Installation Manual
(Approved Model List Supplemental Type Certificate)

This manual contains installation instructions and recommended flight line maintenance information for the KTX2 ADS-B Transponder System. Guidelines for external equipment necessary for installation are included. This information is kept current by revisions, service letters and service bulletins.
FORWARD

This manual provides information intended for use by persons who, in accordance with current regulatory requirements, are qualified to install this equipment. Installation requirements may vary, depending on the particularities of each aircraft, and this manual is intended as a guideline for that purpose. This manual assumes familiarity with the setup and operation of the aircraft systems that interface with the KTX2.

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We welcome your comments concerning this manual. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the manual part number, the paragraph/figure/table number, and the page number. Send your comments to the STC Holder at:

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## RECORD OF REVISIONS

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<th>Description</th>
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ABOUT THIS MANUAL

SECTION 1 – GENERAL INFORMATION
This section provides the following information: unit configurations, unit functionality, items required but not supplied with the unit, equipment specifications, installation approval/limitations and TSO approvals.

SECTION 2 – INSTALLATION INFORMATION
This section contains instructions to locate, assemble and install the KTX2 as well as information for unpacking equipment, and inspection procedure for in-shipment damage.

SECTION 3 – INSTALLATION INSTRUCTIONS
This section contains instructions for post installation setup, post installation and return to service checkout.

SECTION 4 – INSTALLATION CHECKOUT
This section contains general flight line maintenance procedures. It includes periodic maintenance, troubleshooting and instructions for the return of defective components.

SECTION 5 – MAINTENANCE
This appendix defines the electrical characteristics of all input and output signals.

DEFINITIONS OF WARNING, CAUTIONS AND NOTES

**WARNING**
Warnings are used to bring the Installer’s immediate attention to potentially hazardous situations in which equipment damage or personal injury may occur if the instructions are disregarded.

**CAUTION**
Cautions are used to alert the installer that equipment damage or a deviation from the STC may occur if instructions are not followed to the letter.

**IMPORTANT INFORMATION**
Important information is used to explain an installation step in greater detail so that there will be no misunderstanding of the Installation Instructions intent.
# LIST OF EFFECTIVE PAGES

Total number of pages in this publication consist of the following:

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<th>Page of Section</th>
<th>Number of Pages</th>
<th>Current revision</th>
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<td>1</td>
<td>Original</td>
</tr>
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<td>i thru vii</td>
<td>7</td>
<td>Original</td>
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<td>1.1 thru 1.6</td>
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<td>Original</td>
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<td>3.1 thru 3.14</td>
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## DISCLAIMER

Information in this manual is subject to change without notice and will not be updated after distribution. Changes to this manual will be reflected in the next revision. Revisions replace the entire manual and are incorporated as needed in order to keep information accurate and up-to-date.

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SECTION 1  GENERAL INFORMATION

1.1 INTRODUCTION
This manual describes the physical, mechanical, and electrical characteristics as well as instructions, conditions, and limitations for installation and approval of the KTX2 Transponder System.

1.2 DEFINITIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Aircraft Address – ICAO 24-bit address</td>
</tr>
<tr>
<td>AC</td>
<td>Advisory Circular, or Aircraft Category</td>
</tr>
<tr>
<td>ADS-B</td>
<td>Automatic Dependent Surveillance-Broadcast</td>
</tr>
<tr>
<td>AML</td>
<td>Approved Model List</td>
</tr>
<tr>
<td>APP</td>
<td>Application</td>
</tr>
<tr>
<td>ARINC</td>
<td>Aeronautical Radio, Incorporated</td>
</tr>
<tr>
<td>ATCRBS</td>
<td>Air Traffic Control Radar Beacon System</td>
</tr>
<tr>
<td>DL</td>
<td>Data Loading</td>
</tr>
<tr>
<td>DME</td>
<td>Distance Measuring Equipment</td>
</tr>
<tr>
<td>ETX</td>
<td>End of Transmission</td>
</tr>
<tr>
<td>FCC</td>
<td>Federal Communications Commission</td>
</tr>
<tr>
<td>FID</td>
<td>Flight ID</td>
</tr>
<tr>
<td>FPGA</td>
<td>Field Programmable Gate-Array</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
</tr>
<tr>
<td>LRU</td>
<td>Line Replaceable Unit</td>
</tr>
<tr>
<td>NAS</td>
<td>National Airspace System</td>
</tr>
<tr>
<td>NOTAM</td>
<td>Notice to Airman</td>
</tr>
<tr>
<td>RAIM</td>
<td>Receiver Autonomous Integrity Monitoring</td>
</tr>
<tr>
<td>RF</td>
<td>Radio Frequency</td>
</tr>
<tr>
<td>RTCA</td>
<td>Radio Technical Commission for Aeronautics</td>
</tr>
<tr>
<td>RX</td>
<td>Receive</td>
</tr>
<tr>
<td>SBAS</td>
<td>Satellite-Based Augmentation System</td>
</tr>
<tr>
<td>SPE</td>
<td>Single Point Entry</td>
</tr>
<tr>
<td>STB</td>
<td>Standby</td>
</tr>
<tr>
<td>STC</td>
<td>Supplemental Type Certificate</td>
</tr>
<tr>
<td>TQ-G</td>
<td>TQ-Group</td>
</tr>
<tr>
<td>TSO</td>
<td>Technical Standard Order</td>
</tr>
<tr>
<td>TX</td>
<td>Transmit</td>
</tr>
<tr>
<td>WAAS</td>
<td>Wide Area Augmentation System</td>
</tr>
</tbody>
</table>
1.3 TERMINOLOGY
Except where specifically noted, references made to “the Unit” or “the Installation” will apply to the KTX2. Likewise, the terms “1090 Transponder”, “Mode-S Transponder”, or “Transponder” will also mean the KTX2. References to “metal aircraft” will refer to aircraft with an aluminum skin. “Nonmetallic aircraft” will refer all other aircraft including composite, wood, or tube and fabric construction.

1.4 SCOPE
This Installation Manual applies to the modification of an aircraft under AML STC SA02525AK for the installation of the equipment described in Table 1-1. Interfaces between the equipment listed in the second column and the KTX2 are covered by this STC. This STC is only applicable to the 14 CFR, Part 23, Class I, II and III aircraft, as defined in Advisory Circular (AC) 23.1309-I E, which are identified in the AML. Installations in 14 CFR, Part 23 Class IV, Part 25, Part 27 and Part 29 aircraft are not authorized under this AML STC.

<table>
<thead>
<tr>
<th>Equipment Installation Covered under AML STC</th>
<th>Equipment Required, but Installation NOT Covered Under AML STC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• KTX2 Transponder</td>
<td>• GPS receiver</td>
</tr>
<tr>
<td></td>
<td>• WAAS GPS Antenna</td>
</tr>
<tr>
<td></td>
<td>• L-Band Antennas</td>
</tr>
<tr>
<td></td>
<td>• Cables and connectors not included in the Transponder factory ship kit</td>
</tr>
</tbody>
</table>

1.4.1 Approved Aircraft With Systems Not Covered by the AML STC
Aircraft on the AML have been determined to meet the minimum required configuration for application of the STC. However, since some of these aircraft may have been modified since they were manufactured under their original Type Certification, it may be difficult to use the data herein to completely confirm that the installation is in compliance with the STC.

It is therefore the Installer’s responsibility to make the final determination of STC applicability for each individual aircraft.

Use this manual to evaluate each installation prior to modifying a Type Certificated aircraft to ensure applicability and compliance with AML STC SA02525AK. If in doubt, the Installer should consider requesting Field Approval or a unique STC to perform the installation. Consult AC 43-210 for guidance on the Field Approval process. Antennas, particularly when installed on composite and pressurized aircraft, will normally require separate approval.

1.5 INTRODUCTION
This section includes descriptions, specifications, TSO information, and installation approval and limitations for the KTX2. The KTX2 system (also referred to as the Transponder) includes a KTX2 device, an interface to an approved GPS receiver and connections to recommended antennas, the pitot-static system and a power source.

The system requires additional 3rd party components. A list of system components is provided in Table 1-2. See Figure 1-1 for an overview of the unit’s system interface.

Included in SECTION 2, paragraph 2.5 is a list of compatible equipment and equipment required but not supplied with the system.
Table 1-1: KTX2 General Description

<table>
<thead>
<tr>
<th>MODEL/ P/N</th>
<th>DESCRIPTION</th>
<th>INTERFACES/FUNCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTX2 P/N 304110-XX(XX)XX-(XX)</td>
<td>Supports 1090 MHz Mode S(ES) ADS-B OUT</td>
<td>• Approved WAAS GPS RS-232 Input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Altitude data input (Static Port connection)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• L-Band Antenna</td>
</tr>
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</table>

Table 1-2: System Components

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MODELS</th>
<th>H/W PART NO.</th>
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<tbody>
<tr>
<td>Mode-S(ES) Transponder System</td>
<td>NTX2</td>
<td>304110-XX(XX)XX-(XX)</td>
</tr>
</tbody>
</table>

The following components are not supplied with the system, but are required.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>REFERENCE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS Receiver</td>
<td>2.6.1</td>
<td>Required, but installation is not covered by this STC</td>
</tr>
<tr>
<td>GPS Antenna</td>
<td>2.6.1</td>
<td>Required, but installation is not covered by this STC</td>
</tr>
<tr>
<td>L-Band Antenna</td>
<td>Table 2-6</td>
<td>Required, but installation is not covered by this STC</td>
</tr>
<tr>
<td>Static Source</td>
<td>3.3.10</td>
<td>An aircraft static source is required</td>
</tr>
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</table>

1.5.1 Functional Description

The KTX2 is a panel mount Class 1 Non-Diversity Mode-S(ES) ADS-B OUT DO-260B compliant transponder that meets the 2020 ADS-B Mandate requirements when connected to a WAAS GPS source and appropriate L-Band antennas.

