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XVUE TOUCH PRIMARY FLIGHT DISPLAY SYSTEM INSTALLATION MANUAL

FOR USE IN NON-CERTIFIED AIRCRAFT

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RECORD OF REVISIONS

NOTE: The revision level for every page of this document will be updated during the revision process. A list of effective pages is, therefore, not required.

Revision	Revision Date	Description
0	11Apr2018	Initial release
1	29June2018	Rewritten to update design details throughout
2	06Nov2019	Rewritten to update design details throughout

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1 INTRODUCTION

1.1 How to Use This Manual

1.1.1 General

(1) This publication gives installation and maintenance instructions for the equipment shown on the Title page.
(2) Standard maintenance procedures that technicians must know are not given in this manual.
(3) Warnings, cautions, and notes in this manual give the data that follows:

The WARNING symbol indicates a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause injury or death.

The CAUTION symbol indicates a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause damage to the equipment.

The NOTE symbol indicates data, not commands. The NOTE helps personnel when they do the related instruction.

(4) Warnings and cautions precede the applicable paragraph or step. Notes follow the applicable paragraph or step.

1.1.2 Observance of Manual Instructions

(1) Make sure that you carefully obey all safety, quality, operation, and shop procedures for the unit.
(2) All personnel who operate equipment and do maintenance specified in this manual must know and obey the safety precautions.

1.1.3 Symbols

(1) The symbols and special characters are in alignment with IEEE Publication 260 and IEC Publication 27. Special characters in text are spelled out.
(2) The signal mnemonics, unit control designators, and test designators are shown in capital letters.
(3) The signal names followed by an "*" show an active low signal.
(4) The symbols in Figure 1-1 show ESDS and moisture sensitive devices.

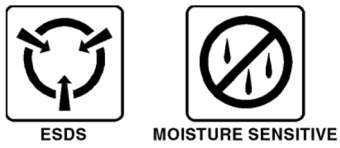

Figure 1-1 Symbols

1.1.4 Units of Measure

Measurements, weights, temperatures, dimensions, and other values are expressed in the USMS followed by the appropriate SI metric units in parentheses. Some standard tools or parts such as drills, taps, bolts, nuts, etc. do not have an equivalent.

1.1.5 Electrostatic Discharge

Handle the items susceptible to electrostatic discharge in accordance with MIL-HDBK-263. Refer to MIL-STD-1686 for definition of the standards and conditions.

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1.2 References

1.2.1 BendixKing/Vendor Publications

The publications listed in Table 1-1 are BendixKing/Vendor references. Check for latest version of publication.

Table 1-1 BendixKing/Vendor References

Document Number	Description
D201804000013	xVue Touch Pilot's Guide
89800109-004	xVue Touch Airplane Flight Procedures (AFP)
006-10662-0007	KSG 7200 ADHARS and KMG 7010 Magnetometer Installation Manual (*Included as reference material for the KMG 7010 Magnetometer*)
9019050	Installation Manual and Operating Instructions -– Model MD32 Series Remote Magnetometer
D201804000014	xVue Touch Experimental Installation and Procedures Documentation

1.2.2 Other Publications

The publications listed in Table 1-2 are standard references. Check for latest version of publication.

Table 1-2 Standard References

Document Number	Description
	United States GPO Style Manual (available at http://www.gpo.gov/fdsys/pkg/GPOSTYLEMANUAL-2008/content-detail.html)
14 CFR Part 43	Title 14 of Code of Federal Regulations (14 CFR) Part 43 – MAINTENANCE, PREVENTIVE MAINTENANCE, REBUILDING, AND ALTERATION
IEEE STD 260.1	Standard Letter Symbols for Units of Measurement (available from the American National Standards Institute at http://www.ansi.org)
ARINC 429	Digital Information Transfer System (DITS)
ARINC 453	Very High Speed (VHS) Bus
ARP5414A	SAE Aerospace Recommended Practice Aircraft Lighting Zoning
ASME Y14.38	Abbreviations for Use on Drawings and Related Documents (available from the American National Standards Institute at http://www.ansi.org)
ASME Y14.5	Dimensioning and Tolerancing (available from the American National Standards Institute at http://www.ansi.org)
ANSI/IEEE STD 91	Graphic Symbols for Logic Functions (available from the American National Standards Institute at http://www.ansi.org)
	H4/H8 CAGE Codes (available from DLA Logistics Information Services at http://www.logisticsinformationservice.dla.mil)
ANSI/NEMA WC 27500	Standard for Aerospace and Industrial Electrical Cable, nongovernmental standard replacement for MIL-DTL-27500

Table 1-2 Standard References

Document Number	Description
IEEE 315/ANSI Y32.2	Graphic Symbols for Electrical and Electronics Diagrams (available from the American National Standards Institute at http://www.ansi.org)
IEEE 802.3	Ethernet Standards
MIL-C-17	Military Specification: Cables, Radio Frequency, Flexible and Semi-rigid
MIL-DTL-5541	Military Specification, Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-DTL-27500	Detail Specification: Cable, Power, Electrical and Cable Special Purpose, Electrical Shielded and Unshielded
MIL-HDBK-263	Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric) (available from any military standards database)
MIL-STD-1686	Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) (Metric) (available from any military standards database).
RS-232/ ANSI TIA-232	Recommended Standard - Serial Interface
RS-422/ ANSI TIA-422	Recommended Standard - Electrical Characteristics of Balanced Voltage Differential Interface Circuits

1.3 Acronyms and Abbreviations

(1) The abbreviations are used in agreement with ASME Y14.38.

(2) Acronyms and non-standard abbreviations used in this publication are as follows in Table 1-3.

Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
#	Number
A	Amp
AC	Advisory Circular
A/C	Aircraft
ADAHRS	Air Data and Attitude Heading Reference System
ADS-B	Automatic Dependent Surveillance
AFCS	Automatic Flight Control System
AFM	Airplane Flight Manual
AHRS	Attitude and Heading Reference System
AI	Attitude Indicator
ALT	Altitude

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Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
AML	Approved Model List
Amdt	Amendment
AMP	Ampere
ANSI	American National Standards Institute
AP	Autopilot
APM	Aircraft Personality Module (also referred to as the Configuration Module)
AR	As Required
ARINC	Aeronautical Radio, Incorporated
ARM	Distance between designated point on the aircraft and the CG of the unit installed on the aircraft
AS	Aerospace Standard
ASME	American Society of Mechanical Engineers
AWG	American Wire Gauge
A429	ARINC 429 Data Transfer Standard
BL	Backlight
BNR	Binary Number
C	Celsius
CAGE	Commercial and Government Entity
CAN	Controller Area Network
CBIT	Continuous Built-in Test
CCA	Circuit Card Assembly
CFR	Code of Federal Regulations
CG	Center of Gravity
CM	Configuration Module
CMD	Command
CMT	Configuration and Maintenance Tool
COMP	Composite
CPU	Central Processing Unit
CRS	Course
DAL	Design Assurance Level
DC	Direct Current

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Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
DEV	Deviation
DIGO	Discrete Input Ground/Open
DI15VO	Discrete Input 15V/Open
DI5VO	Discrete Input 5V/Open
DI28VO	Discrete Input 28V/Open
DOGO	Discrete Output Ground/Open
DO5VO	Discrete Output 5V/Open
DO28VO	Discrete Output 28V/Open
EFIS	Electronic Flight Instrument System
EIS	Engine Information System
ESD	Electrostatic Discharge
ESDS	Electrostatic Discharge Sensitive
EGPWS	Enhanced Ground Proximity Warning System
EQF	Environmental Qualification Form
ETH	Ethernet
F	Fahrenheit
FAA	Federal Aviation Administration
FCS	Flight Control System
FD	Flight Director
FIS-B	Flight Information Services-Broadcast
FPM	Feet Per Minute
GB	Gigabyte
GPO	Government Printing Office
GPS	Global Positioning System
GS	Glideslope
HDG	Heading
HSI	Horizontal Situation Indicator
I/O	Input/Output
ICA	Instructions for Continued Airworthiness
ID	Identification
IEC	International Electrotechnical Commission

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Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
IEEE	Institute of Electrical and Electronics Engineers
IFD	Integrated Flight Display
IFR	Instrument Flight Rules
IM	Installation Manual
in-lb	inch-pound
IR	Infrared
kbps	kilobytes per second
kg	Kilogram
kPa	Kilopascal
KT	Knots
lb	Pound
LED	Light-Emitting Diode
Lgnd	Legend
LOC	Localizer
LRU	Line Replaceable Unit
m	Meter
Mbit	Megabit
MEMS	Micro-Electromechanical Sensors
MIL	Military
MLS	Microwave Landing System
mm	Millimeter
MM	Maintenance Manual
NA	Not Applicable
NAV	Navigation
NAVAID	Navigational Aid
NEMA	National Electrical Manufacturers Association
No.	Number
Nm	Newton Meter
NVM	Non-Volatile Memory
OAT	Outside Air Temperature
PFD	Primary Flight Display

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Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
PBIT	Power-up Built-in Test
PC	Personal Computer
PMA	Parts Manufacturer Approval
PN	Part Number
POH	Pilot's Operating Handbook
PWR	Power
RAM	Random Access Memory
REF	Reference
RF	Radio Frequency
Rngs	RIngs
RTCA	Radio Technical Commission for Aeronautics
RTD	Resistance Temperature Detectors
RTN	Return
RX	Receive
s	Second
SDI	Serial Digital Interface
SEL	Select
SI	International System of Units
SN	Serial Number
SPI	Serial Peripheral Interface
SS	Stainless Steel
STD	Standard
SVS	Synthetic Vision System
SW	Software
SXM	XM Satellite Data
TAWS	Terrain Awareness and Warning System
TC	Type Certificate
TCDS	Type Certificate Data Sheet
TIS-B	Traffic Information Service-Broadcast
TSO	Technical Standard Order
TX	Transmit

Table 1-3 Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
UAT	Universal Access Transceiver
USB	Universal Serial Bus
USMS	United States Measurement System
V	Volt
VDC	Volts Direct Current
VFR	Visual Flight Rule
VSD	Vertical Situational Display
VSI	Vertical Speed Indicator
WAAS	Wide Area Augmentation System
WUXGA	Widescreen Ultra Extended Graphics Array

1.4 Terminology

For the purposes of this installation manual, “metal” airplane refers to airplane with an aluminum skin. Non-metallic aircraft refers to all other aircraft, fiberglass or composite skin and aircraft with tube and fabric construction.

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2 GENERAL INFORMATION

2.1 Introduction

The information in this installation manual applies to the physical, mechanical, and electrical characteristics, as well as instructions, conditions, and limitations, for the installation and approval of the xVue Touch System. The information in this document is subject to change without notice. To download or view publications online, visit the Honeywell Online Technical Publications Website (https://myaerospace.honeywell.com/). Visit the BendixKing Website (www.bendixking.com) for additional materials, information on current updates, and supplemental information concerning the operation of this and other BendixKing products.

Operating instructions are provided in the xVue Touch Pilot's Guide.

Except where specifically required, references to xVue Touch System apply to the complete system that includes the components as shown in Table 2-1.

Table 2-1 xVue Touch System Components

Part Number	Description
89000120-001-[ ]	KSD 100EXP Primary Flight Display (PFD)
89000126-001-[ ] 89000126-003-[ ](1)	KCP 100EXP Control Panel (Portrait) KCP 100EXP Control Panel (Landscape)
89000123-001-[ ]	KG 71EXP Air Data Attitude Heading Reference System (ADAHRS)
065-00189-0101 6420032-[ ]	KMG 7010 Magnetometer OR MD32 Magnetometer
89000138-001 -[ ](2)	KDC 100EXP Data Converter
89000025-001-[ ]	KTP 73 OAT Probe
89400020-064	Programmed Configuration Module
The -[ ] included in the part numbers are placeholders for the major/minor dash number designation. Parts will be marked with a four digit extension (e.g. -0000). Note (1) Alternate part number is used for the Landscape version of the Control Panel. Note (2) Included with the MD32 Magnetometer.	

2.2 Scope

This installation manual applies to the modification of non-type certificated aircraft to install the xVue Touch. This installation manual is not a substitute for an approved airframe-specific flight and/or maintenance manuals, installation drawings, or other approved aircraft-specific documentation.

The content of this installation manual assumes use by competent and qualified avionics engineering personnel and/or avionics installation specialists using standard aviation maintenance practices in accordance with Title 14 of the Code of Federal Regulations and other relevant accepted practices.

2.3 xVue Touch Overview

The xVue Touch System is a touch-controlled Smart Primary Flight Display (PFD) and Multifunction Display (MFD) that replaces the traditional 6- and 8-pack flight instruments. The xVue Touch System is illustrated in Figure 2-1 and consists of:

(1) KSD 100EXP Primary Flight Display
(2) KCP 100EXP Control Panel
(3) KG 71EXP Air Data Attitude Heading Reference System (ADAHRS)
(4) KMG 7010 Magnetometer or MD32 Magnetometer
(5) KDC 100EXP Data Converter (included with MD32 Magnetometer)
(6) KTP 73 Outside Air Temperature (OAT) Probe
(7) Configuration Module

The xVue Touch System is depicted in Figure 2-1 and Figure 2-2.

Figure 2-1 xVue Touch System Components

The xVue Touch System provides primary flight and multi-function information integrated into one display for reduced workload, improved safety, and better reliability. The KSD 100EXP display includes Attitude, Horizontal Situation Indication, Turn Coordinator, Airspeed, Altimeter, Vertical Speed Indication, and Course Deviations. Additionally, the KSD 100EXP has the capability to display Moving

Map, VFR Sectional and IFR charts, Instrument Procedures charts, Synthetic Vision, and ADS-B Traffic and Weather.

The xVue Touch System may also be referenced throughout this document as KFD 900EXP or abbreviated to KFD 900.

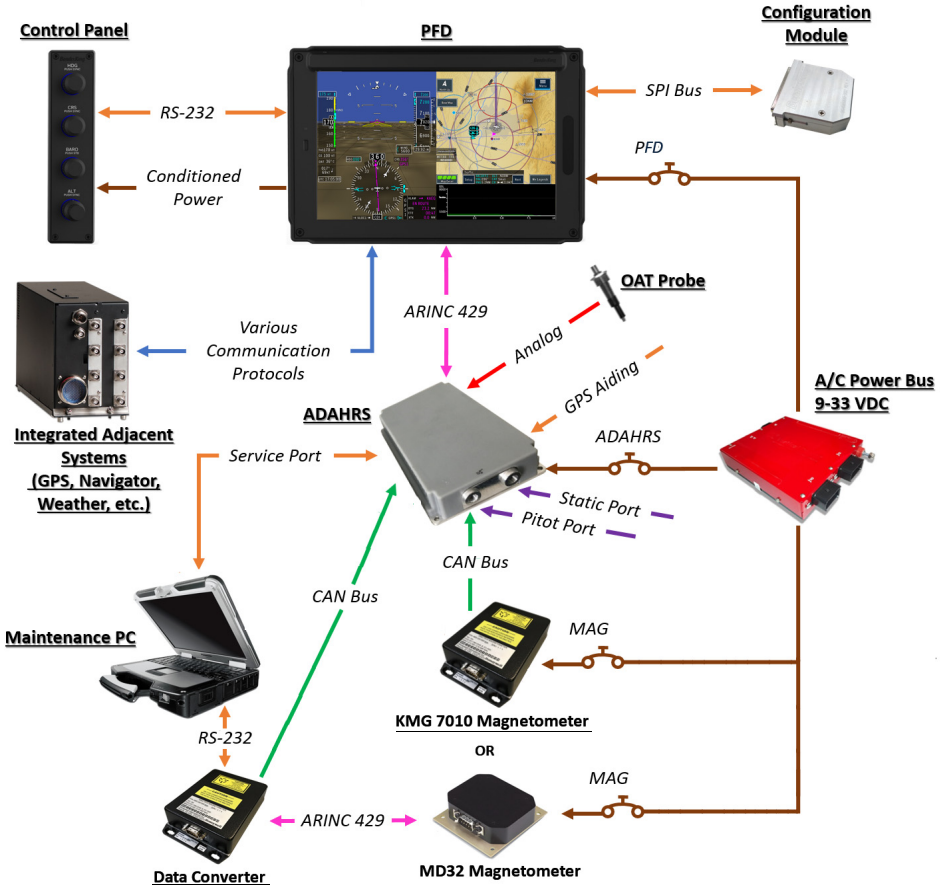

Figure 2-2 xVue Touch System Block Diagram

2.3.1 KSD 100EXP Primary Flight Display

The KSD 100EXP is a 10.1-inch high-resolution (WUXGA) Liquid Crystal Display (LCD) with Infrared (IR) Smart Touch technology. The Smart Touch technology allows operation with a finger, pen, or glove. The display has a light sensor that detects cockpit lighting conditions for automatic dimming of the display. Dimming can also be controlled manually. The KSD 100EXP includes a USB port for database uploads and maintenance functions.

The KSD 100EXP PFD is referenced throughout this manual as either KSD 100EXP or abbreviated as KSD 100.

2.3.2 KCP 100EXP Control Panel

The KCP 100EXP is a control panel that consists of three rotary push button knobs and one dual concentric push button knob. The KCP 100EXP provides an alternative to the KSD 100EXP touch control capability for entering barometric pressure, selected altitude, course and heading parameters. The KCP 100EXP receives its power and LED backlight dimming input from the KSD 100EXP.

The KCP 100EXP Control Panel is referenced throughout this manual as either KCP 100EXP or abbreviated as KCP 100.

2.3.3 KG 71EXP Air Data Attitude Heading Reference System (ADAHRS)

The KG 71EXP provides attitude, altitude, airspeed, air temperature, vertical speed and heading information for the xVue Touch System. The air data parameters are calculated based on total pressure, static pressure, and air temperature. The attitude and heading reference system provides current airplane attitude based on inertial sensors and an aiding source (GPS or airspeed). The heading value is stabilized using the KMG 7010/MD32 Magnetometer measurement.

For the KG 71EXP to be fully functional it requires connection to the airplane pitot-static system and data from the KMG 7010/MD32 Magnetometer and the KTP 73 OAT Probe and connection with a WAAS GPS source. Only the GPS units identified in this install manual will be authorized to provide inputs to the KG 71EXP. The approved WAAS GPS sources include the BendixKing KSN series, the Garmin GNS-W (only the GNS 430W and GNS 530W are certified WAAS navigators) and GTN series; and the Avidyne IFD series that include GPS.

The KG 71EXP communicates with the KSD 100EXP via a dedicated ARINC 429 interface. Additionally, the KG 71EXP provides two ARINC 429 transmit channels which can be configured as required for interface to other airplane avionics. The configuration options include either a pre-defined configuration, or the option for a custom list of labels including transmit rates. Both transmit channels have the option to be configured for either high speed ARINC or low speed ARINC.

The KG 71EXP communication with the KMG 7010 Magnetometer is via a dedicated Controller Area Network (CAN) bus. The KG 71EXP communication with the MD32 Magnetometer is via the KDC 100EXP data converter.

The KG 71EXP has a dedicated connection to receive temperature data from the KTP 73 Outside Air Temperature Probe.

The KG 71EXP receives GPS WAAS data from a connected GPS via an ARINC 429 receive channel. The KG 71EXP requires the following GPS data, present position latitude/longitude, ground speed and track angle. The transmit channel on the GPS source is connected to both the KG 71EXP and the KSD 100EXP.

The KG 71EXP includes an RS-232 transmit channel to provide altitude data to a connected traffic device such as a transponder that outputs Traffic Information System (TIS) data.

The KG 71EXP also includes a dedicated RS-232 channel for communication with the maintenance computer to support configuration of the KG 71EXP and KMG 7010/MD32.

The KG 71EXP ADAHRS is referenced throughout this document as either KG 71EXP or abbreviated as KG 71.

2.3.4 KMG 7010/MD32 Magnetometer

The KMG 7010/MD32 is a magnetometer that senses Earth's magnetic field and provides magnetic heading data to the KG 71EXP. The KMG 7010/MD32 sensing unit is located internally in the airplane wing or in the empennage, separated from all devices generating electromagnetic fields (motors, ferrous metal, wiring, magnets, antennas or anything else causing magnetic interference). The measurements of the Earth's magnetic field is transmitted by a CAN Bus interface to the KG 71EXP (through the KDC 100EXP with MD32). The data from the KMG 7010/MD32 is used for long-term heading output stabilization.

2.3.5 KDC 100EXP Data Converter

The KDC 100EXP is a data converter that converts ARINC 429 messages from the MD32 Magnetometer to CAN BUS, transmitting it to the KG 71EXP (raw data).

2.3.6 KTP 73 OAT Probe

The KTP 73 OAT probe measures air temperature and provides the data to the KG 71EXP. Total air temperature is sensed by the independent probe. The temperature probe is a platinum 500 Ohm thermal sensor. Total air temperature is used to calculate the OAT and is required for the true airspeed calculation.

2.4 Technical Specifications

Table 2-2 KSD 100EXP Primary Flight Display Specifications

Characteristic	Specification
Dimensions	6.897 x 10.45 x 4.08 inches (175.18 x 265.43 x 103.63 mm)
Mounting Information	Front mount
Weight	7.59 lbs. (3.44 kgs.) Max. Weight
Current Draw	Typical (28VDC): 1.33 AMP Typical (14VDC): 2.66 AMP
Operating Voltage	9.0 to 32.2 VDC (9VDC on battery backup, 11VDC for power-up, and 32.2VDC max)
Circuit Breaker	2 AMP for 28 VDC, 3 AMP for 14 VDC systems
Cooling	Convection cooled (does not required forced air cooling within the unit operational temperature range, refer to Section 3.6.5.2 for cooling considerations)
Connectors	2 D-sub connectors (Female 78-pin and Male 78-pin)
Viewing Angle Envelope	80 degree max viewing angle from all directions

Table 2-3 KCP 100EXP Control Panel Specifications

Characteristic	Specification
Dimensions	1.48 x 6.25 x 3.67 inches (37.6 x 158.8 x 93.2 mm)
Mounting Information	Front mount
Weight	1.02 lbs. (0.46 kgs.) Max. Weight
Current Draw	The KCP 100EXP is powered from KSD 100EXP and the KCP 100EXP current draw is included with the KSD 100EXP values shown in Table 2-2.
Operating Voltage	Operating Voltage is provided by the KSD 100EXP.
Circuit Breaker	The KCP 100EXP is powered from KSD 100EXP. The circuit breaker defined under the KSD 100EXP Primary Flight Display Specifications is sufficient.
Cooling	Convection cooled (does not required forced air cooling within the unit operational temperature range)
Connectors	Male 9-pin D-Sub

Table 2-4 KG 71EXP ADAHRS Specifications

Characteristic	Specification
Dimensions	8.65 x 5.1 x 1.4 inches (219.72 x 129.43 x 35.56 mm)
Weight	2.2 lbs. (1.0 kgs.) Max. Weight
Current Draw	Typical (28VDC): 0.2 AMP Typical (14VDC): 0.4 AMP
Operating Voltage	9.0 to 32.2 VDC (9VDC on battery backup, 11VDC for power-up, and 32.2VDC max)
Circuit Breaker	2 AMP for 28 VDC, 3 AMP for 14 VDC systems
Cooling	Convection cooled (does not required forced air cooling within the unit operational temperature range, refer to Section 3.6.7.3 for cooling considerations)
Connectors	Male 50-pin D-sub Female 9-pin D-sub (Maintenance port)

Table 2-5 KG 71EXP ADAHRS Performance Characteristics

Characteristic	Specification
Time to Initialize	Up to 3 min
Airspeed Range	20 to 350 kts
Altitude Range	-1,000 to 35,000 ft
Vertical Speed Range	-20,000 to 20,000 ft/min
Baro-Correction Range	22 to 31.50 InHg
Roll/Pitch Accuracy	DO 334 Category A4
Roll/Pitch Range	Roll: ± 180 Degrees Pitch: ± 90 Degrees
Heading Accuracy	DO 334 Category H4
Heading Range	±180 Degrees
Slip/Skid Accuracy	DO 334 Category T3
Slip/Skid Range	DO 334 Category T3, Max. range ±8.5 Degrees
Turn Rate Output Accuracy	DO 334 Category T3
Turn Rate Output Range	±128 Degrees/Second
Max Pitch/Roll/Yaw Rate	± 245 deg/sec
Max Sustained G	± 4g

Table 2-6 KMG 7010 Magnetometer Specifications

Characteristic	Specification
Dimensions	3.70 x 5.83 x 1.33 inches (93.98 x 148.08 x 37.78 mm)
Weight	0.99 lbs (0.45 kgs) Max. Weight
Temperature	-55 °C to +70°C
Altitude	55,000 ft.
Operating Voltage	9.0 to 32.2 VDC (9VDC on battery backup, 11VDC for power-up, and 32.2VDC max)
Current Draw (at 27.5 VDC)	80 mA Nominal, 25°C, after 2 minute warmup 200 mA Nominal, -55°C, after 2 minute warmup 700 mA Maximum, -55°C Typical (28VDC): 0.08 AMP Typical (14VDC): 0.16 AMP
Circuit Breaker	1 AMP for 28 VDC, 2 AMP for 14 VDC systems
Signal Inputs/Outputs	Serial CAN Bus
Cooling	Convection cooled. No external cooling required.
Connector	Male 9-pin D-sub
Certifications	TSO-C6d/ETSO-C6d (partial)

Table 2-7 MD32 Magnetometer Specifications

Characteristic	Specification
Dimensions (not incl. connector mate)	3.0 x 2.75 x 0.81 inches (LxWxH) (76.20 x 69.85 x 20.57 mm)
Weight	3.0 oz (.085 kg)
Temperature	-55 °C to +70°C (-67°F to +158°F)
Altitude	55,000 ft.
Operating Voltage	7.0 to 32 VDC
Output Data	ARINC 429 (proprietary format)
Mating Connector	MCI P/N 8017287
Certifications	TSO-C6e

Table 2-8 KDC 100EXP Data Converter Specifications

Characteristic	Specification
Dimensions	3.70 x 5.83 x 1.33 inches (93.98 x 148.08 x 37.78 mm)
Weight	0.99 lbs (0.45 kgs) Max. Weight
Temperature	-55 °C to +70°C
Altitude	55,000 ft.
Operating Voltage	14 to 28 VDC
Current Draw (at 27.5 VDC)	80 mA Nominal, 25°C, after 2 minute warmup 200 mA Nominal, -55°C, after 2 minute warmup 700 mA Maximum, -55°C
Circuit Breaker	1 AMP for 28 VDC, 2 AMP for 14 VDC systems
Signal Inputs/Outputs	Serial CAN Bus
Cooling	Convection cooled. No external cooling required.
Connector	Male 15-pin
Certifications	TSO-C6d/ETSO-C6d (partial)

Table 2-9 KTP 73 Outside Air Temperature Probe Specifications

Characteristic	Specification
Dimensions	1.65 x 1.75 x 1.00 inches (41.91 x 44.45 x 25.4 mm)
Weight	0.17 lbs (0.07 kgs) Max. Weight
Current Draw	NA, not connected to the airplane power bus.
Operating Voltage	Connected to the ADAHRS, no interface to the airplane power.
Circuit Breaker	NA
Cooling	Mounted outside the airplane. No cooling required.
Connectors	5 ft. 3-conductor shielded wire lead, spliced into AC wiring harness.
Certifications	TSO-C106 (Incomplete)

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2.5 Environmental Qualification Form (EQF)

The following table provides the DO-160G Environmental categories for the xVue Touch System components.

Table 2-10 KSD 100EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes
4.0	Temperature and Altitude	A1/C1	-20°C/+55°C, -40°C/+70°C Short Term, -55°C/+85°C Storage, 35,000 ft./-15,000ft In-flight Loss of Cooling (Not Applicable)
5.0	Temperature Variation	C	2°C/minute
6.0	Humidity	A	
7.0	Operational Shocks and Crash Safety	B	A/C Type 3, Test R
8.0	Vibration	S (curve M)	Zone 2
9.0	Explosive Atmosphere	X	
10.0	Waterproofness	X	
11.0	Fluids Susceptibility	X	
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	X	
15.0	Magnetic Effect	Z	
16.0	Power Input	BXX	
17.0	Voltage Spike	A	
18.0	Audio-Frequency Conducted Susceptibility	B (See Note 1)	
19.0	Induced Signal Susceptibility	ZCX (See Note 2)	
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	Q (See Note 4 & 5)	
21.0	Emission of Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	A3J3L3	
23.0	Lightning Direct Effects	X	
24.0	Icing	X	
25.0	Electrostatic Discharge	A	
26.0	Fire, Flammability	C (See Note 3)	

Table 2-10 KSD 100EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes

Notes:

1. Duplicate testing not required per DO-160G Section 16.6.1.2's *Note*.
2. No test performed since the Line Replaceable Unit (LRU) has a metallic enclosure.
3. Analysis - Enclosure is constructed of metal on five sides
   - Test – Polycarbonate display with 12 second vertical burn
   - Test – Grip (Santoprene) with horizontal burn
   - Test – Bezel Seal - Neoprene Cord with horizontal burn
4. Conducted Susceptibility (CS) testing was performed using DO-160E Cat A per FAA Policy PS-ACE-23-10.
5. Radiated Susceptibility (RS) testing was performed using the following levels per FAA Policy PS-ACE-23-10:

Frequency	DO-160G Sect 20 Category	V/m	
		SW/CW	PM
100 - 200 MHz	Cat G	100	-
200 - 400 MHz	Cat G	100	-
400 - 700 MHz	Cat F	25	350
700 MHz – 1 GHz	Cat F	50	350
1 - 2 GHz	Cat D	50	500
2 - 4 GHz	Cat D	50	750
4 - 6 GHz	Cat D	50	750
6 - 8 GHz	Cat D	50	250
8 - 12 GHz	Cat D	75	750
12 - 18 GHz	Cat D	50	500

Table 2-11 KCP 100EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes
4.0	Temperature and Altitude	A1/C1	-20°C/+55°C, -40°C/+70°C Short Term, -55°C/+85°C Storage, 35,000 ft./-15,000ft In-flight Loss of Cooling (Not Applicable)
5.0	Temperature Variation	C	2°C/minute
6.0	Humidity	A	
7.0	Operational Shocks and Crash Safety	B	A/C Type 3, Test R
8.0	Vibration	S (curve M)	Zone 2
9.0	Explosive Atmosphere	X	
10.0	Waterproofness	X	
11.0	Fluids Susceptibility	X	
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	X	
15.0	Magnetic Effect	Z	
16.0	Power Input	BXX	
17.0	Voltage Spike	A	
18.0	Audio-Frequency Conducted Susceptibility	B (See Note 1)	
19.0	Induced Signal Susceptibility	ZCX (See Note 2)	
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	Q (See Note 4 & 5)	
21.0	Emission of Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	A3J3L3	
23.0	Lightning Direct Effects	X	
24.0	Icing	X	
25.0	Electrostatic Discharge	A	
26.0	Flammability	C (See Note 3)	

Table 2-11 KCP 100EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes

Notes:

1. Duplicate testing not required per DO-160G Section 16.6.1.2's *Note*.
2. No test performed since LRU has a metallic enclosure.
3. Analysis - Enclosure is constructed of metal on five sides
   - Test – Lighted faceplate with horizontal burn
4. Conducted Susceptibility (CS) testing was performed using DO-160E Cat A per FAA Policy PS-ACE-23-10.
5. Radiated Susceptibility (RS) testing was performed using the following levels per FAA Policy PS-ACE-23-10:

Frequency	DO-160G Sect 20 Category	V/m	
		SW/CW	PM
100 - 200 MHz	Cat G	100	-
200 - 400 MHz	Cat G	100	-
400 - 700 MHz	Cat F	25	350
700 MHz – 1 GHz	Cat F	50	350
1 - 2 GHz	Cat D	50	500
2 - 4 GHz	Cat D	50	750
4 - 6 GHz	Cat D	50	750
6 - 8 GHz	Cat D	50	250
8 - 12 GHz	Cat D	75	750
12 - 18 GHz	Cat D	50	500

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Table 2-12 KG 71EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes
4.0	Temperature and Altitude	A1/B2/C1	-45°C/70°C, -45°C/70°C Short Term -55°C/85°C Storage, 35,000 ft./-15,000 ft In-flight Loss of Cooling (Not Applicable)
5.0	Temperature Variation	B	5°C/minute
6.0	Humidity	B	
7.0	Operational Shocks and Crash Safety	B (See Note 4)	Aircraft Type 3, Test F
8.0	Vibration	S (curve M)	
9.0	Explosive Atmosphere	X	
10.0	Waterproofness	Y	(Condensing water)
11.0	Fluids Susceptibility	X	
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	X	
15.0	Magnetic Effect	Z	
16.0	Power Input	BXX (See Note 1)	
17.0	Voltage Spike	A	
18.0	Audio-Frequency Conducted Susceptibility	Z (See Note 1)	
19.0	Induced Signal Susceptibility	ZCX (See Note 2)	
20.0	Radio Frequency Susceptibility	Q (See Note 5, 6, 7)	
21.0	Emission of Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	A3J3L3	
23.0	Lightning Direct Effects	X	
24.0	Icing	X	
25.0	Electrostatic Discharge	A	
26.0	Flammability	C (See Note 3)	

Table 2-12 KG 71EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes

Notes:

1. Duplicate testing not required per DO-160G Section 16.6.1.2's *Note*.
2. No test performed since LRU has a metallic enclosure.
3. Analysis only – Metallic enclosure, no vent holes
4. Up/Down= 3.0g, Fwd/Aft/Side=20.0g
5. Conducted Susceptibility (CS) testing was performed using DO-160E Cat A per FAA Policy PS-ACE-23-10.
6. Radiated Susceptibility (RS) testing was performed using the following levels per FAA Policy PS-ACE-23-10:

Frequency	DO-160G Sect 20 Category	V/m	
		SW/CW	PM
100 - 200 MHz	Cat G	100	-
200 - 400 MHz	Cat G	100	-
400 - 700 MHz	Cat F	25	350
700 MHz – 1 GHz	Cat F	50	350
1 - 2 GHz	Cat D	50	500
2 - 4 GHz	Cat D	50	750
4 - 6 GHz	Cat D	50	750
6 - 8 GHz	Cat D	50	250
8 - 12 GHz	Cat D	75	750
12 - 18 GHz	Cat D	50	500

7. The Outside Air Temperature (OAT) parameter was tested to DO-160G Category R for both (CS) and (RS).

Table 2-13 KMG 7010 Environmental Qualification Form (EQF)

DO-160G Section	Condition	Category	Notes
4.0	Temperature and Altitude	A2F2	Ground Survival Low Temp: -55°C Operating Low Temp: -55°C Ground Survival High Temp: +85°C Short-time Operating High Temp: +70°C Operating High Temp: +70°C Altitude certified to 55,000 feet Decompression 8K to 55K ≤ 15 sec. Overpressure 170 kPa In-flight Loss of Cooling (Not Applicable)
5.0	Temperature Variation	B	5°C/minute
6.0	Humidity	B	Severe Humidity Environment
7.0	Operational Shocks and Crash Safety	B	3 shocks, 6g, each orientation 1 shock, 20g, each orientation 3 sec. minimum, 20g, each orientation
8.0	Vibration	S (curves E, L, M & T) R (curve G) (See Note 1)	Fixed Wing – Zone 5 Helicopter – Zone 1b.
9.0	Explosive Atmosphere	E	Environment II ***Supplemental Analysis Performed – beyond DO-160D***: DO-160G Section 9 analysis to meet Skydrol-vapor Minimum Ignition Energy / HPN: 004-02256-6232
10.0	Waterproofness	W	Drip Proof
11.0	Fluids Susceptibility	X	Not Tested ***Supplemental Testing beyond DO-160D*** DO-160G Section 11 Cat F / HPN: 004-02256-6232
12.0	Sand and Dust	X	Not Tested
13.0	Fungus Resistance	X	Not Tested
14.0	Salt Fog	X	Not Tested
15.0	Magnetic Effect	Z	≤ 1 degree deflection less than 0.3m
16.0	Power Input	B	From 10 VDC to 32.3 VDC. Additional test of 200ms interrupt.
17.0	Voltage Spike	A	600 Volt Spike
18.0	Audio Frequency Conducted Susceptibility	BZ	DC Powered equipment.
19.0	Induced Signal Susceptibility	Z (See Note 2)	Interference-Free Operation Required
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	RR	
21.0	Emission or Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	A4J33	

Table 2-13 KMG 7010 Environmental Qualification Form (EQF)

DO-160G Section	Condition	Category	Notes
23.0	Lightning Direct Effects	X	Not Tested
24.0	Icing	A	
25.0	Electrostatic Discharge (ESD)	A	
N/A	Fire, Flammability	Not Applicable	***Supplemental Testing beyond DO-160D*** DO-160G Section 26 Cat C Labels only / HPN: 004-02256-6232

Notes:

1. Supplemental Vibration Testing beyond DO-160D
   Fan Blade Off (FBO) DO-160E methodology/HPN: 004-02256-6220

Zone 18 CMCF	UUT	Frequency				
		30.5-28.5	28.5-25.5	25.5-22.5	22.5-18.5	18.5-9.5
		Pk (g)	Pk (g)	Pk (g)	Pk (g)	Pk (g)
X	X	1.51	2.58	2.46	2.39	1.36
Y	Y	2.50	2.50	2.50	3.57	2.08
Z	Z	5.30	9.39	10.92	6.29	2.89
Sweep Rate (Hz/sec)		.0055	.0062	.0666	.0041	.0090

Higher Levels DO-160E methodology/HPN: 004-02256-6232
DO-160G Vibration Qualification level: Cat R (Curves (E, E1)
High Power:
Frequency Range (Hz) 70-140
Sweep Rate (Hz/sec) 0.05
Peak Accel (g) = 2.5

Windmilling:

Frequency Range	Sweep Rate	Peak Accel (g)		
		X1	Y1	Z1
10.0-15.5	0.00833	1.0	3.0	2.8
15.5-19.5	0.00417	1.0	4.1	3.1
19.5-22.5	0.00167	1.0	3.4	1.9
22.5-26.5	0.00111	1.0	3.7	2.1
26.5-31.0	0.00833	1.0	2.2	1.2

2. Section 19.3.1 was not run due to the magnetic fields generated during the test. Since the KMG 7010 measures magnetic fields and the fields generated during the test would be larger than the earth's magnetic field, the unit cannot be expected to pass and therefore, was not tested.

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Table 2-14 MD32 Environmental Qualification Form (EQF)

DO-160G Section	Condition	Category	Notes
4.0	Temperature and Altitude	F2	Operating Low Temp = -55C Operating High Temp = +70C Altitude = +55,000 ft.
5.0	Temperature Variation	S2	
6.0	Humidity	B	
7.0	Operational Shocks and Crash Safety	B	
8.0	Vibration	R (curves E, E1) [REE1]	
9.0	Explosion	X	
10.0	Waterproofness	W	
11.0	Fluids	X	
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	S	
15.0	Magnetic Effect	Z	
16.0	Power Input	Z	
17.0	Voltage Spike	A	
18.0	Audio Frequency Conducted Susceptibility	Z	
19.0	Induced Signal Susceptibility	ZC	
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	WF	
21.0	Emission or Radio Frequency Energy	M	
22.0	Lightning Induced Transient Susceptibility	B3K3L3	B3 (pin injection) K3L3 (cable bundle)
23.0	Lightning Direct Effects	X	
24.0	Icing	X	
25.0	Electrostatic Discharge (ESD)	A	
N/A	Fire, Flammability	X	

Notes:
Sections 20: Radiated susceptibility complies with Category G from 100-400MHz and Category F from 400-18,000MHz.

Table 2-15 KDC 100EXP Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes
4.0	Temperature	B2	Operating Low Temperature = -45°C Operating High Temperature = +70°C
8.0	Vibration	S Curve M	

Table 2-16 KTP 73 Environmental Qualification Form (EQF)

DO-160G Section	Conditions	Category	Notes
4.0	Temperature and Altitude	D2	-55°C/70°C, -55°C/70°C Short Term -55°C/85°C Storage, 50,000 ft In-flight Loss of Cooling (Not Applicable)
5.0	Temperature Variation	A	10°C per minute
6.0	Humidity	C	
7.0	Operational Shocks and Crash Safety	A	6 g, 11 ms Pulse Crash Safety (Impulse & Sustained) – no test performed
8.0	Vibration	S(Curve M & T)	Zone 2 & Zone 5
9.0	Explosive Atmosphere	X	
10.0	Waterproofness	S	
11.0	Fluids Susceptibility	F	(Solvents & Cleaning Fluids, De-Icing Fluid)
12.0	Sand and Dust	X	
13.0	Fungus Resistance	X	
14.0	Salt Fog	S	
15.0	Magnetic Effect	Z	
16.0	Power Input	X	
17.0	Voltage Spike	X	
18.0	Audio-Frequency Conducted Susceptibility	X	
19.0	Induced Signal Susceptibility	X	
20.0	Radio Frequency Susceptibility (Radiated and Conducted)	X	
21.0	Emission of Radio Frequency Energy	X	
22.0	Lightning Induced Transient Susceptibility	X	
23.0	Lightning Direct Effects	XX2A	
24.0	Icing	X	
25.0	Electrostatic Discharge	X	
26.0	Flammability	C	Analysis Only

2.6 Regulatory Compliance

Table 2-17 xVue Touch System Component Regulatory Compliance

Component	Function	Approval Type
KSD 100EXP	Display	PMA
KCP 100EXP	Display Control	PMA
KG 71EXP	Air Data, Attitude and Heading Computer	PMA
KTP 73	Temperature Probe	TSO-C106 INCOMP
KMG 7010 OR MD32	Direction Instrument, Magnetic	TSO-C6d/ETSO-C6d TSO-C6e/ETSO-C6e
KDC 100EXP	Data Converter	N/A

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2.7 Databases

The KSD 100EXP requires various databases for proper operation. The databases are stored in the internal memory of the KSD 100EXP. Each database is described below. Navigation, Cartographic, Obstacle and Terrain databases are preloaded in the KSD 100EXP. A subscription is required to update these databases to current versions. A separate subscription is required to acquire Instrument Procedure Chart, VFR Sectional, High Altitude and Low Altitude databases

2.7.1 Navigation Database

Navigation database contains aeronautical data such as Navigational Aids (NAVAIDs), Instrument Landing System (ILS)/Microwave Landing System (MLS), airport reference point with full name, airport runways, named waypoints, unnamed waypoints, airways.

2.7.2 Cartographic Database

The KSD 100EXP utilizes the Cartography Database to render the cartographic and geopolitical information, aiding the pilot with situational awareness. Cartographic data includes highways, roads, rail lines, city and state names.

2.7.3 Obstacle Database

The obstacle database is made up of human-made obstacles, which may be considered hazardous to air navigation. Obstacle symbols are positioned on the lateral map display, at the location corresponding to the obstacle latitude and longitude.

2.7.4 Terrain Database

The Terrain Database is used to render the terrain to create a realistic view of the terrain, thus helping pilots acquire terrain situational awareness.

2.7.5 Instrument Procedure Charts Database

Contains airport diagrams, approach plates, departure, and arrival charts for each airport by chart type.

2.7.6 Low Altitude Database

Contains digitized FAA IFR Low Altitude Enroute charts for display.

2.7.7 High Altitude Database

Contains digitized FAA IFR High Altitude Enroute charts for display.

2.7.8 VFR Sectional Database

Contains digitized FAA VFR sectional charts for display.

2.8 Synthetic Vision

SVS is used to improve overall flight safety by increasing crew situational awareness of the general nature of the terrain ahead of the airplane. This SVS 3D representation serves as a background for standard PFD symbols to create an ambient, natural, and continuous presentation of the terrain environment.

SVS renders the terrain to simulate natural terrain shading and accent terrain contouring. Terrain colors are varied with terrain elevation, similar to standard aviation topographical charts. Water is presented as dark blue areas with water-like effects. Terrain-related objects, such as terrain grid lines, terrain range rings, man-made obstacles, airport runways, and arrival airport symbology, are also added to the view. Runways depictions are further detailed with a runway identifier, centerline, threshold markings, and

displaced area markings. SVS shows a standard blue/brown background when terrain is deselected or unavailable for any reason.

2.9 Recommended Standby Instruments

Although there is no regulatory requirement requiring the use of standby instruments in the aircraft, BendixKing recommends the installation of standby instruments in the aircraft if flying in any condition other than Day VFR. In the event of a failure of thexVue Touch or a failure of the electrical system, standby instruments provide a secondary reference altitude, altimeter, and airspeed indication.

2.10 Required GPS Navigator

Installation of the xVue Touch System requires at least one GPS/SBAS navigator. The xVue Touch System has the capability to support dual navigator installations. Refer to Table 3-22 for a list of compatible navigators.

2.11 Installation Limitations

(1) The xVue Touch System installation is for use in non-certified aircraft.
(2) The xVue Touch is a primary instrument indicator for installation in airplanes with a maximum altitude of 35,000 ft (10,668 m) or less.
(3) The KG71EXP meets the performance requirements of RTCA DO-334 category A4/H4/T3.
(4) If installing standby instruments which require electrical power, it is highly recommended that the installer electrically isolate the standby instruments from the xVue Touch System.

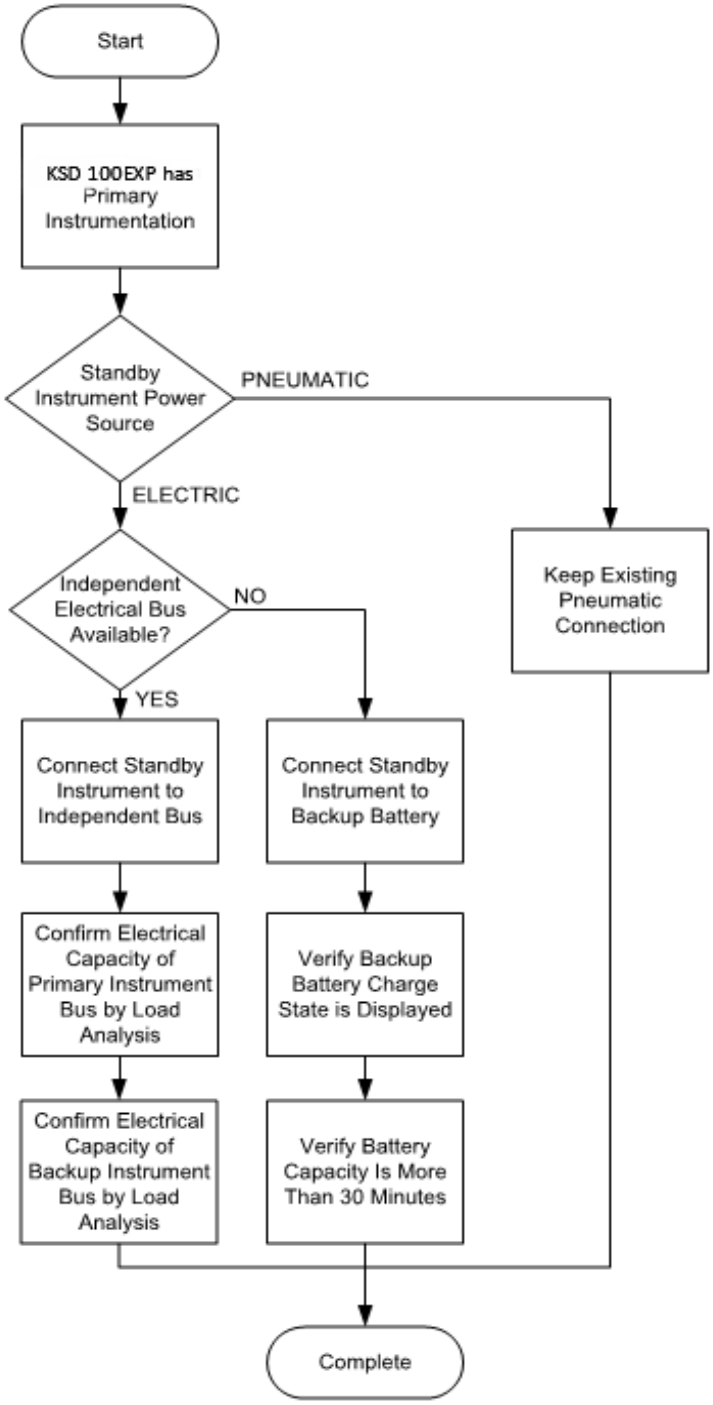

Figure 2-3 Standby Instrument Power Requirements

2.12 Permission

An airplane specific permission letter is not required to use this data. The complete data package is available for download on the BendixKing Website at www.bendixking.com.

2.13 Repair and Return

Refer to the troubleshooting instructions in Section 8 Troubleshooting. If repair is necessary, the unit must be sent to a BendixKing certificated repair facility. The xVue Touch System components are not field repairable.

For information on returning a unit, contact BendixKing support.

Telephone: (855) 250-7027 (Toll Free U.S.A./Canada)

Telephone: (505) 903-6148 (International Direct)

Website: www.bendixking.com

E-mail: techsupport@bendixking.com

MD32 is manufactured by MidContinent and is sold separately. Refer to Appendix D MD32 Installation Manual for more information on repair and return.

3 XVUE TOUCH SYSTEM INSTALLATION OVERVIEW

The xVue Touch System is designed to replace the standard six pack instrumentation. Standby instruments (attitude, airspeed and altimeter) are required. A typical installation is shown in Figure 3-1.

Figure 3-1 Example Instrument Panel Modification

Installations should be accomplished using the guidelines of FAA Advisory Circular 43.13-1B “Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair”, AC 43.13-2B “Acceptable Methods, Techniques, and Practices - Aircraft Alterations” and AC 43.18 Change 1 “Fabrication of Aircraft Parts by Maintenance Personnel.” If the instructions in this manual conflict with, and are more stringent than, the information in the Advisory Circulars, then the instructions in this manual shall take precedence.

Follow the installation considerations in Section 3.6 along with the installation procedures in Section 4, as they are presented, to accomplish a successful installation. Read the entire sections before beginning the work.

Prior to installation, consider the structural integrity of each component of the xVue Touch System as defined in Section 4. Review the airplane logbooks for all equipment that are installed in the airplane to ensure complementing equipment remains installed and to allow for proper systems operation.

Complete an electrical load analysis in accordance with the instructions in Section 4.12 on the airplane prior to starting the modification to ensure the airplane capable of carrying the additional xVue Touch electrical load.

Once the installation is complete, perform the post installation checkout described in Section 7 before closing the work area to ensure the installation was successful.

When working with avionics equipment, be aware of the following warnings and cautions.

CAUTION

SERVICE TECHNICIANS MUST OBEY STANDARD SAFETY PRECAUTIONS, SUCH AS WEARING SAFETY GLASSES, TO PREVENT PERSONAL INJURY WHILE INSTALLING OR PERFORMING SERVICE ON THIS UNIT.

CAUTION

TURN OFF POWER BEFORE DISCONNECTING WIRING. DISCONNECTING WIRING WITHOUT TURNING POWER OFF MAY CAUSE VOLTAGE TRANSIENTS THAT CAN DAMAGE THE SYSTEM.

CAUTION

THIS EQUIPMENT INCLUDES ITEMS THAT ARE ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. ESDS DEVICES ARE SUBJECT TO DAMAGE BY EXCESSIVE LEVELS OF VOLTAGE AND/OR CURRENT. THE LOW-ENERGY SOURCE THAT MOST COMMONLY DESTROYS ESDS DEVICES IS THE HUMAN BODY, WHICH, IN CONJUNCTION WITH NONCONDUCTIVE GARMENTS AND FLOOR COVERINGS, GENERATES AND RETAINS STATIC ELECTRICITY. TO ADEQUATELY PROTECT ESDS DEVICES, THE DEVICE AND EVERYTHING THAT CONTACTS IT MUST BE BROUGHT TO GROUND POTENTIAL BY PROVIDING A CONDUCTIVE SURFACE AND DISCHARGE PATHS. USE STANDARD INDUSTRY PRECAUTIONS TO KEEP RISK OF DAMAGE TO A MINIMUM WHEN REMOVING, SERVICING, OR HANDLING THE EQUIPMENT.

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3.1 Pre-Installation Checklist

Before beginning a xVue Touch System installation, it is important to ensure the airplane meets the pre-requisites for the installation of the xVue Touch System. The following checklist is provided to aid the installer in determining the necessary requirements that must be met before beginning installation of the xVue Touch System in a specific airplane. Ensure each of the items outlined are completed as necessary before beginning the modification.

Table 3-1 Pre-Installation Checklist

Item	Reference	Complete
Airplane Instrument Panel is aluminum.	Section 3.6.2 Instrument Panel	☐
Third party equipment interfaces are compatible with the xVue Touch System.	Section 3.6.1 xVue Touch System Interfaces	☐
Acceptable KSD 100EXP instrument panel location within the primary field of view.	Section 3.6.5 KSD 100EXP Installation Considerations	☐
Acceptable standby instruments are available in an appropriate location.	Section 3.6.3 Standby Instruments	☐
Standby instruments (if installed) provided with an appropriate power source.	Section 3.6.3 Standby Instruments	☐
A compatible WAAS GPS system is installed in the airplane and has sufficient spare I/O to interface to the KSD 100EXP and KG 71EXP.	Section 2.3.3 KG 71EXP Air Data Attitude Heading Reference System (ADAHRS) and Section 6.2.3 GPS/NAV Configuration Setup	☐
Autopilot (if installed) is compatible with the xVue Touch System.	Section 6.2.4 Autopilot Configuration Setup	☐
Acceptable location for the KG 71EXP ADAHRS.	Section 3.6.7.1 KG 71EXP Location	☐
Acceptable location for the KTP 73 OAT.	Section 3.6.10.1 KTP 73 Location	☐
Acceptable location for the KMG 7010/MD32 Magnetometer.	Section 3.6.8 KMG 7010/MD32 Installation Considerations	☐

Table 3-1 Pre-Installation Checklist

Item	Reference	Complete
Acceptable location for the KDC 100EXP Data Converter Box	Section 3.6.9 KDC 100EXP Installation Considerations	
The airplane has an audio panel through which audio alerts can be played.	Section 3.13.4 Audio Panel and Section 6.2.2.3 Master Audio Volume	☐
Installation/operational limitations reviewed to ensure no adverse impact to the installation.	Section 2.11 Installation Limitations, Section 9.2.2 Airworthiness Limitations and Scheduled Maintenance, and see xVue AFP for operational limitations	☐
Airplane electrical system is sufficient for xVue Touch.	Section 4.12 Aircraft Electrical Load Analysis (ELA)	☐
Airplane weight and balance with xVue Touch addition is available.	Section 4.11 Weight and Balance Analysis	☐

3.2 Available Equipment

The xVue Touch System may be configured based on the combinations of equipment and install kits shown in Table 3-2.

Table 3-2 xVue Touch System Components and Kits

Description	PN
KSD 100EXP Primary Flight Display	89000120-001-[ ]
KCP 100EXP Control Panel (Portrait)	89000126-001-[ ]
KCP 100EXP Control Panel (Landscape)	89000126-003-[ ]
KG 71EXP ADAHRS	89000123-001-[ ]
KMG 7010 Magnetometer OR MD32 Magnetometer	065-00189-0101 (1) 6420032-[ ]
KDC 100EXP Data Converter	89000138-001 -[ ] (2)
KTP 73 OAT Probe	89000025-001-[ ]
KSD 100EXP Backshell Assembly Install Kit	89000120-002
KSD 100EXP Configuration Module **& Connectors** Install Kit	89000120-003
KSD 100EXP Mounting Hardware and Grip Install Kit	89000120-007
KCP 100EXP Control Panel Install Kit for Portrait Mounting	89000126-004
KCP 100EXP Control Panel Install Kit for Landscape Mounting	89000126-005 (3)
KG 71EXP ADAHRS Install Kit	89000123-007
KMG 7010 Magnetometer Install Kit	050-03643-0000 REV E
MD32 Magnetometer Connector Kit	9019092-1
KDC 100EXP Data Converter Install Kit	89000138-002

Note (1) Either a KMG 7010 or MD32 and KDC 100EXP can be configured to provide the magnetometer function for the xVue Touch System.

Note (2) Included with the MD32 Magnetometer.

Note (3) Only needed for radio stack DZUS rail mounting of the KCP 100EXP Control Panel (Landscape) and to be used in conjunction with the KCP 100EXP Control Panel Installation Kit.

3.3 Installation Materials

Table 3-3 Installation Kit, Backshell Assembly – KSD 100EXP, PN 89000120-002

Part Number	Description	Qty	UM
89499999-002	Backshell Cover	2	EA
89499999-003	Backshell Base	2	EA
MS3367-7-9	Self-Cinching Tiedown Strap	2	EA

Table 3-3 Installation Kit, Backshell Assembly – KSD 100EXP, PN 89000120-002

Part Number	Description	Qty	UM
MS51959-17	Phillips Flat Head Countersunk Screws	4	EA
7024206-10	Captive Socket Head Cap Screws	4	EA
MS51957-13	Phillips Pan Head Screws	22	EA
MS35335-57	Lock Washers	22	EA

Table 3-4 Installation Kit, Configuration Module & Connectors – KSD 100EXP, PN 89000120-003

Part Number	Description	Qty	UM
89400020-064	Circuit Card Assembly, Programmed, Configuration Module	1	EA
53504890-1	78-pin D-Sub Male Connector	1	EA
53504891-2	Connector Contact Crimp Pin Size 22	78	EA
53501676-2	78-pin D-Sub Female Connector	1	EA
53504891-1	Connector Contact Crimp Socket Size 22	78	EA

Table 3-5 Installation Kit, Mounting Hardware and Grip - KSD 100EXP, PN 89000120-007

Part Number	Description	Qty	UM
89500020-024	KSD 100EXP Grip	1	EA
MS51957-1B	#2-56 X 1/8 inch Pan Head Screws	8	EA
NAS1352-08-10	#8-32 X 5/8 inch Socket Head Cap Screws	4	EA

Table 3-6 KCP 100EXP Control Panel Installation Kit for Portrait Mounting, PN 89000126-004

Part Number	Description	Qty	UM
53504988-1	Connector, SD Series, 9 Pin	1	EA
53504891-3	Contacts – Size 20	9	EA
D9000GE0/AA	Connector Backshell	REF	REF

Table 3-7 KCP 100EXP Control Panel Installation Kit for Landscape Mounting, PN 89000126-005

Part Number	Description	Qty	UM
89500026-010	KCP 100 Center Stack Adapter	1	EA
MS51957-33	#6-32 X 7/8 inch Pan Head Screw	4	EA
089-02353-0001	#6-32 Self Locking Clip Nut	4	EA

Table 3-8 KG 71EXP Installation Kit PN 89000123-007

Part Number	Description	Qty	UM
53501396-4	50-pin D-Sub Female Connector	1	EA
M39029-63-368	Contacts	50	EA
53504975-1	Connector Backshell, D-Sub, w/Jackscrews	1	EA

Table 3-9 KMG 7010 Installation Kit PN 050-03643-0000

Part Number	Description	Qty	UM
030-03519-0001	Connector, D-Sub, Receptacle, Hsg, Brass Shell, 9-Pos	1	EA
155-01771-0000	KMG 7010 Installation Drawing	REF	REF
001-01299-0000	Instruction For Harness Assembly Parts	REF	REF
010-00068-0002	Crimp Terminal 4S	1	EA
030-01157-0011	Socket Crimp 20G	9	EA
030-01499-0011	Connector, D-Sub, Hood, EMI/RFI, Metal, Jackscrews, 9-Pos	1	EA
057-05944-0044	TSO Label, KMG 7010	1	EA
089-02162-0055	Nut Lock 10-32	4	EA
089-06015-0010	Screw Flat Head Phillips 10-32 X 5/8	4	EA
089-06293-0003	Screw Flat Head Phillips 3-48 X 3/16	1	EA
089-06298-0005	Screw Flat Head Phillips 3-48 X 5/16	4	EA
089-06298-0008	Screw Flat Head Phillips 3-48 X 1/2	2	EA
089-08029-0040	Passivated SS Non-Magnetic Flat Std. #10 Washer	4	EA

Table 3-10 MD32 Connector Kit PN 9019092-1

Part Number	Description	Qty	UM
9019092-1	Connector, D-Sub, Receptacle, Hsg, Brass Shell, 9-Pos	1	EA

Table 3-11 KDC 100EXP Installation Kit PN 89000138-002

Part Number	Description	Qty	UM
53505633-1	Connector, D-Sub	1	EA

Table 3-11 KDC 100EXP Installation Kit PN 89000138-002

53505184-1	Connector Accessory, D-Sub	1	EA
M39029/63-368	Contact, Socket	15	EA
MS24693-C273	Screw, Machine, Flat	4	EA
NAS1149-C0332R	Washer, Flat	4	EA
MS21083-N3	Nut, Self Locking	4	EA

3.3.1 Accessories and Support Equipment Available from BendixKing

Table 3-12 xVue Touch System Accessories and Support Equipment

Unit PN	Description	Note
89600023-006.01.01	Configuration and Maintenance Tool	Test/calibration PC software to be used with Maintenance PC for configuring the KG 71EXP and MD32, and performing the post installation compass verification.

3.3.2 Materials Required but Not Supplied

The xVue Touch System is intended for use with standard aviation accessories. The following items are required for installation but not supplied:

Table 3-13 Installation Materials Required but Not Supplied

Description	PN or Specification	Quantity	Note
Wire 22, 20, 18, 16 AWG	M22759/16-X-Y	As Required	ETFE jacket X = Size Y=COLOR
Twisted Shielded Pair Wire 22 AWG	M27500-22	As Required	TE, TG or ETFE jacket
Twisted Shielded Triple Wire 22 AWG	M27500-22	As Required	TE, TG or ETFE jacket
Wire 24 AWG	M27500-24	As Required	TE, TG or ETFE jacket
Twisted Shielded Single Wire 22 AWG	M27500-22	As Required	TE, TG or ETFE jacket
77 OHM Jacket Coax Cable	MIL-C-17/176-00002	As Required	For A708/ 453 connections
DB-9 (Female) Connector	205203-3	1	KG 71EXP Maintenance Port
#4, 6, 8, 10, ¼ inch Ring Terminals	MS25036-XXX	As Required	XXX = Size
Environmental Splices	M81824/1-X	As Required	X = Size
Solder Sleeves	M83519-1-X	As Required	X = Size
Push/Pull (manually resettable) Circuit Breaker	MS26574-X	3	Refer to Section 2.4 Technical Specifications for Circuit Breaker size requirements. X = Size

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Table 3-13 Installation Materials Required but Not Supplied

Description	PN or Specification	Quantity	Note
Straight AN816-4D to 1/8 inch, NPT Male or Elbow AN822-4D to 1/8 inch, NPT Male	Commercially Available	1	Fitting (Static)
Straight AN816-4D to 1/8 inch, NPT Male or Elbow AN822-4D to 1/8 inch, NPT Male	Commercially Available	1	Fitting (Pitot)
Pitot/Static Hose (match to individual aircraft's needs)	Commercially Available	A/R	A combination of different materials can be used for the pitot /static lines
Nutplates #8-32	MS21061L08 or MS21071L08	4	Orientation is optional as long as minimum edge distance is maintained
Nutplates #4-40	MS21069L04 or MS21071L04	4	Orientation is optional as long as minimum edge distance is maintained
Rivets	MS20426AD3-X	16	X = size
#10-32 Rivet nuts	NAS1329A3KXX	4	XX = size
Stainless Steel Mounting Screws #6-32	MS35206-230	4	
Washer head screws	AN525-10R	4	
Washers	AN960-10	4	
Tie Wraps or Lacing Cord	Commercially Available	As Required	
Non-pressure vessel mounting sealant, DOW Corning 3145	MIL-A-46146	As Required	
Pressure vessel mounting sealant, PS 870B-1/2	MIL-PRF-81733D	As Required	
Thread-locking compound	Commercially Available	As Required	
Bonderite M-CR 1132 Aero - Conversion coating	1445846	As Required	
Thread-seal tape (PTFE)	Commercially Available	As Required	
Self-Fusing Silicon Tape, 3M 83010	Commercially Available	As Required	

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Table 3-13 Installation Materials Required but Not Supplied

Description	PN or Specification	Quantity	Note
1/4 inch Braid	Commercially Available	As Required	
32 GB USB drive with Type-C form factor or 32 GB USB drive and USB-C adapter	Commercially Available	As Required	

3.3.3 Tools Required but Not Supplied

The following tools are required for installation but not supplied:

Table 3-14 Tools Required But Not Supplied

Part Number or Specification	Description	Notes
Commercially Available	Screwdriver	
Commercially Available	Torque Wrench	
Commercially Available	Milliohm Meter & Multi Meter	
Commercially Available	Clamp-on In-Circuit Ammeter	
KS5549	Kell-Strom Pro 360 Digital Inclinometer	Equivalent inclinometer with accuracy of ± 0.1 degrees
Commercially Available	Pitot/static tester	
Commercially Available	NAV/ILS Signal Generator	
Commercially Available	Aircraft Power Unit	
Commercially Available	Ring/Terminal Crimper	
Commercially Available	Environmental Crimper	GMT232/ M22520/37-01
Commercially Available	Maintenance PC	Loaded with the CMT
Commercially Available	USB to Serial Converter/Adapter	
D-sub 78 Pin Socket and Pin Connector Tools for the KSD 100 EXP Backshell Assembly Installation Kit (89000120-002)		
M81969/1-04 Green and White Metal	Insert/Removal Tools	
AFM8	Crimp Tool	M22520/2-01
K42	Crimper Turret Head, Positioner	M22520/2-09

D-sub 9 Pin Socket and Pin Connector Tools for the KCP 100EXP Control Panel Installation Kit (89000126-004)		
M81969/1-02 Red and White Metal	Insert/Removal Tools	
AFM8	Crimp Tool	M22520/2-01

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Table 3-14 Tools Required But Not Supplied

Part Number or Specification	Description	Notes
9502-10-0-0 K694	Crimper Turret Head, Positioner	Positronic
D-sub 50 Socket and Pin Connector Tools for the KG 71EXP ADAHRS Installation Kit (89000123-007)		
M81969/1-04 RED and White Metal	Insert/Removal Tools	
AMF8	Crimp Tool	M22520/2-01
K13-1	Crimper Turret Head, Positioner	M22520/2-08
D-sub 9 Socket Connector Tools for the KMG 7010 Magnetometer Installation Kit (050-03643-0000)		
M81969/1-02 Red and White Metal	Insert/Removal Tools	
AFM8	Crimp Tool	M22520/2-01
9502-10-0-0 K694	Crimper Turret Head, Positioner	Positronic
D-sub 9 Socket Connector Tools for the MD32 Magnetometer Connector Kit (9019092-1)		
M81969/1-02 Red and White Metal	Insert/Removal Tools	
AFM8	Crimp Tool	M22520/2-01
9502-10-0-0 K694	Crimper Turret Head, Positioner	Positronic
D-sub 9 Socket Connector Tools for the KDC 100EXP Installation Kit (89000138-002)		
M81969/1-02 Red and White Metal	Insert/Removal Tools	
AFM8	Crimp Tool	M22520/2-01
9502-10-0-0 K694	Crimper Turret Head, Positioner	Positronic

3.4 Unpacking and Inspection

Exercise caution when unpacking the xVue Touch System equipment. Confirm receipt of all installation components refer to, Table 3-2, for the appropriate part lists. Inspect all components for any damage, contact BendixKing Customer Support if any parts are missing or damaged. The shipping container and all packing materials must be retained in the event that storage or reshipment of the equipment is necessary. If a damage claim is needed, the shipping container and all packing materials will be used to substantiate your claim. The claim must be filed as soon as possible.

NOTE

THE KSD 100EXP, KCP 100EXP, KG 71EXP AND KMG 7010/MD32 EXTERNAL CONNECTORS SHOULD BE PROTECTED WITH AN ESD COVER WHEN NOT INSTALLED ON THE AIRPLANE.

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3.5 System Interfaces

3.5.1 Standard Interface Definitions

Unless otherwise stated, the following interface definitions will apply.

3.5.1.1 Discrete I/O

3.5.1.1.1 Discrete Inputs

Refer to the tables below for the discrete input states.

