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ENGINEERING DATA TRANSMITTAL

1. EDT 609610

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	SST Engineering	N/A
5. Proj./Prog./Dept./Div.:	6. Design Authority/ Design Agent/Cog. Engr.:	7. Purchase Order No.:
W-320	JW Bailey/JH Huber	N/A
8. Originator Remarks: For Release		9. Equip./Component No.: Enraf
		10. System/Bldg./Facility: 241-G
11. Receiver Remarks: 11A. Design Baseline Document? [ ] Yes [X] No		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: ~~1/16/98~~ 3-12-98

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-1992	All	0	Acceptance Test Report for the Enraf Control Panel Software	Q	1	1	

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
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(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Design Authority JW Bailey	JW Bailey	3/9/98		4	4	D A King	DA King	3/6/98	S2-48
		Design Agent N/A									
1	1	Cog.Eng. JH Huber	JH Huber	03-5-98	T4-07						
1	1	Cog. Mgr. RE Larson	RE Larson	3/12/98	T4-07						
1	1	QA WK Adams	WK Adams	3/10/98	S5-12						
		Safety									
		Env.									

18. JH Huber JH Huber 3-5-98
Signature of EDT Originator — Date

19. RE Larson 3/12/98
Authorized Representative for Receiving Organization — Date

20. JW Bailey 3/9/98
Design Authority/ Cognizant Manager — Date

21. DOE APPROVAL (if required) Ctrl. No.
[ ] Approved
[ ] Approved w/comments
[ ] Disapproved w/comments

Acceptance Test Report for the Enraf Control Panel Software

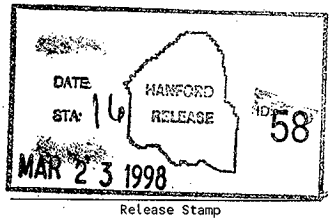
John H. Huber, LMHC
PO BOX 1500, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 609610 UC: 512 and 2030
Org Code: 74800 Charge Code: D2M41
B&R Code: EW3120071 Total Pages: 46

Key Words: Enraf, Densitometer, Software, Control, Panel, Gauge, Gage, ATG, 854, Level, LIT, Level Indicating Transmitter, Density Indicating Transmitter, Logger

Abstract: This Acceptance Test Report was written to document testing of the Enraf Series 854 Control Panel Software created by Lockheed Martin Hanford Company. The report documents verification of functionality and integrity of the software.

Release Approval 3/23/98 Date



Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number HNF-1992	Page 1

(2) Title
ACCEPTANCE TEST REPORT FOR THE ENRAF CONTROL PANEL SOFTWARE

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	Authorized for Release (6) Cog. Mgr. Date
RS 0	(7) EDT 609610	JH Huber	RE Larson 3/12/98

Table of Contents

1.0 Introduction

On March 5, 1998, the Enraf Control Panel Software program was acceptance tested per HNF-1991 Revision 0. The test was performed at the Department of Energy's Hanford Site, 200 West Area, building MO-281. The test validated the functionality of the software for use by project W-320, C-106 Retrieval.

2.0 Description of Test

The purpose of the test procedure was to partially verify the functionality of the Enraf Control Panel Software. The test cycled through the majority of functions within the program. Functions not tested will be tested per Operational Test Procedure OTP-320-010 at a later date.

2.1 Criteria

The following criteria was used to determine whether the software passed or failed the test.

2.1.1 Pass.

- The gauge responds correctly (as described in vendor documentation, Ref. 1) to all commands sent through the program.
- If gauge related error codes are encountered, they may be cleared either through the PET or the program. However, the program, while running, must provide some indication of all gauge related errors encountered.

2.1.2 Fail.

- If any of the pass criteria are not met and cannot be immediately resolved.
- If the system crashes for reasons that are clearly related to program performance and cannot be immediately resolved.

3.0 Test Method and Test Equipment

The Enraf gauge was installed on a test bench with approximately 20 cm of travel between the highest displacer position and the floor. The gauge was connected to a Enraf 858 Computer Interface Unit (CIU) via proprietary connections, and a Portable Enraf Terminal (PET) was connected to the gauge via Enraf proprietary infrared connector. A standard level displacer was used (H-2-817634 item 55). A short, water filled container was placed below the gauge to simulate a tank product interface. The software was installed on a computer workstation with the following relevant specifications.

Make & Model:	Micron Millenia
CPU:	Pentium 166MHz
Memory:	64 MegaByte
Harddrive:	3 GigaByte
Graphics Adapter:	Diamond Stealth 3D Turbo (64bit)
Graphics Memory:	4MB
Monitor:	17" , 1600x1200
Display Setting:	16bit, 1152x864
Operating system:	Microsoft Windows 95 ver 4.00.950a with Internet Explorer 4.0 4.71.1712.6 (effects desktop look and feel)

Visual Basic 5.0 was also loaded on this workstation in order to facilitate rapid turn-around of software revisions. A new executable was created for each revision and copied directly into the installed application directory.

4.0 Test Results

4.1 Discussion of Test Results

A reproduction of the master control copy of the test procedure follows (Attachment 1). The data sheets containing all data taken are included as a part of Attachment 1.