The unit receives Mode A, Mode C, and Mode S interrogations on 1030 MHz and replies on 1090 MHz. The unit is equipped with IDENT capability that activates the Special Identification (SPI) pulse for 18 seconds. Ground stations and airborne TCAS II can interrogate Mode S Transponders individually using a 24-bit ICAO Mode S address, which is unique to the particular aircraft. In addition, ground stations may interrogate the unit for its transponder data capability and the aircraft's Flight ID.

With a GPS source connected, the ADS-B Out (1090ES) function is used to periodically broadcast (without interrogation) information about the aircraft that includes aircraft identification, position, altitude, velocity and other aircraft status information. This provides an immediate surveillance source to the ANSP and air-to-air traffic information to other aircraft.

The unit has been tested and certified for pressure altitudes up to 30,000 ft and a maximum airspeed of 250 kts.

NOTE

With no GPS interface configured, or the GPS source inoperable, the transponder is not ADS-B rule compliant and will behave as a conventional Mode-S transponder.

See Figure 1-1 for an overview of the unit’s system interface. The following paragraphs provide an overview of each of these functions.
1.5.2 ADS-B OUT Functional Overview
The ADS-B Out function supports the transmission of Automatic Dependent Surveillance – Broadcast (ADS-B) Out on a 1090 MHz link. The ADS-B Out data contains information about own aircraft such as aircraft position, velocity, direction, etc. The ADS-B function requires own aircraft data from an external GPS receiver.

Control functions such as squawk codes, Ident, and operational mode (e.g. Mode "A", Mode "C", etc.) are selected on the unit's control panel.

1.5.3 GPS Functional Overview
The external GPS provides position, velocity, time and integrity (NIC, NAC, etc.) information to the Transponder. This GPS source must be rule compliant with the position source requirements of AC20-165A. The external GPS source must support WAAS. Note that the NexNav mini is currently the only compatible GPS source.

1.5.4 Barometric Altitude Inputs
In addition to GPS altitude, the KTX2 has a Temperature compensated high precision piezo-resistive pressure sensor that provides barometric altitude when connected to a calibrated aircraft static source.

1.5.5 Additional Interfaces
The WOW input discrete is optional. The input signals the “On Ground” status to the Transponder via a gear switch or squat switch.

The RF Suppression connection is optional. When other avionics utilizing the same frequency band as the Transponder are installed (e.g. DME), this connection will suppress transmission from a competing transmitter for the duration of the ADS-B transmission.
1.6 EQUIPMENT DESCRIPTIONS
The KTX2 is equipped with a 15-pin sub-D connector (J1) and miniature RF connectors for L-Band OUT (ANT) and an optional L-Band accessory (LOOP).

The KTX2 can interface with a compatible external GPS source via pins 2 and 13 on connector P1;

Mutual Suppression is configured via pin 12 on connector P1;

The Weight on Wheels “On Ground” function is enabled by grounding pin 5 on P1;

±14/28 VDC from the aircraft battery buss or avionics Master Switch is connected via pin 8 (positive) and pin 1 (negative/ground) on P1.

Pins 10 and 6 are not normally connected and are reserved for future use.

1.7 TECHNICAL SPECIFICATIONS
Table 1-3 lists the specifications, certification and compliance standards for the KTX2 transponder. Table 1-4 lists the specifications for the transmitter and receiver sections.

Table 1-3: Specifications for the KTX2

| Part Number: | 304110-XX(XX)-XX(XX) KTX2 Mode S Transponder |
| Authorization: | EASA.210.10069784 |
| Certification: | ETSO-C112d / TSO-C112d |
| Advisory Circulars: | ETSO-C88a / TSO-C88a |
| Advisory Circulars: | ETSO-C166b / TSO-C166b |
| Compliance: | AC 20-165A (ADS-B Out) |
| Environmental Compliance: | RTCA DO-181E / ED-73E / Level 2els,Class 1 |
| Environmental Compliance: | RTCA DO-178C/ ED-12C Level D |
| Environmental Compliance: | RTCA DO-254 / ED80 Level C |
| Environmental Compliance: | RTCA DO-160G / ED-14G |
| Environmental Compliance: | RTCA DO-260B / ED102A Class B1S |
| Environmental Compliance: | CFR 91.225 and CFR 91.227 |
| Environmental Compliance: | FCC ID: 2ANFF-KTX2S |
| Environmental Compliance: | Other Standards: SAE AS8003, AC 20-165A |

| Dimensions: | Height 2.44 inch [62 mm] |
| Dimensions: | Width 2.48 inch [63 mm] |
| Dimensions: | Length 5.86 inch [149 mm] (body only) |
| Dimensions: | Bezel 2.24 inch [57 mm] diameter (standard 2¼” cutout) |

| Weight: | 0.83 lb. [0.381Kg] |
| Maximum Altitude: | 30,000 ft |
| Shock: | 6G Operation |
| Chassis Ground: | Bonding impedance between aircraft ground and the chassis must be less than 2.5 milliohms. |
| Power Requirements: | 9 Vdc to 33 VDC; 0.2A to 1.0A (Illumination 0.02A) |
Table 1-3: Specifications for the KTX2

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Breaker required</td>
<td>3A (14 VDC); 2A (28 VDC), slow-blow.</td>
</tr>
<tr>
<td>Electrical Connectors</td>
<td>J1 is a 15-pin D-Sub male connector that mates with P1, a 15-pin D-Sub female connector with a backshell.</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20° to +55°C (-4° to 131°F)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55° to +85°C (-67° to 185°F)</td>
</tr>
<tr>
<td>Maximum Altitude</td>
<td>30,000 ft (9,144 meters)</td>
</tr>
<tr>
<td>Compass Security Distance</td>
<td>30 cm [12&quot;]</td>
</tr>
<tr>
<td>Scheduled Maintenance</td>
<td>None</td>
</tr>
<tr>
<td>Service Life</td>
<td>The unit has unlimited service life.</td>
</tr>
<tr>
<td>Repairability</td>
<td>Repairs performed at an FAA certificated Repair Station.</td>
</tr>
</tbody>
</table>

Table 1-4: Transmitter/Receiver Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver Sensitivity</td>
<td>RF input power level resulting in a 90% reply rate:</td>
</tr>
<tr>
<td></td>
<td>• MTL for ATCRBS and ATCRBS/Mode S All-Call interrogations: -74dBm ±3dB.</td>
</tr>
<tr>
<td></td>
<td>• MTL for Mode S interrogations: -74dBm ± 3dB.</td>
</tr>
<tr>
<td>Reply Frequency</td>
<td>1090 ± 1MHz</td>
</tr>
<tr>
<td>RF Peak Power</td>
<td>≥ 21 dBW (125 W) at antenna base (with maximum cable attenuation of 1.5 dB)</td>
</tr>
<tr>
<td>Squitter</td>
<td>Transmitted at random intervals uniformly distributed over the range from 0.8 to 1.2 seconds, with full self-verification of data and occurrence</td>
</tr>
</tbody>
</table>
SECTION 2  INSTALLATION INFORMATION

2.1  INTRODUCTION
The following section contains an overview of the steps required for the installation of the KTX2 and its related components. This section includes requirements for selection of proper locations in the aircraft as well as requirements for supporting structure, mechanical alignment, and electrical wiring. Any restrictions related to nearby equipment and requirements are also specified herein.

Always follow acceptable avionics installation practices as set forth in FAA Advisory Circulars (AC) 43.13-1B, 43.13-2B, or later revisions of these documents.

2.2  PRE-INSTALLATION OVERVIEW

2.2.1 Unpacking and Inspection
Carefully unpack the unit and note any damage to shipping containers or equipment. Visually inspect each component for evidence of damage. Compare the equipment received with that noted on the packing list. Report immediately any missing items or evidence of damage to the carrier making the delivery. To justify a claim, retain the original shipping container and all packing materials.

Every effort should be made to retain the original shipping containers for storage. If the original containers are not available, a separate cardboard container should be prepared that is large enough to accommodate sufficient packing material to prevent movement.

2.2.2 Installation Planning
A successful installation starts with careful planning, including determination of mounting locations for the KTX2, cable routing, ventilation, ease of access and other required modifications. After choosing a mounting location:

Consider the structural integrity of the desired installation location in accordance with AC 43.13-2B, Chapter 1.

Complete a weight and balance computation before beginning the installation.
An electrical load analysis (ELA) must be completed on the aircraft both prior to installation and after the installation has been completed to verify that the aircraft electrical system is capable of supporting the KTX2. Table 1-4 and Table 1-6 specify the power requirements for the equipment and MIL – E – 7016F and the Aircraft Manufacturer can provide guidance on ELA methods and maximum permissible loads. The purpose of the ELA is to show compliance with 14 CFR 23.1351.

