

INCH-POUND

MIL-T-85230A(AS)

13 April 1992

SUPERSEDING

MIL-T-85230(AS)

27 March 1984

MILITARY SPECIFICATION

TARGET, TOW, AERIAL, TDU-34A/A

This specification is approved for use by 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 covers the requirements for the design, fabrication, inspection, and test of the TDU-34A/A Aerial Tow Target herein referred to as target.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 Specifications and Standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

Federal

PPP-B-636 Boxes, Shipping, Fiberboard

Military

MIL-A-8591 Airborne Stores, Suspension Equipment and Aircraft-Store Interface (Carriage Phase), General Design Criteria For

MIL-N-18307 Nomenclature and Identification for Aeronautical Systems Including Joint Electronics Type Designed Systems and Associated Support Systems.

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 Warfare Center Aircraft Division Lakehurst, Code SR3, Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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STANDARDS

Federal

FED-STD-595 Colors Used in Government Procurement

Military

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129 Marking for Shipment And Storage

MIL-STD-130 Identification Marking of U.S. Military Property

MIL-STD-210 Climatic Information To Determine Design and Test Requirements For Military Systems and Equipment

MIL-STD-480 Configuration Control, Engineering Changes, Deviations and Waivers

MIL-STD-794 Parts And Equipment, Procedures For Packaging Of

MIL-STD-970 Standards and Specifications, Order of Preference for the Selection of

MIL-STD-1521 Technical Reviews And Audits For Systems, Equipment and Computer Software

MIL-STD-2175 Castings, Classification and Inspection of

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

Navy

NAVAL AIR DEVELOPMENT CENTER, Code Ident. No. 80260

TE21053 Target Adapter Assembly

PDA ENGINEERING, Code Ident. No. 55794

573011 Packaging Assembly
573238 Radar Reflective Nose Cone

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DRAWINGS

Navy (Cont'd)

573239	Aft Reflector Assembly
573635	TDU-34A/A Assembly
573688	TDU-34A/A Body Assembly
573856	Fin
573858	Radar Non-reflective Nose Cone
573948	TA/AS Rack
573962	CG Fixture

(Copies of drawings are available from the Naval Air Warfare Center, Weapons Division, Code 5000, Pt Mugu, CA 93042-5001)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.5) in accordance with 4.3.

3.2 Item description. The target shall be an aerodynamic stabilized airframe capable of being air launched, streamed, towed, and air recovered from fighter and attack aircraft equipment with either an A/A47U-3, A/A47U-4, or A/A47U-4A Tow Target Reeling Machine Launcher System.

3.3 Selection of specifications and standards. Specifications and standards for necessary commodities, services and parts not specified herein shall be selected in accordance with MIL-STD-970 or specified in the detail specification.

3.4 Major components. The target shall consist of the following major components. Serial numbers and the nomenclature of the subsystems and subunits shall be recorded (see 6.3).

- (a) Body Assembly, (See Drawing 573688 for TDU-34A/A)
- (b) Radar Reflective Nose Cone, (see Drawing 573238)
- (c) Aft Reflector Assembly, (see Drawing 573239)
- (d) Fins (4), (see Drawing 573856)
- (e) Target Adapter Assembly, (see Drawing TE21053)

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3.5 Government Furnished Equipment (GFE). The target shall include complete provisions (see 6.4.1) for the following items of GFE (see 6.2).

(a) Radar Non-reflective Nose cone (see Drawing 573858)

(b) TA/AS Rack, (see Drawing 573948)

3.6 Characteristics.

3.6.1 Performance characteristics. The performance characteristics shall apply after transportation, unpackaging and reassembly of the target which has been fabricated and assembled in accordance with the drawings (see 3.7.1), inspected and balanced in accordance with Section 4 herein, and packaged in accordance with Section 5 herein.

3.6.1.1 Flight. The target, after installation on the aircraft, shall be capable of 10 successive stowed and maneuvering towed flights of two hours duration each within the flight envelope of Figure 1.

3.6.1.2 Minimum Radar Cross Section (RCS). When irradiated by any monostatic, linearly polarized radar operating at 10 Gigahertz (GHz), the target shall, as a minimum, exhibit the RCS signature of Appendix A.

3.6.2 Physical characteristics. The following physical characteristics of the target shall be as specified herein and shall not be altered.

3.6.2.1 Weight and center of gravity. The preflight target center-of-gravity shall be within 0.0 to 2.5 inches aft of the tow point with the TA/AS installed plus the ballast weight. The target center of gravity for flight shall not be greater than 2.5 aft of the tow point. Total target weight shall not be greater than 200 lbs. Center of gravity shall be inspected as specified in 4.4.5.

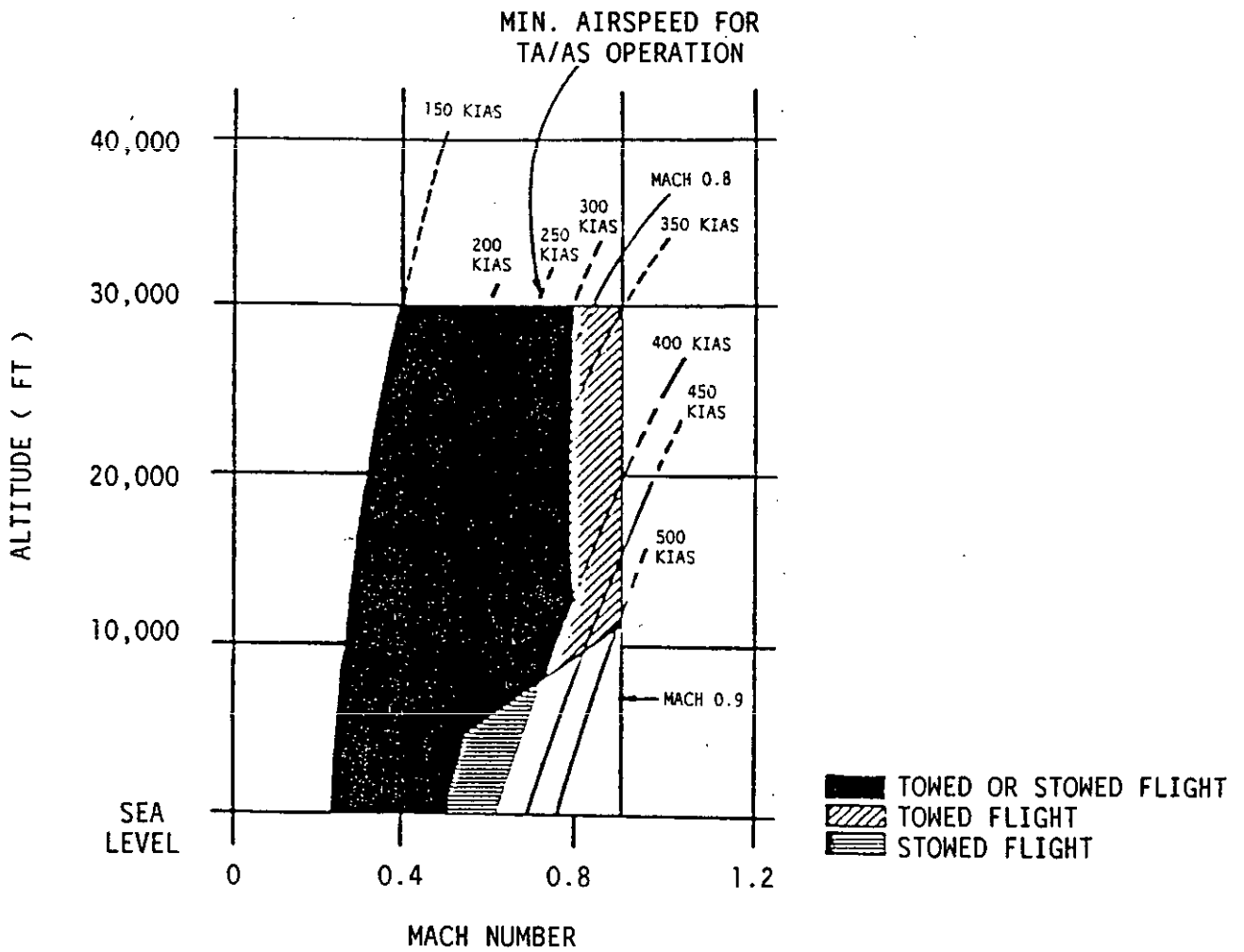
3.6.2.2 Structural strength. The target structure shall survive design limits loads imposed by the catapult, arrestment and flight of the carrying aircraft, in accordance with MIL-A-8591 and the V-N Diagram in Figure 1. The target shall repetitively withstand without failure the load resulting from a target to launcher closure rate of not greater than two and one half feet per second.

3.6.3 Environment. The target shall operate satisfactorily in the presence of the following environments before, during, and after exposure.

