MILITARY SPECIFICATION
CHAFF, COUNTERMEASURES (TYPE RR-( )/AL)
GENERAL SPECIFICATION FOR

This specification is approved for use within the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for design, construction, performance and testing of the Chaff Countermeasures (Type RR-( )/AL. This countermeasure is a Chaff Head (CH) that is used in conjunction with the 5 inch rocket system. The Chaff Countermeasures (radar reflector) contains components capable of creating confusing returns to radar systems operating within specified frequency ranges.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specification and standards. Unless otherwise specified, 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.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Systems Engineering Specifications and Standardization Department (SESD) Code 93, Lakehurst, N.J. 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

SPECIFICATION

Military

MIL-P-116	Preservation Packaging, Method of
DOD-D-1000	Drawings, Engineering and Associated List
MIL-T-18303	Test Procedures; Preproduction, Acceptance and Life for Aircraft Electronic Equipment, Format for
MIL-C-85728/1	Chaff, Countermeasures (Type RR-182/AL) Specification Sheet.

STANDARDS

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-331	Fuze and Fuze Components, Environmental and Performance Tests for
DOD-STD-481	Configuration Control-Engineering Changes, Deviation and Waivers
MIL-STD-794	Parts and Equipment, Procedures for Packaging of
MIL-STD-810	Environmental Test Methods
MIL-STD-1323	Fleet Issue Unit Load
MIL-STD-2071	Testing of Chaff Radar Cross-Section

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

MANUALS

Naval Air Systems Command

NAVAIR 11-85-5	Description, Safety, Service and Handling Instructions (Intermediate) Airborne Rockets

PUBLICATIONS

Code of Federal Regulations

CFR 49 100-177	Transportation

(Copies of specifications standards, other Government documents, and publications required by contractors in connection with specific acquisition should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

STANDARDS

American Society of Mechanical Engineers

ANSI Y14.5	Dimensioning and Tolerancing for Engineering Drawings

(Application for copies should be addressed to the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specification, specification sheet or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.2, 6.2.1 and 6.3).

3.3 Chaff material. The chaff material shall be in accordance with the applicable specification sheet (see 3.1).

3.3.1 Dipoles. Dipoles shall meet the dimension and composition requirements of the applicable specification sheets (see 3.1). Dipoles composed of coated filaments shall have a d.c. resistivity not greater than 10 ohms per linear inch.

3.3.2 Secondary (slip) coating. When specified in the applicable specification sheet (see 3.1), a secondary (slip) coating shall be applied to the chaff material to:

a. Prevent dipole end welding and metal smear during the cutting operation.

b. Prevent cohesion between dipoles which may be caused by corrosive conditions.

c. Increase dispersion by reducing dipole-to-dipole friction.

The formulation of the slip coating shall be approved by the procuring activity prior to use as part of the first article inspection procedures or quality conformance inspection procedures if a first article is not required.

3.4 Design and construction. Each Chaff Head (see 6.4.3) including chaff payload (see 6.4.2) and all parts, assemblies, markings, packaging and packing; shall conform to all the requirements of this specification, and the applicable DL for design, construction and workmanship, except as otherwise specified in the contract (see 6.2.1). Configuration control shall be maintained in accordance with DOD-STD-481.

3.4.1 Nomenclature and identification markings. Nomenclature and identification markings shall be in accordance with MIL-STD-129, MIL-STD-130 and as specified herein.

3.4.2 Item definition. The Chaff Countermeasures (Type RR-( )/AL) is comprised of an conical shaped nose section with a spherical radius nose tip, a settable fuze, pyrotechnic devises, a cylindrical body section with frangible case containing the chaff payload and a rocket motor adapter designed for use as an applicable rocket motor/Chaff Head combination. The chaff payload is comprised of aluminum coated glass dipoles. The dipoles are cut to respond to specified radar threat frequencies. At a predetermined point after launch from the aircraft, equal to the preset of the fuze, the fuze detonates the center burster. The chaff payload is ejected and the chaff dipole muffins are dispensed. The dipoles produce a chaff cloud, creating a simulated target or decoy. The Chaff Head shall be manufactured in accordance with this specification, the applicable Data List (DL) and all drawings and specifications listed herein.

3.4.3 Physical characteristics. The Chaff Head shall be functionally compatible with the LAU-10( ) launcher and the rocket motor designated in the applicable specification sheet (see 3.1). Neither the operational reliability of the launcher nor the effectiveness of the chaff payload shall be degraded when the Chaff Head is used with this launcher.

3.5 Standard conditions. The following conditions shall be used to establish normal performance characteristics under standard conditions.

a.	Temperature	Room ambient (25 degrees +/- 10 degrees C)
b.	Altitude	Normal ground
c.	Vibration	None
d.	Humidity	Room ambient up to 90 percent relative humidity

3.6 Service conditions. The Chaff Head shall operate as required under any of the environmental service conditions or combinations of these conditions specified in MIL-STD-810 and MIL-STD-331 as modified herein. Tolerances shall be in accordance with the general requirements of MIL-STD-810 and MIL-STD-331.

3.7 Performance requirements. Unless otherwise specified herein, values set forth to establish the specified performance apply to performance under both standard and extreme service conditions. When reduced performance under extreme conditions is acceptable, tolerances or values setting forth acceptable variations from the performance and standard conditions will be specified herein.

3.7.1 Performance characteristics. Performance characteristics shall be in accordance with MIL-STD-2071 and this specification, when the Chaff Head is tested in accordance with the requirements specified herein.

3.8 Detail requirements. The Chaff Head contents shall meet the design, construction and physical requirements specified herein. Drawings shall be interpreted with DOD-D-1000 and ANSI Y14.5.

3.8.1 Components. Each Chaff Head shall consist of a nose section, settable fuze, pyrotechnic devices, and a cylindrical body section, chaff payload, rocket motor adapter and other components and shall be of the material, dimensions, quality and quantity specified in this specification and applicable DL.

3.8.1.1 Nose section. The conical shaped nose section shall consist of a nose cap, fuze cover assembly and fuze housing.

3.8.1.2 Settable fuze. The settable fuze shall consist of a timing or other variable device in the applicable specification sheet (see 3.1) and be capable of inititating the center burster (see 3.8.1.3.1) at a predetermined point after launch.

3.8.1.3 Pyrotechnic device(s). The pyrotechnic device(s) shall consist of a center burster and others as specified in the applicable specification sheet (see 3.1).

3.8.1.3.1 Center burster. After launch and at a designated point equal to the preset, the primer striker shall initiate the fuze explosive train and detonate the center burster charge. This charge propels the chaff payload through the frangible case (see 3.8.1.4.1).

3.8.1.4 Cylindrical body section. The cylindrical body section shall consist of a frangible case which contains the center burster, chaff payload/assembly(s) (see 3.8.1.5) and a rocket motor adapter (see 3.8.1.6).

