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FIELD MESS EQUIPMENT

Paul W. Lavendar

Army Test and Evaluation Command
Aberdeen Proving Ground, Maryland

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13. ABSTRACT

Describes a method for evaluation of field mess equipment operational and functional performance characteristics. Identifies supporting tests, facilities, and equipment required. Provides procedures for functional suitability tests. Applicable to utensils and implements designed to be used by individual soldiers to facilitate eating and drinking.

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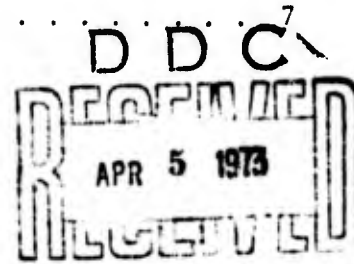
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FIELD MESS EQUIPMENT

Section I.	GENERAL	Paragraph	Page
	Purpose and Scope	1	1
	Background	2	2
	Equipment and Facilities	3	2
II.	TEST PROCEDURES		
	Supporting Tests	4	3
III.	SUPPLEMENTARY INSTRUCTIONS		
	Functional Suitability	5	4
APPENDIX.	REFERENCES		

AD 252816
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SECTION I
GENERAL



1. Purpose and Scope.

a. This Test Operations Procedure (TOP) describes service test procedures for evaluating the operational and functional characteristics of field mess equipment. Test results will be used to determine the degree such equipment meets the criteria prescribed in requirements documents and whether it is suitable for Army use. Testing will be conducted using soldiers representative of the intended users of the test item and under climatic and environmental conditions representative of those areas where the equipment is intended to be used.

b. The test items applicable for testing with this procedure are utensils and implements designed to be used by individual soldiers to facilitate eating and drinking. This includes utensils such as plates, trays, pans, or bowls in which food is held while being eaten; drinking vessels such as cups or cans for drinking beverages; and implements such as knives, forks, and spoons used by the individual soldier for cutting, mixing, stirring, and placing food into the mouth. The equipment may be either expendable or accountable. It may be made of durable materials designed for extended use under field conditions, such as the current mess kit or canteen cup, or it may be made of disposable materials designed to be used once and then thrown away, i.e., paper plates and cups, plastic forks and spoon.

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1 February 1973

c. This procedure addresses a preoperational inspection to determine the physical characteristics and serviceability of the test item, a series of appropriate tests designed to examine the functional performance of the test item, and an examination of the safety, human factors, and value engineering aspects of the test item.

2. Background.

a. Soldiers who are subsisting on operational rations require some kind of field mess equipment to facilitate eating and drinking. The current standard items of equipment provided for this purpose are the mess kit, with knife, fork, and spoon, and the canteen cup.

b. In recent years significant changes have been made in the preparation of food and the feeding of soldiers in the field. Modern concepts must accommodate the increasing demands for greater mobility and dispersion of combat forces as well as greater acceptability and convenience in military foods.

c. Two versions of a mobile field kitchen are currently under development. One is based on fuel-fired cooking equipment, the other is all-electric with microwave cooking performing the major cooking chores. When required, the kitchen can be moved rapidly to a rendezvous point, provide food service in a minimum of time, and be pulled back or moved on to another rendezvous. Cooking en route is possible with certain menus so troops can be fed immediately on arrival of the kitchen.

d. Foods are being preserved and packaged by new and ingenious methods. Many packaged foods can be eaten with little or no preparation. In some instances, the food container may be used as a tray for eating the food.

e. Disposable insulated food containers recently developed will facilitate carrying food to front-line troops after it has been cooked at field kitchens in rear areas. This container will hold hot food for 20 men including the necessary plates, cups, and plastic eating utensils. Because this container is disposable, it need not be returned to the kitchen as required for the present standard insulated food container which is an accountable item.

3. Equipment and Facilities. Equipment and facilities required are defined in the documents listed in Section II.

SECTION II
TEST PROCEDURES

4. Supporting Tests.

a. The procedures outlined in this TOP provide general guidance for the conduct of service tests. Detailed specific procedures are dependent on the characteristics of the item being tested and the stated criteria in applicable requirements documents.

b. In preparing for the test, the test officer should conduct the necessary administrative, personnel, and supply actions outlined in the test officer's guide or manual, and in the organizational standing operating procedures (SOP). Sufficient pretest training must be accomplished to ensure test soldiers are equally familiar with the test and control items. The performance of the test item must not be degraded because it is new or test soldiers are unfamiliar with it.

