FAA STC ST02007LA

Installation of Honeywell Multi-Channel SATCOM 6000 System on Boeing 767-300 Series Aircraft

OVERVIEW

» FAA STC ST02007LA

Installation of Honeywell multi-channel SATCOM 6000 system accordance with Electronic Cable Specialists (ECS) master data list ECS-203976

YOUR NEEDS

STC ST02007LA provides the ability to enhance long range communication abilities by supporting on-board systems such as Automatic Dependent Surveillance (ADS) and international Aircraft Communications Addressing and Reporting System (ACARS), which are not available through HF.

YOUR BENEFITS

Following modification, SATCOM may be used to provide services including cockpit communications with administrative/operational personnel and governmental bodies, such as Air Traffic Services (ATS). The system is designed to ensure that communications for safety and regularity of flight are not delayed by the transmission and reception of other types of messages.

STC AIRCRAFT EFFECTIVITY

» Boeing 767-300 series aircraft

STC CONFIGURATIONS & LIMITATIONS

» **Configuration 1:** Multi- channel SATCOM installation
» **Configuration 2:** E9 rack access door installation
» **Configuration 3:** E12 rack access door installation
» **Configuration 4:** E9 rack installation

STC Limitations: SATCOM High-Gain Antenna (HGA) and diplexer/low-noise amplifier must be installed concurrently per Honeywell STC SA6086NM

PROJECT DESCRIPTION

The Honeywell SATCOM system is a mobile avionics communications system that provides continuous world-wide voice and data communications services to and from the aircraft via satellite. The Honeywell MCS-6000 SATCOM system supports five communication channels capable of simultaneous full duplex voice communications and one channel of data communications. The Honeywell SATCOM system accommodates the four categories of communications:

» Air Traffic Control (ATC)
» Aeronautical Operational Control (AOC)
» Aeronautical Administrative Communications (AAC)
» Aeronautical Passenger Communications (APC)

The Honeywell MCS-6000 SATCOM system consists of the following avionics:

» **Satellite Data Unit (SDU):** Packaged as an ARINC 600 6 MCU and provides the interface to all aircraft avionics and implements all functionality associated with modulation/demodulation, error correction, channel rate/frequency selection, and RF translation for three communication channels. The SDU manages the RF link protocols on the satellite side and provides the system interface with communication management avionics. The SDU interface to other aircraft avionics involves the exchange of ARINC 429 and discrete data.
» **Radio Frequency Unit (RFU):** Packaged as an ARINC 600 4 MCU and provides three additional communication channels capable of simultaneous full duplex voice and data communication services.
» **High Power Amplifier (HPA):** Packaged as an ARINC 600 8 MCU and provides linear power amplification to boost the RF signals up to the power levels required for transmitting to the satellite.
» **Beam Steering Unit (BSU):** Packaged as an ARINC 600 2 MCU and converts tracking and pointing coordinates (aircraft relative azimuth and elevation) from the SDU into signals needed to select the antenna array elements in combinations that point the antenna beam in the desired direction towards the satellite.

FAA STC ST02007LA

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PROJECT DESCRIPTION CONT'D.

The following items are an integral part of the SATCOM system and are installed concurrent with this proposed modification per Honeywell STC SA6086NM.

- **High Gain Antenna (HGA):** Transmits L-Band RF signals from the HPA to a satellite and receives L-Band RF signals from a satellite for the RFU.
- **Diplexer/Low Noise Amplifier (D/LNA):** A three-port RF device (antenna, transmit, and receive), which provides signal routing and filtering functions. Signals in the receive band are routed from the antenna port to the receive port; transmit signals are routed from the transmit port to the antenna port. The low noise amplifier establishes the noise floor of the communication system by boosting the signals and noise received from the antenna to a level much greater than the noise level of subsequent components in the receive path.

ELECTRICAL CHANGES

1. A 7.5 amp circuit breaker is installed in the P11-2 Circuit Breaker Panel (L Xfer Bus) and provides 115V AC power to the SDU and RFU.

2. A 7.5 amp circuit breaker is installed in the P11-2 Circuit Breaker Panel (L Xfer Bus) and provides 115V AC power to the HPA, D/LNA and BSU.

3. A 1.0 amp circuit breaker is installed in the P11-2 Circuit Breaker Panel (28V DC L Bus) and provides power to the SATCOM/HF switching relays.

4. New interface wires will be installed from the SDU to the following existing aircraft equipment:
   - ARINC Communication and Reporting System (ACARS) Management Unit provisions
   - Left and right Engine Indicating Crew Alert System (EICAS)
   - Left and right flight management computer Control Display Units (CDU)
   - Bell chime module of the warning electronics unit.
   - Left Inertial Reference Unit (IRU)
   - Left and right High Frequency (HF) communications transceiver
   - Digital flight data acquisition unit

5. New interface wires will be installed between SATCOM equipment mounted on the E12 Rack (SDU, RFU, HPA and BSU) and the other newly installed components of the Honeywell SATCOM System (HGA, D/LNA, HF/SAT switching panel, audio relay pallet, and SATCOM data loader), as well as wires installed between the E12 and E9 rack for provisions for connection to a CTU installed under a separate STC.

6. New coaxial cables are installed between the HGA and D/LNA. Additionally, new coaxial cables are installed between the D/LNA, SDU, RFU and HPA.

MECHANICAL CHANGES

1. A new E12 avionics rack will be installed outboard of the aft cargo bay on the right hand side of the aircraft between frame stations 1175 and 1197. This rack will provide mounting provisions for the Honeywell SATCOM system LRUs.

2. A cooling duct will be installed from the existing lav/galley vent system to the E12 rack to provide cooling air for the installed avionics.

3. A drip shield will be installed above the E12 rack to provide protection for the installed avionics against spilled or leaking fluids.

4. The existing aft cargo bay liner will be modified and an access panel will be installed to provide access to the new E12 avionics rack.

5. The existing aft cargo bay liner will be modified and an access panel will be installed to provide access to the existing E9 avionics rack.

6. An audio relay pallet will be installed in the E2-6 shelf. The audio relay pallet provides switching between the existing HF audio and SATCOM audio.

7. An HF/SAT switching panel will be installed in the P5 panel to provide switching between the SATCOM and HF systems.

FAA STC ST02007LA

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MECHANICAL CHANGES CONT'D.

8. A SATCOM data loader will be installed into the P61 maintenance panel. This data loader port provides a diagnostic and data loading capability from the flight deck.

9. A new E9 avionics rack will be installed outboard of the aft cargo bay on the right hand side of the aircraft between frame stations 1197+132 and 1219. This rack will provide mounting provisions for the Cabin Telephone Unit (CTU) which is installed under a separate STC.

10. A drip shield will be installed above the E9 rack to provide protection for the installed Avionics against spilled or leaking fluids.

» *Note: The high gain antenna will be installed on the top of the fuselage between frame stations 977 and 1043 along the centerline of the aircraft per Honeywell STC SA6086NM. Additionally, the diplexer/LNA will be installed in close proximity to the high-gain antenna between frame stations 1021 and 1043 at approximately LBL 12.0 per Honeywell STC SA6086NM. It is required that the installation of the SATCOM antenna and diplexer/LNA per Honeywell STC SA6086NM be accomplished concurrently with the SATCOM modification outlined in this certification plan.*