3.8.1.4.1 Frangible case. The frangible case shall consist of a material that fragments when the center burster charge is detonated. This shall propel the chaff assembly(s) radially outward from the Chaff Head.

3.8.1.5 Chaff. The chaff payload/assembly(s) (see 6.4.2) shall be as specified in the applicable specification sheet (see 3.1).

3.8.1.6 Rocket motor adapter. The threaded rocket motor adapter shall be attached to the end of the frangible case. The adapter shall allow the applicable rocket to be assembled to the Chaff Countermeasure. A shipping cap shall cover the threads of the adapter (see 3.8.1.6.1).

3.8.1.6.1 Shipping cap. The shipping cap shall be a removable item that protects the screw threads of the rocket motor adapter prior to assembly to the rocket motor.

3.8.2 Markings. The Chaff Head shall be marked in accordance with the requirements of MIL-STD-130, and the applicable DL.

3.8.3 Assembly(s). The Chaff Head shall be assembled in accordance with the requirements of this specification and applicable DL. The chaff muffins and muffin packs shall be positioned within the chaff assembly(s) as specified in the applicable DL.

3.8.4 Weight. The minimum gross weight of the Chaff Head and chaff payload or chaff assembly(s) shall be as specified in the applicable specification sheet (see 3.1) and applicable DL.

3.9 Workmanship. The Chaff Countermeasure, including all parts shall be manufactured in accordance with the applicable DL and as specified herein.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements. The Government will conduct all flight and ground launch acceptance tests.

4.1.1 Responsibility for compliance. All items must meet all requirements of Section 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality assurance program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Classification of inspections. The inspections requirements specified herein are classified as follows:

a. First Article Inspection (see 4.2).

b. Initial Production Inspection (see 4.3).

c. Quality Conformance Inspection (see 4.4).

4.1.3 Lot information. A lot shall consist of a group of items of a specific configuration, produced within the same time frame at one location, by the same production line and production technique, and submitted for acceptance, inspection, or use at one time.

4.2 First article inspection. First article inspection shall be conducted by the contractor on the Chaff Head and chaff payload that are representative of the production units to be supplied under the contract. The Chaff Head and chaff payload shall be inspected according to the approved first article inspection procedure (see 4.5). No first article inspection shall be conducted prior to acceptance of the first article test procedure by the procuring activity. First article samples shall not be submitted for functional (Government) tests until in-house tests have been conducted in accordance with the approved test procedures, and the test results have been accepted by the contracting officer.

4.2.1 Scope of inspection. Ten Chaff Heads, four static Chaff Heads (see 6.4.6) and chaff assembly(s) shall be selected for first article inspection (see TABLE I) to verify that the Chaff Heads and chaff assembly(s) shall meet all requirements of this specification, applicable DL and the contract (see 6.2.1). The tests on each group shall be run in the order specified in TABLE I. Each of the groups shall be clearly marked on each item before starting first article tests.

4.2.2 First article approval. Approval of the first article samples will be by the procuring activity upon satisfactory completion of all inspections. No production Chaff Heads shall be delivered prior to the approval of the first article samples.

4.2.3 Production chaff head. Chaff Heads supplied under the contract shall be in all respects, including design, construction, workmanship,

performance and quality be equal to the approved first article. Each Chaff Head shall be capable of successfully passing the same tests as imposed on the first article samples. Evidence of noncompliance with the above shall constitute cause for rejection, and it shall be the obligation of the contractor to make the necessary corrections as approved by the procuring activity.

TABLE I. First article inspections-schedule and sequence.

Inspection	Reqm't para.	Insp. para.	CHAFF HEAD/GROUP See NOTE 1								
			A (*)	B (4)	C (2)	D (2)	E (1)	F (2)	G (1)	H (1)	I (1)
Chaff material	3.3	4.6	X	X	X	X	X	X	X	X	X
Visual insp.	3.4	4.7	X	X	X	X	X	X	X	X	X
Weight	3.8.4	4.8.1	X		X	X	X	X	X	X	X
Temp. shock	3.6	4.10.1					X				
Temp/humidity	3.6	4.10.2.1						X			
Salt fog	3.6	4.10.3							X		
Shock	3.6	4.10.4								X	
Vibration	3.6	4.10.5									X
Assembly arena dispersion	3.7	4.9	X								
Static Chaff Head dispersion	3.7	4.9		X							
Functional (ground)	3.7	4.11			X		X	X	X		
Functional (air)	3.7	4.11				X				X	X

NOTE 1: "( )" indicates quantity of units, Group A (*) the quantity of chaff assembly(s) shall be in accordance with 4.9.1, Group B are static Chaff Heads and Group C thru I are Chaff Heads.

4.3 Initial production inspections. Four Chaff Heads of the first 50 production Chaff Heads shall be selected and sent to the designated Government Laboratory for inspection. No other inspections other than those listed below and in accordance with TABLE II shall be conducted on the

samples prior to starting the initial production inspections. The first article units shall not be selected for this inspection. The Government Laboratory inspection shall include, but not be restricted to, the procedures of 4.7, 4.8.1 and 4.11. Initial production inspection shall also include chaff assembly(s) and static head arena dispersion test (4.9, 4.9.1 and 4.9.2) and shall be conducted by the contractor or a Government approved facility. Four static head samples shall be selected from the same 50 production Chaff Heads prior to final assembly into units. The chaff assembly(s) samples shall be selected from the same samples selected from the production Chaff Head and static heads above, prior to final assembly into units. The initial production inspection samples shall be selected by the Government representative after they have successfully passed all the applicable production individual inspection procedures of 4.4.1 and material inspection of 4.6. If first article inspection has been waived, four more Chaff Heads of the original 50 production heads shall be selected and sent to the designated Government Laboratory for the functional air launch test of 4.11.

4.3.1 Scope of inspections. The samples shall be subjected to any and all inspections the procuring activity deems necessary to assure that the production units are equal to the previously approved first article samples in design, construction, workmanship, performance and quality and that they meet all requirements specified herein and in the contract.

TABLE II. Initial production inspections-schedule and sequence.

Inspection	Reqm't Para.	Insp. Para.	CHAFF HEAD/GROUP See NOTE 1				See NOTE 2	
			IA (*)	IB (4)	IC (2)	ID (2)	IE (2)	IF (2)
Chaff material	3.3	4.6	X	X	X	X	X	X
Visual insp.	3.4	4.7	X	X	X	X	X	X
Weight	3.8.4	4.8.1	X	X	X	X	X	X
Temp/humidity	3.6	4.10.2.2				X		X
Assembly arena dispersion	3.7	4.9	X					
Static Chaff Head arena dispersion	3.7	4.9		X				
Functional test (air launch)	3.7	4.11					X	X
Functional test (ground launch)	3.7	4.11			X	X		

NOTE: "( )" Indicates quantity of units, Group IA (*) the quantity of chaff assembly(s) shall be in accordance with 4.9.1, Group IB are static Chaff Heads and Group IC thru IF are Chaff Heads.