c. During each subtest, sufficient data must be collected to support statistically valid conclusions. This goal may be constrained by limitations on the number of test items, time available for testing, manpower and funds available, or the support and control equipment available. When planning the test, the test officers should consult with methodology personnel, e.g., statistical analysts, experimental psychologists, human factors analysts, for assistance in developing the experimental pattern. Methodology personnel can advise and assist the test officer in developing the appropriate experimental design to include the techniques for sampling, sample size required to evaluate the true performance, estimating average performance from a sample, comparing materials or products with respect to average performance (or variability of performance), number of test soldiers needed, and the number of repetitions for a specific exercise. A proper experimental pattern will aid in the control of bias, will simplify the requisite calculations of the analysis, and will permit the clear estimation of the effects of the factors. Additional statistical guidance may be found in TOP 3-1-002, Confidence Intervals and Sample Size, and in National Bureau of Standards Handbook 91, Experimental Statistics.

d. Common Service TOPs, the tests defined in Section III, and other published documents to be considered in formulating an expanded service test plan are listed below. Additional reference material is at the appendix.

<u>TEST SUBJECT TITLE</u>	<u>PUBLICATION NO.</u>
(1) Preoperational Inspection and Physical Characteristics	10-3-500

<u>TEST SUBJECT TITLE</u>	<u>PUBLICATION NO.</u>
(2) Safety	10-3-507
(3) Personnel Training	10-3-501
(4) Photographic Coverage	7-3-519
(5) Functional Suitability (refer to para 5)	
(6) Desert Environmental Test	10-4-001
(7) Tropic Environmental Test	10-4-003
(8) Arctic Environmental Test	10-4-004 and 10-4-500
(9) Airdrop Operations	7-3-511
(10) Durability	10-3-502
(11) Maintainability	10-3-504 and TECR 750-15
(12) Security from Detection	1-3-515
(13) Human Factors Evaluation	10-3-505
(14) Value Analysis	TECR 700-1

SECTION III SUPPLEMENTARY INSTRUCTIONS

5. Functional Suitability.

a. Objective. To determine whether the test item is suitable for its intended function of facilitating eating and drinking under field conditions.

b. Method.

(1) The test item will be evaluated during the conduct of tactical field exercises, using test soldiers representative of the intended users. The field exercises will allow a realistic evaluation of the test item in a tactical environment by providing influencing

factors similar to those felt in combat, such as fatigue, noise, dust, smoke, dirt, and rain. The exercises should resemble as closely as possible the situations and conditions which the test soldiers can reasonably expect to encounter in the performance of their combat missions. TOP 1-1-046, Field Combat Test Exercises, should be used as a guide in planning and conducting the exercises.

(2) During the field exercises, the test soldiers will subsist on operational rations of a type appropriate for using the test item in eating or drinking. The test soldiers will be presented with simulated tactical situations designed to cause all functional characteristics of the test item described in requirements documents or test directives to be fully demonstrated. The functional characteristics will depend on the specific test item, e.g., eating tray, drinking cup, knife, fork, spoon.

(3) The test item will be evaluated for its intended primary use and also for possible additional uses. For example, an eating tray or a drinking cup might have an additional use as a container in which food or water could be heated. In such instances, the test item will be evaluated for both purposes.

(4) When control items are provided, the test design will provide for both test and control items to be used by the same test soldiers and under the same conditions to aid in the collection of valid comparative data.

(5) The functional characteristics of the test item are those directly affecting the utility or usefulness of the item for eating or drinking. This might include characteristics such as:

(a) Sturdiness. Flimsy items bend too easily when used, such as a spoon when used to dip food of heavy consistency, or a food-laden plate that collapses when held by one edge.

(b) Difficulty in holding or handling because of size or shape. A handle might be too long or too short or located at an awkward position.

(c) Effect on the flavor of food or drink due to type of materials used in the test item.

(d) Heat retention or transmission. Test items may become too hot to handle comfortably when a ration is served; rations may cool too quickly in the test item; test item may cause discomfort when touching the lips because it is too hot or too cold.

1 February 1975

c. Data Required.

- (1) A description of the tactical field exercise conducted.
- (2) A description of the operational ration consumed during the field exercise.
- (3) A description of test item functional characteristics observed during testing, and the effect of each characteristic on the functional utility of the test item.

d. Analytical Plan. The test data will be analyzed subjectively to determine whether the established criteria pertaining to functional characteristics have been met.

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1 February 1973

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APPENDIX
REFERENCES

1. AR 70-10, Test and Evaluation During Development and Acquisition of Materiel.
2. FM 21-10, Field Hygiene and Sanitation.
3. TM 10-405, Army Mess Operations.
4. National Bureau of Standards Handbook 91, Experimental Statistics.
5. TECR 70-23, Equipment Performance Reports.
6. TECR 70-24, Documenting Test Plans and Reports.
7. TECR 310-6, TECOM Test Operations Procedures.
8. TECR 385-6, Verification of Safety of Materiel During Testing.
9. TOP 3-1-002, Confidence Intervals and Sample Size.
10. TOP 10-2-212, Preparation Methods and Equipment, Food Service.