



September 14, 2016

# Next Generation Air Space Control - Ensuring Air Force Compliance by January 1, 2020

Subcommittee on Seapower and Projection Forces, Committee on Armed  
Services, United States House of Representatives, One Hundred  
Fourteenth Congress, Second Session

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## HEARING CONTENTS:

### Witnesses

Timothy Fay [\[view PDF\]](#)

Director of Strategic Plans, U.S. Air Force, Office of the Deputy Chief of Staff  
for Strategic Plans and Requirements, HQ USAF

Michael E. Fortney [\[view PDF\]](#)

Vice Commander, U.S. Air Force, Air Force Global Strike Command

David Nahom [\[view PDF\]](#)

Deputy Director, Plans and Programs, U.S. Air Force, Headquarters Air  
Combat Command

Jon Thomas [\[view PDF\]](#)

Director of Strategic Plans, Requirements and Programs, U.S. Air Force,  
Headquarters Air Mobility Command

*\* Please Note: External links included in this compilation were functional at the time of its  
creation but are not maintained thereafter.*

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Naval Postgraduate School, Center for Homeland Defense and Security.*

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**Available Webcast(s)\*:**

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**Compiled From\*:**

<https://armedservices.house.gov/legislation/hearings/next-generation-air-space-control-ensuring-air-force-compliance-january-1-2020>

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## ***ADS-B Requirement Prioritization***

The United States Air Force like other aircraft operators, faces the 1 January 2020 mandate by the FAA to use ADS-B Out in a significant portion of the National Airspace System. Similar standards have been instituted in Europe, creating significant pressure for installation by 7 June 2020. As an Air Force, the ability to project combat power and maintain global reach around the world depends on access to this airspace. Any Air Force aircraft that is not equipped with ADS-B Out risk being excluded or their operations restricted, from areas where mixed civil and military aircraft are operating. While deviations or unconditioned clearances may be granted on case-by-case basis, these airspace restrictions may prevent USAF from enjoying the same ready access to airspace. Not meeting these airspace requirements will not diminish our combat capability but could diminish our ability to operate with efficiency and freedom.

Even if resources were available for all ADS-B Out installations, only approximately 70% of DoD aircraft could be equipped with ADS-B Out by January 1, 2020. The remaining aircraft (approximately 30%) would meet the ADS-B Out requirement no later than 2028. Accelerating the current depot schedule to modify aircraft assumes the AF would be able to stand down an increased number of platforms, which may not be operationally possible and could further increase the cost.

### ***Operational Impacts of Not Equipping***

In order to avoid the loss of access, the Air Force is taking great steps to ensure compliance with the ADS-B Out mandate. While the Air Force plans to have a fully compliant fleet, some aircraft will remain without ADS-B Out and will not be modified by the 2020 mandate. This is a result of both calculated risk and fiscal responsibility. Due to the differences among existing platform avionics architectures and new equipment, a systems engineering approach must be used to determine the most cost-effective solution to meet ADS-B Out requirements. The Air Force recognizes the operational impact and potential risk to our overall readiness by not equipping and is addressing solutions to mitigate this risk to the maximum extent possible. Prioritized aircraft modification schedules have been developed consistent with available funding. Furthermore, those upgrades have been combined with other aircraft modifications to reduce overall costs (for example, GPS M-Code and Mode 5 IFF installation) as well as ensuring new acquisition and procurement efforts address air traffic management compliance.

While the Air Force continues to develop responsible cost-effective solutions to managing and complying with the ADS-B Out mandate, consistent dialogue has been in place with the Federal Aviation Administration to ensure airspace access is not denied to our aircraft. The Air Force is working with the FAA to develop exemptions/accommodations to enable access for non-compliant Air Force, DoD, and Allied aircraft. We are pursuing the same agreements with EuroControl, NATO, and in other regions and countries where Air Force and DoD frequently operate and transit. Similarly, we continue to address our concerns with the Operational Security aspects of ADS-B Out and the impact it poses to military operations.

### ***Current Exemption/Waiver Efforts***

There is a provision within 14 CFR section 91.225 that allows non-equipped aircraft to deviate from the ADS-B Out equipment requirement. This rule requires non-equipped aircraft to notify FAA ATC one hour prior to proposed operation, and ATC may authorize the operation considering workload and potential effect on other aircraft. The FAA can also consider requests

for an exemption to the requirement, provided the operations meet an equivalent level of safety and the exemption would be in the public's interest.

