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ARMY COMMUNICATIONS-ELECTRONICS ENGINEERING INSTALLAT--ETC F/G 17/2
REDSTONE ARSENAL AMME-E ACCEPTANCE TEST (CONTRACT GS-00C-00058)--ETC(U)
MAY 77

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CCC-TED-77-TR-006

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DEPARTMENT OF THE ARMY
 U.S. ARMY COMMUNICATIONS-ELECTRONICS
 ENGINEERING INSTALLATION AGENCY
 FORT HUACHUCA, ARIZONA 85613

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SUBJECT: Test Report, Redstone Arsenal AMME-E Acceptance Test (Contract
 GS-00C-00058), Publication No. CCC-TED-77-TR-006

9 Test repts.

14

Commander
 US Army Communications Systems Agency
 ATTN: CCM-TT-(H)-TA
 Fort Huachuca, Arizona 85613

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1. REFERENCES.

- a. Contract GS-00C-00058, System Installation Plan for AMME Huntsville Expansion, 15 November 1976.
- b. USACEEIA Publication CCC-TED-TSRC, End of Test Report on the Phase I Redstone AMME System COR Letter T-18, 14 October 1975.
- c. DCAC 370-D175-1, LCS AUTODIN Interface and Control Criteria.
- d. DCAC 370-D195-1, DCS AUTODIN Interface Category I Testing.
- e. DCAC 370-D195-2, DCS AUTODIN TEMPEST Category II Testing Requirements.
- f. DCAC 370-D195-3, DCS AUTODIN Category III Operation and Acceptance Testing.
- g. DCAC 310-D70-30, DCS AUTODIN Switching Center and Tributary Operations.
- h. JANAP 128 Automatic Digital Network (AUTODIN) Operating Procedures.
- i. AR 105-31, Communications-Electronics Message Preparation.
- j. USACEEIA Publication ACCC-TED-74-TR-121, 27 March 1974.
- k. USACEEIA Publication ACCC-TED-74-TR-146, 27 September 1974.

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2. STATEMENT OF THE TASK.

→ This report identifies results of the Redstone Arsenal AMME-E acceptance tests conducted in accordance with the requirements of Contract GS-00C-00058. Testing was conducted in accordance with procedures contained in the US Army Automated Multi-media Exchange Test Plan, CDRL Item Number(s) 30 and 32, August 1976, with applicable revisions. ↙

3. BACKGROUND.

a. The AMME Level Automated Telecommunications Center (ATCC) Project is a portion of the Army Telecommunications Automation Program (ATCAP) developed by Commander, US Army Communications Command. The Commander, US Army Communications-Electronics Engineering Installation Agency (USACEEIA) was tasked by Commander, US Army Communications Systems Agency (USACSA) (Project Manager) to provide technical and test support for implementation of the AMME Project. The contract required UNIVAC to engineer, furnish, and install (EF&I) an automatic telecommunications system capable of processing and accounting for narrative and data record traffic at several command sites. After implementation of the fifth AMME site at Bailey's Crossroads, VA, Telecommunications Automation Directorate (TAD) of USACEEIA assumed software maintenance responsibilities for existing and future AMME locations.

b. The AMME is intended to be used as a store and forward switching system, capable of interfacing more than one AUTODIN Switching Center (ASC). Previously installed AMME's have the capability of operating with Interim Remote Terminals (IRT's) and Mode I Terminals in addition to over-the-counter (OTC) service. These sites also have a degraded mode backup capability which provides only OTC operation. Site configurations such as these are described as AMME-Basic installations. The next system level is an AMME-Expanded with dual 9400 processors (system redundancy) to eliminate AMME degraded mode functions. Under ATCAP Program, Redstone Arsenal was the second AMME site to be implemented. Redstone was implemented as an AMME-Basic but due to increasing traffic volume/remote terminals, the system had to be upgraded to an AMME-E. Results of this upgrade are contained in this document.

4. RESPONSIBILITIES.

a. Government Responsibilities. The Government is responsible for the following aspects of the test program:

- (1) Review and approve the vendor-submitted test plan and revisions.
- (2) Appoint system and subsystem test directors and assistants as required.

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(3) Conduct acceptance testing in accordance with the terms of the contract.

(4) Evaluate system's hardware/software test results.

(5) Provide contractually-required Government equipment and supplies for the test.

(6) Evaluate operator training.

