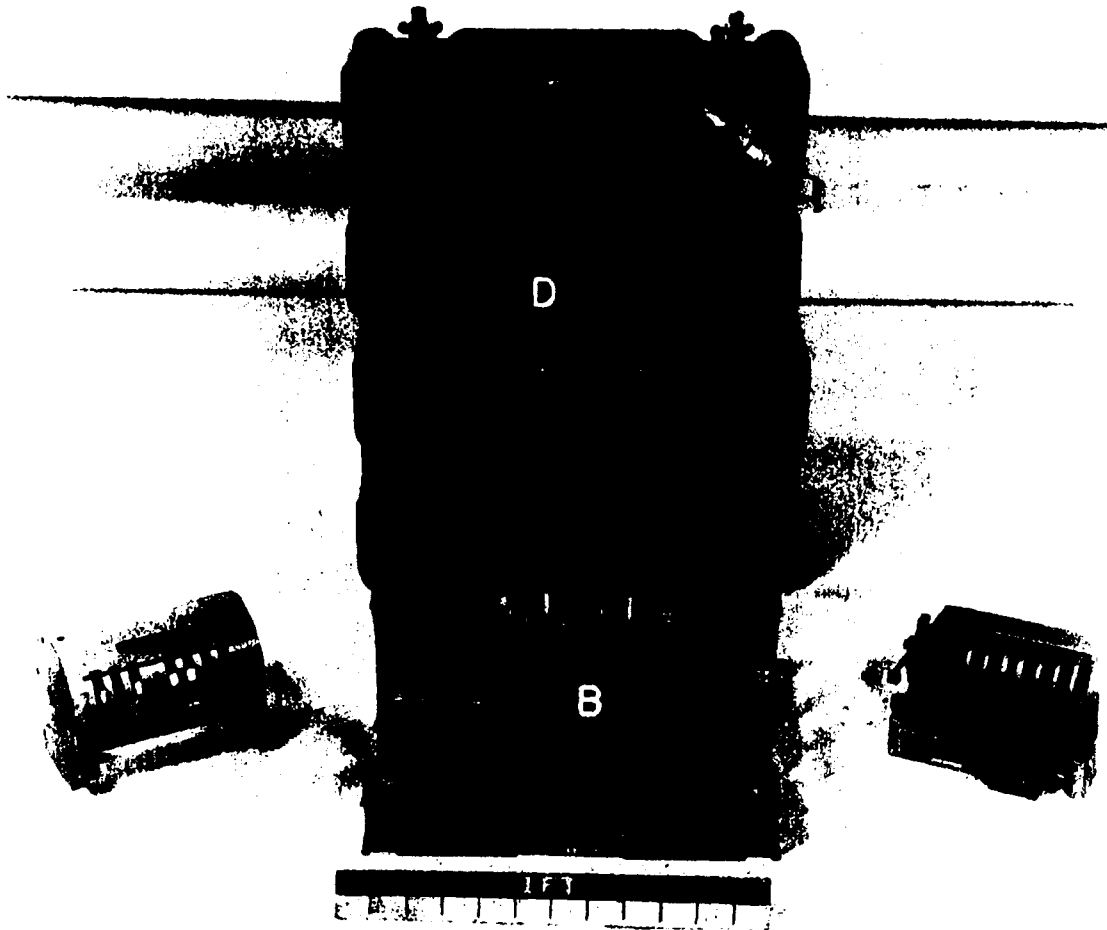


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Board No 1 OCAFF

Communication and Electronics Service Test Division

Fort Bragg, N. C.

DATE 23 OCTOBER 1953

AFSAM 7

PROJECT CE 1552

APPENDIX C.1

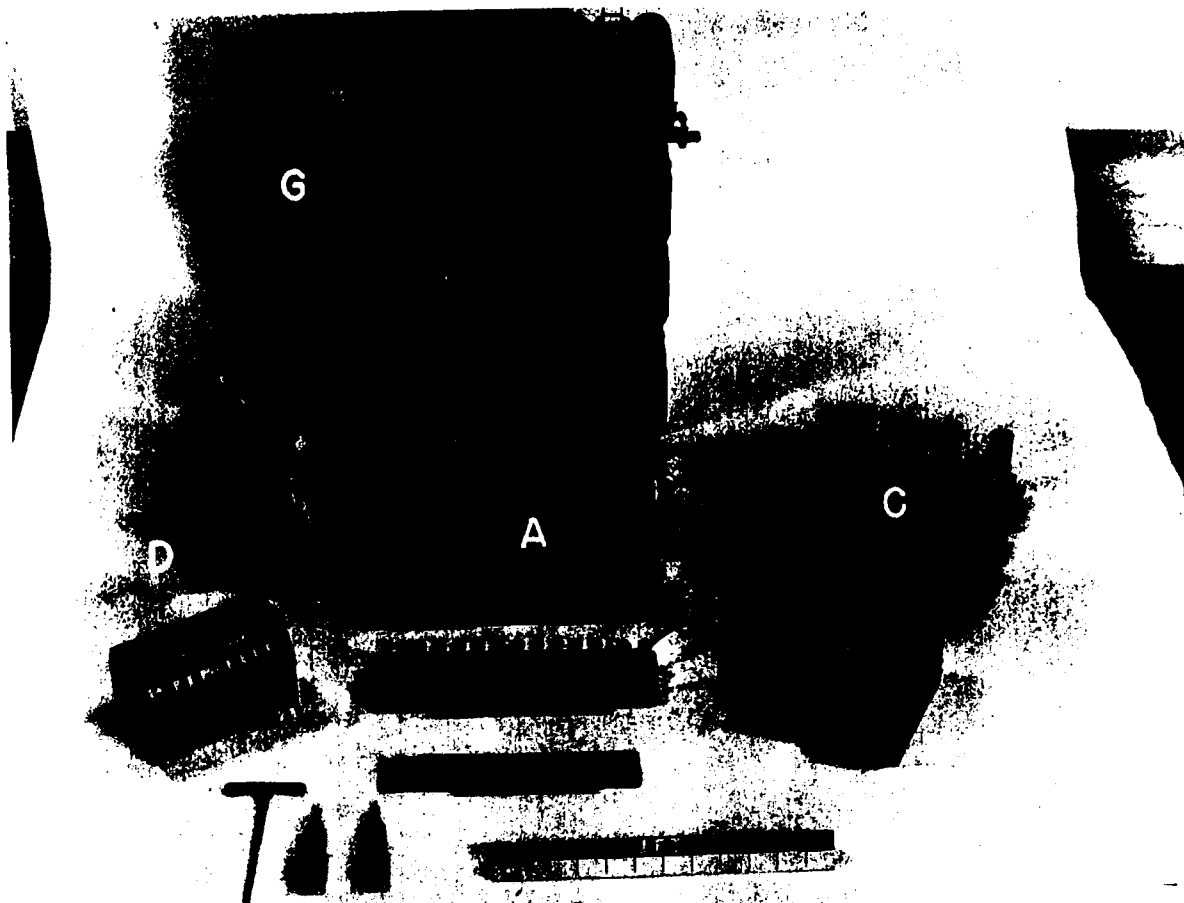
NEG NO. 4495-4

- (A) AFSAM 207 - CIPHER UNIT ASSEMBLY
- (B) AFSAM 7 - BASE, KEYBOARD, CONTACT PANEL, AND PRINTER ASSEMBLIES
- (C) AFSAM 107 - STEPPING UNIT ASSEMBLY
- (D) CARRYING CASE ASSEMBLY

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DOCID: 3842893

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Board No 1 OCAFF

Communication and Electronics Service Test Division

Fort Bragg, N. C.

DATE 23 OCTOBER 1953

AFSAM 7 DISASSEMBLED

PROJECT CE 1552

APPENDIX C.2

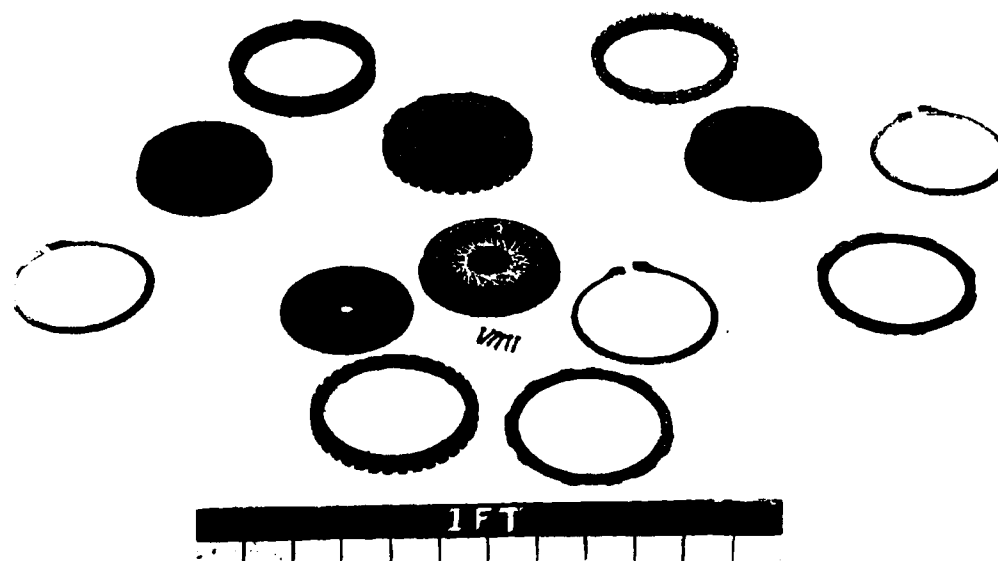
NEG NO. 4027-3

- 1) BASE ASSEMBLY
- 2) KEYBOARD ASSEMBLY WITH SLIDING CONTACT PANEL
- 3) CONTACT PANEL ASSEMBLY
- 4) PRINTER ASSEMBLY

- (E) STEPPING UNIT ASSEMBLY
- (F) CIPHER UNIT ASSEMBLY
- (G) CARRYING CASE ASSEMBLY
- (H) TOOLS REQUIRED TO REMOVE SUBASSEMBLIES