4.2 Discussion of Test Exceptions

4.2.1 Exception 1

At step 1.4.3 it was noted that responsibilities for safety individuals were listed. Since the approval designator for the acceptance test was "Q", the Safety organization was never involved in the procedure. Inclusion of the Safety responsibilities was an oversight on the part of the ATP author. The step was lined out and initialed by the Test Director.

4.2.2 Exception 2

At step 2.3.14 it was found that some of the nomenclature for windows in the program and that shown on window figures in the procedure did not match. The program nomenclature had been changed since the procedure was released. The change was necessary to standardize similar windows within the program. Revision of nomenclature is deemed to have no relevance to the functionality or functional requirements of the program.

4.2.3 Exception 3

At step 2.3.19.1, the step called for using CTRL-F12 to open the PC Enraf Terminal (PCET) window. At this point in the procedure, the program is obtaining continuous level scans from the gauge. These scans involve program loops that included "DoEvents()" routines (See Visual Basic 5.0, Language Reference). For some reason, the "DoEvents()" routines were not capturing the key combination. As a work around, the PCET window was accessed through the menu (SETUP ¦ PCET) which worked fine. Functionality of the CTRL-F12 key combination has no relevance to the functional requirements of the program. Prior to performance of the Operational Test Procedure (OTP) OTP-320-010, a minor modification will be made to the program to handle the key combination more effectively.

4.2.4 Exception 4

At step 2.3.23 the program did not require closure of the text editor window before continuing to the next step. In order to clean up the screen, the text editor window was closed. Keeping the text editor window open was not intentional (i.e. to test the ability of the program to function with the text editor window open). The change is considered editorial in nature.

4.2.5 Exception 5

Steps 2.3.25.1 through 2.3.25.4 involve creation of a gauge log file, which includes some file checking and back-up creation. After the ABORT button was selected, it was required to click the CREATE button again. However, the program simply aborted the log file creation immediately and would not create the log file. The Test Director examined the code and found that the program's abort flag was not getting reset. The code was changed to initialize the abort flag at the beginning of the create routine. The program functioned as desired after that.

5.0 Conclusions and Recommendations

The results of the Acceptance Test Procedure shows that the software functions as intended. The software is acceptable for use with Enraf 854 Advanced Technology Gauges and Enraf 858 Computer Interface Units.

6.0 References

(1) Instruction Manual Series 854 ATG Level Gauge, Enraf Inc., Part No. 4416.220, Version 2.2 (See CV-31560, vendor information file).

(2) Instruction Manual 854 ATG Density Software Package, Enraf Inc., Part No. 0000.564.4416.221-40, Version 1.0 (See CV-31560, vendor information file).

(3) System Requirements for Enraf Control Panel Software, Lockheed Martin Hanford Corporation, HNF-1569, dated February 25, 1998.

Attachment 1

Acceptance Test Procedure
HNF-1991
Master Control Copy

Stat (ES) Recorder Copy HNF-1992 Rev. 0

FEB 2 5 1998

ENGINEERING DATA TRANSMITTAL

1. EDT 609608

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) SST Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: W-320	6. Design Authority/ Design Agent/Cog. Engr.: JW Bailey/JH Huber	7. Purchase Order No.: N/A
8. Originator Remarks: For Release		9. Equip./Component No.: Enraf
		10. System/Bldg./Facility: 241-G
11. Receiver Remarks: 11A. Design Baseline Document? [] Yes [X] No		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 1/16/98

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1	HNF-1991	All	0	Enraf Control Panel Software Acceptance Test Procedure	Q	1	1	

16. KEY

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E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

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(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	1	Design Authority JW Bailey	[signature]	1/7/98		4	4	DA King	DA King	1/7/98	S2-48
		Design Agent N/A				1	2	QA WL Adams	WL Adams	2/24/98	S5-12
1	1	Cog.Eng. JH Huber	[signature]	1-5-98	T4-07						
1	1	Cog. Mgr. ~~JE Homan~~ JE Larson	[signature] for								
4	5	SQA	Cooper	1-29-98							
		Safety									
		Env.									

18.	19.	20.	21. DOE APPROVAL (if required)
JH Huber [signature] 1-5-98 Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	[signature] 1/7/98 Design Authority/ Cognizant Manager / Date	Ctrl. No. [] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (05/96) GEF097

Enraf Control Panel Software Acceptance Test Procedure

John H. Huber, LMHC
PO BOX 1500, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 609608 UC: 512 and 2030
Org Code: 74800 Charge Code: D2M41
B&R Code: EW3120071 Total Pages: ~~28 30~~ 31 2/25/98

Key Words: Enraf, Densitometer, Software, Control, Panel, Gauge, Gage, ATG, 854, Level, LIT, Level Indicating Transmitter, Density Indicating Transmitter, Logger

Abstract: This Acceptance Test Procedure was written to test the Enraf Series 854 Control Panel Software created by Lockheed Martin Hanford Company. The procedure verifies functionality and integrity of the software.