(7) Conduct additional tests as necessary to demonstrate contractual compliance for specific requirements.

b. Vendor Responsibilities. UNIVAC is responsible for the following:

(1) Deliver on-site, system hardware and documentation in a state which is contractually complaint and ready for Government acceptance testing.

(2) Notify the Government, in writing, that a complete and successful dry run of all hardware has been conducted using approved test procedures prior to start of acceptance testing.

(3) Provide technical support, as required, to resolve questions or problems during the test.

(4) Provide maintenance support during the test.

(5) Maintain a complete and accurate record of hardware maintenance, software modifications, and support documentation changes resulting from the test.

5. SUMMARY OF RESULTS.

a. Completed milestone prior to AMME-E System test. Redstone Phase I hardware installation commenced on 5 January 77. This phase was completed while operating with existing AMME-Basic program. A successful Phase I performance period was concluded on 12 March 1977.

b. Testing of Redstone AMME-E System commenced on 4 March 1977. During certification of the AMME-E System (Hardware/Software), the existing Degraded Mode Operation (DCT-9000) was used to maintain on-line operation with the AUTODIN Switching Center.

c. Contractually, Redstone Phase II final hardware installation/re-configuration was completed on 5 March 1977 except for connecting the DCT 9000 into the AMME-E System. The DCT 9000 was originally scheduled for final

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configuration on 7 March 1977, but had to be delayed due to hardware/software problems being encountered. Additional time was needed to implement the AMME-E System and a decision was made to continue AMME-E checkout. By extending the test schedule of the AMME-E System, the Degraded Mode operation had to be maintained to process message traffic with AUTODIN ASC.

d. On 12 March 1977, the DCT 9000 was configured into the AMME System. By reaching this milestone, total AMME-E capabilities were now available to the user command.

e. Between 14-22 March 1977, USACEEIA test team analyzed and corrected some of the additional software problems found during on-site AMME-E test. Pending software problems not corrected are identified in attached Inclosure 1 of this report.

f. In accordance with USER command understanding, pending software problems will be analyzed and corrected by USACEEIA-TAD. After these software corrections have been verified by USACEEIA-TED, each correction will be resubmitted to Redstone for implementation. Allotted time frame for correcting these problems should be coordinated between USACEEIA-TAD and USER command.

g. On-site AMME-E audit was conducted with UNVIAC Customer Engineer. System audit was found correct for Redstone installation. (Attached Inclosure 2 shows results of hardware audit.)

7. CONCLUSIONS.

a. On 12 March 1977, Redstone AMME-E upgrade was successfully implemented with 13 identified software problems.

b. The system outage time incurred for implementing this site is considered reasonable. This system outage was caused by the amount of unexpected hardware/software problems found and corrected while working around live traffic conditions. This AMME-E upgrade was more complicated than the initial AMME-Basic installation because:

(1) Redstone is live operational site with 19 remote terminals.

(2) The hardware reconfiguration and software tests required that extreme care be taken not to interfere with live operation (DCT 9000-Degraded Mode Operation).

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c. AMME USER command was not prepared to continue testing and stay in degraded mode operation longer than three days (Friday evening, Saturday, and Sunday). After three days of AMME-E testing, direct electrical interface was discontinued to Redstone's 19 remote terminals. This was caused by the extended test period. Also, Redstone Communications Center had only one teletype unit available for preparing outgoing narrative traffic in degraded mode operation.

d. Software Support Center (SSC) test capabilities are inadequate for evaluating peak traffic conditions for system like Redstone and Letterkenny AMME. It is estimated that a 70 percent checkout is about the best that can be expected from a SSC verification because of: limited remote terminals, program complexity restricts certain SSC tests, simulation of heavy traffic conditions, and simultaneous system activity as demanded by a live AMME site. Improving or degrading speed of certain system functional capabilities could not be clearly determined during SSC checkout. On-site testing proved certain system capabilities had been degraded. Establishment of an average time response for all (major) system functions and comparing these times against new AMME software packages will be required of future SSC (AMME) releases. These type of system comparisons are becoming very visible because of the demand that is placed on the system for message processing at each particular site. More demands of the system capabilities are being made and this is due to the increase of remote terminals and traffic load.

e. During one of Redstone's heavy traffic periods the AMME-E System was working under the following conditions:

- (1) Around 700-900 messages (100,000 line blocks) scheduled for message transmission.
- (2) Two Message Entry Positions Active.
- (3) Nineteen Remote Terminals active.
- (4) Two traffic manager positions active.
- (5) Both AUTODIN circuits active.