Follow the installation procedures in this installation manual as they are presented for a successful installation. Please familiarize yourself with this manual in its entirety before beginning the procedure.
2.3 PRE-INSTALLATION CHECKLIST

Before beginning the installation, ensure that the aircraft and all associated equipment meet the requirements of the AML STC and government regulations. This pre-Installation Checklist, Table 2-1, should be completed before any aircraft or equipment modification begins.

Table 2-1: Pre-Installation Checklist

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REFERENCE Or Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft is on AML?</td>
<td>SA02525AK</td>
</tr>
<tr>
<td>An Electrical Load Analysis has been performed to ensure that the</td>
<td>2.2.2</td>
</tr>
<tr>
<td>electrical system is sufficient for the installation</td>
<td></td>
</tr>
<tr>
<td>Is there a compatible GPS installed in aircraft?</td>
<td>2.6.1</td>
</tr>
<tr>
<td>All peripheral equipment (GPS Source, antennas, coax, etc.) are</td>
<td>2.5</td>
</tr>
<tr>
<td>approved under STC or a Field Approval</td>
<td></td>
</tr>
<tr>
<td>There is adequate space, structural integrity and ventilation (if</td>
<td>2.2.2</td>
</tr>
<tr>
<td>required) for all installed equipment</td>
<td></td>
</tr>
<tr>
<td>There is an acceptable L-Band antenna location on bottom of aircraft</td>
<td>3.3.9</td>
</tr>
<tr>
<td>All equipment has been unpacked and inspected for damage.</td>
<td>2.2.1</td>
</tr>
<tr>
<td>Equipment received has been compared to packing list(s)</td>
<td>2.2.1</td>
</tr>
</tbody>
</table>

2.4 SUPPLIED EQUIPMENT

The equipment supplied for a typical KTX2 installation is listed in Table 2-2.

Table 2-2: Supplied Equipment

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>304110-XX(XX)-XX(XX)</td>
<td>KTX2</td>
<td>1</td>
</tr>
</tbody>
</table>

2.5 EQUIPMENT REQUIRED BUT NOT SUPPLIED

Use Table 2-3 to identify equipment required for installation, calibration and testing of the KTX2. Equivalent tools, equipment and hardware may be used provided they meet the standards described in FAA Advisory Circulars (AC) 43.13-1B, 43.13-2B, or later revisions of these documents.

Table 2-3: Equipment List – KTX2

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cables and Wiring:</td>
<td>The installer supplies all system wires and cables.</td>
</tr>
<tr>
<td>Matting Connector (P1)</td>
<td>• Wires are 22 AWG (signal) or 20 AWG as noted on interconnect wiring</td>
</tr>
<tr>
<td></td>
<td>diagram in section 2. Use M22759 or equivalent wire for installation.</td>
</tr>
<tr>
<td></td>
<td>• wiring diagram.</td>
</tr>
<tr>
<td>Antenna Cables</td>
<td>• L-Band Antenna</td>
</tr>
<tr>
<td></td>
<td>Require RG400 or equivalent coaxial cable. For the L-Band antenna the</td>
</tr>
<tr>
<td></td>
<td>attenuation must not exceed 1.5 dB per cable (including the connectors).</td>
</tr>
<tr>
<td></td>
<td>Refer to Table 2-5.</td>
</tr>
</tbody>
</table>
### Table 2-3: Equipment List – KTX2

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE</strong></td>
<td>RG type coaxial cable insertion loss can vary significantly between manufacturers. Refer to the cable manufacturer’s specification sheet for actual attenuation (insertion loss) for the cable being used.</td>
</tr>
<tr>
<td>Circuit Breaker:</td>
<td>Installer is responsible for determining appropriate circuit breakers needed to protect aircraft wiring. The installation requires the following circuit breakers:</td>
</tr>
<tr>
<td></td>
<td>• 3.0 amp slow-blow circuit breaker for the installations with 14VDC input.</td>
</tr>
<tr>
<td></td>
<td>• 2.0 amp slow-blow circuit breaker for the installations with 28VDC input.</td>
</tr>
<tr>
<td>Consumables:</td>
<td>Antenna Sealant</td>
</tr>
<tr>
<td></td>
<td>• For pressurized aircraft, use a sealant that meets the requirements of SAE AMS-S-8802 such as Flamemaster® CS3204 class B. For non-pressurized aircraft, use a non-corrosive sealant that meets the physical requirements of MIL-A-46146 such as General Electric RTV162.</td>
</tr>
<tr>
<td></td>
<td>Surface Preparation</td>
</tr>
<tr>
<td></td>
<td>• Alodine® No. 1001 required for installation of the antenna.</td>
</tr>
<tr>
<td>Hardware:</td>
<td>The following items are commercially available from aviation suppliers or other reputable sources and are the responsibility of the installer:</td>
</tr>
<tr>
<td></td>
<td>• Ring Terminals (For Grounding).</td>
</tr>
<tr>
<td></td>
<td>• Solder Sleeves.</td>
</tr>
<tr>
<td></td>
<td>• Cable tie/Tie wrap.</td>
</tr>
<tr>
<td></td>
<td>• Ground Braid (RAY-101-20.0/AA59569R36TXXXX or equivalent).</td>
</tr>
<tr>
<td></td>
<td>• Coaxial connectors.</td>
</tr>
<tr>
<td></td>
<td>• Fusion tape.</td>
</tr>
<tr>
<td>Installation Kits:</td>
<td>Installation Kits for the KTX2 are a customer option and are ordered separately.</td>
</tr>
<tr>
<td>Installation Tools:</td>
<td>• Insertion/Extraction tool CIET-20HD.</td>
</tr>
<tr>
<td></td>
<td>• Crimp Tool: P/N: M22520/2-01.</td>
</tr>
<tr>
<td></td>
<td>• Positioner: P/N: M22520/2-08.</td>
</tr>
<tr>
<td></td>
<td>• Heating tool and reflector: PR-25 or PR-25D and HL1802E-ADAPT. (Tyco Electronics) for solder sleeves.</td>
</tr>
<tr>
<td>Software:</td>
<td>All operating software is pre-installed</td>
</tr>
<tr>
<td>System Components:</td>
<td>The following system components must be purchased separately and do not come with the KTX2 transponder:</td>
</tr>
<tr>
<td></td>
<td>• GPS Source (NexNav Mini, or equivalent) and GPS antenna, L-Band antenna. A list of compatible components is found in paragraph 2.6.</td>
</tr>
<tr>
<td>Test Equipment:</td>
<td>Air Data Test Set</td>
</tr>
<tr>
<td></td>
<td>• Required to test altitude inputs.</td>
</tr>
<tr>
<td></td>
<td>Flightline Tester</td>
</tr>
<tr>
<td></td>
<td>• IFR-6000 Ramp Test Set (with ADS-B upgrade package, Manufacturer: AEROFLEX.</td>
</tr>
<tr>
<td></td>
<td>Milliohm Meter</td>
</tr>
<tr>
<td></td>
<td>• Required to check installation bonding to aircraft structure.</td>
</tr>
</tbody>
</table>
2.5.1 Optional Installation Kits – KTX2
Installations using the NexNav Mini may order the NexNav Mini installation kit. Refer to Table 2-4 for details.

Table 2-4: NexNav Mini GPS Interface Kit

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>312873.0100</td>
<td>Harness for KTX2 interface to NexNav Mini</td>
<td>1</td>
</tr>
</tbody>
</table>

2.5.2 Antenna Cables
Table 2-5 lists examples of the recommended L-Band antenna cable vendors and the type of cable to be used for specific lengths of cable. Any cable meeting these specifications is acceptable for the installation.

Table 2-5: Coaxial Cable Specifications

<table>
<thead>
<tr>
<th>Insertion Loss (dB/100ft)</th>
<th>Carlisle IT Type</th>
<th>MIL-C-17 Type</th>
<th>RG Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5</td>
<td>N/A</td>
<td>M17/128-RG400</td>
<td>RG-400</td>
</tr>
<tr>
<td>11.1</td>
<td>N/A</td>
<td>M17/112-RG304</td>
<td>RG-304</td>
</tr>
<tr>
<td>9.2</td>
<td>N/A</td>
<td>M17/127-RG393</td>
<td>RG-393</td>
</tr>
<tr>
<td>15.2</td>
<td>3C142B</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9.2</td>
<td>311601</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>7.5</td>
<td>311501</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5.8</td>
<td>311201</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3.8</td>
<td>310801</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

[1] RG type coaxial cable insertion loss can vary significantly between manufacturers. The insertion loss for RG type cables shown in this column is considered ‘worst case’. Refer to the cable manufacturer's specification sheet for actual attenuation (insertion loss) for the cable being used.

2.6 PERIPHERAL EQUIPMENT INTERFACES
Only the equipment listed in this section is recommended for use with the KTX2 system.

2.6.1 GPS Units and GPS Antennas
A WAAS GPS that is compliant with TSO-C145c must be connected to pins 2 and 13 to meet the requirements of TSO C-166b for Rule-Compliant Mode S (ES) ADS-B Out. Note that the NexNav mini is currently the only compatible GPS source.

