CATEGORY 5 – TELECOMMUNICATIONS AND "INFORMATION SECURITY"

Part 1 – TELECOMMUNICATIONS

Notes:

1. The control status of "components," test and "production" equipment, and "software" therefor which are "specially designed" for telecommunications equipment or systems is determined in Category 5, Part 1.

N.B.1.: *For "lasers" "specially designed" for telecommunications equipment or systems, see ECCN 6A005.*

N.B.2.: *See also Category 5, Part 2 for equipment, "components," and "software", performing or incorporating "information security" functions.*

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. "END ITEMS," "EQUIPMENT," "ACCESSORIES," "ATTACHMENTS," "PARTS," "COMPONENTS," AND "SYSTEMS"

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

License Requirements

Reason for Control: NS, SL, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to 5A001.a, .e, .b.5, f.3 and .h.	NS Column 1
NS applies to 5A001.b (except .b.5), .c, .d, .f (except f.3), and .g.	NS Column 2
SL applies to 5A001.f.1	A license is required for all destinations, as specified in §742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR). ***Note to SL paragraph:*** *This licensing requirement does not supersede, nor does it implement, construe or limit the scope of any criminal statute, including, but not limited to the Omnibus Safe Streets Act of 1968, as amended.*
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive

Licenses, and Validated End-User authorizations.

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

LVS: N/A for 5A001.a, b.5, .e, f.3 and .h;
$5000 for 5A001.b.1, .b.2, .b.3, .b.6, .d, f.2, f.4, and .g;
$3000 for 5A001.c.
GBS: Yes, except 5A001.a, b.5, e, and h.
CIV: Yes, except 5A001.a, b.3, b.5, e, and h.

Special Conditions for STA

STA: License Exception STA may not be used to ship any commodity in 5A001.b.3, .b.5 or .h to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) See USML Category XI for direction-finding "equipment" defined in 5A001.e that is "subject to the ITAR" (see 22 CFR parts 120 through 130). (2) 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.*

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

b.1 Being underwater untethered communications systems having any of the following:

b.1.a. An acoustic carrier frequency outside the range from 20 kHz to 60 kHz;

b.1.b. Using an electromagnetic carrier frequency below 30 kHz; *or*

b.1.c. Using electronic beam steering techniques; *or*

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.2. Being radio equipment operating in the 1.5 MHz to 87.5 MHz band and having all of the following:

b.2.a.. Automatically predicting and selecting frequencies and "total digital transfer rates" per channel to optimize the transmission; *and*

b.2.b. 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 frequency range of 1.5 MHz or more but less than 30 MHz, or 250 W or more in the frequency range of 30 MHz or more but not exceeding 87.5 MHz, over an "instantaneous bandwidth" of one octave or more and with an output harmonic and distortion content of better than -80 dB;

b.3. Being radio equipment employing "spread spectrum" techniques, including "frequency hopping" techniques, not controlled in 5A001.b.4 and having any of the following :

b.3.a. User programmable spreading codes; *or*

b.3.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.3.b does not control radio equipment "specially designed" for use with any of the following:*

a. Civil cellular radio-communications systems; or

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

Note: *5A001.b.3 does not control equipment operating at an output power of 1 W or less.*

b.4 Being radio equipment employing ultra-wideband modulation techniques, having user programmable channelizing codes, scrambling codes, or network identification codes and having any of the following:

b.4.a. A bandwidth exceeding 500 MHz; *or*

b.4.b. A "fractional bandwidth" of 20% or more;

b.5. Being digitally controlled radio receivers having all of the following:

b.5.a. More than 1,000 channels;

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

b.5.c. Automatic searching or scanning of a part of the electromagnetic spectrum; *and*

b.5.d. Identification of the received signals or the type of transmitter; *or*

Note: *5A001.b.5 does not control radio equipment "specially designed" for use with civil cellular radio-communications systems.*

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

b.6. Employing functions of digital "signal processing" to provide 'voice coding' output at rates of less than 2,400 bit/s.

Technical Notes:

1. For variable rate 'voice coding', 5A001.b.6 applies to the 'voice coding' output of continuous speech.

2. For the purpose of 5A001.b.6, 'voice coding' is defined as the technique to take samples of human voice and then convert these samples of human voice into a digital signal taking into account specific characteristics of human speech.

c. Optical fibers of more than 500 m in length and specified by the manufacturer as being capable of withstanding a 'proof test' tensile stress of 2×10^9 N/m^2 or more;

N.B.*: For underwater umbilical cables, see 8A002.a.3.*

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 (20ºC) and relative humidity 40%. Equivalent national standards may be used for executing the proof test.

d. "Electronically steerable phased array antennas" operating above 31.8 GHz;

Note: *5A001.d does not control "electronically steerable phased array antennas" for landing systems with instruments meeting ICAO standards covering Microwave Landing Systems (MLS).*

e. Radio direction finding equipment operating at frequencies above 30 MHz and having all of the following, and "specially designed" "components" therefor:

e.1. "Instantaneous bandwidth" of 10 MHz or more; and

e.2. Capable of finding a Line Of Bearing (LOB) to non-cooperating radio transmitters with a signal duration of less than 1 ms;

f. Mobile telecommunications interception or jamming equipment, and monitoring equipment therefor, as follows, and "specially designed" "components" therefor:

f.1. Interception equipment designed for the extraction of voice or data, transmitted over the air interface;

f.2. Interception equipment not specified in 5A001.f.1, designed for the extraction of client device or subscriber identifiers (e.g., IMSI, TIMSI or IMEI), signaling, or other metadata transmitted over the air interface;

f.3. Jamming equipment "specially designed" or modified to intentionally and selectively interfere with, deny, inhibit, degrade or seduce mobile telecommunication services and performing any of the following:

f.3.a. Simulate the functions of Radio Access Network (RAN) equipment;

f.3.b. Detect and exploit specific characteristics of the mobile telecommunications protocol employed (e.g., GSM); *or*

f.3.c. Exploit specific characteristics of the mobile telecommunications protocol employed (e.g., GSM);

f.4. Radio Frequency (RF) monitoring equipment designed or modified to identify the operation of items specified in 5A001.f.1, 5A001.f.2 or 5A001.f.3.

Note: *5A001.f.1 and 5A001.f.2 do not apply to any of the following:*

a. Equipment "specially designed" for the interception of analog Private Mobile Radio (PMR), IEEE 802.11 WLAN;

b. Equipment designed for mobile telecommunications network operators; or

c. Equipment designed for the "development" or "production" of mobile telecommunications equipment or systems.

N.B. 1: *See also the International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130). For items specified by 5A001.f.1 (including as previously specified by 5A001.i), see also5A980 and the U.S. Munitions List (22 CFR part 121).*

N.B. 2*: For radio receivers see 5A001.b.5.*

g. Passive Coherent Location (PCL) systems or equipment, "specially designed" for detecting and tracking moving objects by measuring reflections of ambient radio frequency emissions, supplied by non-radar transmitters.

Technical Note: *Non-radar transmitters may include commercial radio, television or cellular telecommunications base stations.*

Note: *5A001.g. does not control:*

a. Radio-astronomical equipment; or

b. Systems or equipment, that require any radio transmission from the target.

h. Counter Improvised Explosive Device (IED) equipment and related equipment, as follows:

h.1. Radio Frequency (RF) transmitting equipment, not specified by 5A001.f, designed or modified for prematurely activating or preventing the initiation of Improvised Explosive Devices (IEDs);

h.2. Equipment using techniques designed to enable radio communications in the same frequency channels on which co-located equipment specified by 5A001.h.1 is transmitting.

N.B.: *See also Category XI of the International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130).*

i. [RESERVED]

N.B.: *See 5A001.f.1 for items previously specified by 5A001.i.*

5A101 Telemetering and telecontrol equipment, including ground equipment, designed or modified for unmanned aerial vehicles or rocket systems (including ballistic missile systems, space launch vehicles, sounding rockets, cruise missile systems, target drones, and reconnaissance drones) capable of a maximum "range" equal to or greater than 300 km.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

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

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

NOTE: 5A101 does not control*:*

1. Telecontrol equipment "specially designed" to be used for remote control of recreational model planes, boats or vehicles and having an electric field strength of not more than 200 microvolts per meter at a distance of 500 meters;

2. Equipment designed or modified for manned aircraft or satellites;

3. Ground based equipment designed or modified for terrestrial or marine applications;

4. Equipment designed for commercial, civil, or safety of life (e.g., data integrity or flight safety) Global Navigation Satellite System services.

NOTE: *ECCN 5A101 does not include items not designed or modified for unmanned aerial vehicles or rocket systems (including ballistic missile systems, space launch vehicles, sounding rockets, cruise missile systems, target drones, and reconnaissance drones) capable of a maximum "range" equal to or greater than 300km (e.g., telemetry circuit cards limited by design to reception only and designed for use in personal computers).*

5A980 Devices primarily useful for the surreptitious interception of wire, oral, or electronic communications, other than those controlled under 5A001.f.1; and "parts," "components" and "accessories" therefor.

License Requirements

Reason for Control: SL, AT

Control(s): SL and AT apply to entire entry. A license is required for all destinations, as specified in §742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).

Note: *This licensing requirement does not supersede, nor does it implement, construe or limit the scope of any criminal statute, including, but not limited to the Omnibus Safe Streets Act of 1968, as amended.*

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

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

List of Items Controlled

Related Controls: (1) See ECCN 5A001.f.1 for systems or equipment, "specially designed" or modified to intercept and process the air interface of 'mobile telecommunications', and "specially designed" components therefor. (2) See ECCN 5D980 for "software" for the "development", "production" or "use" of equipment controlled by 5A980. (3) See ECCN 5E980 for the "technology" for the "development", "production", and "use" of equipment controlled by 5A980.
Related Definitions: N/A
Items:

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

5A991 Telecommunication equipment, not controlled by 5A001 (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

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

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

List of Items Controlled

Related Controls: See also 5E101 and 5E991.
Related Definitions: 1) 'Asynchronous transfer mode' ('*ATM*') is a transfer mode in which the information is organized into cells; it is asynchronous in the sense that the recurrence of cells depends on the required or instantaneous bit rate. 2) '*Bandwidth of one voice channel*' is data communication equipment designed to operate in one voice

channel of 3,100 Hz, as defined in CCITT Recommendation G.151. 3) '*Communications channel controller*' is the physical interface that controls the flow of synchronous or asynchronous digital information. It is an assembly that can be integrated into computer or telecommunications equipment to provide communications access. 4) '*Datagram*' is a self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination data terminal equipment without reliance on earlier exchanges between this source and destination data terminal equipment and the transporting network. 5) '*Fast select*' is a facility applicable to virtual calls that allows data terminal equipment to expand the possibility to transmit data in call set-up and clearing 'packets' beyond the basic capabilities of a virtual call. 6) '*Gateway*' is the function, realized by any combination of equipment and "software", to carry out the conversion of conventions for representing, processing or communicating information used on one system into the corresponding, but different conventions used in another system. 7) *'Integrated Services Digital Network*' (ISDN) is a unified end-to-end digital network, in which data originating from all types of communication (*e.g.*, voice, text, data, still and moving pictures) are transmitted from one port (terminal) in the exchange (switch) over one access line to and from the subscriber. 8) '*Packet*' is a group of binary digits including data and call control signals that is switched as a composite whole. The data, call control signals, and possible error control information are arranged in a specified format.

Items:

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

b. Telecommunication transmission equipment and systems, and "specially designed" "parts," "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 mutiplex 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: *5A991.b.1 does not control equipment "specially designed" to be integrated and operated in any satellite system for civil use.*

b.2. Modems using the 'bandwidth of one voice channel' with a "data signaling rate" exceeding 9,600 bits per second;

b.3. Being "stored program controlled" digital cross connect equipment with "digital transfer rate" exceeding 8.5 Mbit/s per port.

b.4. Being equipment containing any of the following:

b.4.a. 'Network access controllers' and their related common medium having a "digital transfer rate" exceeding 33 Mbit/s; *or*

b.4.b. "Communication channel controllers" with a digital output having a "data signaling rate" exceeding 64,000 bit/s per channel;

Note: *If any uncontrolled equipment contains a "network access controller", it cannot have anytype of telecommunications interface, except those described in, but not controlled by 5A991.b.4.*

b.5. Employing a "laser" and having any of the following characteristics:

b.5.a. A transmission wavelength exceeding 1,000 nm; *or*

b.5.b. Employing analog techniques and having a bandwidth exceeding 45 MHz;

Note: *5A991.b.5.b does not control commercial TV systems.*

b.5.c. Employing coherent optical transmission or coherent optical detection techniques (also called optical heterodyne or homodyne techniques);

b.5.d. Employing wavelength division multiplexing techniques; *or*

b.5.e. Performing "optical amplification";

b.6. Radio equipment operating at input or output frequencies exceeding:

b.6.a. 31 GHz for satellite-earth station applications; *or*

b.6.b. 26.5 GHz for other applications;

Note: *5A991.b.6. 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.7. Being radio equipment employing any of the following:

b.7.a. Quadrature-amplitude-modulation (QAM) techniques above level 4 if the "total digital transfer rate" exceeds 8.5 Mbit/s;

b.7.b. QAM techniques above level 16 if the "total digital transfer rate" is equal to or less than 8.5 Mbit/s;

b.7.c. Other digital modulation techniques and having a "spectral efficiency" exceeding 3 bit/s/Hz; or

b.7.d. Operating in the 1.5 MHz to 87.5 MHz band and incorporating adaptive techniques providing more than 15 dB suppression of an interfering signal.

Notes:

1. *5A991.b.7 does not control equipment "specially designed" to be integrated and operated in any satellite system for civil use.*

2. *5A991.b.7 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/s/Hz.

c. "Stored program controlled" switching equipment and related signaling systems, having any of the following characteristics, functions or features, and "specially designed" "parts," "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. "Data (message) switching" equipment or systems designed for "packet-mode operation" and "parts," electronic assemblies and "components" therefor, n.e.s.

c.2. [RESERVED];

c.3. Routing or switching of 'datagram' packets;

c.4. [RESERVED]

Note: *The restrictions in 5A991.c.3 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 cross connect equipment with "digital transfer rate" exceeding 8.5 Mbit/s per port.

c.8. "Common channel signaling" operating in either non-associated or quasi-associated mode of operation;

c.9. 'Dynamic adaptive routing';

c.10. Being packet switches, circuit switches and routers with ports or lines exceeding any of the following:

c.10.a. A "data signaling rate" of 64,000 bit/s per channel for a 'communications channel controller'; *or*

Note: *5A991.c.10.a does not control multiplex composite links composed only of communication channels not individually controlled by 5A991.b.1.*

c.10.b. A "digital transfer rate" of 33 Mbit/s for a 'network access controller' and related common media;

Note: *5A991.c.10 does not control packet switches or routers with ports or lines not exceeding the limits in 5A991.c.10.*

c.11. "Optical switching";

c.12. Employing 'Asynchronous Transfer Mode' ('ATM') techniques.

d. Optical fibers and optical fiber cables of more than 50 m in length designed for single mode operation;

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

e.1. Receives data from the nodes; *and*

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

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

f. Phased array antennas, operating above 10.5 GHz, containing active elements and distributed "parts" or "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)).

g. Mobile communications equipment, n.e.s., and "parts," electronic assemblies and "components" therefor; *or*

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

B. TEST, INSPECTION AND "PRODUCTION EQUIPMENT"

5B001 Telecommunication test, inspection and production equipment, "components" and "accessories," as follows (See List of Items Controlled).

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

Reporting Requirements

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

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

LVS: $5000
GBS: Yes
CIV: Yes

Special Conditions for STA

STA: License Exception STA may not be used to ship 5B001.a equipment and "specially designed" components or "accessories" therefor, "specially designed" for the "development" or "production" of equipment, functions or features specified by in ECCN 5A001.b.3, .b.5 or .h to any of the destinations listed in Country Group A:6

(See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: See also 5B991.
Related Definition: N/A
Items:

a. Equipment and "specially designed" "components" or "accessories" therefor, "specially designed" for the "development" or "production" of equipment, functions or features, controlled by 5A001;

***Note**: 5B001.a does not apply to optical fiber characterization equipment.*

b. Equipment and "specially designed" "components" or "accessories" therefor, "specially designed" for the "development" of any of the following telecommunication transmission or switching equipment:

b.1. [RESERVED]

b.2. Equipment employing a "laser" and having any of the following:

b.2.a. A transmission wavelength exceeding 1750 nm;

b.2.b. Performing "optical amplification" using Praseodymium-Doped Fluoride Fiber Amplifiers (PDFFA);

b.2.c. Employing coherent optical transmission or coherent optical detection techniques; *or*

***Note:** 5B001.b.2.c applies to equipment "specially designed" for the "development" of systems using an optical local oscillator in the receiving side to synchronize with a carrier "laser."*

***Technical Note:** For the purpose of 5B001.b.2.c, these techniques include optical heterodyne, homodyne or intradyne techniques.*

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

***Note:** 5B001.b.2.d. does not include equipment "specially designed" for the "development" of commercial TV systems.*

b.3. [RESERVED]

b.4. Radio equipment employing Quadrature-Amplitude-Modulation (QAM) techniques above level 256.

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

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

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

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

C. "MATERIALS"

5C991 Preforms of glass or of any other material optimized for the manufacture of optical fibers controlled by 5A991.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

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

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

D. "SOFTWARE"

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

License Requirements

Reason for Control: NS, SL, AT

Control(s)	*Country chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1.
SL applies to the entire entry as applicable for equipment, functions, features, or characteristics controlled by 5A001.f.1	A license is required for all destinations, as specified in § 742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).
Note to SL paragraph: This licensing requirement does not supersede, nor does it implement, construe or limit the scope of any criminal statute, including, but not limited to the Omnibus Safe Streets Act of 1968, as amended.	

Reporting Requirements

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

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

CIV: Yes, except for "software" controlled by 5D001.a and "specially

designed" for the "development" or "production" of items controlled by 5A001.b.5 and 5A001.h.

TSR: Yes, except for exports and reexports to destinations outside of those countries listed in Country Group A:5 (See Supplement No. 1 to part 740 of the EAR) of "software" controlled by 5D001.a and "specially designed" for items controlled by 5A001.b.5 and 5A001.h.

Special Conditions for STA

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

List of Items Controlled

Related Controls: See also 5D980 and 5D991.
Related Definitions: N/A
Items:

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

b. "Software" "specially designed" or modified to support "technology" controlled by 5E001;

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

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

d.1.[RESERVED]

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

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

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

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

d.3. [RESERVED]

d.4. Radio equipment employing Quadrature-Amplitude-Modulation (QAM) techniques above level 256.

5D101 "Software" "specially designed" or modified for the "use" of equipment controlled by 5A101.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

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

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.

5D980 Other "software", other than that controlled by 5D001 (for the equipment, functions, features, or characteristics controlled by 5A001. f.1, or to support certain "technology" controlled by 5E001.a), as follows (see List of Items Controlled).

License Requirements

Reason for Control: SL, AT

Controls: SL and AT apply to entire entry. A license is required for all destinations, as specified in §742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).

Note: *This licensing requirement does not supersede, nor does it implement, construe or limit the scope of any criminal statute, including, but not limited to the Omnibus Safe Streets Act of 1968, as amended.*

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: See also 5D001.a and .c for software controls for equipment, functions, features or characteristics controlled by 5A001.f.1 and also 5D001.b for controls on "software" "specially designed" or modified to support "technology" controlled by 5E001.a (for 5A001.f.1 equipment, functions or features, and for 5D001.a "software" for 5A001.f.1 equipment). See 5E980 for "technology" for the "development", "production", and "use" of equipment controlled by 5A980 or "software" controlled by 5D980.
Related Definitions: N/A
Items:

a. "Software" primarily useful for the surreptitious interception of wire, oral, and electronic communications.

b. "Software" primarily useful for the "development", "production", or "use" of equipment controlled by 5A980.

5D991 "Software" "specially designed" or modified for the "development," "production" or "use" of equipment controlled by 5A991 and 5B991, and dynamic adaptive routing software as described as follows (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
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:

a. "Software", other than in machine-executable form, "specially designed" for "dynamic adaptive routing".

b. [RESERVED]

E. "TECHNOLOGY"

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

License Requirements

Reason for Control: NS, SL, AT

Control(s)	**Country chart** *(See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1.
SL applies to "technology" for the "development" or "production" of equipment, functions or features controlled by 5A001.f.1, or for the "development" or "production" of "software" controlled by ECCN 5D001.a (for 5A001.f.1)	A license is required for all destinations, as specified in § 742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).
	Note to SL paragraph: This licensing requirement does not supersede, nor does it implement, construe or limit the scope of any criminal statute, including, but not limited to the Omnibus Safe Streets Act of 1968, as amended.
AT applies to entire entry	AT Column 1.

Reporting Requirements

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

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

CIV: N/A
TSR: Yes, except for exports or reexports to destinations outside of those countries listed in Country Group A:5 (See Supplement No. 1 to part 740 of the EAR) of "technology" controlled by 5E001.a for the "development" or "production" of the following:
1) Items controlled by 5A001.b.5 or 5A001.h; or
2)"Software" controlled by 5D001.a that is "specially designed" for the "development" or "production" of equipment, functions or features controlled by 5A001.b.5 or 5A001.h.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "technology" according to the General Technology Note for the "development" or "production" of equipment, functions or features specified by 5A001.b.3, .b.5 or .h; or for "software" in 5D001.a that is specified in the STA

paragraph in the License Exception section of ECCN 5D001 to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: See also 5E101, 5E980 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, controlled by 5A001 or "software" controlled by 5D001.a..

b. Specific "technology", 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 "development" of digital cellular radio base station receiving equipment whose reception capabilities that allow multi-band, multi-channel, multi-mode, multi-coding algorithm or multi-protocol operation can be modified by changes in "software";

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

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

a. Civil cellular radio-communications systems; or

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

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

c.1. Equipment employing digital techniques designed to operate at a "total digital transfer rate" exceeding 120 Gbit/s;

Technical Note*: For telecommunication switching equipment the "total digital transfer rate" is the unidirectional speed of a single interface, measured at the highest speed port or line.*

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

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

c.2.b. Performing "optical amplification" using Praseodymium-Doped Fluoride Fiber Amplifiers (PDFFA);

c.2.c. Employing coherent optical transmission or coherent optical detection techniques;

Note: *5E001.c.2.c applies to "technology" "specially designed" for the "development" or "production" of systems using an optical local oscillator in the receiving side to synchronize with a carrier "laser."*

Technical Note*: For the purpose of 5E001.c.2.c, these techniques include optical heterodyne, homodyne or intradyne techniques.*

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

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

Note: *5E001.c.2.e. does not control "technology" for the "development" or "production" of commercial TV systems.*

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

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

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

c.4.a. Quadrature-Amplitude-Modulation (QAM) techniques above level 256; *or*

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

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

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

c.5. [RESERVED]

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

c.6.a. Operating at an optical wavelength greater than or equal to 200nm and less than or equal to 400nm; *and*

c.6.b. Operating as a "local area network";

d. "Technology" according to the General Technology Note for the "development" or "production" of 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;

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

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

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

5E101 "Technology" according to the General Technology Note for the "development", "production" or "use" of equipment or software controlled by 5A101 or 5D101.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

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

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.

5E980 "Technology", other than that controlled by 5E001.a (for 5A001.,f.1 and for 5D001.a (for 5A001.f.1)), primarily useful for the "development", "production", or "use" of equipment, functions or features, of equipment controlled by 5A980 or "software" controlled by 5D980.

License Requirements

Reason for Control: SL, AT

Controls: SL and AT apply to entire entry. A license is required for all destinations, as specified in §742.13 of the EAR. Accordingly, a column specific to this control does not appear on the Commerce Country Chart (Supplement No. 1 to Part 738 of the EAR).

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: See also 5D001.a and .c (for 5A001.f.1 equipment), 5D001.b (supporting 5E001.a "technology" for 5A001.f.1 equipment, or for 5D001.a "software" (for 5A001.f.1 equipment)), and 5E001.a (for 5A001.f.1 equipment, or for 5D001.a "software" for 5A001.f.1 equipment).
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, and other "technologies" as follows (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
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: 1) 'Synchronous digital hierarchy' (SDH) is a digital hierarchy providing a means to manage, multiplex, and access various forms of digital traffic using a synchronous transmission format on different types of media. The format is based on the Synchronous Transport Module (STM) that is defined by CCITT Recommendation G.703, G.707, G.708, G.709 and others yet to be published. The first level rate of 'SDH' is 155.52 Mbits/s. 2) 'Synchronous optical network' (SONET) is a network providing a means to manage, multiplex and access various forms of digital traffic using a synchronous transmission format on fiber optics. The format is the North America version of 'SDH' and also uses the Synchronous Transport Module (STM). However, it uses the Synchronous Transport Signal (STS) as the basic transport module

with a first level rate of 51.81 Mbits/s. The SONET standards are being integrated into those of 'SDH'.

Items:

a. Specific "technologies" as follows:

a.1. "Technology" for the processing and application of coatings to optical fiber "specially designed" to make it suitable for underwater use;

a.2. "Technology" for the "development" of equipment employing 'Synchronous Digital Hierarchy' ('SDH') or 'Synchronous Optical Network' ('SONET') techniques.

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.