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PROJECT CE 1552

APPENDIX C.3

NEG NO. 4495-2

ROTORS FOR AFSAM 7

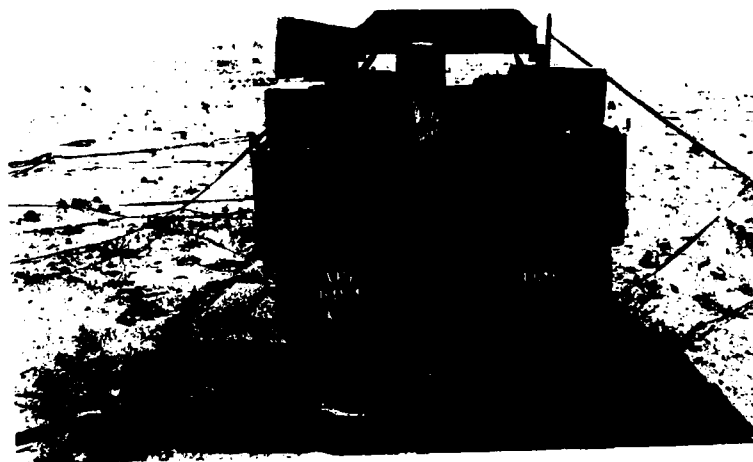
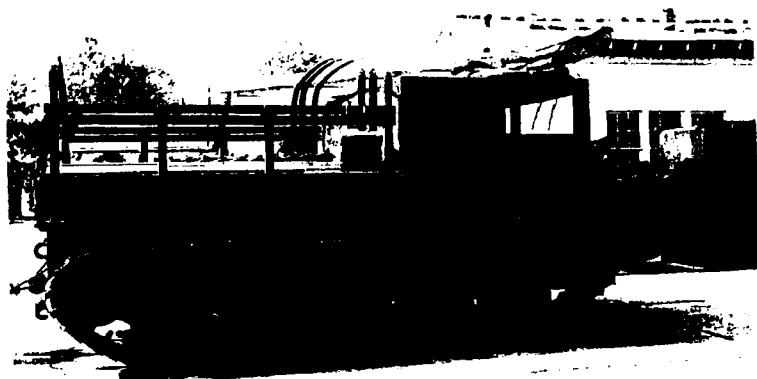
LEFT: DISASSEMBLED ROTOR WITH WIDE RING
 CENTER: DISASSEMBLED ROTOR
 RIGHT: PARTIALLY DISASSEMBLED ROTOR WITH
 NOTCHED AND ALPHABET RINGS

- (A) COMPLETE ROTOR
- (B) CORE COVER PLATE
- (C) ROTOR CORE
- (D) RETAINING RING
- (E) ALPHABET RING
- (F) NOTCHED RING

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Communication and Electronics Service Test Division

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AFSAM 7

PROJECT CE 1552

APPENDIX C.4

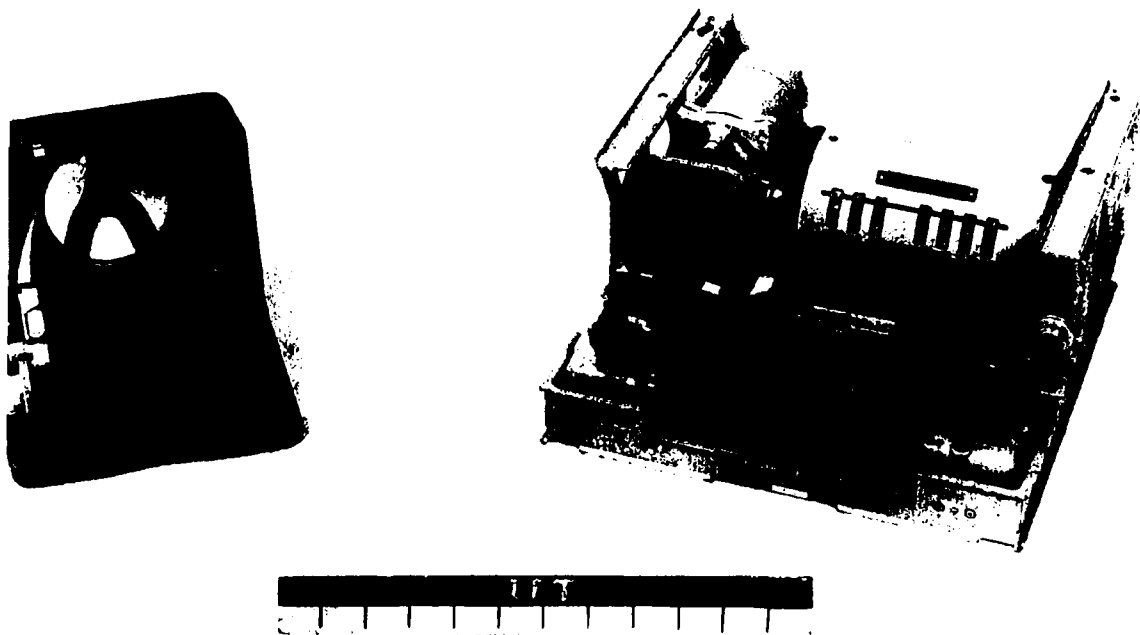
NEG NO. 4081-2
4647-1

TOP: TWO EQUIPMENTS MOUNTED ON TRACTOR, CARGO, T43E2
BOTTOM: TWO EQUIPMENTS MOUNTED IN TRUCK, 1/4-TON, 4X4, FOR VEHICULAR DROP,
USING STANDARD AIRBORNE TECHNIQUES

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Communication and Electronics Service Test Division

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PROJECT GE 1552

APPENDIX C-5

NEG NO. 4495-3

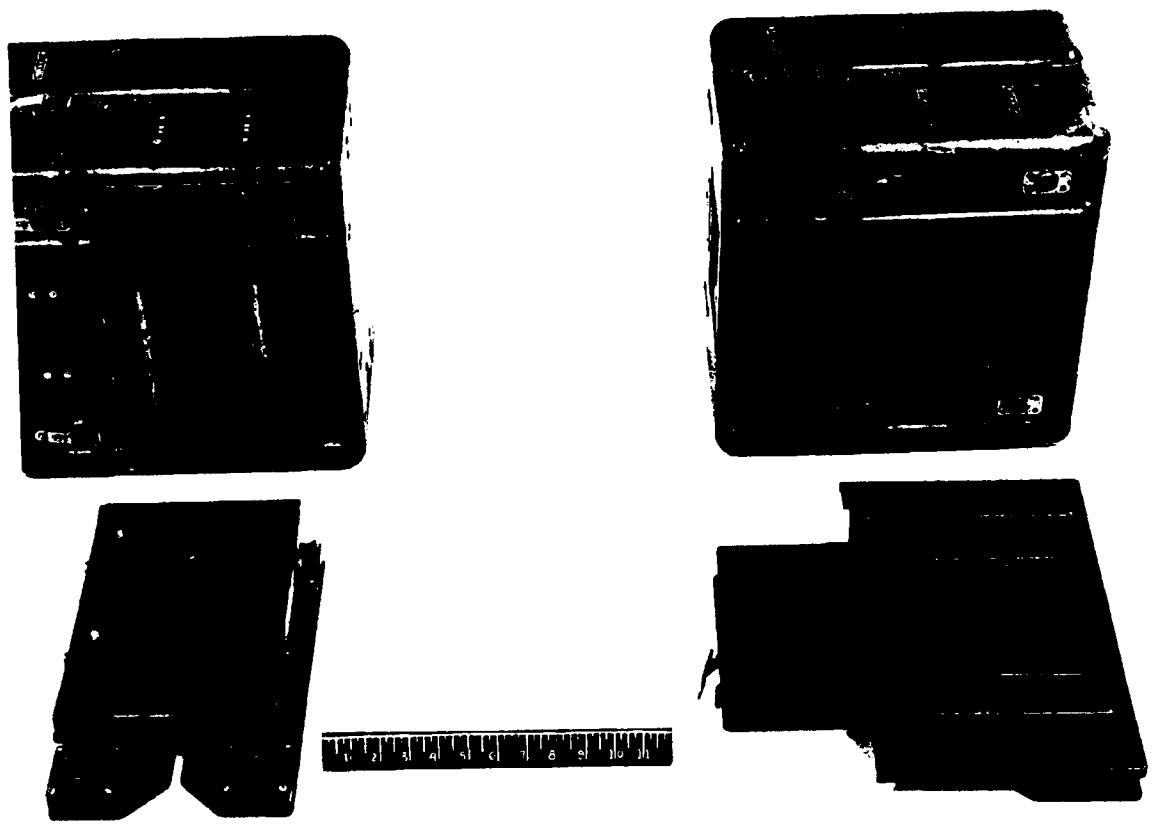
LEFT: CONVERTER M-209

RIGHT: AFSAM 7

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Communication and Electronics Service Test Division

