MIL-S-1399E(AR)
24 August 1984
SUPERSEDING
MIL-S-1399D(PA)
25 July 1974

MILITARY SPECIFICATION

SIGNALS, ILLUMINATION, AIRCRAFT TRACER, DOUBLE-STAR AN-M53A2 THROUGH An-m58A2 PARTS, AND LOADING, ASSEMBLING AND PACKING

This specification is approved for use by the US Army Armament, Munitions and Chemical Command, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification contains requirements not covered by the drawings and provides quality assurance provisions for the fabrication of parts, assembly and packing of one type of aircraft double-star signal with tracer designated as follows:

AN-M53A2	- Yellow tracer, red and yellow stars
AN-M54A2	- Green tracer, red stars
AN-M55A2	- Green tracer, green and red stars
AN-M56A2	- Red tracer , green stars
AN-M57A2	- Red tracer, red stars
AN-M58A2	- Red tracer , green and red stars

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified (see 6.2), the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-P-116	- Preservation, Packaging, Method of
MIL-A-48078	- Ammunition, Standard Quality Assurance Provisions; General Specification For

FSC 1370

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes (ABC-STD-105)
MIL-STD-286 - Propellants; Solid, Sampling, Examination and Testing
MIL-STD-331 - Fuze and Fuze Components, Environmental and Performance Tests For
MIL-STD-1234 - Pyrotechnics: Sampling, Inspection and Testing

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DRAWINGS

U.S. ARMY ARMAMENT RESEARCH AND DEVELOPMENT CENTER (ARDC)

PRODUCT AND PACKAGING DRAWINGS

8847441	Signal, Illumination, Aircraft, Tracer, Double Star AN-M53A2 Thru AN-M58A2 Assemblies
8836949	Carton, Packing, For Signals, Illumination, Aircraft, and Simulator, Projectile, Air Burst
8836950	Box, Packing, Ammunition, For Signals, Illumination, Aircraft and Simulator, Projectile, Air Burst

INSPECTION EQUIPMENT DRAWINGS

9201136	- Tunnel, Light
9201268	- Procedure, Light Output Measurement
9201390	- Procedure, Photocell Checkout
9201392	- Procedure, Color Value Measurement
9247071	- Photocell

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issue of the document which are indicated as DOD adopted shall be the issue listed in the current DODISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM Designation E300 - Recommended Practice for Sampling Industrial Chemicals

(Applications for copies should be addressed to the American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103) 1

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Material. Material and parts shall be in accordance with the applicable drawings and specifications.

3.2 Assembly. The assembly shall comply with all requirements specified on Drawing (dwg.) 8847441 and with all requirements specified in applicable specifications.

3.3 Moisture content.

3.3.1 Star charge composition. The moisture content of the star charge composition, at the loading station shall not exceed 0.1 percent when determined as specified in 4.5.1.1 or 4.5.1.2.

3.3.2 Tracer charge composition. The moisture content of the tracer charge composition, at the time of loading the signals, shall not exceed 0.1 percent when determined as specified in 4.5.1.2.

3.3.3 Black powder. The moisture content of the black powder, at the loading station at the time of loading the signals shall not exceed 0.3 perecent when determined as specified in 4.5.1.3.

3.3.4 Paper, cotton and chipboard components. The moisture content of the paper, cotton and chipboard components, at the loading station at the time of loading the signals, shall not exceed 6 percent when determined as specified in 4.5.1.4.

3.3.5 Polypropylene felt. The moisture content of the polypropylene felt components, at the loading station at the time of loading shall not exceed 0.1 percent when determined as specified in 4.5.1.4.

3.4 Transportation vibration. The signal assembly shall comply with the following requirements:

3.4.1 The signal assembly shall not function during the test,

3.4.2 The signal assembly shall be safe to transport following the test (see 6.7).

3.4.3 There shall be no evidence of external damage to the signal assembly that will affect the intended function (see 6.8).