Table 3-15 KSD 100EXP Discrete Input Ground/Open (DIGO) States

State	Voltage Level
Active	0 VDC
Inactive	Open Circuit

Table 3-16 KSD 100EXP Discrete Input 5V/Open (DI5VO) States

State	Voltage Level
Active	5 VDC
Inactive	Open Circuit

Table 3-17 KSD 100EXP Discrete Input 15V/Open (DI5VO) States

State	Voltage Level
Active	15 VDC
Inactive	Open Circuit

Table 3-18 KSD 100EXP Discrete Input 28V/Open (DI28VO) States

State	Voltage Level
Active	28 VDC
Inactive	Open Circuit

3.5.1.1.2 Discrete Outputs

Table 3-19 KSD 100EXP Discrete Output Ground/Open (DOGO) States

State	Voltage Level
Active	0 VDC
Inactive	Open Circuit

Table 3-20 KSD 100EXP Discrete Output 5V/Open (DO5VO) States

State	Voltage Level
Active	5 VDC
Inactive	Open Circuit

Table 3-21 KSD 100EXP Discrete Output 28V/Open (DO28VO) States

State	Voltage Level
Active	28 VDC
Inactive	Open Circuit

3.5.1.2 Serial I/O

RS-232: Electrical characteristics are per ANSI TIA/EIA-232-F.

RS-422: Electrical characteristics are per ANSI TIA/EIA-422-A.

3.5.1.3 ARINC 429 I/O

Electrical characteristics are per ARINC 429.

3.5.1.4 ARINC 453 I/O

This bus format is 1600 bit Manchester bi-phase per ARINC 708A. The data rate on this bus is 1 Mbit/s.

3.6 Installation Considerations

In general, equipment must be installed in a location convenient for operation, inspection, and maintenance, and in an area free from excessive vibration, heat, and EMI noise generating sources.

The location consideration for each of the xVue Touch System components is described in this section.

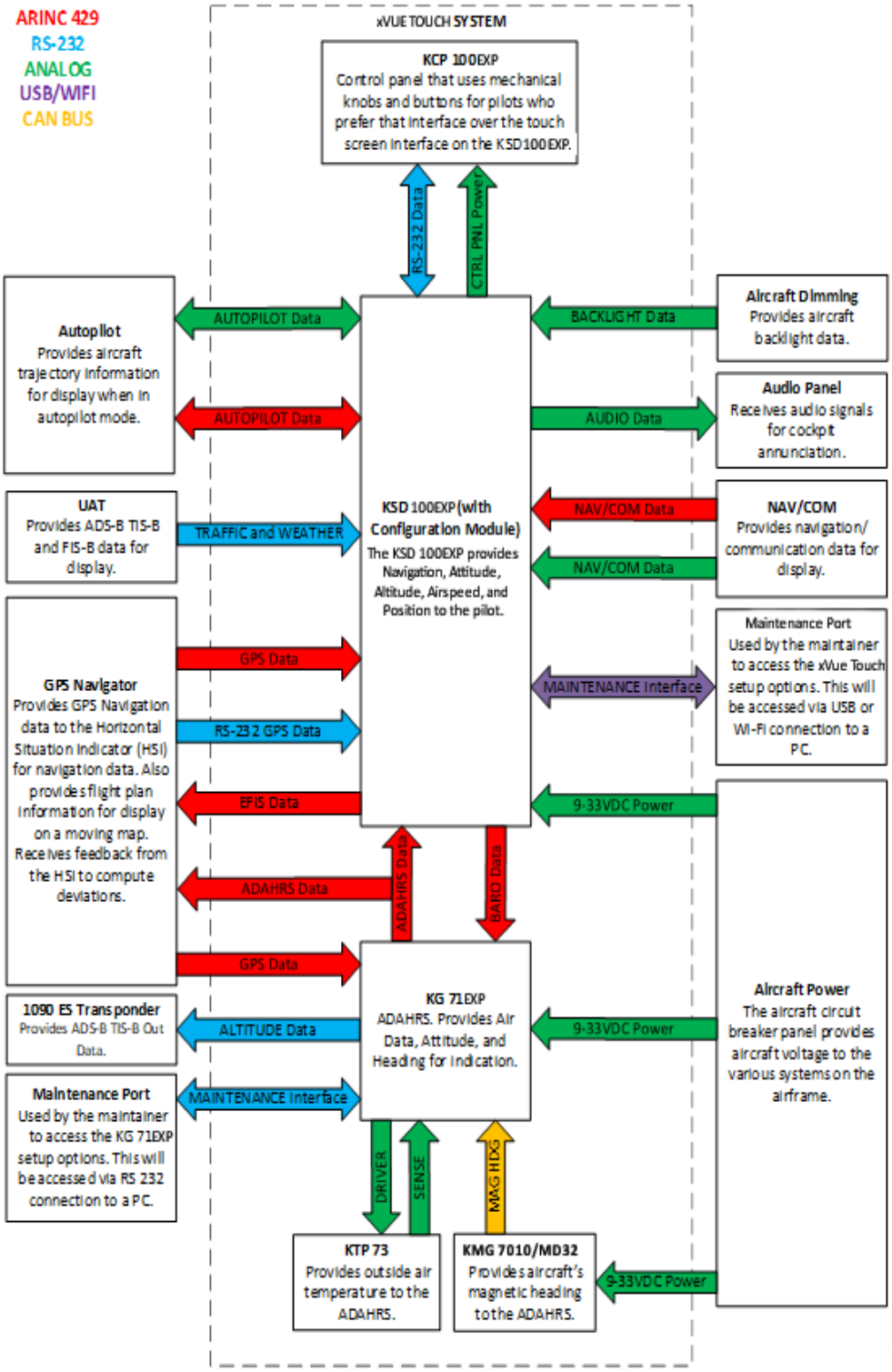

Figure 3-2 xVue Touch System Interfaces

3.6.1 xVue Touch System Interfaces

The xVue Touch System components can interface with a variety of other avionics equipment. The following list includes the proven interfaces. There may be other devices that can be configured the same as the ones listed below but have not been tested by BendixKing.

Table 3-22 xVue Touch Compatible Equipment

Category	Vendor	Model
Audio Panel	BendixKing or Other	KMA 30 or Equivalent audio panel with available 510 ohms unswitched audio input
Autopilot Computers	BendixKing	KC 140
		KC 190
		KC 191
		KC 192
		KC 225
		KC 295
Traffic/TAWS	BendixKing	KMH 820
		KMH 920
		KTA 810
		KTA 910
ADS-B Traffic	BendixKing	KGX 130x
		KGX 150x
	FreeFlight Systems	FDL-978-XVRL
		FDL-978-XVR
		FDL-978-XVR/G
		FDL-978-XVRD
		FDL-978-XVRD/G

Table 3-22 xVue Touch Compatible Equipment

Category	Vendor	Model
GPS Navigators	BendixKing	KSN 765
	Garmin	GNC 420W
		GPS 400W
		GPS 500W
		GTN 625
		GTN 635
		GTN 725
	Avidyne	IFD 410
		IFD 510
		IFD 545
Radio Navigators	BendixKing	KX 155
		KX 155A
		KX 165
		KX 165A
	Garmin	GNC 255
GPS/Radio Navigators	BendixKing	KSN 770
	Garmin	GNS 430W
		GNS 530W
		GTN 650
		GTN 750
	Avidyne	IFD 440
		IFD 540
		IFD 550
FIS-B Weather and TFRs	BendixKing	KGX 130x
		KGX 150x
	FreeFlight Systems	FDL-978-XVRL
		FDL-978-XVR
		FDL-978-XVR/G
		FDL-978-XVRD
		FDL-978-XVRD/G
ADAHRS	BendixKing	KG 71EXP

Table 3-22 xVue Touch Compatible Equipment

Category	Vendor	Model
Magnetometer	BendixKing	KMG 7010
Magnetometer	MidContinent Instruments + Avionics	MD32
Data Converter	BendixKing	KDC 100EXP
OAT Probe	BendixKing	KTP 73

NOTE

GPS DATA IS AVAILABLE FROM KSN 770/765 NAVIGATORS THROUGH A RS-232 OUTPUT BUS (P-EXPRESS BUS). RS-232 SPECIFICATION REQUIRES THIS BUS TO BE A POINT TO POINT CONNECTION AND IT NOT INTENDED TO BE FANNED OUT. DEPENDING ON INSTALLATION NEEDS THERE MAY BE MORE THAN ONE DEVICE THAT REQUIRES GPS RS-232 DATA. DEVICES THAT REQUIRE GPS RS-232 DATA INCLUDE KGX 130X, KT 74 TRANSPONDER, ETC. ONE WAY TO OBTAIN ADDITIONAL GPS RS-232 DATA IS BY USING A KGX 150X. THE KGX 150X HAS INTERNAL GPS, WHICH ELIMINATES THE NEED FOR A RS-232 GPS INPUT FOR THIS DEVICE. IN ADDITION, THE KGX 150X PROVIDES A RS-232 OUTPUT THAT CAN SUPPLY GPS DATA TO ANOTHER DEVICE SUCH AS A KT 74 TRANSPONDER. IF A KGX 150X IS USED IT WILL REQUIRE A GPS ANTENNA.

3.6.2 Instrument Panel

NOTE

INSTALLATION OF THE KSD 100EXP ON COMPOSITE INSTRUMENT PANELS IS NOT COVERED BY THIS MANUAL.

NOTE

INSTALLER IS RESPONSIBLE FOR ENSURING STRUCTURAL ADEQUACY OF THE INSTRUMENT PANEL WITH MODIFIED LAYOUT.

The instrument panel must meet the minimum material thickness of 0.063 inches. It is recommended to prepare a blank instrument panel prior to installation of the KSD 100EXP and KCP 100EXP. The instrument panel may be fabricated using the existing Type Certified panel as a template (refer to design considerations listed below) or blank panel versions may be purchased from the airplane manufacturer.

When fabricating a new panel, the following requirements must be met:

(1) New panel design should be close to the original design. All aspects of the original panel should be kept (material, panel thickness, structural attachment method, etc.).

(2) If the original panel material data is not available, the avionics installer may use 2024-T3 aluminum. For airplane with original panel thickness of less than 0.063 inches, the new panel thickness must increase to the minimum required, 0.063 inches. For airplane with original panel thickness of 0.063 inches or greater, the new panel thickness must match the original panel

thickness.

(3) If the original panel utilizes a tighter bend radius than the minimum bend radius appropriate to material and thickness (refer to AC 43.13-1B, Chapter 4, Section 4), a softer material may be used to match the original design and then heat treated to match the hardness and strength of the original design. It is the installer's responsibility to ensure the heat treatment has been properly performed.

The instrument panel must be aluminum to meet the electrical bonding requirements between the KSD 100EXP unit and the airplane panel, reference Section 3.10.

The xVue Touch system equipment dimensions and installation templates are provided in Appendix A Outline and Installation Drawings. Refer to AC 43.13-1B for edge distance guidance. For KSD 100EXP mounting holes, refer to Appendix A Outline and Installation Drawings.

NOTE

CERTAIN MODELS MAY REQUIRE A MOUNTING ADAPTER TO ACHIEVE THE MINIMUM MOUNTING HOLE TO CUTOUT DISTANCE, PLEASE CONTACT BENDIXKING CUSTOMER SUPPORT FOR ASSISTANCE.

3.6.3 Standby Instruments

The xVue Touch System recommends a standby attitude indicator, airspeed indicator, and altimeter be installed. If the indicator is used as the altitude/attitude source to a system that remains installed on the airplane, it should be retained. In many cases the existing instruments may be retained for use as standby instruments. Either two-inch or three-inch standby instruments may be used.

3.6.3.1 Standby Instrument Location

Standby instrument locations are recommended per AC 23.1311-1C, Section 15, to be within 35 degrees from the pilot view centerline. This is within 21 inches (533 mm) from the reference center line, based on a viewing distance of 30 inches from the panel.

NOTE

INSTALL THE STANDBY INSTRUMENTS IN PROXIMITY TO THE KSD 100EXP.

The preferred order, if the standby instruments are installed vertically is attitude indicator (top), airspeed indicator, and altimeter (bottom). If there are space constraints the alternate vertical installation is airspeed indicator (top), attitude indicator, and altimeter (bottom). The preferred order if the standby instruments are installed horizontally is: airspeed indicator (left), attitude indicator, and altimeter (right). If space limitations prevent the installation of the standby instruments either vertically or horizontally, any order is acceptable provided the instruments are located within the recommendation of AC 23.1311-1C.

3.6.3.2 Standby Attitude Indicator

For airplanes with an existing autopilot, the interfacing Attitude Indicator (AI) must be moved, if it is located in the installation location required by the PFD. Since the AI is supplying attitude information to the autopilot, it must be retained. The AI may be used as a standby indicator and may be relocated to an

approved location for standby instruments.

Any air-driven AI may be used to provide back-up attitude. If an electronic standby AI is used, it must be connected to a bus that receives power as soon as the battery master switch is turned on. If the airplane has multiple power buses, the xVue Touch System and the standby AI should be connected to the “essential” bus. If there is more than one “essential” bus, the standby AI should be connected to a different “essential” bus than the xVue Touch System equipment. The electronic AI requires a battery pack or emergency power system that meets the 30 minute operational requirement. If using a standby attitude indicator that allows for configuration between fixed and movable roll indication, fixed pointer should be used.

3.6.3.3 Standby Airspeed Indicator

The existing airplane Airspeed Indicator (ASI) may be retained for use as a standby instrument. Either two-inch or three-inch standby instruments may be used. If an electronic standby ASI is used, it must be connected to a bus that receives power as soon as the battery master switch is turned on. If the airplane has multiple power buses, thexVue Touch System and the standby ASI should be connected to the “essential” bus. If there are more than one “essential” bus, the standby ASI should be connected to a different “essential” bus than the xVue Touch System equipment. The electronic ASI needs a battery pack or an emergency power system that meets the 30 minute operational requirement.

CAUTION

IF THE ORIGINAL AIRSPEED INDICATOR IS PART OF THE AIRSPEED WARNING SYSTEM IT MUST BE RETAINED IN THE INSTALLATION.

3.6.3.4 Standby Altimeter

The existing airplane altimeter must be retained for use as a standby instrument if it is used as the altitude source to a retained system. Either two-inch or three-inch standby instruments may be used. If an electronic standby altimeter is used, it must be connected to a bus that receives power as soon as the battery master switch is turned on. If the airplane has multiple power buses, the xVue Touch System and the standby altimeter should be connected to the “essential” bus. If there are more than one “essential” bus, the standby altimeter should be connected to a different “essential” bus than the xVue Touch System equipment. The electronic altimeter needs a battery pack or an emergency power system that meets the 30 minute operational requirement.

The static port and airspeed tape / altimeter must be verified in accordance with 14 CFR Part 91.411 and Part 43 Appendix E.

3.6.4 Required GPS Navigator

Interfacing the xVue Touch System to the GPS Navigator is required for proper system operation. GPS information is used by the xVue Touch System for the moving map and for the KG 71EXP GPS aided attitude. At least one WAAS/ GPS navigator is required although the xVue Touch System can support two independent Navigators. Different model navigators may be used. See Section 3.6.1 xVue Touch System Interfaces for applicable navigators.

3.6.5 KSD 100EXP Installation Considerations

The KSD 100EXP dimensions and installation template are provided in Appendix A Outline and Installation Drawings.

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3.6.5.1 KSD 100EXP – Field of View Considerations

The KSD 100EXP PFD must be installed in the instrument panel of the airplane and shall be mounted in place of the six primary instruments. The KSD 100EXP must be installed in a location where the pilot is able to reach and view the screen. The location shall protect the KSD 100EXP display from glare and reflections that might interfere with the pilot's vision. The location must allow for the KSD 100EXP display to be viewed without being obstructed by the glareshield or the control column and yoke.

NOTE

THE KSD 100EXP MUST BE INSTALLED PER 14 CFR 23.1321(a). IF CROSS-COCKPIT OPERATION IS DESIRED, THE POSITION OR ORIENTATION OF THE KSD 100EXP SHOULD BE AS SUCH TO PUT THE CROSS-COCKPIT POSITION WITHIN THE 14 CFR 23.1321(a) FIELD OF VIEW WINDOW.

NOTE

RECORD CROSS-COCKPIT CONFIGURATION STATUS IN THE AIRPLANE FLIGHT PROCEDURES (AFP) (REFER TO SECTION 4.13).

The following paragraphs provide specific mounting requirements based on FAA guidance and are recommended for the xVue Touch System installation.

The primary field of view is measured in both the horizontal and vertical fields as illustrated in Figure 3-3 (reference AC 23.1311-1C, Section 15) in accordance with 14 CFR Part 23.1321(a). The viewing angles are from the pilot's perspective (eye reference point) looking at the display.

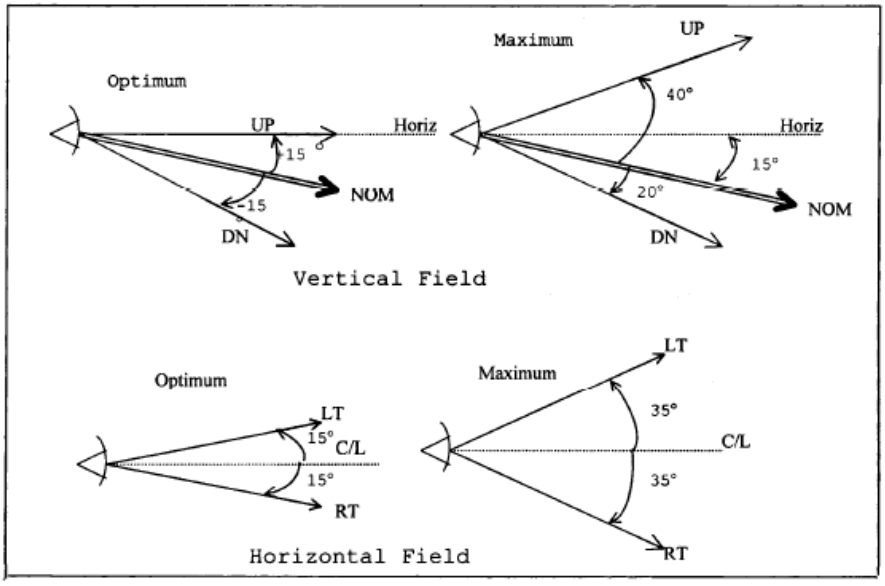

Figure 3-3 KSD 100EXP Primary Field of View

It is the responsibility of the avionics installer to determine that the required airplane viewing envelope is within this specified primary field of view.

The placement of the KSD 100EXP is recommended per AC 23.1311-1C to be within 2 inches of the pilot

view centerline. The acceptable installation location for the KSD 100EXP is to have its AI not dramatically differ from the location of the original type certificated AI. This is accomplished by installing KSD 100EXP such that its AI display overlaps the original type certificated “AI” location. The AI area is in the top half of the KSD 100EXP display as illustrated in Figure 3-4.

The original AI location is illustrated with an outline of the overlaid AI in the figure.

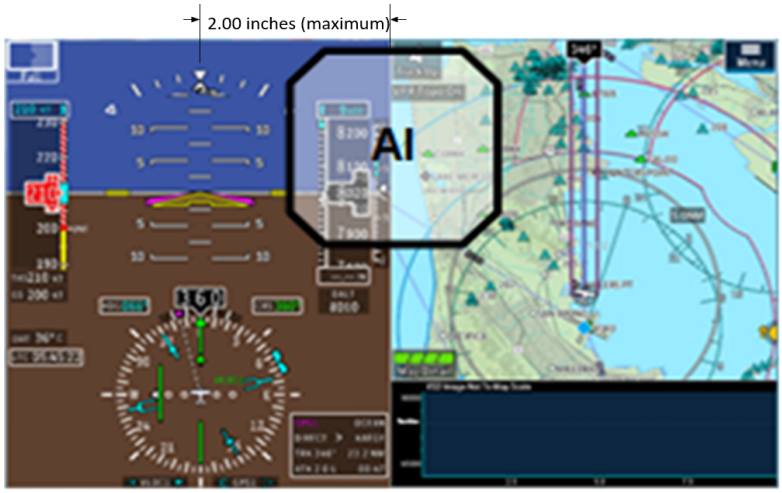

Figure 3-4 KSD 100EXP Location (Attitude Indicator)

3.6.5.2 KSD 100EXP Cooling Considerations

The KSD 100EXP does not require forced air cooling within the unit’s operational temperature range, provided the following conditions are met:

(1) The minimum separation distance from other active instruments is 0.5 inch (12.7 mm) from the top or bottom of the KSD 100EXP cutout to the instrument.
(2) The installed location is away from heat sources (including electronic instruments). Heat generating sources should not be installed below the KSD 100EXP.
(3) Adequate space is provided for installation of cables and connectors.

If the conditions listed above are not met, additional forced air cooling is required and is the responsibility of the installer.

NOTE

IF THE AIR TEMPERATURE BEHIND THE PANEL IS +130°F (+55°C) OR GREATER, WHEN THE KSD 100EXP UNIT IS POWERED ON IT IS POSSIBLE FOR THE AIR NEAR THE KSD 100EXP TO REACH TEMPERATURE OF +160°F (+70°C). IT IS THE INSTALLER’S RESPONSIBILITY TO EVALUATE THE POSSIBLE IMPACT TO OTHER INSTRUMENTS AND PROVIDE ADDITIONAL COOLING IF NEEDED. IT IS RECOMMENDED THAT AIR BEHIND THE PANEL BE KEPT MOVING BY VENTILATION OR A FAN.

3.6.6 KCP 100EXP Installation Considerations

3.6.6.1 KCP 100EXP Location

The location of the KCP 100EXP is determined by the technician and must be placed where the pilot can easily reach and see the panel. The location of the KCP 100EXP control panel will be allocated by the

technician. If the available area on the instrument panel allows, install the KCP 100EXP close to the KSD 100EXP. The KCP 100EXP may be located on any side of the KSD 100EXP based on user preference. The KCP 100EXP dimensions allow for it to be installed in the radio stack as an alternative location. The KCP 100EXP can only be installed in the orientation that it was designed for (portrait or landscape).

NOTE

IF CROSS-COCKPIT OPERATION IS DESIRED, THE KCP 100EXP SHALL BE POSITIONED SO THAT IT IS EASILY ACCESSED AND SEEN FROM BOTH PILOT POSITIONS.

NOTE

RECORD CROSS-COCKPIT CONFIGURATION STATUS IN THE AFP (REFER TO SECTION 4.13).

3.6.7 KG 71EXP Installation Considerations

3.6.7.1 KG 71EXP Location

The KG 71EXP ADAHRS is recommended to be installed in an avionics bay area provided in the nose or tail section of the airplane. The KG 71EXP must be mounted rigidly to the airplane structure. Do not use shock mounting. Avoid areas prone to severe vibration (i.e. near engine mounts and landing gear) and heat generating sources. Vibration outside of the DO-160G vibration level may result in degraded accuracy. Verify the KG 71EXP is not the lowest point in the pitot/static system to reduce the chance of allowing moisture to enter the unit.

The locations chosen for the KG 71EXP, and the method of installation, will vary with each specific type of airplane. The unit should be installed in a convenient location for accessibility for inspection and maintenance. The location should be close to the CG but not at the expense of a “hard to remove or test” access point

.

NOTE

THE KG 71EXP SETUP REQUIRES ACCESS TO THE MAINTENANCE PORT. WHEN INSTALLING THE KG 71EXP IN A REMOTE LOCATION, ENSURE THAT THIS PORT IS ACCESSIBLE TO A MAINTENANCE PC WHILE ENGINES ARE RUNNING.

NOTE

THE KG 71EXP IS NOT APPROVED FOR INSTALLATION INSIDE THE CABIN FOR AIRPLANES WITH A STALL SPEED (V_{SO})GREATER THAN 64 KNOTS.

REFER TO SECTION 6.2.2.2 FOR AIRPLANE STALL SPEED (V_{SO}) AND SETUP ON THE KSD.

Use the dimensions shown in Figure A-7 to prepare the mounting holes for the KG 71EXP (also refer to the 1:1 scale drawing - available for download on the BendixKing Website - Dealer Portal).

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3.6.7.2 KG 71EXP Orientation

The KG 71EXP supports four installation orientations:

(1) Pitot-static ports facing the airplane nose (Unit X axis is aligned with airplane X axis)
(2) Pitot-static ports facing the right wing (Unit Y axis is aligned with airplane X axis)
(3) Pitot-static ports facing the airplane tail (Unit X axis is aligned with airplane X axis)
(4) Pitot-static ports facing the left wing (Unit Y axis is aligned with airplane X axis)

The KG 71EXP installation orientation and alignment with the airplane axis X (longitudinal axis from tail to nose) is illustrated in Figure 3-5.

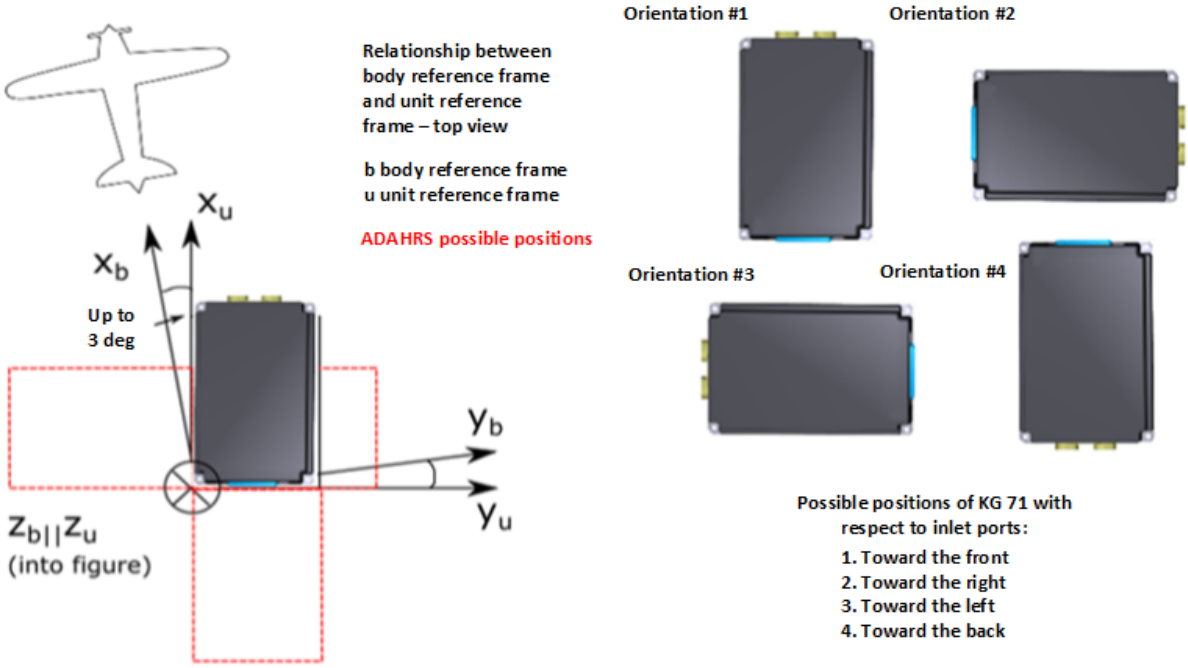

Figure 3-5 Supported KG 71EXP Installation Orientations

NOTE

DO NOT MOUNT THE KG 71EXP ON ITS EDGE OR UPSIDE DOWN.

The KG 71EXP (either shelf or rack mounted) must be leveled with the airplane's pitch and roll within ± 15 degrees. Many airplane models have an airplane-level reference shelf that is in alignment with the actual airplane's pitch and roll "level". A digital inclinometer with an accuracy of 0.1 degree or better should be used to level the shelf to the airplane's pitch and roll "level". The airplane maintenance manual should identify the airplane "level" and leveling procedures.

KG 71EXP offsets in the pitch and roll axis can be compensated up to ±15 degrees in each axis. The offsets in pitch and roll are compensated for by software offsets stored into the KG 71EXP non-volatile memory (NVM). The KG 71EXP provides measured offset information to the installer via the CMT tool (when the airplane is leveled) and these offsets are stored into NVM.

No external measurement of the KG 71EXP pitch and roll installation offsets is required. However, it is important to mechanically align the KG 71EXP in the longitudinal axis to be within ±3 degrees of the

airplane heading. A higher error will impact attitude accuracy output primarily under high pitch or roll angle conditions.

3.6.7.3 KG 71EXP Cooling Considerations

The KG 71EXP does not require forced air-cooling. A minimum separation distance of 1 inch (25.4 mm) around the top and sides of the unit is recommended to allow for air movement and cooling of the unit.

3.6.8 KMG 7010/MD32 Installation Considerations

3.6.8.1 KMG 7010/MD32 Location

The KMG 7010/MD32 must be mounted to a rigid portion of the airplane structure in a location where the dynamic change in local attitude to the KMG 7010/MD32 is minimized (should not exceed 1 degree of movement); it is recommended to utilize a previously installed magnetometer location for mounting the KMG 7010/MD32. When mounted, the three KMG 7010/MD32 primary axes must be parallel within ±5 degrees of each of the longitudinal, lateral and vertical axes of the level airplane.

The KMG 7010/MD32 should be located as far as possible from all sources of magnetic disturbance or ferrous materials such as nickel, iron, steel, cobalt or magnetic field inducing wire.

NOTE

IF A LEGACY BENDIXKING COMPASS SYSTEM, SUCH AS THE KCS 55A, IS REPLACED BY THE XVUE TOUCH SYSTEM, THE EXISTING WIRING FOR FLUX VALVE DETECTOR, KMT 112, MAY BE REUSED IF THE EXISTING WIRING MEETS THE SAME SHIELDING AND EMI TERMINATION REQUIREMENTS FOR THE KMG 7010/MD32. THE KMT 112 INSTALLATION LOCATION MAY ALSO BE ACCEPTABLE FOR INSTALLATION OF THE KMG 7010/MD32.

NOTE

DO NOT INSTALL THE MAGNETOMETER IN A STORAGE AREA, SUCH AS A COMPARTMENT, AS THESE AREAS MAY HAVE VARYING MAGNETIC FIELDS DEPENDING ON WHAT IS BEING STORED.

3.6.8.2 KMG 7010/MD32 Orientation

Pitch and roll offsets for the KMG 7010/MD32 must be measured by the technician during installation and stored into the KG 71EXP Non-Volatile Memory (NVM) during configuration. The technician must align the KMG 7010/MD32 with the airplane's X-axis; error in this alignment will impact heading accuracy indication. The maximum acceptable installation error for the KMG 7010/MD32 is ±5.0 degrees.

NOTE

USE A DIGITAL INCLINOMETER TO MEASURE ACTUAL AIRPLANE PITCH AND ROLL ATTITUDE DURING SYSTEM INSTALLATION.

NOTE

REFER TO AIRPLANE DOCUMENTATION TO DETERMINE A LOCATION AND ORIENTATION FOR THE KMG 7010/MD32. REFER TO THE AIRPLANE'S MAINTENANCE MANUAL FOR THE RECOMMENDED METHOD OF LEVELING THE AIRPLANE.

NOTE

FOR PROPER OPERATION, THE KMG 7010/MD32 MUST BE ELECTRICALLY BONDED TO THE AIRPLANE.

3.6.8.3 Magnetic Interference

3.6.8.3.1 Ground Checks - Prior to Installation of the Magnetometer

Prior to the installation of the KMG 7010/MD32, check for the following effects to locate an installation area that does not have a distorting or varying magnetic field:

(1) Hard Iron Effects: Ensure that the magnetometer mounting location is away from ferrous materials (i.e., iron, carbon steel, stainless steel, nickel and cobalt) which can distort sensing of Earth's magnetic field. A precision compass can be used to ascertain whether there is a hard iron effect by checking for needle swing when moving it near the proximity of the magnetometer.

(2) Soft Iron Effects and Motion Induced Eddy Currents: Ensure that the potential magnetometer mounting location is away from wires carrying high, intermittent, alternating current, and rotational surfaces which can induce heading errors. A precision compass can be used by checking for no needle swing when the electrical state of all nearby wires is varied (energized/de-energized) and all rotational components nearby moved.

(3) Electrical Current Return Paths: When an airplane device is grounded through the airframe the electrical current returning to the power source will flow through the airframe. This returning current can cause significant magnetic field interference when the magnetometer is located alongside it. Isolate the specific electrical device causing the current and ground the device using a wire rather than the airframe. The wire should be routed alongside the devices power wire to minimize the generated magnetic field.

3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing

Each of the steps of this procedure are to be performed at the four major compass rose orientations, North, East, South and West, after a compass swing has been completed. The procedure should be performed at magnetically undisturbed portion of the apron. Magnetic heading should be determined either by using calibrated compass rose area or by calibrated magnetic compass. One acceptable method of obtaining heading at a compass rose is to align both main landing gear on a given compass rose radial line and the resultant aircraft heading will be perpendicular to the radial line.

(1) Check the extent to which the magnetometer heading value varies as the electrical state of each nearby wire is energized/de-energized and each nearby electro-mechanical component (rotational component) is exercised through its range of motion.

(2) The proceeding step can be accomplished by setting the correct magnetometer orientation and tilt angles in the KG 71EXP configuration and maintenance tool (CMT) application. Then power up the complete xVue Touch System in normal mode (prior compass compensation) and observe

heading changes directly on the KSD 100EXP as the scenarios listed below are evaluated.

(3) If the magnetometer heading changes by more than ±2.0 degrees, isolate the wire(s) which should be moved away from the magnetometer. Alternately, magnetically shielding the wire or relocating the magnetometer may be a solution.

(4) Check the extent to which the magnetometer heading value changes as nearby rotational components are moved.

(5) If the magnetometer heading changes by more than ±2.0 degrees, the magnetometer should be moved further away from the rotational component. Alternately, relocation of the magnetometer may be required.

3.6.9 KDC 100EXP Installation Considerations

3.6.9.1 KDC 100EXP Location

The KDC 100EXP Data Converter can be mounted with other adjacent avionics equipment. No special mounting considerations are required for this LRU.

3.6.9.2 KDC 100EXP Orientation

The orientation of the KDC 100EXP does not matter, however, the orientation of the MD32 does - it has 24 different installation orientations.

NOTE

FOR PROPER OPERATION, THE KDC 100EXP MUST BE ELECTRICALLY BONDED TO THE AIRPLANE.

3.6.10 KTP 73 Installation Considerations

3.6.10.1 KTP 73 Location

To ensure accurate temperature readings, the KTP 73 OAT probe must be mounted to the wing or fuselage and away from heat sources, e.g. exhaust, engine cowlings, propeller wash. For a single engine airplane, it is recommended the probe be placed under the wing out of the exhaust stream and not in direct sunlight. For a twin engine airplane, it is recommended the probe be placed on the underside of the outer wing, under, or on the side of the nose fuselage outside of the exhaust stream and not in direct sunlight. It is recommended that the KTP 73 OAT probe be placed near an access panel. A doubler may be needed based on the skin thickness at the mounting location; check the mounting location for similarly sized OEM cutouts to determine if a doubler is required. If a doubler is needed, refer to Figure A-15 for a generic doubler definition to be used with airplane skin thicknesses from 0.016 to 0.032 inches; this generic doubler defines the minimum thickness, size, and number of rivets required for the KTP 73 installation.

NOTE

THE KTP 73 OAT PROBE HAS NO ICING PROTECTION. IF ICE ACCUMULATES ON THE KTP 73 OAT PROBE, ITS ACCURACY IS UNRELIABLE AND AIR TEMPERATURE MEASUREMENTS MAY BE INCORRECT.

The KTP 73 must be located in Lightning Zone 2A or 3; refer to the lightning zones illustrated in Figure 3-6 below; or, refer to SAE Aerospace Recommended Practice Aircraft Lighting Zoning document ARP5414 for more details on lightning zones. The sensor tip should extend out of the airplane structure sufficient to extend the tip into the free-stream. Ensure adequate space for sensor lead cable routing is available. Refer to the airplane maintenance manual for additional information on the location of lighting zones.

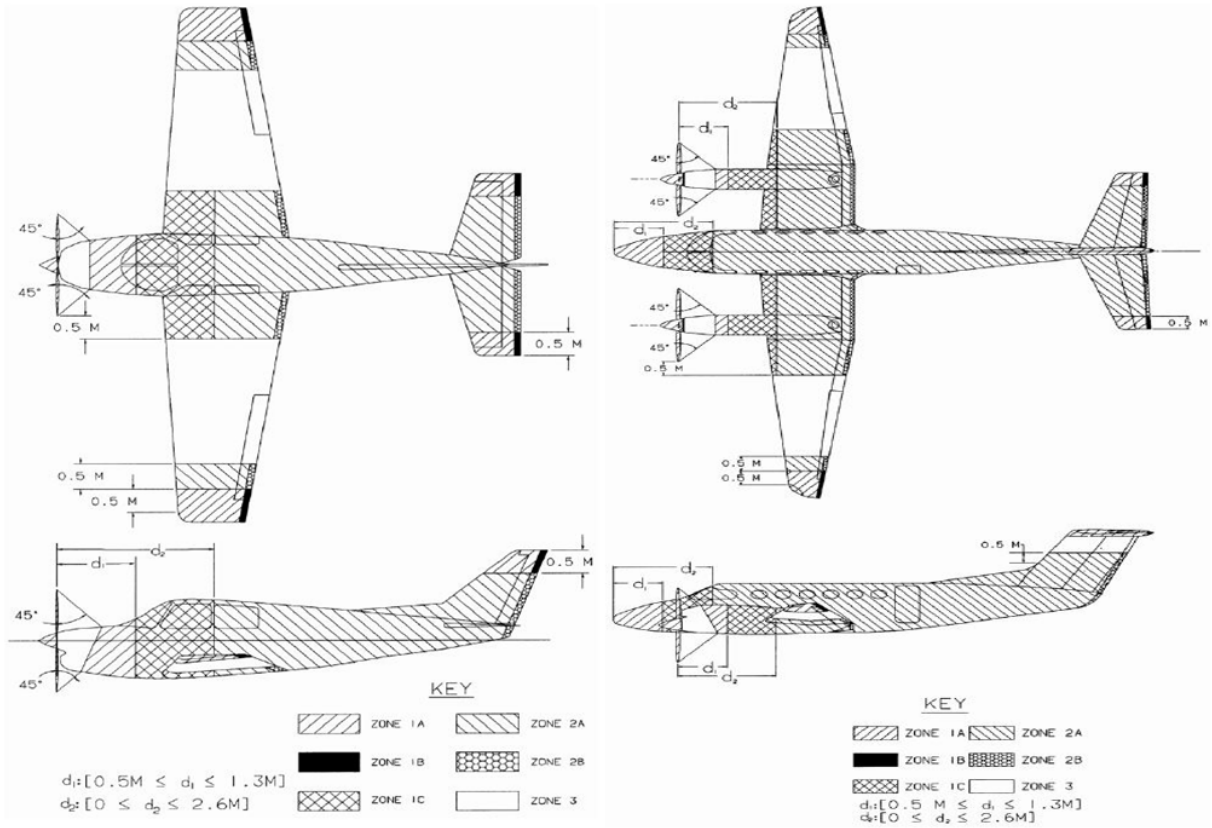

Figure 3-6 Lightning Zones

NOTE

THE KTP 73 COMES WITH A NOMINAL LENGTH OF WIRE. THIS WIRE MAY NOT BE LONG ENOUGH TO REACH THE DESIRED MOUNTING LOCATION, AND IT MAY BE NECESSARY TO EXTEND THE WIRING. ENSURE YOU MATCH THE WIRE SIZE USED ON THE EXISTING WIRE PROVIDED ON THE KT 73. IT IS ACCEPTABLE TO USE SPLICING OR IN-LINE CONNECTORS AND IT IS RECOMMENDED TO CARRY THE SHIELD THROUGH THE SPLICE OR CONNECTORS.

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3.7 Placards and Labels

All placards and labels must be readable in all cockpit lighting conditions. New circuit breakers installed for the KFD 900 must be labeled as follows:

- "PFD" for the KSD 100EXP and KCP 100EXP
- "ADAHRS" for the KG 71EXP
- "MAG" for the KMG 7010/MD32 and KDC 100EXP

If the installation of the xVue Touch System causes existing placard(s) to be relocated, the new placard(s) must meet the following requirements:

- The font size of the new placard must be the same size as the original placard
- The color of the new placard must be the same as the color of the original placard
- The text on the new placard must be the same as the text on the original placard
- The new placard must be readable in all lighting conditions
- The new placard must be located within an acceptable location per previous guidance

3.8 Power Distribution

The xVue Touch System can operate on either 14 VDC or 28 VDC. The xVue Touch must be powered from the airplane's primary power bus through three independent circuit breakers. All required xVue Touch System components must be connected to the same power bus. If there is more than one power bus on the airplane, the xVue Touch System components and the electronic standby instruments should be connected to the "essential" bus. If the airplane has more than one "essential" bus, the xVue Touch System components should be connected to one "essential" bus and the electronic standby instruments connected to the other "essential" bus.

For the KSD 100EXP, a 3 amp circuit breaker is required for 14 VDC installations and a 2 amp circuit breaker is required for 28 VDC installations. The KCP 100EXP is powered by the KSD 100EXP through this same circuit breaker. For the KG 71EXP, a 3 amp circuit breaker is required for 14 VDC installations and a 2 amp circuit breaker is required for 28 VDC installations. For the KMG 7010/MD32, a 2 amp circuit breaker is required for 14 VDC installations and a 1 amp circuit breaker is required for 28 VDC installations. Refer to Figure B-1 for the connection of the xVue Touch System to the airplane's power distribution system.

3.8.1 Circuit Protection

Circuit protection devices for the xVue Touch System shall be manually resettable circuit breakers. The xVue Touch System components should be connected to individual circuit breakers. Refer to Figure B-1 for details on the electrical installation and circuit breaker ratings.

3.9 Cable and Wiring

Wiring should be installed in accordance with AC 43.13-1B Chapter 11:

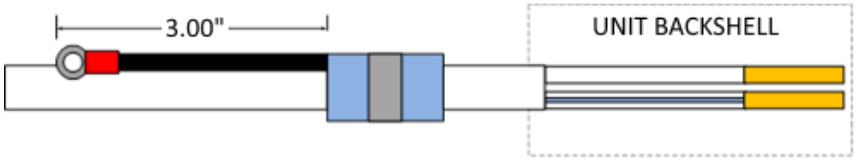
- Section 8 – Wiring Installation Inspection Requirements
- Section 10 – Service Loop Harnesses
- Section 11 – Clamping
- Section 15 – Grounding and Bounding
- Section 16 – Wire Marking

Refer to Section 5 Connector Pinout Information and Appendix B Interconnect Diagrams System Interconnect for the appropriate wiring connections to assemble the wiring connector.

When installing the xVue Touch System, the following cabling requirements must be met:

(1) Wire size for the KSD 100EXP, KCP 100EXP, KG 71EXP, and KMG 7010/MD32 and KDC 100EXP:
    (a) For power and signaling lines, use 22 AWG minimum

3.9.1 Shield Termination



WHEN TERMINATING SHIELD GROUNDS TO THE OUTSIDE OF xVue Touch SYSTEM BACKSHELLS, IT IS RECOMMENDED TO APPLY THE SOLDER SLEEVE AS SHOWN IN THIS FIGURE. THIS IS TO PREVENT OVERCROWDING INSIDE THE BACKSHELL WHILE STILL PROVIDING AN ACCEPTABLE METHOD OF GROUNDING THE SHIELD.

Figure 3-7 Termination Procedure

3.10 Electrical Bonding Considerations

All rack mount/remote mount units must be electrically bonded to the airframe. This is accomplished by ensuring that the mating surfaces between the component mounting tray (or component mounting feet if a tray is not used) provides a low impedance electrical path.

The mating surfaces must be free of all paint and other non-conductive elements and should be burnished to ensure a good bond. If the airplane mating surface is not conductive, a bonding strap of at least 1/4inch wide (preferably 1/2inch wide) tin coated copper braid should be used between the component mounting tray (or component itself if a tray is not used) and the nearest airframe grounding point.

Electrical bonding begins with the equipment attach point(s) such as the mounting rack or the instrument panel. Ensure good metal-to-metal bonding as brackets and shelves are assembled and installed. The electrical bond between the following shall be less than or equal to 2.5 milliohms:

KSD 100EXP:

(1) KSD 100EXP and the airplane instrument panel
(2) KSD 100EXP and the mating backshell

KCP 100EXP:

(3) KCP 100EXP and the airplane instrument panel
(4) KCP 100EXP and the mating backshell

KG 71EXP:

(5) KG 71EXP and the airplane local structure
(6) KG 71EXP and the mating backshell

KMG 7010/MD32 and KDC 100EXP:

(7) KMG 7010/MD32 and KDC 100EXP and the airplane local structure
(8) KMG 7010//MD32 and KDC 100EXP and the mating backshell

KTP 73:

(9) KTP 73 and the airplane ground

Compliance should be verified using a calibrated milliohm meter. Any paint removed from the instrument panel to meet the bonding requirement should have a corrosion resistant protective coating applied that meets the specification found in AC 43.13-1B.

3.11 Pitot-Static Plumbing Considerations

The pitot-static plumbing originally connected to the pilot's side instruments must be connected to the KG 71EXP ports and the standby instruments. Post installation, altimeter system and altitude reporting equipment tests and inspections are required to ensure errors have not been introduced. The integrated system must be tested and inspected per 14 CFR Part 91.411 and 91.413.

3.12 External Annunciators

The KSD 100EXP does not provide any external annunciations. All external annunciator panels must remain installed in the airplane.

Existing external annunciators, that are not part of the xVue Touch System, must remain in the required Field of View in accordance with their respective installation criteria.

3.13 External System Interface Considerations

The KSD 100EXP is capable of displaying the lateral and vertical deviation from GPS sources and navigation receivers in the airplane. It is not recommended to use external CDI in conjunction with the xVue Touch System.

External serial data sources intended to for use with xVue Touch System should be checked for compatibility before installation.

When the xVue Touch System is installed with external sensors, these sensors must be installed in accordance with manufactures data. Installation of any external sensors not approved by this manual is beyond the scope of this manual.

3.13.1 Navigation Receiver

Interfacing the KSD 100EXP to a navigation receiver allows VOR and ILS information to be displayed on the PFD Horizontal Situation Indicator (HSI). The KSD 100EXP supports interfacing to three independent navigation receivers.

3.13.2 ADS-B Traffic, FIS-B Weather and TFRs

The xVue Touch System can support ADS-B Traffic, FIS-B Weather and TFRs. The following are the only supported receivers for traffic and weather.

Table 3-23 Supported Receivers

BendixKing	KGX 130x
	KGX 150x
FreeFlight Systems	FDL-978-XVRL
	FDL-978-XVR
	FDL-978-XVR/G
	FDL-978-XVRD
	FDL-978-XVRD/G

3.13.3 Autopilot Interface

The xVue Touch System is able to interface with a variety of autopilots.

NOTE

PRIOR TO XVUE TOUCH INSTALLATION, VERIFY COMPATIBILITY WITH THE INTENDED AUTOPILOT.

Refer to Table 6-2 for the list of supported autopilots.

3.13.3.1 Autopilot Attitude Indicators/Gyros

AIs which interface with the autopilot installed on the airplane, must be used as a standby instrument for the xVue Touch System. The AI needs to be installed in an approved standby instrument location. The existing AI system provides the data to the autopilot. Do no remove the existing AI/Gyro wiring from the autopilot system.

3.13.3.2 Autopilot Turn Coordinators

Instrument panel mounted turn coordinators, which interface with the existing autopilot on the airplane, must be retained and may require relocation; refer to AC 23.1311-1C. Due to space constraints it may be necessary to blind mount the unit. The installer must ensure that the relocated turn coordinator is installed in accordance with its installation manual for panel incline and other applicable requirements.

3.13.3.3 Autopilot Altitude Pre-Selector and Remote Annunciators

Retain the altitude pre-selector as the KSD 100EXP does not provide this altitude pre-selector function. Retain the remote autopilot annunciators as the KSD 100EXP does not provide these annunciations. Relocate the remote annunciator manufacturer installation guidance.

3.13.4 Audio Panel

The audio panel must have an un-switched audio-in available.

3.14 Part 121/Part 135 Considerations

Not Applicable.

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4 XVUE TOUCH SYSTEM INSTALLATION PROCEDURES

Prior to installation of any xVue Touch System components, complete all power, ground, and continuity checks. Any faults or discrepancies must be corrected before proceeding to component installations.

4.1 Introduction

The xVue Touch System installation encompasses the following major activities:

(1) Physical installation of system components into an airplane (including wiring). This step will require a portion of the existing instrumentation be removed and/or relocated.
(2) Update of software for system components (if needed)
(3) Configuration of the KSD 100EXP (including configuration of interfaces)
(4) Configuration of the KCP 100EXP (Control Panel Lighting)
(5) Configuration of the KG 71EXP (including configuration of interfaces)
(6) Reconfiguration of already installed systems which are newly connected with the xVue Touch System (if needed)
(7) On ground checks
(8) In Air checks
(9) Troubleshooting of installation problems (if any are found)

4.2 Instrument Panel Preparation Procedure

NOTE

MAINTAIN A MINIMUM OF TWO TIMES THE RIVET DIAMETER FOR CENTER OF RIVET HOLES TO THE CUTOUT EDGE.

NOTE

MAINTAIN NECESSARY BONDING SURFACES FOR THE KSD 100EXP AND KCP 100EXP.

(1) Ensure the instrument panel is prepared per Section 3.6.2 and the locations for the KSD 100EXP PFD and KCP 100EXP Control Panel are determined based on considerations in Section 3.6.5 and Section 3.6.6, respectively.
(2) Cut the panel for the KSD 100EXP using the template provided in Figure A-2 KSD 100EXP Panel Cutout Dimensions (also refer to the 1:1 scale drawing and associated electronic format .dxf template - available for download on the BendixKing Website - Dealer Portal).
(3) Cut the panel for the KCP 100EXP using the template provided in Figure A-5 KCP 100EXP Panel Cutout Dimensions (also refer to the 1:1 scale drawing and associated electronic format .dxf template - available for download on the BendixKing Website - Dealer Portal).
(4) Prepare nutplate locations (on the back of the instrument panel at each of the mounting holes) as bonding points such that the bonding resistance conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.
(5) Apply conversion coating material conforming to MIL-C-81706 per AC 43.13-1B, to exposed metal surfaces.
(6) Install four #8-32 nutplates on the back side of the instrument panel at the KSD 100EXP mounting hole locations provisioned in steps (4) and (5).

(7) Install four #4-40 nutplates on the back side of the instrument panel at the KCP 100EXP mounting hole locations provisioned in steps (4)and (5).
(8) Finish the instrument panel as needed and install in airplane.

4.3 KSD 100EXP Installation

4.3.1 KSD 100EXP Connectors/Configuration Module

The J1 and J2 LRU connectors attach to the P1 (upper) and P2 (lower) wiring harness connectors; refer to Figure 4-1. Each 78-pin D-sub connector housing, provided in the KSD 100EXP Installation Kit - Configuration Module And Connectors, is mounted inside a BendixKing Backshell Assembly, provided in the KSD 100EXP Installation Kit - Backshell Assembly. See Figure 4-2 for exploded view diagram and part number references of the backshell assembly.

The Configuration Module is a circuit card assembly (CCA) provided in the KSD 100EXP Installation Kit - Configuration Module. The Configuration Module is installed in the J2 connector. See Section 4.3.1.2 for Configuration Module installation instructions.

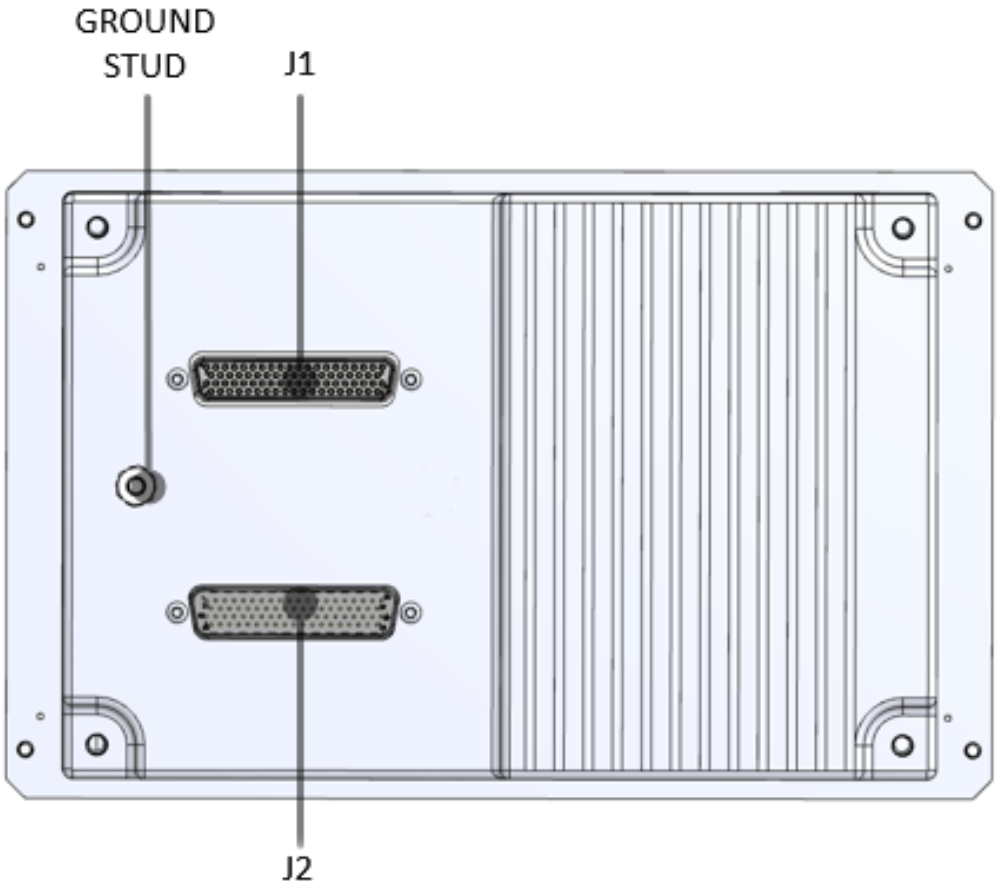

Figure 4-1 KSD 100EXP (Back View)

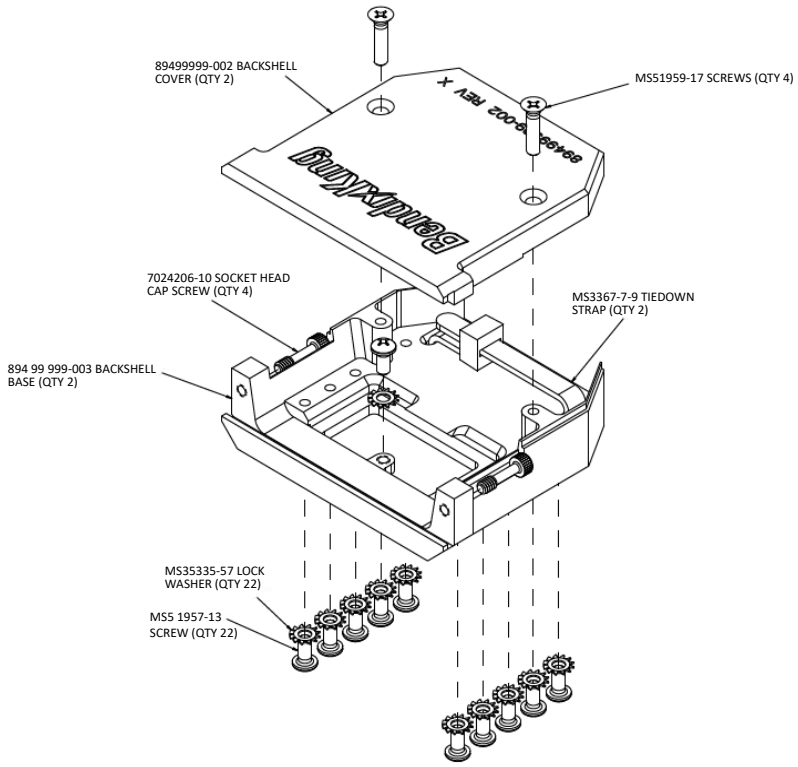

Figure 4-2 BendixKing Backshell Assembly

4.3.1.1 J1 Connector Assembly

The KSD 100EXP J1 Connector mounts to the upper D-Sub receptacle (P1) on the back of the KSD 100EXP. See Figure 4-2 and Figure 4-3 for exploded view diagrams and part descriptions. See Table 5-1 KSD 100EXP J1 Pin Descriptions (Viewed from LRU) for pin designations.

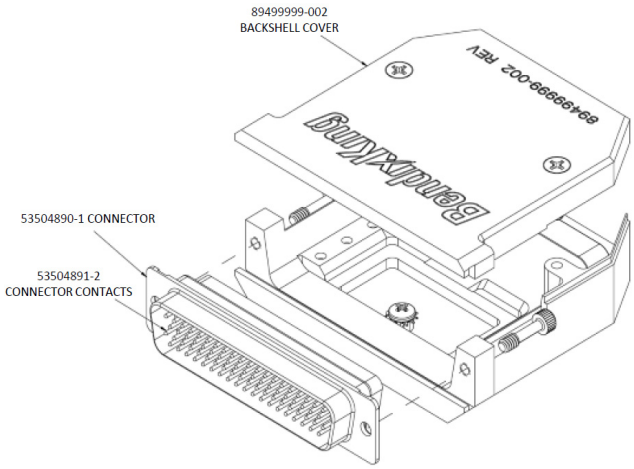

Figure 4-3 KSD 100EXP J1 Connector Assembly

Using the KSD 100EXP Installation Kit - Backshell Assembly and the KSD 100EXP Installation Kit - Configuration Module and Connectors:

(1) Prepare the J1 wire harness by stripping wire ends and applying crimped pin connector contacts.

(2) Insert pinned wires into J1 connector housing per Table 5-1 KSD 100EXP J1 Pin Descriptions (Viewed from LRU).
(3) Insert the J1 connector housing into the backshell base and secure with the two captive socket head jack post screws.
(4) Insert the tiedown strap in the backshell base and secure the wire bundle.
(5) Install the backshell cover to the backshell base with the two countersunk screws. Torque screws to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).
(6) Secure each cable harness shield ground to the J1 backshell assembly with the button head ground screws and lock washers, see Figure 4-8 Bottom Side of J2 Backshell. Torque screws to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

4.3.1.2 J2 Connector/Configuration Module Assembly

The KSD 100 J2 Connector/Configuration Module Assembly mounts to the lower D-Sub receptacle (P2) located on the back of the KSD 100EXP. The Configuration Module CCA is installed in the backshell assembly of the J2 connector.

See Figure 4-2 BendixKing Backshell Assembly, Figure 4-4 KSD 100EXP J2 Connector Assembly, and Figure 4-5 Configuration Module Circuit Card Assembly (Primary Side) for exploded view diagrams and part number references. See Table 5-2 KSD 100EXP J2 Pin Descriptions (Viewed from LRU) and Table 4-1 Configuration Module (J2 Backshell) Pin Descriptions pin designation.

CAUTION

THE CONFIGURATION MODULE CCA SHOULD BE HANDLED AS AN ESD SENSITIVE (ESDS) ITEM DURING INSTALLATION INTO THE CONNECTOR BACKSHELL.

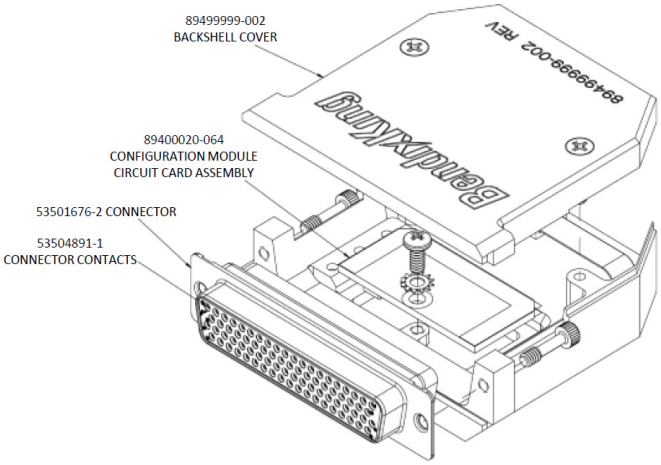

Figure 4-4 KSD 100EXP J2 Connector Assembly

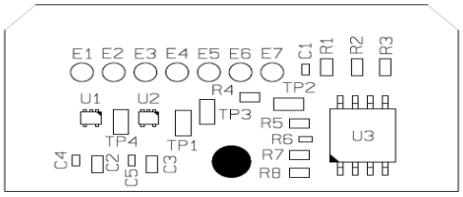

Figure 4-5 Configuration Module Circuit Card Assembly (Primary Side)

Table 4-1 Configuration Module (J2 Backshell) Pin Descriptions

J2 Pin	Signal Name	In/Out	CCA	Wire Color (Recommended)
64	APM Master Out	Out	E1	Orange
65	APM Master In	In	E2	Blue
66	APM Clock	In	E3	Yellow
67	APM Chip Select	In	E4	Green
68	APM Write Protect	In	E5	White
69	APM Power	PWR	E6	Red
70	APM Return	GND	E7	Black

The bottom side of the J2 Backshell is illustrated in Figure 4-8, showing the ground connections for the shielding. The wired configuration module in the J2 Backshell is illustrated in Figure 4-6.

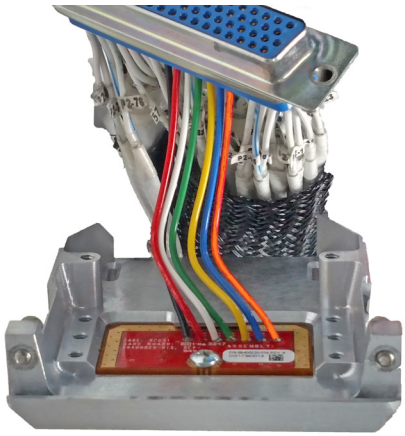

Figure 4-6 Configuration Module Inside J2 Backshell

(1) Cut seven lengths of 22AWG wire (M22759/16-22-XX), per Table 4-1, to 2.5 ± 0.5 inches.
(2) Solder the seven lengths of wire per J-STD-001 to the Configuration Module CCA provided in the KSD 100EXP Installation Kit -Configuration Module using Table 4-1 Configuration Module (J2 Backshell) Pin Descriptions.

NOTE

WIRES ARE INSERTED IN THE CIRCUIT CARD THROUGH HOLES FROM THE SECONDARY SIDE AND SOLDERED TO THE PRIMARY SIDE OF THE CARD (REFER TO FIGURE 4-7). VERIFY SOLDER JOINTS DO NOT PROTRUDE MORE THAN 0.080 INCHES FROM THE CARD SURFACE (PRIMARY SIDE).

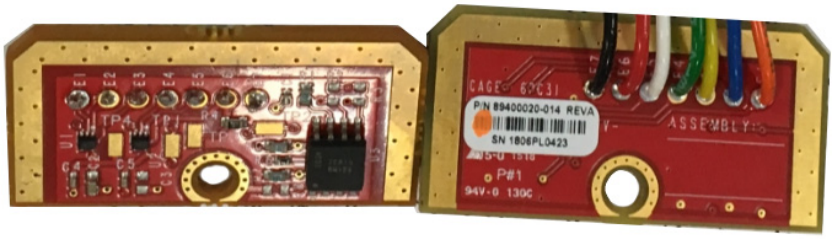

Figure 4-7 Wired Configuration Module Circuit Card Assembly

(3) Strip the remaining end of the seven lengths of wire and crimp on socket connector contacts included in the KSD 100EXP Configuration Module and Connector Installation Kit per IPC-A-610. Set aside.

(4) From the KSD 100EXP Configuration Module And Connector Installation Kit, prepare J2 wire harness by stripping wire ends and applying crimped socket connector contacts.

(5) Prepare J2 wire harness by crimping remaining socket connector contacts and inserting into J2 housing, provided in the KSD 100EXP Backshell Assembly Installation Kit, per Table 5-2 KSD 100EXP J2 Pin Descriptions (Viewed from LRU).

(6) Insert the seven socket connector contacts from the Configuration Module into J2 housing per Table 4-1 Configuration Module (J2 Backshell) Pin Descriptions.

(7) Inside the backshell base, insert the Configuration Module CCA with the primary side (populated side) facing down. Reference Figure 4-5 Configuration Module Circuit Card Assembly (Primary Side).

(8) Secure the Configuration Module CCA with the center mounting screw and lock washer. Torque screw to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

(9) Insert the J2 connector housing into the backshell base and secure with the two captive socket head jack post screws.

(10) Insert the tiedown strap in the backshell base and secure the wire bundle.

(11) Install backshell cover to the backshell base with the two countersunk screws. Torque screws to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

(12) Secure each cable harness shield ground to the J2 backshell assembly with the button head ground screws and lock washers. Torque screw to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

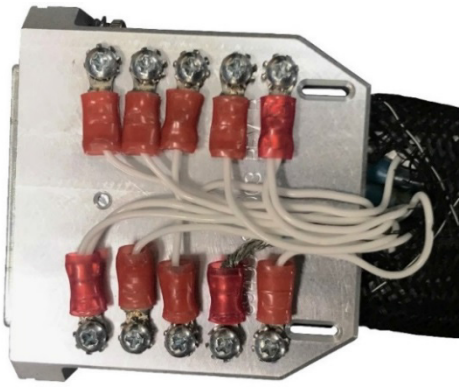

Figure 4-8 Bottom Side of J2 Backshell

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4.3.2 KSD 100EXP Installation Procedures

NOTE

DO NOT REMOVE THE PROTECTIVE FILM FROM THE DISPLAY GLASS UNTIL THE UNIT IS INSTALLED.

(1) Prepare the KSD 100EXP for installation:

(a) Using the KSD 100EXP Mounting Hardware and Grip Installation Kit, install the Santoprene™ Grip by sliding the grip from the back of the KSD 100EXP and snapping it over the front edge of the KSD 100EXP LCD mount.

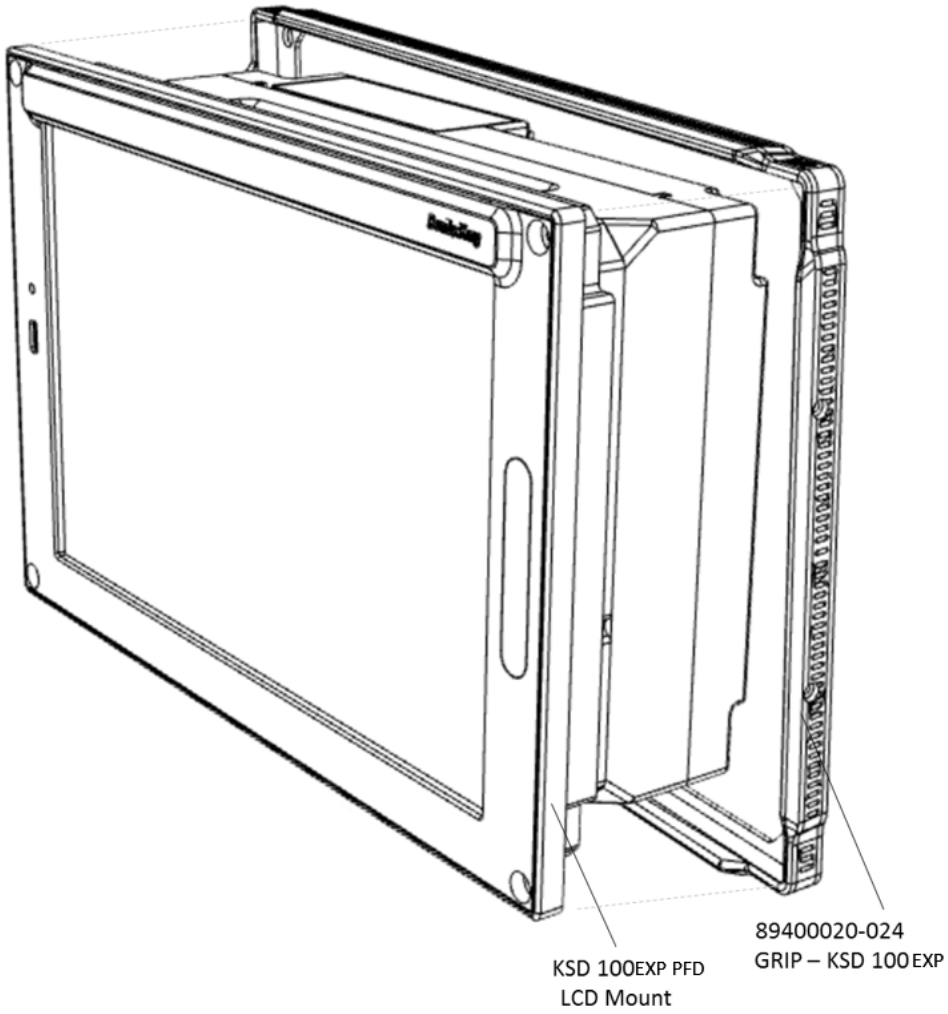

Figure 4-9 KSD 100EXP Grip Installation (Sheet 1 of 2)

(b) Secure the Santoprene™ Grip to the LCD mount using the eight #2-56 screws with thread-locking compound. Torque screws to 2 in-lbs (0.22 Nm) maximum.