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APPENDIX C.6

NEG NO. 4117-1

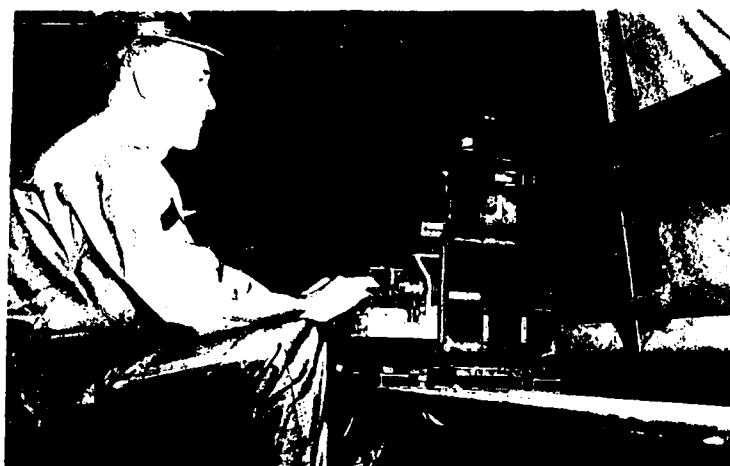
VEHICULAR MOUNTINGS FOR AFSAM 7

LEFT: CASE, SHOWING CHANNEL MEMBER PLATE ADDED LOCALLY TO ENABLE USE OF STANDARD TYPE MOUNTING MT-791/U

RIGHT: CASE WITH FITTINGS, AND SPECIAL MOUNTING BASE SUPPLIED WITH AFSAM 7

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AFSAM 7 VEHICULAR MOUNTED

PROJECT CE 1552

APPENDIX C.7

NEG NO. 4156-4
4495-6

TOP: AFSAM 7 MOUNTED IN TRUCK, 3/4-TON, 4X4, M37
BOTTOM: AFSAM 7 MOUNTED IN TRUCK, CARGO, 2 1/2-TON, 6X6, M135

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AFSAM 7 VEHICULAR MOUNTED

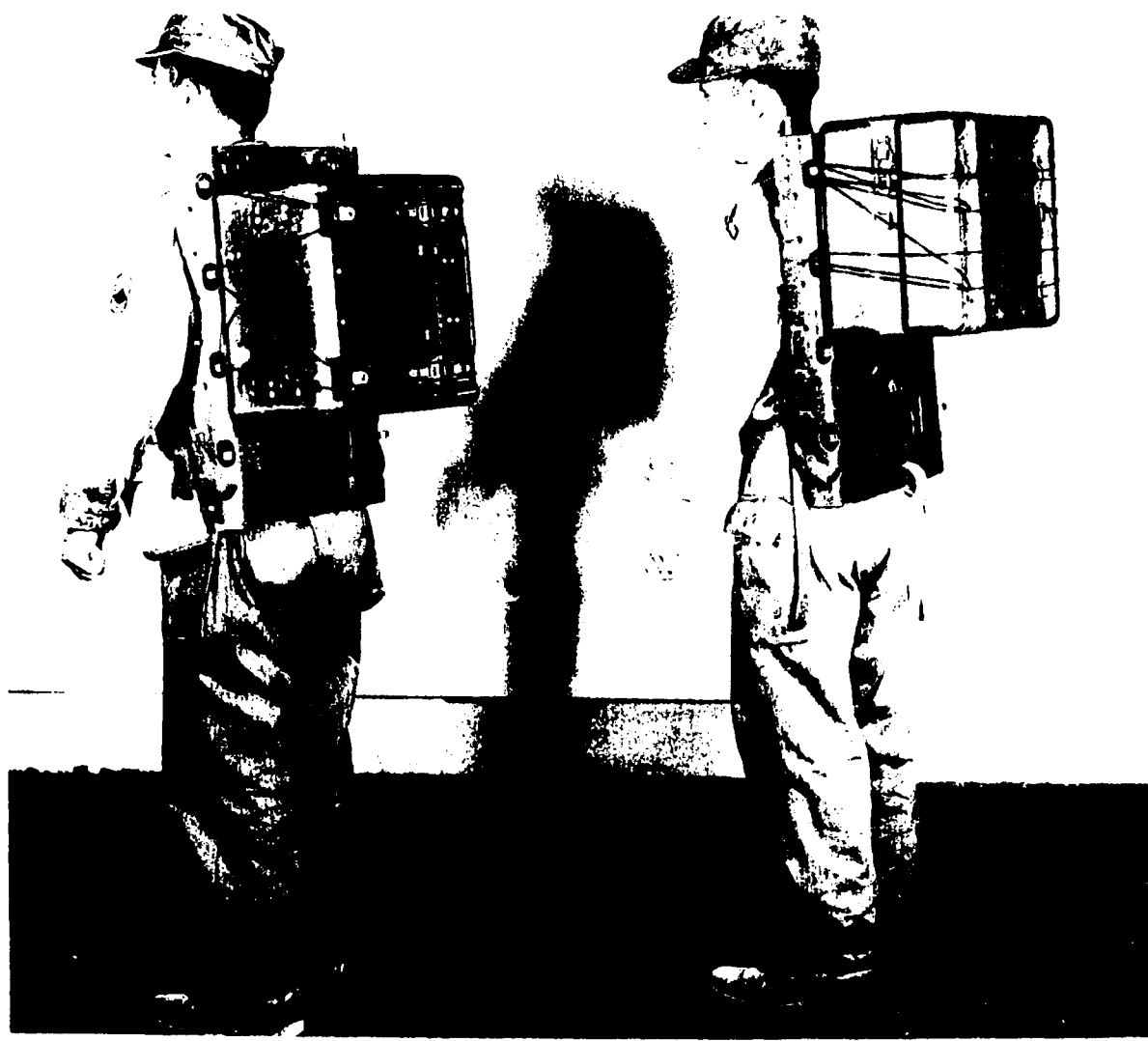
PROJECT CE 1552

APPENDIX C.8

NEG NO. 4495-5
4156-3

TOP: AFSAM 7 MOUNTED IN TRUCK, 1/4-TON, 4X4, M38
BOTTOM: DASHBOARD MOUNTED IN TRUCK, 1/4-TON, 4X4, M38

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Communication and Electronics Service Test Division

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PROJECT CE 1552

APPENDIX C.9

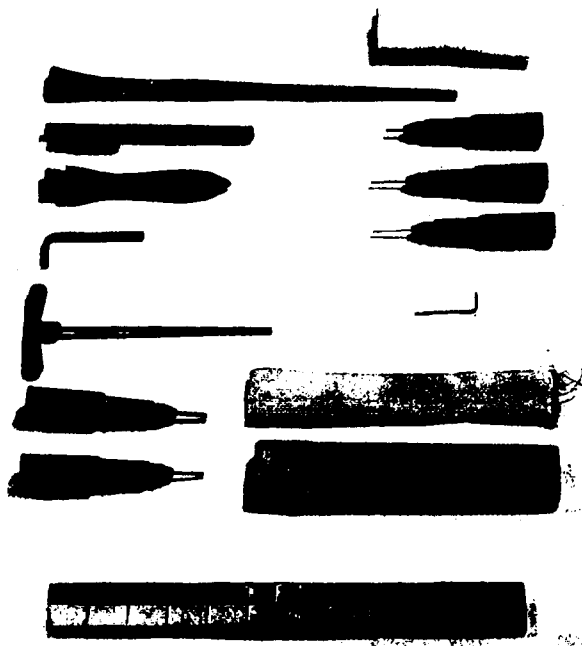
NEG NO. 4112-2

AFSAM 7 PREPARED FOR MANPACK

LEFT: UNBALANCED LOAD, USING PRESCRIBED MOUNTING ARRANGEMENT
 RIGHT: METHOD OF TYING AFSAM 7 TO PACKBOARD TO PROVIDE A BALANCED LOAD

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Board No 1 OCAFF

Communication and Electronics Service Test Division

Fort Bragg, N. C.

DATE 23 OCTOBER 1953

PROJECT CE 1552

APPENDIX C.10

NEG NO. 4334-1

CLEANING MATERIALS AND TOOLS PROVIDED FOR FIELD MAINTENANCE OF AFSAM 7

- (A) SASH-BRUSH TYPE CLEANING BRUSH
- (B) TOOTHBRUSH TYPE CLEANING BRUSH
- (C) SMALL CLEANING BRUSH
- (D) ALLEN KEY
- (E) T-HANDLE ALLEN KEY
- (F) PLASTIC HANDLE ALLEN KEY
- (G) PLASTIC HANDLE ALLEN KEY
- (H) TWILLJEAN CLOTH
- (I) PLASTIC HANDLE ALLEN KEY
- (J) PLASTIC HANDLE ALLEN KEY
- (K) PLASTIC HANDLE ALLEN KEY
- (L) ALLEN KEY
- (M) WEB STRAP
- (N) CLEANING BLOCK ASSEMBLY

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CHART OF FAILURES

The cleaning material and tools provided for maintenance of AFSAM 7 during service test are shown in Appendix C.10. Under present maintenance policy, the cleaning materials, only, were available to the operator for first echelon maintenance. Field maintenance personnel will have the wrenches shown for sub-assembly replacement. Maintenance of subassemblies is to be performed by ASA personnel in communication reconnaissance groups and battalions at army and corps level, respectively. "Special Tools" in Column 6 of the following chart pertain to items not included in the field maintenance items furnished with AFSAM 7 for service test (Appendix C.10).

NO	FAILURE	CAUSE OF FAILURE	NO OF OCCURRENCES MACHINE NO							SPECIAL TOOLS										
			159	160	166	167	168	169	172		176	181								
	Illegible printing.	Improperly designed ribbon reversal mechanism which caused periodic illegibility of three to seven characters, at time of ribbon reversal if reversal occurred while machine was printing.	1																	
		Print wheel became maladjusted.			1								1							Spanner wrench, 5/16" socket wrench.
		Loose screw in print wheel.																		Tightened screw.
																				Adjusted in each individual case to give minimum illegibility. Failure not wholly correctible without design change.

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NO. FAILURE	CAUSE OF FAILURE	NO OF OCCURRENCES MACHINE NO							REPAIRS MADE	SPECIAL TOOLS	
		159	160	166	167	168	169	172			176
	Overprinting caused by sticky tape.	1					1			Replaced printer sub-assembly (unwarranted re-placement).	
2.	Rotors failed to step properly.			1						Replaced sub-assembly.	
	Camming surface on No 7 rotor stepping linkage, which is spot-welded, broke.									Adjusted contacts.	Spring bending tools.
	Rotor stepping contacts became maladjusted.	1					1	2		Cleaned contacts.	
	Dirty rotor stepping contacts.									Replaced rotor assemblies.	
	Rotor retaining rings became sprung and interfered with stepping contact operating levers.									Replaced sub-assembly.	
	"One-Step Advance" switching functioned improperly.										

This failure not attributable to any given machine but to the rotor ring design.

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NO	FAILURE	CAUSE OF FAILURE	159	160	166	167	168	169	172	176	181	REPAIRS MADE	TOOLS
3.	AFSM 107 casting cracked.	Complete set of rotor stepping pawl hold-down springs and studs missing.									1	Replaced sub-assembly.	
4.	Machine failed to operate properly.	Improper spacing inserts.						1				Replaced sub-assembly.	
		Timing shaft clutch pin slipped out.		1								Replaced sub-assembly.	
		Sliding contact board swelled - would not slide.										Removed approximately .010" to provide additional clearance.	TL-29
		Strand of metal under printer shorted two contacts.							1			Removed strand of metal.	
		Print magnet and armature dirty.				1						Cleaned magnet and armature.	
		Dirty rotors.	2	2					3		1	Cleaned rotor contact surfaces.	
		Dirty keyboard contacts.		1				1				Cleaned contacts.	