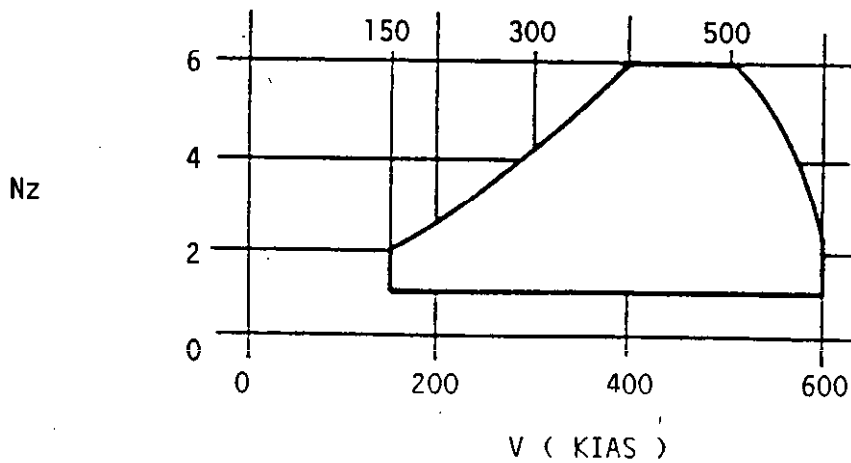
3.6.3.1 Operational environment. The targets shall be towable without failure when exposed to the 20 percent extremes of the Worldwide Air Environment and the Coastal/Ocean Regional Type Environment of MIL-STD-210, and the aircraft shock and vibration environment (see 3.6.2.2).

3.6.3.2 Stowage environment. The target shall be towable without failure after exposure to the Worldwide Surface Environment and the Coastal/Ocean Regional Type Environment of MIL-STD-210 when packaged (see 5.1) for a period of five years, and intermittently exposed unpackaged or when stored in the hangar deck environment, unpackaged, for five years.

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NAVY STANDARD TOW TARGET SYSTEM FLIGHT ENVELOPES



TOWED FLIGHT V-N DIAGRAM

FIGURE I. Flight and Load Envelopes

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3.7 Design and construction.

3.7.1 Drawings. The drawings shall be those listed on the issue of Drawing 573635 (TDU-34A/A) referenced in the contract (see 6.2, 6.3).

3.7.2 Tow system interface. The target shall be physically and functionally compatible with the RMK-19, the RMK-31 or the RMK-34 Reeling Machine Launchers of the A/A47U-3, A/A47U-4 or A/A47U-4A Tow Target Reeling Machine Launcher Systems. The strongback tow-point distances shall be as shown in Figure 2. The distance from the centerline of the tow-bolt hole in the strongback bar to the upper surface of the body shall be 0.750 (+0.060, -0.030) inch.

3.7.3 Component assembly. Brackets, lugs, flanges, inserts, bolts, and other assembly provisions shall retain components securely during the life of the target. Parts shall be mounted and installed so loosening, wear of mounting arrangements, or permanent separation of parts shall not occur. Components shall be designed to be incapable of incorrect assembly.

3.7.4 Simplicity. The target shall represent the simplest design commensurate with performance requirements and shall incorporate features to assure rapidity, safety, ease and economy of checkout and maintenance by organizational level personnel with a minimum of training.

3.7.5 Materials, parts and processes. Materials for the nose and aft reflector assemblies shall be selected to provide radar reflectivity in accordance with Appendix A (see 3.6.1.2). Unless otherwise specified parts shall be as specified in 3.3.

3.7.5.1 Interchangeability. Target parts having the same part number shall be interchangeable (see 6.4.2) between targets. Target fins shall be interchangeable between positions on each target. Assembly indices for the aft reflector assembly and the nose assembly shall be avoided.

3.7.5.2 Alignments.

3.7.5.2.1 Manufacturing alignments. All alignments of fabricated and assembled target components specified on the drawings shall be controlled by tooling.

3.7.5.2.2 Nose and fins alignment and twist. The nose and fin assemblies shall be aligned to the fuselage to provide maximum aerodynamic performance and symmetry. Alignments shall be inspected as specified in 4.4.1, 4.4.2, 4.4.3, and 4.4.4.

3.7.6 Castings. Castings shall be classified in accordance with MIL-STD-2175.

3.8 Maintainability. Except for the target fuselage, the time to replace a major component shall be not greater than 10 minutes using standard Government tools.

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3.9 Marking. Markings of parts shall be in accordance with MIL-STD-130 as indicated on the drawings. A report shall be submitted to the contracting activity specifying the nomenclature assigned.

3.10 Exterior color, markings and insignia. The target exterior color of International Orange color No. 12197 as specified in FED-STD-595, and target insignia and markings shall be in accordance with the drawings.

3.11 Nameplates. Nameplates shall be in accordance with MIL-N-18307. The contractor shall obtain approval of the identification plate format from the acquiring activity (see 6.3).

3.12 Workmanship. Each target shall be uniform in quality and shall be free from irregularities or defects which would affect compliance with the requirements of this specification. Particular attention shall be given to freedom from blemishes, defects, burrs and sharp edges. Assembly of parts shall be accomplished without damage to any part.

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 (examinations and tests) 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.

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

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

- (a) First article inspection (see 4.3)
- (b) Quality conformance inspection (see 4.4)
- (c) Special inspections (see 4.5)

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4.3 First article inspection. First article inspections will consist of tests, analyses and examinations by the Government to determine compliance with the specification requirements, and will be conducted whenever the contractor has not previously fabricated the target to the drawings, or when otherwise required by the Government (see 4.1). Unless otherwise specified in the contract, the size of the inspection lot shall be 100 targets (see 6.2). First articles shall have successfully passed the acceptance inspection at the contractor's facility prior to first article inspection by the Government (see 6.2, 6.3).

4.3.1 Configuration audit. The first article inspection shall include the acceptance inspection, and a physical configuration audit in accordance with the applicable requirements of Appendix F of MIL-STD-1521. The audit will assess compliance with the following requirements:

- (a) 3.4 Major Components
- (b) 3.5 Government Furnished Equipment (GFE)
- (c) 3.6.2 Physical Characteristics
- (d) 3.6.2.1 Weight and C.G.
- (e) 3.7.1 Drawings
- (f) 3.7.3 Component Assembly
- (g) 3.7.5 Material, Parts, and Processes
- (h) 3.7.5.1 Interchangeability
- (i) 3.7.5.2 Alignments
- (j) 3.8 Maintainability
- (k) 3.9 Marking
- (l) 3.10 Exterior Color, Marking and Insignia
- (m) 3.12 Workmanship

4.3.2 First article approval. First article approval shall be in accordance with the contract and shall be submitted in accordance with the CDRL DD Form 1423 (see 6.3).

4.4 Quality conformance inspection. Targets submitted for lot acceptance shall be capable of successfully passing the acceptance inspection specified in Table I as described in the following paragraphs to prove compliance with the requirements of 3.4, 3.6.2.1, 3.7.1, 3.7.5.1, 3.7.5.2, 3.8, and 3.9. (see 4.6)

4.4.1 Nose alignment. The nose cone shall be mounted on the fuselage and placed on a flat surface with the tow-point up. The distance from the surface to the most forward point on the nose cone shall be measured with a steel rule. The fuselage shall then be rolled 90 degrees plus or minus 2 degrees, and the measurement repeated. Both measurements shall be 6.0 ± 0.5 inch.

4.4.2 Fin twist. Fin twist shall be checked by laying the blade of each fin on a flat surface and measuring the out-of-flatness with feeler gages. The maximum gap between the fin blade and the flat surface shall be not greater than 0.10 inch.

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TABLE I. Acceptance Inspection Checklist

Item	Examination for Target Serial No. _____	Inspector			
		Contractor		Government	
		Initials	Date	Initials	Date
1	Nose Alignment, ($6.0 \pm .5$ in) Pitch Plane _____ Yaw Plane _____	_____	_____	_____	_____
2	Fin Twist ($\pm .10$ in) Fin 1 _____ Fin 2 _____ Fin 3 _____ Fin 4 _____	_____	_____	_____	_____
	Fin Alignment ($+.15$ in) Pair 1 _____ Pair 2 _____	_____	_____	_____	_____
4	Fin tip-to-Fin tip (dihedral) ($25.4 \pm .8$ in) Pair 1 _____ Pair 2 _____ Pair 3 _____ Pair 4 _____	_____	_____	_____	_____
5	CG (0.0 to 2.5) _____	_____	_____	_____	_____
6	Strongback edge distance ($.515$ min) Right Side _____ Left Side _____	_____	_____	_____	_____
7	Towbolt Centerline to Fuselage Skin ($.750 + .060/- .030$) _____	_____	_____	_____	_____
8	Casting Integrity _____	_____	_____	_____	_____
9	Interchangeability and Maintainability Interchange two fins (10 minutes) _____ Exchange target noses (10 minutes) _____	_____	_____	_____	_____
10	Install Government property (Satisfactory, Unsatisfactory) TA/AS RACK Radar Non-Reflective Nose Cone	_____	_____	_____	_____
11	Workmanship, Nameplates and Painting and Marking, Inter- national Orange with "TDU-34A/A" (Satisfactory, Unsatisfactory)	_____	_____	_____	_____

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4.4.3 Fin alignment. Pairs of opposing fins (that is 45 degree and 225 degree, 135 degree and 315 degree) shall be parallel to avoid introducing an aerodynamic torque during flight. Fin alignment shall be checked by installing all four fins and measuring parallelism on each opposing pair using feeler gages and a jig that straddles the fuselage and supports a pair of straight-edges that contact the root chords of the opposing fins. The maximum gap between the straight-edges and the fin surfaces shall be not greater than 0.15 inches.

4.4.4 Fin dihedral. The dihedral angle between each pair of adjacent fins shall be checked by measuring between the outboard fin tip to fin tip of each pair of adjacent fins with a steel rule. This distance shall be 25.4 ± 0.8 inch.

