



**DEPARTMENT OF COMMERCE**

**Bureau of Industry and Security**

**15 CFR Parts 740, 772, and 774**

**[Docket No. 200807-0209]**

**RIN 0694-AI03**

**Implementation of Certain New Controls on Emerging Technologies Agreed at Wassenaar Arrangement 2019 Plenary**

**AGENCY:** Bureau of Industry and Security, Commerce.

**ACTION:** Final rule.

**SUMMARY:** The Bureau of Industry and Security (BIS) maintains, as part of its Export Administration Regulations (EAR), the Commerce Control List (CCL), which identifies certain items subject to Department of Commerce jurisdiction. This final rule revises the CCL, as well

as corresponding parts of the EAR, to implement certain changes made to the Wassenaar Arrangement List of Dual-Use Goods and Technologies (WA List) maintained and agreed to by governments participating in the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (Wassenaar Arrangement, or WA) at the December 2019 WA Plenary meeting. The Wassenaar Arrangement advocates implementation of effective export controls on strategic items with the objective of improving regional and international security and stability. This final rule implements multilateral controls on six recently developed or developing technologies, which were identified by the WA December 2019 WA Plenary Meeting in a manner contemplated by the Export Control Reform Act of 2018 (ECRA) to identify emerging technologies that are essential to U.S. national security. This rule harmonizes the CCL with the WA December 2019 Plenary Meeting agreements that pertain to these six technologies. The inclusion of the six technologies in this final rule is consistent with the requirements of ECRA and the decision of the WA to add such technologies to its control lists, thereby making exports of such technologies subject to multilateral control. As these six technologies are recently developed or developing technologies that are essential to the national security of the United States, early implementation of the applicable WA December 2019 Plenary agreements is warranted. The remaining WA 2019 Plenary agreements will be implemented in a separate rule.

**DATES:** This rule is effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**FOR FURTHER INFORMATION CONTACT:** For general questions, contact Sharron Cook,

Office of Exporter Services, Bureau of Industry and Security, U.S. Department of Commerce at 202-482-2440 or by e-mail: Sharron.Cook@bis.doc.gov.

**For technical questions contact:**

Category 2: Joseph Giunta at 202-482-3127 or Joseph.Giunta@bis.doc.gov

Category 3: Carlos Monroy at 202-482-3246 or Carlos.Monroy@bis.doc.gov

Category 5: Aaron Amundson or Anita Zinzuvadia 202-482-0707 or

Aaron.Amundson@bis.doc.gov or Anita.Zinzuvadia@bis.doc.gov

Category 9: Michael Rithmire 202-482-6105 or Michael Tu 202-482-6462 or

Michael.Rithmire@bis.doc.gov or Michael.Tu@bis.doc.gov

Category 9x515 (Satellites): Michael Tu 202-482-6462 or Michael.Tu@bis.doc.gov

**SUPPLEMENTARY INFORMATION:**

**Background**

The Wassenaar Arrangement (Wassenaar or WA) (<http://www.wassenaar.org/>) on Export Controls for Conventional Arms and Dual-Use Goods and Technologies is a group of 42 like-minded states committed to promoting responsibility and transparency in the global arms trade and preventing destabilizing accumulations of arms. As a Participating State, the United States has committed to controlling for export all items on the WA control lists. These lists were first established in 1996 and have been revised annually thereafter. Proposals for changes to the WA control lists that achieve consensus are approved by Participating States at annual plenary meetings. Participating States are charged with implementing the agreed-upon list changes as soon as possible after approval. The United States' implementation of WA list changes ensures

that U.S. companies have a level playing field with their competitors in other WA Participating States. This final rule implements multilateral controls on six recently developed or developing technologies, which were identified by the WA December 2019 WA Plenary Meeting in a manner contemplated by the ECRA to identify emerging technologies that are essential to U.S. national security. This rule harmonizes the CCL with the agreements reached by the WA during the WA December 2019 Plenary Meeting. The inclusion of the six technologies in this final rule is consistent with the requirements of ECRA and the decision of the WA to add the technologies to its control lists, thereby making exports of such technologies subject to multilateral control (following implementation by the United States and other WA participating countries).

To implement the WA control list changes, this rule adds to the EAR's CCL the following six recently developed or developing technologies that are essential to the national security of the United States: hybrid additive manufacturing (AM)/computer numerically controlled (CNC) tools; computational lithography software designed for the fabrication of extreme ultraviolet (EUV) masks; technology for finishing wafers for 5nm production; digital forensics tools that circumvent authentication or authorization controls on a computer (or communications device) and extract raw data; software for monitoring and analysis of communications and metadata acquired from a telecommunications service provider via a handover interface; and sub-orbital craft.

This rule also makes a correction to one ECCN and revises three related ECCNs and one License Exception.

### **Certain Revisions to the Commerce Control List Related to WA 2019 Plenary Agreements**

**Revises five (5) ECCNs: 2B001, 3D003, 5E001, 5A004, 9A004**

**Revises three (4) related ECCNs: 5D002, 5E002, 9A012, 9A515**

**Corrects one (1) ECCN: 5D001**

**License Exception eligibility revisions: ENC**

**Adds (1) ECCN: 3E004**

## **Category 2—Materials Processing**

### **2B001 Machine tools**

Note 4 is added at the beginning of the Items paragraph to advise the public that “A machine tool having an additive manufacturing capability in addition to a turning, milling or grinding capability must be evaluated against each applicable entry 2B001.a, .b or .c,” to ensure consistency in application of controls for these hybrid machine tools. Over the last several years, machine tools manufacturers have been adding more functionality by integrating multiple capabilities in their machines. Lately, manufacturers have integrated additive manufacturing and 5-axis computer numerically controlled (CNC) machines. As technology advances, future hybrid machines that also have multi-axis CNC capability will remain controlled in ECCN 2B001 even if it has the added additive manufacturing capability.

Additive Manufacturing machines classified under ECCN 2B001 require a license to countries that have an “X” under columns NS column 2, NP column 1, or AT column 1. License Exception STA, as well as any applicable transaction-based license exceptions, are available if all of the criteria for the license exception are met and none of the restrictions in § 740.2 apply.

### **Category 3 – Electronics**

#### **3D003 ‘Computational lithography’ “software” “specially designed” for the “development” of patterns on EUV-lithography masks or reticles.**

The Heading of 3D003 is revised to update controls on emerging Electronic Design Automation (EDA) or computational lithography software developed for Extreme Ultraviolet (EUV) masks. Extreme Ultraviolet Lithography (EUVL) introduces a number of issues that must be accurately modeled and corrected on the mask or reticle to produce optimized patterns in resist. Several key issues where specific software is needed for EUVL include mask three-dimensional (3D) effects, mask-shadowing effects, direction of illumination effects, long range flare effects, proximity effects, stochastic effects in resist, and source-masks optimization. Compensation of these effects using software modeling to optimize the patterns on the EUV mask reticle is required for making optimized photoresist patterns on wafers. This software has a license requirement for national security (NS) reasons at the NS column 1 level and for anti-terrorism (AT) reasons at the AT column 1 level. License Exceptions TSR and STA, as well as any applicable transaction-based license exceptions, are available if all of the criteria for the license exception are met and none of the restrictions in § 740.2 apply.

In addition, the two paragraphs in the Related Definitions paragraph are replaced by a definition for ‘computational lithography.’

**3E004 “Technology” “required” for the slicing, grinding and polishing of 300 mm diameter silicon wafers to achieve a ‘Site Front least sQuares Range’ (‘SFQR’) less than or equal to 20 nm at any site of 26 mm x 8 mm on the front surface of the wafer and an edge exclusion less than or equal to 2 mm.**

This rule adds ECCN 3E004 to control “technology” for the production of substrates for high-end integrated circuits. The parameters include minimization of the flatness and the surface defect. Flatness is referred to as SFQR (Site (Flatness) Front least sQuares Range) and surface defect is referred to as LLS (Localized Light Scatter). Though both of these parameters are known to represent wafer specifications, WA determined that the SFQR is the dominant parameter to capture the precision of wafer. “SFQR is equal to or less than 20nm” is an appropriate parameter to control the minimum guaranteed quality for the production of high-end integrated circuits designed for feature size of 5 nm or less taking into account the yield rate for integrated circuit production. This technology will have a license requirement for national security (NS) reasons at the NS column 1 level and for anti-terrorism (AT) reasons at the AT column 1 level. License Exceptions TSR and STA, as well as any applicable transaction-based license exceptions, are available if all of the criteria for the license exception are met and none of the restrictions in § 740.2 apply.

## **Category 5 – Part 1—Telecommunications**

### **5D001 “Software”**

This rule makes a correction by removing 5D001.b from the Special Conditions for STA, because 5D001.b was removed from the 5D001 entry in 2014 and reserved at that time.