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NO	FAILURE	CAUSE OF FAILURE	NO OF OCCURRENCES M. MACHINE NO							REP. IN S. DE	SPECIAL TOOLS		
			159	160	166	167	168	169	172			176	181
		Dirty contacts on stepping unit.	1	2				1				Cleaned stepping contacts.	
		Plunger contact under keyboard stuck.	1					1				Worked loose with small allen wrench.	
		"Letters" timing switch became maladjusted.		1								Replaced sub-assembly.	
5.	Electrical contact between :FS.M 107 and 207 failed.	Experimental latch wore resulting in looseness of right side of AFS.M 207.							1			Replaced sub-assembly.	
6.	Spring loaded stop pin in base assembly malfunctioned.	Spring jammed in base plate.				1						Released by pressing with allen wrench.	
												Released by dis-assembly of equipment to enable access to the base plate.	

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NO	FAILURE	CAUSE OF FAILURE	NO OF OCCURRENCES					MACHINE NO	SPECIAL TOOLS	REPAIRS MADE	
			159	160	166	167	168				169
7.	Drive link assembly became disengaged from rotor stepping unit.	Retaining ring on spring assembly pivot of printer unit came loose, was lost.	1							None. Part unavailable.	
8.	Tape feed pawl slipped off ratchet.	Tape feed pawl eccentric became maladjusted.								Adjusted feed pawl eccentric.	
9.	Carrying case stop spring broke.	Flimsy material.				1				None.	
10.	Motor failed to operate.	Wire broke in Amphenol line plug. Plug came apart in too many places.						1		Soldered wire in place.	Soldering equipment.
11.	Spare fuse clip bent and broke.	Unknown.						1		None.	
12.	Tape failed to advance properly.	Moisture on exposed gummed side of tape.	1	1	1					Pulled dry tape into position.	

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NO	FAILURE	CAUSE OF FAILURE	159	160	166	167	168	169	172	176	181	REPAIRS MADE	TOOLS
		Partially used tape roll expanded during transport.			2							Prior to transport removed tape end from printer and pasted end down on roll to prevent expansion.	
		Tape feed mechanism became maledjusted.	1	5				1				Adjusted mechanism.	
13.	Erratic key action. Keys malfunctioned or became "dead."	"Letters" encipher plunger stuck.	1					1				Released plunger.	
		Dirty keyboard contacts.		1								Cleaned contacts.	
		Shift tube failed.		1								Replaced tube.	Tube puller and pin straightener.
14.	Ribbon failed to reverse.	Improperly seated spool.	1									Replaced subassembly (unwarranted re-placement).	

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NO	FAILURE	CAUSE OF FAILURE	NO OF OCCURRENCES							REF. IRS N. DE	REPAIRS			
			159	160	166	167	168	169	172			176	181	
15.	Upper case equivalents were printed.	Unknown.	1									1	Replaced printer (unwarranted replacement).	Tube puller and pin straightener.
16.	Traffic garbled.	Oxidized rotor contacts. Unknown.	1	1				1	1			1	Replaced subassembly.	Tube puller and pin straightener.
17.	Incorrect 36-45 letter check.	Dirty rotor contacts.	1										Replaced AFM 207 (unwarranted replacement).	
18.	Figures key failed to function.	Dirty contacts.	1							1			Replaced shift tube (unwarranted replacement).	Tube puller and pin.
19.	Double printing.	Tape feed eccentric became mal-adjusted.	1										Adjusted tape feed eccentric.	

~~SECRET~~APPENDIX D - COORDINATIONREPORT OF TEST - PROJECT NO CE 1552

1. ~~(CONFIDENTIAL)~~ The draft plan of test of AFSAM 7 was prepared by this board and circulated to other interested agencies for comment. Their replies, and comments by this board, are consolidated below:

a. Headquarters First Army stated:

* * *

"2. While not applicable to tests being performed at Fort Bragg, it is recommended that consideration be given to the following additional tests:

"a. Operational test under Arctic conditions.

"b. Operational tests, including maintenance under desert conditions."

COMMENT NO 1: This board concurs. Arctic tests are contemplated. Desert tests were conducted beginning 20 July 1953 at Yuma Test Station.

b. Headquarters Second Army stated:

"1. The following additional tests are recommended to be included with proposed tests of the AFSAM-7:

"a. A test to determine the best means of destruction of this crypto equipment, with suitable alternate means, to fit normal combat situations.

"b. A test to determine the average time required for destruction with the methods developed in 1a above."

COMMENT NO 2: Such tests are engineering tests and are beyond the scope of the directive.

"2. It is further recommended that tests be made to develop suitable augmentation to the normal twenty-four (24) volt DC

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power supply, such augmentation to include hand cranked DC generators. It is also recommended that some type of variac or transformer tap changing control with a rugged iron vane type voltmeter be included with the converter unit for AC operation to meet a wide variety of foreign power supply voltage conditions."

COMMENT NO 3: This board does not concur. There is no Army Field Forces requirement for a miniaturized engine generator set for the operation of the AFSAM 7. The AFSAM 7 has been designed for 24-volt operation and will be used in a tactical vehicle as a normal method of employment. It is also supplied with a power converter to enable operation from 115/230-volt, 50/60-cycle ac power when vehicular operation is not desired.

c. Headquarters Sixth Army stated:

"1. . . . the following recommendations for additional test are submitted:

"a. Recommended Test No. 1

"(1) Purpose: To determine if the AFSAM 7 will function properly under extreme cold conditions.

"(2) Method: Tests No. 2, 4, 8, and 13 will be performed during various weather conditions encountered in Arctic climate."

COMMENT NO 4: This board concurs in part. See Comment No 1.

"b. Recommended Test No. 2

"(1) Purpose: To determine if the AFSAM 7 will function properly under tropical conditions.

"(2) Method: Test No. 2, 4, 8, and 13 will be performed during various weather conditions encountered in tropical climate."

COMMENT NO 5: This board concurs in the desirability of tests under tropical conditions. Climatic tests to be conducted by The Air Proving Ground, Eglin Air Force Base, Florida, are considered sufficient.

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~~SECRET~~"c. Recommended Test No. 3

"(1) Purpose: To determine if the AFSAM 7 will function properly during radical temperature variations.

"(2) Method:

"(a) Encipher in low temperature and decipher in high temperature.

"(b) Reverse procedure in (a)."

COMMENT NO 6: This board concurs in the purpose of the proposed test. The temperature, humidity, and arctic tests will include these requirements.

"d. Recommended Test No. 4

"(1) Purpose: To determine if the amount of light required to operate the AFSAM 7 under blackout conditions is objectionable.

"(2) Method: The AFSAM 7 will be distributed to the smallest unit that will use it in tactical operation and experiments will be conducted from ground and air, at night, over different terrain features to check the maximum distance at which the equipment can be spotted."

COMMENT NO 7: This board concurs in the purpose outlined in the proposed test. Since the operator night light was unavailable for the tests conducted at this board, appropriate tests to determine the maximum distance at which the equipment can be spotted were conducted as part of the desert test at Yuma Test Station. Results will be included in report of the desert test.

"2. Reference par p. of inclosure, Test No. 16. Suggest that the preliminary instruction books contain a destruction plan."

COMMENT NO 8: This board concurs. Inclusion of appropriate instructions for destruction of systems material used with the AFSAM 7 in AFSAG 1236 has been recommended (Item 54, Appendix B).

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"3. It is further recommended that the AFSAM 7 be demonstrated to the smallest using unit for their comments and recommendations."

COMMENT NO 9: This board considers that the tests conducted at Fort Bragg which involved personnel of the 82d Airborne Division and the 66th Signal Battalion (Corps) were sufficient for the purpose intended in the recommended test. Questionnaires were completed by all personnel who used the equipment, and their comments and recommendations have been included in reporting the results of test.

d. Headquarters The Armored School stated:

* * *

"2. It is recommended that in Test Nr 3, paragraph 4, c, (2), the current drain on the vehicle battery should be carefully noted to determine whether or not the battery drain will be excessive, particularly when equipped for operation in conjunction with vehicular radio sets."

COMMENT NO 10: This board concurs in part (see Test No 3, Appendix A).

e. The Artillery School stated:

"1. Recommend inclusion of the following tests.

"a. TEST NO. 18.

"(1) PURPOSE: To determine the effect of careless or faulty operation of the keyboard.

"(2) METHOD: The keyboard will be operated for brief periods at a speed considerably in excess of 60 words per minute, with occasional incidents of striking two adjacent keys simultaneously. Excessive striking power will also be used."

COMMENT NO 11: This board concurs in part. The likelihood of having operators who can approach 60 words per minute at the levels at which the AFSAM 7 is intended is very small. The design of the keyboard,

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which is in effect similar to an electromechanical typewriter keyboard, in which an electrical circuit is completed whenever a key is pressed, is such that excessive striking power has no effect on the keys or upon their operation. Test No 2, Appendix A, which covers keyboard operation is considered adequate in determining the capabilities of the keyboard of the AFSAM 7.

"b. TEST NO. 19.

"(1) PURPOSE: To determine effects of exposure to heat and cold under typical field operating conditions.

"(2) METHOD: AFSAM 7 will be operated in temperatures of 125 degrees F and minus 40 degrees F."

COMMENT NO 12: This board concurs in part. Test No 18 is considered adequate for operation and storage under climatic extremes.

"c. TEST NO. 20.

"(1) PURPOSE: To determine if the AFSAM 7 is protected from high voltage power supply or to determine if excessive voltage will cause damage to the machine.

"(2) METHOD: Connect AFSAM 7 to 110 and 220 volt power supply without using 115/230V converter."