NOTE 2: Air launch groups IE and IF are required only if first article has been waived.

4.3.3 Initial production sample approval. Approval of the initial production sample will be by the procuring activity upon satisfactory completion of all inspections. Any design, material, or performance defect made evident during these inspections shall be corrected by the contractor to the satisfaction of the procuring activity. Failure of the initial production sample to pass any of the inspections shall be cause for deliveries under the contract to cease until proper corrective action is approved and accomplished.

4.4 Quality conformance inspections. The contractor shall furnish all samples and with the exception of Government performed flight and ground tests, shall be responsible for accomplishing the quality conformance inspections. All examinations and tests shall be under the supervision of the Government representative. The contractor shall prepare inspection reports showing quantitive results for all applicable quality conformance inspections. Such reports shall be signed by the authorized representative of the contractor or laboratory, as applicable. Acceptance or approval of material during the course of manufacture shall not be construed as a guarantee of the acceptance of the finished product. Quality conformance inspections shall consist of the following:

a. Individual Inspections (see 4.4.1),

b. Sampling Inspections (see 4.4.2) and

c. Special Inspections (see 4.4.3).

4.4.1 Individual inspections. Individual inspections are those inspections conducted on each Chaff Head. Individual inspections for the Chaff Heads shall be as specified in TABLE III. Failure to pass any of these inspections shall be cause for rejection of the Chaff Head.

TABLE III. Individual inspection.

Inspection	Requirements Paragraph	Inspection Paragraph
Chaff Head components	3.8.1	4.7.2
Chaff Head markings	3.8.2	4.7.3
Weight	3.8.4	4.8.1
Packaging and packing	5.2	4.7.4

4.4.2 Sampling inspections. Chaff Heads selected for sampling inspections shall first have passed the individual inspections. The Chaff Heads shall be selected for sampling inspections by the Government representative in accordance with the schedule specified herein. The Government representative shall be informed as to when and where the test(s) will be conducted.

4.4.2.1 Scope of inspections. Sampling inspections shall include examination and tests for verification of manufacturing and performance requirements.

4.4.2.1.1 Sampling inspection for verification of manufacturing processes. Sampling inspections for verification of the manufacturing process shall include, as a minimum, those in-process inspections specified in 4.6, 4.7 and 4.8.

4.4.2.1.2 Sampling inspection for verification of performance requirements.

4.4.2.1.2.1 Arena dispersion test. Sampling inspections for verifications of performance requirements arena dispersion test (see 6.4.1) shall be conducted by the contractor on four static Chaff Heads to demonstrate conformance to the requirements of 4.9.2.

4.4.2.1.2.2 Government performed ground launch test. Sampling inspections for verification of performance requirements (ground launch test) shall be conducted on four Chaff Heads to demonstrate conformance to the requirements of 4.11.2 when conducted in accordance with the procedures of MIL-STD-2071.

4.4.3 Special inspections. Special inspections shall be conducted on four Chaff Heads and chaff assembly(s), if applicable, for the purpose of checking the effect of any design or material change on performance, and to assure adequate quality control. The Chaff Heads and chaff assembly(s), if applicable, selected for special inspections may be selected from those previously subjected to sampling inspections.

4.4.3.1 Special inspection schedule. Selection of Chaff Heads or chaff assembly(s) for special inspections shall be made as follows:

a. On early Chaff Heads after an engineering or major change.

b. Whenever failure reports or other information indicate that additional inspections are required. (This will be determined by the procuring activity.)

4.4.3.2 Scope of inspections. Special inspections shall consist of such examinations and tests as specified in the contract (see 6.2.1). Inspection procedures previously approved for the first article inspection shall be used where applicable.

4.4.4 Chaff head, and chaff payload/assembly(s) failure. Should a failure occur during either the sampling or special inspections, the following action shall be taken:

a. Determine the cause of the failure by conducting a failure investigation and analysis.

b. Determine if the failure is an isolated case of design or fabrication defect.

c. Where practical, include an inspection in the individual inspections to check all units (see 6.4.18) for this requirement until assurance is obtained that the defect has been corrected.

4.5 Inspection procedures. The right is reserved by the procuring activity or the Government inspector to modify the inspections or require any additional inspections deemed necessary to determine compliance with the requirements of this specification and the contract (see 6.2.1). MIL-T-18303 shall be used as a guide for preparation of inspection procedures. When approved inspection procedures are available from previous contracts, such procedures may be used provided their use is acceptable to the procuring activity; however, the right is reserved by the procuring activity to require modification of such procedures, including additional inspections, when deemed necessary (see 6.2.1).

4.6 Inspection of material.

4.6.1 Chaff material inspection. Examination of the materials receiving inspection report for each receiving inspection lot (see 6.4.12) and on-line inspection of chaff-cut lots (see 6.4.10) and chaff-hank lots (see 6.4.11) as specified herein shall be made to adequately demonstrate compliance with the requirements of this specification.

4.6.1.1 Chaff-hank inspections.

4.6.1.1.1 Dipole characteristics inspection. Fifty fibers or strands from each chaff-hank lot shall be inspected for the weight, dimension and coating requirements of this specification. If more than five fibers or strands do not meet the specified requirements, the lot shall be rejected and production stopped until corrective action has been taken. One chaff-hank from each chaff-hank lot may be weighed, as a unit, in lieu of 50 fibers or strands to verify the in-process weight requirements.

4.6.1.1.2 Secondary (slip) coating. The formulation of the secondary (slip) coating shall be verified by means of appropriate chemical analysis. An incorrect formulation shall be rejected and not used for production until corrective action has been taken.

4.6.1.1.3 Conductivity and resistivity test of the coating. Randomly select five fibers 40 inches long from a chaff-hank lot. The fibers shall be used to test the conductivity and resistivity of the coating. Using a d.c. ohmmeter, measurement shall be made on the interior 30 inch length of the

40 inch fiber length for the electrical resistance. Any fiber which fails to meet all the requirements of 3.3.1 shall be cause for rejection of the lot.

4.6.1.2 Chaff-cut/muffin inspection.

4.6.1.2.1 Dipole length inspection. Twenty dipoles from each chaff-cut lot (specified herein) shall be selected at random from each chaff-cut lot. Each of these dipoles shall be measured and recorded. If more than four dipoles from any chaff-cut, or more than 15 percent of the total sample are found to be out of the specified tolerance, that lot of chaff-cuts shall be rejected and production stopped until corrective action has been taken. An alternate method in lieu of dipole length inspection may be used, by measuring the length of the chaff muffin. From each lot of each type of chaff muffin, randomly select five muffins from each type cut. If more than one muffin from any muffin-cut, or more than 15 percent of the total samples are found to be out of specified tolerance, that lot of chaff muffin-cuts shall be rejected and production stopped until corrective action has been taken. The inspection shall be repeated on the first chaff-cut processed after the corrective action has been taken to assure compliance with the specification requirements.