Release Approval 2/25/98 Date

DATE: STA: 4 FEB 25 1998 Release Stamp

Approved for Public Release

HNF-1992 Rev. 0

RECORD OF REVISION	(1) Document Number HNF-1991	Page 1

(2) Title
ENRAF CONTROL PANEL SOFTWARE ACCEPTANCE TEST PROCEDURE

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) EDT 609608	JH Huber [signature]	~~JL Homan~~ RE Larson [signature] for 2/24/98

HNF-1992 Rev. 0

HNF-1991
Revision 0

ENRAF CONTROL PANEL SOFTWARE ACCEPTANCE TEST PROCEDURE

J. H. Huber
Single-Shell Tank Engineering

February 5, 1998

AH5

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HNF-1991
REV 0

ENRAF CONTROL PANEL SOFTWARE ACCEPTANCE TEST PROCEDURE

1.0 INSTRUCTIONS

1.1 PURPOSE

This procedure checks that the Enraf Control Panel software program functions without crashing and fulfills the majority of the requirements set forth in HNF-1569.

1.2 SCOPE

This procedure provides acceptance testing for Enraf Control Panel software as described in HNF-1569 (Ref 1) and Internal Memo 8C620-97-007 (Ref 4). Since this test is performed in-office, rather than in the field, not all requirements can be verified.

1.2.1 Features to be tested.

This test will cover the software's ability to communicate with an Enraf 854 ATG Level Gauge/Densitometer. This will be evidenced by the software's ability to obtain continuous level scans, display data, transmit and receive individual gauge commands.

1.2.2 Features not to be tested.

Full density interface profile scanning capability cannot be tested. Such testing will be performed in the field during Operational Testing (see OTP-320-010). Also, this program will not test non-implemented controls located in the "File to Field" utility feature. This feature is not a program requirement, and there have been some programming difficulties in that area.

1.3 REFERENCES

(1) Instruction Manual Series 854 ATG Level Gauge, Enraf Inc., Part No. 4416.220, Version 2.2 (See CV-31560, vendor information file).

(2) Instruction Manual 854 ATG Density Software Package, Enraf Inc., Part No. 0000.564.4416.221-40, Version 1.0 (See CV-31560, vendor information file).

(3) System Requirements for Enraf Control Panel Software, Lockheed Martin Hanford Corporation, HNF-1569, dated February 25, 1998.

(4) Enraf Densitometer DAS Options, Numatec Hanford Corporation, Internal Memo 8C620-97-007, dated December 10, 1997.

1.4 RESPONSIBILITIES

Each organization participating in the execution of this ATP will designate personnel for the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the Recorder for listing on the Recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

1.4.1 Project Engineer

1.4.1.1 Designate a Test Director.

1.4.1.2 Coordinate testing with facility management.

1.4.1.3 Act as liaison between the participants in acceptance testing.

1.4.1.4 Ensure informal testing and inspection is complete.

1.4.1.5 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.

1.4.1.6 Notify the persons performing and witnessing the test prior to the start of testing.

1.4.1.7 Notify all concerned parties when a change is made in the testing schedule.

1.4.1.8 Approve field changes to the ATP.

1.4.1.9 Sign/date Test Exception Sheet when ATP is approved and accepted.

1.4.1.10 Take necessary action to clear exceptions to the ATP.

1.4.1.11 Sign/date Test Exception Sheet when an exception has been resolved.

1.4.1.12 Provide a distribution list for the approved and accepted ATP.

1.4.1.13 Confirm that all equipment required for performing this test (as listed in Section 1.6) will be available for the test duration.

1.4.1.14 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.

1.4.2 Test Director

1.4.2.1 Witness/Perform the tests.

1.4.2.2 Coordinate all acceptance testing.

1.4.2.3 Confirm that shop testing (if any) and/or inspection (if any) of the test unit(s) or portion of the test unit(s) have been completed.

1.4.2.4 Stop any test which may cause damage to the test unit(s) until the test procedure has been revised.

1.4.2.5 Approve field changes to the ATP.

1.4.2.6 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.

1.4.2.7 Evaluate recorded data, discrepancies, and exceptions.

1.4.2.8 Obtain from the Project Engineer, any information or changes necessary to clear or resolve exceptions.

1.4.2.9 Sign/date Test Data sheets and Test Execution sheet when execution of the ATP has been completed.

1.4.2.10 Sign/date Test Exception Sheet when acceptable retest has been performed.

1.4.2.11 Prepare and obtain required signatures on the Acceptance Test Report prior to reproduction and distribution.

1.4.2.12 Provide software revisions as necessary.

~~1.4.3 Safety~~

~~1.4.3.1 Review and approve the Acceptance Test Procedure.~~

3-5-98

~~A9~~ A1-10

1.4.4 Recorder

1.4.4.1 Witness testing and perform all recording using black ink.

1.4.4.2 Record names of all designated personnel on the Test Execution sheet on the Recorder's copy of ATP prior to testing.

1.4.4.3 Observe tests, record test data and maintain Test Log.

1.4.4.4 Sign/date the Test Execution Sheet, Test Data sheets and Test Exception sheet(s) as the Recorder.

1.4.4.5 "Check off" every test step on the Recorder's copy as it is completed, next to the step number and under the appropriate gauge identifier.

1.4.4.6 Record authorized field changes to the ATP.

1.4.4.7 Record, on a Test Exception Sheet, exceptions and test steps that are not performed. Additional Test Exception Sheets can be reproduced as needed.