NOTE
This AML STC does not confer FAA approval for installation of a GPS receiver and a GPS antenna. Unless these installations have previously received FAA approval, or are covered by a Manufacturer's STC, additional FAA approval will be required. Also consult the applicable Aircraft Structural Repair Manual for approved locations, methods and additional restrictions pertaining to these installations.
2.6.2 L-Band ADS-B Antennas
The L-Band antenna used with the KTX2 must adhere to the following specifications:

Standard 50 Ω, vertically polarized antenna with a VSWR < 1.7:1 at 1090 MHz.
TSO-C66( ), TSO-C74( ), TSO-C112( ), or TSO-154c antennas that also meet the VSWR specification.

Only the L-Band antennas listed in Table 2-6 have been tested for compatibility with KTX2 installations.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Part Number</th>
<th>Connector Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAMI</td>
<td>AV-74</td>
<td>BNC</td>
</tr>
<tr>
<td>Comant</td>
<td>CI-105</td>
<td>BNC</td>
</tr>
<tr>
<td>Comant</td>
<td>CI-105-11</td>
<td>TNC</td>
</tr>
</tbody>
</table>
SECTION 3 INSTALLATION INSTRUCTIONS

3.1 INTRODUCTION
This section provides installation information for the KTX2 ADS-B Transponder System. Installations must be made by qualified personnel in conformance with applicable government regulations.

3.2 LIMITATIONS
1. The KTX2 transceiver must use an L-Band antenna meeting the requirements specified in paragraph 2.6.2.
2. The KTX2 must use a GPS source meeting the requirements in paragraph 2.6.1.
3. It is the installer’s responsibility to follow the installation instructions in order to ensure that the ADS-B Out system is compliant with AC 20-165A, 14 CFR 91.225 (b) and 91.227.

3.3 INSTALLATION PROCEDURES
1. The installer must take the following into consideration prior to installation:
   • Follow the FAA approved AML STC installation instructions.
   • Ensure the units are properly unpacked and inspected per paragraph 2.2.1.
   • Follow the acceptable avionics installation practices in FAA Advisory AC 43.13-2B or later revisions to this document.
   • Installers are responsible for obtaining installation hardware (i.e. screws, supporting plates, etc). Installation kits may be available for purchase. Refer to the Equipment Required Not Supplied, paragraph 2.5.
   • It is recommended that the aircraft battery be disconnected before performing installation procedure.
   • L-band and GPS antenna cables should be clearly labeled to prevent inadvertently installing on the wrong connector.
   • Tighten all screws to snug (i.e. only such torque that can be applied by hand) unless specific torque instructions are given.
   • After installation, refer to the Installation Checkout section for calibration, power-up and ground testing procedures.
2. Electrical equipment chassis, shield/ground terminations, antennas, supporting brackets, and racks must be electrically bonded to the aircraft's main structure (metallic aircraft) or instrument panel (composite aircraft). Compliance of the electrical bonding should be verified by inspection using a calibrated milliohm meter. An equivalent OEM procedure may also be substituted.
   • The electrical bond should achieve direct current (DC) resistance less than or equal to 2.5 mΩ to structure local to where the equipment is mounted for metallic aircraft or tube and fabric aircraft.
   • The electrical bond should achieve direct current (DC) resistance less than or equal to 5.0 mΩ to the instrument panel for composite aircraft.
3. The antenna ground plane must be electrically bonded to the antenna baseplate. Do not
removes paint on outer skin of aircraft under the footprint of the antenna baseplate unless necessary to meet bonding requirements. Refer to antenna manufacturer's installation instructions.

3.3.1 Equipment Location KTX2
The KTX2 provides flight information. When locating the unit in the instrument panel take the following into consideration.

1. The unit should be accessible for inspection, maintenance, and removal, free from excessive vibration or heat and located in a clean and dry area.
2. The wiring cable should not run adjacent to heaters, engine exhaust, or heat sources.
3. Ensure the space requirements for the unit is acceptable at the location area being considered. Refer to Figure 3-1 for dimensional requirements.

The installer is advised to consider the space requirements (2-3 inches) needed for the connector backshell and the cable bend radius.

4. Unit to be mounted firmly to the instrument panel in a 2¼" hole (Figure 3-2) using the four pan head high torque machine screws (provided).
5. The chassis of the unit must be properly bonded to the Ground. The chassis of the unit itself is conductive and acts as a ground.

Figure 3-1: Outline Dimensions for the KTX2
6. The KTX2 requires a standard 2¼ inch diameter cutout in the instrument panel. Use a #18 drill for four M4 machine screws (provided).

![Figure 3-2: Panel Cutout Dimensions](image)

3.3.2 **Electrical Connections**

1. The installer must take the following into consideration before installation.
   - Use of any wire or cable not meeting specification voids all warranties.
   - The installer is responsible for supplying wires, cables and connectors.
   - Wire-marking identification is at the discretion of the installer. GPS and L-band antenna cables should be clearly marked as both connections may use similar connectors.
   - All wiring must be in accordance with industry-accepted methods, techniques, and practices.
   - Refer to paragraph 3.3.3 for details on shielded wire preparation.
   - The length and routing of the external cables must be carefully studied and planned before attempting installation of the equipment.
   - The wiring harness should not run adjacent to heaters, engine exhaust, and heat sources or be located near fuel lines, high electrical capacity lines, flight control cables, and protected areas of the aircraft or be exposed to wire chafing.
   - Avoid sharp bends while routing the cables.
   - Cable runs should be as short as practical. Terminate shields in the backshell of the mating connector, P1.
   - Power wires are 20 AWG and Signal wires are 22 AWG. Use MIL-Spec 22759/34 (Spec 55) or equivalent wire for installation.
   - Installer is responsible for determining appropriate aviation circuit breakers needed to protect aircraft wiring. Manufacturer recommends the following:
     - 3.0 amp circuit breaker for the installations with 14 VDC input.
     - 2.0 amp circuit breaker for the installations with 28 VDC input.
Figure 3-3: KTX2 Interconnect Wiring Overview
3.3.3 P1 Connector Assembly
Use only MIL-Spec 22759/34 (Spec 55) 20AWG / 22AWG wire or equivalent for connection to the P1, 15-pin D-sub connector.

- Crimp pins are always preferred over soldered connectors.
- Required Conductor Cross-Section:

  Power Supply (Power & Ground): AWG20 (0.62 mm²) < 9.88 Ω/MFT
  Signal Wires: AWG22 (0.38 mm²) < 16.2 Ω/MFT

- On completion of the assembly, check the continuity of all wires. Figure 3-4 illustrates the completed P1 harness.

![Diagram of P1 Connector Assembly]

Figure 3-4: Cable Harness Assembly

3.3.4 Mutual Suppression
Other equipment on board (e.g. DME) may transmit in the same frequency band as the transponder. If such a device is installed a single wire bus (Suppression = active at +12V) shall be installed in order to protect the receiving parts of the different devices from in-band transmissions. Mutual suppression is a pulse that is sent to the other equipment to suppress transmission of a competing transmitter for the duration of the pulse train transmission. The transponder transmission may be suppressed by an external source and vice versa.

- To activate mutual suppression the SUPP_I/O (pin-12) requires a +12V source from the other equipment.
3.3.5 **Ground (WOW) Switch**

If a Ground-Switch is connected (and activated in the Setup), the transponder is enabled to distinguish between weight-on-wheel (On the Ground) and (In-Flight) conditions. In the weight-on-wheel condition the transponder automatically enters the Standby mode.

In order to complete this installation the input “FLY-GND” must be connected to a switch, which connects the input to “GND” in case there is weight on wheels, or remains open during flight. For details on configuration please refer to SECTION 4.

3.3.6 **GPS Interface**

The GPS source must be connected to KTX2 via serial interface (RS232) on pins 2 and 13 to provide GPS position data for ADS-B OUT.

The interfaced GPS source must be a WAAS GPS unit that is compliant with TSO-C145c. Note that the NexNav mini (PN 21.000) is currently the only compatible GPS source that provides sufficient performance to meet the 14 CFR 91.227 requirements.

A proprietary cable for interfacing the NexNav Mini with the KTX2 (PN 312873.0100) is available from TQ-G.

A separate Power source and circuit breaker are required for the GPS source.

Removal and replacement of the GPS receiver will require a full functional check of the KTX2 system per paragraph 4.5.3.

3.3.7 **Antenna Installation Guidelines**

This information provides general installation guidance to ensure the installed antennas meet the requirements for the KTX2.

Installation approval for the L-band antenna is not provided through this AML STC. For reference only, antennas that are known to be compatible with KTX2 installations are listed in Paragraphs 2.6.1 and 2.6.2. Consult the antenna manufacturers’ STC, aircraft manufacturers’ data or other FAA approvals for installation instructions for the particular model antenna.

Cable requirements are located in 3.3.2. Cable vendors and approved antenna manufacturers are located in paragraph 2.5.

An example of typical antenna placement, including restrictions, is shown in Figure 3-5. Refer to the aircraft manufacturer's data and the antenna manufacturer's installation instructions to mount the antenna IAW the best installation practices outlined in AC 43.13-2B Chapter 3. In complex cases, the installer may have to use other FAA approved data to gain a separate antenna installation approval.

