ATC-601: Frequently Asked Questions & Answers

Q: How do I use the ATC-601 to check RVS (Reduced Vertical Separation) barometric reporting?
A: The altitude data transmitted via ARINC 429 from the air data computer to the Mode S transponder may be verified on the ATC-601 using the Mode S UF4 test. The altitude is displayed in the AC field.

Q: What is the resolution/accuracy of the ATC-601 Mode S Altitude data?
A: The UF4 test, displays Mode S altitude data to a resolution of 25 ft. The ATC-601 has no tolerance associated with the display of altitude data, as the data is converted to digital format prior to transmission from the air data computer to the Mode S transponder. The ATC-601 just displays the digital data, as down-linked from the Mode S transponder. The important tolerance is that of the barometric test equipment used to stimulate the air data computer.

Q: Why is Auto test displaying 'NO REPLY' at the bottom of the screen, even though the Mode S transponder is turned on and the ATC-601 interrogation indicator is illuminated?
A: Commonly, Mode S installations are configured so that the weight on wheels or strut switch places the transponder into a ground mode via the Ground/Air Discrete.
This inhibits the ATCRBS (Mode A/C) & DF11 acquisition Squitter capability of the Mode S transponder, allowing only replies to Mode S discrete interrogations. The ATC-601 needs replies to ATCRBS/Mode S all call interrogations to obtain the aircraft discrete address, (FAR Part 43 appendix F test requirement). Without the discrete address many tests can not be performed.
To allow comprehensive ground testing, the aircraft installation must be placed in the AIR mode. Installation configurations vary according to airframe manufacturer but usually the installation is provisioned with either a GROUND/AIR test switch or a CCT breaker which when pulled will isolate the weight on wheels or strut switch. In some installations, ADC's are also inhibited while the aircraft is on the ground; therefore even Mode S discrete interrogations will fail to return valid altitude reports.

Q: What is the latest version of ATC-601 firmware?
A: Currently version 3.0R. This is available at Authorized Service Centers, a Flash Memory upgrade board is required to support this software.

Q: Why don't I get replies to the UF16 test?
A: UF0/DF0 and UF16/DF16 are used by TCAS 2 systems for short and long Air to Air Surveillance. If a TCAS 2 system is deactivated or not installed, a failure to reply to a UF16 is normal.

Q: Why do I not get replies to UF20 & UF21 tests?
A: Software version 3.0 is required and also ensure your transponder has at least a level 2 capability i.e. Comm A/B.

Q: How can I display Flight ID?
A: Your ATC-601 needs to have version 2.22 or above firmware fitted. Note: All Mode S transponders with Comm A/B capability will reply to an AIS (Flight ID) request however, if AIS information is not available then zero values will be returned.

Q: Why does the mode C altitude data disagree with the Mode S altitude data shown in the AC field UF0, 4, 16 & 20 tests?
A: Altitude reported in Mode S DF's 0,4,16 & 20 may disagree with Mode C altitude reports. This is due to resolution differences. Mode S has an altitude resolution of 25 ft, Mode C has an altitude resolution of 100 ft. Differences are most noticeable below 300 ft and discrepancies of 50 ft are not uncommon.

Q: Why is the aircraft tail number not displayed in the squitter test?
A: Only certain countries have allocated their Mode S discrete addresses on an aircraft tail number basis. Those countries that have encoded the tail numbers have each used different software algorithms. ATC-601 V3.0R and above firmware can decode USA, Canadian, French, German, Swiss & Danish tail numbers.

Q: How can I print test data?
A: ATC-601 firmware versions 2.3R or above needs to be installed. Setup menu # 2 provides a DUMP facility for memory 1,2 or the current test data.

Q: My transponder supports Enhanced Surveillance, can the ATC-601 support this?
A: Version 3.0R or above software will support the test requirements of Enhanced Surveillance and ADS-B extended squitters (DF17) RTCA DO-260. A hardware modification to your ATC-601 is required to support the new software.

Q: My ATC-601 (only certain software versions), is displaying an UELM test and a DELM test but when the tests are run, why do the tests fail?
A: It is a FAR Part 43 appendix F test requirement to test UF24 & DF24, where supported by the transponder. The transponder must be at least level 3 to support UF24 UELM (Up-link Extended Length Messages) and level 4 to support DF24 DELM (Down-link Extended Length Messages). The transponder must be connected to a suitable subsystem to either receive and/or supply data for multi-segment transfers. Most transponders do not support this service at this time. Failure of the test will not cause an Auto Test failure. If in doubt regarding the installed transponder capabilities, consult either the airframe manufacturer or the transponder manufacturer.

Q: I have an ICAO Amendment 77 Mode S transponder, which will not reply to ATCRBS all-call interrogations when in the ground state. How can I verify VS and FS bits in DF0 and DF4/5 when the installation is in the ground state, as the test set needs an ATCRBS all-call reply to function correctly?
A: Version 3.04 software, will allow the retention of the last Mode S address returned in the airborne state, which will allow the transponder to be interrogated discretely when switched to the ground state