4.4.5 Center of gravity. The target shall be lifted with the CG Fixture, Drawing No. 573962 rev NC, and the lifting strap shall be between the scribed lines on the fixture, which indicates an acceptable target center of gravity. The center of gravity shall be as close as possible to the tow-point and the distance shall not be greater than 2.5 inches from the tow-point.

4.4.6 Strongback edge distance. The strongback tow-point edge distance shall be measured as shown in Figure 2, with calipers. This measurement plus one-half the hole diameter shall be not less than 0.515 inch for both webs. The tow-bolt location distance shall be measured using the depth measurement feature of a set of calipers as shown in Figure 2. The caliper measurement shall be: $0.750 (+0.060, -.030)$ minus the bolt diameter, plus the hole diameter divided by 2, plus the rule width.

4.4.7 Casting integrity. Castings shall be inspected visually. The tow-point region of each strongback casting shall be dye penetrant inspected after drilling by a qualified inspection facility, using a fluorescent dye in accordance with MIL-STD-2175.

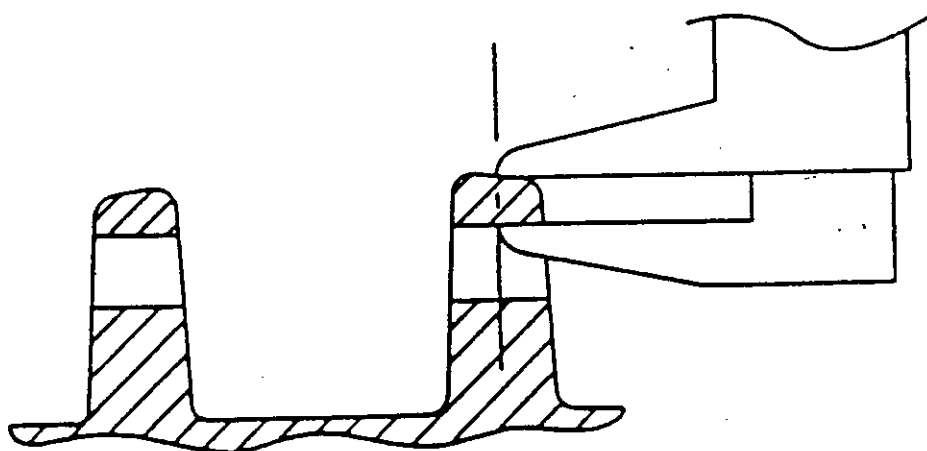
4.4.8 Interchangeability and maintainability. To verify interchangeability (see 6.4.2) and maintainability, noses and fins shall be interchanged between randomly selected targets, and the targets reassembled. The time to disassemble and reassemble a target nose or fin shall be not greater than 10 minutes. If required by the contractor, the Government may furnish equipment to verify interchangeability.

4.4.9 Workmanship and other examinations. The targets shall be examined for workmanship, painting, marking and nameplate for conformance with 3.9, 3.10, 3.11, and 3.12.

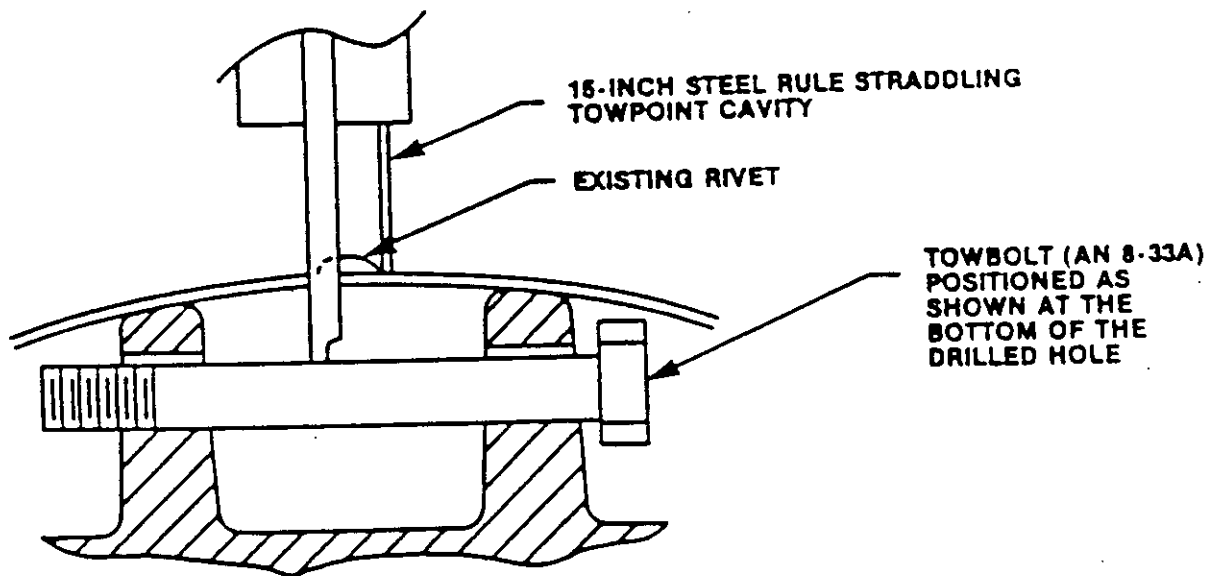
4.5 Special inspections. Special inspections will be conducted by the Government when necessary (see 4.1) to assure that the required performance and physical characteristics (see 3.6) have been maintained by the contractor. Special tests will consist of any one or more or all of the following:

- (a) Flight demonstrations of Table II to assess the capability of the target to comply with the following:
 - (1) Performance (see 3.6.1)
 - (2) Flight (see 3.6.1.1)
 - (3) Structural Strength (see 3.6.2.2)

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EDGE DISTANCE



TOW-BOLT LOCATION

FIGURE II. Strongback Inspection

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- (4) Operational Environment (see 3.6.3.1)
 - (5) Stowage Environment (see 3.6.3.2)
- (b) Ground tests to assess the capability of the target to comply with the following:
- (1) Minimum Radar Cross Section (see 3.6.1.2)
 - (2) Tow System Interface (see 3.7.2)

4.6 Methods of inspection. A sample of targets selected at random from each inspection lot shall be inspected in accordance with the procedures of 4.4.1 through 4.4.9. The results of these tests shall be recorded for each sample target on an acceptance inspection check list similar to Table I which shall be a part of the inspection/test report. Unless otherwise specified in the contract, the size of the inspection lot shall be as specified in 4.3. The sample size and acceptance and rejection criteria shall be as specified in MIL-STD-105 using an Acceptable Quality Level of 1.0 and General Inspection Level II (see 6.2).

5. PACKAGING

5.1 Preservation-packaging. Preservation-packaging of the target for serviceability at destination and verification thereof shall be in accordance with MIL-STD-794, Level A (see 6.2).

5.2 Packing. Packing for each target shall be Level A in accordance with MIL-STD-794, and shall be not less than a double wall weather resistant fiberboard box conforming to PPP-B-636, except neither a wooden nor a metal container shall be selected (see 6.2).

5.3 Specific considerations.

5.3.1 Target disassembly. The four target fins, radar reflective nose cone, and target adapter assembly shall be disassembled and organized within the container to reduce shipping volume. Attaching parts shall be bagged or otherwise secured and identified for proper reassembly of the target.

5.3.2 Container stacking. The container structural design shall provide rigidity for storage in stacks of six containers.

5.3.3 Verified packaging and packing. Drawing 573011 discloses a container which has been verified for compliance with the preservation-packaging and packing requirements herein. Drawing changes or superior substitutes shall be approved by the Administrative Contract Officer (see 6.2).

5.4 Marking. Marking for shipment shall be in accordance with MIL-STD-129.

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TABLE II. Flight Tests

Test No. 1	Test No. 2	Test No. 3	Test No.4
<p>1. Launch and deploy 1,000 ft of towline at 10,000 ft altitude & 300 KCAS airspeed (1000 fpm max reel-out speed)</p> <p>2. Assess stability at following airspeeds: 260, 300, 350, 400, 450 & 570 KCAS.</p> <p>3. Assess stability with 20,000 feet of towline at 260, 300 & 350 KCAS airspeed.</p> <p>4. Recover target at 260 KCAS airspeed & 10,000 feet altitude.</p> <p>5. Repeat 1. with 500 ft of towline at 260 KCAS, then repeat 4.</p>	<p>1. Same as one in Test No. 1, then increase speed to 350 KCAS.</p> <p>2. Assess maneuverability using 180° 2g PORT & STBD turns at 350 & 400 KCAS.</p> <p>3. Recover target at 300 KCAS airspeed & 10,000 feet altitude.</p> <p>4. Repeat 1. with 500 feet of towline, then repeat 3. above.</p> <p>5. Increase airspeed to 400 KCAS and perform 3g PORT and STBD turns.</p>	<p>1. Launch and deploy 1,000 ft of towline at 30,000 ft altitude & 260 KCAS airspeed (1000 fpm max reel-out speed)</p> <p>2. Recover at same altitude and airspeed.</p> <p>3. Repeat 1. & 2. with 1,500 ft of towline at the following KCAS/ altitudes: 300/30,000 260/5,000 300/5,000</p>	<p>1. Launch and deploy 30,000 ft of towline at 260 KCAS and 10,000 ft altitude (3000 fpm max reel out speed)</p> <p>2. Tow straight & level at the following airspeeds: 260, 300, 325, & 350 KCAS.</p> <p>3. Repeat 4. of Test No. 1.</p> <p>4. Repeat 5. of Test No. 1.</p>

- NOTES: 1. Evaluate stowed target during catapult take-off and arrested landings of aircraft.
2. Test values are to be interpreted as "not less than" minimums.

