and transmitted messages to the screen enabled (in some cases this will not be possible because of added timing problems caused by message display) and the audible bell disabled. For the Acromag station specified you should verify that a sequence similar to that shown in Appendix B, section 2.0, is displayed by the emulator after a checksum error. Also verify that you do not see a white alarm stating a Checksum error has occurred displayed on the G2 MOST RECENT ALARM window. This is because a retry is attempted before a checksum error will be reported.	JeB 8/25/94
5	Pause G2 and then set up the Acromag Emulator Configuration Parameters as given in Appendix C, section 1.0, for testing multiple checksum errors. Resume G2 again when this is completed and the emulator should also resume running.	JeB 8/25/94
6	For the Acromag station specified you should verify that a sequence similar to that shown in Appendix C, section 2.0, is displayed by the emulator after a checksum error. Also verify that a white alarm stating a Checksum error has occurred is displayed on the G2 MOST RECENT ALARM window. Because of G2 internal data verification an internal alarm message will be generated which will supersede the checksum error message on the "MOST RECENT ALARM" window. Therefore, to see the white alarm you will need to get into the alarm summary paging mode by clicking on the "CURRENT ALARMS" button on the CONTROL PANEL. Then you will need to page through the alarms until you see the specified checksum error message.	JeB 8/25/94
	5.3 Test Acromag Reject Errors	
7	Pause G2 and then set up the Acromag Emulator Configuration Parameters as given in Appendix D, section 1.0, for testing a single Acromag command reject error. Resume G2 again when this is completed and the emulator should also resume running.	JeB 8/25/94

STEP	DESCRIPTION	VERIFY
8	For the Acromag station specified you should verify that the sequence similar to that shown in Appendix D, section 2.0, is displayed after an Acromag reject error. Also verify that a white alarm stating an Acromag reject error has occurred is displayed on the G2 "MOST RECENT ALARM" window with the Acromag error code you specified in the emulator configuration. Because of G2 internal data verification an internal alarm message will be generated which will supersede the reject alarm message on the "MOST RECENT ALARM" window. Therefore, to see the white alarm you will need to get into the alarm summary paging mode by clicking on the "CURRENT ALARMS" button on the CONTROL PANEL. Then you will need to page through the alarms until you see the specified reject alarm message.	JeB 8/25/94
9	Pause G2 and then set up the Acromag Emulator Configuration Parameters as given in Appendix E, section 1.0, for testing multiple Acromag command reject errors. Resume G2 again when this is completed and the emulator should also resume running.	JeB 8/25/94
10	On the Acromag station specified you should verify that a sequence similar to that shown in Appendix E, section 2.0, is displayed after a reject error. Also verify that a white alarm stating an Acromag reject error has occurred is displayed on the first reject sent from the emulator. The second reject error from the emulator will occur on the next request for that station. You should verify that no command retries are attempted for each reject error received since the Acromag bridge does not retry when a reject error is generated by the Acromag station. In addition the reject error message should only appear once if continuous rejects are received from the Acromag emulator. However, if an intervening Acromag command is accepted this error suppression is terminated and an error message will be displayed upon the next reject generated by the emulator.	JeB 8/25/94

5.4 Test Non-responsive Acromag Stations

11	In this section we will test the situation when an Acromag station stops communicating with the Acromag bridge that the bridge will not attempt to resend a command to that station. We will also verify that when communication is restored that the Acromag bridge will only send a retry when a checksum error is received from the station.	JeB 8/25/94

STEP	DESCRIPTION	VERIFY
12	Set up the emulator to the configuration given in Appendix B (station number is arbitrary). Pause G2 and then unplug the cable to the Acromag emulator from the serial multiplexor. Resume G2 again when this is completed and the emulator should also resume running.	JAB 9/25/94
13	Verify that the Acromag stations on this Serial Port no longer respond to commands from the TMACS Acromag Bridge and that the bridge does not resend commands to which no response is received. This can be observed by the use of a Serial Analyzer between the Unix workstation and Acromag emulator computers. You should also see a series of white alarm messages indicating communication has been lost with these stations.	JAB 9/25/94
14	Pause G2 and then plug the cable from the Acromag emulator back into the serial multiplexor. Resume G2 again when this is completed and the emulator should also resume running.	JAB 9/25/94
15	Verify that the Acromag stations on this Serial Port now respond to commands from the TMACS Acromag Bridge and that the bridge resends commands to the Acromag station which is sending out checksum errors. You should also observe that white alarm messages appear notifying you that communication has been established with these stations.	JAB 9/25/94

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

APPENDIX A: Acromag Emulator Program Display

1.0 Main Screen for Acromag Emulator Program

```
                COMMUNICATION TEST PROGRAM
                        TMACS
                     VERSION 1.00

              MAIN MENU

      "1"    Test #1  -  Generate checksum errors
      "C"    Change configuration parameter values
      "D"    Display configuration parameter values
      "S"    Save configuration parameter values
      "T"    Terminate program and return to DOS

      Enter desired command:
```

