

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Parts 734, 738, 740, 743, 772, and 774

[Docket No. 131224999-3999-01]

RIN 0694-AG05

Wassenaar Arrangement 2013 Plenary Agreements Implementation: Commerce Control List, Definitions, and Reports; and Extension of Fly-by-Wire Technology and Software Controls

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 of the items subject to Department of Commerce jurisdiction. This final rule revises the CCL to

implement changes made to the Wassenaar Arrangement's List of Dual-Use Goods and Technologies (Wassenaar 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 2013 WA Plenary Meeting (the Plenary). The Wassenaar Arrangement advocates implementation of effective export controls on strategic items with the objective of improving regional and international security and stability. This rule harmonizes the CCL with the changes made to the WA List at the Plenary by revising Export Control Classification Numbers (ECCNs) controlled for national security reasons in each category of the CCL, as well as amending the General Technology Note, WA reporting requirements, and definitions section in the EAR. However, BIS intends to publish a separate rule in September setting forth changes to the CCL resulting from the WA agreements for cybersecurity. These changes agreed to at the Plenary include raising the Adjusted Peak Performance (APP) for digital computers in ECCN 4A003. The President's report for High Performance Computers was sent to Congress on July 1, 2014 to set forth the new APP in accordance with the National Defense Authorization Act (NDAA) for FY1998. This rule also makes corresponding revisions to the *de minimis* rule, and post shipment verification reporting requirements in the Export Administration Regulations. This rule also extends the controls on specified fly-by-wire source code software and technology until June 20, 2015, as BIS continues to negotiate for multilateral controls for this software and technology. This rule also revises the license requirements for Mexico on the Commerce Country Chart, because of its recent membership in multiple multilateral export control regimes. In addition, this rule makes changes to the EAR resulting from previous rules issued as part of BIS's export control reform initiative and makes minor editorial corrections to the CCL.

DATES: This rule is effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER], except the amendments to parts 734, 743, and ECCN 4A003 (amendatory instructions: 2, 9, and 28), which are effective on August 30, 2014.

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SUPPLEMENTARY INFORMATION:

Background

The Wassenaar Arrangement (WA) on Export Controls for Conventional Arms and Dual-

Use Goods and Technologies is a group of 41 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. The 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 December Plenary meetings. Participating States are charged with implementing the agreed list changes as soon as possible after approval. Implementation of WA list changes ensures U.S. companies have a level playing field with their competitors in other WA member states.

Unless otherwise indicated, the changes to the EAR described below are made in order to implement changes to the WA control lists approved at the December 2013 Plenary meeting.

Revisions to the Commerce Control List

Category 0 Nuclear Materials, Facilities, and Equipment [And Miscellaneous Items]

0A018 Items on the Wassenaar Munitions List.

In paragraph 0A018.b, the text that previously stated that an item is subject to the license authority of the U.S. Department of State, Directorate of Defense Trade Controls was universally changed to “subject to the ITAR” in the Export Control Reform revisions (78 FR 61874, October 4, 2013). Therefore the new language is inserted here.

A Note is added to paragraph 0A018.b that states that 0A018.b does not apply to: “components” for ammunition crimped without a projectile (blank star); dummy ammunition

with a pierced powder chamber; or other blank and dummy ammunition not incorporating components designed for live ammunition. These components do not pose a threat to national security and are now designated EAR99.

Category 1 Special Materials and Related Equipment, Chemicals, “Microorganisms,” and “Toxins”

1A004 (Protective and detection equipment and “components,” not “specially designed” for military use)

ECCN 1A004 is amended by adding Technical Notes after the Note following the introductory text to paragraph 1A004.a in the items paragraph of the List of Items Controlled section to clarify that filter canisters include filter cartridges.

1B001 (Equipment for the production or inspection of “composite” structures or laminates controlled by 1A002 or “fibrous or filamentary materials” controlled by 1C010 ...)

ECCN 1B001 is amended by revising the text of 1B001.b (‘Tape-laying machines’) and 1B001.g (‘Tow-placement machines’) to remove ambiguity with the current controls, which may result in a double coverage in controls or no control at all. A Technical Note is added to 1B001.b to explain the abilities of ‘tape-laying machines.’ A Technical Note is added to 1B001.g to explain the abilities of ‘tow-placement machines.’ The Technical Notes establish 25 mm as the break point between tape-laying and tow-placement machines, with the intent to distinguish both the tape-laying and tow-placement machines from the filament winding machines specified in 1B001.a. In addition, the existing Technical Note regarding ‘primary servo positioning’ axes control is now Technical Note 1 and a Technical Note 2 is added to

define ‘filament band.’

1C008 (Non-fluorinated polymeric substances)

ECCN 1C008 is amended by revising paragraphs a.3 and .f in the Items paragraph of the List of Items Controlled section to relax the controls on aromatic polyimides in 1C008.a.3 based on the foreign availability of this material. The current validation procedures are limited in accuracy to very small samples. Removal of these validation procedures and reference to national standards in the 1C008 Technical Notes provides a simpler and cleaner text. In order to accommodate the newly referenced testing method, Technical Note 1 is revised and a new Technical Note 2 is added to the existing 1C008 Technical Note. These changes do not affect the scope of the other paragraphs in 1C008.

1C010 (“Fibrous or filamentary materials”)

ECCN 1C010 is amended by removing the Technical Note after paragraph b.2 and adding Technical Notes after the Note following paragraph c.2 in the Items paragraph of the List of Items Controlled section. These changes are made to remove ambiguity regarding the determination of the specific tensile strength and modulus that are specified in various 1C010 entries, especially when the 1C010 tensile properties metrics are applied to various forms of multi-axial materials (woven fabrics, random mats and braids).

Also, a comma is added after the word “pitch” in paragraph e.2.a to correct the punctuation.

Annex to Category 1 “List of Explosives”

The List of Explosives is amended by revising paragraphs 32.d and 43, removing and

reserving paragraph 34 and adding paragraphs 44 through 48. Paragraph 32 is amended by changing the square brackets to parentheses to read “BDNTA ([bis-dinitrotriazole] amine); ((bis-dinitrotriazole) amine);” to be consistent with the International Union of Pure and Applied Chemistry (IUPAC) conventions. The deletion of paragraph 34 is a result of a class of energetics that has short-term high temperature capability, which is no longer in demand. Paragraph 43 is amended by changing the semi-colon to a period at the end of the entry to accommodate the addition of paragraphs to follow. Paragraphs 44 through 48 are added to address the trend towards ‘Insensitive Munitions.’ Insensitive munitions are chemically stable enough to withstand mechanical shock, fire, and impact by shrapnel, but can still explode as intended to destroy their targets.

Category 2 - Materials Processing

“Technical Notes for 2B001 to 2B009, 2B201, 2B290 and 2B991 to 2B999”

“Technical Notes for 2B001 to 2B009, 2B201, 2B290 and 2B991 to 2B999” is amended by revising paragraph .f of the Note to paragraph 5 in order to update the thresholds to ensure the rules regarding stated accuracy remain consistent in Category 2.

2B006 (Dimensional inspection or measuring systems, equipment, and “electronic assemblies”)

ECCN 2B006 is amended by revising paragraphs b.1.b., b.1.c.2.b, and the introductory text of paragraph b.2 in the Items paragraph of the List of Items Controlled section. 2B006.b.1.b is revised to clarify the controls of certain displacement measuring instruments (Linear Variable Differential Transformer - LVDT). 2B006.b.2 is amended to delete the current definition for

“angular position deviation” and to add the word “accuracy” in this entry. The definition refers to a standard that not only is out of date, but no longer published. WA decided that the definition of “accuracy” could be useful to clarify the assessment of accuracy of angular displacement measuring instruments for this entry.

2D002 (“Software” for electronic devices, even when residing in an electronic device or system, enabling such devices or systems to function as a “numerical control” unit, capable of coordinating simultaneously more than 4 axes for “contouring control”.)

The term “machine tools” is replaced with “items” in Notes 1 and 3 to clarify the scope of control on software for electronic devices or systems capable of controlling 5 or more axes.

Category 3 – Electronics

3A001 (Electronic components and “specially designed” “components” therefor)

ECCN 3A001 is amended by removing Notes 3 and 4 from the Related Control Notes paragraph in the List of Items Controlled section, because they refer to ECCN 3A982, which is removed by this rule.

ECCN 3A001 is amended by revising Note 2 to paragraph 3A001.a, paragraphs a.5.a.1, a.7.b, b.2., b.3, and b.4; adding a Technical Note after the introductory text to paragraph 3A001.b; and revising Note 3 to paragraph 3A001.h.

“Three dimensional integrated circuits” are added to Note 2 to paragraph 3A001.a, because a new approach to improve the functionality and performance of integrated circuits is using a 3D integrated circuit (3D-IC).

Paragraph 3A001.a.5.a.1 (High Performance Analog-to-Digital Integrated Circuits) is

amended by replacing the output rate of “greater than 500 million words per second” to “greater than 1 billion words per second” to update the Analog-to-Digital Converter (ADC) control thresholds for the 8 and 9 bit resolution ADCs to reflect the advances in technology used in the commercial cellular communications and oscilloscope applications.

Paragraph 3A001.a.7.b is amended by replacing “or” with “of” to make a correction submitted by a Technical Advisory Committee member.

A Technical Note is added to 3A001.b to set forth alternative terms for “peak saturated power output” that may appear on product data sheets.

This rule makes a series of changes regarding microwave or millimeter wave components specified by entries 3A001.b.2 (Microwave Monolithic Integrated Circuits - MMIC), 3A001.b.3 (Discrete microwave transistors) and 3A001.b.4 (Microwave solid state amplifiers). The changes are intended to add a frequency bandwidth (2.7-3.2 GHz) to each of the existing entries 3A001.b.2, b.3 and b.4. The changes also aim at modernizing the control text over the entire controlled spectrum by replacing the current control parameter ‘*average power*’ with ‘*peak saturated power*.’

A comma is added to Note 3 to paragraph 3A001.h to correct the punctuation. The addition of the comma makes the modifying phrase (incorporated into equipment designed for civil automobile, civil railway, or “civil aircraft” applications) apply to all three nouns (switches, diodes, and modules).

3A002 (General purpose electronic)

ECCN 3A002 is amended by revising the Heading; revising License Exception GBS and CIV paragraphs; revising the introductory text to paragraph .a; removing and reserving

paragraphs a.1 through a.4; revising paragraph a.6; adding paragraph a.7; revising the introductory text to paragraph d.1.; and revising Technical Note 2 that appears after paragraph d.5.

The Heading is amended by removing the phrase “and accessories therefor.” The only accessories enumerated in 3A002 are test tapes in 3A002.a, which are test tapes for instruments described in 3A002.a.1 through 3A002.a.4. As 3A002.a.1 through 3A002.a.4 are removed and reserved by this rule, the reference to “accessories” is no longer needed.

Paragraphs 3A002.a.1 through a.4 are removed and reserved because magnetic instrumentation tape recorders are obsolete technology. The replacement technology is magnetic disk storage, for which instruments remain controlled in 3A002.a.6.

Paragraph 3A002.a.6 (Digital instrumentation data recorders) is revised to address a potential loophole for digital instrumentation recorders that do not digitize data but rather receive digitized data from external digitizers.

This rule adds new entry 3A002.a.7 to control very high-speed oscilloscopes that are used to develop and test military radars, communications systems, and electronic warfare systems. The values used in this new control are intended to separate the highest performing oscilloscopes from those used for more routine commercial applications. Consequential changes are also made in the introductory text to 3A002.a with the addition of ‘and oscilloscopes.’

Paragraph 3A002.d.1 is amended by replacing “pulses” with “pulse-modulated signals” to clarify that “pulses” more accurately refers to signals that are pulse modulated.

Technical Note 2 that appears after paragraph 3A002.d.5 is amended to introduce the industrial norm of ‘pulse duration’ and its measurement.

3A982, 3D982 and 3E982 (Microwave or millimeter wave components)

ECCNs 3A982 and associated software (3D982) and technology (3E982) are removed from the Commerce Control List (CCL). These ECCNs are removed because the microwave and millimeter wave components identified in this entry were discussed and agreed for inclusion in the WA 2013 Plenary updates to 3A001.b.2 and 3A001.b.3. Software “specially designed” for the development or production of equipment controlled by 3A001.b is controlled under ECCN 3D001. Technology for the development or production of 3A001.b is controlled under ECCN 3E001. Because the items of concern are now controlled in these new entries, the need for ECCNs 3A982, 3D982 and 3E982 is eliminated.

3A991 (Electronic devices, and “components” not controlled by 3A001)

ECCN 3A991 is amended by revising paragraph .d (field programmable logic devices) in the items paragraph of the List of Items Controlled section. The parameters are changed from “gate count” and “toggle frequency” to “maximum number of single-ended digital input/outputs.” The control level is set at “200 or greater and less than 500.” This is to align 3A991 parameters with 3A001.a.7.a parameters for these types of devices.

3C005 (Silicon carbide (SiC), gallium nitride (GaN), aluminum nitride (AlN) ...) is amended by adding “semiconductor” to the Heading to clarify the scope of this entry, because the goods that should be controlled by this entry are substrates of semiconductor materials, which are generally referred to as wafers.

3E002 (“Technology” according to the General Technology Note other than that controlled in 3E001 for the “development” or “production” of a “microprocessor microcircuit,” “micro-

computer microcircuit” and microcontroller microcircuit core, having an arithmetic logic unit with an access width of 32 bits or more and any of the following features or characteristics).

ECCN 3E002.b is amended by replacing “two 64-bit or larger floating-point operation results per cycle” with “four 64-bit or larger floating-point operation results per cycle” to update the control text to maintain control of leading edge technology and decontrol that technology no longer considered state-of-the-art.

