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September 6, 2013

Via: *publiccomments@bis.doc.gov*.

Regulatory Policy Division
Bureau of Industry and Security
U.S. Department of Commerce
Room 2099B
14th Street and Pennsylvania Avenue NW
Washington, DC 20230

Re: RIN 0694–AF64. Regulatory Change, USML Category XI

ATTN: Ms. Hillary Hess, Director, Regulatory Policy Division, Bureau of Industry and Security, Department of Commerce

Dear Ms. Hess:

I. Introduction

Garmin International, Inc. ("Garmin") appreciates the opportunity to comment on the radar provisions of proposed revisions to the Commodity Control List ("CCL") published in proposed form by the Department of Commerce, Bureau of Industry and Security ("BIS") as part of the Administration's Export Control Reform ("ECR") Initiative. 78 Fed. Reg. 45026 (July 25, 2013) (hereafter "Proposed CCL"). The Proposed CCL revisions relate to the proposed form of Category XI of the United States Munitions List ("USML") published on the same date at 78 Fed Reg. 45018. "Proposed Category XI."

Retention of EAR jurisdiction over weather radar without military functions will substantially improve passenger air safety and will in no way compromise national security. Electronically steered weather radar should be subject to the EAR. Provided the Administration determines to exclude weather radar from Proposed Cat. XI, we suggest BIS take jurisdiction and consider the following comments.

Appropriate control mechanisms under the CCL will maintain the national security interests of the United States, promote innovation in the development of improved weather radar, provide substantial improvements in air passenger safety, and enhance the industrial base to the benefit of the national security. This should include authorization for License Exception RPL for one-for-one replacement and service.

Garmin respectfully submits that Proposed Cat. XI(a)(3)(xii) as written over-controls weather radar by including commercial weather radar that lacks the functionality of military radar (the latter of which we agree should remain controlled). Proposed Cat. XI(a)(3)(xii) will inhibit innovation and the development of radar that will improve detection of severe weather and provide a leap forward in passenger air safety. These comments recommend specific criteria to exclude commercial weather radar units from the USML. BIS could use these as criteria to

define CCL control parameters under ECCN 0A521 or maintain the ECCN 6A998 classification.

Additionally, Garmin believes very strongly that Proposed Cat. XI as written will be inconsistent with the spirit of Executive Orders 12866 and 13563. The proposed rule will be a detriment to the public health and safety, as electronically steerable commercial weather radar can increase public safety without compromising national security. Garmin believes original equipment manufacturers ("OEMs") and airlines will not adopt electronically steered weather radar made in the United States if the State Department makes it subject to the International Traffic in Arms Regulations ("ITAR"). The history of ITAR controls points to this substantial risk, in which case U.S. developers will likely be forced to stop their domestic development programs for such weather radar.

These comments will:

1. Introduce Garmin and the GWX 7000.
2. Explain how the major goal of the Administration is not met through the Proposed Cat. XI and the failure of the Commerce Department to take jurisdiction.
3. Propose specific performance criteria to exclude certain weather radar from the scope of Proposed Cat. XI(a)(3)(xii) ("weather radar").
4. Describe the appropriate changes in the Export Administration Regulations ("EAR").

II. Background of Garmin

A. Company

Garmin is a global leader in the design and manufacture of a broad array of communication and navigation devices for various applications, including automotive, aviation, marine, fitness, outdoor recreation, and personal wireless communication. The company's U.S. headquarters, principal R&D facility and avionics products factory are in Olathe, Kansas.

Garmin designs, develops, manufactures and markets a diverse family of hand-held, portable and fixed-mount GPS-enabled products and other navigation, communications and information products for the automotive/mobile, outdoor, fitness, marine, and general civil aviation markets. Although widely known for its automobile GPS units, Garmin's expertise extends to other specialized product categories, namely avionics for a broad array of aircraft and pilots. Indeed, avionics was a pioneer product category for Garmin and the company used its expertise in that area as a foundation for developing products for other applications.

Garmin's aviation product line includes GPS-enabled navigation, weather radar, VHF communications transmitters/receivers, multi-function displays, electronic flight instrumentation systems ("EFIS"), automatic flight control systems, traffic advisory systems and traffic collision avoidance systems, terrain awareness and warning systems, instrument landing systems ("ILS"), wireless datalinks, and other product categories.