COMMENT NO 13: This board concurs. Test No 15 has been revised to include this test.

f. The Infantry School stated:

"1. Reference is made to Paragraph 2, tentative plan of test, Incl 1, in which the statement is made that AFSAM 7 will supersede the Converter M-209. In view of the fact that AFSAM 7 apparently operates from vehicular power sources, it is obvious that it cannot satisfactorily replace all Converters M-209 within the infantry regiment unless a portable power source is provided. The infantry regiment must be capable of 'maneuvering in all types of terrain and climatic conditions' - T/O&E 7-11N. This occasionally precludes the use of vehicles.

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"2. If a portable power source is contemplated for AFSAM 7, it is recommended that Test No. 8 include testing of that power source for portability, suitability, and adequacy."

* * *

COMMENT NO 14: This board concurs in part. See Comment No 3, above. The AFSAM 7 is intended to supersede, but not replace in all instances, the Converter M-209. Another equipment, which will be non-electric is under development for use where power facilities are non-existent.

g. The AAA and GM Center stated:

* * *

"2. It is recommended that Test No. 13 be expanded to consider operation of AFSAM 7 under more varied climatic conditions than those encountered in the vicinity of Fort Bragg, to include extremes of temperature and humidity."

* * *

COMMENT NO 15: This board concurs. Test No 18 has been added. Equipment has been tested in the desert and arctic tests are contemplated.

h. Army Field Forces Board Nr 2 stated:

"Since there are many instances in field operations when stable AC or DC currents are not readily available, recommend the equipment be tested on a fluctuating AC supply and a weak DC supply to determine effects of such power supplies on operation and the minimum AC and DC voltages required for satisfactory operation."

COMMENT NO 16: This board concurs in part (Test No 15, Appendix A).

i. Army Field Forces Board No. 3 stated:

* * *

"a. Since the AFSAM 7 has been developed to supersede the Converter M-209, it is recommended that the Converter, M-209, be used as a control item in testing the AFSAM 7."

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COMMENT NO 17: This board concurs. Converter M-209 was used as a control item, wherever applicable, in the testing of AFSAM 7.

"b. In par 4h (2) of the tentative plan of test it is recommended that the power source for the AFSAM 7 and the manner in which it is to be transported be indicated."

COMMENT NO 18: This board concurs. Tests No 7, 8, and 15 include this information.

j. Marine Corps Equipment Board, through Marine Corps Development Center Liaison Officer, AFF Board No 3, stated:

* * *

"2. This Board concurs with the subject plan of test and recommends that the following additional test be considered:

"a. Determine if the equipment complies with current temperature, humidity, and barometric pressure performance requirements."

* * *

COMMENT NO 19: This board concurs. Test No 18 has been added.

2. (UNCLASSIFIED) The following agencies concurred in the draft plan of test:

- Headquarters Third Army
- Headquarters Fourth Army
- Headquarters Fifth Army
- The Army Airborne Center
- The Army General School

3. (UNCLASSIFIED) Army Security Agency replied, but made no comment on the draft plan of test.

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4. (~~CONFIDENTIAL~~) The draft report of Project No CE 1552 was circulated to other interested agencies for comment. Their replies, and comments by this board, are consolidated below:

a. Headquarters Second Army stated:

* * *

"2. Because of maintenance and supply problems, it is recommended the issue of AFSAM 7 not be made lower than regiment."

* * *

COMMENT NO 20: This board does not concur. There is a requirement for a cipher machine that is better, faster, and more secure than the Converter M-209 in all of the echelons listed in Appendix E. Eventually, all Converters M-209 will be replaced by either the AFSAM 7 or the AFSAM 17. The latter is for use where electrical power is not available. The AFSAM 7 is constructed on a unitized subassembly basis and a maintenance plan has been prepared which will provide maintenance support for the equipment wherever issued.

b. Headquarters Fourth Army stated:

* * *

"2. Basis of issue appears to be satisfactory. Units which have only one AFSAM-7 authorized as a means of enciphering communications, particularly at division level, should have on hand spare replacement assemblies to include:

1 each Keyboard Assembly
1 each Printer Assembly
1 each Contact Panel Assembly
1 each Stepping Unit Assembly
1 each Cipher Unit Assembly"

COMMENT NO 21: This board concurs in part. Each holder of the AFSAM 7 will have a spare cipher unit; however, operator and organizational maintenance will not include replacement of those subassemblies which requires tools. Army, Corps, and Division Signal Officers will have spare machines for replacement of inoperative equipment within their jurisdiction.

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SECRETc. Headquarters Sixth Army stated:

* * *

"2. It is recommended for consideration that five (5) each AFSAM 7 Converters be issued to Infantry and Airborne Infantry Division Signal Companies organized under T/O&E 11-7 and T/O&E 11-557 respectively.

"3. Based upon the assumption that the proposed issue of four (4) devices to each of the two Signal Companies referred to above will provide them with two (2) for use at both the forward and rear Command Post, it is felt that a third cipher machine should be on hand at the forward Command Post. The additional machine would serve as a spare during forward jumps of the forward Command Post, when a failure of either one of the other two machines during the displacement would otherwise interrupt the flow of encrypted traffic to and from the forward elements of the division."

COMMENT NO 22: This board concurs. Appendix E has been amended accordingly.

d. Headquarters 9th Infantry Division stated:

"This command concurs with the basis of issue for the AFSAM 7, with the following exception: That Military Police Bn (T/O&E 19-56) presently authorized one each M-209 be issued two (2) each AFSAM 7 and not four (4) as proposed under appendix E (C 1552) Basis of Issue."

COMMENT NO 23: This board does not concur. Information available at this board indicates that deployment of companies of the battalion may be such that four machines will be required.

e. Headquarters Fort Jackson commenting for the Communications School, 8th Infantry Division, stated:

* * *

"3. The present authorization for the M-209 converter in the communications school is one (1) per student. This Headquarters has established the size of the class at 60 students, which provides for an authorization of 60 converters M-209.

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"4. In view of the fact that the AFSAM 7 converter will be used in addition to the M-209 converter, it will be necessary to train personnel in the operation of both items of equipment. It is recommended that the basis for issue of the new type converter be the same as for the M-209 converter."

COMMENT NO 24: This board does not concur. One equipment per ten students is considered sufficient for instruction in the use of cipher equipment of this type.

f. Headquarters Fifth Armored Division stated:

* * *

"2. Recommend the POI 11-2, 11 April 1952 authorization for four hours instruction in the M-209 for each radio operator be increased to eight hours for the AFSAM 7. (paragraph 9c(4))"

COMMENT NO 25: This board concurs; however, this recommendation is beyond the scope of this report.

"3. Also recommend that T/A 60-1 include one per training division communication center for use in administrative overhead section."

COMMENT NO 26: This board does not concur. Crypto-communication of the administrative overhead section of a training division is assumed to be of a non-tactical nature and is therefore a function of the post, camp, or station complement.

g. The Artillery Center stated:

"1. Concur with draft report of test as written.

"2. Concur with recommendations on proposed basis of issue set forth in Appendix 'E' with the exception of T/O&E 6-501. Recommend 2 each AFSAM-7 as basis of issue for this unit."

COMMENT NO 27: This board concurs. Appendix E has been amended accordingly.

h. The Infantry School stated:

"1. The Infantry School concurs with the conclusions and recommendations contained in draft report of Project No. CE 1552 but nonconcur, in part, with Appendix E (Proposed Basis of Issue).

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"2. In an attack situation, an infantry battalion displaces its command post by echelon in order to provide continuous communication facilities. To eliminate the necessity of using two different crypto-systems for communication between forward and rear CPs and the inherent requirement for paraphrasing, it is recommended that the basis of issue for the AFSAM 7 be amended as follows:

"a. Infantry Division

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Infantry Regiment	xxxxxxxxxx T/O&E 7-16, Hq & Hq Co, Bn	xxxxxx 2
	xxxxxxxxxx	

"b. Airborne Infantry Division

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Infantry Regiment	xxxxxxxxxx T/O&E 7-36A, Hq & Hq Co, Bn	xxxxxx 2"
	xxxxxxxxxx	

COMMENT NO 28: This board does not concur. Normal employment of AFSAM 7 at battalion level will be in conjunction with Radio Set AN/GRC-9, of which one each is authorized.

i. The Armored School stated:

"2. * * *

"a. The Armored School does not concur in the proposed basis of issue for the AFSAM 7 Converter in Armor Units (Par 8a and APP E of Draft Report). The flexibility of armor and the requirement for units to be capable of independent action require that rapidly operated cipher machines such as the AFSAM-7 Converter be issued to armor units as shown in Inclosure 2.

"b. The Armored School concurs in par 8b of Draft Report.

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"c. This School does not concur with the recommendation contained in par 8c of Draft Report insofar as armor units are concerned. All M-209 Converters not replaced by the AFSiM 7 Converter should remain in armor units until a suitable replacement, such as the AFSiM 17, is made available.

"3. Recommend that:

"a. The basis of issue proposed in Inclosure 2 be substituted for Appendix E of the Draft Report insofar as armor units are concerned."

COMMENT NO 29: This board concurs. The material contained in the recommended basis of issue for AFSiM 7 in armored units has been substituted in Appendix E.

"b. Converters M-209 in excess of those replaced by the AFSiM 7 be retained by armor units until a suitable replacement is made available."

COMMENT NO 30: This board does not concur. One-for-one replacement of the M-209 with AFSiM 7 and later with AFSiM 17 is not contemplated. In many instances, the quantities of M-209 issued to the field were predicated on the limited traffic handling capability of the machine and maintenance requirements peculiar to the Converter M-209. As a result of the increased speed of the AFSiM 7 and the AFSiM 17, and unitized construction to permit subassembly replacement, a one-for-one replacement will not be necessary. Following the issue of the AFSiM 7, traffic handled in Converter M-209 systems will be so small that the proposed retention would be unjustified. The M-209 will be used only where 24-volt dc or 115-volt ac power is not available. Since there is no power problem in armor units, M-209's will be used only where communication occurs between armor units and units without vehicular power sources.

j. The AA & GM Branch, The Artillery School stated:

"1. The AA & GM Branch, TIS concurs with the draft of the subject report.