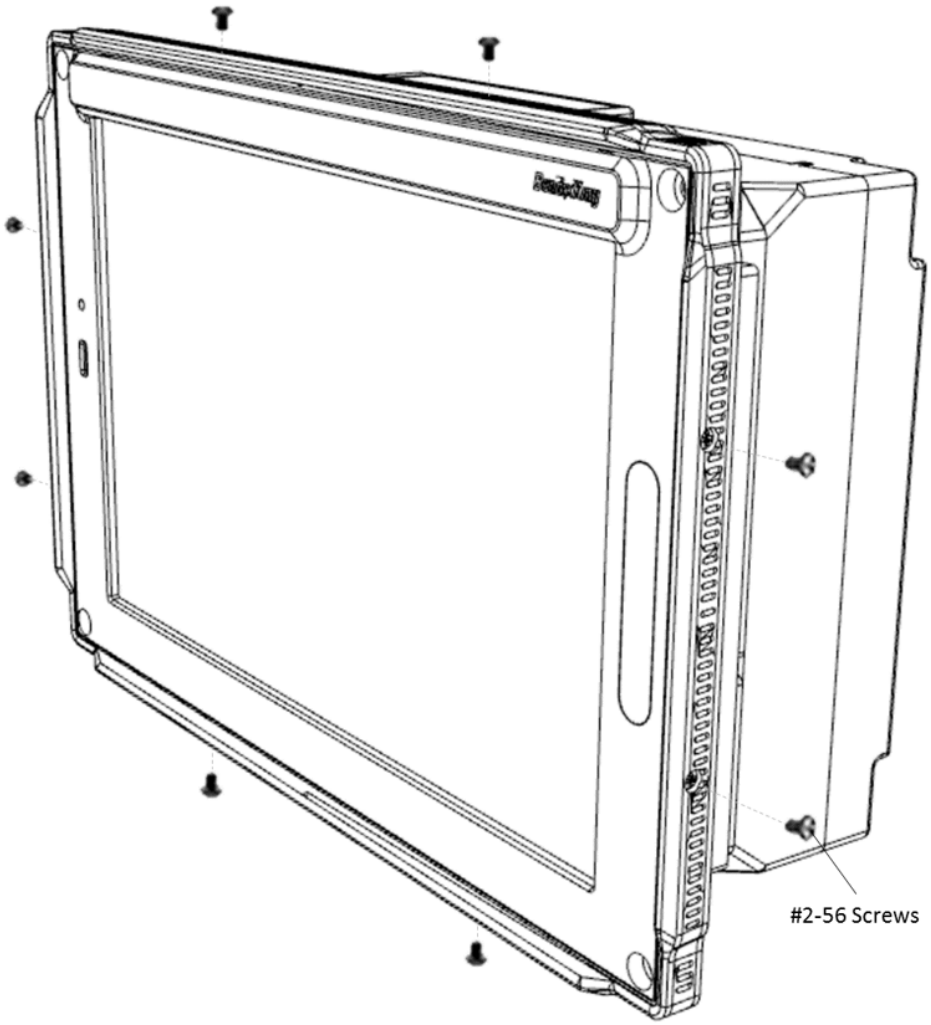

Figure 4-10 KSD 100EXP Grip Installation (Sheet 2 of 2)

(2) Ensure all wiring and power checks have been completed per Section 6.1. Ensure the airplane instrument panel has been prepared per Section 4.2.

(3) Ensure all power is removed from the airplane.

(4) Verify grounding for the KSD 100EXP (see note below). If utilizing the center ground stud located on the back of the KSD 100EXP (refer to Figure 4-1):

(a) Remove the ground stud nut on the back of the KSD 100EXP.

(b) Attach an airframe ground wire to the center ground stud.

(c) Reinstall the ground stud nut using thread-locking compound and torque existing nut to 20 ± 2 in-lbs (2.26 ± 0.22 Nm).

NOTE

GROUNDING OF THE KSD 100EXP MAY BE ACCOMPLISHED THROUGH USE OF THE GROUND STUD. USE OF THE GROUND STUD IS NOT REQUIRED IF THE UNIT IS ALREADY GROUNDED (RESISTANCE OF NO MORE THAN 2.5 MILLIOHMS) TO THE INSTRUMENT PANEL/AIRFRAME.

(5) Secure the DB-78 J1 and J2 connectors, to the KSD 100EXP (refer to Figure 4-1 KSD 100EXP (Back View)). Torque the four jack post connector screws (two per connector) to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

(6) Verify the electrical bond between the backshell and the KSD 100EXP conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.

(7) Install the KSD 100EXP into the instrument panel while ensuring that the USB port is located on the left side of the unit (from the pilot's perspective) and secure using the four #8-32 socket head mounting screws. Torque screws to 20 ± 2 in-lbs (2.26 ± 0.22 Nm).

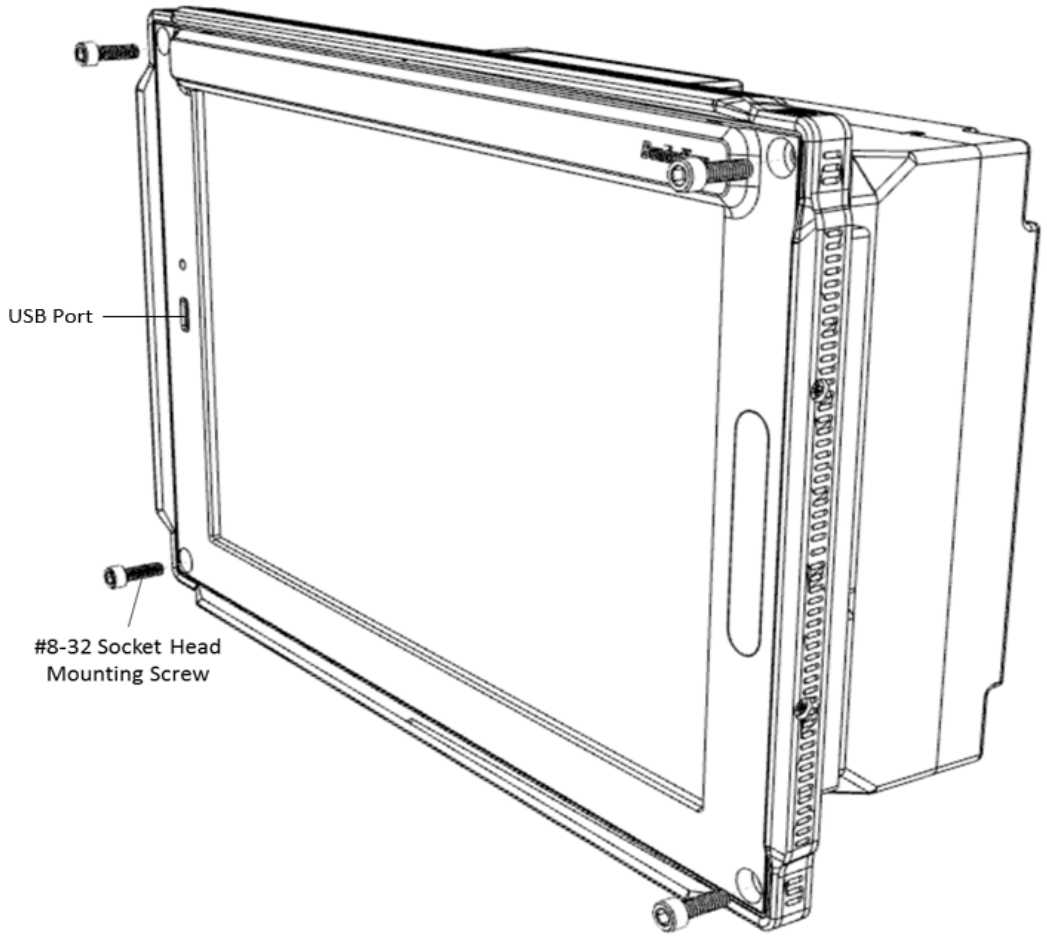

Figure 4-11 KSD 100EXP Installation

(8) Verify the electrical bond between the KSD 100EXP and the airplane instrument panel conforms to the guidelines listed in 3.10 Electrical Bonding Considerations.

4.3.3 KSD 100EXP Installation Unit Verification

Complete the KSD 100EXP System Configuration procedure in Section 6.2 prior to executing post installation checkout documented in Section 7.

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4.4 KCP 100EXP Installation

The KCP 100EXP is available in either a landscape or portrait configuration and may be installed directly in the instrument panel, refer to Section 4.4.1, or in the center stack (for the landscape configuration), refer to Section 4.4.2.

Refer to Section 4.10.1 for connections of the KCP 100EXP wiring harness. Overbraid is required for the wiring interconnect between the KCP 100EXP and KSD 100EXP. Refer to Table 3-13 for the overbraid specifications. For the instrument panel cutout dimensions, refer to Figure A-5.

4.4.1 KCP 100EXP Instrument Panel Installation Procedures

(1) Ensure all wiring and power checks have been completed per Section 6.1.
(2) Ensure airplane instrument panel has been prepared per Section 4.2.
(3) Ensure all power is removed from the airplane.
(4) Secure the DB-9 connector (J1) to the KCP 100EXP. Torque two jack post connector screws to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).
(5) Verify the electrical bond between the backshell and the KCP 100EXP conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.
(6) Install the KCP 100EXP into the instrument panel using the four #4-40 captive socket head mounting screws. Torque screws to 4 ± 0.4 in-lbs (.45 Nm).

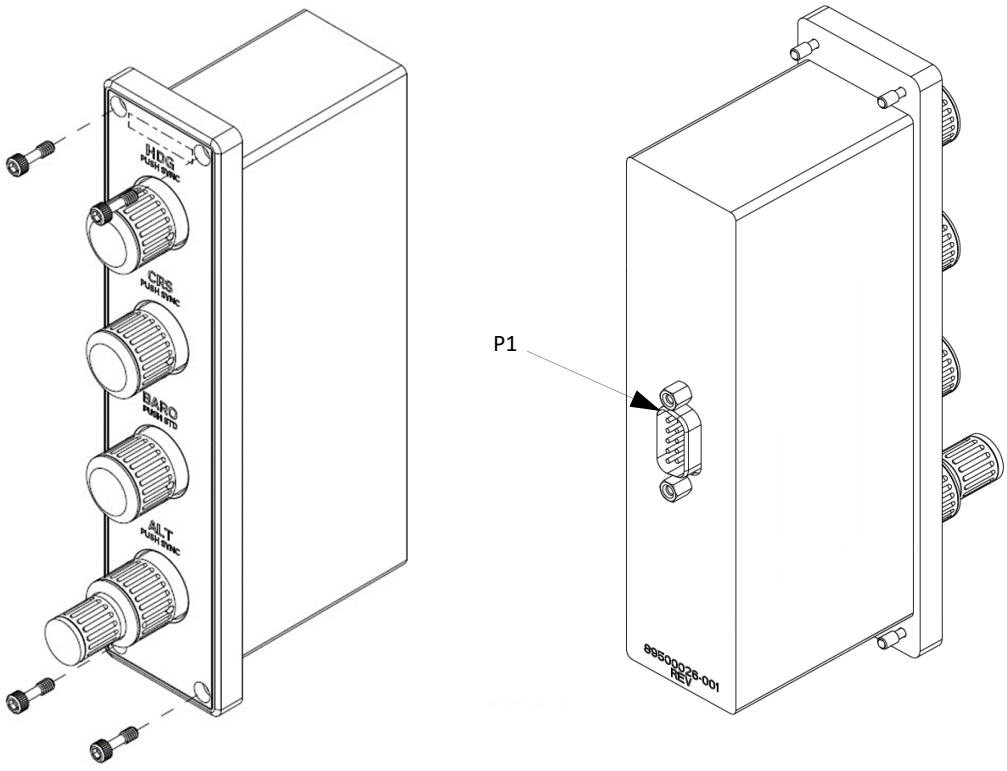

Figure 4-12 KCP 100EXP Installation

(7) Verify the electrical bond between the KCP 100EXP and the instrument panel conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.

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4.4.2 KCP 100EXP Center Stack Installation Procedures

NOTE

THE FOLLOWING PROCEDURE IS FOR DZUS RAIL MOUNTING OF THE LANDSCAPE KCP 100EXP. THE LANDSCAPE KCP 100EXP MAY BE DIRECTLY MOUNTED TO THE INSTRUMENT PANEL FOLLOWING THE PROCEDURES OUTLINED IN SECTION 4.4.1 KCP 100EXP INSTRUMENT PANEL INSTALLATION PROCEDURES.

(1) Ensure all wiring and power checks have been completed per Section 6.1.
(2) Ensure a location is available in the center stack for DZUS rail mounting the KCP 100EXP.
(3) Ensure all power is removed from the airplane.
(4) Secure the DB-9 connector (J1) to the KCP 100EXP. Torque two jack post connector screws to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).
(5) Using the KCP 100EXP Control Panel Installation Kit for Landscape Mounting install the Center Stack Adapter, Landscape – KCP 100EXP
    (a) Locate the Center Stack Adapter and match drill the mounting hole locations.
    (b) Install Center Stack Adapter using the four #6-32 pan head screws and clip nuts (refer to Figure 4-13 KCP 100EXP Landscape Center Stack Installation).
(6) Install the KCP 100EXP to the Center Stack Adapter using the four #4-40 captive socket head mounting screws. Torque screws to 4 ± 0.4 in-lbs (.45 Nm).

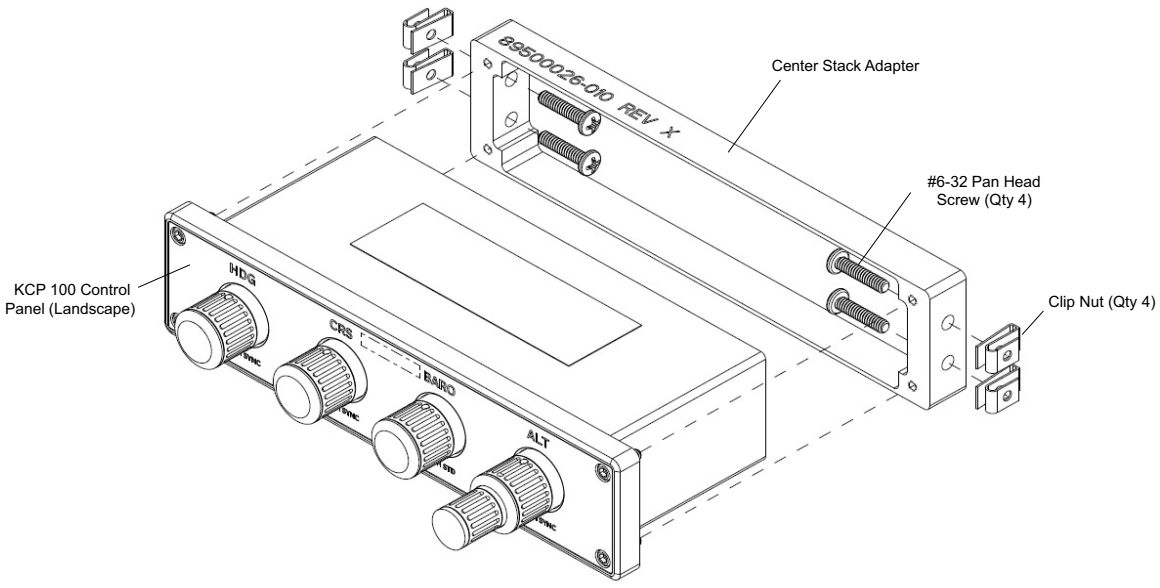

Figure 4-13 KCP 100EXP Landscape Center Stack Installation

4.4.3 KCP 100EXP Post Installation Unit Verification

Complete the KCP 100EXP Control Panel lighting configuration in Section 6.2.1.1 prior to executing post installation checkout in Section 7.2.11 KCP 100EXP Checkout.

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4.5 KG 71EXP Installation

4.5.1 KG 71EXP Installation Procedures

(1) Ensure all wiring and power checks have been completed per Section 6.1.
(2) Ensure all power is removed from airplane.
(3) Locate and drill mounting holes using Figure A-6 KG 71EXP Dimensions and Center of Gravity and Figure A-7 KG 71EXP Mounting Hole Pattern Diagram. The KG 71EXP must be mounted to an avionics shelf or other rigid structure to reduce airplane vibration effects.
(4) Prepare mounting rivet nut locations as bonding points such that the bonding resistance conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.
(5) Apply conversion coating material conforming to MIL-C-81706 per AC 43-13-1B, to exposed metal surfaces.
(6) Install four #10-32 rivet nuts, one at each of the four located mounting holes referenced in step (3) and (4).
(7) Secure the KG 71EXP at the four mounting hole locations with the four #10-32 washer head screws and four washers. Apply thread locking compound and install the mounting screws in the following order (screw, washer, KG 71EXP unit, avionics shelf, rivet nut). Torque fasteners to 28 ± 2.8 in-lbs (3.16 ± 0.32 Nm). See Figure 4-14.

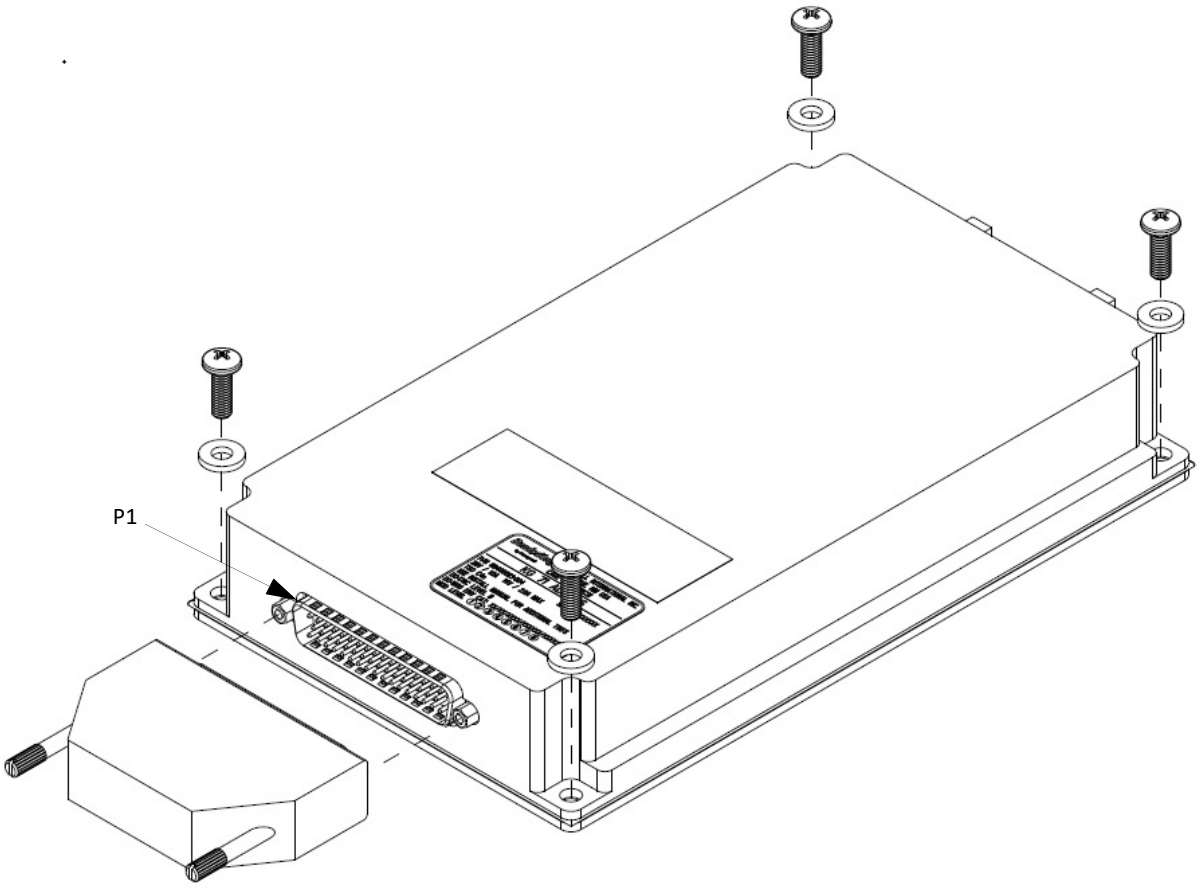

Figure 4-14 KG 71EXP ADAHRS Installation Diagram

(8) Verify KG 71EXP is mounted within orientation parameters listed in Section 3.6.7.2.
(9) Verify that pitot-static drain ports are below the KG 71EXP to prevent condensation accumulation and drainage into the unit.

CAUTION

PITOT/STATIC DRAIN PORTS MUST BE PRESENT AND LOCATED THE LOWEST POINT OF THE KG 71EXP SYSTEM INSTALLATION. A SECONDARY DRAIN OR SUMP BOTTLE MAY BE REQUIRED TO PREVENT CONDENSATATION ACCUMULATION IN THE KG 71EXP.

(10) On the KG 71EXP, apply thread-seal tape and attach the pitot line fitting and static line fitting to the KG 71EXP, refer to Figure 4-15. Torque fittings to 50 in-lbs. (5.7 Nm) minimum, 60 in-lbs. (6.8 Nm) maximum - DO NOT OVER TIGHTEN.

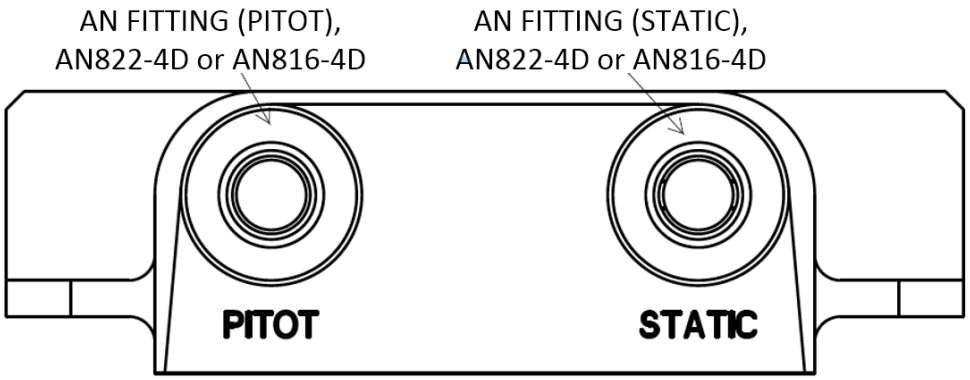

Figure 4-15 KG 71EXP Pressure Fitting Identification Diagram

(11) Verify the pitot and static pressure lines are correctly designated and clearly labeled with permanently affixed labels at the attaching ends.
(12) Attach the pitot and static lines to their corresponding fitting on the KG 71EXP, 60 in-lbs. (6.8 Nm) maximum - DO NOT OVERTIGHTEN. The KG 71EXP is labeled “PITOT” and “STATIC” at the fitting sites to provide guidance.

CAUTION

PITOT AND STATIC LINES MUST BE INSTALLED TO THE CORRESPONDING FITTING. THE KG 71EXP WILL NOT FUNCTION CORRECTLY WITH IMPROPER INSTALLATION.

(13) Attach the J71 connector to the KG 71EXP. Secure the two connector thumbscrews and torque to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).
(14) Verify the electrical bond between the KG 71EXP and the airframe conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations.

4.5.2 KG 71EXP Post Installation Unit Verification

Perform the following procedures of this manual to configure the KG 71EXP:

(1) Section 6.3 KG 71EXP Configuration (ADAHRS)

Perform the following Post Installation Checkout procedures:

(1) Section 7.2.10.1 Autopilot & KSD 100EXP Interface
(2) Section 7.2.10.2 Autopilot & KSD 100EXP Interface Checkout Procedures
(3) Section 7.2.1 Attitude Checkout
(4) Section 7.2.3 Leak Test
(5) Section 7.2.4 Altitude Display/Vertical Display and Standby Altimeter Checkout

4.6 KMG 7010 Installation

The KMG 7010 Magnetometer (Figure 4-16) must be installed in an area that is free of magnetic disturbances from either ferrous materials or locally generated magnetic fields.

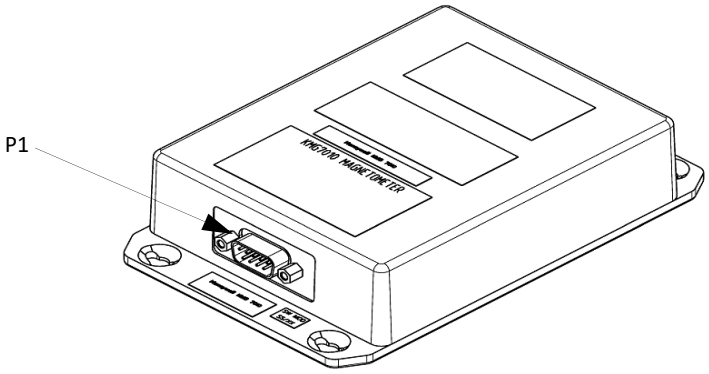

Figure 4-16 KMG 7010 Magnetometer

The KMG 7010 supports variability related to its orientation. The connector of the KMG 7010 can be oriented towards the airplane nose or tail, towards left or right wing or can be oriented down.

The KMG 7010 can be rotated to 4 orientations around the axis which is oriented towards the magnetometer connector.

The only restriction is that, once the KMG 7010 is installed, the KMG 7010 pitch and roll offsets should be within ±5 degrees from the airplane pitch and roll. The total count of acceptable installation orientations is 24, see Table 6-7 KMG 7010/MD32 Installation Orientation Options.

4.6.1 KMG 7010 Installation Procedures

(1) Ensure all wiring and power checks have been completed per Section 6.1.
(2) Ensure all power is removed from airplane.
(3) See Table 6-7 KMG 7010/MD32 Installation Orientation Options for mounting options and Figure A-8 KMG 7010 Outline and Mounting Drawing (Sheet 1 of 2) for unit dimensions and center of gravity information.
(4) Fabricate a mounting adapter plate (if needed).
(5) Prepare mounting hole locations as bonding points such that the bonding resistance conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations. Ensure the installation provides a 10.0 milliohm max impedance bond from the harness backshell to the airplane ground.
(6) Apply conversion coating material conforming to MIL-C-81706 per AC 43-13-1B, to exposed metal surfaces.
(7) Install mounting adapter plate (as applicable).
(8) Using the KMG 7010 Installation Kit, mount the KMG 7010 with the four #10-32 mounting screws,

washers and lock nuts (refer to Figure 4-17). Torque fasteners to 27.5 ± 2.5 in-lbs (3.11 ± .28 Nm). All mounting hardware and brackets must be made from non-ferrous materials to avoid interference with the magnetic field. Note the KMG 7010 orientation using the orientation numbers in Table 6-7 KMG 7010/MD32 Installation Orientation Options. This will be used during the KMG 7010 calibration steps in Section 6.4.

(9) Mount the KMG 7010 on a rigid surface such that the three KMG 7010 primary axes are parallel within 5 degrees of the longitudinal, lateral, and vertical axes of the level airplane. The KMG 7010 may be mounted parallel to the lateral (pitch), longitudinal (roll) or vertical (yaw) axis of the airplane.

(10) Connect the J71 mating connector from the KG 71EXP wire harness to the KMG 7010. Torque the two connector thumbscrews and torque to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

NOTE

SHIELD WIRING MUST REMAIN IN THE BACKSHELL (CONNECT TO GROUND LUG INSIDE THE BACKSHELL).

(11) Verify the electrical bond between the KMG 7010 and the airframe conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations. Verify the electrical bond between the harness backshell and the airplane ground is less than or equal to 10.0 milliohms.

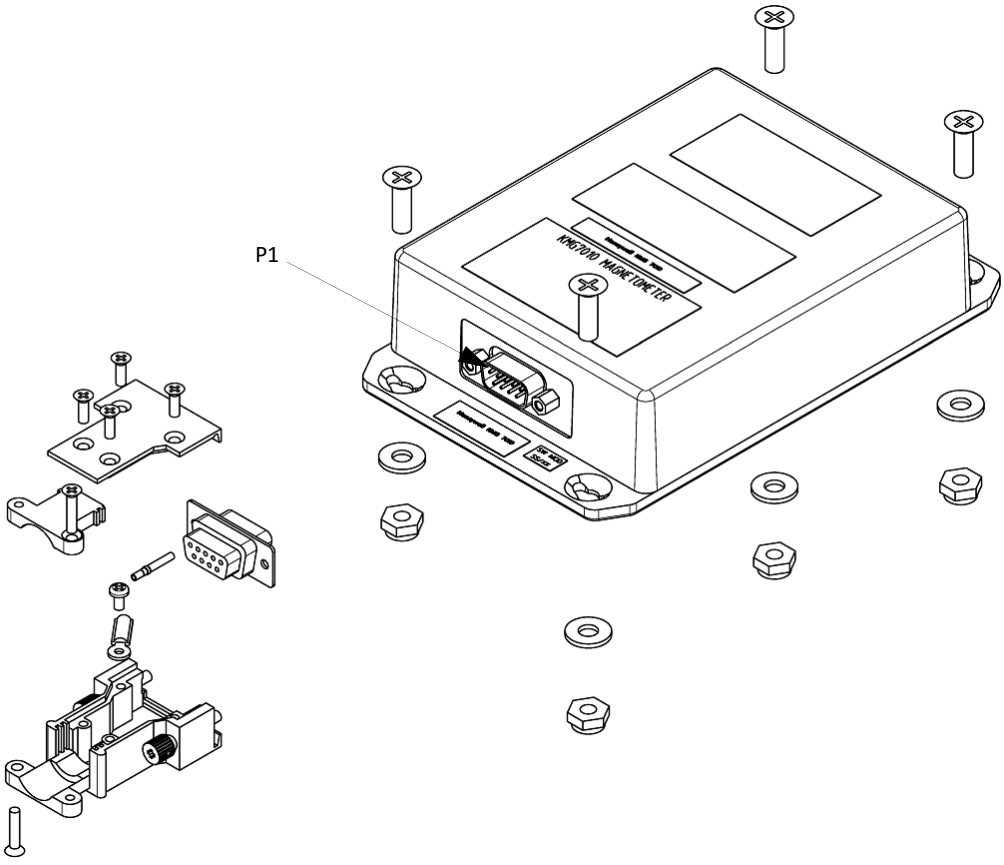

Figure 4-17 KMG 7010 Magnetometer Installation Diagram

4.6.2 KMG 7010 – Post Installation Unit Verification

Accomplish the following steps in this manual before return to service:

(1) Perform Magnetometer Alignment (Section 6.4 KMG 7010/MD32 Calibration (Magnetometer)).
(2) Perform Ground Checks in Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing.
(3) Perform autopilot heading course verification. Refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” test for Heading and Course Datum.

4.7 MD32 Installation

NOTE

THE MD32 MAGNETOMETER MUST BE INSTALLED IN AN AREA THAT IS FREE OF MAGNETIC DISTURBANCES FROM EITHER FERROUS MATERIALS OR LOCALLY GENERATED MAGNETIC FIELDS.

Install the MD32 Magnetometer per its installation manual (see Appendix D MD32 Installation Manual).

4.7.1 MD32 – Post Installation Unit Verification

Accomplish the following steps in this manual before return to service:

(1) Perform Magnetometer Alignment (Section 6.4 KMG 7010/MD32 Calibration (Magnetometer)).
(2) Perform Ground Checks in Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing.
(3) Perform autopilot heading course verification. Refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” test for Heading and Course Datum.

4.8 KDC 100EXP Installation

The KDC 100EXP data converter (Figure 4-18) supports variability related to its orientation.

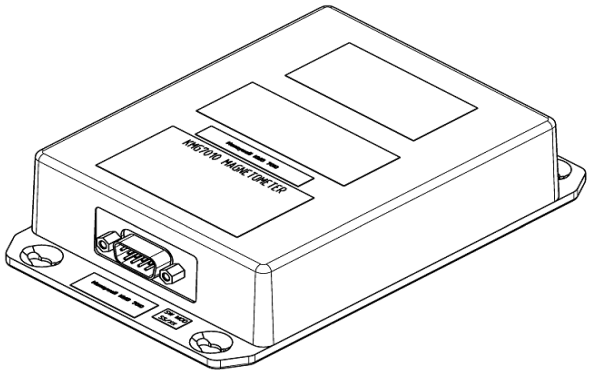

Figure 4-18 KDC 100EXP Connector

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4.8.1 KDC 100EXP Installation Procedures

(1) Install the MD32 Magnetometer per the instructions in Appendix D.
(2) Ensure all wiring and power checks have been completed per Section 6.1.
(3) Ensure all power is removed from airplane.
(4) See Table 6-7 KMG 7010/MD32 Installation Orientation Options for mounting options and Figure A-8 KMG 7010 Outline and Mounting Drawing (Sheet 1 of 2) for unit dimensions and center of gravity information.
(5) Fabricate a mounting adapter plate (if needed).
(6) Prepare mounting hole locations as bonding points such that the bonding resistance conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations. Ensure the installation provides a 10.0 milliohm max impedance bond from the harness backshell to the airplane ground.
(7) Apply conversion coating material conforming to MIL-C-81706 per AC 43-13-1B, to exposed metal surfaces.
(8) Install mounting adapter plate (as applicable).
(9) Using the KDC 100EXP Installation Kit, mount the KDC 100EXP with the four #10-32 mounting screws, washers and lock nuts (refer to Figure 4-16). Torque fasteners to 27.5 ± 2.5 in-lbs (3.11 ± .28 Nm). All mounting hardware and brackets must be made from non-ferrous materials to avoid interference with the magnetic field.
(10) Mount the KDC 100EXP on a rigid surface such that the three KDC 100EXP primary axes are parallel within 5 degrees of the longitudinal, lateral, and vertical axes of the level airplane. The KDC 100EXP may be mounted parallel to the lateral (pitch), longitudinal (roll) or vertical (yaw) axis of the airplane.
(11) Mount the KDC 100EXP on a rigid surface of the airplane and connect it to the MD32 Magnetometer and KG 71EXP ADAHRS.
(12) Connect the J71 mating connector from the KG 71EXP wire harness to the KDC 100EXP. Torque the two connector thumbscrews and torque to 4 ± 0.4 in-lbs (0.45 ± 0.05 Nm).

NOTE

SHIELD WIRING MUST REMAIN IN THE BACKSHELL (CONNECT TO GROUND LUG INSIDE THE BACKSHELL).

(13) Verify the electrical bond between the KDC 100EXP and the airframe conforms to the guidelines listed in Section 3.10 Electrical Bonding Considerations. Verify the electrical bond between the harness backshell and the airplane ground is less than or equal to 10.0 milliohms.

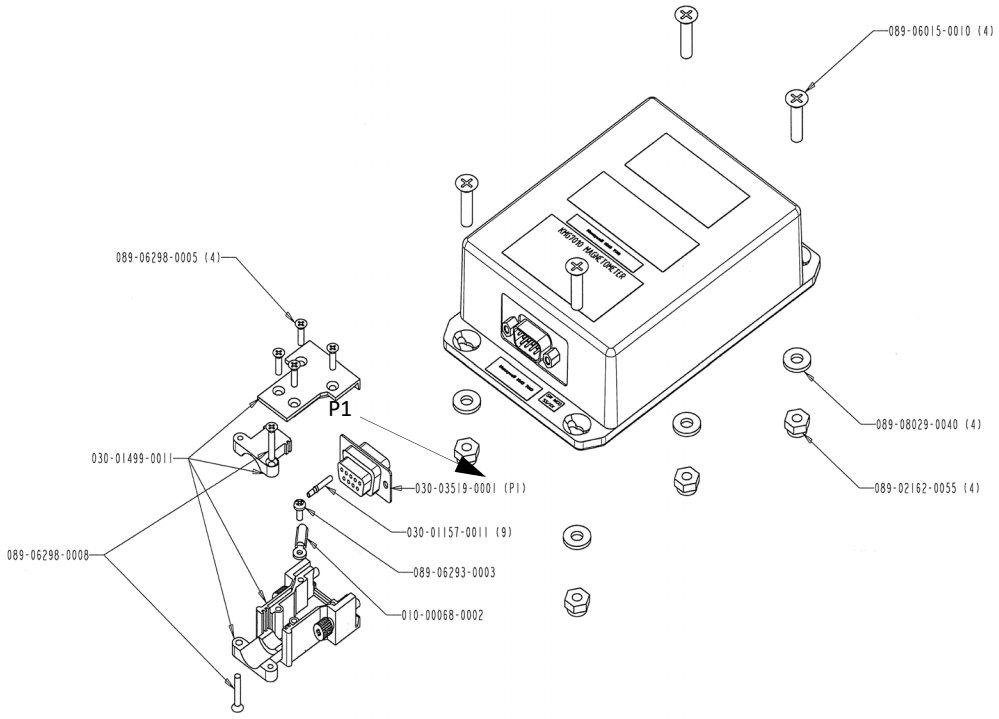

Figure 4-19 KDC 100EXP Data Connector Installation Diagram

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4.8.2 KDC 100EXP – Post Installation Unit Verification

Accomplish the following steps in this manual before return to service:

(1) Perform Magnetometer Alignment (Section 6.4 KMG 7010/MD32 Calibration (Magnetometer)).
(2) Perform Ground Checks in Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing.
(3) Perform autopilot heading course verification. Refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” test for Heading and Course Datum.

4.9 KTP 73 Installation

4.9.1 KTP 73 Installation Procedures

(1) Ensure all power is removed from airplane.
(2) At the selected location for the KTP 73 locate and drill four mounting holes and center hole in airplane skin shown in Figure A-14 KTP 73 Mounting Hole Pattern (also refer to the 1:1 scale drawing - available for download on the BendixKing Website - Dealer Portal). See Figure 4-20 for additional reference information.
(3) A reinforcement doubler is required with the KTP 73 installation if the aircraft skin does not have unreinforced holes of 0.20 inch diameter or larger in the nearby area. A generic doubler and its installation is shown in Figure A-15 for use with aircraft skins from 0.016 to 0.032 inch thickness. The number rivets can be increased and shape of the doubler modified to suit the particular installation. For thicker skins a separate approval is required. Do not install the KTP 73 in skin thinner than 0.016 inch.
(4) Prepare airplane skin mounting hole locations as bonding points such that a bonding resistance of no more than 2.5 milliohms is achieved as measured between the mounting block and airplane skin.
(5) Apply conversion coating material conforming to MIL-C-81706 per AC 43-13-1B, to exposed metal surfaces.
(6) Install four #6-32 stainless steel mounting screws through the outside of the airplane skin into mounting block using thread-locking compound. Torque fasteners to a minimum of 10 ± 1 in- lbs. (1.13 ± .11 NM). Once installed, screws must have a minimum of three full screw threads exposed above the mounting block.
(7) Apply sealer around the sensor block, doubler plate (if installed), and airplane skin penetration to prevent the ingress of moisture to the airframe.
(8) Splice and shield KTP 73 lead wires into airplane wiring harness. Connections for the lead wires and shield to be accomplished using heat-shrink butt-splices. Additional lead wire may be added using M27500-22TE3T14 wire or similar. Refer to Table 5-4 KG 71EXP J71 Pin Descriptions (Viewed from LRU) for KTP 73 wiring to the KG71EXP ADAHRS and refer to Table 5-10 KTP 73 Wire Descriptions.
(9) Extend shield/overbraid and bond to the KG 71EXP.
(10) Verify the electrical bond between the mounting block and the airplane skin conforms to the guidelines Section 3.10 Electrical Bonding Considerations.

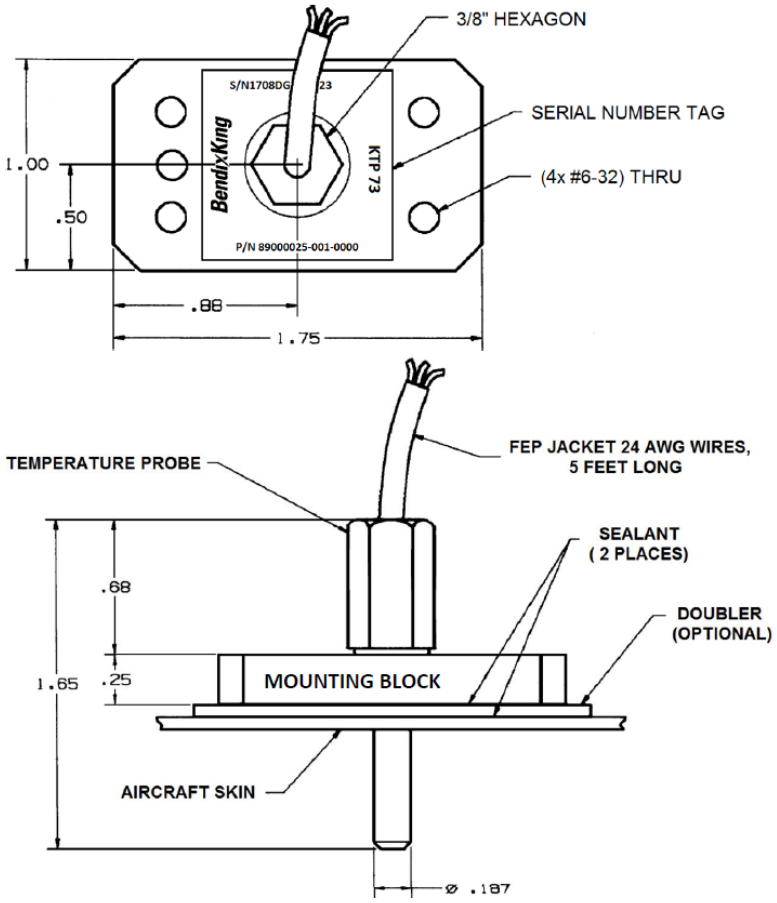

Figure 4-20 KTP 73 Installation Diagram

4.9.2 KTP 73 - Post Installation Unit Verification

Refer to Section 7.2.6 Outside Air Temperature Checkout for post installation verification procedures.

4.10 xVue Touch System Components and Wiring Location Data

The Appendix C xVue Touch System Installation Worksheets and Diagrams must be completed by the avionics installer. The xVue Touch System component locations and wire routing information must be detailed enough to enable maintenance personnel to troubleshoot, repair and service the electrical system. The diagrams should also include a method of determining the connector type (if other than the connectors supplied in the xVue Touch System Installation Kits), wire type, and wire size. The system wiring diagrams are descriptive data of the systems used on the airplane and are part of the Instructions for Continued Airworthiness (ICA).

4.10.1 Wiring Harness

The wiring harness is not available from Honeywell. Refer to Appendix B Interconnect Diagrams for the appropriate wiring connections to fabricate the xVue Touch wiring harness. The wiring diagrams cover the basic, and some optional, installations for the xVue Touch and its interface to the equipment on the airplane. The equipment approved for installation is referenced in Section 3.6.1.

For new installations utilize the connectors, circuit card assembly, etc. included in the xVue Touch System Installation Kits or in Installation Materials Required but Not Supplied and referenced in Table 4-2:

Table 4-2 Wiring Harness Equipment

Description	Installation Kit PN	Additional Information
KSD 100EXP Backshell Assembly Installation Kit	89000120-002	Table 3-3
KSD 100EXP Configuration Module and Connector Installation Kit	89000120-003	Table 3-4
KCP 100EXP Control Panel Installation Kit	89000126-004	Table 3-6
KG 71EXP ADAHRS Installation Kit	89000123-007	Table 3-8
KMG 7010 Magnetometer Installation Kit	050-03643-0000	Table 3-9
MD32 Connector Kit	9019092-1	Table 3-9
KDC 100EXP Installation Kit	89000138-002	Table 3-11
Overbraid	N/A	Table 3-13

Wire routing, bend radius, and harness preparation should be in accordance with AC 43.13-1B Chapter 11 Sections 8 through 11. It is the installers' responsibility to ensure the airworthiness of any additional equipment interfaced to the xVue Touch System.

4.11 Weight and Balance Analysis

A revised weight and balance computation is required after the installation of the xVue Touch System. The weight and balance report must be carried out in accordance with the guidance in AC 43.13-1B, Chapter 10, Section 2, Paragraphs 10-16 through 10-23, pages 10-12 through 10-23.

Prepare a weight and balance report for the airplane records and verify that the airplane does not exceed the authorized weight and Center of Gravity (CG) limits as shown in the Type Certificate Data Sheet (TCDS) and airplane specification(s).

The various xVue Touch System components and associated nominal weights are listed in Table 4-3 below. Note: The connector and backshell weights are not included.

Table 4-3 xVue Touch System Component Weights & Centers of Gravity

xVue Touch System Components	Part Number	Weight (lb)	Weight (kg)	C of G
KSD 100EXP Primary Flight Display	89000120-001-[ ]	6.9	3.13	See Figure A-1
KSD 100EXP Installation Kit (Mounting Hardware and Grip)	89000120-007	0.75	0.34	N/A
KG 71EXP ADAHRS	89000123-001-[ ]	2.0	0.91	SeeFigure A-6
KCP 100EXP Control Panel (Portrait) KCP 100EXP Control Panel (Landscape)	89000126-001-[ ] 89000126-003-[ ]	0.93	0.42	See Figure A-3
KCP 100EXP Installation Kit (Center Stack - Landscape)	89000026-005	0.1	0.05	N/A

Table 4-3 xVue Touch System Component Weights & Centers of Gravity

xVue Touch System Components	Part Number	Weight (lb)	Weight (kg)	C of G
KMG 7010 Magnetometer	065-00189-0101	0.9	0.41	See Figure A-8
MD32 Magnetometer	6420032-[ ]	0.19	0.085	N/A
KDC 100EXP Data Converter	89000138-001-[ ]	0.9	0.41	See Figure A-8
KTP 73 OAT Probe	89000025-001-[ ]	0.15	0.07	N/A

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4.12 Aircraft Electrical Load Analysis (ELA)

An Electrical Load Analysis (ELA) must be completed to confirm that the airplane electrical system is capable of supporting the xVue Touch System. For airplanes in the normal, utility and acrobatic category this ELA can be by analysis or by measurements; the ELA accounts for the electrical loads applied to the electrical system in probable combination and for probable durations.

Table 4-4 Typical LRU Current Draw

LRU	14 VDC Typical	28 VDC Typical	Note
KSD 100EXP	2.66 A	1.33 A	
KCP 100EXP	N/A	N/A	The KCP 100EXP is powered by the KSD 100EXP. KSD 100EXP current draw accounts for the KCP 100EXP.
KG 71EXP	0.40 A	0.20 A	
KMG 7010	0.16 A	0.08 A	80 mA Nominal, 25°C, after 2 minute warmup 200 mA Nominal, -55°C, after 2 minute warmup 700 mA Maximum, -55°C Typical (28VDC): 0.08 AMP Typical (14VDC): 0.16 AMP
MD32	0.04 A	0.02 A	
KDC 100EXP	0.16A	0.08 A	80 mA Nominal, 25°C, after 2 minute warmup 200 mA Nominal, -55°C, after 2 minute warmup 700 mA Maximum, -55°C Typical (28VDC): 0.08 AMP Typical (14VDC): 0.16 AMP
KTP 73	N/A	N/A	No interface to airplane electrical power.

Airplanes with an existing ELA shall use Section 4.12.1, and airplanes without an ELA may perform either Section 4.12.3 or Section 4.12.2.

4.12.1 Aircraft with Existing ELA

If the airplane has an existing ELA, update the ELA to reflect the addition of the xVue Touch System. The updated ELA must show the alternator/generator has adequate capacity to supply power to the modified systems in all anticipated conditions. The typical current draw for the xVue Touch System is provided in Table 4-4 and should be added to the existing ELA under continuous operating conditions. Verify the new electrical load does not exceed 80% of the alternator/generator data plate rated capacity or the maximum load value (if published in the Airplane Flight Manual). In addition, in the event of a complete loss of the primary electrical system the battery(s) must be capable of providing at least 30 minutes of electrical power to those loads that are essential to continued safe flight and landing.

4.12.2 Aircraft without an Existing ELA - Measurement Method

An acceptable method of performing an ELA is to determine the electrical loads by measurement. The measured electrical loads must include all the probable combinations and durations expected during normal aircraft operation. Verify the maximum electrical demand does not exceed 80% of the alternator/generator data plate rated capacity or the maximum load value (if published in the Airplane Flight Manual). In addition, in the event of a complete loss of the primary electrical system the battery(s) must

be capable of providing at least 30 minutes of electrical power to those loads that are essential to continued safe flight and landing.

For guidance on how to prepare an ELA using analysis by measurement it is recommended to follow ASTM F2490-05: Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis.

4.12.3 Aircraft without an Existing ELA - Analysis Method

An ELA must be completed to show the capacity of the aircraft electrical system is sufficient for the additional electrical load from the KFD 900 System. The typical current draw for the KFD 900 System is provided in Table and should be used for the ELA values. Verify the aircraft electrical load does not exceed 80% of the alternator/generator data plate rated capacity or the maximum load value (if published in the Airplane Flight Manual). In addition, in the event of a complete loss of the primary electrical system, the battery(s) must be capable of providing at least 30 minutes of electrical power to those loads that are essential to continued safe flight and landing.

For guidance on how to prepare an ELA it is recommended to follow ASTM F2490-05: Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis.

4.13 Airplane Flight Procedures (AFP)

The xVue Touch Airplane Flight Procedures (AFP), PN 89800109, information must be filled out and provided to the airplane owner. Complete the information on page i of the AFP (Make and Model Airplane, Airplane Registration # and Serial #) and information on page 1-2 relating to installed equipment and cross-cockpit usage.

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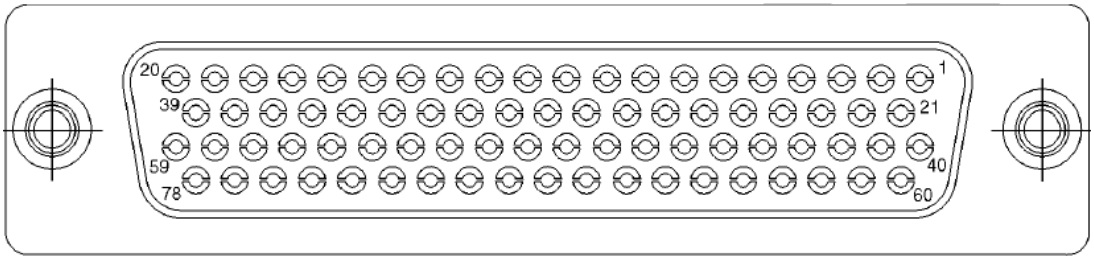
5 CONNECTOR PINOUT INFORMATION

5.1 KSD 100EXP

Table 5-1 KSD 100EXP J1 Pin Descriptions (Viewed from LRU)

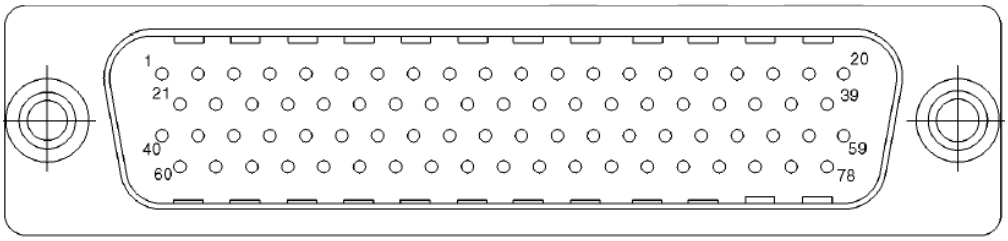


J1 Pin	Description	I/O	Initial Certification
1	CAMERA_COMP_IN_VIDEO	In	Reserved
2	CAMERA_COMP_IN_VGND	In	Reserved
3	EGPWS_A453_RX_H	In	Reserved
4	EGPWS_A453_RX_L_TERM	In	Reserved
5	EGPWS_A429_TX_A	Out	Reserved
6	WX_RADAR_A453_RX_H	In	Reserved
7	WX_RADAR_A429_TX_A	Out	Reserved
8	UAT_WX_RS232_RX	In	Included
9	UAT_WX_RS232_TX	Out	Included
10	NAV1_2_ROLL_STR_VAL_DO28VO	Out	Reserved
11	NAV1_ROLL_STR_VALID_DI28VO	In	Reserved
12	WX_RADAR_ON_DOGO	Out	Reserved
13	AP_DISC_VISUAL_ANN_DIGO	In	Reserved
14	GPS_SEL_DOGO	Out	Included
15	PITCH_TRIM_FAIL_ANN_DIGO	In	Reserved
16	AFCS_A429_RX_B	In	Reserved
17	AFCS_A429_RX_A	In	Reserved
18	AFCS_A429_TX_B	Out	Reserved
19	AFCS_A429_TX_A	Out	Reserved
20	GPS_2_GAMA_429_RX_A	In	Included
21	EGPWS_A453_RX_L	In	Reserved
22	EGPWS_A429_TX_B	Out	Reserved
23	WX_RADAR_A453_RX_L_TERM	In	Reserved
24	WX_RADAR_A453_RX_L	In	Reserved
25	WX_RADAR_A429_TX_B	Out	Reserved
26	UAT_WX_RS232_GND	GND	Included

J1 Pin	Description	I/O	Initial Certification
27	SPARE_BOX_RS422_RX_B	In	Reserved
28	SPARE_BOX_RS422_RX_A	In	Reserved
29	SPARE_BOX_RS422_TX_B	Out	Reserved
30	SPARE_BOX_RS422_TX_A	Out	Reserved
31	NAV1_ROLL_STR_IN_N	In	Reserved
32	NAV1_ROLL_STR_IN_P	In	Reserved
33	LOC_ENERGIZE	Out	Included
34	HEADING_VALID_DOGO	Out	Included
35	ADAHRS1_A429_RX_B	In	Included
36	ADAHRS1_A429_RX_A	In	Included
37	ADAHRS1_A429_TX_B	Out	Included
38	ADAHRS1_A429_TX_A	Out	Included
39	GPS_2_GAMA_429_RX_B	In	Included
40	SPARE_A429_RX_B	In	Reserved
41	SPARE_A429_RX_A	In	Reserved
42	KA_52-57_P15V_PWR	PWR	Reserved
43	AFCS_DATUM_VAL_DO5VO	Out	Reserved
44	AFCS_CRS_DATUM_OUT	Out	Included
45	AFCS_CMD_BAR_RTRCT_DI15VO	In	Included
46	AFCS_CMD_BAR_ROLL_IN_N	In	Included
47	AFCS_CMD_BAR_ROLL_IN_P	In	Included
48	AFCS_CMD_BAR_PITCH_IN_N	In	Included
49	AFCS_CMD_BAR_PITCH_IN_P	In	Included
50	NAV1_2_ROLL_STR_OUT_REF	GND	Reserved
51	GS_FLAG_-	GND	Included
52	GS_+_DOWN	GND	Included
53	NAV_FLAG_-	GND	Included
54	NAV_DEV_+_LT	GND	Included
55	AFCS_DATUM_OUT_REF	GND	Included
56	ADAHRS2_A429_RX_B	In	Reserved
57	ADAHRS2_A429_RX_A	In	Reserved
58	GPS_1_GAMA_429_RX_B	In	Included
59	GPS_1_GAMA_429_RX_A	In	Included
60	EFIS_CTL_429_TX_B	Out	Included
61	EFIS_CTL_429_TX_A	Out	Included
62	KA_52-57_N15V_PWR	PWR	Reserved

J1 Pin	Description	I/O	Initial Certification
63	GPS_2_RS232_IN	In	Included
64	KA_52-57_PWR_RTN	GND	Reserved
65	GPS_1_RS232_IN	In	Included
66	KSD100_DEMO_MODE_DIGO	In	Reserved
67	AFCS_AP_MODE_EN_DIGO	In	Reserved
68	AFCS_ALT_ALERT_DIGO	In	Reserved
69	NAV1_2_ROLL_STR_OUT	Out	Reserved
70	GS_FLAG_+	Out	Included
71	GS_+_UP	Out	Included
72	NAV_FLAG_+	Out	Included
73	NAV_DEV_+_RT	Out	Included
74	AFCS_HDG_DATUM_OUT	Out	Included
75	TRANSPONDER_A429_RX_B	In	Reserved
76	TRANSPONDER_A429_RX_A	In	Reserved
77	ADAHRS2_A429_TX_B	Out	Reserved
78	ADAHRS2_A429_TX_A	Out	Reserved

Table 5-2 KSD 100EXP J2 Pin Descriptions (Viewed from LRU)



J2 Pin	Description	I/O	Initial Certification
1	VOR/ILS2_429_RX_A	In	Included
2	VOR/ILS1_429_RX_A	In	Included
3	VOR/ILS1_429_RX_B	In	Included
4	TRAFFIC_A429_RX_A	In	Reserved
5	TRAFFIC_A429_RX_B	In	Reserved
6	IFD1_ETH_TX_P	Out	Reserved
7	IFD1_ETH_TX_N	Out	Reserved
8	IFD2_ETH_TX_P	Out	Reserved
9	IFD2_ETH_TX_N	Out	Reserved
10	KSD100_MAINT_BOOT_MODE_DIGO	In	Included
11	KSD100_MAINT_ETH_TX_P	Out	Included
12	KSD100_MAINT_ETH_TX_N	Out	Included

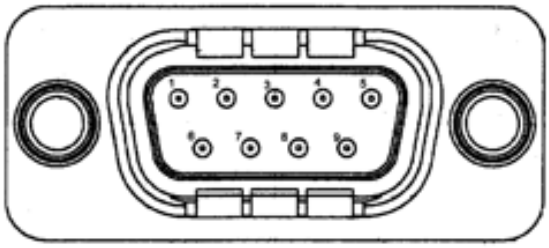
J2 Pin	Description	I/O	Initial Certification
13	KSD100_MAINT_ETH_RX_P	In	Included
14	KSD100_MAINT_ETH_RX_N	In	Included
15	AC_PWR_B1	PWR	Included
16	AC_PWR_B2	PWR	Included
17	AC_PWR_B3	PWR	Included
18	AC_PWR_A1	PWR	Included
19	AC_PWR_A2	PWR	Included
20	AC_PWR_A3	PWR	Included
21	VOR/ILS2_429_RX_B	In	Included
22	RADALT_A429_RX_A	In	Reserved
23	RADALT_A429_RX_B	In	Reserved
24	TRAFFIC_A429_TX_A	Out	Reserved
25	TRAFFIC_A429_TX_B	Out	Reserved
26	AFCS_KINGBUS_CLK_DI5VO	In	Reserved
27	AFCS_KINGBUS_DATA_DI5VO	In	Reserved
28	AFCS_KINGBUS_STROBE_DI5VO	In	Reserved
29	SXM_WX_RS422_RX_A	In	Reserved
30	SXM_WX_RS422_RX_B	In	Reserved
31	SXM_WX_RS422_TX_A	Out	Reserved
32	SXM_WX_RS422_TX_B	Out	Reserved
33	LIGHTNING_RS232_TX	Out	Reserved
34	SPARE_RS232_RX	In	Reserved
35	TRAFFIC_RS232_TX	Out	Reserved
36	TRAFFIC_RS232_RX	In	Reserved
37	AC_PWR_RTN3	GND	Included
38	AC_PWR_RTN2	GND	Included
39	AC_PWR_RTN1	GND	Included
40	AC_DIMMING_BUS	In	Included
41	GS_FLAG_+_IN	In	Included
42	GS_FLAG_-_IN	In	Included
43	LOC_ENERGIZE_IN	In	Included
44	VOR_COMP_IN_HI	In	Included
45	VOR_COMP_IN_LO	In	Included
46	AUDIO_ALERTS_OUT	Out	Included
47	AUDIO_ALERTS_OUT_REF	GND	Included
48	GS_+_UP_IN	In	Included

J2 Pin	Description	I/O	Initial Certification
49	GS_+_DOWN_IN	In	Included
50	IFD1_ETH_RX_P	In	Reserved
51	IFD1_ETH_RX_N	In	Reserved
52	IFD2_ETH_RX_P	In	Reserved
53	IFD2_ETH_RX_N	In	Reserved
54	Spare GND	GND	Reserved
55	Spare GND	GND	Reserved
56	Spare GND	GND	Reserved
57	Spare GND	GND	Reserved
58	Spare GND	GND	Reserved
59	KSD100_CTRL_PANEL_PWR_RTN	GND	Included
60	NAV_DEV_+_RT_IN	In	Reserved
61	NAV_DEV_+_LT_IN	In	Reserved
62	NAV_FLAG_+_IN	In	Reserved
63	NAV_FLAG_-_IN	In	Reserved
64	APM_DATA_MISO	In	Included
65	APM_DATA_MOSI	Out	Included
66	APM_CLK	Out	Included
67	APM_DATA_CS_N	Out	Included
68	APM_WP_N	Out	Included
69	APM_PWR_3P3VDC	PWR	Included
70	APM_PWR_RTN	GND	Included
71	LIGHTNING_RS232_RX	In	Reserved
72	EIS_RS232_TX	Out	Reserved
73	EIS_RS232_RX	In	Reserved
74	KSD100_MAINT_RS232_TX	Out	Included
75	KSD100_MAINT_RS232_RX	In	Included
76	KSD100_CTRL_PANEL_RS232_TX	Out	Included
77	KSD100_CTRL_PANEL_RS232_RX	In	Included
78	KSD100_CTRL_PANEL_PWR_15VDC	PWR	Included

5.2 KCP 100EXP

Input/Output data and power to the KCP 100EXP is transmitted and received through an RS-232 interface, 9-pin male DB-9 connector referenced as J1.

Table 5-3 KCP 100EXP J1 Pin Descriptions (Viewed from LRU)



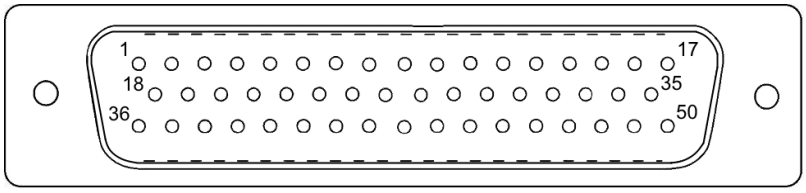
J1 Pin	Description	I/O
1	Ground	GND
2	RS232_TX_OUT	Out
3	RS232_RX_IN	In
4	Spare	-
5	Ground	GND
6	Spare	-
7	Spare	-
8	15VDC_PWR_RTN	GND
9	15VDC_PWR_IN	PWR

5.3 KG 71EXP

5.3.1 KG 71EXP Connector – J71

The electrical interface for the KG 71EXP is provided via the 50 pin D-Sub connector referenced as J71.

Table 5-4 KG 71EXP J71 Pin Descriptions (Viewed from LRU)



J71 Pin	Description	I/O
1	Power Input	In
2	Power Input	In
3	Power Input (Spare)	In
4	Spare	N/A
5	Attitude Valid	Out
6	Excitation Wave 26VAC	In

J71 Pin	Description	I/O
7	Excitation Square Wave 10VAC	In
8	AGND	GND
9	Chassis Ground	GND
10	Analog Pitch Angle	Out
11	Analog Roll Angle	Out
12	Analog Yaw Rate	Out
13	AGND (Analog Yaw Rate Reference)	GND
14	Temp Probe 1	In
15	Temp Probe 2	In
16	Temp Probe 3	In
17	Not Used	N/A
18	Power GND	In
19	Power GND	In
20	Power GND (Spare)	In
21	RS-232 Ch0 TXD	Out
22	RS-232 Ch0 RTS	Out
23	RS-232 Ch0 RXD	In
24	RS-232 Ch0 CTS	In
25	DGND	GND
26	RS-232 Ch1 TXD	Out
27	RS-232 Ch1 RTS	Out
28	RS-232 Ch1 RXD	In
29	RS-232 Ch1 CTS	In
30	DGND	N/A
31	A429 TX2 A	Out
32	Yaw Rate Pseudo Valid Pos	Out
33	Yaw Rate Pseudo Valid Neg	Out
34	A429 RX0 A	In
35	A429 RX0 B	In
36	Chassis GND	GND
37	A429 RX1 A	In
38	A429 RX1 B	In
39	Chassis GND	GND
40	A429 TX0 A	Out
41	A429 TX0 B	Out
42	Chassis GND	GND

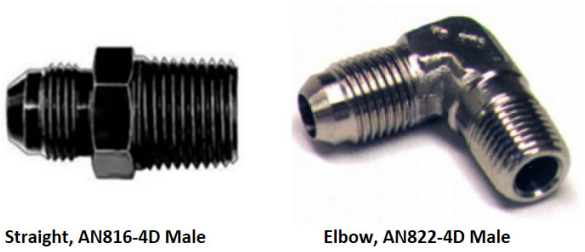
J71 Pin	Description	I/O
43	A429 TX1 A	Out
44	A429 TX1 B	Out
45	Chassis GND	GND
46	CAN H	In
47	CAN L	In
48	A429 TX2 B	Out
49	Interlock 1	In
50	Interlock 2	In

5.3.2 KG 71EXP Pressure Ports

The air pressure interface for static and total pressure ports is provided via static and pitot fittings. Details about the pressure ports are described in Table 5-5 Pressure Port Descriptions. An example of straight and elbow pressure fittings is depicted in Figure 5-1 Pressure Port Fitting(s).

Table 5-5 Pressure Port Descriptions

Pressure Name	KG71EXP IPT Adapter Ending	Recommended Fitting	Operational Pressure Range
Pitot Pressure	Nipple to 1/8 inch, NPT Male	• Straight male AN816-4D • Elbow male AN822-4D	(1.4 - 37) in Hg
Static Pressure	Nipple to 1/8 inch, NPT Male	• Straight male AN816-4D • Elbow male AN822-4D	(1.4 - 32) in Hg



Straight, AN816-4D Male Elbow, AN822-4D Male

Figure 5-1 Pressure Port Fitting(s)

NOTE

THE CONNECTION OF KG 71EXP TO THE ORIGINAL PRESSURE DISTRIBUTION SYSTEM MUST BE IN COMPLIANCE WITH 14 CFR 23.1323 AND 23.1325.

5.3.3 KG 71EXP Maintenance Port

The maintenance port pinout uses a standard PC COMM Port connector, female D-Sub. Details about the maintenance port, J2, interface are shown in Table 5-6 KG 71EXP Maintenance Port Pin Descriptions (Viewed from LRU).

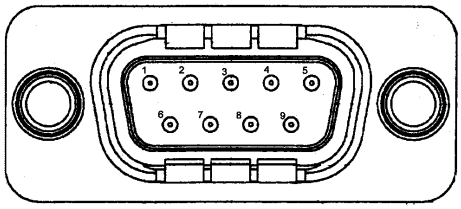
Table 5-6 KG 71EXP Maintenance Port Pin Descriptions (Viewed from LRU)

J2 Pin	Description	I/O
1	Spare	-
2	Serial Channel 0 RX data	In
3	Serial Channel 0 TX data	Out
4	Spare	-
5	Ground	GND
6	Spare	-
7	Serial Channel 0 Request to Send	Out
8	Serial Channel 0 Clear to Send	In
9	Spare	-

5.4 KMG 7010

The electrical interface for the KMG 7010 is provided via the 9 pin DB-9 connector referenced as J7010. Details about the J7010 connector interface are shown in Table 5-7

Table 5-7 KMG 7010 DB-9 Pin Descriptions (Viewed from LRU)



J7010 Pin	Description	I/O
1	AC Power	In
2	Spare	-
3	CAN Bus Hi	In/Out
4	CAN Bus Hi	In/Out
5	CAN Bus Lo	In/Out
6	Power Ground	GND
7	Chassis Ground	GNS
8	Spare	-
9	CAN Bus Lo	In/Out

NOTE

SHIELD WIRING MUST REMAIN IN BACKSHELL (CONNECT TO GROUND LUG INSIDE BACKSHELL).