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### ***Current Plans to Modify Aircraft***

#### **Rapid Global Mobility**

Our ability to project combat power anywhere on the globe depends on airspace access, and not meeting the ADS-B Out mandate threatens that access. We realize that we must prioritize these modifications based on mission needs and both national and global airspace requirements. We plan to have a fully compliant fleet, and the vast majority of our mobility aircraft will be modified by the 2020 mandate.

Due to our global mission requirements and the need to frequently transit saturated international airspace, modernizing our airlift aircraft is our highest priority. Currently our airlift fleet, consisting of C-5s, C-17s and C-130s, is projected to be 49 percent complete with ADS-B Out upgrades by the mandate per the FY 17 PB submission. However, our intent is to raise compliance to above 90 percent by partnering with the acquisition community to separate ADS-B Out from other modifications in order to accelerate compliance. Through this focused effort we have a roadmap to ensure our two hundred and twenty three C-17s and three hundred C-130s are fully compliant by the mandate. Modification of a smaller fleet, such as our fifty two C-5s,

will require more time as we sequence ADS-B Out components into other planned modernization programs upon which the ADS-B Out capability will rely. For any aircraft that will not meet the mandate we will request an exemption. We estimate our entire airlift fleet will be compliant by the end of 2020.

For our tanker fleet, as this committee is aware, we are at the beginning of a recapitalization effort that starts with the acquisition of the KC-46A Pegasus. All 179 aircraft will be fully compliant when delivered. The entire KC-135 fleet is also projected to be fully compliant since the modification for this aircraft only requires a software update. For the KC-10, as we look towards the eventual divestment of this airframe, we must balance completing necessary upgrades, such as ADS-B Out, and safeguarding taxpayer dollars. As part of this balance we have developed a plan to ensure a portion of our KC-10s complete modification prior to January 2020 and will request an exemption for those non-compliant aircraft which are planned to remain in service for shorter time periods after the 2020 mandate.

Finally I want to address our Operational Support and Executive Airlift fleet composed of C-21s, C-32As, C-37s, C-40s and the VC-25A, better known as Air Force One. As you know, this fleet consists of military versions of commercial derivative aircraft and we will capitalize on ADS-B Out modernization efforts within industry to expedite compliance of these aircraft. We plan to have all of these aircraft compliant by the mandate.

#### *Special Operations Forces*

For our Air Force Special Operations fleet, the AC, EC and MC-130J aircraft are tied to AMC's ADS-B Out compliance efforts and will follow similar modification profiles. For those that do not meet the mandate, we will request an exemption. For the 15 legacy MC-130H aircraft, AMC and AFSOC are working to address a combined solution to ensure compliance. Those aircraft that do not meet the mandate will require an exemption. Approximately half of AFSOC's CV-22s will be compliant by the January 2020 mandate; all 51 aircraft will be compliant by January of 2021. Finally, the Air Force will seek waivers for the AC-130U and AC-130W until the platforms retire in FY21 and FY22 respectively.

### Combat Air Forces

Integrating ADS-B Out capability within our Combat Air Forces is an important priority requiring efficient planning and modernization schedule that reduces excess costs and prevents delays in future warfighting capabilities. The Combat Air Force is funding ADS-B Out and Mode-5 to equip the majority of the aircraft that will remain in service after the 1 January 2020 mandate and fly in national and international airspace. Aircraft that we intend to retire before the mandate, or soon after, are not planned for modification. For some airframes, the technical solutions available to enable equipping them for ADS-B Out compliance are very expensive or not currently available. Due to the differences among existing platform avionics architectures and new equipment, a systems engineering approach must be used to determine the most cost-effective solution to meet ADS-B Out and Mode-5 requirements. The CAF recognizes the operational risk of not equipping and is addressing solutions to mitigate this risk to the maximum extent possible. Prioritized aircraft modification schedules have been developed consistent with available funding.

### Global Strike Command

The re-vitalization of our nuclear enterprise is one of the Air Force's top priorities. Unfortunately, due to this higher priority, Air Force Global Strike Command has been unable to fund the ADS-B Out program in the past. With funding expected in fiscal year 2018, Global Strike Command platforms will begin testing ADS-B Out upgrades in fiscal years 2019 and 2020, but no operational bombers will be compliant in time.

With this anticipated funding, only two B-1 and one B-2 test aircraft will be ADS-B Out modified prior to 1 Jan 2020. The remainder of the B-1 and B-2 fleets will be fully compliant by fiscal years 2023 and 2024, respectively.

Similarly, the plan for the B-52 includes combining ADS-B Out and military-required GPS M-code upgrades into a single modification. This combination is required because the B-52 needs a new GPS receiver in order to achieve ADS-B Out mandated accuracies. With fiscal year

2018 funding, only two B-52 test aircraft will be modified prior to the mandate. The remainder of the fleet will be compliant by fiscal year 2024.

Finally, all 38 of the non-Global Strike assigned UH-1Ns will have ADS-B Out installed by the required January 2020 mandate. ADS-B will not be installed on the 24 Global Strike-assigned UH-1Ns, because those platforms do not operate in airspace requiring ADS-B Out. In summary, higher nuclear enterprise priorities, coupled with previous year funding constraints, have placed us in the situation where most bombers will have restricted access to airspace starting in 2020. Without FAA accommodations to provide exemptions or waivers, our aircraft may be prohibited from Class A, B, and C airspace and flight above 10,000 feet MSL until compliance. The operational impacts of this would include restricted airspace access, sub-optimal routings, delayed missions, and increased fuel consumption.

### ***Summary***

The Air Force continues to evaluate all methods to ensure compliance in its fleet in order to meet current and future Next Generation Air Transportation System requirements, with the goal to minimize cost and maximize operational capabilities. While aircraft compliance and modernization efforts remain ongoing, the Air Force continues to work with our partners in the FAA, EuroControl, NATO, and other nations around the globe to ensure we are able to accomplish our mission.

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For our tanker fleet, as this committee is aware, we are at the beginning of a recapitalization effort that starts with the acquisition of the KC-46A Pegasus. All 179 aircraft will be fully compliant when delivered. The entire KC-135 fleet is also projected to be fully compliant since the modification for this aircraft only requires a software update. For the KC-10, as we look towards the eventual divestment of this airframe, we must balance completing necessary upgrades, such as ADS-B Out, and safeguarding taxpayer dollars. As part of this balance we have developed a plan to ensure a portion of our KC-10s complete modification prior to January 2020 and will request an exemption for those non-compliant aircraft which are planned to remain in service for shorter time periods after the 2020 mandate.

Finally I want to address our Operational Support and Executive Airlift fleet composed of C-21s, C-32As, C-37s, C-40s and the VC-25A, better known as Air Force One. As you know, this fleet consists of military versions of commercial derivative aircraft and we will capitalize on ADS-B Out modernization efforts within industry to expedite compliance of these aircraft. We plan to have all of these aircraft compliant by the mandate.

#### *Special Operations Forces*

For our Air Force Special Operations fleet, the AC, EC and MC-130J aircraft are tied to AMC's ADS-B Out compliance efforts and will follow similar modification profiles. For those that do not meet the mandate, we will request an exemption. For the 15 legacy MC-130H aircraft, AMC and AFSOC are working to address a combined solution to ensure compliance. Those aircraft that do not meet the mandate will require an exemption. Approximately half of AFSOC's CV-22s will be compliant by the January 2020 mandate; all 51 aircraft will be compliant by January of 2021. Finally, the Air Force will seek waivers for the AC-130U and AC-130W until the platforms retire in FY21 and FY22 respectively.

### Combat Air Forces

Integrating ADS-B Out capability within our Combat Air Forces is an important priority requiring efficient planning and modernization schedule that reduces excess costs and prevents delays in future warfighting capabilities. The Combat Air Force is funding ADS-B Out and Mode-5 to equip the majority of the aircraft that will remain in service after the 1 January 2020 mandate and fly in national and international airspace. Aircraft that we intend to retire before the mandate, or soon after, are not planned for modification. For some airframes, the technical solutions available to enable equipping them for ADS-B Out compliance are very expensive or not currently available. Due to the differences among existing platform avionics architectures and new equipment, a systems engineering approach must be used to determine the most cost-effective solution to meet ADS-B Out and Mode-5 requirements. The CAF recognizes the operational risk of not equipping and is addressing solutions to mitigate this risk to the maximum extent possible. Prioritized aircraft modification schedules have been developed consistent with available funding.

### Global Strike Command

The re-vitalization of our nuclear enterprise is one of the Air Force's top priorities. Unfortunately, due to this higher priority, Air Force Global Strike Command has been unable to fund the ADS-B Out program in the past. With funding expected in fiscal year 2018, Global Strike Command platforms will begin testing ADS-B Out upgrades in fiscal years 2019 and 2020, but no operational bombers will be compliant in time.

With this anticipated funding, only two B-1 and one B-2 test aircraft will be ADS-B Out modified prior to 1 Jan 2020. The remainder of the B-1 and B-2 fleets will be fully compliant by fiscal years 2023 and 2024, respectively.

Similarly, the plan for the B-52 includes combining ADS-B Out and military-required GPS M-code upgrades into a single modification. This combination is required because the B-52 needs a new GPS receiver in order to achieve ADS-B Out mandated accuracies. With fiscal year

2018 funding, only two B-52 test aircraft will be modified prior to the mandate. The remainder of the fleet will be compliant by fiscal year 2024.

Finally, all 38 of the non-Global Strike assigned UH-1Ns will have ADS-B Out installed by the required January 2020 mandate. ADS-B will not be installed on the 24 Global Strike-assigned UH-1Ns, because those platforms do not operate in airspace requiring ADS-B Out. In summary, higher nuclear enterprise priorities, coupled with previous year funding constraints, have placed us in the situation where most bombers will have restricted access to airspace starting in 2020. Without FAA accommodations to provide exemptions or waivers, our aircraft may be prohibited from Class A, B, and C airspace and flight above 10,000 feet MSL until compliance. The operational impacts of this would include restricted airspace access, sub-optimal routings, delayed missions, and increased fuel consumption.

### ***Summary***

The Air Force continues to evaluate all methods to ensure compliance in its fleet in order to meet current and future Next Generation Air Transportation System requirements, with the goal to minimize cost and maximize operational capabilities. While aircraft compliance and modernization efforts remain ongoing, the Air Force continues to work with our partners in the FAA, EuroControl, NATO, and other nations around the globe to ensure we are able to accomplish our mission.

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SUBCOMMITTEE ON SEAPOWER AND PROJECTION FORCES  
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DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE  
HOUSE ARMED SERVICES COMMITTEE  
SUBCOMMITTEE ON SEAPOWER AND PROJECTIONS FORCES  
U.S. HOUSE OF REPRESENTATIVES

September 14, 2016

SUBJECT: USAF Compliance with FAA Airspace Requirements in 2020

STATEMENT OF: Maj Gen Timothy Fay  
Director, Strategic Plans  
DCS/Strategic Plans and Requirements

Brig Gen Jon Thomas  
Director, Strategic Plans  
Air Mobility Command  
Scott AFB, IL

Maj Gen Michael E. Fortney  
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## ***Introduction***

Chairman Forbes, Ranking Member Courtney and distinguished members of the subcommittee, on behalf of Lieutenant General Holmes, Deputy Chief of Staff for Strategic Plans and Requirements, Headquarters United States Air Force, we would like to thank you for this opportunity to testify before the subcommittee today. As you know, the Air Force priorities are to balance today's readiness with future modernization, and in a time of fiscal austerity, committed to making every dollar count while conducting combat and combat support operations around the globe. As such, our Nation's Air Force must be focused on safety, compliance, and aircraft modernization in order to maintain our national security now and in the future.

## ***ADS-B Requirement Prioritization***

The United States Air Force like other aircraft operators, faces the 1 January 2020 mandate by the FAA to use ADS-B Out in a significant portion of the National Airspace System. Similar standards have been instituted in Europe, creating significant pressure for installation by 7 June 2020. As an Air Force, the ability to project combat power and maintain global reach around the world depends on access to this airspace. Any Air Force aircraft that is not equipped with ADS-B Out risk being excluded or their operations restricted, from areas where mixed civil and military aircraft are operating. While deviations or unconditioned clearances may be granted on case-by-case basis, these airspace restrictions may prevent USAF from enjoying the same ready access to airspace. Not meeting these airspace requirements will not diminish our combat capability but could diminish our ability to operate with efficiency and freedom.

Even if resources were available for all ADS-B Out installations, only approximately 70% of DoD aircraft could be equipped with ADS-B Out by January 1, 2020. The remaining aircraft (approximately 30%) would meet the ADS-B Out requirement no later than 2028. Accelerating the current depot schedule to modify aircraft assumes the AF would be able to stand down an increased number of platforms, which may not be operationally possible and could further increase the cost.

### ***Operational Impacts of Not Equipping***

In order to avoid the loss of access, the Air Force is taking great steps to ensure compliance with the ADS-B Out mandate. While the Air Force plans to have a fully compliant fleet, some aircraft will remain without ADS-B Out and will not be modified by the 2020 mandate. This is a result of both calculated risk and fiscal responsibility. Due to the differences among existing platform avionics architectures and new equipment, a systems engineering approach must be used to determine the most cost-effective solution to meet ADS-B Out requirements. The Air Force recognizes the operational impact and potential risk to our overall readiness by not equipping and is addressing solutions to mitigate this risk to the maximum extent possible. Prioritized aircraft modification schedules have been developed consistent with available funding. Furthermore, those upgrades have been combined with other aircraft modifications to reduce overall costs (for example, GPS M-Code and Mode 5 IFF installation) as well as ensuring new acquisition and procurement efforts address air traffic management compliance.

While the Air Force continues to develop responsible cost-effective solutions to managing and complying with the ADS-B Out mandate, consistent dialogue has been in place with the Federal Aviation Administration to ensure airspace access is not denied to our aircraft. The Air Force is working with the FAA to develop exemptions/accommodations to enable access for non-compliant Air Force, DoD, and Allied aircraft. We are pursuing the same agreements with EuroControl, NATO, and in other regions and countries where Air Force and DoD frequently operate and transit. Similarly, we continue to address our concerns with the Operational Security aspects of ADS-B Out and the impact it poses to military operations.

### ***Current Exemption/Waiver Efforts***

There is a provision within 14 CFR section 91.225 that allows non-equipped aircraft to deviate from the ADS-B Out equipment requirement. This rule requires non-equipped aircraft to notify FAA ATC one hour prior to proposed operation, and ATC may authorize the operation considering workload and potential effect on other aircraft. The FAA can also consider requests

for an exemption to the requirement, provided the operations meet an equivalent level of safety and the exemption would be in the public's interest.

The Air Force has submitted one petition for exemption under 14 CFR part 11 for the F-22 to delay the effective date of the rule from 2020 to 2025. The FAA has not adjudicated this request. The FAA requested a holistic strategy for the Air Force fleet due to their concerns over the potential implications to the NextGen airspace program. We are currently working with the FAA on a written agreement (MOU/A) that would guide our efforts over the next two years to prepare for the rule. This initiative will culminate in an agreement on how to ensure airspace access for those aircraft that will not be equipped by the deadline. The factors under consideration include specific locations and nature of operations, the potential integration of additional DoD radar sensors with the FAA, and development of a national framework for coordinating requests to operate that will be used to update local agreements.

### ***Current Plans to Modify Aircraft***

#### **Rapid Global Mobility**

Our ability to project combat power anywhere on the globe depends on airspace access, and not meeting the ADS-B Out mandate threatens that access. We realize that we must prioritize these modifications based on mission needs and both national and global airspace requirements. We plan to have a fully compliant fleet, and the vast majority of our mobility aircraft will be modified by the 2020 mandate.

Due to our global mission requirements and the need to frequently transit saturated international airspace, modernizing our airlift aircraft is our highest priority. Currently our airlift fleet, consisting of C-5s, C-17s and C-130s, is projected to be 49 percent complete with ADS-B Out upgrades by the mandate per the FY 17 PB submission. However, our intent is to raise compliance to above 90 percent by partnering with the acquisition community to separate ADS-B Out from other modifications in order to accelerate compliance. Through this focused effort we have a roadmap to ensure our two hundred and twenty three C-17s and three hundred C-130s are fully compliant by the mandate. Modification of a smaller fleet, such as our fifty two C-5s,

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