1.4.4.8 Orally notify the Test Director at the time an objection is made.

1.4.4.9 After ATP is complete assign page numbers to Test Exception Sheets.

1.4.4.10 Submit the completed ATP to the Test Director for approval signatures and distribution.

1.4.5 Quality

1.4.5.1 Witness the tests.

1.4.5.2 Evaluate recorded data, discrepancies, and exceptions.

1.4.5.3 Approve field changes to the ATP.

1.4.5.4 Sign/date Test Execution Data Sheet when execution of the ATP is completed and again when it is approved and accepted.

1.4.5.5 Sign/date Test Exception Sheet when an exception is made and again when it has been resolved.

1.5 Description of the System

The Enraf Control Panel software was developed in-house by Lockheed Martin Hanford Corporation. The project began with Visual Basic[1] 3.0, then upgraded to Visual Basic 4.0 and finaly Visual Basic 5.0. The program utilizes standard Microsoft Custom Controls such as MSCOMM in order to effect RS232C communications. Standard routines were also imported from Enraf Inc.'s LoggerV18 program code (provided freely by Enraf Inc.), originally written Microsoft QuickBasic[2].

1.6 TEST CONDITIONS AND EQUIPMENT REQUIRED

The equipment listed below is required to perform this procedure.

- A 486/66 IBM Compatible PC with at least 16MB RAM and 1.0 GB Harddrive.
- A 6-Foot 25-pin to 9-pin null modem cable (RS232C).
- An Enraf 854 ATG Level Gauge with Densitometer EPROM installed.
- An Enraf 858 Communications Interface Unit.
- Portable Enraf Terminal (PET) Model No. 847.

1.7 DELIVERABLES

At completion of testing an Acceptance Test Report shall be produced containing a description of the test, requirements, results, conclusions and completed data sheets.

[1]Visual Basic is a registered trademark of Microsoft Corporation.

[2]QuickBasic is a registered trademark of Microsoft Corporation.

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1.8 Schedule

It is expected that no more than two full days will be required for testing. There is no scheduled start date for software acceptance testing, however project W-320 will require a working program no later than April 10, 1998. An Acceptance Test Report will need to be prepared and released two to three weeks following the test.

1.9 Training

Person or persons setting up the gauge should have successfully completed Enraf Training through Lockheed Martin Hanford Company, or have attanded Enraf Inc.'s Series 854 Advanced Technology Gauge Course at their training facility in Houston, Texas.

2.0 TEST EXECUTION SECTION

PROCEDURE NOTE

In the following steps, if values are requested, the values shall be recorded in the Test Execution Data Sheet (located at the end of this procedure) for the appropriate step number in the Value column. If verification is requested, write accept in the accept/reject column in the Test Execution Data Sheet for the appropriate step number.

If an error occurs in any step, an exception will be entered in the Exceptions Data Sheet listing the step where the error occurred, and a general description of the error. Corrective actions shall be in accordance with section 3.0. A force transducer calibration may be performed at any time at the Test Conductor's discretion.

2.1 GAUGE SETUP

INFORMATION

This section prepares the gauge for software testing. It connects power and signal wires and unlocks the servo motor. See Figure 1 for a diagram of the setup. Some steps listed herein may have already been completed prior to testing. Initialing these steps verifies their prior performance.

DAK 2.1.1 Mount the gauge per the 854 ATG Level gauge Instruction Manual. Provide electrical connections to the gauge per the 854 ATG Level Gauge Instruction Manual, the National Fire Protection Association (NFPA 70) National Electrical Code.

DAK 2.1.2 Install the drum and displacer per the Enraf Series 854 ATG Level Gauge Instruction Manual, Section 8.4.

DAK 2.1.3 Run a pair of 18awg minimum wire from the TT terminals on the gauge to the corresponding terminals on the CIU.

DAK 2.1.4 Unlock the servo motor prior to connecting power per the 854 ATG Level Gauge Instruction Manual, Section 8.5.

DAK 2.1.5 Connect the PET to the optical port located on the side of the gauge housing.

DAK 2.1.6 Connect the gauge to a 120 Vac (+/- 5 Vac) power source, per the 854 ATG Level Gauge Instruction Manual, Section 4.3.1. The display screen on the gauge will show one dark line. After approximately 20 seconds, the display will show the gauge initializing.

DAK 2.1.7 Configure the gauge per Appendix A.

2.2 CHECKING FOR ERROR CODES (Using the PET)

INFORMATION
Record any errors on the data sheet. Correct the errors, or enter it as an exception. For a list of error codes, see the Enraf 854 ATG Level Gauge Instruction Manual.

DAK 2.2.1 Enter Command [EP] = "XPU error code". Verify that EP000 is displayed. RECORD VERIFICATION in the data sheet.

DAK 2.2.2 Enter Command [ES] = "SPU error code". Verify that ES0000 is displayed. RECORD VERIFICATION in the data sheet.

2.3 TESTING PROGRAM FUNCTIONALITY

INFORMATION
This section assumes the gauge has been configured with no error codes and the program has been installed successfully on the computer.

DAK 2.3.1 In Windows95[3], Click START | PROGRAMS and locate the Enraf Control Panel selection. Click on it. RECORD VERIFICATION that the program shows a splash screen for a few seconds then a logon window.