After evaluating the system under the above conditions, it is felt that the AMME-E is close to maximum capability. However, thirteen additional Remote Terminals plus a DPI electrical interface are planned for AMME-E Redstone.

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f. Redstone AMME-E hardware audit was found satisfactory for final system configuration.

g. Performance and coordination of UNVIAC's on-site representatives (Mr. Smith, Customer Engineer and Mr. Miller, customer support of AMME software) in support of USACEEIA's mission was considered by USACEEIA test director as outstanding.

8. RECOMMENDATIONS.

a. Recommend USACEEIA review thirteen discrepancies identified against AMME-E Redstone and advise USER of USACEEIA corrective action.


b. Recommend emphasis be placed on obtaining maximum acceptable downtime and appropriate fallback procedures (if required) for future (major) AMME hardware/software upgrades.

c. Recommend USACEEIA establish what is an acceptable operating time for all (major) AMME functional capabilities during normal (?) and heavy peak conditions (?). Also develop better SSC/On-site AMME test techniques for heavy peak traffic situations. At a minimum, a test will have to be developed that contain 1,000 messages with 100,000 line blocks or more for future system checkouts.

d. Recommend USACSA scrutinized future increases in remote terminals and message traffic volume for AMME systems to prevent system overload. This action should be maintained until such time as maximum AMME loading capabilities can be determined for normal and peak operating conditions.

FOR THE COMMANDER:

2 Incl
as


RAYMOND H. YOUNG
Colonel, Signal Corps
Director, Test and
Evaluation Directorate

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TAD-TCC-TD/CCC-TAD-TCC-SB/CCC-TAD-TCC-SC, Fort Huachuca, AZ 85613
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REDSTONE AMME-E DISCREPANCIES

RSA AMME-E 001 - 013

Incl 1

DISCREPANCY SHEET

Test Procedure: Occurred During Test & On-
Line Status

Discrepancy No: RSA AMME-E-001

Date: 14 March 1977

Software

Location: Redstone Arsenal, Alabama

Hardware

Documentation

Operator

Other

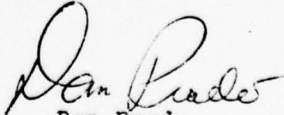
Description of Problem:

AMME Buffer over-run problem. System runs out of buffers during heavy traffic activity. This is an intermittent system problem.

Corrective Action:

Date:

VENDOR TEST DIRECTOR



Dan Prado
GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: Discovered during on-line status

Discrepancy No: RSA AMME-E-002

Date: 19 March 1977

Software x

Location: Redstone Arsenal, Alabama

Hardware
Documentation
Operator
Other

Description of Problem:

AMME-E software did not include alarm notification and double spacing capabilities for Remote Terminals (IRT's). These features were in the Redstone "Basic" AMME.

Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado

Dan Prado
GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Discovered during on-line
Test Procedure: status

Discrepancy No: RSA AMME-E 003

Date: 16 March 1977

Software x

Location: Redstone Arsenal, Alabama

Hardware
Documentation
Operator
Other

Description of Problem:

AMME-E goes into a program loop condition during heavy traffic conditions.

This is an intermittent problem.

Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado

Dan Prado
GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E 004

Date: 19 March 1977

Software X

Location:

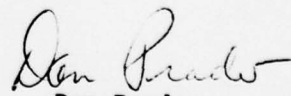
Hardware
Documentation
Operator
Other

Description of Problem:

Intermittent software problem with AMME Restart. When the system has 700-800 message scheduled for output to remote and over-the-counter device and a system restart is required - message duplication occurs. None of these identical message are marked "suspected duplicate".

Corrective Action:

Date:



Dan Prado

VENDOR TEST DIRECTOR

GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: Occurred During Test/On-Line Status

Discrepancy No: RSA-AMME-E-005

Date: 10 March 1977

Software

Location:

Hardware

Documentation

Operator

Other

Description of Problem:

When executing the system command to force route a message from the Traffic Manager Position (TFM) to the high speed printer (HSP) - extraneous characters are placed between the message header pilot and original message header (FL2).

Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado
Dan Prado

GOVERNMENT TEST DIRECTOR

Test Procedure: Occurred During Test/On-Line Status

Discrepancy No: RSA AMME-E-006

Date: 5 March 1977

Software x

Location: Redstone Arsenal, Alabama

Hardware
Configuration
Operator
.....

Description of Problem:

AMME IRT Software handler problem. During message header preparation - if a "BT " is placed on the next to the last line of the IRT VDU to indicate the end of message addressees - the system will go ahead and let the operator finish the first page and provide a second page with incorrect formatting. Protected/non-Protected message mask fields are reversed and the message has to be disregarded (DM) by operator to clear this condition. This is a day one software bug that has never been corrected.

Corrective Action:

Date:

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VENDOR TEST DIRECTOR

Dan Prado
Dan Prado
GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: On-Line Status

Discrepancy No: RSA-AMME-E-007

Date: 19 March 1977

Software x

Location: Redstone Arsenal, Alabama

Hardware
Documentation
Operator
Other

Description of Problem:

Implementation of DCA's TRC/SPECAT requirement. AMME does not handle redundant (F's) in the message Format Line 4 for special TRC codes.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado
Dan Prado

GOVERNMENT TEST DIRECTOR

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-008

Date: 18 March 1977

Software

Location: Redstone Arsenal, Alabama

Hardware

Documentation

Operator

Other

Description of Problem:

Illegal characters from the IRT(s) are being accepted by the AMME system.

These characters in message text are passed through the AMME system and re-

jected by AUTODIN.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado
Dan Prado

GOVERNMENT TEST DIRECTOR

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-009

Date: 17 March 1977

Software

Location: Redstone Arsenal, Alabama

Hardware
Computer
Operator
Other

Description of Problem:

Unable to clear message off system queue. Intermittently messages will hung on system "dummy" queue and there is no operational method to clear this queue without stopping and restarting the AMME system.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado
Dan Prado

GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-010

Date: 18 March 1977

Software X

Location: Redstone Arsenal, Alabama

Hardware
Recorder/Printer
Operator
Other

Description of Problem:

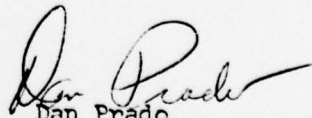
AMME Narrative Routing Problem. During message preparation and multiple addressees required the same routing indicator (RI) - this RI is duplicated twice in format line 2 for transmission. Only one RI is required for this type of transmission.

BEST AVAILABLE COPY

Corrective Action:

Date:

VENDOR TEST DIRECTOR


Dan Prado

GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-011

Date: 20 March 1977

Software

Location: Redstone Arsenal, Alabama

Hardware

Documentation

Operator

Other

Description of Problem:

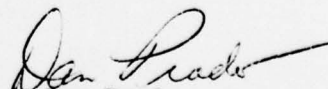
Anme Narrative Routing Problem. In Transmitting a message with more than 4 Routing Indicators in Format line 2. The system intermittently will reject these type of message transmissions.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR



Dan Prado

GOVERNMENT TEST DIRECTOR

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-012

Date: 17 March 1977

Software X

Location: Redstone Arsenal, Alabama

Operator

Description of Problem:

Multiple "#" number signs in a Narrative message with cause the system to halt.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado

Dan Prado
GOVERNMENT TEST DIRECTOR

DISCREPANCY SHEET

Test Procedure: On-Line Status

Discrepancy No: RSA AMME-E-013

Date: 20 March 1977

Software X

Location: Redstone Arsenal, Alabama

HARDWARE
OPERATOR
SUPERVISOR
TESTER

Description of Problem:

Operation of present AMME-E software indicates at times the system is near maximum capability under heavy traffic loads. Questionable if additional 13 IRT(s) and scheduled DPI can be implemented to the system without some kind of software/hardware modification.