Pay particular attention to structural integrity and electrical bonding of antennas installed in composite aircraft. A generic installation scheme based on AC 43.13-2B 309-310 guidance for metal, wood/fabric and composite aircraft is described in Figure 3-6.
NOTE
Antenna installation details are offered as “best practices” guidance only and do not confer FAA approval for their installation under this STC. Consult the applicable Aircraft Structural Repair Manual and antenna manufacturer’s instructions for approved locations, methods and additional restrictions pertaining to antenna installations.

Figure 3-5: Example of Antenna Mounting Locations

Figure 3-6: Example of RF Antenna Mounting and Bonding in Composite Aircraft

3.3.8 GPS Antenna
Since GPS antenna performance is critical to operation of the GPS unit and thus the KTX2, the recommended antenna must be DO-301 compliant meeting the requirements of TSO-C190.

For installations where the aircraft has an existing antenna complying with DO-228 (TSO-
C144a), the unit may be installed utilizing this antenna, as per DO-229D Note 1, Section 2.1.1.10.

3.3.9 L-Band (1090MHz) Antenna

The 1090MHz L-Band antenna must meet the minimum performance requirements for the KTX2 system. Only the antennas listed in paragraph 2.6.2 are known to meet these requirements.

Antennas meeting the minimum performance specifications needed by the KTX2 may already be installed in the aircraft and may be available for use. Use the antenna location information below to verify an existing antenna location is acceptable for use.

Installation approval for the L-Band Antenna is not provided through this manual.

3.3.9.1 L-Band (1090MHz) Antenna Location

The 1090MHZ antenna installation should be installed in accordance with AC 43.13-2B Chapter 3. The following guidance provides information to aid the installer in determining that the best location is selected for the installation of the L-band Antenna.

The 1090MHz antenna must be mounted vertically on the bottom of the aircraft fuselage. The antenna shall be located to minimize obstruction to fields in the horizontal plane.

The total attenuation including connectors shall not exceed 1.5 dB. Based on this, the length of the cable can be decided assuming RG-400 cable. RG type coaxial cable insertion loss can vary significantly between manufacturers. Refer to the cable manufacturer’s specification sheet for actual attenuation (insertion loss) for the cable being used.

The 1090MHZ antenna should be located away from major protrusions, such as engine(s), propeller(s), and antenna masts. It should be as far as practical from landing gear doors, access doors, or other openings that could affect its radiation pattern.

The 1090MHZ antenna must be mounted no closer than 20 inches from any FADEC (Full Authority Digital Engine Control).

The 1090MHZ antenna must be mounted no closer than 36 inches to any DME antenna.

The 1090MHZ antenna must be mounted no closer than 36 inches to any TAS/TCAS/Transponder/Com antenna. L-Band (1090MHZ) Antenna Installation.

Refer to the aircraft manufacturer’s data and the antenna manufacturer’s installation instructions to mount the antenna(s). The installer may use other FAA approved data to gain a separate antenna installation approval.

3.3.9.2 Electrical Bonding Requirements:

Each L-Band antenna requires a minimum ground plane radius of 12 inches of contiguous metal (no access panels, etc.) around the perimeter of the antenna. For metal aircraft, the surrounding metal skin on which the antenna is mounted supplies the ground plane. For non-metal aircraft, the ground plane can be composed of heavy duty aluminum foil tape, such as 3M P/N 438 or other adhesive backed dead soft aluminum foil minimum 0.012 inches thick. It should be noted that if the antenna is struck by lightning, the foil by itself may not be sufficient to dissipate lightning currents. Additional protection may be needed depending on the construction of the structure to which the antenna is mounted.

Connection to the antenna should be made in accordance with the system interconnect diagram Figure 3-3.
Reference paragraph 3.3.9.1 for Antenna cable loss and minimum antenna spacing requirements.
Refer to General Information Section - lists some suitable cable types. Suitable 50ohm, double-shielded coaxial cable assembly that meets airworthiness requirements and the acceptable attenuation requirements (including connectors) may be used. When computing cable loss, a typical loss of 0.2 dB can be used for each connection.

3.3.10 Altitude Input
The KTX2 requires a connection to the aircraft’s Static Port system to provide barometric altitude data.

1. Locate the closest static source to the KTX2. This is typically a ¼” polyethylene (plastic) or aluminum tube connected to a vertical speed indicator or VFR altimeter.
2. Cut the line and install a “T” fitting compatible with the tube type. Before installing the “T”, ensure that the lines are clear and free from debris.
3. Attach a tube of sufficient length to the “T” and connect it to the static (altitude) source fitting on the rear of the Transponder. Tube routing should have sufficient excess length to avoid kinking.
4. Ensure that all connections are secured with hose clamps or compression fittings compatible with the tube type.

NOTE
The static system must be re-certified IAW AC 43-6C after the installation of the KTX2. Refer to 14 CFR 91.411 for guidance.

3.3.11 KTX2 Final Installation Steps
Follow the following steps to install the KTX2:

1. Connect the Static source line to the unit and secure with an approved hose clamp;
2. Connect P1 mating connector-to-connector J1 of the unit;
3. Connect the L-Band antenna to unit at appropriately marked “ANT” connection;
4. Place the unit in the location selected in paragraph 3.3.1;
5. Use four customer supplied fasteners to mount the unit to the aircraft;
6. Proceed to SECTION 4 – Installation Checkout.

3.4 REQUIRED PLACARDS AND MARKINGS
Other than the correct labeling of the KTX2 circuit breaker, no additional placards or markings are required.

3.5 REMOVE AND REPLACEMENT PROCEDURES
If the KTX2 requires removal after initial installation, replace it using the instructions given in SECTION 5 of this manual.
SECTION 4  INSTALLATION CHECKOUT

4.1 INTRODUCTION
This section contains instructions to operate, configure and check out the installation of the KTX2. Power-up and normal (inflight) operations are discussed in Paragraph Error! Reference source not found. and detailed configuration instructions are described in Paragraph 4.4.

Refer to the fault isolation information provided in paragraph 4.4.5 for help in correcting installation issues found during checkout.

Refer to paragraph 2.5 Equipment Required But Not Supplied for details on equipment used in this section.

4.2 BASIC DISPLAYS AND CONTROLS
The KTX2 is a User configurable Mode-S Extended Squitter ADS-B Rule Compliant transponder that meets all the requirements for the FAA 2020 ADS-B OUT Mandate. All operating controls and configuration options are accessed from the front panel screen (Figure 4-1). No external configuration software is required.

4.2.1.1 Control and Display Screen
The main screen provides all the necessary command and annunciation functions for normal operations and also displays the Set-Up and Configuration menus.

![Figure 4-1: Controls & Display Screen](image-url)
### 4.2.2 Controls
The KTX2 has six multifunction controls as described in Table 4-1.

<table>
<thead>
<tr>
<th>Control</th>
<th>Designation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON/OFF</td>
<td>[Locking]</td>
<td>Push = ON, Push = OFF. This switch is mechanically locked until it is pushed a second time</td>
</tr>
<tr>
<td>VFR</td>
<td>[Momentary]</td>
<td>Activate / Deactivate VFR Squawk. Store the Standby Squawk as VFR/VFRW. Press for 3-sec. See paragraph 4.3.4</td>
</tr>
<tr>
<td>CHANGE</td>
<td>[Rocker]</td>
<td>Exchange Active and Standby Squawk. (or) Cursor Back. (or) Navigates backwards through configuration menu</td>
</tr>
<tr>
<td>IDENT</td>
<td>[Momentary]</td>
<td>“Squawk Ident”. Sends Ident (SPI) for 18-sec. See paragraph 4.3.5</td>
</tr>
<tr>
<td>MODE</td>
<td>[Momentary]</td>
<td>Selects Transponder Mode or STBY. See paragraph 4.3.2</td>
</tr>
<tr>
<td>Rotary Knob</td>
<td>[Rotary] [Rocker]</td>
<td>Enters Values at Current Cursor Position. (or) Advances Cursor Position</td>
</tr>
</tbody>
</table>

Table 4-1: KTX2 Controls
### 4.2.3 Display Indications

The State, Status and Failure Conditions of the KTX2 are indicated on the display by icons illustrated in Table 4-2 displayed in the positions described in Figure 4-1. Extended Squitter and ADS-B OUT functions are described in Table 4-3. Detailed troubleshooting is covered in Table 5-1.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Meaning</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔺</td>
<td>Transponder is transmitting Mode-A/C Replies on Interrogations</td>
<td>Appears per reply</td>
</tr>
<tr>
<td>🔺</td>
<td>Transponder is transmitting Mode-S Replies on Interrogations</td>
<td>Appears per reply</td>
</tr>
<tr>
<td>🔺</td>
<td>Transponder is locked by a ground station and will be directly addressed</td>
<td>Appears at every addressed reply</td>
</tr>
<tr>
<td>🐍</td>
<td>Extended Squitter</td>
<td>Status of Extended Squitter transmission</td>
</tr>
<tr>
<td>🍀</td>
<td>Active Squawk</td>
<td></td>
</tr>
<tr>
<td>🍀</td>
<td>Battery power too low (&lt; 11 VDC)</td>
<td>Blinking</td>
</tr>
<tr>
<td>🍀</td>
<td>Antenna Failure</td>
<td>Bad L-Band antenna, or antenna connection</td>
</tr>
<tr>
<td>🍀</td>
<td>Transmits IDENT- Marking</td>
<td>ID („Squawk Ident”) has been pressed – active for 18s</td>
</tr>
<tr>
<td>💧</td>
<td>Flight Level</td>
<td>Flight Level (in 100ft steps)</td>
</tr>
<tr>
<td>🌊</td>
<td>Mode display (STBY, ON, GND, ALT)</td>
<td>See 4.3.2 Transponder- Modes</td>
</tr>
<tr>
<td>🌊</td>
<td>Standby-Squawk</td>
<td>Can be changed with active Squawk by pushing the UP/DOWN (toggle) button</td>
</tr>
</tbody>
</table>