This rule adds Item paragraph 5D001.e to control specified surveillance “software,” other

than that specified by 5D001.a or 5D001.c, “specially designed” or modified for monitoring or analysis by law enforcement, including a Technical Note that defines ‘handover interface’ and specifies some international standards examples. This new entry controls software that is specially designed for use by law enforcement to analyze the content of communications acquired from a handover interface. Such software can be used by international actors in ways that are contrary to U.S. national security. To be controlled, the software must meet both parameters in subparagraphs 5D001.e.1 and e.2, specifically, it must provide the ability to execute searches on the basis of “hard selectors” of either the content of communication or metadata acquired from a communications service provider using a ‘handover interface’ and it must provide the ability to map the relational network or track the movement of targeted individuals based on such searches. This new entry does not control network management tools or banking software and therefore includes an exclusion note for “software” “specially designed” or modified for any of the following: billing purposes, Network Quality of Service (QoS), Quality of Experience (QoE), mediation devices, or mobile payment or banking use. Mediation devices for lawful intercept by the communication service provider may be controlled in 5A980 or 5D980 and are not included in this entry. A definition of “hard selectors” is added to § 772.1 (Definitions) of the EAR. This software has a license requirement for NS column 1, and AT column 1. This software and its corresponding technology are added to the eligibility paragraph for License Exception TSR, limited to Country Group A:5 as specified in the TSR paragraph of the List Based License Exceptions section of ECCNs 5D001 and 5E001. This software and technology are also eligible for License Exception STA.



## **5E001 “Technology”**

This rule adds 5D001.e surveillance software to 5E001.a to control “technology” according to the General Technology Note for the “development”, “production” or “use” (excluding operation) of “software” controlled by 5D001.e. This technology has a license requirement for NS column 1 and AT column 1. This technology is added to the eligibility paragraph for License Exception TSR, as specified in the TSR paragraph of the List Based License Exceptions section of ECCN 5E001. This technology is also eligible for License Exception STA.

## **Category 5 – Part 2 – “Information Security”**

### **5A004 “Systems,” “equipment” and “components” for defeating, weakening or bypassing “information security”**

This rule adds paragraph 5A004.b to control digital forensics or investigative tools. This new entry controls items that circumvent authentication or authorization mechanisms and extract raw data from a computer or communications device. Although once used primarily by law enforcement, these items are increasingly being used by the military to extract time-critical information from devices found on the battlefield. The purpose of the text is to control items that can quickly analyze a device and recover protected information, *i.e.*, to capture products which allow the recovery of protected information by breaking, manipulating, exploiting, and/or bypassing security measures which the manufacturer has installed on a device. The text is not intended to capture items that extract data that is completely unprotected on a device; nor is it intended to capture production or test equipment, system administrator tools, or tools that are used for retail purposes such as unlocking mobile phones. In addition, the phrase “extract raw

data” clarifies that items that are limited to extracting simple user data, such as contact lists, videos, and photos (for example to transfer personal information between mobile phone handsets), would not be controlled.

5A004.b requires a license to countries that have an “X” under columns NS column 1 or AT column 1. An encryption item (EI) license requirement also applies. See §742.15 of the EAR. License Exception LVS and ENC are available as specified in the List Based License Exceptions of 5A004 and the applicable license exception criteria in part 740 so long as none of the restrictions set forth in § 740.2 apply.

#### **§ 740.17 License Exception Encryption Commodities, Software and Technology (ENC)**

This rule also makes changes to License Exception ENC consistent with the addition of 5A004.b. The first sentence in the introductory paragraph to § 740.17 is revised by adding “and digital forensics items (investigative tools)” to the list of items authorized by License Exception ENC. Paragraphs 1 and 3 of the Note to paragraph (b)(2) introductory text are amended by adding “classified in ECCN 5A004.a, 5D002.a.3.a or c.3.a, or 5E002” to clarify what is meant by “cryptanalytic items.” Paragraph (b)(2)(ii) is changed by replacing the reference to “5A004 or 5D002” with a reference to “5A004.a, 5D002.a.3.a or 5D002.c.3.a” where the paragraph mentions “cryptanalytic items.” Paragraph (b)(3)(iii)(B) is revised by removing “including network or computer forensics” from the title and replacing it with “and investigative tools”; and revising the text of the paragraph to point to ECCN 5A004.b for specific characteristics of digital forensics items (investigative tools) subject to the thirty-day (30-day) classification request requirement.

## **5D002 “Software”**

This rule amends 5D002 by revising Item paragraphs 5D002.a.3 and c.3, which are the associated software controls for 5A004 items, to add software controls for 5A004.b digital forensics or investigative tools. This rule also adds an exclusion note to 5D002.c.3.b to exclude “intrusion software.” This rule adds to § 772.1 the definition of “intrusion software” from the agreements reached at the 2013 WA Plenary. 5D002 requires a license to countries that have an “X” under columns NS column 1 or AT column 1. An encryption item (EI) license requirement also applies. See §742.15 of the EAR. License Exception ENC is available as specified in the List Based License Exceptions of 5D002 and the applicable license exception criteria in part 740 so long as none of the restrictions set forth in § 740.2 apply.

## **5E002 “Technology”**

This rule adds an exclusion note to Item paragraph 5E002.a to exclude “technology” for items specified by 5A004.b, 5D002.a.3.b or 5D002.c.3.b. The techniques that are used to circumvent authentication and authorization and extract raw data are well known and therefore do not warrant additional controls. In addition, information on these techniques is often exchanged as part of cyber incident response and vulnerability analysis activities and therefore controlling such information could adversely impact those activities.

## **Category 9 - Aerospace and Propulsion**

### **9A004 Space launch vehicles and “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, and terrestrial equipment**

This rule adds “sub-orbital craft” to Item paragraph 9A004.h and the definition for “sub-

orbital craft” to § 772.1 of the EAR. A sub-orbital craft is designed to operate above the stratosphere and land on Earth without completing an orbit. Therefore, it does not meet the definition of “spacecraft”, which is limited to satellites and space probes. Certain types of sub-orbital craft could already be considered to be controlled under 9A004 as space launch vehicles. However, an overall space launch system may consist of several stages, one of which may be a re-usable spaceplane. This item would generally not be considered a space launch vehicle. While this rule adds 9A004.h for consistency with the Wassenaar List of Dual-Use Goods, the “sub-orbital craft” described by 9A004.h falls within the scope of 9A515.a and is controlled by that entry if subject to the EAR. It should be noted that ITAR Category XV(a)(11) captures certain sub-orbital craft.

### **9A515 “Spacecraft” and related commodities**

“Sub-orbital craft” warrant the same STA eligibility as “spacecraft” described in 9A515.a.1, a.2, a.3 and a.4. Therefore, this rule revises the Special Conditions for STA by adding “sub-orbital craft” to paragraph (1). This means that STA may not be used for “sub-orbital craft” unless determined by BIS to be eligible for License Exception STA in accordance with § 740.20(g) (License Exception STA eligibility requests for certain 9x515 and “600 series” items). Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in 9A515. Note that 9A515 is eligible for License Exception Limited Value Shipment (LVS) at \$1500.

This rule also amends paragraph 9A515.a to add “sub-orbital craft,” because BIS lists “spacecraft” and related commodities in 9A515 of the CCL to more easily implement appropriate license requirements and exceptions. “Sub-orbital craft” under ECCN 9A515.a

require a license to countries that have an “X” under columns NS column 1, RS column 1, or AT column 1, which means a license is required for all destinations other than Canada.

For added clarity, this rule adds “sub-orbital craft” to the Note to 9A515.a, which explains what is included in 9A515.a.

#### **§740.20 License Exception Strategic Trade Authorization (STA).**

This rule amends paragraph (g) “License Exception STA eligibility requests for 9x515 and “600 series” items”. This revision will clarify that “sub-orbital craft”, “spacecraft” described in ECCNs 9A515.a.1, .a.2, .a.3, .a.4, and remote sensing components “specially designed” for these “spacecraft” described in 9A515.g, require prior approval before using License Exception STA.

#### **9A012 Non-military “Unmanned Aerial Vehicles,” (“UAVs”), unmanned “airships”, related equipment and “components”**

This rule enumerates each sentence in the Related Controls paragraph and adds a third sentence that explains that in classifying “UAVs” that are “sub-orbital craft” exporters should look at 9A004.h and 9A515.a.

#### **Export Control Reform Act of 2018**

On August 13, 2018, the President signed into law the John S. McCain National Defense Authorization Act for Fiscal Year 2019, which includes the Export Control Reform Act of 2018 (ECRA), 50 U.S.C. Sections 4801-4852. ECRA provides the legal basis for BIS’s principal authorities and serves as the authority under which BIS issues this rule.

## **Saving Clause**

Shipments of items removed from license exception eligibility or eligibility for export, reexport or transfer (in-country) without a license as a result of this regulatory action that were on dock for loading, on lighter, laden aboard an exporting carrier, or en route aboard a carrier to a port of export, on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, pursuant to actual orders for exports, reexports and transfers (in-country) to a foreign destination, may proceed to that destination under the previous license exception eligibility or without a license so long as they have been exported, reexported or transferred (in-country) before **[INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**. Any such items not actually exported, reexported or transferred (in-country) before midnight, local time, on **[INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**, require a license in accordance with this final rule.

## **Executive Order Requirements**

Executive Orders 13563 and 12866 direct agencies to assess all 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, distributive 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” under Executive Order 12866. The Wassenaar Arrangement (WA) was established in order to contribute to regional and international security and stability by promoting transparency and greater responsibility in

transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations. The goal was also to prevent the acquisition of such items by terrorists. There are presently 42 Participating States, including the United States, which seek through their national policies to ensure that transfers of these items do not contribute to the development or enhancement of military capabilities that undermine these goals, and to ensure that these items are not diverted to support such military capabilities. Implementation of the WA Plenary agreements in a timely manner enhances the national security of the United States and global international trade.

This rule does not contain policies with Federalism implications as that term is defined under Executive Order 13132.

This rule is not subject to the requirements of E.O. 13771 (82 FR 9339, February 3, 2017) because it is issued with respect to a national security function of the United States.

### **Paperwork Reduction Act Requirements**

Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) (PRA), unless that collection of information displays a currently valid Office of Management and Budget (OMB) Control Number.

This rule involves the following OMB-approved collections of information subject to the PRA: 0694-0088, “Multi-Purpose Application”, which carries a burden hour estimate of 29.6 minutes for a manual or electronic submission; 0694-0137 “License Exceptions and Exclusions”, which carries a burden hour estimate average of 1.5 hours per electronic submission (Note:

submissions for License Exceptions are rarely required); 0694-0096 “Five Year Records Retention Period”, which carries a burden hour estimate of less than 1 minute; and 0607-0152 “Automated Export System (AES) Program”, which carries a burden hour estimate of 3 minutes per electronic submission. Specific license application submission estimates are discussed further in the preamble of this rule where the revision is explained. BIS estimates that revisions that are editorial, including moving the location of control text on the Commerce Control List, or that clarify language, will result in no change in license application submissions.

Any comments regarding these collections of information, including suggestions for reducing the burden, may be sent to OMB Desk Officer, New Executive Office Building, Washington, D.C. 20503; and to Jasmeet K. Seehra, Office of Management and Budget (OMB), by e-mail to [Jasmeet\\_K\\_Seehra@omb.eop.gov](mailto:Jasmeet_K_Seehra@omb.eop.gov), or by fax to (202) 395-7285.

### **Administrative Procedure Act and Regulatory Flexibility Act Requirements**

Pursuant to § 4821 of ECRA, this action is exempt from the Administrative Procedure Act (5 U.S.C. 553) requirements for notice of proposed rulemaking, opportunity for public participation, and delay in effective date.

Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule under the Administrative Procedure Act or by any other law, the analytical requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.) are not applicable. Accordingly, no regulatory flexibility analysis is required, and none has been prepared.



## List of Subjects

### 15 CFR Part 740

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements

### 15 CFR Part 772

Exports

### 15 CFR Part 774

Exports, Reporting and recordkeeping requirements.

Accordingly, parts 740, 772, and 774 of the Export Administration Regulations (15 CFR parts 730 through 774) are amended as follows:

## **PART 740—LICENSE EXCEPTIONS**

1. The authority citation for part 740 continues to read as follows:

**Authority:** 50 U.S.C. 4801-4852; 50 U.S.C. 4601 *et seq.*; 50 U.S.C. 1701 *et seq.*; 22 U.S.C. 7201 *et seq.*; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

2. Section 740.17 is amended by:

- a. Revising the first sentence of the introductory text;
- b. Revising paragraphs 1 and 3 of the Note to paragraph (b)(2) introductory text;
- c. Revising paragraphs (b)(2)(ii) and (b)(2)(iv)(B); and

d. Revising paragraph (b)(3)(iii)(B).

The revised text is set forth below.

**§ 740.17 Encryption commodities, software and technology (ENC).**

License Exception ENC authorizes export, reexport, and transfer (in-country) of systems, equipment, commodities, and components therefor that are classified under ECCN 5A002, 5B002, equivalent or related software and technology therefor classified under 5D002 or 5E002, and “cryptanalytic items” and digital forensics items (investigative tools) classified under ECCN 5A004, 5D002 or 5E002. \*\*\*

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(b) \*\*\*

(2) \*\*\*

NOTE TO PARAGRAPH (b)(2) INTRODUCTORY TEXT: \*\*\*

1. All submitted encryption items described in this paragraph (b)(2), except “cryptanalytic items,” classified in ECCN 5A004.a, 5D002.a.3.a or c.3.a, or 5E002, to any end user located or headquartered in a country listed in supplement no. 3 to this part;

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3. “Cryptanalytic items,” classified in ECCN 5A004.a, 5D002.a.3.a or c.3.a, or 5E002, to non-“government end users,” only, located or headquartered in a country listed in supplement no. 3 to this part; and

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(ii) *Cryptanalytic commodities and software.* “Cryptanalytic items” classified in ECCN 5A004.a, 5D002.a.3.a, or 5D002.c.3.a, to non- “government end users” located or headquartered in countries not listed in supplement no. 3 to this part.

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(iv) \*\*\*

(B) *Other technology.* Encryption technology classified under ECCN 5E002 except technology for “cryptanalytic items” classified in ECCN 5A004.a, 5D002.a.3.a or 5D002.c.3.a, “non-standard cryptography” or any “open cryptographic interface,” to any non-“government end user” located in a country not listed in Country Group D:1, E:1, or E:2 of supplement no. 1 to part 740 of the EAR.

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(3) \*\*\*

(iii)\*\*\*

(B) *Digital forensics and investigative tools.* Items specified in ECCN 5A004.b, 5D002.a.3.b, or 5D002.c.3.b, see supplement no. 1 to part 774 Commerce Control List.

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3. Section 740.20 is amended by revising paragraph (g)(1) to read as follows:

**§ 740.20 License Exception Strategic Trade Authorization (STA).**

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(g) **\*\*\*(1) Applicability.** Any person may request License Exception STA eligibility for end items described in ECCN 0A606.a, ECCN 8A609.a, ECCNs 8A620.a or .b, “spacecraft” in ECCNs 9A515.a.1, .a.2, .a.3, or .a.4, “sub-orbital craft,” or items in 9A515.g, 9A610.a, or technology ECCNs 9E515.b, .d, .e, or .f.

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## **PART 772—DEFINITIONS OF TERMS**

4. The authority citation for part 772 continues to read as follows:

**Authority:** 50 U.S.C. 4801-4852; 50 U.S.C. 4601 et seq.; 50 U.S.C. 1701 et seq.; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

5. Section 772.1 is amended by:

- a. Adding the definition of “hard selectors” in alphabetical order;
- b. Adding the definition of “intrusion software” in alphabetical order, with notes 1 and 2 to the definition of “intrusion software”, and technical notes 1 and 2 to the definition of “intrusion software”; and
- c. Adding the definition of “sub-orbital craft” in alphabetical order.

The additions read as follows:

### **§ 772.1 Definitions of Terms As Used In the Export Administration Regulations (EAR).**

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*Hard selectors.* (Cat 5P1) Data or set of data, related to an individual (e.g., family name, given name, e-mail, street address, phone number or group affiliations).

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*Intrusion software.* (5P2) “Software” specially designed or modified to avoid detection by ‘monitoring tools’, or to defeat ‘protective countermeasures’, of a computer or network-capable device, and performing any of the following:

- (1) The extraction of data or information, from a computer or network-capable device, or the modification of system or user data; or
- (2) The modification of the standard execution path of a program or process in order to allow the execution of externally provided instructions.

NOTE 1 TO "INTRUSION SOFTWARE" DEFINITION: “Intrusion software” does not include any of the following: Hypervisors, debuggers or Software Reverse Engineering (SRE) tools; Digital Rights Management (DRM) “software”; or “Software” designed to be installed by manufacturers, administrators or users, for the purposes of asset tracking or recovery.

NOTE 2 TO "INTRUSION SOFTWARE" DEFINITION: Network-capable devices include mobile devices and smart meters.

TECHNICAL NOTE 1 TO "INTRUSION SOFTWARE" DEFINITION: ‘Monitoring tools’: “software” or hardware devices, that monitor system behaviors or processes running on a device. This includes antivirus (AV) products, end point security products, Personal Security Products (PSP), Intrusion Detection Systems (IDS), Intrusion Prevention Systems (IPS) or firewalls.

TECHNICAL NOTE 2 TO "INTRUSION SOFTWARE" DEFINITION: ‘Protective countermeasures’: techniques designed to ensure the safe execution of code, such as Data Execution Prevention

(DEP), Address Space Layout Randomization (ASLR) or sandboxing.

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“*Sub-orbital craft*”. (Cat 9) A craft having an enclosure designed for the transport of people or cargo, which is designed to:

- (1) Operate above the stratosphere;
- (2) Perform a non-orbital trajectory; *and*
- (3) Land back on Earth with the people or cargo intact.