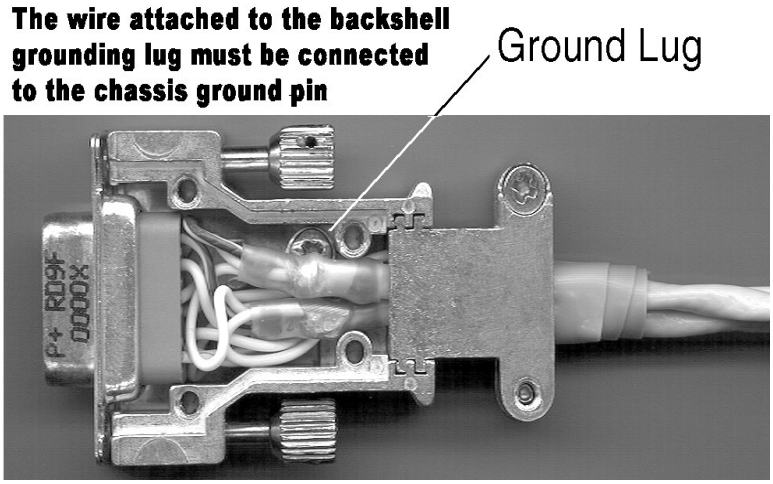
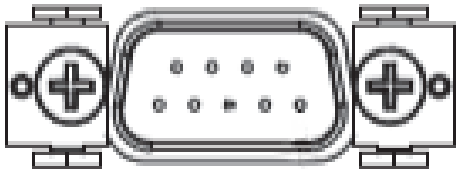


Figure 5-2 KMG 7010 Backshell

5.5 MD32

The electrical interface for the MD32 is provided via the 9 pin DB-9 connector Table 5-8.

Table 5-8 MD32 DB-9 Pin Descriptions (Viewed from LRU)



Pin	Description	I/O
1	Ground	GRN
2	Not Used	-
3	Reserved	-
4	Reserved	-
5	Power	-
6	ARINC B	Out
7	ARINC A	Out
8	Not Used	-
9	Not Used	-

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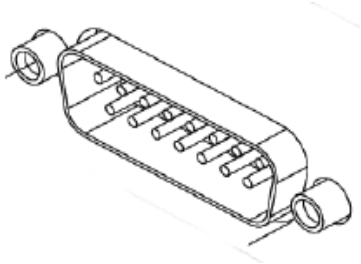
5.6 KDC 100EXP

The electrical interface for the KDC 100EXP is provided via the 15 pin DB-15 connector.Details about the connector interface are shown in Table 5-9.

Table 5-9 KDC 100EXP Pin Descriptions (Viewed from LRU)



Pin	Description	I/O
1	Magnetometer 429 RX HI	In
2	Magnetometer 429 RX LO	In
3	Ground	NC
4	Magnetometer CAN LO Bi-Direction	Out
5	Magnetometer CAN HI Bi-Direction	Out
6	Ground	NA
7	Maintenance RS232 Tx	Out
8	Maintenance RS232 Rx	In
9	Maintenance RS232 Gnd	Gnd
10	Not Used	NC
11	Not Used	NC
12	Not Used	NC
13	Not Used	NC
14	Power-In-Rtn	In
15	Power-In	In

NOTE

SHIELD WIRING MUST REMAIN IN BACKSHELL (CONNECT TO GROUND LUG INSIDE BACKSHELL).

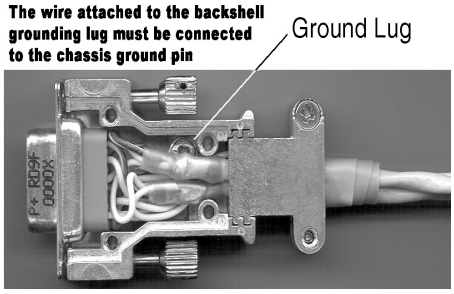


Figure 5-3 KDC 100EXP Backshell

5.7 KTP 73

Table 5-10 KTP 73 Wire Descriptions

Wire Color	Description	I/O
Red	TEMP3	Out
Black	TEMP1	Out
White	TEMP2	Out

5.8 Configuration Module

Table 5-11 Configuration Module (J2 Backshell) Pin Descriptions

Pin	Description	I/O
E1	APM_SO	Out
E2	APM_SI	In
E3	APM_SCLK	In
E4	APM_CS_N	In
E5	APM_WP_N	In
E6	APM_PWR_3P3VDC	PWR
E7	APM_PWR_RTN	GND

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6 SYSTEM CONFIGURATION

After the system components are properly installed, the required wiring is completed, and all electric power and circuit breaker related checks are completed, the technician will apply electrical power to the xVue Touch System.

The KSD 100EXP is configured using the installation menu accessible from the touch screen. Refer to the Installation/Maintenance Functional Diagram for the KSD 100EXP (shown in Figure 6-1).

- If the system is installed properly, but no configuration has been performed (meaning no valid configuration is stored in the configuration module – typical case at first power up), the KSD 100EXP enters the APM Configuration Mismatch Screen (see Figure 6-4). The maintenance technician will then enter the Installation/Maintenance Menu from this page.
- If valid configuration data is already stored in the configuration module, the KSD 100EXP will display the Database Acknowledge Screen (see Figure 6-3). The maintenance technician may enter the Installation/Maintenance Menu from this page.

The KSD 100EXP PFD has one dedicated ARINC 429 receive channel and one dedicated ARINC 429 transmit channel for communication with the KG 71EXP ADAHRS. These ARINC 429 channels cannot be reconfigured, but can be shared with another device.

The configuration of the KG 71EXP and KMG 7010/MD32 are performed using a maintenance PC with the Configuration and Maintenance Tool (CMT) software application installed. Refer to the Installation/ Maintenance Functional Diagram for the KG 71 (shown in Figure 6-2).

NOTE

THE XVUE TOUCH SYSTEM CONFIGURATION STEPS NEED TO BE COMPLETED, BUT DO NOT NEED TO BE COMPLETED IN THE ORDER PRESENTED BELOW.

NOTE

ENTRY TO THE INSTALLER MENU IS PROVIDED VIA THE KSD 100EXP TOUCH INTERFACE.

NOTE

IF THE XVUE TOUCH SYSTEM DETECTS AN “IN AIR” STATE (IAS GREATER THAN 50 KNOTS), THE ENTRY TO THE INSTALLER MENU IS NOT POSSIBLE. THIS PREVENTS ERRONEOUS ENTRY TO THE INSTALLER MENU BY THE PILOT DURING FLIGHT.

NOTE

THE PRESENCE OF FROST OR DUST ON THE INFRA-RED (IR) BAR MAY IMPEDE TOUCH SCREEN FUNCTIONALITY. CLEAN IR BAR IN ACCORDANCE WITH SECTION 9.2.4.3.

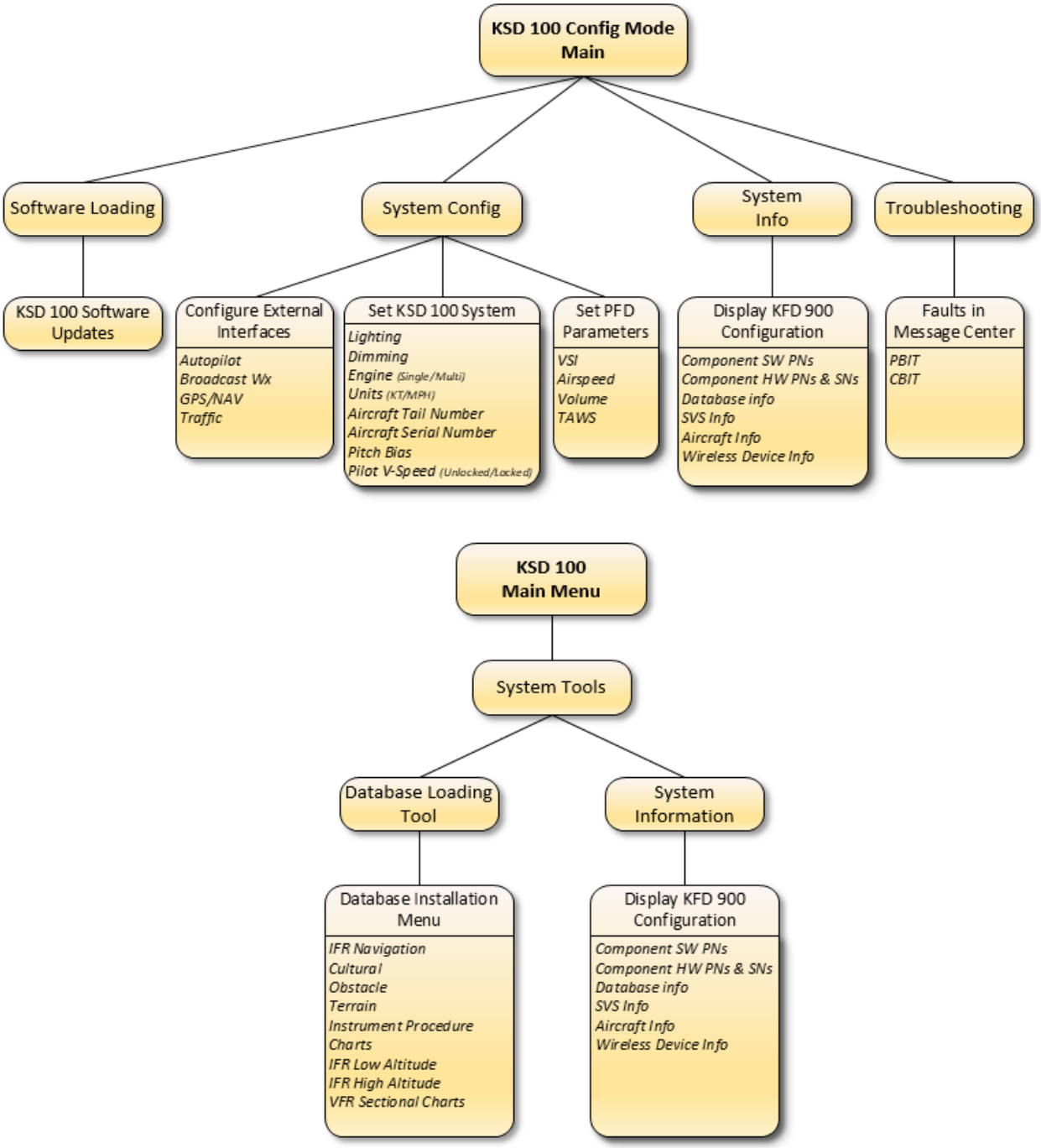

Figure 6-1 KSD 100EXP Installation/Maintenance Functional Diagram

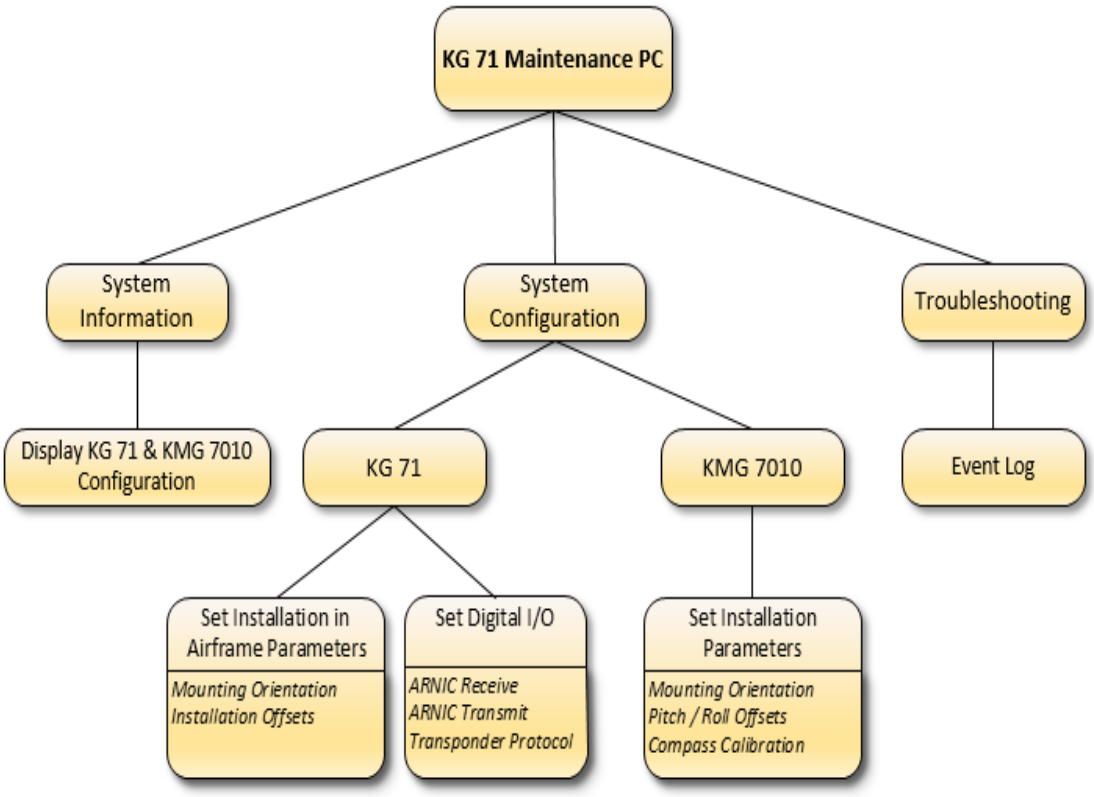

Figure 6-2 KG 71EXP Installation/Maintenance Functional Diagram

6.1 Mounting, Wiring, and Power Checks

Verify all cables are properly secured. Prior to powering up the xVue Touch System, the wiring harness must be checked for proper connections to the airplane power bus. Point to point continuity must be checked to identify any faults such as shorting to ground. Any faults or discrepancies must be corrected before proceeding. Upon completion of the power and ground checks, the system is ready for power to be applied.

CAUTION

AFTER INSTALLATION OF THE CABLING (PRIOR TO EQUIPMENT INSTALL), APPLY AICRAFT PRIMARY POWER TO EACH MOUNTING CONNECTOR AND VERIFY THAT POWER IS APPLIED ONLY TO THE PINS SPECIFIED IN THE INTERCONNECT WIRING DIAGRAMS IN APPENDIX B INTERCONNECT DIAGRAMS.

6.2 KSD 100EXP Configuration (PFD) Setup

To configure the xVue Touch System parameters, the KSD 100EXP must be in Config Mode.

Config Mode, as illustrated in Figure 6-5, is only accessible on ground from the Database Acknowledge Screen, Figure 6-3, or the APM Mismatch Error Screen, Figure 6-4.

NOTE

THE INITIAL (OUT OF BOX) FLIGHT SOFTWARE LOAD WILL POP-UP THE APM CONFIGURATION MISMATCH ERROR SCREEN, FIGURE 6-4. FOLLOW THE INSTRUCTIONS LISTED BELOW TO ACCESS CONFIGURATION MODE, SAVE, AND EXIT.

To access Config Mode apply the following touch sequence:

(1) Touch the “B” on the BendixKing logo.
(2) Touch the “K” on the logo.
(3) Touch the “B” again to display the Config Mode Screen, Figure 6-5.

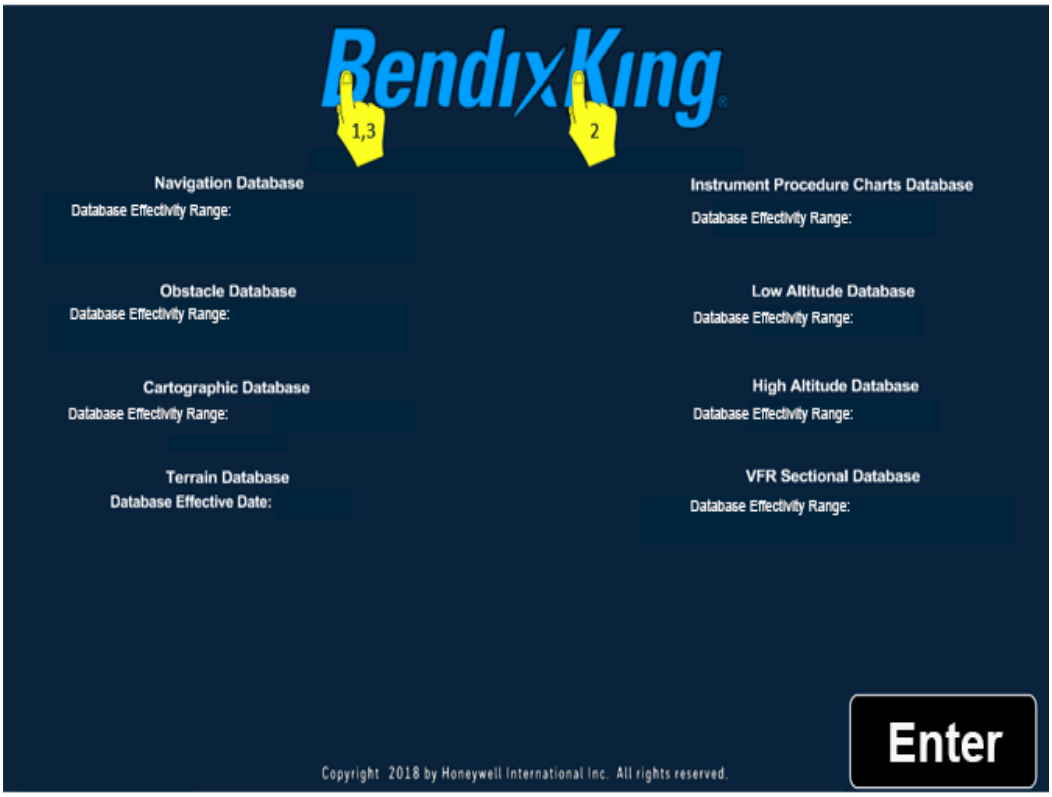

Figure 6-3 Database Acknowledge Screen

Figure 6-4 APM Configuration Mismatch Screen

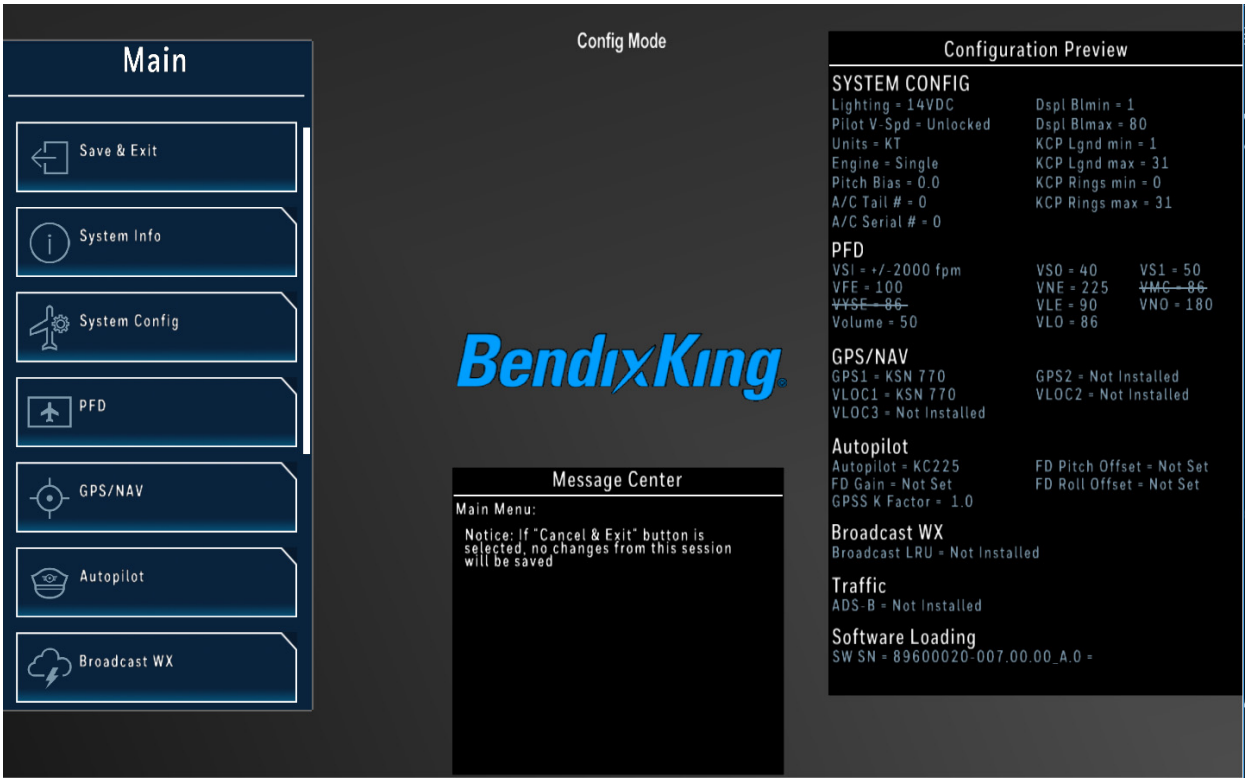

Figure 6-5 Config Mode Screen

The Configuration Preview window on the Config Mode Screen, shown on the right in Figure 6-5 and again in detail on Figure 6-6, displays current configuration settings in the Installer Main Menu. Fields which have been changed are displayed in a green font.

NOTE

NOT ALL CONFIG MODE SETTINGS ARE DISPLAYED IN CONFIGURATION PREVIEW WINDOW.

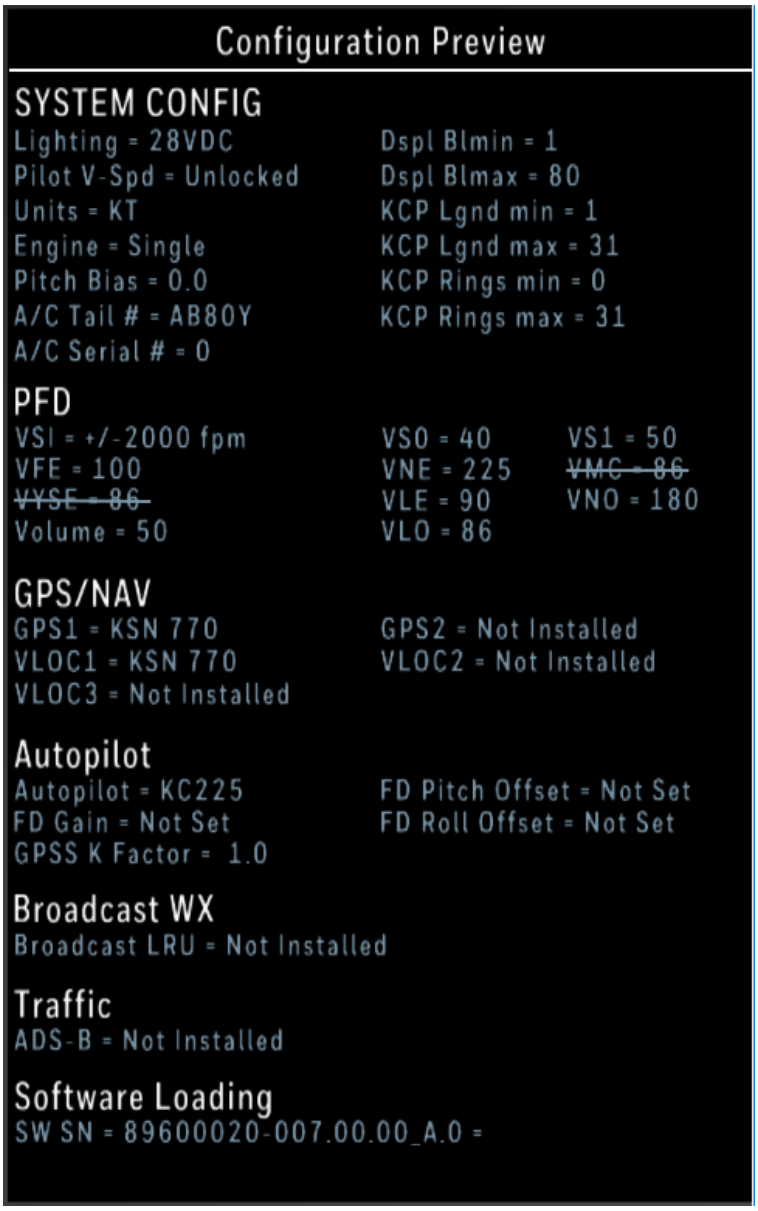

Figure 6-6 Configuration Preview Window

The Installer Main Menu on the left side of the Config Mode Screen, shown in Figure 6-5 and again in detail in Figure 6-7, provides access to the sub-menus that allow the xVue Touch System to be configured. Pressing a button on the main menu will display the related sub-menu. The Back-Arrow

button “<” is available on the top left side of each of the sub-menus. Selecting the Back-Arrow button will return to the previous active menu. Only upon pressing the Save & Exit button are configuration changes saved.

NOTE

CONFIGURATION SETTINGS MUST BE ACCESSED AND VERIFIED WITHIN INSTALLER MAIN MENU.

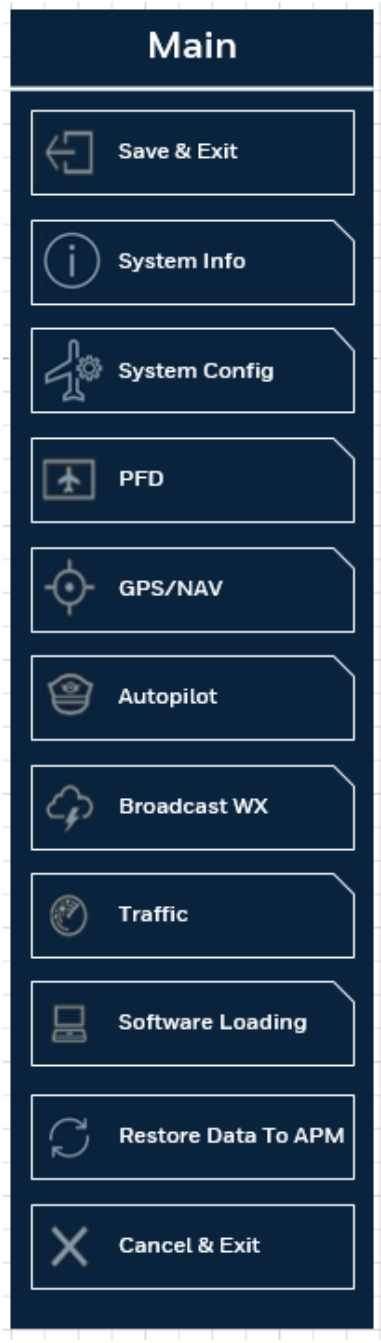

Figure 6-7 Installer Main Menu

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6.2.1 System Configuration Setup

The System Config button allows the technician to configure the following parameters, as shown in Figure 6-8:

(1) Lighting
(2) External Dimming Calibration
(3) Aircraft Tail Number
(4) Aircraft Serial Number
(5) Pitch Bias
(6) Pilot V-Speed
(7) Engine
(8) Units

Figure 6-8 System Config Sub-Menu

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6.2.1.1 Lighting

The lighting configuration defines the type of LCD backlight dimming control being used for the KSD 100EXP PFD and KCP 100EXP Control Panel. The KSD 100EXP has an integrated light sensor for display brightness, and supports usage of an external brightness control for the KCP 100EXP. The dimming control is configured as 28 VDC or 14 VDC. Based on the selected option, the KSD 100EXP will use the dimming voltage from either the 14 VDC or 28 VDC dimming bus.

(1) From the Installer Main Menu, Figure 6-7, press the System Config button to display the System Config sub-menu, Figure 6-8.

NOTE

THE DEFAULT SELECTION IS 28 VDC. IF THE LIGHTING BEING USED IS 14 VDC, THEN THE AVIONICS INSTALLER MUST SET THE LIGHTING TO THE CORRECT SETTING.

(2) To change lighting configuration, press the Lighting button to display the Lighting sub-menu, and select between 28 VDC and 14 VDC, shown in Figure 6-9.

Figure 6-9 Lighting Sub-Menu

6.2.1.2 External Dimming

The xVue Touch System lighting can be controlled through an external input for the KCP 100EXP and from the ambient light sensor for the KSD 100EXP. When an external input is used, the dimming level should be set using the External Dimming Calibration menu as shown in Figure 6-10, to sync the brightness levels with cockpit lighting.

(1) From System Config sub-menu, Figure 6-8, press the External Dimming Calibration button to display the External Dimming Calibration sub-menu, Figure 6-10.

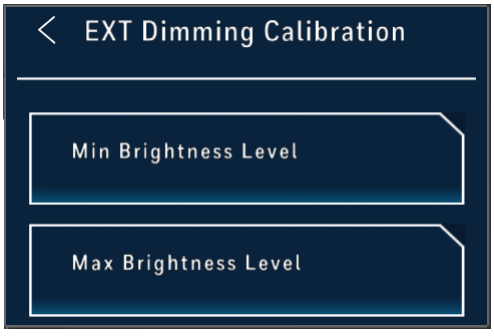

Figure 6-10 External Dimming Calibration Sub-Menu

NOTE

FOR RHEOSTATS WITH AN OFF POSITION, DO NOT MOVE THE CONTROL TO THE OFF DETENT.

NOTE

SET MINIMUM AND MAXIMUM BRIGHTNESS LEVELS IN THE DARKENED COCKPIT (TO REPRESENT NIGHT OPERATING CONDITIONS).

(2) Configure Minimum Brightness Levels:

(a) Select the Min Brightness Level button, shown in Figure 6-10.

(b) Adjust the cockpit lighting control to its minimum setting.

(c) With the dimming bus control at its minimum setting, press the Sync VMin button, shown in Figure 6-11. This sets the current voltage as the minimum voltage input available on the dimming bus.

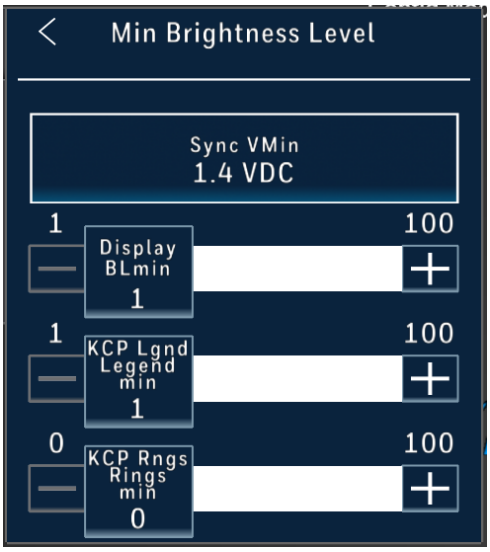

Figure 6-11 Minimum Brightness Level

(d) With the external lighting control at its minimum value, set the Display BLmin value by touching the bar or incrementing the + and - buttons to adjust the Display backlight so the minimum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value is 1)

(e) With the external lighting control at its minimum value, set the KCP Lgnd Legend min value by touching the bar or incrementing the + and - buttons to adjust the Control Panel Legend so the minimum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value is 1)

(f) With the external lighting control at its minimum value, set the KCP Rngs Rings min value by touching the bar or incrementing the + and - buttons to adjust the Control Panel Rings so the minimum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value is 0)

(g) Press the Back-Arrow button to exit the Min Brightness Level window.

(3) Configure Maximum Brightness Levels:

(a) Select the Max Brightness Level button, shown in Figure 6-10.

(b) Adjust the cockpit lighting control to its maximum setting.

(c) With the dimming bus control at its maximum setting, press the Sync VMax button, shown in Figure 6-12. This stores the current voltage as the maximum voltage input available on the dimming bus.

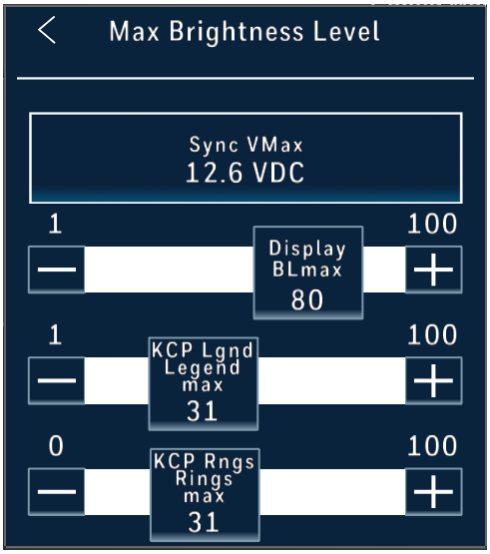

Figure 6-12 Maximum Brightness Levels

(d) With the external lighting control at its maximum value, set the Display BLmax value by touching the bar or incrementing the + and - buttons to adjust the Display backlight so the maximum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value in 80)

(e) With the external lighting control at its maximum value, set the KCP Lgnd Legend max value by touching the bar or incrementing the + and - buttons to adjust the Control Panel Legend so the maximum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value in 31)

(f) With the external lighting control at its maximum value, set the KCP Rngs Rings max value by touching the bar or incrementing the + and - buttons to adjust the Control Panel Rings so the maximum brightness level is appropriately balanced with the other cockpit instruments. (Note: Default value in 31)

(g) Press the Back-Arrow button to exit the Max Brightness Level window

(h) Press the Back-Arrow button to exit the External Dimming Calibration menu

6.2.1.3 Aircraft Tail Number

(1) From the System Config sub-menu, Figure 6-8, press the A/C Tail # button.

(2) Using the alpha-numeric keyboard, shown in Figure 6-13, input the aircraft tail number and press the Enter button.

Figure 6-13 A/C Tail # Keypad

(3) Verify that the Tail Number is reflected correctly on the Aircraft Tail # button as illustrated in Figure 6-14.

Figure 6-14 A/C Tail Number

6.2.1.4 Aircraft Serial Number

(1) From the System Config sub-menu, Figure 6-8, press the A/C Serial # button.

(2) Using the alpha-numeric keyboard, shown in Figure 6-15, input the aircraft serial number and press the Enter button.

Figure 6-15 A/C Serial # Keypad

(3) Verify that the Serial Number is reflected correctly on the Aircraft Serial # button as illustrated in Figure 6-16.

Figure 6-16 A/C Serial #

6.2.1.5 Aircraft Pitch Bias

Pitch bias function provides a means to adjust the KSD 100EXP pitch attitude indicator. Examples of when it might be used is to compensate for non-zero AoA during level flight (level = 0 fpm)

(1) From the Installer Main Menu, Figure 6-7, press the System Config button to display the System Config sub-menu, Figure 6-8.

(2) From System Config sub-menu press the Pitch Bias button.

NOTE

THE PITCH BIAS IS LIMITED TO A RANGE OF ± 5 DEGREES WITH INCREMENTS OF 0.1.

(3) Using the numeric keyboard, shown in Figure 6-17, input the Pitch Bias and press the Enter button.

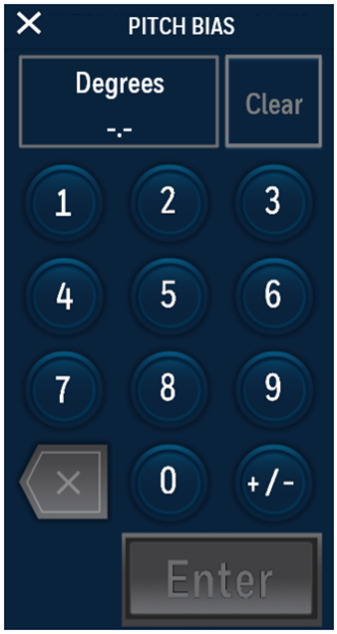

Figure 6-17 Pitch Bias Keypad

(4) Verify that the Pitch Bias is reflected correctly on the Pitch Bias button as illustrated in Figure 6-18.

Figure 6-18 Pitch Bias

6.2.1.6 Pilot V-Speed Locking

In the System Config sub-menu, Figure 6-8, when the Pilot V-Spd indicator shows “Locked”, the Configurable Pilot V-Speed settings on the PFD menu cannot be modified.

NOTE

THE DEFAULT SELECTION FOR PILOT V-SPEEDS IS UNLOCKED.

NOTE

LOCKING THE PILOT V-SPEEDS DOES NOT AFFECT THE PILOT’S ABILITY TO DISPLAY OR HIDE THE ASSOCIATED FLAGS USING THE PFD SET V-SPEEDS AND V-SPEED LABELS ON/OFF BUTTON.

The avionics installer should use the following procedure to lock the pilot v-speeds:

(1) From the Installer Main Menu, Figure 6-7, press the System Config button to display the System Config sub-menu, Figure 6-8.

(2) From System Config sub-menu press the Pilot V-Spd button to toggle between Unlocked and

Locked, shown in Figure 6-19.

Figure 6-19 Pilot V-Spd Locked/Unlocked Toggle

6.2.1.7 Engine Configuration

The Engine configuration is accessed from the System Config sub-menu, Figure 6-8, refer to Section 6.2 and the current Engine configuration selection is shown on the Engine button.

NOTE

THE DEFAULT SELECTION IS SINGLE ENGINE. WHEN THE INDICATOR SHOWS MULTI, THE KSD 100EXP WILL DISPLAY ADDITIONAL V-SPEED PARAMETERS: MINIMUM CONTROL SPEED (V_{MC}) AND BEST RATE OF CLIMB SPEED (V_{YSE}).

(1) Press the Engine button to toggle from Single to Multi, shown in Figure 6-20.

Figure 6-20 Engine Configuration

(2) Press the Back-Arrow button to exit the System Config sub-menu and return to the Installer Main Menu, Figure 6-7.

6.2.1.8 Units Configuration

The Units configuration is accessed from the System Config sub-menu, Figure 6-8, refer to Section 6.2 and the current Unit configuration selection is shown on the Units button.

NOTE

THE DEFAULT UNIT SELECTION IS KNOTS (KT). THE UNITS USED ON THE KSD 100EXP MUST BE SET TO THE SAME UNITS PUBLISHED IN THE AIRPLANE FLIGHT MANUAL (AFM).

(1) Press the Units button to toggle between Knots (KT) and Miles per Hour (MPH), shown in Figure 6-21.

Figure 6-21 Units Configuration

CAUTION

ALL V-SPEED VALUES ARE CLEARED WHEN THE UNITS ARE TOGGLED.

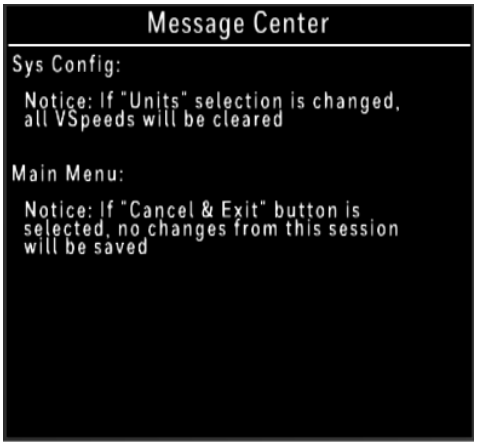

Figure 6-22 Message Center Caution for V-Speed Unit Changes

(2) Press the Back-Arrow button to return to the System Config sub-menu, Figure 6-8.
(3) Press the Back-Arrow button to exit the System Config sub-menu and return to the Installer Main Menu, Figure 6-7.

6.2.2 PFD Configuration Setup

The PFD button allows the technician to configure the following parameters, as shown in Figure 6-23:

(1) Vertical Speed Indicator (VSI)
(2) Airspeed
(3) Master Audio Volume
(4) Terrain Awareness and Warning System (TAWS)
(5) KSD ALT Preselect

Figure 6-23 PFD Sub-Menu

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6.2.2.1 Vertical Speed Indicator Range

The Vertical Speed Indicator (VSI) defines the range for the Vertical Speed Tape on the PFD. The Vertical Speed Tape display varies with the configuration setting, as illustrated in Figure 6-24. The VSI Range configuration options include:

- ± 2000 fpm
- ± 3000 fpm
- ± 4000 fpm

The VSI Range configuration is accessed from the PFD sub-menu, Figure 6-23, and the current VSI Range is shown on the VSI button. Pressing the VSI button displays the options for the VSI Range; ± 2000 fpm, ± 3000 fpm and ± 4000 fpm, as illustrated in Figure 6-24.

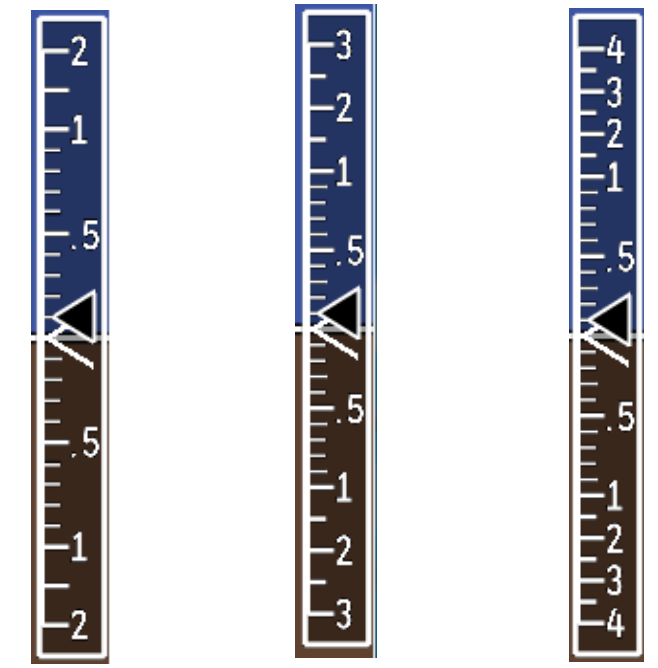

Figure 6-24 Vertical Speed Tape Examples (1/2 PFD View)

NOTE

THE DEFAULT SELECTION IS ± 2000 FPM. IT IS RECOMMENDED THE VSI RANGE BE SET TO A VALUE COMPARABLE TO THE AIRPLANE'S EXISTING VSI'S RANGE. FOR EXAMPLE, IF THE EXISTING VSI HAS A RANGE OF 3000 FPM, THEN THE VSI SHOULD BE SET TO ± 3000 FPM.

(1) From the PFD sub-menu, Figure 6-23, press the VSI button to display the VSI Selection menu, Figure 6-25:

Figure 6-25 VSI Selection Menu

(2) Select desired VSI Range
(3) Press the Back-Arrow button to return to the PFD sub-menu.
(4) Verify that the desired VSI Range is reflected correctly on the VSI button, shown in Figure 6-23.

6.2.2.2 Airspeed

The KSD renders the color bands and lines on the PFD Airspeed Tape that are defined through the following rules:

(1) V_{NE}: Never Exceed speed. If V_{NE} is defined the airspeed tape displays a red and white barber pole band from V_{NE} to the max tape value. A Radial Red Line is displayed on the airspeed tape at V_{NE}.
(2) V_{NO}: Normal Operations Maximum Structural Cruise speed. For airplane with no published V_{NO}, set $V_{NO} = V_{NE}$. A yellow band is displayed on the airspeed tape between V_{NO} and V_{NE}. V_{NO} must be less than or equal to V_{NE}.
(3) V_{FE}: Maximum Flaps Extended speed (top of white band).
(4) V_{S1}: No Flaps Stall speed. A green band is displayed on the airspeed tape between V_{S1} and V_{NO}. V_{S1} must be less than V_{NO}.
(5) V_{SO}: Full Flaps Stall speed (bottom of white band). A white band is displayed on the airspeed tape between V_{SO} and V_{FE}. V_{SO} must be less than V_{FE}.
(6) V_{YSE}: Single engine best rate of climb speed for a multi-engine airplane. A blue horizontal line is displayed at the V_{YSE} airspeed. The V_{YSE} V-Speed is only made available for setting when the Single/Multi Engine parameter is set to Multi.
(7) V_{MC}: Minimum Control Airspeed with Critical Engine Inoperative. A red horizontal line is displayed at the V_{MC} airspeed. The V_{MC} V-Speed is only made available for setting when the Single/Multi Engine parameter is set to Multi.

The Airspeed sub-menu, Figure 6-27, displays the current value and color band for each of the V-Speeds and allows the values to be modified by selecting the specific V-Speed button(s). When the Airspeed sub-menu is displayed, a mock V-Speed tape, Figure 6-26, is also displayed. The mock tape illustrates the relative position and color bands for the V-Speeds in a graphical representation.

Figure 6-26 V-Speed Tape Illustration

WARNING

ONLY A CERTIFIED MECHANIC MAY SET THE AIRSPEED VALUES. THESE VALUES MUST MATCH THE CERTIFIED SPEEDS IN THE AIRPLANE FLIGHT MANUAL (AFM), PILOT'S OPERATING HANDBOOK (POH), OR OTHER LEGAL DOCUMENTATION (E.G. PLACARDS).

NOTE

THE V-SPEED UNITS ARE DEFINED IN SECTION 6.2.1.8 UNITS CONFIGURATION AND THE V-SPEED VALUES ARE CLEARED IF THE UNITS ARE CHANGED.

NOTE

AS AIRSPEED VALUES ARE ENTERED, PHYSICAL LOCATIONS ARE POPULATED ON THE MOCK AIRSPEED TAPE. ONCE AN ENTRY IS MADE, THE ENTRY FILL MAY NOT BE REPOSITIONED TO ACCOMMODATE ANOTHER ENTRY EVEN IF THE LATER ENTRY HAS HIGHER PRIORITY THAN THE FORMER. THIS BEHAVIOR MAY RESULT IN OVERLAPPING ENTRIES AND VALUES THAT ARE NOT SEEN.

(1) From the PFD sub-menu, Figure 6-23, press the Airspeed button to display the Airspeed sub-menu, Figure 6-27.

Figure 6-27 Airspeed Sub-Menu

(2) From the Airspeed sub-menu, press the desired V-Speed button to display the V-Speed Keypad.

NOTE

ANY V-SPEED ON THE AIRSPEED SUB-MENU CAN BE CLEARED BY PRESSING THE CLEAR V-SPD KEY LOCATED ON THE V-SPEED KEYPAD. THE CLEAR V-SPD BUTTON IS ONLY SELECTABLE BEFORE A NUMBER BUTTON IS PRESSED ON THE V-SPEED KEYPAD.

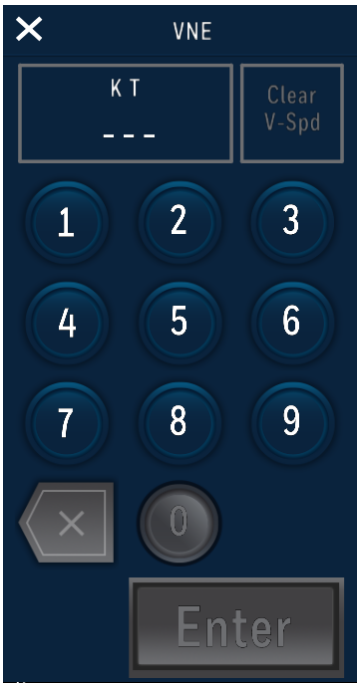

Figure 6-28 VNE V-Speed Keypad Example

(3) Using the keypad, input the value for the selected V-Speed and press the Enter button.

(4) Verify that the new value is reflected correctly for the modified V-Speed button on the Airspeed sub-menu, Figure 6-27.

NOTE

EACH OF THE V-SPEEDS CAN BE MODIFIED USING THE SAME METHOD OUTLINED IN THE PREVIOUS STEPS.

(5) After the V-Speeds are entered, press the Back-Arrow button to return to the PFD sub-menu.

6.2.2.3 Master Audio Volume

(1) From the PFD sub-menu, Figure 6-23, press the Master VOL button to display the Master VOL sub-menu, Figure 6-29.

NOTE

THE DEFAULT VOLUME LEVEL IS 80. THE VOLUME LEVEL FOR THE AUDIO ALERTS SHOULD BE ADJUSTED SUCH THAT THE ALERTS ARE AUDIBLE UNDER ALL ANTICIPATED NOISE CONDITIONS.

(2) From the Master VOL sub-menu, set the Volume by touching the bar or incrementing the + and - buttons to adjust the volume to the desired level, shown in Figure 6-29.

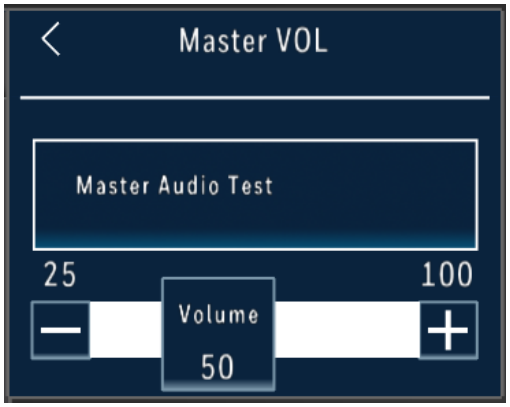

Figure 6-29 Master VOL Sub-Menu

(3) Press the Master Audio Test button to test the volume level.

NOTE

A TRIPLE CHIME WILL BE PLAYED FOLLOWED BY THE WARNING TERRAIN TERRAIN AUDIO. THE VOLUME CAN BE ADJUSTED WHILE THE AUDIO TEST FILES ARE BEING PLAYED.

(4) Using a headset, repeat steps (2) and (3) adjusting the volume as needed.
(5) If there are other audio systems installed in the airplane, compare the volume level of the xVue Touch System with the other system(s) and adjust as needed.
(6) Press the Back-Arrow button to return to the PFD sub-menu.

6.2.2.4 Terrain Awareness and Warning System (TAWS) Toggle

The TAWS configuration is used to indicate if an external TAWS is installed in the airplane.

The TAWS configuration is accessed from the PDF sub-menu, Figure 6-23, and the current TAWS configuration selection is shown on the TAWS button as seen in Figure 6-30.

NOTE

IF AN EXTERNAL TAWS IS INSTALLED, IT PROVIDES THE ALERT FOR TERRAIN/OBSTACLE THREAT/ALERT AND THE KSD 100EXP PFD INTERNAL ALERT IS INHIBITED.

(1) Press the TAWS button to toggle between Not Installed and Installed, shown in Figure 6-30.

Figure 6-30 TAWS Toggle

(2) Press the Back-Arrow button to return to the PFD sub-menu.
(3) Press the Back-Arrow button to exit the PFD sub-menu and return to the Installer Main Menu, Figure 6-7.

6.2.2.5 KSD Altitude Preselect Toggle

The altitude preselect configuration is used to indicate whether the KSD 100EXP PFD pilot selected altitude function is enabled or disabled.

If the airplane is already equipped for a pilot selectable altitude bug/aural, such as an autopilot altitude select, the KSD 100EXP can be configured to disable its selected altitude function, otherwise this setting should remain enabled.

6.2.3 GPS/NAV Configuration Setup

The GPS/NAV button allows the technician to configure the following parameters, as shown in Figure 6-31:

(1) GPS 1
(2) GPS 2
(3) VLOC 1
(4) VLOC 2
(5) VLOC 3

Figure 6-31 GPS/NAV Sub-Menu

The xVue Touch System supports the following navigation sources:

Table 6-1 Supported Navigation Sources

Manufacturer	Model
BendixKing	KSN 770
	KSN 765
Garmin	GNC 420W
	GNS 430W
	GNS 530W
	GPS 400W
	GPS 500W
	GTN 625
	GTN 635
	GTN 650
	GTN 725
	GTN 750
Avidyne	IFD 410
	IFD 440
	IFD 510
	IFD 540
	IFD 545
	IFD 550

The KSD 100EXP has two ARINC 429 receive channels reserved for GPS Navigators data and two ARINC 429 receive channels reserved for Digital VHF Navigators (4 A429 Rx channels in total). The KSD 100EXP has reserved a single ARINC 429 transmit channel for communication with up to two GPS Navigators, this is known as the EFIS Control channel.

NOTE

THE KSD 100 TRANSMIT CHANNEL, WHICH IS RESERVED FOR COMMUNICATION WITH NAVIGATORS, MAY BE CONNECTED TO MULTIPLE RECEIVERS WHICH PROCESS THE OUTPUT DATA.

The KSD 100EXP configuration can be defined with up to two GPS Navigators, two digital VHF Navigator radios, and one analog/legacy VHF Navigator radio. A GPS Navigator and VHF Navigator may be integrated in a single unit.

In addition to the ARINC 429 data, the KSD 100EXP supports processing of the Geometric Altitude parameter from GPS Navigator via RS-232 Serial interface. Geometric altitude is required for correct operation of Synthetic Vision, relative terrain on the moving map, and relative terrain in the Vertical

Situation Display. The GPS Navigator must be connected via the RS-232 Serial Interface and the technician must configure the GPS Navigator properly to provide the correct data.

The availability of the analog VHF Navigator is enabled through the KSD 100EXP configuration. When enabled, the KSD 100EXP will allow selection of the Analog VHF Navigator and will process and monitor all analog signals provided by the Analog VHF Navigator.

The default configuration for the VHF Navigator analog interface is “Not Connected”. In this configuration, the option for the pilot to select it as a navigation source is disabled and no monitoring is provided for this interface.

6.2.3.1 GPS Navigation Source

(1) From the GPS/NAV sub-menu, Figure 6-31, press the GPS1 button to display the GPS1 sub-menu, Figure 6-32.

Figure 6-32 GPS 1 Sub-Menu

(2) Press the button for the installed LRU from the GPS1 sub-menu, Figure 6-32.
(3) Press the Back-Arrow button to return to the GPS/NAV sub-menu.
(4) Verify the selected LRU is reflected correctly on the GPS 1 button, shown in Figure 6-32.

NOTE

THE XVUE TOUCH WILL AUTOMATICALLY SET THE NAVIGATION RADIO SOURCE, VLOC 1 OR 2, WHEN THE SELECTED GPS SOURCE CONTAINS BOTH A GPS AND NAV RADIO SYSTEM. THE SUPPORTED GPS/NAV RADIO SYSTEMS ARE KSN 770, GNS 430W, GNS 530W, GTN 650, GTN 750, IFD 440, IFD 540, AND IFD 550.

(5) If there is a second GPS installed, press the GPS2 button to display the GPS2 sub-menu.

Figure 6-33 GPS2 Sub-Menu

(6) Press the button for the installed LRU option from the GPS2 sub-menu, Figure 6-33.
(7) Press the Back-Arrow button to return to the GPS/NAV sub-menu.
(8) Verify that the selected LRU is reflected correctly on the GPS2 button, shown in Figure 6-31.

6.2.3.2 VLOC Navigation Source

NOTE

IF THE SELECTED GPS SOURCE CONTAINS BOTH A GPS AND NAV RADIO SYSTEM, THEN THE XVUE TOUCH SYSTEM AUTOMATICALLY SETS THE NAVIGATION RADIO SOURCE AND THE CORRESPONDING VLOC BUTTON IS INACTIVATED. IF THE SELECTED GPS SOURCE IS A GPS ONLY SYSTEM, THEN THE CORRESPONDING VLOC BUTTON IS SELECTABLE.

NOTE

ONLY ONE ANALOG NAV RADIO CAN BE CONFIGURED WITH THE XVUE TOUCH SYSTEM. WHEN ONE OF THE ANALOG RADIOS; KX 155, KX 155A, KX 165, OR KX 165A, IS SELECTED THE ONLY AVAILABLE OPTION IN THE OTHER TWO VLOC MENUS IS GNC 255, UNLESS AN INTEGRATED GPS/VLOC WAS SELECTED FOR THE GPS SOURCE.

NOTE

THE GNC 255 CANNOT BE INSTALLED TO VLOC3.

(1) From the GPS/NAV sub-menu, Figure 6-31, press the VLOC1 button to display the VLOC1 sub-menu, Figure 6-34.

Figure 6-34 VLOC1 Sub-Menu

(2) Press the button for the installed LRU option from the VLOC1 sub-menu, Figure 6-34.
(3) Press the Back-Arrow button to return to the GPS/NAV sub-menu.
(4) Verify that the selected LRU is reflected correctly on the VLOC1 button, shown in Figure 6-31.
(5) If there is a second NAV radio installed, press the VLOC2 button to display the VLOC 2 sub-menu.

Figure 6-35 VLOC2 Sub-Menu

(6) Press the button for the installed LRU option from the VLOC2 sub-menu, Figure 6-35.

(7) Press the Back-Arrow button to return to the GPS/NAV sub-menu.

(8) Verify that the selected LRU is reflected correctly on the VLOC2 button, shown in Figure 6-31.

NOTE

VLOC 3 IS ONLY USED IF THE NAV RADIO HAS A COMPOSITE ANALOG SIGNAL.

BendixKing

6.2.4 Autopilot Configuration Setup

NOTE

THE PROCESS FOR CONFIGURING THE AUTOPILOT AND KSD 100EXP INTERFACE IS DESCRIBED IN SECTION 7.2.10.1 AUTOPILOT & KSD 100EXP INTERFACE.

The Autopilot button allows the technician to configure the following parameters, as shown in Figure 6-36:

(1) Autopilot LRU
(2) Sync FD Offset
(3) Sync FD Gain

NOTE

FLIGHT DIRECTOR (FD) FUNCTION IS NOT AUTHORIZED.

(4) GPSS K Factor

Figure 6-36 Autopilot Sub-Menu

The xVue Touch System supports the following autopilots:

Table 6-2 Supported Autopilots

Manufacturer	Model
BendixKing	KC 140
	KFC 150
	KC 190
	KC 191
	KC 192
	KFC 200
	KC 225
	KC 295
Genesys Aerosystems	S-TEC 20
	S-TEC 30
	S-TEC 40
	S-TEC 50
	S-TEC 55
	S-TEC 55x
	S-TEC 60-2
	S-TEC 65
Note: Installation of S-TEC autopilots is not authorized.	

The Autopilot sub-menu, as illustrated in Figure 6-36, provides the ability to select, synchronize, and configure the autopilot parameters. The installed autopilot must be selected before the autopilot parameters can be set.

NOTE

FD OPERATION WITH KSD 100EXP IS NOT AUTHORIZED.

The default configuration for the Autopilot interface is “No Autopilot Connected”. The KSD 100EXP in this configuration, does not drive outputs for a legacy autopilot and related monitoring is deactivated.

Only the analog autopilot interface is supported. The technician must configure the KSD 100EXP to provide data to an analog autopilot. When the KSD 100EXP is configured to support an analog autopilot, the analog outputs are provided and monitoring of the outputs is activated.

6.2.4.1 AP Computer

(1) From the Autopilot sub-menu, Figure 6-36, press the AP Computer button to display the AP Computer sub-menu, Figure 6-37.

NOTE

THE DEFAULT SELECTION IS “NOT INSTALLED”.

NOTE

THE AP COMPUTER SUB-MENU LISTS S-TEC AUTOPILOTS THAT ARE CURRENTLY NOT AUTHORIZED FOR INSTALLATION.

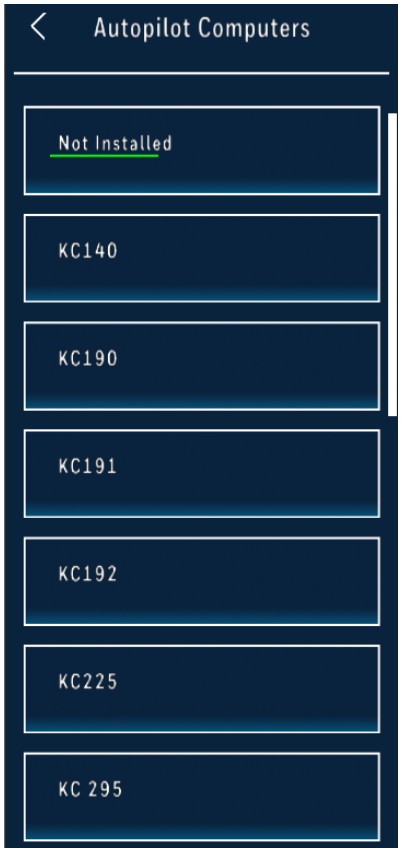

Figure 6-37 AP Computer Sub-Menu

(2) Press the button for the installed LRU option from the AP Computer sub-menu, Figure 6-37.
(3) Press the Back-Arrow button to return to the Autopilot sub-menu.

(4) Verify that the selected LRU is reflected correctly on the AP Computer button, Figure 6-38.

Figure 6-38 AP Computer

6.2.4.2 Sync FD Offset

Use of FD functionality is not authorized.

6.2.4.3 Sync FD Gain

Use of FD functionality is not authorized.

6.2.4.4 GPSS K Factor

GPSS K Factor provides a means for the installer to tune the performance of the GPSS mode for roll steering. Heading Datum command is derived from the GPS navigator's roll steering command when GPSS is ON. Heading Datum command from the KSD 100EXP is provided to the installed autopilot when operating in the HDG mode. The default for GPSS K Factor is 1.0 where Heading Datum command = GPS Navigator Roll Steering command.

GPSS K Factor adjusts the Heading Datum/Roll Steering relationship from 50% (GPSS K Factor of 0.5) to 200% (GPSS K Factor of 2.0) with 10% resolution. Use the following procedure for setting the GPSS K Factor:

(1) Create a flight plan using the airplane navigator that includes the following course changes (order is not critical).

Note: Most autopilots are bank angle command limited above 17 to 20 degrees so evaluation above 15 degree of course change is optional:

(a) ~5 degrees right
(b) ~10 degrees right
(c) ~15 degrees right
(d) ~5 degrees left
(e) ~10 degrees left
(f) ~15 degrees left

(2) Fly the flight plan with GPSS On and HDG mode active - note the resulting bank angle command at each waypoint.

(3) Land and adjust GPSS K Factor such that course change and bank angle command are nearly equal or as preferred

(a) GPSS K Factor < 1.0 will result in less bank angle command per degree of course change and GPSS K Factor >1.0 will result in greater bank angle command per degree of course change.

(4) From the Autopilot sub-menu, Figure 6-36, press the GPSS K Factor button to display the numeric keypad, Figure 6-39.

Figure 6-39 GPSS K Factor Keypad

(5) Using the keypad, input the new value for the GPSS K Factor and press the Enter button.

(6) Verify that the new GPSS K Factor value is reflected correctly on the GPSS K Factor button as shown in Figure 6-40.

Figure 6-40 GPSS K Factor

BendixKing

6.2.5 Broadcast WX Configuration

The xVue Touch System supports the following Broadcast WX sources:

Table 6-3 Supported Broadcast WX Sources

Manufacturer	Model
BendixKing	KGX 130x
	KGX 150x
FreeFlight Systems	FDL-978-XVRL
	FDL-978-XVR
	FDL-978-XVR/G
	FDL-978-XVRD
	FDL-978-XVRD/G

NOTE

THE XVUE TOUCH SYSTEM PROVIDES FIS-B INFORMATION THAT CAN ONLY BE USED FOR ADVISORY PURPOSES AS AN AID FOR SITUATIONAL AWARENESS. THE FIS-B INFORMATION PROVIDED SHOULD NOT BE USED FOR FLIGHT SAFETY CRITICAL INFORMATION AND OPERATION. THE USER IS ADVISED TO EXERCISE CAUTION WHEN CONFRONTED WITH SEVERE WEATHER CONDITIONS.

(1) From the Installer Main Menu, Figure 6-7, press the Broadcast WX button to display the Broadcast WX sub-menu, Figure 6-41.

Figure 6-41 Broadcast WX Sub-Menu

(2) From the Broadcast WX sub-menu, Figure 6-41, press the Broadcast WX button.

Figure 6-42 Broadcast LRU Sub-Menu

(3) Press the button for the installed Broadcast LRU option from the Broadcast LRU sub-menu, Figure 6-42.
(4) Press the Back-Arrow button to return to the Broadcast WX sub-menu
(5) Verify that the selected Broadcast LRU is reflected correctly on the Broadcast WX button, shown in Figure 6-41.

6.2.6 Traffic Configuration Setup

The xVue Touch System supports the following ADS-B Traffic sources:

Table 6-4 Supported ADS-B Traffic Sources

Manufacturer	Model
BendixKing	KGX 130x
	KGX 150x
FreeFlight Systems	FDL-978-XVRL
	FDL-978-XVR
	FDL-978-XVR/G
	FDL-978-XVRD
	FDL-978-XVRD/G

(1) From the Installer Main Menu, Figure 6-7, press the Traffic button to display the Traffic sub-menu, Figure 6-43.

Figure 6-43 Traffic Sub-Menu

(2) From the Traffic sub-menu, Figure 6-44, press the ADS-B Traffic button.

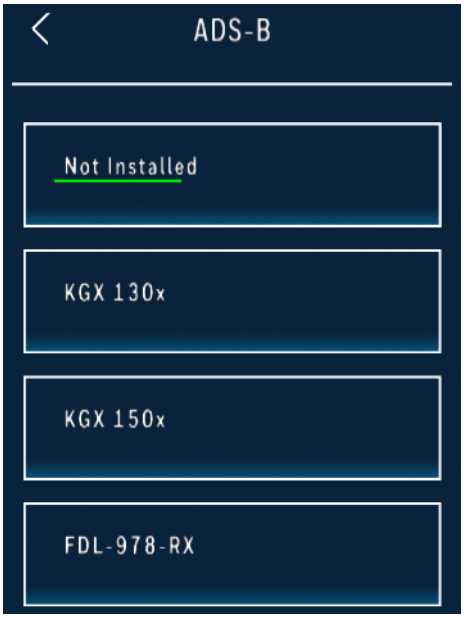

Figure 6-44 ADS-B Sub-Menu

(3) Press the button for the installed ADS-B from the list of options on the ADS-B sub-menu, Figure 6-44.

(4) Press the Back-Arrow button to return to the Traffic sub-menu

(5) Verify that the selected ADS-B is reflected correctly on the Traffic button, shown in Figure 6-43.

6.2.7 Save & Exit Configuration Mode

When the Save & Exit button is pressed, normal operation stores the Installer configuration data, closes the Installer Menu, and displays a screen to inform the avionics installer to “Please Cycle Power”, as illustrated in Figure 6-45.

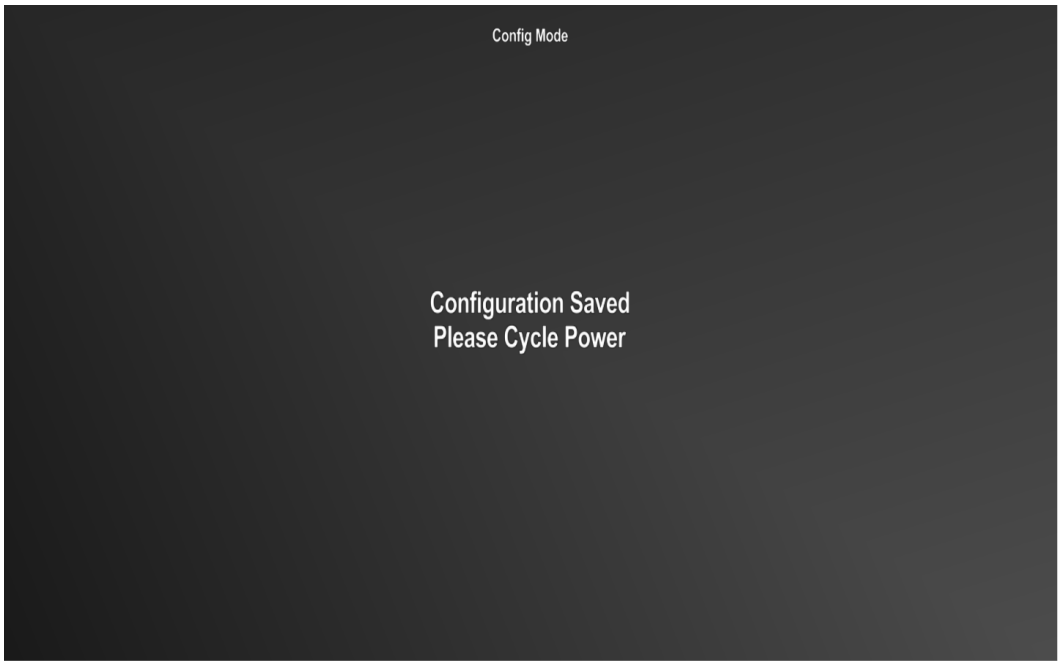

Figure 6-45 Installer Menu Closed

NOTE

WHEN THE SAVE & EXIT BUTTON IS PRESSED AND THERE IS AN ERROR STORING THE DATA, THE INSTALLER MENU WITH USER SELECTIONS AND A MESSAGE BOX ARE DISPLAYED TO NOTIFY THE USER THAT AN ERROR OCCURRED AND SETTINGS MUST BE SAVED AGAIN.

6.3 KG 71EXP Configuration (ADAHRS)

NOTE

THE AIRPLANE MUST FIRST BE LEVELED AT THE ZERO PITCH AND ZERO ROLL POSITION PER THE AIRPLANE MANUFACTURER’S MAINTENANCE MANUAL (WITH ACCURACY ±0.25 DEGREES).

After the KG 71EXP is physically installed into the airplane and the wiring complete and verified, complete the following configuration steps:

(1) Maintenance Interface Configuration
(2) KG 71EXP Installation Orientation and Tilt Angles
(3) KMG 7010/MD32 Installation Orientation and Tilt Angles
(4) KMG 7010/MD32 Magnetometer Compensation

Load the KG 71EXP Configuration and Maintenance Tool (CMT) software application, available for download on the BendixKing Website - Dealer Portal, onto a maintenance PC. Connect the Maintenance PC to the DB-9 KG 71EXP maintenance port using the USB to Serial Converter/Adapter, refer to Section 5.3.3 and Figure B-7 for more information on the maintenance port and wiring. Proceed with the configuration steps as outlined in the following sections.