4.6.1.2.2 Chaff muffin dipole inspection. From each lot of each type of chaff muffin, randomly select five muffins from each type cut. The chaff muffin shall be inspected after the cutting operation to visually inspect for dipole end-welding, metal smearing and cohesion between dipoles. Any chaff muffin failing to meet all the requirements of 3.3 shall be cause for rejection of the muffin lot.

4.7 Visual inspection.

4.7.1 Chaff payload/assembly(s). Verification of the presence of all component parts in accordance with the applicable DL shall be made through visual inspection.

4.7.2 Chaff head/components. Verification of the presence of all component parts in accordance with 3.8.1 and the applicable DL shall be made through visual inspection.

4.7.3 Chaff head/component marking. Visual inspection shall be made to confirm compliance with the applicable DL.

4.7.4 Packaging and packing. Visual inspection shall be made of the packaging and packing to assure compliance with Section 5 of this specification. Any discrepancies from the specification shall be cause for rejection.

4.8 Chaff head inspection.

4.8.1 Weight. All of the first article, initial production and production chaff assembly(s) and Chaff Heads shall be weighed in accordance with 3.8.4 and recorded.

4.9. Arena dispersion test. Arena dispersion test shall be conducted by the contractor on samples selected from first article and initial production as specified in TABLES I and II and production lots in accordance with 4.4.2.1.2.1. The Government representative shall be informed as to when and where the contractor will conduct the above test.

4.9.1 Chaff assembly(s) dispersion test. The chaff assembly(s) dispersion test shall be conducted in accordance with the applicable specification sheet (see 3.1). Place the test fixture 90 +/-2 feet above a flat ground area with a minimum diameter of 200 feet. The dispersion arena is specified in FIGURE 1. Initiate detonation and evaluate the results for compliance with the applicable specification and applicable specification sheet (see 3.1). Determine and record the number of muffins/muffin packs which fail to unwrap in a continued free fall as follows:

a. Collect all muffins or muffin packs which partially or completely failed to unwrap.

b. Hold each of the above individual muffins or muffin packs by the end of the outer wrap and note those which fail to unwrap under their own weight.

c. Hold each of the above muffin packs by the end of the outer wrap and determine which of those that failed to unwrap under their own weight. Repeat for each succeeding wrap and accomplish step (b) for all muffins that release from their packs.

d. Muffins which fail to unwrap, shall be not greater than the next whole number over 3 percent per assembly(s) and shall be not greater than 10 percent for any one dipole length.

e. Record the following for each chaff assembly(s):

(1) The number of individual muffins failing to unwrap and their respective dipole length.

(2) The number of muffin packs that fail to unwrap and the number of muffins in each pack and their respective dipole length.

4.9.2 Static chaff head dispersion test. Prepare the static Chaff Head for dispersion test. The static head is manufactured with the following items not installed: the safety pin, nose cap, fuze cover, fuze retainer ring and settable fuze. Install a blasting cap (see 6.6.1) in the fuze well in-line with the center burster; pack with sealing compound (NSN 8030-00-281-2337, Nashua 101 Ductsealer) or equal to hold in place and connect the necessary wiring. Place the static Chaff Head 80 +/-2 feet above a flat cleared ground area with a minimum diameter of 250 feet. Initiate detonation and evaluate the results for compliance with the applicable specification sheet (see 3.1). Record the data on a form similar to FIGURE 2.

4.9.3 Arena test failure criteria.

4.9.3.1 Chaff assembly(s). All chaff muffins and muffin packs shall unwrap when expelled after detonation in accordance with the requirements of 4.9.1. Any discrepancies from this specification shall be cause for rejection of the lot.

4.9.3.2 Static chaff head. The static Chaff Head shall disperse the chaff payload, (chaff muffins and muffin packs) in accordance with the requirements of 4.9.1 and 4.9.2. Any discrepancies from this specification shall be cause for rejection of the lot.

4.10 Environmental test. The simulated environmental test specified below shall be performed in the order presented herein. Tolerances for these tests shall be in accordance with MIL-STD-810 and MIL-STD-331 unless otherwise specified herein. The Chaff Head shall show no signs of degradation or appreciable damage and shall meet all dimensional and performance requirements after exposure.

4.10.1 Temperature shock. The Chaff Head shall be subjected to a temperature shock test in accordance with MIL-STD-810, Method 503.2, Procedure I, except the diural cycle shall be deleted. Temperature is to cycle between -54 degree C and +71 degree C.

4.10.2 Temperature and humidity.

4.10.2.1 Temperature and humidity (first article). The Chaff Heads selected for First Article testing shall be subjected to a 28-day temperature and humidity test in accordance with MIL-STD-331, Method 105.1.

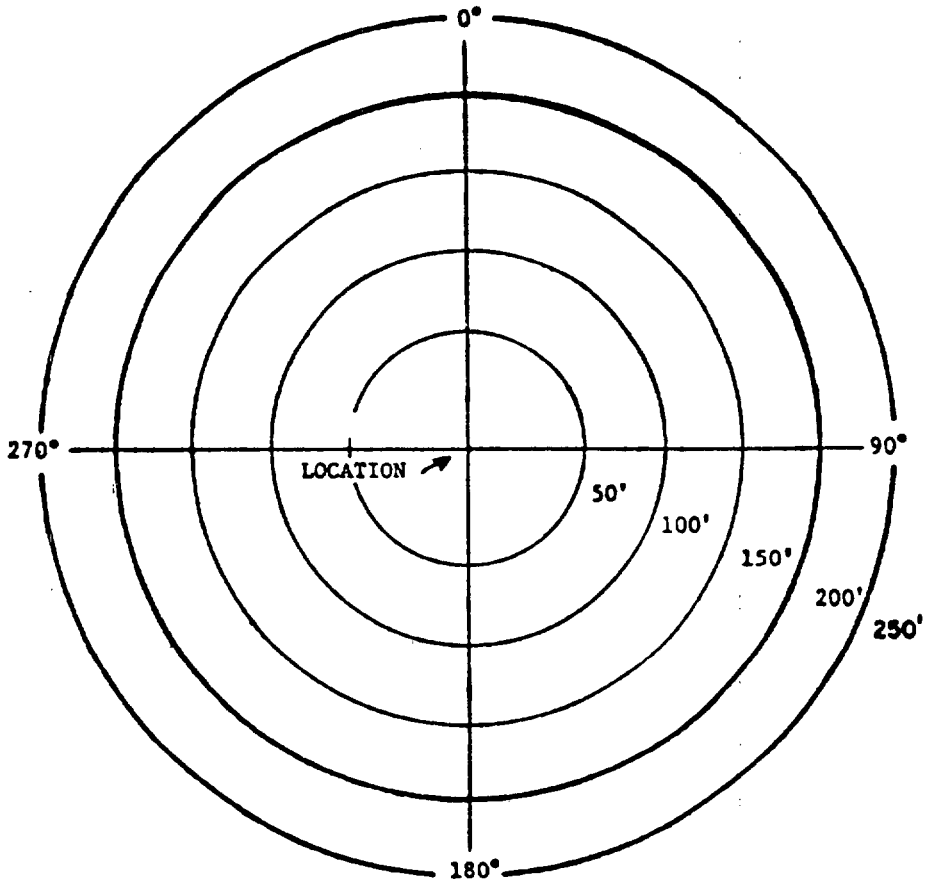
4.10.2.2 Temperature and humidity (Initial Production). The Chaff Heads selected for Initial Production testing shall be tested in accordance with MIL-STD-331, Method 105.1, except the test duration shall be four days. Either the two chamber method or the single chamber method may be utilized as follows:

a. Two chamber method - Conduct the test as specified in 5.1.1 through 5.1.5 and 5.1.19.