3.4.4 There shall be no evidence of damage in the packing or packaging that would affect the storage life of the signal assemblies.

3.4.5 The signal assembly shall comply with the requirements of 3.5 following this test.

3.5 Functioning. The signals shall function in accordance with the following requirements:

3.5.1 No tracer or star shall burst in the pistol.

3.5.2 The signal case shall not split, rupture, or bulge to the extent that it sticks or “freezes” in the pistol barrel.

3.5.3 The primer shall not fail to function.

3.5.4 The tracer shall ignite within 1 second after firing pistol.

3.5.5 The stars shall not ignite within 1 1/2 seconds after firing.

3.5.6 The burning stars shall not fail to attain a minimum (min.) altitude of 150 feet above the firing point.

3.5.7 The tracer and both stars shall not fail to function and shall not burn longer than 1 1/2 seconds simultaneously.

3.5.8 The interval between extinction of the tracer and initiation of both stars shall not exceed 1 second.

3.5.9 Portions of composition that become detached during star burning shall not burn for more than 2 seconds.

3.6 Air leakage test. The signal shall show no evidence of leakage when tested as specified in 4.5.4.

3.7 First article inspection. This specification contains technical provisions for first article inspection. Requirements for the submission of first article samples by the contractor shall be as specified in the contract.

3.8 Workmanship. All parts and assemblies shall be fabricated and loaded in a thorough, workmanlike manner. They shall be free of burrs, sharp edges, cracks, dirt, rust, and other foreign matter. The cleaning method used shall not be injurious to any part nor shall the parts be contaminated by the cleaning agent. Exterior surface coatings shall be continuous except for a few light scratches not exposing base material. All required markings shall be neat and sharply defined.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection and standard quality assurance provisions. Unless otherwise specified herein or in the contract, the provisions of MIL-A-48078 shall apply and are hereby made a part of this detail specification.

4.2 Classification of inspections. The following types of inspection shall be conducted on this item:

a. First Article Inspection
b. Quality Conformance Inspection

4.3 First article inspection.

4.3.1 Submission. The contractor shall submit a first article sample as designated by the Contracting Officer for evaluation in accordance with provisions of 4.3.2. The first article sample shall consist of the following items in sample quantities as indicated.

4.3.2 Inspections to be performed. See MIL-A-48078 and Table I specified herein.

4.3.3 Rejection. See MIL-A-48078.

TABLE I. First article inspection

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E

PARAGRAPH	TITLE		SHEET 1 OF 3		DRAWING NUMBER
	Signal, Illumination, Aircraft Tracer, Double Star, AN-M53A2 thru AN-M58A2				See below
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
	Inert Parts (See TDPL for Drawing)				
	Examination for defects	Note 1		3.2	Visual/Gage
	Star Assembly (Dwg. 8847448)				
	Examination for defects	30		3.2	4.4.2.3
	Static Test (10 of each color)	30(a)		4.3.3.5	4.5.5
	Tracer Assembly (Dwg. 8847453)				
	Examination for defects	30		3.2	4.4.2.5
	Static test (10 of each color)	30(a)		4.3.3.5	4.5.5
	Illumination and Tracer Assembly (Dwg. 8847441)				
	Examination for defects	30		3.2	4.4.2.8
	Chamber gaging	30(a)		3.2	4.5.6
	Signal Assembly (Prior to Inserting Illuminant and Tracer Assembly) (Dwg. 8847441)				
	Examination for defects	30		3.2	4.4.2.9

NOTES:
1. Fifteen (15) complete sets of each component and inert subassembly shall be inspected in accordance with specification and drawing requirements.
(a) Above items to be used for test.