B. GWX 7000

The GWX 7000 weather radar that has been under development is designed to be integrated into a suite such as the G1000 and G5000 glass cockpit for civil aircraft.[1] The avionics cockpit panel is used by consumers for directional navigation in aviation applications. Weather radar aids in navigation to avoid bad weather. Weather radar is standard civil aviation equipment and required in all FAR Part 25 aircraft carrying passengers, as required by FAA Regulation 14 CFR Part 135, §135.175. The GWX 7000 is based upon technology prevalent in the cell-phone industry. It was developed from inception as civil radar and is not derived from other electronically steered radar. It should be stressed that techniques such as monopulse and null steering are not being designed for Garmin's electronically steered weather radar.

Today, an electronically steered weather radar could be developed from existing publicly available technology and commercially available civil components. Currently, civil aircraft rely on mechanically steerable radar that is prone to breakdown (e.g., mechanical failure of the moving components, gears, bearings, motor, etc.). In addition to increased reliability and safety, electronically steered weather radar contains no antenna mass to be moved from one position to another. This allows electronically steered weather radar to rapidly reposition the antenna beam, a significant performance benefit over a mechanically operated one. Although performing the same functions as mechanically steerable radar, the weather data provided to the pilot from electronically steerable radar is more current than that provided by mechanically steered weather radar. Simply put, this innovative civil weather radar moves from the old, less reliable mechanical system to electronically steerable technology that will drastically improve reliability, dependability, and pilot and passenger safety. Benefits include:

- **Rapid Steering:** Allows for more complete volume scans, increasing situational awareness through rapid beam scanning and agility.
- **Reliability:** Increased reliability through no moving parts.
- **Size:** Lacking a mechanically steered antenna, the GWX 7000 will only utilize a portion of the radome occupied by currently available weather radars, allowing a smaller lighter civil aircraft to incorporate larger antenna sizes, improving resolution of the weather radar.
- **Support of Search and Rescue, Firefighting, and Medevac:** Many commercially available weather radars also perform additional functionality such as search and rescue. Electronically steerable radar can interleave this functionality, in real time, with many additional weather functions, providing safety to the crew in terms of weather analysis while performing a search and rescue function.

III. Proposed Cat. XI Improperly Captures Commercial Weather Radar

Proposed Cat. XI improperly captures commercial electronically steerable weather radar and should be revised to exclude such items. Specifically, Proposed Cat. XI(a)(3)(xii) covers the

[1] A glass cockpit is an aircraft cockpit that features electronic instrument displays. Where a traditional cockpit relies on numerous mechanical gauges to display information, a glass cockpit uses several displays driven by flight management systems that can be adjusted to display flight information as needed. The Garmin G5000 is an all-glass avionics suite designed for OEM or custom retrofit installation on a wide range of business aircraft. See Attachment "A."

following: "Radar incorporating pulsed operation with electronics [sic] steering of transmit beam in elevation and azimuth." Garmin's GWX 7000 weather radar meets these criteria although it was developed exclusively for commercial aviation weather radar uses.

Absent the revision contemplated in Proposed Cat. XI(a)(3)(xii), GWX 7000 would be subject to the Export Administration Regulations ("EAR"), controlled under ECCN 6A998.

The polestar of President Barack Obama's export control reform ("ECR") initiative is not to capture commercial items in the ITAR. President Obama stated in his August 31, 2010 speech to the audience of BIS Update that ECR is intended to "allow us to build higher walls around the export of our most sensitive items while allowing the export of less critical ones under less restrictive conditions."[2] Then-Secretary of Defense Gates stated in his 2010 "Charter Speech" on export control reform that the principal aim of ECR is that "higher walls are placed around fewer, more critical items."[3] Similarly, Secretary of Commerce Pritzker stated that ECR is "focusing on technologies that pose the greatest risk, while permitting more exports of items that pose less or no risk."[4] Under Secretary of Commerce Hirschhorn stated that, "[w]ith any regulatory reform effort as large as this, small mistakes and unintended consequences are inevitable. You [the regulated community] can help by pointing out any seemingly odd results from your application of the regulations in the day-to-day business of exporting."[5]

In recognition of this imperative, the Federal Register notice publishing Proposed Cat. XI states that, "[i]n light of the revised regulation, the Department requests that those who still believe it captures commercial articles to provide specific examples of such articles that would be covered by model or nomenclature, rather than the general comment that the regulation would capture commercial articles."[6]

Garmin's GWX 7000 weather radar will be such a commercial item, as explained in these comments. It was developed exclusively for commercial aviation weather radar application, without military know-how, involvement, and with no government funding.