"2. It is recommended that:

"a. One AFSiM-7 Converter be issued to Hq & Hqs Battery of each type AA battalion (TO&E's 44-164, 44-26, 44-36, 44-76, 44-1164, 44-126, 44-146, 44-276, 44-316, and 44-416.

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"b. Two AFSAM Converters be issued to Hq & Hqs Battery of each AAA Brigade and Group (TO&E's 44-12A, 44-101A, 44-112 and 44-201).

"c. The proposed allocation of one AFSAM-7 Converter to the AMOD TO&E 44-7A be deleted."

COMMENT NO 31: This board concurs. Appendix E has been amended accordingly.

k. The Army General School stated:

"This school recommends that basis of issue be modified as follows:

- "a. Recon Bn TO&E 17-46, Hq, Hq & Svc Co 2 each
- "b. Armcd Cav Regt TO&E 17-52, Hq & Hq Co 2 each
- "c. TO&E 17-56, Hq, Hq Co, Recon Bn 2 each
- "d. Armcd Cav Gp TO&E 17-32, Hq & Hq Co 2 each"

COMMENT NO 32: This board concurs. Appendix E has been amended accordingly, except that the Reconnaissance Battalion T/O&E 17-46, Hq and Hq Svc Co basis of issue has been increased to three instead of two at the request of The Armored School.

1. Board No 3, OCAFF stated:

* * *

"a. The recommendation in paragraph 8a to adopt an item with a large number of known deficiencies without further user test seems inadvisable. Recommend that paragraph 8a be modified to provide for a check test of the first production models of the AFSAM 7 Converter by Board No 1, OCAFF, and that the AFSAM 7 Converter be not issued to troops pending the outcome of such check test."

* * *

COMMENT NO 33: This board does not concur. Following the service test of the AFSAM 7, a desert test was conducted utilizing an equipment containing some of the modifications proposed in this report. Subsequent to the desert test, at a conference held at this board with

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ISI and factory representatives, action was initiated to correct remaining deficiencies. On 20 November 1953, a representative of this board visited the factory where the AFSAM 7 Converter is in production and viewed machines modified to include correction of most of the deficiencies except the suppression problem, which may be a long range modification. Most of the other modifications recommended in the service and desert test reports will have been completed by the time the equipment reaches AFF units in the field. In the event models over and above training requirements are completed without some of the modifications recommended, installation of necessary items will be made in the field by maintenance personnel. This would include such things as dust cover plates and cipher unit louver covers. These items have been designed in such a way that only a screwdriver will be required to install them.

m. Board No 4, OC/AFF stated:

"The following errors or omissions in the listing of AIA T/O&E's in Annex E are noted:

"a. Para a. T/O&E 44-16A, Hq & Hq Btry, should read: T/O&E 44-76, Hq & Hq Battery, AW Bn (SP).

"b. Para d. T/O&E 44-36, Hq & Hq Btry, 75-mm Gun Bn and T/O&E 44-76, Hq & Hq Btry, AW Bn (SP) should be added.

"c. Para e. T/O&E 44-36, Hq & Hq Btry, 75-mm Gun Bn should be added."

COMMENT NO 34: This board concurs. Appendix E has been amended accordingly.

5. (UNCLASSIFIED) The following agencies concurred in the draft report of test:

Headquarters Third Army

Headquarters Fifth Army

Headquarters Tenth Infantry Division

Headquarters Sixth Armored Division

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6. (UNCLASSIFIED) The following agencies replied, but made no comment on draft report of test:

Board No 2, OCAFF

Lt Col Philip F. Yeatman, 143556, RSigs, British Liaison Officer, Board No 1, OCAFF

Marine Corps Development Center

7. (UNCLASSIFIED) No reply has been received from the following agencies; their replies, and comments by this board, will be forwarded upon receipt:

Headquarters First Army

Headquarters Third Armored Division

Headquarters Seventh Armored Division

Headquarters Sixth Infantry Division

The Signal Corps School

The Army Security Agency School

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~~SECRET~~APPENDIX E - BASIS OF ISSUEREPORT OF TEST - PROJECT NO CE 1552

(SECRET) It is recommended that the AFSAM 7 be issued on the following basis:

a. Infantry Division

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Inf Regt	T/O&E 7-12, Hq & Hq Co	2 ea
	T/O&E 7-16, Hq & Hq Co, Bn	2 ea
	T/O&E 7-13, Svc Co	1 ea
Div Arty	T/O&E 6-101A, Hq & Hq Btry	2 ea
	T/O&E 6-26N, Hq & Hq Btry, Bn	1 ea
	T/O&E 6-336N, Hq & Hq Btry, Bn	1 ea
Engr Bn	T/O&E 5-16N, Hq, Hq & Svc Co	1 ea
	T/O&E 5-17N, Engr Co, Bn	1 ea
Medical Bn	T/O&E 8-16, Hq & Hq Co	1 ea
Ordnance Bn	T/O&E 9-26, Hq & Hq Det, Bn	1 ea
Quartermaster Co	T/O&E 10-17, Qm Co	1 ea
Signal Co	T/O&E 11-7, Sig Co, Div	5 ea
Tank Bn	T/O&E 17-36, Hq, Hq & Svc Co	2 ea
Recon Co	T/O&E 17-57, Recon Co	1 ea
AAA Bn	T/O&E 44-76, Hq & Hq Btry, AW Bn (SP)	1 ea

b. Airborne Infantry Division

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Inf Regt	T/O&E 7-32A, Hq & Hq Co	2 ea
	T/O&E 7-33A, Svc Co	1 ea
	T/O&E 7-36A, Hq & Hq Co, Bn	2 ea

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<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Div Arty	T/O&E 6-201, Hq & Hq Btry	2 ea
	T/O&E 6-226, Hq & Hq Btry, Bn	1 ea
Engr Bn	T/O&E 5-226A, Hq, Hq & Svc Co	1 ea
	T/O&E 5-227A, Co	1 ea
Medical Bn	T/O&E 8-16, Hq & Hq Co	1 ea
Ordnance Bn	T/O&E 9-36, Hq & Hq Det	1 ea
Quartermaster Co	T/O&E 10-17, Qm Co	1 ea
Signal Co	T/O&E 11-557, Sig Co	5 ea
Tank Bn	T/O&E 17-36, Hq, Hq & Svc Co	2 ea
Recon Co	T/O&E 17-57, Recon Co	1 ea
AAA Bn	T/O&E 44-276, Hq & Hq Btry	1 ea

c. Armored Division

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Armd Inf Bn	T/O&E 7-26, Hq, Hq & Svc Co	2 ea
Combat Comds	T/O&E 17-22A, Hq & Hq Co	3 ea
Tank Bn	T/O&E 17-26, Hq, Hq & Svc Co	2 ea
	T/O&E 16-36, Hq, Hq & Svc Co	2 ea
Div Arty	T/O&E 6-301A, Hq & Hq Btry	3 ea
	T/O&E 6-316, Hq & Hq Btry Bn	2 ea
	T/O&E 6-317, FA Btry, 105mm How (SP)	1 ea
	T/O&E 6-319 Svc Btry FA Bn 155 and 105mm How (SP)	1 ea
	T/O&E 6-326, Hq & Hq Btry, Bn	2 ea
	T/O&E 6-327 FA Btry, FA Bn 155mm How (SP)	1 ea
Armd Engr Bn	T/O&E 5-216, Hq, Hq & Svc Co	2 ea
	T/O&E 5-217, Armd Engr Co	1 ea
	T/O&E 5-218, Bridge Co	1 ea

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<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Medical Bn	T/O&E 8-76, Hq & Hq Co	2 ea
Ordnance Bn	T/O&E 9-66, Hq & Hq Co	2 ea
Quartermaster Bn	T/O&E 10-46, Hq & Hq Det	2 ea
Armd Sig Co	T/O&E 11-57, Co	7 ea
Recon Bn	T/O&E 17-46, Hq, Hq & Svc Co T/O&E 17-57, Recon Co	3 ea 1 ea
Div Trains	T/O&E 17-62A, Hq & Hq Co	2 ea
AAA Bn	T/O&E 44-76, Hq & Hq Btry AAA AW Bn (SP) T/O&E 44-78, AAA AW Btry (SP)	2 ea 1 ea

d. Corps (Organic Units and Type Units normally attached)

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Corps Arty	T/O&E 6- (FA Firing Bn)	1 ea
	T/O&E 6-12, Hq & Hq Btry FA Gp	1 ea
	T/O&E 6-76, Hq & Hq Btry FA Obsn Bn	1 ea
	T/O&E 6-501, Hq & Hq Btry	2 ea
	T/O&E 6-616, Hq & Hq Btry FA Bn (Rocket)	1 ea
	Signal Bn	T/O&E 11-17, Rad & Msg Cen Opn Co
AAA Arty	T/O&E 44-12A, Hq & Hq Btry, AAA Gp	2 ea
	T/O&E 44-16A, Hq & Hq Btry AAA Gun Bn	1 ea
	T/O&E 44-36, Hq & Hq Btry, 75mm Gun Bn, AW Bn (SP)	1 ea
	T/O&E 44-70, Opn Det	1 ea
	T/O&E 44-76, Hq & Hq Btry, AW Bn (SP)	1 ea

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<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Armd Cav Regt	T/O&E 17-52, Hq & Hq Co	2 ea
	T/O&E 17-53, Svc Co	1 ea
	T/O&E 17-56, Hq & Hq Co, Recon Bn	2 ea
	T/O&E 17-57, Co, Recon Bn	1 ea
	T/O&E 6-317, How Co, Recon Bn	1 ea
Armd Cav Gp	T/O&E 17-32A, Hq & Hq Co	2 ea
Amphib Tank Bn	T/O&E 17-116A, Hq, Hq & Svc Co	2 ea
Amphib Tractor Co	T/O&E 17-126A, Hq, Hq & Svc Co	2 ea
Engineers	T/O&E 5-192, Hq & Hq Co, C Gp	1 ea
	T/O&E 5-301A, Hq & Hq Co, Brigade	1 ea
	T/O&E 5- (Eng C Bn)	4 ea
Military Police Bn	T/O&E 19-56, Hq & Hq Co	4 ea

e. Army (Organic Units and Type Units Normally Attached)