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

TABLE I. First article inspection

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E

PARAGRAPH	TITLE: Signal, Illumination, Aircraft Tracer, Double Star, AN-M53A2 thru AN-M58A2		SHEET 2 OF 3		DRAWING NUMBER: See below
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
	Signal Assembly (Prior to Inserting Top) (Dwg. 8847441)				
	Examination for defects	30		3.2	4.4.2.10
	Signal Assembly (Dwg. 8847441)				
	Examination for defects	30(a)		3.2	4.4.2.11
	Transportation vibration			3.4	4.5.2
	Air leakage			3.6	4.5.4
	Functioning			3.5	4.5.3
	Carton (Prior to Sealing) (Dwg. 8836949)				
	Examination for defects	1 cart.		3.2	4.4.2.12
	Sealed Carton (Dwg. 8836949)				
	Examination for defects	1 cart.		3.2	4.4.2.13

NOTES:

(a) To be tested in sequence noted after examination for defects.

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

TABLE I. First article inspection

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E

PARAGRAPH	TITLE: Signal, Illumination, Aircraft Tracer, Double Star, AN-M53A2 thru AN-M58A2		SHEET 3 OF 3		DRAWING NUMBER: See below NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
	Wood Box (Prior to Sealing) (Dwg. 8836950) Examination for defects	1 box		3.2	4.4.2.14
	Sealed Wood Packing Box (Dwg. 8836950) Examination for defects	1 box		3.2	4.4.2.15
	Barrier Bag (Dwg. 8836949) Examination for defects	3 boxes		3.2	4.4.2.16
	Heat seal test	30(a)		3.2	4.4.3.8

NOTES:

(a) Above units to be used for test.

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

4.4 Quality conformance inspection.

4.4.1 Inspection lot formation. Inspection lots shall comply with the lot formation provisions of MIL-A-48078. In addition, inspection lots of signals shall contain:

a. Primers of one lot interfix number from one manufacture.
b. Black powder from not more than one lot.
c. Signals of one designation only.
d. Star charge composition produced by one manufacturer under one continuous set of operating conditions and which consists of one or more batches that have been subjected to the same unit chemical or physical mixing process intended to make the final product homogeneous.
e. Tracer charge composition produced by one manufacturer under one continuous set of operating conditions and which consists of one or more batches that have been subjected to the same unit chemical or physical mixing process intended to make the final product homogeneous.

4.4.2 Examination. (See MIL-A-48078). Unless otherwise specified in the classification of defects and test tables, sampling plans for major and minor defects shall be in accordance with MIL-STD-105, Inspection Level II.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.1	Case, Signal				8847475
					NEXT HIGHER ASSEMBLY
					8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Diameter of primer hole, maximum (max.)		0.40%	3.2	Gage
Minor					
201	Inside diameter max.		0.65%	3.2	Gage
202	Outside diameter minimum (min.)		0.65%	3.2	Gage
203	Diameter of flange		0.65%	3.2	Gage
204	Angle of flange		0.65%	3.2	Gage
205	Thickness of base at primer hole		0.65%	3.2	Gage
206	Thickness of base in area above propelling charge cavity		0.65%	3.2	Gage
207	Radii missing		0.65%	3.2	Visual
208	Finish improper		0.65%	3.2	Visual
209	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.2	Signal Case Assembly				8847468
					NEXT HIGHER ASSEMBLY 8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Primer above flush or more than max. below flush		0.40%	3.2	Gage
102	Primer not sealed 360°		0.40%	3.2	Visual
Minor					
201	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE	SHEET 1 OF 1	DRAWING NUMBER
4.4.2.3	Star Assembly		8847448
			NEXT HIGHER ASSEMBLY 8847441

CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Color identification incorrect		100%	3.2	Visual
Major					
101	Length of protruding quickmatch		0.40%	3.2	Gage
102	Priming charge distribution of total hole area, less than 2/3 min.		0.40%	3.2	Visual
103	Quickmatch missing		0.40%	3.2	Visual
104	Disc loose		0.40%	3.2	Manual
Minor					
201	Crimp not full 360 degrees		0.65%	3.2	Visual
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER 8847473
4.4.2.4	Top				NEXT HIGHER ASSEMBLY 8847411
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Crack or split		0.40%	3.2	Visual
Minor					
201	Thickness		0.65%	3.2	Gage
202	Outside diameter at datum height		0.65%	3.2	Gage
203	Protrusion of side above bottom		0.65%	3.2	Gage
204	Length of side		0.65%	3.2	Gage
205	Bare spot in protective coating or coating missing		0.65%	3.23	Visual
206	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.5	Tracer Assembly				8847453
					NEXT HIGHER ASSEMBLY 8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Color identification incorrect		100%	3.2	Visual
Major					
101	Priming charge distribution of total hole area less than 2/3 min.		0.40%	3.2	Visual
102	Component missing or loose		0.40%	3.2	Visual/Manual
103	Component damaged to extent that function many be impaired		0.40%	3.2	Visual
Minor					
201	Cement missing		0.65%	3.2	Visual
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-QA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

*PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.6	Illuminant Assembly				8847443
					NEXT HIGHER ASSEMBLY 8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Color identification incorrect		100%	3.2	Visual
Major					
101	Quickmatch fails to protrude		0.40%	3.2	Visual
102	Plug missing or weight under min.		0.40%	3.2	Visual/Balance
103	Dividing charge missing		0.40%	3.2	Visual
Minor					
201	Ends not folded over for full 360 degrees		0.65%	3.2	Visual
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.7	Illuminant and Tracer Assembly (Prior to Inserting Illuminant Assembly)				8847442
					NEXT HIGHER ASSEMBLY 8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major 101	Relay charge missing		0.40%	3.2	Visual
Minor 201	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.8	Illuminant and Tracer Assembly				8847442
					NEXT HIGHER ASSEMBLY 8847441
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Color identification of illuminant assembly incorrect		100%	3.2	Visual
2	Color identification of tracer assembly incorrect		100%	3.2	Visual
Major					
101	Filler or cover component missing or loose		0.40%	3.2	Visual/Manual
102	Chamber sizing		44.3%	3.2	4.5.6
Minor					
201	Crimp missing		0.65%	3.2	Visual
202	Poor workmanship		0.65%	3.8	Visual

NOTES:

DRSMC-QA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.9	Signal Assembly (Prior to Inserting Illuminant and Tracer Assembly				8847441
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Propelling charge missing		100%	3.2	Visual
2	Wad disc assembly punctured, missing, or incorrectly assembled		100%	3.2	Visual
3	Propelling charge weight less than min. (See Note)		100%	3.2	Balance
Major					
101	Retaining washer missing or incorrectly positioned		0.40%	3.2	Visual
Minor					
201	Poor workmanship		1.0%	3.8	Visual

NOTE: Volumetric weighing may be utilized as a substitute for precise weighing following qualification. Qualification shall consist of precise weighing until such time as twenty-five hundred (2,500) consecutively volumetric loaded charges are found to meet the minimum prescribed weight. After successful completion of the qualification quantity, the contractor may use a 32-0-1 check weighing sampling plan for each hours production of powder loaded signal cases. If a "weight under min." critical defect is found in the thirty-two (32) unit sample, the hour's production represented by the sample plus an additional eight hundred and forty (840) consecutive, defect free units, must be produced and check weighed before returning to the 32-0-1 hourly sampling plan.

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET OF		DRAWING NUMBER
4.4.2.10	Signal Assembly (Prior to Inserting Top)				8847441
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Illuminant and tracer assembly		0.40%	3.2	Visual
102	Spacer missing		0.40%	3.2	Visual
Minor					
201	Poor workmanship		1.0%	3.8	Visual

NOTES:

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.11	Signal Assembly				8847441
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical					
1	Band color incorrect		100%	3.2	Visual
Major					
101	Diameter of top crimp		0.40%	3.2	Gage
102	Contents loose		0.40%	3.2	Manual
103	Color band missing		0.40%	3.2	Visual
104	Marking misleading or unidentifiable		0.40%	3.2	Visual
105	Case split or assembly otherwise damaged		0.40%	3.2	Visual
106	Sealing compound missing form mating surfaces of top and signal case		0.40%	3.2	Visual
Minor					
201	Total length		0.65%	3.2	Gage
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.12	Box, Fiberboard (Prior to Sealing)				8836949
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Number of assemblies in box incorrect		0.40%	3.2	Visual
102	Assembly improperly packed in box (inverted or packing material missing)		0.40%	3.2	Visual
Minor					
201	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-QA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.13	Sealed Box, Fiberboard				8836949
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Sealing strip improperly applied		0.40%	3.2	Visual
102	Box damaged to extent that contents are exposed or liable to become exposed		0.40%	3.2	Visual
Minor					
201	Contents loose		0.65%	3.2	Manual
202	Marking missing or unidentifiable		0.65%	3.2	Visual
203	Poor workmanship		1.0%	3.8	Visual
NOTES:					

DRSMC 9A (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.14	Wood Packing Box (Prior to Sealing)				8836950
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Box, Fiberboard inverted (primer end up)		0.40%	3.2	Visual
Minor					
201	Incorrect number of cartons		0.65%	3.2	Visual
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

CLASSIFICATION OF DEFECTS & TESTS

MIL-S-1399E(AR)

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.15	Sealed Wood Packing Box				8836950
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Box damaged to extent that contents are exposed or liable to become exposed		0.40%	3.2	Visual
102	Hardware or strapping missing, broken, loose or improperly engaged or assembled		0.40%	3.2	Visual/Manual
103	DOT symbol missing or unidentifiable		0.40%	3.2	Visual
Minor					
201	Metallic seal missing, unsealed or improperly positioned		0.65%	3.2	Visual
202	Contents loose		0.65%	3.2	Manual
203	Marking missing, misleading or unidentifiable (other than marking)		0.65%	3.2	Visual
204	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-QA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

QUALITY CONFORMANCE INSPECTION

CLASSIFICATION OF DEFECTS & TESTS

PARAGRAPH	TITLE		SHEET 1 OF 1		DRAWING NUMBER
4.4.2.16	Barrier Bag, Sealed				8836949
					NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	NO. OF SAMPLE UNITS	AQL OR 100%	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE /INSPECTION METHOD
Critical	None defined				
Major					
101	Seal improper or incomplete		0.40%	3.2	Visual
102	Bag punctured, torn or cut		0.40%	3.2	Visual
103	Heat seal test		0.40%	3.2	4.4.3.8
Minor					
201	Marking missing, incorrect or unidentifiable		0.65%	3.2	Visual
202	Poor workmanship		1.0%	3.8	Visual

NOTES:

DRSMC-OA (D) Form 160, 1 Aug 83 replaces edition of 1 Jul 77 which may be used until exhausted.

4.4.3 Testing.

4.4.3.1 Moisture content. (See Table II) - Major Defect.

TABLE II

Material
Star. charge composition (see 3.3.1)
Tracer charge composition (see 3.3.2)
Black powder (see 3.3.3)
Felt (see 3.3.5)
Paper (see 3.3.4)
Chipboard (see 3.3.4)
Cotton (see 3.3.4)

The contractor shall provide controls to protect the material identified in Table II from moisture pick-up. In addition, a representative sample of each of these materials shall be obtained in accordance with procedures described in ASTM E-300 from the beginning of each eight hour production cycle and tested to determine conformance with the requirements given in paragraphs 3.3.1 to 3.3.5. It the moisture content of a sample fails to meet the requirement, and loading has not started, the material should be rejected until it is dried and retested and found to conform to the moisture requirement. If assemblies have been loaded with non-conforming material (excessive moisture), those assemblies shall be rejected.

4.4.3.2 Transportation vibration. The signal assemblies shall be observed and examined visually without disassembly for any evidence of failure to comply with the requirements as classified in Table III.

TABLE III

Defect	Classification
Signal functions during test (see 3.4.1)	Critical
Signal not sate to transport following test (see 3.4.2)	Critical
Signal damaged after test (see 3.4.3)	Major
Signal packing damaged (see 3.4.4)	Major

4.4.3.2.1 First three (3) lots. Beginning with the first lot produced and continuing until three (3) consecutive lots have complied with the acceptance criteria specified, two hundred and forty (240) signal assemblies shall be selected from each lot for test. The lot shall be rejected if any defect as classified in Table III occurs. The test shall be performed as specified in 4.5.2.

4.4.3.2.2 After three (3) consecutive lots. After three consecutive lots have complied with the acceptance criteria 4.4.3.2.1, eighty (80) signal assemblies shall be selected from each lot for test. The lot shall be rejected if any defect as classified in Table III occurs.

4.4.3.3 Functioning. The signal assemblies shall be observed for any evidence of failure to comply with the requirements as classified in Table IV when tested-as specified in 4.5.3.

TABLE IV

Defect	Classification
Star color incorrect (see dwg. 8847448)	Critical
Star or tracer bursts in pistol (see 3.5.1)	Critical
Tracer color incorrect (see dwg. 8847453)	Critical
Tracer and one star ingite but second star fails to ignite (see 3.5.7)	Critical
Star burning time incorrect (see dwg. 8847448)	Major
Tracer burning time incorrect (see dwg. 8847453)	Major
Star ignition time less than min. (see 3.5.5)	Major
Primer fails to function (see 3.5.3)	Major
Signal case defect (see 3.5.2)	Major
Altitude below min. (see 3.5.6)	Major
Tracer ignition time over max. (See 3.5.4)	Major
Tracer and star simultaneous burning time over max (see 3.5.7)	Major

Tracer extinction and star initiation interval over max (see 3.5.8)	Major
Detached composition burning time over max (see 3.5.9)	Major

4.4.3.3.1 Two hundred forty (240) signal assemblies selected and tested in accordance with 4.4.3.2.1 shall be function tested in accordance with 4.5.3. The lot shall be rejected if a Critical defect occurs or if eight (8) or more defects are found during the test (see Table IV).

4.4.3.3.2 The eighty (80) signal assemblies selected and tested in accordance with 4.4.3.2.2 shall be tested for functioning in accordance with 4.5.3. " The lot shall be rejected if a Critical defect occurs or if four (4) or more Major defects are found during the test (see Table IV).

4.4.3.4 Air leakage test (see 3.6). This test shall be performed 100 percent in accordance with the procedure specified in 4.5.4* All assemblies that fail to comply with the requirement shall be classed defective and removed from the lot.

4.4.3.5 Static test of star and tracer assemblies (see dwgs. 8847448 and 8847453). The star assembly and tracer assembly shall each be tested and observed for the following defects as classified in Table V.

TABLE V

Defect	Classification
Assembly fails to ignite	Major
Candlepower under min.	Major
Color value under min.	Major

4.4.3.5.1 First three (3) lots. Beginning with the first lot produced and continuing until three (3) consecutive lots have complied with the acceptance criteria specified, eighty (80) star assemblies shall be selected from each lot for test in accordance with the procedure specified in 4.5.5. The lot shall be rejected if five (5) or more defects are found during the test.

4.4.3.5.2 After three (3) consecutive lots. After three consecutive lots have complied with the acceptance criteria of 4.4.3.5.1, thirty-two (32) star assemblies of each color and thirty-two (32) tracer assemblies of each color shall be selected from each lot. for test. The lot shall be rejected if, during the test, three (3) or more assemblies exhibit any of the defects as listed in Table V.

4.4.3.6 Chamber gaging. (see dwg. 8847441) . Chamber gaging shall be performed 100 percent. Any assembly that binds or otherwise-fails to gage freely shall be classed defective and removed from the lot. The gaging shall be performed as specified in 4.5.6.

4.4.3.7 Check test for possible deteriotation of primers (see applicable primer specification) . If the total elapsed time between original acceptance of any primer lot and the assembly of that lot into the signal assemblies exceeds two years, or if the primers have been subjected to adverse conditions, however brief, at any time since previous tests, the primer lots shall be subjected to and must satisfactorily pass the check test specified in the applicable primer specification. The check test shall be performed by the contractor (see 6.6) prior to assembling the primers into the signals.

4.4.3.8 Heat seal test of sealed bag (see dwg. 8836949). Sampling, acceptance criteria, and test methods shall be as specified in MIL-P-116.

4.4.4 Inspection equipment. The inspection equipment required to perform the examinations and test prescribed herein is described in the paragraph Reference/Inspection Method column in the tables starting with paragraph 4.4.2.1. The contractor shall submit for approval inspection equipment designs in accordance with the terms of the contract. See Section 6 of MIL-A-48078 and 6.3 herein.

4.5 Methods of inspection.

4.5.1 Moisture content.

4.5.1.1 Star charge composition.

4.5.1.1.1 Preferred method. Determine the moisture content of the star charge composition in accordance with Method 101.2 given in MIL-STD-1234 using a suitable size sample (50g).

4.5.1.1.2 Alternate method. The moisture content shall be determined in accordance with Method 101.4 of MIL-STD-286.

4.5.1.2 Tracer composition. Determine the moisture content of the tracer composition in accordance with Method 102.1.1 given in MIL-STD-1234 using 10g. sample and 70° + 2°C heat for 2 hours.

4.5.1.3 Black powder. Determine the moisture content of black powder in accordance with Method 102.1.1 given in MIL-STD-1234 using a 2g. sample and 70° to 75°C for 4 hours.

4.5.1.4 Other components (paper, cotton, chipboard and polypropylene. Determine the moisture content of the "other components" in accordance with Method 102.1.1 given in MIL-STD-1234.

4.5.1.5 Cotton. Ten g. of cotton shall be accurately weighed and placed in a tared weighing dish. The dish and contents shall be weighed and placed in an oven and dried at 100 + 2°C for 2 hours. The dish and contents shall be cooled in a desiccator and weighed. The loss in weight shall be calculated as percent moisture in the sample.

4.5.2 Transportation vibration. The signal assemblies selected as specified in 4.4.3.2.1 or 4.4.3.2.2 shall be packaged and packed in accordance with dwg. 8836949 and 8836950. Each packed box shall be subjected to the transportation-vibration test as specified in MIL-STD-331, except that each box shall be vibrated at the specified amplitudes for four (4) hours in each of three different positions (i.e. box positioned so that signal assemblies are vertical with base end down, box positioned so that signal assemblies are horizontal, and box positioned so that the signal assemblies are vertical with base end up). After the test, the box packing and the signal assemblies shall be examined to determine compliance with the requirements.

4.5.3 Functioning. The signal shall be immersed to a depth between 6 and 9 inches for 2 hours, in water maintained at 70 ± 10%?. At the end of the immersion time, the signals shall be removed from the water and the exterior surfaces wiped dry. The signals shall be fired in a pistol, for which the signal is standard, that is mounted on a tower platform, at a min. height of 100 feet above the ground. The signal functioning shall be observed for compliance with the requirements. Any signal which fails to conform to the applicable requirements shall be classed defective.

4.5.3.1 Test Validity. If for any reason the test conditions have detrimentally affected the test results, the test shall be declared invalid and a new test shall be performed with additional samples.

4.5.4 Air leakage test. The signal assembly shall be placed in a cylindrical air tight chamber with the free space minimized. The air pressure within the chamber shall be raised-to a min. of 3 p.s.i.g. by means of a fixed volume of air. With the air supply shut off the pressure shall be maintained for 15 seconds min. An accurate pressure measuring instrument shall be observed for evidence of signal leakage.

4.5.5 Static test of star assembly and tracer assembly. The assembly shall be supported in a horizontal position with the axis of the assembly perpendicular to the photometric axis. The assembly shall be ignited with a quickmatch, and the candlepower and color

value determined and recorded in accordance with the procedures and equipment specified in dwgs. 9201136, 9201268, 9201390 and associated dwgs., 9201392 and 9247071. When measuring tracer candlepower, the peak reading shall be taken in lieu of the average candlepower reading specified on dwg. 9201258.

4.5.6 Chamber gaging. The signal assembly shall be gaged with equipment specified in 4.4.4. Any assembly which fails to comply with the drawing requirement shall be classed defective.

5. PACKAGING

5.1 Preservation and packaging.

5.1.1 Level A. Signals shall be packaged in accordance with dwgs . 8836949 and 8836950.

5.2 Marking. Marking shall be in accordance with dwgs. 8836949, 8836950 and 8796522.

6. NOTES

6.1 Intended use. The components covered by this specification are intended for use on the AN-M53A2 thru AN-M58A2 Signals Illumination, Aircraft Tracer.

6.2 Ordering data. See MIL-A-48078.

6.3 Submission of Inspection Equipment for Design Approval. See MIL-A-48078. Submit equipment designs as required to: Commander, US Army Armament Research and Development Center, ATTN: DRSMC-QAT-I(D), Dover, NJ 07801.

6.4 Distribution of ammunition data cards. Distribution of data cards shall include the following: Commander, US Army Armament Research and Development Center, ATTN: DRSMC-QAT-M(D), Dover, NJ 07801.

6.5 Star burning time. The star burning time is defined as the time from the appearance of the first colored light from the illuminant assembly (not the first sputtering light from the quickmatch or black powder priming charge) until the time that the light from the star has decreased to approximately less than 10 percent of peak brilliance.

6.6 Cost of check test. The Contracting Officer should arrange for the contractor to be reimbursed for the expense incurred in the performance of the check test. The tests shall be conducted at Government expense without cost to the contractor who loaded the primer or to the contractor assembling the primers in the signals and shall not constitute a basis for rejection against either contractor except where deterioration has occurred as a direct result of carelessness in handling, storage, etc., permitted while the primer lots where under the jurisdiction of either contractor.

6.7 Safe to transport. The signal assembly will be considered safe to transport providing no evidence exists of loose powder or composition in the box, or missing, loose or protruding primers.

6.8 Signal free of damage. The signal assemblies will be considered free of damage that will affect the intended function provided the top seal has not been broken by movement or displacement of the top, or the case side has not been distorted sufficiently to prevent ejection of the star assembly.

6.9 Identification of international standardization agreements. Certain provisions of this specification are the subject of international standardization agreement STANAG 3398-Air Pyrotechnics Interchangeability Chart. When amendment, revision, or cancellation of this specification is proposed, the departmental custodians will inform their respective Departmental Standardization Officers sc that appropriate action may be taken respecting the interns-t-'ibnal.. agreement concerned.

6.10 Test summary.

Lot	Sample Size	Test	Requirements
First Article	30 of each color	Functioning	See Table IV
Regular production (First three consecutive acceptable lots)	240	Functioning	See Table IV
Remaining	80	Functioning	See Table IV

Custodian:
Army-AR

Preparing activity:
Army-AR

(Project 1370-A172)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document*(s)* or to amend contractual requirements.

(Fold along this line)

(Fold along this line)

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 12062 WASHINGTON D. C.
POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE ARMY

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

COMMANDER
US ARMY ARMAMENT RESEARCH & DEVELOPMENT CENTER
ATTN: DRSAR_QA
DOVER, NJ 07801 5001

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-S-1399E	Signals, Illumination, Aircraft Tracer, Doublestar AN-M53A2

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426 PREVIOUS EDITION IS OBSOLETE.