b. Single chamber method - The test duration of 5.2.2 shall be four days in lieu of two 14-day cycles. The Chaff Head shall be returned to room temperature at the end of four days rather then 28-days as specified in 5.23.

4.10.3 Salt fog. The Chaff Head shall be subjected to a salt fog test in accordance with MIL-STD-810, Method 509.2, Test Configuration 3.

4.10.4 Shock. The Chaff Head shall be subjected to a shock test in accordance with MIL-STD-810, Method 516.3, Procedure I. The Chaff Head shall not suffer damage or subsequently fail to provide performance specified after being subjected to 18 impact shocks, consisting of three



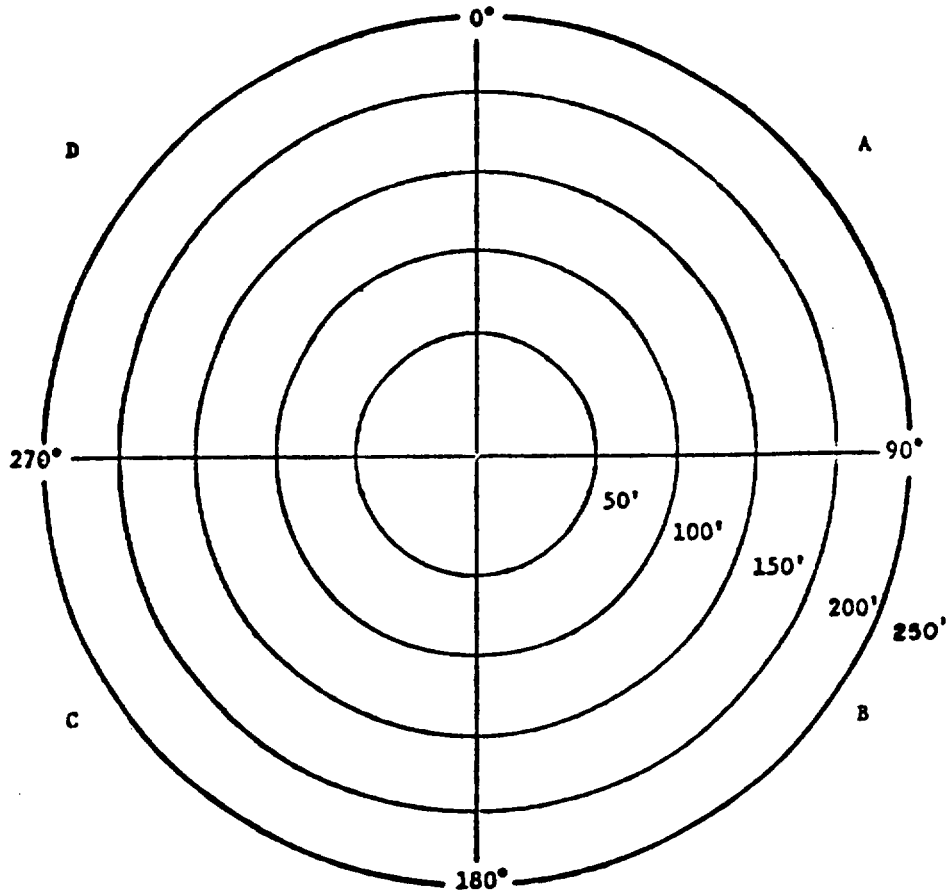
NOTE: ARENA SHALL BE RELATIVELY FLAT. NO OBSTRUCTIONS EXCEPT 3" MARKING STAKES, IF REQUIRED, SHALL BE PRESENT FOR A DISTANCE 200' FROM THE TOWER.

FIGURE 1. Dispersion arena

SERIAL NO. _____ TEST DATE & TIME _____

HGT. _____ WIND VELOCITY _____ DIRECTION _____

AMBIENT TEMP. _____



TOTAL NO. DISPENSERS RECOVERED _____

TOTAL NO. EMPTY DISPENSERS _____

TOTAL NO. EMPTY DISPENSERS BEYOND 50' _____

TOTAL NO. DISPENSERS FROM SECTOR:

A _____ B _____

C _____ D _____

FIGURE 2. Test data

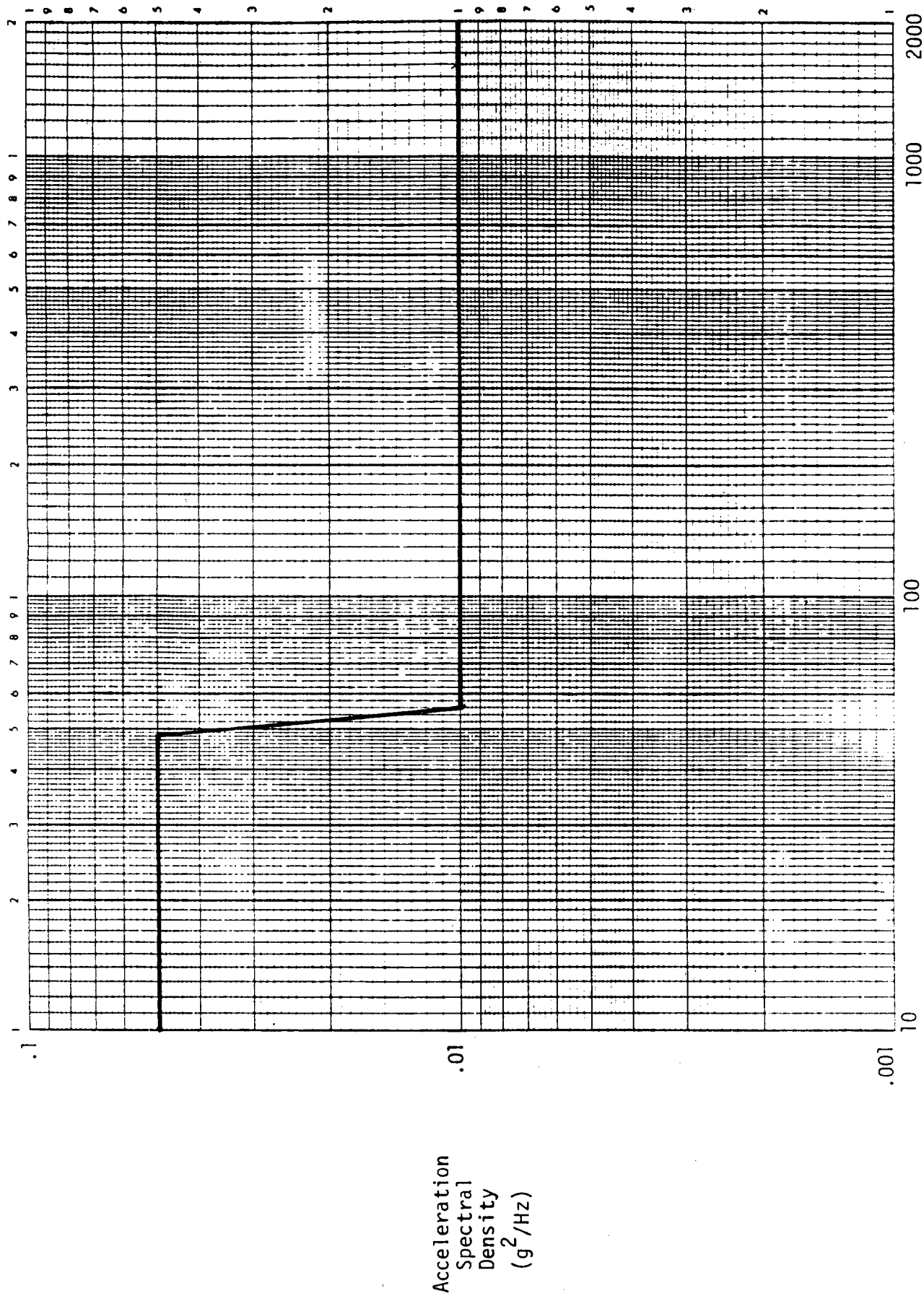


FIGURE 3. Vibration for Functional Test of Chaff Countermeasures RR-182/AL

shocks in opposite directions along each of three mutually perpendicular axes. Each shock impulse shall be 15g +0g, -3g, half-sine pulse having a time duration of 11 +/-1 milliseconds at ambient temperature. The maximum acceleration shall occur at approximately 5 1/2 milliseconds.

4.10.5 Vibration. The Chaff Head shall be subjected to a vibration test in accordance with MIL-STD-810, Method 514.3, Category 7B to the level shown on FIGURE 3 for one hour in each mutually perpendicular axes.

4.11 Functional test.

4.11.1 Flight test.

4.11.1.1 Flight test. The Government performed flight test will be conducted on first article, initial production (if first article is not required) and special test units to verify performance capability. Tests will include Radar Cross-Section (RCS) (see 6.4.16) measurements and LAU-10( ) launcher compatibility tests in accordance with MIL-STD-2071 and this specification.

4.11.1.2 Aircraft. Flight test will be conducted by the Government using an aircraft type which has previously been used to provide data to establish the minimum performance requirements specified in MIL-STD-2071 and this specification.

4.11.1.3 Launcher. The LAU-10( ) rocket launcher will be used for all Chaff Countermeasures RR-( )/AL flight and ground launch tests in accordance with this specification.

4.11.1.4 Loading launcher. The Chaff Countermeasures RR-( )/AL will be loaded in the LAU-10( ) launcher. The loading procedures will be in accordance with NAVAIR 11-85-5.

4.11.1.5 Radar. The Chaff Countermeasures RR-( )/AL will be evaluated using radar equipment in accordance with the applicable specification sheet (see 3.1).

4.11.1.6 Sampling. The test objective will be to collect RCS data in all 15 gates for all test samples. One Chaff Head with an appropriate rocket motor shall be fired per flight test run or ground launch in accordance with this specification.

4.11.1.7 Data processing of pulse to pulse RCS-data. The pulse-to-pulse RCS data will be processed as specified in MIL-STD-2071 to provide: shadow graphs, first level statistics, including summary sheets; and second level statistics for basic data, corrections for aspect angle and corrections for aspect angle and antenna gain. A printout shall be provided to show range, azimuth angle, elevation angle and aspect angle for all flight tests. For Ground launch tests, launch angle vice aspect angle is applicable.

4.11.1.8 Flight test failure criteria. Any Chaff Head that fails to function properly in accordance with the requirements of 4.11.1 and this specification shall be cause for rejection of the lot.

4.11.2 Ground launch test.

4.11.2.1 Ground launch test. The Government performed ground launch test shall be conducted on first article, initial production and production units and special test units to verify performance capability. Test shall include RCS (see 6.4.16) measurements and a LAU-10( ) launcher compatibility test in accordance with MIL-STD-2071 and the applicable specification sheet (see 3.1). Paragraphs 4.11.1.4, 4.11.1.5, 4.11.1.6 and 4.11.1.7 shall apply.

4.11.2.2 Ground launch. The MK36 mount with a LAU-10( ) rocket launcher shall be used for all Chaff Countermeasures RR-( )/AL ground launch test.

4.11.2.3 Ground launch failure criteria. Any Chaff Head that fails to function properly in accordance with the requirements of 4.11.2, this specification shall be cause for rejection of the lot.

4.11.3 Radar Cross-Section procedures.

4.11.3.1 Aircraft operation. The aircraft shall fly a "racetrack" course as depicted on FIGURE 4, a standby and launch command will be given at a range specified in the applicable specification sheet (see 3.1). The aircraft will fly a radial outbound flight path from the radar site prior to rocket launch. Upon initial radar acquisition, the aircraft shall be directed to the desired out bound radial course.

4.11.3.2 Ground launch operation. Ground launch shall be as specified in 4.11.2.

4.11.3.3 Data gathering. There shall be test radars set-up as shown on FIGURE 4 and assigned to E, I and J band frequencies, which are equipped with a Pulse Data Processing System (PDPS) capable of multiplexing chaff signals to the radars, recovering each radar signal on a pulse-to-pulse basis. The envelope for each signal return shall be sampled by multiple gates, each 2 nanoseconds wide and spaced 200 nanoseconds apart. The PDPS data shall be recorded on magnetic tape for subsequent processing. The RCS accuracy of the radar shall be 2 decibels (db) or better. The radar test system shall be calibrated before and after each test period to convert the return signal levels into (db) relative to one square meter (dbM (2)). Radar azimuth and elevation shall be available (recorded) for at least two radars during each test. All radars shall track the aircraft prior to rocket launch, then follow the rocket flight , after detonation, hold onto the chaff cloud. Record data required to evaluate the chaff countermeasure with respect to the applicable specification sheet (see 3.1). Record all data from T (T = time of launch) minus 10 seconds (T -10 seconds) to T plus 90 seconds (T +90 seconds) horizontal polarization. The following data shall be recorded:

(1) Time (seconds),

(2) Slant Range (yards),

(3) Elevation (degrees),

(4) Azimuth (degrees true),

(5) Elapsed time from Chaff Head launch to Chaff Head burst,

(6) Aircraft altitude, azimuth, location and Knots True Air Speed (KTAS) at launch,

(7) Signs of multiple or unusual behavior of the chaff clouds and

(8) Radar parameters (antenna beamwidth, frequency, PRF, pulsewidth, polarization and calibration parameters).