<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Army Arty	T/O&E 6- (Firing Bn)	1 ea
AAA Arty	T/O&E 44-12A, Hq & Hq Btry Gp	2 ea
	T/O&E 44-26, Hq & Hq Btry, AW Bn, Mbl	1 ea
	T/O&E 44-36, Hq & Hq Btry, 75mm Gun Bn	1 ea
	T/O&E 44-101A, Hq & Hq Btry, Brig	2 ea
	T/O&E 44-116, Hq & Hq Btry, Gun Bn	1 ea
	T/O&E 44-126, Hq & Hq Btry, AAA Bn (AW) (Smb1)	1 ea
	T/O&E 44-146, Hq & Hq Btry, AAA Missile Bn (Tent)	1 ea
Signal	T/O&E 11-95A, Sig Bn Opn	11 ea
	T/O&E 11-117, Sig Support Co	3 ea
Chemical	T/O&E 3-32A, Hq & Hq Det, Cml Op	1 ea

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E.4 (CE 1552)

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<u>Organization</u>	<u>Unit</u>	<u>Amount</u>
Engineers	T/O&E 5-192, Hq & Hq Co, C Gp	1 ea
	T/O&E 5-301A, Hq & Hq Co, Brig	1 ea
	T/O&E 5- (Eng C Bn)	4 ea
f. Special (Static) (CONUS)		
AAA Arty	T/O&E 44-112A, Hq & Hq Btry, AAA Gp (Static)	2 ea
	T/O&E 44-201, Hq & Hq Btry, AAA Brig (Static)	2 ea
	T/O&E 44-316, Hq & Hq Btry, AAA Bn (90mm Gun)	1 ea
	T/O&E 44-416, Hq & Hq Btry, AAA Bn (120mm Gun)	1 ea

g. Replacement Training Centers and Service Schools:

- Division):
- (1) T/A 60-1, Replacement Training Centers (Training)
 - One (1) per ten (10) students or MFCT
 - (2) T/A 17-2, The Armored School:
 - One (1) per ten (10) students or MFCT in Communications Department
 - (3) T/A 6-2, The Artillery School:
 - One (1) per ten (10) students or MFCT in Communications Department
 - (4) T/A 7-2, The Infantry School:
 - One (1) per ten (10) students or MFCT in Communications Department

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COMMUNICATION AND ELECTRONICS SERVICE TEST DIVISION
ARMY FIELD FORCES BOARD NO. 1

22 May 1953

APPENDIX F - REPORT OF CONFERENCEREPORT OF TEST - PROJECT NO CE 1552

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HEADQUARTERS
ARMY SECURITY AGENCY
WASHINGTON 25, D. C.

19 May 1953

NOTES ON CONFERENCE HELD AT ARMY SECURITY AGENCY 19 MAY 1953
TO REVIEW RESULTS OF SERVICE TEST OF AFSAM 7

Conference was called at 1000 hours.
Those attending were:

Lt Col Carmon L. Clay, Signal Section, OCAFF
Maj W. C. Washcoe, Test Officer, AFF Board #1
Maj Bernard E. William, ASA Ln Office, Ft Monroe, Va.
Mr. R. S. Childs, Anderson-Nichols & Co., Boston, Mass.
Mr. E. W. Schenings, Burroughs Corporation
Lt Col H. J. Revane, NSA-402
Mr. Bruce G. Erickson, NSA-31
Mr. John A. Smith, NSA-172
Maj E. C. Grant, NSA-172
Mr. J. D. Moskowitz, NSA-313
Mr. H. C. Barlow, NSA-31
Dr. L. W. Tordella, NSA-12
Mr. T. H. Witcher, NSA-311
Mr. Thomas R. Chittenden, NSA-402
Mr. E. C. Flowers, NSA-42
Maj Robert E. Mills, M&P Br, OCSigO
Maj O. A. Davis, OCSigO
Mr. W. L. Hintz, OCSigO
Mr. Warren F. Beck, ASA, GAS50
Mr. Burton F. Diller, ASA, GAS50

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Lt Col L. C. Swanson, ASA, GAS50
 Capt J. R. Clark, ASA, GAS50
 Mr. A. W. Small, ASA, GAS15
 Mr. R. C. Preall, ASA
 Mr. H. C. Glass, ASA, GAS24
 Maj Randolph M. Browne, ASA, GAS24
 Mr. R. M. Scott, ASA, GAS24
 Mr. D. Wolfand, ASA, GAS24

1. The following deficiencies were discussed, and Army Field Forces suggested modifications and National Security Agency comments are appended:

No.

1. Camming surface which is spot welded on the rotor stepping linkage broke loose.

AFF suggested modification: None, since only one of 84 failed during test.

NSA Comment: No recommendation necessary.

2. Machine lacked radio frequency filtering interference suppression, particularly over the 2-40 mc AM band.

AFF suggested modification: Provide proper filtering.

NSA Comment: Will provide proper filtering.

3. Selector handle assembly inadequately detented. Rotor advance mechanism does not always work properly.

AFF suggested modification: Provide adequate detention; provide reliable "one step advance."

NSA Comment: One step advance mechanism is under investigation.

4. Case lacked means for fastening cover, containing copy holder, upon top of case when operating.

AFF suggested modification: Provide means of fastening cover for copy reading in the operating position.

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NSA Comment: Will attempt to provide means by time of desert test.

5. Timing shaft clutch pin slipped.

AFF suggested modification: Provide better retention of clutch pin.

NSA Comment: Will investigate this.

6. One or the other ribbon spool was free to unwind, resulting in unwound ribbon, especially during operation in windy weather.

AFF suggested modification: Provide slight drag, in the unwind condition, on each spool.

NSA Comment: Production equipments to be available by 1 June will remedy this.

7. Experimental latch wore, resulting in looseness of right side of AFSAM 207.

AFF suggested modification: None, since latch has been redesigned.

NSA Comment: New latches being put on production equipment now.

8. Machine apparently adjusted for efficient operation at higher than normal vehicular voltage, i.e., about 27 volts.

AFF suggested modification: Provide adjustment on Army machines for efficient operation at 23-24 volts.

NSA Comment: Action has been taken.

9. Gummed side of tape exposed to weather where it enters tape chute.

AFF suggested modification: Provide means of protecting gummed side of tape.

NSA Comment: Will take action.

10. Screws lacked locking devices, particularly in rotors and in the figured wheel.

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AFF suggested modification: Provide means for locking screws where appropriate.

NSA Comment: Will investigate this deficiency particularly on the rotors.

11. Metal parts corroded, particularly cap screws and sheet metal parts of ribbon assembly.

AFF suggested modification: Treat metal parts against corrosion.

NSA Comment: Will investigate to determine the best remedy for this deficiency.

12. Accessories inadequate.

AFF suggested modification: Provide accessory case; tube puller, tube pin straightener; tape moistening tool, equivalent to Western Union tool or Teletype No. 70169 Tape Moistener, with cutter, tape, thimble, Size No. 9, Teletype No. 72638; ruby eraser for cleaning rotor contacts.

NSA Comment: All being provided. Additional items not already included in this accessory case will be included.

13. No operator night light provided, although receptacle for it exists.

AFF suggested modification: Provide night light.

NSA Comment: Is being provided. Will attempt to get four in time for desert test 20 July 53.

14. No dust protection provided when in operate position.

AFF suggested modification: Provide dust protection where applicable, particularly at AFSAM 207 rotor windows.

NSA Comment: Protective dust covers for printer unit and timing cams are designed. Will investigate possibility of covering rotor windows. Overall protection would require a new base casting slightly larger. Two models of the 207 will be available for desired tests in July with windows protected. Dust covers for four models will be made available.

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No.

- 15. Sliding contact board swelled as result of moisture, failed to slide.

AFF suggested modification: Provide tolerances in fitting, to allow for slight swell.

NSA Comment: Presently under investigation at NSA.

- 16. AFSAG 1236 inadequate.

The following deficiencies were noted in interim operating instructions (AFSAG 1236):

<u>PAGE</u>	<u>ITEM</u>	<u>DEFICIENCY</u>	<u>SUGGESTED CHANGE</u>
a. 11	1202a	Omits "36-45 letter check group" which is part of key list shown in diagram, item 1202b.	Add as item 1202a (7).
b. 11	1202b	Diagram omits the system indicator mentioned in item 1202a(6).	Add system indicator to diagram.
c. 13	2001c	Lacks precautionary comment to assure ring is seated firmly.	After "ring in position" add "making certain that it is seated firmly in place." Reason: In several instances during test, rings became sprung, did not seat firmly, with consequent interference with the stepping pattern.
d. 13	2001	Document fails to explain how to disassemble and reassemble rotors.	Revise item 2001 to include assembly and disassembly of rotors, with

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<u>PAGE</u>	<u>ITEM</u>	<u>DEFICIENCY</u>	<u>SUGGESTED CHANGE</u>
			illustration. Reason: This is a new technique, and should be explained and illustrated.
e. 13	2002 a(1)	Second sentence is incorrect.	Make item 2002a(1) agree with item 5006a, which is correct in this respect. Reason: Frequently, keyboard is dead after light comes on after depressing figures key. An average of 15 seconds is required for circuits to reach an operating condition. The light sometimes can be lighted in four or five seconds.
f. 14	2002b	Last sentence of item 2002b lacks emphasis.	Italicize last sentence of item 2002b. Reason: It is noted that elsewhere throughout the document, emphasis is effected by use of italics or capital letters. This sentence is considered important enough for such treatment.

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F.6 (CE 1552)

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	<u>PAGE</u>	<u>ITEM</u>	<u>DEFICIENCY</u>	<u>SUGGESTED CHANGE</u>
g.	25 29	5005e 5108	Items omit maximum current or wattage requirement.	Indicate approximate maximum current or wattage required in each case. Reason: For convenience.
h.	30	5202b	Method described for replacing keyboard assembly is more difficult than need be.	Revise instructions. Reason: It is easier to place the sliding contact board in place over the control panel, and then position the keyboard assembly.
i.	31	5206a	It is unnecessary to remove the support brackets in order to remove the contact panel assembly.	Revise instructions. Reason: Simplify maintenance.
j.	43	Fig 4	Item 14 is incorrect.	Change listing. Reason: Contacts in question are flat head.
k.			The manual does not contain instructions pertaining to:	
		(1)	Lashing of AFSAM 7 to packboard.	(1) Include appropriate instructions in manual.
		(2)	Emergency destruction.	(2) " "
		(3)	Vehicular mounting and its use.	(3) " "
		(4)	Trouble shooting for "shift-to-figures trouble."	(4) " "

<u>PAGE</u>	<u>ITEM</u>	<u>DEFICIENCY</u>	<u>SUGGESTED CHANGE</u>
	(5)	Selectivity of tubes, i.e., Not all 2D21 tubes will work in the circuit and some that will work on one machine will not work on another.	(5) Include appropriate instructions in manual.

Added comments to k:

NSA Comment: With respect to Item (2): NSA is preparing a policy whereby destruction of the AFSAM 7 in the field will not be required but destruction of the key list and disassembly and disarrangement of the rotor set-up for the day will be required. This is a policy matter which is under discussion and preparation within NSA but is not yet official.

AFF Comment: With respect to Item (1): Lashing instructions should specify that machine be lashed to packboard so that case is in upright position. This will provide even distribution of the load. The previous NSA method provided an unbalanced load.

With respect to Item (3): AFF requests that kit be made up to include: the vehicular mounting; a base plate with channels for mounting on the case with screws, by means of topped holes to be provided in the case, an electrical connector kit to include a female Scintilla connector with two solid conductors with 3/8" drilled lugs attached to one end. (Receptacle 6-742-773 1417, female plug, part of ordnance kit).

1.	14	2003b	Conflicts with Par. 2403a (2) of AFSAG 1210A which permits burial of classification at any point in text.	Bring the two into agreement.
m.		5204b	The reader is not cautioned on the care necessary in inserting the rotor stepping unit.	Suggest that the following par. replace the one in question: "To replace the stepping unit,

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<u>PAGE</u>	<u>ITEM</u>	<u>DEFICIENCY</u>	<u>SUGGESTED CHANGE</u>
			tilt it backward at approximately a 45 degree angle and engage the slots in the stepping unit blocks with the slots in the mounting blocks on the base of the cipher machine, making sure that the rotor stepping crank (fig 4(16)) fits into the yoke of the drive link assembly (fig 4(8)), and lower the unit into place. CAUTION: CARE MUST BE TAKEN NOT TO BEND THE PLUNGER CONTACTS ON THE CONTACT PANEL ASSEMBLY."

NOTE: Correction of other deficiencies may occasion further changes to AFSAG 1236.

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17. Unable to read last 10 characters printed without removing tape.

AFF suggested modification: Provide means to enable operator to read that portion of the tape, without removal of tape.

NSA Comment: The solution is not simple and this will be taken under advisement over a long period of time by NSA.

18. Tape stuck as result of moisture.

AFF Comment: Assure tropicalized tape in the supply system.

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NSA Comment: ASA will take care of this.

19. Monofil came out of letters engraved on rotors.

AFF suggested modification: Provide better engraving and fill with white material that will last.

NSA Comment: Engraving has been improved and material will last because it is down below the surface.

20. Raised numerals on stator ring difficult to identify.

AFF suggested modification: Engrave numbers and fill with white material that will last.

NSA Comment: Will be accomplished in a production change.

21. Flat contact on Rotor AAG4, series 45, improperly molded, resulting in greatly lessened contact surface.

AFF suggested modification: Provide quality control through inspection of rotors.

NSA Comment: Corrected by tightening up inspection procedure.

22. Rotor retaining rings became sprung and interfered with stepping contact operating lever.

AFF suggested modification: Redesign retaining rings.

NSA Comment: A new ring has been designed but is not yet in production.

23. Retaining rings on spring assembly pivot of printer unit came loose, allowing drive link assembly to drop out of engagement with rotor stepping crank (2 machines).

AFF suggested modification: Improve retention.

NSA Comment: NSA believes that a different retaining ring may solve the problem.

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24. Left captive screws on printer unit were inaccessible.
AFF suggested modification: Provide accessibility.
NSA Comment: This is being corrected, now in production.
25. Tape worked out of position laterally when pressure roller was released during rotor setting.
AFF suggested modification: Improve tape feed chute.
NSA Comment: NSA will have to examine this.
26. One group of printed characters illegible when ribbon reversed.
AFF suggested modification: Modify ribbon reversal arrangement to allow legible printing of this group.
NSA Comment: Redesign has been accomplished and after 1 July production items will have modifications in them.
27. Handle on selector assembly too long.
AFF suggested modification: Shorten approximately one inch.
NSA Comment: Factory will correct by shortening and changing the angle of the handle. This involves a mold change and will require about six months.
28. Fusing of machine and accessory power converter inadequate. Does not protect against abnormal voltages.
AFF suggested modification: Provide proper fusing.
NSA Comment: This problem will be re-examined and proper fuses requested for production item.
29. Partially used roll of tape expanded in tape case during cross-country transport, resulting in poor tape advance, and blurred printing.
AFF suggested modification: Amplify instructions to cover this point, and direct that tape be removed from printer

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channel, and gummed down to prevent expansion, or provide locking device during transit.

NSA Comment: Will investigate.

30. NSI method of lashing to packboard provided unbalanced load.

AFF suggested modification: Change to technique of lashing shown in photograph provided at conference. Add instructions and illustrations to AFSAG 1236.

NSA Comment: Instructions will include new method of lashing.

31. No destruction means provided.

AFF suggested modification: If emergency destruction is required, provide either means, as part of accessories, or, if already available means are to be used, provide destruction instructions.

NSA Comment: Destruction is no longer required by NSA. Only key list must be destroyed and rotor rings disassembled and disarranged.

32. Machine not capable of continuous operation.

AFF suggested modification: None, since individual deficiencies, when corrected, should of themselves, correct this deficiency.

NSA Comment: None.

NSA Comment: None.

33. Document AFSAG 1236 poorly bound for field use. Lacks weather proofing.

AFF suggested modification: Provide stiffer cover - treated for use in the field in damp weather.

NSA Comment: NSA will provide more durable more weather resistant cover.

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34. Rotor stepping contacts required frequent adjustment and were difficult to adjust.

AFF suggested modification: Provide more separator clearance between switches in pileup and, if possible, additional space for adjustment.

NSA Comment: Will be corrected at the factory.

35. Power cord lacked facility for connecting to 24 volt vehicular power supply.

AFF suggested modification: Provide an 8-foot cable with a male Scintilla plug on one end and an appropriate connector for the AFSAM 7 on the other. Suggest 3 prong connector stock No. 2Z3023-76 with fitting conduit 6Z3858-26.

ASA Comment: Will select appropriate connectors.

36. Present amphenol plug on AFSAM 7 power cord is unsatisfactory as it comes apart in too many places and breaks wire.

AFF suggested modification: Provide simple, durable (locking type) plug.

ASA, NSA Comment: Will investigate and try to procure suitable standard connectors.

37. AFSAM 107 casting cracked.

AFF suggested modification: None, since one in 14 cracked, it is not known how.

NSA Comment: NSA will have factory change design of die sufficiently to let more metal appear at the point where crack occurred.

38. Spring-loaded stop pin in base assembly became jammed in base plate (two machines).

AFF suggested modification: Redesign pin or spring action.

NSA Comment: NSA will correct.

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39. Tape feed pawl eccentric frequently became maladjusted, occasionally slipped off ratchet.

AFF suggested modification: Provide better feed pawl-ratchet design, as included in factory sample.

NSA Comment: Will be corrected in production by 1 July.

40. Two rotor cores among 64 tested chipped badly.

AFF suggested modification: None. Use of rotors was equivalent to one year's normal operation, insofar as stepping was concerned. Suggest trouble be analyzed and development agency take steps, if possible, to remedy trouble.

NSA Comment: Cannot be corrected with present material which has a certain fragility. Breakage factor estimated to be small enough that it will not be any great problem.

41. Spare fuse clips did not spring properly, bent, broke.

AFF suggested modification: Provide clips of proper material.

NSA Comment: Standard fuse holder was used. It is made of standard spring material and it must have been a defective item that slipped by the assembly line inspection.

42. Copy holder lacks facility for holding tape copy for decryption.

AFF suggested modification: Provide long slotted member as part of bottom of front message holder clip, for holding tape, with index marks at a beginning point, and end of 10 groups.

NSA Comment: NSA will modify clip in cover to include a tape holding attachment.

43. Figures shift circuit became incorrectly activated, intermittently substituted figures for letters with a random pattern on both encipher and decipher.

AFF suggested modification: Correct this deficiency or else eliminate encryption of numerals except where all numerals are used, as in number groups in weather traffic.

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NSA Comment: NSA considers this problem to be due primarily to rotor resistance, possibly warrants circuit changes. However, the AFF agree that they can use a machine giving no greater random numeral rate than occurred in the present equipments, provided numeral encryption is not directed.

11. Does not meet Military Characteristics with respect to suppression, destruction means, or size and weight.

AFF suggested modification: Provide suppression and destruction means, if required.

NSA Comment: Equipment cannot possibly be changed at this date to meet entirely the size and weight requirements of the JCS. However, it seems acceptable to the AFF in its present size and weight.

2. Major Washcoe reviewed all the previous comments briefly and requested that the following be provided before the machine is issued to the field:

- a. Adequate suppression.
- b. Vehicular mount kit, to include vehicular power connection facilities, as discussed.
- c. Night light.
- d. Accessories.
- e. Modified sliding contact board.
- f. Raised numerals on the stator.
- g. Modification of copy holder for tape.
- h. Modification of design of stop pin in base.
- i. Line cord plug.
- j. Changes in document and binding.
- k. Proper fusing of machine.

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l. Improved retaining ring on spring assembly pivot of printer unit.

m. Better plug on machine input, converter output, and machine end of power line cable.

n. Scintilla plug on vehicle end of power cord.

/s/ Robert M. Scott
for DAVID WOLFAND
Chairman

WC Washcoe
W. C. WASHCOE
Maj SigC
Test Officer

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