2.0 Sample Display of Acromag Emulator Configuration Parameters

```
                CONFIGURATION PARAMETERS VALUES

RS-232 PARAMETERS
      Port Number:  1          Baud Rate:   9600 Parity:  N
      Data Bits:    8          Stop Bits:      1

ACROMAG PARAMETERS
      Acromag Address:       0
      TC Temperature:       70.0
      Temperature Station Offset:  -1.0
      Temperature Channel Offset:   0.1
      Digital Data (Hex):  00008000
      Selected Address:       0
      Selected channel:       5
      Selected TC Temperature:       70.0
      Response Delay Time (sec.):     0.0

ERROR PARAMETERS
      Error Rate (%):        30.0
      Multiple Rate:          0
      Checksum Mask (Hex):  01
      Channel Error Mask (Hex):  A000
      Reject Value:            12
      Audible Bell:            OFF


      ( - Press any key to continue - )
```

APPENDIX B: Single Checksum Errors Test Configuration

Display of Acromag Emulator Configuration Parameters
for Testing of Single Checksum Errors

1.0 CONFIGURATION PARAMETER VALUES

RS-232 PARAMETERS
Port Number: 1 Baud Rate: 9600 Parity: N
Data Bits: 8 Stop Bits: 1

ACROMAG PARAMETERS
Acromag Address: 5
TC Temperature: 70.0
Temperature Station Offset: -1.0
Temperature Channel Offset: 0.1
Digital Data (Hex): 00008000
Selected Address: 0
Selected channel: 0
Selected TC Temperature: 70.0
Response Delay Time (sec.): 0.000

ERROR PARAMETERS
Error Rate (%): 30.0
Multiple Rate: 0
Checksum Mask (Hex): 80
Channel Error Mask (Hex): A000
Reject Value: 00
Audible Bell: ON

2.0 EXPECTED OUTPUT FROM ACROMAG EMULATOR

0501RH2051#28	Command from Driver to Emulator for Station 5 requesting ASCII Hex data for all channels specified by mask value (between the "RH" and "#" characters.
A0501:00B800BC00BD00BF#4E	Response from Emulator to Driver Accepting Read Hex Command for station 5 and returning the data for 4 channels along with a **bad** checksum (preceded by the "#" character).
0501RH2051#28	Driver has detected bad checksum and resends the command to the Emulator.
A0501:00B800BC00BD00BF#CE	Response from Emulator to Driver Accepting Read Hex Command for station 5 and returning the data for 4 channels along with a **good** checksum.

APPENDIX C: Multiple Checksum Errors Test Configuration

Display of Acromag Emulator Configuration Parameters
for Testing of Multiple Checksum Errors

1.0 CONFIGURATION PARAMETER VALUES

RS-232 PARAMETERS

Port Number:	1	Baud Rate:	9600	Parity:	N
Data Bits:	8	Stop Bits:	1		

ACROMAG PARAMETERS

Acromag Address:	5
TC Temperature:	70.0
Temperature Station Offset:	-1.0
Temperature Channel Offset:	0.1
Digital Data (Hex):	00008000
Selected Address:	0
Selected channel:	0
Selected TC Temperature:	70.0
Response Delay Time (sec.):	0.000

ERROR PARAMETERS

Error Rate (%):	30.0
Multiple Rate:	1
Checksum Mask (Hex):	80
Channel Error Mask (Hex):	A000
Reject Value:	00
Audible Bell:	ON

2.0 EXPECTED OUTPUT FROM ACROMAG EMULATOR

0501RH2051#28	Command from Driver to Emulator for Station 5 requesting ASCII Hex data for all channels specified by mask value (between the "RH" and "#" characters.
A0501: 00B800BC00BD00BF#4E	Response from Emulator to Driver Accepting Read Hex Command for station 5 and returning the data for 4 channels along with a **bad** checksum (preceded by the "#" character).
0501RH2051#28	Driver has detected bad checksum and resends the command to the Emulator.
A0501: 00B800BC00BD00BF#4E	Response from Emulator to Driver Accepting Read Hex Command for station 5 and returning the data for 4 channels along with a second **bad** checksum.

No more retires should appear

APPENDIX D: Single Reject Errors Test Configuration

Display of Acromag Emulator Configuration Parameters
for Testing of a Single Reject Error

1.0 CONFIGURATION PARAMETER VALUES

RS-232 PARAMETERS
Port Number: 1 Baud Rate: 9600 Parity: N
Data Bits: 8 Stop Bits: 1

ACROMAG PARAMETERS
Acromag Address: 5
TC Temperature: 70.0
Temperature Station Offset: -1.0
Temperature Channel Offset: 0.1
Digital Data (Hex): 00008000
Selected Address: 0
Selected channel: 0
Selected TC Temperature: 70.0
Response Delay Time (sec.): 0.000

ERROR PARAMETERS
Error Rate (%): 30.0
Multiple Rate: 0
Checksum Mask (Hex): 00
Channel Error Mask (Hex): A000
Reject Value: 12
Audible Bell: ON

2.0 EXPECTED OUTPUT FROM ACROMAG EMULATOR

0501RH2051#28 — Command from Driver to Emulator for Station 5 requesting ASCII Hex data for all channels specified by mask value (between the "RH" and "#" characters.

