Mode S Transponders – Frequently Asked Questions (FAQ)

Q: Do the Trig transponders offer Extended Squitter ADS-B out?

A: As of 2010, the TT22 & TT31 transponders include support for Extended Squitter (ES) ADS-B Out. The software in the Trig transponders for the ES ADS-B Out provides all of the required parameters listed in EASA AMC20-24. AMC20-24 is ADS-B airworthiness approval for EASA. This "Acceptable Means of Compliance" spells out the performance requirements of such equipment.

In order to utilize the ADS functions of the Trig transponders, a GPS receiver meeting specific criteria must be interfaced with the transponder. As of 2010, the Freeflight 1201 & NexNav 3101 are the only GPS receivers that can be used with the Trig transponders for this function.

Please visit www.seaerospace.com for continuous updates on the ADS-B discussion and added features to the Trig transponders.

Q: Do the Trig transponders offer TIS traffic?

A: Yes. A Trig software upgrade adds TIS (Traffic Information Service) functionality to any TT21 or TT31 transponder. The traffic upgrade is compatible with any Garmin 396/495/496/695/696 GPS for display of TIS traffic information. The TIS feature has been ground tested and real-time flight tested by Trig Avionics and Southeast Aerospace personnel.

All new Trig transponders, including TT21, TT22 & TT31, will ship with the most recent software upgrade.

Q: Should a new transponder certification be performed if simply replacing an existing transponder?

A: Yes, anytime a transponder is removed or replaced an altitude correlation between what the transponder is reporting and what is displayed on the altimeter needs to be performed. This is outlined in FAA CFR Part 91.413. This regulation indicates that following any installation or maintenance of a transponder where data correspondence error could be introduced, the integrated system has been tested, inspected, and found to comply with paragraph (c), appendix E. Furthermore, these references indicate that an integration test between the altitude reporting equipment and transponder system must be conducted.

Q: Can the Trig transponders receive NMEA GPS data from any GPS receiver?

A: Yes, you can connect any NMEA GPS position source to a Trig transponder, and with the correct configuration the transponder will broadcast ADS-B position squitters. However there are limitations with the NMEA data. The NMEA messages do not include Receiver Autonomous Integrity Monitoring (RAIM) information, which means that the position transmitted by the Trig transponder will be indentified as "low quality" on most traffic information systems. Please note that this type of NMEA GPS/transponder configuration will not meet forthcoming FAA ADS-B requirements, but in the end it will be rather beneficial for use in flight tracking and traffic avoidance.

Q: How do I enter my Mode S address into the Trig transponder?

A: The Mode S Address is a 24 bit number issued to the aircraft by the registration authority for the aircraft. These addresses are usually written as a 6 digit hexadecimal number. You may encounter the address written as an 8 digit octal number as is the case with the FAA aircraft registration website. The Trig TT21, TT22, and TT31 only accept the hexadecimal format. To convert from octal to hex code, you can utilize the Calculator in the Microsoft Accessories folder. Or, there are many online tools to accomplish the conversion as well.

Southeast Aerospace can answer any questions or inquiries relating to the programming of the Trig transponders. Please contact us for assistance.

TT31 Specific FAQ:

Q: How does the Trig TT31 compare to the Bendix/King KT-76C?

A: The Trig TT31 Mode S Transponder is a cost-effective replacement for the Bendix/King KT-76C, especially since it is a direct replacement for KT-76A, KT-78A and KT-76C transponders with no installation changes.

Q: Does Southeast Aerospace offer "Shop" pricing for the TT31 Mode S Transponder?

A: Yes, SEA does offer a “shop” price for the TT31 to certified repair stations that meet the following criteria:

Per FAA Part 91.413 (ATC transponder tests and inspections), after any installation or maintenance on an ATC transponder, the integrated system must be tested, inspected, and found to comply with specific performance standards. In addition, Section 7 of the TT31 installation manual indicates that a post installation check should be carried out to verify correct Mode S address programming. A Mode S test set is required for this testing.

For proper certification, these tests must be conducted by a certified repair station with a Class III radio rating or limited rating appropriate to the test being performed. In order to receive the Shop price for the TT31 transponder, interested parties must submit a Repair Station license and Operation Specifications certificate to Southeast Aerospace.

Q: Will the Trig TT31 transponder interface with the Garmin GNS430/530 series unit for ADS-B functionality?

A: As of June 2010, the TT31 can accept GPS information from the Garmin GNS 430/530 navigators; however the data from the GNS 430/530 does not meet the requirements of the FAA ADS-B Final Rule. The GNS 430/530 GPS does not export position integrity, which is now required by the new Rule. The Garmin GNS 430W/530W (WAAS) is an acceptable data source.

TT21/22 Specific FAQ:

Q: What is the installation procedure for a Trig TT21 or TT22 transponder?

A: An FAA Form 337 or STC is not required for a TT21/22 transponder installation. To install a TT21/31 you must have the proper installation equipment & complete a log book entry noting the install.

Q: When I powered up my new TT21 transponder for the first time, I received the message "No remote link", then the unit went directly into "setup/test mode". Is this normal?

A: This is completely normal. The TT21, like most avionics units, needs to be setup and configured upon first use. The pilot's guide and installation manual provided with the unit provides complete information for the setup and configuration process.

Q: I have installed my TT21/TT22 transponder along with my GPSMAP series GPS, why can't I get TIS to work?

A: First of all, your equipment should be properly installed with setup, including transponder & GPS. Next, you must be receiving a signal. Finally you should check to make sure your software has been upgraded to version 1.4 or 1.3. If everything is functioning properly, you are receiving a signal & have the proper software – TIS should be working.

If you software has not been upgraded, please Contact Southeast Aerospace or your free software upgrade. For additional trouble shooting, please contact SEA.

Q: I have my Trig transponder installed & am receiving a signal; however I now hear a "ticking" noise on my radio. What could this be?

A: The transponder transmissions are causing interference. The most likely reason for this is that your aircraft is not grounded and you have unshielded wiring. Just a small piece of unshielded wiring could cause this problem.

There are two ways to stop the ticking. First you can create a grounded plane. However, this isn't an ideal solution, since you still have a wiring problem.

The second solution is to find the exposed wire & correct the problem. You should test to find the wire by using only one piece of equipment at a time – if you have 2 radios, listen to each one individually, etc. Next check your headset & your aircraft power wiring. A good way to test your wires for shielding is to wrap aluminum foil on different sections of wiring while trouble shooting.

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