Category 4 – Computers

ECCN 4A003 (“Digital computers,” “electronic assemblies” and related equipment therefor)

The AT license requirement paragraph is revised to update the Adjusted Peak Performance (APP) upper limit in the range in the cross reference to ECCN 4A994 from 3.0 Weighted TeraFLOPS (WT) to 8.0 WT to harmonize with the change to 4A003.b.

The Congressional notification requirement set forth in subsections 1211(d) and (e) of the National Defense Authorization Act (NDAA) for FY 1998 (Pub. L. 105–85, November 18, 1997, 111 Stat. 1932) provide that the President must submit a report to Congress 60 days before adjusting the composite theoretical performance level above which exports of digital computers to Tier 3 countries require a license. The President sent a report to Congress on July 1, 2014 that establishes and provides justification for the 8.0 WT control level using the APP formula.

The APP in the Note in the License Requirements section is changed from 3.0 WT to 8.0 WT to harmonize with the change to 4A003.b. This paragraph explains that no license is required for computers with an APP not exceeding 8.0 WT and for electronic assemblies described in 4A003.c that are not capable of exceeding an APP exceeding 8.0 WT in aggregation, except to destinations in Country Group E:1 of Supplement No. 1 to part 740.

The APP in 4A003.b for digital computers is raised from 3.0 WT to 8.0 WT, because multi-

core processor technology has continued to advance rapidly as feature size shrinks. Most high-performance computer systems use processors with four, eight, or more cores as the compute engine, and each core also has greater double-precision floating point capabilities.

4D001 (“Software” for digital computers)

List based License Exception TSR eligibility and License Exception STA conditions are amended by raising the APP from 0.5 WT to 1.0 WT to align with revision to 4D001 in the WA Sensitive List. The control parameter for software for digital computers is amended by raising the APP from 0.25 to 0.60 WT in paragraph 4D001.b.1, in order to maintain control on leading-edge software for the development or production of digital computers.

4E001 (“Technology” for the development or production of digital computers)

List based License Exception TSR eligibility and License Exception STA conditions are amended by raising the APP from 0.5 WT to 1.0 WT to align with revision to 4E001 in the WA Sensitive List. The control parameter for software for digital computers is amended by raising the APP from 0.25 to 0.60 WT in paragraph 4E001.b.1, in order to maintain control on leading-edge technology for the development or production of digital computers.

Category 5 Part 1 – “Telecommunications”

5A001 (Telecommunications systems, equipment, “components” and “accessories”)

A comma is added to 5A001.b.1.d to correct the punctuation and clarify the meaning of the sentence.

In 5A001.b.5.b, the term “frequency switching time” is replaced by “channel switching time”

and a Technical Note is added to define ‘channel switching time.’ The definition for “frequency switching time” had been crafted for the purposes of defining a signal generator’s characteristics more so than a radio receiver’s. The change in term and definition will help clarify its interpretation for both signal generators specified under 3A002.d, as well as radio receivers specified by 5A001.b.5.

5E001 (“Technology”)

ECCN 5E001.d is amended to align with the revisions made to ECCN 3A001.b. The changes are intended to add a frequency bandwidth (2.7-3.2 GHz) to 5E001.d. The changes also modernize the control text over the entire controlled spectrum in 5E001.d by replacing the current control parameter ‘*average power*’ with ‘*peak saturated power*.’

Category 5 Part 2 – “Information Security”

Category 5 Part 2 is amended by revising paragraph b of Note 3. ‘Executable software’ is added to Note 3, as well as a Technical Note to define ‘executable software’ as “‘software’ in executable form, from an existing hardware component excluded from 5A002 by the Cryptography Note.” A Note is also added after the Technical Note that states, “‘Executable software’ does not include complete binary images of the “software” running on an end-item.” Encryption is increasingly a commonplace functionality implemented by ‘mass market’ Information and Communications Technology (ICT) products. Moreover, cryptographic functionality is often implemented in “software,” with comparable capability found in hardware. This revision ensures that all such comparable components of ‘mass market’ products are given equal treatment under the Cryptography Note.

Category 5 Part 2 is amended by moving the Technical Note at the end of Note 4 to after

5A002.a.1.a. The Technical Note states, “Parity bits are not included in the key length.” so that it now immediately follows the text to which it refers. Within Category 5 Part 2, the topic of ‘parity bits’ is only relevant to how key lengths are calculated and considered, and 5A002.a.1 is the only paragraph that involves key lengths.

5A002 (“Information security” systems, equipment “components” therefor).

An editorial correction is made to paragraph (i) of the 5A002 decontrol note to remove “or” from the end of paragraph (i). “Or” is added to paragraph (j) of the 5A002 decontrol Note, because of the addition of paragraph (k). Paragraph (k) “mobile telecommunications Radio Access Network (RAN) equipment designed for civil use ...” is added to the 5A002 decontrol Note. Domestic small cells for use in the home offer telecommunications service providers a way to roll out their networks without the need to install expensive infrastructure. Using their customer’s internet connections, they can backhaul data from their subscribers in the immediate vicinity of a small cell. These items are designed to be simple to install by anyone, and in many cases are mass market items. However, these items are not always marketed in a way that allows the application of Note 3 in Category 5 Part 2, because in some countries the sale of some small cells is restricted to privileged customers or high value individuals, and some have restrictions on where they may be used.

This rule amends the Nota Bene after the introductory text of paragraph .a by adding the phrase, “, and for related decryption “software” and “technology” see 7D005 and 7E001.” This is a consequential change to harmonize with the addition of ECCN 7D005 ““Software” specially designed to decrypt Global Navigation Satellite Systems (GNSS) ranging signals designed for government use” and related technology in ECCN 7E001, and to ensure that GNSS-related

software and technology resides in Cat 7 only and is not spread across two Categories, which may be undesirable and cause confusion.

Paragraph 3 in the Technical Note to 5A001.a.1 is moved to the definition for “cryptography” in § 772.1 of the EAR, because paragraph 3 applies directly and broadly to the definition of “cryptography.”

The Note to 5A002.a.1 is removed because it is redundant. 5A002.a.1 controls the implementation of “cryptography” utilizing ‘digital techniques’ regardless of what types of ‘principles’ (*i.e., whether ‘analog’ or otherwise*) these ‘digital techniques’ are based on.

The introductory text to paragraph a.9 is amended by adding the phrase “or perform” to clarify the scope of the control. The whole text reads, “Designed or modified to use or perform ‘quantum cryptography.’”

Category 6 - Sensors and Lasers

6A001 (Acoustic systems, equipment and components)

Note 3 is added to the introductory paragraph a.1.c, in order to clarify that 6A001.a.1.c applies to projectors or transducers designed and manufactured using either of two high performance transduction materials: 1) lead-magnesium-niobate/lead-titanate ($Pb(Mg_{1/3}Nb_{2/3})O_3$ - $PbTiO_3$, or PMN-PT), or 2) lead-indium-niobate/lead-magnesium-niobate/lead-titanate ($Pb(In_{1/2}Nb_{1/2})O_3$ - $Pb(Mg_{1/3}Nb_{2/3})O_3$ - $PbTiO_3$, PIN-PMN-PT). These materials are currently being used in medical ultrasound applications, but are increasingly being used in high performance military and civil projectors and transducers.

In the Technical Note below paragraph a.1.c.2, a single quotation mark is added to the beginning of the term ‘acoustic power density’ to add the missing single quotation mark.

Paragraph a.1.e (Active individual sonars, “specially designed” or modified to detect, locate and automatically classify swimmers or divers) is amended by adding the phrase “and “specially designed” transmitting and receiving acoustic arrays therefor,” in order to control critical components of such systems.

Paragraph a.2.a.3.d (Lead-magnesium-niobate/lead-titanate (i.e., $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$, or PMN-PT) piezoelectric single crystals grown from solid solution) and paragraph a.2.a.3.e (Lead-indium-niobate/lead-magnesium niobate/lead-titanate (i.e., $\text{Pb}(\text{In}_{1/2}\text{Nb}_{1/2})\text{O}_3\text{-Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$, or PIN-PMN-PT) piezoelectric single crystals grown from solid solution) are added as parameters for hydrophone sensing elements, because PMN-PT and PIN-PMN-PT single crystals are a new generation of piezoelectric materials that exhibit superior piezoelectric properties over PZT ceramics. Hydrophones designed using PIN-PMN-PT have greater bandwidth and sensitivity, as well as lower self-noise.

Paragraph a.2.b.8 (Accelerometer-based hydro-acoustic sensors specified by 6A001.a.2.g) is added as a parameter for towed acoustic hydrophone arrays because these sensors are useful for military applications.

Paragraph a.2.e.3 (Incorporating accelerometer-based hydro-acoustic sensors specified by 6A001.a.2.g) is added as a parameter for bottom or bay-cable hydrophone arrays because these sensors are useful for military applications. Consequential editorial revisions are made to paragraphs a.2.e.1 (removing an “or”) and a.2.e.2.b (adding an “or”), because of the addition of paragraph a.2.e.3.

Paragraph a.2.g (Accelerometer-based hydro-acoustic sensors) is added under passive marine acoustic systems, equipment, and specially designed components therefor, because these sensors are useful for military applications. A Note is included to clarify that 6A001.a.2.g does not apply

to particle velocity sensors or geophones. Two Technical Notes are added to inform the reader that accelerometer-based hydro-acoustic sensors are also known as vector sensors, and to include a definition for the term ‘acceleration sensitivity,’ which is used in the parameters for these sensors.

6A005 (“Lasers,” “components” and optical equipment)

In the NP License Requirement paragraph, the existing text is replaced with “NP applies to “lasers” that exceed the parameters of 6A205.” The License Requirement Note pertaining to NP controls is removed.

References to 6A005.b.6.c.2 and 6A005.b.6.c.2.b are changed to 6A005.b.6.d.2 and 6A005.b.6.d.2.b in the License Exceptions GBS and CIV eligibility paragraphs. These are consequential changes due to the revisions in 6A005.b.6.

References to 6A005.a.6.b.1 and 6A005.b.6 are added after the definition for ‘wall-plug efficiency’ in the Related Definitions paragraph. The definition for ‘non-repetitive pulsed’ is added to the Related Definitions paragraph with references to where the term is used: Note 2 of 6A005 and 6A005.d.6.

Note 2 at the beginning of the Items paragraph is revised by adding single quotes to the term ‘non-repetitive pulsed’ and a Technical Note is added to Note 2 to define ‘non-repetitive pulsed’ to improve the understanding of Note 2.

The Technical Note that defines ‘non-repetitive pulsed’ is moved from 6A005.d.6 to after Note 2, where it is first used in 6A005. The definition is also added to the Related Definitions paragraph, because it is used more than once in 6A005.

Note 2 is added to 6A005.a.6.b to describe multiple transverse mode industrial “lasers” that

are not controlled under 6A005.a.6.b. This Note includes a Technical Note to define ‘brightness.’

The parameters in paragraph 6A005.b.4, b.5, and b.6 are revised to reset the control level below the level for which military utility can be achieved for lasers with pulse durations less than 1 picosecond. Consequential changes are made to distinguish or move paragraphs that pertain to lasers with pulse durations equal to or exceeding 1 picosecond. Here is where they were located and where they move to: b.4.a to b.4.b.1; b.4.b to b.4.b.2; b.5.a to b.5.b; b.5.b to b.5.c; b.6.a to b.6.b; b.6.b to b.6.c; and b.6.c to b.6.d. Consequential changes within ECCN 6A005 include: correcting references to these paragraphs that have moved in the NP paragraph of the License Requirements section, License Requirement paragraphs: (b) and (f), and License Exceptions GBS and CIV eligibility paragraphs. Consequential changes outside of ECCN 6A005 include revising the Related Controls Note 3 in ECCN 6A205 and the Heading of ECCN 6E201 to correct references to these paragraphs that have moved.

6A007 (Gravity meters (gravimeters) and gravity gradiometers)

Paragraph 6A007.a is amended by removing “μgal” and adding in its place “μGal” to correct the scientific abbreviation for microgal (one millionth of a gal). The gal, sometimes called galileo, (symbol Gal) is a unit of acceleration used extensively in the science of gravimetry. The gal is defined as 1 centimeter per second squared (1 cm/s^2).

Paragraphs b.1 and b.2 are amended by removing “mgal” and adding in its place “mGal” to correct the scientific abbreviation for milligal (one thousandth of a gal). The gal, sometimes called galileo, (symbol Gal) is a unit of acceleration used extensively in the science of gravimetry. The gal is defined as 1 centimeter per second squared (1 cm/s^2).

A Technical Note is added to 6A007.b to define ‘time-to-steady-state registration,’ which is used in 6A007.b.2, to make the control text clearer and more effective.

6A008 (Radar systems, equipment and assemblies, having any of the following (see List of Items Controlled section), and “specially designed” “components” therefor)

Paragraph 6A008.k.2 is amended by adding the adjective “compressed” and by adding a Note to decontrol two dimensional ‘marine radar’ or ‘vessel traffic service’ radar from 6A008.k.2. Solid state devices, which apply “pulse compression,” are replacing magnetron devices as a component of marine radars and Vessel Traffic Safety (VTS) radars for safety navigation. This revision decontrols such radars for safety navigation incorporating solid state devices from 6A008.k.2.

The Note to 6A008.l.1 is amended by revising the phrase “marine or harbor radar” to read ‘marine radar,’ as well as adding single quotes around the term ‘marine radar.’

The Note following the paragraph l.4 is amended by revising the paragraph it applies to from 6A008.l.4 to 6A008.l, as well as changing the term “marine traffic control” to single quoted ‘vessel traffic services.’

Technical Notes are added to the end of the Items paragraph of 6A008 to define ‘marine radar’ and ‘vessel traffic service.’

6A205 (“Lasers,” “laser” amplifiers and oscillators, other than those controlled by 6A005)

ECCN 6A205 is amended by removing the reference to “6A005.b.6.b” and adding in its place “6A005.b.6.c” in paragraph (3) of the Related Controls paragraph of the List of Items Controlled section, to harmonize with revisions to 6A005 in this rule.

6B007 (Equipment to produce, align and calibrate land-based gravity meters with a static accuracy of better than 0.1 mgal)

The Heading is amended by replacing “mgal” with “mGal” to correct the scientific unit abbreviation for milligal (one thousandth of a gal). The gal, sometimes called galileo, (symbol Gal) is a unit of acceleration used extensively in the science of gravimetry. The gal is defined as 1 centimeter per second squared (1 cm/s²).

6D001 (Software specially designed for the development or production of equipment controlled by 6A004, 6A005, 6A008 or 6B008)

This rule removes the Nuclear Proliferation (NP) license requirement paragraph from the License Requirements section of 6D001, because the Nuclear Suppliers Group (NSG) Annex does not list software controls for any of the equipment identified in the heading of 6D001.

6E201 (Technology for “use” of specified equipment in Category 6)

The Heading of ECCN 6E201 is amended by revising references to 6A005 to harmonize with revisions to the items paragraph of 6A005 and the NP controls of 6A005 in this rule. In order to determine NP controls on 6A005 commodities, you must analyze 6A205 to determine if the commodities meet or exceed the parameters of commodities in 6A205. If the 6A005 commodities meet or exceed the parameters of 6A205 commodities, then the 6A005 commodity is NP controlled. If the 6A005 commodity is NP controlled, then the “use” technology for it is classified in 6E201.

Category 7 - Navigation and Avionics

7A002 (Gyros or angular rate sensors, having any of the following (see List of Items Controlled section) and “specially designed” “components” therefor)

The Note to 7A002.a.1.b in the Items paragraph is amended by replacing the single quotes with double quotes around the term “spinning mass gyros,” as the Technical Note below this Note that defined this term is deleted and the term is now defined in § 772.1 of the EAR. Terms used in multiple locations are generally not locally defined and indicated by single quotes, but are defined in § 772.1 of the EAR and are indicated with double quotes.

Paragraph 7A002.a.2.a is amended by revising the “bias” “stability” from “less (better) than 40 degrees per hour” to “less (better) than 4 degrees per hour.” Paragraph 7A002.a.2.b is amended by revising the “angle random walk” from “less (better) than or equal to 0.2 degree per square root hour” to “less (better) than or equal to 0.1 degree per square root hour.” These changes are made in consideration of commercial and technological development in the area of Micro-Electro-Mechanical Systems (MEMS). The Note to 7A002.a.2.b is amended by replacing the single quotes with double quotes around the term “spinning mass gyros.”

7A003 (‘Inertial measurement equipment or systems’)

The Heading is amended by using a more general phrase, ‘inertial measurement equipment or systems’ instead of ‘inertial systems’ to encompass the breadth of controlled products. The Heading establishes a “having any of the following” structure regarding the functionalities that follow, which is intended to better accommodate multiple-output equipment. This new text is not intended to change the scope of the entry, but to better specify the inertial equipment to facilitate easier evaluation by licensing officers.

“Specially designed components” no longer appear in the Heading or in the List of Items Controlled section. “Specially designed components” that should be controlled are specified in 7A001 (Accelerometers) and 7A002 (Gyros).

The definition for the term “Data-Based Referenced Navigation” (“DBRN”) Systems is removed from the Related Definitions paragraph, because this definition is moved to § 772.1. Defined terms that are used in multiple ECCNs are placed in § 772.1 and this term is used in 7A003, 7D003 and 7E004.

A new note (Note 1) has been added at the beginning of the Items paragraph in order to help readers better understand the scope of the entry. In addition to describing the basic functionality of these products, the new note also provides a list of the most commonly used product names.

A Technical Note below 7A003.a explains how to assess the performance depending on the application that is typical for that system (air, land and sea platforms). There are different controls for different types of products and the Technical Note provides instructions on how to apply these controls, i.e., 7A003.a.1, 7A003.a.2 and 7A003.a.3 typically apply to ‘inertial measurement equipment or systems’ designed for “aircraft,” vehicles, and vessels, respectively. Even though there is now a control specifically for navigation equipment for land vehicles, it is important to note that the control limit applied is not intended to control civilian car navigation equipment.

Space qualified systems are now specified in 7A003.d because these are systems and not components specified by 7A002. Note the reference to “spacecraft” is removed from the current text of 7A003.a, because inertial equipment for “spacecraft” does not provide position.

7D003 (Other “software,” as specified)

7D003.c (“Source code” for integrated avionics or mission systems which combine sensor data and employ “expert systems”) is removed and reserved, because no mission management systems employing “expert systems” could be identified. The definition for “expert systems” is also removed from § 772.1 as a consequential change. The reference to 7D003.c is removed from the STA paragraph in the Special Conditions for STA section as well.

7D004 (“Source code” incorporating “development” “technology” specified by 7E004.a.1 to a.6 or 7E004.b.)

The Heading for 7D004 is amended by revising the reference to “7E004.a” to read “7E004.a.1 to a.6” to specify only the technology relevant to flight control source code in 7D004.

7D005 (“Software” “specially designed” to decrypt Global Navigation Satellite Systems (GNSS) ranging signals designed for government use)

ECCN 7D005 is added to close a loophole in the controls which are associated with the control of receivers for Global Navigation Satellite Systems (GNSS); there is no entry which explicitly includes the software which performs the data processing of the relevant signals. It also takes into account the fact that GNSS receivers making use of encrypted signals do not actually contain the decrypt algorithms and software. The new entry will capture the software of concern irrespective of whether it is intended to reside in a receiver or elsewhere, for example a secure server. This software is controlled for NS:1 and AT:1 reasons and will require a license to all destinations, except Canada. No list-based license exceptions are available for this ECCN;

however, License Exception STA may be available, as well as transaction based license exceptions as outlined in Part 740 of the EAR.

7E001 (“Technology” according to the General Technology Note for the “development” of equipment or “software,” specified by 7.A., 7.B., 7D001., 7D002., or 7D003, or 7D005)

ECCN 7D005 is added to the Heading and the NS license requirement paragraph of 7E001 to control “development” “software” specified in 7D005 to close a loophole in the controls which are associated with the control of receivers for Global Navigation Satellite Systems (GNSS). This technology is controlled under NS:1 and AT:1 to all destinations, except Canada. No list-based license exceptions or License Exception STA are available for this ECCN. A Note is added to clarify that 7E001 includes key management “technology” exclusively for equipment specified in 7A005.a to capture development technology used to produce potentially controlled software, including the development of decryption algorithms.

7E004 (Other “technology” as specified)

ECCN 7E004 is amended by removing and reserving paragraph b.6 (Full authority digital flight control or multisensory mission management system, employing “expert systems”) and removing the Nota Bene below it, because no such system could be identified.

Category 8 – Marine

8A002 (Marine systems, equipment, “parts” and “components,”)

Paragraph 8A002.i.2 in the Items paragraph of the List of Items Controlled section is amended by deleting the phrase “or by using a dedicated computer,” because it has been found

that remotely controlled articulated manipulators specially designed or modified for use with submersible vehicles do not use a control method by a dedicated computer anymore, with the development of new technology.

The Technical Note below 8A002.i.2 is amended by adding the phrase “related motion” to clarify the control and by removing the phrase “or by using a dedicated computer” for reasons stated in the previous paragraph.

A Nota Bene is added below the Note that follows paragraph q.2 to reference 8A620.f for equipment and devices “specially designed” for military use.

Category 9 - Aerospace and Propulsion

9A001 (Aero gas turbine engines)

The Note to 9A001.a is revised to be Note 1, in order to add Note 2.

Note 2 is added following 9A001.a to state that “9A001.a does not apply to aero gas turbine engines for Auxiliary Power Units (APUs) approved by the civil aviation authority in a Wassenaar Arrangement Participating State, see Supplement No. 1 to part 743 of the EAR.”

Supplement No. 2 to part 774 “General Technology and Software Notes”

Supplement No. 2 to part 774 “General Technology and Software Notes” is amended by removing the phrase “operation, maintenance (checking), and repair” and adding in its place “operation, maintenance (checking), or repair” in the General Technology Note. This change is made to clarify that technology meeting any one of the aspects listed is controlled and does not have to meet all of the aspects to be controlled.

Supplement No. 5 to part 774 “Items Classified Under ECCNS 0A521, 0B521, 0C521, 0D521 and 0E521”

Supplement No. 5 to part 774 “Items Classified Under ECCNS 0A521, 0B521, 0C521, 0D521 and 0E521” is amended by extending the expiration date to June 20, 2015 for 0D521 No. 2 and 0E521 No. 6, which is “source code” for the “development” of fly-by-wire control systems and specified “technology” for fly-by-wire control systems. The extension is justified because Wassenaar proposals are being negotiated to add this source code and technology to the WA List.

Supplement No. 6 to part 774 “Sensitive List”

Paragraphs (4)(ii) 4D001 and (4)(iii) 4E001 are amended by revising the APP from 0.5 Weighted TeraFLOPS (WT) to 1.0 WT.

Paragraph (7)(iv) 7D003.c is removed and reserved to harmonize with the removal of this paragraph from the CCL.

This rule redesignates paragraphs (7)(v) and (7)(vi) to read (7)(vi) and (7)(vii), and adds new paragraph (7)(v) “7D004.a to .d and .g” to correct the oversight of dropping the Sensitive List entry when this software moved from 7D003 to 7D004.

§ 734.4 “*De minimis* US Content”

Previously, foreign-made computers with an APP of 3.0 WT located in a foreign country are not eligible for the application of the *de minimis* rules when they contain U.S.-origin controlled semiconductors (other than memory circuits) classified under ECCN 3A001 and are destined to a country in Computer Tier 3 of Section 740.7 of the EAR. This rule increases the APP parameter

from 3.0 WT to 8.0 WT in § 734.4(a) to harmonize with the revision made to ECCN 4A003.

Supplement No. 1 to part 738 “Commerce Country Chart”

Mexico was added as a Wassenaar Participating State in 2011. It was added as an Australia Group member in 2013. In 2013, it was also added to the Nuclear Suppliers Group. Therefore, BIS has decided to remove the “X” for Mexico under columns NS:2 and RS:2.

§ 740.13 License Exception TSU

Section 740.13 is amended by replacing the phrase “operation, maintenance (checking), and repair” with “operation, maintenance (checking), or repair” in the second sentence of paragraph (a)(1). The same change was made to the General Software Note of the Wassenaar List, which is the Note License Exception TSU is based upon. Instead of meeting all of four of the listed characteristics (installation, operation, maintenance (checking), and repair), now the technology would only have to meet one of the four characteristics to be considered “operation technology.”

§ 740.20 License Exception STA

This rule removes and reserves paragraph (b)(2)(ix) that restricted the use of License Exception STA for 3A982 (Microwave or millimeter wave components that operate at frequencies below those controlled by 3A001). This change is being made because ECCN 3A982 is removed by this rule and because the microwave and millimeter wave components identified in that ECCN are now controlled under 3A001.b.2 and 3A001.b.3.

Section 743.2 “High Performance Computers: Post Shipment Verification Reporting”

This section outlines special post-shipment reporting requirements for the export of certain computers to destinations in Computer Tier 3 of License Exception APP (Section 740.7 of the EAR). The reporting requirement applies to high performance computers exported to a destination in Computer Tier 3, as well as to exports of commodities used to enhance computers previously exported or reexported to Computer Tier 3 destinations, where the “APP is greater than 3.0 Weighted TeraFLOPS (WT). This rule increases that APP level from 3.0 WT to 8.0 WT in accordance with the WA agreement to increase the APP in ECCN 4A003.

Part 772 Definitions

While the WA agreed to remove the definition for “angular position deviation” from the WA list definitions, BIS is not removing the term from § 772.1 of the EAR, because this term is still used in 2B206.b.2 and .c.

The definition for “cryptography” is amended by adding the phrase “‘secret parameters’ (e.g., crypto variables) and/or associated key management,” as well as adding a Technical Note that defines ‘secret parameters.’ The ‘secret parameter’ phrase and Technical Note were agreed upon by WA in 2012, but were inadvertently missed in the drafting of the implementation rule. These additions occurred in the context of establishing preventative measures for reverse engineering that is occurring during analysis of failures in integrated circuits. Also, the Technical Note in 5A002.a that explains that “cryptography” does not include “fixed” data compression or coding techniques applies directly and broadly to the definition of “cryptography.” Accordingly, this Technical Note is moved into the definition of “cryptography.”

The definition for the term “Data-Based Referenced Navigation” (“DBRN”) Systems is removed from the Related Definitions paragraph of 7A003 and added to § 772.1, because defined terms that are used in multiple ECCNs are placed in § 772.1. This term is used in 7A003, 7D003 and 7E004.

This rule removes the term “expert systems” from § 772.1 of the EAR, because the control list paragraphs where it was used are deleted by this rule (7D003.c and 7E004.b.6). See explanations for removal of these paragraphs in the respective ECCN preambles above.

The term “frequency switching time” in § 772.1 of the EAR is amended by removing the phrase “(Cat 3 and 5)” and adding in its place “(Cat 3),” because in 5A001.b.5.b, the term “frequency switching time” is replaced by “channel switching time.” For more explanation, see the preamble for 5A001 above.

The definition for “measurement uncertainty” used in Category 2 is amended by removing one of the referenced standards “VDI/VDE 2617,” because the VDI/VDE 2617 standard was withdrawn in mid-2005 and may not be purchased by the public. It is not appropriate to reference a standard in the control list definitions that is no longer published.

The term “space-qualified” is amended by removing the phrase “Cat 3 and 6” and adding in its place “Cat 3, 6, and 7,” because “space-qualified” systems are now specified in 7A003.d.

This rule adds the term “spinning mass gyros” in alphabetic order to § 772.1 of the EAR. This term is used in decontrol Notes to 7A002.a.1.b, a.2.b, and 7A003.d.2. Because it is used in multiple locations in the CCL, the Technical Notes that defined this term are removed and the definition is added to § 772.1 of the EAR.

This rule adds the term “three dimensional integrated circuit” in alphabetic order to § 772.1 of the EAR. This term is added to Note 2 to 3A001.a to clarify that the controls in 3A001 apply

to these types of integrated circuits. 3D integrated circuit design is a recent approach to improving the functionality and performance of integrated circuits.

Export Administration Act

Since August 21, 2001, the Export Administration Act of 1979, as amended, has been in lapse. However, the President, through Executive Order 13222 of August 17, 2001, 3 CFR, 2001 Comp., p. 783 (2002), as amended by Executive Order 13637 of March 8, 2013, 78 FR 16129 (March 13, 2013), and as extended by the Notice of August 8, 2013, 78 FR 49107 (August 12, 2013) has continued the EAR in effect under the International Emergency Economic Powers Act (50 U.S.C. §§ 1701 *et seq.*). BIS continues to carry out the provisions of the Export Administration Act, as appropriate and to the extent permitted by law, pursuant to Executive Order 13222 as amended by Executive Order 13637.

Saving Clause

Shipments of items removed from license exception eligibility or eligibility for export 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 export 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 from the United States before [INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. Any such items not actually exported before midnight, on [INSERT DATE 60 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], require a license in accordance with this regulation.

Rulemaking Requirements

1. 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. Accordingly, the rule has been reviewed by the Office of Management and Budget.

2. 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 two collections of information subject to the PRA. One of the collections has been approved by OMB under control number 0694-0088, “Multi-Purpose Application,” and carries a burden hour estimate of 58 minutes for a manual or electronic submission. The other of the collections has been approved by OMB under control number 0694-0106, “Reporting and Recordkeeping Requirements under the Wassenaar Arrangement,” and carries a burden hour estimate of 21 minutes for a manual or electronic submission. Send comments regarding these burden estimates or any other aspect of these collections of information, including suggestions for reducing the burden, to OMB Desk Officer, New Executive Office Building, Washington, DC 20503; and to Jasmeet Seehra, OMB Desk Officer, by e-mail at Jasmeet_K._Seehra@omb.eop.gov or by fax to (202) 395-7285; and to the Office of Administration, Bureau of Industry and Security, Department of Commerce, 1401 Constitution Ave., NW, Room 6622, Washington, DC 20230.

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

4. The provisions of the Administrative Procedure Act (5 U.S.C. 553) requiring notice of proposed rulemaking, the opportunity for public participation, and a 30-day delay in effective date, are inapplicable because this regulation involves a military and foreign affairs function of the United States (5 U.S.C. 553(a)(1)). Immediate implementation of these amendments fulfills the United States’ international obligation to the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies. The Wassenaar Arrangement

contributes to international security and regional stability by promoting greater responsibility in transfers of conventional arms and dual use goods and technologies, thus preventing destabilizing accumulations of such items. The Wassenaar Arrangement consists of 41 member countries that act on a consensus basis and the changes set forth in this rule implement agreements reached at the December 2012 plenary session of the WA. Because the United States is a significant exporter of the items covered by this rule, implementation of this rule is necessary for the WA to achieve its purpose. Any delay in implementation will create a disruption in the movement of affected items globally because of disharmony between export control measures implemented by WA members, resulting in tension between member countries. Export controls work best when all countries implement the same export controls in a timely manner. If this rulemaking were delayed to allow for notice and comment and a 30-day delay in effectiveness, it would prevent the United States from fulfilling its commitment to the WA in a timely manner and would injure the credibility of the United States in this and other multilateral regimes.

Further, no other law requires that a notice of proposed rulemaking and an opportunity for public comment be given for this final rule. 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. Therefore, this regulation is issued in final form. Although there is no formal comment period, public comments on this regulation are welcome on a continuing basis. Comments should be submitted to Sharron Cook, Office of Exporter Services, Bureau of Industry and Security, Department of Commerce, 14th and Pennsylvania Ave., NW, Room 2099, Washington, DC 20230.

List of Subjects

15 CFR Part 734

Administrative practice and procedure, Exports, Inventions and patents, Research Science and technology

15 CFR Parts 738 and 772

Exports

15 CFR Part 740

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements

15 CFR Part 743

Administrative practice and procedure, Reporting and recordkeeping requirements

15 CFR Part 774

Exports, Reporting and recordkeeping requirements

Accordingly, Parts 734, 738, 740, 743, 772 and 774 of the Export Administration Regulations (15 CFR Parts 730-774) are amended as follows:

PART 734 [AMENDED]

1. The authority citation for part 734 continues to read as follows:

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; E.O. 12938, 59 FR

59099, 3 CFR, 1994 Comp., p. 950; E.O. 13020, 61 FR 54079, 3 CFR, 1996 Comp., p. 219; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13637 of March 8, 2013, 78 FR 16129 (March 13, 2013); Notice of August 8, 2013, 78 FR 49107 (August 12, 2013); Notice of November 7, 2013, 78 FR 67289 (November 12, 2013).

§ 734.4 [Amended]

2. Section 734.4 is amended in paragraph (a)(1) by removing the phrase “3.0 Weighted TeraFLOPS (WT)” and adding in its place “8.0 Weighted TeraFLOPS (WT)”.

PART 738 [AMENDED]

3. The authority citation for part 738 continues to read as follows:

Authority: 50 U.S.C. app. 2401 et seq.; 50 U.S.C. 1701 et seq.; 10 U.S.C. 7420; 10 U.S.C. 7430(e); 22 U.S.C. 287c; 22 U.S.C. 3201 et seq.; 22 U.S.C. 6004; 30 U.S.C. 185(s), 185(u); 42 U.S.C. 2139a; 42 U.S.C. 6212; 43 U.S.C. 1354; 15 U.S.C. 1824a; 50 U.S.C. app. 5; 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; Notice of August 8, 2013, 78 FR 49107 (August 12, 2013).

Supplement No. 1 to Part 738 [Amended]

4. Supplement No. 1, the entry for Mexico is amended by removing the “X” for columns NS:2 and RS:2.

PART 740 [AMENDED]

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

Authority: 50 U.S.C. app. 2401 *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; Notice of August 8, 2013, 78 FR 49107 (August 12, 2013).

§ 740.13 [Amended]

6. Section 740.13 is amended in the second sentence in paragraph (a)(1) by removing the phrase “operation, maintenance (checking), and repair” and adding in its place “operation, maintenance (checking), or repair”.

§ 740.20 [Amended]

7. Section 740.20 is amended by removing and reserving paragraph (b)(2)(ix).

PART 743 [AMENDED]

8. The authority citation for part 743 continues to read as follows:

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13637 of March 8, 2013, 78 FR 16129 (March 13, 2013); 78 FR 16129 ; Notice of August 8, 2013, 78 FR 49107 (August 12, 2013).

§ 743.2 [Amended]

9. Section 743.2 is amended in paragraph (b) by removing the phrase “3.0 Weighted TeraFLOPS (WT)” and adding in its place “8.0 Weighted TeraFLOPS (WT)”.

PART 772 [AMENDED]

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

Authority: 50 U.S.C. app. 2401 *et seq.*; 50 U.S.C. 1701 *et seq.*; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; Notice of August 12, 2011, 76 FR 50661 (August 16, 2011).

11. Section 772.1 is amended by:

- a. Revising the term “Cryptography”;
- b. Adding the term “Data-Based Referenced Navigation” (“DBRN”) Systems”;
- c. Removing the term “Expert systems”;
- d. Removing the phrase “(Cat 3 and 5)” and adding in its place “(Cat 3)” in the term “Frequency switching time.”; and
- e. Revising the term “Measurement uncertainty”;
- f. Removing the phrase “Cat 3 and 6” and adding in its place “Cat 3, 6, and 7” in the term “Space-qualified”; and
- g. Adding the terms “Spinning mass gyros” and “Three dimensional integrated circuit” in alphabetic order,.

The additions and revisions read as follows:

§772.1 Definitions of terms as used in the Export Administration Regulations (EAR).

Cryptography. (Cat 5) The discipline that embodies principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification or prevent its unauthorized use. “Cryptography” is limited to the transformation of information using one or more ‘secret parameters’ (e.g., crypto variables) and/or associated key management.

Note: “Cryptography” does not include “fixed” data compression or coding techniques.

Technical Note: ‘Secret parameter’: a constant or key kept from the knowledge of others or shared only within a group.

Data-Based Referenced Navigation (“DBRN”) Systems. (Cat 7) Systems which use various sources of previously measured geo-mapping data integrated to provide accurate navigation information under dynamic conditions. Data sources include bathymetric maps, stellar maps, gravity maps, magnetic maps or 3-D digital terrain maps.

Measurement uncertainty. (Cat 2) The characteristic parameter that specifies in what range around the output value the correct value of the measurable variable lies with a confidence level of 95%. It includes the uncorrected systematic deviations, the uncorrected backlash, and the random deviations (Ref.: ISO 10360-2).

Spinning mass gyros. (Cat 7) “Spinning mass gyros” are gyros which use a continually rotating mass to sense angular motion.

Three dimensional integrated circuit. (Cat 3) A collection of semiconductor die, integrated together, and having vias passing completely through at least one die to establish interconnections between die.

PART 774 [AMENDED]

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

Authority: 50 U.S.C. app. 2401 et seq.; 50 U.S.C. 1701 et seq.; 10 U.S.C. 7420; 10 U.S.C.

7430(e); 22 U.S.C. 287c, 22 U.S.C. 3201 et seq.; 22 U.S.C. 6004; 30 U.S.C. 185(s), 185(u); 42 U.S.C. 2139a; 42 U.S.C. 6212; 43 U.S.C. 1354; 15 U.S.C. 1824a; 50 U.S.C. app. 5; 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; Notice of August 12, 2011, 76 FR 50661 (August 16, 2011).

13. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 0, ECCN 0A018 is amended by revising paragraph b., and adding a Note after paragraph b., of the items paragraph in the List of Items Controlled section to read as follows:

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

* * * * *

0A018 Items on the Wassenaar Munitions List (see List of Items Controlled).

List of Items Controlled

Items:

b. “Specially designed” components and parts for ammunition, except cartridge cases, powder bags, bullets, jackets, cores, shells, projectiles, boosters, fuses and components, primers, and other detonating devices and ammunition belting and linking machines (all of which are “subject to the ITAR.” (See 22 CFR parts 120 through 130);

Note: 0A018.b does not apply to “components” “specially designed” for blank or dummy ammunition as follows:

- a. Ammunition crimped without a projectile (blank star);*
- b. Dummy ammunition with a pierced powder chamber;*
- c. Other blank and dummy ammunition, not incorporating components designed for live ammunition.*

14. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 1, ECCN 1A004 is amended by removing the Technical Note after the Note following the introductory text to paragraph a. of the items paragraph in the List of Items Controlled section and adding in its place the Technical Notes to read as follows:

1A004 Protective and detection equipment and “components,” not “specially designed” for military use, as follows (see List of Items Controlled).

List of Items Controlled

Items:

a. ***

Technical Notes: For the purpose of 1A004.a:

- 1. Full face masks are also known as gas masks.*
- 2. Filter canisters include filter cartridges.*

15. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 1, ECCN 1B001 is amended by revising paragraphs b. and g., and adding Technical Notes after both paragraphs b. and g., in the items paragraph of the List of Items Controlled section to read as follows:

1B001 Equipment for the production or inspection of “composite” structures or laminates controlled by 1A002 or “fibrous or filamentary materials” controlled by 1C010, as follows (see List of Items Controlled), and “specially designed” “components” and “accessories” therefor.

List of Items Controlled

Items:

b. 'Tape laying machines', of which the motions for positioning and laying tape are coordinated and programmed in five or more 'primary servo positioning' axes, "specially designed" for the manufacture of "composite" airframe or missile structures;

Technical Note: For the purposes of 1B001.b, 'tape-laying machines' have the ability to lay one or more 'filament bands' limited to widths greater than 25 mm and less than or equal to 305 mm, and to cut and restart individual 'filament band' courses during the laying process.

g. Tow-placement machines, of which the motions for positioning and laying tows are coordinated and programmed in two or more 'primary servo positioning' axes, "specially designed" for the manufacture of "composite" airframe or missile structures.

Technical Note to 1B001.g: *For the purposes of 1B001.g, 'tow-placement machines' have the ability to place one or more 'filament bands' having widths less than or equal to 25 mm, and to cut and restart individual 'filament band' courses during the placement process.*

Technical Notes for 1B001:

1. *For the purpose of 1B001, 'primary servo positioning' axes control, under computer program direction, the position of the end effector (i.e., head) in space relative to the work piece at the correct orientation and direction to achieve the desired process.*

2. *For the purposes of 1B001, a 'filament band' is a single continuous width of fully or partially resin-impregnated tape, tow or fiber.*

16. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 1, ECCN 1C008 is amended by revising paragraphs a.3. and f., and removing the Technical Note and adding two Technical Notes in its place, in the Items paragraph of the List of Items Controlled section to read as follows:

1C008 Non-fluorinated polymeric substances as follows (see List of Items Controlled).

List of Items Controlled

Items:

a. ***

a.3. Aromatic polyimides having a 'glass transition temperature (Tg)' exceeding 505 K (232°C);

f. Polybiphenylenethersulphone having a 'glass transition temperature (Tg)' exceeding 563 K (290° C).

Technical Notes:

1. The 'glass transition temperature (Tg)' for 1C008.a.2 thermoplastic materials and 1C008.a.4 materials is determined using the method described in ISO 11357-2 (1999) or national equivalents''

2. The 'glass transition temperature (Tg)' for 1C008.a.2 thermosetting materials and 1C008.a.3 materials is determined using the 3-point bend method described in ASTM D 7028-07

or equivalent national standard. The test is to be performed using a dry test specimen which has attained a minimum of 90% degree of cure as specified by ASTM E 2160-04 or equivalent national standard, and was cured using the combination of standard- and post-cure processes that yield the highest Tg.

17. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 1, ECCN 1C010 is amended by:

- a. Removing the Technical Note after the Note in paragraph b.2 in the Items paragraph of the List of Items Controlled section;
- b. Adding Technical Notes after the Note following paragraph c.2. in the Items paragraph of the List of Items Controlled section; and
- c. Adding a comma after the word “pitch” in paragraph e.2.a.

The additions read as follows:

1C010 “Fibrous or filamentary materials” as follows (see List of Items Controlled).

List of Items Controlled

Items:

c. ***

c.2. ***

Note:***

Technical Notes:

1. For the purpose of calculating “specific tensile strength”, “specific modulus” or specific weight of “fibrous or filamentary materials” in 1C010.a, 1C010.b or 1C010.c, the tensile strength and modulus should be determined by using Method A described in ISO 10618 (2004) or national equivalents.

2. Assessing the “specific tensile strength”, “specific modulus” or specific weight of non-unidirectional “fibrous or filamentary materials” (e.g., fabrics, random mats or braids) in 1C010 is to be based on the mechanical properties of the constituent unidirectional monofilaments (e.g., monofilaments, yarns, rovings or tows) prior to processing into the non-unidirectional “fibrous or filamentary materials”.

18. In Supplement No. 1 to part 774, Category 1, Annex to Category 1 “List of Explosives” is amended by:

- a. Revising paragraphs 32.d and 43;
- b. Removing and reserving paragraph 34; and
- c. Adding paragraphs 44 through 48.

The revisions and additions read as follows:

ANNEX to Category 1

List of Explosives (See ECCNs 1A004 and 1A008)

32. ***

d. BDNTA ((bis dinitrotriazole)amine);

43. Nitroguanidine (NQ) (CAS 556-88-7);

44. DNAN (2,4-dinitroanisole) (CAS 119-27-7);

45. *TEX (4,10-Dinitro-2,6,8,12-tetraoxa-4,10-diazaisowurtzitane);*

46. *GUDN (Guanylurea dinitramide) FOX-12 (CAS 217464-38-5);*

47. *Tetrazines as follows:*

a. *BTAT (Bis(2,2,2-trinitroethyl)-3,6-diaminotetrazine);*

b. *LAX-112 (3,6-diamino-1,2,4,5-tetrazine-1,4-dioxide);*

48. *Energetic ionic materials melting between 343 K (70°C) and 373 K (100°C) and with detonation velocity exceeding 6,800 m/s or detonation pressure exceeding 18 GPa (180 kbar).*

19. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 2, Product Group B, “Technical Notes for 2B001 to 2B009, 2B201, 2B290 and 2B991 to 2B999” is amended by revising paragraph f. of the Note to paragraph 5, to read as follows:

B. TEST, INSPECTION AND “PRODUCTION EQUIPMENT”

Technical Notes for 2B001 to 2B009, 2B201, 2B290 and 2B991 to 2B999:

5. ***

*Note to paragraph 5:****

f. If any axis of a machine model not controlled by 2B001.a. to 2B001.c. has a stated accuracy \bar{A} equal to or less than the specified positioning accuracy of each machine tool model plus 2 μm , the builder should be required to reaffirm the accuracy level once every eighteen months.

20. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 2, ECCN 2B006 is amended by revising paragraphs b.1.b. through b.1.b.2., b.1.c.2.b., and the introductory text of paragraph b.2., and by adding a Technical Note after b.1.b.2. in the Items paragraph of the List of Items Controlled section to read as follows:

2B006 Dimensional inspection or measuring systems, equipment, and “electronic assemblies”, as follows (see List of Items Controlled).

List of Items Controlled

Items:

b. ***

b.1. ***

b.1.b. Linear Variable Differential Transformer (LVDT) systems having all of the following:

b.1.b.1. “”Having any of the following:

b.1.b.1.a. “Linearity” equal to or less (better) than 0.1% measured from 0 to the ‘full operating range’, for LVDTs with a ‘full operating range’ up to and including ± 5 mm; *or*

b.1.b.1.b. “Linearity” equal to or less (better) than 0.1% measured from 0 to 5 mm for LVDTs with a ‘full operating range’ greater than ± 5 mm; *and*

b.1.b.2. Drift equal to or less (better) than 0.1% per day at a standard ambient test room temperature ± 1 K;

Technical Note: *_For the purposes of 2B006.b.1.b, ‘full operating range’ is half of the total possible linear displacement of the LVDT. For example, LVDTs with a ‘full operating range’ up to and including ± 5 mm can measure a total possible linear displacement of 10 mm.*

b.1.c. ***

b.1.c.2. ***

b.1.c.2.b. Capable of achieving a “measurement uncertainty” equal to or less (better) than $(0.2 + L/2,000) \mu\text{m}$ (L is the measured length in mm) at any point within a measuring range, when compensated for the refractive index of air; *or*

b.2. Angular displacement measuring instruments having an angular position “accuracy” equal to or less (better) than 0.00025° ;

21. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 2, ECCN 2D002 is amended by revising the items paragraph in the List of Items Controlled section to read as follows:

2D002 “Software” for electronic devices, even when residing in an electronic device or system, enabling such devices or systems to function as a “numerical control” unit, capable of coordinating simultaneously more than 4 axes for “contouring control”.

List of Items Controlled

Items:

Note 1: 2D002 does not control “software” “specially designed” or modified for the operation of items not specified by Category 2.

Note 2: 2D002 does not control “software” for items specified by 2B002. See 2D001 and 2D003 for “software” for items specified by 2B002.

Note 3: 2D002 does not apply to “software” that is exported with, and the minimum necessary for the operation of, items not specified by Category 2.

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

22. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCN 3A001

is amended by:

a. Removing Related Control Notes (3) and (4) in the List of Items Controlled section;

- b. Revising Note 2 to paragraph a. in the Items paragraph of the List of Items Controlled section;
- c. Revising paragraphs a.5.a.1. and a.7.b. in the Items paragraph of the List of Items Controlled section;
- d. Adding a Technical Note after the introductory text to paragraph b. in the Items paragraph of the List of Items Controlled section;
- e. Revising paragraphs b.2., b.3., and b.4.; and
- f. Revising Note 3 to paragraph h. in the Items paragraph of the List of Items Controlled section.

The revisions and additions read as follows:

3A001 Electronic components and “specially designed” “components” therefor, as follows (see List of Items Controlled).

List of Items Controlled

Items:

- a. ***

Note 2: Integrated circuits include the following types:

- *Monolithic integrated circuits;*
- *Hybrid integrated circuits;*
- *Multichip integrated circuits;*
- *Film type integrated circuits, including silicon-on-sapphire integrated circuits;*
- *Optical integrated circuits;*
- *“Three dimensional integrated circuits”.*

a.5. ***

a.5.a. ***

a.5.a.1. A resolution of 8 bit or more, but less than 10 bit, with an output rate greater than 1 billion words per second;

a.7.***

a.7.b. An ‘aggregate one-way peak serial transceiver data rate’ of 200 Gb/s or greater;

b. ***

Technical Note: For purposes of 3A001.b, 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.

b.2. Microwave “Monolithic Integrated Circuits” (MMIC) power amplifiers that are any of the following:

b.2.a. 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:

b.2.a.1. 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;

b.2.a.2. 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;

b.2.a.3. 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*

b.2.a.4. 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;

b.2.b. 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:

b.2.b.1. A peak saturated power output greater than 10 W (40 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz; *or*

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

b.2.c. 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%;

b.2.d. Rated for operation with a peak saturated power output greater than 0.1n W (-70 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.2.e. 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%;

b.2.f. 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%;

b.2.g. 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*

b.2.h. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 90 GHz;

Note 1: *[RESERVED]*

Note 2: *The control status of the MMIC whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.2.a through 3A001.b.2.h, is determined by the lowest peak saturated power output control threshold.*

Note 3: *Notes 1 and 2 following the Category 3 heading for product group A. Systems, Equipment, and Components mean that 3A001.b.2 does not control MMICs if they are “specially designed” for other applications, e.g., telecommunications, radar, automobiles.*

b.3. Discrete microwave transistors that are any of the following:

b.3.a. Rated for operation at frequencies exceeding 2.7 GHz up to and including 6.8 GHz and having any of the following:

b.3.a.1. A peak saturated power output greater than 400 W (56 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

b.3.a.2. A peak saturated power output greater than 205 W (53.12 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

b.3.a.3. A peak saturated power output greater than 115 W (50.61 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; *or*

b.3.a.4. A peak saturated power output greater than 60 W (47.78 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

b.3.b. Rated for operation at frequencies exceeding 6.8 GHz up to and including 31.8 GHz and having any of the following:

b.3.b.1. A peak saturated power output greater than 50 W (47 dBm) at any frequency exceeding 6.8 GHz up to and including 8.5 GHz;

b.3.b.2. A peak saturated power output greater than 15 W (41.76 dBm) at any frequency exceeding 8.5 GHz up to and including 12 GHz;

b.3.b.3. A peak saturated power output greater than 40 W (46 dBm) at any frequency exceeding 12 GHz up to and including 16 GHz; *or*

b.3.b.4. A peak saturated power output greater than 7 W (38.45 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz;

b.3.c. Rated for operation with a peak saturated power output greater than 0.5 W (27 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.3.d. 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; *or*

b.3.e. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 43.5 GHz;

Note 1: *The control status of a transistor, whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.3.a through 3A001.b.3.e, is determined by the lowest peak saturated power output control threshold.*

Note 2: *3A001.b.3 includes bare dice, dice mounted on carriers, or dice mounted in packages. Some discrete transistors may also be referred to as power amplifiers, but the status of these discrete transistors is determined by 3A001.b.3.*

b.4. Microwave solid state amplifiers and microwave assemblies/modules containing microwave solid state amplifiers, that are any of the following:

b.4.a. 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:

b.4.a.1. A peak saturated power output greater than 500 W (57 dBm) at any frequency exceeding 2.7 GHz up to and including 2.9 GHz;

b.4.a.2. A peak saturated power output greater than 270 W (54.3 dBm) at any frequency exceeding 2.9 GHz up to and including 3.2 GHz;

b.4.a.3. A peak saturated power output greater than 200 W (53 dBm) at any frequency exceeding 3.2 GHz up to and including 3.7 GHz; *or*

b.4.a.4. A peak saturated power output greater than 90 W (49.54 dBm) at any frequency exceeding 3.7 GHz up to and including 6.8 GHz;

b.4.b. Rated for operation at frequencies exceeding 6.8 GHz up to and including 31.8 GHz with a “fractional bandwidth” greater than 10%, and having any of the following:

b.4.b.1. A peak saturated power output greater than 70 W (48.54 dBm) at any frequency

exceeding 6.8 GHz up to and including 8.5 GHz;

b.4.b.2. A peak saturated power output greater than 50 W (47 dBm) at any frequency exceeding 8.5 GHz up to and including 12 GHz;

b.4.b.3. A peak saturated power output greater than 30 W (44.77 dBm) at any frequency exceeding 12 GHz up to and including 16 GHz; *or*

b.4.b.4. A peak saturated power output greater than 20 W (43 dBm) at any frequency exceeding 16 GHz up to and including 31.8 GHz;

b.4.c. Rated for operation with a peak saturated power output greater than 0.5 W (27 dBm) at any frequency exceeding 31.8 GHz up to and including 37 GHz;

b.4.d. Rated for operation with a peak saturated power output greater than 2 W (33 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz, and with a “fractional bandwidth” of greater than 10%;

b.4.e. Rated for operation at frequencies exceeding 43.5 GHz and having any of the following:

b.4.e.1. A peak saturated power output greater than 0.2 W (23 dBm) at any frequency exceeding 43.5 GHz up to and including 75 GHz, and with a “fractional bandwidth” of greater than 10%;

b.4.e.2. A peak saturated power output greater than 20 mW (13 dBm) at any frequency exceeding 75 GHz up to and including 90 GHz, and with a “fractional bandwidth” of greater than 5%; *or*

b.4.e.3. A peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 90 GHz; *or*

b.4.f. Rated for operation at frequencies above 2.7 GHz and all of the following:

b.4.f.1. A peak saturated power output (in watts), P_{sat} , greater than 400 divided by the maximum operating frequency (in GHz) squared [$P_{\text{sat}} > 400 \text{ W} \cdot \text{GHz}^2 / f_{\text{GHz}}^2$];

b.4.f.2. A “fractional bandwidth” of 5% or greater; *and*

b.4.f.3. Any two sides perpendicular to one another with either length d (in cm) equal to or less than 15 divided by the lowest operating frequency in GHz [$d \leq 15 \text{ cm} \cdot \text{GHz} / f_{\text{GHz}}$];

Technical Note: 2.7 GHz should be used as the lowest operating frequency (f_{GHz}) in the formula in 3A001.b.4.f.3., for amplifiers that have a rated operation range extending downward to 2.7 GHz and below [$d \leq 15 \text{ cm} \cdot \text{GHz} / 2.7 \text{ GHz}$].

N.B.: MMIC power amplifiers should be evaluated against the criteria in 3A001.b.2.

Note 1: [RESERVED]

Note 2: *The control status of an item whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by 3A001.b.4.a through 3A001.b.4.e, is determined by the lowest peak saturated power output control threshold.*

Note 3: *3A001.b.4 includes transmit/receive modules and transmit modules.*

h. ***

Note 3: *3A001.h. does not apply to switches, diodes, or ‘modules’, incorporated into equipment designed for civil automobile, civil railway, or “civil aircraft” applications.*

23. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCN 3A002

is amended by:

- a. Revising the heading;
- b. Revising License Exception GBS and CIV paragraphs;
- c. Revising the introductory text to paragraph a.;

- d. Removing and reserving paragraphs a.1. through a.4;
- e. Revising paragraph a.6;
- f. Adding paragraph a.7;
- g. Revising the introductory text to paragraph d.1.; and
- h. Revising Technical Note 2 that appears after paragraph d.5.

The revisions and additions read as follows:

3A002 General purpose electronic equipment, as follows (see List of Items Controlled).

List Based License Exceptions (See Part 740 for a description of all license exceptions)

GBS: N/A.

CIV: N/A.

List of Items Controlled

Items:

a. Recording equipment and oscilloscopes, as follows:

a.6. Digital instrumentation data recorder systems using magnetic disk storage technique and having all of the following, and “specially designed” digital recorders therefor:

a.6.a. Digitized instrumentation data rate equal to or more than 100 million samples per second and at a resolution of 8 bits or more; *and*

a.6.b. A ‘continuous throughput’ of 1 Gbit/s or more;

Technical Note: *Digital instrumentation data recorder systems can be configured either with a digitizer integrated within or outside the digital recorder.*

a.7. Real-time oscilloscopes having a vertical root-mean-square (rms) noise voltage of less than 2% of full-scale at the vertical scale setting that provides the lowest noise value for any input 3dB bandwidth of 60 GHz or greater per channel;

Note: 3A002.a.7 does not apply to equivalent-time sampling oscilloscopes.

d. ***

d.1. Specified to generate pulse-modulated signals having all of the following, anywhere within the synthesized frequency range exceeding 31.8 GHz but not exceeding 75 GHz:

d.5. ***

Technical Notes:

1. The maximum synthesized frequency of an arbitrary waveform or function generator is calculated by dividing the sample rate, in samples/second, by a factor of 2.5.

2. For the purposes of 3A002.d.1.a, 'pulse duration' is defined as the time interval from the point on the leading edge that is 50% of the pulse amplitude to the point on the trailing edge that is 50% of the pulse amplitude.

24. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCNs 3A982, 3D982 and 3E982 are removed.

25. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCN 3A991 is amended by revising paragraph .d in the items paragraph of the List of Items Controlled section to read as follows:

3A991 Electronic devices, and “components” not controlled by 3A001.

List of Items Controlled

Items:

d. Field programmable logic devices having a maximum number of single-ended digital input/outputs of 200 or greater and less than 500;

26. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCN 3C005 is amended by revising the heading to read as follows:

3C005 Silicon carbide (SiC), gallium nitride (GaN), aluminum nitride (AlN) or aluminum

gallium nitride (AlGaN) semiconductor “substrates”, or ingots, boules, or other preforms of those materials, having resistivities greater than 10,000 ohm-cm at 20°C.

27. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 3, ECCN 3E002 is amended by revising paragraph b. in the Items paragraph of the List of Items Controlled section to read as follows:

3E002 “Technology” according to the General Technology Note other than that controlled in 3E001 for the “development” or “production” of a “microprocessor microcircuit”, “micro-computer microcircuit” and microcontroller microcircuit core, having an arithmetic logic unit with an access width of 32 bits or more and any of the following features or characteristics (see List of Items Controlled).

List of Items Controlled

Items:

b. Designed to perform more than four 64-bit or larger floating-point operation results per cycle;

or

28. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 4, ECCN 4A003 is amended by:

- a. Revising the AT paragraph in the License Requirements section;
- b. Revising the Note in the License Requirements section; and
- c. Revising paragraph b. in the Items paragraph of the List of Items Controlled section.

The revisions read as follows:

4A003 “Digital computers”, “electronic assemblies”, and related equipment therefor, as follows (see List of Items Controlled) and “specially designed” “components” therefor.

License Requirements

<i>Control(s)</i>	<i>Country Chart</i>
-------------------	----------------------

	(See Supp. No. 1 to part 738).

AT applies to entire entry (refer to 4A994 for controls on “digital computers” with a APP > 0.0128 but ≤ 8.0 WT).	AT Column 1

Note: For all destinations, except those countries in Country Group E:1 of Supplement No. 1 to part 740 of the EAR, no license is required (NLR) for computers with an “Adjusted Peak Performance” (“APP”) not exceeding 8.0 Weighted TeraFLOPS (WT) and for “electronic assemblies” described in 4A003.c that are not capable of exceeding an “Adjusted Peak Performance” (“APP”) exceeding 8.0 Weighted TeraFLOPS (WT) in aggregation, except certain transfers as set forth in §746.3 (Iraq).

List of Items Controlled

Items:

- b. “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 8.0 weighted TeraFLOPS (WT);

29. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 4, ECCN 4D001 is amended by:

- a. Revising the TSR paragraph in the List Based License Exceptions section;
- b. Revising the Special Conditions for STA section; and
- c. Revising paragraph b.1. in the Items paragraph of the List of Items Controlled section.

The revisions read as follows:

4D001 “Software” as follows (see List of Items Controlled).

List Based License Exceptions (See Part 740 for a description of all license exceptions)

TSR: Yes, except for “software” for the “development” or “production” of commodities with an “Adjusted Peak Performance” (“APP”) exceeding 1.0 WT.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit “software” “specially designed” for the “development” or “production” of equipment specified by ECCN 4A001.a.2 or for the “development” or “production” of “digital computers” having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 1.0 Weighted TeraFLOPS (WT) 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

Items:

b. ***:

b.1. “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 0.60 Weighted TeraFLOPS (WT);

30. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 4, ECCN 4E001

is amended by:

- a. Revising the TSR paragraph in the List Based License Exceptions section;
- b. Revising the Special Conditions for STA section; and
- c. Revising paragraph b.1. in the Items paragraph of the List of Items Controlled section.

The revisions read as follows:

4E001 “Technology” as follows (see List of Items Controlled).

List Based License Exceptions (See Part 740 for a description of all license exceptions)

TSR: Yes, except for “technology” for the “development” or “production” of commodities with an “Adjusted Peak Performance” (“APP”) exceeding 1.0 WT.

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 any of the following equipment or “software”: a. Equipment specified by ECCN 4A001.a.2; b. “Digital computers” having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 1.0 Weighted TeraFLOPS (WT); or c. “software” specified in the License Exception STA paragraph found in the License Exception section of ECCN 4D001 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

Items:

b. ***

b.1. “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 0.60 Weighted TeraFLOPS (WT);

31. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 5, Part 1, ECCN

5A001 is amended by:

a. Revising paragraphs b.1.d. and b.5.b. in the Items paragraph of the List of Items Controlled section; and

b. Adding a Technical Note after the Note following paragraph b.5.d. in the Items paragraph of the List of Items Controlled section.

The revisions and addition read as follows:

5A001 Telecommunications systems, equipment, “components” and “accessories,” as follows (see List of Items Controlled).

List of Items Controlled

Items:

b. ***

b.1 ***

b.1.d. Using “lasers” or light-emitting diodes (LEDs), with an output wavelength greater than 400 nm and less than 700 nm, in a “local area network”;

b.5. ***

b.5.b. A ‘channel switching time ’ of less than 1 ms;

b.5.d. ***

Note: ***

Technical Note: ‘Channel switching time’: the time (i.e., delay) to change from one receiving frequency to another, to arrive at or within $\pm 0.05\%$ of the final specified receiving frequency. Items having a specified frequency range of less than $\pm 0.05\%$ around their centre frequency are defined to be incapable of channel frequency switching.

32. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 5, Part 1, ECCN

5E001 is amended by removing paragraph d., including all subparagraphs, Notes, and Technical Notes, and adding in its place d., including all subparagraphs, Notes, and Technical Notes, in the Items paragraph of the List of Items Controlled section to read as follows:

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

List of Items Controlled

Items:

d. “Technology” according to the General Technology Note for the “development” or “production” of Microwave Monolithic Integrated Circuit (MMIC) power 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 0.1n W (-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;

33. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 5, Part 2 is amended by:

a. Revising paragraph b. of Note 3 to read as follows; and

b. Removing the Technical Note at the end of Note 4 that reads “Parity bits are not included in the key length.”

The revision reads as follows:

CATEGORY 5 – TELECOMMUNICATIONS AND “INFORMATION SECURITY”

Part 2 – “INFORMATION SECURITY”

Note 3: ***

b. ***

3. The feature set of the component or ‘executable software’ is fixed and is not designed or

modified to customer specification; and

34. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 5, Part 2, ECCN 5A002 is amended by:

- a. Revising paragraphs (i) and (j), and adding paragraph (k) to the Note at the beginning of the Items paragraph of the List of Items Controlled section;
- b. Revising the Nota Bena after the introductory text of paragraph a. in the Items paragraph of the List of Items Controlled section;
- c. Removing paragraph 3 in the Technical Note to 5A002.a.1. in the Items paragraph of the List of Items Controlled section;
- d. Removing the Note to 5A002.a.1. in the Items paragraph of the List of Items Controlled section;
- e. Adding a Technical Note after the introductory text of paragraph a.1.a. in the Items paragraph of the List of Items Controlled section; and
- f. Revising the introductory text to paragraph a.9. in the Items paragraph of the List of Items Controlled section.

The revisions and addition read as follows:

5A002 “Information security” systems, equipment “components” therefor, as follows (see List of Items Controlled).

List of Items Controlled

Items:

Note: ***

(i) Wireless “personal area network” equipment that implement only published or commercial cryptographic standards and where the cryptographic capability is limited to a nominal operating range not exceeding 30 meters according to the manufacturer’s specifications, or not exceeding 100 meters according to the manufacturer’s specifications for equipment that cannot interconnect with more than seven devices;

(j) Equipment, having no functionality specified by 5A002.a.2, 5A002.a.4, 5A002.a.7, or 5A002.a.8, where all cryptographic capability specified by 5A002.a meets any of the following:

1. It cannot be used; or

2. *It can only be made useable by means of “cryptographic activation”; or*

***N.B.:** See 5A002.a for equipment that has undergone “cryptographic activation”.*

(k) Mobile telecommunications Radio Access Network (RAN) equipment designed for civil use, which also meet the provisions 2. to 5. of part a. of the Cryptography Note (Note 3 in Category 5, Part 2), having an RF output power limited to 0.1W (20 dBm) or less, and supporting 16 or fewer concurrent users.

a. ***

***N.B.:** For the control of Global Navigation Satellite Systems (GNSS) receiving equipment containing or employing decryption, see ECCN 7A005, and for related decryption “software” and “technology” see 7D005 and 7E001.*

a.1. ***

a.1.a. ***

***Technical Note:** Parity bits are not included in the key length.*

a.9. Designed or modified to use or perform ‘quantum cryptography.’

35. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 6, ECCN 6A001 is amended by:

- a. Adding Note 3 to the introductory paragraph a.1.c. in the Items paragraph of the List of Items Controlled section;
- b. Revising the Technical Note following a.1.c.2., the introductory text to paragraph a.1.e., a.2.a.3. through a.2.a.3.e., a.2.b.7., and a.2.e. through a.2.e.3.;
- c. Removing and reserving paragraph a.2.b.6.
- c. Adding paragraphs a.2.b.8 and a.2.g. through a.2.g.4., and one Note to 6A001.a.2 and two Technical Notes following the Note to 6A001.a.2.g. ; and
- d. Removing the Note after paragraph a.2.f. and adding it after new paragraph a.2.g.4. in the Items paragraph of the List of Items Controlled section.

The revisions and additions read as follows:

6A001 Acoustic systems, equipment and components, as follows (see List of Items Controlled).

List of Items Controlled

Items:

a. ***

a.1. ***

a.1.c. ***

Notes:

3. Piezoelectric elements specified in 6A001.a.1.c include those made from lead-magnesium-niobate/lead-titanate ($Pb(Mg_{1/3}Nb_{2/3})O_3$ - $PbTiO_3$, or PMN-PT) single crystals grown from solid solution or lead-indium-niobate/lead-magnesium niobate/lead-titanate ($Pb(In_{1/2}Nb_{1/2})O_3$ -

Pb(Mg_{1/3}Nb_{2/3})O₃-PbTiO₃, or PIN-PMN-PT) single crystals grown from solid solution.

a.1.c.2. ***

Technical Note: 'Acoustic power density' is obtained by dividing the output acoustic power by the product of the area of the radiating surface and the frequency of operation.

a.1.e. Active individual sonars, "specially designed" or modified to detect, locate and automatically classify swimmers or divers, having all of the following, and "specially designed" transmitting and receiving acoustic arrays therefor:

a.2. ***

a.2.a. ***

a.2.a.3. Having any of the following sensing elements:

a.2.a.3.a. Optical fibers;

a.2.a.3.b. 'Piezoelectric polymer films' other than polyvinylidene-fluoride (PVDF) and its co-polymers {P(VDF-TrFE) and P(VDF-TFE)};

a.2.a.3.c. 'Flexible piezoelectric composites';

a.2.a.3.d. Lead-magnesium-niobate/lead-titanate (*i.e.*, $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$, or PMN-PT) piezoelectric single crystals grown from solid solution; or

a.2.a.3.e. Lead-indium-niobate/lead-magnesium niobate/lead-titanate (*i.e.*, $\text{Pb}(\text{In}_{1/2}\text{Nb}_{1/2})\text{O}_3\text{-Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$, or PIN-PMN-PT) piezoelectric single crystals grown from solid solution;

a.2.b. ***

a.2.b.6. [RESERVED];

a.2.b.7. Hydrophone characteristics controlled by 6A001.a.2.a; *or*

a.2.b.8. Accelerometer-based hydro-acoustic sensors specified by 6A001.a.2.g;

a.2.e. Bottom or bay-cable hydrophone arrays having any of the following:

a.2.e.1. Incorporating hydrophones controlled by 6A001.a.2.a;

a.2.e.2. Incorporating multiplexed hydrophone group signal modules having all of the following characteristics:

a.2.e.2.a. Designed to operate at depths exceeding 35 m or having an adjustable or removal depth sensing device in order to operate at depths exceeding 35 m; *and*

a.2.e.2.b. Capable of being operationally interchanged with towed acoustic hydrophone array modules; *or*

a.2.e.3. Incorporating accelerometer-based hydro-acoustic sensors specified by 6A001.a.2.g;

a.2.f. ***

a.2.g. Accelerometer-based hydro-acoustic sensors having all of the following:

a.2.g.1. Composed of three accelerometers arranged along three distinct axes;

a.2.g.2. Having an overall ‘acceleration sensitivity’ better than 48 dB (reference 1,000 mV rms per 1g);

a.2.g.3. Designed to operate at depths greater than 35 meters; *and*

a.2.g.4. Operating frequency below 20 kHz;

Note: 6A001.a.2.g does not apply to particle velocity sensors or geophones.

Note: 6A001.a.2 also applies to receiving equipment, whether or not related in normal application to separate active equipment, and “specially designed” components therefor.

Technical Notes:

- 1. Accelerometer-based hydro-acoustic sensors are also known as vector sensors.*
- 2. ‘Acceleration sensitivity’ is defined as twenty times the logarithm to the base 10 of the ratio of rms output voltage to a 1 V rms reference, when the hydro-acoustic sensor, without a preamplifier, is placed in a plane wave acoustic field with an rms acceleration of 1 g (i.e., 9.81 m/s²).*

36. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 6, ECCN 6A005 is amended by:

- a. Revising the NP paragraph in the License Requirement section;
- b. Removing the License Requirements Note;
- c. Revising License Exception paragraphs GBS and CIV in the List Based License Exception section;
- d. Revising the Related Definitions paragraph in the List of Items Controlled section;
- e. Revising Note 2 and adding a Technical Note after Note 2 at the beginning of the Items paragraph in the List of Items Controlled section;
- f. Revising the Note below paragraph a.6.b.2. to make it “Note 1” and adding Note 2 and a Technical Note;
- g. Removing paragraphs b.4., b.5., and b.6. and adding in place b.4., b.5., and .b.6.; and
- h. Removing the Note below paragraph d.6.b.

The revisions read as follows:

6A005 “Lasers,” “components” and optical equipment, as follows (see List of Items Controlled), excluding items that are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

License Requirements

Reason for Control: NS, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
NP applies to “lasers” that meet or exceed the parameters of 6A205.	NP 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 for NP items

\$3000 for all other items

GBS: Neodymium-doped (other than glass) “lasers” controlled by 6A005.b.6.d.2(except 6A005.b.6.d.2.b) that have an output wavelength exceeding 1,000 nm, but not exceeding 1,100 nm, and an average or CW output power not exceeding 2kW, and operate in a pulse-excited, non- “Q-switched” multiple-transverse mode, or in a continuously excited, multiple-transverse mode; Dye and Liquid Lasers controlled by 6A005.c.1, c.2 and c.3, except for a pulsed single longitudinal mode oscillator having an average output power exceeding 1 W and a repetition rate exceeding 1 kHz if the

“pulse duration” is less than 100 ns; CO “lasers” controlled by 6A005.d.2 having a CW maximum rated single or multimode output power not exceeding 10 kW; CO₂ or CO/CO₂ “lasers” controlled by 6A005.d.3 having an output wavelength in the range from 9,000 to 11,000 nm and having a pulsed output not exceeding 2 J per pulse and a maximum rated average single or multimode output power not exceeding 5 kW; CO₂ “lasers” controlled by 6A005.d.3 that operate in CW multiple-transverse mode, and having a CW output power not exceeding 15kW; and 6A005.f.1.

CIV: Neodymium-doped (other than glass) “lasers” controlled by 6A005.b.6.d.2 (except 6A005.b.6.d.2.b) that have an output wavelength exceeding 1,000 nm, but not exceeding 1,100 nm, and an average or CW output power not exceeding 2kW, and operate in a pulse-excited, non- “Q-switched” multiple-transverse mode, or in a continuously excited, multiple-transverse mode; Dye and Liquid Lasers controlled by 6A005.c.1, c.2 and c.3, except for a pulsed single longitudinal mode oscillator having an average output power exceeding 1 W and a repetition rate exceeding 1 kHz if the “pulse duration” is less than 100 ns; CO “lasers” controlled by 6A005.d.2 having a CW maximum rated single or multimode output power not exceeding 10 kW; CO₂ or CO/CO₂ “lasers” controlled by 6A005.d.3 having an output wavelength in the range from 9,000 to 11,000 nm and having a pulsed output not exceeding 2 J per pulse and a maximum rated average single or multimode output power not exceeding 5 kW; CO₂ “lasers” controlled by 6A005.d.3 that operate in CW multiple-transverse mode, and having a CW output power not exceeding 15kW; and 6A005.f.1.

List of Items Controlled

Related Controls: (1) See ECCN [6D001](#) for “software” for items controlled under this entry. (2) See ECCNs [6E001](#) (“development”), [6E002](#) (“production”), and [6E201](#) (“use”) for technology for items controlled under this entry. (3) Also see ECCNs [6A205](#) and [6A995](#). (4) See ECCN 3B001 for excimer “lasers” “specially designed” for lithography equipment. (5) “Lasers” “specially designed” or prepared for use in isotope separation are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (6) Shared aperture optical elements, capable of operating in “super-high power laser” applications, and “lasers” specifically designed, modified, or configured for military application are “subject to the ITAR” (see 22 CFR parts 120 through 130).

Related Definitions: (1) ‘Wall-plug efficiency’ is defined as the ratio of “laser” output power (or “average output power”) to total electrical input power required to operate the “laser”, including the power supply/conditioning and thermal conditioning/heat exchanger, see 6A005.a.6.b.1 and 6A005.b.6; (2) ‘Non-repetitive pulsed’ refers to “lasers” that produce either a single output pulse or that have a time interval between pulses exceeding one minute, see Note 2 of 6A005 and 6A005.d.6.

Items:

Note 2: *Excimer, semiconductor, chemical, CO, CO₂, and ‘non-repetitive pulsed’*

Nd:glass “lasers” are only specified by 6A005.d.

Technical Note: *'Non-repetitive pulsed' refers to "lasers" that produce either a single output pulse or that have a time interval between pulses exceeding one minute.*

a. ***

a.6. ***

a.6.b. ***

a.6.b.2. ***

Note 1: *6A005.a.6.b does not control multiple transverse mode, industrial "lasers" with output power exceeding 2kW and not exceeding 6 kW with a total mass greater than 1,200 kg. For the purpose of this note, total mass includes all "components" required to operate the "laser," e.g., "laser," power supply, heat exchanger, but excludes external optics for beam conditioning and/or delivery.*

Note 2: *6A005.a.6.b does not apply to multiple transverse mode, industrial "lasers" having any of the following:*

a. *Output power exceeding 500 W but not exceeding 1 kW and having all of the*

following:

1. *Beam Parameter Product (BPP) exceeding 0.7 mm•mrad; and*
 2. *'Brightness' not exceeding 1024 W/(mm•mrad)²;*
- b. Output power exceeding 1 kW but not exceeding 1.6 kW and having a BPP exceeding 1.25 mm•mrad;*
 - c. Output power exceeding 1.6 kW but not exceeding 2.5 kW and having a BPP exceeding 1.7 mm•mrad;*
 - d. Output power exceeding 2.5 kW but not exceeding 3.3 kW and having a BPP exceeding 2.5 mm•mrad;*
 - e. Output power exceeding 3.3 kW but not exceeding 4 kW and having a BPP exceeding 3.5 mm•mrad;*
 - f. Output power exceeding 4 kW but not exceeding 5 kW and having a BPP exceeding 5 mm•mrad;*
 - g. Output power exceeding 5 kW but not exceeding 6 kW and having a BPP exceeding 7.2 mm•mrad;*
 - h. Output power exceeding 6 kW but not exceeding 8 kW and having a BPP exceeding 12 mm•mrad; or*
 - i. Output power exceeding 8 kW but not exceeding 10 kW and having a BPP exceeding 24 mm•mrad;*

Technical Note: For the purpose of 6A005.a.6.b, Note 2.a., 'brightness' is defined as the output power of the "laser" divided by the squared Beam Parameter Product (BPP), i.e., (output power)/BPP².

b. ***

b.4. Output wavelength exceeding 540 nm but not exceeding 800 nm and any of the following:

b.4.a. "Pulse duration" less than 1 ps and any of the following:

b.4.a.1. Output energy exceeding 0.005 J per pulse and "peak power" exceeding 5 GW; *or*

b.4.a.2. "Average output power" exceeding 20 W; *or*

b.4.b. "Pulse duration" equal to or exceeding 1 ps and any of the following:

b.4.b.1. Output energy exceeding 1.5 J per pulse and "peak power" exceeding 30 W;
or

b.4.b.2. "Average output power" exceeding 30 W;

b.5. Output wavelength exceeding 800 nm but not exceeding 975 nm and any of the following:

b.5.a. “Pulse duration” less than 1ps and any of the following:

b.5.a.1. Output energy exceeding 0.005 J per pulse and “peak power” exceeding 5 GW; *or*

b.5.a.2. Single transverse mode output and “average output power” exceeding 20 W;

b.5.b. “Pulse duration” equal to or exceeding 1 ps and not exceeding 1 μ s and any of the following:

b.5.b.1. Output energy exceeding 0.5 J per pulse and “peak power” exceeding 50 W;

b.5.b.2. Single transverse mode output and “average output power” exceeding 20 W; *or*

b.5.b.3. Multiple transverse mode output and “average output power” exceeding 50 W; *or*

b.5.c. “Pulse duration” exceeding 1 μ s and any of the following:

b.5.c.1. Output energy exceeding 2 J per pulse and “peak power” exceeding 50 W;

b.5.c.2. Single transverse mode output and “average output power” exceeding 50 W;
or

b.5.c.3. Multiple transverse mode output and “average output power” exceeding 80 W.

b.6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm and any of the following:

b.6.a. “Pulse duration” of less than 1 ps, and any of the following:

b.6.a.1. Output “peak power” exceeding 2 GW per pulse;

b.6.a.2. “Average output power” exceeding 10 W; *or*

b.6.a.3. Output energy exceeding 0.002 J per pulse;

b.6.b. “Pulse duration” equal to or exceeding 1 ps and less than 1 ns, and any of the following:

b.6.b.1. Output “peak power” exceeding 5 GW per pulse;

- b.6.b.2. “Average output power” exceeding 10 W; *or*
- b.6.b.3. Output energy exceeding 0.1 J per pulse;
- b.6.c. “Pulse duration” equal to or exceeding 1 ns but not exceeding 1 μ s and any of the following:
 - b.6.c.1. Single transverse mode output and any of the following:
 - b.6.c.1.a. “Peak power” exceeding 100 MW;
 - b.6.c.1.b. “Average output power” exceeding 20 W limited by design to a maximum pulse repetition frequency less than or equal to 1 kHz;
 - b.6.c.1.c. ‘Wall-plug efficiency’ exceeding 12%, “average output power” exceeding 100 W and capable of operating at a pulse repetition frequency greater than 1 kHz;
 - b.6.c.1.d. “Average output power” exceeding 150 W and capable of operating at a pulse repetition frequency greater than 1 kHz; *or*
 - b.6.c.1.e. Output energy exceeding 2 J per pulse; *or*
 - b.6.c.2. Multiple transverse mode output and any of the following:

b.6.c.2.a. “Peak power” exceeding 400 MW;

b.6.c.2.b. ‘Wall-plug efficiency’ exceeding 18% and “average output power” exceeding 500 W;

b.6.c.2.c. “Average output power” exceeding 2 kW; or

b.6.c.2.d. Output energy exceeding 4 J per pulse; *or*

b.6.d. “Pulse duration” exceeding 1 μ s and any of the following:

b.6.d.1. Single transverse mode output and any of the following:

b.6.d.1.a. “Peak power” exceeding 500 kW;

b.6.d.1.b. ‘Wall-plug efficiency’ exceeding 12% and “average output power” exceeding 100 W; *or*

b.6.d.1.c. “Average output power” exceeding 150 W; *or*

b.6.d.2. Multiple transverse mode output and any of the following:

b.6.d.2.a. “Peak power” exceeding 1 MW;

b.6.d.2.b. “Wall-plug efficiency” exceeding 18% and “average output power” exceeding 500 W; *or*

b.6.d.2.c. “Average output power” exceeding 2 kW;

d. Other “lasers”, not controlled by 6A005.a., 6A005.b, or 6A005.c as follows:

37. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 6, ECCN 6A007 is amended by:

a. Removing “μgal” and adding in its place “μGal” in paragraph 6A007.a; and

b. Revising paragraphs b.1. and b.2. in the Items paragraph of the List of Items Controlled section.

The revisions read as follows:

6A007 Gravity meters (gravimeters) and gravity gradiometers, as follows (see List of Items Controlled).

List of Items Controlled

Items:

b. ***

b.1. A static accuracy of less (better) than 0.7 mGal; *and*

b.2. An in-service (operational) accuracy of less (better) than 0.7 mGal having a ‘time-to-steady-state registration’ of less than 2 minutes under any combination of attendant corrective compensations and motional influences;

38. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 6, ECCN 6A008 is amended by:

a. Revising paragraph k.2., and adding a Note to 6A008.k, in the Items paragraph of the List of Items Controlled section;

b. Revising the Note to 6A008.1.1. following paragraph l.1. in the Items paragraph of the List of Items Controlled section;

c. Revising the Note to 6A008.1 following the Nota Bene after paragraph l.4; and

d. Adding Technical Notes to the end of the Items paragraph of the List of Items Controlled section, to read as follows:

6A008 Radar systems, equipment and assemblies, having any of the following (see List of Items Controlled), and “specially designed” “components” therefor.

List of Items Controlled

Items:

k. ***

k.2. A compressed pulse width of less than 200 ns; *or*

Note: 6A008.k.2 does not apply to two dimensional 'marine radar' or 'vessel traffic service' radar, having all of the following:

- a. "Pulse compression" ratio not exceeding 150;*
- b. Compressed pulse width of greater than 30 ns;*
- c. Single and rotating mechanically scanned antenna;*
- d. Peak output power not exceeding 250 W; and*
- e. Not capable of "frequency hopping".*

l. ***

l.1. ***

Note: 6A008.l.1 does not control conflict alert capability in ATC systems, or 'marine radar'.

l.4. ***

N.B.: ***

Note: 6A008.l does not apply to systems, equipment and assemblies designed for 'vessel traffic services'.

Technical Notes:

1. For the purposes of 6A008, 'marine radar' is a radar that is used to navigate safely at sea, inland waterways or near-shore environments.

2. For the purposes of 6A008, 'vessel traffic service' is a vessel traffic monitoring and control service similar to air traffic control for aircraft.

39. ECCN 6A205 is amended by removing the reference to "6A005.b.6.b" and adding in its place "6A005.b.6.c" in paragraph (3) of the Related Controls paragraph of the List of Items Controlled section.

40. In Supplement No. 1 to part 774 (the Commerce Control List, Category 6, ECCN 6B007, the heading is amended by removing "mgal" and adding in its place "mGal."

41. In Supplement No. 1 to part 774 (the Commerce Control List, Category 6, ECCN 6D001 is amended by removing "NP" from the reason for control paragraph and the NP control paragraph in the License Requirements section.

42. ECCN 6E201 is amended by revising the heading to read as follows:

6E201 “Technology” according to the General Technology Note for the “use” of equipment controlled by 6A003.a.2., 6A003.a.3, 6A003.a.4; 6A005.a.2, 6A005.b.2.b, 6A005.b.3, 6A005.b.4.b.2, 6A005.b.6.c, 6A005.c.1.b, 6A005.c.2.b, 6A005.d.2, 6A005.d.3.c, or 6A005.d.4.c (that meet or exceed the parameters of 6A205); 6A202, 6A203, 6A205, 6A225 or 6A226.

* * * * *

43. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7A002 is amended by:

a. Revising the Note to 7A002.a.1.b in the Items paragraph of the List of Items

Controlled section;

b. Removing the Technical Note below the Note to 7A002.a.1.b in the Items paragraph of the List of Items Controlled section; and

c. Revising paragraphs a.2.a. and a.2.b., and the Note to 7A002.a.2.b in the Items paragraph of the List of Items Controlled section.

The revisions read as follows:

7A002 Gyros or angular rate sensors, having any of the following (see List of Items Controlled) and “specially designed” “components” therefor.

List of Items Controlled

Items:

a. ***

a.1. ***

a.1.b. ***

Note: 7A002.a.1.b does not control “spinning mass gyros”.

a.2. ***

a.2.a. A “bias” “stability” of less (better) than 4 degrees per hour, when measured in a 1 g environment over a period of three minutes, and with respect to a fixed calibration value; *or*

a.2.b. An “angle random walk” of less (better) than or equal to 0.1 degree per square root hour; *or*

Note: 7A002.a.2.b does not apply to “spinning mass gyros”.

44. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7A003

is amended by:

a. Revising the heading;

b. Removing the text and adding in its place “N/A” in the Related Definitions paragraph of the List of Items Controlled section; and

c. Revising the Items paragraph in the List of Items Controlled section.

The revisions read as follows:

7A003 ‘Inertial measurement equipment or systems’, having any of the following (see List of Items Controlled).

List of Items Controlled

Items:

Note 1: *‘Inertial measurement equipment or systems’ incorporate accelerometers or gyroscopes to measure changes in velocity and orientation in order to determine or maintain heading or position without requiring an external reference once aligned. ‘Inertial measurement equipment or systems’ include:*

- *Attitude and Heading Reference Systems (AHRSSs);*
- *Gyrocompasses;*
- *Inertial Measurement Units (IMUs);*
- *Inertial Navigation Systems (INSs);*
- *Inertial Reference Systems (IRSs);*
- *Inertial Reference Units (IRUs).*

Note 2: *7A003 does not apply to ‘inertial measurement equipment or systems’ which are certified for use on “civil aircraft” by civil authorities of a Wassenaar Arrangement Participating State, see Supplement No. 1 to part 743 of the EAR.*

Technical Notes:

1. *‘Positional aiding references’ independently provide position, and include:*
 - a. *Global Navigation Satellite Systems (GNSS);*
 - b. *“Data-Based Referenced Navigation” (“DBRN”).*

2. *‘Circular Error Probable’ (‘CEP’) - In a circular normal distribution, the radius of the circle containing 50% of the individual measurements being made, or the radius of the circle within which there is a 50% probability of being located.*

a. Designed for “aircraft”, land vehicles or vessels, providing position without the use of ‘positional aiding references’, and having any of the following accuracies subsequent to normal alignment:

a.1.0.8 nautical miles per hour (nm/hr) ‘Circular Error Probable’ (‘CEP’) rate or less (better);

a.2.0.5% distanced travelled ‘CEP’ or less (better); or

a.3.Total drift of 1 nautical mile ‘CEP’ or less (better) in a 24 hr period;

Technical Note: *The performance parameters in 7A003.a.1, 7A003.a.2 and 7A003.a.3 typically apply to ‘inertia measurement equipment or systems’ designed for “aircraft”, vehicles and vessels, respectively. These parameters result from the utilization of specialized non-positional aiding references (e.g., altimeter, odometer, velocity log). As a consequence, the specified performance values cannot be readily converted between these parameters. Equipment designed for multiple platforms are evaluated against each applicable entry 7A003.a.1, 7A003.a.2, or 7A003.a.3.*

b. Designed for “aircraft”, land vehicles or vessels, with an embedded ‘positional aiding reference’ and providing position after loss of all ‘positional aiding references’ for a period of up to 4 minutes, having an accuracy of less (better) than 10 meters ‘CEP’;

Technical Note: *7A003.b refers to systems in which ‘inertial measurement equipment or systems’ and other independent ‘positional aiding references’ are built into a single unit (i.e., embedded) in order to achieve improved performance.*

c. Designed for “aircraft”, land vehicles or vessels, providing heading or True North determination and having any of the following:

c.1. A maximum operating angular rate less (lower) than 500 deg/s and a heading accuracy without the use of ‘positional aiding references’ equal to or less (better) than 0.07 deg sec (Lat) (equivalent to 6 arc minutes rms at 45 degrees latitude); *or*

c.2. A maximum operating angular rate equal to or greater (higher) than 500 deg/s and a heading accuracy without the use of ‘positional aiding references’ equal to or less (better) than 0.2 deg sec (Lat) (equivalent to 17 arc minutes rms at 45 degrees latitude);

d. Providing acceleration measurements or angular rate measurements, in more than one dimension, and having any of the following:

d.1. Performance specified by 7A001 or 7A002 along any axis, without the use of any aiding references; *or*

d.2. Being “space-qualified” and providing angular rate measurements having an “angle random walk” along any axis of less (better) than or equal to 0.1 degree per square root hour.

Note: 7A003.d.2 does not apply to ‘inertial measurement equipment or systems’ that contain “spinning mass gyros” as the only type of gyro.

45. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7D003 is amended by:

a. Revising the Special Conditions for STA section; and

b. Removing and reserving paragraph 7D003.c.

The revision reads as follows:

7D003 Other “software” as follows (see List of Items Controlled).

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit software in 7D003.a or .b to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

46. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7D004 is amended by revising the heading to read as follows:

7D004 “Source code” incorporating “development” “technology” specified by 7E004.a.1 to a.6 or 7E004.b, for any of the following: (see List of Items Controlled).

47. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7 is amended by adding ECCN 7D005 to read as follows:

7D005 “Software” “specially designed” to decrypt Global Navigation Satellite Systems (GNSS) ranging signals designed for government use.

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)

CIV: N/A

TSR: N/A

List of Items Controlled

Related Controls: N/A

Related Definitions: N/A

Items:

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

48. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7E001

is amended by:

a. Revising the heading;

b. Revising the NS paragraph in the License Requirements section; and

c. Adding a Note to the end of the Items paragraph of the List of Items Controlled section.

The revisions and addition to read as follows:

7E001 “Technology” according to the General Technology Note for the “development” of equipment or “software”, specified by 7.A., 7.B., 7D001, 7D002, 7D003 or 7D005.

License Requirements

<i>Control(s)</i>	<i>Country Chart (See Supp. No. 1 to part 738).</i>
NS applies to “technology” for items controlled by 7A001 to 7A004, 7A006, 7A008, 7B001 to 7B003, 7D001 to 7D005.	NS Column 1

List of Items Controlled

Items:

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

Note: 7E001 includes key management “technology” exclusively for equipment specified in 7A005.a.

49. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 7, ECCN 7E004 is amended by removing and reserving paragraph b.6 and removing the Nota Bene below it. Note that 7E004.b remains.

50. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 8, ECCN 8A002

is amended by:

a. Revising paragraph i.2 and the Technical Note below it in the Items paragraph of the List of Items Controlled; and

b. Adding a Nota Bene below the Note that follows paragraph q.2 in the Items paragraph of the List of Items Controlled section.

The revisions and addition read as follows:

8A002 Marine systems, equipment, “parts” and “components,” as follows (see List of Items Controlled).

List of Items Controlled

Items:

i. ***

i.2. Controlled by proportional master-slave techniques and having 5 degrees of ‘freedom of movement’ or more;

Technical Note: Only functions having proportionally related motion control using positional feedback are counted when determining the number of degrees of 'freedom of movement'.

q. ***

q.2. ***

Note: ***

N.B. For equipment and devices "specially designed" for military use see ECCN 8A620.f.

51. In Supplement No. 1 to Part 774 (the Commerce Control List), Category 9, ECCN 9A001 is amended by revising the Note to 9A001.a to be Note 1 and adding Note 2 following 9A001.a in the Items paragraph of the List of Items Controlled section, to read as follows:

9A001 Aero gas turbine engines having any of the following (see List of Items Controlled).

List of Items Controlled

Items:

a. ***

Note 1: 9A001.a. does not control aero gas turbine engines which meet all of the following:

a. Certified by the civil aviation authority in a country listed in Supplement No. 1 to Part 743; and

b. Intended to power non-military manned aircraft for which any of the following has been issued by a Wassenaar Arrangement Participating State listed in Supplement No. 1 to Part 743 for the aircraft with this specific engine type:

b.1. A civil type certificate; or

b.2. An equivalent document recognized by the International Civil Aviation Organization (ICAO).

Note 2: 9A001.a does not apply to aero gas turbine engines for Auxiliary Power Units (APUs) approved by the civil aviation authority in a Wassenaar Arrangement Participating State (see Supplement No. 1 to part 743 of the EAR).

52. Supplement No. 2 to part 774 “General Technology and Software Notes” is amended by removing the phrase “operation, maintenance (checking), and repair” and adding in its place “operation, maintenance (checking), or repair” in the General Technology Note.

53. Supplement No. 5 to part 774 “Items Classified Under ECCNS 0A521, 0B521, 0C521, 0D521 and 0E521” is amended by removing the date “June 20, 2014” and adding in its place “June 20, 2015” from rows 0D521 No. 2 and 0E521 No. 6 and under the column entitled “Date when the item will be designated EAR99, unless reclassified in another ECCN or the 0Y521 classification is reissued.”

54. Supplement No. 6 to part 774 “Sensitive List” is amended by:

a. Revising paragraphs (4)(ii) and (iii);

b. Removing and reserving paragraph (7)(iv);

c. Redesignating paragraphs (7)(v) and (vi) as paragraphs (7)(vi) and (vii);

d. Adding new paragraph (7)(v).

The revisions and addition read as follows:

Supplement No. 6 to Part 774—Sensitive List

(4) ***

(ii) 4D001—“Software” “specially designed” for the “development” or “production” of equipment controlled under ECCN 4A001.a.2 or for the “development” or “production” of “digital computers” having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 1.0 Weighted TeraFLOPS (WT).

(iii) 4E001— “Technology” according to the General Technology Note for the “development” or “production” of any of the following equipment or “software”: equipment controlled under ECCN 4A001.a.2, “digital computers” having an ‘Adjusted Peak Performance’ (‘APP’) exceeding 1.0 Weighted TeraFLOPS (WT), or “software” controlled under the specific provisions of 4D001 described in this Supplement.

(7) ***

(v) 7D004.a to .d and .g.

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Kevin J. Wolf

Assistant Secretary for Export Administration

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