6.3.1 KG 71EXP Maintenance Interface Configuration

The RS-232 Serial interface for maintenance purposes is dedicated to a specific RS-232 port. The maintenance port is wired directly into the KG 71EXP main connector and must be accessible by the technician to connect to the port. The maintenance port is connected to the maintenance PC via a USB to RS-232 cable. The cable must support a baud rate of at least 115200 bits per second and must be long enough to allow the PC to be easily operated by the technician. The KG 71EXP should be powered off when the USB to RS-232 cable is connected to the maintenance port. The CMT application should be started after the PC is connected to the maintenance port. Once the CMT application is running the PC should display the startup screen as illustrated in Figure 6-46 CMT Startup Screen. The KG 71EXP can then be powered on. If the KG 71EXP was already running when CMT application is started, then power must be cycled on the KG 71EXP before continuing.

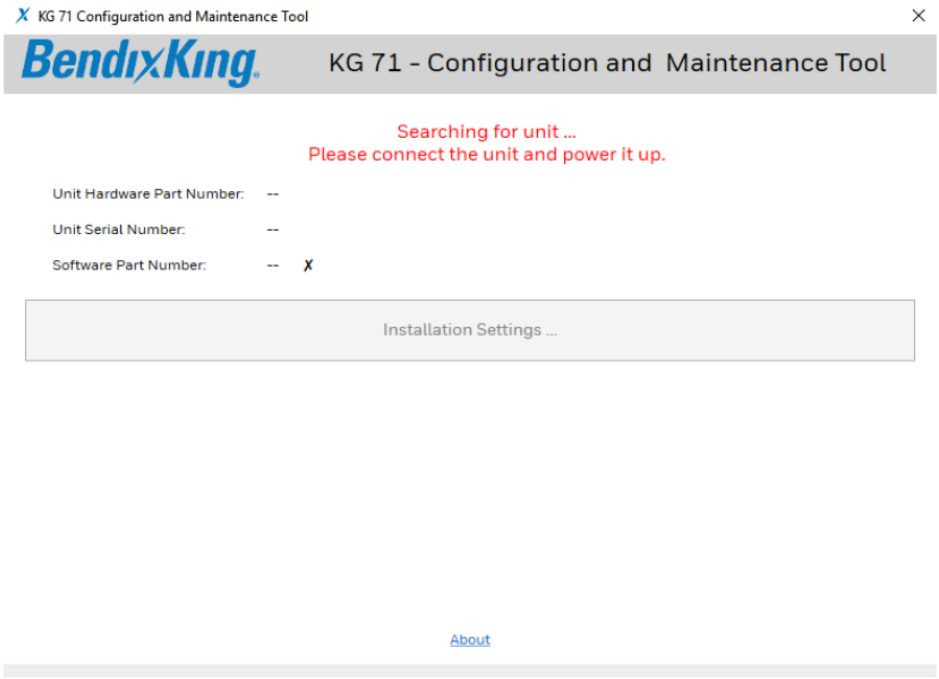

Figure 6-46 CMT Startup Screen

When the KG 71EXP is powered up, the CMT application will detect the KG 71EXP unit and initialize the connection. Once communication is established, the CMT application will display the main configuration screen with following four major tabs at the left side (see Figure 6-47 CMT Main Configuration Screen):

- KG 71 (Default active tab) – this tab allows setting of the KG 71EXP installation orientation, detection of offsets and configuration of the unit I/O.
- KMG 7010 – this tab allows setting of the KMG 7010/MD32 installation orientation, entering of the KMG 7010/MD32 offsets and provides a guide through the magnetometer compensation procedure.
- Event Log – this tab provides list of logged events, actual number of power ups. The tab also provides a mean to erase event log.

- System Info – this tab provides following information about the KG 71EXP system:
  - KG 71EXP computer Hardware Part Number (KG 71EXP PN)
  - KG 71EXP computer Hardware Serial Number (KG 71EXP SN)
  - KG 71EXP computer Software Part Number (KG 71EXP SW PN)
  - KMG 7010 magnetometer Hardware Part Number (KMG 7010 PN/MD32 PN)
  - KMG 7010 magnetometer Hardware Serial Number (KMG 7010 SN/MD32 SN)
  - KMG 7010 magnetometer Software Image Number (KMG 7010 SIN/MD32 SIN)

NOTE

THE KG 71EXP AND KMG 7010/MD32 SERIAL NUMBERS MAY NOT BE DISPLAYED IN ENTIRETY ON THE KSD 100EXP SYSTEM INFO PAGE (REFER TO FIGURE 6-7 INSTALLER MAIN MENU).

Figure 6-47 CMT Main Configuration Screen

6.3.1.1 KG 71EXP Orientation

The KG 71EXP orientation and tilt angles (offsets) must be configured and stored as a first step during the unit configuration. The KG 71 tab provides two sub-tabs:

(1) Installation in Airframe
(2) Digital I/O

The tab “Installation in Airframe” tab displays the current unit orientation setting, actual Pitch and Roll Offsets and the currently measured Pitch and Roll angles.

The CMT application provides a pictorial drop-down list for the selection of the KG 71EXP orientation. The four available orientations are described in Section 3.6.7.2. The technician will select proper orientation from the drop-down list. The orientation of the unit in the airframe is in relation to the positioning of the pressure inlet ports. Figure 6-48 illustrates the page with the drop-down list active. When the KG 71EXP

orientation is changed, the CMT application will display dashes for the actual Pitch and Roll Offsets and actual Pitch and Roll Angles.

When the orientation of the KG 71EXP is properly selected, the installation offsets must then be determined. The technician will click the **Detect Offsets** button. The KG 71EXP will analyze the data using the new orientation to determine the actual offsets. Note, the re-calculation of offsets may take several seconds.

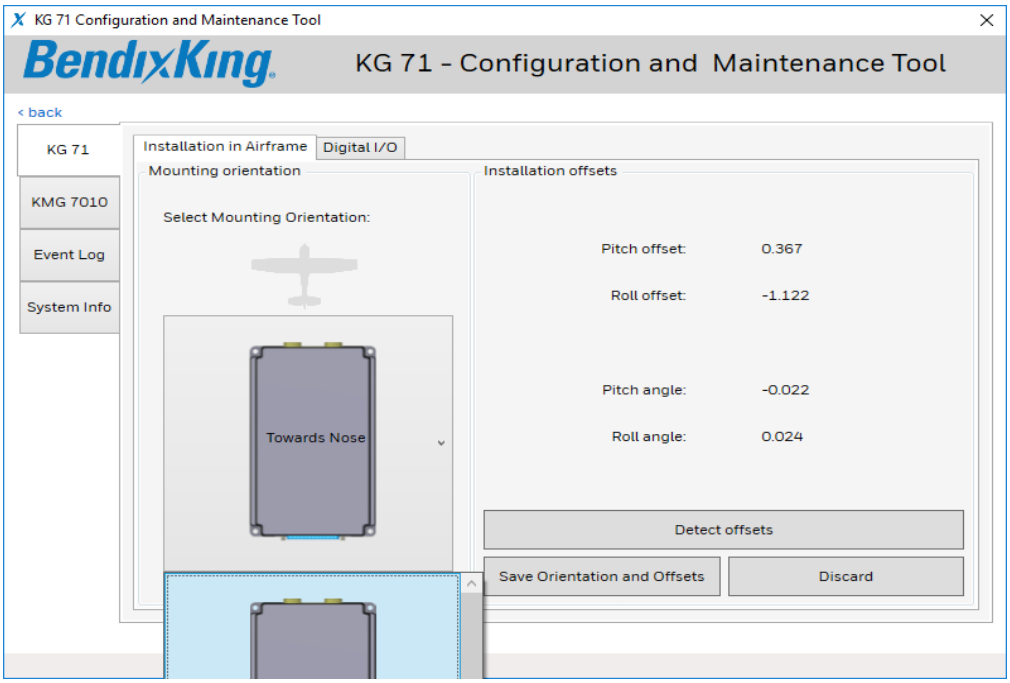

Figure 6-48 KG 71EXP Orientation Drop-Down List

Once the new offsets using the new orientation are determined, the pitch angle and roll angle are measured and displayed.

If the KG 71EXP pitch and roll offsets are installed within ±15 degrees and the detected pitch and roll angle are within ±1 degree (typically, the actual pitch and roll should be less than ±0.5 degree), then detection of offsets was successfully done. If displayed values are within the ranges specified above, the technician should press the **Save Orientation and Offsets** button. The offsets and orientation will be stored into the KG 71EXP memory and the confirmation screen will be displayed as illustrated in Figure 6-49.

If the pitch and roll offsets or the actual pitch and roll angles are not within range then the KG 71EXP's physical positioning must be adjusted to reduce the offsets and the KG 71EXP orientation calibration procedure then repeated.

NOTE

IF THE DEFAULT ORIENTATION WAS NOT CHANGED, THE OFFSETS DETECTION CAN STILL BE PERFORMED VIA **DETECT OFFSETS** BUTTON.

NOTE

THE KMG 7010/MD32 CALIBRATION SHOULD BE PERFORMED TOGETHER WITH THE KG 71EXP OFFSETS MEASUREMENT USING THE SAME LEVELING POSITION TO ENSURE THAT THE AIRPLANE IS IN THE SAME REFERENCE POSITION FOR BOTH KG 71EXP AND KMG 7010/MD32 CALIBRATIONS.

If the **Discard** button is selected, the last stored orientation and offsets will be restored.

Figure 6-49 CMT Confirmation of Orientation and Offsets Store

6.3.1.2 KG 71EXP Digital I/O Configuration

The “Digital I/O” tab illustrated in displays the KG 71EXP I/O configuration and provides means to modify the I/O setup. The KG 71EXP has a dedicated receive channel, Rx0, for the PFD and the SDI must be set to match the PFD’s value. The SDI can be set to values of 00, 01, 10, and 11. The SDI is set to 01 for standard installations.

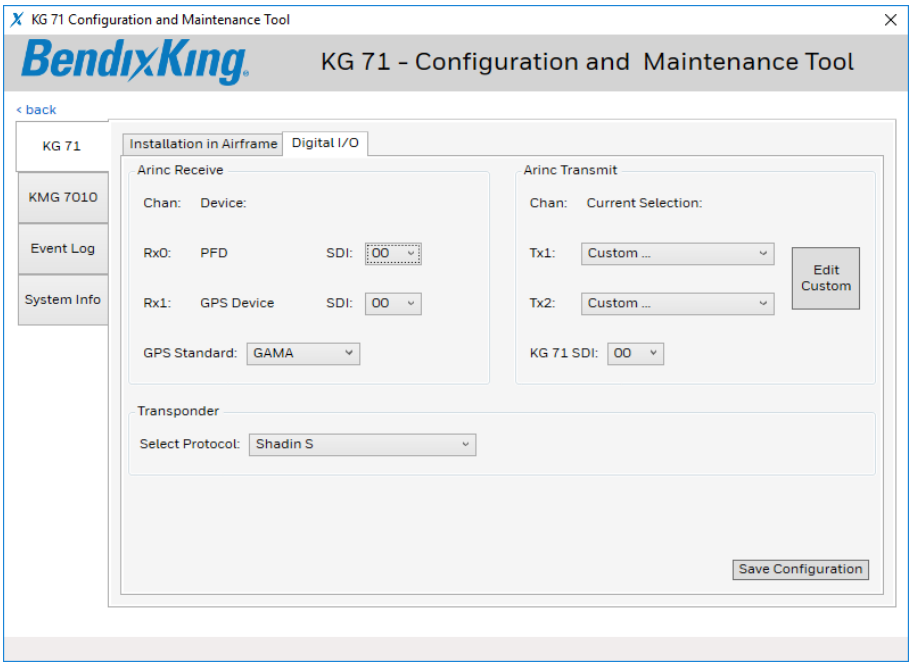

Figure 6-50 CMT Page for Digital I/O Configuration

The KG 71EXP needs to receive the following GPS data for correct operation:

(1) Present Position – Latitude
(2) Present Position – Longitude
(3) Ground Speed
(4) Track Angle

The KG 71EXP is able to support GAMA standard or ARINC 743A GPS data standard to receive this data. The ARINC receive channel Rx1 (dedicated for the GPS Navigator) can be configured as follows:

(1) SDI can be set to values 00, 01, 10, 11. The value must be the same as the SDI of labels which are provided by the GPS Navigator.
(2) GPS Standard:
    (a) GAMA - if GPS meets the GAMA standard (common for General Aviation GPS navigators)
    (b) ARINC 743A - for the GPS systems which meets ARINC 743A standard.

The technician must select proper standard as different labels are assigned to the required parameters under these two standards.

6.3.1.3 ARINC 429 Transmit Channel Configuration

In addition to the dedicated transmit channel for communication with the KSD 100EXP, the KG 71EXP provides two ARINC 429 Transmit channels which can be used for other devices, such as TAWS, TCAS/ TAS, GPS navigators that may require heading or air data parameters. Each of the two Transmit (Tx) channels can be configured differently – based on the particular airplane integration needs.

The transmit channel configuration is set using a drop down list illustrated in Figure 6-51.

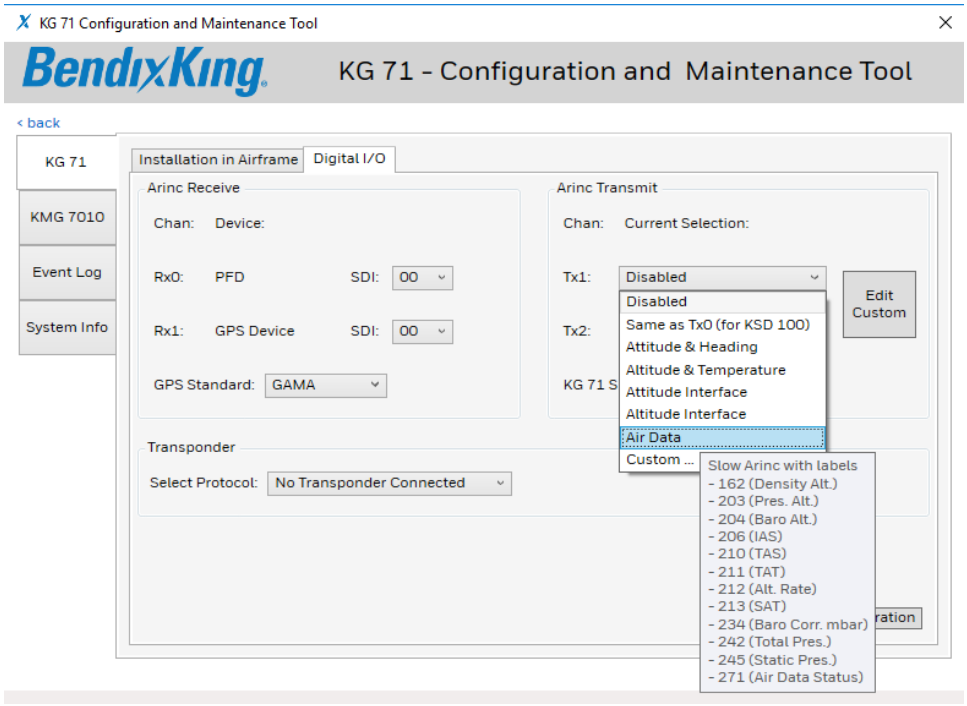

Figure 6-51 KG 71EXP ARINC Transmit Drop-down List

The following subsections describe the supported configuration options for the two A429 Tx channels.

When the KG 71EXP I/O configuration setup is complete, the technician will press the **Save Configuration** button to save and store the configuration values.

6.3.1.3.1 Same as Tx0 (for KSD 100EXP)

The transmit channel can be configured in the same manner as the Tx channel which is dedicated for communication with the KSD 100EXP.

6.3.1.3.2 Attitude & Heading

The transmit channel can be configured to support existing AHRS systems with a basic set of attitude and heading data. This configuration sets transmit channel as High Speed A429. The KG 71EXP will send out the following labels:

(1) 320 – Magnetic Heading, transmit rate 20 Hz
(2) 324 – Pitch Angle, transmit rate 80 Hz

6.3.1.3.3 Altitude & Temperature

The transmit channel can be configured to support existing systems with air data. This configuration sets the transmit channel as Low Speed A429. The KG 71EXP will send out the following labels:

(1) 203 – Pressure Altitude, transmit rate 20 Hz
(2) 204 – Baro-Corrected Altitude, transmit rate 20 Hz
(3) 212 – Altitude Rate, transmit rate 20 Hz
(4) 213 – Static Air Temperature, transmit rate 20 Hz
(5) 234 – Baro Correction (mbar), transmit rate 20 Hz

6.3.1.3.4 Air Data

The transmit channel is be used to support air data values. This configuration sets transmit channel as Low Speed A429. The KG 71EXP will send out the following labels:

(1) 162 – Density Altitude, transmit rate 5 Hz
(2) 203 – Altitude, transmit rate 20 Hz
(3) 204 – Baro-Corrected Altitude, transmit rate 5 Hz
(4) 206 – Computed Airspeed, transmit rate 20 Hz
(5) 210 – True Airspeed, transmit rate 20 Hz
(6) 211 – Total Air Temperature, transmit rate 5 Hz
(7) 212 – Altitude Rate, transmit rate 20 Hz
(8) 213 – Static Air Temperature, transmit rate 5 Hz
(9) 234 – Baro Correction (mb), transmit rate 20 Hz
(10) 242 – Total Pressure, transmit rate 20 Hz
(11) 245 – Static Pressure, transmit rate 20 Hz
(12) 271 – Air Data Discrete Status, transmit rate 5 Hz

6.3.1.3.5 Attitude Interface

The transmit channel can be configured to support existing systems with an attitude output only. This configuration sets transmit channel as High Speed A429. The KG 71EXP will send out the following labels:

(1) 324 – Pitch Angle, transmit rate 80 Hz
(2) 325 – Roll Angle, transmit rate 80 Hz

6.3.1.3.6 Altitude Interface

The transmit channel can be configured to support existing systems with an altitude data set. This configuration sets transmit channel as Low Speed A429. The KG 71EXP will send out following labels:

(1) 203 – Pressure Altitude, transmit rate 20 Hz
(2) 204 – Baro Corrected Altitude, transmit rate 20 Hz

6.3.1.3.7 Custom Configuration

In addition to the pre-defined configurations, the KG 71EXP allows custom configuration of each transmit channel. If this option is selected all the outgoing AHRS and Air Data labels listed in Table 6-5 and Table 6-6 are available to be configured. If the Custom option is selected from the drop down menu, the technician can customize both of the ARINC ADC transmit channel labels by pressing the **Edit Custom** button from the “Digital I/O” tab (shown in Figure 6-50 CMT Page for Digital I/O Configuration). The labels values are entered on the ARINC Transmit Channel Custom Configuration screen, shown in Figure 6-52 below.

NOTE

IN THE DIGITAL I/O TAB OF THE CMT EITHER OR BOTH TX CHANNELS CAN BE SET TO CUSTOM. IF ONLY ONE TRANSMIT CHANNEL IS SET TO “CUSTOM”, THE CUSTOM CONFIGURATION OF THE OTHER TRANSMIT CHANNEL WILL BE IGNORED.

NOTE

CHANGES IN CUSTOM CONFIGURATION WILL BE DISCARDED IF THE “<BACK” LINK AT THE LEFT-UPPER CORNER IS SELECTED INSTEAD OF “OK” SELECTION BUTTON.

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Table 6-5 KG 71EXP AHRS Output Labels

Label ID (Octal)	Label Name	Label Type	Default Transmit Rate [Hz]
377	Equipment Identification	DISC	80
270	AHRS Discrete#1	DISC	80
320	Magnetic Heading	BNR	80
324	Pitch Angle	BNR	80
325	Roll Angle	BNR	80
326	Body Pitch Rate	BNR	80
327	Body Roll Rate	BNR	80
330	Body Yaw Rate	BNR	80
331	Body Longitudinal Acceleration	BNR	80
332	Body Lateral Acceleration	BNR	80
333	Body Normal Acceleration	BNR	80
336	Inertial Pitch Rate	BNR	80
337	Inertial Roll Rate	BNR	80
340	Inertial Yaw Rate	BNR	80
364	Vertical Acceleration	BNR	80
365	Inertial Vertical Velocity	BNR	80

Table 6-6 KG 71EXP Air Data Output Labels

Label ID (Octal)	Label Name	Label Type	Default Transmit Rate [Hz]
377	Equipment Identification	DISC	20
162	Density Altitude	BNR	20
203	Altitude	BNR	20
204	Baro-Corrected Altitude	BNR	20
206	Computed Airspeed	BNR	20
210	True Airspeed	BNR	20
211	Total Air Temperature	BNR	20
212	Altitude Rate	BNR	20
213	Static Air Temperature	BNR	20
234	Baro Correction (mb)	BNR	20
242	Total Pressure	BNR	80

Table 6-6 KG 71EXP Air Data Output Labels

Label ID (Octal)	Label Name	Label Type	Default Transmit Rate [Hz]
245	Static Pressure	BNR	80
271	Air Data Discrete	DISC	80

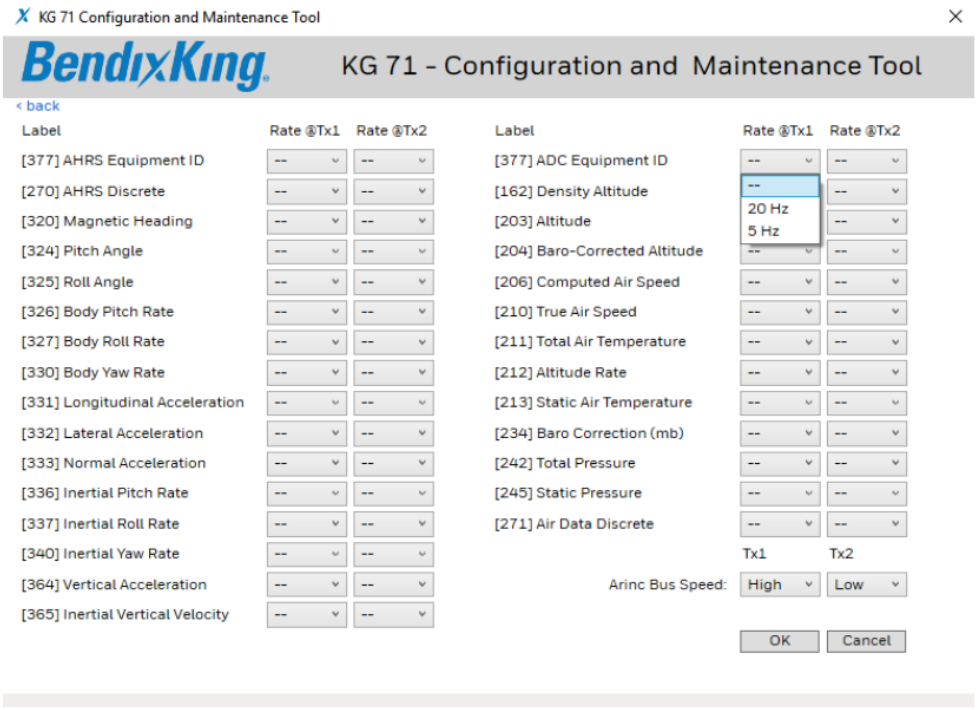

Figure 6-52 ARINC Transmit Channel Custom Configuration

Each channel can be configured to High Speed or Low Speed from the two drop-down lists at the right-bottom side of the page. All available labels are listed on the page with rate option. If "- -" are displayed in the Rate drop-down list for a specific label, then that label is not transmitted. The technician can select any combination of AHRS and ADC labels to send out. If the rate for the label is selected, the label will be transmitted at that rate. Once ARINC Bus Speed and all required labels and rates are selected, the technician will click **Save Selection** button at the bottom of the page. The **Save Selection** button will store the custom configuration and return to the Digital I/O page.

NOTE

NUMBER OF LABELS WHICH CAN BE SENT AT LOW SPEED ARINC IS LIMITED. IF THE COMBINATION OF SELECTED LABELS AND RATES EXCEED THE LOW SPEED ARINC THROUGHPUT, THE SAVE SELECTION BUTTON BECOMES NOT AVAILABLE.

The following formula can be used for the check that low speed ARINC will be able to transmit all selected labels at selected rates:

X + Ceiling(Y/4) + Ceiling(Z/16) <= 4; where:

- X – is a number of labels transmitted at 80 Hz
- Y – is a number of labels transmitted at 20 Hz
- Z – is a number of labels transmitted at 5 Hz
- Ceiling is a function which maps a number to nearest higher integer

6.3.1.4 KG 71EXP Transponder Serial Interface

The KG 71EXP has two serial interfaces. One interface is dedicated to maintenance and the second can be used for communication with other systems – typically with transponders. The CMT provides the means for the technician to configure this serial port. The Transponder serial interface is configured using the Select Protocol pull-down list on the Transponder section of the KG 71 CMT page as illustrated in Figure 6-50.

The KG 71EXP Serial interface can be configured to use one of the following protocols:

(1) Icarus 10’
(2) Icarus 100’
(3) SHADIN S
(4) SHADIN M
(5) BendixKing Format C

6.4 KMG 7010/MD32 Calibration (Magnetometer)

NOTE

THE AIRPLANE MUST BE LEVELED AT THE ZERO PITCH AND ZERO ROLL POSITION PER THE AIRPLANE MANUFACTURER’S MAINTENANCE MANUAL (WITH ACCURACY ±0.25 DEGREES) BEFORE MEASURING THE MAGNETOMETER OFFSETS.

NOTE

THE KMG 7010/MD32 CALIBRATION MUST BE PERFORMED TOGETHER WITH THE KG 71EXP OFFSETS MEASUREMENT. PERFORM AT THE SAME LEVELING POSITION TO ENSURE THAT THE AIRPLANE IS IN THE SAME REFERENCE POSITION FOR BOTH KG 71EXP AND KMG 7010/MD32 CALIBRATIONS.

The KG 71EXP system supports 24 different installation orientations for the KMG 7010/MD32 Magnetometer. Table 6-7 KMG 7010/MD32 Installation Orientation Options can be used to identify the physical orientation of the KMG 7010/MD32 in the airplane. The CMT application provides the means for the technician to enter which orientation is applicable for the particular installation. Once the KMG 7010/MD32 installation orientation is confirmed by the technician, the CMT application will transmit that information via the maintenance interface into the KG 71EXP and the KG 71EXP will store that information into NVM.

Orientations in the CMT do not match the MD32 orientations. Use Table 6-7 to map the MD32 orientations to the corresponding CMT image and number.

Table 6-7 KMG 7010/MD32 Installation Orientation Options

KMG Mounting Location	KMG Connector Location	MD32 Mounting Location	MD32 Connector Location	KMG CMT Image #
Up	Back	Down	Right	7
Up	Left	Down	Back	16
Up	Front	Down	Left	3
Up	Right	Down	Front	15
Down	Back	Up	Left	5
Down	Left	Up	Front	14
Down	Front	Up	Right	1
Down	Right	Up	Back	13
Back	Down	Front	Right	10
Back	Left	Front	Down	20
Back	Up	Front	Left	12
Back	Right	Front	Up	18
Front	Up	Back	Right	9
Front	Right	Back	Down	17
Front	Down	Back	Left	11
Front	Left	Back	Up	19
Left	Back	Right	Up	6
Left	Down	Right	Back	22
Left	Front	Right	Down	2
Left	Up	Right	Front	23
Right	Back	Left	Down	8
Right	Down	Left	Front	21
Right	Front	Left	Up	4
Right	Up	Left	Back	24

The KMG 7010 calibration page provides the interface for following procedures:

- Set the magnetometer installation orientation and enter the tilt angles
- Perform the magnetometer compensation

6.4.1 Magnetometer Installation Orientation

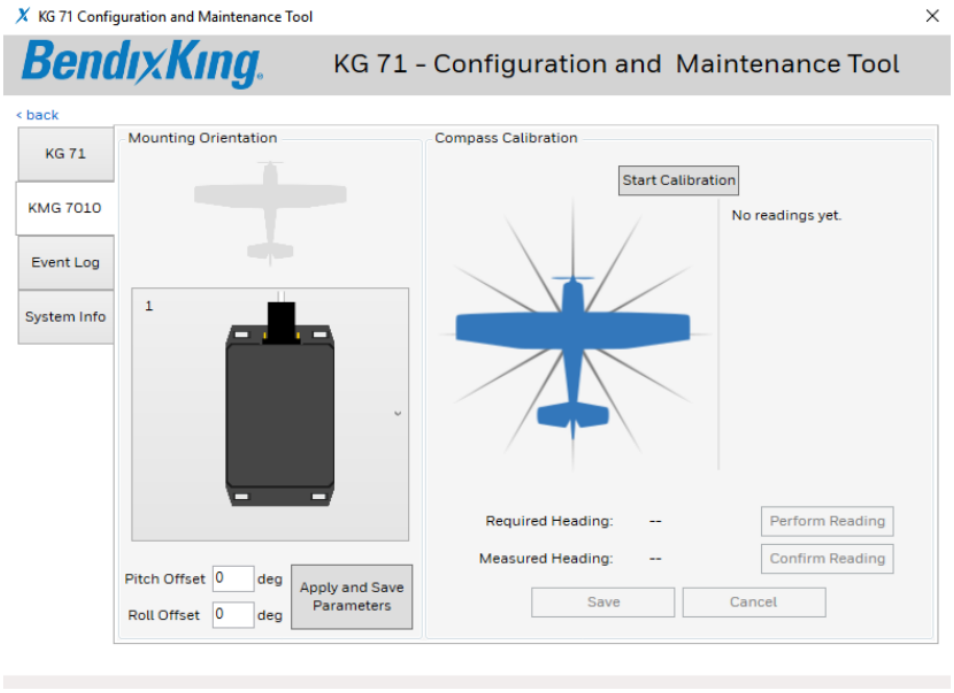

Figure 6-53 KMG 7010 Calibration Page

NOTE

THE STANDARD CONVENTION FOR ROLL MEASUREMENT: RIGHT WING DOWN IS A POSITIVE ROLL ANGLE. THE STANDARD CONVENTION FOR PITCH MEASUREMENT: NOSE UP IS A POSITIVE PITCH ANGLE.

As shown in Figure 6-53, once the mounting orientation is selected, the technician must enter the measured pitch offset and roll offset of the KMG 7010/MD32.

(1) Select mounting orientation, as shown in Figure 6-53.
(2) Using the inclinometer, measure the angles at the KMG 7010/MD32 for both the pitch and roll axis.

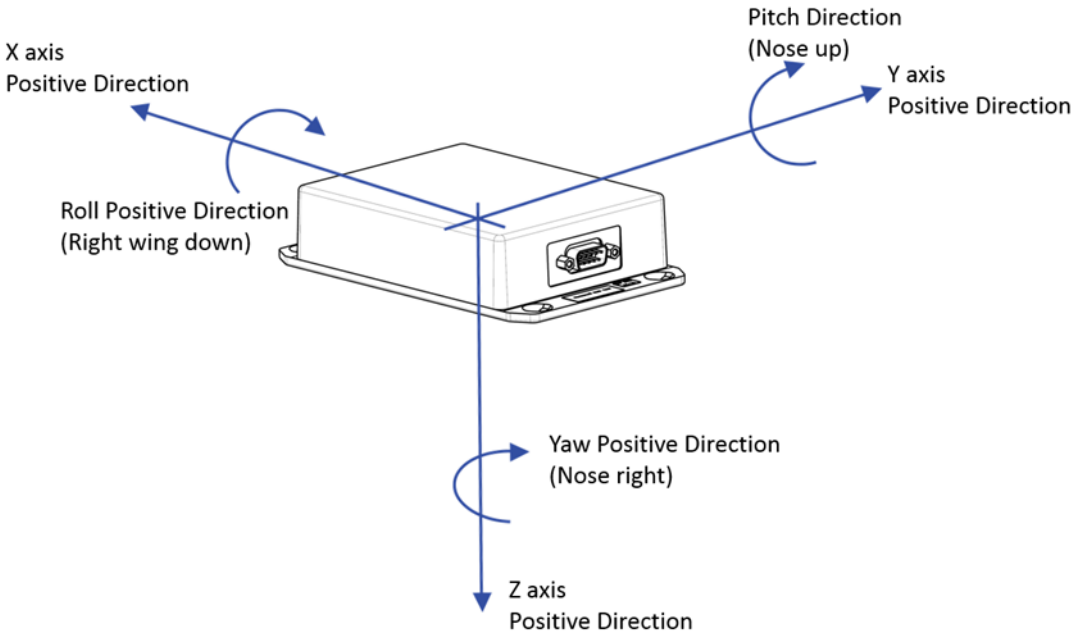

Figure 6-54 X, Y, Z Axis Positive Direction

NOTE

FIGURE 6-54 ILLUSTRATES THE KMG 7010/MD32 IN ORIENTATION # 5 (KMG 7010) AND # 16 (MD32) (AS DEPICTED IN TABLE 6-7). THE X,Y, AND Z AXES ARE IN REFERENCE TO THE AIRPLANE COORDINATE SYSTEM AND ARE NOT DEPENDENT ON THE KMG 7010/MD32 ORIENTATION.

(3) Enter the pitch and roll offsets in the Pitch Offset and Roll Offset fields on the CMT KMG 7010 configuration page.

NOTE

THE ACCURACY OF THE OFFSET MEASUREMENT IS CRITICAL TO THE SUCCESSFUL MAG COMPENSATION AND SUBSEQUENT COMPASS SWING. CAREFUL MEASUREMENT WITH A CALIBRATED INCLINOMETER WITH ACCURACY TO 0.1 DEGREES IS REQUIRED.

(4) Once mounting orientation is selected and magnetometer offsets are entered, press the Apply and Save Parameters button. Once the magnetometer offsets have been entered and while aircraft is leveled, the maintenance connection can be disconnected and the KG 71EXP circuit breaker can be cycled and pitch and roll should be displayed as zero on the KSD 100EXP.

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6.4.2 Magnetometer Compensation

NOTE

BEFORE THE MAGNETOMETER CALIBRATION PROCEDURE IS STARTED, THE KG 71EXP ORIENTATION AND INSTALLATION OFFSETS MUST BE ENTERED AND SAVED. OTHERWISE THE HEADING CALCULATION PERFORMED DURING THE MAGNETOMETER COMPENSATION WILL BE ERRONEOUS.

The “Required Heading” and “Measured Heading” fields become active after magnetometer calibration is started. These fields display “--” before the calibration process is started.

The KG 71EXP uses a 12-points compensation procedure with 30 degree increments. The airplane needs to be physically oriented during the procedure to the following magnetic headings: 360, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330 degrees. An airport compass rose or a landing compass with an accuracy of ± 2 degrees will be used to place the airplane at the correct headings. The proper magnetometer configuration and calibration is required for correct system operation.

NOTE

THE FOLLOWING PROCEDURES SHOULD BE COMPLETED WITH ENGINE(S) RUNNING AND ALL AVIONICS ON. PERFORM AT A MAGNETICALLY UNDISTURBED PORTION OF THE APRON. MAGNETIC HEADING SHOULD BE DETERMINED USING THE CALIBRATED COMPASS ROSE AREA OR BY CALIBRATED MAGNETIC COMPASS.

NOTE

MAGNETIC FIELD STABILITY IS DETERMINED BY THE KG 71EXP FROM THE KMG 7010/ MD32 MAGNETIC VECTOR DATA.

IF THE MAGNETIC VECTOR DATA IS STABLE (VARIANCE OF INCOMING SIGNAL IS LOW), THE KG 71EXP CALCULATES THE HEADING VALUE FROM THE MAGNETIC DATA AND THE VALUE IS DISPLAYED IN THE MEASURED HEADING FIELD AS ILLUSTRATED IN Figure 6-55.

IF THE MAGNETIC VECTOR DATA IS UNSTABLE (IF THE MEASUREMENT IS DISTURBED), THE CMT APPLICATION PROVIDES THIS INFORMATION TO THE TECHNICIAN TO REPEAT STEPS. IF THE PROBLEM IS PERSISTENT, FOLLOW TROUBLESHOOTING PROCEDURES TO REMOVE THE MAGNETIC DISTURBANCE, REFER TO SECTION 8.4.1.

WAIT 30 TO 60 SECONDS AT EACH HEADING FOR READING TO STABILIZE.

(1) With the airplane on the compass rose, align the nose of the airplane to the North position.
(2) Start the magnetometer calibration procedure on the CMT application by selecting the Start Calibration button on the KMG 7010 page.
(3) Follow the CMT application display and rotate the airplane to the required heading value, it should begin with 360 degrees.
(4) Once the airplane is physically oriented to the specified heading, wait 30 - 60 seconds for the reading to stabilize.

(5) Once the specified heading is stable, press the Perform Reading button on the CMT screen.
(6) Verify that the Measured Heading value is within ± 9 degrees:
    (a) If the value is within range, press the Confirm Reading button, refer to Figure 6-55.
    (b) If the value is out of the range, correct the airplane heading and repeat the steps above, beginning with Step 4, to re-establish a measured heading value.
(7) Repeat steps 3 through 6 above for each 30 degree increment.

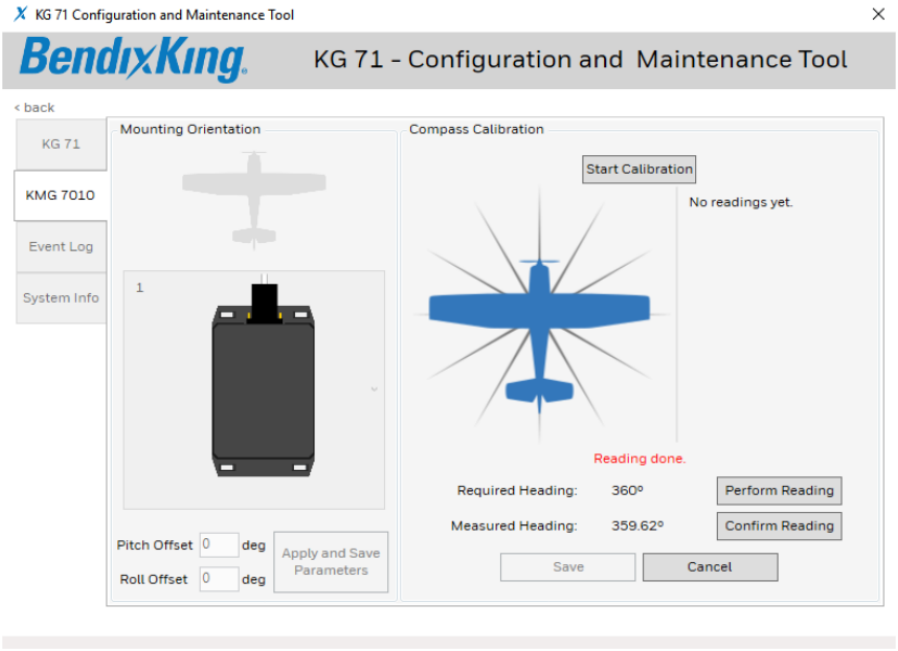

Figure 6-55 KMG 7010/MD32 Calibration Reading

(8) When all required heading points are measured, the CMT application will report successful completion of the magnetometer compensation, refer to Figure 6-56. Confirm storage of parameters into the KG 71EXP NVM by pressing the Save button.

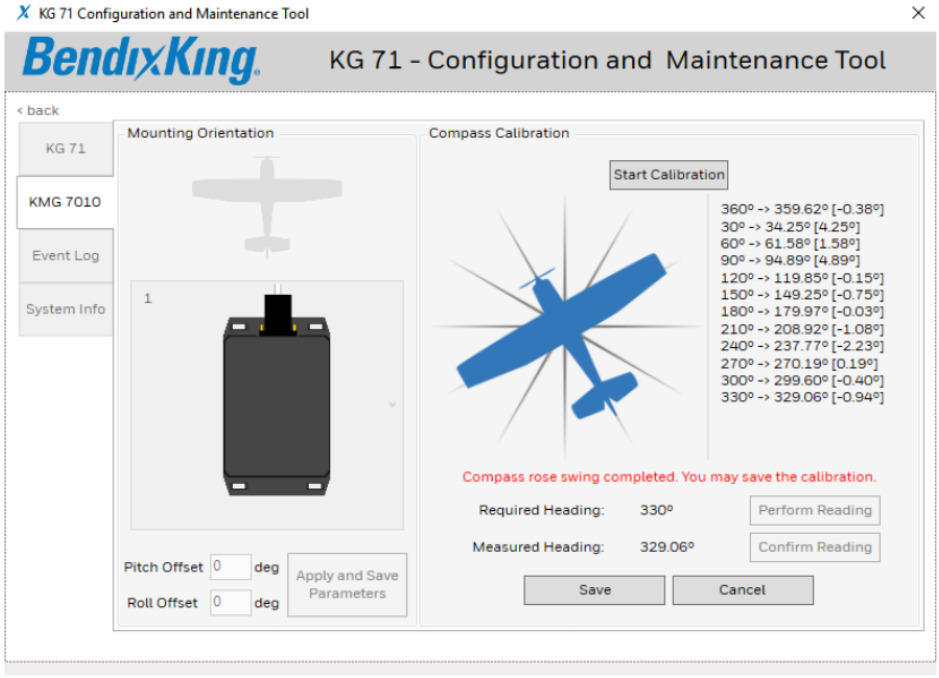

Figure 6-56 Completion of Magnetometer Calibration

NOTE

ANY PREVIOUSLY ENTERED MEASURED PITCH AND/OR ROLL OFFSETS WILL REMAIN IN THE KG 71EXP MEMORY UNTIL THE SAVE BUTTON IS SELECTED. RESELECTING THE KMG 7010/MD32 MOUNTING ORIENTATION TO THE ORIENTATION FROM WHICH EXISTING OFFSETS HAVE BEEN GENERATED WILL RESULT IN THE DISPLAY OF THOSE SAVED PITCH AND ROLL OFFSET VALUES.

(9) Exit the CMT application software and disconnect the maintenance PC from the KG 71EXP maintenance port.

(10) Pull and reset the ADAHRS circuit breaker to cycle power on the KG 71EXP.

(11) Pull and reset the PFD circuit breaker to cycle power on the KSD 100EXP.

(12) With the KSD 100EXP in normal mode, verify the heading values, displayed on the PFD, orientation in 4 directions (North, 90, 180, and 270 degrees). Verify accuracy of ± 2 degrees of the airplane's orientation and verify drift from each of the target heading values is not observed. This satisfies the post installation heading check in Section 7.2.2 Heading Checkout.

(13) With engines running pneumatic pitch and roll standby instrument can be compared with KSD pitch and roll for accuracy. This satisfies the post installation attitude check in Section 7.2.1 Attitude Checkout.

6.5 KTP 73 Configuration (Outside Air Temperature Probe)

There are no configuration settings for the KTP 73 Temperature Probe.

7 SYSTEM CHECKOUT

This section defines the requirements for configuring the installed xVue Touch System and the procedures for verifying that all systems are operational. The system configuration must be accomplished before proceeding to the ground and flight tests.

7.1 Recommended Test Equipment

The following test equipment is recommended to complete the post installation checkout procedures in this section:

(1) Pitot/static tester
(2) NAV/ILS Signal Generator
(3) Digital Multimeter
(4) Electrical Bonding Tester

All test equipment should have applicable calibration records that are current.

7.2 xVue Touch System Post Installation System Checkout

The KSD 100EXP is configured using the touch screen, shown in Figure 7-1, and the Menu button, Figure 7-2.

Figure 7-1 KSD 100EXP Screen

Figure 7-2 Menu Button

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7.2.1 Attitude Checkout

Attitude checkout was performed as outlined in Section 6.4.2 Magnetometer Compensation when the airplane was leveled in pitch and roll or at known pitch and roll angles, the KSD 100EXP pitch and roll attitude were visually matched to the known angles. Refer to Section 6.3 KG 71EXP Configuration (ADAHRS) and Section 6.4 KMG 7010/MD32 Calibration (Magnetometer) for the initial heading checkout completed with the xVue Touch System setup.

7.2.2 Heading Checkout

Heading checkout was performed as outlined in Section 6.4.2 Magnetometer Compensation using an airport compass rose or a landing compass with an accuracy of ± 2 degrees for airplane orientation. The heading value displayed on the PFD should be within ± 2 degrees of the airplane's orientation.

7.2.3 Leak Test

Using the instructions provided in the airplane maintenance manual or with the pitot/static tester, connect the tester to the airplane pitot static system and perform a leak check of the system. This may be conducted concurrently with the Altitude Display/Vertical Display Checkout.

CAUTION

DO NOT, AT ANY TIME, EXCEED THE MAXIMUM VALUES OF AIRSPEED, VERTICAL SPEED, AND ALTITUDE ESTABLISHED IN THE AIRPLANE AFM OR POH. EXCEEDING MAXIMUM VALUES COULD DAMAGE THE KFD 900 SYSTEM OR ANY OF THE INSTRUMENTS CURRENTLY INSTALLED.

CAUTION

DO NOT, AT ANY TIME, EXCEED THE MAXIMUM CAPABILITY FOR THE XVUE TOUCH SYSTEM EQUIPMENT, AS DOCUMENTED IN SECTION 2.5 ENVIRONMENTAL QUALIFICATION FORM (EQF).

7.2.4 Altitude Display/Vertical Display and Standby Altimeter Checkout

The following procedure requires the pitot/static tester be connected to the airplane pitot static system using the instructions provided in the airplane maintenance manual or with the tester. This may be conducted concurrently with the Leak Test.

CAUTION

SOME TEST POINTS LISTED IN TABLE 7-1 MAY EXCEED THE CAPABILITY OF SPECIFIC AIRPLANES. TO AVOID HARMING INSTALLED EQUIPMENT, DO NOT EXCEED THE AIRPLANE SERVICE CEILING AND MAXIMUM AIRSPEED SPECIFIED IN THE AFM OR POH.

NOTE

COMPLETE A PITOT AND STATIC LEAK CHECK PRIOR TO ANY ALTITUDE AND AIRSPEED CHECKS.

(1) Set the BARO to 29.92 IN or 1013 HPA.
(2) Set the pitot/static tester to an altitude listed in 14 CFR Part 43 Appendix E Table 1, such that the altitude is at least 3,000 ft. or more above the field elevation at a rate of 500 feet per minute (fpm).
(3) Validate that the VSI needle shows a rate of 500 fpm climb.
(4) Set ground conditions on the pitot/static tester and perform the applicable test points.
(5) When the altitude set in the pitot/static tester is achieved and stabilized, verify that the KSD 100EXP altitude tape and standby altimeter display the same altitude as the pitot/static tester ± the tolerance listed in 14 CFR Part 43 Appendix E Table 1.

The test tolerance values from 14 CFR Part 43 Appendix E Table 1 are listed in Table 7-1 for reference.

Table 7-1 Test Tolerance from 14 CFR Part 43 Appendix E Table 1

Altitude	Equivalent Pressure (Inches of Mercury)	Tolerance ± (Feet)
−1,000	31.018	20
0	29.921	20
500	29.385	20
1,000	28.856	20
1,500	28.335	25
2,000	27.821	30
3,000	26.817	30
4,000	25.842	35
6,000	23.978	40
8,000	22.225	60
10,000	20.577	80
12,000	19.029	90
14,000	17.577	100
16,000	16.216	110
18,000	14.942	120
20,000	13.75	130
22,000	12.636	140
25,000	11.104	155
30,000	8.885	180
35,000	7.041	205
40,000	5.538	230
45,000	4.355	255
50,000	3.425	280

7.2.5 Airspeed Display and Standby Airspeed Indicator Checkout

The following procedure requires the pitot/static tester be connected to the airplane pitot static system using the instructions provided in the airplane maintenance manual or with the tester. Prior to this checkout, set the airplane V-speeds per Section 6.2.2.2.

(1) Turn on Airspeed Labels

(a) From the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2.

(b) From the Menu, Figure 7-6, press the PFD button to launch the PFD Menu, Figure 7-7.

(c) Press the PFD Setup button, Figure 7-3.

(d) On the PFD Setup sub-menu press the Airspeed Labels button, Figure 7-4, and ensure that Airspeed Labels are toggled on.

Figure 7-3 PFD Setup Sub-Menu

Figure 7-4 Airspeed Labels Button

(2) Verify the airspeed units (KTS OR MPH) set during the configuration, Section 6.2.1.8, match the units displayed in the selected airspeed box, located above the airspeed tape.

(3) Slowly increase the speed of the pitot/static system tester and confirm the displayed V-Speed values match the airspeeds documented for the airplane in the AFM, POH, and placarding.

(4) Using the airplane's airspeed limitations from the AFM, POH, and placards, verify the correct color band is associated with each V-Speed and that color bands on KSD 100EXP and standby airspeed Indicator are same. For multi-engine airplanes, verify that VMC and/or VYSE has been set, then verify the red/blue horizontal lines are set correctly.

(5) Decrease the airspeed to zero.

(6) Set the altitude to the current location elevation.

(7) Disconnect the pitot/static tester.

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7.2.6 Outside Air Temperature Checkout

There are no calibration requirements for the temperature probe. Verify the data provided by the OAT is displaying the current ambient temperature within ±3°C.

7.2.7 GPS Receiver

The following procedure requires the airplane to be located outside of the installation hanger, with the GPS antenna(s) having a clear view of the sky/GPS satellite constellation, to allow for display of GPS data on the KSD 100EXP.

(1) Ensure the airplane is located outside.
(2) On the Navigator, ensure the GPS has acquired a position by verifying the airplane ownship on the GPS display or through the GPS status page (available on most GPS systems).
(3) On the Navigator, clear any existing Flight Plan, and enter a Direct-To waypoint with a known location relative to the airplanes current position.
(4) On the Navigator, set the CDI switch to GPS.
    (a) A GPS/Nav Radio Navigator CDI switch can be set to either GPS or VLOC.
    (b) A GPS only Navigator will not have a CDI switch, and this step 4 can be ignored.
(5) From the KSD 100EXP screen, press the CDI button located at the bottom of the PFD screen, Figure 7-1.
(6) From the CDI Source sub-menu, Figure 7-5, set the navigation source to either “NAV1” or “GPS1”.
    (a) A GPS/Nav Radio Navigator will be displayed as “NAV1”.
    (b) A GPS only Navigator will be displayed as “GPS1”.

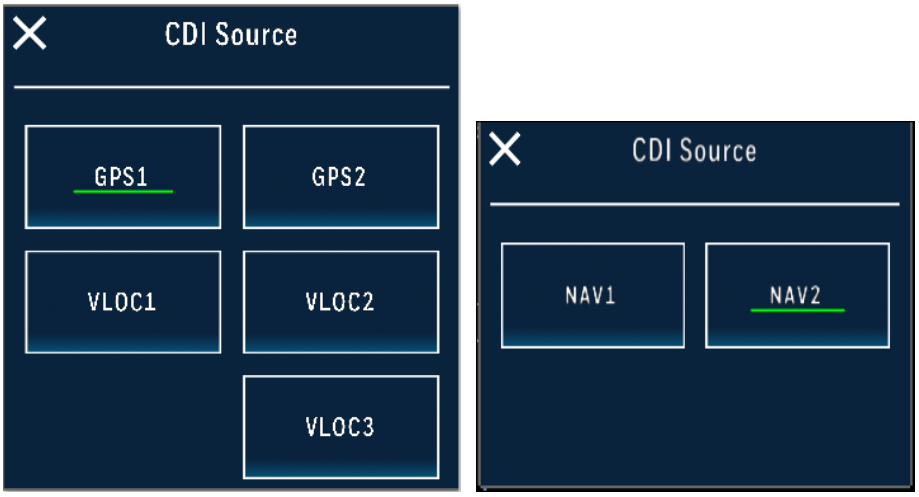

Figure 7-5 CDI Source Sub-Menu (Options Shown For Reference)

(7) Press the “X” button to close the CDI Source sub-menu and return to the KSD 100EXP screen.
(8) From the KSD 100 EXP screen, Figure 7-1, press the Menu button, Figure 7-2, located at the top right.

(9) From the Menu, Figure 7-6, press the PFD button to launch the PFD Menu, Figure 7-7.

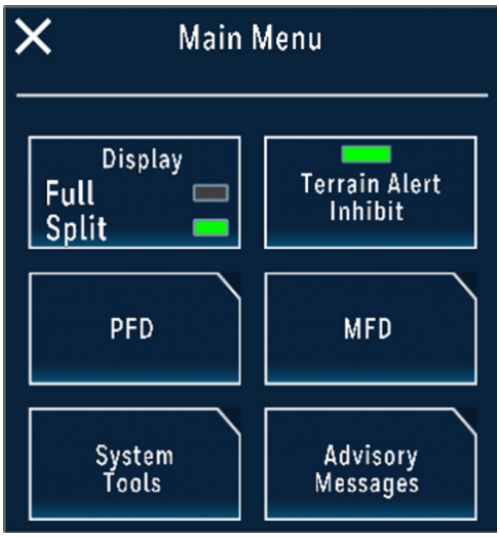

Figure 7-6 Main Menu

Figure 7-7 PFD Menu

(10) From the PFD Menu, press the Bearing Pointers button, to launch the Bearing Pointers sub-menu, Figure 7-8.

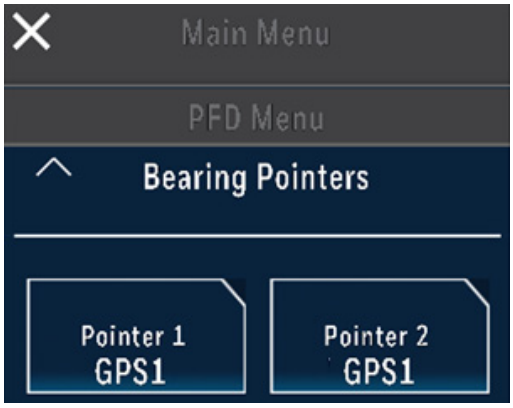

Figure 7-8 Bearing Pointers Sub-Menu

(11) From the Bearing Pointers sub-menu, press the Pointer 1 button and set the Bearing 1 source to GPS1, Figure 7-9.

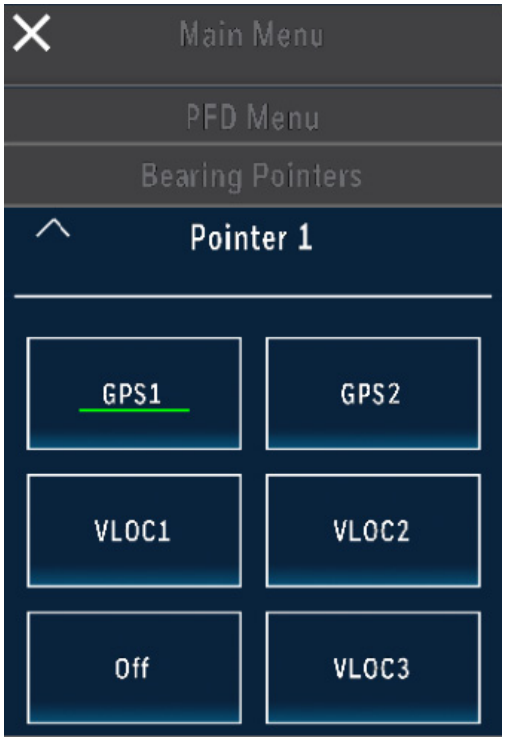

Figure 7-9 Pointer 1 Sub-Menu

(12) From the Pointer 1 sub-menu, press the Up Arrow "^" button to return to the Bearing Pointers sub-menu.

(13) From the Bearing Pointers sub-menu, Figure 7-8, press the Pointer 2 button and set the source to GPS1, Figure 7-9.

(14) Close the Main Menu, by pressing the "X" button, to return to the KSD 100EXP screen.

(15) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to "GPS1", displayed in magenta.

(b) Verify the CDI CRS numeric value and CDI course pointer matches the GPS Navigators desired track (DTK).

(c) Verify the CDI course deviation (left/right) matches the GPS Navigators CDI deviation.

(d) Verify the Bearing Pointer 1 and Bearing Pointer 2 sources are set to “GPS1”.

(e) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 are both pointing in the direction of the Navigators Direct-To waypoint, relative to the airplane position.

(16) On the Navigator, clear the existing Flight Plan/Direct-To.

(17) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “GPS1”, displayed in magenta.

(b) Verify the CDI course deviation (left/right) is removed from the PFD CDI.

(c) Verify the Bearing Pointer 1 and Bearing Pointer 2 sources are set to “GPS1”.

(d) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 are both removed from the PFD CDI.

(18) On the Navigator, enter a new flight plan with the TO waypoint being an OBS defined course.

(19) On the KCP 100EXP, press the CRS knob to sync the CDI CRS numeric value and CDI course pointer to current GPS1 bearing.

(20) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “GPS1”, displayed in magenta.

(b) Verify the CDI course deviation is centered with no left/right deflection.

(c) Verify the CDI CRS numeric value and CDI course pointer matches the Bearing Pointer 1 and Bearing Pointer 2.

(21) On the KCP 100EXP, rotate the CRS knob counterclockwise such that the CDI course pointer is to the left of the GPS1 bearing.

(22) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “GPS1”, displayed in magenta.

(b) Verify the CDI course deviation is deflected to the right (towards the bearing pointers).

(23) On the KCP 100EXP, rotate the CRS knob clockwise such that the CDI course pointer is to the right of the GPS1 bearing.

(24) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “GPS1”, displayed in magenta.

(b) Verify the CDI course deviation is deflected to the left (towards the bearing pointers).

(25) If a second GPS Navigator is installed in the airplane, repeat the above steps for “NAV2” or “GPS2”.

(a) A second GPS/Nav Radio Navigator will be displayed as “NAV2”.

(b) A second GPS only Navigator will be displayed as “GPS2”.

7.2.8 NAV Receiver

A VHF Radio Navigation Tester (for example, a Nav 401L for testing and calibration of, VOR, LOC, and G/S) is required for the following procedure. To comply with 14 CFR Part 91.171 the maximum permissible indicated bearing error is ± 4 degrees for IFR operations.

(1) On the Navigator, tune/activate the VHF radio to a valid VOR frequency.

(2) On the Navigator, set the CDI switch to VLOC.

(a) A GPS/Nav Radio Navigator CDI switch can be set to either GPS or VLOC.

(b) A Nav Radio Navigator will not have a CDI switch, and this step 2 can be ignored.

(3) From the KSD 100EXP screen, press the CDI button located at the bottom of the PFD screen, Figure 7-1.

(4) From the CDI Source sub-menu, Figure 7-5, set the navigation source to either “NAV1” or “VLOC1”.
   (a) A GPS/Nav Radio Navigator will be displayed as “NAV1”.
   (b) A Nav Radio only Navigator will be displayed as “VLOC1”.

(5) Press the “X” button to close the CDI Source sub-menu and return to the KSD 100EXP screen.

(6) From the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2, located at the top right.

(7) From the Menu, Figure 7-6, press the PFD button to launch the PFD Menu, Figure 7-7.

(8) From the PFD Menu, press the Bearing Pointers button, to launch the Bearing Pointers sub-menu, Figure 7-8.

(9) From the Bearing Pointers sub-menu, press the Pointer 1 button and set the Bearing 1 source to VLOC1, Figure 7-9.

(10) From the Pointer 1 sub-menu, press the Up Arrow “^” button to return to the Bearing Pointers sub-menu.

(11) From the Bearing Pointers sub-menu, Figure 7-8, press the Pointer 2 button and set the source to VLOC1, Figure 7-9.

(12) Close the Main Menu, by pressing the “X” button, to return to the KSD 100EXP screen.

(13) On the VHF Radio Tester, set the mode to VOR and tune the same VOR frequency as displayed on the Navigator (see step 1 above).

(14) On the VHF Radio Tester, set the VOR bearing output to the following 4 test points and observe the Bearing Pointer 1 and Bearing Pointer 2 on the KSD 100EXP:
   (a) 45 degrees
   (b) 135 degrees
   (c) 225 degrees
   (d) 315 degrees

(15) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the Bearing Pointer 1 and Bearing Pointer 2 sources are set to “VLOC1”.
   (c) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 were both pointing to the same VOR bearing outputs called out in step 14 (i.e., 45, 135, 225, and 315).

(16) On the VHF Radio Tester, set the VOR bearing output to 100 degrees.

(17) From the KSD 100EXP screen, Figure 7-1, press the CRS button, Figure 7-10, and press the SYNC button, Figure 7-11, to sync the course pointer to the current bearing (100 degrees).

Figure 7-10 CRS Button (Value Shown for Reference Only)

Figure 7-11 SYNC Button (Value Shown for Reference Only)

(18) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the CDI CRS numeric value and CDI course pointer are both set to 100 degrees.
   (c) Verify the CDI course deviation is centered with no left/right deflection.
   (d) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 are both pointing to 100 degrees.

(19) On the KCP 100EXP, rotate the CRS knob until the CDI CRS numeric value and CDI course pointer are both set to 105 degrees.

(20) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the CDI course deviation is deflected left at the first deviation scale dot (5 degree dot).

(21) On the KCP 100EXP, rotate the CRS knob until the CDI CRS numeric value and CDI course pointer are both set to 110 degrees.

(22) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the CDI course deviation is deflected left at the second deviation scale dot (10 degree dot).

(23) On the KCP 100EXP, rotate the CRS knob until the CDI CRS numeric value and CDI course pointer are both set to 95 degrees.

(24) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the CDI course deviation is deflected right at the first deviation scale dot (5 degree dot).

(25) On the KCP 100EXP, rotate the CRS knob until the CDI CRS numeric value and CDI course pointer are both set to 90 degrees.

(26) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “VOR1”, displayed in green.
   (b) Verify the CDI course deviation is deflected right at the second deviation scale dot (10 degree dot).

(27) On the Navigator, tune/activate the VHF radio to a valid LOC/ILS frequency.

(28) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “LOC1”, displayed in green.
   (b) Verify the CDI course deviation (left/right) is removed from the PFD CDI.
   (c) Verify the Bearing Pointer 1 and Bearing Pointer 2 sources are set to “VLOC1”.
   (d) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 are both removed from the PFD CDI.

(29) On the VHF Radio Tester, set the mode to LOC/ILS, tune the same LOC/ILS frequency as displayed on the Navigator (see step 27 above), and set both LOC DDM and G/S DDM to centered.

(30) From the KSD 100EXP PFD screen, verify the following:
   (a) Verify the CDI source is set to “LOC1”, displayed in green.
   (b) Verify the CDI course deviation is centered with no left/right deflection.
   (c) Verify the Lateral and Vertical Deviation bars (near the attitude indicator) are both centered with no left/right or up/down deflection.
   (d) Verify the CDI Bearing Pointer 1 and Bearing Pointer 2 are both removed from the PFD CDI.

(31) On the VHF Radio Tester, set the LOC DDM to simulate a one dot left deviation and set the G/S DDM to simulate a one dot up deviation.

(32) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “LOC1”, displayed in green.

(b) Verify the CDI course deviation is deflected left near the first deviation scale dot.

(c) Verify the Lateral Deviation bar is deflected left near the first deviation scale dot and the Vertical Deviation bar is deflected up near the first deviation scale dot.

(33) On the VHF Radio Tester, set the LOC DDM to simulate a two dot left deviation and set the G/S DDM to simulate a two dot up deviation.

(34) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “LOC1”, displayed in green.

(b) Verify the CDI course deviation is deflected left near the second deviation scale dot.

(c) Verify the Lateral Deviation bar is deflected left near the second deviation scale dot and the Vertical Deviation bar is deflected up near the second deviation scale dot.

(35) On the VHF Radio Tester, set the LOC DDM to simulate a one dot right deviation and set the G/S DDM to simulate a one dot down deviation.

(36) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “LOC1”, displayed in green.

(b) Verify the CDI course deviation is deflected right near the first deviation scale dot.

(c) Verify the Lateral Deviation bar is deflected right near the first deviation scale dot and the Vertical Deviation bar is deflected down near the first deviation scale dot.

(37) On the VHF Radio Tester, set the LOC DDM to simulate a two dot right deviation and set the G/S DDM to simulate a two dot down deviation.

(38) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “LOC1”, displayed in green.

(b) Verify the CDI course deviation is deflected right near the second deviation scale dot.

(c) Verify the Lateral Deviation bar is deflected right near the second deviation scale dot and the Vertical Deviation bar is deflected down near the second deviation scale dot.

(39) On the Navigator, tune/activate the VHF radio to a valid VOR frequency.

(40) From the KSD 100EXP PFD screen, verify the following:

(a) Verify the CDI source is set to “VOR1”, displayed in green.

(b) Verify the CDI course deviation (left/right) is removed from the PFD CDI.

(c) Verify the Lateral and Vertical Deviation bars are both removed from the PFD.

(41) If a second VHF Radio Navigator is installed in the airplane, repeat the above steps for “NAV2” or “VLOC2”.

(a) A second GPS/Nav Radio Navigator will be displayed as “NAV2”.

(b) A second Nav Radio only Navigator will be displayed as “VLOC2”.

(42) If a third VHF Radio Navigator is installed in the airplane, repeat the above steps for “VLOC3”.

7.2.9 Universal Access Transceiver (UAT) Checkout

The manufacturer’s Universal Access Transceiver (UAT) system configuration procedure must be completed and is expected to function properly before proceeding to the next steps. Refer to the UAT system installation manual for setup and configuration details.

Use the following procedure to verify UAT device communication:

(1) Ensure the airplane is located outside and within reception range of known ADS-B station. Depending on your location, you may need to be airborne to receive ADS-B data.

(2) Apply power to the ADS-B receiver.

(a) Allow the UAT receiver to acquire a position (if equipped with GPS), this may take several minutes depending on the location of the airplane.

(3) Verify UAT status:

(a) From the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2.

(b) From the Menu, Figure 7-6, press the Advisory Messages button to launch the Advisory Messages sub-menu also referred to as the Message Center.

(c) Verify that a “UAT FAIL” or “UAT POSITION FAIL” message is not listed.

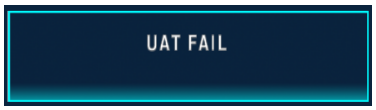

Figure 7-12 UAT Fail Message

- “UAT FAIL” may indicate UAT maintenance is required.
- “UAT POSITION FAIL” indicates loss of GPS signal to the UAT.

(4) Pull the circuit breaker for the UAT device.

(5) Verify UAT status:

(a) From the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2.

(b) From the Menu, Figure 7-6, press the Advisory Messages button to launch the Advisory Messages sub-menu, Figure 7-7.

(c) Verify that a “UAT NO COMMUNICATION” message is listed.

(6) Reset the UAT device circuit breaker.

(7) Verify UAT status:

(a) Verify that the “UAT NO COMMUNICATION” message is no longer listed.

(b) Press the Up Arrow “^” button to return to the Main menu.

(a) Close the Main Menu, by pressing the “X” button, to return to the KSD 100EXP screen.

7.2.10 Autopilot System Setup

The manufacturer’s autopilot AFCS setup, configuration and/or alignment procedure must be completed and is expected to function properly.

Refer to the autopilot installation manual and perform the course, heading or any other offset alignment/ calibration procedures required before proceeding to the next steps.

7.2.10.1 Autopilot & KSD 100EXP Interface

FD operation on the KSD 100EXP is not authorized.

7.2.10.2 Autopilot & KSD 100EXP Interface Checkout Procedures

Perform an interface test of the KSD 100EXP and autopilot commands for the functions included in the installed autopilot. The autopilot/KSD 100EXP interface checkout requires a ramp generator function of the NAV/ILS Signal Generator to simulate the localizer and glide slope signals.

(1) Engage the autopilot and put it in Heading mode.

(2) Turn the heading knob on the KCP 100EXP to the left and verify the autopilot commands a roll left.

(3) Turn the heading knob on the KCP 100EXP to the right and verify the autopilot commands a roll right.

(4) Set the KSD 100EXP NAV source to VLOC by selecting CDI source on the KSD 100EXP and pressing the VLOC/GPS button to the appropriate setting on the GPS navigator.

(5) Set up the NAV generator and VLOC receiver to a VOR station.

(6) Synchronize the course to the VOR bearing to station value by pushing and holding the CRS knob on the KCP 100EXP Control Panel.
(7) Place the Autopilot in Navigation mode, with the autopilot engaged; use the ramp generator or change the course to simulate both left and right deflections.
(8) Validate the autopilot commands respond correctly in both directions.
(9) Place the Autopilot in Approach mode and using a ramp generator to simulate a valid localizer and glide slope signal.
(10) With the autopilot engaged, use the ramp generator to simulate both up and down glide slope deflections.
(11) Validate the autopilot commands respond correctly in both directions.

7.2.11 KCP 100EXP Checkout

Perform an interface test of the KCP 100EXP control panel by performing to following procedure:

(1) Turn the heading knob to the left and verify heading value decreases.
(2) Turn the heading knob to the right and verify heading value increases.
(3) Verify the heading on the HSI to the current detected heading by pushing the HDG knob on the KCP 100EXP.
(4) With no Flight Plan on the Navigator and VLOC selected,
    (a) Turn the course knob to the left and verify course value decreases.
    (b) Turn the course knob to the right and verify course value increases.
(5) Enter a Flight Plan to an OBS WPT on the Navigator
    (a) Verify the course on the HSI is synchronized with the GPS Bearing to WPT value by pushing the CRS knob on the KCP 100EXP.
(6) Turn the baro knob to the left and verify baro value decreases.
(7) Turn the baro knob to the right and verify baro value increases.
(8) Verify the baro is set to the standard 29.92 inHg/1013 hPa by pushing the Baro knob on the KCP 100EXP.
(9) Turn the altitude outer knob to the left and verify altitude value decreases by 1000 increments.
(10) Turn the altitude outer knob to the right and verify altitude value increases by 1000 increments.
(11) Turn the altitude inner knob to the left and verify altitude value decreases by 100 increments.
(12) Turn the altitude inner knob to the right and verify altitude value increases by 100 increments.
(13) Verify the selected altitude is synchronized to the current altitude value by pushing the Alt knob on the KCP 100EXP.

7.2.12 Interfaced Subsystem Checkout

7.2.12.1 Navigator

After wiring KG 71EXP heading and air data inputs to the KSN 7XX, verify that TAS Fail message and HGD Fail messages are not present. For Garmin or Avidyne navigators, refer to the devices' install manual for proper configuration and checkout for these inputs.

7.2.12.2 TAWS/Traffic

Refer to KMH install manual for diagnostic tool to verify air data and heading inputs.

7.2.13 Lighting Checkout

Evaluate the dimming of the KSD 100EXP Display and KCP 100EXP Legends and Rings throughout the range and adjust the brightness levels as described in Section 6.2.1.2 External Dimming to match the

other equipment in the instrument panel.

7.3 EMI Interaction Checkout

The EMI Interaction Checkout must be completed to verify the xVue Touch System does not cause any interference with the installed airplane avionics and the installed airplane systems do not affect the operation of the xVue Touch System.

Monitor the KSD 100EXP display for heading, attitude, altitude, airspeed changes, red-X's, flags, and any error messages while performing the following test:

(1) Individually turn on each piece of equipment (transponder, DME, Weather Radar, and all other pulse type equipment) for 30 seconds, then turn off.
(2) Individually transmit on each communication radio for 30 seconds at one local frequency, one remote frequency, and one unused frequency.
(3) Individually turn on all airplane lighting including navigation lights, position lights, strobe lights and all other forms of lighting for 30 seconds each.
(4) Operate all environmental equipment including air conditioning, heaters, fans and all other forms of environmental control equipment for 30 seconds each.
(5) Individually turn on for 30 seconds, then turn off each; fuel pump, deice boots, windshield heat, prop heat, and flaps.
(6) Individually operate autopilot, servos, yaw damper, and all electric trim servos.
(7) Operate engine(s) and verify no interference.

7.4 Post Installation Flight Checks

All flight checks must be performed by an appropriately rated pilot during the day under VFR at a safe altitude. All installed airplane equipment must be operated using normal airplane operating procedures unless the procedure requires otherwise.

7.5 Post Installation Activities

7.5.1 Database Updates

Database updates are downloaded from the Internet and installed using one of two methods:

(1) A memory device and USB port on the front of the display, refer to Section 7.5.1.1.
(2) A Wi-Fi connected device using the external database loading application, refer to Section 7.5.1.2.

NOTE

IF USING A USB DRIVE, DATABASE UPDATES MUST BE DOWNLOADED TO A 32GB USB DRIVE AND ARE UPLOADED TO THE KSD 100EXP USING A USB-C ADAPTER.

Instructional videos and databases can be downloaded from the following website:

https://wingmanservices.bendixking.com/wingman

Database updates require individual subscriptions to:

- Wingman Services (https://wingmanservices.bendixking.com)
- Seattle Avionics (http://www.seattleavionics.com/ChartData/Default.aspx?. For Wi-Fi loading, download the FlyQ App from the Apple® App Store).

Table 7-2 Available Database

Wingman Services	Seattle Avionics
• Navigation • Cartographic • Obstacles • Terrain	• Charts • IFR Lo • IFR Hi • VFR Sectional

Wingman Services database subscription(s) is paired with the unit during installation and Seattle Avionics subscription is per user.

NOTE

BENDIXKING RECOMMENDS CHECKING FOR DATABASE UPDATES EVERY 28 DAYS.

7.5.1.1 USB Database Loading

(1) Power on the KSD 100EXP.
(2) Insert the memory device into the USB port in front of the display.
(3) Press Enter on the Database Acknowledge Screen, refer to Figure 6-3.
(4) On the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2, located at the top right of the screen.
(5) From the Main Menu, Figure 7-6, press the System Tools button.
(6) From the System Tools Menu, Figure 7-13, press the Database Loading Tool button, Figure 7-14

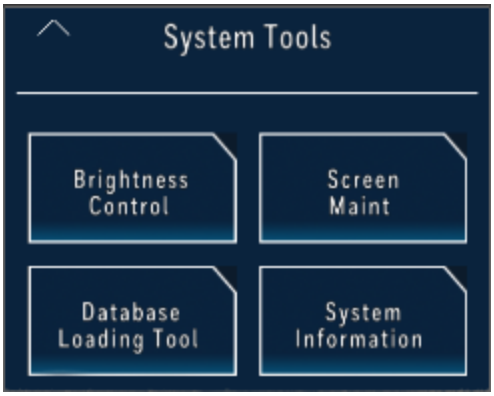

Figure 7-13 System Tools Menu

Figure 7-14 Database Loading Tool Button

(7) From the Database Loading Menu, press the USB button, Figure 7-15.

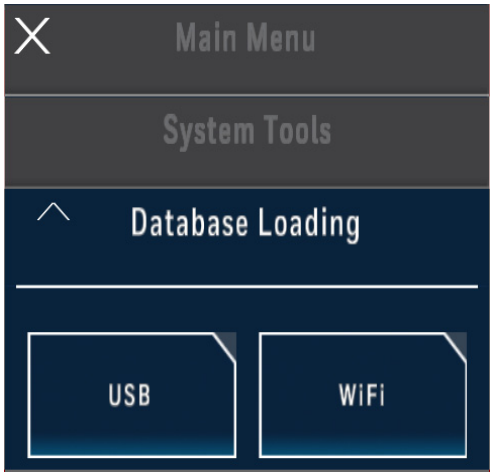

Figure 7-15 Database Loading Menu

(8) The Database Loading Page is displayed while the files are unpacked. During this time the External Database column shows status as “Scanning”, Figure 7-16.

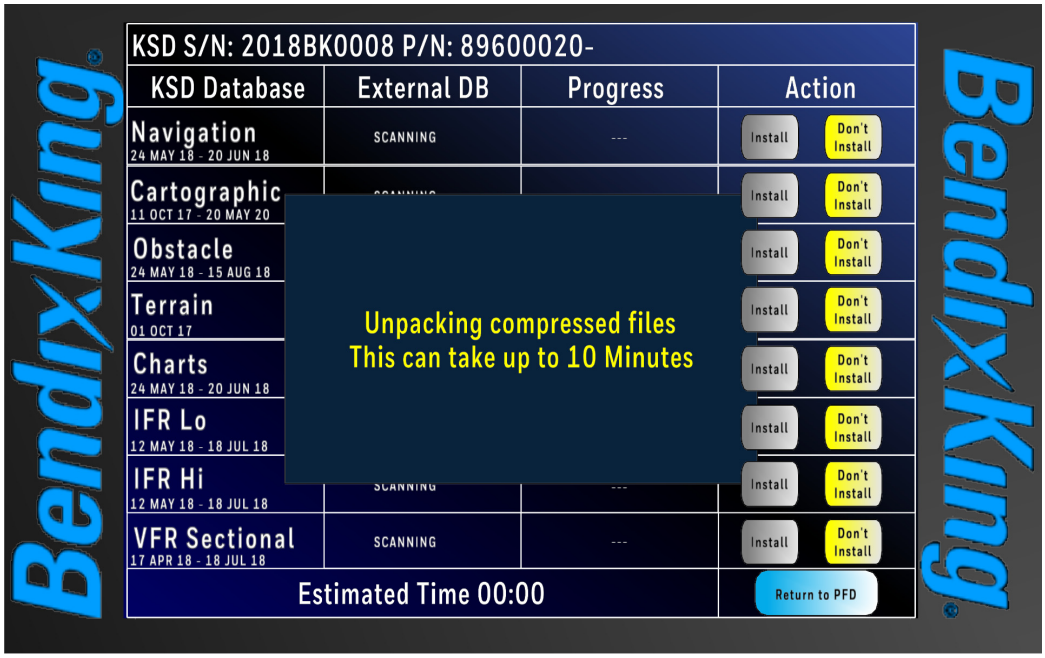

Figure 7-16 Database Loading Page (Unpacking)

(9) After the database scanning is complete, the database loading page is updated with status information, as shown in Figure 7-17. This page allows the user to select the databases to install and shows the estimated time to complete the installation.

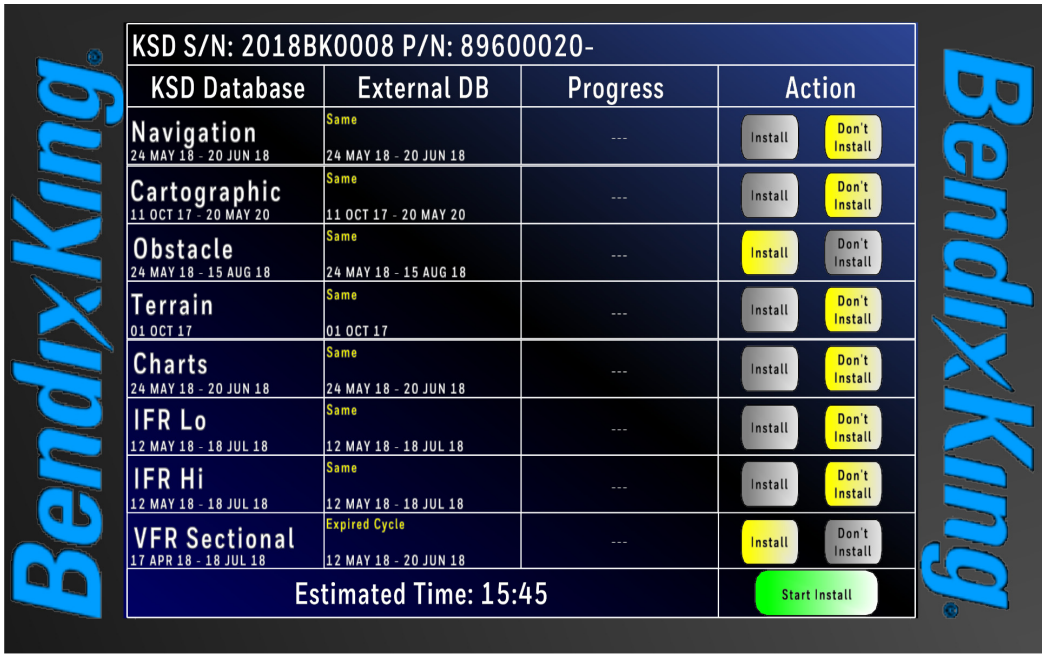

Figure 7-17 Database Loading Page

The KSD Database column displays the currently installed databases and database effectivity dates.

The External DB column lists each database on the USB drive, along with the database effectivity dates, as:

- Same (the installed database and USB database are the same)
- Future Cycle (the USB database is newer than the installed database)
- Expired Cycle (the USB database is older than the installed database)

If no database is available on the USB drive, an error message “Error! No database detected on external device.” is displayed.

The Estimated Time field shows the estimated time to install all selected databases in hours, minutes, and seconds format.

The Action column displays a toggle button for each database as shown in Figure 7-18.

Figure 7-18 Database Install Buttons

(10) Select the appropriate install action for each database and press the Start Install button, shown in Figure 7-17, to begin the database loading process. Once the database loading has started, the previously installed databases, if any, will be erased.

(11) During the loading process the Progress column displays the installation progress and the time remaining is displayed for each remaining database to be loaded, shown in Figure 7-19.

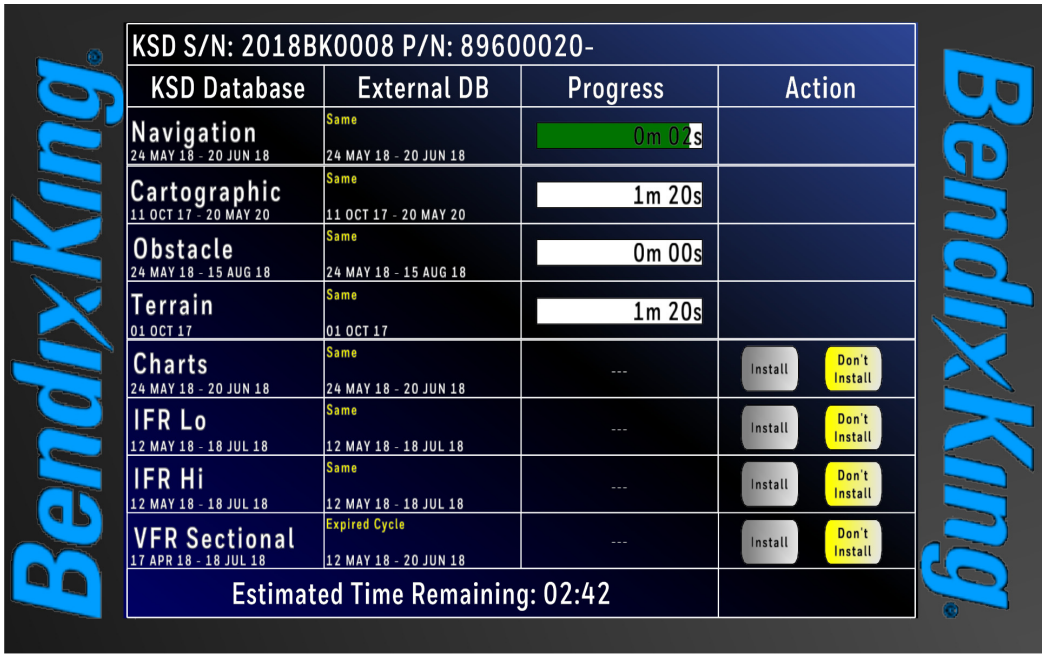

Figure 7-19 Database Loading in Progress Screen

(12) When the database loading is complete, a pop-up window is displayed as shown in Figure 7-20.

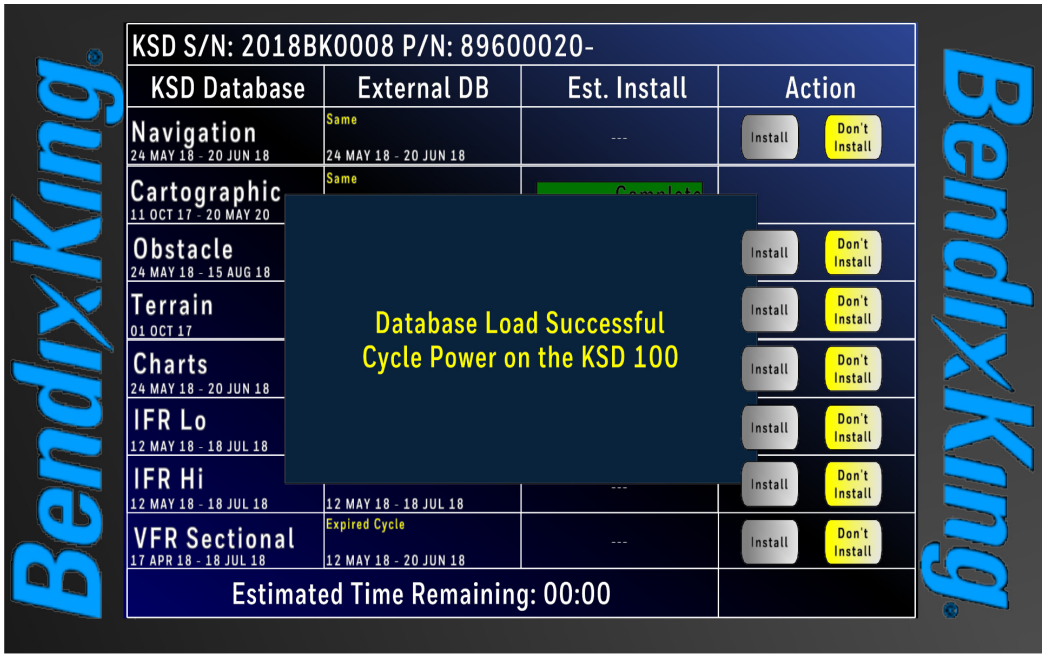

Figure 7-20 Database Loading Complete

(13) Remove the USB drive, remove power from the KSD 100EXP, wait 10 seconds, and power the KSD back on.

(14) Review and acknowledge the updated dates and effectivity ranges shown on the Database Acknowledge Screen (refer to Figure 6-3).

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7.5.1.2 Wi-Fi Database Loading

7.5.1.2.1 Wingman Services Databases

(1) Download Wingman Services' Databases to an external Wi-Fi enabled device.

(a) On the external device, check that Wi-Fi is turned on and open an Internet browser.

(b) Go to Wingman Services website: https://wingmanservices.bendixking.com and sign into your account

(c) Select the applicable aeronautical and terrain database file(s) for the specific KSD 100EXP serial number.

NOTE

THE FIRST 4 DIGITS IN THE NAME OF THE FILE INDICATE THE CYCLE (REFER TO PAGE 7-15).

(d) Download the database file(s) (a .ZIP file).

(2) Power on the KSD 100EXP.

(3) Press Enter on the Database Acknowledge Screen, refer to Figure 6-3.

(4) On the KSD 100EXP screen, Figure 7-1, press the Menu button, Figure 7-2, located at the top right of the screen.

(5) From the Main Menu, Figure 7-6, press the System Tools button.

(6) From the System Tools Menu, Figure 7-13, press the Database Loading Tool button, Figure 7-14.

NOTE

THE DATABASE LOADING TOOL BUTTON IS GRAYED OUT (NOT AVAILABLE) WHEN AIRPLANE IS NOT ON THE GROUND.

(7) From the Database Loading Menu, press the WiFi button, Figure 7-15.

(8) The Wi-Fi Connection Enabled window is displayed, Figure 7-21.

Figure 7-21 KSD 100 Wi-Fi Connection Enabled

(9) On the external device connect to the xVue Touch Wi-Fi. The Wi-Fi name is "KSD_AP", followed by the serial number of the unit (for example, "KSD_AP89000020").

(10) Enter Ksd*user as password.

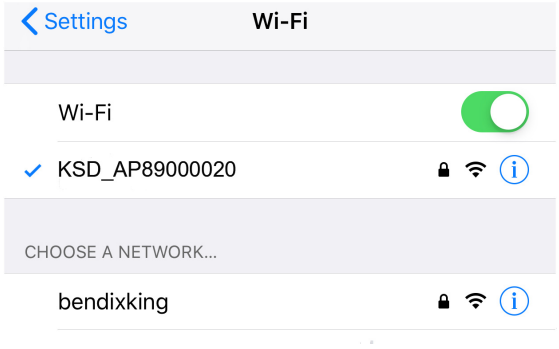

Figure 7-22 Connected to KSD Wi-Fi

NOTE

THE WI-FI ENABLED WINDOW DISPLAYS UNTIL THE DATABASE UPLOAD AND SUBSEQUENT XVUE TOUCH DISPLAY POWER CYCLE ARE COMPLETE. DURING THIS TIME THE XVUE TOUCH DOES NOT ALLOW ANY USER INTERACTION.

(11) On the external device, open an Internet browser and enter the web address: https://ksd100.bendixking.com, to access the DataManager Lite application, Figure 7-23.

(12) From the webpage, select “Choose File”.

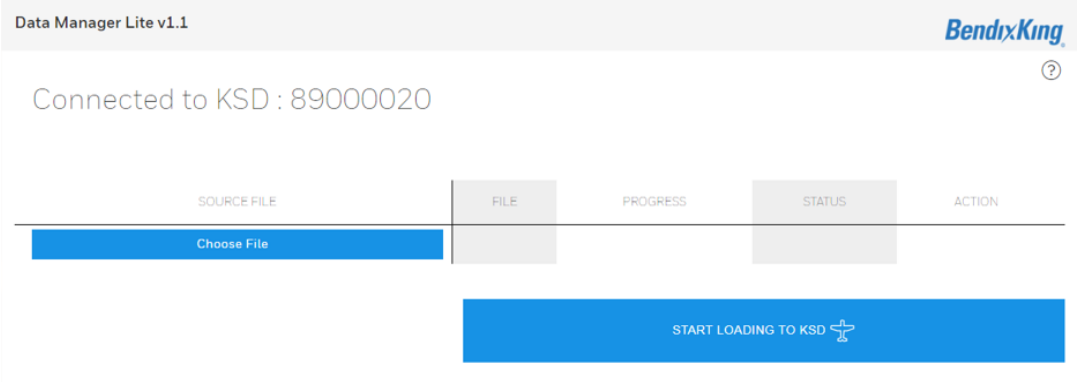

Figure 7-23 DataManager Lite Main Page

(13) Select the database .ZIP file downloaded in Step (1) from Wingman Services, Figure 7-24.

(14) Select “Start Loading to KSD” to begin the database loading process.

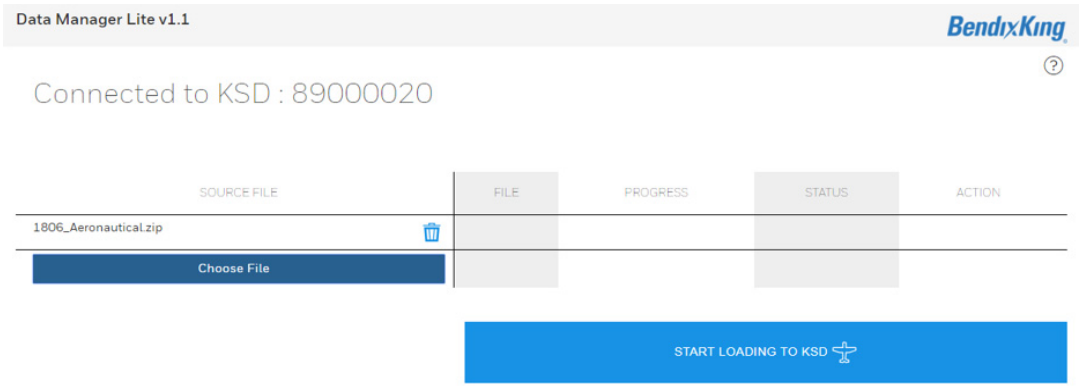

Figure 7-24 Wi-Fi Webpage with Selected Database

Uploading and verifying the database(s) takes about 6 to 10 minutes. This process uploads the databases from the external device to the KSD 100EXP, Figure 7-25, and verifies the database information, Figure 7-26.

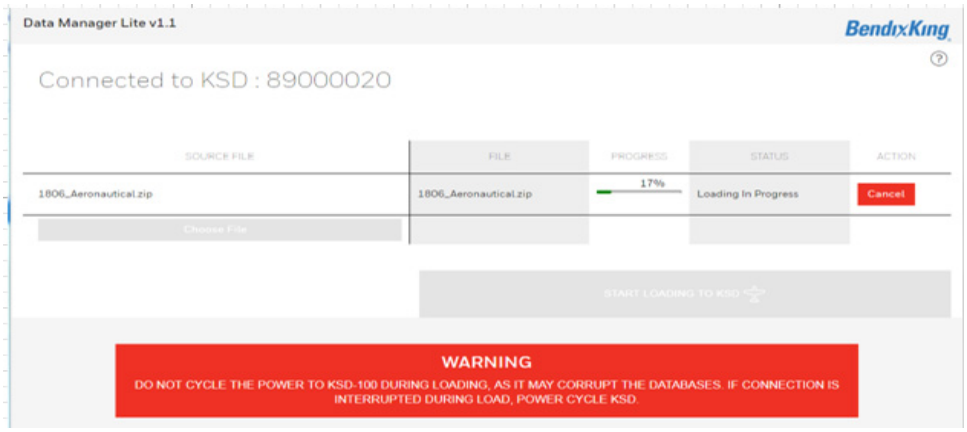

Figure 7-25 Uploading Databases to KSD 100EXP

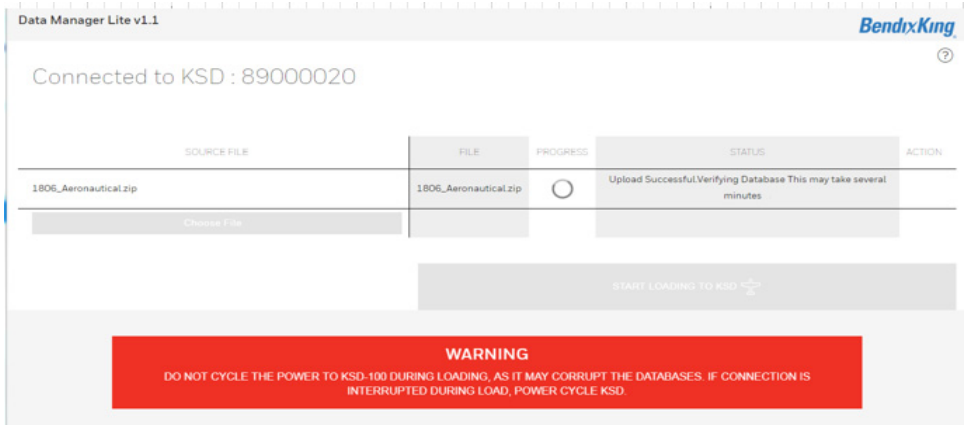

Figure 7-26 Verifying Databases

(15) When the database loading has completed, the status indicates “Loading Successful”, Figure 7-27.

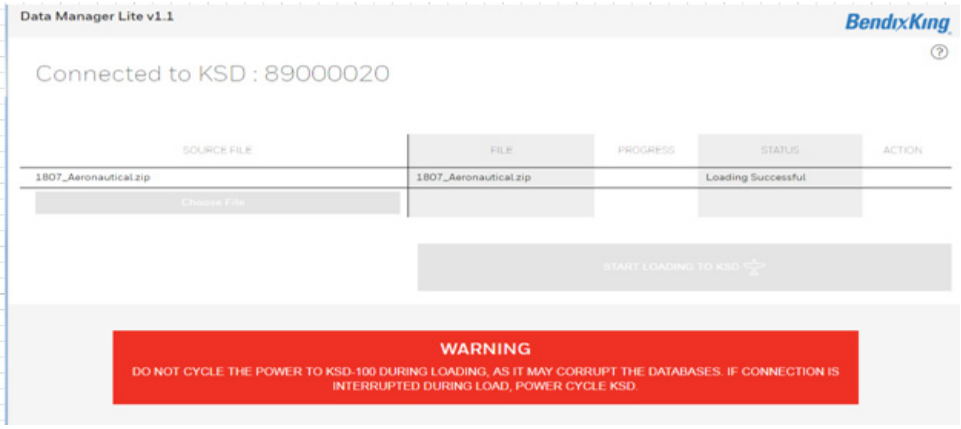

Figure 7-27 Wi-Fi Database Loading Complete

(16) A restart window appears on the external device signaling the completion of the Wi-Fi database loading procedure, Figure 7-28.

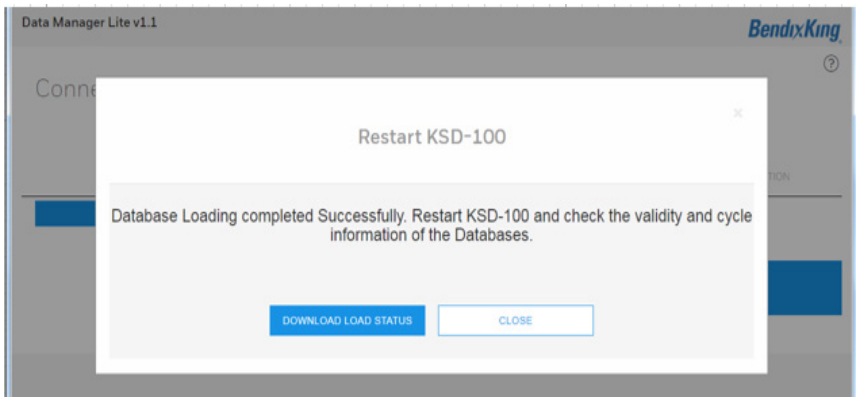

Figure 7-28 Restart KSD 100EXP Window

(17) Cycle power on the KSD 100EXP.

(18) Review and acknowledge the updated dates and effectivity ranges shown on the Database Acknowledge Screen, Figure 6-3.

7.5.1.2.2 Seattle Avionics Databases

NOTE

DOWNLOAD THE FLYQ APP FROM THE APPLE APP STORE.

(1) Check that Wi-Fi is turned on and connected to the Internet.

(2) Press on the iPad® or iPhone®.

(3) Login to your account

(4) On the FlyQ App main screen, press the Download symbol, Figure 7-29.

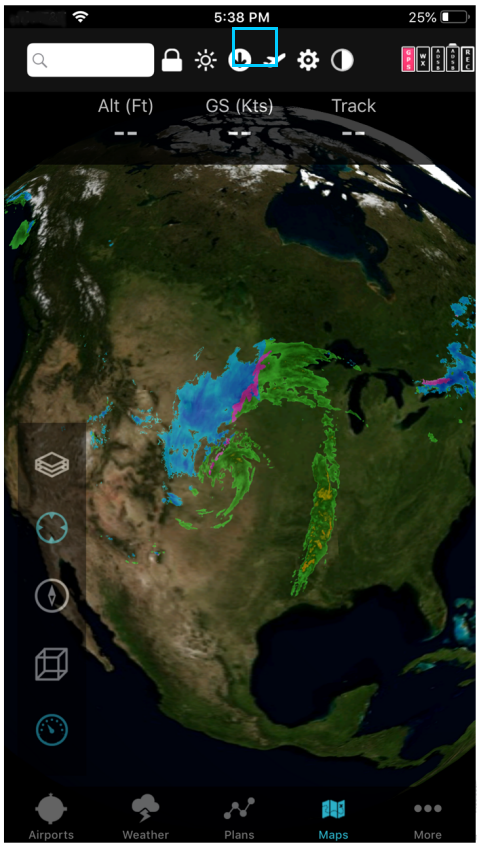

Figure 7-29 FlyQ App Main Screen

The ChartData Manager screen appears and displays the status of databases for all states, Figure 7-30:

- Not selected
- Current
- Expired or not downloaded
- Update available

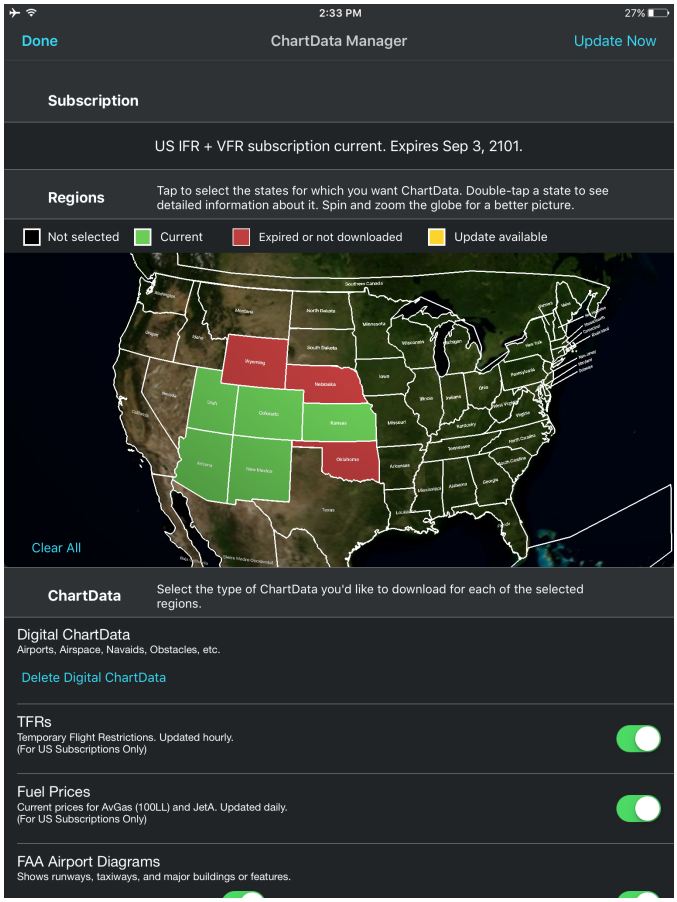

Figure 7-30 ChartData Manager Screen

(5) Tap the map to select the regions (states) for chart data, double-tap a region to see detailed information, if needed, Figure 7-30.

NOTE

SELECT ALL STATES THAT YOU MAY FLY TO (IN THE NEAR FUTURE). ONLY THE STATES THAT HAVE BEEN SELECTED ON THE FLYQ ARE SHOWN ON THE XVUE TOUCH DISPLAY AFTER THE DOWNLOAD. DO NOT DESELECT A STATE YOU MAY NEED, EVEN THOUGH IT WAS RECENTLY DOWNLOADED TO XVUE TOUCH. IF YOU DESELECT A STATE, THEN THE DATA CORRESPONDING TO THE STATE IS DELETED FROM KSD 100EXP.

NOTE

THE MAP VIEW CAN BE ZOOMED IN AND OUT, AND PANNED TO SEE DIFFERENT REGIONS AROUND THE WORLD.

To clear all selections, press “Clear All” (middle-left of the screen), Figure 7-30.

(6) Select the chart data type to download for each selected region (available charts depend on subscription), Figure 7-30:

- Charts
- IFR Lo

- IFR Hi
- VFR Sectional
- FAA airport diagrams (has an option to only download new or changed diagrams)

NOTE

DIGITAL CHARTDATA (AIRPORTS, AIRSPACE, NAVAIDS, OBSTACLES, ETC.) IS AUTOMATICALLY DOWNLOADED.

(7) Press “Update Now” (top-right of the screen) to update the database(s) if any of the states are shown in yellow or red, Figure 7-30.

NOTE

IF DATABASES ARE UPDATED USING THE INDIVIDUAL STATE SELECTION CAPABILITY, THE DATABASE EFFECTIVITY DATES DISPLAYED ON THE DATABASE ACKNOWLEDGE SCREEN MAY DISPLAY “EXPIRED” BECAUSE THE XVUE TOUCH EFFECTIVITY DATE FUNCTION DOES NOT ACCOUNT FOR INDIVIDUAL STATE EFFECTIVITY.

(8) Follow Step 2through Step 10 to set up the connection between the KSD 100EXP and iPad/iPhone.

After the connection has been set up, FlyQ application detected window appears on the KSD 100EXP, Figure 7-31.

(9) On the iPad/iPhone, check that the desired states have been updated

NOTE

WHEN UPDATING JUST SELECTED STATES, REST OF THE STATES WILL NOT BE AVAILABLE.

(10) Press “OK” on the KSD 100, Figure 7-31.

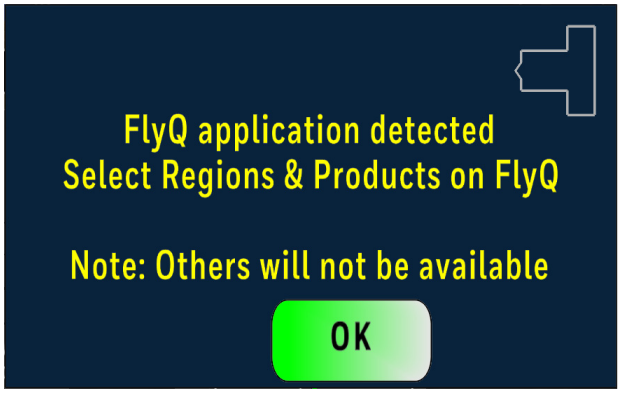

Figure 7-31 FlyQ Application Detected Window

FlyQ database update available window displaying available file(s) for update appears, Figure 7-32.

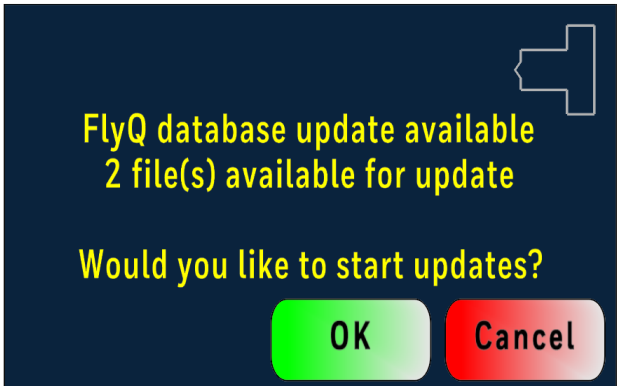

Figure 7-32 FlyQ Database Update Available Window

(11) Press “OK” to update or “Cancel”, Figure 7-32.

Performing FlyQ database update window appears, Figure 7-33.

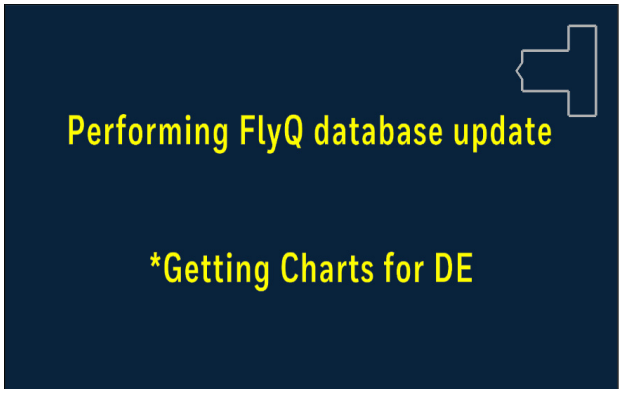

Figure 7-33 Performing FlyQ Database Update Window

Several performing FlyQ database update windows appear showing the update progress (based on the number of states and databases that need to be updated), Figure 7-34.

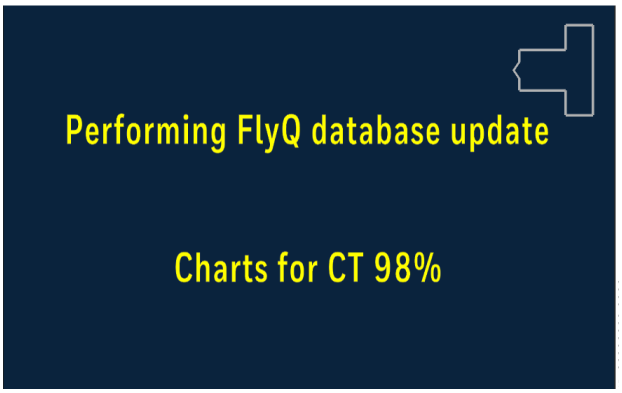

Figure 7-34 Performing FlyQ Database Update Progress Window

After all the databases have been updated, database update complete window appears, Figure 7-35.

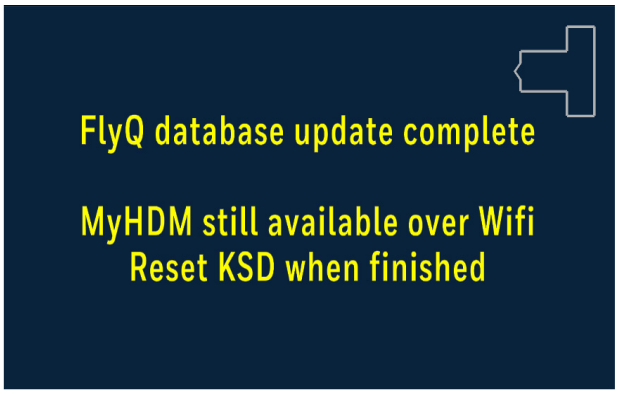

Figure 7-35 Database(s) Update Complete Window

(12) Cycle power on the KSD 100EXP.

(13) Review and acknowledge the updated dates and effectivity ranges shown on the Database Acknowledge Screen, Figure 6-3.

7.5.1.3 Database Loading Errors

Any database loading error messages appear on the KSD 100EXP during the database loading process.

7.5.1.3.1 USB Database Loading Errors

The following USB database loading error messages may appear:

Table 7-3 USB Database Loading Error Messages

Error Message	Description	Corrective Action
ERROR! NO DATABASES DETECTED ON EXTERNAL DEVICE	Database not present on the USB drive.	Download the database again and reload.
Future Cycle	Database on USB drive is newer than the existing database on the KSD 100EXP.	Verify effectivity dates of the new database and load.
Same	Database on USB drive is the same as the existing database on the KSD 100EXP.	No action required - skip loading.
Expired Cycle	Database on USB drive is older than the existing database on the KSD 100EXP or the database is expired.	Verify effectivity dates of the database and load only if desired (not recommended).
ERR: DB not authorized for this KSD-100 Contact Bendix King	The database is not set up with the correct KSD 100EXP serial number and there is mismatch between what is set in the database and the serial number of the unit on the airplane.	Verify KSD 100EXP serial number (unit on airplane) and download the correct file from Wingman Services and reload.

Table 7-3 USB Database Loading Error Messages

Error Message	Description	Corrective Action
ERR: Cannot load One time registration already utilized	The one-time registration download for the database is already utilized.	Download the paid subscription.
ERROR! DATABASE IS NOT CERTIFIED	Non-certified database/charts are being loaded onto a certified KSD 100EXP.	Download certified database/charts.

7.5.1.3.2 Wi-Fi Database Loading Errors

The following Wi-Fi database loading error messages may appear.

7.5.1.3. 2.1 Wingman Services

Any database loading error messages appear on the external loading device. To view more information on the loading failure, select "Download Load Status", Figure 7-36.

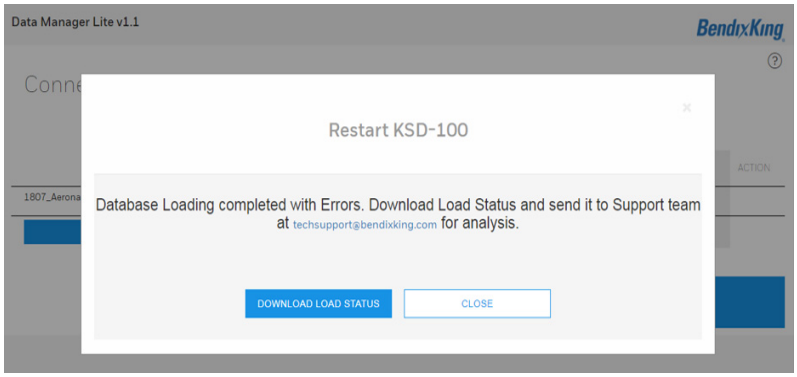

Figure 7-36 Database Loading Completed with Errors Window

The Wi-Fi database loading has unique error messages that will appear in the status window, refer to the example in Figure 7-37 and the list of Wi-Fi errors in Table 7-4.

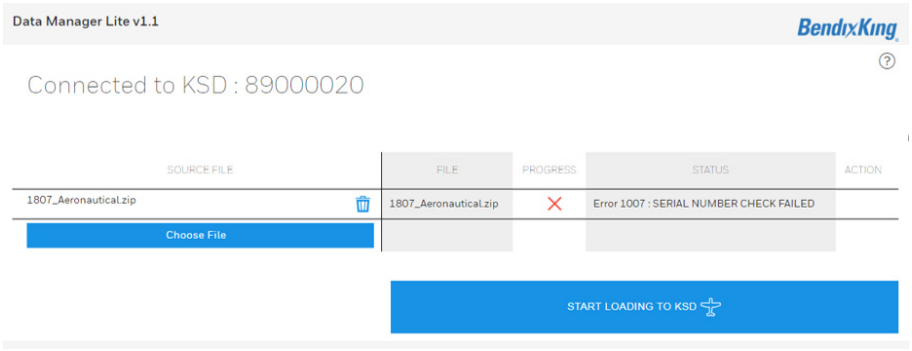

Figure 7-37 Wi-Fi Serial Number Mismatch Example

The following additional Wi-Fi error messages may appear during the database loading.

Table 7-4 Wi-Fi Database Loading Errors

Error Message	Description	Corrective Action
SERIAL NUMBER CHECK FAILED	The database .ZIP file is not set up with the correct KSD 100EXP serial number and there is mismatch between what is set in the database and the serial number of the unit on the airplane.	Verify KSD 100EXP serial number (unit on airplane), download a new database .ZIP file with the correct KSD 100EXP serial number and reload.
Unable to Contact KSD, check Wi-Fi Connection	This occurs if the Wi-Fi connection between the KSD 100EXP and the Wi-Fi device is disconnected for any reason.	Restart the KSD 100EXP and try loading again.
Error 1007: REGISTRATION ALREADY USED	The one-time registration download for the database is already utilized.	Download the paid subscription.

7.5.1.3. 2.2 FlyQ

Any database loading error messages appear on the KSD 100EXP, Figure 7-38.

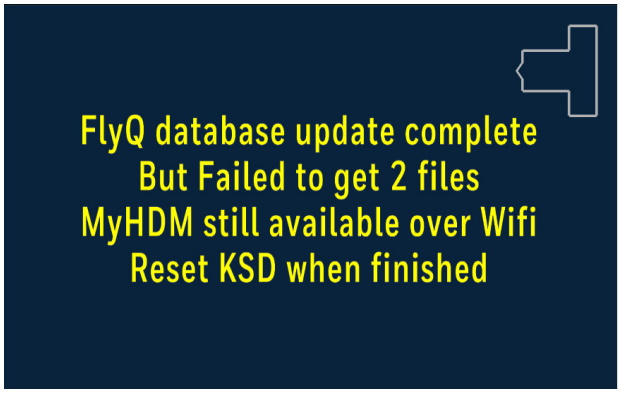

Figure 7-38 FlyQ Database Update Error Message

NOTE

IF ANY FILE(S) FAILED TO DOWNLOAD, THERE IS MOST LIKELY AN ISSUE WITH THE FLYQ APP. TO CHECK THE STATUS OF THE FILES DOWNLOADED FOR A PARTICULAR STATE, DOUBLE -TAP ON THE STATE. CONTACT SEATTLE AVIONICS FOR FURTHER ASSISTANCE.

Figure 7-39 FlyQ Wi-Fi Connection Failed Message

If a power cycle occurs during database(s) download to the KSD 100EXP, all Seattle Avionics databases will indicate “Database Load Fail” on the KSD 100EXP. To resolve the issue, try downloading again. The program will try to continue to download from where the downloading process stopped.

7.5.2 xVue Touch Flight Software Update

The following system components of the xVue Touch System support update of software in the field (provision for future SW upgrades):

- KSD 100EXP Primary Flight Display

The maintenance technician will check if the pre-loaded software in any of the xVue Touch System components need an update. If any xVue Touch System components need a software update, the maintenance technician will enter the Installer Menu and will select an option to update the KSD 100EXP software.

The xVue Touch System components (Hardware and Software) have part numbers and serial numbers stored in the various system component’s NVM. Installation of new software in a xVue Touch component will change the part number of the unit and must follow the procedures defined for that specific software update to ensure that the new software load is compatible with the existing hardware. The update must be documented in a Service Bulletin or in an Installation Manual or other approved documentation that is provided with the system update.

7.5.2.1 KSD 100EXP Software Update

When a software update is required for the KSD 100EXP the technician will download software onto a USB drive and install into the front USB port on the KSD 100EXP. Prior to the software update, the technician will be able to verify the USB software version. Once the software load begins, it may only be canceled from the initial loading pop-up window. If the technician selects to continue the load, the KSD 100EXP will permanently update the application software.

If the software load is interrupted, the KSD 100EXP will provide a message regarding the data load failure and the user will need to cycle power and repeat the loading process.

NOTE

DO NOT POWER OFF THE KSD 100EXP DURING THE SOFTWARE LOADING PROCESS UNTIL PROMPTED TO CYCLE POWER THE UNIT.

NOTE

IF A PROBLEM OCCURS DURING THE KSD 100EXP SOFTWARE UPDATE, CONTACT BENDIXKING CUSTOMER SUPPORT.

7.5.2.1.1 KSD 100EXP Software Field Loading Procedure

(1) Format the USB drive to FAT32.
(2) Download KSD 100EXP software onto the USB drive from the BendixKing Website - Dealer Portal.

NOTE

THE UNZIPPED SOFTWARE. TAR FILE MUST BE SAVED TO THE USB ROOT DIRECTORY AND NOT CONTAINED IN A FOLDER.

(3) Apply power to the KSD 100EXP display by setting the PFD breaker or turning on the avionics.
(4) Access Config Mode (refer to steps in Section 6.2)
(5) Insert the USB drive with USB-C adapter into the front USB port on the KSD 100EXP (refer to Figure 2-1 for USB port location).
(6) From the Installer Main menu, press the Software Loading button.
(7) Press the Check USB for updates button on the Software Loading sub-menu as shown in Figure 7-40.

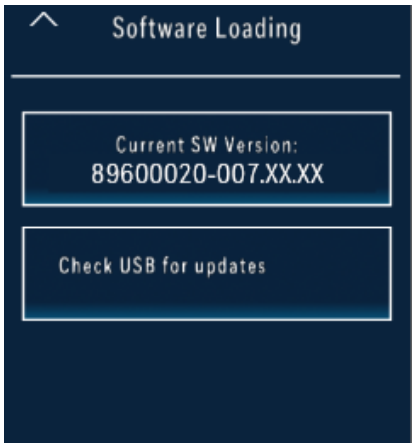

Figure 7-40 Software Loading Sub-Menu (Check for USB Updates)

(8) On the Software Loading sub-menu as shown in Figure 7-42 verify the new software found part number displays the correct part information.

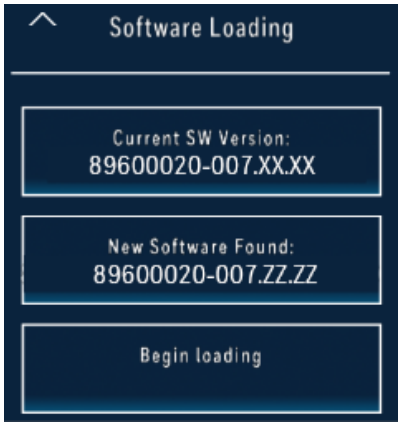

Figure 7-41 Software Loading Sub-Menu (New Software Found)

(9) Press the Begin loading button, Figure 7-41.

(10) A prompt window, Figure 7-42, will appear and states the projected duration of the software load and a reminder to not interrupt power. Press the Ok button to proceed and the system will begin the software update.

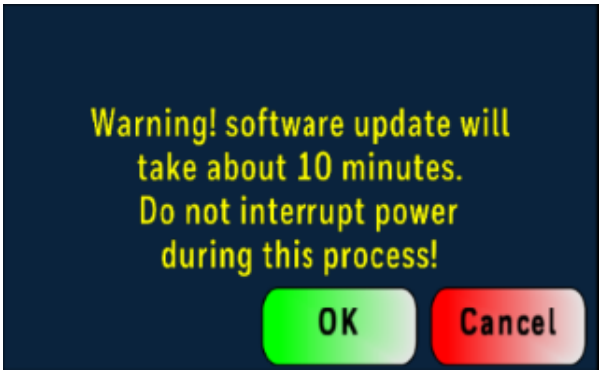

Figure 7-42 Software Loading Pop-Up Window (Initiate)

(11) A series of pop-up window messages, Figure 7-43, will appear that describe the installation status.

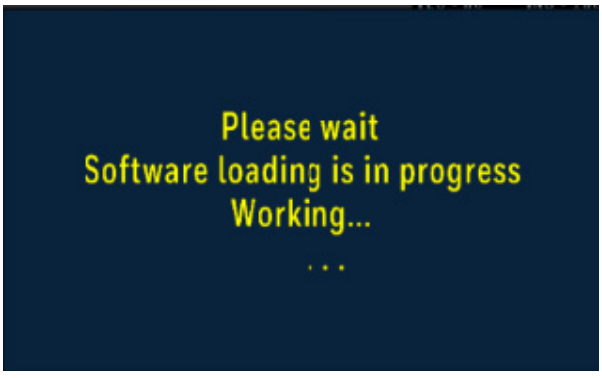

Figure 7-43 Software Loading Pop-Up Window (Loading In Progress)

(12) When the software load is complete a prompt window, Figure 7-44, will appear to calibrate touch or to cancel. If touch recalibration is not required, press the Cancel button.

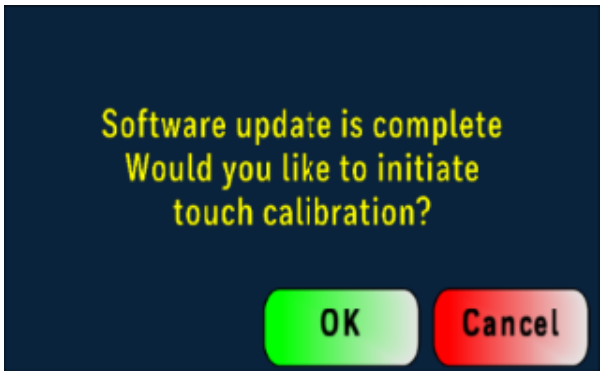

Figure 7-44 Software Loading Pop-Up Window (Loading Complete)

(13) A pop-up window message will appear to cycle power, Figure 7-45. Power cycle the KSD 100EXP display by pulling and resetting the PFD breaker.

Figure 7-45 Software Loading Pop-Up Window (Power Cycle)

(14) During boot up Access Config Mode (refer to steps in Section 6.2) if there is an APM configuration mismatch, error message is displayed on the screen, or if there is a need to update the installation parameters.

(a) If the APM requires a reset to default values, from the Installer Main Menu press the Restore Data to APM button.

Figure 7-46 Restore Data to APM

(b) Power cycle the KSD 100EXP display by pulling and resetting the PFD breaker.

(15) Software installation is complete, record the software part information in the airplane logbook.

7.5.2.2 KSD 100EXP Software Loading Errors

The following error message may appear in the Software Loading Pop-Up Window during the loading process:

Table 7-5 Software Loading Error

Status Message	Criteria	Corrective Action
File Corrupted Please re-download the file and try again	The .tar file is corrupted and cannot be loaded onto the KSD 100EXP.	Delete the existing .tar file and re-download a the KSD 100EXP software onto the USB drive. Restart software loading process.

7.5.2.3 KG 71EXP Software Update

The KG 71EXP software cannot be updated in the field. The unit must be returned to BendixKing if an update is required.

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8 TROUBLESHOOTING

If thexVue Touch fails to work, as it should, verify its operation using the xVue Touch Pilot's Guide and identify the functionality that has been lost. Match the symptom to the discrepancy to get an idea for a corrective action.

Table 8-1 xVue Touch System Troubleshooting Chart

Symptom	Causes	Corrective Action
Display Does Not Power Up	Improper Power/Ground	• Check KSD 100EXP current draw, reference Table 4-4 • Check wiring to KSD 100EXP
	Circuit Breaker Not Set or Defective	• Check and/or replace circuit breaker
	KSD 100EXP Defective	• Replace KSD 100EXP
Smart Touch Not Working	Touch Sensor Failure	• Reset KSD 100EXP • Remove frost or dust from IR bar (see Section 9.2.4.2) • If fault persists, replace KSD 100EXP
	Inconsistent/Degraded Touch Response	• Perform Manual Touch Calibration (see Section 8.2)
	KSD 100EXP Defective	• Replace KSD 100EXP
Altimeter, Airspeed Failures (Red X)	Improper Pitot/Static Connection	• Verify pitot static connections • Check for blockage in pitot static, water, or debris
	Communication failure between KG 71EXP and KSD 100EXP	• Cycle power on KG 71EXP and KSD 100EXP
	KG 71EXP Defective	• Check KG 71EXP current draw, reference Table 4-4 • Check wiring from KG 71EXP to KSD 100EXP • Replace KG 71EXP

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Table 8-1 xVue Touch System Troubleshooting Chart

Symptom	Causes	Corrective Action
Attitude Fail (Red X)	AHRS Has Not Completed Initialization	• Wait for Attitude Aligning message to complete. If on ground, do not move aircraft while alignment is annunciated. If in-flight, maintain straight and level flight while alignment is annunciated
	Communication failure between KG 71EXP and KSD 100EXP	• Cycle power on KG 71EXP and KSD 100EXP
	KG 71EXP Defective	• Check KG 71EXP current draw, reference Table 4-4 • Check wiring from KG 71EXP to KSD 100EXP • Replace KG 71EXP
Heading Fail (Red X)	AHRS Has Not Completed Initialization	• Wait for Attitude Aligning message to complete. If on ground, do not move aircraft while alignment is annunciated. If in-flight, maintain straight and level flight while alignment is annunciated
	Communication failure between KG 71EXP and KSD 100EXP	• Cycle power on KG 71EXP and KSD 100EXP
	Magnetometer Data Invalid	• Complete Magnetometer Alignment Procedure
	Loss of Communications with KMG 7010/MD32	• Check wiring from KMG 7010/MD32 to KG 71EXP • Check KMG 7010/MD32 current draw, reference Table 4-4 • Replace KMG 7010/MD32
	KG 71EXP Defective	• Perform magnetometer alignment procedure if replacement KMG 7010/MD32 has been installed • Check KG 71EXP current draw, reference Table 4-4 • Check wiring from KG 71EXP to KSD 100EXP • Replace KG 71EXP

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Table 8-1 xVue Touch System Troubleshooting Chart

Symptom	Causes	Corrective Action
OAT Data Not Displayed or Dashed	Loss Of Communications with OAT Probe	• Check wiring from KTP 73 to KG 71EXP • Replace KTP 73
	Broken Wiring or Probe OAT Probe Failed	• Replace KTP 73
	KG 71EXP Defective	• Replace KG 71EXP
Wind Data Not Displayed or Dashed	On ground	• Normal Operation
	In Air and Groundspeed < 2 knots or > 225 knots.	• Normal Operation
	Wind Speed > 255 knots for at least 6 or more seconds.	• See “Altimeter, Airspeed Failures” troubleshooting procedure
	No GPS ground track	• See “No Navigation Data or Failure” troubleshooting procedure
	Airspeed failed	• See “Altimeter, Airspeed Failures” troubleshooting procedure
	Any status parameters related to Ground Speed, Track Angle, Magnetic Variation, True Airspeed, and Magnetic Heading are invalid.	• See “No Navigation Data or Failure” troubleshooting procedure
Heading Error >4 Degrees	Magnetometer Misalignment	• Complete magnetometer alignment procedure
	Magnetometer Interference	• Check heading in a clean magnetic location for accuracy
	Located To Close To Metal Structure	• Taxi away from structures
No Navigation Data or Failure	No Navigation Signal Received	• Use a Navigation Tester to generate a test signal, position the airplane to receive a Navigation signal or GPS satellites • Check wiring from Navigation Sensor to KSD 100EXP
	Improper Configuration For Type of VOR or GPS	• Check configuration set up for type of VOR or GPS

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8.1 Built-in-Test (BIT) Function

The xVue Touch has the ability to recognize system failures and record information related to the failures. The purpose of BIT is to monitor the equipment and report failures. Two types of BIT are performed by the system – Power-up BIT (PBIT), and Continuous BIT (CBIT).

8.1.1 P-BIT

Power Up Built-in-Tests (P-BITs) are executed during each power up to make sure that all xVue Touch components, critical to safe operation, are not failed. Most of the PBITs are repeated twice in the case of a detected failure in order to eliminate the risk of a nuisance fault due to random environmental influences on hardware.

The following PBITs are performed:

- RAM Memory Check
- Heartbeat Check
- APM Backup Check
- APM Module Check
- APM Module Data Check
- APM Backup Module and APM Module Mismatch
- Pilot Configuration NVM Memory Check
- Loopback Check
- FPGA SPI Bus Check
- Ambient Light Sensor Check
- KG 71EXP Hardware Watch dog circuit check
- KG 71EXP RAM Integrity Check
- KG 71EXP Application Software Integrity Check
- KG 71EXP Software Part Number Check
- KG 71EXP NVM Application Data Integrity Check
- KG 71EXP Differential IPT Sensor Check
- KG 71EXP Static IPT Sensor Check
- KG 71EXP HG 1120 Status Check

Refer to Table 8-2 for troubleshooting of the P-BIT failures.

Table 8-2 P-BIT Failures Troubleshooting Chart

Symptom	Fault Recorded (NOTE 1)	Causes	Corrective Action
"Display Hardware Error" on Screen	"PBIT RAM Fault"	KSD 100EXP Defective	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
	"PBIT Heartbeat Fault"	KSD 100EXP Defective	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
	"PBIT FPGA SPI Bus Fault"	KSD 100EXP Defective	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP

Table 8-2 P-BIT Failures Troubleshooting Chart

Symptom	Fault Recorded (NOTE 1)	Causes	Corrective Action
"APM Configuration Mismatch Error" on Screen	"APM Backup module / APM module mismatch"	The Configuration Data Stored in KSD 100EXP and Configuration Module Differ	• Reset Configuration Data in Configuration Module
"APM BACKUP FAULT" Displayed	"PBIT APM Backup Fault"	The Backup Configuration Data is unavailable	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
"APM MODULE DETECTION FAULT" Displayed	"PBIT APM Module Detection Fault"	Loss of Communication with Configuration Module	• Check that Configuration Module is installed and wired properly
		Configuration Module Defective	• Replace Configuration Module
"APM MODULE CONFIGURATION DATA FAULT" Displayed	"PBIT APM Module Configuration Data Fault"	Configuration Module Defective	• Check that Configuration Module is installed and wired properly • Reset Configuration Data in Configuration Module. If fault persists, replace Configuration Module
"PILOT CONFIGURATION FAULT" Displayed	"PBIT Pilot Configuration Fault"	Pilot Stored Configuration Data Has Been Lost	• Replace KSD 100EXP
"LIGHT SENSOR FAULT MANUAL DIM REQ" Display	"PBIT Light Sensor Communication Fault"	Loss of Communication with Ambient Light Sensor	• Revert dimming control to manual operation • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
NOTE 1: For directions how to retrieve the Event Log, refer to Section 6.3.1.			

8.1.2 C-BIT

Continuous Built-in-Tests (C-BIT) run continuously as a background task checking important functional capability during normal operation. If the CBIT detects a fault, the appropriate annunciation will be displayed.

The following PBITs are performed:

- Heartbeat Monitor
- Over-Temperature Monitor
- Loopback Monitor

- FPGA SPI Bus Monitor
- Ambient Light Sensor Monitor

Refer to Table 8-3 for troubleshooting of the C-BIT failures.

Table 8-3 C-BIT Failures Troubleshooting Chart

Symptom	Fault Recorded (NOTE 1)	Causes	Corrective Action
PFD Data Stale	"CBIT Heartbeat Fault"	KSD 100EXP Defective	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
"KSD OVERTEMP" Displayed	"CBIT Over-Temperature Fault"	KSD 100EXP Unit Temperature Is Too High	• Turn KSD 100EXP off to allow it to cool down • Check for adequate ventilation • Check airflow around the KSD 100EXP for any blockages
"COURSE DEVIATION DATA OUT FAULT" Displayed	"CBIT AFCS_CRS_ DEV _OUT Loopback Fault"	Data Mismatch	• Check Wiring from Autopilot to KSD 100EXP • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
	"CBIT AFCS_CRS_ DEV _FLAG_OUT Loopback Fault"	Data Corrupted	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
"GLIDESLOPE DEVIATION DATA OUT FAULT" Displayed	"CBIT AFCS_GS_ DEV _OUT Loopback Fault"	Data Mismatch	• Check Wiring from Autopilot to KSD 100EXP • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
	"CBIT AFCS_GS_ FLAG _OUT Loopback Fault"	Data Corrupted	• Reset KSD 100EXP • If fault persists, replace KSD 100EXP
"FPGA SPI BUS FAULT" Displayed	"CBIT FPGA SPI Bus Fault"	See "PBIT FPGA SPI Bus Fault" under ""Display Hardware Error" on Screen" troubleshooting procedure in Table 8-2 P-BIT Failures Troubleshooting Chart.	
"LIGHT SENSOR FAULT MANUAL DIM REQ" Display	"CBIT Light Sensor Communication Fault"	See "PBIT Light Sensor Communication Fault" under ""LIGHT SENSOR FAULT MANUAL DIM REQ" Display" troubleshooting procedure in Table 8-2 P-BIT Failures Troubleshooting Chart	
NOTE 1: For directions how to retrieve the Event Log, refer to Section 6.3.1.			

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8.2 KSD 100EXP Touch Calibration

8.2.1 KSD 100EXP Manual Touch Calibration

When the manual touch calibration is performed, all touch functionality is disabled except the touches needed to complete the calibration procedure.

(1) Power on the KSD 100EXP by setting the PFD breaker or turning on the avionics.
(2) Press Enter on the Database Acknowledge Screen, refer to Figure 6-3.
(3) On the KSD 100EXP screen, Figure 7-1, select the Menu button, Figure 7-2, located at the top right of the screen.
(4) From the Main Menu, Figure 7-6, select the System Tools button.
(5) From the System Tools Menu, Figure 7-13, select the Screen Maint button.
(6) From the Screen Maint Menu, Figure 8-1, select the Manual Touch Calibration button.

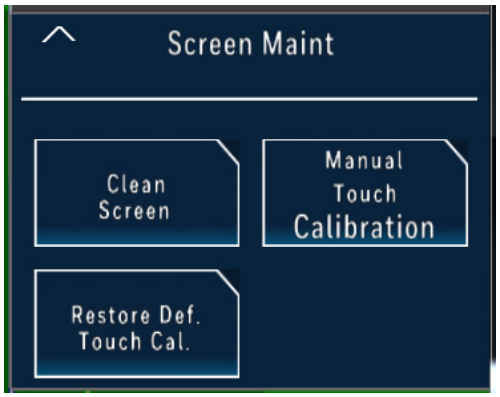

Figure 8-1 Screen Maint Menu

(7) The Manual Touch Calibration Menu, Figure 8-2, contains a message box asking the user to confirm if the manual touch re-calibration procedure can proceed.

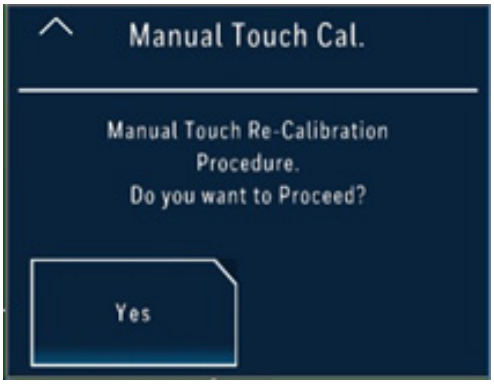

Figure 8-2 Manual Touch Calibration Menu

NOTE

TO PROCEED WITHOUT MANUAL TOUCH CALIBRATION, CLOSE THE MANUAL TOUCH CALIBRATION MENU BY PRESSING THE UP ARROW "^" BUTTON.

(8) Select the Yes button and the full screen Touch Calibration Utility Screen is displayed with the first touch point presented as a plus sign.

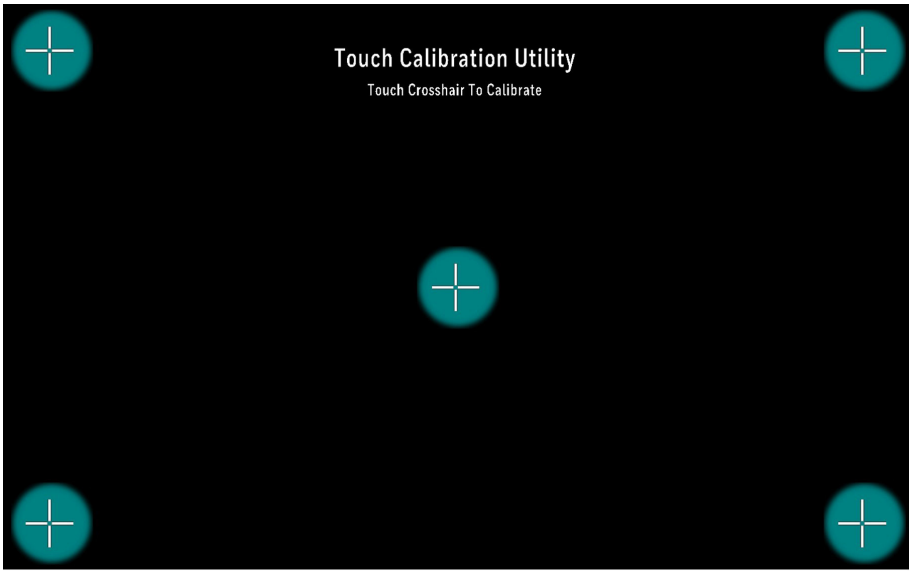

Figure 8-3 Example of Touch Calibration Utility Screen

NOTE

THE TOUCH CALIBRATION UTILITY SCREEN FIGURE SHOWS ALL THE TOUCH POINTS FOR REFERENCE PURPOSES. DURING CALIBRATION THE TOUCH POINTS ARE DISPLAYED IN SEQUENCE.

(9) When the user's touch is detected, a bloom is displayed around the requested touch point.
(10) The touch point plus sign is removed and the next touch point is displayed.
(11) This cycle continues until all 5 points are presented 3 times.

(12) When the touch point cycle is complete, the Touch Calibration Utility Test Screen, Figure 8-4, is displayed. This screen is used to verify the precision of the touch and accept the new calibration when the user is satisfied.

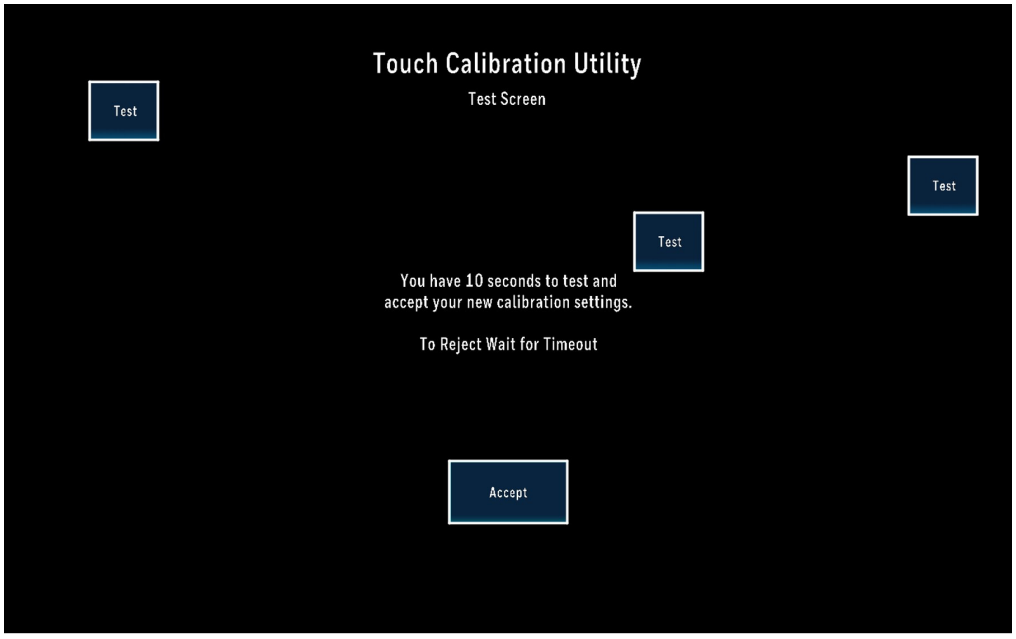

Figure 8-4 Example of the Touch Calibration Utility Test Screen

NOTE

THE TOUCH CALIBRATION UTILITY SCREEN FIGURE SHOWS ALL THE TEST POINTS AND ACCEPT BUTTON FOR REFERENCE PURPOSES. WITHIN THE UTILITY, THE TOUCH POINTS ARE DISPLAYED IN SEQUENCE.

(13) The test screen displays the following message “You have XX seconds to test and accept your new calibration settings. To Reject Wait for Timeout.” where the XX is a decrementing counter starting at 15, counting down to 0. The countdown is to indicate the number of seconds remaining.
(14) The test screen displays 4 buttons at random locations, one after the other, on the screen where the user should touch, to test the precision of the Touch operation.
(15) Following the test button operation, the Accept button is displayed at the bottom of the screen.
(16) On detection of touch, the buttons (including the Accept) bloom to give a feedback to the user.
(17) If the current touch calibration is acceptable, the user must press the Accept button before the time out.
(18) If the Accept button is pressed, within the countdown time, the new calibration settings are saved and the PFD is restored to normal display with no menus open.
(19) If the user does not press the Accept button prior to the countdown time reaching 0, the following screen (Figure 8-5) is displayed indicating that the calibration settings are reverted to the previous setting.

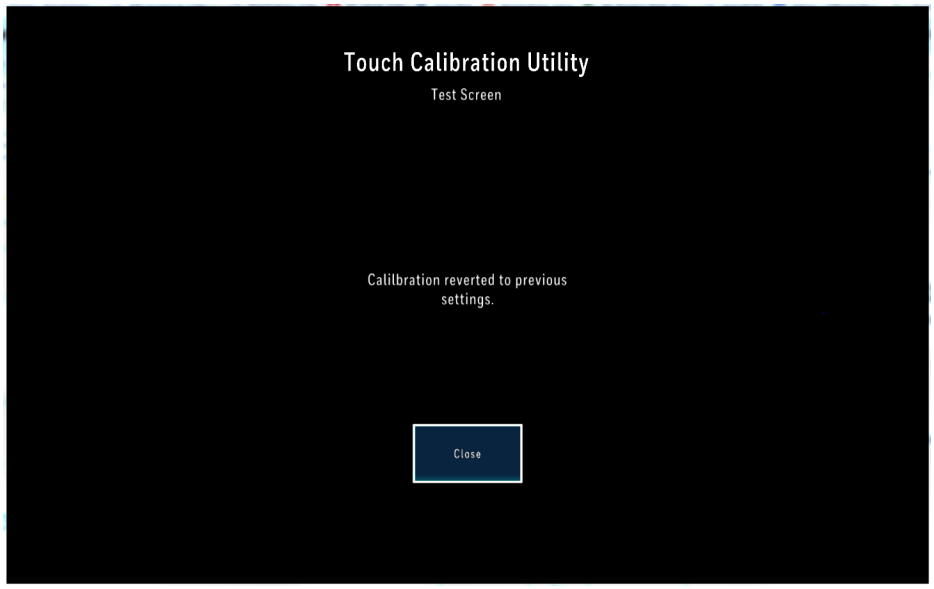

Figure 8-5 Reverting Touch Calibration Screen

(20) When the user presses the Close button, the PFD is restored to normal display with no menus open.

8.2.2 Default Touch Calibration

The user has the option to revert to the default calibration settings.

(1) Press the Restore Def Touch Cal. button from the Screen Maint Menu, Figure 8-1, to display the Restore Def Touch Cal. menu, Figure 8-6.

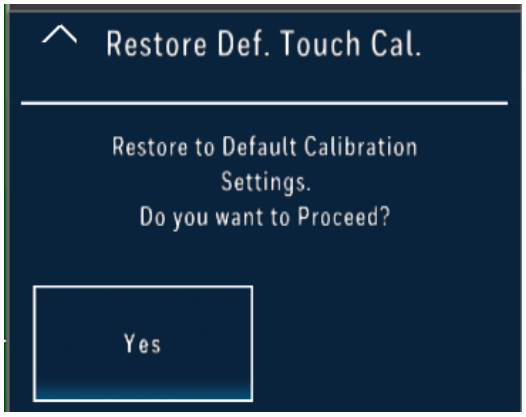

Figure 8-6 Restore Def. Touch Cal. Screen

NOTE

TO PROCEED WITHOUT REVERTING TO THE DEFAULT TOUCH CALIBRATION SETTINGS, CLOSE THE RESTORE DEF. TOUCH CAL. SCREEN BY PRESSING THE UP ARROW "^" BUTTON.

(2) When the user presses the Yes button from the Restore Def. Touch Cal. menu, the following screen, Figure 8-7, is displayed indicating the successful restoration of the default values.

Figure 8-7 Restoration of Default Values Successful Screen

(3) Press the Up Arrow "^" button to return to the Screen Maint menu.

(4) Press the Up Arrow "^" button to return to the System Tools menu.

(5) Close the Main Menu, by pressing the "X" button, to restore the PFD to normal display with no menus open.

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8.3 KG 71EXP Troubleshooting

Table 8-4 KG 71EXP Installation Troubleshooting

System Behavior	Possible Root Cause	Troubleshooting Action
After power up, the KG 71EXP system does not provide any valid data – all attitude as well as air data remains invalid at the PFD. When CMT is connected and power is applied, the connection between the KG 71EXP and the CMT is not established.	The KG 71EXP does not power up when electrical power is applied.	• Check the KG 71EXP circuit breaker. • Check the KG 71EXP power wiring including the KG 71EXP connector. • If power installation is correct, restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	RAM Integrity Check fails	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	Application SW Integrity check fails	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
*Note that because the CMT Application SW cannot communicate with the KG 71EXP, there is no event logged.		
After power up, the KG 71EXP system does not provide any valid data – all attitude as well as air data remains invalid at the PFD. When CMT is connected and power is applied, the connection between the KG 71EXP and the CMT is correctly established.	HW Watch Dog PBIT Check (Part 1 or Part 2) fails.	• Restart the KG 71EXP. If problem persists, replace the KG 71 unit.
	Software Part Number Check fails.	• Replace the KG 71EXP unit. Note: If in-field SW updates will be allowed, then the KG 71EXP SW should be re-loaded first.
	NVM Application Data Integrity Check fails.	• Connect CMT and re-configure the KG 71EXP system. If problem persists, replace the KG 71EXP unit.
After power up, the KG 71EXP provides all attitude and heading data but no air data except the Indicated Airspeed.	Static IPT Sensor Check fails. Event Log Code 5.	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
After power up, the KG 71EXP provides Altitude only, no airspeed.	Differential IPT sensor Check fails. Event Log Code 5.	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.

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Table 8-4 KG 71EXP Installation Troubleshooting

System Behavior	Possible Root Cause	Troubleshooting Action
After power up, the KG 71EXP provides all air data, but no attitude data and no heading information.	HG 1120 Status Check fails. Event Log Code 7.	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
Loss of air temperature, TAS and Density Altitude is reported.	Temperature Probe CBIT detects a failure. Event Log Code 12.	• Inspect the temperature probe wiring (including the KG 71EXP connector). If there is no problem with wiring, replace temperature probe. If problem persists, replace the KG 71EXP unit. • Note: If temperature is out of the range from -70C to +70C, then air temperature (and related parameters) becomes invalid. Loss of this data is correct system behavior.
Loss of magnetic heading.	Magnetometer availability CBIT detects a failure. Event Log Code 14.	• Check the KMG 7010/MD32 wiring and circuit breaker (including KMG 7010/MD32 and KG 71EXP connectors). • If there is no issue with wiring, replace KMG 7010/MD32. If problem persists, replace the KG 71EXP.

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Table 8-5 KG 71EXP Event Codes

System Behavior	Possible Root Cause	Event Log Code	Troubleshooting Action
After power up, the KG 71EXP system does not provide any valid data – all attitude as well as air data remains invalid at the PFD. When CMT is connected and power is applied, the connection between the KG 71EXP and the CMT is not established.	The KG 71EXP does not power up when electrical power is applied.	NA	• Check the KG 71EXP circuit breaker. • Check the KG 71EXP power wiring including the KG 71EXP connector. • If power installation is correct, restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	RAM Integrity Check fails.	NA	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit. Note that because of this failure Application SW cannot start, thus no event is logged. Next, the communication with the CMT will not be established.
	Application SW Integrity check fails	NA	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit. Note that because of this failure Application SW cannot start, thus no event is logged. Next, the communication with the CMT will not be established.
After power up, the KG 71EXP system does not provide any valid data – all attitude as well as air data remains invalid at the PFD. When CMT is connected and power is applied, the connection between the KG 71EXP and the CMT is correctly established.	HW Watch Dog PBIT Check (Part 1 or Part 2) fails.	1 or 2	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	Software Part Number Check fails.	3	• Replace the KG 71EXP unit. Note: When in-field SW updates will be allowed, then the KG 71EXP SW should be re-loaded first.
	NVM Application Data Integrity Check fails	4	• Connect CMT and re-configure the KG 71EXP system. If problem persists, replace the KG 71EXP unit.
After power up, the KG 71EXP provides all attitude and heading data but no air data except the Indicated Airspeed.	Static IPT Sensor Check fails.	5	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
After power up, the KG 71EXP provides Altitude only.	Differential IPT sensor Check fails.	6	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.

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Table 8-5 KG 71EXP Event Codes

System Behavior	Possible Root Cause	Event Log Code	Troubleshooting Action
After power up, the KG 71EXP provides all air data, but no attitude data and no heading information.	HG 1120 Status Check fails.	7	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
The KG 71EXP complete data loss (attitude, heading, air data) during flight is reported.	Electric power failure.	NA	• Check the KG 71EXP circuit breaker. • Check the KG 71EXP power wiring including the KG 71EXP connector. • If power installation is correct, restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	Hardware watchdog resets processor.	NA	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
Loss of attitude data and heading data during flight is reported.	HG 1120 CBIT detects a failure.	7	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	HG 1120 SPI Communication CBIT detects a failure.	8	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
	Excessive rate (over 250 degrees/seconds) detected.	13	• This event may happen during high rate aerobatic maneuvers. If the even happen during regular flight and occurs randomly under normal flight conditions (not aerobatic), then replace the KG 71EXP unit.
Loss of airspeed data during flight is reported.	Differential Pressure SPI Communication Integrity CBIT detects a failure.	11	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.
Loss of altitude data during flight is reported.	Static Pressure SPI Communication Integrity CBIT detects a failure.	10	• Restart the KG 71EXP. If problem persists, replace the KG 71EXP unit.

Table 8-5 KG 71EXP Event Codes

System Behavior	Possible Root Cause	Event Log Code	Troubleshooting Action
Loss of air temperature, TAS and Density Altitude is reported.	Temperature Probe CBIT detects a failure.	12	• Inspect the temperature probe wiring (including the KG 71EXP connector). If there is no problem with wiring, replace temperature probe. If problem persists, replace the KG 71EXP unit. • Note: If temperature is out of the range from -70C to +70C, then air temperature (and related parameters) becomes invalid – it is correct system behavior as the temperature is out of the system operation range.
Loss of magnetic heading during flight is reported.	Horizontal magnetic field strength was less than 80 miligauss.	NA	• This is normal system behavior – when horizontal magnetic field strength is too low, magnetic heading output is not more reliable.
	Magnetometer availability CBIT detects a failure.	14	• Check the KMG 7010/MD32 wiring and circuit breaker (including KMG 7010/MD32 and KG 71EXP connectors). • If there is no issue with wiring, replace KMG 7010/MD32. If problem persists, replace the KG 71EXP.
GPS Aiding only is reported during the flight.	The airspeed aiding source was evaluated by the KG 71EXP as not reliable.	16	• If the problem is frequent and accompanied by significant deviations of IAS, then the KG 71EXP need to be replaced. If problem occurs rarely and without IAS deviation, no action needed.
“Cross Check Attitude” message is reported during the flight, attitude remains stable and correct.	The GPS aiding data accuracy was reduced, system revered to airspeed aiding.	17	• No action needed. If problem persists, the GPS aiding source need to be inspected.
“Cross Check Attitude” message is reported during the flight, attitude exhibits significant drifts.	HG 1120 sensor performance degraded.	17	• Replace the KG 71EXP unit.

8.4 KMG 7010/MD32 Troubleshooting

8.4.1 Troubleshooting – Continuous Measurement Disturbances

If the magnetometer data readouts are continuously disturbed and the disturbance source cannot be identified, there are following probable sources of the problem:

(1) There is some external source – not obvious to the technician – which continuously disturbs the magnetic field close to the place where compensation is performed. This problem will be resolved if a different location for the magnetometer compensation is selected.

(2) The magnetometer is affected by internal sources of disturbance (for example the magnetometer is installed too close to alternator) – this type of problem must be resolved by separating the source of the disturbance from the KMG 7010/MD32, moving either the magnetometer or source of the disturbance to a different location.

8.4.2 Troubleshooting – Significant Difference between Required and Sensed Heading

If the magnetometer data readouts are significantly off from the required heading values, there are the following probable sources:

(1) Ferrous bolts/nuts were used to secure magnetometer or ferrous connector was used for connect magnetometer. Ferrous parts should be replaced by non-ferrous materials.

(2) The magnetometer installation orientation was incorrectly set (or was not set) during configuration. The magnetometer orientation must be set properly, then compensation procedures need to be repeated. Note that this error will affect all compensation points by almost the same amount of error.

(3) The magnetometer pitch/roll angles were incorrectly measured or incorrectly entered (or were not entered) during configuration. The magnetometer pitch/roll angles need to be correctly measured and the offset entered, then the magnetometer calibration procedure needs to be repeated. Note that errors caused by this problem may vary between compensation points.

8.5 Alerts

The xVue Touch is capable of displaying as well as provide an audio alert for a number of different failures.

These alerts are listed in the following chart:

Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
ATTITUDE FAIL	See “Attitude Fail” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart	

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Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
HEADING FAIL • Heading Fail with GPS Track Available • Heading and GPS Track Fail	See “Heading Fail” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart If GPS track is available, track is displayed in place of heading. • Course pointer and GPS Steering (GPSS) mode continue to function normally • Heading bug continues to be displayed but represents desired track; can be adjusted using the keypad or KCP 100EXP • Autopilot heading mode uses desired track in place of magnetic heading If GPS track is unavailable, use the magnetic compass	
AIRSPEED FAIL	Computed airspeed failure	Use the standby airspeed indicator
ALTITUDE FAIL	Barometric altitude failure	Use the standby altitude indicator
VERTICAL SPEED FAIL	Altitude rate failure or rate is out of range ±5500.	Use the standby vertical speed indicator
GPS SOURCE ALERT	Loss of communication with GPS	Switch to secondary GPS (if installed) or use alternate source for navigation
CROSS CHECK ATTITUDE	If Failure Occurred During Power Up	• Reset KG 71EXP • If fault persists, replace KG 71EXP
	Normal After Abrupt Maneuvers on Ground or In Air	• Reset KG 71EXP • If fault persists, replace KG 71EXP
	KG 71EXP Defective	• Check KG 71EXP current draw, reference Table 4-4 • Check wiring from KG 71EXP to KSD 100EXP • Replace KG 71EXP
GPSS FAIL	The GPS navigation source (GPS 1 or GPS 2) horizontal command (roll steer) is invalid when GPSS is enabled	• Reselect GPSS if the alert is caused by momentary loss of the GPS position • Fly without the GPSS mode enabled, utilizing other autopilot modes (for example NAV/APPR)

Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
HDG ALIGNING	The heading source is aligning	• Use the magnetic compass and the GPS track information for heading information until the condition is no longer displayed • During alignment maintain wings level (limit airplane to ±5° in roll and ±5° in pitch) and maintain constant heading and airspeed for 3 minutes or until the alert clears
A/P NAV INOP	Failure of one or more of the four lateral or vertical deviation outputs from the KSD 100EXP	Do not use the autopilot NAV or APPR mode
SVS FAIL	SVS POS Fault: • If any of the following inputs become invalid: o Pitch/Roll Angle o Body Acceleration (Normal/ Lateral/Longitudinal)	See “Attitude Fail” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart
	SVS POS Fault: • If any of the following inputs become invalid: o Pressure Altitude o True Airspeed o Calibrated Airspeed	See “Altimeter, Airspeed Failures” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart
	SVS POS Fault: • If any of the following inputs become invalid: o Magnetic Heading	See “Heading Fail” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart
	SVS POS Fault: • If any of the following inputs become invalid: o Geometric Altitude o Latitude/Longitude o Ground Speed o Magnetic Variation o True Track	See “No Navigation Data or Failure” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart
	SVS TER Fault: • Failure To Receive Terrain Data From the Terrain Server • Internal Terrain Rendering Error	Check that airplane maneuvers are within boundaries of the high resolution database

Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
KCP FAIL	KCP 100EXP Failed to Respond	• Check KCP 100EXP Current Draw • Check Wiring from KCP 100EXP to KSD 100EXP • If fault persists, replace KCP 100EXP
	Checksum Failed	Replace KCP 100EXP
	Values Echoed Back Does Not Match The Transmitted Values	Replace KCP 100EXP
GPS 1 FAIL GPS 2 FAIL	See “No Navigation Data or Failure” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart	
VLOC 1 FAIL VLOC 2 FAIL VLOC 3 FAIL	See “No Navigation Data or Failure” troubleshooting procedure in Table 8-1 xVue Touch System Troubleshooting Chart	
UAT FAIL	Loss of Communication with UAT	Check Wiring from UAT to KSD 100EXP
	Improper Configuration Setup	Check data port configuration setting of the UAT
	UAT Not Functioning Properly	• Reset UAT • Check function of UAT
AHRS AIDED SECONDARY MODE	ADAHRS is in airspeed aiding only mode	If observed before takeoff, do not take off in IMC/IFR until the message clears Note: This message is accompanied by the Cross Check Attitude caution alert in flight.
AHRS AIDED SECONDARY MODE NOT AVAILABLE	Airspeed not available	• Reset KG 71EXP. Inspect pitot and static system blockage or leaks • If fault persists, replace KG 71EXP

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Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
DATABASE LOAD FAIL NAVIGATION OBSTACLE CARTOGRAPHIC TERRAIN CHARTS IFR LOW ALTITUDE IFR HIGH ALTITUDE VFR SECTIONAL	Database CRC Failed During Database Loading	• Reload failed database • Re-download failed database source content to USB drive and reload failed database • Reload failed database using a different USB drive • If fault persists, replace KSD 100EXP
	Database Has Failed to Load	• Reload failed database • Re-download failed database source content to USB drive and reload failed database • Reload failed database using a different USB drive • If fault persists, replace KSD 100EXP
	Database Tiles Failed to Load During Run Time	• Reload failed database • Re-download failed database source content to USB drive and reload failed database • If fault persists, replace KSD 100EXP
	Database Tiles Corrupted During Run Time	• Reload failed database • Re-download failed database source content to USB drive and reload failed database • If fault persists, replace KSD 100EXP
DATABASE EXPIRED	Database(s) has expired	Download the latest database(s)
DATABASE FUTURE CYCLE	Newer version of a database has loaded before the effectivity date	Verify database effectivity date
UAT NO COMMUNICATION	No Data Received on the Bus from the UAT Receiver	See “UAT FAIL” troubleshooting procedure in this table.
UAT POSITION FAIL	The UAT’s GPS position is invalid	If the UAT’s GPS is used for ADS-B Out, ADSB Out is no longer provided
SET BARO	BARO is not set	Set BARO to current setting
AHRS IN-MOTION ALIGMENT	AHRS is in alignment during flight	Fly straight and level If possible until system is done with alignment.

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Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
LIGHT SENSOR FAULT MANUAL DIM REQ	Loss of Communication with Ambient Light Sensor	• Revert dimming control to manual operation • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
LATERAL DEVATION OUTPUT FAIL	Data Mismatch	• Check Wiring from Autopilot to KSD 100EXP • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
VERTICAL DEV OUTPUT FAIL	Data Mismatch	• Check Wiring from Autopilot to KSD 100EXP • Reset KSD 100EXP • If fault persists, replace KSD 100EXP
APM MODULE DETECTION FAULT	Loss of Communication with Configuration Module Configuration Module Defective	• Check that Configuration Module is installed and wired properly • Replace Configuration Module
PILOT CONFIGURATION FAULT	Pilot Stored Configuration Data Has Been Lost	Replace KSD 100EXP
APM MODULE CONFIGURATION DATA FAULT	Configuration Module Defective	• Check that Configuration Module is installed and wired properly • Reset Configuration Data in Configuration Module. If fault persists, replace Configuration Module
APM BACKUP FAULT	The Backup Configuration Data is unavailable	• Reset KSD 100EXP • If fault persists, replace the KSD 100EXP
FPGA SPI BUS FAULT	CBIT FPGA SPI Bus Fault	See “PBIT FPGA SPI Bus Fault” under “ ‘Display Hardware Error’ on Screen” troubleshooting procedure in Table 8-2 P-BIT Failures Troubleshooting Chart
AHRS ALIGNING-DO NOT TAXI	AHRS is in alignment mode	Do not taxi the airplane until alignment is finished
AHRS ALIGNING KEEP WINGS LEVEL	AHRS is in alignment during flight	Fly straight and level If possible until system is done with alignment.

Table 8-6 Alerts Troubleshooting Chart

Symptom	Causes	Corrective Action
KSD OVERTEMP	KSD 100EXP Unit Temperature Is Too High	• Turn KSD 100EXP off to allow it to cool down • Check for adequate ventilation • Check airflow around the KSD 100EXP for any blockages
WARNING TERRAIN TERRAIN	Warning during flight	Comply with Warning
WARING OBSTACLE OBSTACLE	Warning during flight	Comply with Warning
CAUTION TERRAIN TERRAIN	Caution during flight	Comply with Caution
CAUTION OBSTACLE OBSTACLE	Caution during flight	• Comply with Caution
ATTITUDE ALIGNING	Attitude is in alignment	• Let system align • If system will not complete alignment use Table 8-4 for troubleshooting the KG 71EXP system.

8.6 Repair and Return

If repair is necessary, the units must be sent to a BendixKing repair facility. There are no field repairable items inside the xVue Touch LRUs.

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9 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

9.1 Purpose

The purpose of this section is to provide information to supplement the airplane operators ICA.

9.2 ICA Content

9.2.1 Description of System and Installation

The KSD 100EXP Primary Flight Display is installed in the instrument panel of the airplane and may be installed on the left (typical) or right side of the cockpit. The default configuration is the “Left Location”. Install the KSD 100EXP in a location to make sure that the pilot can operate it without unreasonable efforts to reach or see the screen, and is protected from glare and or reflections that interfere with a pilot’s vision. If the KSD 100EXP will be the primary attitude indicator it should be installed within the viewing envelope shown in Figure 3-3 KSD 100EXP Primary Field of View. The KCP 100EXP Control Panel is installed in instrument panel of the airplane as companion to the KSD 100EXP. The KCP 100EXP provides an alternative to the KSD 100EXP touch control capability for entering parameters such as altitude and barometric pressure, course and heading. The configuration module stores the configuration data for the xVue Touch System.

A KTP 73 Outside Air Temperature Probe, a KMG 7010/MD32 Magnetometer and a KG 71EXP ADAHRS complete the system. There are no antenna installations associated with this type design change.

9.2.2 Airworthiness Limitations and Scheduled Maintenance

9.2.2.1 Airworthiness Limitations

The xVue Touch System installation is for non-certified aircraft only.

9.2.2.2 Scheduled Maintenance Checks

Each static pressure system, altimeter instrument, and automatic pressure altitude reporting system must be tested, inspected and in compliance with Appendices E and F of 14 CFR Part 43 within the preceding 24 calendar months.

9.2.3 Control and Operating Information

The xVue Touch System power is controlled by three circuit breakers, PFD, ADAHRS and MAG, powered from the airplane’s primary power bus, refer to Section 3.8.

If the xVue Touch System is inoperative, secure cables and wiring, and collar the applicable circuit breakers as inoperative.

9.2.4 Unscheduled Maintenance

9.2.4.1 Cleaning

CAUTION

THE DISPLAY SCREEN GLASS HAS AN OPTICAL COATING THAT IS EASILY DAMAGED.

CAUTION

DO NOT USE PAPER PRODUCTS TO CLEAN DISPLAY SCREEN.

CAUTION

DO NOT USE ABRASIVE OR AGGRESSIVE SOLVENT ON THE SCREEN.

CAUTION

DO NOT APPLY CLEANER DIRECTLY TO THE SURFACE OF THE SCREEN.

CAUTION

USE EXTREME CARE WHEN CLEANING THE DISPLAY TO AVOID DAMAGING THE IR BAR.

9.2.4.2 Screen Cleaning

Do not press excessively hard on the glass. Use correct shop procedures to clean the glass. Remove oil, grease, dust, and dirt that collects on the surfaces. Usually, only minimal cleaning is needed. Do not use abrasive or aggressive solvent on the screen.

There are two acceptable cleaning procedures for the KSD 100EXP screen that follow:

Clean with a lint-free, anti-static sachet.

(1) Carefully wipe the glass with a damp, lint-free, anti-static sachet until the glass is clean.
(2) Wipe off moisture that remains with a dry, lint-free, anti-static sachet.

Clean with a mild water-based detergent solution (Dawn® dish-washing soap (or similar) and distilled water).

(1) Apply the water-based detergent solution onto a clean, lint-free, cotton cloth or cotton swab to clean the glass face.
(2) Carefully wipe glass with the moist, lint-free, cotton cloth until the glass is clean.
(3) Wipe off any moisture that remains with a clean, lint-free, anti-static sachet.

9.2.4.3 IR Bar Cleaning

The IR bar is located at the top edge of the screen. The IR bar is made of polycarbonate and can be easily damaged. To clean the IR bar, complete the following procedure.

NOTE

TO ENSURE PROPER IR BAR FUNCTION, ALL EXPOSED EDGES OF THE IR BAR, ESPECIALLY THE EDGE BETWEEN THE IR BAR AND THE SCREEN, NEED TO REMAIN FREE OF DEBRIS.

NOTE

THE IR BAR SHOULD BE CLEANED EITHER AFTER CLEANING THE DISPLAY OR INDEPENDENTLY. DISPLAY CLEANING MAY INADVERTENTLY CAUSE DEBRIS TO COVER THE IR BAR.

Clean with a dry or moist cotton swab.

(1) Carefully run a dry or moistened cotton swab along the upper edge of the display screen. Distilled water may be used to lightly moisten swab if needed. If water only is not adequate, a mild water-based detergent solution (Dawn® dish-washing soap (or similar) and distilled water) may be used to lightly moisten cotton swab.

(2) Wipe off moisture that remains with a dry cotton swab.

9.2.4.4 Inspection

A general visual inspection of the KSD 100EXP PFD, KCP 100EXP Control Panel, KG 71EXP ADAHRS, KMG 7010/MD32 Magnetometer, and the KTP 73 Outside Air Temperature Probe and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security.

Loose and chaffing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, are not lose or chafing. Connection points to the units and to the airframe should be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test should be performed independent of the time interval. An electrical bonding test requires the use of a milliohm meter to confirm that there is a maximum resistance of 2.5 milliohms, or less, between the unit and airframe ground. If a resistance is found to be too high, disassembly of the brackets will be required. Check each metal mating surface to be sure it is clear of paint and primer. If necessary, lightly sand the mating areas to clean them. Always treat bare aluminum with Conversion coating before reassembly.

9.2.4.5 Configuration Module Inspection

The configuration must be checked during each annual inspection.

(1) Apply power to the airplane and the xVue Touch and check for any of the following messages:

(a) APM BACKUP FAULT

(b) APM MODULE DETECTION FAULT

(c) APM MODULE CONFIGURATION DATA FAULT

If any of the messages above are displayed, the configuration for xVue Touch System must be reconfigured, repaired or replaced, refer to Section 8 Troubleshooting. No action is required if no messages are displayed.

9.2.4.6 xVue Touch System Bonding Inspection

The xVue Touch System electrical bonding must be checked every two years.

(1) Verify there is a resistance of 2.5 milliohms, or less, from the KSD 100EXP PFD housing and to the airframe ground as well from the KCP 100 Control Panel housing to the airframe ground.

(2) Verify there is a resistance of 2.5 milliohms, or less, from the KG 71EXP ADAHRS to the airplane local structure as well as from the KMG 7010/MD32 Magnetometer to the airplane local structure.

(3) Verify there is a resistance of 2.5 milliohms, or less, from the KTP 73 Temperature Probe element to the airplane local structure.

(4) The xVue Touch System mating connector metal back shells should be checked to verify a resistance of 2.5 milliohms, or less, to airframe ground.

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9.2.4.7 Inspection Criteria

Table 9-1 ICA Inspection Criteria

xVue Touch System Component Description	Inspection Requirement	Recommended Minimum Inspection Interval	Completed
KCP 100EXP Control Panel	A general visual inspection of the KCP 100EXP Control Panel, installation and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed.	12 months	☐
KTP 73 Outside Air Temperature Probe	A general visual inspection of the KTP 73 Outside Air Temperature Probe and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed.	12 months	☐

Table 9-1 ICA Inspection Criteria

xVue Touch System Component Description	Inspection Requirement	Recommended Minimum Inspection Interval	Completed
KSD 100EXP PFD	A general visual inspection of the KSD 100EXP PFD and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed.	12 months	☐
KMG 7010/MD32 Magnetometer	A general visual inspection of the KMG 7010/MD32 Magnetometer and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed.	12 months	☐

Table 9-1 ICA Inspection Criteria

xVue Touch System Component Description	Inspection Requirement	Recommended Minimum Inspection Interval	Completed
KDC 100EXP Data Converter	A general visual inspection of the KDC100 EXP Data Converter and the associated wiring must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed.	12 months	☐

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Table 9-1 ICA Inspection Criteria

xVue Touch System Component Description	Inspection Requirement	Recommended Minimum Inspection Interval	Completed
KG 71EXP ADHARS	A general visual inspection of the KG 71EXP ADHARS and the associated wiring and Pitot and Static lines must be performed during each annual inspection. Visually check wiring for general condition, routing, chafing, bonding straps and/or wires and integrity of clamping and stand-offs. Visually check the mechanical installation for condition, including checking the unit and all mounting brackets for security. Loose and chafing brackets will increase the resistance between parts. Check for signs that the units have not been tampered with or removed. Inspect and verify the bonding straps or ground wires are in good condition, and are not loose or chafing. Connection points to the units and to the airframe must be inspected for evidence of corrosion. If any of these indications are present, an electrical bonding test must be performed. Within the preceding 24 calendar months, each static pressure system, each altimeter instrument, and each automatic pressure altitude reporting system has been tested and inspected and found to comply with Appendices E and F of 14 CFR Part 43.	12 months 24 months	☐
Connectors	Check for general condition, and integrity of the attachment hardware.	12 months	☐
Circuit breakers	Check for general condition and operation.	12 months	☐
Switches	Check for general condition and operation.	12 months	☐
Associated wiring	Check for general condition, routing, chafing, and integrity of clamping and stand-offs, and shields.	12 months	☐

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9.2.4.8 Adjustments

There are no adjustments or alignments required for maintenance of the KSD 100EXP, KCP 100EXP, and the KTP 73.

Removing and replacing the KG 71EXP and or KMG 7010/MD32 requires compass calibration and airplane leveling. Refer to Section 6.3 KG 71EXP Configuration (ADAHRS) and Section 6.4 KMG 7010/MD32 Calibration (Magnetometer).

If a new configuration module is installed, it will not include the existing data. Utilize the Restore Data To APM feature within the Installer Menu to restore the settings within the new configuration module, follow the procedures in Section 6.2.

9.2.4.9 Testing

No scheduled system maintenance testing is required.

9.2.4.10 Lubrication

There are no requirements for periodic lubrication of the xVue Touch System components.

9.2.5 Servicing Information

No scheduled servicing tasks are required on the xVue Touch System components.

9.2.6 Troubleshooting

Refer to Section 8 of this document for troubleshooting steps.

The xVue Touch System components are not field-repairable. Repairs must be made by a properly certificated repair facility. Contact BendixKing Customer Service for details.

9.2.7 Storage Limitation

There are no storage limitations on the xVue Touch System components.

9.2.8 Removal and Reinstallation Information

9.2.8.1 Removal

9.2.8.1.1 KSD 100EXP Removal

NOTE

BE SURE TO HOLD THE KSD 100EXP SUCH THAT THE GLASS DOES NOT REST AGAINST THE AIRPLANE CONTROL COLUMN OR YOKE DURING REMOVAL AND INSTALLATION.

Execute the following steps for removal of the KSD 100EXP:

(1) Ensure all power is removed from the airplane.
(2) Remove the four socket head mounting screws from the front of the KSD 100EXP.
(3) Remove the KSD 100EXP from the instrument panel.
(4) Remove the ground stud nut and ground wire from the back of the KSD 100EXP, if installed.
(5) Disconnect the two DB-78 connectors, J1 and J2, from the back of the KSD 100EXP.
(6) Remove the eight #2-56 screws attaching the Santoprene™ Grip to the LCD mount.
(7) Unsnap the Santoprene™ Grip from the front edge of the LCD Mount and slide the grip towards the back of the KSD 100EXP to remove.

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9.2.8.1.2 KCP 100EXP Removal

Execute the following steps for removal of the KCP 100EXP:

(1) Ensure all power is removed from the airplane.
(2) Remove the four socket head mounting screws from the front of the KCP 100EXP.
(3) Remove the KCP 100EXP from the instrument panel.
(4) Disconnect the DB-9 connector, J1, from the back of the KCP 100EXP.

9.2.8.1.3 KTP 73 Removal

Execute the following steps for removal of the KTP 73:

(1) Ensure all power is removed from airplane.
(2) Remove the four #6-32 stainless steel mounting screws, located on the KTP 73 mounting block, attaching the KTP 73 to the airplane skin.
(3) Remove the KTP 73 from the airplane; this requires removal of the sealant from the component as well as the airplane skin.
(4) Locate the KTP 73 lead wire splice or connector.
    (a) For a wire splice configuration, cut the wires and remove the KTP 73 from the airplane.
    (b) For a connector configuration, disconnect the connector and remove the KTP 73 from the airplane.

9.2.8.1.4 KG 71EXP Removal

Execute the following steps for removal of the KG 71EXP:

(1) Ensure all power is removed from airplane.
(2) Disconnect the KG 71EXP connector, J71.
(3) Disconnect and cap the airplane the Pitot and Static lines.
(4) Remove the four #10-32 washer head screws and washers from the four corners of the KG 71EXP.
(5) Remove the KG 71EXP from the airplane.

9.2.8.1.5 KMG 7010 Removal

Execute the following steps for removal of the KMG 7010:

(1) Ensure all power is removed from airplane.
(2) Disconnect J71 mating connector from the KMG 7010.
(3) Remove the four #10-32 mounting screws, washers and lock nuts from the four corners of the KMG 7010.
(4) Remove the KMG 7010 from the airplane

9.2.8.1.6 MD32 Removal

Execute the following steps for removal of the MD32:

(1) Ensure all power is removed from airplane.
(2) Disconnect mating connector from the MD32.
(3) Remove the four #4 or #6 machine screws from the baseplate.
(4) Remove the MD32 from the airplane.

9.2.8.1.7 KDC 100EXP Removal

Execute the following steps for removal of the KDC 100EXP:

(1) Ensure all power is removed from airplane.
(2) Disconnect J71 mating connector from the KDC 100EXP.
(3) Remove the four #10-32 mounting screws, washers and lock nuts from the four corners of the KDC100 EXP.

(4) Remove the KDC 100EXP from the airplane.

9.2.8.2 Reinstallation

Repaired LRUs must be re-installed on the airplane in accordance with the instructions provided in this manual. Refer to specific instructions for each LRU in Section 4 xVue Touch System Installation Procedures.

9.2.8.2.1 KSD 100EXP Reinstallation

For reinstallation of the KSD 100EXP, execute the steps in the Section 4.3 KSD 100EXP Installation. If the unit being installed is a new unit, execute the steps found in Section 6 System Configuration, Section 6.2 KSD 100EXP Configuration (PFD) Setup, and Section 7 System Checkout.

9.2.8.2.2 KCP 100EXP Reinstallation

For reinstallation of the KCP 100EXP, execute the steps in Section 4.4 KCP 100EXP Installation as well as the steps in Section 7.2.11 KCP 100EXP Checkout.

9.2.8.2.3 KTP 73 Reinstallation

For reinstallation of the KTP 73, execute the steps in Section 4.9 KTP 73 Installation and verify the temperature data as described in Section 7.2.6 Outside Air Temperature Checkout.

9.2.8.2.4 KG 71EXP Reinstallation

For reinstallation of the KG 71EXP, execute the steps in Section 4.5 KG 71EXP Installation as well as the steps in Section 6.3 KG 71EXP Configuration (ADAHRS), Section 7.2.10.1 Autopilot & KSD 100EXP Interface, Section 7.2.10.2 Autopilot & KSD 100EXP Interface Checkout Procedures and Section 7.2.1 Attitude Checkout, Section 7.2.3 Leak Test and Section .

9.2.8.2.5 KMG 7010 Reinstallation

For reinstallation of the KMG 7010, execute the steps in Section 4.6 KMG 7010 Installation as well as the steps in Section 6.3 KG 71EXP Configuration (ADAHRS), Section 6.4 KMG 7010/MD32 Calibration (Magnetometer), and Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing. Then, perform autopilot heading course verification; refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” for Heading and Course Datum.

9.2.8.2.6 MD32 Reinstallation

For reinstallation of the MD32, execute the steps in the Installation Manual and Operating Instructions – Model MD32 Series Remote Magnetometer (see Appendix D MD32 Installation Manual), Section 4.7 MD32 Installation, as well as the steps in Section 6.3 KG 71EXP Configuration (ADAHRS), Section 6.4 KMG 7010/MD32 Calibration (Magnetometer), and Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing. Then, perform autopilot heading course verification; refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” for Heading and Course Datum.

9.2.8.2.7 KDC 100 EXP Reinstallation

For reinstallation of the KDC 100EXP, execute the steps in Section 4.8 KDC 100EXP Installation as well as the steps in Section 3.6.8.3.2 Ground Checks - After Magnetometer Installation and Compass Swing. Then, perform autopilot heading course verification; refer to the autopilot installation and/or maintenance manual for the autopilot installed in the airplane and perform the “Set Installation Offsets” for Heading and Course Datum.

9.2.8.3 Return to Service

Verify proper operation of the xVue Touch System by following the procedures in Section 7 System Checkout.

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APPENDIX A OUTLINE AND INSTALLATION DRAWINGS

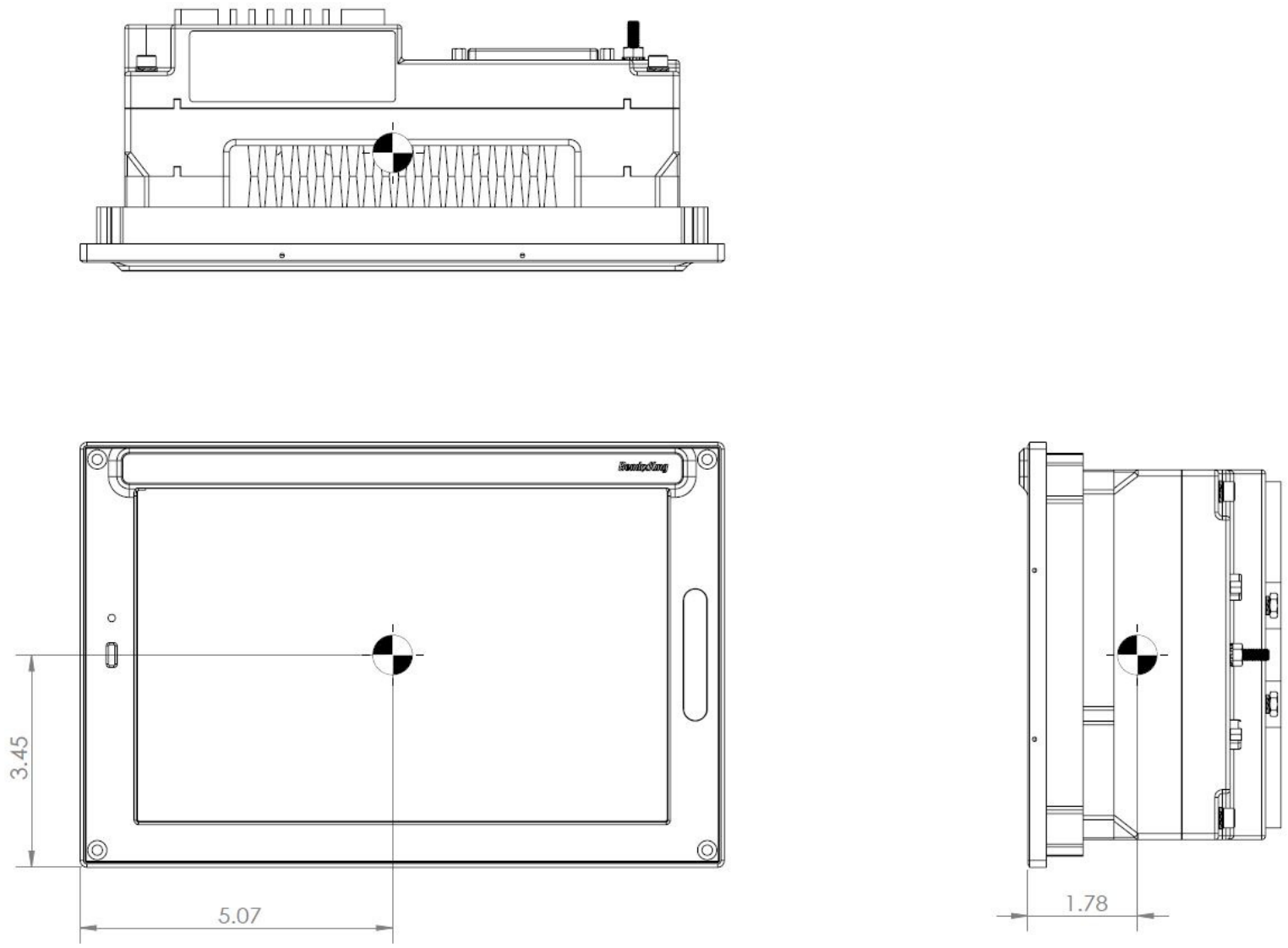

Figure A-1 KSD 100EXP Center of Gravity

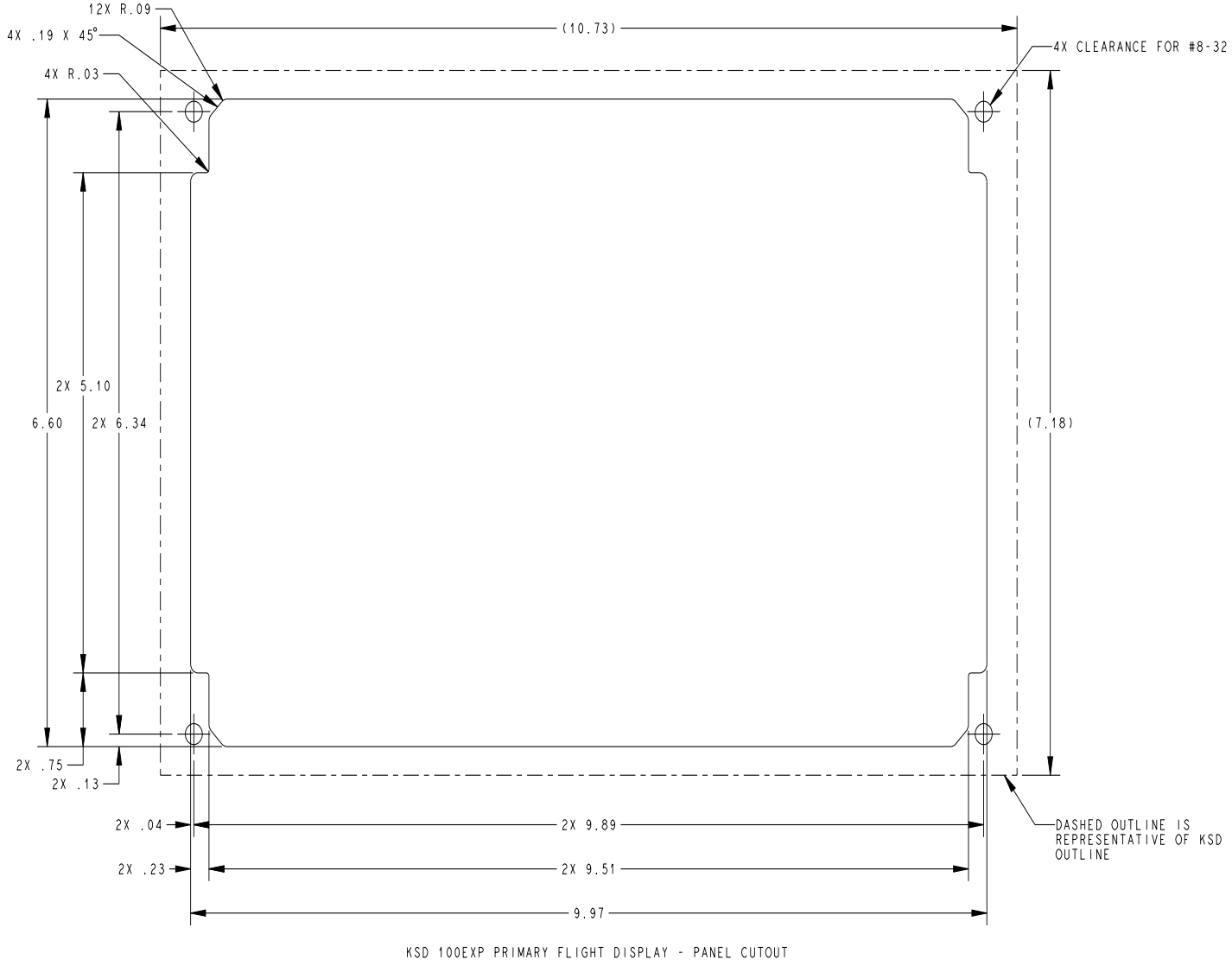

Figure A-2 KSD 100EXP Panel Cutout Dimensions

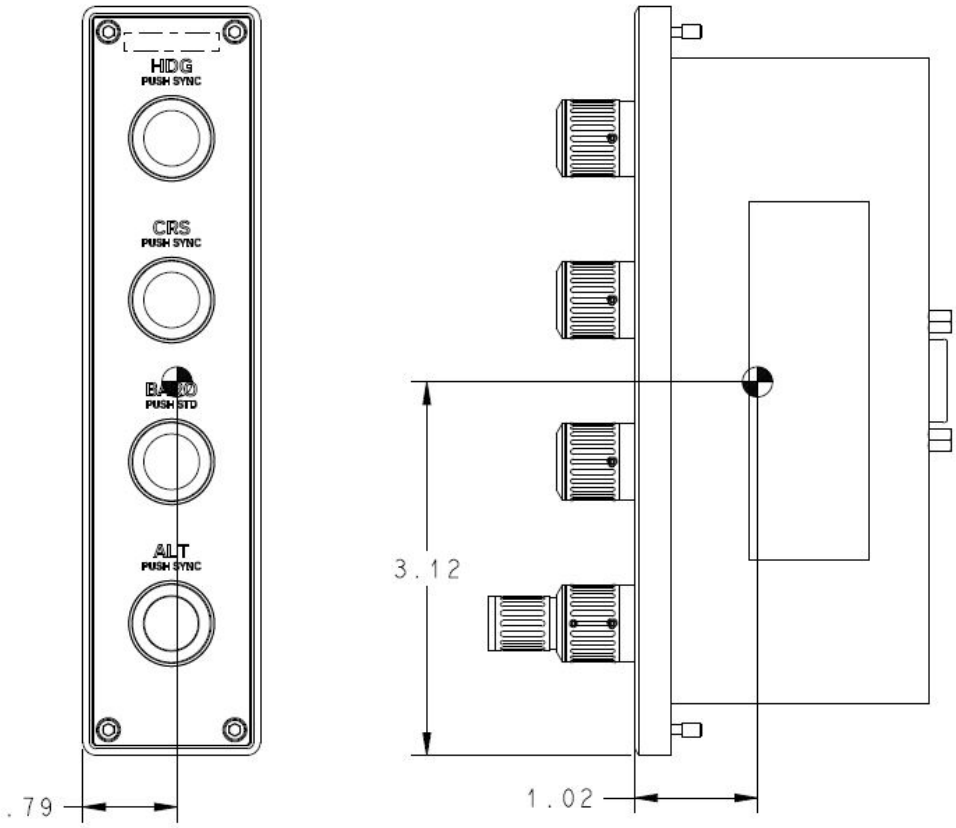

Figure A-3 KCP 100EXP Dimensions and Center of Gravity - Portrait Orientation

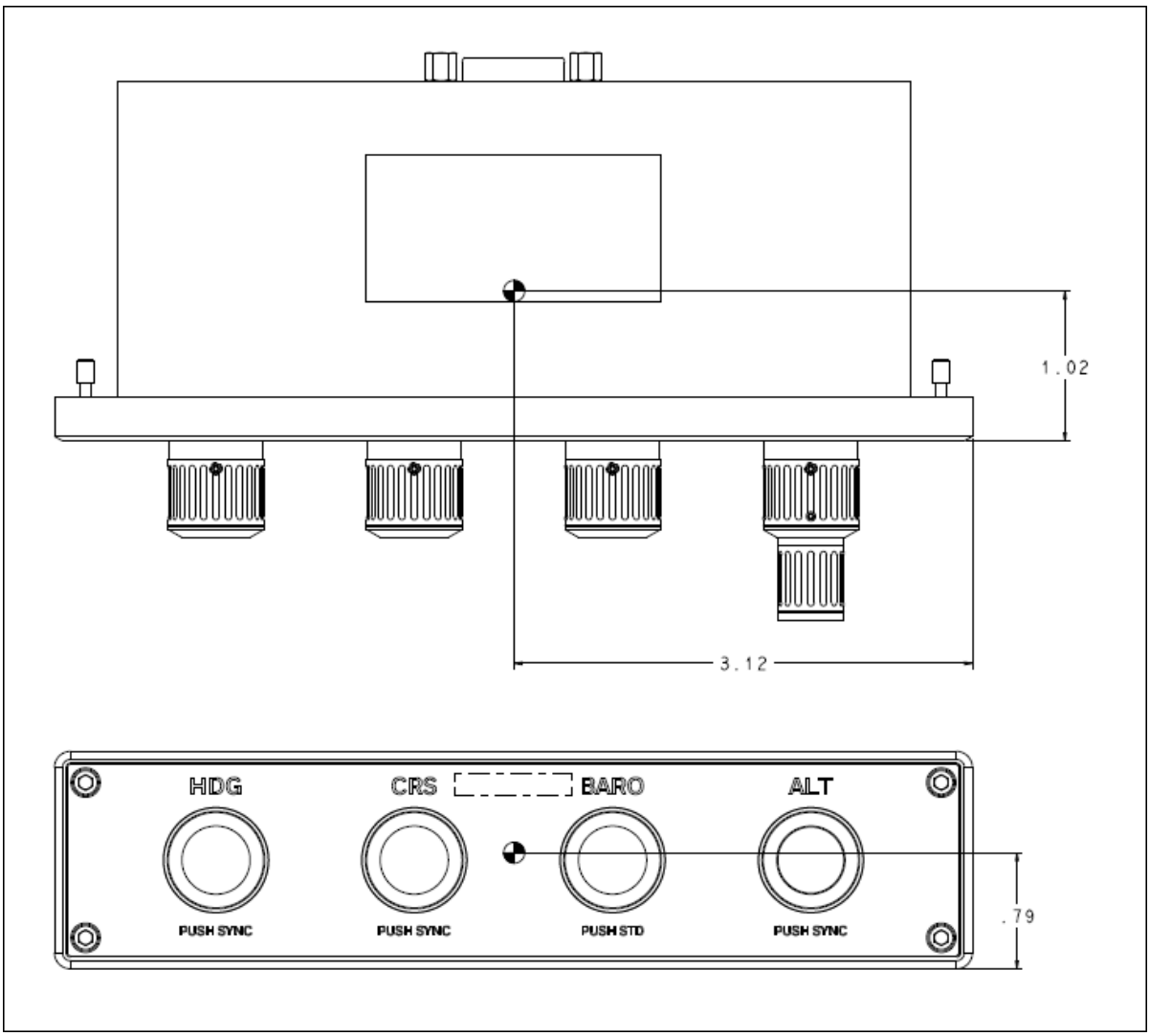

Figure A-4 KCP 100EXP Dimensions and Center of Gravity - Landscape Orientation

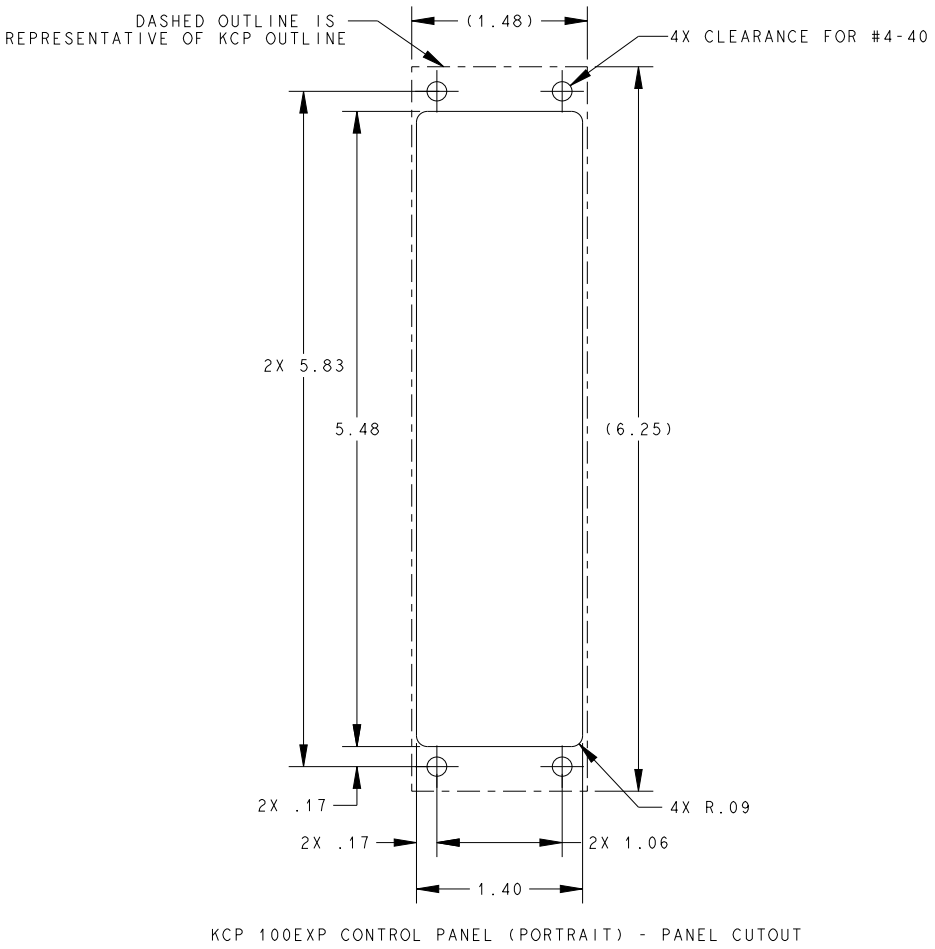

Figure A-5 KCP 100EXP Panel Cutout Dimensions

NOTE

UTILIZE SAME KCP 100EXP PANEL CUTOUT DIMENSIONS FOR HORIZONTAL KCP 100EXP INSTALLATION BUT ROTATED 90 DEGREES.

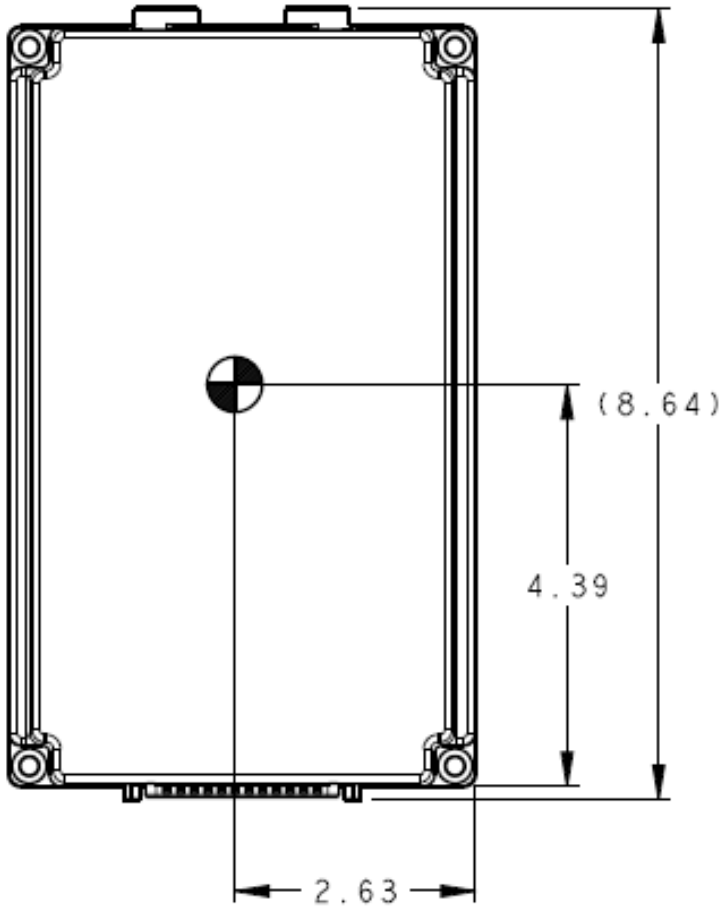

Figure A-6 KG 71EXP Dimensions and Center of Gravity

Figure A-7 KG 71EXP Mounting Hole Pattern Diagram

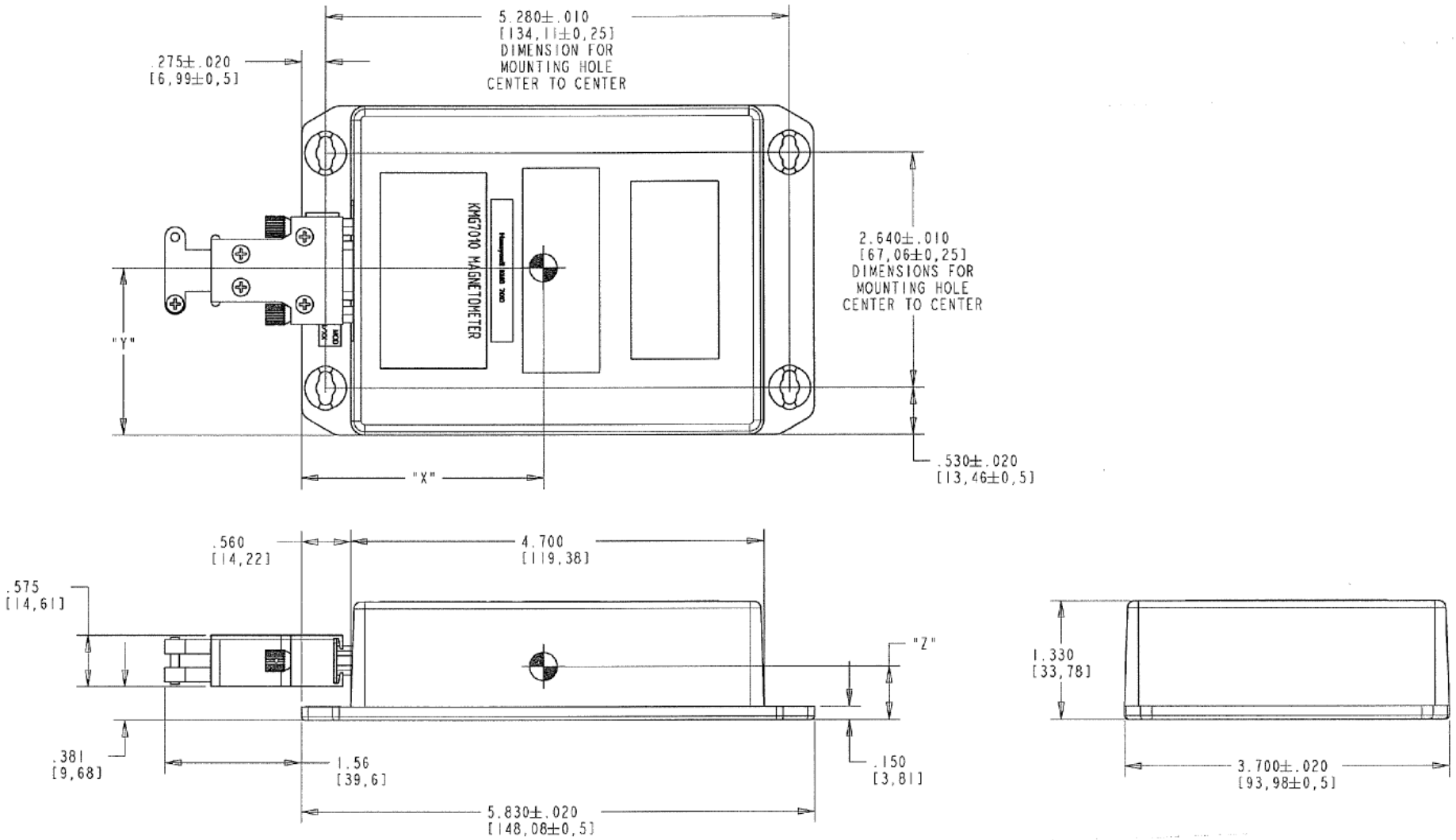

Figure A-8 KMG 7010 Outline and Mounting Drawing (Sheet 1 of 2)

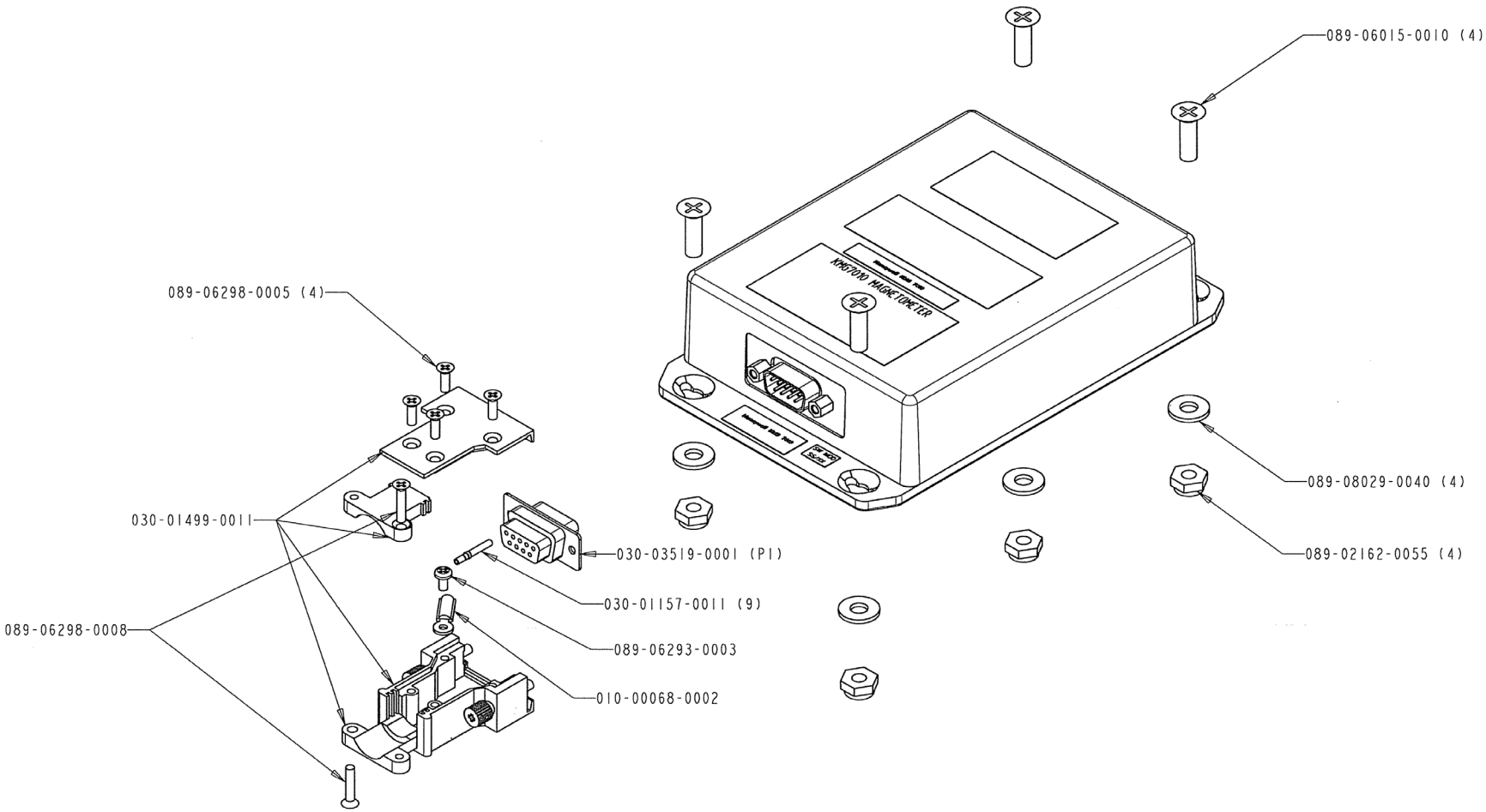

Figure A-9 KMG 7010 Outline and Mounting Drawing (Sheet 2 of 2

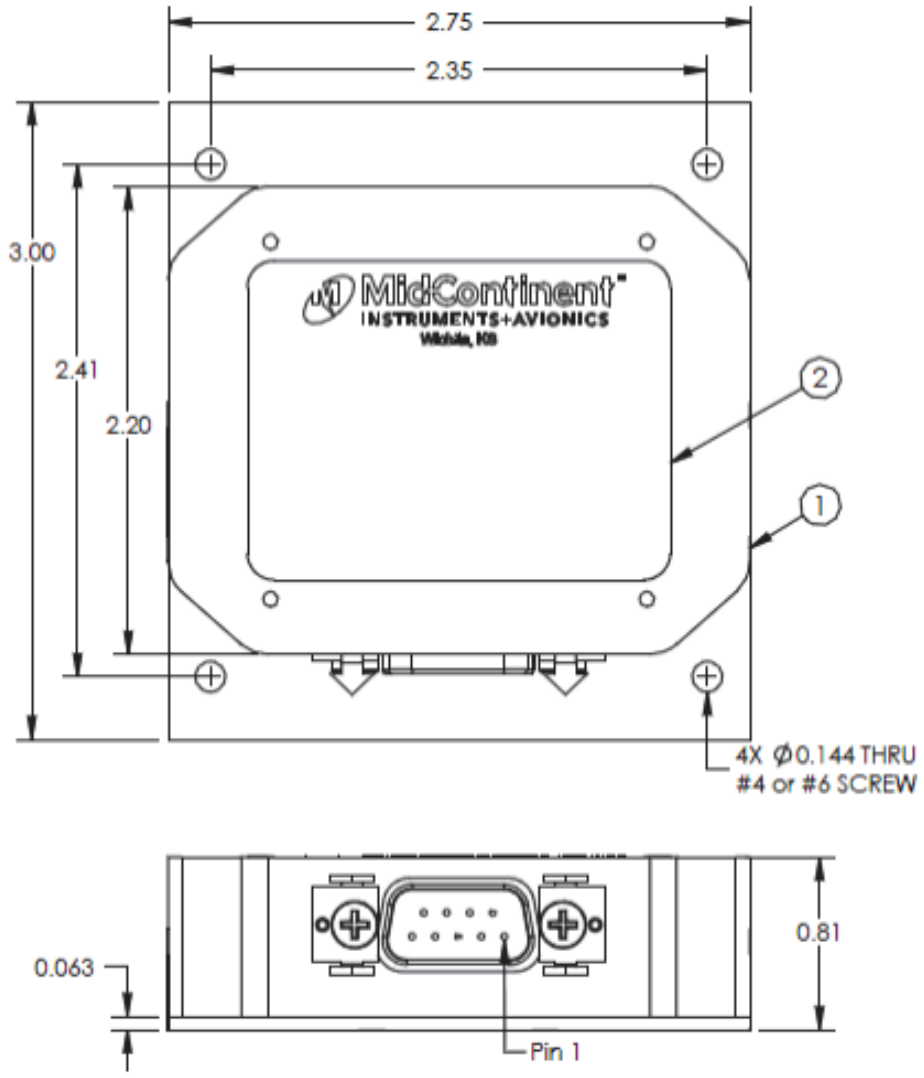

Figure A-10 MD32 Outline Drawing

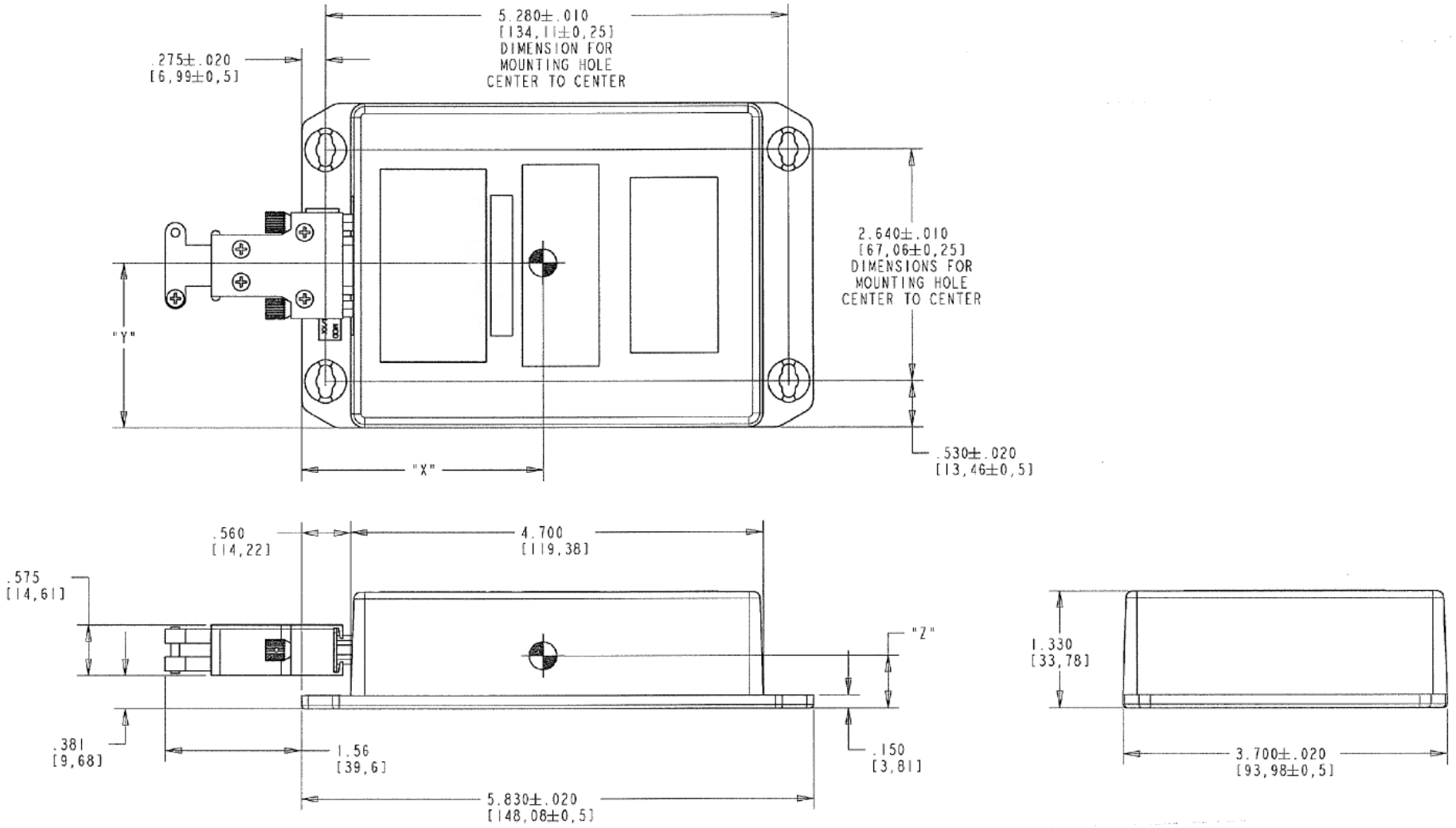

Figure A-11 KDC 100EXP Outline and Mounting Drawing (Sheet 1 of 2)

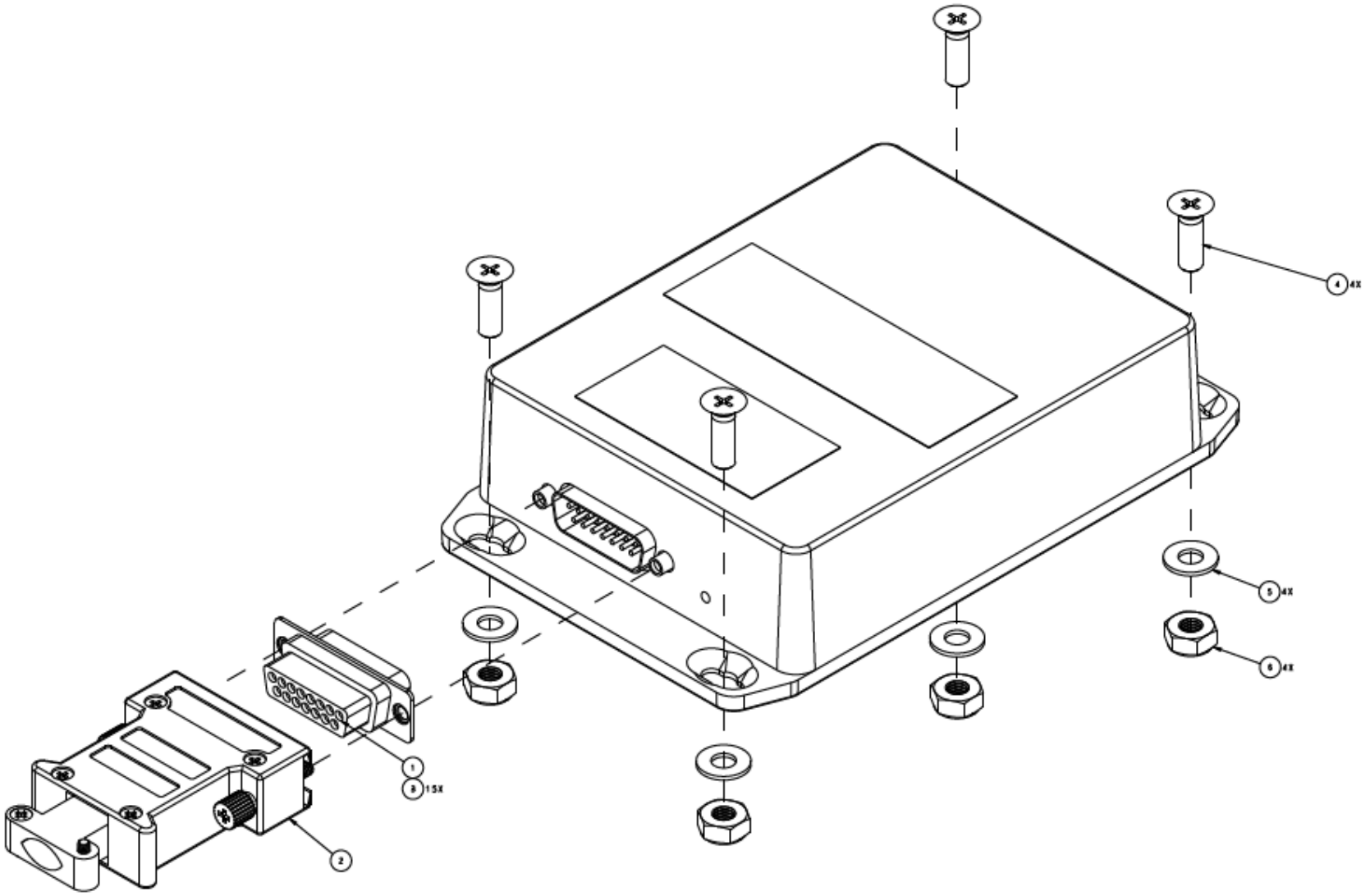

Figure A-12 KDC 100EXP Outline and Mounting Drawing (Sheet 2 of 2)

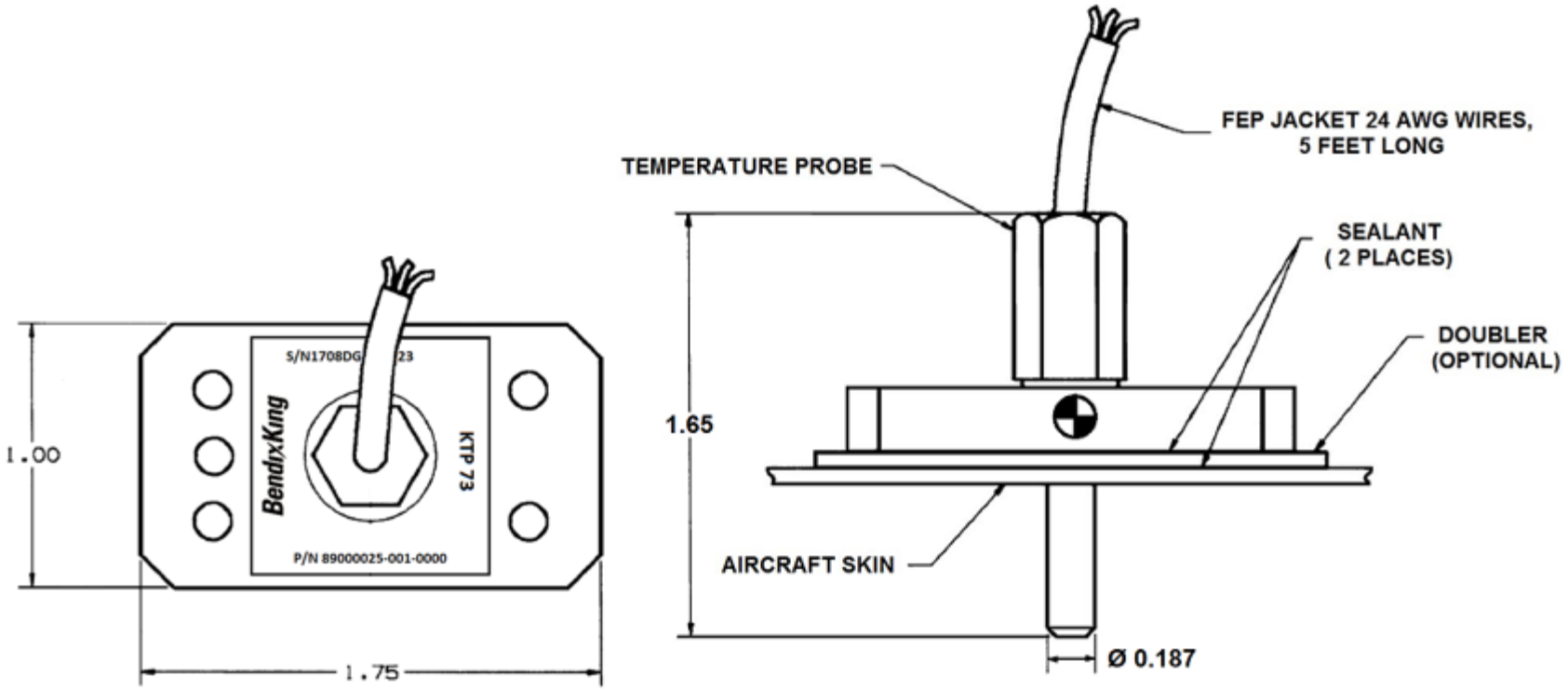

Figure A-13 KTP 73 Dimensions and Center of Gravity

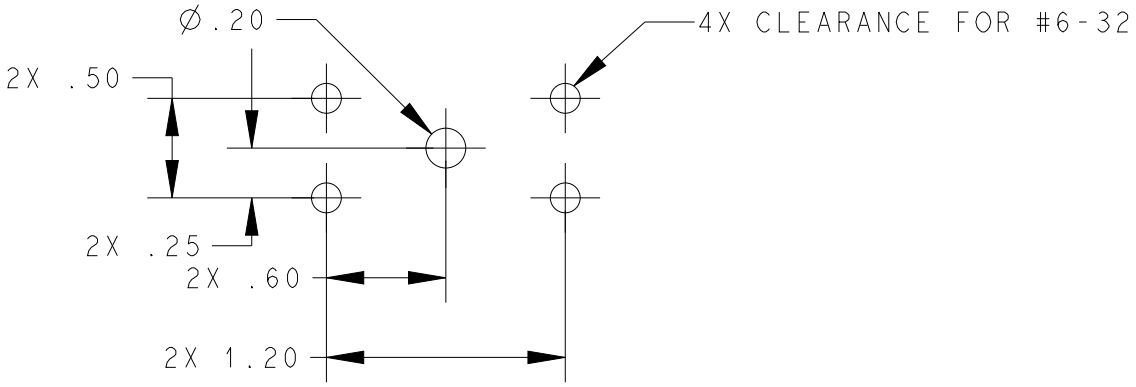

Figure A-14 KTP 73 Mounting Hole Pattern

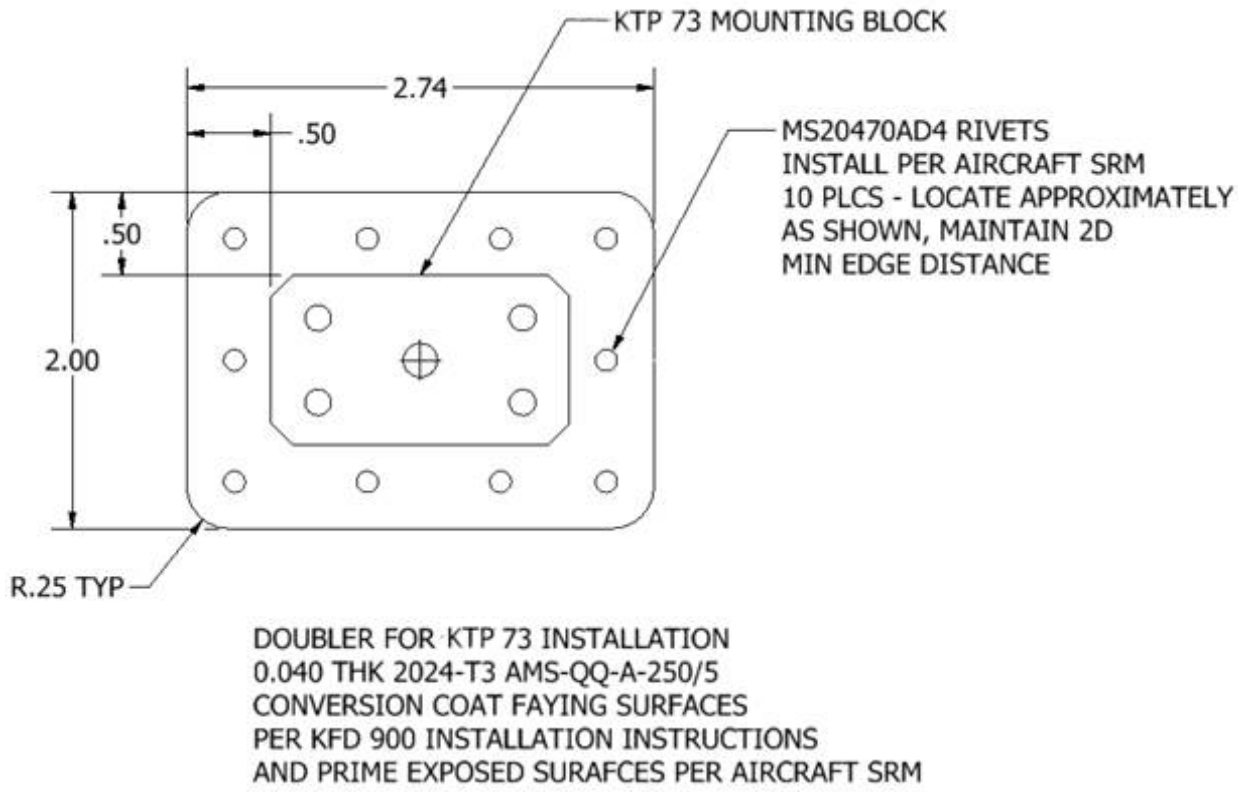

Figure A-15 KTP 73 Generic Doubler (for 0.016 - 0.032 Inch Skin Thickness)

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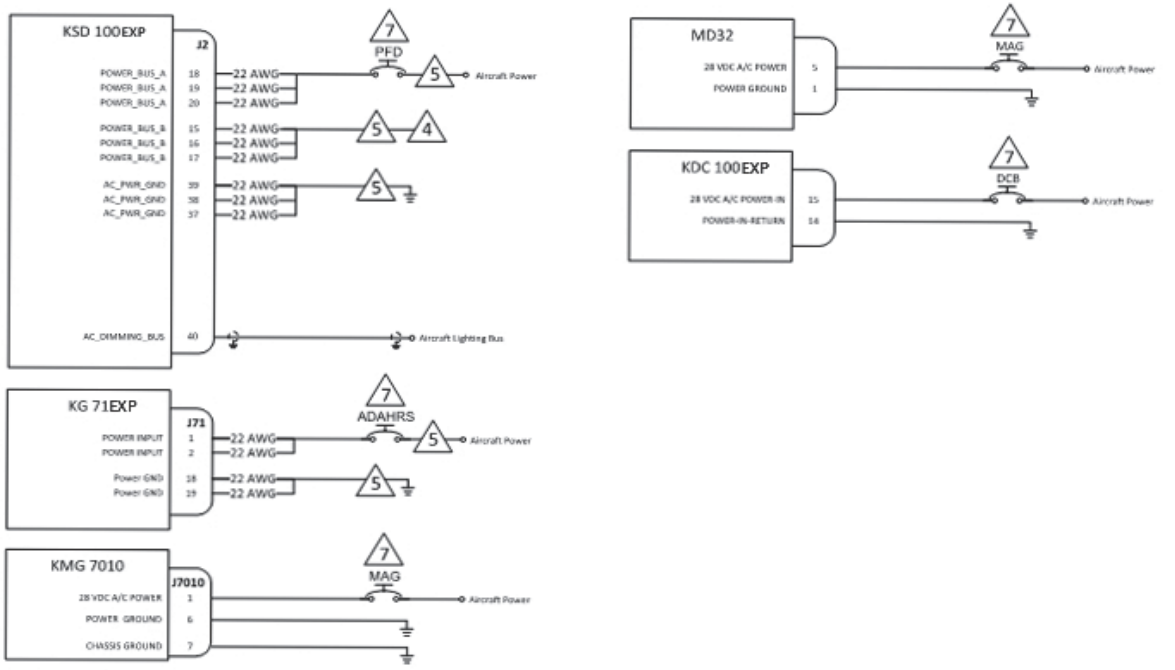
APPENDIX B INTERCONNECT DIAGRAMS



NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 PFD 2 Power Bus Wiring
- Cap and stow for future system expansion

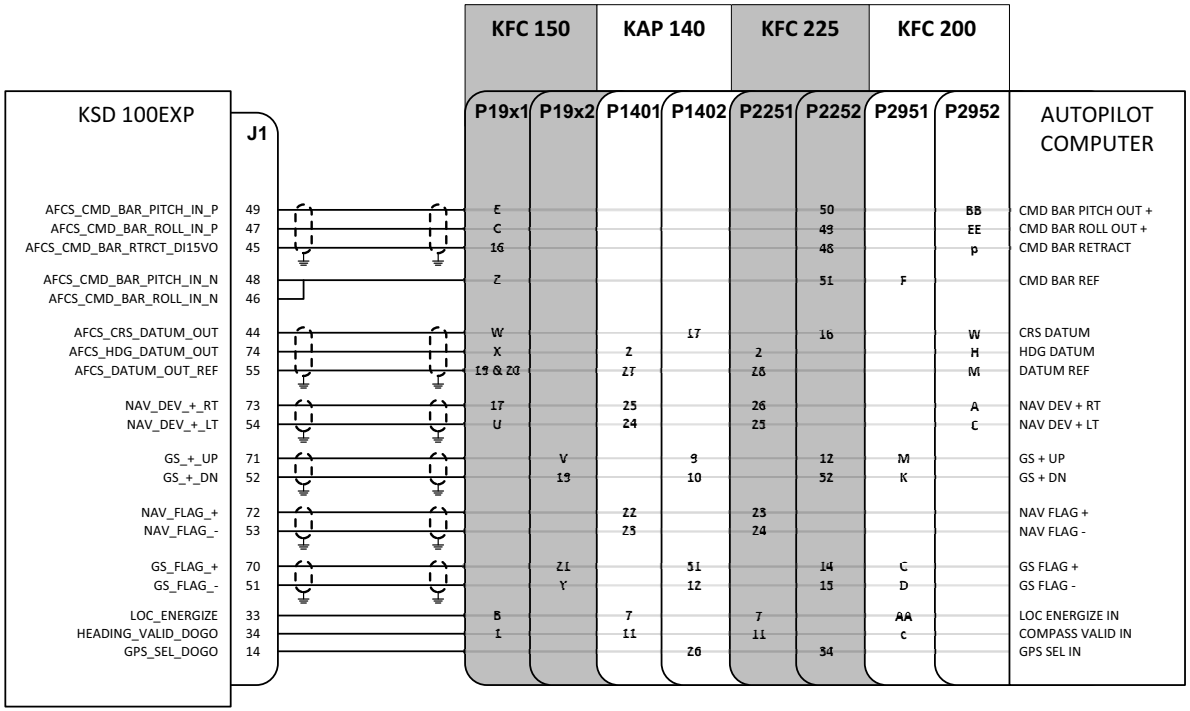
5 All PFD power and ground bus wires shall be 20 AWG fanned out to 22 AWG within 6 inches of the PFD backshell.

6 Drawing Symbols:

- Single
- Shielded Twisted Pair
- Shielded Single

7 PFD Circuit Breaker – 2 ampere for 28 VDC, 3 ampere for 14 VDC
ADAHRS Circuit Breaker – 2 ampere for 28 VDC, 3 ampere for 14VDC
MAG Circuit Breaker – 1 ampere for 28 VDC, 2 ampere for 14 VDC
DBC (Data Converter Box) Circuit Breaker – 1 ampere for 28 VDC, 2 ampere for 14 VDC

Figure B-1 xVue Touch Power Connection Diagrams



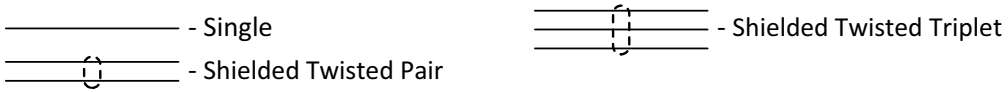
NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

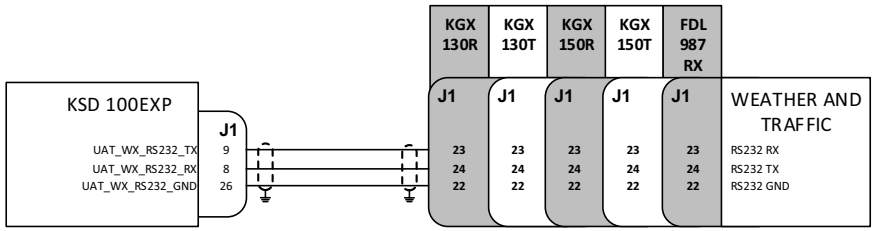
3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols:



5 AFCS command bar pitch and roll wires J149, 47 and 45 should not be connected. These are future provisional signals.

Figure B-2 Autopilot Interconnect Diagram



NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols:

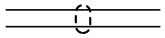
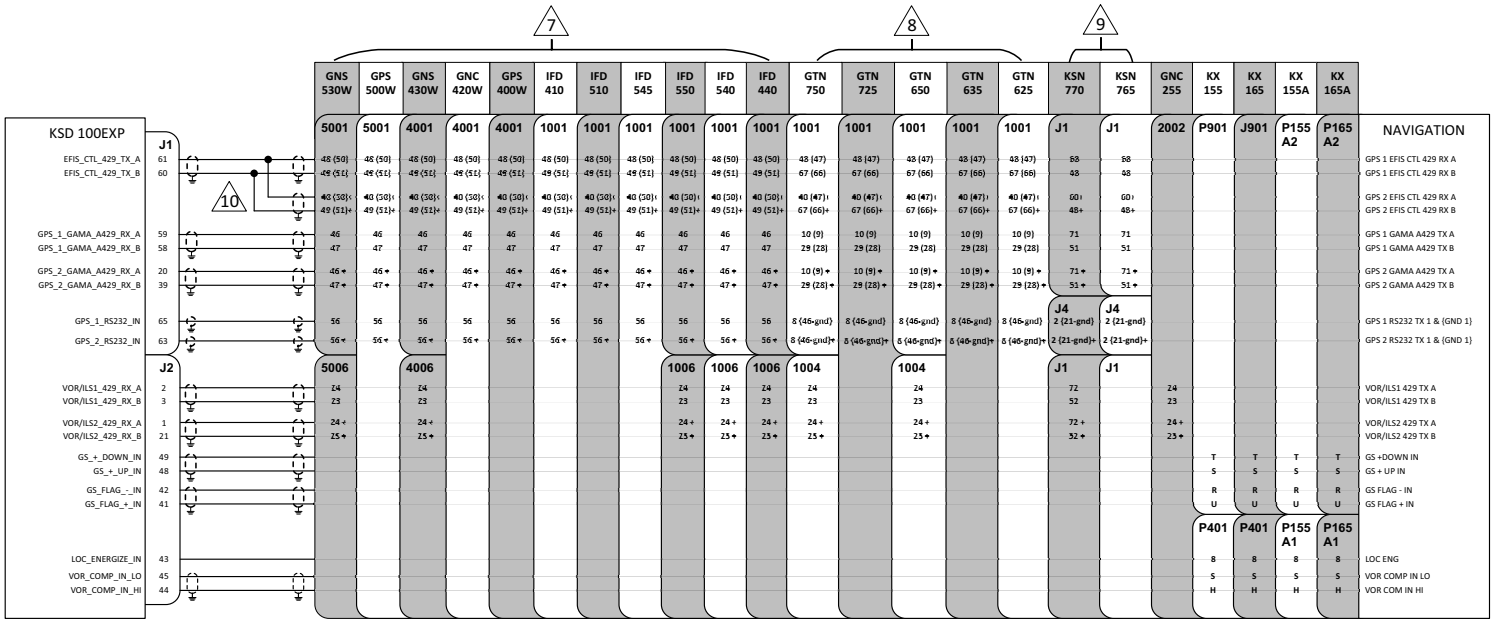
 - Shielded Twisted Pair

Figure B-3 Weather and Traffic Interconnect Diagram



NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points.
For metallic backshells with grounding capability, ground shield directly to the backshell.

4 The symbol "+" denotes Navigator 2 position radios.

5 Connections shown in parentheses "()" denotes an alternate acceptable interconnect.

6 Drawing Symbols:

——————— - Single

———(·)——— - Shielded Single

- Shielded Twisted Pair

7 GNS Series/IFD Series Setup:
- Main ARINC 429 Config
  - In 1: Speed = High, Data = EFIS
  - Out 1: Speed = High, Data = GAMA 429 Graphics w/Int
  - 1 Navigator Installation: SDI = Common
  - 2 Navigator Installation: SDI = LNAV 1 or LNAV 2 (based on the position of the Navigator)
  - VNAV = Enable Labels
- Main RS232 Config
  - CHNL 1: Input = Off, Output = Aviation

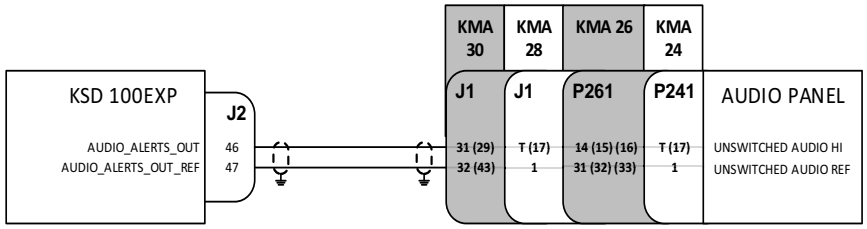
8 GTN Series Setup:
- ARINC 429 Configuration
  - ARINC 429 In 1: Speed = High, Data = EFIS Format 3
  - ARINC 429 Out 1: Speed = High, Data = GAMA Format 3
  - 1 Navigator Installation: SDI = Common
  - 2 Navigator Installation: SDI = LNAV 1 or LNAV 2 (based on position of the Navigator)
- RS-232 Configuration
  - RS-232 1: Input = Off, Output = Aviation Output 1

9 KSN Series Setup:
- Config Navigation 1 of 2
  - OBS Installed = ARINC 429
  - SBAS Providers = WAAS Enabled, MSAS Enabled, EGNOS Enabled
- Config Navigation 2 of 2
  - GAMA Output Type = Enhanced GAMA/Aspen (High Speed)
  - Auto Approach Transition = Enabled
  - CDI Mode = Normal
- Config Aircraft 2 of 2
  - 1 Navigator Installation: KSN Position Installed = Position 1
  - 2 Navigator Installation: KSN Position Installed = Position 1 or Position 2 (based on position of the Navigator)

10 In the event of two GPS systems being installed, the installer must splice the EFIS_CTL_429_TX connection to both Navigators and set the respective SDIs on the GPS (see notes above). This splice must be located as close to the GPS Connector end as possible. The EFIS_CTL_429_TX_B is a High Speed Bus.

11 VOR/ILS ARINC 429 input to the KSD 100EXP can be set to either High Speed or Low Speed, High Speed is preferred when available.

Figure B-4 Navigation Interconnect Diagram



NOTES:

1 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

2 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

3 Connections shown in parentheses "()" denotes an alternate acceptable interconnect.

4 Drawing Symbols:

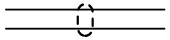
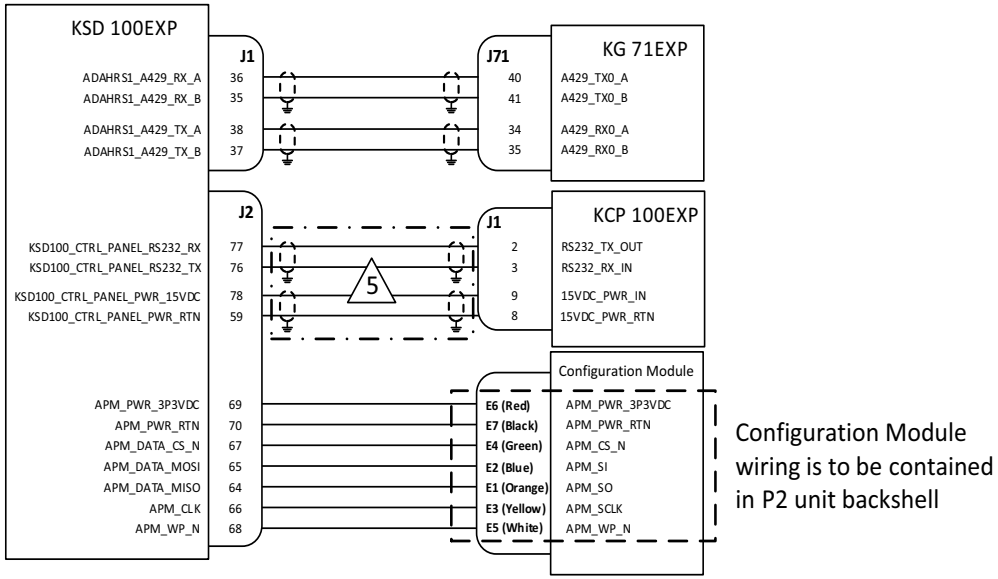
 - Shielded Twisted Pair

Figure B-5 Audio Panel Interconnect Diagram



NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

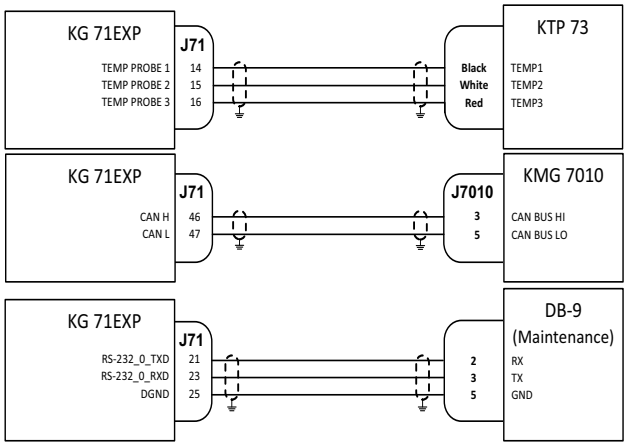
2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols: ——— - Single ——○—— - Shielded Twisted Pair

5 Over Braid will be installed between all wires from J2 of the KSD 100EXP and P1 of the KCP 100EXP. Terminate Braid within connector backshells.

Figure B-6 KSD 100EXP LRU Interconnect Diagram



NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols:

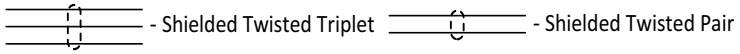
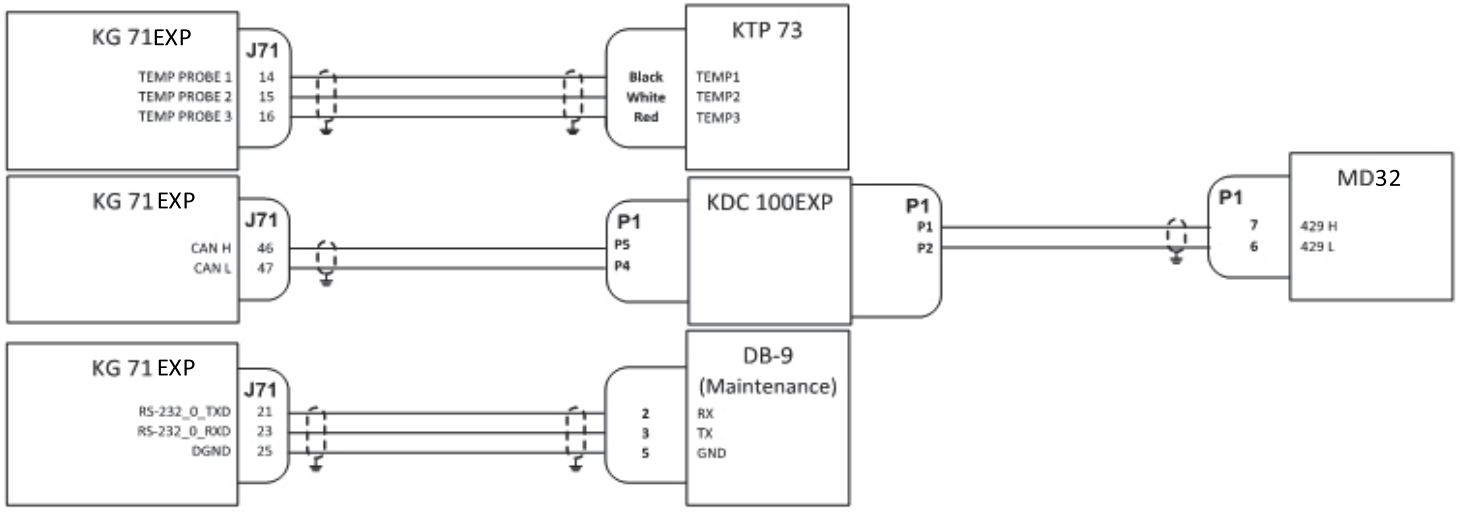


Figure B-7 KG 71 LRU Interconnect Diagram - 1



NOTES:

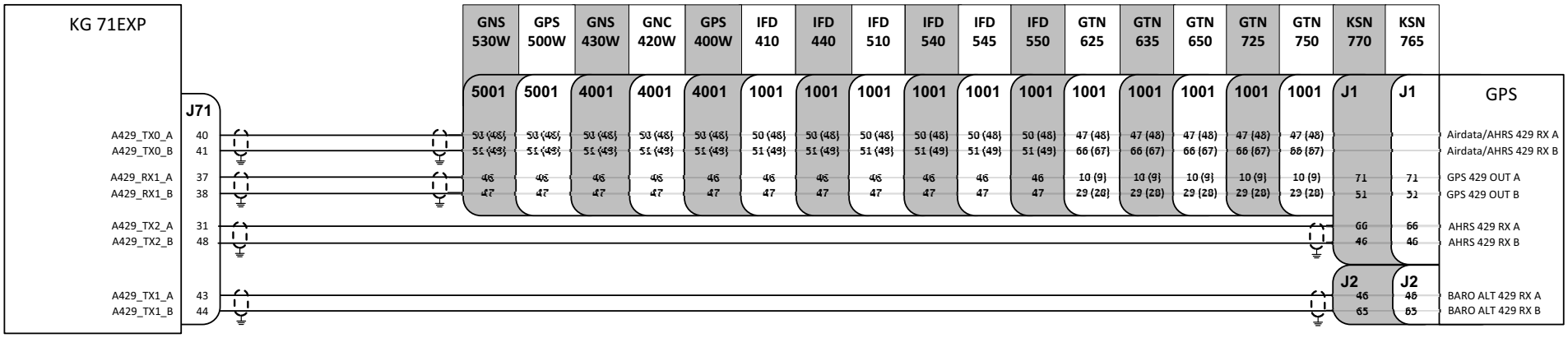
1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols:

Figure B-8 KG 71 LRU Interconnect Diagram - 2



NOTES:

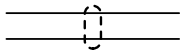
1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Connections shown in parentheses "()" denotes an alternate acceptable interconnect.

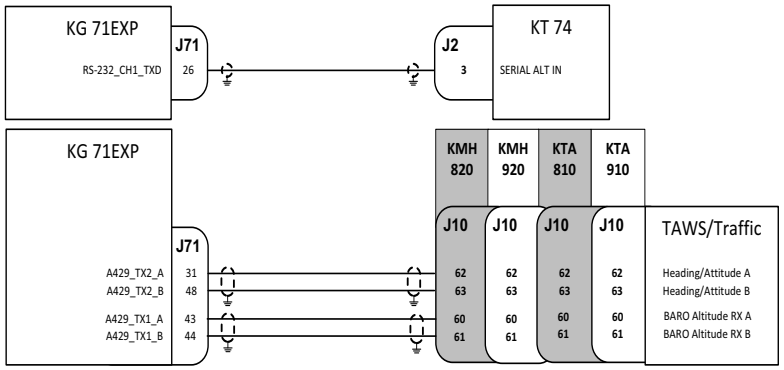
5 Drawing Symbols:

 - Shielded Twisted Pair

6 Connection to the KG 71 A429_RX1 is required for GPS aiding.
- In the event of two GPS systems being installed, the installer must select which GPS will be used for aiding of the KG 71 sensors

7 All other Connections, such as A429_TX1, are optional but may limit capabilities on the GPS systems (e.g. wind calculations).
- In the event of two GPS systems being installed, the installer may elect to splice the KG 71 A429_TX signals to both GPS systems
- If a splice is required, the splice must be located as close to the GPS Connector end as possible

Figure B-9 KG 71 LRU Interconnect Diagram - 3



KG 71EXP CMT Settings	
Transponder	Icarus 10

6

KG 71EXP CMT Settings				
KG 71EXP ARINC TX Bus	**Data Labels**	**Data Rate**	**SDI**	**Bus Speed**
TX0	Not modifiable - All	Not modifiable	01	Not modifiable - High
TX1	All Airdata labels	20 Hz	01	Low
TX2	All AHRS labels	20 Hz	01	High

6

NOTES:

1 Single Conductor Wire
- All wires shall be 22 AWG unless otherwise noted power wires
- Wiring shall meet AS22759/16/XX/Y (Where XX is gauge and Y is color)

2 Twisted Shielded Pair/Triplet and Shielded Single Wire
- All wires shall conform to ANSI/NEMA WC 27500
- Do not remove any wiring between other active aircraft systems. Leave those systems installed as they are.

3 All shield grounds are to be grounded at the closest grounding point to their respective connectors. This includes connector grounding points. For metallic backshells with grounding capability, ground shield directly to the backshell.

4 Drawing Symbols:

5 KG 71EXP to KT 74 interface is optional if an alternative source of pressure altitude is provided to KT 74

6 See Installation Manual of interfaced equipment to complete setup that is consistent with KG 71EXP settings

Figure B-10 KG 71 LRU Interconnect Diagram - 4

BendixKing

APPENDIX C XVUE TOUCH SYSTEM INSTALLATION WORKSHEET

Complete the following items and include in the airplane log book.

Airplane Make: _____

Airplane Model: _____

Airplane Serial Number: _____

Complete Table C-1: Identify the location of the xVue Touch System components and any applicable airplane access panels. Include all information necessary to gain access to the xVue Touch System Components when access plates are not provided.

Table C-1 xVue Touch System Component Locations

Description	PN	Airplane Location	Access Panels
KSD 100EXP PFD	89000120-001-[ ]		
KCP 100EXP Control Panel (Portrait) KCP 100EXP Control Panel (Landscape)	89000126-001-[ ] 89000126-003-[ ](1)		
KG 71EXP ADAHRS	89000123-001-[ ]		
KMG 7010 Magnetometer OR MD32 Magnetometer	065-00189-0101(2) 6420032-[ ]		
KDC 100EXP Data Converter	89000138-001 -[ ](3)		
KTP 73 OAT Probe	89000025-001-[ ]		
Configuration Module	89400020-064		

The -[ ] included in the part numbers are placeholders for the major/minor dash number designation. Parts will be marked with a four digit extension (e.g. -0000).

Note (1) Alternate part number is used for the Landscape version of the Control Panel.

Note (2) Either a KMG 7010 or MD32 and KDC 100EXP can be configured to provide the magnetometer function for the xVue Touch System.

Note (3) Included with the MD32 Magnetometer.

On Figure C-1, draw in the location of the xVue Touch System components and the wiring routing.

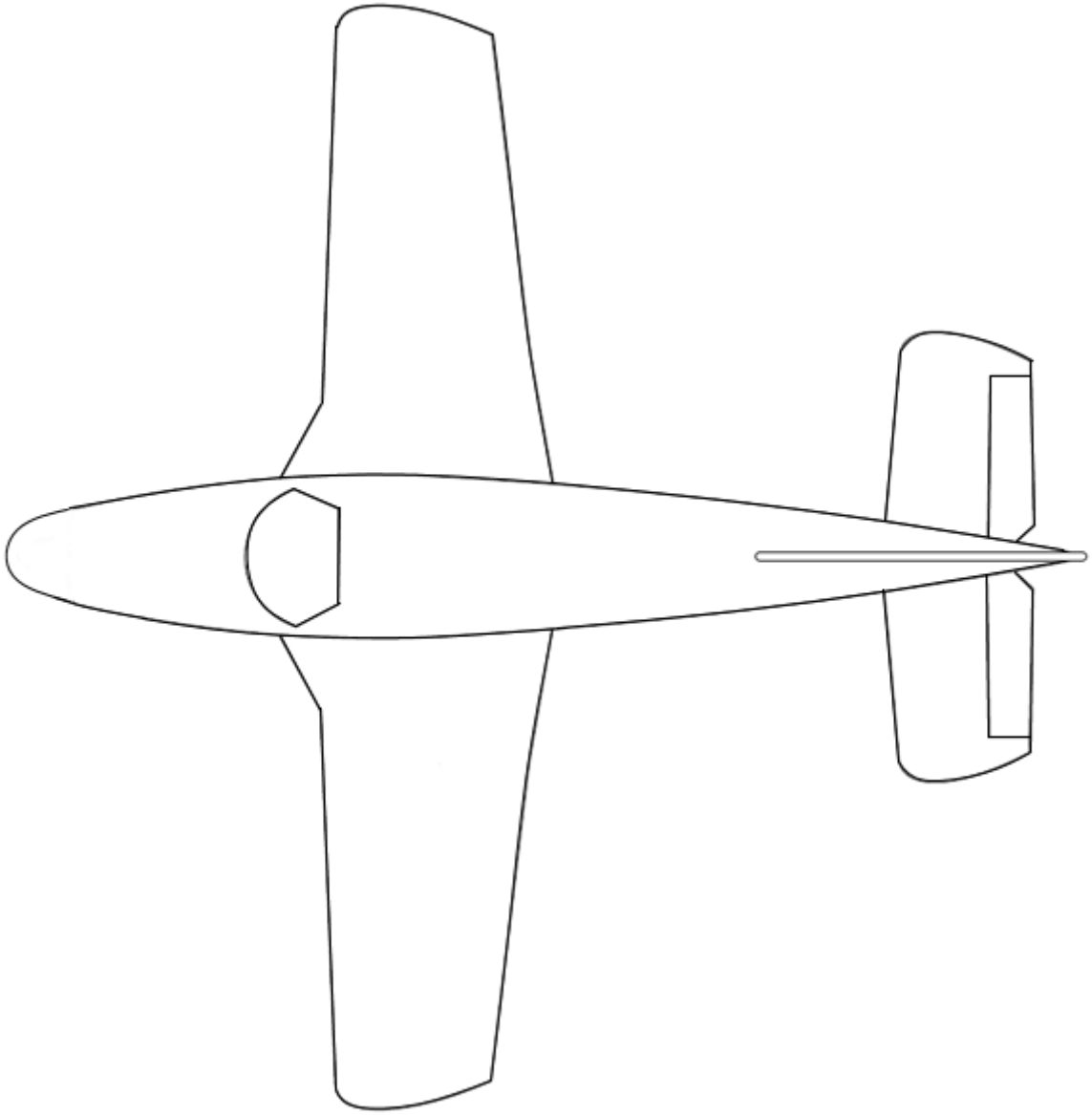


Figure C-1 xVue Touch System Components and Cable Routing (Top View)

On Figure C-2, draw in the location of the xVue Touch System components and the wiring routing.

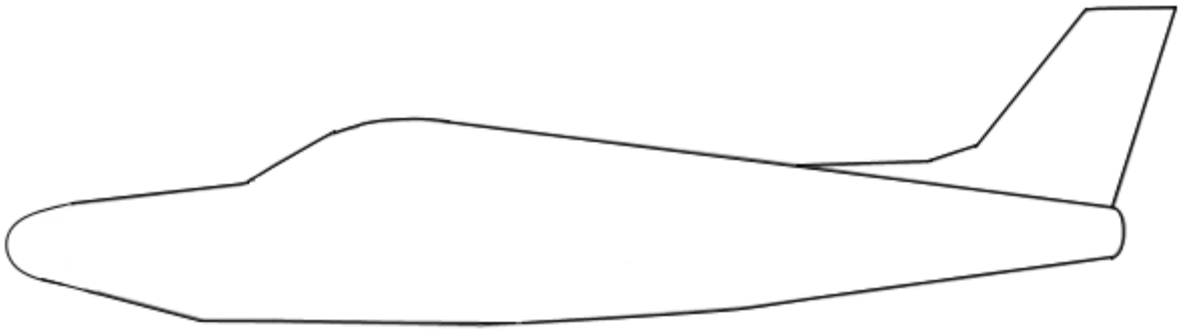


Figure C-2 xVue Touch System Components and Cable Routing (Side View)

On Figure C-3, draw in the xVue Touch Circuit Breaker and Switch locations on the cockpit depiction.

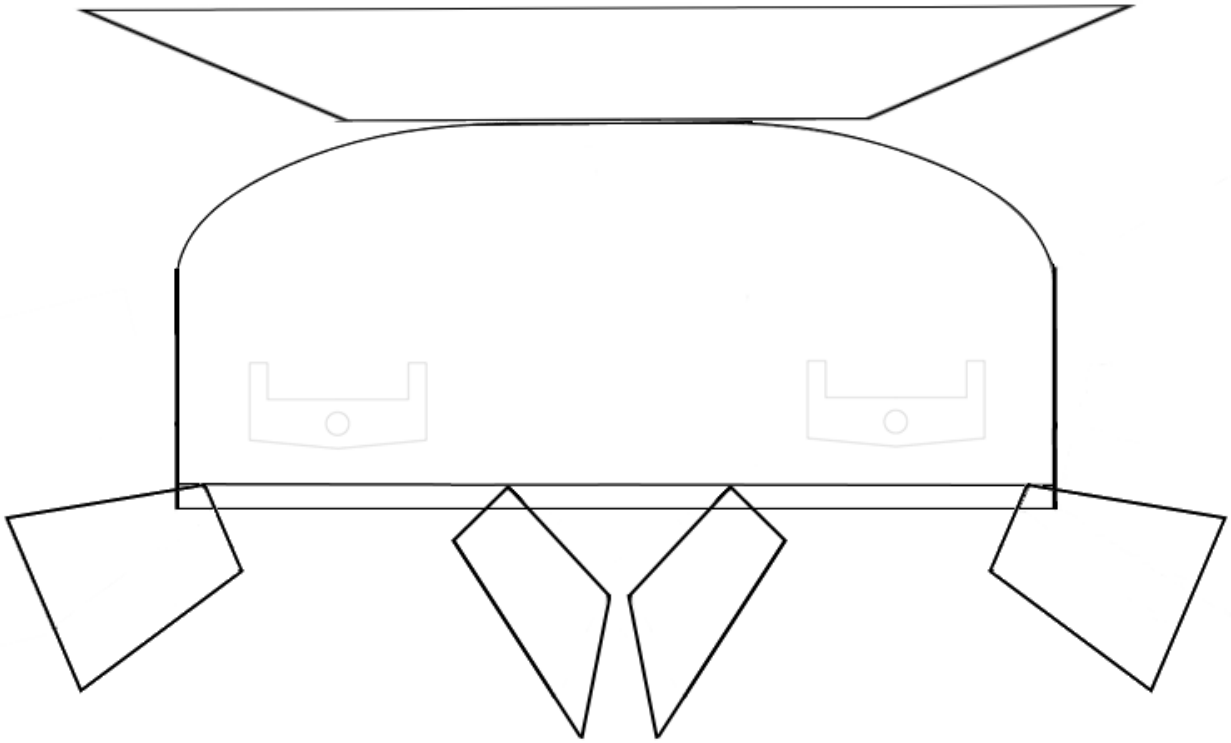


Figure C-3 xVue Touch System Circuit Breakers and Switch Locations

Complete Table C-2 per ASTM F2490-05: Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis and confirm the aircraft electrical system is capable of supporting the xVue Touch System. Refer to Section 4.12 for additional information.

Table C-2 Electrical Load Analysis - Normal Operating Conditions

Circuit/System	Circuit Breaker	Load at Circuit Breaker	Operating Time (min)	Condition of Aircraft Operation	Normal Operations					
					Taxing - 10 min		Takeoff/Land - 10 min		Cruise - 60 min	
					Ampere	Ampere min	Ampere	Ampere min	Ampere	Ampere min

APPENDIX D MD32 INSTALLATION MANUAL

For instructions on how to install the MD32 Magnetometer, see the Installation Manual and Operating Instructions – Model MD32 Series Remote Magnetometer.

Installation Manual and Operating Instructions

Model MD32 Series
Remote Magnetometer

Mid-Continent Instrument Co., Inc.
dba Mid-Continent Instruments and Avionics
9400 E. 34th Street N.
Wichita, KS 67226
PH (800) 821-1212 FX (316) 630-0723

Manual Number 9019050
Rev C, March 30, 2018

FOREWORD

This manual provides information intended for use by persons who, in accordance with current regulatory requirements, are qualified to install this equipment. If further information is required, please contact:

Mid-Continent Instruments and Avionics
Attn: Customer Service Dept.
9400 E. 34th St. N.
Wichita, KS 67226 USA
Phone 316-630-0101
Fax 316-630-0723
ks.customerservice@mcico.com
www.mcico.com

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 reference and the page number. Send your comments to:

Mid-Continent Instruments and Avionics
Attn: Customer Service Dept.
9400 E. 34th St. N.
Wichita, KS 67226 USA
Phone 316-630-0101
Fax 316-630-0723
ks.customerservice@mcico.com

All products produced by Mid-Continent Instrument, Co., Inc., are designed and manufactured in Wichita, KS, USA.

REVISION DETAIL

Revision	Date	Approved	Detail
A	03/02/2018	CAS	Initial release
B	03/21/2018	CAS	1) Provided additional details in 2.4 regarding limitations and deviations 2) Added description for wire shield terminations 3) Updated Environmental Qualification Statement in 3.2 4) Removed reference to EASA qualification 5) Miscellaneous clerical corrections.
C	03/30/2018	BAW	Removed reference to magnetic field strength deviation, Section 2.4, Limitations.

TABLE OF CONTENTS

SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

The model MD32 Remote Magnetometer, part number series 6420032-( ), extends the functionality of the MD302 Standby Attitude Module to a full air data, attitude and heading reference system (ADAHRS) solution. By providing magnetic heading data, the MD32 enables the MD302 to independently meet the gyro-stabilized heading indication requirements of TSO-C6e as part of the integrated cockpit display, or as a remote data source.

The MD32 provides ARINC 429 data by way of a simple 4-wire shielded cable connecting data and power to the MD302. As an added benefit, the backup battery integral to the MD302 is also capable of supporting the MD32 Remote Magnetometer in the case of aircraft power loss (MD302 Mod 2 versions or greater).

The MD32 option for the MD302 is suitable for certified aircraft in 14 CFR, Part 23, 25, 27, or 29. The MD32 series Remote Magnetometer is FAA certified to TSO-C6e, with embedded software designed to RTCA/DO-178C, Design Assurance Level A (DAL A), and tested to the rigorous environmental standards of RTCA/DO-160G.

Highlighted features include: all solid-state components, easy and flexible installation, on-aircraft calibration, and a small, light-weight housing appropriate for installations in a wing or tail location.

1.2 TECHNICAL SPECIFICATIONS

1.2.1 Electrical Attributes

Input Voltage:	7 – 32 VDC
Input Power:	0.56 watts
Output Data:	ARINC 429 (proprietary format)

Table 1.1

1.2.2 Physical Attributes

Weight:	3.0 ounces (.085 kg)
Dimensions: (not including connector mate)	3.0 inches x 2.75 inches x 0.81 inches (LxWxH)
Mating Connector:	MCI P/N 8017287
Mounting:	Base mount – any orientation

Table 1.2

1.2.3 Performance Limits

Heading Accuracy vs. Latitude:	Within +/-2° up to 55°N or 45°S; increasing error towards the magnetic N and S poles
Altitude:	+55,000 feet
Temperature:	-55°C to +70°C (-67°F to +158°F)

Table 1.3

1.2.4 Qualifications

Certification:	FAA TSO-C6e
Environmental Qualification:	RTCA/DO-160G Environmental Category; See Section 3.2
Software Qualification:	RTCA/DO-178C, Design Assurance Level A

Table 1.4

SECTION 2 INSTALLATION

2.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the MD32 Remote Magnetometer. After installation of cabling and before installation of the equipment, ensure that power is applied only to the appropriate pins.

2.2 PARTS LIST

When unpacking this equipment, make a visual inspection for evidence of any damage that may have incurred during shipment. The following parts should be included:

Item Description	MCIA Part Number
a. MD32 Magnetometer	6420032-( )
b. Installation Manual	9019050
c. Connector Kit	9019092-1

2.3 EQUIPMENT LOCATION

To support the ease of installation, the MD32 is designed to be capable of mounting in any orientation. Using four (4) #4 or #6 machine screws, secure the baseplate of the unit to a secure/stable portion of the airframe. The MD32 Remote Magnetometer is recommended to be installed in the wing or similar location away from large concentrations of ferrous materials or potential electromagnetic interference to produce the most accurate results.

2.4 LIMITATIONS

The MD32 Remote Magnetometer is certified to TSO-C6e as part of a system (i.e. “incomplete system”). It must be installed in conjunction with an MD302 Standby Attitude Module, MCIA part number 6420302-( ), to provide complete heading functionality. The MD302 must have software version 1.1.0 or higher installed to support the function of the MD32. Limitations associated with accuracy and performance of the heading indication are listed in Section 1.2.

The conditions and tests for TSO approval of this article are minimum performance standards. Those installing this article, either on or within a specific type or class of aircraft must determine that the aircraft installation conditions are within the TSO standards which include any accepted integrated non-TSO functions. TSO articles and any accepted integrated non-TSO function(s) must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR part 43 or the applicable airworthiness requirements. This is an incomplete system intended to provide the following functions: magnetic direction sensing data presented to an MD302 Standby Attitude Module.

The TSO requires that the article must meet the minimum performance specifications (MPS) within SAE/AS8013 Revision A. The MD32 complies with the requirements of Sections 4 and 5 of AS8013A. Performance requirements were evaluated using a system comprised of the MD32 and the MD302, demonstrating that the MD32 provided sufficiently accurate sensor data. The

general requirements in Section 3 are not addressed by the MD32 since the MD302 provides the indication/display and user interface portion of the system.

The conditions for TSO approval include the following granted deviations:

- RTCA/DO-160G was used in lieu of RTCA/DO-160E for environmental qualification
- RTCA/DO-178C was used in lieu of RTCA/DO-178B for software qualification

2.5 MODIFICATIONS

Each model MD32 (part number 6420032-( )) has a nameplate that identifies the manufacturer, part number, description, certifications and technical specifications of the unit. It also includes the “MOD” or modification number representing notable changes in the hardware design of the unit. Software revisions are reflected in the software version displayed on the MD302 Review Configuration screen. The following are descriptions of the current modification releases of the MD32 Remote Magnetometer.

MOD 0
Modification (MOD) 0 is identified on the nameplate by the lack of marking on the MOD numbers shown as blocks 1 through 9 (i.e. 1-9 are visible).

Mod 0 is the initial release of the MD32 Remote Magnetometer.

2.6 CABLE HARNESS

2.6.1 Wire Gauge Selection

M27500-22TG2T14 (or equivalent) shielded twisted pair for both power/ground and data lines. The ground wire should be attached to the airframe as close to the power source as practicable.

2.6.2 Pin Assignment Information

The MD32 is intended to connect directly to the MD302, requiring a single-point modification to the installed cable harness. MD302 units updated with MOD 2 provide additional connection options to allow for backup power to the MD32 from the internal battery, and to accommodate a second ARINC 429 input so that the first input may remain connected to an existing EFIS or ARINC data source.

Pin 1 – Ground. One option is to make a tee connection to Pin 6 of the MD302.

Pin 5 – Power connects to aircraft power (7-32 VDC). One option is to make a tee connection to Pin 1 of the MD302. Another option is to connect to Pin 11 of a MOD 2 MD302 for backup power from the internal battery.

Pin 6 – ARINC Out B connects to MD302 Pin 13. Optionally, it may connect to the second ARINC input Pin 4 of a MOD 2 MD302.

Pin 7 – ARINC Out A connects to MD302 Pin 12. Optionally, it may connect to the second ARINC input Pin 9 of a MOD-2 MD302.

Mating connector backshell – ground shield(s) from the shielded twisted pair should be terminated to the mating connector backshell (case ground).

Pin #	Description
1	Ground
2	Not Used
3	Reserved
4	Reserved
5	Power
6	ARINC Out B
7	ARINC Out A
8	Not Used
9	Not Used

Table 2.1
Connector Pinout

2.7 INSTALLATION COMPLETION

The system must be calibrated after installation. Calibration is done through access to the MD302 Configuration Menu. MD302 software version 1.1.0 or greater is required. Note that MOD 2 is not required for the MD302, but it may make installation easier as noted above in 2.6.2. See MD302 installation manual for additional details.

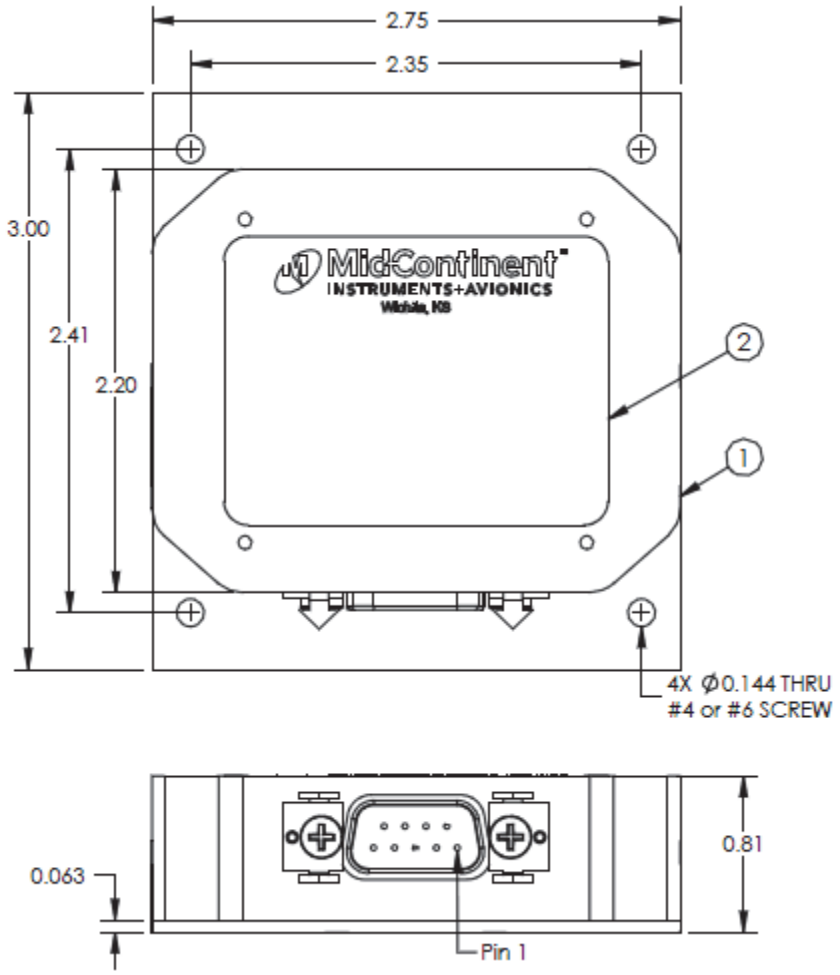


Figure 2.1
MD32 Outline Drawing

SECTION 3 CONFORMANCE

3.1 INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

No periodic scheduled maintenance or calibration is necessary for continued airworthiness of the MD32 Remote Magnetometer.

If the unit fails to perform to specifications, or if the magnetic environment of the aircraft installation changes over time, recalibration may be performed as noted in Section 2.7. If recalibration does not resolve the issue, the unit must be removed and serviced by Mid-Continent Instruments and Avionics or their authorized designee.

3.2 ENVIRONMENTAL QUALIFICATION STATEMENT

NOMENCLATURE: Remote Magnetometer **TSO APPROVAL:** C6e
MODEL NUMBER: MD32 **PART NUMBER:** 6420032-( ) series
MANUFACTURER: Mid-Continent Instrument Co., Inc.
MANUFACTURERS SPECIFICATIONS: Test Specification (TS) 715, Test Data Sheet (TDS) 715
QUALIFICATION STANDARD: RTCA/DO-160G, dated 12/08/10

CONDITIONS	SECTION	DESCRIPTION OF TEST
Temperature and Altitude Low Temperature High Temperature Altitude	4 4.5.2 4.5.4 4.6.1	Category F2 Operating Low Temp = -55C Operating High Temp = +70C Altitude = +55,000 ft.
Temperature Variation	5	Category S2
Humidity	6	Category B
Operational Shock and Crash Safety	7	Category B
Vibration	8	Category R; Curves E, E1 [REE1]
Explosion	9	Category X
Waterproofness	10	Category W
Fluids	11	Category X
Sand and Dust	12	Category X
Fungus	13	Category X
Salt Fog	14	Category S
Magnetic Effect	15	Category Z
Power Input	16	Category Z
Voltage Spike	17	Category A
Audio Frequency Conducted Susceptibility	18	Category Z
Induced Signal Susceptibility	19	Category ZC
Radio Frequency Susceptibility	20	Category W (conducted) Category F (radiated)* [WF]
Emission of Radio Freq Energy	21	Category M
Lightning Induced Transient Susceptibility	22	Category B3 (pin injection) Category K3L3 (cable bundle) [B3K3L3]
Lightning Direct Effects	23	Category X
Icing	24	Category X
ESD	25	Category A
Flammability	26	Category X

REMARKS:
Sections 20: Radiated susceptibility complies with Category G from 100-400MHz and Category F from 400-18,000MHz.

Review Center Approver Signature Report
Peer-Review: 89000109-002 xVue Touch Installation Manual v.7
Status: Completed
Jama REV - 6201

Start Date: October 31, 2019 5:42 PM **End Date:** November 2, 2019 12:00 AM **Moderator(s):** Lora Fox Elina Peurifoy	**Number of Approvers:** 6 **Approved:** 6 **Needs Work:** 0 **Not Finished:** 0	**Number of Reviewers:** 1 **Finished:** 1 **Not Finished:** 0

Approver Progress

Approver Name	Title	Percent Complete	Approval Date	Signature	Signature Comments
Dustin J. Sinko	Engineer Pr Systems	100%	November 1, 2019 10:43 PM	Yes	
Bill Safieh	Manager Sr FPA	100%	November 1, 2019 11:11 PM	Yes	Approved
Omar Eltohamy	Engineer I Systems	100%	October 31, 2019 9:39 PM	Yes	
Elina Peurifoy	Technical Writer	100%	November 1, 2019 4:53 AM	Yes	
Jay Follett	Staff Engineer	100%	October 31, 2019 9:23 PM	Yes	
Vincent Villavicencio	Software Quality Assurance	100%	October 31, 2019 9:39 PM	Yes	