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6. NOTES.

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The basic target will be loaded on an aircraft-mounted reeling-machine launcher, streamed and flown as a tow target for air-to-air gunnery or missile training, recovered by the aircraft reeling-machine launcher, and landed with the aircraft aboard a carrier or at land base. Recovered targets will be stored unpacked, until made flight-ready and expended during subsequent towed flights.

6.1.1 Application. The target TDU-34A/A has been designed to be deployed with or without TA/AS depending on mission requirements. The target without the TA/AS installed will be suitable for radar seeking missile firings. Dependent upon the TA/AS installed, the target will also be used to provide threat simulations for the following purposes:

- a. infrared seeking missile firings
- b. aircraft and shipboard gunnery firings
- c. scoring gunnery and missile firings
- d. threat missile radar signature simulation

6.1.2 Classification. The TDU-34A/A system will be classified as production items and will conform to the design, disclosed by the Master Data List (DL) for the target systems, or an equivalent bill-of-material to the extent that the design disclosed by the DL does not conflict with the requirements specified herein.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).
- (c) When first article is required.
- (d) Current top assembly drawing for the target (see 3.7.1).
- (e) Inspection lot size, if other than specified in 4.3.
- (f) Levels of preservation and packaging and packing (see 5.1 and 5.2).
- (g) Configuration control procedures in accordance with MIL-STD-480 for the target drawings. Targets previously fabricated in accordance with drawing package 573850 have

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been demonstrated to comply with the requirements herein. Accordingly, proposed changes to the drawings may require contractor analyses and Government verification and approval to confirm that the requirements herein will not be degraded (see 3.6.1). Engineering change proposals to the drawings shall not degrade the physical characteristics of the target.

- (h) Authorization to use the Government Furnished Equipment property listed in 3.5.
- (i) Specific instructions in acquisition documents regarding arrangements for inspection and approval of the first article.
- (g) The manner in which rejected targets may be repaired or corrected and resubmitted for approval.

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable data item descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference Para.</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
3.4	DI-CMAN-80195	Request for assignment of serial number & serial number prefix letters	--
3.7.1	DI-CMAN-80194	Request for confirmation of nomenclature	--
3.7.1, 6.2	DI-CMAN-80639	Engineering change proposal	--
3.11	DI-CMAN-80196	Request for approval of identification plate drawings	--
4.3; 4.3.1; 4.3.2; 4.4	DI-RELI-80322	Quality conformance inspection and test procedures	--
4.3, 4.3.2, 4.5, 4.6	DI-NDTI-80809A	Test/inspection reports	--

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

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6.4 Definitions.

6.4.1 Complete provisions. Complete provisions shall be defined to mean that all supports, brackets, tubes, and fittings, etc., have been installed and adequate weight and space allowed in order that the equipment can be installed with or without ballast alteration to the target, and that no additional parts are required for installation, other than the item itself. Standard stock items such as nuts, bolts, cotter pins, etc., need not be furnished.

6.4.2 Interchangeable. When two or more items possess such functional and physical characteristics as to be equivalent in performance and durability and capable of being exchanged one for the other without alteration of the items themselves, or of adjoining items except for adjustment, and without selection for fit or performance, the items are interchangeable.

6.5 First Article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first production item, a sample selected from the first 10 production items, a standard production item from the contractor's current inventory (see 3.1), and the number of items to be tested as specified in 4.3. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for 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 or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.6 Subject term (key word listing).

Air-to-air gunnery training
 Gunnery firings
 Gunnery spot, training
 Missile training
 Surface to air gunnery training

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
 NAVY - AS
 (Project No. 1550-N007)

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APPENDIX A

RADAR CROSS SECTION REQUIREMENTS
FOR THE TDU-34A/A TOW TARGET

10. SCOPE

10.1 Scope. This appendix presents the monostatic Radar Cross Section (RCS) signature to be exhibited by the TDU-34A/A aerial tow target. This Appendix is a mandatory part of the specification. The information contained herein is intended for compliance. Any change to the target design which may result in a change in the RCS signature constitutes a change in function and requires engineering change proposal documentation and technical evaluation for Government approval (see 6.2).

10.2 APPLICABLE DOCUMENTS

None.

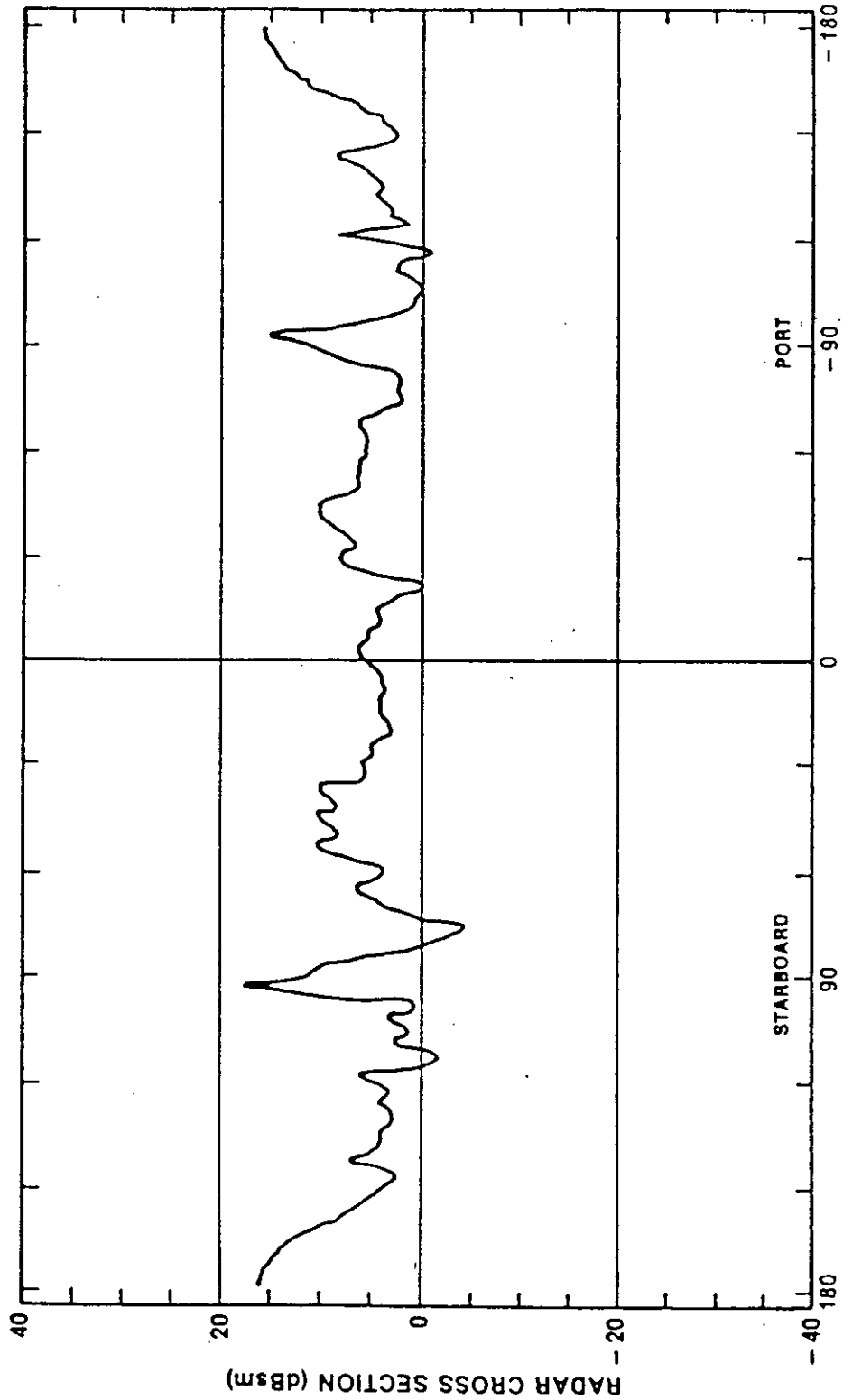
10.3 REQUIREMENTS

When irradiated by any monostatic, linearly polarized radar operating at 10.0 Gigahertz (GRz), the target shall exhibit median RCS signatures similar to those of figures A-1 through A-10. From a head-on view within a 30 degree conical angle, the target shall have a minimum of one square meter reflective area. For all other aspect angles, maxima (peaks) in the median RCS signature greater than or equal to 8 dBsm and minima (nulls) less than or equal to 0 dBsm shall occur within +5 degrees aspect angle of their associated maxima and minima in figures A-1 through A-10. The target median RCS shall be within +1 dBsm of the median RCS of figures A-1 through A-10 in a +5 degrees aspect angle band about each maxima and minima so defined. All other points on the target median RCS signature shall be within +1 dBsm of the associated points on figures A-1 through A-10.

