

## Table of Contents

§ 774.1 INTRODUCTION ..... 1

§774.2 [RESERVED] ..... 2

SUPPLEMENT NO. 1 TO PART 774 –  
THE COMMERCE CONTROL LIST..... 1

SUPPLEMENT NO. 2 TO PART 774 –  
GENERAL TECHNOLOGY AND  
SOFTWARE NOTES ..... 1

SUPPLEMENT NO. 3 TO PART 774 –  
STATEMENTS OF UNDERSTANDING . 1

SUPPLEMENT NO. 4 TO PART 774 –  
COMMERCE CONTROL LIST ORDER  
OF REVIEW..... 1

SUPPLEMENT NO. 5 TO PART 774 -  
ITEMS CLASSIFIED UNDER ECCNS  
0A521, 0B521, 0C521, 0D521 AND 0E521  
..... 1

SUPPLEMENT NO. 6 TO PART 774 –  
SENSITIVE LIST ..... 1

SUPPLEMENT NO. 7 TO PART 774 –  
VERY SENSITIVE LIST ..... 1

### § 774.1 INTRODUCTION

#### (a) Scope of the control list

In this part, references to the EAR are references to 15 CFR chapter VII, subchapter C. The Bureau of Industry and Security (BIS) maintains the Commerce Control List (CCL) that includes “items” -- i.e., “commodities,” “software,” and “technology” -- subject to the authority of BIS. The CCL does not include items exclusively controlled for export by another department or agency of the U.S. Government, though in instances where other agencies administer

controls over related items, entries in the CCL may contain a reference to such controls. In addition, those items “subject to the EAR” but not identified on the CCL are identified by the designator “EAR99.” See § 734.2(a) of the EAR for items that are “subject to the EAR.” EAR Part 738 contains an explanation of the organization of the CCL and its relationship to the Country Chart.

**(b) (1) ECCN cross-references for items subject to exclusive jurisdiction of another agency.** Prior to October 15, 2013, the CCL contained certain ECCNs that were only included as cross references to items subject to the export control regulations administered by the Nuclear Regulatory Commission.

**(2)** ECCNs formerly listed on the CCL that, as of October 15, 2013 were subject to the export licensing authority of the Nuclear Regulatory Commission at 10 CFR part 110 are: 0A001, 0B001, 0B002, 0B003, 0B004, 0B005, 0B006, 0C001, 0C002, 0C004, 0C005, 0C006, 0C201 and 1C012.

**(3)** The following multilateral export control regime reference is provided, as an additional point of historical reference: 0C201 - INFCIRC 254 Part 1, 5.3.1(b).

*Note to paragraph (b): ECCNs 0D001 and 0E001 are “subject to the ITAR” (see 22 CFR parts 120 through 130). These ECCNs are retained on the CCL as cross references to the ITAR, although the former cross references to export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110) for ECCN 0D001, and to the Department of Energy (see 10 CFR part 810) for 0E001 were removed from the Control(s) paragraph in the License Requirements section of these two ECCNs and added as a more general jurisdictional cross reference in a heading note added to these two ECCNs as of June 5, 2014.*

**(c) *Where to find the CCL?***

The CCL is contained in Supplement No. 1 to this part, and Supplement No. 2 to this part contains the General Technology and Software Notes relevant to entries contained in the CCL.

**(d) *Conventions related to the use of quotation marks on the CCL***

The use of double quotation marks on the CCL is intended to be an aid to alert you to terms used on the CCL that are defined in part 772 (Definitions of Terms), or for purposes of ECCNs, where a definition is provided in the “related definitions” paragraph in the License Requirements section of ECCNs or sometimes in Notes and Technical Notes for particular ECCNs and that definition is specific to that particular ECCN. In this sense the quotes are helpful both in the use of single and double quotes, but a good compliance practice is to familiarize yourself with the defined terms in part 772, and when reviewing a control parameter on the CCL that uses a term that is not in quotes to be aware it may be defined in part 772. It is also a useful compliance practice to review the “Related Definitions” paragraph and Notes and Technical Notes to determine if the term is defined for purposes of a particular ECCN.

**(1) Use of double quotes.** If a term on the CCL uses double quotes it means there is a defined term in part 772. However, the absence of double quotes does not mean that a term used on the CCL is not defined in part 772. Because the CCL includes many terms that are defined in part 772, BIS’s practice is to use double quotes for certain key terms and to use double quotes

when needed for consistency with multilateral export control regime based entries, such as many derived from control lists, in particular for the Wassenaar Arrangement that also uses the double quotes convention. However, because of the large number of defined terms used on the CCL and a desire to avoid hindering readability by placing quotes around too many words used in particular ECCNs, BIS’s practice is to not add double quotes around certain terms, such as items and commodities. This convention also applies to the use of double quotes within the Definition of Terms section under part 772.

**(2) Use of single quotes.** The CCL also includes a convention regarding the use of single quotes. Single quotes on the CCL identify a term as a defined term in the context of a particular ECCN. This convention also applies to the use of single quotes within the Definition of Terms section under part 772.

**(e) *Chemicals identified by Chemical Abstracts Service (CAS) number***

In some instances chemicals are listed by name and CAS number. The list applies to chemicals of the same structural formula (including hydrates) regardless of name or CAS number. CAS numbers are shown to assist in identifying a particular chemical or mixture, irrespective of nomenclature. CAS numbers cannot be used as unique identifiers because some forms of the listed chemical have different CAS numbers, and mixtures containing a listed chemical may also have different CAS numbers.

**§774.2 [RESERVED]**

**SUPPLEMENT NO. 1 TO PART 774 – THE COMMERCE CONTROL LIST**

The Commerce Control List is in a separate file.

## SUPPLEMENT NO. 2 TO PART 774 – GENERAL TECHNOLOGY AND SOFTWARE NOTES

### 1. *General Technology Note.*

The export of "technology" that is "required" for the "development", "production", or "use" of items on the Commerce Control List is controlled according to the provisions in each Category.

"Technology" "required" for the "development", "production", or "use" of a controlled product remains controlled even when applicable to a product controlled at a lower level.

License Exception TSU is available for "technology" that is the minimum necessary for the installation, operation, maintenance (checking), or repair of those products that are eligible for License Exceptions or that are exported under a license.

*N.B.:* This does not allow release under a License Exception of the repair "technology" controlled by 1E002.e, 1E002.f, 8E002.a, or 8E002.b.

*N.B.:* The 'minimum necessary' excludes "development" or "production" technology and permits "use" technology only to the extent "required" to ensure safe and efficient use of the product. Individual ECCNs may further restrict export of "minimum necessary" information.

### 2. *General Software Note.*

License Exception TSU (mass market software) (see § 740.13 of the EAR) is available to all destinations, except countries in Country Group E:1 of Supplement No. 1 to part 740 of the EAR,

for release of "software" which is any of the following:

1. Generally available to the public by being:
  - a. Sold from stock at retail selling points, without restriction, by means of:
    1. Over the counter transactions;
    2. Mail order transactions;
    3. Electronic transactions; *or*
    4. Telephone call transactions; *and*
  - b. Designed for installation by the user without further substantial support by the supplier.
2. [RESERVED] *See § 734.3(b)(3) for "publicly available technology and software."*
3. The minimum necessary "object code" for the installation, operation, maintenance (checking) or repair of those items whose export has been authorized.

*Note:* Minimum necessary "object code" does not enhance or improve the performance of an item or provide new features or functionality.

*Note:* The General Software Note does not apply to "software" controlled by Category 5 - part 2 "Information Security"). For "software" controlled by Category 5, part 2, see Supplement No. 1 to part 774, Category 5, part 2, Note 3 – Cryptography Note.

**3. General “Information Security” Note.**

“Information security” items or functions should be considered against the provisions in Category 5–Part 2, even if they are components, “software” or functions of other items.

**SUPPLEMENT NO. 3 TO PART 774 – STATEMENTS OF UNDERSTANDING*****(a) Statement of Understanding - medical equipment.***

Commodities that are ‘specially designed for medical end-use’ that ‘incorporate’ commodities or software on the Commerce Control List (Supplement No. 1 to part 774 of the EAR) that do not have a reason for control of Nuclear Nonproliferation (NP), Missile Technology (MT), or Chemical & Biological Weapons (CB) are designated by the number EAR99 (i.e., are not elsewhere specified on the Commerce Control List).

***Notes to paragraph a:***

*(1) ‘Specially designed for medical end-use’ means designed for medical treatment or the practice of medicine (does not include medical research).*

*(2) Commodities or software are considered ‘incorporated’ if the commodity or software is: Essential to the functioning of the medical equipment; customarily included in the sale of the medical equipment; and exported or reexported with the medical equipment.*

*(3) Except for such software that is made publicly available consistent with § 734.3(b)(3) of the EAR, commodities and software ‘specially designed for medical end-use’ remain subject to the EAR.*

*(4) See also § 770.2(b) interpretation 2, for other types of equipment that incorporate items on the Commerce Control List that are subject to the EAR.*

*(5) For computers used with medical equipment, see also ECCN 4A003 note 2 regarding the "principal element" rule.*

*(6) For commodities and software “specially designed” for medical end use that incorporate an encryption or other "information security" item subject to the EAR, see also section 3 (General "Information Security" Note (GISN)) to Supplement No. 2 to this part.*

***(b) Statement of Understanding - Source Code.***

For the purpose of national security controlled items, “source code” items are controlled either by “software” or by “software” and “technology” controls, except when such “source code” items are explicitly decontrolled.

***(c) Category 5 - Part 2 - Note 4 Statement of Understanding.***

All items previously described by Notes (b), (c) and (h) to 5A002 are now described by Note 4 to Category 5 - Part 2. Note (h) to 5A002 prior to June 25, 2010 stated that the following was not controlled by 5A002:

Equipment specially designed for the servicing of portable or mobile radiotelephones and similar client wireless devices that meet all the provisions of the Cryptography Note (Note 3 in Category 5, Part 2), where the servicing equipment meets all of the following:

(1) The cryptographic functionality of the servicing equipment cannot easily be changed by the user of the equipment;

(2) The servicing equipment is designed for installation without further substantial support by the supplier; and

(3) The servicing equipment cannot change the cryptographic functionality of the device being serviced.

*(d) Statement of Understanding—Used Goods.*

The specifications in the Commerce Control List apply equally to new or used goods. In the case of used goods, an evaluation by the Bureau of Industry and Security may be carried out in order to assess whether the goods are capable of meeting the relevant specifications.

**SUPPLEMENT NO. 4 TO PART 774 –  
COMMERCE CONTROL LIST  
ORDER OF REVIEW**

**(a)** As described in EAR § 734.3, the EAR govern only items “subject to the EAR,” e.g., items not subject to the exclusive jurisdiction of another agency. Thus, for example, if an item is described in the U.S. Munitions List (USML) (22 CFR Part 121) of the International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130), including one of its catch-all paragraphs, then the item is a “defense article” subject to the ITAR and there is no need to review the CCL with respect to whether it describes the item. See 22 CFR § 120.6 (“Defense article means any item or technical data designated in § 121.1 of the ITAR. The policy described in § 120.3 is applicable to designations of additional items”). If an item is not described on the USML and is otherwise “subject to the EAR,” then work through each of the following steps to determine where the item is covered by the CCL or, if it is not covered by the CCL, and is therefore designated as EAR99.

**(1) Step 1.** To classify an item “subject to the EAR” against the CCL, review the general characteristics of the item. This will usually guide you to the appropriate category (0 through 9) on the CCL.

**(2) Step 2.** Once the potentially applicable CCL categories are identified, determine which product group within the CCL category or categories -- i.e., A, B, C, D, or E -- is applicable to the item.

**(3) Step 3.** The “600 series” describes military items that were once subject to the ITAR. The 9x515 ECCNs describe “spacecraft,” related items, and some radiation-hardened

microelectronic circuits that were once subject to the ITAR under USML Category XV. Just as the ITAR effectively trumps the EAR, items described in a 9x515 ECCN or “600 series” ECCN trump other ECCNs on the CCL. Thus, the next step in conducting a classification analysis of an item “subject to the EAR” is to determine whether it is described in a 9x515 ECCN or “600 series” ECCN paragraph other than a “catch-all” paragraph such as a “.x” paragraph that controls unspecified “parts” and “components” “specially designed” for items in that ECCN or the corresponding USML paragraph. If so, the item is classified under that 9x515 ECCN or “600 series” ECCN paragraph even if it would also be described in another ECCN.

**(4) Step 4.** If the item is not described in a 9x515 ECCN or “600 series” ECCN, then determine whether the item is classified under a 9x515 ECCN or “600 series” catch-all paragraph, i.e., one that controls non-specific “parts,” “components,” “accessories,” and “attachments” “specially designed” for items in that ECCN or the corresponding USML paragraph. Such items are generally in the “.x” paragraph of ECCN 9A515 or a “600 series” ECCN.

**(i) Step 4.a.** Determine whether the item would meet the criteria of either paragraphs (a)(1) or (a)(2) of the “specially designed” definition in § 772.1 of the EAR. (These are informally known as the “catch” paragraphs.) If not applicable, then the item is not within the scope of the ECCN paragraph that contains a “specially designed” control parameter. Skip to Step 5.

**(ii) Step 4.b.** If the item meets the criteria of either paragraph (a)(1) or (a)(2) of the “specially designed” definition, then determine whether any of the provisions of paragraph (b) of the “specially designed” definition would apply. (These are informally known as the “release” provisions.) If so, then the item is not within the scope of the ECCN paragraph that contains a “specially designed” control parameter.

*Note to paragraph (a)(4): The emphasis on the word “control” in Steps 4.a and 4.b is deliberate. Some ECCNs use “specially designed” as a de-control parameter. If an item would not be classified under a particular ECCN because it falls within the scope of either subparagraph (a)(1) or (a)(2) of the “specially designed” definition, then there is no need to analyze whether any element of paragraph (b) of the definition would apply to the item. One needs only review the “release” provisions in paragraph (b) of the “specially designed” definition if paragraph (a) of the “specially designed” definition applies to the item in a “control” paragraph of an ECCN that uses the term “specially designed.”*

**(5) Step 5.** If an item is not classified by a “600 series” or in a 9x515 ECCN, then starting from the beginning of the product group analyze each ECCN to determine whether any other ECCN in that product group describes the item. If any ECCN uses the term “specially designed,” see Steps 4.a and 4.b above in paragraphs (a)(4)(i) and (a)(4)(ii) respectively. If the item is described in one of these ECCNs, then the item is classified under that ECCN.

**(6) Step 6.** If the item is not described under any ECCN of any category of the CCL, then the item is designated as EAR99. EAR99 items may require a license if destined for a prohibited

or restricted end user, end use or destination. See paragraphs (g) through (n) of § 732.3 “Steps Regarding the Ten General Prohibitions,” or General Prohibitions Four through Ten of part 736 of the EAR for license requirements other than those imposed by the CCL.

**(b)** [RESERVED].

**SUPPLEMENT NO. 5 TO PART 774 - ITEMS CLASSIFIED UNDER ECCNS 0A521, 0B521, 0C521, 0D521 AND 0E521**

The following table lists items subject to the EAR that are not listed elsewhere in the CCL, but which the Department of Commerce, with the concurrence of the Departments of Defense and State, has identified warrant control for export or reexport because the items provide at least a significant military or intelligence advantage to the United States or for foreign policy reasons.

<b>Item descriptor.</b>  <i>Note: The description must match by model number or a broader descriptor that does not necessarily need to be company specific.</i>	<b>Date of initial or subsequent BIS classification.</b>  (ID = initial date; SD = subsequent date)	<b>Date when the item will be designated EAR99, unless reclassified in another ECCN or the 0Y521 classification is reissued.</b>	<b>Item-specific license exception eligibility.</b>
<b>0A521. Systems, Equipment and Components.</b>			
<i>No. 1</i> Targets made of or containing lithium “specially designed” for the production of tritium by insertion in the core of a nuclear reactor.	August 8, 2016 (ID)	August 8, 2017	License Exception GOV under § 740.11(b)(2)(ii) only.
<b>0B521. Test, Inspection and Production Equipment.</b>			
<b>[RESERVED]</b>			
<b>0C521. Materials.</b>			
<i>No.1</i> XBS Epoxy system designed to obfuscate critical technology components against x-ray and terahertz microscopy imaging attempts.	November 16, 2015(ID)	November 16, 2016	License Exception GOV under § 740.11(b)(2)(ii) only.
<i>No.2</i> [RESERVED]	[RESERVED]	[RESERVED]	[RESERVED]
<b>0D521. Software.</b>			

<b>[RESERVED]</b>			
<b>0E521. Technology.</b>			
<i>No. 1</i> “Technology” required for the “development” or “production” of 0A521 No. 1 items.	August 8, 2016 (ID)	August 8, 2017	License Exception GOV under § 740.11(b)(2)(ii) only.

**SUPPLEMENT NO. 6 TO PART 774 – SENSITIVE LIST**

*Note to Supplement No. 6: While the items on this list are identified by ECCN rather than by Wassenaar Arrangement numbering, the item descriptions are drawn directly from the Wassenaar Arrangement's Sensitive List. If text accompanies an ECCN below, then the Sensitive List is limited to a subset of items classified under the specific ECCN or has differing parameters.*

**(1) Category 1**

(i) 1A002.

(ii) 1C001.

(iii) 1C007.c.

(iv) 1C010.c and .d.

(v) 1C012.

(vi) 1D002 – “Software” for the “development” of organic “matrix”, metal “matrix”, or carbon “matrix” laminates or composites controlled under 1A002, 1C007.c, 1C010.c or 1C010.d.

(vii) 1E001 – “Technology” according to the General Technology Note for the “development” or “production” of equipment and materials controlled under 1A002, 1C001, 1C007.c, 1C010.c, 1C010.d, or 1C012.

(viii) 1E002.e and .f.

**(2) Category 2**

(i) 2D001—“Software,” other than that controlled by 2D002, specially designed for the “development” or “production” of equipment as follows:

(A) Machine tools for turning (ECCN 2B001.a) having two or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

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

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

(B) Machine tools for milling (ECCN 2B001.b) having any of the following:

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

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

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

(2) Specified by 2B001.b.2.a, 2B001.b.2.b or 2B001.b.2.c and having a “unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis; or

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

(C) Electrical discharge machines (EDM) controlled under 2B001.d;

(D) Deep-hole-drilling machines controlled under 2B001.f;

(E) “Numerically controlled” or manual machine tools controlled under 2B003.

(ii) 2E001—“Technology” according to the General Technology Note for the “development” of “software” specified by 2D001 described in this Supplement or for the “development” of equipment as follows:

(A) Machine tools for turning (ECCN 2B001.a) having two or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

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

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

(B) Machine tools for milling (ECCN 2B001.b) having any of the following:

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

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

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

(2) Specified by 2B001.b.2.a, 2B001.b.2.b or 2B001.b.2.c and having a “unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis; or

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

(C) Electrical discharge machines (EDM) controlled under 2B001.d;

(D) Deep-hole-drilling machines controlled under 2B001.f;

(E) “Numerically controlled” or manual machine tools controlled under 2B003.

(iii) 2E002—“Technology” according to the General Technology Note for the “production” of equipment as follows:

(A) Machine tools for turning (ECCN 2B001.a) having two or more axes which can be coordinated simultaneously for “contouring control” having any of the following:

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

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

(B) Machine tools for milling (ECCN 2B001.b) having any of the following:

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

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

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

(2) Specified by 2B001.b.2.a, 2B001.b.2.b or 2B001.b.2.c and having a “unidirectional positioning repeatability” equal to or less (better) than 1.1  $\mu\text{m}$  along one or more linear axis; or

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

(C) Electrical discharge machines (EDM) controlled under 2B001.d;

(D) Deep-hole-drilling machines controlled under 2B001.f;

(E) “Numerically controlled” or manual machine tools controlled under 2B003.

**(3) Category 3**

(i) 3A002.g.1.

(ii) 3D001 – “Software” specially designed for the “development” or “production” of equipment controlled under 3A002.g.1.

(iii) 3E001 – “Technology” according to the General Technology Note for the “development” or “production” of equipment controlled under 3A002.g.1.

**(4) Category 4**

(i) 4A001.a.2.

(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 16 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 16 Weighted TeraFLOPS (WT), or “software” controlled under the specific provisions of 4D001 described in this Supplement.

**(5) Category 5 – Part 1**

(i) 5A001.b.3, .b.5, and .h.

(ii) 5B001.a – Equipment and specially designed components or accessories therefor, specially designed for the “development” or “production” of equipment, functions or features controlled under 5A001.b.3, b.5, or .h.

(iii) 5D001.a – “Software” specially designed for the “development” or “production” of equipment, functions or features controlled under 5A001.b.3, b.5, or .h.

(iv) [Reserved]

(v) 5E001.a – “Technology” according to the General Technology Note for the “development” or “production” of equipment, functions or features controlled under 5A001.b.3, b.5, or .h or “software” described in this Supplement’s description of 5D001.a.

**(6) Category 6**

(i) 6A001.a.1.b – Systems or transmitting and receiving arrays, designed for object detection or location, having any of the following:

(A) A transmitting frequency below 5 kHz or a sound pressure level exceeding 224 dB (reference 1  $\mu$ Pa at 1 m) for equipment with an operating frequency in the band from 5 kHz to 10 kHz inclusive;

(B) Sound pressure level exceeding 224 dB (reference 1  $\mu$ Pa at 1 m) for equipment with an operating frequency in the band from 10 kHz to 24 kHz inclusive;

(C) Sound pressure level exceeding 235 dB (reference 1  $\mu$ Pa at 1 m) for equipment with an operating frequency in the band between 24 kHz and 30 kHz;

(D) Forming beams of less than 1° on any axis and having an operating frequency of less than 100 kHz;

(E) Designed to operate with an unambiguous display range exceeding 5,120 m; *or*

(F) Designed to withstand pressure during normal operation at depths exceeding 1,000 m and having transducers with any of the following:

(1) Dynamic compensation for pressure; *or*

(2) Incorporating other than lead zirconate titanate as the transduction element;

(ii) 6A001.a.1.e.

(iii) 6A001.a.2.a.1, a.2.a.2, a.2.a.3, a.2.a.5, and a.2.a.6.

(iv) 6A001.a.2.b.

(v) 6A001.a.2.c – Processing equipment, specially designed for real time application with towed acoustic hydrophone arrays, having “user-accessible programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes.

(vi) 6A001.a.2.d.

(vii) 6A001.a.2.e.

(viii) 6A001.a.2.f— Processing equipment, specially designed for real time application with bottom or bay cable systems, having “user-accessible programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes.

(ix) 6A002.a.1.a, a.1.b, and a.1.c.

(x) 6A002.a.1.d.

(xi) 6A002.a.2.a – Image intensifier tubes having all of the following:

(A) A peak response in the wavelength range exceeding 400 nm but not exceeding 1,050 nm;

(B) Electron image amplification using any of the following:

(1) A microchannel plate for electron image amplification with a hole pitch (center-to-center spacing) of 12  $\mu\text{m}$  or less; or

(2) An electron sensing device with a non-binned pixel pitch of 500  $\mu\text{m}$  or less, specially designed or modified to achieve ‘charge multiplication’ other than by a microchannel plate; and

(C) Any of the following photocathodes:

(1) Multialkali photocathodes (e.g., S-20 and S-25) having a luminous sensitivity exceeding 700  $\mu\text{A}/\text{lm}$ ;

(2) GaAs or GaInAs photocathodes; *or*

(3) Other “III-V compound” semiconductor photocathodes having a maximum “radiant sensitivity” exceeding 10 mA/W.

(xii) 6A002.a.2.b.

(xiii) 6A002.a.3 – Subject to the following additional notes:

**Note 1:** 6A002.a.3 does not apply to the following “focal plane arrays” in this Supplement:

a. Platinum Silicide (PtSi) “focal plane arrays” having less than 10,000 elements;

b. Iridium Silicide (IrSi) “focal plane arrays”.

**Note 2:** 6A002.a.3 does not apply to the following “focal plane arrays” in this Supplement:

a. Indium Antimonide (InSb) or Lead Selenide (PbSe) “focal plane arrays” having less than 256 elements;

b. Indium Arsenide (InAs) “focal plane arrays”;

*c. L Lead Sulphide (PbS) “focal plane arrays”;*

*d. Indium Gallium Arsenide (InGaAs) “focal plane arrays”.*

**Note 3:** 6A002.a.3 does not apply to Mercury Cadmium Telluride (HgCdTe) “focal plane arrays” as follows in this Supplement:

*a. ‘Scanning Arrays’ having any of the following:*

*1. 30 elements or less; or*

*2. Incorporating time delay-and-integration within the element and having 2 elements or less;*

*b. ‘Staring Arrays’ having less than 256 elements.*

**Technical Notes:**

*a. ‘Scanning Arrays’ are defined as “focal plane arrays” designed for use with a scanning optical system that images a scene in a sequential manner to produce an image;*

*b. ‘Staring Arrays’ are defined as “focal plane arrays” designed for use with a non-scanning optical system that images a scene.*

**Note 6:** 6A002.a.3 does not apply to the following “focal plane arrays” in this List:

*a. Gallium Arsenide (GaAs) or Gallium Aluminum Arsenide (GaAlAs) quantum well “focal plane arrays” having less than 256 elements;*

*b. Microbolometer “focal plane arrays” having less than 8,000 elements.*

**Note 7:** 6A002.a.3.g does not apply to the linear (1-dimensional) “focal plane arrays” specially designed or modified to achieve ‘charge multiplication’ having 4,096 elements or less.

**Note 8:** 6A002.a.3.g. does not apply to the non-linear (2-dimensional) “focal plane arrays” specially designed or modified to achieve ‘charge multiplication’ having a maximum linear dimension of 4,096 elements and a total of 250,000 elements or less.

(xiv) 6A002.b.

(xv) 6A002.c – ‘Direct view’ imaging equipment incorporating any of the following:

(A) Image intensifier tubes having the characteristics listed in this Supplement’s description of 6A002.a.2.a or 6A002.a.2.b;

(B) “Focal plane arrays” having the characteristics listed in this Supplement’s description of 6A002.a.3; or

(C) Solid-state detectors having the characteristics listed in 6A002.a.1.

(xvi) 6A003.b.3 – Imaging cameras incorporating image intensifier tubes having the characteristics listed in this Supplement’s description of 6A002.a.2.a or 6A002.a.2.b

*Note: 6A003.b.3 does not apply to imaging cameras specially designed or modified for underwater use.*

(xvii) 6A003.b.4 – Imaging cameras incorporating “focal plane arrays” having any of the following:

(A) Incorporating “focal plane arrays” specified by this Supplement’s description of 6A002.a.3.a to 6A002.a.3.e;

(B) Incorporating “focal plane arrays” specified by this Supplement’s description of 6A002.a.3.f; or

(C) Incorporating “focal plane arrays” specified by this Supplement’s description of 6A002.a.3.g.

*Note 1: ‘Imaging cameras’ described in 6A003.b.4 include “focal plane arrays” combined with sufficient “signal processing” electronics, beyond the read out integrated circuit, to enable as a minimum the output of an analog or digital signal once power is supplied.*

*Note 2: 6A003.b.4.a does not control imaging cameras incorporating linear “focal plane arrays” with twelve 12 elements or fewer, not employing time-delay-and-integration within the element, and designed for any of the following:*

*a. Industrial or civilian intrusion alarm, traffic or industrial movement control or counting systems;*

*b. Industrial equipment used for inspection or monitoring of heat flows in buildings, equipment or industrial processes;*

*c. Industrial equipment used for inspection, sorting or analysis of the properties of materials;*

*d. Equipment specially designed for laboratory use; or*

*e. Medical equipment.*

*Note 3: 6A003.b.4.b does not control imaging cameras having any of the following characteristics:*

*a. A maximum frame rate equal to or less than 9 Hz;*

*b. Having all of the following:*

- 1. Having a minimum horizontal or vertical ‘Instantaneous-Field -of-View (IFOV)’ of at least 10 mrad/pixel (milliradians/pixel);*
- 2. Incorporating a fixed focal-length lens that is not designed to be removed;*
- 3. Not incorporating a ‘direct view’ display; and*

**Technical Note:** *‘Direct view’ refers to an imaging camera operating in the infrared spectrum that presents a visual image to a human observer using a near-to-eye micro display incorporating any light-security mechanism.*

*4. Having any of the following:*

- a. No facility to obtain a viewable image of the detected field-of-view; or*
- b. The camera is designed for a single kind of application and designed not to be user modified; or*

**Technical Note:**

*‘Instantaneous Field of View (IFOV)’ specified in Note 3.b is the lesser figure of the ‘Horizontal FOV’ or the ‘Vertical FOV’.*

*‘Horizontal IFOV’ = horizontal Field of View (FOV)/number of horizontal detector elements*

*‘Vertical IFOV’ = vertical Field of View (FOV)/number of vertical detector elements.*

*c. Where the camera is specially designed for installation into a civilian passenger land vehicle of less than 3 tonnes three tons (gross vehicle weight) and having all of the following:*

- 1. Is operable only when installed in any of the following:*
  - a. The civilian passenger land vehicle for which it was intended; or*
  - b. A specially designed, authorized maintenance test facility; and*
- 2. Incorporates an active mechanism that forces the camera not to function when it is removed from the vehicle for which it was intended.*

*Note:* When necessary, details of the items will be provided, upon request, to the Bureau of Industry and Security in order to ascertain compliance with the conditions described in Note 3.b.4 and Note 3.c in this Note to 6A003.b.4.b.

*Note 4:* 6A003.b.4.c does not apply to ‘imaging cameras’ having any of the following characteristics:

- a. *Having all of the following:*
  1. *Where the camera is specially designed for installation as an integrated component into indoor and wall-plug-operated systems or equipment, limited by design for a single kind of application, as follows:*
    - a. *Industrial process monitoring, quality control, or analysis of the properties of materials;*
    - b. *Laboratory equipment specially designed for scientific research;*
    - c. *Medical equipment;*
    - d. *Financial fraud detection equipment; and*
  2. *Is only operable when installed in any of the following:*
    - a. *The system(s) or equipment for which it was intended; or*
    - b. *A specially designed, authorized maintenance facility; and*
  3. *Incorporates an active mechanism that forces the camera not to function when it is removed from the system(s) or equipment for which it was intended;*
- b. *Where the camera is specially designed for installation into a civilian passenger land vehicle of less than 3 tonnes (gross vehicle weight), or passenger and vehicle ferries having a length overall (LOA) 65 m or greater, and having all of the following:*
  1. *Is only operable when installed in any of the following:*
    - a. *The civilian passenger land vehicle or passenger and vehicle ferry for which it was intended; or*
    - b. *A specially designed, authorized maintenance test facility; and*
  2. *Incorporates an active mechanism that forces the camera not to function when it is removed from the vehicle for which it was intended;*
  - c. *Limited by design to have a maximum “radiant sensitivity” of 10 mA/W or less for wavelengths exceeding 760 nm, having all of the following:*

1. *Incorporating a response limiting mechanism designed not to be removed or modified; and*
  2. *Incorporates an active mechanism that forces the camera not to function when the response limiting mechanism is removed; and*
  3. *Not specially designed or modified for underwater use; or*
- d. *Having all of the following:*
1. *Not incorporating a ‘direct view’ or electronic image display;*
  2. *Has no facility to output a viewable image of the detected field of view;*
  3. *The “focal plane array” is only operable when installed in the camera for which it was intended; and*
  4. *The “focal plane array” incorporates an active mechanism that forces it to be permanently inoperable when removed from the camera for which it was intended.*

*Note:* When necessary, details of the item will be provided, upon request, to the Bureau of Industry and Security in order to ascertain compliance with the conditions described in Note 4 above.

*Note 5:* 6A003.b.4.c does not apply to imaging cameras specially designed or modified for underwater use.

(xviii) 6A003.b.5.

(xix) 6A004.c.

(xx) 6A004.d.

(xxi) 6A006.a.1.

(xxii) 6A006.a.2 – “Magnetometers” using optically pumped or nuclear precession (proton/Overhauser) “technology” having a ‘sensitivity’ lower (better) than 2 pT (rms) per square root Hz.

(xxiii) 6A006.c.1 – “Magnetic gradiometers” using multiple “magnetometers” specified by 6A006.a.1 or this Supplement’s description of 6A006.a.2.

(xxiv) 6A006.d – “Compensation systems” for the following:

(A) Magnetic sensors specified by 6A006.a.2 and using optically pumped or nuclear precession (proton/Overhauser) “technology” that will permit these sensors to realize a ‘sensitivity’ lower (better) than 2 pT rms per square root Hz.

(B) Underwater electric field sensors specified by 6A006.b.

(C) “Magnetic gradiometers” specified by 6A006.c. that will permit these sensors to realize a ‘sensitivity’ lower (better) than 3 pT/m rms per square root Hz.

(xxv) 6A006.e – Underwater electromagnetic receivers incorporating “magnetometers” specified by 6A006.a.1 or this Supplement’s description of 6A006.a.2.

(xxvi) 6A008.d, .h, and .k.

(xxvii) 6B008.

(xxviii) 6D001 – “Software” specially designed for the “development” or “production” of equipment specified by 6A004.c, 6A004.d, 6A008.d, 6A008.h, 6A008.k, or 6B008.

(xxix) 6D003.a.

(xxx) 6E001.

(xxxi) 6E002 – “Technology” according to the General Technology Note for the “production” of equipment specified by the 6A or 6B provisions described in this Supplement.

*(7) Category 7*

(i) 7D002.

(ii) 7D003.a.

(iii) 7D003.b.

(iv) [RESERVED]

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

(vi) 7E001.

(vii) 7E002.

*(8) Category 8*

(i) 8A001.b to .d.

(ii) 8A002.b – Systems specially designed or modified for the automated control of the motion of submersible vehicles specified by 8A001.b through .d using navigation data having closed loop servo-controls and having any of the following:

(A) Enabling a vehicle to move within 10 m of a predetermined point in the water column;

(B) Maintaining the position of the vehicle within 10 m of a predetermined point in the water column; or

(C) Maintaining the position of the vehicle within 10 m while following a cable on or under the seabed.

(iii) 8A002.h and .j.

(iv) 8A002.o.3.

(v) 8A002.p.

(vi) 8D001 – “Software” specially designed for the “development” or “production” of equipment in 8A001.b to .d, 8A002.b (as described in this Supplement), 8A002.h, 8A002.j, 8A002.o.3, or 8A002.p.

(vii) 8D002.

(viii) 8E001 – “Technology” according to the General Technology Note for the “development” or “production” of equipment specified by 8A001.b to .d, 8A002.b (as described in this Supplement), 8A002.h, 8A002.j, 8A002.o.3, or 8A002.p.

(ix) 8E002.a.

**(9) Category 9**

(i) 9A011.

(ii) 9B001.

(iii) 9D001 – “Software” specially designed or modified for the “development” of equipment or “technology”, specified by 9A011, 9B001.b, 9E003.a.1, 9E003.a.2 to a.5 or 9E003.a.8 or 9E003.h.

(iv) 9D002 – “Software” specially designed or modified for the “production” of equipment specified by 9A011 or 9B001.b.

(v) 9D004.a and .c.

(vi) 9E001.

(vii) 9E002.

(viii) [Reserved]

(ix) 9E003.a.2 to a.5, a.8.

(x) 9E003.h.

**SUPPLEMENT NO. 7 TO PART 774 – VERY SENSITIVE LIST**

*Note to Supplement No. 7: While the items on this list are identified by ECCN rather than by Wassenaar Arrangement numbering, the item descriptions are drawn directly from the Wassenaar Arrangement's Very Sensitive List, which is a subset of the Wassenaar Arrangement's Sensitive List. If text accompanies an ECCN below, then the Very Sensitive List is limited to a subset of items classified under the specific ECCN or has differing parameters.*

**(1) Category 1**

(i) 1A002.a.

(ii) 1C001.

(iii) 1C012.

(iv) 1E001 – “Technology” according to the General Technology Note for the “development” or “production” of equipment and materials specified by 1A002.a, 1C001, or 1C012.

**(2) Category 5 – Part 1**

(i) 5A001.b.5.

(ii) 5A001.h.

(iii) 5D001.a – “Software” specially designed for the “development” or “production” of equipment, functions or features specified by 5A001.b.5 or 5A001.h.

(iv) 5E001.a – “Technology” according to the General Technology Note for the “development” or “production” of equipment, functions, features or “software” specified by 5A001.b.5, 5A001.h, or 5D001.a.

**(3) Category 6**

(i) 6A001.a.1.b.1 – Systems or transmitting and receiving arrays, designed for object detection or location, having a sound pressure level exceeding 210 dB (reference 1 µPa at 1 m) and an operating frequency in the band from 30 Hz to 2 kHz.

(ii) 6A001.a.2.a.1 to a.2.a.3, a.2.a.5, or a.2.a.6.

(iii) 6A001.a.2.b.

(iv) 6A001.a.2.c – Processing equipment, specially designed for real time application with towed acoustic hydrophone arrays, having “user accessible programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes.

(v) 6A001.a.2.e.

(vi) 6A001.a.2.f – Processing equipment, specially designed for real time application with bottom or bay cable systems, having “user accessible programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes.

(vii) 6A002.a.1.c.

(viii) 6B008.

(ix) 6D001 – “Software” specially designed for the “development” or “production” of equipment specified by 6B008.

(x) 6D003.a.

(xi) 6E001 – “Technology” according to the General Technology Note for the “development” of equipment or “software” specified by the 6A, 6B, or 6D provisions described in this Supplement.

(xii) 6E002 – “Technology” according to the General Technology Note for the “production” of equipment specified by the 6A or 6B provisions described in this Supplement.

**(4) Category 7**

(i) 7D003.a.

(ii) 7D003.b.

**(5) Category 8**

(i) 8A001.b.

(ii) 8A001.d.

(iii) 8A002.o.3.b.

(iv) 8D001 – “Software” specially designed for the “development” or “production” of equipment specified by 8A001.b, 8A001.d, or 8A002.o.3.b.

(v) 8E001 – “Technology” according to the General Technology Note for the “development” or “production” of equipment specified by 8A001.b, 8A001.d, or 8A002.o.3.b.

**(6) Category 9**

(i) 9A011.

(ii) 9D001 – “Software” specially designed or modified for the “development” of equipment or “technology” specified by 9A011, 9E003.a.1, or 9E003.a.3.a.

(iii) 9D002 – “Software” specially designed or modified for the “production” of equipment specified by 9A011.

(iv) 9E001 – “Technology” according to the General Technology note for the “development” of equipment or “software” specified by 9A011 or this Supplement’s description of 9D001 or 9D002.

(v) 9E002 – “Technology” according to the General Technology Note for the “production” of equipment specified by 9A011.

(vi) 9E003.a.1.

(vii) 9E003.a.3.a.