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#### **PART 774—THE COMMERCE CONTROL LIST**

6. The authority citation for part 774 continues to read as follows:

**Authority:** 50 U.S.C. 4801-4852; 50 U.S.C. 4601 et seq.; 50 U.S.C. 1701 et seq.; 10 U.S.C. 8720; 10 U.S.C. 8730(e); 22 U.S.C. 287c, 22 U.S.C. 3201 et seq.; 22 U.S.C. 6004; 42 U.S.C. 2139a; 15 U.S.C. 1824; 50 U.S.C. 4305; 22 U.S.C. 7201 et seq.; 22 U.S.C. 7210; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

7. In supplement no. 1 to part 774:

- a. Revise ECCN 2B001 under Category 2—Materials Processing, section B. “Test”, “Inspection” and “Production Equipment”;
- b. Revise ECCN 3D003 under Category 3—Electronics, section D. “Software”;
- c. Add ECCN 3E004 after 3E003 under Category 3—Electronics, section E. “Technology”;

- d. Revise ECCN 5D001 under Category 5—Telecommunications and “Information Security”, Part 1—Telecommunications, section D. "Software";
- e. Revise ECCN 5E001 under Category 5—Telecommunications and “Information Security”, Part 1—Telecommunications, section E. "Technology";
- f. Revise ECCN 5A004 under Category 5—Telecommunications and “Information Security”, Part 2—“Information Security”, section A. “End Items,” “Equipment,” “Accessories,” “Attachments,” “Parts,” “Components,” and “Systems”, subsection III. DEFEATING, WEAKENING, OR BYPASSING “INFORMATION SECURITY”;
- g. Revise ECCN 5D002 under Category 5—Telecommunications and “Information Security”, Part 2—“Information Security”, section D. “Software”;
- h. Revise ECCN 5E002 under Category 5—Telecommunications and “Information Security”, Part 2—“Information Security”, section E. “Technology”;
- i. Revise ECCN 9A004 under Category 9—Aerospace and Propulsion, section A. “End Items”, “Equipment”, “Accessories”, “Attachments”, “Parts”, “Components” and “Systems”;
- j. Revise ECCN 9A012 under Category 9—Aerospace and Propulsion, section A. “End Items”, “Equipment”, “Accessories”, “Attachments”, “Parts”, “Components” and “Systems”; and

k. Revise ECCN 9A515 under Category 9—Aerospace and Propulsion, section A. “End Items”, “Equipment”, “Accessories”, “Attachments”, “Parts”, “Components” and “Systems”.

The revisions and additions read as follows:

**Supplement No. 1 to Part 774—The Commerce Control List**

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**CATEGORY 2—MATERIALS PROCESSING**

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B. “TEST”, “INSPECTION” AND “PRODUCTION EQUIPMENT”

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**2B001 Machine tools and any combination thereof, for removing (or cutting) metals, ceramics or “composites”, which, according to the manufacturer's technical specifications, can be equipped with electronic devices for “numerical control”; as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, NP, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 2



<p>NP applies to 2B001.a, .b, .c, and .d, EXCEPT:</p> <p>(1) turning machines under 2B001.a with a capacity no greater than 35 mm diameter; (2) bar machines (Swissturn), limited to machining only bar feed through, if maximum bar diameter is equal to or less than 42 mm and there is no capability of mounting chucks. (Machines may have drilling and/or milling capabilities for machining “parts” or “components” with diameters less than 42 mm); or</p> <p>(3) milling machines under 2B001.b with x-axis travel greater than two meters and overall positioning accuracy according to ISO 230/2 (2006) on the x-axis more (worse) than 22.5 µm.</p>	<p>NP Column 1</p>
<p>AT applies to entire entry</p>	<p>AT Column 1</p>

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*LVS:* N/A

*GBS:* N/A

LIST OF ITEMS CONTROLLED

*Related Controls:* (1) See ECCN 2B002 for optical finishing machines. (2) See ECCNs 2D001 and 2D002 for software for items controlled under this entry. (3) See ECCNs 2E001

(“development”), 2E002 (“production”), and 2E201 (“use”) for technology for items controlled under this entry. (4) Also see ECCNs 2B201 and 2B991.

*Related Definitions:* N/A

*Items:*

**Note 1:** *2B001 does not control special purpose machine tools limited to the manufacture of gears. For such machines, see 2B003.*

**Note 2:** *2B001 does not control special purpose machine tools limited to the manufacture of any of the following:*

- a. Crank shafts or cam shafts;*
- b. Tools or cutters;*
- c. Extruder worms;*
- d. Engraved or faceted jewelry parts; or*
- e. Dental prostheses.*

**Note 3:** *A machine tool having at least two of the three turning, milling or grinding capabilities (e.g., a turning machine with milling capability), must be evaluated against each applicable entry 2B001.a, .b or .c.*

**Note 4:** *A machine tool having an additive manufacturing capability in addition to a turning, milling or grinding capability must be evaluated against each applicable entry 2B001.a, .b or .c.*

a. Machine tools for turning having two or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

a.1. "Unidirectional positioning repeatability" equal to or less (better) than 0.9  $\mu\text{m}$  along one or more linear axis with a travel length less than 1.0 m; *or*

a.2. “Unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 1.0 m;

**Note 1:** *2B001.a does not control turning machines “specially designed” for producing contact lenses, having all of the following:*

a. *Machine controller limited to using ophthalmic based “software” for part programming data input; and*

b. *No vacuum chucking.*

*Note 2: 2B001.a does not apply to bar machines (Swissturn), limited to machining only bar feed thru, if maximum bar diameter is equal to or less than 42 mm and there is no capability of mounting chucks. Machines may have drilling or milling capabilities for machining parts with diameters less than 42 mm.*

b. Machine tools for milling having any of the following:

b.1. Three linear axes plus one rotary axis which can be coordinated simultaneously for “contouring control” having any of the following:

b.1.a. "Unidirectional positioning repeatability" equal to or less (better) than 0.9  $\mu\text{m}$  along one or more linear axis with a travel length less than 1.0 m; *or*

b.1.b. “Unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 1.0 m;

b.2. Five or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

b.2.a. “Unidirectional positioning repeatability” equal to or less (better) than 0.9  $\mu\text{m}$  along one or more linear axis with a travel length less than 1.0 m;

b.2.b. “Unidirectional positioning repeatability” equal to or less (better) than 1.4  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 1 m and less than 4 m; *or*

b.2.c. “Unidirectional positioning repeatability” equal to or less (better) than 6.0  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 4 m;

b.3. A “unidirectional positioning repeatability” for jig boring machines, equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis; *or*

b.4. Fly cutting machines having all of the following:

b.4.a. Spindle “run-out” and “camming” less (better) than 0.0004 mm TIR; *and*

b.4.b. Angular deviation of slide movement (yaw, pitch and roll) less (better) than 2 seconds of arc, TIR, over 300 mm of travel;

c. Machine tools for grinding having any of the following:

c.1. Having all of the following:

c.1.a. “Unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis; *and*

c.1.b. Three or four axes which can be coordinated simultaneously for “contouring control”; *or*

c.2. Five or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

c.2.a. “Unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along

one or more linear axis with a travel length less than 1 m;

c.2.b. “Unidirectional positioning repeatability” equal to or less (better) than 1.4  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 1 m and less than 4 m; *or*

c.2.c. “Unidirectional positioning repeatability” equal to or less (better) than 6.0  $\mu\text{m}$  along one or more linear axis with a travel length equal to or greater than 4 m.

*Notes: 2B001.c does not control grinding machines as follows:*

*a. Cylindrical external, internal, and external-internal grinding machines, having all of the following:*

*a.1. Limited to cylindrical grinding; and*

*a.2. Limited to a maximum workpiece capacity of 150 mm outside diameter or length.*

*b. Machines designed specifically as jig grinders that do not have a z-axis or a w-axis, with a “unidirectional positioning repeatability” less (better) than 1.1  $\mu\text{m}$ .*

*c. Surface grinders.*

d. Electrical discharge machines (EDM) of the non-wire type which have two or more rotary axes which can be coordinated simultaneously for “contouring control”;

e. Machine tools for removing metals, ceramics or “composites”, having all of the following:

e.1. Removing material by means of any of the following:

e.1.a. Water or other liquid jets, including those employing abrasive additives;

e.1.b. Electron beam; or

e.1.c. “Laser” beam; and

e.2. At least two rotary axes having all of the following:

e.2.a. Can be coordinated simultaneously for “contouring control”; *and*

e.2.b. A positioning “accuracy” of less (better) than 0.003°;

f. Deep-hole-drilling machines and turning machines modified for deep-hole-drilling, having a maximum depth-of-bore capability exceeding 5m.

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### **CATEGORY 3—ELECTRONICS**

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D. “SOFTWARE”

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**3D003 ‘Computational lithography’ ‘software’ ‘specially designed’ for the  
‘development’ of patterns on EUV-lithography masks or reticles.**

## LICENSE REQUIREMENTS

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*TSR:* Yes

LIST OF ITEMS CONTROLLED

*Related Controls:* N/A

*Related Definitions:* ‘Computational lithography’ is the use of computer modelling to predict, correct, optimize and verify imaging performance of the lithography process over a range of patterns, processes, and system conditions.



*Items:*

The list of items controlled is contained in the ECCN heading.

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E. "TECHNOLOGY"

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**3E004 "Technology" "required" for the slicing, grinding and polishing of 300 mm diameter silicon wafers to achieve a 'Site Front least sQuares Range' ('SFQR') less than or equal to 20 nm at any site of 26 mm x 8 mm on the front surface of the wafer and an edge exclusion less than or equal to 2 mm.**

LICENSE REQUIREMENTS

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE  
EXCEPTIONS)

*TSR:* Yes

LIST OF ITEMS CONTROLLED

*Related Controls:* N/A

*Related Definitions:* For the purpose of 3E004, 'Site Front least sQuares Range' ('SFQR') is the range of maximum deviation and minimum deviation from front reference plane, calculated by least square method with all front surface data including site boundary within a site.

*Items:*

The list of items controlled is contained in the ECCN heading.

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**CATEGORY 5—TELECOMMUNICATIONS AND “INFORMATION SECURITY”**

**PART 1--TELECOMMUNICATIONS**

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D. "SOFTWARE"

**5D001 "Software" as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, SL, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No.1 to part 738)</i>
NS applies to entire entry	NS Column 1.
SL applies to the entire entry as applicable for equipment, functions, features, or characteristics controlled by 5A001.f.1	<p>A license is required for all destinations, as specified in § 742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).</p> <p><i>Note to SL paragraph: This licensing requirement does not supersede, implement, construe or limit the scope of any criminal statute, including, but not limited to, the Omnibus Safe Streets Act of 1968, as amended.</i></p>
AT applies to entire entry	AT Column 1.

REPORTING REQUIREMENTS

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions and

Validated End-User authorizations.

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*TSR:* Yes, except for exports and reexports to destinations outside of those countries listed in Country Group A:5 (See Supplement No. 1 to part 740 of the EAR) of the following:

- (1) “Software” controlled by 5D001.a and “specially designed” for items controlled by 5A001.b.5 and 5A001.h. or
- (2) “Software” controlled by 5D001.e.

SPECIAL CONDITIONS FOR STA

*STA:* License Exception STA may not be used to ship or transmit 5D001.a “software” “specially designed” for the “development” or “production” of equipment, functions or features, specified by ECCN 5A001.b.3, .b.5 or .h. for “software” “specially designed” or modified to support “technology” specified by the STA paragraph in the License Exception section of ECCN 5E001 to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

LIST OF ITEMS CONTROLLED

*Related Controls:* See also 5D980 and 5D991.

*Related Definitions:* N/A

*Items:*

a. “Software” “specially designed” or modified for the “development”, “production” or “use” of equipment, functions or features controlled by 5A001;

b. [Reserved]

c. Specific “software” “specially designed” or modified to provide characteristics, functions or features of equipment, controlled by 5A001 or 5B001;

d. “Software” “specially designed” or modified for the “development” of any of the following telecommunication transmission or switching equipment:

d.1.[Reserved]

d.2. Equipment employing a “laser” and having any of the following:

d.2.a. A transmission wavelength exceeding 1,750 nm; *or*

d.2.b. Employing analog techniques and having a bandwidth exceeding 2.5 GHz; *or*

*Note: 5D001.d.2.b does not control “software” “specially designed” or modified for the “development” of commercial TV systems.*

d.3. [Reserved]

d.4. Radio equipment employing Quadrature-Amplitude-Modulation (QAM) techniques above level 1,024;

e. “Software”, other than that specified by 5D001.a or 5D001.c, “specially designed” or modified for monitoring or analysis by law enforcement, providing all of the following:

e.1. Execution of searches on the basis of “hard selectors” of either the content of communication or metadata acquired from a communications service provider using a ‘handover interface’; *and*

***Technical Notes:***

1. *For the purposes of 5D001.e, a ‘handover interface’ is a physical and logical interface, designed for use by an authorised law enforcement authority, across which targeted interception measures are requested from a communications service provider and the results of interception are delivered from a communications service provider to the requesting authority. The ‘handover interface’ is implemented within systems or equipment (e.g., mediation devices) that receive and validate the interception request, and deliver to the requesting authority only the results of interception that fulfil the validated request.*

2. *‘Handover interfaces’ may be specified by international standards (including but not limited to ETSI TS 101 331, ETSI TS 101 671, 3GPP TS 33.108) or national equivalents.*

e.2. Mapping of the relational network or tracking the movement of targeted individuals based on the results of searches on content of communication or metadata or searches as described in 5D001.e.1.

*Note: 5D001.e does not apply to “software” “specially designed” or modified for any of the following:*

- a. Billing purposes;*
- b. Network Quality of Service (QoS);*
- c. Quality of Experience (QoE);*
- d. Mediation devices; or*
- e. Mobile payment or banking use.*

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E. "TECHNOLOGY"

**5E001 “Technology” as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, SL, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1.
SL applies to “technology” for the “development” or “production” of equipment, functions or features controlled by 5A001.f.1, or for the “development” or “production” of “software” controlled by ECCN 5D001.a (for 5A001.f.1)	A license is required for all destinations, as specified in § 742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).  <i>Note to SL paragraph: This licensing requirement does not supersede, implement, construe or limit the scope of any criminal statute, including, but not limited to, the Omnibus Safe Streets Act of 1968, as amended.</i>
AT applies to entire entry	AT Column 1.

#### REPORTING REQUIREMENTS

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions and Validated End-User authorizations.

#### LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*TSR:* Yes, except for exports or reexports to destinations outside of those countries listed in Country Group A:5 (See Supplement No. 1 to part 740 of the EAR) of “technology” controlled by 5E001.a for the “development” or “production” of the following:



- (1) Items controlled by 5A001.b.5 or 5A001.h;
- (2) “Software” controlled by 5D001.a that is “specially designed” for the “development” or “production” of equipment, functions or features controlled by 5A001.b.5 or 5A001.h.; or
- (3) “Software” controlled by 5D001.e.

#### SPECIAL CONDITIONS FOR STA

*STA:* License Exception STA may not be used to ship or transmit “technology” according to the General Technology Note for the “development” or “production” of equipment, functions or features specified by 5A001.b.3, .b.5 or .h; or for “software” in 5D001.a that is specified in the STA paragraph in the License Exception section of ECCN 5D001 to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

#### LIST OF ITEMS CONTROLLED

*Related Controls:* (1) See also 5E101, 5E980 and 5E991. (2) “Technology” for “development” or “production” of “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers that meet the control criteria given at 3A001.b.2 is controlled in 3E001; 5E001.d refers only to that additional “technology” “required” for telecommunications.

*Related Definitions:* N/A

*Items:*

a. “Technology” according to the General Technology Note for the “development”, “production” or “use” (excluding operation) of equipment, functions or features, controlled by 5A001 or “software” controlled by 5D001.a or 5D001.e.

b. Specific “technology”, as follows:

b.1. “Technology” “required” for the “development” or “production” of telecommunications equipment “specially designed” to be used on board satellites;

b.2. “Technology” for the “development” or “use” of “laser” communication techniques with the capability of automatically acquiring and tracking signals and maintaining communications through exoatmosphere or sub-surface (water) media;

b.3. “Technology” for the “development” of digital cellular radio base station receiving equipment whose reception capabilities that allow multi-band, multi-channel, multi-mode, multi-coding algorithm or multi-protocol operation can be modified by changes in “software”;

b.4. “Technology” for the “development” of “spread spectrum” techniques, including “frequency hopping” techniques.

*Note: 5E001.b.4 does not apply to “technology” for the “development” of any of the following:*

*a. Civil cellular radio-communications systems; or*

*b. Fixed or mobile satellite Earth stations for commercial civil telecommunications.*

c. “Technology” according the General Technology Note for the “development” or “production” of any of the following:

c.1. [Reserved]

c.2. Equipment employing a “laser” and having any of the following:

c.2.a. A transmission wavelength exceeding 1,750 nm;

c.2.b. [Reserved]

c.2.c. [Reserved]

c.2.d. Employing wavelength division multiplexing techniques of optical carriers at less than 100 GHz spacing; *or*

c.2.e. Employing analog techniques and having a bandwidth exceeding 2.5 GHz;

**Note:** *5E001.c.2.e does not control “technology” for commercial TV systems.*

*N.B.: For “technology” for the “development” or “production” of non-telecommunications equipment employing a “laser”, see Product Group E of Category 6, e.g., 6E00x*

c.3. Equipment employing “optical switching” and having a switching time less than 1 ms; *or*

c.4. Radio equipment having any of the following:

c.4.a. Quadrature-Amplitude-Modulation (QAM) techniques above level 1,024; *or*

c.4.b. Operating at input or output frequencies exceeding 31.8 GHz; *or*

*Note: 5E001.c.4.b does not control “technology” for equipment designed or modified for operation in any frequency band which is “allocated by the ITU” for radio-communications services, but not for radio-determination.*

c.4.c. Operating in the 1.5 MHz to 87.5 MHz band and incorporating adaptive techniques providing more than 15 dB suppression of an interfering signal; *or*

c.5. [Reserved]

c.6. Mobile equipment having all of the following:

c.6.a. Operating at an optical wavelength greater than or equal to 200nm and less than or

equal to 400nm; *and*

c.6.b. Operating as a “local area network”;

d. “Technology” according to the General Technology Note for the “development” or “production” of “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers “specially designed” for telecommunications and that are any of the following:

*Technical Note: For purposes of 5E001.d, the parameter peak saturated power output may also be referred to on product data sheets as output power, saturated power output, maximum power output, peak power output, or peak envelope power output.*

d.1. Rated for operation at frequencies exceeding 2.7 GHz up to and including 6.8 GHz with a “fractional bandwidth” greater than 15%, and having any of the following:

d.1.a. A peak saturated power output greater than 75 W (48.75 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

d.1.b. A peak saturated power output greater than 55 W (47.4 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

d.1.c. A peak saturated power output greater than 40 W (46 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; *or*

d.1.d. A peak saturated power output greater than 20 W (43 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

d.2. Rated for operation at frequencies exceeding 6.8 GHz up to and including 16 GHz with a “fractional bandwidth” greater than 10%, and having any of the following:

d.2.a. A peak saturated power output greater than 10W (40 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz; or

d.2.b. A peak saturated power output greater than 5W (37 dBm) at any frequency exceeding 8.5 GHz up to and including 16 GHz;

d.3. Rated for operation with a peak saturated power output greater than 3 W (34.77 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz, and with a “fractional bandwidth” of greater than 10%;

d.4. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

d.5. Rated for operation with a peak saturated power output greater than 1 W (30 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz, and with a “fractional bandwidth” of greater than 10%;

d.6. Rated for operation with a peak saturated power output greater than 31.62 mW (15 dBm) at any frequency exceeding 43.5 GHz up to and including 75 GHz, and with a “fractional bandwidth” of greater than 10%;

d.7. Rated for operation with a peak saturated power output greater than 10 mW (10 dBm) at any frequency exceeding 75 GHz up to and including 90 GHz, and with a “fractional bandwidth” of greater than 5%; or

d.8. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 90 GHz;

e. “Technology” according to the General Technology Note for the “development” or “production” of electronic devices and circuits, “specially designed” for telecommunications and containing “components” manufactured from “superconductive” materials, “specially designed” for operation at temperatures below the “critical temperature” of at least one of the “superconductive” constituents and having any of the following:

e.1. Current switching for digital circuits using “superconductive” gates with a product of delay time per gate (in seconds) and power dissipation per gate (in watts) of less than  $10^{-14}$  J; *or*

e.2. Frequency selection at all frequencies using resonant circuits with Q-values exceeding 10,000.

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PART 2—“INFORMATION SECURITY”

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A. “END ITEMS,” “EQUIPMENT,” “ACCESSORIES,” “ATTACHMENTS,” “PARTS,” “COMPONENTS,”  
AND “SYSTEMS”

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III. DEFEATING, WEAKENING, OR BYPASSING “INFORMATION SECURITY”

**5A004 “Systems,” “equipment” and “components” for defeating, weakening or bypassing  
“information security,” as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, AT, EI

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1



EI applies to entire entry	Refer to §742.15 of the EAR.
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*LICENSE REQUIREMENTS NOTE: See §744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.*

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*LVS:* Yes: \$500 for “components.”

N/A for systems and equipment.

*GBS:* N/A

*ENC:* Yes for certain EI controlled commodities. See §740.17 of the EAR for eligibility.

LIST OF ITEMS CONTROLLED

*Related Controls:* ECCN 5A004.a controls “components” providing the means or functions necessary for “information security.” All such “components” are presumptively “specially designed” and controlled by 5A004.a.

*Related Definitions:* N/A

*Items:*

a. Designed or modified to perform ‘cryptanalytic functions.’

*Note: 5A004.a includes systems or equipment, designed or modified to perform ‘cryptanalytic functions’ by means of reverse engineering.*

**Technical Note:** ‘Cryptanalytic functions’ are functions designed to defeat cryptographic mechanisms in order to derive confidential variables or sensitive data, including clear text, passwords or cryptographic keys.

b. Items, not specified by 5A004.a, designed to perform all of the following:

b.1. ‘Extract raw data’ from a computing or communications device; *and*

b.2. Circumvent “authentication” or authorisation controls of the device, in order to perform the function described in 5A004.b.1.

**Technical Note:** ‘Extract raw data’ from a computing or communications device means to retrieve binary data from a storage medium, e.g., RAM, flash or hard disk, of the device without interpretation by the device’s operating system or filesystem.

**Note 1:** 5A004.b does not apply to systems or equipment specially designed for the “development” or “production” of a computing or communications device.

**Note 2:** 5A004.b does not include:

a. Debuggers, hypervisors;

- b. *Items limited to logical data extraction;*
- c. *Data extraction items using chip-off or JTAG; or*
- d. *Items specially designed and limited to jail-breaking or rooting.*

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D. "SOFTWARE"

**5D002 "Software" as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, AT, EI

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1
EI applies to "software" in 5D002.a.1, a.3, .b, c.1 and c.3, for commodities or "software" controlled for EI reasons in ECCN 5A002, 5A004 or 5D002.	Refer to §742.15 of the EAR.  <i><b>Note:</b> Encryption software is controlled because of its functional capacity, and not because of any informational value of such software; such software is not accorded the same treatment under the EAR as other "software"; and for export licensing purposes,</i>

	<i>encryption software is treated under the EAR in the same manner as a commodity included in ECCN 5A002.</i>
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*LICENSE REQUIREMENTS NOTE: See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.*

**LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)**

*TSR:* N/A

*ENC:* Yes for certain EI controlled software. See §740.17 of the EAR for eligibility.

**LIST OF ITEMS CONTROLLED**

*Related Controls:* After classification or self-classification in accordance with § 740.17(b) of the EAR, mass market encryption software that meets eligibility requirements is released from “EI” and “NS” controls. This software is designated as 5D992.c.

*Related Definitions:* 5D002.a controls “software” designed or modified to use “cryptography” employing digital or analog techniques to ensure “information security.”

*Items:*

a. “Software” “specially designed” or modified for the “development,” “production” or “use” of any of the following:

a.1. Equipment specified by 5A002 or “software” specified by 5D002.c.1;

a.2. Equipment specified by 5A003 or “software” specified by 5D002.c.2; *or*

a.3. Equipment or “software”, as follows:

a.3.a. Equipment specified by 5A004.a or “software” specified by 5D002.c.3.a;

a.3.b. Equipment specified by 5A004.b or “software” specified by 5D002.c.3.b;

b. “Software” having the characteristics of a ‘cryptographic activation token’ specified by 5A002.b;

c. “Software” having the characteristics of, or performing or simulating the functions of, any of the following:

c.1. Equipment specified by 5A002.a, .c, .d or .e;

*Note: 5D002.c.1 does not apply to “software” limited to the tasks of “OAM” implementing only published or commercial cryptographic standards.*

c.2. Equipment specified by 5A003; *or*

c.3. Equipment, as follows:

c.3.a. Equipment specified by 5A004.a;

c.3.b. Equipment specified by 5A004.b.

*Note:* 5D002.c.3.b does not apply to “intrusion software”.

d. [Reserved]

*N.B.:* See 5D002.b for items formerly specified in 5D002.d.

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E. “TECHNOLOGY”

**5E002 “Technology” as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, AT, EI

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
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NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1
EI applies to “technology” in 5E002.a for commodities or “software” controlled for EI reasons in ECCNs 5A002, 5A004 or 5D002, and to “technology” in 5E002.b.	Refer to § 742.15 of the EAR.

*LICENSE REQUIREMENTS NOTES:*

*(1) See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating “information security” functionality, and associated “software” and “technology” for the “production” or “development” of such microprocessors.*

*(2) When a person performs or provides technical assistance that incorporates, or otherwise draws upon, “technology” that was either obtained in the United States or is of U.S.-origin, then a release of the “technology” takes place. Such technical assistance, when rendered with the intent to aid in the “development” or “production” of encryption commodities or software that would be controlled for “EI” reasons under ECCN 5A002, 5A004 or 5D002, may require authorization under the EAR even if the underlying encryption algorithm to be implemented is from the public domain or is not of U.S.-origin.*

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*TSR:* N/A

*ENC:* Yes for certain EI controlled technology. See §740.17 of the EAR for eligibility.

#### LIST OF ITEMS CONTROLLED

*Related Controls:* See also 5E992. This entry does not control “technology” “required” for the “use” of equipment excluded from control under the Related Controls paragraph or the Technical Notes in ECCN 5A002 or “technology” related to equipment excluded from control under ECCN 5A002.

*Related Definitions:* N/A

*Items:*

a. “Technology” according to the General Technology Note for the “development,” “production” or “use” of equipment controlled by 5A002, 5A003, 5A004 or 5B002, or of “software” controlled by 5D002.a or 5D002.c.

*Note:* 5E002.a does not apply to “technology” for items specified by 5A004.b, 5D002.a.3.b or 5D002.c.3.b.

b. “Technology” having the characteristics of a ‘cryptographic activation token’ specified by 5A002.b.

*Note:* 5E002 includes “information security” technical data resulting from procedures carried out to evaluate or determine the implementation of functions, features or techniques specified in



Category 5 Part 2.

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**CATEGORY 9—AEROSPACE AND PROPULSION**

A. “END ITEMS”, “EQUIPMENT”, “ACCESSORIES”, “ATTACHMENTS”, “PARTS”, “COMPONENTS”  
AND “SYSTEMS”

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**9A004 Space launch vehicles and “spacecraft,” “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, terrestrial equipment, and air-launch platforms, as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS and AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to 9A004.g, .u, .v, .w and .x	NS Column 1

AT applies to 9A004.g, .u, .v, .w, .x and .y	AT Column 1
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*LICENSE REQUIREMENTS NOTE: 9A004.b through .f, and .h are controlled under ECCN 9A515.*

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*LVS:* N/A

*GBS:* N/A

LIST OF ITEMS CONTROLLED

*Related Controls:* (1) See also 9A104, 9A515, and 9B515. (2) See ECCNs 9E001 (“development”) and 9E002 (“production”) for technology for items controlled by this entry. (3) See USML Categories IV for the space launch vehicles and XV for other spacecraft that are “subject to the ITAR” (see 22 CFR parts 120 through 130).

*Related Definition:* N/A

*Items:*

- a. Space launch vehicles;
- b. “Spacecraft”;

c. “Spacecraft buses”;

d. “Spacecraft payloads” incorporating items specified by 3A001.b.1.a.4, 3A002.g, 5A001.a.1, 5A001.b.3, 5A002.c, 5A002.e, 6A002.a.1, 6A002.a.2, 6A002.b, 6A002.d, 6A003.b, 6A004.c, 6A004.e, 6A008.d, 6A008.e, 6A008.k, 6A008.l or 9A010.c;

e. On-board systems or equipment, specially designed for “spacecraft” and having any of the following functions:

e.1. ‘Command and telemetry data handling’;

*Note: For the purpose of 9A004.e.1, ‘command and telemetry data handling’ includes bus data management, storage, and processing.*

e.2. ‘Payload data handling’; or

*Note: For the purpose of 9A004.e.2, ‘payload data handling’ includes payload data management, storage, and processing.*

e.3. ‘Attitude and orbit control’;

*Note: For the purpose of 9A004.e.3, ‘attitude and orbit control’ includes sensing and actuation to determine and control the position and orientation of a “spacecraft”.*

*N.B.: Equipment specially designed for military use is “subject to the ITAR”. See 22 CFR parts 120 through 130.*

f. Terrestrial equipment specially designed for “spacecraft”, as follows:

f.1. Telemetry and telecommand equipment “specially designed” for any of the following data processing functions:

f.1.a. Telemetry data processing of frame synchronization and error corrections, for monitoring of operational status (also known as health and safe status) of the “spacecraft bus”; *or*

f.1.b. Command data processing for formatting command data being sent to the “spacecraft” to control the “spacecraft bus”;

f.2. Simulators “specially designed” for ‘verification of operational procedures’ of “spacecraft”.

***Technical Note:*** *For the purposes of 9A004.f.2, ‘verification of operational procedures’ is any of the following:*

- 1. Command sequence confirmation;*
- 2. Operational training;*

3. *Operational rehearsals; or*

4. *Operational analysis.*

g. “Aircraft” “specially designed” or modified to be air-launch platforms for space launch vehicles;

h. “Sub-orbital craft”.

i. through t. [RESERVED]

u. The James Webb Space Telescope (JWST) being developed, launched, and operated under the supervision of the U.S. National Aeronautics and Space Administration (NASA).

v. “Parts,” “components,” “accessories” and “attachments” that are “specially designed” for the James Webb Space Telescope and that are *not*:

v.1. Enumerated or controlled in the USML;

v.2. Microelectronic circuits;

v.3. Described in ECCN 7A004 or 7A104; *or*

v.4. Described in an ECCN containing “space-qualified” as a control criterion (*See* ECCN 9A515.x.4).

w. The International Space Station being developed, launched, and operated under the supervision

of the U.S. National Aeronautics and Space Administration.

x. “Parts,” “components,” “accessories” and “attachments” that are “specially designed” for the International Space Station.

y. Items that would otherwise be within the scope of ECCN 9A004.v or .x but that have been identified in an interagency-cleared commodity classification (CCATS) pursuant to § 748.3(e) as warranting control in 9A004.y.

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**9A012 Non-military “Unmanned Aerial Vehicles,” (“UAVs”), unmanned “airships”, related equipment and “components”, as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, MT, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry	NS Column 1

MT applies to non-military Unmanned Aerial Vehicles (UAVs) and Remotely Piloted Vehicles (RPVs) that are capable of a maximum range of at least 300 kilometers (km), regardless of payload, and UAVs that meet the requirements of 9A120	MT Column 1
AT applies to entire entry	AT Column 1

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

*LVS:* N/A

*GBS:* N/A

LIST OF ITEMS CONTROLLED

*Related Controls:* 1) See the U.S. Munitions List Category VIII (22 CFR Part 121). 2) Also see ECCN 9A610 and § 744.3 of the EAR. 3) For “UAVs” that are “sub-orbital craft,” see ECCNs 9A004.h and 9A515.a.

*Related Definitions:* N/A

*Items:*

a. “UAVs” or unmanned “airships”, designed to have controlled flight out of the direct ‘natural vision’ of the ‘operator’ and having any of the following:

a.1. Having all of the following:

a.1.a. A maximum 'endurance' greater than or equal to 30 minutes but less than 1 hour;

and

a.1.b. Designed to take-off and have stable controlled flight in wind gusts equal to or exceeding 46.3 km/h (25 knots); *or*

a.2. A maximum 'endurance' of 1 hour or greater;

***Technical Notes:***

1. *For the purposes of 9A012.a, 'operator' is a person who initiates or commands the "UAV" or unmanned "airship" flight.*

2. *For the purposes of 9A012.a, 'endurance' is to be calculated for ISA conditions (ISO 2533:1975) at sea level in zero wind.*

3. *For the purposes of 9A012.a, 'natural vision' means unaided human sight, with or without corrective lenses.*

b. Related equipment and "components", as follows:

b.1 [Reserved]



b.2. [Reserved]

b.3. Equipment or “components” “specially designed” to convert a manned “aircraft” or a manned “airship” to a “UAV” or unmanned “airship”, controlled by 9A012.a;

b.4. Air breathing reciprocating or rotary internal combustion type engines, “specially designed” or modified to propel “UAVs” or unmanned “airships”, at altitudes above 15,240 meters (50,000 feet).

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**9A515 “Spacecraft” and related commodities, as follows (see List of Items Controlled).**

LICENSE REQUIREMENTS

*Reason for Control:* NS, RS, MT, AT

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738)</i>
NS applies to entire entry, except .e and .y.	NS Column 1
RS applies to entire entry, except .e and .y.	RS Column 1
RS applies to 9A515.e.	RS Column 2

RS applies to 9A515.y, except to Russia for use in, with, or for the International Space Station (ISS), including launch to the ISS.	China, Russia or Venezuela (see § 742.6(a)(7)).
MT applies to microcircuits in 9A515.d and 9A515.e.2 when “usable in” “missiles” for protecting “missiles” against nuclear effects (e.g., Electromagnetic Pulse (EMP), X-rays, combined blast and thermal effects). MT also applies to 9A515.h when the total impulse capacity is equal to or greater than 8.41x10 <sup>5</sup> newton seconds.	MT Column 1
AT applies to entire entry	AT Column 1

*LICENSE REQUIREMENT NOTE: The Commerce Country Chart is not used for determining license requirements for commodities classified in ECCN 9A515.a.1, .a.2., .a.3., .a.4, and .g. See § 742.6(a)(9), which specifies that such commodities are subject to a worldwide license requirement.*

LIST BASED LICENSE EXCEPTIONS (SEE PART 740 FOR A DESCRIPTION OF ALL LICENSE EXCEPTIONS)

LVS: \$1500

GBS: N/A

## SPECIAL CONDITIONS FOR STA

*STA:* (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for “spacecraft“ in ECCNs 9A515.a.1, .a.2, .a.3, or .a.4, “sub-orbital craft,” or items in 9A515.g, unless determined by BIS to be eligible for License Exception STA in accordance with § 740.20(g) (License Exception STA eligibility requests for certain 9x515 and “600 series” items). (2) License Exception STA may not be used if the “spacecraft” controlled in ECCN 9A515.a.1, .a.2, .a.3, or .a.4 contains a separable or removable propulsion system enumerated in USML Category IV(d)(2) or USML Category XV(e)(12) and designated MT. (3) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in 9A515.

## LIST OF ITEMS CONTROLLED

*Related Controls:* Spacecraft, launch vehicles and related articles that are enumerated in the USML, and technical data (including “software”) directly related thereto, and all services (including training) directly related to the integration of any satellite or spacecraft to a launch vehicle, including both planning and onsite support, or furnishing any assistance (including training) in the launch failure analysis or investigation for items in ECCN 9A515.a, are “subject to the ITAR.” All other “spacecraft,” as enumerated below and defined in § 772.1, are subject to the controls of this ECCN. See also ECCNs 3A001, 3A002, 3A991, 3A992, 6A002, 6A004, 6A008, and 6A998 for specific “space-qualified” items, 7A004 and 7A104

for star trackers, and 9A004 for the International Space Station (ISS), the James Webb Space Telescope (JWST), and “specially designed” “parts” and “components” therefor. See USML Category XI(c) for controls on “Monolithic Microwave Integrated Circuit” (“MMIC”) amplifiers that are “specially designed” for defense articles. See ECCN 9A610.g for pressure suits used for high altitude aircraft.

*Related Definitions:* ‘Microcircuit’ means a device in which a number of passive or active elements are considered as indivisibly associated on or within a continuous structure to perform the function of a circuit.

*Items:*

“Spacecraft” and other items described in ECCN 9A515 remain subject to the EAR even if exported, reexported, or transferred (in-country) with defense articles “subject to the ITAR” integrated into and included therein as integral parts of the item. In all other cases, such defense articles are subject to the ITAR. For example, a 9A515.a “spacecraft” remains “subject to the EAR” even when it is exported, reexported, or transferred (in-country) with a “hosted payload” described in USML Category XV(e)(17) incorporated therein. In all other cases, a “hosted payload” performing a function described in USML Category XV(a) always remains a USML item. The removal of the defense article subject to the ITAR from the spacecraft is a retransfer under the ITAR and would require an ITAR authorization, regardless of the CCL authorization the spacecraft is exported under. Additionally, transfer of technical data regarding the defense article subject to the ITAR integrated into the spacecraft would require an ITAR authorization.

a. “Spacecraft,” including satellites, and space vehicles and “sub-orbital craft,” whether designated developmental, experimental, research or scientific, not enumerated in USML Category XV or described in ECCN 9A004.u or .w, that:

a.1. Have electro-optical remote sensing capabilities and having a clear aperture greater than 0.35 meters, but less than or equal to 0.50 meters;

a.2. Have remote sensing capabilities beyond NIR (*i.e.*, SWIR, MWIR, or LWIR);

a.3. Have radar remote sensing capabilities (*e.g.*, AESA, SAR, or ISAR) having a center frequency equal to or greater than 1.0 GHz, but less than 10.0 GHz and having a bandwidth equal to or greater than 100 MHz, but less than 300 MHz;

a.4. Provide space-based logistics, assembly, or servicing of another “spacecraft”; *or*

a.5. Are not described in ECCN 9A515.a.1, .a.2, .a.3 or .a.4.

*Note: ECCN 9A515.a includes commercial communications satellites, remote sensing satellites, planetary rovers, planetary and interplanetary probes, in-space habitats, and “sub-orbital craft,” not identified in ECCN 9A004 or USML Category XV(a).*

b. Ground control systems and training simulators “specially designed” for telemetry, tracking, and control of the “spacecraft” controlled in paragraphs 9A004.u or 9A515.a.

c. [Reserved]

d. Microelectronic circuits (*e.g.*, integrated circuits, microcircuits, or MOSFETs) and discrete electronic components rated, certified, or otherwise specified or described as meeting or exceeding all the following characteristics and that are “specially designed” for defense articles, “600 series” items, or items controlled by ECCNs 9A004.v or 9A515:

d.1. A total dose of  $5 \times 10^5$  Rads (Si) ( $5 \times 10^3$  Gy (Si));

d.2. A dose rate upset threshold of  $5 \times 10^8$  Rads (Si)/sec ( $5 \times 10^6$  Gy (Si)/sec);

d.3. A neutron dose of  $1 \times 10^{14}$  n/cm<sup>2</sup> (1 MeV equivalent);

d.4. An uncorrected single event upset sensitivity of  $1 \times 10^{-10}$  errors/bit/day or less, for the CRÈME-MC geosynchronous orbit, Solar Minimum Environment for heavy ion flux; and

d.5. An uncorrected single event upset sensitivity of  $1 \times 10^{-3}$  errors/part or less for a fluence of  $1 \times 10^7$  protons/cm<sup>2</sup> for proton energy greater than 50 MeV.

e. Microelectronic circuits (*e.g.*, integrated circuits, microcircuits, or MOSFETs) and discrete electronic components that are rated, certified, or otherwise specified or described as meeting or exceeding the characteristics in either paragraph e.1 or e.2, AND “specially designed” for defense

articles controlled by USML Category XV or items controlled by ECCNs 9A004.u or 9A515:

e.1. A total dose  $\geq 1 \times 10^5$  Rads (Si) ( $1 \times 10^3$  Gy(Si)) and  $< 5 \times 10^5$  Rads (Si) ( $5 \times 10^3$  Gy(Si)); and a single event effect (SEE) (*i.e.*, single event latchup (SEL), single event burnout (SEB), or single event gate rupture (SEGR)) immunity to a linear energy transfer (LET)  $\geq 80$  MeV-cm<sup>2</sup>/mg;  
*or*

e.2. A total dose  $\geq 5 \times 10^5$  Rads (Si) ( $5 \times 10^3$  Gy (Si)) and not described in 9A515.d.

*Note 1 to 9A515.d and .e:* Application specific integrated circuits (ASICs), integrated circuits developed and produced for a specific application or function, specifically designed or modified for defense articles and not in normal commercial use are controlled by Category XI(c) of the USML regardless of characteristics.

*Note 2 to 9A515.d and .e:* See 3A001.a for controls on radiation-hardened microelectronic circuits “subject to the EAR” that are not controlled by 9A515.d or 9A515.e.

f. Pressure suits (*i.e.*, space suits) capable of operating at altitudes 55,000 feet above sea level.

g. Remote sensing components “specially designed” for “spacecraft” described in ECCNs 9A515.a.1 through 9A515.a.4 as follows:

g.1. Space-qualified optics (*i.e.*, lens, mirror, membrane having active properties (*e.g.*, adaptive, deformable)) with the largest lateral clear aperture dimension equal to or less than 0.35 meters; or with the largest clear aperture dimension greater than 0.35 meters but less than or equal to 0.50 meters;

g.2. Optical bench assemblies “specially designed” for ECCN 9A515.a.1, 9A515.a.2, 9A515.a.3, or 9A515.a.4 “spacecraft;” *or*

g.3. Primary, secondary, or hosted payloads that perform a function of ECCN 9A515.a.1, 9A515.a.2, 9A515.a.3, or 9A515.a.4 “spacecraft.”

h. Spacecraft thrusters using bi-propellants or mono-propellants that provide thrust equal to or less than 150 lbf (*i.e.*, 667.23 N) vacuum thrust.

i. through w. [RESERVED]

x. “Parts,” “components,” “accessories” and “attachments” that are “specially designed” for defense articles controlled by USML Category XV or items controlled by 9A515, and that are NOT:

x.1. Enumerated or controlled in the USML or elsewhere within ECCNs 9A515 or 9A004;



- x.2. Microelectronic circuits and discrete electronic components;
- x.3. Described in ECCNs 7A004 or 7A104;
- x.4. Described in an ECCN containing “space-qualified” as a control criterion (*i.e.*, 3A001.b.1, 3A001.e.4, 3A002.g.1, 3A991.o, 3A992.b.3, 6A002.a.1, 6A002.b.2, 6A002.d.1, 6A004.c and .d, 6A008.j.1, 6A998.b, or 7A003.d.2);
- x.5. Microwave solid state amplifiers and microwave assemblies (refer to ECCN 3A001.b.4 for controls on these items);
- x.6. Travelling wave tube amplifiers (refer to ECCN 3A001.b.8 for controls on these items); *or*
- x.7. Elsewhere specified in ECCN 9A515.y.

***Note to 9A515.x:*** “Parts,” “components,” “accessories,” and “attachments” specified in USML subcategory XV(e) or enumerated in other USML categories are subject to the controls of that paragraph or category.

y. Items that would otherwise be within the scope of ECCN 9A515.x but that have been identified in an interagency-cleared commodity classification (CCATS) pursuant to § 748.3(e) as warranting control in 9A515.y.

y.1. Discrete electronic components not specified in 9A515.e;

y.2. Space grade or for spacecraft applications thermistors;

y.3. Space grade or for spacecraft applications RF microwave bandpass ceramic filters (Dielectric Resonator Bandpass Filters);

y.4. Space grade or for spacecraft applications hall effect sensors;

y.5. Space grade or for spacecraft applications subminiature (SMA and SMP) plugs and connectors, TNC plugs and cable and connector assemblies with SMA plugs and connectors; *and*

y.6. Space grade or for spacecraft applications flight cable assemblies.

Matthew S. Borman

Deputy Assistant Secretary for Export Administration.