Table 4-2: Indications
4.2.4 Extended Squitter (ADS-B) Indications
The symbols for Extended Squitter show the current operational status of ES and ADS-B transmissions.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Extended Squitter on. Letter “A” appears white" /></td>
<td>Extended Squitter on. Letter “A” appears white</td>
<td>NORMAL ADS-B Operation&lt;br&gt;ADS-B out function is active and transmitting messages</td>
</tr>
<tr>
<td><img src="image" alt="Extended Squitter on. Letter “A” appears yellow" /></td>
<td>Extended Squitter on. Letter “A” appears yellow</td>
<td>Indicates an ADS-B FAILURE&lt;br&gt;ADS-B out function is active but not transmitting messages. [Mode-S may still be active]</td>
</tr>
<tr>
<td><img src="image" alt="Extended Squitter on. Letter “A” appears red" /></td>
<td>Extended Squitter on. Letter “A” appears red</td>
<td>Indicates an ADS-B FAILURE&lt;br&gt;Possible GPS FAILURE&lt;br&gt;ADS-B out function is active and transmitting type ZERO position messages or no position messages due to missing position data (longitude, altitude, latitude)</td>
</tr>
<tr>
<td><img src="image" alt="Extended Squitter off. Letter “A” disappears" /></td>
<td>Extended Squitter off. Letter “A” disappears</td>
<td>Indicates an ADS-B FAILURE&lt;br&gt;Indicates a Mode-S(ES) FAILURE&lt;br&gt;No ES is being transmitted</td>
</tr>
</tbody>
</table>

Table 4-3: Extended Squitter and ADS-B Indications
4.3 NORMAL OPERATION
The KTX2 is a menu-driven system (Table 4-4) with various display, control and configuration screens accessed by pushing, rotating, or rocking its six front panel controls.

Table 4-4: KTX2 Operations Menus
4.3.1 ON/OFF
The device is switched on/off by pushing the mechanically locked key. After power up, the system displays the start-up screen (Figure 4-2):

![Start-Up Screen](image)

Device Name: KTX2
S/W Version: e.g. 0101
Firmware Version: e.g. 6.0

![Figure 4-2: Start-Up Screen](image)

After approx. 2 seconds, the normal operation window appears (Figure 4-3) and the transponder will enter ALT mode. If a weight on wheels switch is installed and the aircraft is on ground the mode GND will be set.

![Normal Operations Screen](image)

No GND Switch Installed
GND Switch Installed – A/C on GND

![Figure 4-3: Normal Operations Screen](image)
If multiple Flight ID’s are present, the screen will first display the FID selection menu. Select the correct FID by rotating the Rotary Knob to the desired selection and confirm by pushing the knob.

4.3.2 Select Transponder Modes
The Transponder Mode is always displayed in the lower left-hand corner of the screen (see Figure 4-4). Press MDE button to change modes.

<table>
<thead>
<tr>
<th>STBY</th>
<th>Transponder is on but does not respond to any interrogation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>Transponder in &quot;On Ground&quot; status</td>
</tr>
<tr>
<td>ON</td>
<td>Transponder responds to all interrogations, only altitude is not transmitted.</td>
</tr>
<tr>
<td>ALT</td>
<td>Transponder responds to all interrogations</td>
</tr>
</tbody>
</table>

Table 4-5: Transponder Modes

4.3.3 Changing the Squawk

1. Push the Rotary Knob – the first number in the standby squawk turns green
2. Rotate the knob to select a number
3. Push the rotary knob again to save the number and move to the next
4. Continue until the desired squawk is set
5. With the toggle button you can make the Standby squawk into the Active squawk. The Active squawk is always on the top line (Figure 4-4).

4.3.4 VFR Squawk
The factory setting of the VFR transponder code is 7000 (set to 1200 for U.S.). The VFR transponder code however can be defined in accordance with local requirements (see setup details paragraph 4.4.2.8).

To activate the VFR-Squawk push the VFR button (Top Center). The VFR code is then indicated on the display as the active squawk.
4.3.5  **Squawk IDENT**  
On request of the air traffic control, push the ID button (when not in the STBY mode).

Transmission of the ID signal will last for 18 seconds and “IDT” is displayed above the mode and left side of the Flight ID ( ).

![Figure 4-5: Squawk IDENT](image)

4.3.6  **Flight / Ground Indication**  
Aircraft with AIR/GROUND switches display “FLY” (Flight) or “GND” (Ground) in the lower right corner (Figure 4-6).

![Figure 4-6: FLY / GND](image)

This function must be activated in the set-up procedure (see paragraph 4.4.2.4).

When this function is not activated, there are no indications on the display and modes must be manually selected in accordance with Table 4-5.

4.3.7  **Adjustable Parameters in Operation Mode**

4.3.7.1  **Flight ID**

To modify the Flight ID (FID) during operation, push the ID button for at least 3 seconds.

![Figure 4-7: Modify Flight ID](image)
4.3.7.2 Brightness
To modify the display brightness during operation, push the VFR button for at least 3 seconds. When the menu appears, brightness can be adjusted by pushing the Rotary Knob and rotating it to change the level.

![Figure 4-8: Display Brightness Adjustment](image)

4.3.7.3 GPS Data
Actual GPS data can be displayed when pushing the Toggle Button for at least 3 seconds.

![Figure 4-9: GPS Data](image)

4.4 CONFIGURATION SET-UP
KTX2 configuration is performed directly from the Primary Display; no external connections are necessary. Once the configuration parameters have been entered and saved, they will remain in the Transponder’s memory until changed.

4.4.1 Entering Set-Up Mode

1. To enter set-up mode, press the ID button during system startup. The following menus will appear (2 pages):

![Figure 4-10: Entering Set-Up Mode](image)
2. Rotation of the rotary knob moves to the desired menu item. Pushing the rotary knob selects the desired parameter to be modified;
3. Detailed configuration procedures begin in paragraph 4.4.2 below.
4. Figure 4-11 is an outline of the various configuration pages available.
Figure 4-11: Configuration Pages
4.4.2 Configuration Pages

4.4.2.1 Set Flight ID (FID)

Before you can enter the 24-bit Aircraft Address (AA), the Flight ID needs to be defined.

1. Rotate the Rotary Knob to select Flight ID;

   Setup 1/2
   Brightness
   >Flight ID
   Modify VFR
   Factory Reset

2. Push the Rotary Knob to enter the Flight ID sub-menu;

   ← Flight ID
   >Add
   Modify
   Delete

3. Select “Add” to add a Flight ID, modify to modify or delete to delete a Flight ID by pushing the rotary knob;
4. In the “Add” sub-menu, the following screen appears:

   ← Edit FID Param.
   >FID  DE123456
   AA-Code  123456
   Device Parameter
   Save

5. Press and rotate the rotary knob to enter the Flight ID. Press to jump to the next digit, rotate to select the desired character until the Flight ID is complete.
6. When selection is done, turn rotary knob to move cursor to “Save”, save configuration by pushing the rotary knob.
7. Leave the menu by moving to the first line (“Edit FID Param.”) and by pushing the rotary knob.
4.4.2.2 Set the Aircraft Address (ICAO 24-bit Code)

This 24-Bit unique address is assigned to an aircraft during the registration process. The code can be obtained from either the aircraft registration certificate or the N-number inquiry page (http://registry.faa.gov/aircraftinquiry/).

1. Rotate the Rotary Knob to select Flight ID;

2. Push the Rotary Knob to enter Flight ID sub-menu;

3. Select “Add” by pushing the Rotary Knob. In the sub-menu, the following screen appears:
4. Rotate the rotary knob to enter the AA-Code submenu. Press to jump to the next digit, rotate to select the desired character until the Aircraft Address is complete.
5. When code is complete, turn rotary knob to move cursor to “Save”, save configuration by pushing the rotary knob. Leave the menu entering the first line (“Edit FID Param.”) and by pushing the rotary knob.

4.4.2.3 Aircraft Parameter

1. Rotate the Rotary Knob to select “Device Parameter” and push the knob to select. The following screens appear (2 pages):

2. Select the “Aircraft Category” sub-menu and the following screens appear (2 pages):

3. Select “FixW < 5.7t”. This is equivalent to the ICAO emitter category for aircraft <15,000 lbs.;
4. When selection is complete, leave the menu in the usual way.
4.4.2.4 Ground Switch
The next submenu is activates / deactivates AIR/GND switch function.