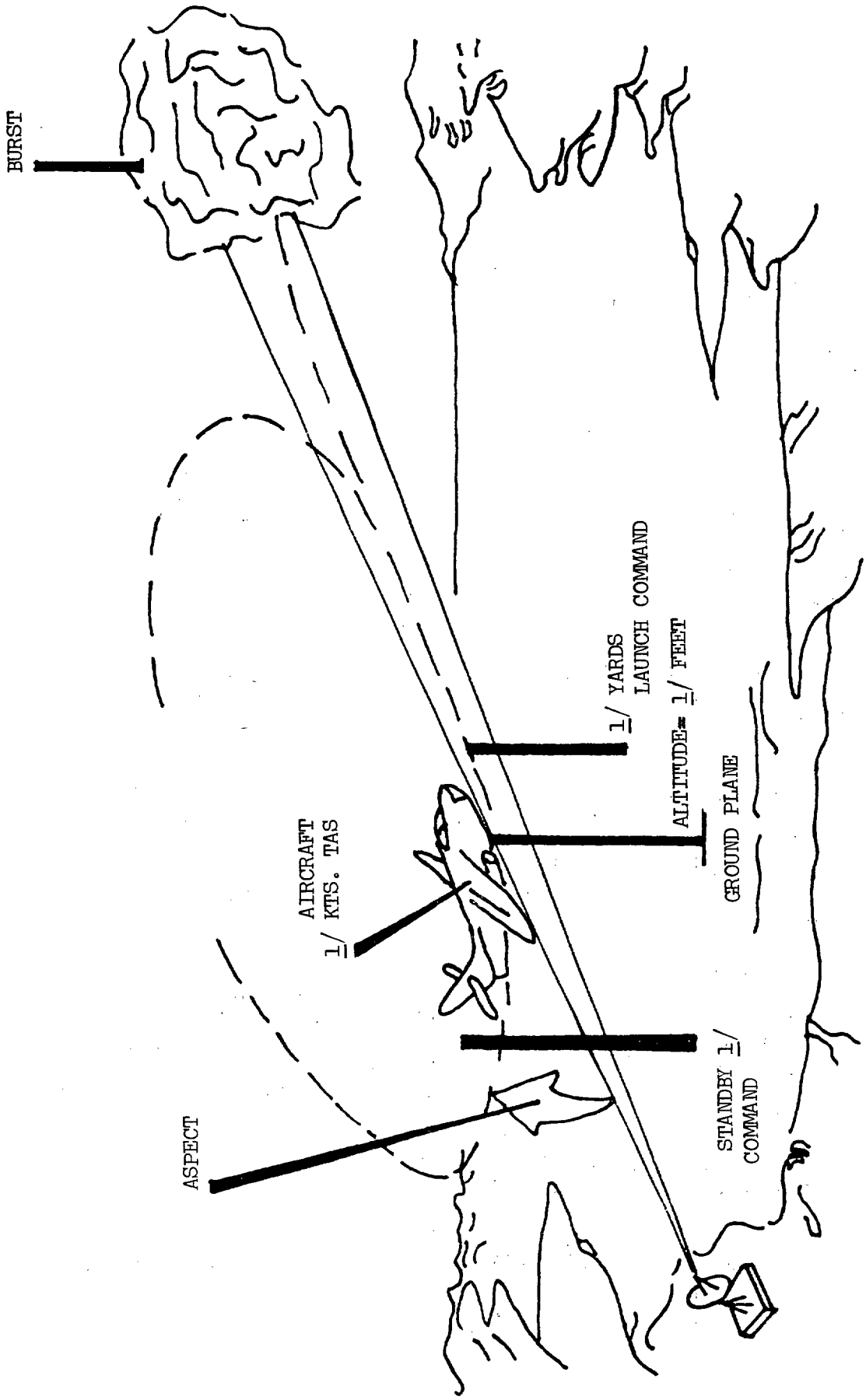
4.11.3.4 Data evaluation. Data shall be evaluated to determine the presence of not less than four gates of pulse-to-pulse data for each Chaff Head to meeting the requirements of the procedures for collecting data on chaff in front of the aircraft and the requirements for aspect angles as specified in MIL-STD-2071. The shadow graph shall be examined to ensure that at least four gates of data for each unit meet the requirements for valid data as stated in 4.11.3.3 above. Poor radar tracking in angle as shown by the shadow graph shall invalidate the data that would otherwise meet the requirements of 4.11.3.3 above. The valid data as shown by the shadow graphs shall be identified for further data processing. The test data shall be invalid for any chaff units where less than four gates contain valid RCS data.

4.11.3.5 Data processing. Data shall be processed to obtain RCS values of dispersed chaff in the radar resolution cells. Processing shall be accomplished in accordance with MIL-STD-2071 and provide the outputs specified in 4.11.1.7 herein. The data shall be processed to provide average RCS values and the weighted average of the number of consecutive gates specified in 4.11.3.3.

4.11.3.5.1 Calibration check. RCS measurement of a standard calibration sphere shall be made prior to any chaff measurements. The sphere RCS data shall be compared to the theoretical RCS of the sphere and the calibration constant (_K) for processor shall be set to provide the measured sphere data as near as possible to the theoretical value of the sphere RCS. The corrected value of _K shall be used in the first and second level data processing.

4.11.4 Pass/fail criteria. The Chaff Countermeasures RR-( )/AL shall meet the requirements of 4.11.4.1.

4.11.4.1 Radar cross-section (RCS) flight and ground launch test. The average of the pulse-to-pulse RCS values as measured shall meet or



1/ Refer to applicable specification sheet for flight profile data.

FIGURE 4. Flight profile for testing of the RR-182/AL Chaff Countermeasures.

exceed the number of square meters specified in the applicable specification sheet (see 3.1) for any unit to be acceptable.

5. PACKAGING

5.1 General. All major units and parts of the equipment shall be preserved, packaged, packed and marked for the level of shipment specified in the contract or purchase order (see 6.2.1) in accordance with MIL-STD-794, CFR-49 100-177 and as specified herein. Unless otherwise specified in the procurement document, the method of preservation-packaging shall be Method I, Submethod IA-15 in accordance with MIL-P-116 and this specification (see 6.2.1).

