

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

N JO 7110.639

Effective Date:
October 24, 2013

Cancellation Date:
July 24, 2014

SUBJ: Global Navigation Satellite System (GNSS)-Equipped Aircraft Operating on Random Routes

- 1. Purpose of This Notice.** This notice amends procedures contained within Federal Aviation Administration (FAA) Order JO 7110.65, Air Traffic Control, and introduces procedures and phraseology applicable to GNSS-equipped aircraft operating on random routes. This notice cancels and replaces N JO 7110.613, Exception for GNSS-Equipped Departures.
- 2. Audience.** This notice applies to the following Air Traffic Organization (ATO) service units: En Route and Oceanic, Terminal, Mission Support, and System Operations; and all associated air traffic control facilities.
- 3. Where Can I Find This Notice?** This notice is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/ and on the air traffic publications Web site at http://www.faa.gov/air_traffic/publications/.
- 4. Explanation of Changes.** This change implements revised air traffic control (ATC) procedures for GNSS-equipped aircraft operating on area navigation (RNAV) air traffic service (ATS) routes and on random point-to-point and random impromptu routes in airspace in which ATC procedures are applied, excluding oceanic airspace. Expanded explanation of GNSS equipment suffixes and random routes is provided with references added. Additionally, this change incorporates use of the term GNSS in place of GPS for space-based positioning and navigation systems where /G equipage is required.
- 5. Procedures.** Amend the following paragraphs in FAA Order JO 7110.65, to read as follows:

2-3-8. AIRCRAFT EQUIPMENT SUFFIX

Title thru a, no change.

- b. GNSS-equipped aircraft:
 1. Have a NAS suffix of /G, /L, /S, and /V.
 2. May be determined by executing an ICAO flight plan readout and verifying a filed "G" in the ICAO equipment list.
 3. May be determined by verifying with the pilot that the aircraft is GNSS-equipped.

Subparagraphs b and c, reletter as c and d.

NOTE-

/H is for ATC use only. Users are not authorized to file this suffix.

2-3-10. TABLE 2-3-10 AIRCRAFT EQUIPMENT SUFFIXES

TBL 2-3-10
Aircraft Equipment Suffixes

	Navigation Capability	Transponder Capability	Suffix
RVSM	Any	Failed transponder or Failed Mode C capability	/H
	No GNSS, No RNAV	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
No RVSM	No DME	No transponder	/X
		Transponder with no Mode C	/T
		Transponder with Mode C	/U
	DME	No transponder	/D
		Transponder with no Mode C	/B
		Transponder with Mode C	/A
	TACAN	No transponder	/M
		Transponder with no Mode C	/N
		Transponder with Mode C	/P
	RNAV, No GNSS	No transponder	/Y
		Transponder with no Mode C	/C
		Transponder with Mode C	/I
	GNSS	No transponder	/V
		Transponder with no Mode C	/S
		Transponder with Mode C	/G

4-1-2. EXCEPTIONS

Altitude and distance limitations need not be applied when any of the following conditions are met:

- a. Routing is initiated by ATC or requested by the pilot and radar monitoring is provided.

EXCEPTION-

GNSS equipped aircraft /G, /L, /S, and /V not on a random impromptu route.

NOTE-

1. *Except for GNSS-equipped aircraft /G, /L, /S, and /V, not on a random impromptu route, Paragraph 5-5-1, Application, requires radar separation be provided to RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.*

Delete Note 2. Note 3, renumber to Note 2.

REFERENCE-

FAAO JO 7110.65, Para 2-1-3 Procedural Preference.

FAAO JO 7110.65, Para 4-4-2, Route Structure Transitions.

FAAO JO 7110.65, Para 5-1-10, Deviation Advisories.

FAAO JO 7110.65, Para 5-5-1, Application.

FAAO JO 7110.65, Para 6-5-4, Minima Along Other Than Established Airways or Routes.

AIM, Para 5-1-8c, Direct Flights.

AIM, Para 5-1-8d, Area Navigation (RNAV).

P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].

No further changes to paragraph.

4-3-2. DEPARTURE CLEARANCES

Title thru c4(a), no change.

NOTE-

Departure procedure descriptive text contained within parentheses (for example, “Jimmy One (RNAV) Departure”) is not included in departure clearance phraseology.

Phraseology, no change.

EXAMPLE-

“Stroudsburg One Departure.”

“Stroudsburg One Departure, Sparta Transition.”

NOTE, c4(b), and Phraseology, no change.

EXAMPLE-

“Stroudsburg One Departure, except cross Quaker at five thousand. I say again, cross Quaker at five thousand.”

“Astoria Two Departure, except cross Astor waypoint at six thousand. I say again, cross Astor waypoint at six thousand.”

c4(c) and Phraseology, no change.

EXAMPLE–

“Stroudsburg One Departure. Cross Jersey intersection at four thousand. Cross Range intersection at six thousand.”
“Engle Two departure. Cross Pilim waypoint at or above five thousand. Cross Engle waypoint at or above seven thousand. Cross Gorge waypoint at niner thousand.”

No further changes to paragraph.

4-3-3. ABBREVIATED DEPARTURE CLEARANCE

Title through d, Phraseology, no change.

EXAMPLE–

“Cleared to Reynolds Airport; David Two Departure, Kingham Transition; then, as filed. Maintain niner thousand. Expect flight level four one zero, one zero minutes after departure.”

“Cleared to Reynolds Airport as filed. Maintain niner thousand. Expect flight level four one zero, one zero minutes after departure.”

No further changes to paragraph.

4-4-1. ROUTE USE

Title thru a, no change.

PHRASEOLOGY-

VIA:

Victor (color) (airway number)(the word Romeo when RNAV for existing Alaska routes),

or

J (route number) (the word Romeo when RNAV for existing Alaska routes),

or

Q (route number),

or

Tango (route number)

or

SUBSTITUTE (ATS route) FROM (fix) to (fix),

or

IR (route number).

CROSS/JOIN VICTOR (color) (airway number), (number of miles) MILES (direction) OF (fix).

- b. Radials, courses, azimuths to or from NAVAIDs.

PHRASEOLOGY-

VIA;

(name of NAVAID) (specified)

RADIAL/COURSE/AZIMUTH,

or

RADIALS OF (ATS route) AND (ATS route).

- c. Random routes.

1. When not being radar monitored, GNSS-equipped RNAV aircraft on random RNAV routes must be cleared via or reported to be established on point-to-point route.

(a) The points must be published NAVAIDs, waypoints, fixes, or airports recallable from the aircraft's navigation database. The points must be displayed on controller video maps or depicted on the controller chart displayed at the control position. When applying nonradar separation, the maximum distance between points must not exceed 500 miles.

(b) Protect 4 miles either side of the route centerline.

(c) Assigned altitudes must be at or above the highest MIA along the projected route segment being flown, including the protected airspace of that route segment.

2. Impromptu.

PHRASEOLOGY–

DIRECT (name of NAVAID/waypoint/fix/airport).

NOTE–

A random impromptu routing is a direct course initiated by ATC or requested by the pilot during flight. Aircraft are cleared from their present position to a NAVAID, waypoint, fix, or airport.

3. Point-to-Point.

PHRASEOLOGY–

After (fix) proceed direct (fix).

NOTE–

A point-to-point route segment begins and ends with a published NAVAID, waypoint, fix, or airport.

- d. DME arcs of NAVAIDS.
- e. Radials, courses, azimuths, and headings of departure or arrival routes.
- f. SIDs/STARs.
- g. Vectors.
- h. Fixes defined in terms of degree-distance from NAVAIDs for special military operations.
- i. Courses, azimuths, bearings, quadrants, or radials within a radius of a NAVAID.

PHRASEOLOGY–

CLEARED TO FLY (general direction from NAVAID) OF (NAVAID name and type) BETWEEN (specified) COURSES TO/BEARINGS FROM/RADIALS (NAVAID name when a NDB) WITHIN (number of miles) MILE RADIUS,
or

CLEARED TO FLY (specified) QUADRANT OF (NAVAID name and type) WITHIN (number of miles) MILE RADIUS.

EXAMPLE–

1. “Cleared to fly east of Allentown VORTAC between the zero four five and the one three five radials within four zero mile radius.”
2. “Cleared to fly east of Crystal Lake radio beacon between the two two five and the three one five courses to Crystal Lake within three zero mile radius.”
3. “Cleared to fly northeast quadrant of Philipsburg VORTAC within four zero mile radius.”

Subparagraph i, reletter as j. Delete subparagraph currently lettered j.

REFERENCE-

FAAO JO 7110.65, Para 2-3-8 Aircraft Equipment Suffix.

FAAO JO 7110.65, Para 2-5-3 NAVAID Fixes.

FAAO JO 7110.65, Para 4-1-2, Exceptions.

FAAO JO 7110.65, Para 5-5-1, Application.

FAAO JO 7110.65, Para 6-5-4, Minima Along Other Than Established Airways or Routes.

P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].

No further changes to paragraph.

4-4-2. ROUTE STRUCTURE TRANSITIONS

To effect transition within or between route structures, clear an aircraft by one or more of the following methods, based on NAVAIDs or RNAV:

Subparagraph a through f, no change.

g. Clear RNAV aircraft between designated or established ATS routes via random RNAV routes to a NAVAID, waypoint, or fix on the new route.

h. Provide radar monitoring to RNAV equipped aircraft transitioning via random RNAV routes.

EXCEPTION. GNSS equipped aircraft /G, /L, /S, and /V not on a random impromptu route.

REFERENCE-

FAAO JO 7110.65, Para 4-1-2, Exceptions.

FAAO JO 7110.65, Para 4-4-1, Route Use.

FAAO JO 7110.65, Para 5-5-1, Application.

P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].

4-4-4. ALTERNATIVE ROUTES

When any part of an airway or route is unusable because of NAVAID status, clear aircraft that are not RNAV capable via one of the following alternative routes:

No further changes to paragraph.

4-7-1. CLEARANCE INFORMATION

Title thru b, EXAMPLE, no change.

NOTE-

1. *If a civil pilot does not wish to use a STAR issued in an ATC clearance or any other STAR published for that location, the pilot is expected to advise ATC.*

2. *Arrival procedure descriptive text contained within parentheses (for example, "Devine One (RNAV) Arrival") are not included in arrival clearance phraseology.*

EXAMPLE-

"Bayview Three Arrival, Helen Transition, maintain Flight Level Three Three Zero."

"Descend via the Civit One Arrival."

"Descend via the Lendy One Arrival, Runway 22 left."

"Cross JCT at Flight Level Two Four Zero."

"Descend via the Coast Two Arrival."

"Civit One Arrival, Descend and Maintain Flight Level Two Four Zero."

No further changes to paragraph.

5-1-10. DEVIATION ADVISORIES

Inform an aircraft when it is observed in a position and on a track, which will obviously cause the aircraft to deviate from its protected airspace area. If necessary, help the aircraft return to the assigned protected airspace.

NOTE-

1. RNAV ATS routes have a width of 8 miles and laterally protected airspace of 4 miles on each side of the route centerline.
2. Navigation system performance requirements for operations on RNAV ATS routes require the aircraft system be capable of remaining within 2 miles of the route centerline. Aircraft approaching this limit may be experiencing a navigation system error or failure.

REFERENCE-

FAAO JO 7110.65, Para 4-2-5, Route or Altitude Amendments.

FAAO JO 7110.65, Para 7-9-3, Methods.

FAAO 7400.2, Para 20-5-3. Lateral Protected Airspace Criteria for RNAV En Route Segments.

AC90-100A, U.S. Terminal and En Route Area Navigation (RNAV) Operations, Para 8a. Navigation System Accuracy.

No further changes to paragraph.

5-5-1. APPLICATION

- a. Radar separation must be applied to all RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

EXCEPTION. GNSS equipped aircraft /G, /L, /S, and /V not on a random impromptu route.

REFERENCE-

FAAO JO 7110.5, Para 2-3-8, Aircraft Equipment Suffixes.

FAAO JO 7110.5, TBL 2-3-10, Aircraft Equipment Suffixes.

b thru b3(e), no change.

FAAO JO 7110.65, Para 4-4-1, Route Use.

AIM, Para 5-1-8d., Area Navigation (RNAV).

AIM, Para 5-3-4a.3, Area Navigation (RNAV) Routes.

P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].

P/CG Term - Global Positioning Satellite/ Wide Area Augmentation Minimum En Route IFR Altitude (GPS/WAAS MEA).

P/CG Term - Parallel Offset Route.

AC 90-101A, U.S. Terminal and En Route Area Navigation (RNAV) Operations, Para 8a, Navigation System Accuracy.

6-4-3. MINIMA ON OPPOSITE COURSES

Title thru d, no change.

NOTE-

Except for GNSS-equipped aircraft /G, /L, /S, and /V not on a random impromptu route, Paragraph 5-5-1, Application, requires radar separation be provided to RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

6-5-4. MINIMA ALONG OTHER THAN ESTABLISHED AIRWAYS OR ROUTES

Title thru a3, no change.

NOTE-

Except for GNSS-equipped aircraft /G, /L, /S, and /V not on a random impromptu route, Paragraph 5-5-1, Application,

requires radar separation be provided to RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

REFERENCE-

FAAO JO 7110.65, Para 4-4-2, Route Structure Transitions.

FAAO JO 7110.65, Para 5-5-1, Application.

P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].

4. GNSS-equipped RNAV aircraft provided non-radar separation on random RNAV routes must be cleared via or reported to be established on point-to-point route segments.

(a) The points must be published NAVAIDs, waypoints, fixes, or airports recallable from the aircraft's navigation database. The points must be displayed on controller video maps or depicted on the controller chart displayed at the control position. The maximum distance between points must not exceed 500 miles.

(b) Protect 4 miles either side of the route centerline.

(c) Assigned altitudes must be at or above the highest MIA along the projected route segment being flown, including the protected airspace of that route segment.

(d) When the GNSS aircraft is being provided radar service and is transitioning to non-radar airspace, provide clearance direct to the named point in non-radar airspace in accordance with subparagraphs a4(a) through (c).

EXAMPLE-

A pilot has filed a point-to-point route from XYZ to ABC at 13,000 feet. Departure procedures from the originating airport place the aircraft a significant distance from XYZ; however, the aircraft can establish itself along the route segment from XYZ to ABC. Determine when the pilot is established on the point-to-point route segment and at an altitude, which meets or exceeds the highest MVA/MIA projected along the route of flight, then issue a clearance. "Verify when you are established on the XYZ to ABC route segment at or above 6,000 feet."

REFERENCE-

FAAO JO 7110.65, Para 4-4-2, Route Structure Transitions.

FAAO JO 7110.65, Para 5-5-1, Application.

No further changes to paragraph.

6-5-5. RNAV MINIMA - DIVERGING/CROSSING COURSES

Title thru b, no change.

NOTE-

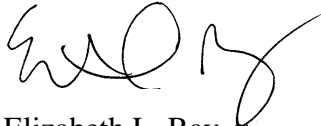
Except for GNSS-equipped aircraft /G, /L, /S, and /N not on a random impromptu route, Paragraph 5-5-1, Application, requires radar separation be provided to RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

6. Distribution. This notice is distributed to the following ATO service units: Terminal, En Route and Oceanic, System Operations, and Mission Support; the Office of ATO Safety and Technical Training; the Air Traffic Safety Oversight Service; the William J. Hughes Technical Center; and the Mike Monroney Aeronautical Center.

7. Safety Management System. Since December 2003, non-radar GNSS operations have been conducted within the Anchorage Air Route Traffic Control Center (ARTCC) domestic controlled airspace. Initially, a waiver was authorized to support GNSS-equipped aircraft transitioning from the en route structure to airports with Global Positioning System (GPS) instrument approaches and from airports outside of radar coverage to the en route structure. Based on the experience gained

through the application of the waiver, N JO 7110.491, Random Point-to-Point GPS RNAV Routes within the Anchorage Air Route Traffic Control Center (ZAN) Controlled Airspace, Excluding Oceanic Airspace, effective October 1, 2008, was implemented to support the use of GNSS routes for properly-equipped aircraft operating on point-to-point RNAV routes within Anchorage ARTCC-controlled airspace, excluding oceanic airspace, regardless of ATC surveillance coverage.

Subsequently, based on additional risk analysis and continued operational experience in Alaska, it has been determined that similar provisions can be safely implemented throughout the National Airspace System.



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9/25/13
Date Signed