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Corrective Action:

Date:

VENDOR TEST DIRECTOR

Dan Prado

Dan Prado
GOVERNMENT TEST DIRECTOR

REDSTONE AMME-E
SYSTEM HARDWARE AUDIT

Incl 2

REDSTONE AMME-E
EQUIPMENT INSTALLATION AUDIT
15 MAR 77

MODEL NO. AND DESCRIPTION	QUANTITY ON SITE	INSTALLED	NOTE*
1 3019-00 PROCESSOR/CONSOLE	2	2	
2 C1232-02 CONSOLE ASC II Pc WHEEL	2	2	
3 F1093-00 COMMUNICATIONS ADAPTER	2	2	
4 F1092-00 SELECTOR CHANNEL I	2	2	
5 F1092-01 SELECTOR CHANNEL 2	2	2	
6 7010-99 STORAGE 196 K BYTES	2	2	
7 7010-72 STORAGE EXPANSION 196U-262K	2	2	
8 0768-02 PRINTER & CONTROL	1	1	
9 0711-05 CARD READER	1	1	
10 F1177-00 VALIDITY CHECK	1	1	
11 5017-00 UNISERVO 16 CONTROL	2	2	
12 F0825-00 DUAL CHANNEL	2	2	
13 F0826-00 9 TRACK NRZI	2	2	
14 0862-04 UNISERVO 16	9	9	
15 5024-99 8425 DISC CONTROL	2	2	
16 F1043-00 DUAL CHANNEL	2	2	
17 S425-00 DISC DRIVE	4	4	
18 F2001-00 DUAL ACCESS	4	4	
19 8575-01 LINE TERMINAL CONTROL 16	3	3	
20 D1012-00 DUAL CHANNEL	3	3	
21 F1008-00 LONGITUDINAL REDUNDANCY CHECK	3	3	
22 F1005-98 LINE TERMINAL SYNCHRONOUS	41		

* NOTE: 26 in use. Additional units are for future remotes.

MODEL NO. AND DESCRIPTION	QUANTITY	INSTALLED	NOTE*
23 F1002-08 C1 205B (MIL 188)	43	20	
24 8543-00 DIRECT CONNECTION MODULE	14	14	
25 3542-99 U-200 VDU	7	7	
26 C2045-03 24x80 SCREEN PROTECTED FORMAT	7	7	
27 F1844-08 KEYBOARD	7	7	
28 F2044-01 GENERATOR EXPANSION	7	7	
29 F1245-01 SYNCHRONOUS I/F	7	7	
30 C1468-02 MIL 188 I/F	7	7	
31 F1001-00 9300 CHANNEL ADAPTER	1	1	
32 3030-00 DCT 9000 III PRINTER/PROCESSOR	1	1	
33 F1104-00 SELECTOR/MUX CHANNEL	1	1	
34 F1097-00 MULTI STROBE READ	1	1	
35 7007-12 STORAGE 16 K BYTES	1	1	
36 0711-00 CARD READER	1	1	
37 0604-00 CARD PUNCH	2	2	
38 F1174-00 EDGE NOTCH	2	2	
39 8573-00 DLT-70 AUTODIN I/F	2	2	
40 F1214-00 DISC PACK	6	6	
41 0920-02 PAPER TAPE CONTROL	1	1	
42 F1033-02 PAPER TAPE READER	1	1	
43 F1100-00 KLEINSCHMIDT READER	1	1	
44 9AB21D JULIAN DATE CLOCK	1	1	
45 2871358 DCM CABLE (50 ft)	7	7	
46 RPQ R 5001-05 MUX CHANNEL SWITCH	4	4	
47 RPQ W2424-00 MUX CHANNEL EXTENSION	2	2	
48 RPQ R5076-00 RED/BLACK INSTALLATION & CABLES	1	1	

MODEL NO. AND DESCRIPTION	QUANTITY ON SITE	INSTALLED	NOTE*
49 F1396-00 (tables)	7	7	
50 F1003-99 LINE TERMINAL TELEGRAPH	4	0	
51 F1004-98 LINE TERMINAL ASYNCHRONOUS	5	0	
52 F1010-99 ATA 75 BAUD	2	0	
53 F1010-99 ATA 150 BAUD	1	0	
54 F1010-99 ATA 4200 BAUD	2	0	
55 9AB21A VIDEO DISPLAY	7	0	
56 9AF29 CHANNEL SWITCH	1	0	
57 8536-00 CMA TYPE A	1	0	
58 F1202-00 FIRST MODULE	1	0	
59 F1201-04 CAU/8 BIT MIL 188	1	0	
60 2871358 DCM CABLE 10 ft	4	0	
61 2871305 DCM CABLE T CONNECTOR	2	0	
62 RPQ W2351-00 8425 TEMPEST KIT	0	0	--(1)
63 RPQ W2409-00 U200 TEMPEST KIT	7	0	

NOTE: (1) Not on site.