5.2 Packaging details.

5.2.1 Shipping container. The Chaff Head shall be packaged in a shipping and storage container CNU-438(V)/E in accordance with the requirements of this specification, applicable specification sheet (see 3.1) and applicable DL.

5.2.2 Marking. The Chaff Head shall be marked in accordance with MIL-STD-129 and applicable DL.

5.2.3 Marking for shipment. The shipping container CNU-438(V)/E shall be marked in accordance with 5.2.1, applicable DL and as specified in the contract (see 6.2.1).

5.3 Palletization. Palletizing shall be accomplished in accordance with MIL-STD-1323, applicable DL or contract (see 6.2.1).

6. NOTES

6.1 Intended use. The Chaff Countermeasures RR-( )/AL is a chaff loaded head and is intended to be used to dispense a chaff cloud to create a simulated target, decoy, or other types of radar confusion. The Chaff Countermeasure is intended for air launch from a LAU-10( ) rocket launcher.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.

b. Chaff Head type (see item description of applicable specification sheet).

c. Levels of preservation-packaging, packing and marking required (see Section 5).

d. If design, construction or workmanship are to be other than

specified in the specification (see 3.4).

e. If first article is required (see 3.2, 6.3).

f. If test procedures are to be expanded or modified (see 4.5).

g. If special inspections is required (see 4.4.3.2).

6.2.2 Data requirements. When this specification is used for an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DOD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraphs.

Paragraph No.	Data Requirement Title	Applicable Option DID No.
3.2, 4.5	Procedure, First Article Inspection	DI-T-4901
4.2	Report, First Article Inspection	DI-T-4902
4.4	Report, Production Inspection	DI-T-4904
4.4.3.2, 4.5	Procedure, Production/Acceptance Inspection	DI-T-4903
4.4.4	Failure Data Collection, Analysis and Corrective Action Plan	UDI-T-23719

(Data item description related to this specification and identified in Section 6 will be approved and listed as such in DOD 5010.12L, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.3 First article. When a first article inspection is required, the items shall be a first article sample. The first article should consist of 10 Chaff Heads, four static Chaff Heads, chaff assembly(s) as required per applicable specification sheet (see 3.1). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, approval of first article test results and disposition of first article. Invitations for bids should provide that the Government reserves the right to waiver the requirement for samples for the first article inspection to those bidders offering a product which has been previously acquired or tested by the Government and that bidders offering such products, who wish to rely on such production to test, must furnish

evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Definitions. The following definitions apply to this specification:

6.4.1 Arena dispersion test. A test designed to check the distance and direction of the chaff dispersion and unwrapping of chaff muffins from a specified center of detonation and height.

6.4.2 Chaff payload/assembly(s). Contains a specified quantity of chaff muffins comprised of small diameter, aluminum-coated, glass fibers of specify length requirements wrapped in a specified film.

6.4.3 Chaff head. The Chaff Head configuration containing the chaff payload is for use with the applicable rocket motor and launched from a LAU-10( ) rocket launcher mounted on specified aircraft.

6.4.4 Chaff-cut. A process by which a quantity of dipoles cut from a chaff-hank to a specific length to provide dipole elements for placement within an assembly, normally a muffin.

6.4.5 Chaff-hank. An assemblage of drawn aluminized glass fibers produced by one machine prior to the dipole cutting operation. The number of fibers in the chaff-hank is normally equivalent to the number of dipoles required for each chaff-cut within a specific chaff muffin.

6.4.6 Chaff head, static. A complete Chaff Head, with the following items not installed to be utilized in the arena dispersion test; safety pin, nose cap, fuze cover, fuze, retainer ring and settable fuze.

6.4.7 Dipole (chaff). Small diameter, aluminum-coated, glass fibers, cut to specified radar threat frequencies.

6.4.8 Launch range. Distance from the rocket launch to the point of deployment of the chaff payload.

6.4.9 Lot, chaff head. A Chaff Head lot shall contain that quantity of Chaff Countermeasures as specified in the contract or purchase order.

6.4.10 Lot, chaff-cut. A chaff-cut lot shall consist of all chaff-cuts produced by one production machine for use in the Chaff Head payload. The lot shall contain that quantity of chaff-cuts necessary to produce one Chaff Head lot.

6.4.11 Lot, chaff-hank. A chaff-hank shall consist of all chaff-hanks produced by the same production machine within the same time frame for use at one time. The lot shall not contain more hanks than that amount required to produce one lot of Chaff Heads.

6.4.12 Lot, receiving inspection. A receiving inspection lot shall

consist of all material of one type received from one supplier at one time.

6.4.13 Metal smear. Cohesion of adjoining metal surfaces, as a result of the manufacturing process.

6.4.14 Muffin. A quantity of small diameter dipoles (chaff-cut aluminum-coated glass fibers) bundled in a polyimide wrap. In some cases two or more of these bundles are arranged end-to-end and are provided with an additional polyimide wrap to form a muffin pack. For the purpose of this specification the muffin is used to describe an independent bundle of dipoles or each bundle of dipoles within a muffin pack.

6.4.15 Muffin pack. Two or more muffins arranged end-to-end and wrapped in a polyimide film.

6.4.16 Radar-cross-section (RCS). An average value of the individual pulse measurement of the chaff cloud area.

6.4.17 Slip coating. A secondary coating, in layer form, which promotes non-cohesion, i.e.; dipole fibers are prevented from sticking together.

6.4.18 Units. As used herein refers to a Chaff Head or a group of Chaff Heads.

6.5 Dipole quantity and chaff-cut. The dipole quantity per chaff-cut, (Q) can be calculated, given the dipole diameter (d) and the percent packing density (p), as follows:

$$Q = \frac{p}{100} \; \frac{1.44414}{2.59808\,(0.57735d)}$$

6.6 Test equipment.

6.6.1 Blasting cap. A No.8 blasting cap or equivalent that has been used to satisfactorily perform the test described in 4.9.1 and 4.9.2.

6.7 Safety.

6.7.1 Explosive safety precautions. Minimum explosive safety precautions for use by the contractor are detailed in DOD Instruction 4145.26M DOD Contractors Safety Manual for Ammunition, Explosives and Related Dangerous Materials. In addition, it is the contractors responsibility to comply with all local, state and Federal Regulations concerning personnel health and safety regarding the use of hazardous materials including but not limited to explosive and pyrotechnic materials.

6.8 Subject term (key word) listing.

1. Arena test

2. Chaff Head, static

3. Coating, slip
4. Cut, chaff
5. Dipole
6. Hank, chaff
7. Head, Chaff
8. Launch range
9. Lot, chaff-cut
10. Lot, chaff-hank
11. Lot, chaff head
12. Metal smear
13. Muffin
14. Muffin pack
15. Payload, chaff
16. Radar Cross-Section
17. Unit

Preparing Activity
Navy - AS
(Project 5865-N069)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER MIL-C-85728

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- ☐ VENDOR
- ☐ 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.