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PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	90-0112 0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	YK
		DATE	03MR80
		TILT ANGLE	0°
		ROLL ANGLE	0°
		PITCH ANGLE	0°
		DISTATIC ANGLE	0°

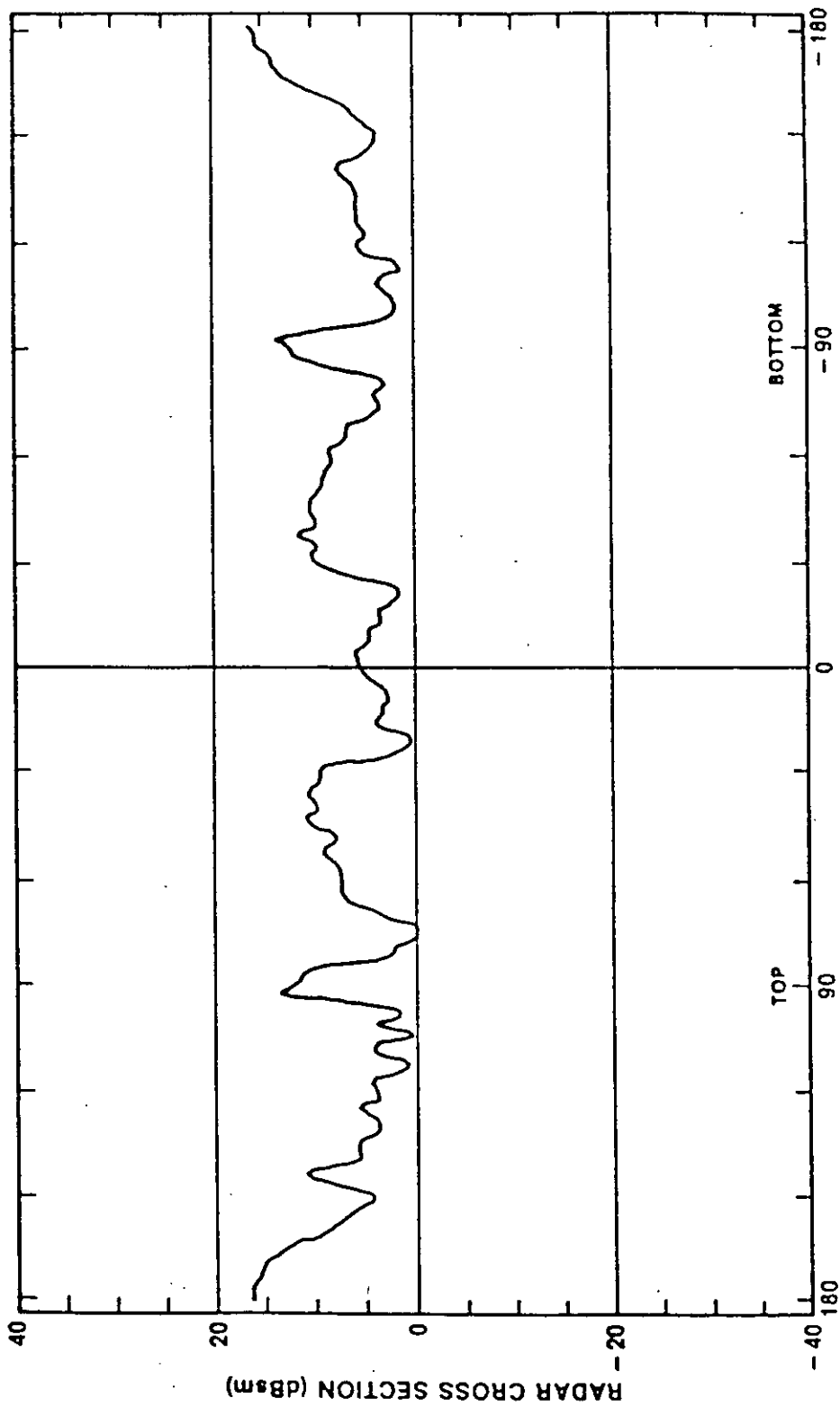


ASPECT ANGLE (DEGREES)
RCS FOR 0° ROLL ANGLE
FIGURE A-1

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN 90-0113 0	FREQUENCY 10.0 GHz	TILT ANGLE 0°	
PROJECT TDU-34A	POLARIZATION VV	ROLL ANGLE -10°	
TARGET PDA-0PTT	ENGINEERS YK	PITCH ANGLE 0°	
	DATE 03MR60	BISTATIC ANGLE 0°	

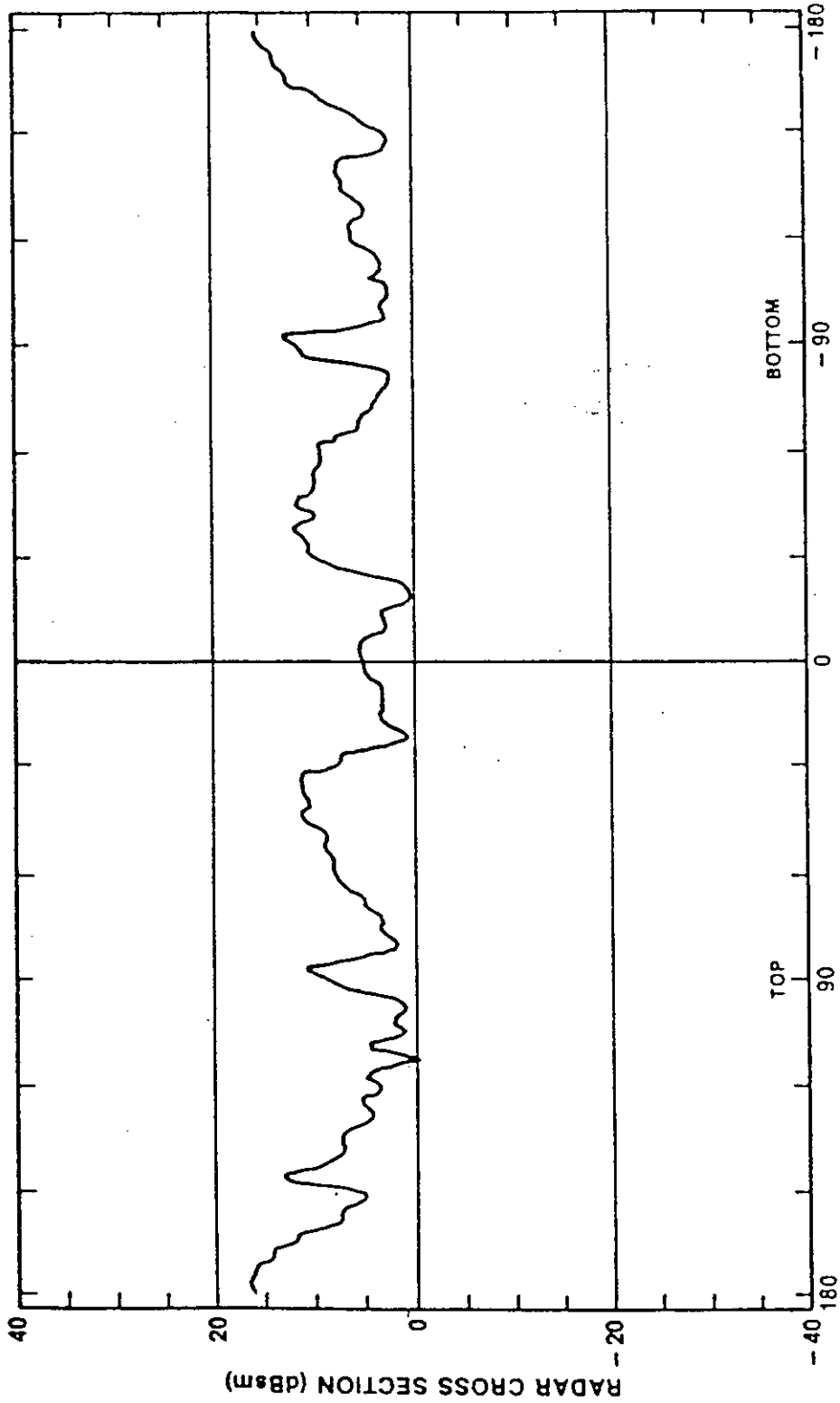


ASPECT ANGLE (DEGREES)
RCS FOR 10° ROLL ANGLE
FIGURE A-2

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PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	90-01131	FREQUENCY	10.0 GHz
PROJECT	TDU.34A	POLARIZATION	VV
TARGET	PDA.0P1T	ENGINEERS	YK
		DATE	03MR60
		TILT ANGLE	0°
		ROLL ANGLE	-20°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°

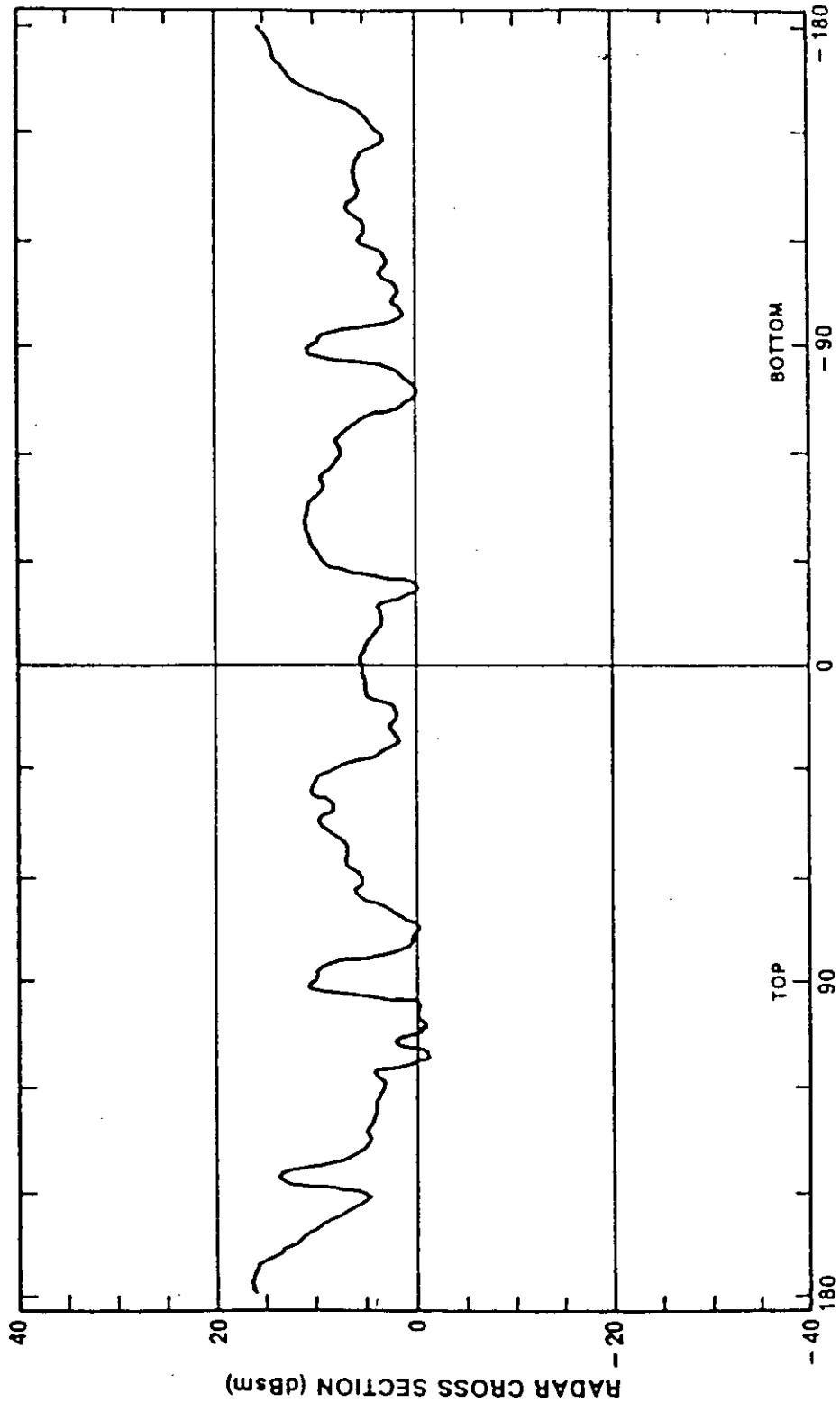


ASPECT ANGLE (DEGREES)
RCS FOR 20° ROLL ANGLE
FIGURE A-3

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUDU, CALIFORNIA			
PATTERN	90-0114.0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA QFTT	ENGINEERS	YK
		DATE	03MR90
		TILT ANGLE	0°
		ROLL ANGLE	-30°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°

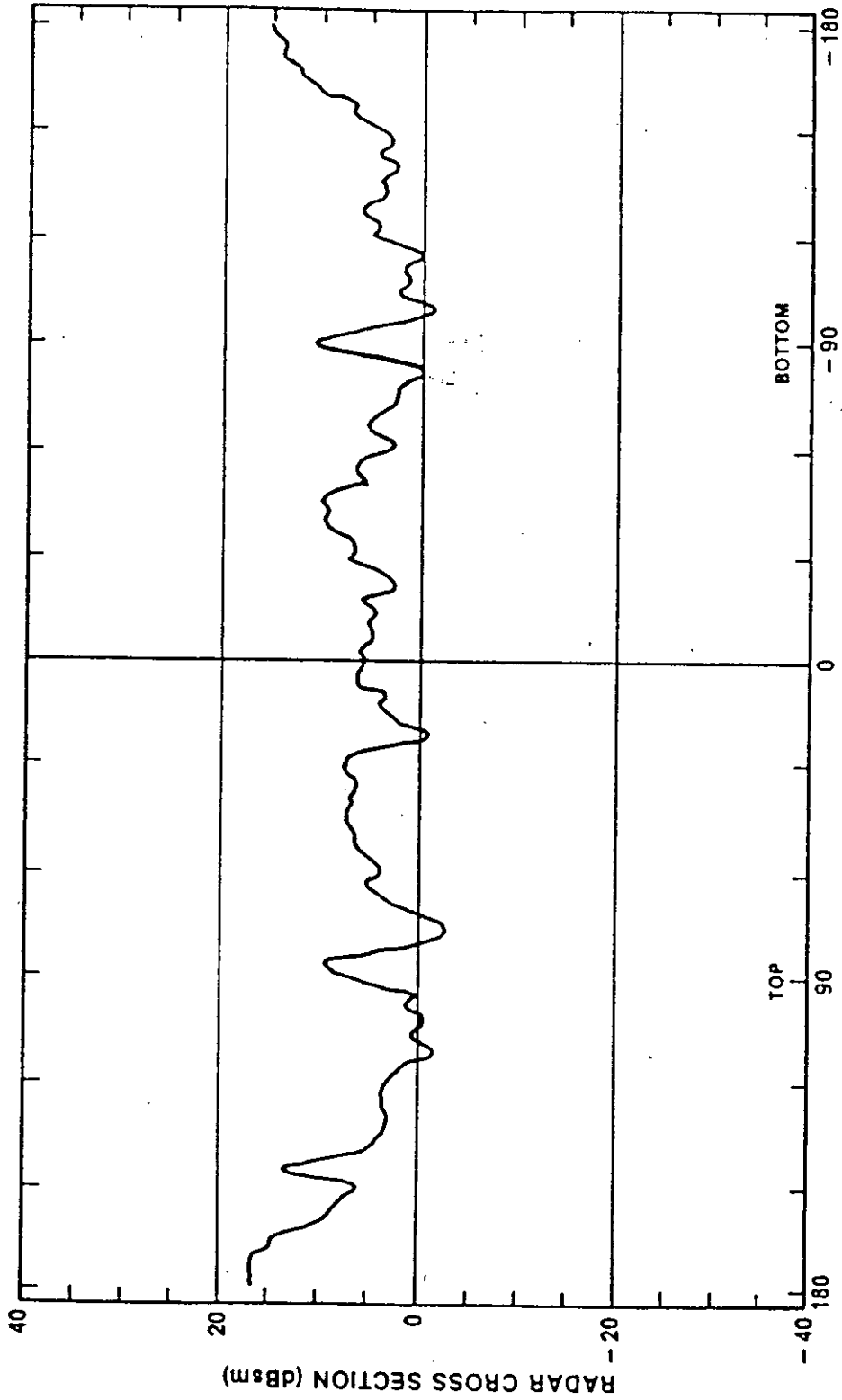


ASPECT ANGLE (DEGREES)
RCS FOR 30° ROLL ANGLE
FIGURE A-4

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	90-0115 0	FREQUENCY	10.0 GHz
PROJECT	TOU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	YK
		DATE	03MR80
		TILT ANGLE	0°
		ROLL ANGLE	-40°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°

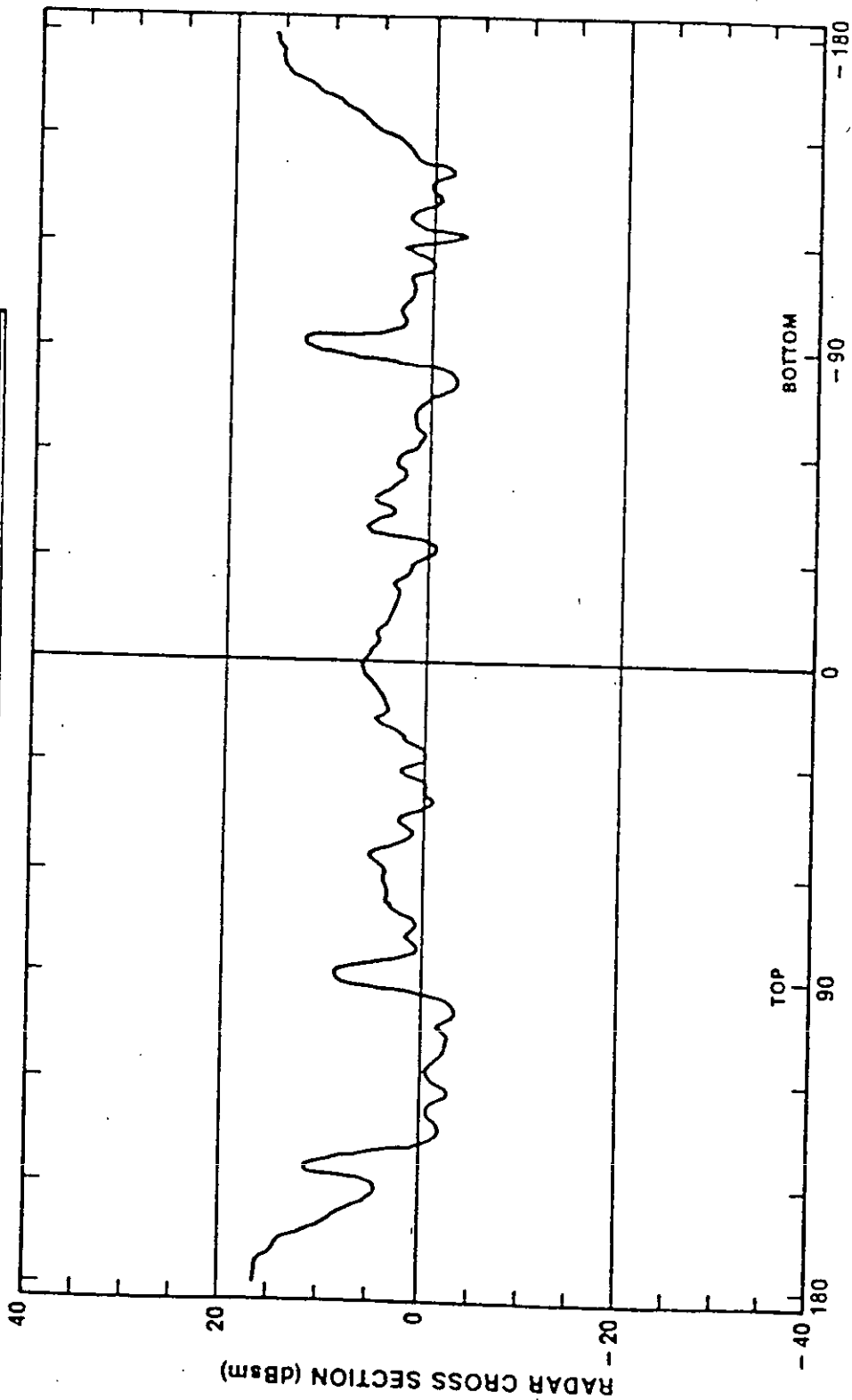


ASPECT ANGLE (DEGREES)
RCS FOR 40° ROLL ANGLE
FIGURE A-5

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUGO, CALIFORNIA			
PATTERN	80-0118 0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	YK
		DATE	03MR80
		ROLL ANGLE	-50°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°
		TYLT ANGLE	0°

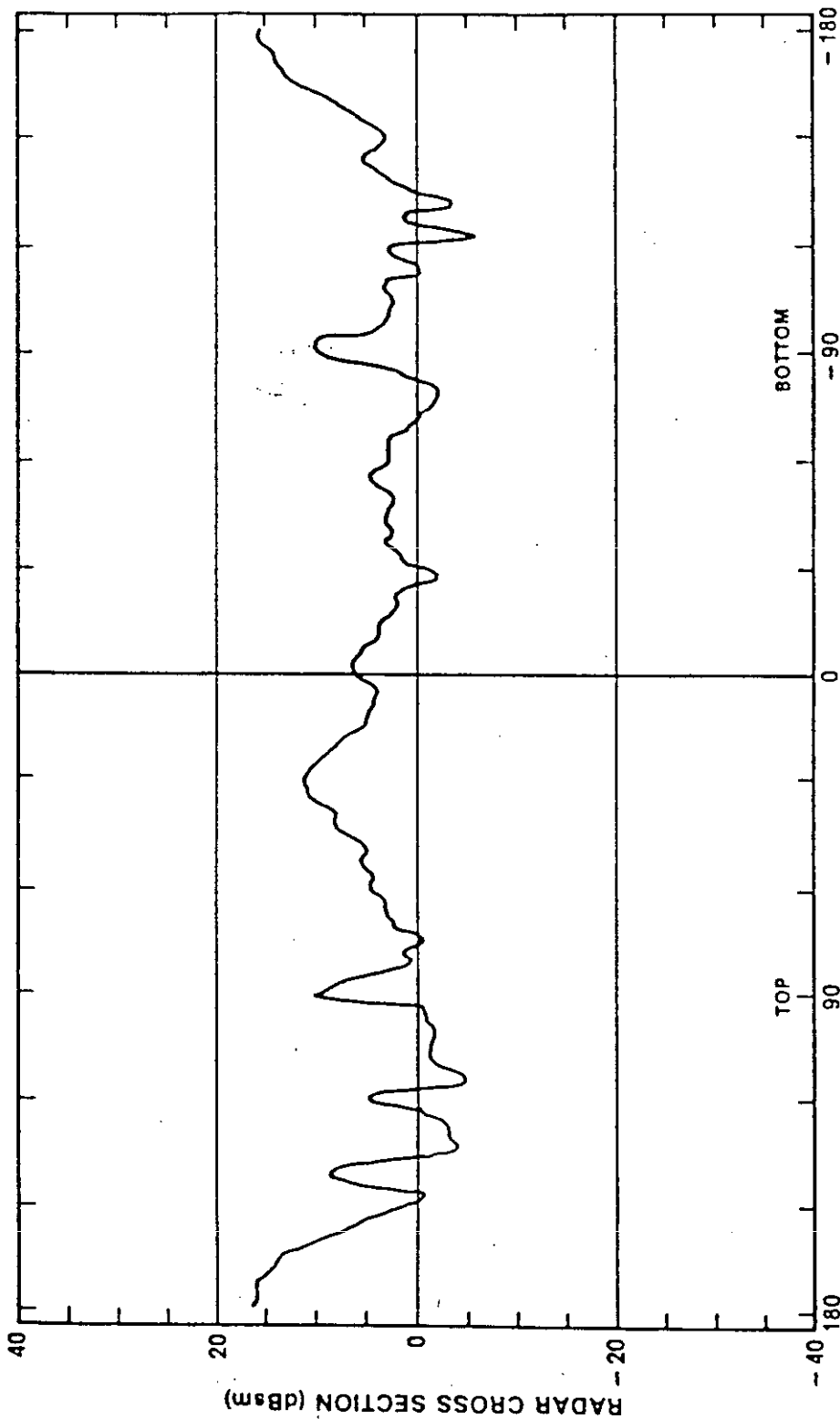


ASPECT ANGLE (DEGREES)
RCS FOR 50° ROLL ANGLE
FIGURE A-8

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PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	96-0117 0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	YK
		DATE	03MR80
		TILT ANGLE	0°
		ROLL ANGLE	-90°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°

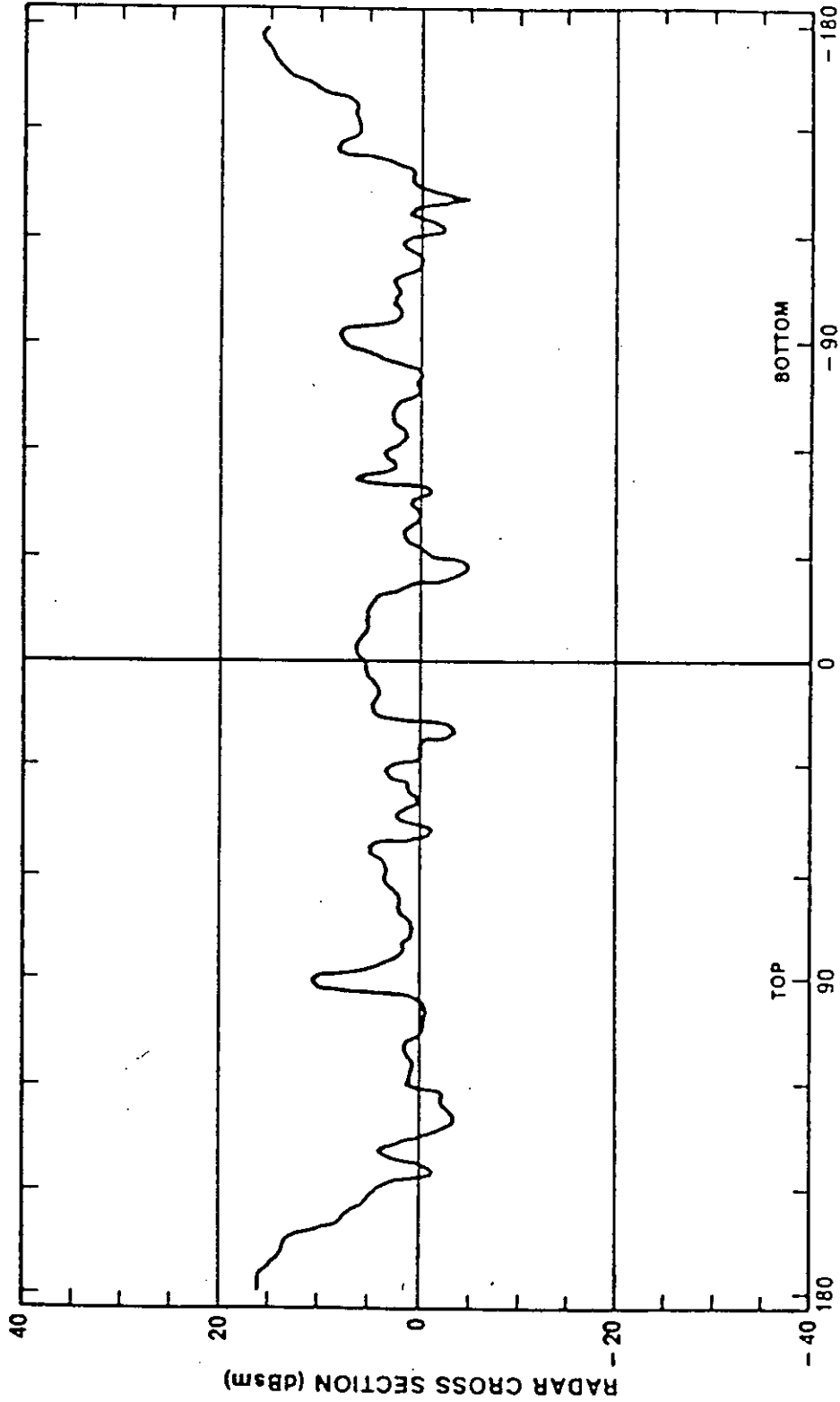


ASPECT ANGLE (DEGREES)
RCS FOR 60° ROLL ANGLE
FIGURE A-7

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	90-0118 0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	TK
		DATE	03MR80
		TILT ANGLE	0°
		ROLL ANGLE	-20°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°

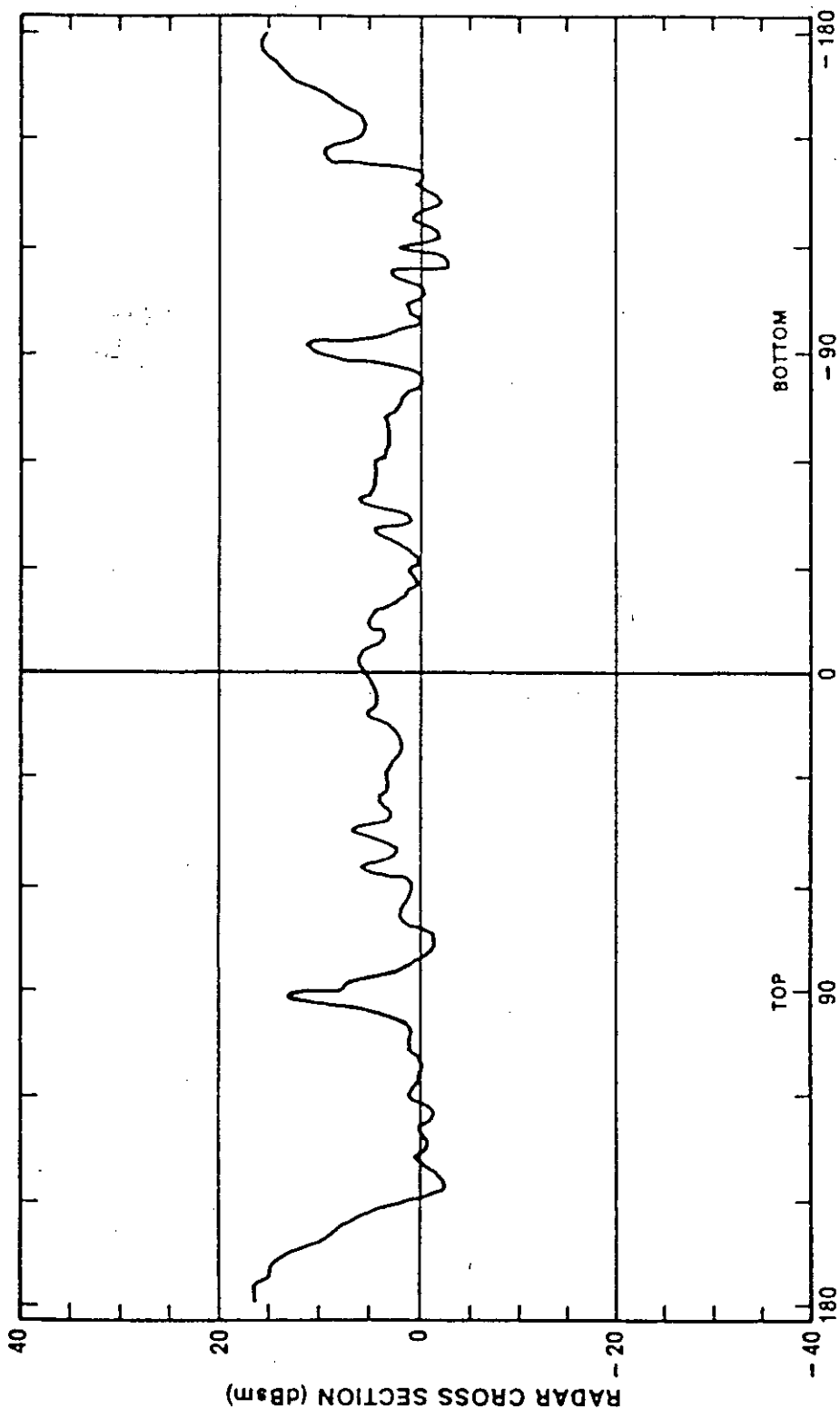


ASPECT ANGLE (DEGREES)
RCS FOR 70° ROLL ANGLE
FIGURE A-8

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PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN 80-0119 0	FREQUENCY 10.0 GHz	TILT ANGLE 0°	
PROJECT TDU-34A	POLARIZATION VV	ROLL ANGLE -80°	
TARGET PDA GPIT	ENGINEERS YK	PITCH ANGLE 0°	
	DATE 03MR80	BISTATIC ANGLE 0°	

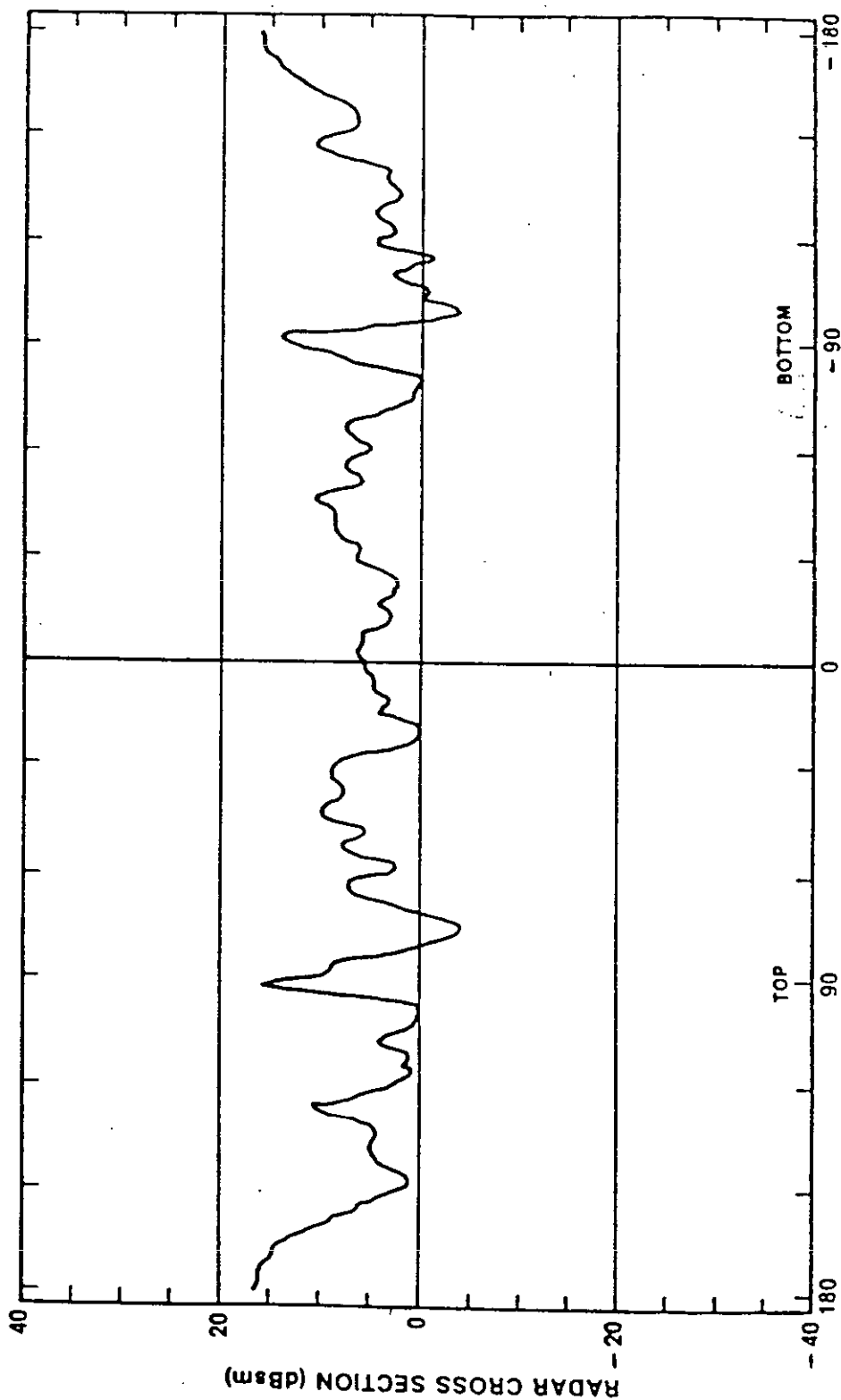


ASPECT ANGLE (DEGREES)
RCS FOR 80° ROLL ANGLE
FIGURE A-8

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APPENDIX A

PACIFIC MISSILE TEST CENTER POINT MUGU, CALIFORNIA			
PATTERN	90-0120 0	FREQUENCY	10.0 GHz
PROJECT	TDU-34A	POLARIZATION	VV
TARGET	PDA OPTT	ENGINEERS	YK
		DATE	03MR80
		TILT ANGLE	0°
		ROLL ANGLE	-90°
		PITCH ANGLE	0°
		BISTATIC ANGLE	0°



ASPECT ANGLE (DEGREES)
RCS FOR 90° ROLL ANGLE

FIGURE A-10

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92/04/13

3. DOCUMENT TITLE

TARGET, TOW, AERIAL, TDU-34A/A

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

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