It is nevertheless important to note that certain commercial items will remain on the USML where they confer critical military advantages. Under Secretary Hirschhorn stated that the goal of ECR is "to revise the U.S. Munitions List so that its categories are more specific and list only

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[2] President Barack Obama, video remarks to BIS Update August 31, 2010, available at http://www.whitehouse.gov/the-press-office/2010/08/30/video-remarks-president-department-commerce-annual-export-controls-updat.

[3] Secretary of Defense Robert Gates, speech to Business Executives for National Security April 20, 2010, available at http://www.defense.gov/speeches/speech.aspx?speechid=1453.

[4] Secretary of Commerce Penny Pritzger, speech to BIS Update July 23, 2013 available at http://www.commerce.gov/news/secretary-speeches/2013/07/23/remarks-2013-update-conference-export-controls-and-policy.

[5] Under Secretary of Commerce Eric Hirschhorn, speech to BIS Update July 23, 2013, available at http://www.bis.doc.gov/index.php/policy-guidance/deemed-exports/guidelines-for-foreign-national-license-applications/103-about-bis/newsroom/speeches/speeches-2013/568-remarks-of-under-secretary-eric-l-hirschhorn-as-prepared-for-delivery-at-the-bis-update-conference-july-23-2013.

[6] 78 Fed. Reg. 45017, 45019 (July 25, 2013) available at http://www.gpo.gov/fdsys/pkg/FR-2013-07-25/html/2013-17556.htm.

those defense articles that are critical to maintaining a military or intelligence advantage or that otherwise warrant the types of controls in the ITAR."[7]

As Garmin noted in its comments to the Directorate of Defense Trade Controls ("DDTC"), the Garmin electronically steered weather radar does not confer a military advantage because it does not perform a military function; simple performance characteristics can be added to the description in Proposed Cat. XI(a)(3)(xii) to maintain USML control on electronically steerable phased array radar that confers a military advantage.

IV. Specific Performance Criteria Proposed that Exclude Certain Commercial Weather Radar from the Scope of Proposed Cat. XI(a)(3)(xii) and Designate Such Weather Radar on the CCL

Garmin proposes that the Directorate of Defense Trade Controls ("DDTC") add the following exclusion note to Proposed Cat. XI(a)(3)(xii):

> XI(a)(3)(xii) does not apply to airborne radar that meets each of the following:
>
> 1. Does not incorporate a beam solid angle controlled under Category XI(a)(3)(x);
> 2. Does not incorporate T/R[8] modules controlled under Category XI(c)(4);
> 3. Does not incorporate an antenna controlled under Category XI(c)(10);
> 4. Operates with T/R modules with a maximum peak power of 1 Watt per module;
> 5. Operates only within the following frequency bands:
> a. S Band: 2.7 – 2.9 GHz
> b. C Band: 5.35 – 5.47 GHz
> c. X Band: 9.3 – 9.5 GHz
> d. Ku Band: 15.5 – 15.7 GHz;
> 6. Operates with an average transmit power less than or equal to 250 Watts,
> 7. Does not operate with a null steer beam, and
> 8. Achieves an FAA certification authorization or will achieve an FAA certification authorization prior to use as standard weather radar for civil aircraft.

The above performance criteria are identical to the exclusion note Garmin has recommended that DDTC implement as an exclusion note from Proposed Cat. XI(a)(3)(xii).

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[7] Under Secretary of Commerce Eric Hirschhorn, speech to BIS Update July 23, 2013, available at http://www.bis.doc.gov/index.php/policy-guidance/deemed-exports/guidelines-for-foreign-national-license-applications/103-about-bis/newsroom/speeches/speeches-2013/568-remarks-of-under-secretary-eric-l-hirschhorn-as-prepared-for-delivery-at-the-bis-update-conference-july-23-2013.

[8] Transmit/Receive

Garmin engineers developed these proposed performance criteria from published sources without any access to classified information, classified technology, classified performance standards, or classified contracts.

V. Control Parameters and Licensing under the CCL

Garmin believes it is essential that electronically steered weather radar subject to the EAR have reasonable procedures for prompt one-for-one replacement and servicing of weather radar for an aircraft, especially for aircraft on the ground ("AOG").

Under the current EAR, "meteorological (weather) radar" is excluded from ECCN 6A008, and ECCN 6A998.a captures airborne radar equipment and specially designed components therefor. If BIS retains jurisdiction, under the current proposed rule the above classification for civil weather radar would not change. Although Garmin believes that all civil meteorological radar should be controlled the same, we understand that the government has some concerns over electronically steerable radar. Therefore, if this is the case, Garmin urges BIS and the Administration to consider creation of a control for the commodity under ECCN 0A521 with authority to use License Exception RPL. This would apply to electronically steered radar that scans in elevation and azimuth but is excluded from Proposed Cat. XI(a)(3)(xii) via the exclusion note Garmin has recommended to DDTC in a public comment to Proposed Cat XI. With the use of ECCN 0A521 the government retains visibility and control while keeping to the spirit of Executive Orders 12866 and 13563 concerning public safety.

A. 600 Series Is Inappropriate for the Completed Weather Radar

A 600 series control under the CCL would not be appropriate for completed electronically steered weather radar because License Exception STA will not be available and License Exception RPL is not authorized. License Exception STA will not be available under a 600 series control because weather radar will be sold to private sector OEMs, private sector airlines, and privately-owned general aviation aircraft. Such weather radar typically will not be exported for ultimate use by a government because the radar must be for aircraft certified by the FAA. License Exception RPL is not authorized under a typical 600 series control.

B. License Exception RPL is Suitable for Completed Radar if Controlled under ECCN 0A521

If the Administration chooses to control electronically steered radar released from Proposed Cat. XI(a)(3)(xii), it may to do so as an innovative commodity under ECCN 0A512. License Exception RPL should be authorized for such weather radar in Supplement No. 5 to Part 774 along with the scope of license requirements. BIS has discretion to add appropriate License Exceptions for related commodities at the fifth column of Supplement No. 5 to Part 774 that provides for such License Exceptions.

Under FAA regulations, weather radar must be in operational order before an aircraft may takeoff. For that reason, the failure of mechanically steered weather radar prevents commercial aircraft from flying. i.e. causes aircraft grounding (AOG) events.. Electronically steered weather

radar will seldom cause an aircraft to remain on the ground abroad because electronically steered weather radar has no moving parts and is far more reliable than mechanically steered weather radar. Nonetheless, it is prudent to provide for efficient, cautious means to replace electronically steered weather radar promptly in an AOG on a one-for-one basis for weather radar legally exported or reexported. Use of License Exception RPL to replace the worn or defective radar and return it promptly to the United States or other country BIS authorizes for export will enhance the national security and prevent diversion and reverse engineering. We note that under License Exception RPL, no commodities may be held abroad as spares or equipment for future use. Garmin believes that BIS need not modify License Exception RPL[9] and need only add this authority to the fifth column of Supplement No. 5 to Part 774 along with a description of electronically steered weather radar subject to the EAR.

C. License review policy

Electronically steered weather radar should be reviewed under a general policy of approval for commercial aircraft and general aviation aircraft. Reviews of license applications for use on other aircraft should be on the merits as BIS applies that standard.

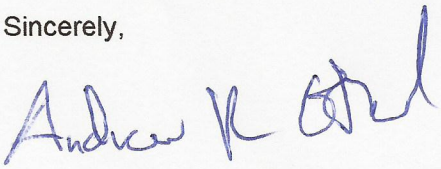
VI. Conclusion

Retention of EAR jurisdiction over weather radar without military functions will substantially improve passenger air safety and will in no way compromise national security. Proposed Cat. XI(a)(3)(xii) as written will inhibit innovation and the development of radar that will improve detection of severe weather. Appropriate control mechanisms under the CCL will also enhance the U.S. industrial base to the benefit of the national security.

Electronically steered weather radar should be subject to the EAR. Should the Administration determine to exclude weather radar from Proposed Cat. XI, we suggest BIS either create controls under ECCN 0A521 or leave the USML-excluded electronically steered weather radar under ECCN 6A998.

Please feel free to contact us if you have any comments or questions.

Sincerely,



Andrew R. Etkind

Vice President and General Counsel

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[9] EAR Section 740.10(a) and (b).

Attachment A

Features at a glance.

- Fully integrated glass flight deck technology for crew-flown Part 25 business jets*
- Scalable for installation in a wide range of aircraft: From light jets to super-midsize and larger models
- Features one of the most intuitive pilot/vehicle interface offered in any business jet avionics system
- Supports multiple display and touchscreen Vehicle Management System control unit configurations
- Provides enhanced situational awareness through Garmin SVT™ synthetic vision technology
- Offers global operations capability with NextGen/SESAR growth provisions
- WAAS technology enables GPS-guided LPV/RNP "glidepath" approaches to ILS-comparable minimums – without reliance upon ground-based navaids
- Multi-frame PFD and MFD displays place more – and more usable – graphical data at the pilots' fingertips
- Supports "paperless flight deck" concept with display capability for electronic charts, flight manual data, and more
- Growth-oriented architecture allows many future technologies to be accommodated via software updates
- Voice/data communications supported by digital radios and satellite datalink capability
- Graphical synoptics displays help simplify systems control, monitoring and troubleshooting
- Advanced weather detection and avoidance technology
- Optional Iridium-based worldwide satellite weather datalink access
- ADS-B enhanced active and passive traffic surveillance with TCAS II/ACAS II technology
- Multiple Vehicle Management System touchscreen controllers enable each crew member to have full operational accessibility
- System reliability backed by industry's top-ranked Garmin Avionics Support network

*Specifications and descriptions are preliminary and subject to change without notice. The breakdown of which features will be standard and which will be optional will vary depending upon the specific implementation chosen by the airframe OEM.

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0910 MKD-10214-00

Today, a new jet age begins.

Introducing

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Integrated glass flight deck technology for a whole new echelon of business jets.

Bigger jets. Faster jets. Part 25 transport category jets. Now, they're all becoming Garmin jets – with the introduction of our new G5000 digital avionics suite.

Designed specifically for the operational environment of today's most sophisticated crew-flown turbine aircraft, the G5000 system brings fresh thinking, vision, sensibility and leadership to a segment of the market that's clearly overdue for all of the above.

On everything from light and midsize jets to super-midsize and larger models, this fully scalable Garmin system supports an unprecedented range of flight deck configurations and capabilities. New Vehicle Management units with infrared touchscreen interface replace a myriad of knobs, buttons and switches scattered throughout the cockpit – bringing centralized systems management and input right to the pilots' fingertips. The G5000's streamlined pilot/vehicle interface offers jet-fast access to more data, controls and sensors, requiring fewer keystrokes to sequence through menus and pages. As a result, you're looking at one of the most efficient, most intuitive electronic flight deck systems ever designed for high-end business jet aircraft.

Multi-tasking panoramic displays.

The G5000's sleek WXGA high-resolution displays (available in 12- or 14-inch diagonal widescreen formats) feature multi-frame capability on both the PFDs and MFDs – thus vastly expanding the amount of graphical information that can be viewed concurrently. With this pilot-selectable functionality, a three-display flight deck can essentially become a six-display presentation – to meet the demands of those high-workload phases of flight. Supplementing this multi-frame capability, selectable inset windows can accommodate additional smaller views of traffic, terrain/obstacles, flight path mapping, video inputs, and more*.

For enhanced attitude/heading reference, Garmin's SVT™ Synthetic Vision Technology provides a 3-D "virtual reality" topographic landscape on the G5000 PFD displays – showing airports, runways, obstacles, towers, traffic, and other visual aids to situational awareness. A dimensional Pathway view – also called "highway in the sky" – displays the selected route of flight by sequencing a series of windows or "flying rectangles" on the display. With this technology, pilots can more easily visualize terminal and approach procedures, course intercepts, enroute legs and other transitional stages of flight.

A clear path to global NextGen operations.

Like all Garmin integrated systems, the G5000's architecture is designed with future growth and technologies in mind. Built-in provisions will enable many of these capabilities to be added or updated via software – oftentimes precluding the need for hardware upgrades or replacement as tomorrow's ATC system requirements evolve.

Designed to satisfy the global operational requirements of emerging NextGen (Next Generation for U.S. airspace) and SESAR (Single European Sky ATM Research) initiatives– as well as similar Air Traffic Modernization programs now in development around the world – Garmin's G5000 system offers a clear and all-encompassing window on the future. Active and passive traffic surveillance functionality using advanced TCAS II technology and featuring Garmin ADS-B target correlation and tracking will provide state-of-the-art traffic management and airspace monitoring. Plus, worldwide weather datalinks, graphical system synoptics, crew alerting and flight parameter reporting, WAAS-enabled self-guided approaches, and much more will be integrated with the G5000's core comm/nav/ident system avionics.

Further highlighting the G5000's advanced multi-sensor FMS features will be the ability to calculate aircraft-specific performance data for all flight regimes – thus minimizing the time spent trying to locate and interpolate such information from the aircraft flight manuals.

All in all, the new G5000 system promises to leverage Garmin experience, technology, innovation and top-ranked customer support to bring a whole new level of flight deck performance to Part 25 business aircraft.

Garmin G5000. It's a new day, a new age, a new flight experience. And for two-pilot jets, it's one easy choice. To find out more, go to www.garmin.com.

*Suggested applications may require optional equipment, sold separately.