DAK 2.3.2 Enter a username, then the password [1234] and click OK. Record Verfication that the program rejects this password.

[3]Windows95 is a registered trademark of Microsoft Corporation.

DAK 2.3.3 Enter password [W5=ENRAF5] and click OK. RECORD VERIFICATION that the program accepts this password and loads the main window (Figure 2).

DAK 2.3.4 Select HELP | ABOUT and RECORD the program revision number.

DAK 2.3.5 Select Setup | CIU SETUP from the menu. A new window appears (Figure 7) with text boxes as follows. RECORD VERIFICATION that the values are entered as shown. If not change them.

Baud Rate = 2400
Com Port = 2
CIU Address = 1
Gauge Address = 10
Scan Rate (sec) = 3
Turn Around (msec) = 900

DAK 2.3.6 Click ADVANCED on the CIU Setup window. A new window appears with text boxes as follows. RECORD VERIFICATION that the values are entered as shown. If not, change them and click OK.

Parity = O (the letter 'O')
Data Bits = 7
Stop Bits = 1
CIU Wait = 0.5

DAK 2.3.7 Click OK on the CIU Setup window.

DAK 2.3.8 Click the START SCANS button, OR select CONNECT | START SCANS OR press F2. RECORD VERIFICATION of the following.

DAK 2.3.8.1 Indicator lights on the 858 CIU flash.

DAK 2.3.8.2 Communications status icon on upper left corner of main window shows yellow, arrowed lines connecting the instruments.

DAK 2.3.8.3 "Connected..." finally appears below the Communications status icon.

BAK 2.3.8.4 Within 30 seconds, a level readings appears in the GAUGE DISPLAY window.

BAK 2.3.9 Click the SEND button. RECORD VERIFICATION that a new window appears (Figure 4).

BAK 2.3.10 Click the TG button. RECORD VERIFICATION that the gauge displacer begins to raise and exclamation marks (!) appear after the level reading in the GAUGE DISPLAY.

BAK 2.3.11 After gauge completes the TG function ("INN" appears in gauge display), click the CA button and respond YES to the HPT coverage prompt. RECORD VERIFICATION that CA appears in the GAUGE DISPLAY.

BAK 2.3.12 Click the FR button. RECORD VERIFICATION that "FR" appears in the GAUGE DISPLAY.

BAK 2.3.13 Click the UN button. RECORD VERIFICATION that "I1" appears on the GAUGE DISPLAY (No "F"s are permitted in the GAUGE DISPLAY).

Note - The gauge part number is found on the gauge name plate.

BAK 2.3.14 In the Command Entry box type PN, then click SEND. RECORD VERIFICATION that a number representing the gauge part number is displayed in the ~~Gauge~~ Communication ~~Response~~ window. Record BAK 3-5-98

BAK 2.3.15 Click the DENSITY button. RECORD VERIFICATION that a new window appears (Figure 3).

BAK 2.3.16 Enter parameters as follows.

BAK 2.3.16.1 Start Level: 156

BAK 2.3.16.2 Sediment Level: 1

BAK 2.3.16.3 Interval: 12

BAK 2.3.17 Click GO and respond YES to the prompt, then after a few seconds, click ABORT. RECORD VERIFICATION that the output window indicates that the function has aborted.

DAK 2.3.18 Click GO. RECORD VERIFICATION that the program attempts to start an IP function, then displays a Gauge SPU Error message box and exits the function.

2.3.19 Recover from the SPU error as follows.

DAK 2.3.19.1 ~~Press CTRL-F12.~~ Select SETUP/PSET DAK 3-5-93

DAK 2.3.19.2 Enter password: ecpws

DAK 2.3.19.3 Click the W2 button (Figure 6) on the PC Enraf Terminal window that appears.

DAK 2.3.19.4 Click the EX button. The gauge should recover within 1 minute and perform a TG (the displacer will raise, then lower).

DAK 2.3.19.5 After the gauge recovers, click CLOSE to close the window.

DAK 2.3.19.6 Close the Get Density Window.

Note - Most of the functionality of the File-to-Field window is outside the scope of this test and either will not be tested or has been disabled at designtime.

DAK 2.3.20 Click the FTF button. RECORD VERIFICATION that a new window appears (Figure 8).

DAK 2.3.21 Click on a file tab next to the RQS Filename entry box. A dialog window appears. Select a file, then click the VIEW button. A text window should open containing the contents of the file.

DAK 2.3.22 At the text window menu, click FILE | PRINT. The file should print to the local printer.

DAK 2.3.23 Close the File to Field Window. Text editor and DAK 3-5-93

DAK 2.3.24 On the main window, click the LOG button. RECORD VERIFICATION that a new window appears (Figure 5).

DAK 2.3.25 Click CREATE.

DAK 2.3.25.1 The program creates a file for the gauge log file. If the file already exists, dialog will

be displayed asking to overwrite or not, or cancel. Click NO to overwrite.

DAK 2.3.25.2 The program will start polling the gauge parameters, displaying them in the text window and a progress bar will show. RECORD VERIFICATION that this occurs.

DAK 2.3.25.3 Abort log file creation, RECORD VERIFICATION that the program aborts log file creation.

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DAK 2.3.25.4 Restart log file creation and choose to overwrite the existing file. Allow this log file to be created in its entirety. RECORD VERIFICATION that a log file is created.

3.0 EXCEPTIONS AND PASS/FAIL CRITERIA

3.1 EXCEPTIONS

Exceptions to the test are dispositioned and agreed to by all witnesses. Actions taken regarding disposition are noted on the "Exception to Acceptance Test" sheet. Typical dispositions are:

- Test approved with exception (i.e., rerun of the acceptance test unnecessary).
- Entire acceptance test to be repeated after the discrepancy has been corrected.
- ATP step(s) affected to be repeated after the discrepancy has been corrected.

3.2 PASS/FAIL CRITERIA

3.2.1 Pass.

The following conditions must be met in order for the program to have passed this acceptance test.

- The gauge responds correctly (as described in vendor documentation, Ref. 1) to all commands sent through the program.
- If gauge related error codes are encountered, they may be cleared either through the PET or the progam. However, the program, while running, must provide some indication of all gauge related errors encountered.

3.2.2 Fail.

If any of the following conditions/incidences are encountered, the program has failed the acceptance test.

- If any of the pass criteria are not met and cannot be immediately resolved.
- If the system crashes for reasons that are clearly related to program performance and cannot be immediately resolved.

3.2.3 Final Acceptance.

Final acceptance of the software is evidenced by a signed Exceptions Data Sheet, Test Approved, with or without exceptions. All exceptions must be resolved.

4.0 CHANGE CONTROL AND EXCEPTIONS TO ACCEPTANCE TEST SECTION

4.1 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required field changes must be per Sections 1.4.1, 1.4.2, and 1.4.5. Field changes shall also be recorded as an exception.

4.2 TEST EXECUTION

The acceptance test procedures detailed in Section 2.0 shall be performed in sequential steps starting with Section 2.1. As required by Section 1.4.4, the Recorder will check off every test step in the space provided on the Recorder's copy of the ATP as each step is completed. Any step that requires a value recording or verification must also be recorded on the Test Data Sheet. If program revisions are required to complete the testing, a new executable will be created and copied to the application directory. The new executable will have incremented the minor revision number by one. Record the new revision in the current comment block on the Data Sheet.

4.2.1 Without Exception

4.2.1.1 Check applicable space on the Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.

4.2.1.2 Sign and date the Test Execution Sheet in the spaces provided.

4.2.1.3 Distribute requisite copies of ATP.

4.2.2 With Exception/Resolved

4.2.2.1 Check applicable space on the Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.

4.2.2.2 Sign and date the Test Execution Sheet in the spaces provided.

4.2.2.3 Distribute requisite copies of ATP.

4.2.3 With Exception/Outstanding

4.2.3.1 Check applicable space on the Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

4.2.3.2 Sign and date the Test Execution Sheet in the spaces provided.

4.2.3.3 Distribute requisite copies of ATP.

5.0 TEST DATA MANAGEMENT

The test data shall be entered on the attached data sheets. Witness signatures at the bottom of the data sheet indicates that the witness agrees to the accuracy of the data recorded and comparisons made.

Upon successful completion of testing activities, the master copy of the DATA SHEETS will be signed by the Test Witnesses. An appropriate "Acceptance Test Report" shall be generated to publish the results of testing activities.

5.1 ACCEPTANCE TEST REPORT GUIDANCE

The data sheets which are completed during the testing activities will be included in the Acceptance Test Report. If additional gauges are tested using this procedure, a different data sheet will be used for each gauge and added to the ATR as a revision.

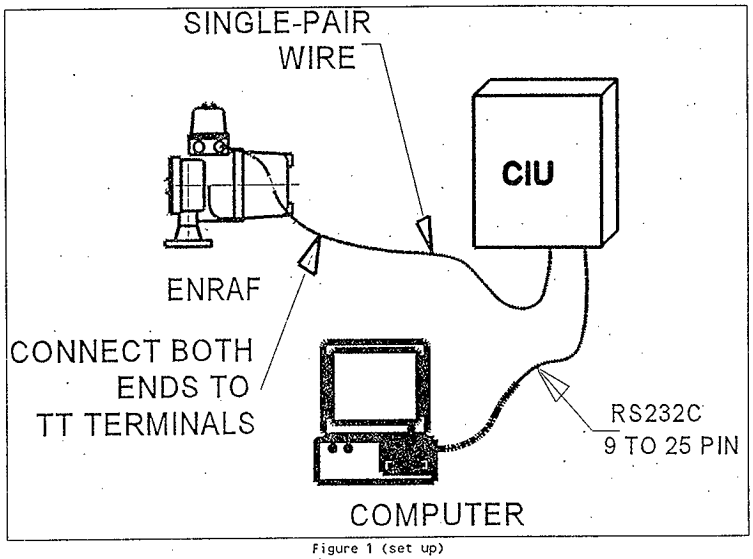

Figure 1 (set up)

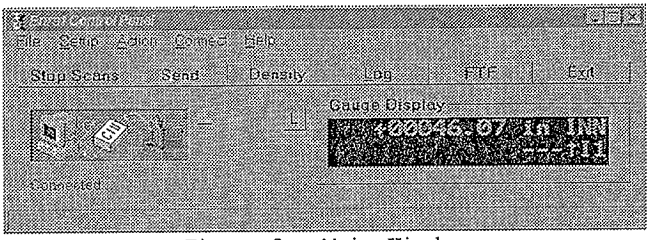

Figure 2 - Main Window

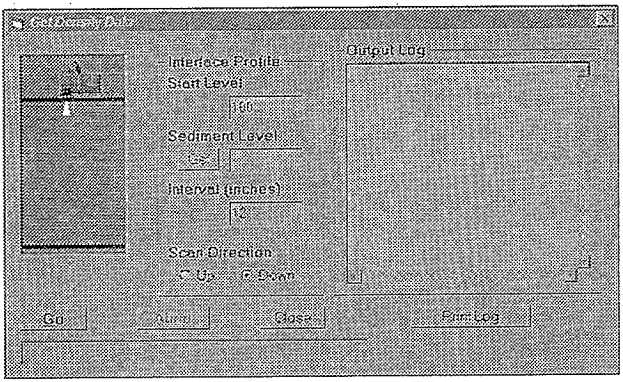

Figure 3 - Density Window

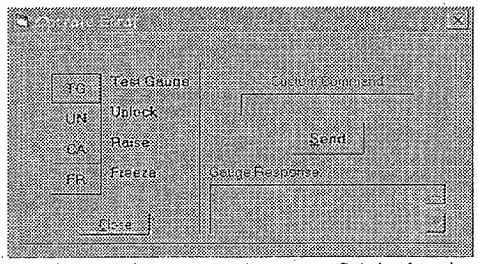

Figure 4 - Operate Enraf Window

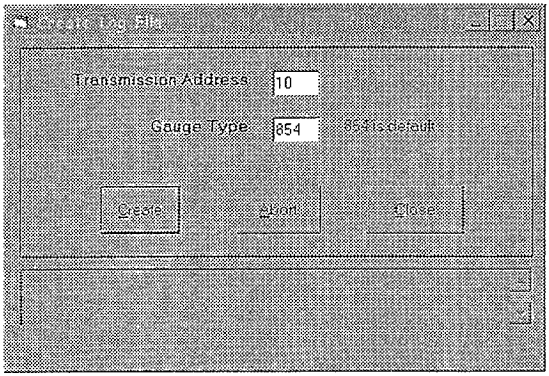

Figure 5 - Gauge Log Window

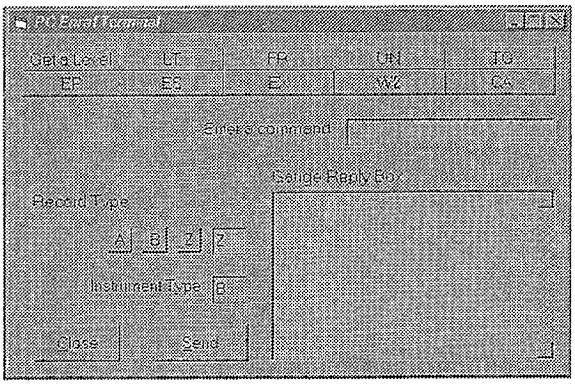

Figure 6 - Service Window

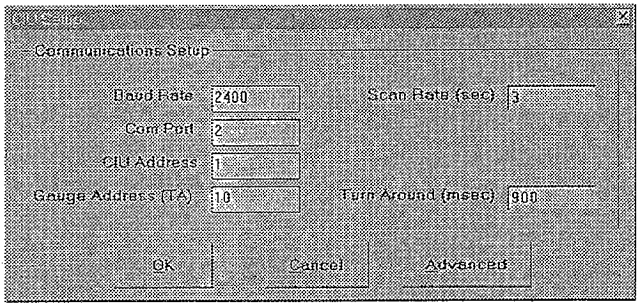

Figure 7 - CIU Setup Window

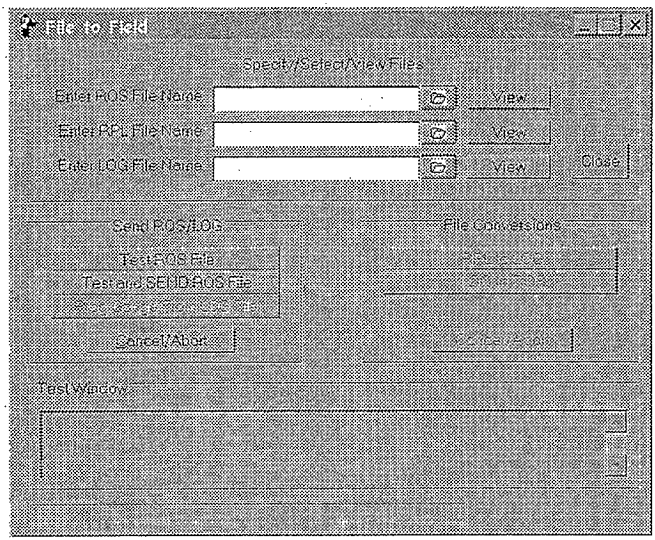

Figure 8 - File To Field Window

TEST EXECUTION DATA SHEET				
Date: 3/5/98				Tank Number:
Gauge Serial Number: 854-21-250				Densitometer? (Yes) No
Test Performed By: John Huber				
Reference Sequence	Attribute	Accept /Reject	Value	Comment
2.2.1	EP	A	EP000	
2.2.2	ES	A	ES0000	
2.3.1	LOADS	A		
2.3.2	1234 REJ.	A		
2.3.3	W5=ENRAF5	A		
2.3.4	Revision	A	1.0.0	Changed to 1.0.1
2.3.5	CIU Setup	A	2400,2,1,10,3,900	
2.3.6	CIU Advanced	A	0,7,1,0.5	
2.3.8.1	CIU LIGHTS	A		
2.3.8.2	COM ICON	A		
2.3.8.3	CONNECTED	A		
2.3.8.4	LEVEL RDGS	A		
2.3.9	NEW WINDOW	A		
2.3.10	TG	A		
2.3.11	CA	A		
2.3.12	FR	A		
2.3.13	UN	A		
2.3.14	PN	A	21250	
2.3.15	NEW WINDOW	DMK A		
2.3.17	ABORT	A		
2.3.18	IP ATTEMPT	A		
2.3.20	NEW WINDOW	A		

TEST EXECUTION DATA SHEET				
Date: 3/5/98				Tank Number:
Gauge Serial Number: 854-21-250				Densitometer? (Yes) No
Test Performed By: John Huber				
Reference Sequence	Attribute	Accept /Reject	Value	Comment
2.3.24	NEW WINDOW	A	10,854	
2.3.25.1	LOG FILE CHECK	A		
2.3.25.2	LOG FILE START	A		
2.3.25.3	LOG FILE ABORT	A		
2.3.25.4	LOG FILE CREATED	A		Corrected test exception with new S/W Rev.

Test Witnesses:

TEST DIRECTOR — Date: 3-5-98

TEST RECORDER — 3-5-98

Quality Control — Date: 3-5-98

HNF-1991
REV 0

TEST EXECUTION DATA SHEET CONTINUED

EXCEPTIONS DATA SHEET

Page 1 of 1

Paragraph No.	Description/Disposition
~~2.3.25.4~~ 1.4.3	Safety NOT required - Approval designator = Q
2.3.14	Nomenclature on Range Response changed to Communication Record for clarification.
2.3.19.1	Changed step to use menu rather than shortcut keys. - shortcut keys are not a program requirement.
2.3.23	Added "close text editor" to clean up windows before proceeding to next step. Clarification and ease of test execution.
2.3.25.4.	This function was inadvertently aborting. Revised software to fix the problem. The "abort" flag was not getting reset in the "create" routine. New software version 1.0.1.

TEST APPROVED - NO EXCEPTIONS:		TEST APPROVED - WITH EXCEPTIONS:	
Quality Assurance	Date	W.L. Adams Quality Assurance	3/5/98 Date
Test Director	Date	Test Director	3-5-98 Date
Project Engineer	Date	Project Engineer	3-5-98 Date

APPENDIX A

NOTE:

The commands typed on the PET or computer are shown in square brackets "[]" (The square brackets are NOT to be typed as part of the command). Included is any additional information the command requires. After typing the text within the square brackets, press the ENTER key. If an error is made during the typing of the command, use the backspace (BS) key to delete the error.

After entering a command, the PET or computer will give one of two responses: The first response will show the entered command with an "&" character at the end (i.e. "TG&"). This response tells the user that the gauge accepted the command. The second response will show the two digit command (i.e. TG) followed by a "!" and a three digit error code (i.e. "TG!053"). This command tells the user that the gauge did not accept the command. For a list of error codes, see the Enraf 854 ATG Level Gauge Instruction Manual, section 12.4.

GAUGE SETUP GUIDANCE:

1. Turn PET ON. Connect the infrared connector from the PET to the ENRAF gauge.

2. Enter the TA command, note the gauge address displayed in the PET display, (i.e. TA05).

3. Enter command [W2=ENRAF2] <ENTER>.

4. Enter command [TS] <ENTER>. The PET should display the gauge baud rate setting. If it is not set to 2400, change it as follows.

   a. Enter command [TS=2400] <ENTER>. The gauge should accept this value.

5. Enter command [TA] <ENTER>. The PET should display the gauge address to be 10. If not, set it to 10 as follows.

a. Enter command [TA=10] <ENTER>. The gauge should accept this value.

6. Enter command [TT] <ENTER>. The PET should display a level equal to 20.00 inches. If not, set it to 20 as follows.

a. Enter command [TT=+00020.00] <ENTER>.
b. Enter command [RL=+00012.00] <ENTER>.
c. Enter command [HH=+00019.00] <ENTER>.
d. Enter command [HA=+00018.00] <ENTER>.
e. Enter command [MZ=+00015.00] <ENTER>.
f. Enter command [ML=+00000.00] <ENTER>.
g. Enter command [LL=+00001.00] <ENTER>.
h. Enter command [LA=+00002.00] <ENTER>.
i. Ensure that the displacer is touching the floor (or other desired reference level point and

Enter command [AR] <ENTER>.

k. The gauge will reinitialize. Wait for the displacer to come to rest before continuing.

l. Enter command [MH=+00017.00] <ENTER>.

7. Enter command [EX] <ENTER>. The gauge will reinitialize. Wait for the displacer to come to rest before continuing.