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**DEPARTMENT OF STATE**

**22 CFR Part 121**

**[Public Notice: 9110]**

**RIN 1400-AD32**

**Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category XII**

**AGENCY:** Department of State.

**ACTION:** Proposed rule.

**SUMMARY:** As part of the President's Export Control Reform effort, the Department of State proposes to amend the International Traffic in Arms Regulations (ITAR) to revise Category XII (fire control, range finder, optical and guidance and control equipment) of the U.S. Munitions List (USML) to describe more precisely the articles warranting control on the USML.

**DATES:** The Department of State will accept comments on this proposed rule until [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

**ADDRESSES:** Interested parties may submit comments within 60 days of the date of publication by one of the following methods:

- E-mail: *DDTCPublicComments@state.gov* with the subject line, “ITAR Amendment – Category XII.”
- Internet: At *www.regulations.gov*, search for this notice by using this rule’s RIN (1400-AD32).

Comments received after that date will be considered if feasible, but consideration cannot be assured. Those submitting comments should not include any personally identifying information they do not desire to be made public or any information for which a claim of confidentiality is asserted. All comments and transmittal e-mails will be made available for public inspection and copying after the close of the comment period via the Directorate of Defense Trade Controls website at *www.pmdtdc.state.gov*. Parties who wish to comment anonymously may do so by submitting their comments via *www.regulations.gov*, leaving the fields that would identify the commenter blank and including no identifying information in the comment itself. Comments submitted via *www.regulations.gov* are immediately available for public inspection.

**FOR FURTHER INFORMATION CONTACT:** Mr. C. Edward Peartree, Director, Office of Defense Trade Controls Policy, Department of State,

telephone (202) 663-2792; e-mail *DDTCTPublicComments@state.gov*.

ATTN: Regulatory Change, USML Category XII.

**SUPPLEMENTARY INFORMATION:** The Directorate of Defense Trade Controls (DDTC), U.S. Department of State, administers the International Traffic in Arms Regulations (ITAR) (22 CFR parts 120-130). The items subject to the jurisdiction of the ITAR, *i.e.*, “defense articles,” are identified on the ITAR’s U.S. Munitions List (USML) (22 CFR 121.1). With few exceptions, items not subject to the export control jurisdiction of the ITAR are subject to the jurisdiction of the Export Administration Regulations (“EAR,” 15 CFR parts 730-774, which includes the Commerce Control List (CCL) in Supplement No. 1 to Part 774), administered by the Bureau of Industry and Security (BIS), U.S. Department of Commerce. Both the ITAR and the EAR impose license requirements on exports and reexports. Items not subject to the ITAR or to the exclusive licensing jurisdiction of any other set of regulations are subject to the EAR.

The revisions contained in this rule are part of the Department of State’s retrospective plan under E.O. 13563 completed on August 17, 2011. The Department of State’s full plan can be accessed at <http://www.state.gov/documents/organization/181028.pdf>.

**Revision of Category XII**

This proposed rule revises USML Category XII, covering fire control, range finder, optical and guidance and control equipment, to advance the national security objectives set forth above and to more accurately describe the articles within the category, in order to establish a “bright line” between the USML and the CCL for the control of these articles.

Paragraph (a) is revised to add subparagraphs (1) through (9) to more clearly describe the articles controlled in (a).

Paragraph (a)(1) is added for fire control systems and equipment.

Paragraph (a)(2) is added for weapons sights and weapons aiming or imaging systems, with certain infrared focal plane arrays, image intensifier tubes, ballistic computers, or lasers.

Paragraph (a)(3) is added for electronic or optical weapon positioning, laying, or spotting systems or equipment.

Paragraph (a)(4) is added for certain laser spot trackers and laser spot detectors.

Paragraph (a)(5) is added for bomb sights and bombing computers.

Paragraph (a)(6) is added for electro-optical missile or ordnance tracking or guidance systems.

Paragraph (a)(7) is added for electro-optical systems or equipment that automatically detect and locate weapons launch or fire.

Paragraph (a)(8) is added for certain remote wind sensing systems or equipment for enhanced targeting.

Paragraph (a)(9) is added for certain helmet mounted display (HMD) systems.

Paragraph (b) is revised to add subparagraphs (1) through (14) to more clearly describe the articles controlled in (b).

Paragraph (b)(1) is added for laser target designators or coded target markers.

Paragraph (b)(2) is added for certain infrared laser aiming or target illumination systems.

Paragraph (b)(3) is added for certain laser range finders.

Paragraph (b)(4) is added for certain targeting or target location systems.

Paragraph (b)(5) is added for optical augmentation systems.

Paragraph (b)(6) is added for certain light detection and ranging (LIDAR), laser detection and ranging (LADAR), or range-gated systems and includes a carve out for certain LIDAR systems for civil automotive applications.

Paragraph (b)(7) is added for certain synthetic aperture LIDAR or LADAR systems.

Paragraph (b)(8) is added for LIDAR, LADAR, or other laser range-gated identified in subparagraphs (i) – (vi).

Paragraph (b)(9) is added for certain lasers for electronic combat systems controlled in Category XI(a)(4).

Paragraph (b)(10) is added for certain tunable semiconductor lasers.

Paragraph (b)(11) is added for certain non-tunable single transverse mode semiconductor lasers.

Paragraph (b)(12) is added for certain non-tunable multiple transverse mode semiconductor lasers.

Paragraph (b)(13) is added for laser stacked arrays identified in subparagraphs (i) – (iv).

Paragraph (b)(14) is added for developmental lasers funded by the Department of Defense.

Paragraph (c) is revised to add subparagraphs (1) through (21) to more clearly describe the articles controlled in (c).

Paragraph (c)(1) is added for certain second and third generations image intensifier tubes (IITs).

Paragraph (c)(2) is added for certain photon detector, microbolometer detector, or multispectral detector infrared focal plane arrays (IRFPAs).

Paragraph (c)(3) is added for certain one-dimensional photon detector IRFPAs in a permanent encapsulated sensor assembly.

Paragraph (c)(4) is added for certain two-dimensional photon detector IRFPAs in a permanent encapsulated sensor assembly.

Paragraph (c)(5) is added for certain microbolometer IRFPAs in a permanent encapsulated sensor assembly.

Paragraph (c)(6) is added for multispectral IRFPAs in a permanent encapsulated sensor assembly.

Paragraph (c)(7) is added for certain charge multiplication focal plane arrays.

Paragraph (c)(8) is added for certain charge multiplication focal plane arrays in a permanent encapsulated sensor assembly.

Paragraph (c)(9) is added for certain integrated IRFPA dewar cooler assemblies (IDCAs).

Paragraph (c)(10) is added for gimbals with two or more axes of active stabilization having a minimum root-mean-square (RMS) stabilization better (less) than 200 microradians.

Paragraph (c)(11) is added for gimbals with two or more axes of active stabilization having a minimum root-mean-square (RMS) stabilization better (less) than 100 microradians.

Paragraph (c)(12) is added for infrared imaging camera cores identified in subparagraphs (i) – (xi). Camera cores meeting the shock tolerance criteria described in (c)(12)(ii) are controlled on the USML whether or not they are tested to meet these criteria.

Paragraph (c)(13) is added for binoculars, bioculars, monoculars, goggles, or head- or helmet-mounted imaging systems with IITs or camera cores controlled in this category.

Paragraph (c)(14) is added for certain targeting systems.

Paragraph (c)(15) is added for infrared search and track (IRST) systems.

Paragraph (c)(16) is added for infrared imaging systems identified in subparagraphs (i) – (ix).

Paragraph (c)(17) is added for certain terahertz imaging systems.

Paragraph (c)(18) is added for near-to-eye display systems or equipment, specially designed for articles controlled in this subchapter.

Paragraph (c)(19) is added for systems or equipment that project radiometrically calibrated scenes directly into the entrance aperture of an electro-optical or infrared (EO/IR) sensor controlled in this subchapter within either the spectral band exceeding 10 nm but not exceeding 400 nm, or the spectral band exceeding 900 nm but not exceeding 30,000 nm.

Paragraph (c)(20) is added for certain systems or equipment incorporating an infrared beacon or emitter specially designed for Identification Friend or Foe (IFF) and specially designed parts and components therefor.

Paragraph (c)(21) is added for developmental imaging systems funded by the Department of Defense.

A note is added to paragraph (c) to address the incorporation of these defense articles into commercial items. With minor exceptions, all bare IRFPAs are controlled in Category XII, paragraph (c)(2). However, once an IRFPA has been incorporated into a permanent encapsulated sensor assembly, it ceases to be controlled in paragraph (c)(2) because it is incorporated into a higher order assembly. The permanent encapsulated sensor assembly will be controlled in paragraphs (c)(3) – (6), if it meets the control parameters of one of those paragraphs. These control parameters are set at a level that the Department has determined excludes most commercial products. Further, once most IRFPAs and permanent encapsulated sensor assemblies are incorporated into a camera core, monocular, or binocular or other higher order system, that system will not be subject to the ITAR or require authorization from the Department for export, unless it is specifically enumerated. Most multi-spectral IRFPAs and IRFPAs with charge

multiplication are excluded from the note and remain subject to the ITAR, even when incorporated into higher order assemblies or end-items. IRFPA, permanent encapsulated sensor assemblies, camera cores, monoculars, binoculars, and other higher order systems not enumerated on the USML are generally subject to the EAR.

Paragraph (d) is revised to move controls on Global Navigation Satellite System (GNSS) equipment from Category XV and to add subparagraphs (1) through (9) to more clearly describe the articles controlled in (d).

Paragraph (d)(1) is added for certain guidance or navigation systems.

Paragraph (d)(2) is added for certain accelerometers.

Paragraph (d)(3) is added for certain gyroscopes or angular rate sensors.

Paragraph (d)(4) is added for certain mobile relative gravimeters.

Paragraph (d)(5) is added for certain mobile gravity gradiometers.

Paragraph (d)(6) is added for Global Navigation Satellite System receiving equipment from Category XV.

Paragraph (d)(7) is added for certain GNSS anti-jam systems employing adaptive antennas.

Paragraph (d)(8) is added for certain GNSS security devices.

Paragraph (d)(9) is added for developmental guidance, navigation, or control devices, systems or equipment funded by the Department of Defense.

Paragraph (e) is revised to add subparagraphs (1) through (15) to more clearly describe the parts and components controlled in (e).

A significant aspect of this more positive, but not yet tiered, proposed USML category is that it does not contain controls on all generic parts, components, accessories, and attachments that are specifically designed or modified for a defense article, regardless of their significance to maintaining a military advantage for the United States. Rather, it contains, with a few exceptions, a positive list of specific types of parts, components, accessories, and attachments that continue to warrant control on the USML. The exceptions pertain to those parts, components, accessories, and attachments identified as “specially designed.”

Paragraph (e)(1) is added for specially designed optical sensors for electronic combat systems controlled in Category XI(a)(4).

Paragraph (e)(2) is added for certain image intensifier tube (IIT) parts and components identified in subparagraphs (i) – (vii).

Paragraph (e)(3) is added for certain wafers incorporating structures for Read-Out Integrated Circuits (ROICs) controlled in (e)(4) or (e)(5) or for IRFPA detectors controlled in (c)(2).

Paragraph (e)(4) is added for ROICs specially designed for IRFPAs.

Paragraph (e)(5) is added for certain ROICs specially designed for a system, camera core, or packaged IRFPA controlled in paragraph (c).

Paragraph (e)(6) is added for specially designed vacuum packages or other sealed enclosures for an IRFPA or IIT controlled in paragraph (c).

Paragraph (e)(7) is added for integrated IRFPA dewar cooler assembly (IDCA) parts and components identified in subparagraphs (i) – (iv).

Paragraph (e)(8) is added for specially designed IRFPA Joule-Thomson (JT) self-regulating cryostats.

Paragraph (e)(9) is added for specially designed infrared lenses, mirrors, beam splitters or combiners, filters, and treatments and coatings.

Paragraph (e)(10) is added for specially designed drive, control, signal or image processing electronics.

Paragraph (e)(11) is added for signal processing electronics identified in subparagraphs (i) – (iii).

Paragraph (e)(12) is added for specially designed near-to-eye displays.

Paragraph (e)(13) is added for specially designed resonators, receivers, transmitters, modulators, gain media, and drive electronics or frequency converters.

Paragraph (e)(14) is added for two-dimensional infrared scene projector emitter arrays (i.e., resistive arrays) that emit infrared radiation within the 900 nm to 30,000 nm wavelength range.

Paragraph (e)(15) is added for classified parts, components, accessories, attachments, and associated equipment.

A note is added to paragraph (e) to address the incorporation of these defense articles into commercial items.

Paragraph (f) is revised to more clearly describe the technical data and defense services controlled in paragraph (f).

Three notes are added to paragraph (f) to address technical data and defense services when incorporating defense articles into commercial items. Note 1 clarifies that technical data directly related to IITs, IRFPAs, integrated IRFPA dewar cooler assemblies and related wafers and ROICs controlled in this Category remains USML controlled, even when those defense articles are part of a system that is subject to the EAR. Note 2 enumerates certain technical data and software that are directly related to the defense articles controlled in this Category in paragraphs A, B, and C. It also

includes a note to paragraph A, identifying certain technology that is not technical data. Note 3 states that certain technology for the incorporation or integration of IRFPAs and IITs in to items subject to the EAR, including into permanent encapsulated sensor assemblies, is subject to the EAR.

A new (x) paragraph has been added to USML Category XII, allowing ITAR licensing for commodities, software, and technology subject to the EAR provided those commodities, software, and technology are to be used in or with defense articles controlled in USML Category XII *and* are described in the purchase documentation submitted with the application.

Finally, articles common to the Missile Technology Control Regime (MTCR) Annex and the USML are to be identified on the USML with the parenthetical “(MT)” at the end of each section containing such articles. A separate proposed rule will address the sections in the ITAR that include MTCR definitions.

The following definitions explain and amplify terms used in this Category and are provided to assist exporters in understanding the scope of the proposed control.

Charge multiplication is a form of electronic image amplification, the generation of charge carriers as a result of an impact ionization gain process.

Focal plane array is a linear or two-dimensional planar layer, or combination of planar layers, of individual detector elements, with or without readout electronics, which work in the focal plane.

Note: This definition does not include a stack of single detector elements or any two, three, or four element detectors provided time delay and integration is not performed within the element.

Image intensifier tube refers to an imaging device that incorporates a photoemissive transducer (i.e., photocathode) and achieves electron image amplification in the vacuum space.

Microbolometer is a thermal imaging detector that, as a result of a temperature change in the detector caused by the absorption of infrared radiation, is used to generate a usable signal.

Multispectral refers to producing discrete outputs associated with more than one spectral band of response.

### **Request for Comments**

As the U.S. Government works through the proposed revisions to the USML, some control parameters are proposed recognizing that they will control items in normal commercial use and on the Wassenaar Arrangement's Dual Use List. With the thought that multiple perspectives would be beneficial to the USML revision process, the Department

welcomes the assistance of users of the lists and requests input on the following:

- 1) A key goal of this rulemaking is to ensure the USML and the CCL together control all the items that meet Wassenaar Arrangement commitments embodied in Munitions List Categories 5, 11 and 15 (WA-ML15) and the relevant Dual Use List Categories including the IRFPAs in Category 6 (WA-DU 6.A.2). To that end, the public is asked to identify any potential lack of coverage brought about by the proposed rules for Category XII contained in this notice and the new and revised ECCNs published separately by the Department of Commerce when reviewed together.
- 2) Another key goal of this rulemaking is to identify items proposed for control on the USML or the CCL that are not controlled on the Wassenaar Arrangement's Munitions or Dual Use List. The public is asked to identify any items proposed for control on the USML that are not controlled on the Wassenaar Arrangement's Munitions or Dual Use List.
- 3) A third key goal of this rulemaking is to establish a "bright line" between the USML and the CCL for the control of these materials. The public is asked to provide specific examples of control criteria that do not clearly describe items that would be defense articles and thus do not establish a "bright line" between the USML and the CCL.

- 4) Although the proposed revisions to the USML do not preclude the possibility that items in normal commercial use would or should be ITAR-controlled because, *e.g.*, they provide the United States with a critical military or intelligence advantage, the U.S. government does not want to inadvertently control items on the ITAR that are in normal commercial use. Items that would be controlled on the USML in this proposed rule have been identified as possessing parameters or characteristics that provide a critical military or intelligence advantage. The public is thus asked to provide specific examples of items, if any, that would be controlled by the revised USML Category XII that are now in normal commercial use. The examples should demonstrate actual commercial use, not just potential or theoretical use, with supporting documents, as well as foreign availability of such items.
- 5) For any criteria the public believes control items in normal commercial use, the public is asked to identify parameters or characteristics that cover items exclusively or primarily in military use.
- 6) For any criteria the public believes control items in normal commercial use, the public is asked to identify the multilateral controls (such as the Wassenaar Arrangement's Dual Use List), if any, for such items, and the consequences of such items being controlled on the USML.

7) DDTC seeks public comments on each paragraph of the proposed USML Category XII. In addition, DDTC specifically seeks public comments on the following concepts that are introduced in proposed USML Category XII: A) using integration of an IRFPA into a permanent encapsulated sensor assembly as a control parameter; B) using the incorporation of an IRFPA into an infrared imaging camera core as a control parameter and the definition of camera cores in the note to XII(c)(12); C) the weapon shock load control criterion in XII(c)(12)(ii); and D) proposed controls on specific technical data in XII(f).

## **REGULATORY ANALYSIS AND NOTICES**

### *Administrative Procedure Act*

The Department of State is of the opinion that controlling the import and export of defense articles and services is a foreign affairs function of the United States Government and that rules implementing this function are exempt from sections 553 (rulemaking) and 554 (adjudications) of the Administrative Procedure Act (APA). Although the Department is of the opinion that this rule is exempt from the rulemaking provisions of the APA, the Department is publishing this rule with a 60-day provision for public comment and without prejudice to its determination that controlling the import and export of defense services is a foreign affairs function.

*Regulatory Flexibility Act*

Since this rule is exempt from the rulemaking provisions of 5 U.S.C. 553, it does not require analysis under the Regulatory Flexibility Act.

*Unfunded Mandates Reform Act of 1995*

This proposed amendment does not involve a mandate that will result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any year and it will not significantly or uniquely affect small governments. Therefore, no actions were deemed necessary under the provisions of the Unfunded Mandates Reform Act of 1995.

*Small Business Regulatory Enforcement Fairness Act of 1996*

This proposed amendment has been found not to be a major rule within the meaning of the Small Business Regulatory Enforcement Fairness Act of 1996.

*Executive Orders 12372 and 13132*

This proposed amendment will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 13132, it is determined that this proposed amendment does not have sufficient

federalism implications to require consultations or warrant the preparation of a federalism summary impact statement. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this proposed amendment.

*Executive Orders 12866 and 13563*

Executive Orders 13563 and 12866 direct agencies to assess costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects, distributed impacts, and equity). Executive Order 13563 emphasizes the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility. This rule has been designated a “significant regulatory action,” although not economically significant, under section 3(f) of Executive Order 12866. Accordingly, the rule has been reviewed by the Office of Management and Budget (OMB).

*Executive Order 12988*

The Department of State has reviewed the proposed amendment in light of Executive Order 12988 to eliminate ambiguity, minimize litigation, establish clear legal standards, and reduce burden.

*Executive Order 13175*

The Department of State has determined that this rulemaking will not have tribal implications, will not impose substantial direct compliance costs on Indian tribal governments, and will not preempt tribal law. Accordingly, Executive Order 13175 does not apply to this rulemaking.

*Paperwork Reduction Act*

Following is a listing of approved Department of State collections that will be affected by revision of the U.S. Munitions List (USML) and the Commerce Control List pursuant to the President's Export Control Reform (ECR) initiative. The list of collections and the description of the manner in which they will be affected pertains to revision of the USML in its entirety, not only to the categories published in this rule. In accordance with the Paperwork Reduction Act, the Department of State will request comment on these collections from all interested persons at the appropriate time. In particular, the Department will seek comment on changes to licensing burden based on implementation of regulatory changes pursuant to ECR, and on projected changes based on continued implementation of regulatory changes pursuant to ECR. The information collections are as follows:

1) Statement of Registration, DS-2032, OMB No. 1405-0002. The Department estimates that between 3,000 and 5,000 of the currently-registered persons will not need to maintain registration following full

revision of the USML. This would result in a burden reduction of between 6,000 and 10,000 hours annually, based on a revised time burden of two hours to complete a Statement of Registration.

2) Application/License for Permanent Export of Unclassified Defense Articles and Related Unclassified Technical Data, DSP-5, OMB No. 1405-0003. The Department estimates that there will be 35,000 fewer DSP-5 submissions annually following full revision of the USML. This would result in a burden reduction of 35,000 hours annually.

3) Application/License for Temporary Import of Unclassified Defense Articles, DSP-61, OMB No. 1405-0013. The Department estimates that there will be 200 fewer DSP-61 submissions annually following full revision of the USML. This would result in a burden reduction of 100 hours annually.

4) Application/License for Temporary Export of Unclassified Defense Articles, DSP-73, OMB No. 1405-0023. The Department estimates that there will be 800 fewer DSP-73 submissions annually following full revision of the USML. This would result in a burden reduction of 800 hours annually.

5) Application for Amendment to License for Export or Import of Classified or Unclassified Defense Articles and Related Technical Data, DSP-6, -62, -74, -119, OMB No. 1405-0092. The Department estimates that there will be

2,000 fewer amendment submissions annually following full revision of the USML. This would result in a burden reduction of 1,000 hours annually.

6) Request for Approval of Manufacturing License Agreements, Technical Assistance Agreements, and Other Agreements, DSP-5, OMB No. 1405-0093. The Department estimates that there will be 1,000 fewer agreement submissions annually following full revision of the USML. This would result in a burden reduction of 2,000 hours annually.

7) Maintenance of Records by Registrants, OMB No. 1405-0111. The requirement to actively maintain records pursuant to provisions of the ITAR will decline commensurate with the drop in the number of persons who will be required to register with the Department pursuant to the ITAR. As stated above, the Department estimates that up to 5,000 of the currently-registered persons will not need to maintain registration following full revision of the USML. This would result in a burden reduction of 100,000 hours annually. However, the ITAR does provide for the maintenance of records for a period of five years. Therefore, persons newly relieved of the requirement to register with the Department may still be required to maintain records.

### **List of Subjects in 22 CFR Part 121**

Arms and munitions, Exports.

Accordingly, for the reasons set forth above, title 22, chapter I, subchapter M, part 121 is proposed to be amended as follows:

**PART 121 – THE UNITED STATES MUNITIONS LIST**

1. The authority citation for part 121 continues to read as follows:

**Authority:** Secs. 2, 38, and 71, Pub. L. 90–629, 90 Stat. 744 (22 U.S.C. 2752, 2778, 2797); 22 U.S.C. 2651a; Pub. L. 105–261, 112 Stat. 1920; Section 1261, Pub. L. 112-239; E.O. 13637, 78 FR 16129.

**§121.1 [Amended]**

2. Section 121.1 is amended by removing and reserving paragraph (e) in U.S. Munitions List Category VIII.

3. Section 121.1 is amended by revising U.S. Munitions List Category XII to read as follows:

**§121.1 The United States Munitions List.**

\* \* \* \* \*

**Category XII — Fire Control, Range Finder, Optical and Guidance and Control Equipment**

\*(a) Fire control, weapons sights, aiming, and imaging systems and equipment, as follows:

(1) Fire control systems or equipment, and specially designed parts and components therefor;

(2) Weapon sights, weapon aiming systems or equipment, and weapon imaging systems or equipment (e.g., clip-on), with or without an integrated viewer, display, or reticle, and incorporating or specially designed to incorporate any of the following:

(i) An infrared focal plane array having a peak response at a wavelength exceeding 1,000 nm;

(ii) An article subject to this subchapter; or

(iii) A ballistic computer for adjusting the aim point display;

(3) Electronic or optical weapon positioning, laying, or spotting systems or equipment;

(4) Laser spot trackers or laser spot detection, location or imaging systems or equipment, with an operational wavelength shorter than 400 nm or longer than 710 nm, and a detection range greater than 300 m;

Note to paragraph (a)(4): For controls on LIDAR, see paragraph (b)(9) of this category.

(5) Bomb sights or bombing computers;

(6) Electro-optical missile or ordnance tracking systems or equipment, or electro-optical ordnance guidance systems or equipment;

(7) Electro-optical systems or equipment that automatically detect and locate weapons launch or fire;

(8) Remote wind-sensing systems or equipment specially designed for ballistic-corrected aiming, and specially designed parts and components therefor;

(9) Helmet mounted display (HMD) systems or equipment, incorporating optical sights or slewing devices, which include the ability to aim, launch, track, or manage munitions, or control infrared imaging systems or equipment, other than such items controlled in Category VIII, (e.g., Combat Vehicle Crew HMD, Mounted Warrior HMD, Integrated Helmet Assembly Subsystem, Drivers Head Tracked Vision System).

\*(b) Lasers, and laser systems and equipment, as follows:

(1) Laser target designators or coded target markers;

(2) Aiming or target illumination systems or equipment having a laser output wavelength exceeding 710 nm;

(3) Laser rangefinders having any of the following:

(i) Q-switched laser pulse; or

(ii) Laser output wavelength exceeding 1,000 nm;

(4) Targeting or target location systems or equipment incorporating or specially designed to incorporate a laser rangefinder controlled in paragraph

(b)(3) of this category, and incorporating or specially designed to

incorporate a Global Navigation Satellite System (GNSS), guidance or

navigation article controlled in paragraph (d) of this category (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned aerial vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km range);

(5) Systems or equipment that use laser energy with an output wavelength exceeding 710 nm to exploit differential target-background retroreflectance in order to detect personnel or optical / electro-optical equipment (e.g., optical augmentation systems);

(6) Light detection and ranging (LIDAR), laser detection and ranging (LADAR), or range-gated systems or equipment, incorporating or specially designed to incorporate an article controlled in this subchapter (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned aerial vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km);

Note to paragraph (b)(6): This paragraph does not control LIDAR systems or equipment for civil automotive applications having a range limited to 200 m or less.

(7) Synthetic aperture LIDAR or LADAR systems or equipment, having a stand-off range of 100 m or greater (MT if designed or modified for rockets,

missiles, SLVs, drones, or unmanned aerial vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km);

(8) LIDAR, LADAR, or other laser range-gated systems or equipment, as follows (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned aerial vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km):

(i) Systems or equipment having a resolution (i.e., ground point spacing) of 0.2 m or less (better) from an altitude above ground level of greater than 16,500 ft, and incorporating or specially designed to incorporate a gimbal-mounted transmitter or beam director, and specially designed parts and components therefor;

(ii) Aircraft systems or equipment having a laser output wavelength exceeding 1,000 nm and a detection range exceeding 500 m for an obstacle with a diameter or width less than or equal to 10 mm (e.g., wire, power line);

(iii) Systems or equipment having an electrical bandwidth of 100 MHz or greater, and incorporating or specially designed to incorporate either a Geiger-mode detector array having at least 32 elements or a linear-mode detector array having at least 128 elements;

(iv) Systems or equipment employing coherent heterodyne or coherent homodyne detection techniques, having an angular resolution of less (better)

than 100 microradians and an operational carrier noise ratio (CNR) less than 10;

(v) Systems or equipment that automatically classify or identify submersibles, mines, unexploded ordnance or improvised explosive devices (IEDs); or

(vi) Systems or equipment specially designed for obstacle avoidance or autonomous navigation in ground vehicles controlled in Category VII;

Note to paragraphs (b)(4) and (b)(6) through (8): “Payload” is the total mass that can be carried or delivered by the specified rocket, missile, SLV, drone or unmanned aerial vehicle that is not used to maintain flight. For definition of “range” as it pertains to rocket systems, see note 1 to paragraph (a) of USML Category IV. For definition of “range” as it pertains to aircraft systems, see note to paragraph (a) of USML Category VIII.

(9) Lasers operating at a wavelength exceeding 3,000 nm that provide a modulated output for systems or equipment controlled in Category XI(a)(4);

(10) Tunable semiconductor lasers having an output wavelength exceeding 1,400 nm and an output power greater than 1 W;

(11) Non-tunable single transverse mode semiconductor lasers having an output wavelength exceeding 1,510 nm and either an average output power or continuous wave (CW) output power greater than 2 W;

(12) Non-tunable multiple transverse mode semiconductor lasers having an output wavelength exceeding 1,900 nm and either an average output power or CW output power greater than 2 W;

(13) Laser stacked arrays as follows:

(i) Having an output wavelength not exceeding 1,400 nm and a peak pulsed power density greater than 3,300 W/cm<sup>2</sup>;

(ii) Having an output wavelength exceeding 1,400 nm but less than 1,900 nm and a peak pulsed power density greater than 700 W/cm<sup>2</sup>;

(iii) Having an output wavelength exceeding 1,900 nm and a peak pulsed power density greater than 70 W/cm<sup>2</sup>; or

(iv) Having an output wavelength exceeding 1,900 nm, and either an average output power or CW output power greater than 20W;

(14) Developmental lasers and laser systems or equipment funded by the Department of Defense;

*Note 1 to paragraph (b)(14):* This paragraph does not control developmental lasers and laser systems or equipment (a) in production, (b) determined to be subject to the EAR via a commodity jurisdiction determination (see §120.4 of this subchapter), or (c) identified in the relevant Department of Defense contract or other funding authorization as being developed for both civil and military applications.

Note 2 to paragraph (b)(14): Note 1 does not apply to defense articles enumerated on the U.S. Munitions List, whether in production or development.

Note 3 to paragraph (b)(14): This provision is applicable to those contracts or other funding authorizations that are dated XXXX, 2016, or later.

\*(c) Infrared focal plane arrays, image intensifier tubes, night vision, electro-optic, infrared and terahertz systems, equipment and accessories, including cameras and cores, as follows:

(1) Image intensifier tubes (IITs) having a peak response within the wavelength range exceeding 400 nm but not exceeding 2,050 nm and incorporating either a microchannel plate described in paragraph (e)(2)(i) of this category or electron sensing device described in paragraph (e)(2)(iv) of this category, as follows, and specially designed parts and components therefor:

(i) Incorporating a multialkali photocathode having a luminous sensitivity exceeding 500 microamps per lumen (e.g., GEN 2 IITs);

(ii) Incorporating a compound semiconductor photocathode having a radiant sensitivity exceeding 20 mA/W (e.g., GEN 3 IITs);

(2) Photon detector, microbolometer detector, or multispectral detector infrared focal plane arrays (IRFPAs) having a peak response within the

wavelength range exceeding 900 nm but not exceeding 30,000 nm and not integrated into a permanent encapsulated sensor assembly, and detector elements therefor;

Note 1 to paragraph (c)(2): This paragraph does not control lead sulfide or lead selenide IRFPAs having a peak response within the wavelength range exceeding 1,000 nm but not exceeding 5,000 nm and not exceeding 16 detector elements, or pyroelectric IRFPAs with detectors composed of any of the following or their variants: triglycine sulphate, lead-lanthanum-zirconium titanate, lithium tantalite, polyvinylidene fluoride, or strontium barium niobate.

Note 2 to paragraph (c)(2): For controls on readout integrated circuits (ROICs), see paragraphs (e)(4) and (e)(5) of this category.

(3) One-dimensional photon detector IRFPAs described in paragraph (c)(2) of this category in a permanent encapsulated sensor assembly, having greater than 640 detector elements;

(4) Two-dimensional photon detector IRFPAs described in paragraph (c)(2) of this category in a permanent encapsulated sensor assembly, having greater than 256 detector elements;

- (5) Microbolometer IRFPAs described in paragraph (c)(2) of this category in a permanent encapsulated sensor assembly, having greater than 328,000 detector elements;
- (6) Multispectral IRFPAs in a permanent encapsulated sensor assembly, having a peak response in any spectral band within the wavelength range exceeding 1,500 nm but not exceeding 30,000 nm;
- (7) Charge multiplication focal plane arrays having greater than 1,600 elements in any dimension and having a maximum radiant sensitivity exceeding 50 mA/W for any wavelength exceeding 760 nm but not exceeding 900 nm, and avalanche detector elements therefor;
- (8) Charge multiplication focal plane arrays described in paragraph (c)(7) of this category in a permanent encapsulated sensor assembly, and avalanche detector elements therefor;
- (9) Integrated IRFPA dewar cooler assemblies (IDCAs), with or without an IRFPA, having any of the following:
- (i) Cryocoolers having a cooling source temperature below 218 K and a mean-time-to-failure (MTTF) in excess of 3000 hours;
  - (ii) Active cold fingers;
  - (iii) Variable or dual aperture mechanisms; or

(iv) Dewars specially designed for articles controlled in paragraphs (a), (b), or (c) of this category;

(10) Gimbals with two or more axes of active stabilization having a minimum root-mean-square (RMS) stabilization better (less) than 200 microradians, and specially designed for articles controlled in this subchapter;

(11) Gimbals with two or more axes of active stabilization having a minimum root-mean-square (RMS) stabilization better (less) than 100 microradians;

*Note to paragraph (c)(11):* This paragraph does not control gimbals containing only a non-removable camera payload operating exclusively in the visible spectrum (i.e., 400 nm to 760 nm).

(12) Infrared imaging camera cores (e.g., modules, engines, kits), and specially designed electronics and optics therefor, having any of the following:

(i) An image intensifier tube described in paragraph (c)(1) of this category;

(ii) Output imagery when subject to more than 20 weapon shock load events of 325 g for 0.4 ms and a microbolometer IRFPA having greater than 111,000 detector elements;

- (iii) A microbolometer IRFPA described in paragraph (c)(2) of this category having greater than 328,000 detector elements, or a microbolometer IRFPA described in paragraph (c)(5) of this category;
- (iv) An IDCA described in paragraph (c)(9) of this category, or IDCA parts or components described in paragraph (e)(7) of this category;
- (v) A one-dimensional photon detector IRFPA described in paragraph (c)(2) of this category having a peak response within the wavelength range exceeding 900 nm but not exceeding 2,500 nm and greater than 640 detector elements;
- (vi) A one-dimensional or two-dimensional photon detector IRFPA described in paragraph (c)(2) of this category having a peak response within the wavelength range exceeding 2,500 nm but not exceeding 30,000 nm and greater than 256 detector elements;
- (vii) A one-dimensional photon detector IRFPA described in paragraph (c)(3) of this category;
- (viii) A two-dimensional photon detector IRFPA described in paragraph (c)(2) or (4) of this category having a peak response within the wavelength range exceeding 900 nm but not exceeding 2,500 nm, and greater than 111,000 detector elements;

(ix) A two-dimensional photon detector IRFPA described in paragraph (c)(4) of this category having a peak response within the wavelength range exceeding 2,500 nm but not exceeding 30,000 nm;

(x) A multispectral infrared focal plane array described in paragraph (c)(2) or (6) of this category; or

(xi) A charge multiplication IRFPA controlled in paragraph (c)(7) or (8) of this category;

Note to paragraph (c)(12): The articles controlled by this paragraph have sufficient electronics to enable as a minimum the output of an analog or digital signal once power is applied.

(13) Binoculars, bioculars, monoculars, goggles, or head or helmet-mounted imaging systems or equipment (including video-based articles having a separate near-to-eye display) that incorporate or are specially designed to incorporate any of the following, and specially designed electronics, optics, and displays therefor:

(i) An IIT controlled in this category; or

(ii) An infrared imaging camera core controlled in paragraph (c)(12)(i) through (xi) of this category;

Note to paragraph (c)(13): The articles controlled in this paragraph include binoculars, bioculars, monoculars, goggles, or head- or helmet-mounted imaging systems or equipment (including video-based articles having a separate near-to-eye display) that incorporate or are specially designed to incorporate an IRFPA or IIT article (e.g., IDCA, IRFPA assembly) and electronics separately.

(14) Targeting systems or equipment incorporating or specially designed to incorporate an article controlled in this category (e.g., pods, IBAS, SGFLIR, gunner TIS), and specially designed parts and components therefor;

(15) Infrared search and track (IRST) systems or equipment that incorporate or are specially designed to incorporate an article controlled in this category, and maintain positional or angular state of a target through time, and specially designed parts and components therefor;

(16) Infrared imaging systems or equipment (e.g., fully packaged cameras) incorporating or specially designed to incorporate an article controlled in this category, as follows, and specially designed electronics, optics, and displays therefor:

(i) Having two or more axes of active stabilization and a minimum root-mean-square (RMS) stabilization better (less) than 200 microradians;

(ii) Mobile reconnaissance, scout, or surveillance systems or equipment providing real-time target location at ranges greater than 5 km (e.g., LRAS, CIV, HTI, SeeSpot, MMS);

(iii) Fixed-site reconnaissance, surveillance or perimeter security systems or equipment having greater than 640 detector elements in any dimension;

(iv) Combat vehicle, tactical wheeled vehicle, naval vessel, or aircraft pilotage systems or equipment having a variable field of view or field of regard (e.g., electronic pan or tilt), and either an IRFPA article controlled in this subchapter with greater than 640 detector elements in any dimension, or an IIT controlled in this category (e.g., DAS, DVE, SeaFLIR, PNVS);

Note to paragraph (c)(16)(iv): This paragraph does not control distributed aperture sensors specially designed for civil automotive lane departure warning or collision avoidance.

(v) Multispectral imaging systems or equipment that either incorporate a multispectral IRFPA described in paragraph (c)(2) or (6) of this category, or classify or identify military or intelligence targets or characteristics;

(vi) Automated missile detection or warning;

(vii) Hardened to withstand electromagnetic pulse (EMP) or chemical, biological, or radiological threats;

(viii) Incorporating mechanism(s) to reduce signature; or

- (ix) Specially designed for military platforms controlled in USML Categories VI, VII or VIII (MT if designed or modified for unmanned aerial vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km);
- (17) Terahertz imaging systems or equipment having a peak response in the frequency range exceeding 30 GHz but not exceeding 3000 GHz and having a resolution less (better) than 0.5 milliradians at a standoff range of 100 m;
- (18) Near-to-eye display systems or equipment, specially designed for articles controlled in this subchapter;
- (19) Systems or equipment that project radiometrically calibrated scenes directly into the entrance aperture of an electro-optical or infrared (EO/IR) sensor controlled in this subchapter within either the spectral band exceeding 10 nm but not exceeding 400 nm, or the spectral band exceeding 900 nm but not exceeding 30,000 nm; or
- (20) Systems or equipment incorporating an infrared (IR) beacon or emitter specially designed for Identification Friend or Foe (IFF), and specially designed parts and components therefor;
- (21) Developmental imaging systems or equipment funded by the Department of Defense.

Note 1 to paragraph (c)(21): This paragraph does not control imaging systems or equipment (a) in production; (b) determined to be subject to the EAR via a commodity jurisdiction determination (see §120.4 of this subchapter), or (c) identified in the relevant Department of Defense contract or other funding authorization as being developed for both civil and military applications.

Note 2 to paragraph (c)(21): Note 1 does not apply to defense articles enumerated on the U.S. Munitions List, whether in production or development.

Note 3 to paragraph (c)(21): This provision is applicable to those contracts or other funding authorizations that are dated XXXX, 2016, or later.

Note 1 to paragraph (c): A permanent encapsulated sensor assembly (e.g., sealed enclosure, vacuum package) prevents direct access to the IRFPA, disassembly of the sensor assembly, and removal of the IRFPA without destruction or damage to the IRFPA.

Note 2 to paragraph (c): The articles described in paragraphs (c)(1) through (5), (c)(7), (c)(8), and (c)(12) other than (c)(12)(ix) having greater than 640 detector elements in any dimension, and (c)(12)(x) are subject to the EAR when, prior to export, reexport, retransfer, or temporary import, they are integrated into and included as an integral part of an item subject to the

EAR, and cannot be removed without destruction or damage to the article or render the item inoperable. Articles are not subject to the EAR until integrated into the item subject to the EAR. Defense articles intended to be integrated, and technical data and defense services directly related thereto remain subject to the ITAR prior to integration. See paragraph (f) of this category for enumerated technical data and software, and specific information subject to the EAR.

(d) Guidance, navigation, and control systems and equipment as follows:

(1) Guidance or navigation systems (e.g., inertial navigation systems, inertial measurement units, inertial reference units, attitude and heading reference systems) as follows (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned aerial vehicle systems capable of a range greater than or equal to 300 km);

(i) Having a circle of equal probability (CEP) of position error rate less (better) than 0.35 nautical miles per hour;

(ii) Having a heading error or true north determination of less (better) than 0.50 mrad secant (latitude) (0.02865 degrees secant (latitude)); or

(iii) Specified to function at linear acceleration levels exceeding 25 g;

Note to paragraph (d)(1): For aircraft and unmanned aerial vehicle guidance or navigation systems, see USML Category VIII(e). For rocket or missile

flight control and guidance systems (including guidance sets), see USML Category IV(h).

(2) Accelerometers having a bias stability of less (better) than 20  $\mu\text{g}$ , a scale factor stability of less (better) than 20 parts per million, or capable of measuring greater than 100,000 g (MT if having a scale factor repeatability less (better) than 1250 ppm and bias repeatability less (better) than 1250 micro g or specified to function at acceleration levels greater than 100 g);

Note 1 to paragraph (d)(2): For weapon fuze accelerometers, see USML Category III(d) or IV(h).

Note 2 to paragraph (d)(2): MT designation does not include accelerometers that are designed to measure vibration or shock.

(3) Gyroscopes or angular rate sensors having an angle random walk of less (better) than 0.00125 degree per square root hour or having a bias stability less (better) than 0.0015 degrees per hour (MT if having a rated drift stability of less than 0.5 degrees (1 sigma or rms) per hour in a 1 g environment or specified to function at acceleration levels greater than 100 g);

(4) Mobile relative gravimeters, having automatic motion compensation, with an in-service accuracy of less (better) than 0.4 mGal (MT if designed or

modified for airborne or marine use and having a time to steady-state registration of two minutes or less);

(5) Mobile gravity gradiometers having an accuracy of less (better) than 10 Eötvös squared per radian per second for any component of the gravity gradient tensor, and having a spatial gravity wavelength resolution of 50 m or less (MT if designed or modified for airborne or marine use);

*Note to paragraph (d)(5):* “Eötvös” is a unit of acceleration divided by distance that was used in conjunction with the older centimeter-gram-second system of units. The Eötvös is defined as 1/1,000,000,000 Galileo (Gal) per centimeter.

(6) Global Navigation Satellite System (GNSS) receiving equipment, as follows, and specially designed parts and components therefor:

(i) Global Navigation Satellite System (GNSS) receiving equipment specially designed for military applications (MT if designed or modified for airborne applications and capable of providing navigation information at speeds in excess of 600 m/s);

(ii) Global Positioning System (GPS) receiving equipment specially designed for encryption or decryption (e.g., Y-Code, M-Code) of GPS precise positioning service (PPS) signals (MT if designed or modified for airborne applications);

(iii) GPS receiving equipment specially designed for use with a null steering antenna, an electronically steerable antenna, or including a null steering antenna designed to reduce or avoid jamming signals (MT if designed or modified for airborne applications); or

Note to paragraph (6)(iii): The articles described in this paragraph are subject to the EAR when, prior to export, reexport, retransfer, or temporary import, they are integrated into and included as an integral part of an item subject to the EAR. Articles do not become subject to the EAR until integrated into the item subject to the EAR. Export, reexport, retransfer, or temporary import of, and technical data and defense services directly related to, defense articles intended to be integrated, remain subject to the ITAR.

(iv) GPS receiving equipment specially designed for use with rockets, missiles, space launch vehicles (SLVs), drones, or unmanned air vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km (MT);

Note to paragraph (6)(iv): “Payload” is the total mass that can be carried or delivered by the specified rocket, missile, SLV, drone or unmanned aerial vehicle that is not used to maintain flight. For definition of “range” as it pertains to rocket systems, see note 1 to paragraph (a) of USML Category

IV. For definition of “range” as it pertains to aircraft systems, see note to paragraph (a) of USML Category VIII.

(7) GNSS anti-jam systems employing adaptive antennas that have a minimum of four antenna elements, add 35 dB or greater anti-jam margin, and produce nulls in the direction of jammers or high-gain beams in the direction of satellites at any ranging code frequency;

(8) GNSS security devices (e.g., Selective Availability Anti-Spoofing Modules, Security Modules, and Auxiliary Output Chips), Selective Availability Anti-Spoofing Module (SAASM), Security Module (SM) and Auxiliary Output Chip (AOC) chips; or

(9) Developmental guidance, navigation, or control devices, systems or equipment funded by the Department of Defense (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned aerial vehicle systems capable of a range equal to or greater than 300 km);

*Note 1 to paragraph (d)(9):* This paragraph does not control guidance, navigation, or control, systems, or equipment (a) in production, (b) determined to be subject to the EAR via a commodity jurisdiction determination (see §120.4 of this subchapter), or (c) identified in the relevant Department of Defense contract or other funding authorization as being developed for both civil and military applications.

Note 2 to paragraph (d)(9): Note 1 does not apply to defense articles enumerated on the U.S. Munitions List, whether in production or development.

Note 3 to paragraph (d)(9): This provision is applicable to those contracts or other funding authorizations that are dated XXXX, 2016, or later.

Note 4 to paragraph (d)(9): For definition of “range” as it pertains to rocket systems, see note 1 to paragraph (a) of USML Category IV. For definition of “range” as it pertains to aircraft systems, see note to paragraph (a) of USML Category VIII.

(e) Parts, components, accessories, attachments, and associated equipment as follows:

(1) Optical sensors having a spectral filter for systems or equipment controlled in USML Category XI(a)(4), or optical sensor assemblies that provide threat warning or tracking for systems or equipment controlled in Category XI(a)(4) and specially designed optics and electronics therefor;

(2) Image intensifier tube (IIT) parts and components as follows:

(i) Microchannel plates having a hole pitch (center-to-center spacing) of 12  $\mu\text{m}$  or less;

(ii) Multialkali photocathodes (e.g., S-20 and S-25) having a luminous sensitivity exceeding 500 microamps per lumen;

- (iii) III/V compound semiconductor (e.g., GaAs or GaInAs) photocathodes and transferred electron photocathodes having a radiant sensitivity exceeding 20 mA/W;
  - (iv) Electron sensing devices with detectors having a non-binned center-to-center spacing less than 100  $\mu\text{m}$ , and either achieving charge multiplication within the vacuum space other than by a microchannel plate or specially designed for operation with a microchannel plate;
  - (v) Phosphor screens, including output faceplates, specially designed for IITs controlled in this category;
  - (vi) Miniature autogated power supplies providing internal sensing and control of the photocathode to increase the dynamic range of IITs controlled in this category; or
  - (vii) Fiber-optic inverters, couplers or tapers specially designed for IITs controlled in this category;
- (3) Wafers incorporating structures for either a ROIC controlled in paragraph (e)(4) or (5) of this category, or an IRFPA or detector elements therefor controlled in paragraph (c)(2) of this category;
- (4) Read-Out Integrated Circuits (ROICs) specially designed for an IRFPA controlled in paragraph (c)(2) of this category or detector elements therefor, as follows:

- (i) One-dimensional photon detector IRFPA having greater than 640 detector elements;
- (ii) Two-dimensional photon detector IRFPA having greater than 256 detector elements;
- (iii) A microbolometer IRFPA having greater than 19,200 elements; or
- (iv) Multispectral IRFPA;

Note to paragraph (e)(4): ROICs are specially designed for an infrared focal plane array detector even if the detector is incorporated into an item that is not enumerated on the U.S. Munitions List.

- (5) ROICs specially designed for a camera/core/package IRFPA subject to the controls of this subchapter;
- (6) Vacuum packages or other sealed enclosures for an IRFPA or IIT controlled in paragraph (c) of this category specially designed for incorporation or integration into an article controlled in paragraphs (a), (b), or (c) of this category;
- (7) Integrated IRFPA dewar cooler assembly (IDCA) parts and components, as follows:
  - (i) Cryocoolers having a cooling source temperature below 218 K and a mean-time-to-failure (MTTF) in excess of 3000 hours;
  - (ii) Active cold fingers;

- (iii) Variable or dual aperture mechanisms; or
  - (iv) Dewars specially designed for articles controlled in paragraphs (a), (b) or (c) of this category;
  - (8) IRFPA Joule-Thomson (JT) self-regulating cryostats specially designed for articles controlled in this subchapter;
  - (9) Infrared lenses, mirrors, beam splitters or combiners, filters, and treatments and coatings, specially designed for any article controlled in this category;
  - (10) Drive, control, signal or image processing electronics, specially designed for articles controlled in this category;
  - (11) Signal processing electronics, attachments or accessories that provide:
    - (i) Automatic or aided detection and recognition, classification, identification or discrimination of military or intelligence items;
    - (ii) Multi-sensor fusion other than image blending; or
- Note to paragraph (e)(11)(ii):* Multi-sensor fusion refers to automatically combining imagery or information from two or more sensors, including at least one article controlled in this category, to improve classification, identification, or tracking of targets relative to any of the individual sensors.
- (iii) Target aim point adjustment;

(12) Near-to-eye displays specially designed for articles controlled in this category;

(13) Resonators, receivers, transmitters, modulators, gain media, and drive electronics or frequency converters specially designed for laser systems or equipment controlled in this category;

(14) Two-dimensional infrared scene projector emitter arrays (i.e., resistive arrays) that emit infrared radiation within the 900 nm to 30,000 nm wavelength range; or

(15) Any part, component, accessory, attachment, or associated equipment, that:

(i) Is “classified”;

(ii) Contains “classified” software;

(iii) Is manufactured using “classified” production data; or

(iv) Is being developed using “classified” information.

*Note to paragraph (e)(15):* “Classified” means classified pursuant to Executive Order 13526, or predecessor order, and a security classification guide developed pursuant thereto or equivalent, or to the corresponding classification rules of another government.

*Note to paragraph (e):* The articles described in this paragraph are subject to the EAR when, prior to export, reexport, retransfer, or temporary import,

they are integrated into and included as an integral part of an item subject to the EAR, and cannot be removed without destruction or damage to the article or render the item inoperable. Articles are not subject to the EAR until integrated into the item subject to the EAR. Defense articles intended to be integrated, and technical data and defense services directly related thereto, remain subject to the ITAR prior to integration. See paragraph (f) of this category for enumerated technical data and software, and specific information subject to the EAR.

\*(f) Technical data (as defined in §120.10 of this subchapter) and defense services (as defined in §120.9 of this subchapter) directly related to the defense articles enumerated in paragraphs (a) through (e) of this category. (See §125.4 of this subchapter for exemptions.) (MT for technical data and defense services related to articles designated as such.)

*Note 1 to paragraph (f):* Technical data and defense services directly related to image intensifier tubes and specially designed parts and components therefor controlled in paragraph (c)(1) of this category, infrared focal plane arrays (IRFPAs) and detector elements therefor controlled in paragraph (c)(2) of this category, integrated IRFPA dewar cooler assemblies (IDCAs) controlled in paragraph (c)(9) of this category, wafers incorporating IRFPA or ROIC structures controlled in paragraph (e)(3) of this category, and

specially designed readout integrated circuits (ROICs) controlled in paragraphs (e)(4) and (5) of this category, remain subject to the ITAR even if the technical data or defense services could also apply to items subject to the EAR.

Note 2 to paragraph (f): Software and technical data include:

A. Design or manufacturing process descriptions (e.g., steps, sequences, conditions, parameters) for lasers described in paragraphs (b)(6) and (b)(9) through (13) of this category, IITs controlled in paragraph (c)(1) of this category and their parts and components controlled in paragraph (e)(2) of this category (including tube sealing techniques, interface techniques within the vacuum space for photocathodes, microchannel plates, phosphor screens, input glass-window faceplates, input or output fiber optics (e.g., inverter)), IRFPAs and detector elements therefor controlled in paragraph (c)(2) of this category, integrated IRFPA dewar cooler assemblies (IDCAs) controlled in paragraph (c)(9) of this category, wafers incorporating structures for an IRFPA and detector elements therefor controlled in paragraph (c)(2) or structures for ROICs controlled in paragraph (e)(4) or (5) of this category, and specially designed ROICs controlled in paragraphs (e)(4) and (5) of this category (including bonding or mating (e.g., hybridization of IRFPA

detectors and ROICs), prediction or optimization of IRFPAs or ROICs at cryogenic temperatures, junction formation, passivation).

*Note to paragraph A of note 2 to paragraph (f):* Technical data does not include information directly related to basic operating instructions, testing results, incorporating or integrating IRFPAs into higher level packaged assemblies not enumerated in this category, or external interface control documentation associated with such assemblies or assemblies subject to the EAR, provided such information does not include design methodology, engineering analysis, or manufacturing know-how for a USML controlled IRFPA.

B. Software that converts an article controlled in this category into an item subject to the EAR or an item subject to the EAR into an article controlled in this category is directly related to the defense article controlled in this category. When a defense article has been converted into an item subject to the EAR through software, the presence of the software that prevents the item from meeting or exceeding a USML control parameter does not make the item subject to the ITAR.

C. EO/IR simulation or projection system software that replicates via simulation either the output data or information provided by any article controlled in this category, a radiometrically calibrated spectral signature of

any article controlled in this subchapter, volumetric effects of plumes or military operational obscurants, or countermeasure effects.

Note 3 to paragraph (f): Technology for incorporating or integrating IRFPAs into permanent encapsulated sensor assemblies subject to the EAR, or integrating such assemblies into an item subject to the EAR, and integrating IITs into an item subject to the EAR, including integrating items subject to the EAR into foreign military commodities outside the United States, is subject to the EAR.

(g)-(w) [Reserved]

(x) Commodities, software, and technology subject to the EAR (see §120.42 of this subchapter) used in or with defense articles controlled in this category.

Note to paragraph (x): Use of this paragraph is limited to license applications for defense articles controlled in this category where the purchase documentation includes commodities, software, or technology subject to the EAR (see §123.1(b) of this subchapter).

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#### **§121.1 [Amended]**

4. Section 121.1 is amended by removing and reserving paragraph (c) in U.S. Munitions List Category XV.

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