

# NOTICE

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

N JO 7110.724

**Effective Date:**  
Oct 11, 2016

**Cancellation Date:**  
April 27, 2017

**SUBJ:** 5-2-9 UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK

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- 1. Purpose of This Notice.** This notice amends procedures contained within Federal Aviation Administration (FAA) Order 7110.65W, Air Traffic Control, and introduces Unmanned Aircraft Systems (UAS) lost link procedures.
- 2. Audience.** This notice applies to the Air Traffic Organization (ATO) service units: Air Traffic Services, Mission Support Services, and System Operations; Department of Defense (DOD) air traffic facilities, and all associated Terminal, En route, and Federal Contracted 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/](https://employees.faa.gov/tools_resources/orders_notices/) and on the air traffic publications Web site at [http://www.faa.gov/air\\_traffic/publications/](http://www.faa.gov/air_traffic/publications/).
- 4. Cancellation.** This notice expires on April 27, 2017.
- 5. Explanation of Policy Change.** This notice adds a new paragraph to Chapter 5. Radar, Section 2. Beacon Systems titled Unmanned Aircraft Systems (UAS) Lost Link. This notice authorizes the exclusive use of non-discrete beacon code 7400 for lost link conditions of UAS. It also provides guidance for the air traffic controller on how to handle the lost link situation.
- 6. Distribution.** This notice is distributed to the following ATO service units: Air Traffic Services, Mission Support Services, and System Operations, and Safety and Technical Training; the Air Traffic Safety Oversight Service; the William J. Hughes Technical Center; and the Mike Monroney Aeronautical Center.
- 7. Background.** Unmanned Aircraft Systems (UAS) are unique as they are operated through commands sent via line of sight, relayed by satellite relay, or by responding to pre-set programming in the on-board computer. There are two components to lost link: one is the uplink that transmits command and control (C2) instructions to the aircraft; the second is the downlink which relays the operation/status of onboard systems within the aircraft to the ground control station. If either link is disabled or malfunctions, the result is defined as "lost link," and some aircraft transponders will automatically reset to code 7400, execute a pre-programmed flight profile and controllers will react accordingly. NAS Automation changes have been made to all NAS platforms to recognize the Mode 3 7400 Code. Upon this introduction to the NAS, not all UAS platforms are adapted for this code, some will still Squawk Mode 3 7600, therefore ATC personnel should continue to treat each situation as a Lost Link and continue existing procedures.

## **8. Action.**

Add FAA Order JO 7110.65, paragraph 5-2-9 to read as follows:

### **5-2-9 UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK**

Code 7400 may be displayed by unmanned aircraft systems (UAS) when the control link between the aircraft and the pilot is lost. Lost link procedures are programmed into the flight management system and associated with the flight plan being flown.

When you observe a Code 7400 display, do the following:

- a. Determine the lost link procedure, as outlined in the Special Airworthiness Certificate or Certificate of Waiver or Authorization (COA).
- b. Coordinate, as required, to allow UAS to execute the lost link procedure.
- c. Advise Front Line Manager (FLM), when feasible, so the event can be documented.
- d. If you observe or are informed by the PIC that the UAS is deviating from the programmed Lost Link procedure, or is encountering another anomaly, treat the situation in accordance with FAA JO 7110.65 Chapter 10, Section 1, Para 10-1-1(c).

#### ***NOTE 1-***

The available lost link procedure should, at a minimum, include lost link route of flight, lost link orbit points, lost link altitudes, communications procedures and preplanned flight termination points if the event recovery of the UAS is deemed unfeasible.

#### ***NOTE 2-***

Each lost link procedure may differ and is dependent upon airframe and operation. These items are contained in the flight's Certificate of Authorization or Waiver (COA) and must be made available to ATC personnel in their simplest form at positions responsible for Unmanned Aircraft (UAs).

#### ***NOTE 3-***

Some UA airframes (Global Hawk, RQ-4) will not be programmed upon the NAS Automation roll out to squawk 7400. These airframes will continue to squawk 7600 should a lost link occur. The ATC Specialist must apply the same procedures described above.

Renumber 5-2-9 thru 5-2-24 to 5-2-10 thru 5-2-25.

## **9. Definitions.**

**Flight Termination** - The intentional and deliberate process of terminating the flight of a UA in the event of an unrecoverable lost link, loss of control, or other failure that compromises the safety of flight.

Lost Link – Loss of command and control link between the control station and aircraft. There are two types of links:

- Uplink which transmits command instructions to the aircraft, and
- Downlink which transmits the status of the aircraft and provides situational awareness to the pilot.

Lost Link Procedure - Preprogrammed or predetermined mitigations to ensure the continued safe operation of the UA in the event of a lost link (LL) In the event positive link cannot be established, flight termination must be implemented.

**10. Safety Management System.** This notice provides information to ATO personnel of the NAS Automation changes related to the display of Mode 3 Code 7400 as an indication of a UA Lost Link Status. Procedural actions are unchanged from the current actions taken when a UA Mode 3 Code 7600 is observed. These procedures and definitions are currently published in FAA JO 7200.23 or are taken from FAA Order 8900.1, Flight Safety Information Management System, Volume 16 Unmanned Aircraft Systems. This guidance has no positive or negative effect on safety risk and is not intended as a mitigation to an existing hazard as highlighted in the Safety Management System Manual Version 4.0, Paragraph 4.2.3. No safety documentation is required.

Original signed by Heather Hemdal

October 11, 2016

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Heather Hemdal  
 Director, Air Traffic Procedures  
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Date Signed