1. Select “GND Switch Support” from the Device Parameter Page 1:

   GND Switch Sup.
   >Yes
   No

2. YES/NO can be selected by rotating the rotary knob, push to confirm.

4.4.2.5 Speed Category
This sub-menu will allow you to set the typical cruising speed of your aircraft.

   Maximum Speed
   ≤ 75kt
   > 75 and ≤150kt
   >150 and ≤300kt

1. Select the appropriate value for your aircraft and push the knob to confirm.

Note: Setting the speed too low may result in erroneous FLY-GND status during high speed taxi.
4.4.2.6 Select GNSS Device
This page will allow you to select an appropriate WAAS GPS source for the KTX2. Note that the NexNav mini is currently the only compatible GPS source.

When “NexNav mini” is selected, the baud rate will be automatically set.

NOTE
If “NexNav mini is NOT selected, the KTX2 does not meet the requirements for the 2020 Mandate and does not qualify as an ADS-B transponder.

4.4.2.7 Select Length / Width and GNSS Antenna Offset
These selections will help determine the exact position of the GPS antenna on the aircraft.

1. Select the “Length/Width sub-menu and enter the appropriate values in meters (rounded up):

2. Select the “GNSS Ant. Offset” sub-menu and enter the longitudinal (distance from the aircraft nose) and lateral (distance from the aircraft centerline) offset for the installed GPS antenna.
4.4.2.8 Modify VFR

1. In Set-Up Mode, select “Modify VFR” by rotating the Rotary Knob and pushing to enter the sub-menu:

```
Setup 1/2
Brightness
Flight ID
>Modify VFR
Factory Reset
```

2. The following menu appears:

```
← Modify VFR
>VFR 1234
```

3. The Rotary Knob will modify the digits.

4.4.3 Factory Reset
In certain cases, it may be necessary to perform a Factory Reset.

1. Select “factory Reset” from page 1 of the Set-Up menu;

```
← Factory Reset
>No
>Yes
```

2. If you select “Yes” by pushing the Rotary Knob, the system will do a Factory Reset. You
will then be prompted to restart the Transponder.

4.4.4 Test Menu
The Test Menu incorporates the following sub-menus:

- Altitude Offset
- Test Mode
- Device Information

4.4.4.1 Altitude Offset
This value is set at the Factory and should not be changed.

4.4.4.2 Test Mode
The Test Mode displays three parameters:

- Operating Voltage (Battery level)
- DC Converter voltage
- Altitude (in feet)

4.4.4.3 Device Information
This sub-menu displays the checksum of the software / firmware and the Serial Number of the device. This information may be used for maintenance purposes.
4.4.5 Errors and Warnings
The KTX2 will alert the User to three types of anomalies as indicated in Table 4-6:

- Warnings
- Set-up Errors
- Elementary Function Errors

<table>
<thead>
<tr>
<th>ALERT / WARNING</th>
<th>MEANING</th>
<th>ACTION REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure</td>
<td>If no FID-Code (Flight ID) and the corresponding Aircraft Address (AA-Code) is entered or uncomplete, the following displays will appear after switching on the transponder</td>
<td>Enter appropriate FID and AA-Code described in paragraphs 4.4.2.1 and 4.4.2.2</td>
</tr>
<tr>
<td>Failure</td>
<td>Err FPGA</td>
<td>Send Unit for servicing</td>
</tr>
<tr>
<td></td>
<td>Intern. Comm. Fail</td>
<td>Send Unit for servicing</td>
</tr>
<tr>
<td></td>
<td>Do System Restart</td>
<td>Switch Unit OFF &amp; ON again</td>
</tr>
<tr>
<td>Failure</td>
<td>No output from Transponder. Check all connections and battery voltage (4.4.4.2)</td>
<td>If no root cause discovered, send unit for servicing</td>
</tr>
<tr>
<td></td>
<td>Data from GPS source not sufficient</td>
<td>Check GPS source</td>
</tr>
<tr>
<td></td>
<td>Not enough satellites</td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>Battery voltage has fallen below 11 VDC</td>
<td>Check battery</td>
</tr>
<tr>
<td></td>
<td>(Unit will operate &gt; 9 VDC)</td>
<td>Increase engine RPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check generator output</td>
</tr>
</tbody>
</table>
4.5 POST-INSTALLATION CHECKOUT

Once the KTX2 has been configured, the Installer must perform the following checks to determine that the unit is operating correctly and that it will have no adverse effects on other aircraft equipment.

4.5.1 General

1. Connect the aircraft battery and ensure that full battery voltage is available. Since the full series of checks may take an hour or more, a charger may be necessary to avoid draining the battery.

2. Check all connections, paying particular attention to the both the L-Band and GPS antenna coax connectors, static source and 15-pin D-Sub (P1).

3. Turn on the GPS source and the KTX2 and proceed with the full post-installation checks listed below.

4.5.2 KTX2 Operational Checks

1. After power has been applied, note that the start-up screen (Figure 4-2) appears.

2. Wait approximately 2 seconds for the Normal Operation screen (Figure 4-3) to appear. Note - If the FID and AA have not yet been configured and/or the GPS has not fully aligned, failure & warning screens (see Table 4-6) may alternatively appear.

3. Complete any remaining configuration items in accordance with the instructions in paragraph 4.4.

4.5.3 GPS Source Check

1. This check requires that the GPS antenna to be open to a clear sky or a GPS Simulator or repeater to generate the necessary signal.

2. Verify that no CRC Failure is present on the GNSS Data screen. If a CRC Failure is present:

---

**Table 4-6: Errors and Warnings**

<table>
<thead>
<tr>
<th>ADS-B (L-Band) antenna failure</th>
<th>Check antenna installation</th>
<th>Check antenna installation including cables &amp; connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak or failed transmitter</td>
<td>Resolve problem before next flight</td>
<td>If warning persists, send unit for servicing</td>
</tr>
</tbody>
</table>
- The GPS signal may be blocked; move the aircraft to an open environment or input a GPS signal using test equipment;
- Check the GPS antenna or wiring for installation issues;
- Check that the L-Band and GPS antenna cables are not swapped.

3. Compare the GPS position (lat/lon) to the aircraft's actual position.

4. Note any other Alerts or Warnings that are displayed.

4.5.4 ADS-B Out Check
Before performing this check ensure that the GPS position is acquired and that no Failures or Warnings are present.

1. Perform the ADS-B Out check per AC 20-165A using an IFR-6000 (or equivalent) Ramp Test Set.
   These tests should confirm the configuration settings made in paragraph 4.4 are correctly transmitted in the ADS-B Out messages;
   Several different Squawk Codes, including the pre-set VFR code should be checked;
   Cycling the Mode through STB / GND / ON / ALT will verify their correct function.

4.5.5 Static System Check

1. After installation, a Static System test must be performed in accordance with 14 CFR Part 91.411 and 14 CFR Part 43 Appendix E.
2. Verify that the displayed altitudes on the screen and the IFR-6000 are within +/- 100 ft.

4.5.6 Electromagnetic Interference (E.M.I.) Check
Check the following applicable aircraft systems, as well as any other system or device that is not listed, for interference. Tests should be conducted with the aircraft operating on external ground power. Disregard any system or device that does not apply.

NOTE
The Electromagnetic Interference Check is required only for initial system installations and not required if the unit is subsequently removed or replaced.

1. Communications
   a. Cockpit Intercom
      Using the cockpit intercom, verify interference free communications between the crew while monitoring the effects of the KTX2.
   
      VHF Communications
      Set VHF communications radios to multiple frequencies and monitor effects of KTX2 while transmitting and receiving. At a minimum, the frequencies listed below should be tested, in addition to locally available frequencies:
Check the GPS signal status of each satellite being received. Ensure that it does not drop while transmitting each frequency for a period of 35 seconds.

Test the following frequencies for 25 kHz COM channel spacing:

<table>
<thead>
<tr>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>121.150 MHz</td>
</tr>
<tr>
<td>121.175 MHz</td>
</tr>
</tbody>
</table>

b. In addition test the following frequencies for VHF radios with 8.33 kHz channel spacing:

<table>
<thead>
<tr>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>121.185 MHz</td>
</tr>
<tr>
<td>121.175 MHz</td>
</tr>
</tbody>
</table>

2. Navigation
   a. **VOR / ILS**
      Verify the operation of each VHF Nav receiver in both VOR and ILS modes (including glideslope) while monitoring the effects of the KTX2.
   b. **DME**
      Verify the operation of each DME while monitoring the effects of the KTX2. The same frequencies used for VOR and ILS testing may be used for this test.
   c. **Marker Beacon**
      Verify the operation of the Marker Beacon Receiver while monitoring the effects of the KTX2.
   d. **ADF**
      Verify the operation of the ADF receiver while monitoring the effects of the KTX2. Frequencies from each band should be tested when possible. Public broadcast stations are acceptable for conducting test.

3. Flight Director / Autopilot
   Operate the flight director/autopilot system and verify it responds to commands from the flight guidance panel while monitoring the effects of the KTX2.

4. **Compass System**
   Verify each compass system is presenting correct information while monitoring the effects of the KTX2.

5. **Attitude System**
   Verify each attitude system is presenting correct information while monitoring the effects of the KTX2.

6. **Safety Equipment**
   a. **TAWS (If Installed)**
      Verify the function of the TAWS and Terrain Display while monitoring the effects of the KTX2.
   b. **Weather Monitoring System (If Installed)**
      Verify the function of the weather monitoring system while monitoring the effects of the KTX2.
4.5.7 Flight Test
A flight test is not required after installation. However, reports that “ADS-B is not being received”, etc. do warrant further evaluation of the installation.

4.5.8 Installation Checkout Complete
This completes the Installation Checkout procedure for the KTX2. The Installer should fill out a copy of the Configuration and Checkout Log Sheet (Error! Reference source not found.) and include it in the aircraft logbook after the installation is complete.
SECTION 5 MAINTENANCE

5.1 INTRODUCTION
This section contains general flight line maintenance and fault isolation procedures. Fault isolation is intended to aid in identifying and correcting invalidities or isolating failures to a defective assembly.

5.2 CONTINUED AIRWORTHINESS
Regular maintenance of the KTX2 is not required except as included in this section and is to be maintained on a "Condition Monitorered" basis. Condition monitoring is based upon the following:

Visual observation by the user.

All units have unlimited service life, therefore service life is defined as that point in time when repair is no longer economical.

NOTE
A copy of the KTX2 Instructions for Continued Airworthiness should be kept in the aircraft logbook.

5.2.1 Periodic Maintenance KTX2
Perform the following at regular aircraft inspection intervals:

- Visually inspect for signs of corrosion.
- Visually inspect for condition of wiring, shield terminations for proper grounding, routing, and attachment/clamping.
- Visually inspect the unit mounting to the aircraft, verify visually that the screw heads are in full contact with the mounting holes etc. Re-torque the screws if required.
- It is recommended that an electrical bond check be performed between the unit and nearby exposed portion of the aircraft metallic structure and verify that the measured value is less than or equal to 2.5 milliohms.
- In the event of bonding check failure, remove the unit and clean it and its mounting holes at both the unit and the aircraft structure and reattach the unit. Re-verify the resistance between the unit and nearby exposed portion of aircraft metallic structure, and ensure it is less than or equal to 2.5 milliohms.

5.3 FAULT ISOLATION
Use the troubleshooting help provided in Table 5-1 during initial installations and debugging issues that may appear during operation.

Use Table 5-1 to view observed failures or conditions and determine possible causes and recommended corrective actions. Failures are typically observed via Failure or Warning indications on the KTX2 screen.

If the only corrective action left is to contact TQ-Group Field Service, then Field service personnel may request information copied from the Test and Configuration pages.
Table 5-1: Troubleshooting KTX2

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Cause / Corrective Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No sign of power and/or Screen blank.</strong></td>
<td>KTX2 is not operating: 1. Verify KTX2 breaker is closed. Check and reset the circuit breaker; 2. Verify power and ground supplied to the KTX2; 3. Replacement of the KTX2 may be required. Contact TQ-G Direct Support before removal of the unit.</td>
</tr>
<tr>
<td><strong>Err FPGA</strong></td>
<td>A severe error has been detected. There is no access to the FPGA: 1. Attempt to restart the unit; 2. Replacement of the KTX2 may be required. Contact TQ-G Direct Support before removal of the unit.</td>
</tr>
<tr>
<td><strong>Intern. Comm. Fail</strong></td>
<td>Severe failure. An internal communications error has occurred: 1. Attempt to restart the unit; 2. Replacement of the KTX2 may be required. Contact TQ-G Direct Support before removal of the unit.</td>
</tr>
<tr>
<td><strong>Do System Restart</strong></td>
<td>An error has been detected and the KTX2 should be restarted: 1. Switch unit off, wait 5 seconds and switch on; 2. If error repeats, contact TQ-G Direct Support for further advice.</td>
</tr>
<tr>
<td><strong>Trans. Output</strong></td>
<td>Severe Failure. The KTX2 is not transmitting. 1. Check all connections; 2. If no root cause can be discovered, replacement of the KTX2 may be required. Contact TQ-G Direct Support before removal of the unit.</td>
</tr>
<tr>
<td><strong>CRC Failure</strong></td>
<td>Insufficient data from GPS source. 1. A minimum of 3 GPS satellites must be in view; 2. Check GPS antenna connection; 3. If problem persists, GPS source may have failed. Contact GPS source manufacturer for further details.</td>
</tr>
<tr>
<td><strong>BAT LOW</strong></td>
<td>Voltage is &lt; 11 VDC. 1. If engine is running, increase RPM; 2. If engine is off, recharge or replace battery. The KTX2 is designed to operate above 9 VDC, but determine cause of low voltage before next flight.</td>
</tr>
<tr>
<td><strong>ANT</strong></td>
<td>Possible L-Band antenna failure. 1. Check antenna installation (cable &amp; connector); 2. Resolve problem before next flight.</td>
</tr>
<tr>
<td><strong>TRX</strong></td>
<td>Weak Transmitter – Output power limited. 1. Check antenna installation (cable &amp; connector); 2. If no root cause can be discovered, replacement of the KTX2 may be required. Contact TQ-G Direct Support before removal of the unit.</td>
</tr>
</tbody>
</table>
5.4 RETURN TO SERVICE
Use this procedure to remove and replace the KTX2. The instructions herein are generic in scope. The best established methods, techniques and practices should be used where no specific procedure is given.

1. Removal Procedure
   a. Ensure power to the unit is off;
   b. Remove mating connector P1;
   c. Disconnect L-Band antenna coax;
   d. Disconnect Static Line;
   e. Loosen (4) screws;
   f. Remove the unit from aircraft.

2. Installation Procedure
   a. Ensure aircraft power is off;
   b. Connect mating connector P1;
   c. Connect Static Source;
   d. Connect UAT L-Band coax;
   e. Carefully place the unit in aircraft;
   f. Secure the unit using (4) screws.

3. Functional Check Procedure
   a. Apply power to the unit and system components;
   b. Ensure no failure messages are annunciated on the display;
   c. Perform the checkout procedure provided in paragraph 4.5 to verify unit is functioning correctly;
   d. Refer to the fault isolation section if errors are detected.

5.5 DISPOSITION OF FAILED ITEMS
1. The KTX2 can only be repaired by TQ-Group or an FAA Certified Repair Station Facility. For further information on your nearest authorized repair facility see the TQ-Group General Aviation website at:


2. Refer to the manufacturer’s data for GPS sources and antennas interfaced to the KTX2.

3. If available, pack components in their original shipping container. If the original container is not available, pack them as follows:
   a. Ensure that conductive covers/caps are installed on the exposed terminals of connector, if applicable.
   b. LRU’s that are marked as electrostatic discharge sensitive (ESDS) must be wrapped in static protective materials.
   d. Place assembly in a cardboard box.
   e. Wrap any accessories in tissue and place in the box. Fill spaces with bubble pack.
   f. Place an explanation letter in the box with the following information.
      • Your name, address, and telephone number.
      • Purchase order number.
• Description of component including, when applicable, model and serial number.
• A brief description of the difficulty.
g. Shut box, and seal with reinforced tape.
h. Attach a packing list to outside of box.

CAUTION

Do not use desiccant crystals when packaging electronic assemblies. Since the assembly must be packed tightly, crystals in bag form cannot be used. The use of loose crystals may cause unnecessary damage resulting in a cleaning problem.
APPENDIX A  FCC RELATED ISSUES

A.1 RADIOFREQUENCY RADIATION EXPOSURE INFORMATION
This transponder complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transponder should be installed and operated with minimum distance of 200 mm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

A.2 COMPLIANCE
This transponder has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. This transponder may not cause harmful interference and;
2. This transponder must accept any interference received, including interference that may cause undesired operation.

A.3 MODIFICATIONS
Changes or modifications made to this transponder not expressly approved by TQ-Systems GmbH may void the FCC authorization to operate this equipment.
## APPENDIX B CONFIGURATION AND CHECKOUT WORKSHEET

### Configuration and Checkout Worksheet

(This sheet should be retained in aircraft records for future reference)

<table>
<thead>
<tr>
<th>Date: ______________</th>
<th>By:__________________________________</th>
</tr>
</thead>
</table>

### Installation Information

(use the information found in the general information section to help fill out the following data)

- Model KTX2 P/N 304110 (xx)
- Unit Serial Number: ______________
- Aircraft Model: ______________
- Aircraft Serial Number: ______________

### Configuration

#### Aircraft Options

- Aircraft Call Sign (FID): ______________ Set: □
- ICAO Mode S ID (AA-Code): ______________ Set: □
- VFR Code: ______________ Set: □
- Aircraft Emitter Category: __________ Set: □
- AIR/GND switch Enabled: Yes □ No □
- Maximum Speed: ≤ 75kt □ 75 and ≤150kt □ 150 and ≤300kt □
- GNSS Source: NexNav Mini □ Other □ ___________ None □
- GNSS Baud Rate: 4800 □ 9600 □ 19200 □ 38400 □
- Aircraft Length (Meters): __________ Aircraft Wingspan (Meters): __________
- GNSS Antenna Offset (Meters): Longitudinal (From Nose) __________ Lateral __________

### Notes:

______________________________
______________________________
______________________________
______________________________