



DEPARTMENT OF THE ARMY
UNITED STATES ARMY AVIATION AND MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA 35898-5120

REPLY TO
ATTENTION OF:

19 August 2014

Legal Office

Ms. Julia Horwitz
1718 Connecticut Avenue NW, SUITE 200
Washington, DC 20009

Dear Ms. Horwitz:

This is our first interim response to your Freedom of Information Act (FOIA) request to the Department of the Army dated 1 November 2013 and seeking, in summary, records pertaining to the capabilities of the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), to include JLENS contracts and statements of work reflecting said capabilities (request enclosed). Enclosed are two documents responsive to your request, a substantial portion of the Performance Specification for the JLENS (135 of 145 pages provided) and the Amendment/Modification of Contract No. P00180 for Contract No. DASG60-98-C-0001 (4 pages total). Portions of the 139 pages provided have been redacted pursuant to FOIA Exemptions 1, 3, 4 and 6 (5 U.S.C. § 552(b)(1), (b)(3), (b)(4) and (b)(6) respectively). Ten pages of the Performance Specification for the JLENS have been withheld in their entirety pursuant to FOIA Exemption 1.

Exemption 1 of the FOIA protects from disclosure national security information concerning the national defense or foreign policy, provided that it has been properly classified in accordance with the substantive and procedural requirements of an executive order.

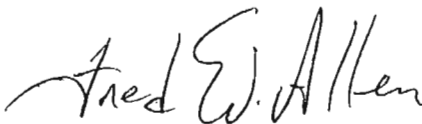
Exemption 3 of the FOIA incorporates the various nondisclosure provisions that are contained in other federal statutes. Title 10, United States Code (U.S.C.), Section 130 permits the withholding of certain technical data from public disclosure. The custodial agency has determined that, in accordance with DoD Directives implementing Section 130, the document in question contains critical technical data with military or space application not intended for release to the public or foreign governments without an approval, authorization, or license under the Export Administration Act of 1979 (Title 50, U.S.C. App., Sections 2401-2420) or the Arms Export Control Act (Title 22, U.S.C., Section 2751 et seq.).

Exemption 4 protects from disclosure commercial or financial information obtained from a person as privileged or confidential.

Exemption 6 protects information contained in personnel and medical files and similar files, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Although I am aware that your request is the subject of ongoing litigation and appeals are not ordinarily acted on in such situations, I am required by statute and regulation to inform you of your right to file an administrative appeal. Any such appeal should be addressed to the **United States Army Aviation and Missile Command Legal Office, Attention: AMSAM-LG, 5300 Martin Road, Redstone Arsenal, Alabama 35898-5000**, for forwarding to the Army General Counsel for final disposition on behalf of the Secretary of the Army. If you elect to file an appeal, it must be postmarked no later than 60 calendar days after the date of this interim release letter and include a copy of this letter. In your appeal letter, you must provide a statement of the reasons why you believe this initial decision to be in error. The appeal envelope and letter must be clearly marked "Freedom of Information Act Appeal."

Sincerely,

A handwritten signature in black ink that reads "Fred W. Allen". The signature is written in a cursive style with a large, sweeping initial "F".

Fred W. Allen
Chief Counsel

Enclosures

epic.org

November 1, 2013

VIA FACSIMILE

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Re: Freedom of Information Act Request

Dear Ms. Bolling,

This letter constitutes a request under the Freedom of Information Act ("FOIA"), 5 U.S.C. § 522, and is submitted on behalf of the Electronic Privacy Information Center ("EPIC") to the Department of the Army ("Army") FOIA Office.

EPIC seeks records regarding the capabilities of the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System ("JLENS").

Background

Aerostats are lighter-than-air aircrafts,¹ and include balloons, non- and semi-rigid airships, and dirigibles.² They have been used for military purposes for many decades.³ Currently, the Department of Defense is engaged in numerous efforts to enlist aerostats for various purposes, among them the JLENS system. According to manufacturer Raytheon, JLENS "consists of two tethered, 74-meter helium-filled aerostats connected to mobile mooring stations and a communications and processing groups. The aerostats fly as high as 10,000 feet above sea level and can remain aloft and operational for up to 30 days. One aerostat carries a surveillance radar with 360-degree surveillance capability; the other aerostat carries a fire control radar."⁴ A video produced by Raytheon states that JLENS allows "commanders to develop and analyze patterns of life over time..."⁵

¹ Merriam-Webster, *Aerostat*, <http://www.merriam-webster.com/dictionary/aerostat>;

² See *The Five Principal Kinds of Lighter-Than-Air Craft Illustrated and Described*, POPULAR MECHANICS 932 (June, 1930).

³ See *id.* at 929-44.

⁴ Raytheon, *JLENS*, <http://www.raytheon.com/capabilities/products/jlens/> (last accessed Oct. 31, 2013).

⁵ Raytheon, *JLENS: The Future of Defense*, YOUTUBE.COM (Oct. 22, 2012), <https://www.youtube.com/watch?v=q8hkpQ8ujyM>.

According to the GAO, “[t]he Army is developing JLENS in two spirals. Spiral 1 is complete and served as a test bed to demonstrate the concept. Spiral 2 will utilize two aerostats with advanced sensors for surveillance and tracking, as well as mobile mooring stations, communication payloads, and processing stations.”⁶

The radar system of JLENS is capable of tracking “hostile cruise missiles; low-flying manned and unmanned aircraft; and moving surface vehicles such as boats, mobile missile launchers, automobiles, trucks and tanks”⁷ from up to 340 miles away.⁸ A test undertaken by Raytheon proved that JLENS is capable of “simultaneously detect[ing] and track[ing] double-digit swarming boats, hundreds of cars and trucks, non-swarming boats and manned and unmanned aircraft.”⁹ Another test showed that JLENS equipped with an electro-optical/infrared sensor was able to simultaneously surveil multiple individuals and vehicles:

During the Raytheon-funded demonstration, and despite heavy smoke from recent, naturally-occurring forest fires, an MTS-B electro-optical/infrared (EO/IR) sensor mounted on a JLENS surveillance aerostat tracked numerous targets with the IR sensor. Video from the MTS-B was passed through the aerostat's tether, enabling operators to watch live feed of trucks, trains and cars from dozens of miles away. While the MTS-B visually tracked targets, the JLENS simultaneously tracked surface targets with its integrated radar system, demonstrating the potential to integrate the JLENS radar and EO/IR payloads. As part of the demonstration, operators also used the MTS-B's EO sensor to watch Raytheon employees simulate planting a roadside improvised explosive device.¹⁰

As of 2007, the Army had four JLENS aerostats.¹¹ According to a GAO study, between 2007 and 2012 the Department of Defense spent \$2.56 billion on developing the JLENS system.

NBC News reports that the Army is currently testing JLENS at the Aberdeen Proving Ground in Maryland and will then begin a long-term surveillance program over the D.C. area.¹²

⁶ United States Government Accountability Office, *Assessments of Selected Weapon Programs* 95 (Mar. 2012) available at <http://www.gao.gov/assets/590/589695>.

⁷ Raytheon, *US Army Soliders Test JLENS in real-world scenarios* (Jul. 24, 2013), <http://raytheon.mediaroom.com/index.php?s=43&item=2386>.

⁸ *Id.*

⁹ Raytheon, *JLENS simultaneously tracks swarming boats, cars, aircraft* (Dec. 5, 2012), <http://raytheon.mediaroom.com/index.php?s=43&item=2235>.

¹⁰ Raytheon, *Operators use JLENS-mounted sensor to observe role-players planting mock-IED during demonstration* (Jan. 14, 2013), <http://raytheon.mediaroom.com/index.php?s=43&item=2254>.

¹¹ Susan Berfield, *Raytheon Missile-Seeking Blimp to Get Test Run Guarding Capital*, BLOOMBERG.COM (Feb. 28, 2013), <http://www.bloomberg.com/news/2013-02-28/raytheon-missile-seeking-blimp-to-get-test-run-guarding-capital.html>.

¹² NBC Washington, *Massive Blimps Could Soon Conduct 360-Degree Surveillance Over D.C. Area* (Jul. 25, 2013), <http://www.nbcwashington.com/news/local/Massive-Blimps-Could-Soon-Conduct-360-Degree-Surveillance-Over-DC-Area.html>.

According to NBC, “[t]he blimps will stay in the skies for up to three years.”¹³ They are expected to operate at a height of 10,000 feet.¹⁴

Documents Requested

EPIC seeks:

1. All technical specifications, contracts, and statements of work for JLENS systems purchased or contracted for by the Department of the Army, including but not limited to contracts with Ratheon;
2. All instructions, policies, and procedures concerning the use of JLENS to collect, store, transmit, reproduce, retain, degrade, or delete images and sounds.
3. All documents detailing the technical specifications of visual and auditory surveillance hardware on JLENS aerostats;
4. All contracts and statements of work entered into by the Department of the Army for JLENS hardware, software, or training that concerns the ability of JLENS to collect, obscure, degrade, store, transmit, reproduce, retain, or delete images and sounds.

Request for “News Media” Fee Status and Fee Waiver

Per 5 U.S.C. § 552(4)(A)(ii), EPIC is a “representative of the news media” for fee waiver purposes.¹⁵ Based on our status as a “news media” requester, we are entitled to receive the requested records with only duplication fees assessed.

Further, in accordance with 5 U.S.C. § 552(4)(A), any duplication fees should be waived because the subject of this request will “contribute significantly to the public understanding of the operations or activities of the government.” This request concerns both significant expenditures of the federal government and the use of surveillance equipment within the United States. In particular, the government’s surveillance activities have been the subject of intense scrutiny over the past several months.¹⁶ At a time of great concern over the expenses of the federal government and increased privacy concerns, the information that is the subject of this request will greatly increase public understanding of how the government works.

¹³ *Id.*

¹⁴ Darren Orf, *JLENS, the Military Surveillance Airship, Is Ready for Action*, POPULAR MECHANICS (Jul. 24, 2013), <http://www.popularmechanics.com/technology/military/planes-uavs/jlens-the-military-surveillance-airship-is-ready-for-action-15727775>.

¹⁵ *EPIC v. Department of Defense*, 241 F. Supp. 2d 5 (D.D.C. 2003).

¹⁶ See, e.g., Craig Timberg and Ellen Nakashima, *Amid NSA spying revelations, tech leaders call for new restraints on agency*, Washington Post (Oct. 31, 2013), http://www.washingtonpost.com/world/national-security/amid-nsa-spying-revelations-tech-leaders-call-for-new-restraints-on-agency/2013/10/31/7f280aec-4258-11e3-a751-f032898f2dbc_story.html; Glenn Greenwald, *NSA collecting phone records of millions of Verizon customers daily*, THE GUARDIAN (Jun. 5, 2013), <http://www.theguardian.com/world/2013/jun/06/nsa-phone-records-verizon-court-order>; Somini Sengupta, *U.S. Border Agency Allows Others to Use Its Drones*, THE NEW YORK TIMES (Jul. 3, 2013), <http://www.nytimes.com/2013/07/04/business/us-border-agency-is-a-frequent-lender-of-its-drones.html>.

Conclusion

Thank you for your consideration of this request. As provided in 5 U.S.C. § 552(a)(6)(A), I look forward to your determination regarding compliance with this request within 20 business days. For questions regarding this request, I can be contacted at 202-483-1140 or FOIA@epic.org

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Adam Marshall', with a large, sweeping flourish extending to the right.

Adam Marshall
Chief Internet Activist, EPIC

A handwritten signature in black ink, appearing to read 'Julia Horwitz', with a small flourish at the end.

Julia Horwitz
Director, EPIC Open Government Project

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACTED CODE V	PAGE OF PAGES 1 4
2. AMENDMENT/MODIFICATION NO. P00180	3. EFFECTIVE DATE 04 MAR 09	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY US ARMY (SPACE & MISSILE DEFENSE COMMAND) SMDC-RDC PO BOX 1500 HUNTSVILLE AL 35897-3501	CODE WD113M	7. ADMINISTERED BY (If other than item 6) DCMA RAYTHEON 30 APPLE HILL DRIVE MMS T2FR2 TRUMBULL MA 01960		CODE S2205A
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) RAYTHEON COMPANY 380 LOWELL ST. ANDOVER MA 01910-4400			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X 10A. MOD. OF CONTRACT/ORDER NO. DASG60-08-C-0001	
			X 10B. DATED (SEE ITEM 13) 30-Jan-1908	
CODE 05718	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as change in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Changes Clause				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: (b) (6) To modify CLIN 0017 to de-scope the Electro Optical Infrared (EOIR) material.				
Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remain in full force and effect.				
15A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) (b) (6)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) (b) (6)	
15B. CONTRACTOR SIGNATURE (b) (6)			15C. DATE SIGNED 3-4-09	
(Signature of person authorized to sign)			16C. DATE SIGNED 4 MAR 09	
			(Signature of Contracting Officer)	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

1. SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was decreased by \$6,310,846.00 from \$1,665,516,875.00 to \$1,659,206,029.00.

2. SECTION B - SUPPLIES OR SERVICES AND PRICES

SUBCLIN 0017AA

The target cost has decreased by (b) (4) from (b) (4) to (b) (4).

The target profit/fee has decreased by (b) (4) from (b) (4) to (b) (4).

The total cost of this line item has decreased by (b) (4) from (b) (4) to (b) (4).

This includes a decrease in target cost (b) (4) of cost and (b) (4) of facilities capital cost of money) and a decrease in target fee of (b) (4) which is (b) (4) of target cost less facilities capital cost of money.

The following Section B clauses are hereby revised:

B-17. INCENTIVE FEE FOR SUBCLIN 0017AA/CLIN 0018 (SEE H-19):

In accordance with FAR 52.216-7, entitled "Allowable Cost and Payments", and FAR 52.216-10, entitled "Incentive Fee", the total amount for reimbursement of cost and fee for performance under SubCLIN 0017AA/CLIN 0018 are set forth below:

Target Cost (b) (4)
Target Fee (b) (4)

Incentive Arrangement: Maximum Fee: (b) (4)
Minimum Fee: (b) (4)

(Share Ratio: Government/Contractor)

Underrun (b) (4) for the amount by which the total allowable cost is less than the target cost until maximum fee is attained.

Overrun (b) (4) for the amount by which the total allowable cost exceeds the target cost until minimum fee is attained.

FAR 52.216-10, INCENTIVE, paragraph (e)(1), is stated as follows:

(e) Fee Payable.

(1) The fee payable under this contract shall be the target fee increased by (b) (4) cents for every dollar that the total allowable cost is less than the target cost or decreased by (b) (4) cents for every dollar that the total allowable cost exceeds the target cost. In no event shall the fee be greater than (b) (4) percent or less than (b) (4) percent of the target cost.

(b)(4)

B-18. TARGET COST, TARGET FEE, MINIMUM INCENTIVE FEE, MAXIMUM INCENTIVE FEE, AND INCENTIVE ARRANGEMENT FOR SUBCLIN 0017AA/CLIN 0018:

SUBCLIN 0017AA - (Two SDD JLENS Systems)

- a. Target cost: (b) (4)
- b. Target fee: (b) (4)
- c. Minimum incentive fee: (b) (4)
- d. Maximum incentive fee: (b) (4)
- e. Total target cost and target fee: (b) (4)

3. SECTION G - CONTRACT ADMINISTRATION DATA

Paragraph G-6, IMPLEMENTATION OF AND EXPLANATION OF THE RELATIONSHIP OF THE LIMITATION OF FUNDS (LOF) CLAUSE TO FEE OBLIGATIONS, subparagraph c., is revised to read as follows:

SUBCLIN 0017AA :	PRIOR	THIS MODIFICATION	CUMULATIVE TOTAL*
(1) Amount Required for Full Funding, Including Fee:	(b) (4)	(\$6,310,846)	(b) (4)
(2) Amount Allotted Under the LOF Clause for Payment of Costs:	(b) (4)	\$ 0	(b) (4)
(3) Amount Separately Obligated for Payment of Fee:	(b) (4)	\$ 0	(b) (4)
(4) Total Amount Allotted and Obligated:	\$ (b) (4)	\$ 0	(b) (4)
(5) Net Amount Required for Full Funding	\$ (b) (4)	(\$6,310,846)	(b) (4)

* These figures take into consideration the negotiated total value of SubCLIN 0017AA (This does not include SubCLIN 17AH).

4. SECTION H - SPECIAL CONTRACT REQUIREMENTS is changed as follows:

Paragraph H-19, INCENTIVE FEE STRUCTURE AND PAYMENT FOR CLIN 0017, SYSTEM DEVELOPMENT AND DEMONSTRATION (SDD), subparagraphs a. and b., are revised as follows:

a. General.

SubCLIN 0017AA, System Development and Demonstration (SDD), is a cost-plus-incentive-fee (CPIF) Line Item with cost and schedule incentives as described below. Paragraph H-19(b) applies only to the Cost Incentive and Paragraph H-19(c) applies only to the Schedule Incentive. The contract price amount of (b) (4) includes a target cost of (b) (4) (which includes (b) (4) of cost and (b) (4) of facilities capital cost of money) and a target incentive fee of (b) (4) which is (b) (4) of target cost less facilities capital cost of money.

b. Cost Incentive.

(1) The target fee payable under SubCLIN 0017AA is (b) (4) of the target cost less facilities capital cost of money (b) (4), an amount equal to (b) (4)

(2) The maximum fee payable under SubCLIN 0017AA is (b) (4) of the target cost less facilities capital cost of money (b) (4) an amount equal to (b) (4) (b)(4)

- (3) The minimum fee payable under SubCLIN 0017AA is [REDACTED] of the target cost less facilities capital cost of money [REDACTED], an amount equal to [REDACTED]. (b)(4)
- (4) Fee will be adjusted for actual cost that is less than or more than the target cost stated above using a share ratio of [REDACTED] Government / [REDACTED] Contractor for actual costs less than the target cost, and a ratio of [REDACTED] Government / [REDACTED] Contractor for actual costs greater than the target cost range applied according to Paragraph H-19(c)(1). (b)(4)
- (5) Nothing stated in this clause shall take precedence over the clause 52.216-10 - Incentive Fee contained in this contract.

(End of Summary of Changes)

PERFORMANCE SPECIFICATION
FOR THE
JOINT LAND ATTACK CRUISE MISSILE DEFENSE ELEVATED NETTED SENSOR SYSTEM (JLENS)
Prepared By:

Program Executive Office Missiles and Space

Cruise Missile Defense Systems Project Office, Redstone Arsenal, AL 35898

SUBMITTED BY:

(b)(6)

Director, Systems Engineering Development Directorate
CMDS Project Office

REVIEWED BY:

(b)(6)

Director, Performance Engineering Directorate
CMDS Project Office

APPROVED FOR USE:

(b)(6)

JLENS SDD Technical Monitor, JLENS Product Office
CMDS Project Office

(b)(6)

LTC, MP
Product Manager, JLENS Product Office
CMDS Project Office

(b)(6)

Project Manager
CMDS Project Office

(b)(3)

(b)(1)

FSC-5841

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JLENS Performance Specification (U)

1 (U) SCOPE

(U) The JLENS Performance Specification defines the performance requirements and operating environment for a JLENS system employing technologies with specific attention given to Land Attack Cruise Missile Defense (LACMD). The system (a) enables Surface-to-Air Missile (SAM) systems to perform over-the-horizon (OTH) intercepts of Land Attack Cruise Missiles (LACM) under the Air Directed Surface-to-Air Missile (ADSAM) concept, (b) contributes to Single Integrated Air Picture (SIAP), (c) provides target data on surface moving targets (SMT), and (d) detects and tracks Theater Ballistic Missiles (TBM) and Large Caliber Rockets (LCR). The scope of operations ranges from single Service applications to a full Joint environment in all phases of warfare.

1.1 (U) Concept

(U) One complete JLENS Orbit consists of an elevated Surveillance System and an elevated Fire Control System. The Surveillance System detects hostile targets and cues the Fire Control System to support weapon systems in the engagement of these hostile targets. The elevated Fire Control System enables air defense weapons to engage low-flying cruise missiles at extended ranges and minimizes the likelihood of these threats completing their mission. When tasked, the Fire Control System can perform other missions in support of the warfighter. Either system can be employed as a stand-alone sensor. The Fire Control System engagement performance will be reduced when operating autonomously.

1.2 (U) System Description

(U) Each Fire Control System and Surveillance System includes a platform, payload(s), processing station, and ancillary equipment. The platform is a non-rigid, aerodynamically shaped, helium and air filled air vehicle that is tethered to a mooring (ground or sea-based) station. The tether is a cable that secures the air vehicle, controls the operating altitude, provides power to airborne components and performs bi-directional data communication. The payloads are a multi-functional fire control sensor for performing sector surveillance and supporting intercepts, and a surveillance sensor performing wide area surveillance and supporting fire control sensor cueing and the necessary communications equipment for each sensor system. The processing station includes operator station(s) and communications equipment. Figure 1.3-1 depicts a notional specification tree. The term "Systems" refers to both the Fire Control System and the Surveillance System.

1.3 (U) Requirement Markings

(U) All requirements must be met unless marked objective [O]. Requirements marked with [O] represent desired performance. When used following a parameter or before the period of a sentence, the designation applies only to that parameter or sentence, respectively.

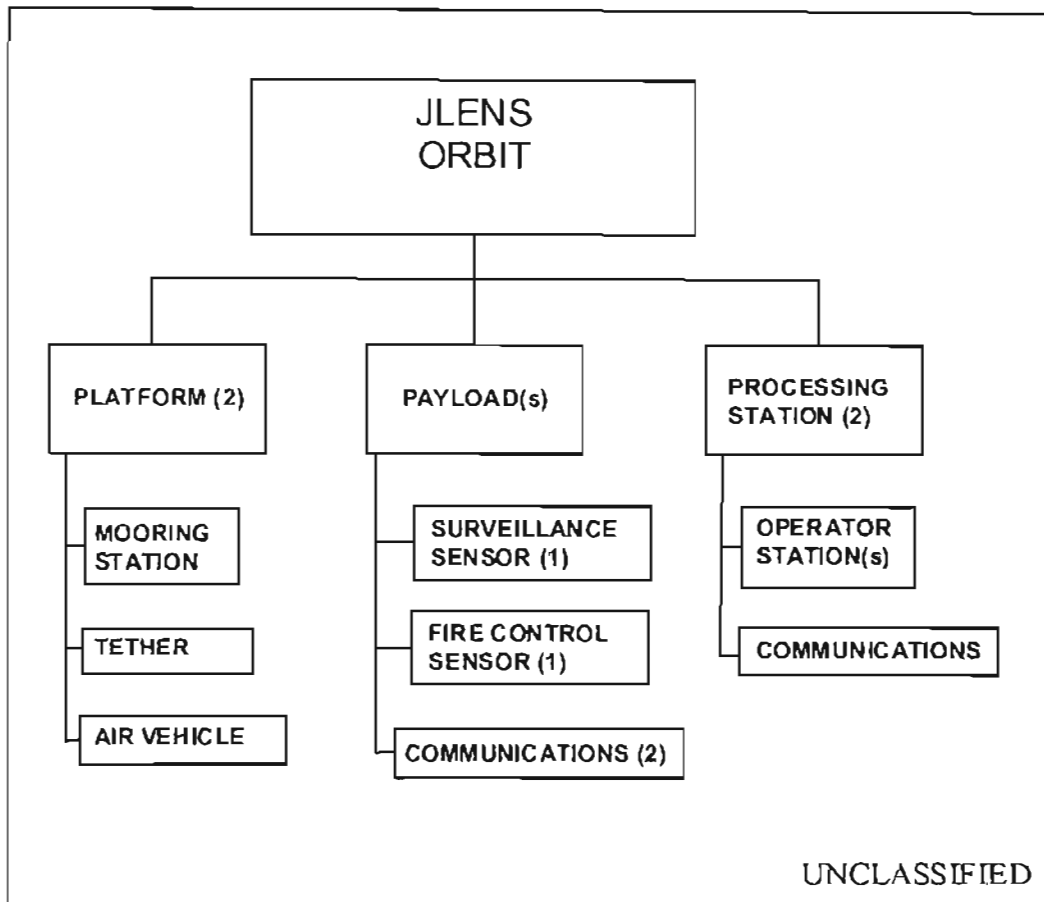


Figure 1.3-1. (U) JLENS System Specification Tree

1.4 (U) States and Modes

(U) The JLENS System provides operational capabilities to support both wartime and peacetime missions through the use of the system states and modes. The JLENS System may transition between these states and their modes as a system or as individual elements of the system.

1.4.1 (U) Storage State

(U) The Storage State ensures the availability of the system after long or short periods of storage. It consists of the short-term and long-term storage modes. The JLENS Systems normally transition into and out of the storage state from/to the movement state. This state is a non-operational state.

1.4.1.1 (U) Short-Term Storage Mode

(U) The system equipment is placed in short-term storage mode with the owning organization when mission requirements require the unit to perform functions other than their normal missions. (b)(3) The equipment is placed in short-term storage without pre-conditioning and is maintained at a reduced maintenance level. Normal preventive maintenance checks and services (PMCS) actions are to be performed while in short-term storage. (b)(3)

(b)(3). The items are to be removable by the operator using standard tools. (b)(3)

(b)(3) The equipment is returned to operations in accordance with the appropriate technical manuals. Transition from this mode to the operational state within the emplace timeline defined in the requirements. This mode is a non-operational mode.

1.4.1.2 (U) Long-Term Storage Mode

(U) The JLENS system equipment is placed in long-term storage mode when mission requirements do not require the equipment for both peacetime and wartime operations. The equipment may remain stored through the duration of its service life. The system equipment is prepared and pre-conditioned for transition into long-term storage in accordance with the appropriate technical manuals. All sensitive and pilferable items, as well as any item that may deteriorate and/or corrode, are to be removable. (b)(3)

(b)(3) PMCS is limited to periodic visual inspection of the material condition of the equipment. The equipment is returned to operations in accordance with the appropriate technical manuals. This mode is a non-operational mode.

1.4.2 (U) Movement State

(U) The movement state consists of the transport mode for intra-theater and inter-theater shipment of the JLENS System using non-organic means. The march-order mode for movement in-theater is by organic means. This state is a non-operational state.

1.4.2.1 (U) Transport Mode

(U) In the transport mode, the equipment is placed into an air, ground, rail, or water transport configuration. All JLENS equipment is transportable by C-17 and C-5 fixed-wing military aircraft for strategic airlift, sealift, and/or rail. The JLENS system is transportable by C-130 intra-theater with the exception of the Mobile Mooring Station and other specified ground support equipment as approved by the government. Transitions to the transport mode are conducted using organic equipment or the transportation unit's special handling equipment. It remains in the transport configuration until it arrives at its final destination or is prepared for road march. This mode is a non-operational mode.

1.4.2.2 (U) March Order Mode

(U) The JLENS system transitions to the march-order mode when required to move by organic means. A JLENS unit is mobile with sufficient vehicles, personnel, supplies, and both system peculiar and common equipment to displace the entire unit in one move. JLENS must be capable of movement on primary and secondary roads, as well as movement off-road. It must be capable of limited off-road movement to reach pre-selected emplacement sites over cross-country terrain and unimproved roads. The system is capable of relocating on public roads and highways, including those having unimproved road surfaces (such as gravel or hard-packed dirt), to support emplacement at prepared sites. This mode is a non-operational mode.

1.4.3 (U) Deployment State

(U) Deployment state consists of two modes: the emplace mode and the displace mode.

1.4.3.1 (U) Emplace Mode

(U) The emplace mode includes the physical positioning, aerostat inflation, and physical integration of the system. The system equipment transitions to the emplace mode upon arrival at its designated location. After physical positioning and integration, the system can begin initialization of individual prime items. Initialization is the power-up sequence for the individual prime items that ends with the system ready to begin configuration mode for an assigned mission. This mode is a non-operational mode.

1.4.3.2 (U) Displace Mode

(U) The displace mode provides the capabilities to transition system equipment to march order configurations prior to entering the movement state. The assigned crews shut down, disassemble, and stow all deployed equipment in preparation for movement. This mode is a non-operational mode.

1.4.4 (U) Operations State

(U) The operations state begins with the system being configured for a mission and continues through all tactical or training operations. The operations state also includes maintenance and sustainment activities. This state is an operational state.

1.4.4.1 (U) Configuration Mode

(U) The configuration mode provides the ability for the operators to build and implement a mission profile. The mission profile contains the performance parameters and force operations (FO) data for the radar and communications systems to meet the tasks in the assigned mission. Operator system interfaces are provided for monitoring external stimuli. Voice and data communications, both external and internal to the system, are provided to receive commands, provide status, and exchange data. The configuration mode can be entered as many times as is necessary during operations to change the performance parameters due to mission assignment change. This mode is an operational mode.

1.4.4.2 (U) Tactical Mode

(U) The Tactical Mode provides the capability to perform all assigned mission operations to include: surveillance, detection, tracking and discrimination, and threat evaluation. The system operates in the tactical mode subsequent to the configuration mode. In this mode, the radar may or may not be radiating, depending on operational requirements. The JLENS System (Surveillance or Fire Control) can only be in the tactical state during operational environmental conditions. This mode is an operational mode.

1.4.4.3 (U) Training Mode

(U) The training mode provides the capabilities to perform operator training at a number of levels including operator/maintainer, crew, unit and netted in both live and simulated operations simultaneously. The training mode allows the operators to maintain their proficiency in tactical

decision making, console operations, and maintenance functions. The system operates in the training mode subsequent with the configuration mode and provides for a fast transition to the tactical mode. The four levels of training are Operator/Maintainer Training, Crew Training, Unit Training, and Netted Training. This mode is an operational mode.

1.4.4.3.1 (U) Operator/Maintainer Training

(U) Operator/Maintainer training for the soldier provides hands-on practice in the use of the hardware, software applications, and fault detection and isolation for individual pieces of equipment. Operator task training reinforces skills taught in training institutions, sustains skill previously learned, and is an invaluable tool to teach advanced skills. This mode is an operational mode.

1.4.4.3.2 (U) Crew Training

(U) Crew training is a progressive set of individual tasks that integrate the actions of the various system crews. It provides for conduct of crew battle drills for system/prime item emplacement, initialization, and integration. Crew training provides for training on system tactics, techniques, and procedures. This mode is an operational mode.

1.4.4.3.3 (U) Unit Training

(U) Unit training is progressive set of individual and crew battle drills that link the prime items together during system integration and culminates with simulated engagement and force operations. Unit training is performed using tactical software and hardware communications means. This mode is an operational mode.

1.4.4.3.4 (U) Netted Training

(U) During netted training, the JLENS system participates in a common training scenario, coordinated in near real-time, with other JLENS batteries and/or battalion, lower-tier air defense units, higher-echelon headquarters, and other combined arms and joint exercise participants. The JLENS battery participates in netted training exercises through interface with distributed interactive compliant simulations. This mode is an operational mode.

1.4.4.4 (U) Operations Sustainment Mode

(U) The operations sustainment mode functions allow the system to sustain continuous operations for extended periods of time. It includes refueling, retraining, and resupplying operations. This mode can be concurrent with the other modes in the Operations State. This mode is an operational mode.

1.4.5 (U) Maintenance State

(U) The Maintenance state consists of preventive maintenance and corrective maintenance modes. While in this state, system equipment is maintained to ensure its operational readiness or return failed equipment to a mission capable status. This state is an operational or a non-operational state dependent on mode.

1.4.5.1 (U) Preventive Maintenance Mode

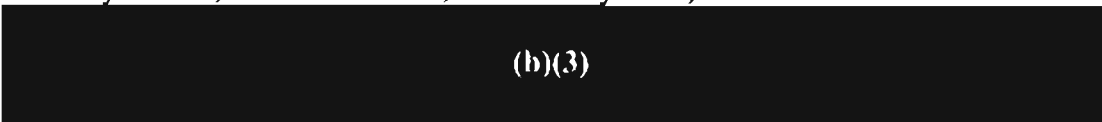

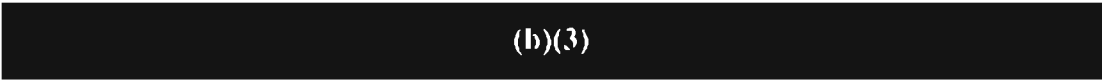
(U) The preventive maintenance mode allows the JLENS crew to perform scheduled PMCS designed to extend and ensure the operational readiness of the system. Preventive maintenance tasks may be conducted on individual prime items on a non-interference basis with system operation as long as safety policies and procedures allow. Transition to and from the preventive maintenance mode can occur from the storage, transportation, or operation states. This can be either an operational or non-operational mode.

1.4.5.2 (U) Corrective Maintenance Mode

(U) The corrective maintenance mode is for repair of system failures resulting in unscheduled maintenance actions. Repair is defined as the restoration or replacement of parts to return the end items to an operational condition and maintain efficient operations. This mode is a non-operational mode.

2 (U) APPLICABLE DOCUMENTS

(U) The following documents are to be used for further clarification. Should there be a conflict between this specification and any of the following documents, this specification takes precedence.

- (U) United States Army Objective Force Operational and Organization Concept for Air and Missile Defense, Director of Combat Developments, US Army Air Defense Artillery School, Fort Bliss Texas, 15 February 2002, UNCLASSIFIED.
-  (b)(3)
- (U) Environmental Models for the Aerostat Program, JHU/APL A1A-97U-041, 16 June 1997, J. P. Reilly, R. L. McDonald, G. D. Dockery, and J. Stapleton (NSWC/DD), UNCLASSIFIED.
-  (b)(3)
- (U) DoD International AIMS Program Performance Standard, 18 March 1998, UNCLASSIFIED
-  (b)(3)
- (U) MIL-STD 464, Department of Defense Interface Standard for Electromagnetic Environmental Effects Requirements for Systems.
- (U) MIL-STD-1472, Department of Defense Design Criteria Standard, Human Engineering.
- (U) MIL-E-6051, Military Specification, Electromagnetic Compatibility Requirements, Systems, 7 September 1967.
- (U) MIL-STD-461, Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility.
- (U) MIL-B-5087, Military Specification, Bonding, Electrical, and Lightning Protection for Aerospace Systems.
- (U) MIL-STD-1310, Department of Defense Standard Practice for Shipboard Bonding, Grounding, and other Techniques for Electromagnetic Compatibility and Safety.
- (U) MIL-STD 6016, Department of Defense Interface Standard for Tactical Digital Information Link (TADIL) J Message Standard.
- (U) MIL-STD 301 I, Interoperability Standard for the Joint Range Extension Application Protocol (JREAP).
- (U) JLENS Information Support Plan (ISP), Stage II DRAFT.
- (U) DoD Internet Protocol Version 6 Transition Plan.
- (U) MIL-STD-1366, Definition of Materiel Transportation System Dimensional and Weight Constraints.
- (U) MIL-STD-130, Department of Defense Standard Practice, Identification Marking of U.S. Military Property.

- (U) MIL-STD-882, Department of Defense Standard Practice for System Safety.
- (U) MIL-HDBK-454, Department of Defense Handbook, General Guidelines for Electronic Equipment.
- (U) MIL-STD-1474, Department of Defense Design Criteria Standard, Noise Limits.
- (U) MIL-HDBK-1472(454), Department of Defense Handbook, Human Engineering Program Process and Procedures.
- (U) MIL-STD-2169, Department of Defense Standard for High-Altitude Electromagnetic Pulse (HEMP) Environment.
- (U) MIL-STD-1385, Department of Defense Standard for General Requirements for Preclusion of Ordnance Hazards in Electromagnetic Fields.
- MIL-STD 2525, Common Warfighting Symbology, 30 Jan 1999
- (U) MIL-STD-469, Department of Defense Interface Standard for Radar Engineering Interface Requirements Electromagnetic Compatibility
- (U) MIL-STD-129, Department of Defense Standard Practice for Military Marking For Shipment And Storage

3 (U) REQUIREMENTS

(b)(3)

3.1 (U) Joint Land Attack Cruise Missile Elevated Sensor System (JLENS) Orbit

3.1.1 (U) Orbit Composition

(U) The JLENS Orbit is defined to consist of a Fire Control System and Surveillance System.

3.1.2 (U) Orbit Land and Sea Operations

(U) The Systems shall be designed for land-based and sea-based operations.

3.1.3 (U) Systems Standalone Operations

(U) Both the Fire Control System and the Surveillance system shall be operable as a stand-alone sensor system.

3.2 (U) Missions

3.2.1 (U) Primary Mission

(U) The JLENS Orbit shall detect, track and support engagement of Land Attack Cruise Missiles (LACM) and other airborne threats.

3.2.2 (U) Secondary Missions

(U) Within the constraints of the primary mission, the JLENS Orbit shall provide detection, track data, and launch point estimates of Theater Ballistic Missiles (TBM) and Large Caliber Rockets (LCR) and to provide surveillance, detection, and tracking of Surface Moving Targets (SMT).

3.2.3 (U) Impact Point Predictions

(U) The JLENS Fire Control System shall provide impact point predictions for TBM and LCR tracks. [O]

3.3 (U) Threat

3.3.1 (U) ABT Threat Engagements

(b)(3)

3.3.2 (U) Threat Surveillance and Tracking

(U) The JLENS Orbit shall support surveillance and tracking of the ABT, surface moving threats, tactical ballistic missiles and large caliber rockets as defined in Appendix A with no a priori knowledge of the threat.

3.4 (U) Operating Environment

3.4.1 (U) Electronic Countermeasures (ECM)

3.4.1.1 [Redacted] (b)(3)
[Redacted] (b)(1)

3.4.1.2 [Redacted] (b)(3)

3.4.1.3 [Redacted] (b)(3)

3.4.2 [Redacted] (b)(3)
[Redacted] (b)(1)

3.4.3 (U) Clutter and Multipath

(U) The system requirements shall be met in the Clutter and Multipath environments defined in Appendix C.

3.4.4 (U) Natural Environments

3.4.4.1 (U) Temperature

3.4.4.1.1 (U) Other than Storage and Transport

(U) The Systems shall meet performance requirements during exposure to an ambient temperature range from -40°C to +49°C (Mean Sea Level).

3.4.4.1.2 (U) Storage and Transport

(U) The Systems or Components shall meet all performance requirements following exposure to an ambient temperature range from -46°C to 71°C while in the storage or movement state.

3.4.4.2 (U) Relative Humidity

(U) The Systems shall meet all performance requirements during exposure to a relative humidity range from 3% to 100% non-condensing using MIL-STD 810F as guidance.

3.4.4.3 [REDACTED] (b)(3)

3.4.4.3.1 [REDACTED] (b)(3)

3.4.4.3.1.1 [REDACTED] (b)(3)

3.4.4.3.1.2 [REDACTED] (b)(3)

3.4.4.3.2 [REDACTED] (b)(3)

3.4.4.3.2.1 [REDACTED] (b)(3)

3.4.4.3.2.2 [REDACTED] (b)(3)

3.4.4.4 (U) Hail

3.4.4.4.1 (U) Other than Storage and Transport

(U) The JLENS System shall survive during exposure to hail up to one-half inch in diameter.

3.4.4.4.2 (U) Storage and Transport

(U) The JLENS System shall be protected during exposure to hail up to one-half inch in diameter.

3.4.4.5 (U) Snow

3.4.4.5.1 (U) Other than Storage and Transport

(U) The JLENS Orbit shall meet performance requirements except sensor performance which can degrade from benign condition during exposure up to 4 inches of snow, with a specific gravity of 0.3, accumulation on ground equipment surfaces and during a snow falling rate of up to 1 inch/hour.

3.4.4.5.2 (U) Storage and Transport

(U) The JLENS System shall be protected during exposure to snow, with a specific gravity of 0.3, accumulation of up to 6 inches in 12 hours.

3.4.4.6 (U) Salt Atmosphere

(U) The systems shall meet performance requirements when exposed to a salt atmosphere in sea locations, coastal regions, and during ocean transportation using MIL-STD-810F Method 509.4 Salt Fog as guidance.

3.4.4.7 (U) Sand and Dust

3.4.4.7.1 (U) Other than Storage and Transport

(U) The Systems shall meet performance, reliability, and maintainability requirements during exposure to blowing sand and dust using MIL-STD-810F Sand and Dust Method 510.4 Procedure I- Blowing Dust and Procedure II- Blowing Sand as guides.

3.4.4.7.2 (U) Storage and Transport

(U) The JLENS Systems, or Components while in a storage or transport configuration shall meet performance requirements after exposure to blowing sand and dust using MIL-STD-810F Sand and Dust Method 510.4 Procedure I – Blowing Dust and Procedure II – Blowing Sand as guides.

3.4.4.8 (U) Fungus

(U) The JLENS system shall only be composed of materials that do not support the growth of fungus or that are protected from environments that would result in fungus growth.

3.4.4.9 (U) Wind

3.4.4.9.1 (U) Other than Storage and Transport

(U) The JLENS Orbit shall meet all performance requirements while being subjected to steady state winds up to 40 kts and 6.5fps turbulence.

3.4.4.9.1.1 (U) Survival Wind

(U) The JLENS Orbit while moored or at altitude shall survive an exposure to steady state winds of up to 80 kts and 10 fps turbulence.

3.4.4.9.2 (U) Storage and Transport

(U) The JLENS Orbit shall survive an exposure to steady state winds of up to 100 kts.

3.4.4.9.3 (U) Wind Turbulence

(U) Deleted

3.4.4.10 (U) Lightning**3.4.4.10.1 (U) Other than Airborne Equipment**

(U) All JLENS equipment shall be protected against direct and indirect lightning in accordance with MIL-STD-464 excluding all airborne equipment.

3.4.4.10.2 (U) Airborne Equipment

(U) All JLENS airborne equipment shall survive direct and indirect lightning strikes that produce a maximum of 145 kA.

3.4.4.10.3 (U) Status Recovery

(U) The systems shall return to the state, mode and stored configuration existing prior to a shutdown induced by a nearby lightning strike as defined in MIL-STD-464 after a restart of the system, not requiring repair.

3.4.4.10.4 (U) Lightning EMP

(U) The systems shall be protected against direct-strike and LEMP-induced currents using MIL-HBK-419A and NFPA-780 as guidance.

3.4.5 (U) Induced Environments**3.4.5.1 (U) Vibration****3.4.5.1.1 (U) Other than Storage and Transport**

(U) The JLENS System shall meet all performance requirements while being subjected to vibration levels caused during operation.

3.4.5.1.2 (U) Storage and Transport

(U) The JLENS system shall meet all performance requirements following exposure to vibration levels caused by normal transportation, maintenance, or storage. Transportation includes, air, ground (both road and rail), and sea.

3.4.5.2 (U) Nuclear, Biological, and Chemical

3.4.5.2.1 (U) Decontamination

3.4.5.2.1.1

(b)(3)

3.4.5.2.1.2 (U) Effectiveness

(U) The system shall be restorable to an operational condition such that use of MOPP IV need not be continued after a NBC decontamination process.

3.4.5.2.2

(b)(3)

3.4.5.2.3 (U) Personnel Protection

(U) The JLENS processing station(s) shall provide protection for personnel from the effects of NBC contamination to allow operation without MOPP IV gear during exposure.

3.4.5.3 (U) Electrostatic Discharge (ESD)

3.4.5.3.1 (U) LRU ESD

(U) LRU shall meet performance requirements following exposure to an electrostatic discharge of (b)(3) volts from a $250 \pm 5\%$ picofarad source and $500 \pm 5\%$ ohm series resistance.

3.4.5.4 (U) Electromagnetic Environmental Effects (E3)

3.4.5.4.1 (U) Electromagnetic Interference (EMI)

(U) The JLENS Orbit shall protect against spurious electromagnetic interference from other systems using MIL-STD-461E, Table V, Ground Army, as a guide.

3.4.5.4.2 (U) Electromagnetic Compatibility (EMC)

(U) The JLENS Systems shall control extraneous emissions using MIL-STD-461E, Table V, Ground Army, as a guide.

3.4.5.5 (U) Grounding and Bonding

(U) Grounding and bonding shall be implemented using guidance in MIL-STD-464A.

3.4.5.6 (U) Ordnance

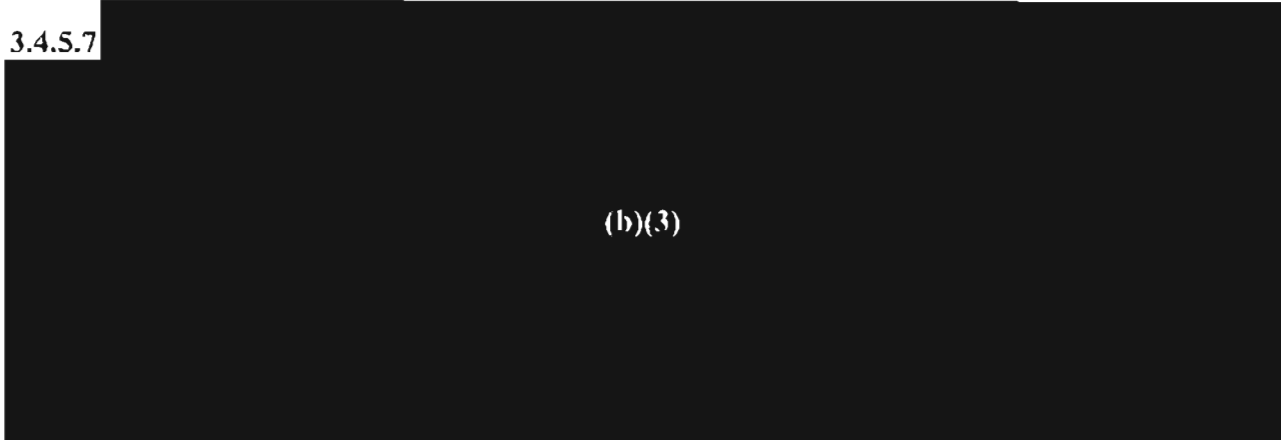
3.4.5.6.1 (U) Safe Rendering

(U) The electrically initiated devices (EID) or electro-explosive devices (EED) shall be capable of being rendered safe using explosive ordnance disposal (EOD) tools, methods, and technology.

3.4.5.6.2 (U) Inadvertent Ignition

(U) The EIDs and EEDs shall be protected from inadvertent ignition during, or experience degraded performance characteristics after, exposure to externally radiated electromagnetic environments (EME) using MIL-STD-464A as guidance.

3.4.5.7



(b)(3)

3.5 (U) Standardization and Commonality

3.5.1 (U) Vehicles, Shelters, and Trailers

(U) The JLENS Orbit shall use standard military vehicles, shelters and trailers unless the government approves justification for non-military equipment.

3.5.2 (U) Lifting and Handling Equipment

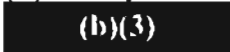
(U) Military lifting and handling equipment shall be used for the JLENS Orbits, unless the government approves justification for non-military equipment.

3.6 (U) Interoperability

(U) The system shall comply with the applicable information technology standards contained in the DoD Information Technology Standards Registry (DISR).

3.6.1 (U) Global Positioning System (GPS)

(U) The systems shall perform system initialization and synchronization utilizing GPS data in GPS standard format.



(b)(3)

3.6.2

(b)(3)

3.6.3 (U) External BM/C4I Interface

(U) The system shall prioritize data reporting using guidelines established by an external BM/C4I authority.

3.6.4 (U) C4ISR Architectures

(U) The system shall integrate into existing Service and JTAMD C4ISR architectures.

3.6.5 (U) Secondary Data Dissemination

(U) The JLENS Orbit shall disseminate appropriate types of information on defense information systems network (DISN), military satellite communications (MILSATCOM), Super High Frequency SATCOM, Ultra High Frequency SATCOM, Secure Telephone Unit-III/Secure Telephone Equipment, Signal Corps Communications assets (currently known as Warfighter Information Network-Terrestrial (WIN-T) Increment 1), and Secure Internet Protocol Router Network.

3.6.6 (U) Network Degradation

(U) The JLENS Orbit C4I systems shall interface to external networks without degrading the nominal operation of those networks.

3.6.7 (U) Communication and Data Interfaces Implementation

(U) The systems shall implement an interface to the tactical satellite (TACSAT) for voice connectivity to the Joint Interface Control Officer.

3.6.8 (U) Extensible Markup Language (XML) Interface

(U) The systems shall interface with AMDWS.

3.6.9 (U) Tactical Data Information Link J (TADIL J)/Link 16**3.6.9.1 (U) Link 16 Participants**

(U) The systems shall be participants as defined per MIL-STD-6016C on TADIL J/Link 16.

3.6.9.2 (U) Joint Range Extension Application Protocol Participants

(U) The systems shall be participants on Joint Range Extension Application Protocol as defined per MIL-STD-3011, Appendix A and C.

3.6.9.3 (U) Aerial Data Type

(U) The systems shall provide aerial surveillance, aerial target detection and aerial target tracking data utilizing Link 16 in accordance with MIL-STD6016C and MIL-STD-3011, non-simultaneously.

3.6.9.4 (U) SMT Data Type

(U) The systems shall provide surface target detection and surface target tracking data utilizing Link 16 in accordance with MIL-STD-6016C and MIL-STD-3011, non-simultaneously.

3.6.9.5 (U) Receive Data Type

(U) The systems shall receive and process aerial and surface moving tracks from external sources utilizing Link 16 in accordance with MIL-STD-6016C and MIL-STD-3011.

3.6.9.6 [Redacted] (b)(3)

3.6.9.7 [Redacted] (b)(3)
[Redacted] (b)(1)

3.6.9.8 [Redacted] (b)(3)
[Redacted] (b)(1)

3.6.9.9 (U) Provide CID Support Data

(U) The systems shall provide Combat ID support data, including IFF responses, utilizing Link 16 in accordance with MIL-STD-6016C and MIL-STD-3011, non-simultaneously.

3.6.9.10 (U) Provide Operational Status and Change Information

(U) The systems shall provide operational status and change of operational status information utilizing Link 16 in accordance with MIL-STD-6016C and MIL-STD-3011, non-simultaneously.

3.6.10 [Redacted] (b)(3)

3.6.10.1 [Redacted] (b)(3)

3.6.10.2 [Redacted] (b)(3)

3.6.10.3 [Redacted] (b)(3)

3.6.10.4 [Redacted] (b)(3)

3.6.10.5

(b)(3)

3.6.10.6

(b)(3)

3.6.11 (U) Integrated Broadcast Service (IBS)

3.6.11.1 (U) Provide Aerial Data Type

(U) The systems shall provide aerial surveillance, aerial target detection and aerial target tracking data for situational awareness utilizing IBS in accordance with the IBS Common Message Format (CMF) Interactive (IBS (I)) and Joint Tactical Terminal (JTT).

3.6.11.2 (U) Provide SMT Data Type

(U) The systems shall provide surface target detection and surface target tracking data for situational awareness utilizing IBS in accordance with the IBS (I) and JTT.

3.6.11.3 (U) Receive Aerial Data Type

(U) The systems shall receive and process aerial tracks from external sources utilizing IBS in accordance with the IBS (I) and JTT.

3.6.11.4 (U) Receive SMT Data Type

(U) The systems shall receive and process surface moving tracks from external sources utilizing IBS in accordance with the IBS (I) and JTT.

3.6.11.5

(b)(3)

3.6.11.6

(b)(3)

3.6.11.7 (U) Provide TBM and LCR LPE

(U) The systems shall provide TBM and LCR LPE information utilizing IBS in accordance with the IBS (I) and JTT.

3.6.12 (U) Army Battle Command System (ABCS)

3.6.12.1 (U) Provide SMT Data Type

(U) The systems shall provide surface target detection and surface target tracking data utilizing the ABCS network.

3.6.12.2 (U) Provide Operational Status and Change Information

(U) The systems shall provide operational status and change of operational status information utilizing the ABCS network.

3.6.12.3 (U) Provide Aerial Data Type

(U) The systems shall provide aerial target detection and aerial target tracking data utilizing the ABCS network.

3.7 (U) Identification Friend or Foe

3.7.1 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.7.2 (U) IFF Interrogator Modes

(U) The systems shall include an on-board IFF system consisting of an interrogator that supports modes 1, 2, 3A, 3C, 4, 5 (level 1 and level 2), and (receive only squitter Mode S [O]) and is compatible with DoD IFF systems.

3.7.3 (U) IFF Transponder Modes

(U) The systems shall include an on-board IFF system consisting of a transponder that supports modes 1, 2, 3A, 3C, 4, 5 (level 1 and level 2), and S and is compatible with DoD IFF systems.

3.8 (U) GPS Compliance

(U) Non-tethered airborne GPS related equipment shall be global air traffic management (GATM) compliant.

3.9 (U) Precise Participant Location and Identification (PPLI)

(U) The systems shall interpret PPLI messages and correlate this information to organic tracks, as appropriate.

3.10 [REDACTED] (b)(3)
[REDACTED] (b)(1)

(b)(1)

3.11 (U) Movement

3.11.1 (U) Rail Transportation

(b)(3)

3.11.1.1 (U) Rail Transportation Tunnel

(b)(3)

3.11.1.2 (U) Rail Transport Vibration

(U) The JLENS Orbit shall perform without degradation after exposure to the Railroad Transportation vibration of MIL-STD-810F, Method 514.5, Procedure I, Category 11.

3.11.2 (U) Land Transportation

3.11.2.1 (U) Highway Transportation

(U) The JLENS Orbit shall be transportable on highways defined in MIL-STD-1366D including special permits.

3.11.2.2 (U) Secondary Road Transportation

(U) The JLENS Orbit shall be transportable on secondary roads as defined in section 6.2.

3.11.2.3 (U) Unimproved Road Transportation

(U) The JLENS Orbit shall be transportable on unimproved roads represented by the Perryman Cross-Country Course No. 1.

3.11.2.4 (U) Off-road Transportation

(U) The JLENS Orbit shall be transportable off-road for (b)(3)

3.11.2.5 (U) Large Assembly Transport Vibration

(U) The JLENS Orbit shall meet performance requirements after exposure to unimproved roads represented by the Perryman Cross-Country Course No. 1, and the following mobility profile for primary, secondary, and unimproved roads given by the Operational Mode Summary/Mission Profile in Appendix E.

3.11.3 (U) Sea Transportation

(U) The JLENS Orbit shall be marine transportable in accordance with MIL-STD-1366 section titled Water Transportation.

3.11.3.1 (U) Sea Transportation Vibration

(U) The JLENS Orbit shall perform without degradation after exposure to the Ship Transportation vibration of MIL-STD-810F, Method 514.5, Procedure I, Category 10.

3.11.4 (U) Air Transportation

(U) The JLENS Orbit shall be transportable on C-130 (except the Mobile Mooring Station (MMS), peculiar ground support equipment and ISO containers / shelters that do not conform to the 8' x 8' x 20' dimensions), C-5 and C-17 aircraft.

3.11.4.1 (U) Air Transport Vibration

(U) The JLENS Orbit shall perform without degradation after exposure to the Aircraft vibration of MIL-STD-810F, Method 514.5, Procedure I, Category 7 and 8.

3.11.5 (U) Transportation Packaging

(U) Except for items approved by the government JLENS Product Manager, all JLENS equipment shall be packed for shipment using standard ISO containers, shelters, or pallets that are compatible with military standard lifting and handling equipment.

3.11.6 (U) Transportation Performance-oriented Packaging

(U) The JLENS Orbit shall meet the U.S. Department of Transportation (DOT), NATO, and European Union (EU) performance-oriented packaging (POP) standards for unrestricted highway, rail, and sea transportation.

3.11.7 (U) Shock**3.11.7.1 (U) Functional Shock**

(U) The JLENS System shall meet all performance requirements while being subjected to shock levels caused during normal operation.

3.11.7.2 (U) Rail Shock

(U) The JLENS Orbit shall meet all performance requirements after being subjected to the rail impacts as defined in MIL-STD-810F Method 516.5, Procedure VII.

3.11.7.3 (U) Packaged LRU Drop

(U) The JLENS LRUs in their shipping containers shall meet their performance requirements after being subjected to MIL-STD-810F Method 516.5, Procedure II.

3.11.7.4 (U) Transit Drop**3.11.7.4.1 (U) Transit Edge Drop**

(U) The JLENS system shall meet performance requirements after being subjected to a (b)(3) bottom edge-wise drop while in the Movement State using MIL-STD-810F Method 516.5, Procedure IV as guidance.

3.11.7.4.2 (U) Transit Flat Drop

(U) The JLENS system shall meet performance requirements after being subjected to a (b)(3) flat (bottom face) drop while in the Movement State using MIL-STD-810F Method 516.5, Procedure IV as guidance.

3.11.7.4.3 (U) Transit Flat Drop for Fragile Hardware

(U) Fragile components of the JLENS system shall meet performance requirements after being subjected to (b)(3) flat (bottom face) drop while in the Movement State using MIL-STD-810F Method 516.5, Procedure IV as guidance.

3.11.7.4.3.1 (U) Transit Shock Indicators for Fragile Hardware

(U) Mechanical shock indicators shall be included in ISO shipping containers and shelters containing fragile hardware.

3.11.7.4.3.2 (U) Container Handling for Fragile Hardware

(U) The exterior of the shipping containers containing fragile hardware shall be marked with special handling procedures using MIL-STD-129P as guidance.

3.11.7.4.3.3 (U) Fixture Handling for Fragile Hardware

(U) Each JLENS unique transportation fixtures containing fragile hardware shall be marked with special handling procedures using MIL-STD-129P as guidance.

3.11.7.5 (U) Transport and Handling Vehicles

(U) JLENS Orbit shall use standard military vehicles for ground transportation and handling.

3.11.8 (U) March Order and Emplacement**3.11.8.1 (U) Emplacement Time**

(U) The JLENS Orbit shall be operational within (b)(3) from arrival of all equipment on two prepared sites as defined in section 6.2.

3.11.8.2 (U) March Order Time

(U) The JLENS Orbit shall transition from operational status to March Order configuration within (b)(3)

3.11.9 (U) Location, Position, and Alignment

3.11.9.1 (U) Inertial Navigation System

(U) The systems shall incorporate a GPS-aided inertial navigation system for automatic positioning, orientation determination and data alignment /registration.

3.11.9.2 (U) GPS (b)(3)

(U) GPS receivers shall be equipped (b)(3)

3.12 (U) Reliability, Availability, and Maintainability

3.12.1 (b)(3)

(b)(1)

3.12.2 (b)(3)

(b)(1)

3.12.3 (b)(3)

3.12.4

(b)(3)

3.13 (U) Fault Detection and Isolation**3.13.1 (U) Monitoring**

(U) The systems shall continuously monitor the operational status.

3.13.2 (U) Status Reporting to the Operator

(U) The systems shall display the operational status to the operator.

3.13.3 (U) Fault Storage

(U) The detected faults shall be stored in non-volatile memory or on removable data storage devices.

3.13.4 (U) Failure Detection and Isolation

(U) All system critical failures shall be detected and isolated (detection and isolation are performed through a combination of interactive electronic technical manuals (IETM) procedures and built-in test/built-in test equipment (BIT/BITE)).

3.13.5 (U) BIT/BITE Operational Impact

(U) Operational performance shall meet performance requirements during the execution of background BIT/BITE.

3.13.6 (U) Fault Detection and Isolation

(U) Fault detection and isolation to an ambiguity group of no greater than five (one [O]) line replaceable units (LRU) shall be correct not less than 95% of the time.

3.13.7 (U) BIT/BITE False Alarm Rate

(U) False alarm rate for all critical failure BIT/BITE notifications shall be less than 10%.

3.13.8 (U) Prognostic Incorporation

(U) The systems shall incorporate a continuous prognostic capability to evaluate the condition of, and predict impending faults and failures of, electronic and mechanical elements / components.

3.13.9 (U) Prognostic Performance

(U) The prognostic capability shall predict impending faults and failures of components such that 30% of impending critical faults or failures are identified (with 70% accuracy [O]) within no less than 20 hours before mission failure.

3.13.10 (U) Prognostic Data

(U) The systems shall provide prognostic system data on demand.

3.13.11 (U) BIT/BITE Circuitry Isolation

(U) The Systems shall meet mission critical requirements during failure of BIT/BITE circuitry, excluding safety critical BIT indicators.

3.13.12 (U) Failure Degradation

(b)(3)

3.14 (U) Logistics**3.14.1 (U) Standard Test Equipment**

(U) The system shall use army standard Test, Measurement, and Diagnostic Equipment (TMDE) and automatic test equipment (ATE).

3.14.2 (U) Non-standard Test Equipment

(U) Where standard TMDE or ATE cannot be used, the contractor shall obtain prior government approval before proceeding with the JLENS Orbit design.

3.14.3 (U) Supply

(U) The systems shall conform to Service supply systems.

3.14.4 (U) Maintenance Concept

(U) The JLENS Orbit shall have a two-level maintenance concept for system peculiar equipment (e.g., radars and platform) and the existing maintenance concept for common equipment.

3.14.5 (U) Preventive Maintenance Checks and Services (PMCS)**3.14.5.1**

(b)(3)

3.14.5.2

(b)(3)

3.14.6 (U) Supply Support Concept

(U) Supply management, transportation and storage of helium shall be included in the logistics support concept.

3.14.7 (U) Helium Quantity

(U) Each JLENS Orbit shall include the required volume of helium and the required number of helium containers for two orbit inflations and replenishment for a continuous 120 day period available on site.

3.14.8 (U) Unique Identification

(U) The JLENS equipment shall be marked for unique identification in accordance with MIL-STD-130L.

3.15 (U) Safety

(U) The JLENS system shall not cause injury, illness, or death to personnel; damage to or loss of a system, equipment or property; or damage to the environment when operated, maintained, and transported using the contractor specified safety procedures and operating/maintenance manuals as approved by the government in accordance with MIL-STD-882D.

3.15.1 (U) Mishap Risk Values

(U) The JLENS Orbit shall have no Mishap Risk Values rated high or serious, within program constraints, as defined in MIL-STD-882D Appendix Table A-IV.

3.15.2 (U) Noise

(U) Noise levels and durations shall adhere to MIL-STD-882D and MIL-STD-1472.

3.16 (U) Survivability

3.16.1

[REDACTED]
(b)(3)

3.16.2

[REDACTED]
(b)(3)
(b)(1)

3.16.3 (U) Distinctive Characteristics

(U) The systems shall exhibit minimal distinctive RF, thermal, optic, and acoustic signatures. [O]

3.17 (U) Computer Hardware / Software

(U) The systems shall provide computing equipment and host software to incorporate databases that support requirements of C4I, logistics, personnel and medical, and other mission and support functions. Database updates can be accomplished by reloading data via internal or external networks or other media while meeting all performance requirements.

3.17.1 (U) Uninterruptible Power Source (UPS)

(U) Ground-based processors shall employ an UPS to support orderly shutdown so they can be restarted, preserving the integrity of the databases.

3.17.2 (U) Data Processing Reserve Capacity

(U) The systems shall be designed such that there is an inherent 50% reserve computer memory and computer throughput for data processing.

3.17.3 (U) Signal Processing Reserve Capacity

(U) The systems shall be designed such that there is an inherent 50% reserve computer memory and computer throughput for signal processing. [O]

3.17.4 (U) Removable Storage Media

(U) All classified data storage media including floppy disks, hard disks, compact disks, and tapes shall be easily removed from the computer without the use of special tools or equipment.

3.17.5

(b)(3)

3.18 (U) Power

3.18.1 (U) U.S. Prime Power

(U) Each JLENS system shall meet all performance requirements when operating on 60 Hz, 3 phase, alternating current (AC) electrical power supplied from the U.S. commercial power system.

3.18.2 (U) Alternate Power

(U) Redundant standard DoD generators shall be used as an alternate for power where commercial power is not available.

3.18.3 (U) Automatic Power Switching

(U) The system shall automatically switch from commercial to tactical power and from primary to backup tactical power without system interruption.

3.18.4 (U) Manual Power Switching

(U) The system shall manually switch between tactical and commercial power and between primary and backup tactical power without system interruption.

3.18.5 (U) Foreign Prime Power

(U) Each JLENS system shall meet all performance requirements when operating on power supplied from any non-U.S. commercial power system. [O]

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(b)(1)

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(b)(3)

3.21 (U) Information Assurance

(b)(3)

3.21.1 (U) Classified and Unclassified Information

(U) The JLENS Orbit shall receive, process, store, and disseminate classified and unclassified information by independent systems.

3.21.2 (U) Process Approval

(U) Interconnection of systems operating at different classification levels shall be accomplished by processes (e.g., SECRET and below interoperability (SABI)) that have been approved by the DoD Chief Information Officer (CIO).

3.21.3

(b)(3)

3.22 (U) Human Engineering

(U) Human Factors Engineering shall be implemented on the JLENS Orbit using MIL-STD-1472F as a guide.

3.22.1 (U) Anthropometrics

(U) The JLENS Orbit shall be operable, maintainable and resupplied by 5th to 95th percentile of Army personnel while wearing worst case combat gear and protective clothing (cold weather / Mission Oriented Protective Posture (MOPP) IV) in accordance with DoD HDBK 743A (for guidance) and MIL-STD-1472F.

3.22.2 (U) Environmental Control Systems

(U) Environmental control systems and other features shall support human physical needs, endurance, and comfort during extended operations.

3.22.3 (U) Human-To-Machine Interfaces

(U) The operator station human-to-machine interfaces shall be designed to use state-of-the-art computer and display technology.

3.22.4 (U) Symbology

(U) Symbology shall be consistent with current Army Command, Control, Communications, Computers, and Intelligence (C4I) system operations, development, and training using MIL-STD 2525-B and MIL-STD-1477C.

3.23 [REDACTED] **(b)(3)****3.23.1 (U) EO/IR Surveillance Range**

(U) The systems shall incorporate EO/IR surveillance with sufficient resolution to distinguish between wheeled vehicles, tracked vehicles and dismounted personnel out to 5 km from the mobile mooring station in clear weather and air conditions [O].

3.23.2 (U) EO/IR Azimuth Coverage

(U) The optics capability shall provide real-time video, 360 degrees slewable with day and night capabilities [O].

3.23.3 (U) EO/IR System Control

(U) The EO/IR System shall be controlled remotely from a location with a linear distance NLT 500 feet from the communications processing group [O].

3.24 (U) Platform

(U) The platform is defined to consist of the mobile mooring station, tether, air vehicle and ground support equipment.

3.24.1 (U) Interchangeability

(U) The surveillance and fire control platforms shall be interchangeable.

3.24.2 [REDACTED] **(b)(3)****3.24.3 (U) Visual Flight Rules**

(U) The platform shall include all required equipment to fly in Visual Flight Rules (VFR) conditions.

3.24.4 (U) Instrumented Flight Rules

(U) The platform shall include all required instrumentation to fly in Instrumented Flight Rules (IFR) conditions.

3.24.5 (U) Tether

(U) The tether shall provide connection between the mooring station and the air vehicle and control the air vehicle operating altitude.

3.25 (U) Air Vehicle[REDACTED] **(b)(3)**

3.25.1

(b)(3)

3.25.2 (U) Strobe Light

(U) The air vehicle shall include strobe lighting configured for operator selected visual or infrared modes.

3.26 (U) Ground Support Equipment (GSE)**3.26.1 (U) Meteorological Monitoring**

(U) GSE shall include equipment to monitor and record meteorological data and conditions to include: temperature, humidity, precipitation, icing, wind velocity, barometric pressure and lightning.

3.26.1.1 (U) Meteorological Monitoring Range

(U) Meteorological equipment shall have a range to provide warning to allow the air vehicle to be in-hauled and moored for protection against thunderstorms and winds greater than the limits specified in section 3.

3.26.1.2 (U) Weather Display

(U) Standard weather forecasts, data and observations shall be displayed in the Processing Station.

3.26.2 (U) Flight Directors Station

(U) The flight director's station shall be located in the processing station.

3.27 (U) Fire Control System

(U) The JLENS Fire Control System will provide sector surveillance information, Fire Control support and accept cues from other systems.

3.27.1 (U) USMCEB Certification

(U) The Fire Control System shall be designed to be certifiable by the U.S. Military Communications-Electronics Board (USMCEB) to operate in frequency bands in accordance with the national and international tables of spectrum allocation.

3.27.2

(b)(3)

(b)(1)

3.27.3 (U) Fire Control System ABT Loading**3.27.3.1**

(b)(3)

3.27.3.2 [Redacted] (b)(3)
[Redacted] (b)(1)

3.27.3.3 [Redacted] (b)(3)
[Redacted] (b)(1)

3.27.3.4 [Redacted] (b)(3)

3.27.3.4.1 [Redacted] (b)(3)

3.27.3.4.2 [Redacted] (b)(3)
[Redacted] (b)(1)

3.27.4 (U) Fire Control Radar Operational Functions

(U) The Fire Control System shall support the following non-simultaneous functions.

- Surveillance, Detection, Tracking, Discrimination, Classification, and Engagement support for Air Breathing Targets (ABT).
- Surveillance, Detection, Tracking, and Discrimination for Surface Moving Target (SMT)
- Surveillance, Detection, Tracking and Launch Point Estimation for TBM
- Surveillance, Detection, Tracking and Launch Point Estimation for LCR

3.27.4.1 (U) Interleaving

(U) The Fire Control System shall permit interleaving of ABT and SMT functions.

3.27.4.2 (U) Air Breathing Target Function

3.27.4.2.1 (U) Function Priorities

(U) The Fire Control System shall accept and implement priorities defined in the mission plan.

3.27.4.2.2 [Redacted] (b)(3)

3.27.4.2.3 [Redacted] (b)(3)

3.27.4.2.4

(b)(3)

(b)(1)

3.27.5 (U) Fire Control Cues

(U) The Fire Control System shall accept cues from other JLENS sensors and external sensors.

3.27.6

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3.27.6.1

(b)(3)

(b)(1)

3.27.6.2

(b)(3)

(b)(1)

(b)(1)

3.27.6.3

(b)(3)

3.27.7

(b)(3)

3.27.7.1

(b)(3)

(b)(1)

3.27.7.2

(b)(3)

(b)(1)

(b)(1)

3.27.7.3

(b)(3)

3.27.8 (U) Instrumented Range

(U) The Fire Control System shall have an instrumented range of NLT 550 km.

3.27.9 (U) ABT Target Tracking

(U) ABTs operating above the radar horizon shall be tracked at ranges commensurate with their signature and location within the electronic field of view of the Fire Control sensor.

3.27.9.1

(b)(3)
(b)(1)

3.27.10 (U) Transition to Track

(b)(3)

3.27.11

(b)(3)

(b)(1)

3.27.12

(b)(3)

(b)(1)

[REDACTED]

3.27.13 [REDACTED] (b)(3)

3.27.14 [REDACTED] (b)(3)

3.27.14.1 [REDACTED] (b)(3)

3.27.14.2 [REDACTED] (b)(3)

3.27.14.3 [REDACTED] (b)(3)

3.27.14.4 [REDACTED] (b)(3)

3.27.15 (U) Sectored Surveillance

3.27.15.1 (U) Sectored Surveillance Azimuth Coverage

(U) The Fire Control System shall provide operator selectable sectored surveillance azimuth coverage extents to a maximum of NLT 100°.

3.27.15.2 [REDACTED] (b)(3)

3.27.15.3 (U) Sectored Surveillance Range

3.27.15.3.1

(b)(3)

(b)(1)

3.27.15.3.2

(b)(3)

(b)(1)

3.27.15.4 (U) Track Initiation

(U) The Fire Control System shall provide automatic track initiation of detected targets.

3.27.15.5

(b)(3)

(b)(1)

3.27.16 (U) SMT Function

(U) The Fire Control system shall perform SMT detection and track against the SMT threat defined in Section 3 when operating in the environments defined in Appendices B, and C.

3.27.16.1 (U) SMT Surveillance Azimuth Coverage

(U) The Fire Control System shall provide operator selectable sectored SMT surveillance azimuth coverage extents to a maximum of NLT 100°.

3.27.16.2

(b)(3)

(b)(1)

3.27.16.3

(b)(3)

(b)(1)

3.27.16.4 (U) SMT Track Initiation

(U) The Fire Control System shall provide automatic track initiation of detected targets.

3.27.16.5

(b)(3)

(b)(1)

3.27.16.6

(b)(3)

(b)(1)

3.27.16.7

(b)(3)

(b)(1)

3.27.17 (U) TBM Function

(U) The Fire Control system shall track TBM threats that are in the ascent phase and determine a launch point estimate (LPE) for the TBM threats as defined in Section 3.3.2 while operating in a sector surveillance function.

3.27.17.1 (U) TBM Surveillance Azimuth Coverage

(U) The Fire Control System shall provide operator selectable sectored TBM surveillance azimuth coverage extends to a maximum of NLT 100°.

3.27.17.2 (U) Elevation Coverage

(U) The Fire Control system shall track TBMs as defined in Section 3.3.2 during ascent phase until it is

(b)(3)

3.27.17.3

(b)(3)

(b)(1)

3.27.18 (U) LCR Function

(U) The Fire Control system shall track ascent phase and determine launch point estimate (LPE) for the LCR threats as defined in Section 3.3.2 while operating in a LCR sector surveillance function.

3.27.18.1 (U) LCR Surveillance Azimuth Coverage

(U) The JLENS Fire Control system shall provide surveillance over a 100° azimuth sector to detect and track LCR threats defined in Section 3.3.2.

3.27.18.2 (U) Elevation Coverage

(U) The Fire Control system shall track LCRs as defined in Section 3.3.2 while operating in a sector surveillance function.

3.27.18.3 (b)(3)
(b)(1)

3.27.19 (b)(3)
(b)(1)

3.27.20 (b)(3)
(b)(1)

3.27.21 (b)(3)
(b)(1)

3.27.22 (b)(3)
(b)(1)

3.27.23 (U) Discrimination
Deleted (Modified and Moved to Appropriate Sections)

3.27.24 (b)(3)
(b)(1)

3.27.25 (b)(3)
(b)(1)

3.27.26 (b)(3)
(b)(1)

3.27.27 (U) Clutter Tracks
(U) The Fire Control System shall include automatic and operator adjustable manual controls to reduce the number of moving clutter tracks reported to the networks.

3.27.28 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.27.29 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.28 (U) Processing Station.

(U) The processing station shall house the operator stations, signal data processors and communications equipment.

3.28.1 (U) Interchangeability

(U) The communication and control shelter, operator stations and communications equipment shall be interchangeable between Fire Control and Surveillance System.

3.28.2 (U) Operator Station(s)

3.28.2.1 (U) System Initialization

(U) The system shall be initialized via the operator station to conduct its assigned mission using rules defined by the directing C2 node [e.g., geo-political boundaries, air corridors, surveillance/engagement sectors, CID, surface weapon systems engagement support, priorities, Tactics Techniques and Procedures (TTP), and reporting rules].

3.28.2.2 (U) Automation

(U) System initialization shall be automatic and have the capability for manual update.

3.28.2.3 (U) Location Systems

(U) The system initialization and operation shall use organic automated location systems as input.

3.28.2.4 (U) Terrain Analysis

(U) The system shall perform terrain analysis to support the mission using standard National Imagery and Mapping Agency (NIMA) data to Level 1 and 2 Digital Terrain Elevation Data (DTED), standard world vector shoreline (WVS) maps and Digital Feature Analysis Data (DFAD).

3.28.2.5 (U) Mission Control

(U) The operator station shall control the system mission operations automatically and manually via operator intervention.

3.28.2.6 (U) Tasking Responses

(U) The system shall respond to tasking by C2 elements and surface weapon systems for engagement support.

3.28.2.7 (U) Operator Actions

(U) The operator station shall provide a selectable display that presents at a minimum, initialization information, system status information, and sensor data.

3.28.2.8 (U) Target Designation

(U) The operator shall have the option to designate targets to be placed into precision track and targets to be dropped.

3.28.2.9 (U) Integrated Data Management Environment

(U) The system shall provide an integrated data management environment that supports information discovery, knowledge management, automated archiving, consistency checking and personalized access controls. Information discovery and knowledge management is satisfied by having an organized file structure on operator computer systems that can be searched by automated processes and is augmented by decision aids.

3.28.3 (U) Embedded Training

(U) The processing station shall incorporate embedded training to support sustainment training of the operator and maintainers of all orbit hardware and software elements.

3.28.3.1 (U) Simulated Conditions

(U) System embedded training shall simulate realistic conditions.

3.28.3.2 (U) Individual Training

(U) Embedded training shall provide individual training by simulating problem situations that replicate actual mission operations.

3.28.3.3 (U) Team Training

(U) Embedded training shall provide team training by simulating problem situations that replicate actual mission operations.

3.28.3.4 (U) Unit Training

(U) Embedded training shall provide unit collective training by simulating problem situations that replicate actual mission operations.

3.28.3.5 (U) Web-based Training

(U) Web-based training shall be provided as an integral part of the embedded training capability.

3.28.3.6 (U) Growth

(U) All embedded trainers and training devices shall be designed for growth potential and upgraded when doctrinal, procedural, software, or hardware changes to tactical system are required.

3.28.3.7 (U) Distributed Interactive Simulation

(U) The processing station shall participate in simulated training exercises by incorporating Distributed Interactive Simulation (DIS).

3.28.3.8 (U) Joint Semi-Automated Forces (JSAF)

(U) The processing station embedded trainer shall be interoperable through the Joint Semi-Automated Forces (JSAF) architecture to link, simultaneously, the live and virtual pieces of the training arena.

3.28.3.9 (U) High Level Architecture

(U) The system embedded training shall be compliant and interoperable with High Level Architecture (HLA).

3.28.3.10 (U) Common Training

(U) The systems shall include embedded training which can interface, interact, and accept the common simulated air picture as viewed by

(b)(3)

3.29 (U) Communications**3.29.1 (U) Interface Panel**

(U) The processing station shall have a signal entrance panel at the shelter exterior to interface electronically and mechanically with tactical, non-tactical and commercial telephone systems and have organic user communications equipment.

3.29.2 (U) Message Format

(U) The Systems shall exchange force operations / sensor management information with its supported / affiliated battle management center or node via United States Message Text Format (USMTF) and XML format or other message formats as approved by the government.

3.29.3 (U) Text Formatted Messages

(U) The Systems shall have the capability to receive, exchange, display and archive mission support computer-assisted electronic text-formatted messages.

3.29.4 (U) Air and Missile Defense Planning and Control Station

(U) DELETED.

3.29.5 (U) Voice Communications

(U) The Systems operators and maintainers shall have multiple means of voice communications available to include military telephones and radios.

3.29.6 (U) Combat Net Radio

(U) The Systems shall have a combat net radio (CNR) capability, either frequency modulation (FM) or high frequency (HF), to support organizational C2, and administration and logistics.

3.29.7 (U) Tactical Voice Communications

(U) The systems shall have voice communications systems that interface to military tactical telephone systems including Secure Telephone Units (STU) or Secure Terminal Equipment (STE).

3.29.8 (U) Commercial Voice Communications

(U) The systems shall have voice communications systems that interface to commercial telephone systems.

3.29.9 (U) Defense Switched Network

(U) The systems shall have the capability to communicate via the secure defense switched network (DSN).

3.29.10 (U) Integrated Services Digital Network

(U) The systems shall have the capability to communicate via the integrated services digital network (ISDN).

3.29.11 (U) Air and Missile Defense Workstation

(U) The systems shall maintain communications in the Army Battle Command System (ABCS) via the Air and Missile Defense Workstation (AMDWS) for Force Operations.

3.30 (U) Data Recording

(U) The systems shall provide real time recording and storage of data.

3.30.1 (U) Data Recording Impacts

(U) The systems shall record all data types defined in section 6.2 while meeting all of its operational performance requirements.

3.30.2 (U) Data Recording Control

(U) The systems shall operate under manual control for selecting details for data recording.

3.30.3 (U) Data Storage Devices

(U) The systems shall provide nonvolatile, data storage devices with removable media.

3.30.4

(b)(3)

3.30.5 (U) Selective Data Retrieval

(U) The systems shall provide selective data retrieval, report formatting and report generation via an interactive operator interface.

3.30.6 (U) Interactive Operator Interface

(U) The systems shall provide recorded data archival via an interactive operator interface for post mission analysis.

3.30.7 (U) Data Recording Duration**3.30.7.1**

(b)(3)

3.30.7.2 (U) Mission Data Recording Duration

(U) The systems shall provide data recording of other mission data (operator actions, tracks and messages to/from the Processing Station) for not less than 4 hours (12 hours [O]) in support of post mission analysis and testing.

3.30.7.3 (U) Voice Recording Duration

(U) The systems shall continuously record intercom tactical and processing station voice communications for 12 hours.

3.30.7.4 (U) Video Recording Duration

(U) The systems shall continuously record all operator video displays for 12 hours. [O]

3.30.7.5 (U) Weather Data Recording Duration

(U) The systems shall continuously record organic weather data for 12 hours.

3.30.7.6 (U) Video Data Playback

(U) The systems shall provide a selective video playback capability through existing organic workstations. [O]

3.30.7.7 (U) Voice Playback

(U) The systems shall provide a selective voice playback capability through existing organic workstations.

3.31 (U) Surveillance System

(U) The JLENS Surveillance System will provide wide area- surveillance information for the following non-simultaneous functions:

- (U) Air Breathing Target surveillance
- (U) TBM target surveillance
- (U) LCR target surveillance
- (U) Surface Moving Target (SMT) surveillance

3.31.1 (U) Air Breathing Target (ABT) Function

(U) The JLENS Surveillance System shall perform ABT detection and tracking of the ABT threat defined in section 3.3.2 when operating in the environments defined in Annex A and Appendix C and section 3.4.

3.31.2 (U) Azimuth Coverage

(U) The Surveillance System shall have the capability to continuously cover 360° in azimuth.

3.31.3 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.4 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.5 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.6 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.6.1 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.6.2 (U) Saturation Alleviation

(U) The Surveillance System shall provide automatic and user-selectable saturation alleviation.

3.31.7 [REDACTED] (b)(3)
[REDACTED] (b)(1)

3.31.8 (U) Instrumented Range

(U) The Surveillance System shall provide an instrumented range of NLT 550 km.

3.31.9 (U) Track Initiation

(U) The Surveillance System shall automatically initiate tracks.

3.31.10

(b)(3)

(b)(1)

3.31.11

(b)(3)

(b)(1)

3.31.12 (U) Emission Controls

(b)(3)

3.31.12.1 (U) Sector Blanking Control

(U) The Surveillance System shall maintain the blanked sector until commanded by the operator to start radiating in the blanked sector.

3.31.12.2 (U) ERP Control

(b)(3)

3.31.13 (U) Combat ID Support

(b)(3)

3.31.13.1 (U) Surface/Air Declaration

(b)(3)

3.31.13.2 (U) Surface/Air Declaration Accuracy

(b)(3)

3.31.14 (U) TBM Function

(U) The Surveillance System shall track ascent phase and determine launch point estimated (LPE) for the TBM threats as defined in Section 3.3.2.

3.31.14.1 (U) Surveillance Coverage

(U) The Surveillance System shall provide 360° surveillance to detect and track TBM threats defined in Section 3.3.2.

3.31.14.2 (U) Elevation Coverage

(U) The Surveillance System shall track TBMs as defined in Section 3.3.2 during ascent phase.

3.31.14.3

(b)(3)

(b)(1)

3.31.15 (U) LCR Function

(U) The Surveillance System shall track ascent phase and determine launch point estimated (LPE) for the LCR threats as defined in Section 3.3.2.

3.31.15.1 (U) Surveillance Coverage

(U) The Surveillance System shall provide 360° surveillance to detect and track LCR threats defined in Section 3.3.2.

3.31.15.2 (U) Elevation Coverage

(U) The Surveillance System shall track LCRs as defined in Section 3.3.2

3.31.15.3

(b)(3)

(b)(1)

3.31.16 (U) SMT Function.

(U) The Surveillance System shall perform SMT detection and track against the SMT threat defined in Section 3.3.2 when operating in the environments defined in Annex A, Appendix C, and section 3.4.

3.31.16.1

(b)(3)

(b)(1)

3.31.16.2

(b)(3)

(b)(1)

3.31.16.3 (U) Track Initiation

(U) The Surveillance System shall have the capability to automatically initiate a SMT track.

3.31.16.4

(b)(3)

(b)(1)

3.31.17 (U) USMCEB Certification

(U) The Surveillance System shall be designed to be certifiable by the U.S. Military Communications-Electronics Board (USMCEB) to operate in frequency bands in accordance with the national and international tables of spectrum allocation.

3.31.18 (U) Clutter Tracks

(U) The Surveillance System shall include automatic and operator adjustable manual controls to reduce the number of moving clutter tracks reported to the networks.

4 (U) Verification

4.1 (U) General Test and Evaluation Provisions

(U) The methods and procedures that verify the requirements of Section 3 are to be contractor-proposed and Government-approved. Table I defines the verification class and method for each requirement in Section 3. All requirement verification, regardless of class or method, will be conducted and completed by the contractor, unless otherwise stated.

4.2 (U) Requirements Verification

(U) This section establishes the quality assurance provisions for Section 3 of this Performance Specification by establishing requirement verification methods. The purpose of the verification is to assure the deliverable JLENS Orbit conforms to the performance, design and operability requirements stated in Section 3.

4.3 (U) Verification Methods

(U) The intent of assigning specific methods to requirements is to ensure a high level of confidence the requirement is met. Combinations of methods are used to facilitate cost effective means of verification. The following basic methods of verification are applied to the requirements.

4.3.1 (U) Demonstration (D)

(U) Demonstration is an exhibition of the operability or supportability of an item under intended service use conditions. Sufficient data for requirements verification can be obtained by observing functional operation of the system, or a part of the system, without the use of instrumentation or special test equipment beyond that inherently provided in the system being verified.

4.3.2 (U) Test (T)

(U) Test is the verification method by which the operability, supportability, performance capability or other specified qualities of an item are verified when subjected to controlled conditions that are real or simulated. These verifications may require use of special test equipment and instrumentation that is not an integral part of the system being verified to obtain quantitative data for analysis, as well as qualitative data derived from displays and indicators inherent in the item(s) for monitor and control.

4.3.3 (U) Analysis (A)

(U) Analysis is the method used to verify requirements by determining qualitative and quantitative properties and performance of the system by studying and examining engineering drawings, software, and hardware flow diagrams, software and hardware specifications, and other software and hardware documentation (e.g., commercial off-the-shelf (COTS) vendor documentation). It also includes performing modeling, simulation, and/or calculations and analyzing the results. Analysis techniques include interpretation or interpolation/extrapolation of analytical or empirical data collected under defined conditions.

4.3.4 (U) Inspection (I)

(U) Inspection is the verification method used to verify characteristics of an item by inspecting engineering documentation produced during development or by inspection of the product itself to verify conformance with specified requirements. Inspection is nondestructive and consists of visual inspections or simple measurements without the use of precision measurement equipment. Inspection typically applies to a single parameter or attribute with a yes/no answer.

4.4 (U) Classes of Verifications:**4.4.1 (U) Type D, Design**

(U) Type D classes of verifications are those that can be determined in the design phase and recorded prior to any hardware being fabricated.

4.4.2 (U) Type S, System

(U) Type S classes of verifications require the complete assembly of the JLENS Fire Control or Surveillance System to verify the requirement.

4.4.3 (U) Type L, Subsystem

(U) Type L classes of verifications will be used to verify requirements allocated to lower level specifications.

4.4.4 (U) Type O, Orbit

(U) Type O classes of verifications require the complete assembly of the JLENS Orbit to verify the requirement.

(U) TABLE I Requirement/Verification Cross Reference Matrix

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3	(U) REQUIREMENTS		
3.1	(U) Joint Land Attack Cruise Missile Elevated Sensor System (JLENS) Orbit		
3.1.1	(U) Orbit Composition		
3.1.2	(U) Orbit Land and Sea Operations	L/S	A
3.1.3	(U) Systems Standalone Operations	S	T
3.2	(U) Missions		
3.2.1	(U) Primary Mission	O	A/D/T
3.2.2	(U) Secondary Missions	O/S	A/D/T
3.2.3	(U) Impact Point Predictions	S	A
3.3	(U) Threat		
3.3.1	(U) ABT Threat Engagements	O/S	A/T
3.3.2	(U) Threat Surveillance and Tracking	O/S	A/D/T
3.4	(U) Operating Environment		
3.4.1	(U) Electronic Countermeasures (ECM)		
3.4.1.1	(b)(3)		
3.4.1.2	(b)(3)		
3.4.1.3	(b)(3)		
3.4.2	(b)(3)		
3.4.3	(U) Clutter and Multipath	S	A/D/T
3.4.4	(U) Natural Environments		
3.4.4.1	(U) Temperature		
3.4.4.1.1	(U) Other than Storage and Transport	D/S	A/T
3.4.4.1.2	(U) Storage and Transport	D/S	A/T
3.4.4.2	(U) Relative Humidity	D/S	A/T
3.4.4.3	(b)(3)		
3.4.4.3.1	(b)(3)		
3.4.4.3.1.1	(b)(3)		
3.4.4.3.1.2	(b)(3)		
3.4.4.3.2	(b)(3)		
3.4.4.3.2.1	(b)(3)		
3.4.4.3.2.2	(b)(3)		
3.4.4.4	(U) Hail		
3.4.4.4.1	(U) Other than Storage and Transport	L/S	A
3.4.4.4.2	(U) Storage and Transport	L	A
3.4.4.5	(U) Snow		

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.4.4.5.1	(U) Other than Storage and Transport	D/L/S	A
3.4.4.5.2	(U) Storage and Transport	D/L	A
3.4.4.6	(U) Salt Atmosphere	D/L/S	A/T
3.4.4.7	(U) Sand and Dust		
3.4.4.7.1	(U) Other than Storage and Transport	L	A/T
3.4.4.7.2	(U) Storage and Transport	D/L	A/T
3.4.4.8	(U) Fungus	L	A
3.4.4.9	(U) Wind		
3.4.4.9.1	(U) Other than Storage and Transport	L/S	A/T
3.4.4.9.1.1	(U) Survival Wind	D/L/S	A
3.4.4.9.2	(U) Storage and Transport	D/L/S	A
3.4.4.9.3	(U) Wind Turbulence		
3.4.4.10	(U) Lightning		
3.4.4.10.1	(U) Other than Airborne Equipment	S	T
3.4.4.10.2	(U) Airborne Equipment	S	T
3.4.4.10.3	(U) Status Recovery	S	T
3.4.4.10.4	(U) Lightning EMP	D/S	A/T
3.4.5	(U) Induced Environments		
3.4.5.1	(U) Vibration		
3.4.5.1.1	(U) Other than Storage and Transport	S	A/D
3.4.5.1.2	(U) Storage and Transport	D/L/S	A/D/T
3.4.5.2	(U) Nuclear, Biological, and Chemical		
3.4.5.2.1	(U) Decontamination		
3.4.5.2.1.1	(b)(3)		
3.4.5.2.1.2	(U) Effectiveness	D/L/S	A
3.4.5.2.2	(b)(3)		
3.4.5.2.3	(U) Personnel Protection	L	A
3.4.5.3	(U) Electrostatic Discharge (ESD)		
3.4.5.3.1	(U) LRU ESD	L	A/T
3.4.5.4	(U) Electromagnetic Environmental Effects (E3)		
3.4.5.4.1	(U) Electromagnetic Interference (EMI)	O	A/D/T
3.4.5.4.2	(U) Electromagnetic Compatibility (EMC)	L/S	A/T
3.4.5.5	(U) Grounding and Bonding	L/S	A/I/T
3.4.5.6	(U) Ordnance		
3.4.5.6.1	(U) Safe Rendering	L	I
3.4.5.6.2	(U) Inadvertent Ignition	S/D	T/I
3.4.5.7	(b)(3)		
3.5	(U) Standardization and Commonality		

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.5.1	(U) Vehicles, Shelters, and Trailers	L	A/D
3.5.2	(U) Lifting and Handling Equipment	L	A/D
3.6	(U) Interoperability	D/S	A/D
3.6.1	(U) Global Positioning System (GPS)	S	D
3.6.2	(b)(3)		
3.6.3	(U) External BM/C4I Interface	L	D
3.6.4	(U) C4ISR Architectures	L/O/S	D/T
3.6.5	(U) Secondary Data Dissemination	L/S	D/T
3.6.6	(U) Network Degradation	L/O/S	D/T
3.6.7	(U) Communication and Data Interfaces Implementation	L/S	D/T
3.6.8	(U) Extensible Markup Language (XML) Interface	L/S	D/T
3.6.9	(U) Tactical Data Information Link J (TADIL J)/Link 16		
3.6.9.1	(U) Link 16 Participants	L/S	D/T
3.6.9.2	(U) Joint Range Extension Application Protocol Participants	L/S	D/T
3.6.9.3	(U) Aerial Data Type	L/O/S	D/T
3.6.9.4	(U) SMT Data Type	L/O/S	D/T
3.6.9.5	(U) Receive Data Type	L/S	D/T
3.6.9.6	(b)(3)		
3.6.9.7	(b)(3)		
3.6.9.8	(b)(3)		
3.6.9.9	(U) Provide CID Support Data	L/O/S	D/T
3.6.9.10	(U) Provide Operational Status and Change Information	L/S	D/T
3.6.10	(b)(3)		
3.6.10.1	(b)(3)		
3.6.10.2	(b)(3)		
3.6.10.3	(b)(3)		
3.6.10.4	(b)(3)		
3.6.10.5	(b)(3)		
3.6.10.6	(b)(3)		
3.6.11	(U) Integrated Broadcast Service (IBS)		
3.6.11.1	(U) Provide Aerial Data Type	L/S	D/T

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.6.11.2	(U) Provide SMT Data Type	L/S	D/T
3.6.11.3	(U) Receive Aerial Data Type	L/S	D/T
3.6.11.4	(U) Receive SMT Data Type	L/S	D/T
3.6.11.5	(b)(3)		
3.6.11.6	(b)(3)		
3.6.11.7	(U) Provide TBM and LCR LPE	L/O/S	D/T
3.6.12	(U) Army Battle Command System (ABCS)		
3.6.12.1	(U) Provide SMT Data Type	L/S	D/T
3.6.12.2	(U) Provide Operational Status and Change Information	L/S	D/T
3.6.12.3	(U) Provide Aerial Data Type	L/S	D/T
3.7	(U) Identification Friend or Foe		
3.7.1	(b)(3)		
3.7.2	(U) IFF Interrogator Modes	D/L/S	D/I/T
3.7.3	(U) IFF Transponder Modes	D/L/S	D/I/T
3.8	(U) GPS Compliance	D	I
3.9	(U) Precise Participant Location and Identification (PPLI)	S	T
3.10	(b)(3)		
3.11	(U) Movement		
3.11.1	(U) Rail Transportation	L	A/T
3.11.1.1	(U) Rail Transportation Tunnel	L	A
3.11.1.2	(U) Rail Transport Vibration	L	A
3.11.2	(U) Land Transportation		
3.11.2.1	(U) Highway Transportation	L	A
3.11.2.2	(U) Secondary Road Transportation	L	A/T
3.11.2.3	(U) Unimproved Road Transportation	L	A/T
3.11.2.4	(U) Off-road Transportation	L	A/T
3.11.2.5	(U) Large Assembly Transport Vibration	L	A/T
3.11.3	(U) Sea Transportation	D/L	A
3.11.3.1	(U) Sea Transportation Vibration	D/L	A
3.11.4	(U) Air Transportation	L	I
3.11.4.1	(U) Air Transport Vibration	D/L	A
3.11.5	(U) Transportation Packaging	L	I

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.11.6	(U) Transportation Performance-oriented Packaging	D/L	A/I
3.11.7	(U) Shock		
3.11.7.1	(U) Functional Shock	S	A/D
3.11.7.2	(U) Rail Shock	S	A/T
3.11.7.3	(U) Packaged LRU Drop	D/L	A/T
3.11.7.4	(U) Transit Drop		
3.11.7.4.1	(U) Transit Edge Drop	D/L/S	A/T
3.11.7.4.2	(U) Transit Flat Drop	D/L/S	A/T
3.11.7.4.3	(U) Transit Flat Drop for Fragile Hardware	D/L	A/I
3.11.7.4.3.1	(U) Transit Shock Indicators for Fragile Hardware	D/L/S	A/T
3.11.7.4.3.2	(U) Container Handling for Fragile Hardware	D/L	A/I
3.11.7.4.3.3	(U) Fixture Handling for Fragile Hardware	D/L	A/I
3.11.7.5	(U) Transport and Handling Vehicles	L/S	A/D
3.11.8	(U) March Order and Emplacement		
3.11.8.1	(U) Emplacement Time	S	A/D
3.11.8.2	(U) March Order Time	S	A/D
3.11.9	(U) Location, Position, and Alignment		
3.11.9.1	(U) Inertial Navigation System	L/S	A/D/I/T
3.11.9.2	(U) GPS (b)(3)	L	I
3.12	(U) Reliability, Availability, and Maintainability		
3.12.1	(b)(3)		
3.12.2	(b)(3)		
3.12.3	(b)(3)		
3.12.4	(b)(3)		
3.13	(U) Fault Detection and Isolation		
3.13.1	(U) Monitoring	L/S	D/T
3.13.2	(U) Status Reporting to the Operator	S	D/T
3.13.3	(U) Fault Storage	S	I
3.13.4	(U) Failure Detection and Isolation	S	A/D
3.13.5	(U) BIT/BITE Operational Impact	L/S	A/D/T
3.13.6	(U) Fault Detection and Isolation	L/S	A/D
3.13.7	(U) BIT/BITE False Alarm Rate	L/S	A
3.13.8	(U) Prognostic Incorporation	L/S	A/T
3.13.9	(U) Prognostic Performance	L/S	A/T
3.13.10	(U) Prognostic Data	L	D/I

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.13.11	(U) BIT/BITE Circuitry Isolation	L/S	A
3.13.12	(U) Failure Degradation	L	A/T
3.14	(U) Logistics		
3.14.1	(U) Standard Test Equipment	L/S	D/I
3.14.2	(U) Non-standard Test Equipment	D	I
3.14.3	(U) Supply	S	I
3.14.4	(U) Maintenance Concept	O	I
3.14.5	(U) Preventive Maintenance Checks and Services (PMCS)		
3.14.5.1	(b)(3)		
3.14.5.2	(b)(3)		
3.14.6	(U) Supply Support Concept	S	I
3.14.7	(U) Helium Quantity	O	A
3.14.8	(U) Unique Identification	L	I
3.15	(U) Safety	D/L/S	A/D/I/T
3.15.1	(U) Mishap Risk Values	S	A/D/I/T
3.15.2	(U) Noise	S	A/I/T
3.16	(U) Survivability		
3.16.1	(b)(3)		
3.16.2	(b)(3)		
3.16.3	(U) Distinctive Characteristics	S	I
3.17	(U) Computer Hardware / Software	L	I
3.17.1	(U) Uninterruptible Power Source (UPS)	L	D
3.17.2	(U) Data Processing Reserve Capacity	L	A/T
3.17.3	(U) Signal Processing Reserve Capacity		
3.17.4	(U) Removable Storage Media	L	D
3.17.5	(b)(3)		
3.18	(U) Power		
3.18.1	(U) U.S. Prime Power	S	A/T
3.18.2	(U) Alternate Power	S	T/I
3.18.3	(U) Automatic Power Switching	S	D/I
3.18.4	(U) Manual Power Switching	L/S	A/D
3.18.5	(U) Foreign Prime Power		
3.19	(b)(3)		
3.20	(b)(3)		
3.21	(U) Information Assurance	D/S	A/D/I/T
3.21.1	(U) Classified and Unclassified Information	L/S	A/D/I/T
3.21.2	(U) Process Approval	D/L/S	D/I/T

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.21.3	(b)(3)		
3.22	(U) Human Engineering	L	D/I
3.22.1	(U) Anthropometrics	S	A/D/I
3.22.2	(U) Environmental Control Systems	L/S	A/D/T
3.22.3	(U) Human-To-Machine Interfaces	D	I
3.22.4	(U) Symbology	L	I
3.23	(b)(3)		
3.23.1	(U) EO/IR Surveillance Range		
3.23.2	(U) EO/IR Azimuth Coverage		
3.23.3	(U) EO/IR System Control		
3.24	(U) Platform		
3.24.1	(U) Interchangeability	S	D
3.24.2	(b)(3)		
3.24.3	(U) Visual Flight Rules	L	D/I/T
3.24.4	(U) Instrumented Flight Rules	L	D/I
3.24.5	(U) Tether	L	D/I
3.25	(U) Air Vehicle	S	A/D
3.25.1	(b)(3)		
3.25.2	(U) Strobe Light	L	D
3.26	(U) Ground Support Equipment (GSE)		
3.26.1	(U) Meteorological Monitoring	L	D/I
3.26.1.1	(U) Meteorological Monitoring Range	L	A
3.26.1.2	(U) Weather Display	S	D
3.26.2	(U) Flight Directors Station	L	I
3.27	(U) Fire Control System		
3.27.1	(U) USMCEB Certification	D/L	A
3.27.2	(b)(3)		
3.27.3	(U) Fire Control System ABT Loading		
3.27.3.1	(b)(3)		
3.27.3.2	(b)(3)		
3.27.3.3	(b)(3)		
3.27.3.4	(b)(3)		
3.27.3.4.1	(b)(3)		
3.27.3.4.2	(b)(3)		
3.27.4	(U) Fire Control Radar Operational Functions	L/S	T
3.27.4.1	(U) Interleaving	L/S	D/T
3.27.4.2	(U) Air Breathing Target Function		
3.27.4.2.1	(U) Function Priorities	L/S	D/T

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.27.4.2.2	(b)(3)		
3.27.4.2.3	(b)(3)		
3.27.4.2.4	(b)(3)		
3.27.5	(U) Fire Control Cues	S	T
3.27.6	(b)(3)		
3.27.6.1	(b)(3)		
3.27.6.2	(b)(3)		
3.27.6.3	(b)(3)		
3.27.7	(b)(3)		
3.27.7.1	(b)(3)		
3.27.7.2	(b)(3)		
3.27.7.3	(b)(3)		
3.27.8	(U) Instrumented Range	L/S	D/A/T
3.27.9	(U) ABT Target Tracking	L	A/T
3.27.9.1	(b)(3)		
3.27.10	(U) Transition to Track	L	D/T
3.27.11	(b)(3)		
3.27.12	(b)(3)		
3.27.13	(b)(3)		
3.27.14	(b)(3)		
3.27.14.1	(b)(3)		
3.27.14.2	(b)(3)		
3.27.14.3	(b)(3)		
3.27.14.4	(b)(3)		
3.27.15	(U) Sectored Surveillance		
3.27.15.1	(U) Sectored Surveillance Azimuth Coverage	L/S	D/T
3.27.15.2	(b)(3)		
3.27.15.3	(U) Sectored Surveillance Range		
3.27.15.3.1	(b)(3)		
3.27.15.3.2	(b)(1)		
3.27.15.4	(U) Track Initiation	L	D/T
3.27.15.5	(b)(3)		
3.27.16	(U) SMT Function	L/S	A/D
3.27.16.1	(U) SMT Surveillance Azimuth Coverage	L/S	D/T

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.27.16.2	(b)(3)		
3.27.16.3	(b)(3)		
3.27.16.4	(U) SMT Track Initiation	L/S	D/T
3.27.16.5	(b)(3)		
3.27.16.6	(b)(3)		
3.27.16.7	(b)(3)		
3.27.17	(U) TBM Function	L/S	A/T
3.27.17.1	(U) TBM Surveillance Azimuth Coverage	L/S	D/T
3.27.17.2	(U) Elevation Coverage	L/S	A/T
3.27.17.3	(b)(3)		
3.27.18	(U) LCR Function	L/S	A/T
3.27.18.1	(U) LCR Surveillance Azimuth Coverage	L/S	A/T
3.27.18.2	(U) Elevation Coverage	L/S	A/T
3.27.18.3	(b)(3)		
3.27.19	(b)(3)		
3.27.20	(b)(3)		
3.27.21	(b)(3)		
3.27.22	(b)(3)		
3.27.23	(U) Discrimination		
3.27.24	(b)(3)		
3.27.25	(b)(3)		
3.27.26	(b)(3)		
3.27.27	(U) Clutter Tracks	S	D
3.27.28	(b)(3)		
3.27.29	(b)(3)		
3.28	(U) Processing Station	L	I
3.28.1	(U) Interchangeability	D	I
3.28.2	(U) Operator Station(s)		
3.28.2.1	(U) System Initialization	L/S	D/T
3.28.2.2	(U) Automation	S	D
3.28.2.3	(U) Location Systems	L	D
3.28.2.4	(U) Terrain Analysis	L/S	D/T
3.28.2.5	(U) Mission Control	L/S	D/T
3.28.2.6	(U) Tasking Responses	L/S	D/T
3.28.2.7	(U) Operator Actions	L/S	D
3.28.2.8	(U) Target Designation	S	D

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.28.2.9	(U) Integrated Data Management Environment	L	D/I
3.28.3	(U) Embedded Training	L	D/I
3.28.3.1	(U) Simulated Conditions	L	D/I
3.28.3.2	(U) Individual Training	L	D
3.28.3.3	(U) Team Training	L	D
3.28.3.4	(U) Unit Training	L	D
3.28.3.5	(U) Web-based Training	L/S	D/I
3.28.3.6	(U) Growth	D	A/D
3.28.3.7	(U) Distributed Interactive Simulation	L/S	D/T
3.28.3.8	(U) Joint Semi-Automated Forces (JSAF)	L/S	D/T
3.28.3.9	(U) High Level Architecture	L/S	D/T
3.28.3.10	(U) Common Training	L	D
3.29	(U) Communications		
3.29.1	(U) Interface Panel	L	I/T
3.29.2	(U) Message Format	L	D
3.29.3	(U) Text Formatted Messages	L	D/I
3.29.4	(U) Air and Missile Defense Planning and Control Station		
3.29.5	(U) Voice Communications	L	T
3.29.6	(U) Combat Net Radio	L	T
3.29.7	(U) Tactical Voice Communications	L	T
3.29.8	(U) Commercial Voice Communications	L	T
3.29.9	(U) Defense Switched Network	L	T
3.29.10	(U) Integrated Services Digital Network	L	T
3.29.11	(U) Air and Missile Defense Workstation	L	D/T
3.30	(U) Data Recording	L/S	A/D/T
3.30.1	(U) Data Recording Impacts	L/S	A/D/T
3.30.2	(U) Data Recording Control	L/S	D
3.30.3	(U) Data Storage Devices	D	I
3.30.4	(b)(3)		
3.30.5	(U) Selective Data Retrieval	L	D
3.30.6	(U) Interactive Operator Interface	L	D
3.30.7	(U) Data Recording Duration		
3.30.7.1	(b)(3)		
3.30.7.2	(U) Mission Data Recording Duration	L/S	A/D/T
3.30.7.3	(U) Voice Recording Duration	L	D
3.30.7.4	(U) Video Recording Duration	S	D
3.30.7.5	(U) Weather Data Recording Duration	L/S	D/T

Paragraph	Requirements Title	Classes of Verification: D=Design S=System L=Subsystem O=Orbit	Method(s) of Verification: D=Demonstration T=Test A=Analysis I=Inspection
3.30.7.6	(U) Video Data Playback	S	D
3.30.7.7	(U) Voice Playback	L	D
3.31	(U) Surveillance System		
3.31.1	(U) Air Breathing Target (ABT) Function	L/S	A/T
3.31.2	(U) Azimuth Coverage	L/S	D/T
3.31.3	(b)(3)		
3.31.4	(b)(3)		
3.31.5	(b)(3)		
3.31.6	(b)(3)		
3.31.6.1	(b)(3)		
3.31.6.2	(U) Saturation Alleviation	L/S	D/T
3.31.7	(b)(3)		
3.31.8	(U) Instrumented Range	L/S	D/T
3.31.9	(U) Track Initiation	S	D/T
3.31.10	(b)(3)		
3.31.11	(b)(3)		
3.31.12	(U) Emission Controls	L/S	D/T
3.31.12.1	(U) Sector Blanking Control	L/S	D/T
3.31.12.2	(U) ERP Control	L	T
3.31.13	(U) Combat ID Support	L/S	D/T
3.31.13.1	(U) Surface/Air Declaration	S	A/D
3.31.13.2	(U) Surface/Air Declaration Accuracy	S	A/D
3.31.14	(U) TBM Function	S	A/T
3.31.14.1	(U) Surveillance Coverage	L/S	D/T
3.31.14.2	(U) Elevation Coverage	L/S	A/T
3.31.14.3	(b)(3)		
3.31.15	(U) LCR Function	L/S	A/D/T
3.31.15.1	(U) Surveillance Coverage	L/S	D/T
3.31.15.2	(U) Elevation Coverage	L/S	A/D/T
3.31.15.3	(b)(3)		
3.31.16	(U) SMT Function.	L/S	A/T
3.31.16.1	(b)(3)		
3.31.16.2	(b)(3)		
3.31.16.3	(U) Track Initiation	S	T
3.31.16.4	(b)(3)		
3.31.17	(U) USMCEB Certification	D/L	A/T
3.31.18	(U) Clutter Tracks	S	D

5 (U) Packaging

Defined in transportation requirements.

6 (U) Notes

6.1 (U) Intended Use

6.2 (U) Glossary Definitions

(b)(3)

(U) Aerostat – A semi-rigid aerodynamic structure filled with helium that is tethered to the ground. An aircraft that embodies one or more containers filled with a gas lighter than air and that is supported chiefly by buoyancy derived from the surrounding air. An aerostat is tethered, which distinguishes it from an airship.

(U) Air Breathing Threats (ABT) – ABTs include cruise missiles, fixed wing aircrafts, rotary wing aircraft (helicopters), unmanned combat aerial vehicles and unmanned aerial vehicles.

(U) Air and Missile Defense Workstation (AMDWS) – AMDWS is the primary tool for monitoring and managing AMD operations. It receives air situational awareness from the ADSI, ground situation and intelligence information from the maneuver control system (MCS), all source analysis system remote workstations (ASAS RWS), and other sources. The AMDWS maintains a comprehensive database of the tactical situation and provides mission-planning capabilities.

(b)(3)

(U) Altitude – The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.

(U) Battle Management – (BMDO C2 Plan) – The automated responses to command and control system control directives: combinations or fusion of data from different sensors; automated sensor and weapon tasking; and preparation for summaries for performance assessment.

(b)(1)

(b)(1)

(U) Classification: The process of determining the type of platform represented in a track through an analysis of target characteristics. (USAADASCH) - The categorization of detected entities according to type. (1) manned versus unmanned; (2) fixed-wing versus rotary-wing; (3) (b)(3) Target classification does not address the intent of the detected entities. See target identification.

(b)(3)

(U) Clutter Track – a track on any item defined in Appendix C.1-C.4.

(U) Combat Gear – Includes the following: Army Combat Uniform (ACU) with combat boots, Army Combat Helmet (ACU), M-40 Protective Mask with carrier, Interceptor Body Armor (IBA) with plates, Load Bearing Vest (LBV), and Individual weapon (on person or nearby) which is currently M-16A2, M-4, M-249, M-203, or M-9 pistol.

(U) Command and Control – The exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities and procedures employed by a commander in planning, directing, coordinating and controlling forces and operations in the accomplishment of the mission.

(U) Command, Control, Communications, Computers and Intelligence (C4I) – (JP 3-01.5) – C4I is the systems used to coordinate and integrate the joint force capabilities to conduct and link passive defense, active defense, and attack operations. It includes missile warning and cueing of defense systems by missile warning sensors and ground stations. C4I provides command authorities at all levels with timely and accurate data and systems to plan, monitor, direct, control and report TAMDM operations.

(U) Communications Connectivity –The degree to which communications can be maintained up and down the chain of command and horizontally. Descriptors: Continuous (operates with almost no interruptions); Intermittent (some interruptions will occur); Periodic (only operates periodically); Comm Out.

(U) CONOPS. CONOPS is a description of the desired system characteristics from an operational point of view. It is used to coordinate the overall non-quantitative system goals with the user(s), the buyer, the contractor(s), and other interfacing systems and organizations.

(U) Conventional Aircraft: Manned aircraft that exhibit (b)(3)

(U) Critical System Characteristics – Design features that drive program cost and risk and determine how well the system will function in its intended operational environment. They include (b)(3)

(U) Cruise Missile (CM) – A guided missile whose flight path to its target is conducted at approximately constant velocity; depends on the dynamic reaction of the air for lift and upon propulsion forces to overcome drag and move along the flight path. (b)(3) Pilotless, non-recoverable guided vehicles, using propulsion and aerodynamic lift during all or nearly all of their flight, and whose primary mission is to place ordnance or special payloads on a target.

(U) Cue Quality data: Surveillance System target state vector and covariance data within the handover accuracy requirements that are provided in time for the Fire Control System to search and acquire the target within the within a (b)(3) probability of contour of Fire Control cue acquisition.

(b)(3)

(U) Data Types: Data Types include: Initialization parameters, changed parameters, operator interventions, external messages, track data, status, CID-related products, operator actions/interventions, (b)(3) organic weather data.

(U) Degrade. To make inferior to the normal condition, to damage. A general term that denotes a reduction in inherent capabilities compared to those of the undegraded normal condition.

(U) Detection – The process of detecting the presence and location of a target in sufficient detail to initiate a track without any a priori knowledge of the target.

(U) Discrimination – The process of identifying a track as either aerial or surface.

(U) Doctrine – (FM 3-0) – Doctrine is the concise expression of how Army forces contribute to unified action in campaigns, major operations, battles, and engagements. While it complements joint doctrine, Army doctrine also describes the Army's approach and contributions to full spectrum operation on land. Doctrine represents consensus on how the Army conducts operations today. Doctrine ranges from tactics, techniques, and procedures (TTP) to doctrinal principles contained in FM 3-0, Operations. Doctrinal field manuals (FMs) and Army contributions to joint publications are derived from Army guidance and validated assessment results. Where conflicts between Army and joint doctrine arise, joint doctrine takes precedence. (TRADOC Pam 71-9) – Body of thought composed of the fundamental principles by which military forces guide their actions in support of national objectives. It represents consensus on how the Army conducts operation today. It ranges from TTP to doctrine principles (such as FM 3-0).

(b)(3)

(b)(3)

(b)(3)

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(b)(3)

(U) External Sources (sensors). Non-organic Sensors that provides cueing data to the JLENS System.

(U) Field of Regard (FOR). The azimuth and elevation extent within which a JLENS can detect and track a target.

(b)(3)

(U) Fire-Control Sensor – Advanced airborne sensors capable of high-precision target tracking, identification, and interceptor missile in-flight control.

(b)(3)

(U) Function: The system may execute several functions, possibly simultaneously, while in a given mode.

(b)(3)

(U) Horizon – (JP 1-02) – In general, the apparent or visible junction of the Earth and sky, as seen from any specific position. Other terms called the apparent, visible, or local horizon. A

horizontal plane passing through a point of vision or perspective center. The apparent or visible horizon approximates the true horizon only when the point of vision is very close to sea level.

(U) Identification (b)(3) The process of determining the friendly or hostile character of an unknown detected contact. (b)(3) The process (es) of determining that an unknown detected object is friendly, neutral, hostile, or unknown, or the result of those processes.

(U) (b)(3) Information used in an identification process that contributes to the determination of identity (friendly, hostile, neutral) of a detected object. Indicators may be any or all of outputs from (b)(3) devices, intelligence-sourced data, radar measurement data, flight / trajectory characteristics, and / or other information which contributes to an identification determination.

(U) Instrumented Radar Range (b)(3) The range over which a radarscope or monitor permits the display of targets. Any detections outside this range will not be displayed, but will still be processed for target range determination and for assessing whether or not to display the target on the scope or monitor.

(U) Integrated Broadcast Service – An integrated intelligence broadcast network, which in theater, is planned to subsume TIBS.

(U) Internal sources(sensors). Sensors that are part of the JLENS Orbit.

(U) Interoperability (b)(3) The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. (2) (DoD) - The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and / or their users. The degree of interoperability should be defined when referring to specific cases. (3) (AR 71-9) - Interoperability of a tactical automated system is the ability of two or more systems to directly exchange and process data.

(U) ISO Shelters – Army ISO Shelters are available in three distinct models (Non-Expandable, One-Side Expandable, and Two-Side Expandable) that all conform to the ISO container standards and have exterior dimensions of 8' x 8' x 19'11" when in their transportation mode. Army ISO shelters are compatible with military and commercial handling equipment and can be transported by all modes of transportation including cargo container ships, C-130, C-141, C-5, and C-17 military aircraft, trucks, trailers, and the M1022A1 ISO Dolly Set.

(U) Jam-resistant: The confidentiality, integrity, availability, authentication, and non-repudiation of information and information systems, along with EMI, COMSEC, and TRANSEC safeguards as applied to information systems.

(U) JLENS Orbit: All equipment necessary to meet the requirements of the JLENS Performance Specification, which include both Surveillance system and Fire control system and all individual supporting prime items.

(U) JLENS System: The JLENS Orbit is architecture into two independently operated systems: Surveillance System and Fire Control System. A system also include all associated supporting prime items such as processing station, platform, power generation equipment, etc.

(b)(3)

(b)(3)

(U) Joint Engagement Zone (JEZ) (b)(3) In air defense, that airspace of defined dimensions within which multiple air defense systems (b)(3) (b)(3) are simultaneously employed (b)(3)

(U) Joint Mission Areas (JMA) (b)(3) A functional group of joint tasks and activities that share a common purpose and facilitate joint force operations and interoperability.

(U) Joint Planning Network (JPN) (b)(3) The JPN is the collection of non-real time and near-real time communications and information systems that will be used to carry out JTAMD planning throughout the theater. It provides a distributed

collaborative planning capability, automated decision aids, and a means for distributing plans within theater. The core of the JPN is the Global Command and Control System (GCCS) operating in the Global Information Grid (GIG). The Joint Defense Planner (JDP), available within the Theater Battle Management Core Systems (TBMCS) portion of GCCS, is being developed to provide for JTAMD planning in theater.

(b)(3)

(U) Kill assessment data: Features derived from post-intercept (b)(3) data suitable for a kill assessment determination. At a minimum this data will consist of a

(b)(3)

(U) Kill assessment support: Collection and reporting of kill assessment data.

(U) Kill assessment: Ability to provide timely and accurate assessment of aerial target

(b)(3)

(U) Land Attack Cruise Missile (LACM) – (DSB) – Broadly defined, “encompassing” all unmanned aerodynamic platforms which can perform in a land attack role. The term includes platforms that can carry sensors for reconnaissance, surveillance, and targeting as well as lethal payloads. It includes attack and RSTA UAVs, remotely piloted vehicles (RPV), drones as well as anti-radiation missiles (ARM), and systems designated as cruise missiles. The systems can be fired from fixed or mobile land launchers, aircraft, ships, or submarines.

(U) Large Caliber Rocket (LCR) (b)(3) An unguided, surface-launched, indirect fire rocket that can be fired from a single or multiple launch platform, and has a diameter of (b)(3) or greater and a range of at least (b)(3)

(U) Line-of-Sight (LOS) (b)(3) The unobstructed path from a soldier, weapon, weapon sight, electronic sending and receiving antennas, or piece of reconnaissance equipment from one point to another. (See also intervisibility.)

(U) Littoral – (From the Sea, the Navy Operational Concept 3/97) – Those areas adjacent to the oceans and seas that are within direct control of and vulnerable to the striking power of sea-based forces.

(U) Low (b)(3) A height between five hundred and two thousand feet.

(U) Low Level Flight – a.k.a. terrain flight / nap-of-the-earth flight (JP 1-02) - Flight close to the Earth's surface during which airspeed, height and / or altitude are adapted to the contours and cover of the ground in order to avoid enemy detection and fire.

(b)(3)

(b)(1)

(U) Manlift – Work platform, either scissors lift or boom lift (cherry picker).

(U) March Order. Consists of all of the actions needed to prepare the system to move, under its own power, from its current location to a new location. The locations may be employment sites or Ports of Departure (PODs). March Order begins when the system commander acknowledges receipt of the order to prepare to move; and ends when the last vehicle crosses the start point (SP) designated in the order. (Note: If no SP is provided in the order, then March Order ends when the last vehicle reports ready to move).

(b)(3)

(U) Mission: The primary activity for the system. In the case of JLENS, the defined missions are associated with supporting defense against a specific set of threats - LACMs and ABTs; TBMs and LCRs; or SMTs.

(U) Mode: A second-level defined descriptive system status. The system may be in multiple modes simultaneously.

(U) Near Lightning Strike – A discharge of atmospheric electricity from one cloud to another or between a cloud and the earth that is greater than 1 km from the equipment and does not directly impact (strike) equipment but transfers energy to that equipment thru a third medium (air, ground, water, etc).

(U) Node – An entity in an organization or command that performs a specific set of management / supervisor / operational functions which can be decomposed. In network topology, a terminal of any branch of a network or a terminal common to two or more branches of a network.

(U) Node/C4 Node – (JP 1-02) – The physical and functional grouping of communications and computer systems that provide terminating, switching, and gateway access services to support information exchange.

(U) Non Line-of-Sight (NLOS) – Target is not visible (masked) to the radar due to intervening terrain features, depressions, etc.

(U) Off Road Surface - Consist of a moderately smooth surface made up of small rocks, sand, dirt, and chert, and may have some potholes approximately 6 inches deep.



(b)(3)

(U) Payload – The load which the aerostat is designed to lift to an operation altitude under specified conditions of operation.

(U) PDETT: Probability of detection, evaluation, transfer, and track.



(b)(3)

(U) Platform: The platform is defined to consist of the mobile mooring station, tether, air vehicle and ground support equipment.



(b)(3)

(U) Primary Road. Two or more lanes, all weather, maintained, hard surfaced(paved) roads with good driving visibility used for heavy and high density traffic. These roads have lanes with a minimum width of 2.75 m(108 inches), road crown to 2 degrees and the legal maximum gross vehicle weight/gross combat weight(GVW/GCW) for the country or state is assured for all bridges. The Munson Test Area High Speed Paved Road Course and the Perryman Area High Speed Paved Road Course at Aberdeen Proving Ground (APG) are representative of primary roads.

(b)(3)

(U) Probability of evaluation: The probability that the JLENS Orbit will correctly identify a detected threat object as a potential threat

(U) Probability of successful transfer: The probability that the JLENS Orbit will correctly transfer data between the Surveillance System and Fire Control System.

(U) Radar – (JP 1-02) – A radio detection device that provides information on range, azimuth and / or elevation of objects.

(U) Radar Coverage – (JP 1-02) – The limits within which objects can be detected by one or more radar stations.

(b)(3)

(b)(3)

(U) Radar Horizon – (JP 1-02) – The locus of points at which the rays from a radar antenna become tangential to the Earth's surface. On the open sea this locus is horizontal but on land it varies according to the topographical features of the terrain.

(U) Range – The radial distance from a radar to a target or other object.

(U) Real time – (JP 1-02, NATO) – Pertaining to the timeliness of data or information which has been delayed only by the time required for electronic communication. This implies that there are no noticeable delays.

(U) Reliability. The probability that a system will complete its mission. When assuming an exponential failure distribution, reliability can be computed by the following equation:

$$REL = e^{\frac{-MD}{MTBSA}}$$

MD = duration of mission day(hours)
MTBSA = mean time between system aborts.

(U) Reserve Capacity: The portion of available processing resources (throughput and memory) not required for handling the worse case load.

(U) Road Hazard. A natural entity that may cause damage to the JLENS Orbit while being transported. Man-made hostile threats are excluded.

(U) Saturation Alleviation: Measures taken to prevent overload of the JLENS Orbit resulting in performance degradation.

(U) Secondary Road. Two lanes, all weather, occasionally maintained, hard or loose surface(e.g., large rock, paved, crushed rock, gravel) intended for medium-weight, low density traffic. These roads have lanes with minimum width of 2.5 m(98.5 inches) and no guarantee that the legal maximum GVW/GCW for the country or state is assured for all bridges. The Munson Test Area Improved Gravel Road Course and Belgian Block Course, in addition to the Perryman Area Secondary Road, Course A and Course B at Aberdeen Proving Ground(APG) are representative of secondary roads.

(b)(3)

(b)(3)

(U) Surface Moving Targets (SMT): Any land vehicles or maritime / naval vessels moving on the surface with characteristics defined in Appendix A of this document.

(U) State: A first-level defined system descriptive status.

(U) Surveillance – (JP 1-02) – The systematic observation of aerospace, surface or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means.

(U) Survivability – (JP 1-02) – (1) Includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. (2) Encompasses planning and locating position sites, designing adequate overhead cover, analyzing terrain conditions and construction materials, selecting excavation methods, and countering the effects of direct and indirect fire weapons. – (DoD 5000.2-R) - The capability of a system and crew to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

(U) Survive – The ability of the JLENS systems to be repaired and return to full operations within the allocated MTTR after exposure to any one event which impairs the ability of a JLENS System to perform Mission Critical Functions.

(U) Susceptibility – (DoD 5000.2-R) – The degree to which a weapon system is open to effective attack due to one or more inherent weakness. (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.). Susceptibility is considered a subset of survivability.

(U) System Aborts. Failures of mission essential functions(failures that prevent the JLENS System from continuing its mission).

(U) Tactical Information Broadcast Service (TIBS) – TIBS provides theater commanders with current electronic order of battle and limited air situation display to enhance mission planning and execution. Connectivity to TIBS is achieved via SATCOM / LOS broadcast / data link.

(b)(3)

(b)(3)

(b)(3)

(b)(3)

(b)(3)

(U) Threat – (AR 71-9) – Ability of an enemy, or potential enemy, to limit, neutralize, or destroy effectiveness of current or projected mission, organization, or item of equipment.

(U) Track – (JP 1-02) – (1) A series of related contacts displayed on a data display console or other display device. (2) To display or record the successive positions of a moving object. (3) To lock onto a point of radiation and obtain guidance therefrom. (4) To keep a gun properly aimed, or to point continuously a target-locating instrument at a moving target. (5) The actual path of an aircraft above, or a ship on, the surface of the Earth. The course is the path that is planned; the track is the path that is actually taken. – (USAADASCH) – A computer generated representation of a moving object, displayed either in terms of geographical position, vector, and both.

(U) Track Data: Values or parameters that constitute a state vector.

(U) Tracking – Following a selected target (or targets) in range, angle, or Doppler frequency (or some combination of these).

(U) TTP. Tactics, Techniques, and Procedures. Tactics are based on doctrinal concepts which units apply in combat. Tactics include the ordered placement and maneuver of units in relation to each other, the enemy, and terrain to obtain decisive results. Techniques are based on tactics which small units, crews, or individuals apply to a given set of circumstances (such as battle drills and crew drills). Procedures are courses or modes of action that describe how to perform certain tasks. This is the lowest level of detail. Task-level performance requires one or more procedures. (CGSC Student Text 101-5, "Command and Staff Decision Processes")

(U) Turbulence – (FM 34-81-1) – A condition of the atmosphere in which air currents vary greatly over short distances. Turbulence may occur at any altitude, and the intensity may vary rapidly over short distances. See wind shear.

(b)(3)

(b)(3)

(U) United States Message Text Format (USMTF) – The USMTF program establishes the standards and prescribes the rules and conventions governing message text formats. The program applies to all character-oriented message text formats used in support of Joint and Combined operations. The USMTFs are both human readable and machine processable. They provide information exchange through vocabulary control (standardized data elements) and provide uniform reporting procedures to be used in all defense conditions.

(U) Unmanned Aerial Vehicle (UAV) – (JP 3-55-1) – A powered aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or non-lethal payload. Ballistic or semi-ballistic, cruise missiles, and artillery projectiles are not considered UAVs.

(U) Unmanned Combat Aerial Vehicles (UCAV) – Recoverable systems that use a UAV as a delivery platform for expendable ordnance. Includes concepts for air-to-air and air-to-surface munition delivery.

(U) Valid Aerial Track (b)(3) Pertains to differentiating between aerial objects of (potential) interest versus other objects.

(U) Valid Reportable Track (b)(3) Any track which meets the criteria established for track reporting on a network (e.g., JDN).

(U) Very Low – A height below (b)(3)

(U) Vulnerability – (JP 3-13) – The characteristics of a system that cause it to suffer a definite degradation (loss or reduction of capability to perform the designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man-made) hostile environment. Vulnerability is considered a subset of survivability. In information operations, a weakness in information system security design, procedures, implementation, or internal controls that could be exploited to gain unauthorized access to information or an information system.

(b)(1)

6.3 (U) Acronyms.

AAC	Approach Angle Control
ABSOJ	Airborne Standoff Jammer
AC	Alternating Current
ADP	Aerostat Development Program
ADSAM	Air Directed Surface-to-Air Missile
AGL	Above Ground Level
Ai	Inherent Availability
AM	Amplitude Modulation
AMDPCS	Air and Missile Defense Planning and Control Station
(b)(3)	
Ao	Operational Availability
C2	Command and Control
C4I	Command, Control, Communications, Computers, and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
(b)(3)	
CEP	Cooperative Engagement Processor
CES	Common Equipment Set
CHS	Common Hardware and Software
CID	Combat Identification
cm	Centimeters
CM	Cruise Missile
CMF	Common Message Format
CNR	Combat Net Radio
COMMs	Communications
COMSEC	Communication Security
COTS	Commercial Off-The-Shelf
CW	Continuous Wave
CWI	Continuous Wave Illumination
DC	Direct Current
DDS	Data Distribution System
DFAD	Digital Feature Analysis Data
DIA	Defense Intelligence Agency
DII	Defense Information Infrastructure
DII COE	Defense Information Infrastructure Common Operating Environment

DIS	Distributed Interactive Simulation
DISN	Defense Information Systems Network
DISR	DoD Interoperability Standards Registry
dm	Data Mile
DoD	Department of Defense
DT	Downtime
DTED	Digital Terrain Elevation Data
ECCM	Electronic Counter-Countermeasure
ECM	Electronic Countermeasure
EED	Electro-Explosive Device
EID	Electrically-Initiated Device
EM	Electromagnetic
EMI	Electromagnetic Interference
EO	Engagement Operations
(b)(3)	
ERP	Effective Radiated Power
EU	European Union
f	Frequency
FFT	Fast Fourier Transform
FM	Frequency Modulation
FOUO	For Official use only
FSC	Federal Supply Code
G	Gravitational Constant
GATM	Global Air Traffic Management
GFE	Government Furnished Equipment
GHz	Gigahertz
GIC	Gabarit International de Chargement
gm	Gram
GOTS	Government Off-The-Shelf
gpm	Gallons Per Minute
GPS	Global Positioning System
GS/DS	General Support / Direct Support
GSE	Ground Support Equipment
(b)(3)	
HERO	Hazards of Electromagnetic Radiation to Ordnance
HF	High Frequency
H-H	Horizontal - Horizontal
HLA	High Level Architecture

HPRF	High Pulse Repetition Frequency
hr	Hour
HWIL	Hardware-In-The-Loop
Hz	Hertz
ICC	Information Coordination Central
ICW	Interrupted Continuous Wave
IETM	Interactive Electronic Technical Manuals
IFC	Integrated Fire Control
IFF	Identification Friend or Foe
IFR	Instrumented Flight Rules
IHPRF	Interrupted High Pulse Repetition Frequency
IIU	Inertial Instrument Unit
INFOSEC	Information Security
IPT	Integrated Product Team
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
JCTN	Joint Composite Tracking Network
JDN	Joint Data Network
JHU	John Hopkins University
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
JMNS	Joint Mission Need Statement
JPO	Joint Project Office
JPS	JLENS Performance Specification
JROC	Joint Requirement Oversight Council
JS2	JLENS - Spiral 2
JSPEC	JLENS Specification
JTA	Joint Technical Architecture
JTAMD	Joint Theater Air and Missile Defense
JTIDS	Joint Tactical Information Distribution System
JVMF	Joint Variable Message Format
Kg	Grazing Angle Adjustment
kHz	kilohertz
km	kilometer
km	kilometer
km/hr	kilometers Per Hour
KP	Polarization Adjustment
kts	knots

kVA	kilo-Volt-Amps
LACM	Land Attack Cruise Missile
LACMD	Land Attack Cruise Missile Defense
LCR	Large Caliber Rockets
Low E	Low Elevation
LPE	Launch Point Estimated
LRU	Line Replacement Unit
LSB	Least Significant Bit
LTC	Lieutenant Colonel
(b)(3)	
MHz	Megahertz
MILSATCOM	Military Satellite Command
MIL-STD	Military Standard
MNS	Mission Needs Statement
MOPP	Mission Oriented Protective Posture
mph	Miles Per Hour
MSL	Mean Sea Level
MTBSA	Mean Time Between System Aborts
MTTR	Mean Time To Repair
NBC	Nuclear, Biological, and Chemical
NGT	Not Greater Than
NIMA	National Imagery and Mapping Agency
NLT	Not Less Than
NOFORN	Not Releaseable to Foreign Nationals
NSWC	Naval Surface Warfare Center
NTE	Not To Exceed
OADR	Originating Agency's Determination Required
OPSEC	Operational Security
ORD	Operational Requirements Document
OSHA	Occupational Safety and Health Administration
OT	Operational Time
OTH	Over-The-Horizon
(b)(3)	
PCW	Pulsed Continuous Wave
PDETT	Probability of Detection, Evaluation, Transfer, and Track (b)(3)
PMCS	Preventive Maintenance Checks And Services
PPLI	Precise Participant Location Identification
ppm	Parts Per Million

PT1	Probability of successful transfer within the system and to/from the data networks.
PT2	Probability of tracking target with sufficient accuracy (b)(3)
RCS	Radar Cross-Section
RF	Radio Frequency
RMS	Root Mean Square
RVM	Requirements Verification Matrix (b)(3) (b)(3)
SAM	Surface-to-Air Missile
SBAA	Shipboard Active Array
SBJ	Surface Based Jammer
SCDL	Surveillance Control Data Link
SDD	System Design and Development (b)(3)
SIAP	Single Integrated Air Picture
SIL	System Integration Laboratory (b)(3) (b)(3) (b)(3)
SMDC	Space and Missile Defense Command
SMT	Surface Moving Targets
SRBM	Short Range Ballistic Missile
SSAA	System Security Authorization Agreement (b)(3)
STU	Secure Telephone Unit
SuR	Surveillance Radar (b)(3) (b)(3)
TAFIM	Technical Architecture Framework for Information Management
TAMD	Theater Air and Missile Defense
TASM	Tactical Air-to-Surface Missile
TBD	To Be Determined
TBM	Theater Ballistic Missile
TLE	Target Location Error
TMDE	Test, Measurement, and Diagnostic Equipment
TSI	Terrain Scattered Interference

TTP	Tactics, Techniques, and Procedures
(b)(3)	
UAV	Unmanned Aerial Vehicle
UHF	Ultra High Frequency
USAADASCH	United States Army Air Defense Artillery School
USMCEB	U.S. Military Communications-Electronics Board
USMTF/JVMF	United States Message Text Format (USMTF) and Joint Variable Message Format (JVMF).
V/m	Volts Per Meter
VMF	Variable Message Format
V-V	Vertical - Vertical
(b)(3)	
WCS	Weapon Control System

Appendix A Target Threat (U)

A.0 (U) Threat Characteristics

(b)(3)

A.1

(b)(3)

(b)(1)

(b)(1)

(b)(1)

A.2

(b)(3)

(b)(1)

(b)(1)

A.3

(b)(3)

(b)(1)

(b)(1)

Appendix B Electronic Countermeasure Threat (U)

(b)(3)

B.1

(b)(3)

(b)(1)

(b)(1)

(b)(1)

(b)(1)

(b)(1)

B.2

(b)(3)

(b)(1)

(b)(1)

(b)(1)

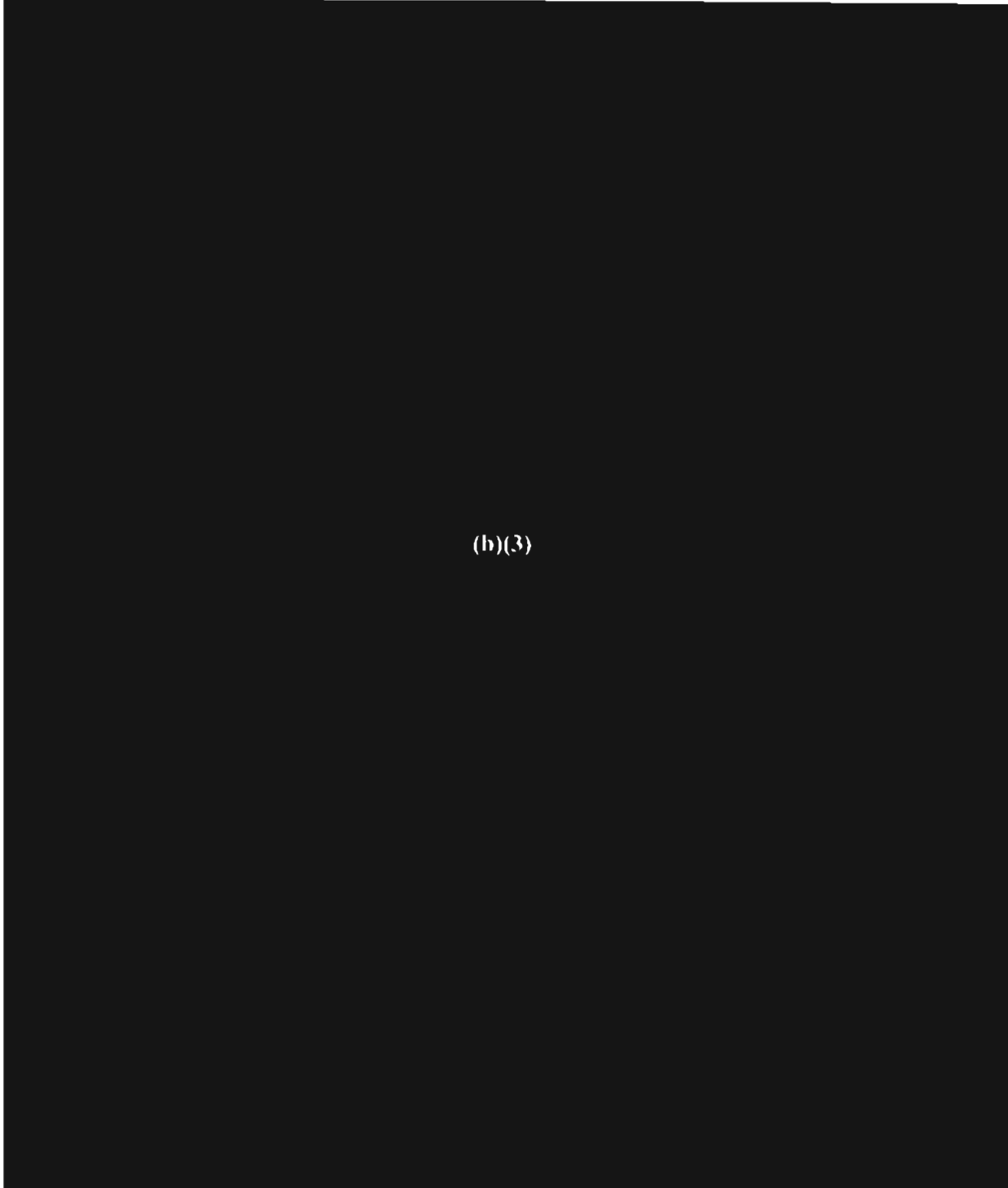
B.3

(b)(3)

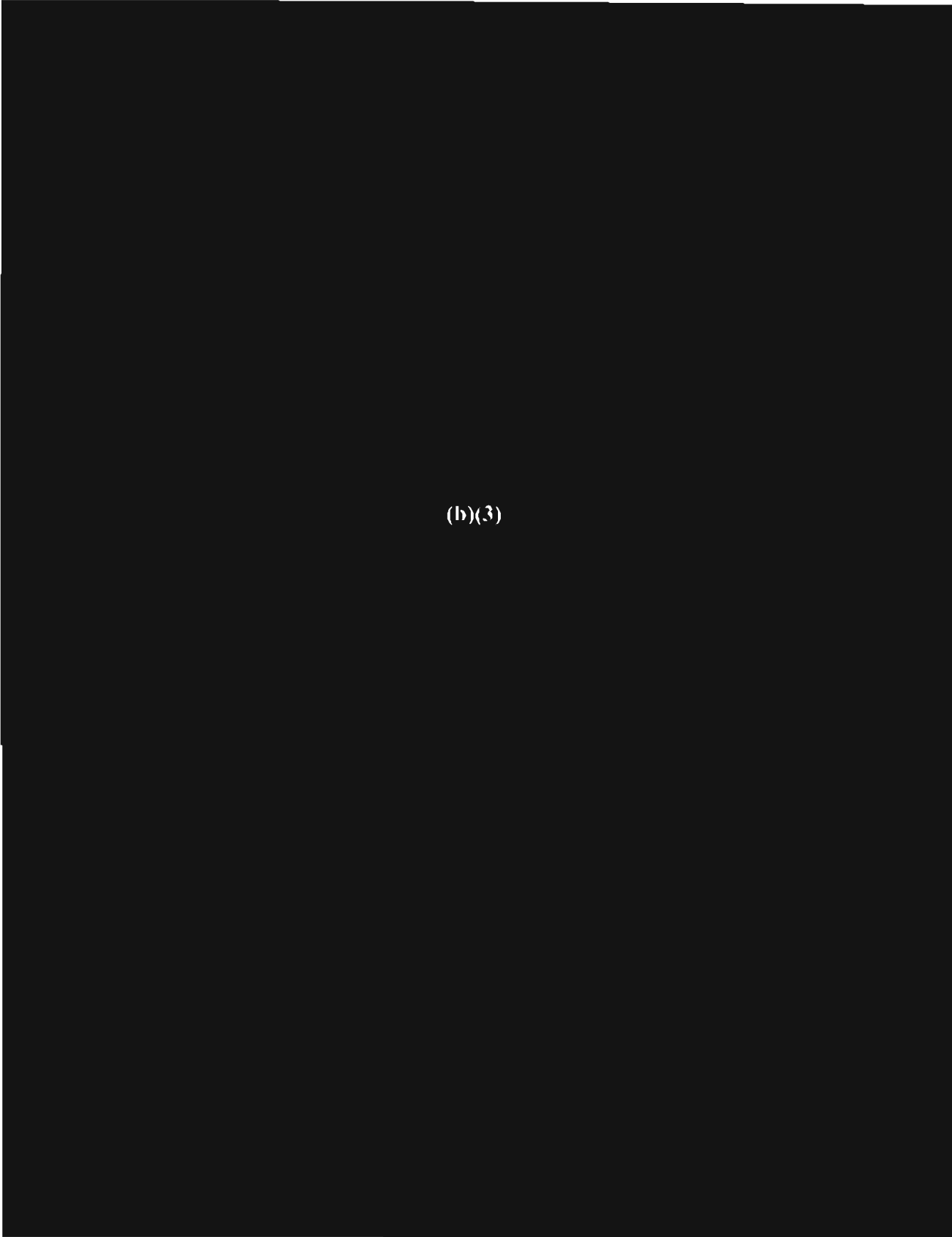
(b)(1)

(b)(1)

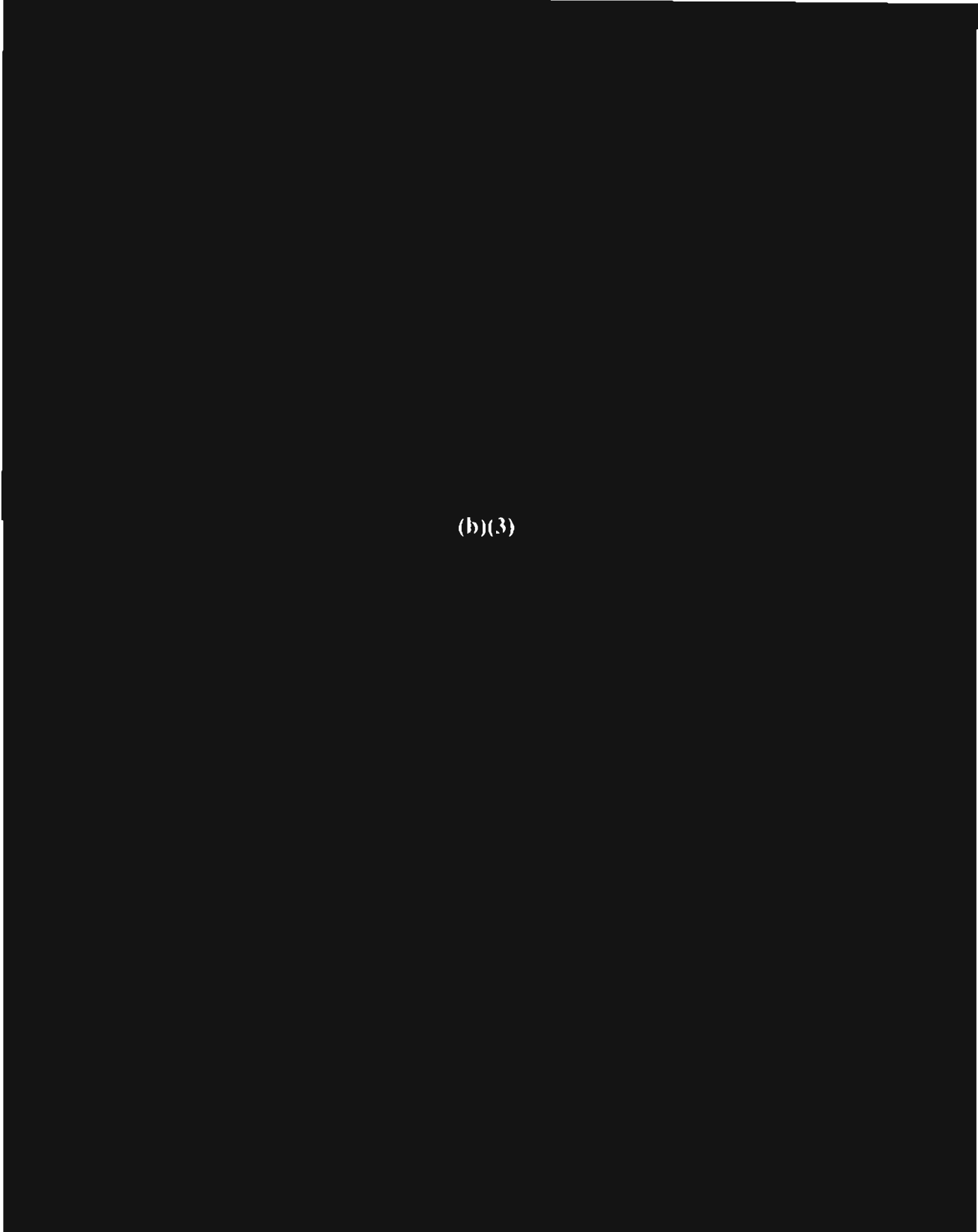
Appendix C



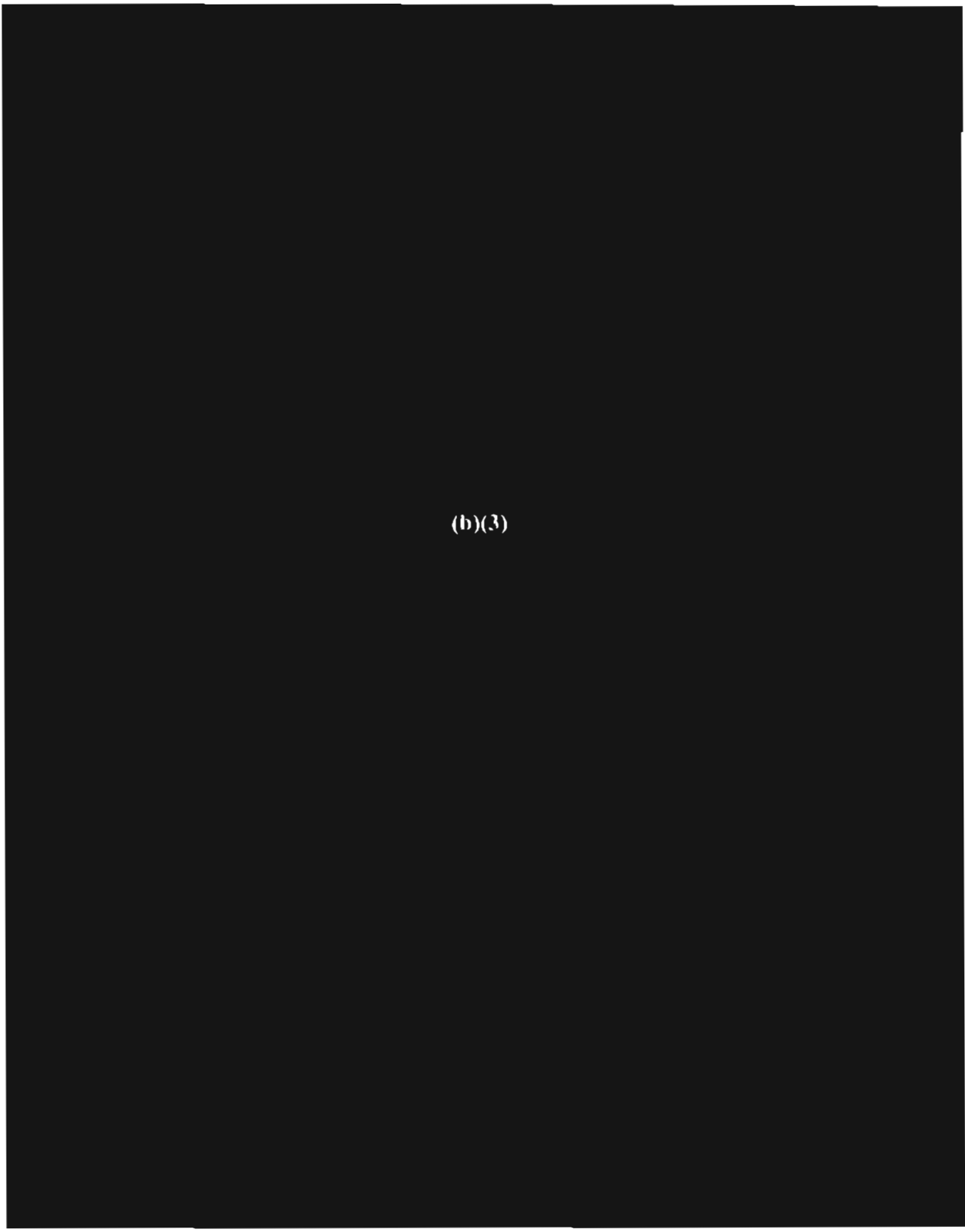
(b)(3)



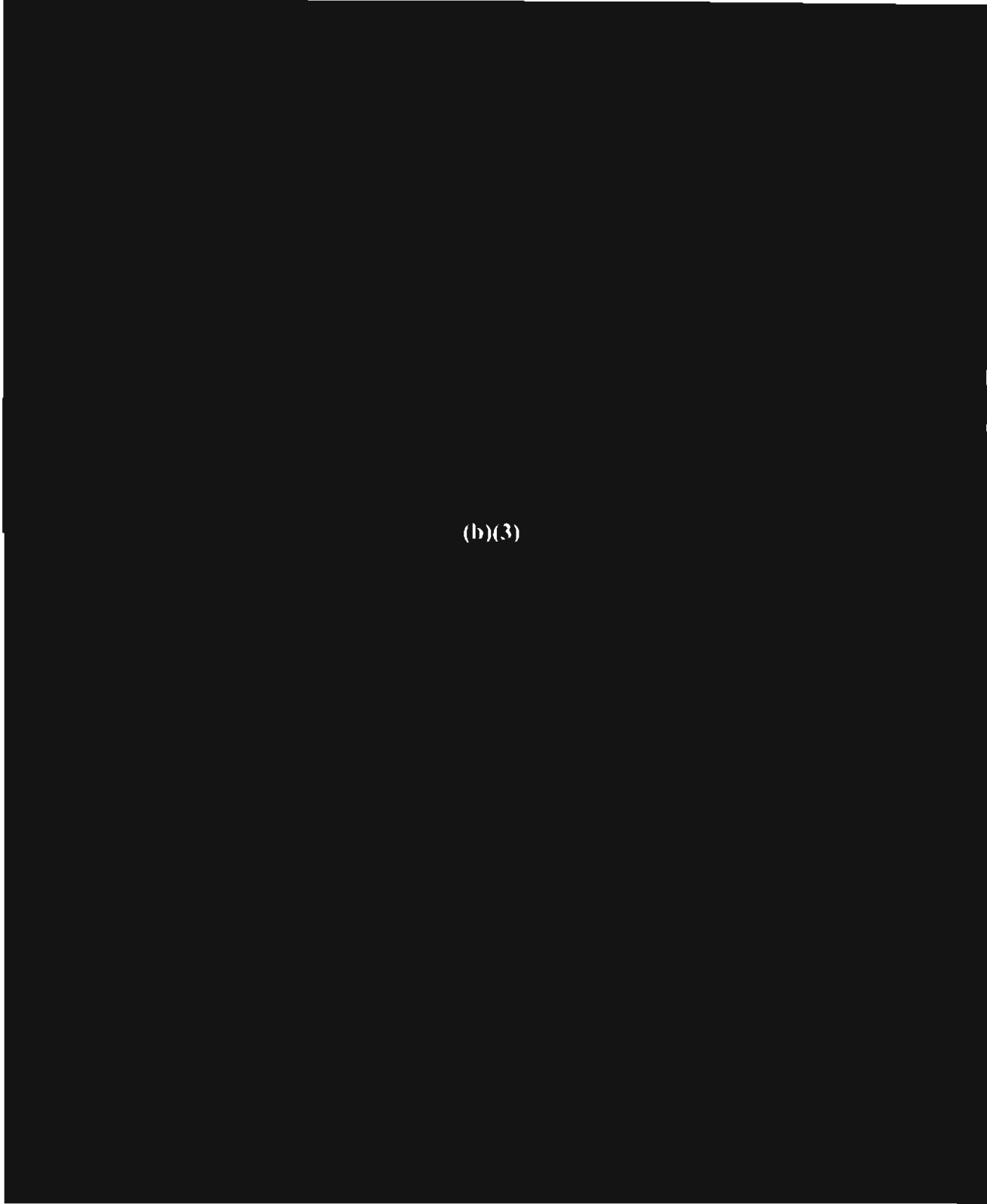
(b)(3)



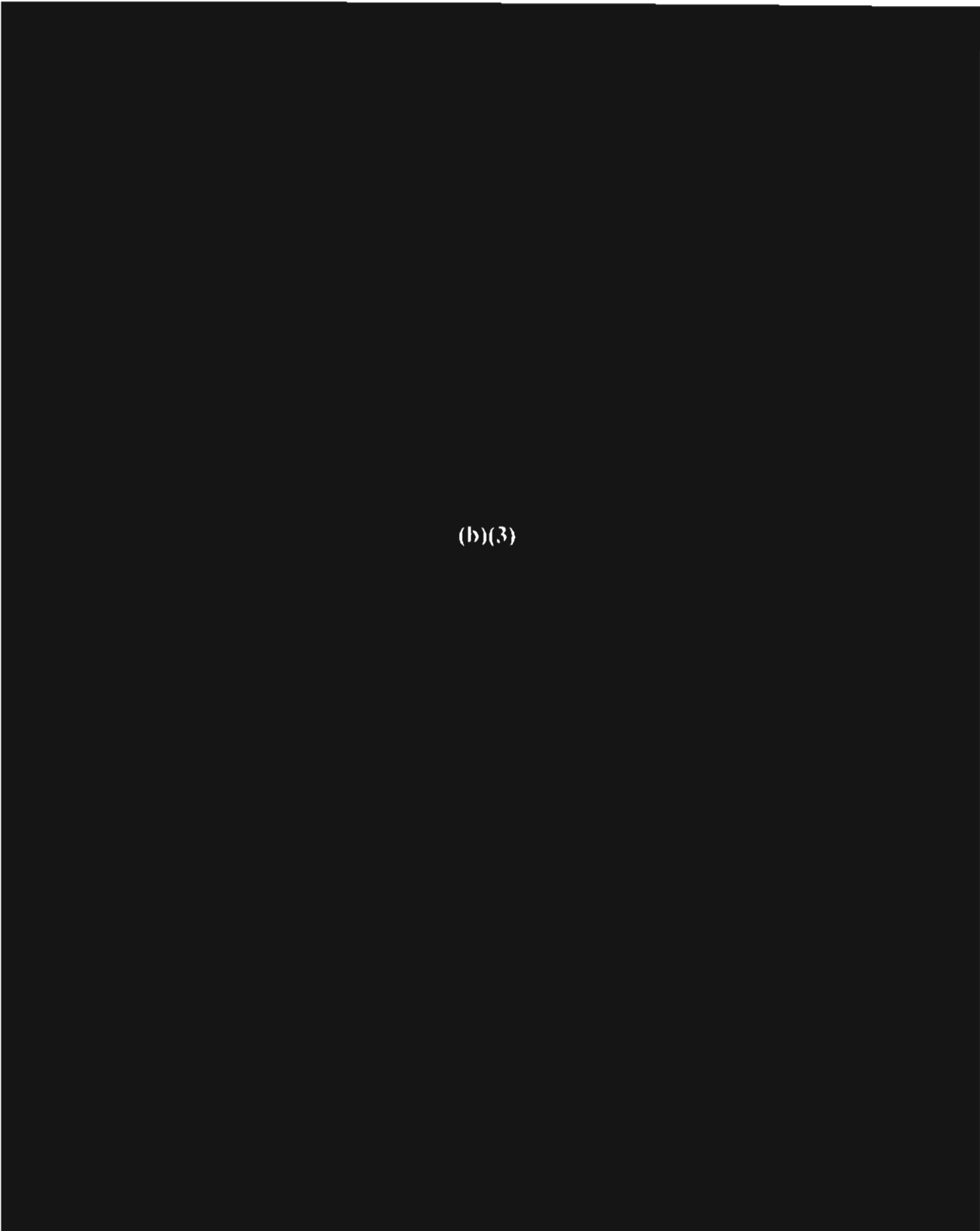
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(b)(3)



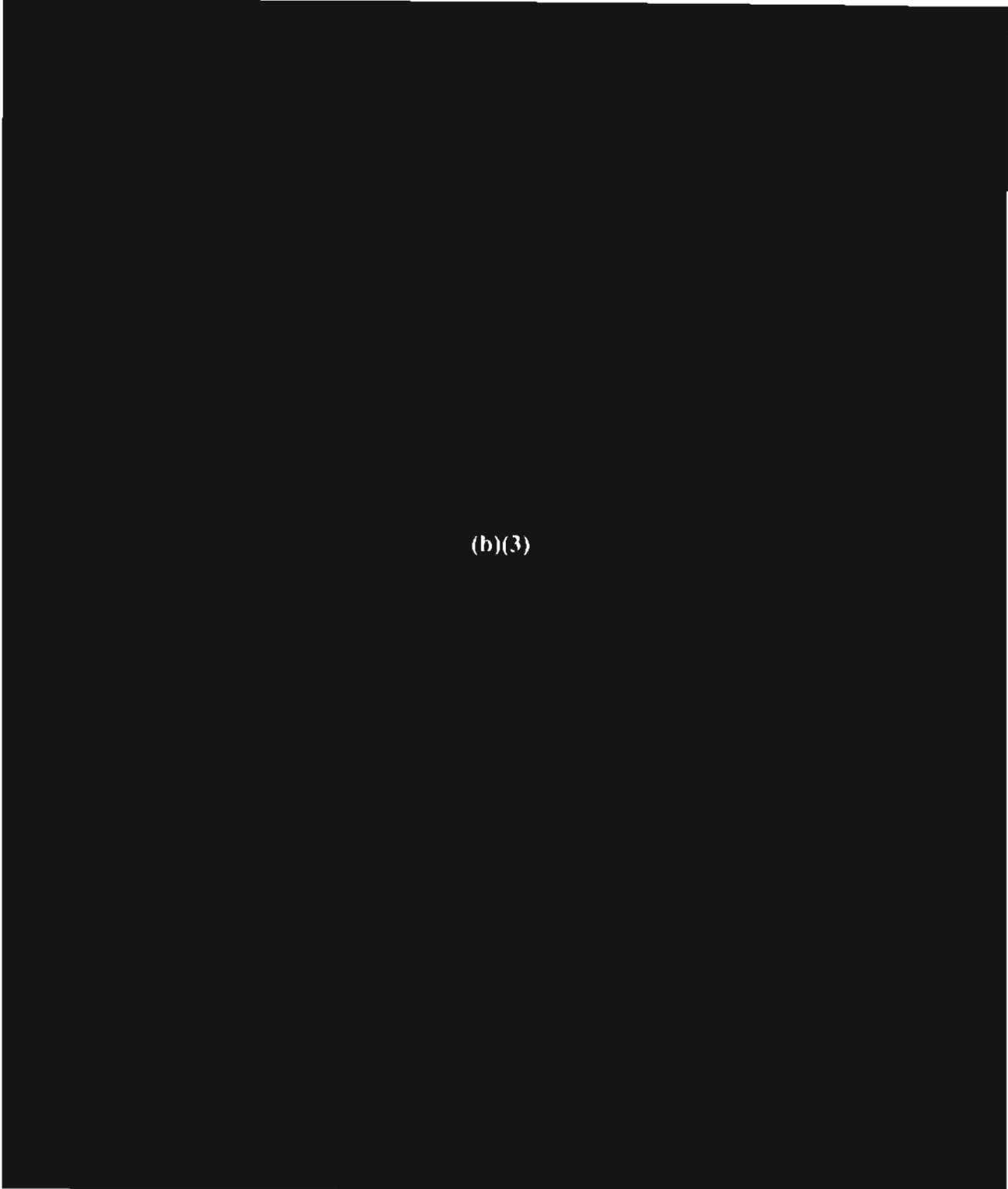
(b)(3)



(b)(3)



(b)(3)



(b)(3)

Appendix D

Weapon Systems (U)

D.4

(b)(3)

D.4.1 (U) Ground Rules

(b)(3)

D.4.2 (U) Sea-Based Assumptions

(b)(3)

(b)(3)

(b)(3)

(b)(1)

D.4.3 (b)(3)

(b)(3)

(b)(1)

(b)(1)

D.4.4 (U) Missile and Target Tracking

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(b)(1)

(b)(1)

(b)(3)

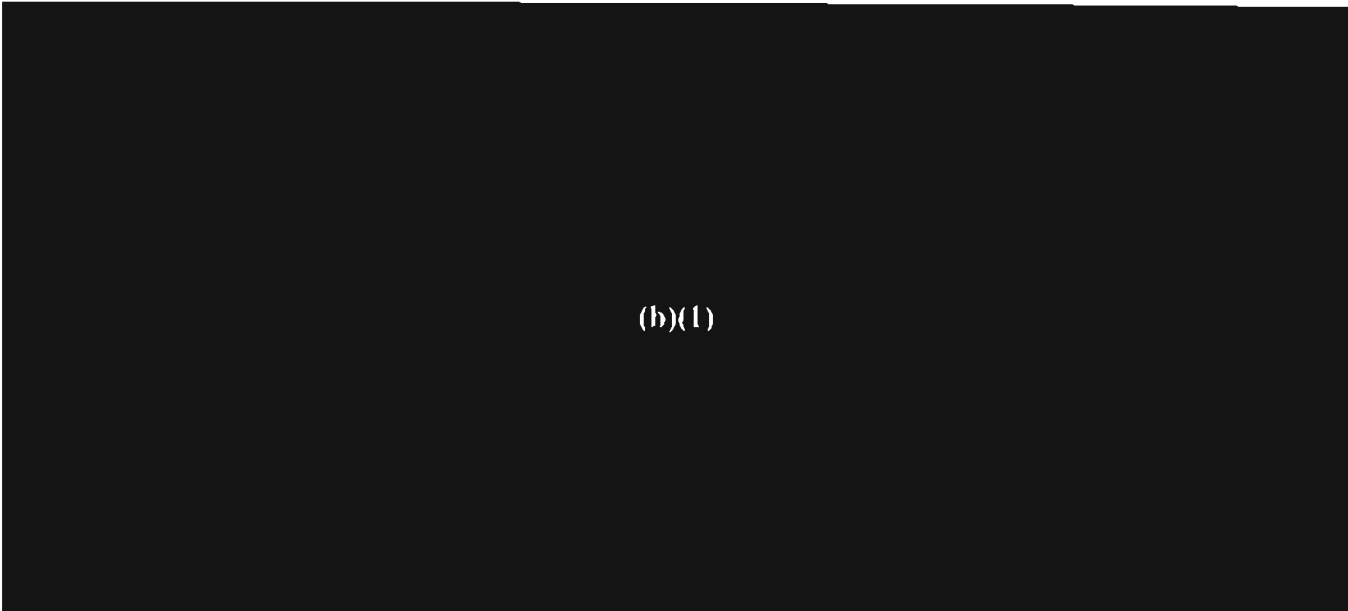
(b)(1)

(b)(1)

(b)(1)

D.4.5 (U) Midcourse Guidance

(b)(1)

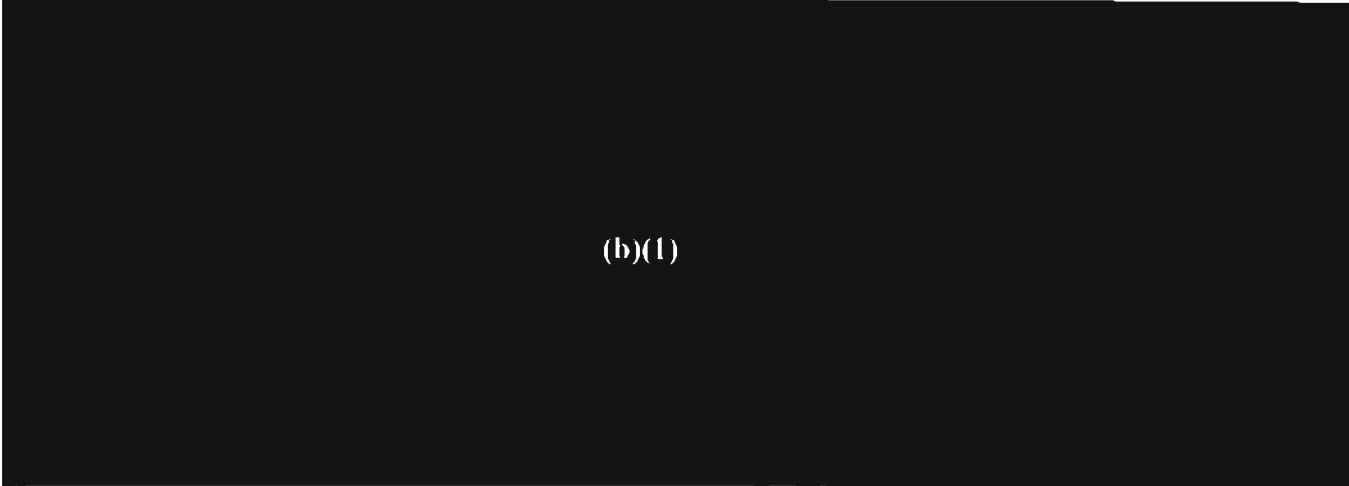


(b)(1)

D.4.6 (U) Illuminator



(b)(1)



(b)(1)

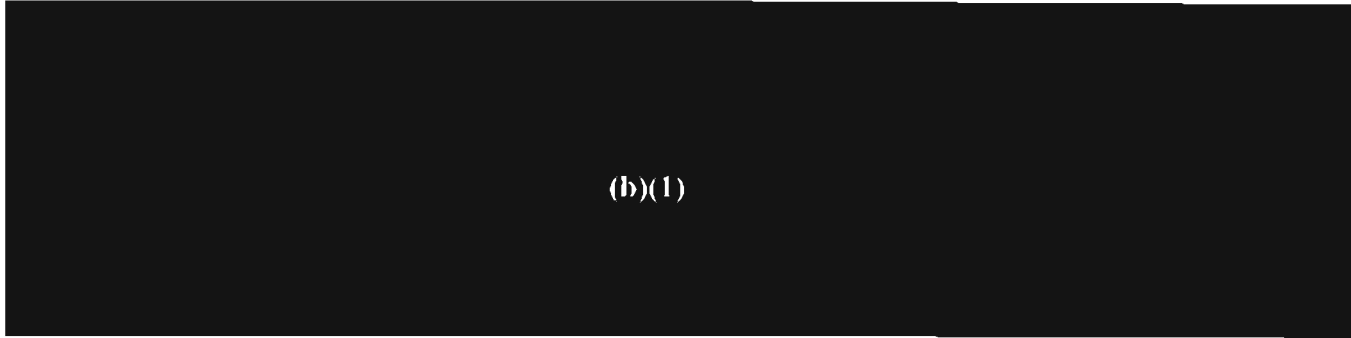


(b)(1)

Figure D.4.6-1. (U) Current CWI FM Noise Specification [O]

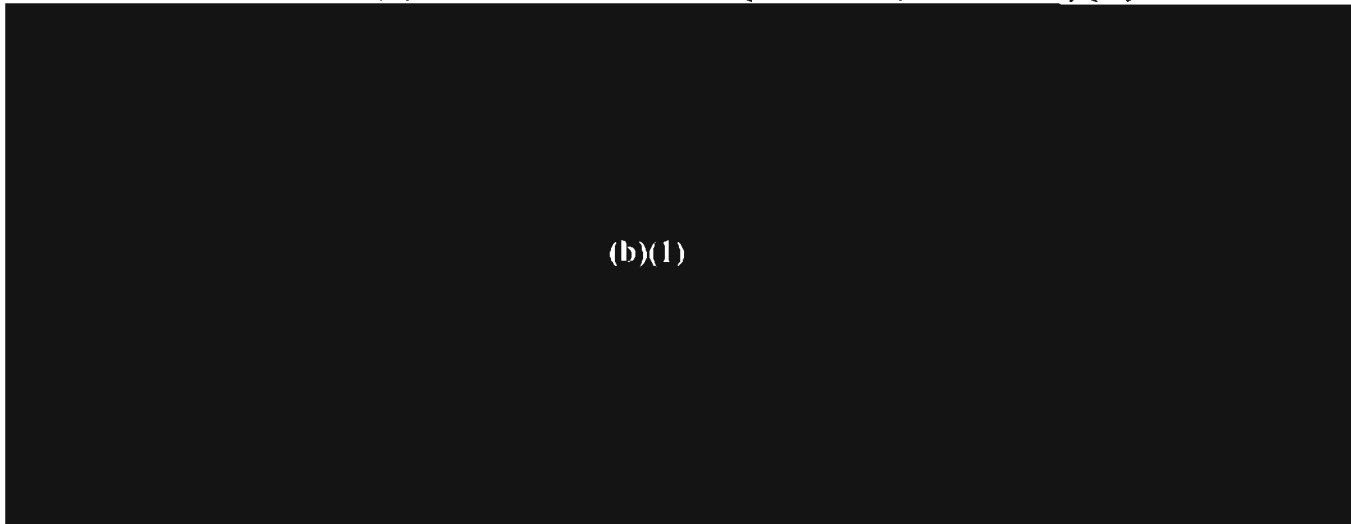


(b)(1)



(b)(1)

Table D.4.6-2. (U) JLENS Illuminator Requirements(Transmitter) [O]



(b)(1)

D.4.7 (U) Acquisition and Handover



(b)(1)

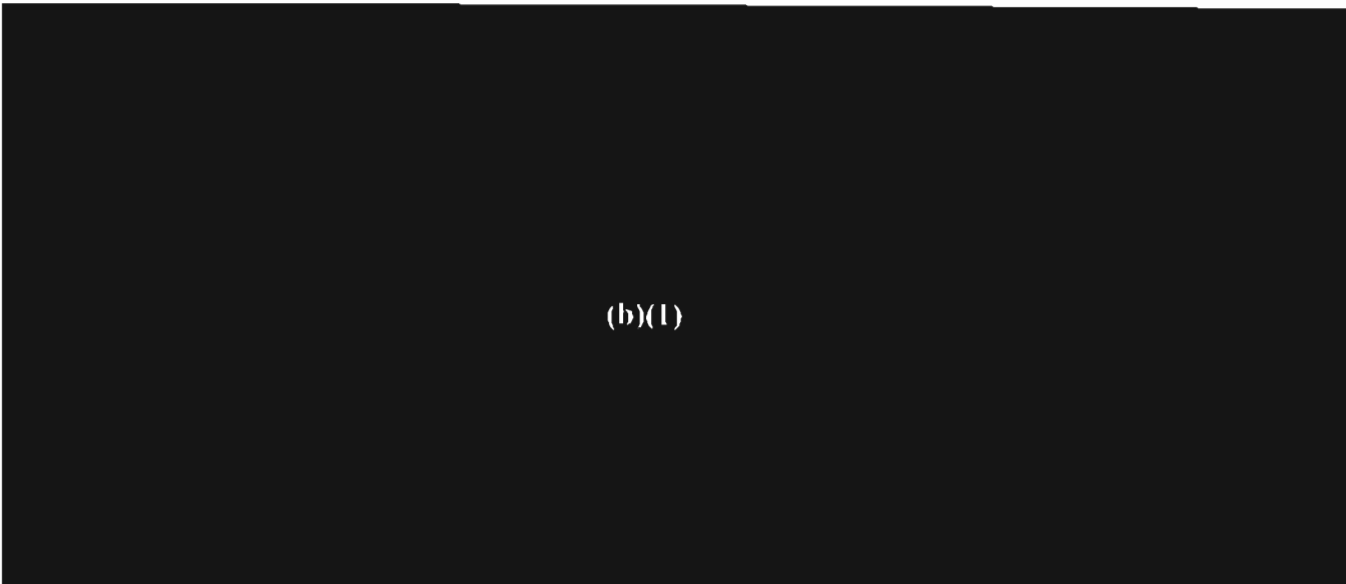
(b)(1)

(U) It should be recognized that these times assume the seeker head is slewing continuously and that Fast Fourier Transform(FFT) data collection and analysis are performed asynchronously. If a step search shall be implemented, a longer search time would be required. [O]

(b)(3)

(b)(1)

(b)(1)

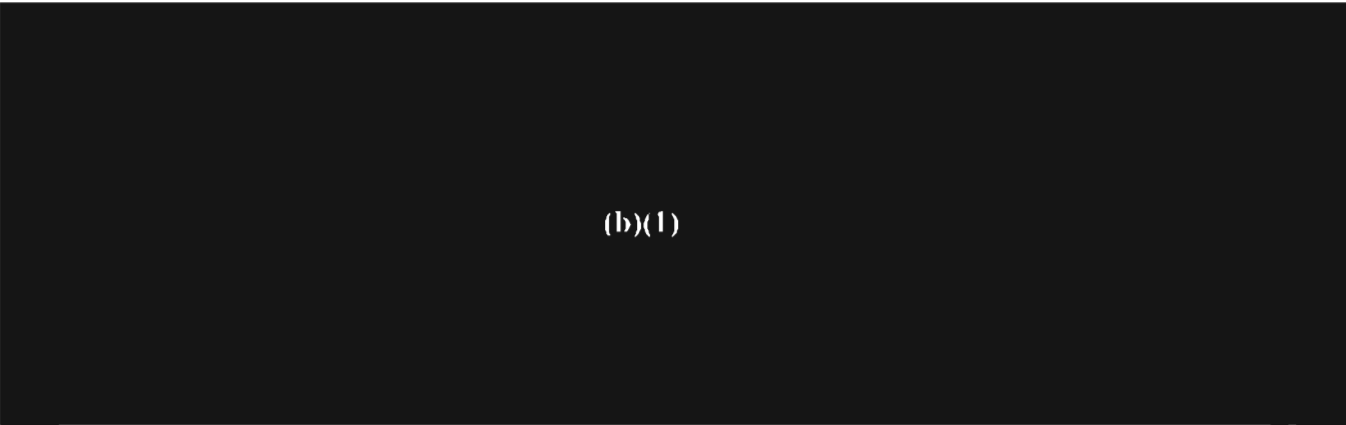


(b)(1)

D.4.8 (U) Terminal Receiver / Signal Processor



(b)(3)



(b)(1)



(b)(1)



(b)(1)



(b)(1)

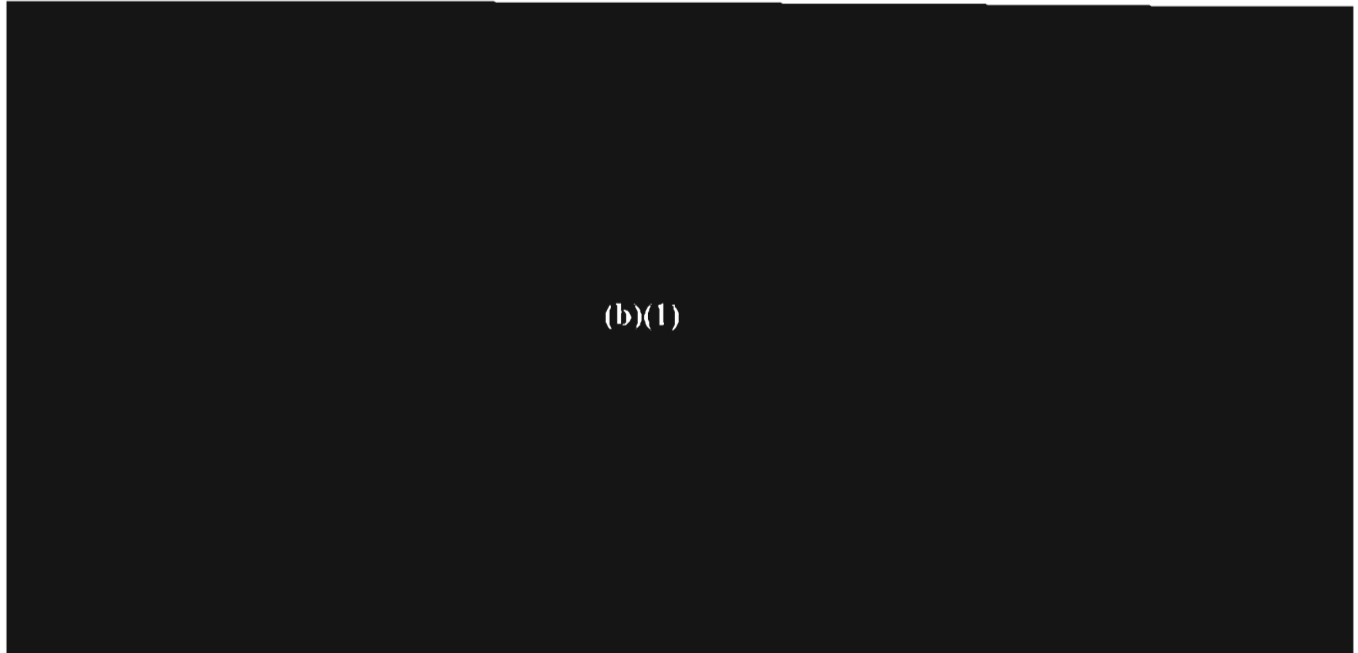


(b)(1)



(b)(1)

D.4.9 (U) Gridlock



(b)(1)

(U) The following random JLENS system errors shall be included in the random JLENS system precision track illumination sensor measurement error used for error basket calculations [O]:

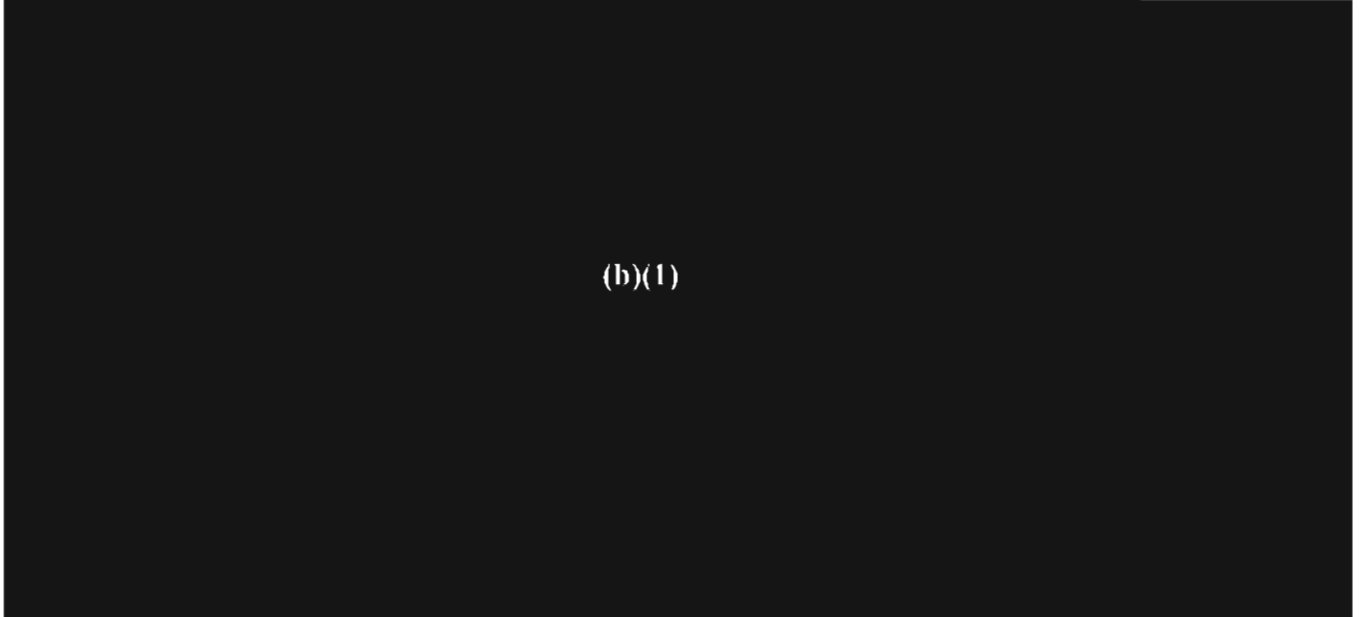
- a. short-term(random) attitude(pitch, roll, and yaw) errors
- b. short-term(random) platform flexure

D.4.10 (U) Time Delays



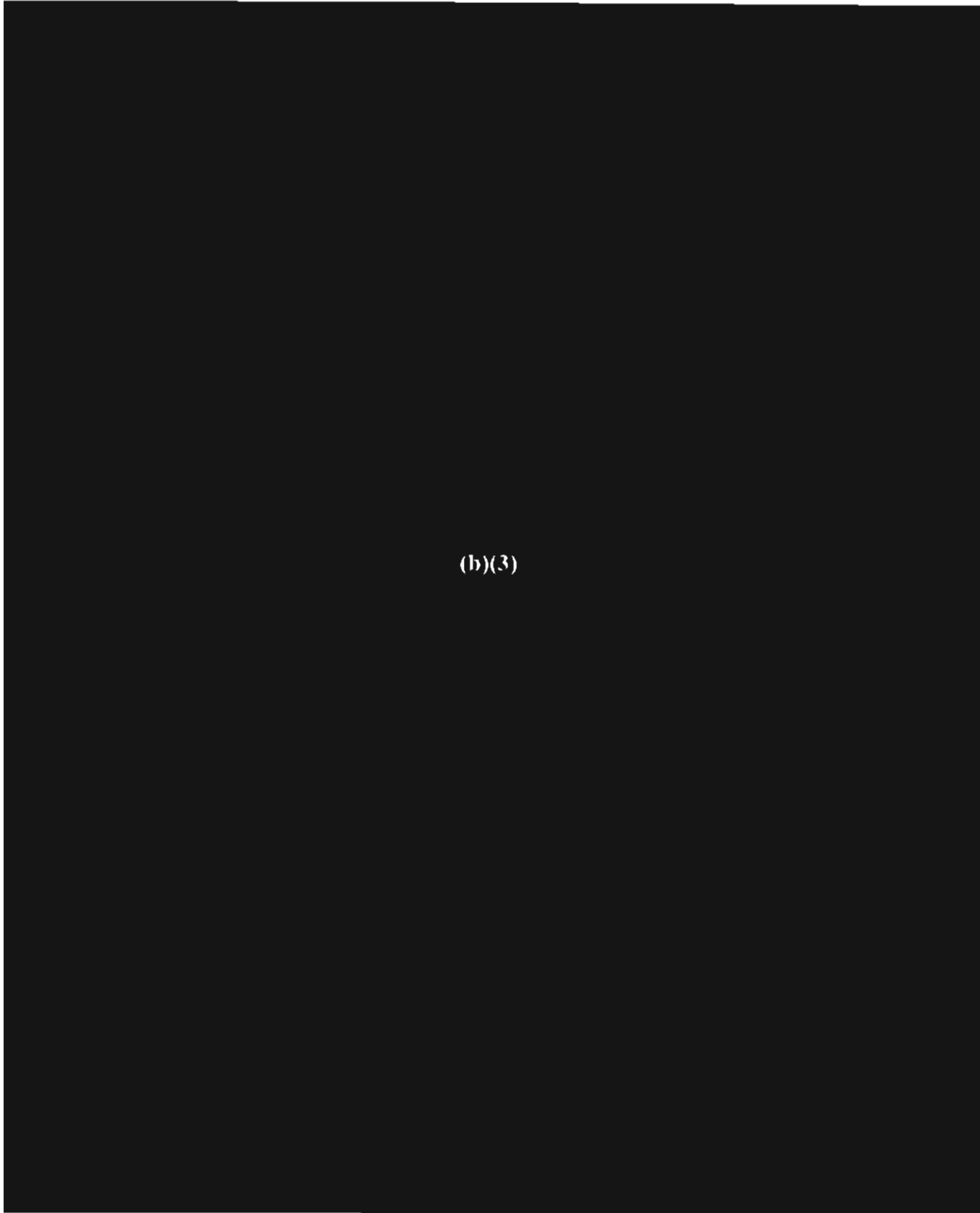
(b)(3)

Table D.4.10-1. (U) Data Transfer Time Delays [O]



(b)(1)

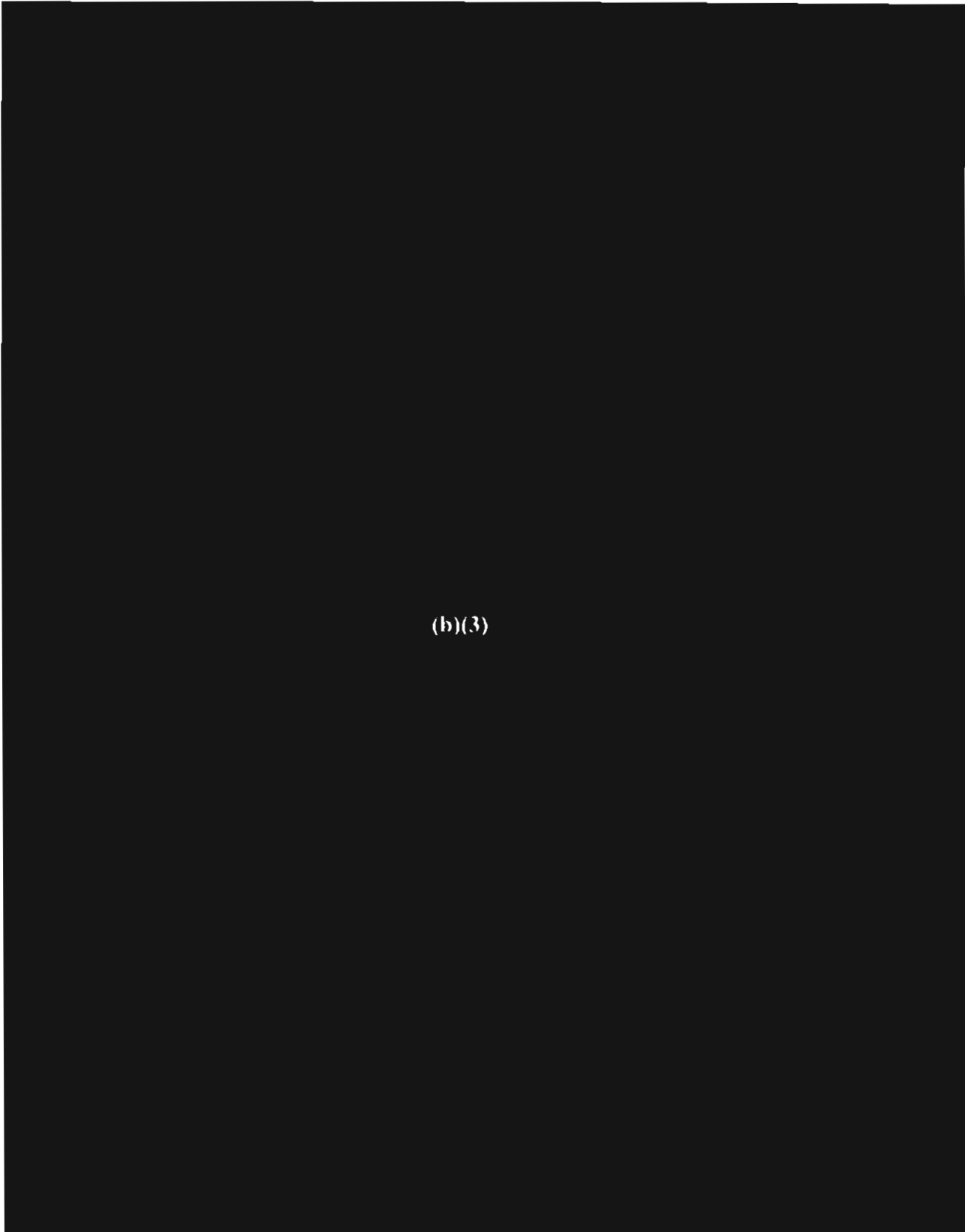
(U) Appendix E



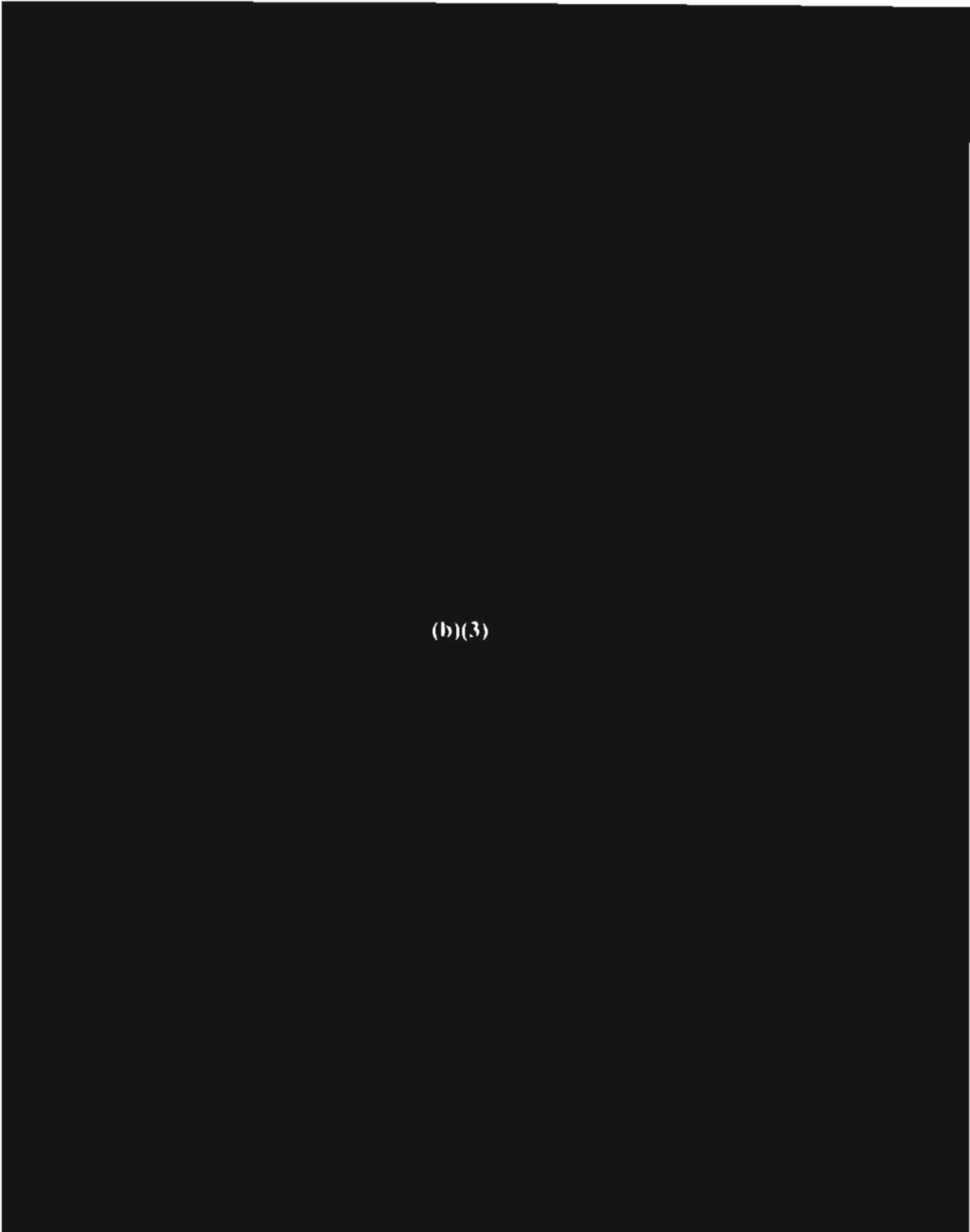
(b)(3)



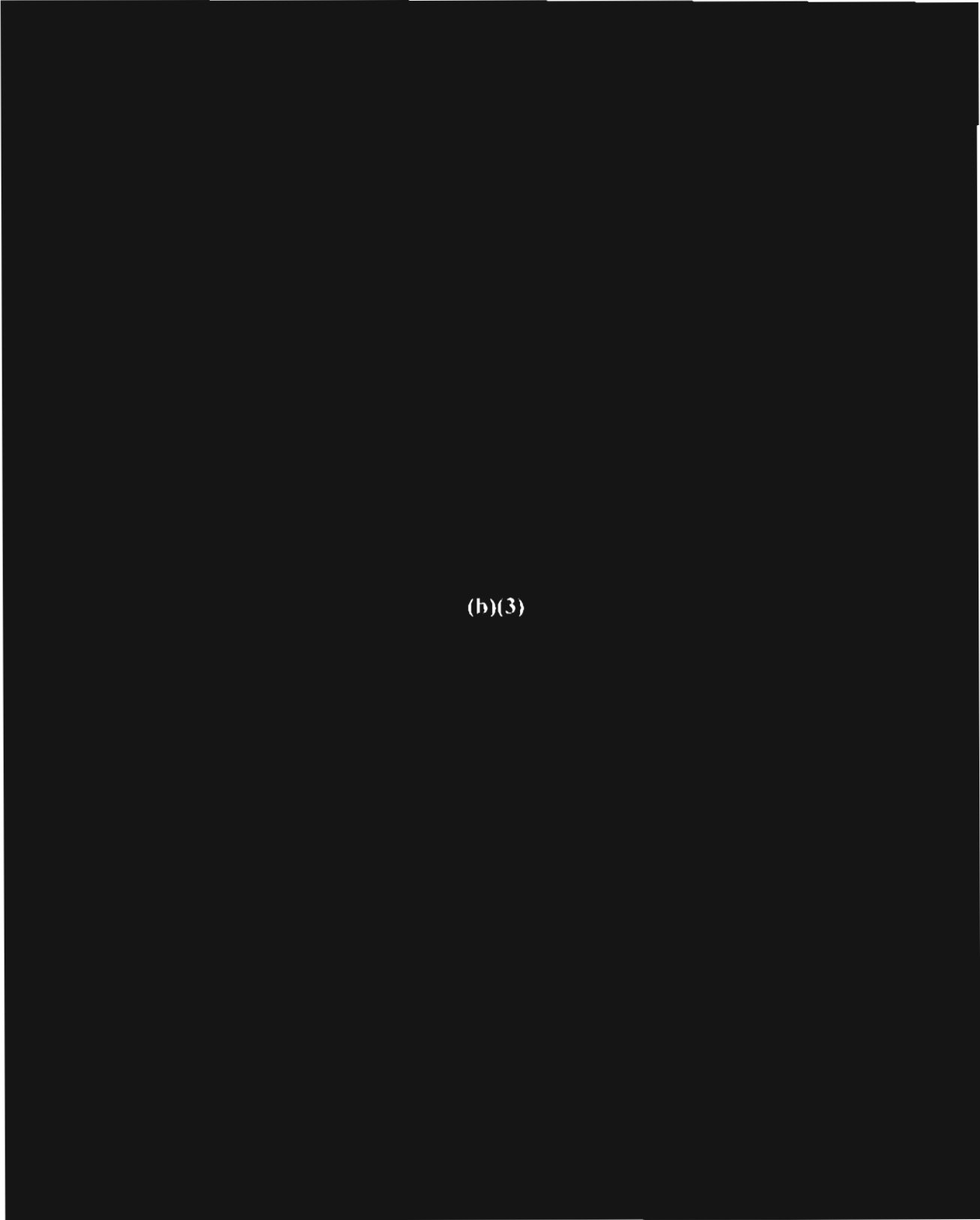
(b)(3)



(b)(3)



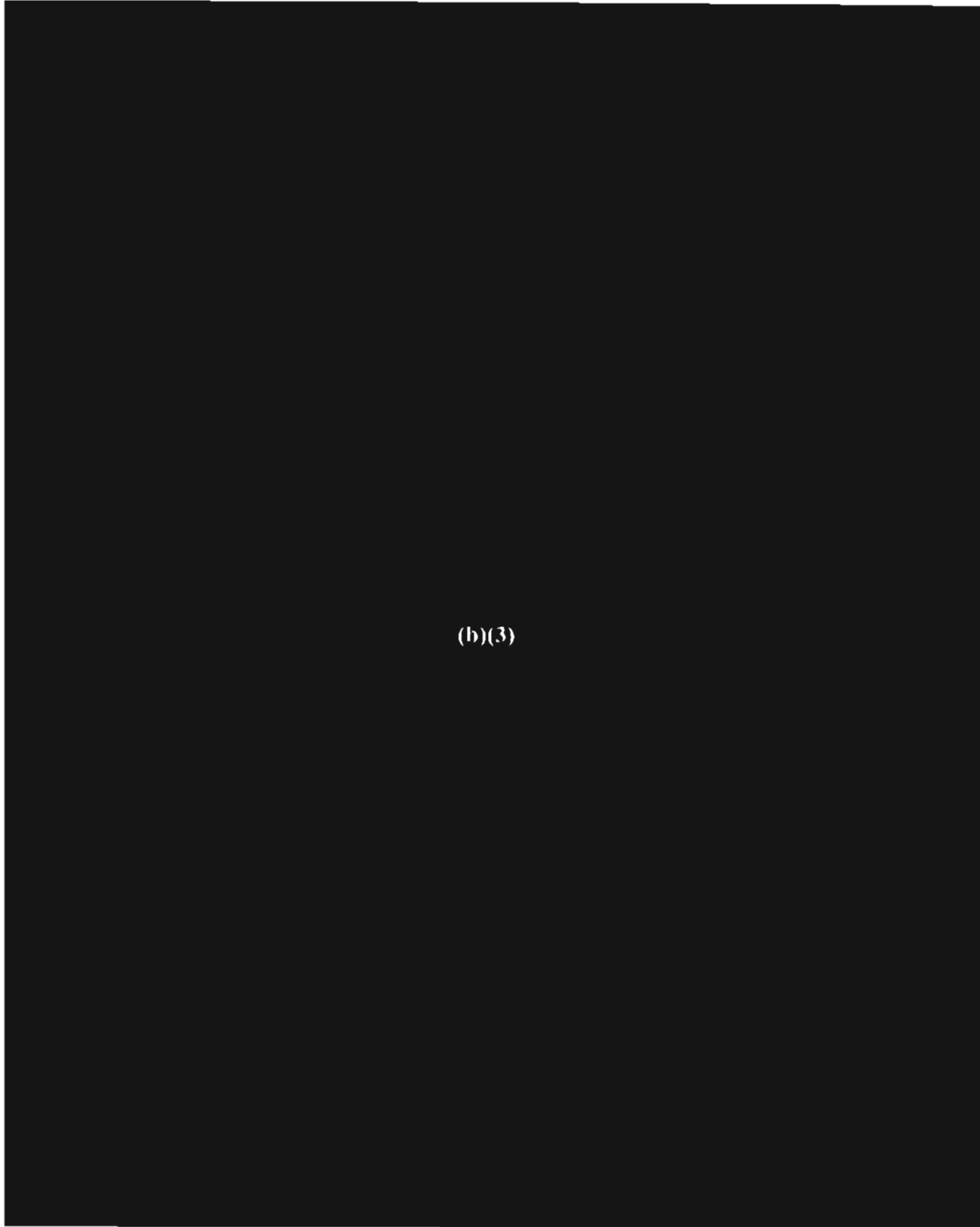
(b)(3)



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