R0501:12#B5 — Response from Emulator to Driver **Rejecting** Read Hex Command for station 5 and returning an Acromag error code of **12** along with a checksum (preceded by the "#" character).

APPENDIX E: Multiple Reject Errors Test Configuration

Display of Acromag Emulator Configuration Parameters
for Testing of Multiple Reject Errors

1.0 CONFIGURATION PARAMETER VALUES

RS-232 PARAMETERS

Port Number:	1	Baud Rate:	9600	Parity:	N
Data Bits:	8	Stop Bits:	1		

ACROMAG PARAMETERS

Acromag Address:	5
TC Temperature:	70.0
Temperature Station Offset:	-1.0
Temperature Channel Offset:	0.1
Digital Data (Hex):	00008000
Selected Address:	0
Selected channel:	0
Selected TC Temperature:	70.0
Response Delay Time (sec.):	0.000

ERROR PARAMETERS

Error Rate (%):	30.0
Multiple Rate:	1
Checksum Mask (Hex):	00
Channel Error Mask (Hex):	A000
Reject Value:	12
Audible Bell:	ON

2.0 EXPECTED OUTPUT FROM ACROMAG EMULATOR

0501RH2051#28	Command from Driver to Emulator for Station 5 requesting ASCII Hex data for all channels specified by mask value (between the "RH" and "#" characters.
R0501:12#B5	Response from Emulator to Driver **Rejecting** Read Hex Command for station 5 and returning the data for 4 channels along with a **bad** checksum (preceded by the "#" character).

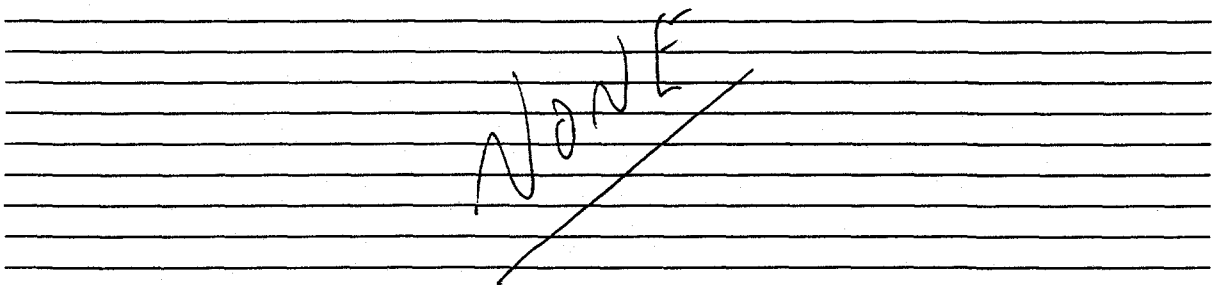
Note: The second command may happen after requests for other stations.

0533RH2051#28	Second Command from Driver to Emulator for Station 5 requesting ASCII Hex data for all channels specified by mask value (between the "RH" and "#" characters.
R0501:12#B5	Response from Emulator to Driver Accepting Read Hex Command for station 5 and returning the data for 4 channels along with a **bad** checksum (preceded by the "#" character).

EXCEPTION SHEET

TEST PROCEDURE NUMBER: TP009 **STEP#:** _____ **DATE:** _____

DESCRIPTION:



RESOLUTION: **DATE RESOLVED:** _____

APPROVAL:

TMACS Software Test Procedure Tester	Date
TMACS Software Test Procedure Witness	Date
SJ Washburn, TMACS Test Procedure Software Engineer	Date
DG Spurling, TMACS Software Project Manager	Date

ACCEPTANCE SHEET

TEST PROCEDURE NUMBER: TP009 **DATE:** 8/25/94

ORGANIZATION NAME: C&WMSS **ORG#:** 62616

EXCEPTION SHEETS FOR THIS TEST PROCEDURE:

TESTER	WITNESS	STEP	DATE	RESOLVED
NONE				

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

APPROVAL:

Steven J Washburn — 8/25/94
TMACS Software Test Procedure Tester — Date

John E Brannan — 8/25/94
TMACS Software Test Procedure Witness — Date

Steven J Washburn — 8/25/94
SJ Washburn, TMACS Test Procedure Software Engineer — Date

Dave Spurling — 8/25/94
DG Spurling, TMACS Software Project Manager — Date

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

Steven J Washburn /	SJW	8/25/94
Tester / Organization	Initials	Date
John E Brannan / 62610	JEB	8/25/94
Witness / Organization	Initials	Date
Steven J Washburn	SJW	8/25/94
SJ Washburn, TMACS Test Procedure Software Engineer	Initials	Date
Dave Spurling	DS	8/25/94
DG Spurling, TMACS Software Project Manager	Initials	Date
Name / Organization	Initials	Date
Name / Organization	Initials	Date
Name / Organization	Initials	Date

TEST LOG

TEST PROCEDURE NUMBER: TP009 **Date:** 8/25/94

WITNESS: John B Brannon

TEST LOG NOTES:

STEP 10 5.3 CAN BE ELIMINATED FROM TEST CASE

COMMENTS: