

**CATEGORY 4 - COMPUTERS**

**Note 1:** Computers, related equipment and “software” performing telecommunications or “local area network” functions must also be evaluated against the performance characteristics of Category 5, Part 1 (Telecommunications).

**Note 2:** Control units that directly interconnect the buses or channels of central processing units, ‘main storage’ or disk controllers are not regarded as telecommunications equipment described in Category 5, Part 1 (Telecommunications).

**N.B.:** For the control status of “software” “specially designed” for packet switching, see ECCN 5D001. (Telecommunications).

**Technical Note:** ‘Main storage’ is the primary storage for data or instructions for rapid access by a central processing unit. It consists of the internal storage of a “digital computer” and any hierarchical extension thereto, such as cache storage or non-sequentially accessed extended storage.

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

**4A001** Electronic computers and related equipment, having any of the following (see List of Items Controlled), and “electronic assemblies” and “specially designed” “components” therefor.

**License Requirements**

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

|                   |  |
|-------------------|--|
| <i>Control(s)</i> | <i>Country Chart<br/>(See Supp. No.)</i> |
|-------------------|--|

|  | <i>I to part 738)</i> |
|--|-----------------------|
| NS applies to entire entry   | NS Column 2           |
| MT applies to items in 4A001.a when the parameters in 4A101 are met or exceeded  | MT Column 1           |
| AT applies to entire entry   | AT Column 1           |
| NP applies, unless a License Exception is available. See §742.3(b) of the EAR for information on applicable licensing review policies. | N/A                   |

**Reporting Requirements**

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

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

LVS: \$5000 for 4A001.a; N/A for MT.  
GBS: N/A  
CIV: N/A

**Special Conditions for STA**

STA: License Exception STA may not be used to ship any commodity in 4A001.a.2 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 [4A101](#) and [4A994](#). Equipment designed or rated for transient ionizing radiation is “subject to the ITAR” (see 22 CFR parts 120 through 130).

**Related Definitions:** For the purposes of integrated circuits in 4A001.a.2,  $5 \times 10^3$  Gy(Si) =  $5 \times 10^5$  Rads (Si);  $5 \times 10^6$  Gy (Si)/s =  $5 \times 10^8$  Rads (Si)/s.

*Items:*

a. “Specially designed” to have any of the following:

a.1. Rated for operation at an ambient temperature below 228 K (-45°C) or above 358 K (85°C); or

**Note:** 4A001.a.1 does not apply to computers “specially designed” for civil automobile, railway train or “civil aircraft” applications.

a.2. Radiation hardened to exceed any of the following specifications:

a.2.a. A total dose of  $5 \times 10^3$  Gy (Si);

a.2.b. A dose rate upset of  $5 \times 10^6$  Gy (Si)/s; or

a.2.c. Single Event Upset of  $1 \times 10^{-8}$  Error/bit/day;

**Note:** 4A001.a.2 does not apply to computers “specially designed” for “civil aircraft” applications.

b. [Reserved]

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

### License Requirements

**Reason for Control:** NS, CC, AT

| Control(s)   | Country Chart (See Supp. No. 1 to part 738) |
|--|---|
| NS applies to 4A003.b and .c                       | NS Column 1                                 |
| NS applies to 4A003.e and .g                       | NS Column 2                                 |
| CC applies to “digital computers” for computerized | CC Column 1                                 |

|   |             |
|---|-------------|
| finger-print equipment  |             |
| AT applies to entire entry<br>(refer to 4A994 for controls<br>on “digital computers” with a<br>APP > 0.0128 but $\leq$ 29 WT) | AT Column 1 |

**Note:** : For all destinations, except those countries in Country Group E:1 or E:2 of Supplement No. 1 to part 740 of the EAR, no license is required (NLR) for computers with an “Adjusted Peak Performance” (“APP”) not exceeding 29 Weighted TeraFLOPS (WT) and for “electronic assemblies” described in 4A003.c that are not capable of exceeding an “Adjusted Peak Performance” (“APP”) exceeding 29 Weighted TeraFLOPS (WT) in aggregation, except certain transfers as set forth in § 746.3 (Iraq).

### Reporting Requirements

Special Post Shipment Verification reporting and recordkeeping requirements for exports of computers to destinations in Computer Tier 3 may be found in § 743.2 of the EAR.

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

LVS: \$5000; N/A for 4A003.b and .c.  
 GBS: Yes, for 4A003.g and “specially designed” “parts” and “components” therefor, exported separately or as part of a system.  
 APP: Yes, for computers controlled by 4A003.b, and “electronic assemblies” controlled by 4A003.c, to the exclusion of other technical parameters. See § 740.7 of the EAR.  
 CIV: Yes, for 4A003.g.

### List of Items Controlled

**Related Controls:** See also [4A994](#) and [4A980](#)

**Related Definitions:** N/A

**Items:**

**Note 1:** 4A003 includes the following:

- ‘Vector processors’ (as defined in Note 7 of the “Technical Note on “Adjusted Peak Performance” (“APP”));
- Array processors;
- Digital signal processors;
- Logic processors;
- Equipment designed for “image enhancement.”

**Note 2:** The control status of the “digital computers” and related equipment described in 4A003 is determined by the control status of other equipment or systems provided:

- a. The “digital computers” or related equipment are essential for the operation of the other equipment or systems;
- b. The “digital computers” or related equipment are not a “principal element” of the other equipment or systems; and

**N.B. 1:** The control status of “signal processing” or “image enhancement” equipment “specially designed” for other equipment with functions limited to those required for the other equipment is determined by the control status of the other equipment even if it exceeds the “principal element” criterion.

**N.B. 2:** For the control status of “digital computers” or related equipment for telecommunications equipment, see Category 5, Part 1 (Telecommunications).

- c. The “technology” for the “digital computers” and related equipment is determined by 4E.

a. [Reserved]

b. “Digital computers” having an “Adjusted Peak Performance” (“APP”) exceeding 29 Weighted TeraFLOPS (WT);

c. “Electronic assemblies” “specially designed” or modified to be capable of enhancing performance by aggregation of processors so that the “APP” of the aggregation exceeds the limit in 4A003.b.;

**Note 1:** 4A003.c applies only to “electronic assemblies” and programmable interconnections not exceeding the limit in 4A003.b when shipped as unintegrated “electronic assemblies.”

**Note 2:** 4A003.c does not control “electronic assemblies” “specially designed” for a product or family of products whose maximum configuration does not exceed the limit of 4A003.b.

d. to f. [Reserved]

**N.B.:** For “electronic assemblies,” modules or equipment, performing analog-to-digital conversions, see 3A002.h.

g. Equipment “specially designed” for aggregating the performance of “digital computers” by providing external interconnections which allow communications at unidirectional data rates exceeding 2.0 Gbyte/s per link.

**Note:** 4A003.g does not control internal interconnection equipment (e.g., backplanes, buses) passive interconnection equipment, “network access controllers” or “communication channel controllers”.

**4A004** Computers as follows (see List of Items Controlled) and “specially designed” related equipment, “electronic assemblies” and “components” therefor.

**License Requirements***Reason for Control:* NS, AT

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

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

LVS: \$5000  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. ‘Systolic array computers’;
- b. ‘Neural computers’;
- c. ‘Optical computers’.

**Technical Notes:**

1. ‘Systolic array computers’ are computers where the flow and modification of the data is dynamically controllable at the logic gate level by the user.

2. ‘Neural computers’ are computational devices designed or modified to mimic the behaviour of a neuron or a collection of neurons, i.e., computational devices which are distinguished by their hardware capability to modulate the weights and numbers of the interconnections of a multiplicity of computational components based on previous data.

3. ‘Optical computers’ are computers designed or modified to use light to represent data and whose computational logic elements are based on directly coupled optical devices.

**4A101** Analog computers, “digital computers” or digital differential analyzers, other than those controlled by 4A001 designed or modified for use in “missiles”, having any of the following (see **List of Items Controlled**).

**License Requirements***Reason for Control:* MT, AT

| <i>Control(s)</i>          | <i>Country Chart<br/>(See Supp. No. 1<br/>to part 738)</i> |
|----------------------------|--|
| 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:*

- a. Rated for continuous operation at temperatures from below 228 K (-45° C) to above 328 K (+55° C); or
- b. Designed as ruggedized or ‘radiation hardened’.

**Note:** ‘Radiation hardened’ means that the “part,” “component” or equipment is designed or rated to withstand radiation levels which meet or exceed a total irradiation dose of 5 X

$10^5$  rads (Si).

**4A102** “Hybrid computers” “specially designed” for modelling, simulation or design integration of “missiles” or their subsystems. (These items are “subject to the ITAR” See 22 CFR parts 120 through 130.)

**4A611** Computers, and “parts,” “components,” “accessories,” and “attachments” “specially designed” therefor, “specially designed” for a military application that are not enumerated in any USML category are controlled by ECCN 3A611.

**4A980** Computers for fingerprint equipment, n.e.s.

#### License Requirements

*Reason for Control:* CC, AT

| Control(s)                 | Country Chart<br>(See Supp. No. 1<br>to part 738) |
|----------------------------|---|
| CC applies to entire entry | CC 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:** 4A980 does not control equipment limited to one finger and designed for user authentication or access control.

**4A994** Computers, “electronic assemblies” and related equipment, not controlled by 4A001 or 4A003, and “specially designed” “parts” and “components” therefor (see List of Items Controlled).

#### License Requirements

*Reason for Control:* AT

| Control(s)                 | Country Chart<br>(See Supp. No. 1<br>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:*

**Note 1:** The control status of the “digital computers” and related equipment described in 4A994 is determined by the control status of other equipment or systems provided:

- a. The “digital computers” or related equipment are essential for the operation of the other equipment or systems;
- b. The “digital computers” or related equipment are not a “principal element” of the other equipment or systems; and

**N.B. 1:** *The control status of “signal processing” or “image enhancement” equipment “specially designed” for other equipment with functions limited to those required for the other equipment is determined by the control status of the other equipment even if it exceeds the “principal element” criterion.*

**N.B. 2:** *For the control status of “digital computers” or related equipment for telecommunications equipment, see Category 5, Part 1 (Telecommunications).*

*c. The “technology” for the “digital computers” and related equipment is determined by 4E.*

a. Electronic computers and related equipment, and “electronic assemblies” and “specially designed” “parts” and “components” therefor, rated for operation at an ambient temperature above 343 K (70°C);

b. “Digital computers”, including equipment of “signal processing” or image enhancement”, having an “Adjusted Peak Performance” (“APP”) equal to or greater than 0.0128 Weighted TeraFLOPS (WT);

c. “Electronic assemblies” that are “specially designed” or modified to enhance performance by aggregation of processors, as follows:

c.1. Designed to be capable of aggregation in configurations of 16 or more processors;

c.2. [Reserved];

**Note 1:** 4A994.c applies only to “electronic assemblies” and programmable interconnections with a “APP” not exceeding the limits in 4A994.b, when shipped as unintegrated “electronic assemblies”. It does not apply to “electronic assemblies” inherently limited by nature of their design for use as related equipment controlled by 4A994.k.

**Note 2:** 4A994.c does not control any “electronic assembly” “specially designed” for a product or family of products whose maximum configuration does not exceed the limits of 4A994.b.

d. [Reserved];

e. [Reserved];

f. Equipment for “signal processing” or “image enhancement” having an “Adjusted Peak Performance” (“APP”) equal to or greater than 0.0128 Weighted TeraFLOPS WT;

g. [Reserved];

h. [Reserved];

i. Equipment containing “terminal interface equipment” exceeding the limits in 5A991;

j. Equipment “specially designed” to provide external interconnection of “digital computers” or associated equipment that allows communications at data rates exceeding 80 Mbyte/s.

**Note:** 4A994.j does not control internal interconnection equipment (e.g., backplanes, buses) passive interconnection equipment, “network access controllers” or “communication channel controllers”.

k. “Hybrid computers” and “electronic assemblies” and “specially designed” “parts” and “components” therefor containing analog-to-digital converters having all of the following characteristics:

k.1. 32 channels or more; and

k.2. A resolution of 14 bit (plus sign bit) or more with a conversion rate of 200,000 conversions/s or more.