

word length.) The combination of a mantissa ALU and an exponent ALU of a floating point processor or unit is considered to be one “CE” with a Word Length (WL) equal to the number of bits in the data representation (typically 32 or 64) for purposes of the “CTP” calculation.

This adjustment is not applied to specialized logic processors that do not use XOR instructions. In this case TP = R.

Select the maximum resulting value of TP for:

Each XP-only “CE” (R_{xp});

Each FP-only “CE” (R_{fp});

Each combined FP and XP “CE” (R);

Each simple logic processor not implementing any of the specified arithmetic operations; and

Each special logic processor not using any of the specified arithmetic or logic operations.

Step 3: “CTP” for aggregations of “CEs”, including CPUs.

For a CPU with a single “CE”, “CTP” = TP (for “CEs” performing both fixed and floating point operations TP = max (TP_{fp}, TP_{xp}))

“CTP” for aggregations of multiple “CEs” operating simultaneously is calculated as follows:

- Note 1:** For aggregations that do not allow all of the “CEs” to run simultaneously, the possible combination of “CEs” that provides the largest “CTP” should be used. The TP of each contributing “CE” is to be calculated at its maximum value theoretically possible before the “CTP” of the combination is derived.
- N.B.:** To determine the possible combinations of simultaneously operating “CEs”, generate an instruction sequence that initiates operations in multiple “CEs”, beginning with the slowest “CE” (the one needing the largest number of cycles to complete its operation) and ending with the fastest “CE”. At each cycle of the sequence, the combination of “CEs” that are in operation during that cycle is a possible combination. The instruction sequence must take into account all hardware and/or architectural constraints on overlapping operations.
- Note 2:** A single integrated circuit chip or board assembly may contain multiple “CEs”.
- Note 3:** Simultaneous operations are assumed to exist when the computer manufacturer claims concurrent, parallel or simultaneous operation or execution in a manual or brochure for the computer.
- Note 4:** “CTP” values are not to be aggregated for “CE” combinations (inter) connected by “Local Area Networks”, Wide Area Networks, I/O shared connections/devices, I/O controllers and any communication interconnection implemented by “software”.
- Note 5:** “CTP” values must be aggregated for multiple “CEs” specially designed to enhance performance by aggregation, operating simultaneously and sharing memory,—or multiple memory/”CE”—combinations operating simultaneously utilizing specially designed hardware.
- This aggregation does not apply to “electronic assemblies” described by 4A003.d.

“CTP”=TP₁+C₂ * TP₂+* * *+C_n * TP_n, where the TP_s are ordered by value, with TP₁ being the highest, TP₂ being the second highest, * * *, and TP_n being the lowest. C_i is a coefficient determined by the strength of the interconnection between “CEs”, as follows:

For multiple “CEs” operating simultaneously and sharing memory:
C₂=C₃=C₄=* * *-C_n=0.75

Note 1: When the “CTP” calculated by the above method does not exceed 194 Mtops, the following formula may be used to calculate C_i:

$$C_i = \frac{0.75}{\sqrt{m}} \quad (i=2, \dots, n)$$

where m=the number of “CEs” or groups of “CEs” sharing access.

Provided:

1. The TP_i of each “CE” or group of “CEs” does not exceed 30 Mtops;
2. The “CEs” or groups of “CEs” share access to main memory (excluding cache memory) over a single channel; and
3. Only one “CE” or group of “CEs” can have use of the channel at any given time.

N.B.: This does not apply to items controlled under Category 3.

Note 2: “CEs” share memory if they access a common segment of solid state memory. This memory may include cache memory, main memory or other internal memory. Peripheral memory devices such as disk drives, tape drives or RAM disks are not included.

For Multiple “CEs” or groups of “CEs” not sharing memory, interconnected by one or more data channels:

C_i=0.75 * k_i (i=2, * * *, 32) (see Note below)

=0.60 * k_i (i=33, * * *, 64)

=0.45 * k_i (i=65, * * *, 256)

=0.30 * k_i (i >256)

The value of C_i is based on the number of “CE”s, not the number of nodes, where

k_i=min (S_i/K_r, 1), and

K_r=normalizing factor of 20 MByte/s.

S_i=sum of the maximum data rates (in units of MByte/s) for all data channels connected to the ith “CE” or group of “CEs” sharing memory.

When calculating a C_i for a group of “CEs”, the number of the first “CE” in a group determines the proper limit for C_i. For example, in an aggregation of groups consisting of 3 “CEs” each, the 22nd group will contain “CE”₆₄, “CE”₆₅ and “CE”₆₆. The proper limit for C_i for this group is 0.60.

Aggregation (of “CEs” or groups of “CEs”) should be from the fastest-to-slowest; i.e.: TP₁ ≥TP₂≥ * * *. >TP_n, and in the case of TP_i=TP_i+1, from the largest to smallest; i.e.:

C_i ≥ C_{i+1}

Note: The k_i factor is not to be applied to “CEs” 2 to 12 if the TP_i of the “CE” or group of “CEs” is more than 50 Mtops; i.e., C_i for “CEs” 2 to 12 is 0.75.

CATEGORY 5—TELECOMMUNICATIONS AND “INFORMATION SECURITY”

I. Telecommunications

Notes: 1. The control status of components, “lasers”, test and “production” equipment, materials and “software” thereof which are specially designed for telecommunications equipment or systems is determined in Category 5, Part 1.

2. “Digital computers”, related equipment or “software”, when essential for the operation and support of telecommunications equipment described in this Category, are regarded as specially designed components, provided they are the standard models customarily supplied by the manufacturer. This includes operation, administration, maintenance, engineering or billing computer systems.

A. Systems, Equipment and Components

5A001 Telecommunications systems, equipment, and components.

License Requirements
Reason for Control: NS, AT

Control(s)	Country Chart
NS applies to 5A001.a	NS Column 1
NS applies to 5A001.b, .c, .d, or .e	NS Column 2
AT applies to entire entry	AT Column 1

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions

LVS: N/A for 5A001.a and b.9; \$5,000 for 5A001.b.1 to b.8 and b.10, .c, and .e; \$3,000 for 5A001.d

GBS: Yes, except 5A001.a and b.9

CIV: Yes, except 5A001.a, b.8, and b.9

List of Items Controlled

Unit: Equipment in number; parts and accessories in \$ value

Related Controls: See also 5A101 and 5A991

Related Definitions: N/A

Items:

a. Any type of telecommunications equipment having any of the following characteristics, functions or features:

- a.1. Specially designed to withstand transitory electronic effects or electromagnetic pulse effects, both arising from a nuclear explosion;
- a.2. Specially hardened to withstand gamma, neutron or ion radiation; or
- a.3. Specially designed to operate outside the temperature range from 218 K (-55°C) to 397 K (124°C).

Note: 5A001.a.3 applies only to electronic equipment.

Note: 5A001.a.2 and 5A001.a.3 do not apply to equipment on board satellites.

b. Telecommunication transmission equipment and systems, and specially designed components and accessories therefor, having any of the following characteristics, functions or features:

Note: Telecommunication transmission equipment:

a. Categorized as follows, or combinations thereof:

1. Radio equipment (e.g., transmitters, receivers and transceivers);
2. Line terminating equipment;
3. Intermediate amplifier equipment;
4. Repeater equipment;
5. Regenerator equipment;
6. Translation encoders (transcoders);
7. Multiplex equipment (statistical multiplex included);
8. Modulators/demodulators (modems);
9. Transmultiplex equipment (see CCITT Rec. G701);
10. "Stored program controlled" digital crossconnection equipment;
11. "Gateways" and bridges;
12. "Media access units"; and

b. Designed for use in single or multi-channel communication via any of the following:

1. Wire (line);
2. Coaxial cable;
3. Optical fiber cable;
4. Electromagnetic radiation; or
5. Underwater acoustic wave propagation.

b.1. Employing digital techniques, including digital processing of analog signals, and designed to operate at a "digital transfer rate" at the highest multiplex level exceeding 45 Mbit/s or a "total digital transfer rate" exceeding 90 Mbit/s;

Note: 5A001.b.1 does not control equipment specially designed to be integrated and operated in any satellite system for civil use.

b.2. Being underwater communications systems having any of the following characteristics:

- b.2.a. An acoustic carrier frequency outside the range from 20 kHz to 60 kHz;
- b.2.b. Using an electromagnetic carrier frequency below 30 kHz; or
- b.2.c. Using electronic beam steering techniques;
- b.3. Being equipment containing any of the following:
 - b.3.a. "Network access controllers" and their related common medium having a "digital transfer rate" exceeding 156 Mbit/s; or
 - b.3.b. "Communication channel controllers" with a digital output having a "data signalling rate" exceeding 2.1 Mbit/s per channel;

Note: If any uncontrolled equipment contains a "network access controller", it cannot have any type of telecommunications interface, except those described in, but not controlled by 5A001.b.3.

- b.4. Employing a "laser" and having any of the following characteristics:
 - b.4.a. A transmission wavelength exceeding 1,000 nm; or
 - b.4.b. Employing analog techniques and having a bandwidth exceeding 45 MHz;

Note: 5A001.b.4.b does not control commercial TV systems.

- b.4.c. Employing coherent optical transmission or coherent optical detection techniques (also called optical heterodyne or homodyne techniques);
- b.4.d. Employing wavelength division multiplexing techniques; or
- b.4.e. Performing "optical amplification";
- b.5. Being radio equipment operating at input or output frequencies exceeding 31 GHz;

Note: 5A001.b.5 does not control equipment designed or modified for operation in any ITU allocated band.

b.6. Being radio equipment employing any of the following:

- b.6.a. Quadrature-amplitude-modulation (QAM) techniques above level 4 if the "total digital transfer rate" exceeds 8.5 Mbit/s;
- b. QAM techniques above level 16 if the "total digital transfer rate" is equal to or less than 8.5 Mbit/s; or
- c. Other digital modulation techniques and having a "spectral efficiency" exceeding 3 bit/sec/Hz;

Notes: 1. 5A001.b.6 does not control equipment specially designed to be integrated and operated in any satellite system for civil use.

2. 5A001.b.6 does not control radio relay equipment for operation in an ITU allocated band:

a. Having any of the following:

- a.1. Not exceeding 960 MHz; or
- a.2. With a "total digital transfer rate" not exceeding 8.5 Mbit/s; and
- b. Having a "spectral efficiency" not exceeding 4 bit/sec/Hz.

b.7. Being radio equipment operating in the 1.5 MHz to 87.5 MHz band and having any of the following characteristics:

b.7.a. Incorporating adaptive techniques providing more than 15 dB suppression of an interfering signal; or

b.7.b. Having all of the following:

b.7.b.1. Automatically predicting and selecting frequencies and "total digital transfer rates" per channel to optimize the transmission; and

b.7.b.2. Incorporating a linear power amplifier configuration having a capability to support multiple signals simultaneously at an output power of 1 kW or more in the 1.5 MHz to 30 MHz frequency range or 250 W or more in the 30 MHz to 87.5 MHz frequency range, over an "instantaneous bandwidth" of one octave or more and with an output harmonic and distortion content of better than -80 dB;

b.8. Being radio equipment employing "spread spectrum" or "frequency agility" (frequency hopping) techniques having any of the following characteristics:

b.8.a. User programmable spreading codes; or

b.8.b. A total transmitted bandwidth which is 100 or more times the bandwidth of any one information channel and in excess of 50 kHz;

Note: 5A001.b.8.b does not control cellular radio equipment operating in civil bands.

Note: 5A001.b.8 does not control equipment operating at an output power of 1.0 Watt or less.

b.9. Being digitally controlled radio receivers having all of the following:

- b.9.a. More than 1,000 channels;
- b.9.b. A "frequency switching time" of less than 1 ms;
- b.9.c. Automatic searching or scanning of a part of the electromagnetic spectrum; and
- b.9.d. Identification of the received signals or the type of transmitter; or

Note: 5A001.b.9 does not control cellular radio equipment operating in civil bands.

b.10. Employing functions of digital "signal processing" to provide voice coding at rates of less than 2,400 bit/s.

c. "Stored program controlled" switching equipment and related signalling systems, having any of the following characteristics, functions or features, and specially designed components and accessories therefor:

Note: Statistical multiplexers with digital input and digital output which provide switching are treated as "stored program controlled" switches.

- c.1. "Common channel signalling" operating in either non-associated or quasi-associated mode of operation;
- c.2. "Dynamic adaptive routing";

Note: 5A001.c.2 does not control packet switches or routers with ports or lines not exceeding the limits in 5A001.c.3.

c.3. Being packet switches, circuit switches and routers with ports or lines exceeding any of the following:

c.3.a. A "data signalling rate" of 2.1 Mbit/s per channel for a "communications channel controller"; or

Note: 5A001.c.3.a does not control multiplexed composite links composed only of communication channels not individually controlled by 5A001.c.3.a.

c.3.b. A "digital transfer rate" of 156 Mbit/s for a "network access controller" and related common medium;

c.4. "Optical switching";

c.5. Employing "Asynchronous Transfer Mode" ("ATM") techniques.

d. Optical fiber communication cables, optical fibers and accessories, as follows:

d.1. Optical fibers and optical fiber cables of more than 50 m in length having any of the following characteristics:

d.1.a. Designed for single mode operation; or

d.1.b. For optical fibers, specified by the manufacturer as being capable of withstanding a proof test tensile stress of 2×10^9 N/m² or more;

Technical Note: Proof Test: on-line or off-line production screen testing that dynamically applies a prescribed tensile stress over a 0.5 to 3 m length of fiber at a running rate of 2 to 5 m/s while passing between capstans approximately 150 mm in diameter. The ambient temperature is a nominal 293 K (20°C) and relative humidity 40%.

N.B.: Equivalent national standards may be used for executing the proof test.

d.2. Optical fiber cables and accessories designed for underwater use.

Note: 5A001.d.2 does not control standard civil telecommunication cables and accessories.

N.B.: For fiber-optic hull penetrators or connectors, see 8A002.c.

e. “Electronically steerable phased array antennae” operating above 31 GHz.

Note: 5A001.e does not control “electronically steerable phased array antennae” for landing systems with instruments meeting ICAO standards covering microwave landing systems (MLS).

5A101 Telemetry and telecontrol equipment usable for “missiles”.
License Requirements
Reason for Control: MT, AT

Control(s)	Country Chart
MT applies to entire entry AT applies to entire entry	MT Column 1 AT Column 1

License Exceptions
LVS: N/A
GBS: N/A
CIV: N/A
List of Items Controlled
Unit: Number
Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

5A980 Communications intercepting devices; and parts and accessories therefor.
License Requirements
Reason for Control: Controls on equipment described in this entry are maintained in accordance with the Omnibus Crime Control and Safe Streets Act of 1968 (Public Law 90-351). A license is required for ALL destinations, regardless of end-use. Accordingly, a column specific to this control does not appear on the Commerce Country Chart. (See §742.13 of the EAR for additional information on the scope of this control.)

Note: These items are subject to the United Nations Security Council arms embargo against Rwanda described in §746.8 of the EAR.

License Exceptions
LVS: N/A
GBS: N/A
CIV: N/A
List of Items Controlled
Unit: \$ value
Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

5A991 Telecommunication equipment, not controlled by 5A001.
License Requirements
Reason for Control: AT

Control(s)	Country Chart
AT applies to entire entry	AT Column 1

License Exceptions
LVS: N/A
GBS: N/A
CIV: N/A
List of Items Controlled
Unit: \$ value
Related Controls: N/A
Related Definitions: N/A
Items:

a. Any type of telecommunications equipment, not controlled by 5A001.a, specially designed to operate outside the temperature range from 219 K (-54°C) to 397 K (124°C).

b. Transmission equipment, as follows:

b.1. Modems using the “bandwidth of one voice channel” with a “data signalling rate” exceeding 9,600 bits per second;

b.2. “Communication channel controllers” with a digital output having a “data signalling rate” exceeding 64,000 bit/s per channel; or

b.3. “Network access controller” and their related common medium having a “digital transfer rate” exceeding 33 Mbit/s.

b.4. Being “stored program controlled” digital cross connect equipment with “digital transfer rate” exceeding 8.5 Mbit/s per port.

b.5. Radio equipment operating at input or output frequencies exceeding:

b.5.1. 31 GHz for satellite-earth station applications; or

b.5.2. 26.5 GHz for other applications;

Note: 5A991.b.5. does not control equipment for civil use when conforming with an International Telecommunications Union (ITU) allocated band between 26.5 GHz and 31 GHz.

b.6. Providing functions of digital “signal processing” as follows:

b.6.a. Voice coding at rates less than 2,400 bit/s;

b.6.b. Employing circuitry that incorporates “user-accessible programmability” of digital “signal processing” circuits exceeding the limits of 4A003.b.

c. “Stored program controlled” switching equipment and related signalling systems as follows:

c.1. “Data (message) switching” equipment or systems designed for “packet-mode operation” and assemblies and components therefor, n.e.s.

c.2. Containing “Integrated Services Digital Network” (ISDN) functions and having any of the following:

c.2.a. Switch-terminal (e.g., subscriber line) interfaces with a “digital transfer rate” at the highest multiplex level exceeding 192,000 bit/s, including the associated signalling channel (e.g., 2B+D); or

c.2.b. The capability that a signalling message received by a switch on a given channel that is related to a communication on another channel may be passed through to another switch.

Note: 5A991.b. does not preclude the evaluation and appropriate actions taken by the receiving switch or unrelated user message traffic on a D channel of ISDN.

c.3. Routing or switching of “datagram” packets;

c.4. Routing or switching of “fast select” packets;

Note: The restrictions in 5A991.c.3 and c.4 do not apply to networks restricted to using only “network access controllers” or to “network access controllers” themselves.

c.5. Multi-level priority and pre-emption for circuit switching;

Note: 5A991.c.5. does not control single-level call preemption.

c.6. Designed for automatic hand-off of cellular radio calls to other cellular switches or automatic connection to a centralized subscriber data base common to more than one switch;

c.7. Containing “stored program controlled” digital crossconnect equipment with “digital transfer rate” exceeding 8.5 Mbit/s per port.

c.8. Being packet switches, circuit switches and routers with ports or lines exceeding any of the following:

c.8.a. A “data signalling rate” of 64,000 bit/s per channel for a “communications channel controller”; or

Note: 5A991.c.8.a. does not control multiplex composite links composed only of communication channels not individually controlled by 5A001.b.1.

c.8.b. A “digital transfer rate” of 33 Mbit/s for a “network cess controller” and related common media;

d. Centralized network control having all of the following characteristics:

d.1. Receives data from the nodes; and

d.2. Process these data in order to provide control of traffic not requiring operator decisions, and thereby performing “dynamic adaptive routing”;

Note: 5A991.d. does not preclude control of traffic as a function of predictable statistical traffic conditions.

e. Phased array antennae, operating above 10.5 GHz, containing active elements and distributed components, and designed to permit electronic control of beam shaping and pointing, except for landing systems with instruments meeting International Civil Aviation Organization (ICAO) standards (microwave landing systems (MLS)).

f. Mobile communications equipment, n.e.s., and assemblies and components therefor; or

g. Radio relay communications equipment designed for use at frequencies equal to or exceeding 19.7 GHz and assemblies and components therefor, n.e.s.

B. Test, Inspection and Production Equipment

5B001 Equipment and specially designed components or accessories therefor, specially designed for the “development”, “production” or “use” of equipment, materials, functions or features controlled by 5A001, 5B001, 5C001, 5D001 or 5E001.

License Requirements
Reason for Control: NS, AT

Table with 2 columns: Control(s), Country Chart. Row 1: NS applies to entire entry, AT applies to entire entry. Row 2: NS Column 2, AT Column 1.

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions
LVS: \$5,000
GBS: Yes
CIV: Yes

List of Items Controlled
Unit: Equipment in number; parts and accessories in \$ value
Related Controls: See also 5B991. This entry does not control optical fibers and “optical fiber preform” characterization equipment not using semiconductor “lasers”.
Related Definition: N/A
Items: The list of items controlled is contained in the ECCN heading.

5B991 Telecommunications test equipment, n.e.s.

License Requirements
Reason for Control: AT

Table with 2 columns: Control(s), Country Chart. Row 1: AT applies to entire entry. Row 2: AT Column 1.

License Exceptions
LVS: \$1,000 for Syria; N/A to Iran
GBS: N/A
CIV: N/A

List of Items Controlled
Unit: \$ value
Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

C. Materials

5C001 Preforms of glass or of any other material optimized for the manufacture of optical fibers controlled by 5A001.d.

License Requirements
Reason for Control: NS, AT

Table with 2 columns: Control(s), Country Chart. Row 1: NS applies to entire entry, AT applies to entire entry. Row 2: NS Column 2, AT Column 1.

License Exceptions
LVS: \$3,000
GBS: Yes
CIV: Yes

List of Items Controlled
Unit: \$ value
Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

D. Software

5D001 “Software”, as described in the List of Items Controlled.

License Requirements
Reason for Control: NS, AT

Table with 2 columns: Control(s), Country Chart. Row 1: NS applies to entire entry, AT applies to entire entry. Row 2: NS Column 1, AT Column 1.

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions
CIV: Yes, except for “software” controlled by 5D001.b or .c, when specially designed or modified for equipment, functions or features controlled by 5A001.b.9
TSR: Yes, except for exports and reexports to destinations outside of Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, or the United Kingdom of “software” controlled by 5D001.a and specially designed for items controlled by 5A001.b.9
List of Items Controlled
Unit: \$ value
Related Controls: See also 5D991
Related Definitions: N/A
Items:

- a. “Software” specially designed or modified for the “development”, “production” or “use” of equipment, functions or features controlled by 5A001, 5B001 or 5C001.
- b. “Software” specially designed or modified to support “technology” controlled by 5E001.
- c. Specific “software” as follows:
c.1. “Software”, other than in machine-executable form, specially designed or modified for the “use” of digital cellular radio equipment or systems;
c.2. “Software” specially designed or modified to provide characteristics, functions or features of equipment controlled by 5A001 or 5B001;
c.3. “Software” which provides the capability of recovering “source code” of telecommunications “software” controlled by 5A001, 5B001, or 5C001;
c.4. “Software”, other than in machine-executable form, specially designed for “dynamic adaptive routing”.

N.B.: For “software” for “signal processing” see also 4D and 6D.

5D101 “Software” designed or modified for the “development”, “production” or “use of items controlled by 5A101.

License Requirements
Reason for Control: MT, AT

Table with 2 columns: Control(s), Country Chart. Row 1: MT applies to entire entry, AT applies to entire entry. Row 2: MT Column 1, AT Column 1.

License Exceptions
CIV: N/A
TSR: N/A
List of Items Controlled
Unit: \$ value

Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

5D991 “Software” specially designed or modified for the “development”, “production”, or “use” of equipment controlled by 5A991 and 5B991.

License Requirements
Reason for Control: AT

Table with 2 columns: Control(s), Country Chart. Row 1: AT applies to entire entry. Row 2: AT Column 1.

License Exceptions
CIV: N/A
TSR: N/A
List of Items Controlled
Unit: \$ value

Related Controls: N/A
Related Definitions: N/A

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

E. Technology

5E001 “Technology”, (see List of Items Controlled).
License Requirements
Reason for Control: NS, AT

Control(s)	Country Chart
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions

CIV: N/A

TSR: Yes, except for exports or reexports to destinations outside of Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, or the United Kingdom of “technology” controlled by 5E001.a for the “development” or “production” of items controlled by 5A001.b.9 or 5D001.a.

List of Items Controlled

Unit: \$ value

Related Controls: See also 5E101 and 5E991

Related Definitions: N/A

Items:

a. “Technology” according to the General Technology Note for the “development”, “production” or “use” (excluding operation) of equipment, functions or features, materials or “software” controlled by 5A001, 5B001, 5C001 or 5D001.

b. Specific “technologies”, as follows:

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

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

b.3. “Technology” for the processing and application of coatings to optical fiber specially designed to make it suitable for underwater use;

b.4. “Technology” for the “development” of equipment employing “Synchronous Digital Hierarchy” (“SDH”) or “Synchronous Optical Network” (“SONET”) techniques;

b.5. “Technology” for the “development” of “switch fabric” exceeding 64,000 bit/s per information channel other than for digital cross connect integrated in the switch;

b.6. “Technology” for the “development” of centralized network control or “dynamic adaptive routing”;

b.7. “Technology” for the “development” of digital cellular radio systems;

b.8. “Technology” for the “development” of broadband “Integrated Services Digital Network” (“ISDN”);

b.9. “Technology” for the “development” of QAM techniques, for radio equipment, above level 4;

b.10. “Technology” for the “development” of “spread spectrum” or “frequency agility” (frequency hopping) techniques.

5E101 “Technology” according to the General Technology Note for the “development”, “production” or “use” of equipment controlled by 5A101.

License Requirements

Reason for Control: MT, AT

Control(s)	Country Chart
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

License Exceptions

CIV: N/A

TSR: N/A

List of Items Controlled

Unit: \$ value

Related Controls: N/A

Related Definitions: N/A

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

5E111 “Technology” according to the General Technology Note for the “development”, “production”, or “use” of “software” controlled by 5D101.

License Requirements

Reason for Control: MT, AT

Control(s)	Country Chart
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

License Exceptions

CIV: N/A

TSR: N/A

List of Items Controlled

Unit: N/A

Related Controls: N/A

Related Definitions: N/A

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

5E991 “Technology” for the “development”, “production” or “use” of equipment controlled by 5A991 or 5B991, or “software” controlled by 5D991.

License Requirements

Reason for Control: AT

Control(s)	Country Chart
AT applies to entire entry	AT Column 1

License Exceptions

CIV: N/A

TSR: N/A

List of Items Controlled

Unit: \$ value

Related Controls: N/A

Related Definitions: N/A

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

EAR99 Items subject to the EAR that are not elsewhere specified in this CCL Category or in any other category in the CCL are designated by the number EAR99.

II. “Information Security”

Note: The control status of “information security” equipment, “software”, systems, application specific “electronic assemblies”, modules, integrated circuits, components, or functions is determined in Category 5, Part 2 even if they are components or “electronic assemblies” of other equipment.

A. Systems, Equipment and Components

5A002 Systems, equipment, application specific “assemblies”, modules or integrated circuits for “information security”, and specially designed components therefor.

License Requirements

Reason for Control: NS, AT, EI

Control(s)	Country Chart
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

EI applies to encryption items transferred from the U.S. Munitions List to the Commerce Control List consistent with E.O. 13026 of November 15, 1996 (61 FR 58767) and pursuant to the Presidential Memorandum of that date. Refer to §742.15 of the EAR.

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A
List of Items Controlled
Unit: \$ value

Related Controls: See also 5A992. This entry does not control: (a) “Personalized smart cards” or specially designed components therefor, with any of the following characteristics: (1) Not capable of message traffic encryption or encryption of user-supplied data or related key management functions therefor; or (2) When restricted for use in equipment or systems excluded from control under the note to 5A002.c, or under paragraphs b through h of this note. (b) Equipment containing “fixed” data compression or coding techniques; (c) Receiving equipment for radio broadcast, pay television or similar restricted audience television of the consumer type, without digital encryption and where digital decryption is limited to the video, audio or management functions; (d) Portable or mobile radiotelephones for civil use (e.g., for use with commercial civil cellular radiocommunications systems) that are not capable of end-to-end encryption; (e) Decryption functions specially designed to allow the execution of copy-protected “software”, provided the decryption functions are not user-accessible; (f) Access control equipment, such as automatic teller machines, self-service statement printers or point of sale terminals, that protects password or personal identification numbers (PIN) or similar data to prevent unauthorized access to facilities but does not allow for encryption of files or text, except as directly related to the password or PIN protection; (g) Data authentication equipment that calculates a Message Authentication Code (MAC) or similar result to ensure no alteration of text has taken place, or to authenticate users, but does not allow for encryption of data, text or other media other than that needed for the authentication; (h) Cryptographic equipment specially designed and limited for use in machines for banking or money transactions, such as automatic teller machines, self-service statement printers or point of sale terminals.

Related Definitions: For the control of global navigation satellite systems receiving equipment containing or employing decryption (i.e., GPS or GLO-NASS see 7A005)

Items:

a. Systems, equipment, application specific “assemblies”, modules or integrated circuits for “information security”, and specially designed components therefor:

- a.1. Designed or modified to use “cryptography” employing digital techniques to ensure “information security”;
- a.2. Designed or modified to perform cryptoanalytic functions;
- a.3. Designed or modified to use “cryptography” employing analog techniques to ensure “information security”;

Note: 5A002.a.3 does not control the following:

- 1. Equipment using “fixed” band scrambling not exceeding 8 bands and in which the transpositions change not more frequently than once every second;
- 2. Equipment using “fixed” band scrambling exceeding 8 bands and in which the transpositions change not more frequently than once every ten seconds;
- 3. Equipment using “fixed” frequency inversion and in which the transpositions change not more frequently than once every second;
- 4. Facsimile equipment;
- 5. Restricted audience broadcast equipment; *and*
- 6. Civil television equipment;

a.4. Designed or modified to suppress the compromising emanations of information-bearing signals;

Note: 5A002.a.4 does not control equipment specially designed to suppress emanations for reasons of health and safety.

a.5. Designed or modified to use cryptographic techniques to generate the spreading code for “spread spectrum” or the hopping code for “frequency agility” systems;

a.6. Designed or modified to provide certified or certifiable “multilevel security” or user isolation at a level exceeding Class B2 of the Trusted Computer System Evaluation Criteria (TCSEC) or equivalent;

a.7. Communications cable systems designed or modified using mechanical, electrical or electronic means to detect surreptitious intrusion.

5A992 “Information security” equipment, n.e.s.; (e.g., cryptographic, cryptoanalytic, and cryptologic equipment, n.e.s.), and components therefor.

License Requirements
Reason for Control: AT

Control(s)	Country Chart
AT applies to entire entry	AT Column 1

License Exceptions

LVS: N/A
GBS: N/A
CIV: N/A

List of Items Controlled
Unit: \$ value

Related Controls: N/A

Related Definitions: N/A

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

B. Test, Inspection and Production Equipment

5B002 Information Security—test, inspection and “production” equipment.

License Requirements
Reason for Control: NS, AT

Control(s)	Country Chart
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions

LVS: N/A
GBS: N/A
CIV: N/A

List of Items Controlled
Unit: \$ value

Related Controls: N/A

Related Definitions: N/A

Items:

a. Equipment specially designed for:

- a.1. The “development” of equipment or functions controlled by 5A002, 5B002, 5D002 or 5E002, including measuring or test equipment;
- a.2. The “production” of equipment or functions controlled by 5A002, 5B002, 5D002, or 5E002, including measuring, test, repair or production equipment;
- b. Measuring equipment specially designed to evaluate and validate the “information security” functions controlled by 5A002 or 5D002.

C. Materials [Reserved]

D. Software

5D002 Information Security—“Software”.

License Requirements
Reason for Control: NS, AT, EI

Control(s)	Country Chart
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

EI applies to encryption items transferred from the U.S. Munitions List to the Commerce Control List consistent with E.O. 13026 of November 15, 1996 (61 FR 58767) and pursuant to the Presidential Memorandum of that date. Refer to §742.15 of the EAR.

Note: Encryption software is controlled because of its functional capacity, and not because of any informational value of such software; such software is not accorded the same treatment under the EAR as other “software”; and for the export licensing purposes encryption software is treated under the EAR in the same manner as a commodity included in ECCN 5A002. License Exceptions for commodities are not applicable.

Note: Encryption software controlled for EI reasons under this entry remains subject to the EAR even when made publicly available in accordance with part 734 of the EAR, and it is not eligible for the General Software Note (“mass market” treatment under License Exception TSU for mass market software). After a one-time BXA review, certain encryption software may be released from EI controls and made eligible for the General Software Note treatment as well as other provisions of the EAR applicable to software.

Refer to §742.15(b)(1) of the EAR and Supplement No. 6 to part 742 of the EAR.

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions
CIV: N/A
TSR: N/A

List of Items Controlled
Unit: \$ value

Related Controls: See also 5D992. This entry does not control “software” “required” for the “use” of equipment excluded from control under 5A002 or “software” providing any of the functions of equipment excluded from control under 5A002

Related Definitions: N/A

Items:

- a. “Software” specially designed or modified for the “development”, “production” or “use” of equipment or “software” controlled by 5A002, 5B002 or 5D002.
- b. “Software” specially designed or modified to support “technology” controlled by 5E002.
- c. Specific “software” as follows:
 - c.1. “Software” having the characteristics, or performing or simulating the functions of the equipment controlled by 5A002 or 5B002;
 - c.2. “Software” to certify “software” controlled by 5D002.c.1.

5D992 “Software” not controlled by 5D002.

License Requirements
Reason for Control: AT

Control(s)	Country Chart
AT applies to 5D992.a and .b.	AT Column 1
AT applies to 5D992.c.	AT Column 2

License Exceptions
CIV: N/A
TSR: N/A

List of Items Controlled
Unit: \$ value

Related Controls: N/A
Related Definitions: N/A

Items:

- a. “Software”, specially designed or modified for the “development”, “production”, or “use” of information security or cryptologic equipment (e.g., equipment controlled by 5A992)
- b. “Software” having the characteristics, or performing or simulating the functions of the equipment controlled by 5A992.
- c. “Software” designed or modified to protect against malicious computer damage, e.g., viruses.

E. Technology

5E002 “Technology” according to the General Technology Note for the “development”, “production” or “use” of equipment controlled by 5A002 or 5B002 or “software” controlled by 5D002.

License Requirements
Reason for Control: NS, AT, EI

Control(s)	Country Chart
NS applies to entire entry AT applies to entire entry	NS Column 1 AT Column 1

EI applies to encryption items transferred from the U.S. Munitions List to the Commerce Control List consistent with E.O. 13026 of November 15, 1996 (61 FR 58767) and pursuant to the Presidential Memorandum of that date. Refer to §742.15 of the EAR.

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under **License Exceptions**.

License Exceptions
CIV: N/A
TSR: N/A

List of Items Controlled
Unit: N/A

Related Controls: See also 5E992

Related Definitions: N/A

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

5E992 “Technology”, n.e.s., for the “development”, “production”, or “use” of “information security” or cryptologic equipment (e.g., equipment controlled by 5A992), or “software” controlled by 5D992.

License Requirements
Reason for Control: AT

Control(s)	Country Chart
AT applies to entire entry	AT Column 1

License Exceptions
CIV: N/A
TSR: N/A

List of Items Controlled
Unit: N/A

Related Controls: N/A
Related Definitions: N/A

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

EAR99 Items subject to the EAR that are not elsewhere specified in this CCL Category or in any other category in the CCL are designated by the number EAR99.

CATEGORY 6—SENSORS AND LASERS

A. Systems, Equipment and Components

6A001 Acoustics.

License Requirements
Reason for Control: NS, AT

Control(s)	Country Chart
NS applies to entire entry AT applies to entire entry	NS Column 2 AT Column 1

License Requirement Notes: See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

License Exceptions
LVS: \$3,000; N/A for 6A001.a.2.a.1, a.2.a.2, a.2.a.7, a.2.b; processing equipment controlled by 6A002.a.2.c, and specially designed for real time application with towed acoustic hydrophone arrays; a.2.e.1, a.2.e.2; and bottom or bay cable systems controlled by 6A002.a.2.e.3 and having processing equipment specially designed for real time application with bottom or bay cable systems

GBS: Yes for 6A001.a.1.b.4

CIV: Yes for 6A001.a.1.b.4

List of Items Controlled
Unit: \$ value

Related Controls: See also 6A991

Related Definitions: N/A

Items:

- a. Marine acoustic systems, equipment and specially designed components therefor, as follows: a.1. Active (transmitting or transmitting-and-receiving) systems, equipment and specially designed components therefor, as follows:
 - Note:** 6A001.a.1 does not control:
 - a. Depth sounders operating vertically below the apparatus, not including a scanning function exceeding ±20°, and limited to measuring the depth of water, the distance of submerged or buried objects or fish finding;
 - b. Acoustic beacons, as follows:
 - 1. Acoustic emergency beacons;
 - 2. Pingers specially designed for relocating or returning to an underwater position.
 - a.1.a. Wide-swath bathymetric survey systems designed for sea bed topographic mapping, having all of the following: