

DASH NO. (-XXX)	DESCRIPTION	MORITZ P/N
003	DATA ACQUISITION UNIT, NEW PIPER PA46-350P	A1740
002	DATA ACQUISITION UNIT, NEW PIPER PA34	A1700
001	DATA ACQUISITION UNIT, NEW PIPER PA28, PA32 AND PA44	A1380
000	DATA ACQUISITION UNIT, NEW PIPER PA32	A1215

200-00041-001 (A1380) UPGRADE EFFECTIVITY GUIDE. CONSULT THIS UPGRADE GUIDE WHEN RETURNING UNITS TO MORITZ FOR REPAIR AND/OR UPGRADE.	
INCOMING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)	OUTGOING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)
MORITZ REV A	MORITZ REV F Mod 1
MORITZ REV B	MORITZ REV F Mod 1
MORITZ REV C	MORITZ REV F Mod 1
MORITZ REV D	MORITZ REV F
MORITZ REV E	MORITZ REV F
MORITZ REV E MOD 1	MORITZ REV F Mod 1
MORITZ REV F	MORITZ REV F (no change)
MORITZ REV F MOD 1	MORITZ REV F Mod 1 (no change)

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
00	RELEASE PER ECO-04-154	7/22/04	EJS
01	RELEASE PER ECO-04-291	01/12/05	EJS
02	RELEASE PER ECO-05-010	01/18/05	EJS
03	RELEASE PER ECO-05-196	12/08/05	SB
04	RELEASE PER ECO-06-059	03/31/06	SB
05	RELEASE PER ECO-06-095	06/19/06	EJS
06	RELEASE PER ECO-07-027	01/29/07	AWM
07	RELEASE PER ECO-07-065	03/16/07	AWM
08	RELEASE PER ECO-07-275	08/08/07	AWM
09	RELEASE PER ECO-07-330	09/14/07	AWM
10	RELEASE PER ECO-07-358	10/03/07	AWM
11	RELEASE PER ECO-07-395	10/23/07	AWM
12	RELEASE PER ECO-07-495	01/03/08	AWM
13	RELEASE PER ECO-08-168	05/21/08	AWM
14	RELEASE PER ECO-08-206	06/16/08	AWM

DASH NO. (-XXX)	REV	MOD	DESCRIPTION
003	F	00	MORITZ ECO 2375
003	E1	-	MORITZ ECO 2312
003	E	01	MORITZ ECO 2194 (see note 26)
003	E	00	MORITZ ECO 2194
003	D	01	MORITZ ECO 2163 (see note 26)
003	D	00	MORITZ ECO 2163
003	C	00	MORITZ ECO 2103
003	B	00	MORITZ ECO 2026
003	A	-	MORITZ PRODUCTION RELEASE
002	F	00	MORITZ ECO 2352
002	E1	-	MORITZ ECO 2312
002	E	01	MORITZ ECO 2190 (see note 27)
002	E	00	MORITZ ECO 2190
002	D	02	MORITZ ECO 2182 (see note 27)
002	D	01	MORITZ ECO 2182 (see note 27)
002	D	00	MORITZ ECO 2103
002	C	00	MORITZ ECO 2046
002	B	00	MORITZ ECO 1854
001	F	00	MORITZ ECO 2393
001	E1	-	MORITZ ECO 2312
001	E	01	MORITZ ECO 2195 (see note 28)
001	E	00	MORITZ ECO 2195
001	D	00	MORITZ ECO 2103
001	C	00	MORITZ ECO 1903
001	B	00	MORITZ ECO 1687
001	A	00	CORRECTS "VOLTS RS-232 GARBAGE" ISSUE
000	A	01	CORRECTS "DAU NOT COMMUNICATING" ISSUE

200-00041-002 (A1700) UPGRADE EFFECTIVITY GUIDE. CONSULT THIS UPGRADE GUIDE WHEN RETURNING UNITS TO MORITZ FOR REPAIR AND/OR UPGRADE.	
INCOMING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)	OUTGOING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)
MORITZ REV A	MORITZ REV F
MORITZ REV B	MORITZ REV F
MORITZ REV C	MORITZ REV F
MORITZ REV D	MORITZ REV F
MORITZ REV D MOD 1	MORITZ REV F (see note 1 below)
MORITZ REV D MOD 2	MORITZ REV F
MORITZ REV E	MORITZ REV F
MORITZ REV F	MORITZ REV F (no change)
Note 1: Rev D Mod 1 added for completeness, however it is not an intended configuration for the 200-00041-002 (A1700) and shouldn't be encountered.	

200-00041-003 (A1740) UPGRADE EFFECTIVITY GUIDE. CONSULT THIS UPGRADE GUIDE WHEN RETURNING UNITS TO MORITZ FOR REPAIR AND/OR UPGRADE.	
INCOMING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)	OUTGOING UNIT REVISION LEVEL (REFERENCE MORITZ REVISION)
MORITZ REV A	MORITZ REV F Mod 1
MORITZ REV B	MORITZ REV F Mod 1
MORITZ REV C	MORITZ REV F
MORITZ REV D	MORITZ REV F
MORITZ REV E	MORITZ REV F
MORITZ REV E MOD 1	MORITZ REV F Mod 1
MORITZ REV F	MORITZ REV F (no change)
MORITZ REV F MOD 1	MORITZ REV F Mod 1 (no change)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± 1/32 DECIMALS .X ±.02 .XX ±.01 .XXX ±.005 ANGLES ± .5° MATERIALS FINISH DO NOT SCALE DRAWING		AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773	
		APPROVALS	DATE	DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING	
		DRAWN BY E. SHEASBY	7/15/04		
		CHECKED P. LYNCH	7/15/04	SIZE D	DWG. NO. 200-00041-XXX
				REV. 14	
				SCALE	SHEET 1 OF 9

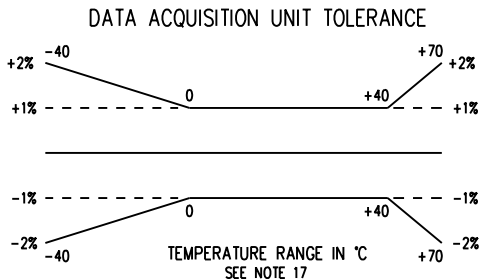
- 000 CONFIGURATION

SENSOR INPUT INFORMATION

PARAMETER	RANGE/ UNIT	FACTOR	CALIBRATION DATA									TOLERANCE OVER ENTIRE RANGE		SENSOR EXCITATION	SENSOR EXCITATION TOLERANCE WITH 10K LOAD		SENSOR INFORMATION
												NORMAL TEMP	EXTREME TEMP		NORMAL TEMP	EXTREME TEMP	
MAP	10.0 TO 42.0 IN HG	VDC / IN HG	1.786 / 10.0	2.179 / 15.0	2.572 / 20.0	2.965 / 25.0	3.358 / 30.0	3.751 / 35.0	4.144 / 40.0	4.302 / 42.0		± 0.4 IN-HG	± 0.8 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTE -251 -1000 -25A
RPM	0 TO 3500 RPM	HZ / RPM	0.00 / 0	12.50 / 500	30.00 / 1200	38.75 / 1550	47.50 / 1900	56.25 / 2250	65.00 / 2600	87.50 / 3500		± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	B&D P/N 0404 - 102
EGT (6 CH)	500 TO 1800 DEG F	MV / F CJ = ICE	10.561 / 500	26.978 / 1200	29.315 / 1300	31.628 / 1400	33.912 / 1500	36.166 / 1600	37.281 / 1650	40.581 / 1800		± 18° F	± 36° F	N/A	N/A	N/A	K - TYPE THERMOCOUPLE NORWICH P/N 101 - 00103
TIT	500 TO 1800 DEG F	MV / F CJ = ICE	10.561 / 500	26.978 / 1200	29.315 / 1300	31.628 / 1400	33.912 / 1500	36.166 / 1600	37.281 / 1650	40.581 / 1800		± 18° F	± 36° F	N/A	N/A	N/A	K - TYPE THERMOCOUPLE NORWICH P/N 101 - 00103
FF	0.0 TO 44.0 GPH	HZ / GPH	0.000 / 0.0	70.62 / 10.0	104.68 / 15.0	137.90 / 20.0	170.29 / 25.0	201.84 / 30.0	232.56 / 35.0	262.44 / 40.0	285.75 / 44.0	±0.4 GPH	±0.8 GPH	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	FLOSCAN P/N 201C - 6 SEE NOTE 24.
CHT (6CH)	0 TO 570 DEG F	OHMS / DEG F	45.40 / 0	48.97 / 25	60.09 / 100	76.87 / 200	96.09 / 300	118.41 / 400	143.80 / 500	163.90 / 570		± 5° F	± 10° F	N/A	N/A	N/A	TRANSMITTER PER MS24482 -1, -2 OUTPUT PER MIL-T25446D
OP	0 TO 150 PSI	VDC / PSI	1.00 / 0	1.667 / 25	2.467 / 55	3.533 / 95	4.067 / 115	4.867 / 145	5.000 / 150			± 1 PSI	± 2 PSI	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTE -252 -2000 -150G
OT	-20 TO 260 DEG F	OHMS / DEG F	80.91 / -20	84.50 / 0	91.90 / 40	99.71 / 80	112.28 / 140	121.29 / 180	137.03 / 245	140.86 / 260		± 2° F	± 5° F	N/A	N/A	N/A	RESISTANCE BULB PER MS28034 OUTPUT PER MIL-T-7990B
AMP (ALT)	0 TO 100 AMP	MVDC / AMP	0.00 / 0	10.00 / 20	20.00 / 40	30.00 / 60	40.00 / 80	50.00 / 100				± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
AMP (BAT)	-100 TO 100 AMP	MVDC / AMP	-50.00 / -100	-30.00 / -60	-20.00 / -40	0.00 / 0	20.00 / 40	30.00 / 60	40.00 / 80	50.00 / 100		± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
VDC (MAIN)	0.0 TO 36.0 VDC	VDC / VDC	0.00 / 0.0	10.00 / 10.0	15.00 / 15.0	20.00 / 20.0	25.00 / 25.0	28.00 / 28.0	32.00 / 32.0	36.00 / 36.0		± 0.4 VDC	± 0.7 VDC	N/A	N/A	N/A	AIRCRAFT POWER BUS
VAC	2.0 TO 6.0 IN / HG	VDC / IN / HG	1.66 / 2.0	2.05 / 2.5	2.46 / 3.0	2.87 / 3.5	3.27 / 4.0	3.68 / 4.5	4.09 / 5.0	4.50 / 5.5	4.91 / 6.0	± 0.1 IN-HG	± 0.2 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTE -253 -1000 -3D
FQ LEFT AND RIGHT	-1.5 TO 53.0 GAL EACH	OHMS / GAL	0.0 / -1.5	2.5 / E (0.0)	20.0 / 10.0	31.8 / 20.0	45.5 / 30.0	63.0 / 40.0	88.3 / F (51.0)	90.6 / 52.0	92.9 / 53.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	PS10013-7 ROCHESTER P/N 7740 - 204 L. INBD PS10013-8 ROCHESTER P/N 7740 - 205 R. INBD PS10013-12 ROCHESTER P/N 7740 - 518 L. OUTBD PS10013-13 ROCHESTER P/N 7740 - 519 R. OUTBD CONNECTED IN SERIES
FUEL USED	0 TO 106 GAL	GAL										± 1 GAL	± 2 GAL	N/A	N/A	N/A	CALCULATED OUTPUT BASED ON CONSTANT K FACTOR OF 24,924 PPG. SEE NOTE 25.

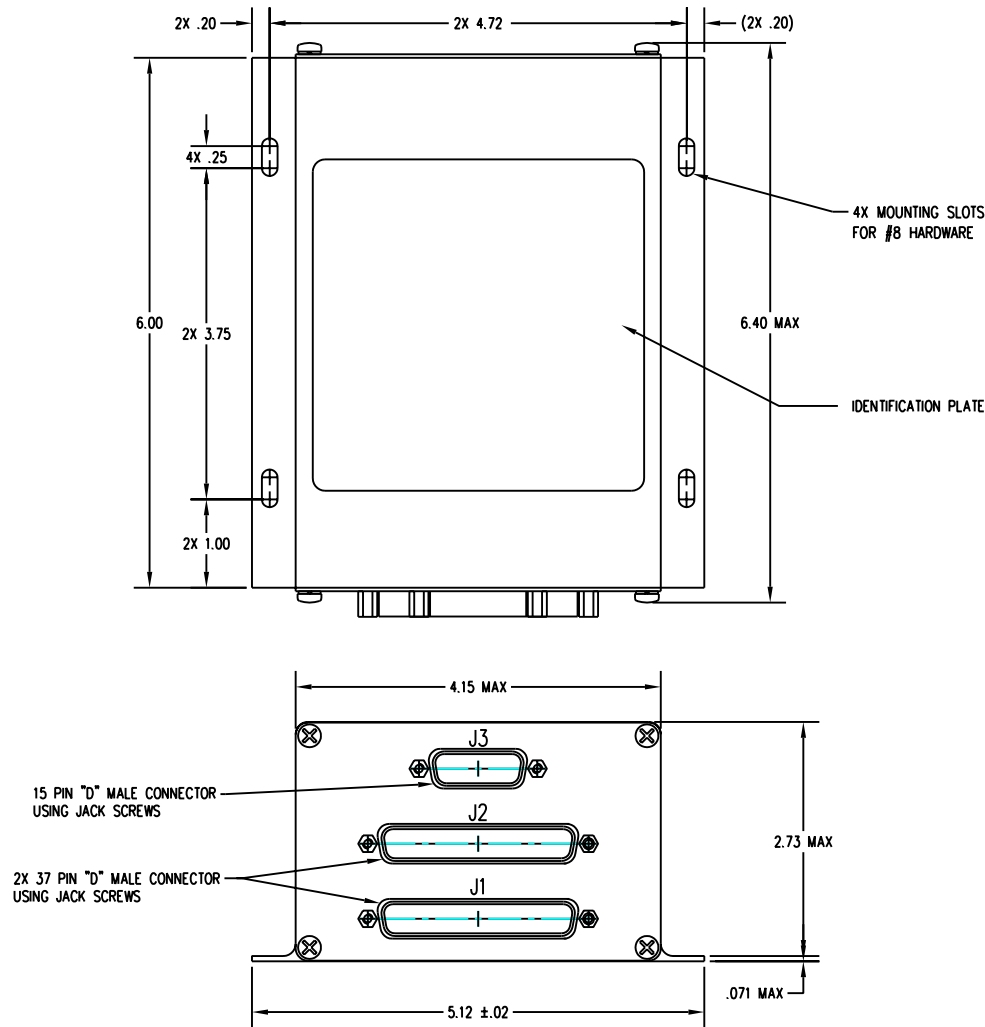
RS232 DATA FORMAT		
HEADER NAME	RESOLUTION	PARAMETER
AC (SEE NOTE 21)	NA	AIRCRAFT TYPE
E1	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 1
E2	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 2
E3	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 3
E4	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 4
E5	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 5
E6	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 6
C1	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 1
C2	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 2
C3	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 3
C4	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 4
C5	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 5
C6	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 6
OILT	1 DEGREE	OIL TEMPERATURE IN °F
OILP	1 PSI	OIL PRESSURE
RPM	10 RPM	TACHOMETER
MAP	0.1 IN-HG	MANIFOLD PRESSURE
FF	0.1 GPH	FUEL FLOW
USED	0.1 GALLON	FUEL USED (CALCULATED)
AMPI	1 AMP	ALTERNATOR CURRENT SENSE
AMPB	1 AMP	BATTERY CURRENT SENSE
TIT	1 DEGREE	TIT IN DEGREES F
VAC	0.1 IN-HG	VACUUM
MBUS	0.1 VDC	MAIN BUS VOLTAGE
FQL	0.1 GAL	FUEL QUANTITY LEFT
FQR	0.1 GAL	FUEL QUANTITY RIGHT
WOW (SEE NOTE 23)	NA	WEIGHT ON WHEELS

TABLE 2



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± 1/32 DECIMALS .X ± .02 .XX ± .01 .XXX ± .005	AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773	
	APPROVALS	DATE	DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING	
	DRAWN BY E. SHEASBY	7/15/04		
	CHECKED P. LYNCH	7/15/04	SIZE D	DWG. NO. 200-00041-XXX
DO NOT SCALE DRAWING			SCALE	SHEET 2 OF 9

- 000 CONFIGURATION



DO-1600 ENVIRONMENTAL QUALIFICATION TESTS		
ENVIRONMENTAL TESTS	RTCA/DO-1600 SECTION	CONDUCTED TEST CATEGORY
TEMPERATURE AND ALTITUDE		
LOW TEMPERATURE	4.5.1	EQUIPMENT TESTED TO CATEGORY B1
HIGH TEMPERATURE	4.5.2 AND 4.5.3	EQUIPMENT TESTED TO CATEGORY B1
IN-FLIGHT LOSS OF COOLING	4.5.4	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ALTITUDE	4.6.1	EQUIPMENT TESTED TO CATEGORY C1
DECOMPRESSION	4.6.2	EQUIPMENT TESTED TO CATEGORY A1
OVERPRESSURE	4.6.3	EQUIPMENT TESTED TO CATEGORY A1
TEMPERATURE VARIATION	5	EQUIPMENT TESTED TO CATEGORY B
HUMIDITY	6	EQUIPMENT TESTED TO CATEGORY A
OPERATIONAL SHOCKS AND CRASH SAFETY	7	EQUIPMENT TESTED TO CATEGORY B
VIBRATION	8	EQUIPMENT TESTED TO CATEGORY S, CURVE M
EXPLOSIVE PROOFNESS	9	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
WATER PROOFNESS	10	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FLUIDS SUSCEPTABILITY	11	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SAND AND DUST	12	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FUNGUS RESISTANCE	13	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SALT SPRAY	14	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
MAGNETIC EFFECTS	15	EQUIPMENT CLASS IS A
POWER INPUT	16	EQUIPMENT TESTED TO CATEGORY B
VOLTAGE SPIKE	17	EQUIPMENT TESTED TO CATEGORY B
AUDIO FREQUENCY CONDUCTED SUSCEPTABILITY	18	EQUIPMENT TESTED TO CATEGORY B
INDUCED SIGNAL SUSCEPTABILITY	19	EQUIPMENT TESTED TO CATEGORY A
RADIO FREQUENCY SUSCEPTABILITY	20	EQUIPMENT TESTED TO CATEGORY W
EMISSION OF RADIO FREQUENCY ENERGY	21	EQUIPMENT TESTED TO CATEGORY M
LIGHTNING INDUCED TRANSIENT SUSCEPTABILITY	22	EQUIPMENT TESTED TO CATEGORY A3E3
LIGHTNING DIRECT EFFECTS	23	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ICING	24	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ELECTRO STATIC DISCHARGE	25	EQUIPMENT IDENTIFIED AS CATEGORY A

TABLE 1

J1 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL-A)
- VAC SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- VDC (MAIN POWER BUS) SIGNAL INPUT HIGH
- RPM SIGNAL INPUT HIGH
- AMP BAT SIGNAL INPUT HIGH
- AMP ALT SIGNAL INPUT HIGH
- OIL PRESS SIGNAL INPUT HIGH
- OIL TEMP SIGNAL INPUT HIGH
- FUEL QUANTITY RIGHT SIGNAL INPUT HIGH
- TIT SIGNAL INPUT - CHROMEL
- EGT CYL - 6 SIGNAL INPUT - CHROMEL
- EGT CYL - 5 SIGNAL INPUT - CHROMEL
- EGT CYL - 4 SIGNAL INPUT - CHROMEL
- EGT CYL - 3 SIGNAL INPUT - CHROMEL
- EGT CYL - 2 SIGNAL INPUT - CHROMEL
- EGT CYL - 1 SIGNAL INPUT - CHROMEL
- RS232 GROUND COM1
- RS232 TRANSMIT COM1
- POWER INPUT RETURN (CHANNEL A & B) AND VDC (MAIN POWER BUS) SIGNAL INPUT RETURN
- VAC SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- RPM SIGNAL INPUT RETURN
- AMP BAT SIGNAL INPUT LOW
- AMP ALT SIGNAL INPUT LOW
- OIL PRESS SIGNAL INPUT RETURN
- OIL TEMP SIGNAL INPUT RETURN
- FUEL QUANTITY RIGHT SIGNAL INPUT RETURN
- TIT SIGNAL INPUT - ALUMEL
- EGT CYL - 6 SIGNAL INPUT - ALUMEL
- EGT CYL - 5 SIGNAL INPUT - ALUMEL
- EGT CYL - 4 SIGNAL INPUT - ALUMEL
- EGT CYL - 3 SIGNAL INPUT - ALUMEL
- EGT CYL - 2 SIGNAL INPUT - ALUMEL
- EGT CYL - 1 SIGNAL INPUT - ALUMEL
- SPARE, NO CONNECTION
- RS232 RECEIVE COM1

J2 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL-B)
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- FUEL FLOW SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- MAP SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- FUEL QUANTITY LEFT SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- CHT CYL - 6 SIGNAL INPUT HIGH
- CHT CYL - 5 SIGNAL INPUT HIGH
- CHT CYL - 4 SIGNAL INPUT HIGH
- CHT CYL - 3 SIGNAL INPUT HIGH
- CHT CYL - 2 SIGNAL INPUT HIGH
- CHT CYL - 1 SIGNAL INPUT HIGH
- RS232 GROUND COM2
- RS232 TRANSMIT COM2
- POWER INPUT RETURN (CHANNEL A & B)
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- FUEL FLOW SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- MAP SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- FUEL QUANTITY LEFT SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- CHT CYL - 6 SIGNAL INPUT RETURN
- CHT CYL - 5 SIGNAL INPUT RETURN
- CHT CYL - 4 SIGNAL INPUT RETURN
- CHT CYL - 3 SIGNAL INPUT RETURN
- CHT CYL - 2 SIGNAL INPUT RETURN
- CHT CYL - 1 SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- RS232 RECEIVE COM2

J3 PIN CONNECTIONS

- +12 VDC FF SENSOR EXCITATION OUTPUT HIGH
- +12 VDC RPM SENSOR EXCITATION OUTPUT HIGH
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- AIRCRAFT TYPE DESIGNATOR INPUT - 1
- AIRCRAFT TYPE DESIGNATOR INPUT - 2
- AIRCRAFT TYPE DESIGNATOR INPUT - 3
- WOW (SQUAT SWITCH) SIGNAL INPUT
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION

NOTES:

- MORITZ PART NUMBER IS A1215.(SEE NOTE 2 FOR APPLICABILITY)
- AVIDYNE PART NUMBER IS 200-00041-000.
- A1215 DATA ACQUISITION UNIT APPLICATION (NEW PIPER AIRCRAFT):
 - SARATOGA II HP
 - SARATOGA II TC
 - SARATOGA 6X
 - SARATOGA 6XT
- ELECTRICAL CHARACTERISTICS:
 - 14 TO 33 VDC POWER INPUT VARIATION.
 - MAXIMUM POWER CONSUMPTION, 3.5 WATTS.
- WEIGHT: 2.0 LBS MAX.
- TEMPERATURE:
 - 40 TO +70 OPERATING
 - 55 TO +85 STORAGE
- HARDWARE ENVIRONMENTAL TEST AND CERTIFICATION REQUIREMENT:
 - DO-1600 LISTED ON TABLE 1.
- SOFTWARE TEST AND CERTIFICATION REQUIREMENT:
 - DO-178B LEVEL C
- DATA ACQUISITION UNIT CERTIFICATION REQUIREMENT:
 - FAA TSO

PARAMETERS	TSO
CHT, EGT	TSO-C43c
TIT, OT	
FUEL FLOW	TSO-C44b
MAP	TSO-C45a
OP, VAC	TSO-C47
RPM	TSO-C49b
FUEL QTY	TSO-C55

- SOFTWARE DOCUMENT PART NUMBERS:
 - PSAC (PLAN FOR SOFTWARE ASPECT OF CERTIFICATION) D1287
 - SDS (SOFTWARE DESIGN STANDARDS) D1288
 - SRS (SOFTWARE REQUIREMENTS SPECIFICATIONS) D1289
 - SDD (SOFTWARE DESIGN DOCUMENTS) D1291
 - STP (SOFTWARE TEST PROCEDURES) D1292
 - STR (SOFTWARE TEST REPORT) D1293
 - VDD (VERSION DESCRIPTION DOCUMENT) D1294
 - SAS (SOFTWARE ACCOMPLISHMENT SUMMARY) D1295
- SOFTWARE PART NUMBER AND REVISION:
 - MAIN CARD NO.1 E1301 VER. 01
 - MAIN CARD NO.2 E1302 VER. 01
 - COMMUNICATION CARD E1303 VER. 01

- MORITZ ACCEPTANCE TEST REPORT
 - FORM F-144.
- MORITZ DESIGN REFERENCE:
 - FINAL ASSEMBLY A1286
 - MAIN CARD NO.1 SCHEMATIC S1283-1
 - MAIN CARD NO.2 SCHEMATIC S1283-2
 - COMMUNICATION CARD SCHEMATIC S1284-1
 - CONNECTOR CARD SCHEMATIC S1282-1
 - FILTER CARD SCHEMATIC S1314-1
- TO MEET EMI PROTECTION REQUIREMENTS OF DO-1600, ALL SIGNAL INPUT AND OUTPUT LINES MUST BE SHIELDED, WITH THE SHIELD GROUNDED AT THE DATA ACQUISITION UNIT CONNECTOR SIDE.
- SHUNTS FOR THE ALTERNATOR AND BATTERY AMPS MUST BE LOCATED IN THE HIGH SIDE OF EACH LINE WITH A COMMON MODE OF +28 VDC.
- THE ACTUAL FUEL QTY RANGE FOR THE LEFT AND RIGHT TANK IS 0 TO 51 GALLONS EACH. THE EXTENDED RANGE IS FOR THE FIELD CALIBRATION OPTION, USED BY THE MFD.
- TOLERANCE IS BASED ON +/-1% OF THE FULL SCALE VALUE OR ONE COUNT, WHICHEVER IS GREATER, FROM 0 TO 40 DEG. C AND +/-2% OR TWO COUNTS, WHICHEVER IS GREATER, FROM -40 TO 0 AND +40 TO +70 DEG. C. EXCEPT RPM WHERE TOLERANCE IS BASED ON +/-0.57% OF THE FULL SCALE. FROM 0 TO 40 DEG. C AND +/- 0.86% FROM -40 TO 0 AND +40 TO +70 DEG. C.
- THE DATA ACQUISITION UNIT MAINTAINS ITS CONFIGURATION AND CALIBRATION DATA WHEN POWERED OFF.
- OPEN AND SHORTED INPUT: IN CASE OF AN OPEN AND SHORTED INPUT CONDITION, THE OUTPUT FOR THE RELATED PARAMETER(S) SHALL BE THE MINIMUM RANGE SHOWN IN THE "SENSOR INPUT INFORMATION" TABLE.
- COM1 AND COM2 COMMUNICATION:
 - THE TWO RS232 DATA OUTPUTS ARE IDENTICAL.
 - THE TWO RS232 INTERFACES WILL TRANSMIT DATA TO THE "MFD" AND "PFD".
 - 19200 BPS, NO PARITY, 8 BITS, 1 STOP BIT.
 - OUTPUT: ASCII, COMMA DELIMITED TEXT.
 - TRANSMITS AN ASCII HEADER EVERY 15 TRANSMISSIONS.
 - 16 BIT ADDITIVE CHECKSUM FOR SERIAL TRANSMISSION ERROR CHECKING FOR EACH TRANSMISSION (4 DIGIT HEX)
 - TRANSMISSION RATE, 8 HZ MIN.
 - FOR RS232 DATA FORMAT SEE TABLE 2.

21. AIRCRAFT TYPE DESIGNATOR:

THE AIRCRAFT TYPE IS DETERMINED VIA JUMPERS AT J3 PINS 8, 9 AND 10. THE JUMPERS WILL BE PART OF THE AIRCRAFT HARNESS. FOR JUMPER / AIRCRAFT TYPE SEE THE CHART BELOW.

J3 - 8	J3 - 9	J3 - 10	AIRCRAFT	AIRCRAFT TYPE
GND	GND	GND	SARATOGA II HP, II TC, 6X, 6XT	10
GND	GND	OPEN	TBD	11
GND	OPEN	GND	TBD	12
GND	OPEN	OPEN	TBD	13
OPEN	GND	GND	TBD	14
OPEN	GND	OPEN	TBD	15
OPEN	OPEN	GND	TBD	16
OPEN	OPEN	OPEN	TBD	17

- HEADER EXAMPLE:
"AC","E1","E2","E3","E4","E5","E6","C1","C2","C3","C4","C5","C6","OILT","OILP",
"RPM","MAP","FF","USED","AMP1","AMPB","TIT","VAC","MBUS","FOL","FOR","WOW",
<checksum><cr><lf>
- WOW DISCRETE INPUT:
 - GROUND CLOSURE WHEN AIRCRAFT ON GROUND, WOW IS "0"
 - OPEN WHEN AIRCRAFT IN FLIGHT, WOW IS "1"
 - IN FIXED GEAR APPLICATIONS (6X, 6XT) WOW WILL ALWAYS BE "1".
- THE FOLLOWING EQUATION IS USED TO CALCULATE THE FUEL FLOW CAL. DATA:
$$GPH = 216.437 - \sqrt{52.2584 - 0.0668 * HZ}$$

0.0334
- THE "FUEL USED" VALUE RESETS TO ZERO ON POWER-UP RESET.
- WHEN THE SIGNAL INPUT OF ANY FREQUENCY BASED PARAMETER FALLS BELOW 1 HZ, THAT PARAMETER WILL DISPLAY AN OUTPUT EQUIVALENT TO 0 HZ.
- MOD 1 BOX ON IDENTIFICATION PLATE TO BE CHECKED FOR ALL REV "A" UNITS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773	
FRACTIONS ± 1/32	DECIMALS X ±.02 XX ±.01 XXX ±.005	ANGLES ± 5°	APPROVALS	DATE	
MATERIALS	DRAWN BY E. SHEASBY	CHECKED P. LYNCH		7/15/04	
				7/15/04	
FINISH					
DO NOT SCALE DRAWING					
SIZE D	DWG. NO. 200-00041-XXX	REV. 14	SCALE		SHEET 3 OF 9

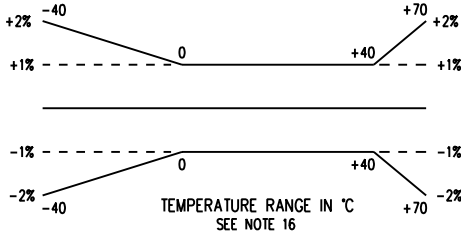
SENSOR INPUT INFORMATION

PARAMETER	HEADER	AIRCRAFT	RANGE/ UNIT	FACTOR	CALIBRATION DATA										TOLERANCE OVER ENTIRE RANGE		SENSOR EXCITATION	SENSOR EXCITATION TOLERANCE WITH 10K LOAD		SENSOR INFORMATION
					NORMAL TEMP					EXTREME TEMP					NORMAL TEMP	EXTREME TEMP				
MAP	MAP	ALL	0.0 TO 45.0 IN HG	VDC / IN HG	1.000 / 0.0	2.179 / 15.0	2.572 / 20.0	2.965 / 25.0	3.358 / 30.0	3.751 / 35.0	4.144 / 40.0	4.537 / 45.0		± 0.4 IN-HG	± 0.9 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APT-251-1000-25A	
RPM	RPM	PA28-161, PA28-181, PA28R-201, PA44-180	0 TO 3500 RPM	HZ / RPM	0.00 / 0	8.33 / 500	16.67 / 1000	25.00 / 1500	33.34 / 2000	41.67 / 2500	50.00 / 3000	58.33 / 3500		± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	B&D P/N 0404 - 102	
RPM	RPM	PA32, PA34-220T, PA46-350P	0 TO 3500 RPM	HZ / RPM	0.00 / 0	12.5 / 500	25.00 / 1000	37.50 / 1500	50.00 / 2000	62.50 / 2500	75.00 / 3000	87.50 / 3500		± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	B&D P/N 0404 - 102	
EGT (6 CH)	E1..E6	PA32, PA28-181, PA28R-201, PA44-180	500 TO 2000 DEG F	MV / F CJ = ICE	10.561 / 500	22.255 / 1000	26.978 / 1200	31.628 / 1400	36.166 / 1600	40.581 / 1800	42.741 / 2000			± 20° F	± 40° F	N/A	N/A	N/A	K - TYPE THERMOCOUPLE NORWCH P/N 101 - 00103	
TIT	TIT	PA32, PA34-220T, PA46-350P	500 TO 2000 DEG F	MV / F CJ = ICE	10.561 / 500	22.255 / 1000	26.978 / 1200	31.628 / 1400	36.166 / 1600	40.581 / 1800	42.741 / 2000			± 20° F	± 40° F	N/A	N/A	N/A	K - TYPE THERMOCOUPLE NORWCH P/N 101 - 00103	
FUEL FLOW	FF	ALL	0.0 TO 45.0 GPH	HZ / GPH	0.00 / 0.0	70.61 / 10.0	104.68 / 15.0	137.90 / 20.0	201.84 / 30.0	262.43 / 40.0	291.50 / 45.0			±0.4 GPH	±0.9 GPH	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	FLOSCAN P/N 201C - 6 SEE NOTE 23.	
CHT	C1..C6	PA32, PA34-220T, PA44-180, PA46-350P	0 TO 570 DEG F	OHMS / DEG F	45.40 / 0	48.97 / 25	60.09 / 100	76.87 / 200	96.09 / 300	118.41 / 400	143.80 / 500	163.90 / 570		± 5° F	± 10° F	N/A	N/A	N/A	TRANSMITTER PER MS24482 -1, -2 OUTPUT PER MIL-T25446D	
OP (RESISTIVE)	OILP	PA44-180, PA28-161 PA28-181, PA28R-201	0 TO 120 PSI	OHMS / PSI	10.0 / 0	37.0 / 20	63.0 / 40	77.0 / 50	90.0 / 60	113.0 / 80	135.0 / 100	157.01 / 120		± 1 PSI	± 2 PSI	N/A	N/A	N/A	R.C. ALLEN/KELLY P/N 23-1505-2	
OP (VOLTAGE)	OILP	PA34-220T, PA46-350P PA32	0 TO 150 PSI	VDC / PSI	1.0 / 0	1.8 / 30	2.6 / 60	3.4 / 90	4.2 / 120	5.0 / 150				± 1 PSI	± 2 PSI	+28 VDC FROM AC	N/A	N/A	KULITE P/N APT-252-2000-150G	
FUEL PRESSURE	FP	NOT USED																	NOT USED	
OT	OILT	ALL	-20 TO 275 DEG F	OHMS / DEG F	80.91 / -20	84.50 / 0	91.90 / 40	99.71 / 80	112.28 / 140	121.29 / 180	137.03 / 245	144.60 / 275		± 2° F	± 5° F	N/A	N/A	N/A	RESISTANCE BULB PER MS28034 OUTPUT PER MIL-T-7990B	
AMP (ALT1)	AMP1	ALL	0 TO 100 AMP	MVDC / AMP	0.00 / 0	10.00 / 20	20.00 / 40	30.00 / 60	40.00 / 80	50.00 / 100				± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP Ø 50MV SHUNT +28 VDC COMMON MODE	
AMP (ALT2)	AMP2	NOT USED	0 TO 100 AMP	MVDC / AMP	0.00 / 0	10.00 / 20	20.00 / 40	0.00 / 0	20.0 / 40	30.0 / 60	40.0 / 80	50.0 / 100		± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP Ø 50MV SHUNT +28 VDC COMMON MODE	
AMP (BAT)	AMPB	ALL	-100 TO 100 AMP	MVDC / AMP	-50.0 / -100	-30.0 / -60	-20.0 / -40	0.00 / 0	20.0 / 40	30.0 / 60	40.0 / 80	50.0 / 100		± 1 AMP	± 2 AMP	N/A	N/A	N/A	AIRCRAFT POWER BUS	
VDC	VDC1	ALL	0.0 TO 36.0 VDC	VDC / VDC	0.0 / 0.0	10.0 / 10.0	15.0 / 15.0	20.0 / 20.0	25.0 / 25.0	28.0 / 28.0	32.0 / 32.0	36.0 / 36.0		± 0.4 VDC	± 0.7 VDC	+28 VDC FROM AC	N/A	N/A	AIRCRAFT POWER BUS	
VDC	VDC2	NOT USED	0.0 TO 36.0 VDC	VDC / VDC	0.0 / 0.0	10.0 / 10.0	15.0 / 15.0	20.0 / 20.0	25.0 / 25.0	28.0 / 28.0	32.0 / 32.0	36.0 / 36.0		± 0.4 VDC	± 0.7 VDC	+28 VDC FROM AC	N/A	N/A	AIRCRAFT POWER BUS	
VAC	VAC	PA32	2.0 TO 6.0 IN / HG	VDC / IN / HG	1.66 / 2.0	2.05 / 2.5	2.46 / 3.0	2.87 / 3.5	3.27 / 4.0	3.68 / 4.5	4.5 / 5.5	4.91 / 6.0		± 0.1 IN-HG	± 0.2 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTE-253-1000-3D	
OAT	OAT	TBD	-40 TO 60 DEG C	OHMS/ DEG	84.23 / -40.0	92.15 / -20	100 / 0	107.81 / 20	115.56 / 40	123.26 / 60				± 1 DEG C	± 2 DEG C	N/A	N/A	N/A	ROSEMOUNT 1060MAXXXA	
VAC DE-ICE	DEICE	PA34-220T, PA46-350P	0 TO 6.0 IN HG	VDC/ IN HG	0.0 / 0.0	1.8 / 1.2	2.6 / 2.4	3.4 / 3.6	4.2 / 4.8	5.0 / 6.0				± 0.1 IN HG	± 0.2 IN HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTE-253-1000-3D	
FUEL QTY L/R	FQR, FQL	PA32	-1.5 TO 53.0 GAL PER TANK	OHMS / GAL	0.0 / -1.5	2.5 / 0.0	20.0 / 10.0	31.8 / 20.0	45.5 / 30.0	63.0 / 40.0	88.3 / 51.0	92.9 / 53.0		± 1 GAL	± 2 GAL	N/A	N/A	N/A	PS10013-7 ROCHESTER P/N 7740 - 204 L. INBD PS10013-8 ROCHESTER P/N 7740 - 205 R. INBD PS10013-12 ROCHESTER P/N 7740 - 518 L. OUTBD PS10013-13 ROCHESTER P/N 7740 - 519 R. OUTBD CONNECTED IN SERIES	
FUEL QTY L/R	FQR, FQL	PA28-161, PA28-181	-1.8 TO 27.0 GAL PER TANK	OHMS / GAL	0.0 / -1.8	3.0 / 0.0	14.0 / 5.0	23.0 / 10.0	33.0 / 15.0	40.0 / 20.0	45.0 / 25.0	48.36 / 27.0		± 1 GAL	± 2 GAL	N/A	N/A	N/A		
FUEL QTY L/R	FQR, FQL	PA28R-201	-2.8 TO 38.0 GAL PER TANK	OHMS / GAL	0.0 / -2.8	6.5 / 0.0	23.0 / 10.0	47.5 / 20.0	73.0 / 30.0	90.0 / 36.0	94.63 / 38.0			± 1 GAL	± 2 GAL	N/A	N/A	N/A		
FUEL QTY L/R	FQR, FQL	PA34-220T	-4.6 TO 63.0 GAL PER TANK	OHMS / GAL	0.0 / -4.6	6.5 / 0.0	24.0 / 10.0	38.0 / 20.0	52.0 / 30.0	64.0 / 40.0	75.0 / 50.0	93.0 / 61.0	95.83 / 63.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A		
FUEL QTY L/R	FQR, FQL	PA44-180	-5.1 TO 57.0 GAL PER TANK	OHMS / GAL	0.0 / -5.1	8.0 / 0.0	54.0 / 20.0	84.0 / 40.0	95.0 / 55.0	98.16 / 57.0				± 1 GAL	± 2 GAL	N/A	N/A	N/A		
FUEL QTY L/R	FQR, FQL	PA46-350P	-4.5 TO 62.0 GAL PER TANK	OHMS / GAL	0.0 / -4.5	7.65 / 0.0	19.5 / 5.0	43.05 / 15.0	63.45 / 30.0	81.75 / 45.0	109.65 / 60.0	113.05 / 62.0		± 1 GAL	± 2 GAL	N/A	N/A	N/A		

TABLE 2

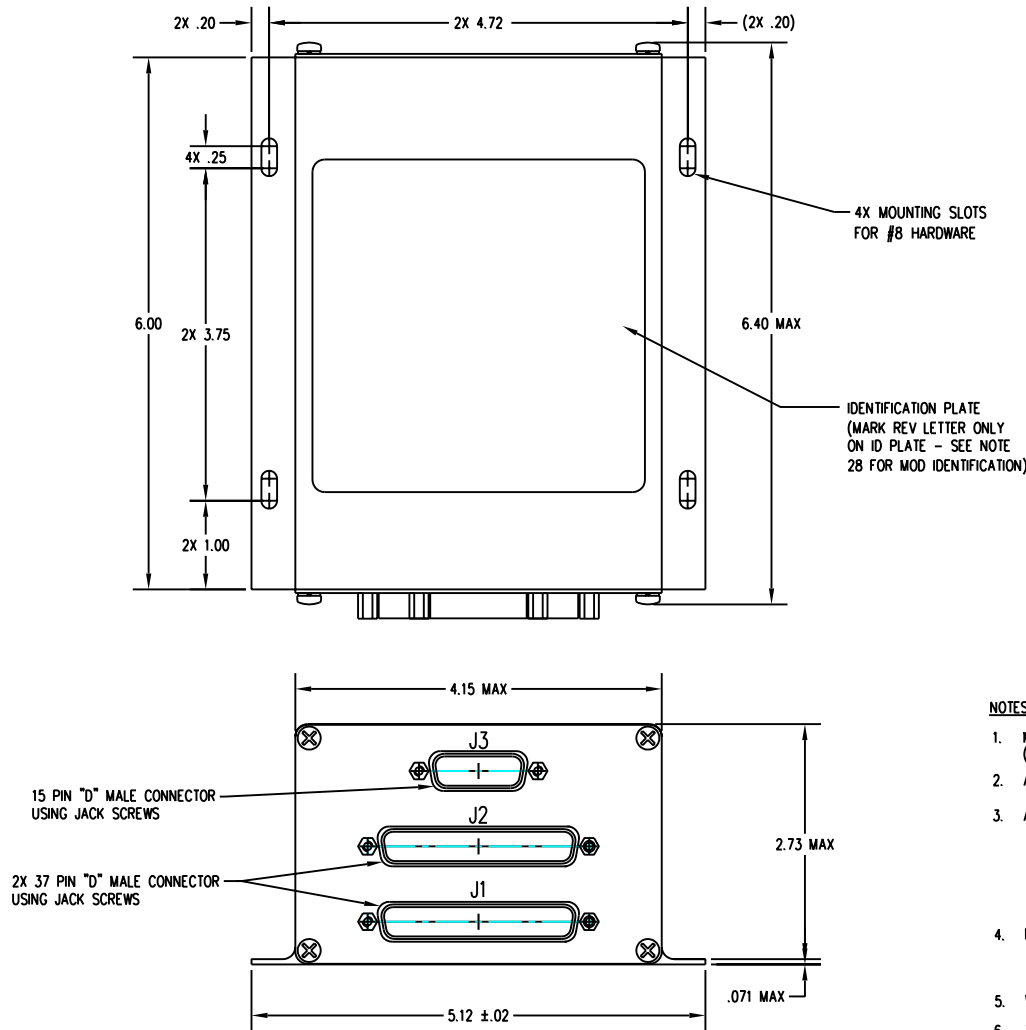
RS232 DATA FORMAT					
HEADER NAME	RESOLUTION	PARAMETER	HEADER NAME	RESOLUTION	PARAMETER
AC	NA	AIRCRAFT TYPE (SEE NOTE 20)	OAT	1 DEGREE	OUTSIDE AIR TEMPERATURE
E1	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 1	MAP	0.1 IN-HG	MANIFOLD PRESSURE
E2	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 2	FF	0.1 GPH	FUEL FLOW
E3	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 3	USED	0.1 GALLON	FUEL USED (CALCULATED)
E4	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 4	AMP1	1 AMP	ALTERNATOR 1 CURRENT SENSE
E5	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 5	AMP2	1 AMP	ALTERNATOR 2 CURRENT SENSE
E6	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 6	AMPB	1 AMP	BATTERY CURRENT SENSE
C1	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 1	TIT	1 DEGREE	TIT IN DEGREES F
C2	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 2	VAC	0.1 IN-HG	VACUUM
C3	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 3	VDC1	0.1 VDC	BUS VOLTAGE 1
C4	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 4	VDC2	0.1 VDC	BUS VOLTAGE 2
C5	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 5	FQL	0.1 GAL	FUEL QUANTITY LEFT
C6	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 6	FQR	0.1 GAL	FUEL QUANTITY RIGHT
OILT	1 DEGREE	OIL TEMPERATURE IN °F	FP	1 PSI	FUEL PRESSURE
OILP	1 PSI	OIL PRESSURE	DEICE	TBD	VACUUM DE-ICE
RPM	10 RPM	TACHOMETER	WOW	NA	WEIGHT ON WHEELS (SEE NOTE 22)

DATA ACQUISITION UNIT TOLERANCE



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 ± .02 ± .15 .XX ±.01 .XXX ±.005		AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773		
		APPROVALS DATE		DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING		
MATERIALS		DRAWN BY E. SHEASBY				7/15/04
FINISH		CHECKED P. LYNCH		7/15/04		
				SIZE D	DWG. NO. 200-00041-XXX	REV. 14
DO NOT SCALE DRAWING				SCALE		SHEET 4 OF 9

- 001 CONFIGURATION



DO-1600 ENVIRONMENTAL QUALIFICATION TESTS		
ENVIRONMENTAL TESTS	RTCA/DO-1600 SECTION	CONDUCTED TEST CATEGORY
TEMPERATURE AND ALTITUDE		
LOW TEMPERATURE	4.5.1	EQUIPMENT TESTED TO CATEGORY B1
HIGH TEMPERATURE	4.5.2 AND 4.5.3	EQUIPMENT TESTED TO CATEGORY B1
IN-FLIGHT LOSS OF COOLING	4.5.4	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ALTITUDE	4.6.1	EQUIPMENT TESTED TO CATEGORY C1
DECOMPRESSION	4.6.2	EQUIPMENT TESTED TO CATEGORY A1
OVERPRESSURE	4.6.3	EQUIPMENT TESTED TO CATEGORY A1
TEMPERATURE VARIATION	5	EQUIPMENT TESTED TO CATEGORY B
HUMIDITY	6	EQUIPMENT TESTED TO CATEGORY A
OPERATIONAL SHOCKS AND CRASH SAFETY	7	EQUIPMENT TESTED TO CATEGORY B
VIBRATION	8	EQUIPMENT TESTED TO CATEGORY S, CURVE M
EXPLOSIVE PROOFNESS	9	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
WATER PROOFNESS	10	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FLUIDS SUSCEPTABILITY	11	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SAND AND DUST	12	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FUNGUS RESISTANCE	13	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SALT SPRAY	14	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
MAGNETIC EFFECTS	15	EQUIPMENT CLASS IS A
POWER INPUT	16	EQUIPMENT TESTED TO CATEGORY B
VOLTAGE SPIKE	17	EQUIPMENT TESTED TO CATEGORY B
AUDIO FREQUENCY CONDUCTED SUSCEPTABILITY	18	EQUIPMENT TESTED TO CATEGORY B
INDUCED SIGNAL SUSCEPTABILITY	19	EQUIPMENT TESTED TO CATEGORY A
RADIO FREQUENCY SUSCEPTABILITY	20	EQUIPMENT TESTED TO CATEGORY W
EMISSION OF RADIO FREQUENCY ENERGY	21	EQUIPMENT TESTED TO CATEGORY M
LIGHTNING INDUCED TRANSIENT SUSCEPTABILITY	22	EQUIPMENT TESTED TO CATEGORY A3E3
LIGHTNING DIRECT EFFECTS	23	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ICING	24	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ELECTRO STATIC DISCHARGE	25	EQUIPMENT IDENTIFIED AS CATEGORY A

TABLE 1

J1 PIN CONNECTIONS

- NOTE 26
- +28 VDC POWER INPUT HIGH (CHANNEL A)
 - VAC SIGNAL INPUT HIGH
 - SPARE, NO CONNECTION
 - VDC1 SIGNAL INPUT HIGH
 - RPM SIGNAL INPUT HIGH
 - AMP BAT SIGNAL INPUT HIGH
 - AMP ALT1 SIGNAL INPUT HIGH
 - OIL PRESS SIGNAL INPUT HIGH (VOLTAGE TYPE)
 - OIL TEMP SIGNAL INPUT HIGH
 - FUEL QUANTITY RIGHT SIGNAL INPUT HIGH
 - TIT SIGNAL INPUT - CHROMEL
 - EGT CYL - 6 SIGNAL INPUT - CHROMEL
 - EGT CYL - 5 SIGNAL INPUT - CHROMEL
 - EGT CYL - 4 SIGNAL INPUT - CHROMEL
 - EGT CYL - 3 SIGNAL INPUT - CHROMEL
 - EGT CYL - 2 SIGNAL INPUT - CHROMEL
 - EGT CYL - 1 SIGNAL INPUT - CHROMEL
 - RS-232 GROUND COM 1
 - RS-232 TRANSMIT COM 1
 - POWER INPUT RETURN (CHANNEL A & B) AND VDC1 SIGNAL INPUT RETURN
 - VAC SIGNAL INPUT RETURN
 - SPARE, NO CONNECTION
 - RPM SIGNAL INPUT RETURN
 - AMP BAT SIGNAL INPUT LOW
 - AMP ALT1 SIGNAL INPUT LOW
 - OIL PRESS SIGNAL INPUT RETURN (VOLTAGE TYPE)
 - OIL TEMP SIGNAL INPUT RETURN
 - FUEL QUANTITY RIGHT SIGNAL INPUT RETURN
 - TIT SIGNAL INPUT - ALUMEL
 - EGT CYL - 6 SIGNAL INPUT - ALUMEL
 - EGT CYL - 5 SIGNAL INPUT - ALUMEL
 - EGT CYL - 4 SIGNAL INPUT - ALUMEL
 - EGT CYL - 3 SIGNAL INPUT - ALUMEL
 - EGT CYL - 2 SIGNAL INPUT - ALUMEL
 - EGT CYL - 1 SIGNAL INPUT - ALUMEL
 - SHIELD
 - RS-232 RECEIVE COM 1
- NOTE 26

NOTES:

- MORITZ PART NUMBER IS A1380 REV A OR LATER (SEE NOTE 28 FOR APPLICABILITY)
- AVDYNE PART NUMBER IS 200-00041-001.
- A1380 DATA ACQUISITION UNIT APPLICATION (NEW PIPER AIRCRAFT):
 - PA32 II HP, II TC, 6X, 6XT
 - PA28-161
 - PA28-181
 - PA28R-201
 - PA44-180
- ELECTRICAL CHARACTERISTICS:
 - 14 TO 33 VDC POWER INPUT VARIATION, 1.5 WATTS
 - MAXIMUM POWER CONSUMPTION, 1.5 WATTS
- WEIGHT: 2.0 LBS MAX.
- TEMPERATURE:
 - 40 TO +70 OPERATING
 - 55 TO +85 STORAGE
- HARDWARE ENVIRONMENTAL TEST AND CERTIFICATION REQUIREMENT:
 - DO-1600 LISTED ON TABLE 1.
- DATA ACQUISITION UNIT CERTIFICATION REQUIREMENT:
 - FAA TSO

PARAMETERS	TSO
CHT, EGT	TSO-C43c
TIT, OT	
FUEL FLOW	TSO-C44b
MAP	TSO-C45a
OP, VAC	TSO-C47
RPM	TSO-C49b
FUEL QTY	TSO-C55

- SOFTWARE TEST AND CERTIFICATION REQUIREMENT:
 - DO-178B LEVEL C
- SOFTWARE PART NUMBER, VERSION AND CHECKSUM:
 - PART NUMBER - SW1380, VER 6.0
 - CHECKSUM (MAIN 1) 7207
 - CHECKSUM (MAIN 2) 3032
 - CHECKSUM (COMM) 8670

J2 PIN CONNECTIONS

- NOTE 26
- +28 VDC POWER INPUT HIGH (CHANNEL B)
 - DE-ICE SIGNAL INPUT HIGH
 - FUEL PRESSURE SIGNAL INPUT HIGH
 - VDC2 SIGNAL INPUT HIGH
 - FUEL FLOW SIGNAL INPUT HIGH
 - SPARE, NO CONNECTION
 - AMP ALT2 SIGNAL INPUT HIGH
 - MAP SIGNAL INPUT HIGH
 - OIL PRESS SIGNAL INPUT HIGH (RESISTIVE TYPE)
 - FUEL QUANTITY LEFT SIGNAL INPUT HIGH
 - OAT SIGNAL INPUT HIGH
 - CHT CYL - 6 SIGNAL INPUT HIGH
 - CHT CYL - 5 SIGNAL INPUT HIGH
 - CHT CYL - 4 SIGNAL INPUT HIGH
 - CHT CYL - 3 SIGNAL INPUT HIGH
 - CHT CYL - 2 SIGNAL INPUT HIGH
 - CHT CYL - 1 SIGNAL INPUT HIGH
 - RS-232 GROUND COM 2
 - RS-232 TRANSMIT COM 2
 - POWER INPUT RETURN (CHANNEL A & B) AND VDC2 SIGNAL INPUT RETURN
 - DE-ICE SIGNAL INPUT RETURN
 - FUEL PRESSURE SIGNAL INPUT RETURN
 - FUEL FLOW SIGNAL INPUT RETURN
 - SPARE, NO CONNECTION
 - AMP ALT2 SIGNAL INPUT LOW
 - MAP SIGNAL INPUT RETURN
 - OIL PRESS SIGNAL INPUT RETURN (RESISTIVE TYPE)
 - FUEL QUANTITY LEFT SIGNAL INPUT RETURN
 - OAT SIGNAL INPUT RETURN
 - CHT CYL - 6 SIGNAL INPUT RETURN
 - CHT CYL - 5 SIGNAL INPUT RETURN
 - CHT CYL - 4 SIGNAL INPUT RETURN
 - CHT CYL - 3 SIGNAL INPUT RETURN
 - CHT CYL - 2 SIGNAL INPUT RETURN
 - CHT CYL - 1 SIGNAL INPUT RETURN
 - SHIELD
 - RS-232 RECEIVE COM 2
- NOTE 26

- FOR MORITZ ACCEPTANCE TEST PROCEDURE, SEE FORM A1380-ATP
- MORITZ DESIGN REFERENCE:
 - FINAL ASSEMBLY A1409
 - VERSION DESCRIPTION DOCUMENT A1380_VDD
- CONFORMAL COATED CIRCUIT CARD ASSEMBLIES USED ON ALL A1380 REV D AND UP UNITS.
- TO MEET EMI PROTECTION REQUIREMENTS OF DO-1600, ALL SIGNAL INPUT AND OUTPUT LINES MUST BE SHIELDED, WITH THE SHIELD GROUNDED AT THE DATA ACQUISITION UNIT CONNECTOR SIDE.
- SHUNTS FOR THE ALTERNATOR AND BATTERY AMPS MUST BE LOCATED IN THE HIGH SIDE OF EACH LINE WITH A COMMON MODE OF +28 VDC.
- THE EXTENDED FUEL QUANTITY RANGE IS FOR THE FIELD CALIBRATION OPTION, USED BY THE MFD.
- TOLERANCE IS BASED ON +/- 1% OF THE FULL SCALE VALUE OR ONE COUNT, WHICHEVER IS GREATER, FROM 0 TO 40 DEG. C AND +/- 2% OR TWO COUNTS, WHICHEVER IS GREATER, FROM -40 TO 0 AND +40 TO +70 DEG. C. EXCEPT RPM WHERE TOLERANCE IS BASED ON +/- 0.57% OF THE FULL SCALE, FROM 0 TO 40 DEG. C AND +/- 0.86% FROM -40 TO 0 AND +40 TO +70 DEG. C.
- THE DATA ACQUISITION UNIT MAINTAINS ITS CONFIGURATION AND CALIBRATION DATA WHEN POWERED OFF.
- OPEN AND SHORTED INPUT: IN CASE OF AN OPEN AND SHORTED INPUT CONDITION, THE OUTPUT FOR THE RELATED PARAMETER(S) SHALL BE THE MINIMUM RANGE SHOWN IN THE "SENSOR INPUT INFORMATION" TABLE.
- COM1 AND COM2 COMMUNICATION:
 - THE TWO RS232 DATA OUTPUTS ARE IDENTICAL.
 - THE TWO RS232 INTERFACES WILL TRANSMIT DATA TO THE "MFD" AND "PFD".
 - 19200 BPS, NO PARITY, 8 BITS, 1 STOP BIT.
 - OUTPUT: ASCII, COMMA DELIMITED TEXT.
 - TRANSMITS AN ASCII HEADER EVERY 15 TRANSMISSIONS.
 - 16 BIT ADDITIVE CHECKSUM FOR SERIAL TRANSMISSION ERROR CHECKING FOR EACH TRANSMISSION (4 DIGIT HEX)
 - TRANSMISSION RATE, 8 HZ MIN.
 - FOR RS232 DATA FORMAT SEE TABLE 2.

J3 PIN CONNECTIONS

- +12 VDC FF SENSOR EXCITATION OUTPUT HIGH
- +12 VDC RPM SENSOR EXCITATION OUTPUT HIGH
- OAT SENSOR EXCITATION OUTPUT HIGH
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- AIRCRAFT TYPE DESIGNATOR INPUT - 1
- AIRCRAFT TYPE DESIGNATOR INPUT - 2
- AIRCRAFT TYPE DESIGNATOR INPUT - 3
- WOW (SQUAT SWITCH) SIGNAL INPUT
- SHIELD
- SPARE, NO CONNECTION
- OAT SENSOR EXCITATION RETURN
- SPARE, NO CONNECTION

20. AIRCRAFT TYPE DESIGNATOR:

THE AIRCRAFT TYPE IS DETERMINED VIA JUMPERS AT J3 PINS 8, 9 AND 10. THE JUMPERS WILL BE PART OF THE AIRCRAFT HARNESS. FOR JUMPER / AIRCRAFT TYPE SEE THE CHART BELOW.

J3-8	J3-9	J3-10	AIRCRAFT	AIRCRAFT TYPE
GND	GND	GND	PA32 II HP, ITC, 6X, 6XT	AC
GND	GND	OPEN	PA28-161	10
GND	OPEN	GND	PA28-181	11
GND	OPEN	GND	PA28-181	12
GND	OPEN	OPEN	PA28R-201	13
OPEN	GND	GND	PA34-220T	14
OPEN	GND	OPEN	PA44-180	15
OPEN	OPEN	GND	PA46-350P	16
OPEN	OPEN	OPEN	TBD	17

- HEADER EXAMPLE:
"AC","E1","E2","E3","E4","E5","E6","C1","C2","C3","C4","C5","C6","OILT","OILP",
"RPM","OAT","MAP","FF","USED","AMP1","AMP2","AMPB","TIT","VAC","VDC1",
"VDC2","FQL","FOR","FP","DEICE","WOW",2608<CR><LF>
- WOW DISCRETE INPUT:
 - GROUND CLOSURE WHEN AIRCRAFT ON GROUND, WOW IS "0"
 - OPEN WHEN AIRCRAFT IN FLIGHT, WOW IS "1"
- THE FOLLOWING EQUATION IS USED TO CALCULATE THE FUEL FLOW CAL. DATA:
$$GPH = 216.437 - \sqrt{52.2584 - 0.0668 * HZ}$$

0.0334
- THE "FUEL USED" VALUE RESETS TO ZERO ON POWER-UP RESET. FUEL USED IS CALCULATED BASED ON A K FACTOR OF 24,920.
- WHEN THE SIGNAL INPUT OF ANY FREQUENCY BASED PARAMETER FALLS BELOW 1 HZ, THAT PARAMETER WILL DISPLAY AN OUTPUT EQUIVALENT TO 0 HZ.
- CHT INPUTS ARE NOT USED ON ANY PA28 MODEL. EGT IS NOT USED ON PA28-161, PA34-220T AND PA46-350P. TIT IS NOT USED ON ANY PA28 MODEL AND PA44-180. VAC IS ONLY USED ON THE PA32 MODEL.
- PA44-180, CONNECT CHT SENSOR TO EGT6 INPUTS. CHT SIGNAL OUTPUT WILL BO ON C1.
- FOR MOD IDENTIFICATION SEE TABLE BELOW.

MOD #	DESCRIPTION	APPLICABLE REV
1	PCB'S W/O CONFORMAL COAT	E, F

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 ± .02 ± 5° .XX ±.01 XXX ±.005			AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773					
			APPROVALS		DATE		DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING			
MATERIALS			DRAWN BY E. SHEASBY		7/15/04					
			FINISH			CHECKED P. LYNCH		7/15/04		
								SIZE D		DWG. NO. 200-00041-XXX
			DO NOT SCALE DRAWING			SCALE			SHEET 5 OF 9	

SENSOR INPUT INFORMATION

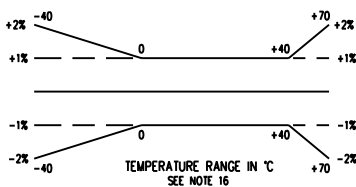
PARAMETER	HEADER	AIRCRAFT	RANGE/ UNIT	FACTOR	CALIBRATION DATA								TOLERANCE OVER ENTIRE RANGE		SENSOR EXCITATION	SENSOR EXCITATION TOLERANCE WITH 10K LOAD		SENSOR INFORMATION
													NORMAL TEMP	EXTREME TEMP		NORMAL TEMP	EXTREME TEMP	
MAP	MAP	ALL	0.0 TO 45.0 IN HG	VDC IN HG	1.000 0.0	2.179 15.0	2.572 20.0	2.965 25.0	3.358 30.0	3.751 35.0	4.144 40.0	4.537 45.0	± 0.4 IN-HG	± 0.9 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE PN APTÉ-251-1000-25A
RPM	RPM	PA28-161, PA28-181, PA28R-201, PA44-180	0 TO 3500 RPM	HZ RPM	0.00 0	8.33 500	16.67 1000	25.00 1500	33.34 2000	41.67 2500	50.00 3000	58.33 3500	± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	SPIRENT SYSTEMS PN 0402-102
RPM	RPM	PA32, PA34-220T, PA46-350P	0 TO 3500 RPM	HZ RPM	0.00 0	12.5 500	25.00 1000	37.50 1500	50.00 2000	62.50 2500	75.00 3000	87.50 3500	± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	SPIRENT SYSTEMS PN 0402-102
EGT	E1...E6	PA32, PA28-181, PA28R-201, PA44-180	160 TO 2000 DEG F	MV ** DEG F	2.897 160	10.561 500	22.255 1000	26.978 1200	31.628 1400	36.166 1600	40.581 1800	42.741 2000	± 20° F	± 40° F	N/A	N/A	N/A	NORMWCH PN 101-00103 (PA32) • KS AVONICS PN A002B (PA28, PA44) •
TIT	TIT	PA32, PA34-220T PA46-350P	160 TO 2000 DEG F	MV ** DEG F	2.897 160	10.561 500	22.255 1000	26.978 1200	31.628 1400	36.166 1600	40.581 1800	42.741 2000	± 20° F	± 40° F	N/A	N/A	N/A	NORMWCH PN 101-00103 (PA32), 101-00240 (PA34) • ROSEMOUNT PN 0135Y (PA46) •
FUEL FLOW	FF	ALL	0.0 TO 45.0 GPH	HZ GPH	0.00 0.0	70.61 10.0	104.68 15.0	137.90 20.0	201.84 30.0	262.43 40.0	291.50 45.0		±0.4 GPH	±0.9 GPH	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	FLOSCAN PN 201C - 6 SEE NOTE 23.
CHT (RESISTIVE)	C1...C6	PA32	0 TO 570 DEG F	OHMS DEG F	45.40 0	48.97 25	60.09 100	76.87 200	96.09 300	118.41 400	143.80 500	163.90 570	± 5° F	± 10° F	N/A	N/A	N/A	TRANSMITTER PER MS24482 -1, -2 OUTPUT PER MIL-T25446D
CHT (THERMOCOUPLE)	C1...C6	PA34-220T, PA44-180 PA46-350P	160 TO 570 DEG F	MV ** DEG F	2.897 160	3.820 200	6.094 300	8.316 400	10.561 500	12.163 570			± 5° F	± 10° F	N/A	N/A	N/A	KS AVONICS PN A002B •
OP (RESISTIVE)	OILP	PA44-180, PA28-161 PA28-181, PA28R-201	0 TO 120 PSI	OHMS PSI	10.0 0	37.0 20	63.0 40	77.0 50	90.0 60	113.0 80	135.0 100	157.01 120	± 1 PSI	± 2 PSI	N/A	N/A	N/A	R.C. ALLEN/KELLY PN 23-1505-2
OP (VOLTAGE)	OILP	PA34-220T, PA46-350P PA32	0 TO 150 PSI	VDC PSI	1.0 0	1.8 30	2.6 60	3.4 90	4.2 120	5.0 150			± 1 PSI	± 2 PSI	+28 VDC FROM AC	N/A	N/A	KULITE PN APTÉ-252-1000-150G
FUEL PRESSURE	FP	NOT USED																NOT USED
OT	OILT	ALL EXCEPT PA-34	-20 TO 275 DEG F	OHMS DEG F	80.91 -20	84.50 0	91.90 40	99.71 80	112.28 140	121.29 180	137.03 245	144.60 275	± 2° F	± 5° F	N/A	N/A	N/A	RESISTANCE BULB PER MS28034 OUTPUT PER MIL-T-7990B
OT	OILT	PA-34	75 TO 250 DEG F	OHMS DEG F	902.0 75	497.0 100	288.0 125	179.0 150	72.0 200	34.0 250			± 2° F	± 5° F	N/A	N/A	N/A	PIPER B6685 ROCHESTER 3080-37
AMP (ALT1)	AMP1	ALL	0 TO 100 AMP	MV AMP	0.00 0	10.00 20	20.00 40	30.00 60	40.00 80	50.00 100			± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
AMP (ALT2)	AMP2	NOT USED	0 TO 100 AMP	MV AMP	0.00 0	10.00 20	20.00 40	30.00 60	40.00 80	50.00 100			± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
AMP (BAT)	AMPB	ALL	-100 TO 100 AMP	MV AMP	-50.0 -100	-30.0 -60	-20.0 -40	0.00 0	20.0 40	30.0 60	40.0 80	50.0 100	± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
VDC	VDC1	ALL	0.0 TO 36.0 VDC	VDC VDC	0.0 0.0	10.0 10.0	15.0 15.0	20.0 20.0	25.0 25.0	28.0 28.0	32.0 32.0	36.0 36.0	± 0.4 VDC	± 0.7 VDC	N/A	N/A	N/A	AIRCRAFT POWER BUS
VDC	VDC2	NOT USED	0.0 TO 36.0 VDC	VDC VDC	0.0 0.0	10.0 10.0	15.0 15.0	20.0 20.0	25.0 25.0	28.0 28.0	32.0 32.0	36.0 36.0	± 0.4 VDC	± 0.7 VDC	N/A	N/A	N/A	AIRCRAFT POWER BUS
VAC	VAC	PA32	2.0 TO 6.0 IN HG	VDC IN HG	2.33 2.0	2.66 2.5	3.0 3.0	3.33 3.5	3.66 4.0	4.0 4.5	4.66 5.5	5.0 6.0	± 0.1 IN-HG	± 0.2 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTÉ-253-1000-3D
OAT	OAT	PA46-350P, PA34	-40 TO 60 DEG C	OHMS DEG	84.23 -40	92.15 -20	100 0	107.81 20	115.56 40	123.26 60			± 1 DEG C	± 2 DEG C	3.0 VDC FROM DAU WITH 10K LOAD	± 0.10	± 0.15	ROSEMOUNT 1060MAXXA
VAC DE-ICE	DEICE	PA34-220T, PA46-350P	0 TO 6.0 IN HG	VDC IN HG	1.0 0.0	1.66 1.0	2.33 2.0	3.0 3.0	3.66 4.0	4.33 5.0	5.0 6.0		± 0.1 IN HG	± 0.2 IN HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTÉ-253-1000-3D
FUEL QTY L/R	FOR, FOL	PA32	-1.5 TO 53.0 GAL PER TANK	OHMS GAL	0.0 -1.5	2.5 0.0	20.0 10.0	31.8 20.0	45.5 30.0	63.0 40.0	88.3 51.0	92.9 53.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	PS10013-7 ROCHESTER P/N 7740 - 204 L. INBD PS10013-8 ROCHESTER P/N 7740 - 205 R. INBD PS10013-12 ROCHESTER P/N 7740 - 518 L. OUTBD PS10013-13 ROCHESTER P/N 7740 - 519 R. OUTBD CONNECTED IN SERIES
FUEL QTY L/R	FOR, FOL	PA28-161, PA28-181	-1.8 TO 27.0 GAL PER TANK	OHMS GAL	0.0 -1.8	3.0 0.0	14.0 5.0	23.0 10.0	33.0 15.0	40.0 20.0	45.0 25.0	48.36 27.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA28R-201	-2.8 TO 38.0 GAL PER TANK	OHMS GAL	0.0 -2.8	6.5 0.0	23.0 10.0	47.5 20.0	73.0 30.0	90.0 36.0	94.63 38.0		± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA34-220T	-4.6 TO 63.0 GAL PER TANK	OHMS GAL	0.0 -4.6	6.5 0.0	24.0 10.0	38.0 20.0	52.0 30.0	75.0 50.0	93.0 61.0	95.83 63.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA44-180	-5.1 TO 57.0 GAL PER TANK	OHMS GAL	0.0 -5.1	8.0 0.0	54.0 20.0	84.0 40.0	95.0 55.0	98.16 57.0			± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA46-350P	-4.5 TO 62.0 GAL PER TANK	OHMS GAL	0.0 -4.5	7.65 0.0	19.5 5.0	43.05 15.0	63.45 30.0	81.75 45.0	109.65 60.0	113.05 62.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	

TABLE 2
RS232 DATA FORMAT

HEADER NAME	RESOLUTION	PARAMETER	HEADER NAME	RESOLUTION	PARAMETER
AC	NA	AIRCRAFT TYPE (SEE NOTE 20)	OAT	1 DEGREE	OUTSIDE AIR TEMPERATURE
E1	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 1	MAP	0.1 IN-HG	MANIFOLD PRESSURE
E2	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 2	FF	0.1 GPH	FUEL FLOW
E3	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 3	USED	0.1 GALLON	FUEL USED (CALCULATED)
E4	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 4	AMP1	1 AMP	ALTERNATOR 1 CURRENT SENSE
E5	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 5	AMP2	1 AMP	ALTERNATOR 2 CURRENT SENSE
E6	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 6	AMPB	1 AMP	BATTERY CURRENT SENSE
C1	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 1	TIT	1 DEGREE	TIT IN DEGREES F
C2	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 2	VAC	0.1 IN-HG	VACUUM
C3	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 3	VDC1	0.1 VDC	BUS VOLTAGE 1
C4	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 4	VDC2	0.1 VDC	BUS VOLTAGE 2
C5	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 5	FOL	0.1 GAL	FUEL QUANTITY LEFT
C6	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 6	FOR	0.1 GAL	FUEL QUANTITY RIGHT
OILT	1 DEGREE	OIL TEMPERATURE IN °F	FP	1 PSI	FUEL PRESSURE
OILP	1 PSI	OIL PRESSURE	DEICE	0.1 IN-HG	VACUUM DE-ICE
RPM	10 RPM	TACHOMETER	WOW	NA	WEIGHT ON WHEELS (SEE NOTE 22)

PIPER MODEL REFERENCE	
PA MODEL NO.	AIRCRAFT
PA32- SERIES	SARATOGA
PA28-161	WARRIOR
PA28-181	ARCHER
PA28R-201	ARROW
PA34-220T	SENECA
PA44-180	SEMINOLE
PA46-350P	MIRAGE

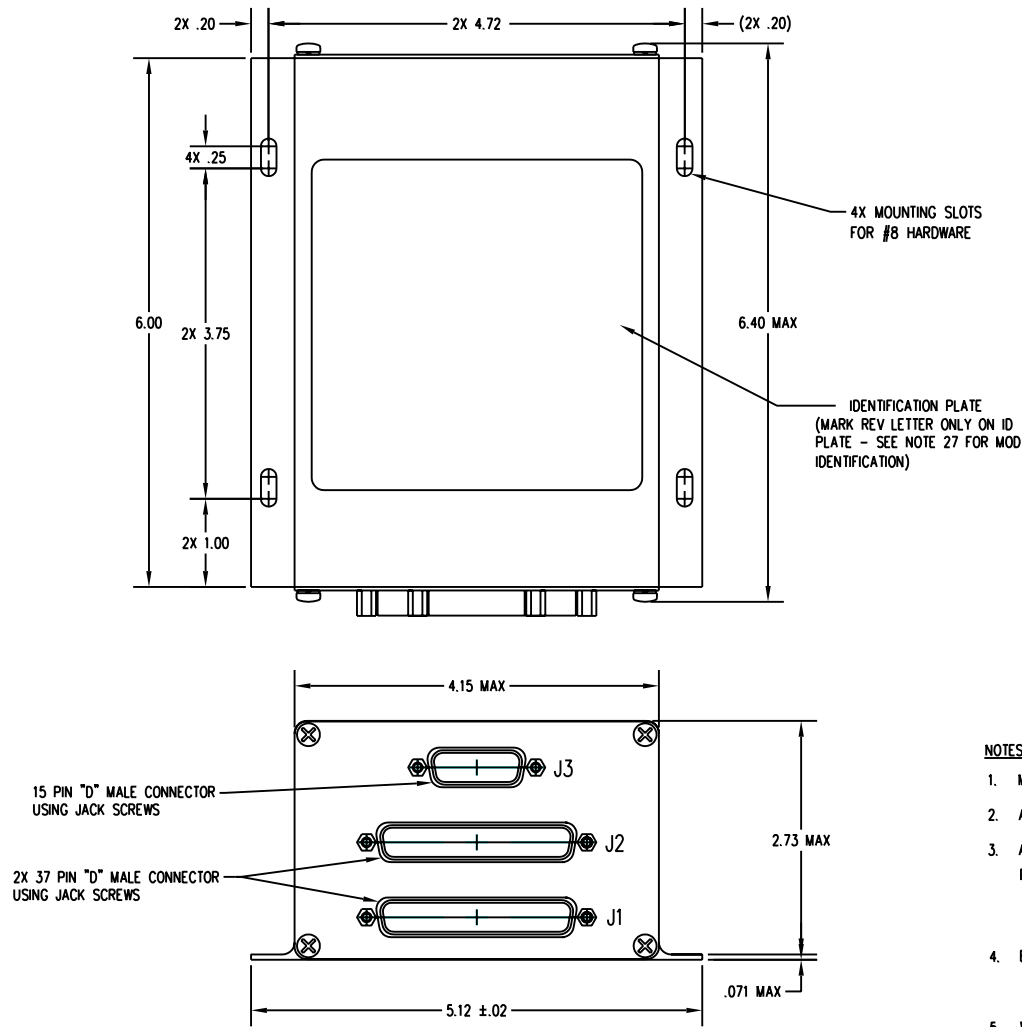
DATA ACQUISITION UNIT TOLERANCE



* TYPE K THERMOCOUPLE
** MV REFERENCED AT ICE POINT (32 DEG F)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 ± .02 ± .5° XX ±.01 XXX ±.005		AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773		
		APPROVALS		DATE		DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING
MATERIALS		DRAWN BY E. SHEASBY		7/15/04		
		CHECKED P. LYNCH		7/15/04		
FINISH				SIZE D		
				DWG. NO. 200-00041-XXX		
DO NOT SCALE DRAWING				REV. 14		
				SHEET 6 OF 9		

- 002 CONFIGURATION



DO-1600 ENVIRONMENTAL QUALIFICATION TESTS		
ENVIRONMENTAL TESTS	RTCA DO-1600 SECTION	CONDUCTED TEST CATEGORY
TEMPERATURE AND ALTITUDE		
LOW TEMPERATURE	4.5.1	EQUIPMENT TESTED TO CATEGORY B1
HIGH TEMPERATURE	4.5.2 AND 4.5.3	EQUIPMENT TESTED TO CATEGORY B1
IN-FLIGHT LOSS OF COOLING	4.5.4	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ALTITUDE	4.6.1	EQUIPMENT TESTED TO CATEGORY C1
DECOMPRESSION	4.6.2	EQUIPMENT TESTED TO CATEGORY A1
OVERPRESSURE	4.6.3	EQUIPMENT TESTED TO CATEGORY A1
TEMPERATURE VARIATION	5	EQUIPMENT TESTED TO CATEGORY B
HUMIDITY	6	EQUIPMENT TESTED TO CATEGORY A
OPERATIONAL SHOCKS AND CRASH SAFETY	7	EQUIPMENT TESTED TO CATEGORY B
VIBRATION	8	EQUIPMENT TESTED TO CATEGORY S, CURVE M
EXPLOSIVE PROOFNESS	9	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
WATER PROOFNESS	10	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FLUIDS SUSCEPTABILITY	11	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SAND AND DUST	12	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FUNGUS RESISTANCE	13	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SALT SPRAY	14	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
MAGNETIC EFFECTS	15	EQUIPMENT CLASS IS A
POWER INPUT	16	EQUIPMENT TESTED TO CATEGORY B
VOLTAGE SPIKE	17	EQUIPMENT TESTED TO CATEGORY B
AUDIO FREQUENCY CONDUCTED SUSCEPTABILITY	18	EQUIPMENT TESTED TO CATEGORY B
INDUCED SIGNAL SUSCEPTABILITY	19	EQUIPMENT TESTED TO CATEGORY A
RADIO FREQUENCY SUSCEPTABILITY	20	EQUIPMENT TESTED TO CATEGORY W
EMISSION OF RADIO FREQUENCY ENERGY	21	EQUIPMENT TESTED TO CATEGORY M
LIGHTNING INDUCED TRANSIENT SUSCEPTIBILITY	22	EQUIPMENT TESTED TO CATEGORY A3E3
LIGHTNING DIRECT EFFECTS	23	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ICING	24	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ELECTRO STATIC DISCHARGE	25	EQUIPMENT IDENTIFIED AS CATEGORY A

TABLE 1

J1 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL A)
- VAC SIGNAL INPUT HIGH
- OIL TEMP (PA-34) SIGNAL INPUT HIGH
- VDC1 SIGNAL INPUT HIGH
- RPM SIGNAL INPUT HIGH
- AMP BAT SIGNAL INPUT HIGH
- AMP ALT1 SIGNAL INPUT HIGH
- OIL PRESS SIGNAL INPUT HIGH (VOLTAGE TYPE)
- OIL TEMP SIGNAL INPUT HIGH
- FUEL QUANTITY RIGHT SIGNAL INPUT HIGH
- TIT SIGNAL INPUT - CHROMEL
- EGT CYL - 6 SIGNAL INPUT - CHROMEL
- EGT CYL - 5 SIGNAL INPUT - CHROMEL
- EGT CYL - 4 SIGNAL INPUT - CHROMEL
- EGT CYL - 3 SIGNAL INPUT - CHROMEL
- EGT CYL - 2 SIGNAL INPUT - CHROMEL
- EGT CYL - 1 SIGNAL INPUT - CHROMEL
- RS-232 GROUND COM 1
- RS-232 TRANSMIT COM 1
- POWER INPUT RETURN (CHANNEL A & B) AND VDC1 SIGNAL INPUT RETURN
- VAC SIGNAL INPUT RETURN
- OIL TEMP (PA-34) SIGNAL INPUT RETURN
- RPM SIGNAL INPUT RETURN
- AMP BAT SIGNAL INPUT LOW
- AMP ALT1 SIGNAL INPUT LOW
- OIL PRESS SIGNAL INPUT RETURN (VOLTAGE TYPE)
- OIL TEMP SIGNAL INPUT RETURN
- FUEL QUANTITY RIGHT SIGNAL INPUT RETURN
- TIT SIGNAL INPUT - ALUMEL
- EGT CYL - 6 SIGNAL INPUT - ALUMEL
- EGT CYL - 5 SIGNAL INPUT - ALUMEL
- EGT CYL - 4 SIGNAL INPUT - ALUMEL
- EGT CYL - 3 SIGNAL INPUT - ALUMEL
- EGT CYL - 2 SIGNAL INPUT - ALUMEL
- EGT CYL - 1 SIGNAL INPUT - ALUMEL
- SHIELD
- RS-232 RECEIVE COM 1

J2 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL B)
- DE-ICE SIGNAL INPUT HIGH
- FUEL PRESSURE SIGNAL INPUT HIGH
- VDC2 SIGNAL INPUT HIGH
- FUEL FLOW SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- AMP ALT2 SIGNAL INPUT HIGH
- MAP SIGNAL INPUT HIGH
- OIL PRESS SIGNAL INPUT HIGH (RESISTIVE TYPE)
- FUEL QUANTITY LEFT SIGNAL INPUT HIGH
- OAT SIGNAL INPUT HIGH
- CHT CYL - 6 SIGNAL INPUT HIGH
- CHT CYL - 5 SIGNAL INPUT HIGH
- CHT CYL - 4 SIGNAL INPUT HIGH
- CHT CYL - 3 SIGNAL INPUT HIGH
- CHT CYL - 2 SIGNAL INPUT HIGH
- CHT CYL - 1 SIGNAL INPUT HIGH
- RS-232 GROUND COM 2
- RS-232 TRANSMIT COM 2
- POWER INPUT RETURN (CHANNEL A & B) AND VDC2 SIGNAL INPUT RETURN
- DE-ICE SIGNAL INPUT RETURN
- FUEL PRESSURE SIGNAL INPUT RETURN
- FUEL FLOW SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- AMP ALT2 SIGNAL INPUT LOW
- MAP SIGNAL INPUT RETURN
- OIL PRESS SIGNAL INPUT RETURN (RESISTIVE TYPE)
- FUEL QUANTITY LEFT SIGNAL INPUT RETURN
- OAT SIGNAL INPUT RETURN
- CHT CYL - 6 SIGNAL INPUT RETURN
- CHT CYL - 5 SIGNAL INPUT RETURN
- CHT CYL - 4 SIGNAL INPUT RETURN
- CHT CYL - 3 SIGNAL INPUT RETURN
- CHT CYL - 2 SIGNAL INPUT RETURN
- CHT CYL - 1 SIGNAL INPUT RETURN
- SHIELD
- RS-232 RECEIVE COM 2

J3 PIN CONNECTIONS

- +12 VDC FF SENSOR EXCITATION OUTPUT HIGH
- +12 VDC RPM SENSOR EXCITATION OUTPUT HIGH
- OAT SENSOR EXCITATION OUTPUT HIGH
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- AIRCRAFT TYPE DESIGNATOR INPUT - 1
- AIRCRAFT TYPE DESIGNATOR INPUT - 2
- AIRCRAFT TYPE DESIGNATOR INPUT - 3
- WOW (SQUAT SWITCH) SIGNAL INPUT
- SHIELD
- SPARE, NO CONNECTION
- OAT SENSOR EXCITATION RETURN
- SPARE, NO CONNECTION

NOTES:

- MORITZ PART NUMBER IS A1700.
- AVDYNE PART NUMBER IS 200-00041-002.
- A1700 DATA ACQUISITION UNIT APPLICATION (NEW PIPER AIRCRAFT): PA34-220T, SENECA
- ELECTRICAL CHARACTERISTICS:
14 TO 33 VDC POWER INPUT VARIATION.
MAXIMUM POWER CONSUMPTION, 5.0 WATTS.
- WEIGHT: 2.0 LBS MAX.
- TEMPERATURE:
-40 TO +70 OPERATING
-55 TO +85 STORAGE
- HARDWARE ENVIRONMENTAL TEST AND CERTIFICATION REQUIREMENT:
DO-1600 LISTED ON TABLE 1.
- DATA ACQUISITION UNIT CERTIFICATION REQUIREMENT:
FAA TSO

PARAMETERS	TSO
CHT, EGT TIT, OT, OAT	TSO-C43c
FUEL FLOW	TSO-C44b
MAP	TSO-C45a
OP, VAC	TSO-C47
RPM	TSO-C49b
FUEL QTY	TSO-C55

- SOFTWARE TEST AND CERTIFICATION REQUIREMENT:
DO-178B LEVEL C
- SOFTWARE PART NUMBER, VERSION AND CHECKSUM:
PART NUMBER: SW1700, VER 7.0
CRC, MAIN 1; 2FB9
CRC, MAIN 2; 52EF
CRC, COMM; 1C46

- FOR MORITZ ACCEPTANCE TEST PROCEDURE, SEE FORM A1700-ATP.

- MORITZ DESIGN REFERENCE:
FINAL ASSEMBLY A1812
VERSION DESCRIPTION DOCUMENT A1700_VDD

CONFORMAL COATED CIRCUIT CARD ASSEMBLIES USED ON ALL A1700 REV D AND UP UNITS.

- TO MEET EMI PROTECTION REQUIREMENTS OF DO-1600, ALL SIGNAL INPUT AND OUTPUT LINES MUST BE SHIELDED, WITH THE SHIELD GROUNDED AT THE DATA ACQUISITION UNIT CONNECTOR SIDE.
- SHUNTS FOR THE ALTERNATOR AND BATTERY AMPS MUST BE LOCATED IN THE HIGH SIDE OF EACH LINE WITH A COMMON MODE OF +28 VDC.
- THE EXTENDED FUEL QUANTITY RANGE IS FOR THE FIELD CALIBRATION OPTION, USED BY THE MFD.
- TOLERANCE IS BASED ON +/-1% OF THE FULL SCALE VALUE OR ONE COUNT, WHICHEVER IS GREATER, FROM 0 TO 40 DEG. C AND +/-2% OR TWO COUNTS, WHICHEVER IS GREATER, FROM -40 TO 0 AND +40 TO +70 DEG. C. EXCEPT RPM WHERE TOLERANCE IS BASED ON +/-0.57% OF THE FULL SCALE, FROM 0 TO 40 DEG. C AND +/- 0.86% FROM -40 TO 0 AND +40 TO +70 DEG. C.
- THE DATA ACQUISITION UNIT MAINTAINS ITS CONFIGURATION AND CALIBRATION DATA WHEN POWERED OFF.
- OPEN AND SHORTED INPUT: IN CASE OF AN OPEN AND SHORTED INPUT CONDITION, THE OUTPUT FOR THE RELATED PARAMETER(S) SHALL BE THE MINIMUM RANGE SHOWN IN THE "SENSOR INPUT INFORMATION" TABLE.
- COM1 AND COM2 COMMUNICATION:
 - THE TWO RS232 DATA OUTPUTS ARE IDENTICAL.
 - THE TWO RS232 INTERFACES WILL TRANSMIT DATA TO THE "MFD" AND "PFD".
 - 19200 BPS, NO PARITY, 8 BITS, 1 STOP BIT.
 - OUTPUT: ASCII, COMMA DELIMITED TEXT.
 - TRANSMITS AN ASCII HEADER EVERY 15 TRANSMISSIONS.
 - 16 BIT ADDITIVE CHECKSUM FOR SERIAL TRANSMISSION ERROR CHECKING FOR EACH TRANSMISSION (4 DIGIT HEX)
 - TRANSMISSION RATE, 8 HZ MIN.
 - FOR RS232 DATA FORMAT SEE TABLE 2.

- AIRCRAFT TYPE DESIGNATOR:

THE AIRCRAFT TYPE IS DETERMINED VIA JUMPERS AT J3 PINS 8, 9 AND 10. THE JUMPERS WILL BE PART OF THE AIRCRAFT HARNESS. FOR JUMPER AIRCRAFT TYPE SEE THE CHART BELOW.

J3 - 8	J3 - 9	J3 - 10	AIRCRAFT	AIRCRAFT TYPE
GND	GND	GND	PA32 SERIES	AC
GND	GND	OPEN	PA28-161	10
GND	OPEN	GND	PA28-181	11
GND	OPEN	OPEN	PA28R-201	12
OPEN	GND	GND	PA34-220T	13
OPEN	GND	OPEN	PA44-180	14
OPEN	OPEN	GND	PA46-350P	15
OPEN	OPEN	OPEN	TBD	16
				17

- HEADER EXAMPLE:
"AC","E1","E2","E3","E4","E5","E6","C1","C2","C3","C4","C5","C6","OILT","OILP",
"RPM","OAT","MAP","FF","USED","AMP1","AMP2","AMPB","TIT","VAC","VDC1",
"VDC2","FOL","FOR","FP","DEICE","WOW",2608<CR><LF>
- WOW DISCRETE INPUT:
 - GROUND CLOSURE WHEN AIRCRAFT ON GROUND, WOW IS "0"
 - OPEN WHEN AIRCRAFT IN FLIGHT, WOW IS "1"
- THE FOLLOWING EQUATION IS USED TO CALCULATE THE FUEL FLOW CAL. DATA:
$$GPH = 216.437 - \sqrt{52.2584 - 0.0668 * HZ}$$
$$0.0334$$
- THE "FUEL USED" VALUE RESETS TO ZERO ON POWER-UP RESET. FUEL USED IS CALCULATED BASED ON A K FACTOR OF 24,920.
- WHEN THE SIGNAL INPUT OF ANY FREQUENCY BASED PARAMETER FALLS BELOW 1 HZ, THAT PARAMETER WILL DISPLAY AN OUTPUT EQUIVALENT TO 0 HZ.
- CHT INPUTS ARE NOT USED ON ANY PA28 MODEL. EGT IS NOT USED ON PA28-161, PA34-220T AND PA46-350P. TIT IS NOT USED ON ANY PA28 MODEL AND PA44-180. VAC IS ONLY USED ON THE PA32 MODEL.

MOD #	DESCRIPTION	APPLICABLE REV
1	PCB'S WITHOUT CONFORMAL COAT	D, E, F
2	NO CAPACITORS ON XTALS	D

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± 1/32 DECIMALS .X ±.02 .XX ±.01 .XXX ±.005 ANGLES ± 5°	AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773	
	APPROVALS	DATE	DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING	
	DRAWN BY E. SHEASBY	7/15/04		
	CHECKED P. LYNCH	7/15/04	SIZE D	DWG. NO. 200-00041-XXX
DO NOT SCALE DRAWING			SCALE	REV. 14
				SHEET 7 OF 9

SENSOR INPUT INFORMATION

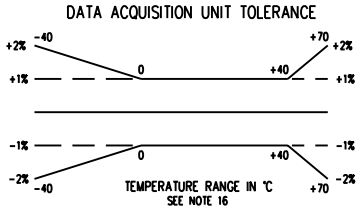
- 003 CONFIGURATION

PARAMETER	HEADER	AIRCRAFT	RANGE/ UNIT	FACTOR	CALIBRATION DATA								TOLERANCE OVER ENTIRE RANGE		SENSOR EXCITATION	SENSOR EXCITATION TOLERANCE WITH 10K LOAD		SENSOR INFORMATION
													NORMAL TEMP	EXTREME TEMP		NORMAL TEMP	EXTREME TEMP	
MAP	MAP	ALL	0.0 TO 45.0 IN HG	VDC IN HG	1.000 0.0	2.179 15.0	2.572 20.0	2.965 25.0	3.358 30.0	3.751 35.0	4.144 40.0	4.537 45.0	± 0.4 IN-HG	± 0.9 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE PN APTC-251-1000-25A
RPM	RPM	PA28-161, PA28-181, PA28R-201, PA44-180	0 TO 3500 RPM	HZ RPM	0.00 0	8.33 500	16.67 1000	25.00 1500	33.34 2000	41.67 2500	50.00 3000	58.33 3500	± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	SPIRENT SYSTEMS PN 0402-102
RPM	RPM	PA32, PA34-220T, PA46-350P	0 TO 3500 RPM	HZ RPM	0.00 0	12.5 500	25.00 1000	37.50 1500	50.00 2000	62.50 2500	75.00 3000	87.50 3500	± 20 RPM	± 30 RPM	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	SPIRENT SYSTEMS PN 0402-102
EGT	E1...E6	PA32, PA28-181, PA28R-201, PA44-180	160 TO 2000 DEG F	MV ** DEG F	2.897 160	10.561 500	22.255 1000	26.978 1200	31.628 1400	36.166 1600	40.581 1800	42.741 2000	± 20° F	± 40° F	N/A	N/A	N/A	NORWICH PN 101-00103 (PA32) • KS AVIONICS PN A002B (PA28, PA44) •
TIT	TIT	PA32, PA34-220T PA46-350P	160 TO 2000 DEG F	MV ** DEG F	2.897 160	10.561 500	22.255 1000	26.978 1200	31.628 1400	36.166 1600	40.581 1800	42.741 2000	± 20° F	± 40° F	N/A	N/A	N/A	NORWICH PN 101-00103 (PA32), 101-00240 (PA34) • ROSEMOUNT PN 0135Y (PA46) •
FUEL FLOW	FF	ALL	0.0 TO 45.0 GPH	HZ GPH	0.00 0.0	70.61 10.0	104.68 15.0	137.90 20.0	201.84 30.0	262.43 40.0	291.50 45.0		±0.4 GPH	±0.9 GPH	+12 VDC FROM DAU WITH 10K LOAD	± 0.25	± 0.5	FLOSCAN PN 201C - 6 SEE NOTE 23.
CHT (RESISTIVE)	C1...C6	PA32	0 TO 570 DEG F	OHMS DEG F	45.40 0	48.97 25	60.09 100	76.87 200	96.09 300	118.41 400	143.80 500	163.90 570	± 5° F	± 10° F	N/A	N/A	N/A	TRANSMITTER PER MS24482 -1, -2 OUTPUT PER MIL-T-25446D
CHT (THERMOCOUPLE)	C1...C6	PA34-220T, PA44-180 PA46-350P	160 TO 570 DEG F	MV ** DEG F	2.897 160	3.820 200	6.094 300	8.316 400	10.561 500	12.163 570			± 5° F	± 10° F	N/A	N/A	N/A	KS AVIONICS PN A002B •
OP (RESISTIVE)	OILP	PA44-180, PA28-161 PA28-181, PA28R-201	0 TO 120 PSI	OHMS PSI	10.0 0	37.0 20	63.0 40	77.0 50	90.0 60	113.0 80	135.0 100	157.01 120	± 1 PSI	± 2 PSI	N/A	N/A	N/A	R.C. ALLEN/KELLY PN 23-1505-2
OP (VOLTAGE)	OILP	PA34-220T, PA46-350P PA32	0 TO 150 PSI	VDC PSI	1.0 0	1.8 30	2.6 60	3.4 90	4.2 120	5.0 150			± 1 PSI	± 2 PSI	+28 VDC FROM AC	N/A	N/A	KULITE PN APTC-252-1000-150G
FUEL PRESSURE	FP	NOT USED																NOT USED
OT	OILT	ALL EXCEPT PA-34	-20 TO 275 DEG F	OHMS DEG F	80.91 -20	84.50 0	91.90 40	99.71 80	112.28 140	121.29 180	137.03 245	144.60 275	± 2° F	± 5° F	N/A	N/A	N/A	RESISTANCE BULB PER MS28034 OUTPUT PER MIL-T-7990B
OT	OILT	PA-34	75 TO 250 DEG F	OHMS DEG F	902.0 75	497.0 100	288.0 125	179.0 150	72.0 200	34.0 250			± 2° F	± 5° F	N/A	N/A	N/A	PIPER 86685 ROCHESTER 3080-37
AMP (ALT1)	AMP1	ALL	0 TO 100 AMP	MV AMP	0.00 0	10.00 20	20.00 40	30.00 60	40.00 80	50.00 100			± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
AMP (ALT2)	AMP2	ALL	0 TO 100 AMP	MV AMP	0.00 0	10.00 20	20.00 40	30.00 60	40.00 80	50.00 100			± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
AMP (BAT)	AMPB	ALL	-100 TO 100 AMP	MV AMP	-50.0 -100	-30.0 -60	-20.0 -40	0.00 0	20.0 40	30.0 60	40.0 80	50.0 100	± 1 AMP	± 2 AMP	N/A	N/A	N/A	100 AMP @ 50MV SHUNT +28 VDC COMMON MODE
VDC	VDC1	ALL	0.0 TO 36.0 VDC	VDC VDC	0.0 0.0	10.0 10.0	15.0 15.0	20.0 20.0	25.0 25.0	28.0 28.0	32.0 32.0	36.0 36.0	± 0.4 VDC	± 0.7 VDC	N/A	N/A	N/A	AIRCRAFT POWER BUS
VDC	VDC2	NOT USED	0.0 TO 36.0 VDC	VDC VDC	0.0 0.0	10.0 10.0	15.0 15.0	20.0 20.0	25.0 25.0	28.0 28.0	32.0 32.0	36.0 36.0	± 0.4 VDC	± 0.7 VDC	N/A	N/A	N/A	AIRCRAFT POWER BUS
VAC	VAC	PA32	2.0 TO 6.0 IN HG	VDC IN HG	2.33 2.0	2.66 2.5	3.0 3.0	3.33 3.5	3.66 4.0	4.0 4.5	4.66 5.5	5.0 6.0	± 0.1 IN-HG	± 0.2 IN-HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTC-253-1000-3D
OAT	OAT	PA46-350P	-40 TO 60 DEG C	OHMS DEG	84.23 -40	92.15 -20	100 0	107.81 20	115.56 40	123.26 60			± 1 DEG C	± 2 DEG C	N/A	N/A	N/A	ROSEMOUNT 1060MAXXA
VAC DE-ICE	DEICE	PA34-220T, PA46-350P	0 TO 6.0 IN HG	VDC IN HG	1.0 0.0	1.66 1.0	2.33 2.0	3.0 3.0	3.66 4.0	4.33 5.0	5.0 6.0		± 0.1 IN HG	± 0.2 IN HG	+28 VDC FROM AC	N/A	N/A	KULITE P/N APTC-253-1000-3D
FUEL QTY L/R	FOR, FOL	PA32	-1.5 TO 53.0 GAL PER TANK	OHMS GAL	0.0 -1.5	2.5 0.0	20.0 10.0	31.8 20.0	45.5 30.0	63.0 40.0	88.3 51.0	92.9 53.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	PS10013-7 ROCHESTER P/N 7740 - 204 L. INBD PS10013-8 ROCHESTER P/N 7740 - 205 R. INBD PS10013-12 ROCHESTER P/N 7740 - 518 L. OUTBD PS10013-13 ROCHESTER P/N 7740 - 519 R. OUTBD CONNECTED IN SERIES
FUEL QTY L/R	FOR, FOL	PA28-161, PA28-181	-1.8 TO 27.0 GAL PER TANK	OHMS GAL	0.0 -1.8	3.0 0.0	14.0 5.0	23.0 10.0	33.0 15.0	40.0 20.0	45.0 25.0	48.36 27.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA28R-201	-2.8 TO 38.0 GAL PER TANK	OHMS GAL	0.0 -2.8	6.5 0.0	23.0 10.0	47.5 30.0	73.0 30.0	90.0 36.0	94.63 38.0		± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA34-220T	-4.6 TO 63.0 GAL PER TANK	OHMS GAL	0.0 -4.6	6.5 0.0	24.0 10.0	38.0 20.0	52.0 30.0	75.0 50.0	93.0 61.0	95.83 63.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA44-180	-5.1 TO 57.0 GAL PER TANK	OHMS GAL	0.0 -5.1	8.0 0.0	54.0 20.0	84.0 40.0	95.0 55.0	98.16 57.0			± 1 GAL	± 2 GAL	N/A	N/A	N/A	
FUEL QTY L/R	FOR, FOL	PA46-350P	-4.5 TO 62.0 GAL PER TANK	OHMS GAL	0.0 -4.5	7.65 0.0	19.5 5.0	43.05 15.0	63.45 30.0	81.75 45.0	109.65 60.0	113.05 62.0	± 1 GAL	± 2 GAL	N/A	N/A	N/A	

TABLE 2

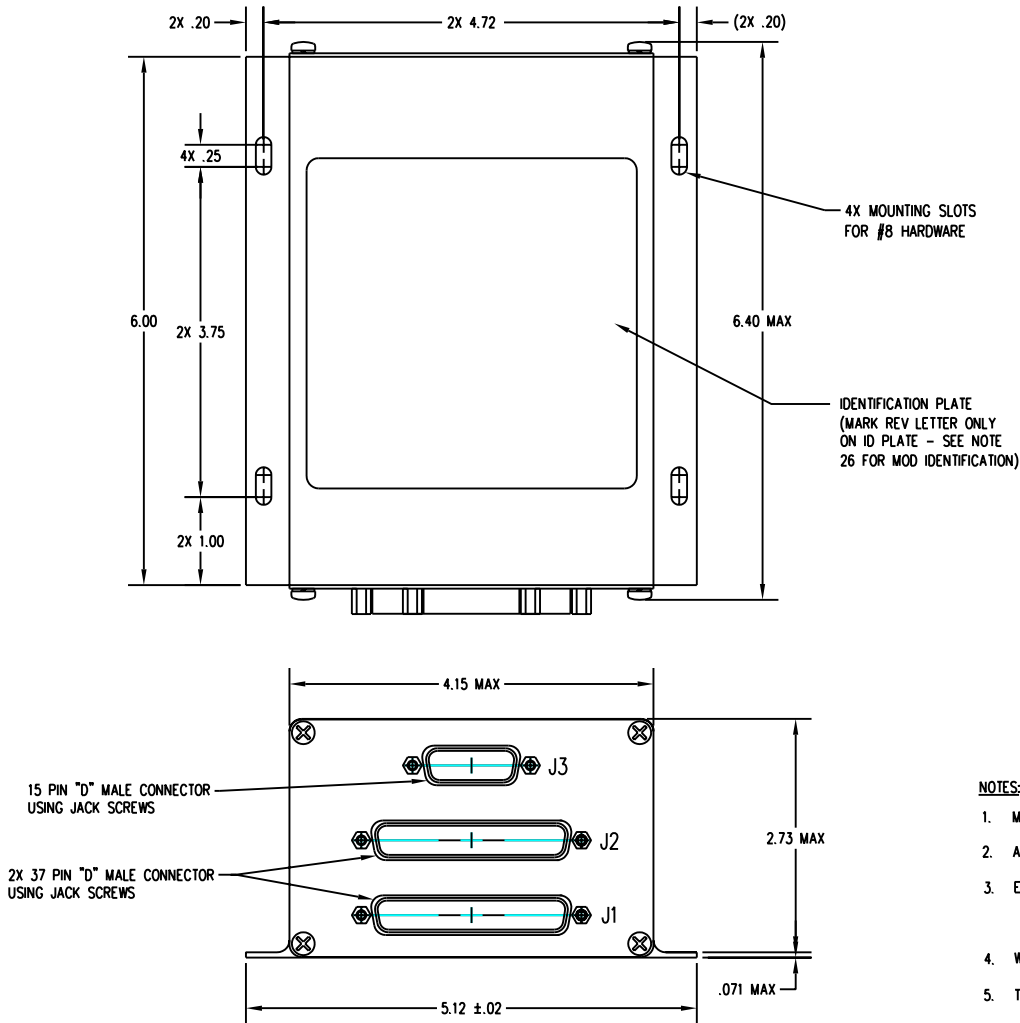
RS232 DATA FORMAT					
HEADER NAME	RESOLUTION	PARAMETER	HEADER NAME	RESOLUTION	PARAMETER
AC	NA	AIRCRAFT TYPE (SEE NOTE 20)	OAT	1 DEGREE	OUTSIDE AIR TEMPERATURE
E1	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 1	MAP	0.1 IN-HG	MANIFOLD PRESSURE
E2	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 2	FF	0.1 GPH	FUEL FLOW
E3	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 3	USED	0.1 GALLON	FUEL USED (CALCULATED)
E4	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 4	AMP1	1 AMP	ALTERNATOR 1 CURRENT SENSE
E5	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 5	AMP2	1 AMP	ALTERNATOR 2 CURRENT SENSE
E6	1 DEGREE	EXHAUST GAS TEMPERATURE (EGT) IN °F, CYLINDER 6	AMPB	1 AMP	BATTERY CURRENT SENSE
C1	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 1	TIT	1 DEGREE	TIT IN DEGREES F
C2	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 2	VAC	0.1 IN-HG	VACUUM
C3	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 3	VDC1	0.1 VDC	BUS VOLTAGE 1
C4	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 4	VDC2	0.1 VDC	BUS VOLTAGE 2
C5	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 5	FOL	0.1 GAL	FUEL QUANTITY LEFT
C6	1 DEGREE	CYLINDER HEAD TEMPERATURE (CHT) IN °F, CYLINDER 6	FOR	0.1 GAL	FUEL QUANTITY RIGHT
OILT	1 DEGREE	OIL TEMPERATURE IN °F	FP	1 PSI	FUEL PRESSURE
OILP	1 PSI	OIL PRESSURE	DEICE	0.1 IN-HG	VACUUM DE-ICE
RPM	10 RPM	TACHOMETER	WOW	NA	WEIGHT ON WHEELS (SEE NOTE 22)

PIPER MODEL REFERENCE	
PA MODEL NO.	AIRCRAFT
PA32- SERIES	SARATOGA
PA28-161	WARRIOR
PA28-181	ARCHER
PA28R-201	ARROW
PA34-220T	SENECA
PA44-180	SEMINOLE
PA46-350P	MIRAGE



* TYPE K THERMOCOUPLE
** MV REFERENCED AT ICE POINT (32 DEG F)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± 1/32 DECIMALS .X ± .02 	
--	--



DO-1600 ENVIRONMENTAL QUALIFICATION TESTS		
ENVIRONMENTAL TESTS	RTCA DO-1600 SECTION	CONDUCTED TEST CATEGORY
TEMPERATURE AND ALTITUDE		
LOW TEMPERATURE	4.5.1	EQUIPMENT TESTED TO CATEGORY B1
HIGH TEMPERATURE	4.5.2 AND 4.5.3	EQUIPMENT TESTED TO CATEGORY B1
IN-FLIGHT LOSS OF COOLING	4.5.4	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ALTITUDE	4.6.1	EQUIPMENT TESTED TO CATEGORY C1
DECOMPRESSION	4.6.2	EQUIPMENT TESTED TO CATEGORY A1
OVERPRESSURE	4.6.3	EQUIPMENT TESTED TO CATEGORY A1
TEMPERATURE VARIATION	5	EQUIPMENT TESTED TO CATEGORY B
HUMIDITY	6	EQUIPMENT TESTED TO CATEGORY A
OPERATIONAL SHOCKS AND CRASH SAFETY	7	EQUIPMENT TESTED TO CATEGORY B
VIBRATION	8	EQUIPMENT TESTED TO CATEGORY S, CURVE M
EXPLOSIVE PROOFNESS	9	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
WATER PROOFNESS	10	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FLUIDS SUSCEPTABILITY	11	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SAND AND DUST	12	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
FUNGUS RESISTANCE	13	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
SALT SPRAY	14	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
MAGNETIC EFFECTS	15	EQUIPMENT CLASS IS A
POWER INPUT	16	EQUIPMENT TESTED TO CATEGORY B
VOLTAGE SPIKE	17	EQUIPMENT TESTED TO CATEGORY B
AUDIO FREQUENCY CONDUCTED SUSCEPTABILITY	18	EQUIPMENT TESTED TO CATEGORY B
INDUCED SIGNAL SUSCEPTABILITY	19	EQUIPMENT TESTED TO CATEGORY A
RADIO FREQUENCY SUSCEPTABILITY	20	EQUIPMENT TESTED TO CATEGORY W
EMISSION OF RADIO FREQUENCY ENERGY	21	EQUIPMENT TESTED TO CATEGORY M
LIGHTNING INDUCED TRANSIENT SUSCEPTIBILITY	22	EQUIPMENT TESTED TO CATEGORY A3E3
LIGHTNING DIRECT EFFECTS	23	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ICING	24	EQUIPMENT IDENTIFIED AS CATEGORY X, NO TEST PERFORMED
ELECTRO STATIC DISCHARGE	25	EQUIPMENT IDENTIFIED AS CATEGORY A

TABLE 1

J1 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL A)
- VAC SIGNAL INPUT HIGH
- OIL TEMP (PA-34) SIGNAL INPUT HIGH
- VDC1 SIGNAL INPUT HIGH
- RPM SIGNAL INPUT HIGH
- AMP BAT SIGNAL INPUT HIGH
- AMP ALT1 SIGNAL INPUT HIGH
- OIL PRESS SIGNAL INPUT HIGH (VOLTAGE TYPE)
- OIL TEMP SIGNAL INPUT HIGH
- FUEL QUANTITY RIGHT SIGNAL INPUT HIGH
- TIT SIGNAL INPUT - CHROMEL
- EGT CYL - 6 SIGNAL INPUT - CHROMEL
- EGT CYL - 5 SIGNAL INPUT - CHROMEL
- EGT CYL - 4 SIGNAL INPUT - CHROMEL
- EGT CYL - 3 SIGNAL INPUT - CHROMEL
- EGT CYL - 2 SIGNAL INPUT - CHROMEL
- EGT CYL - 1 SIGNAL INPUT - CHROMEL
- RS-232 GROUND COM 1
- RS-232 TRANSMIT COM 1
- POWER INPUT RETURN (CHANNEL A & B) AND VDC1 SIGNAL INPUT RETURN
- VAC SIGNAL INPUT RETURN
- OIL TEMP (PA-34) SIGNAL INPUT RETURN
- RPM SIGNAL INPUT RETURN
- AMP BAT SIGNAL INPUT LOW
- AMP ALT1 SIGNAL INPUT LOW
- OIL PRESS SIGNAL INPUT RETURN (VOLTAGE TYPE)
- OIL TEMP SIGNAL INPUT RETURN
- FUEL QUANTITY RIGHT SIGNAL INPUT RETURN
- TIT SIGNAL INPUT - ALUMEL
- EGT CYL - 6 SIGNAL INPUT - ALUMEL
- EGT CYL - 5 SIGNAL INPUT - ALUMEL
- EGT CYL - 4 SIGNAL INPUT - ALUMEL
- EGT CYL - 3 SIGNAL INPUT - ALUMEL
- EGT CYL - 2 SIGNAL INPUT - ALUMEL
- EGT CYL - 1 SIGNAL INPUT - ALUMEL
- SHIELD
- RS-232 RECEIVE COM 1

NOTES:

- MORITZ PART NUMBER IS A1740.
- AVIDYNE PART NUMBER IS 200-00041-003.
- ELECTRICAL CHARACTERISTICS:
14 TO 33 VDC POWER INPUT VARIATION.
MAXIMUM POWER CONSUMPTION, 5.0 WATTS.
- WEIGHT: 2.0 LBS MAX.
- TEMPERATURE:
-40 TO +70 OPERATING
-55 TO +85 STORAGE
- HARDWARE ENVIRONMENTAL TEST AND CERTIFICATION REQUIREMENT:
DO-1600 LISTED ON TABLE 1.
- DATA ACQUISITION UNIT CERTIFICATION REQUIREMENT:
FAA TSO

PARAMETERS	TSO
CHT, EGT	TSO-C43c
TIT, OT, OAT	TSO-C43c
FUEL FLOW	TSO-C44b
MAP	TSO-C45a
OP, VAC	TSO-C47
RPM	TSO-C49b
FUEL QTY	TSO-C55

- SOFTWARE TEST AND CERTIFICATION REQUIREMENT:
DO-178B LEVEL C
- SOFTWARE PART NUMBER, VERSION AND CHECKSUM:
PART NUMBER: SW1740, VER 4.0
CHECKSUM (MAIN 1): 7207
CHECKSUM (MAIN 2): 3032
CHECKSUM (COMM): 8670

J2 PIN CONNECTIONS

- +28 VDC POWER INPUT HIGH (CHANNEL B)
- DE-ICE SIGNAL INPUT HIGH
- FUEL PRESSURE SIGNAL INPUT HIGH
- VDC2 SIGNAL INPUT HIGH
- FUEL FLOW SIGNAL INPUT HIGH
- SPARE, NO CONNECTION
- AMP ALT2 SIGNAL INPUT HIGH
- MAP SIGNAL INPUT HIGH
- OIL PRESS SIGNAL INPUT HIGH (RESISTIVE TYPE)
- FUEL QUANTITY LEFT SIGNAL INPUT HIGH
- OAT SIGNAL INPUT HIGH
- CHT CYL - 6 SIGNAL INPUT HIGH
- CHT CYL - 5 SIGNAL INPUT HIGH
- CHT CYL - 4 SIGNAL INPUT HIGH
- CHT CYL - 3 SIGNAL INPUT HIGH
- CHT CYL - 2 SIGNAL INPUT HIGH
- CHT CYL - 1 SIGNAL INPUT HIGH
- RS-232 GROUND COM 2
- RS-232 TRANSMIT COM 2
- POWER INPUT RETURN (CHANNEL A & B) AND VDC2 SIGNAL INPUT RETURN
- DE-ICE SIGNAL INPUT RETURN
- FUEL PRESSURE SIGNAL INPUT RETURN
- FUEL FLOW SIGNAL INPUT RETURN
- SPARE, NO CONNECTION
- AMP ALT2 SIGNAL INPUT LOW
- MAP SIGNAL INPUT RETURN
- OIL PRESS SIGNAL INPUT RETURN (RESISTIVE TYPE)
- FUEL QUANTITY LEFT SIGNAL INPUT RETURN
- OAT SIGNAL INPUT RETURN
- CHT CYL - 6 SIGNAL INPUT RETURN
- CHT CYL - 5 SIGNAL INPUT RETURN
- CHT CYL - 4 SIGNAL INPUT RETURN
- CHT CYL - 3 SIGNAL INPUT RETURN
- CHT CYL - 2 SIGNAL INPUT RETURN
- CHT CYL - 1 SIGNAL INPUT RETURN
- SHIELD
- RS-232 RECEIVE COM 2

- FOR MORITZ ACCEPTANCE TEST PROCEDURE, SEE FORM A1740-ATP.
- MORITZ DESIGN REFERENCE:
FINAL ASSEMBLY A1881

CONFORMAL COATED CIRCUIT CARD ASSEMBLIES USED ON ALL A1740 REV C AND UP UNITS.

- TO MEET EMI PROTECTION REQUIREMENTS OF DO-1600, ALL SIGNAL INPUT AND OUTPUT LINES MUST BE SHIELDED, WITH THE SHIELD GROUNDED AT THE DATA ACQUISITION UNIT CONNECTOR SIDE.
- SHUNTS FOR THE ALTERNATOR AND BATTERY AMPS MUST BE LOCATED IN THE HIGH SIDE OF EACH LINE WITH A COMMON MODE OF +28 VDC.
- THE EXTENDED FUEL QUANTITY RANGE IS FOR THE FIELD CALIBRATION OPTION, USED BY THE MFD.
- TOLERANCE IS BASED ON +/-1% OF THE FULL SCALE VALUE OR ONE COUNT, WHICHEVER IS GREATER, FROM 0 TO 40 DEG. C AND +/- 2% OR TWO COUNTS, WHICHEVER IS GREATER, FROM -40 TO 0 AND +40 TO +70 DEG. C. EXCEPT RPM WHERE TOLERANCE IS BASED ON +/-0.57% OF THE FULL SCALE. FROM 0 TO 40 DEG. C AND +/- 0.86% FROM -40 TO 0 AND +40 TO +70 DEG. C.
- THE DATA ACQUISITION UNIT MAINTAINS ITS CONFIGURATION AND CALIBRATION DATA WHEN POWERED OFF.
- OPEN AND SHORTED INPUT: IN CASE OF AN OPEN AND SHORTED INPUT CONDITION, THE OUTPUT FOR THE RELATED PARAMETER(S) SHALL BE THE MINIMUM RANGE SHOWN IN THE "SENSOR INPUT INFORMATION" TABLE.
- COM1 AND COM2 COMMUNICATION:
 - THE TWO RS232 DATA OUTPUTS ARE IDENTICAL.
 - THE TWO RS232 INTERFACES WILL TRANSMIT DATA TO THE "MFD" AND "PFD".
 - 19200 BPS, NO PARITY, 8 BITS, 1 STOP BIT.
 - OUTPUT: ASCII, COMMA DELIMITED TEXT.
 - TRANSMITS AN ASCII HEADER EVERY 15 TRANSMISSIONS.
 - 16 BIT ADDITIVE CHECKSUM FOR SERIAL TRANSMISSION ERROR CHECKING FOR EACH TRANSMISSION (4 DIGIT HEX)
 - TRANSMISSION RATE, 8 HZ MIN.
 - FOR RS232 DATA FORMAT SEE TABLE 2.

- 003 CONFIGURATION

J3 PIN CONNECTIONS

- +12 VDC FF SENSOR EXCITATION OUTPUT HIGH
- +12 VDC RPM SENSOR EXCITATION OUTPUT HIGH
- OAT SENSOR EXCITATION OUTPUT HIGH
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- SPARE, NO CONNECTION
- AIRCRAFT TYPE DESIGNATOR INPUT - 1
- AIRCRAFT TYPE DESIGNATOR INPUT - 2
- AIRCRAFT TYPE DESIGNATOR INPUT - 3
- WOW (SQUAT SWITCH) SIGNAL INPUT
- SHIELD
- SPARE, NO CONNECTION
- OAT SENSOR EXCITATION RETURN
- SPARE, NO CONNECTION

- AIRCRAFT TYPE DESIGNATOR:

THE AIRCRAFT TYPE IS DETERMINED VIA JUMPERS AT J3 PINS 8, 9 AND 10. THE JUMPERS WILL BE PART OF THE AIRCRAFT HARNESS. FOR JUMPER AIRCRAFT TYPE SEE THE CHART BELOW.

J3-8	J3-9	J3-10	AIRCRAFT	AIRCRAFT TYPE
GND	GND	GND	PA32 SERIES	AC
GND	GND	OPEN	PA28-161	10
GND	OPEN	GND	PA28-181	11
GND	OPEN	OPEN	PA28R-201	12
OPEN	GND	GND	PA34-220T	13
OPEN	GND	OPEN	PA44-180	14
OPEN	OPEN	GND	PA46-350P	15
OPEN	OPEN	OPEN	TBD	16
				17

- HEADER EXAMPLE:
"AC","E1","E2","E3","E4","E5","E6","C1","C2","C3","C4","C5","C6","OIL1","OILP",
"RPM","OAT","MAP","FF","USED","AMP1","AMP2","AMPB","TIT","VAC","VDC1",
"VDC2","FQL","FQR","FP","DEICE","WOW",2608<CR><LF>
- WOW DISCRETE INPUT:
 - GROUND CLOSURE WHEN AIRCRAFT ON GROUND, WOW IS "0"
 - OPEN WHEN AIRCRAFT IN FLIGHT, WOW IS "1"
- THE FOLLOWING EQUATION IS USED TO CALCULATE THE FUEL FLOW CAL. DATA:
$$GPH = 216.437 - \sqrt{52.2584 - 0.0668 * HZ}$$

0.0334
- THE "FUEL USED" VALUE RESETS TO ZERO ON POWER-UP RESET. FUEL USED IS CALCULATED BASED ON A K FACTOR OF 24,920.
- WHEN THE SIGNAL INPUT OF ANY FREQUENCY BASED PARAMETER FALLS BELOW 1 HZ, THAT PARAMETER WILL DISPLAY AN OUTPUT EQUIVALENT TO 0 HZ.
- CHT INPUTS ARE NOT USED ON ANY PA28 MODEL. EGT IS NOT USED ON PA28-161, PA34-220T AND PA46-350P. TIT IS NOT USED ON ANY PA28 MODEL AND PA44-180. VAC IS ONLY USED ON THE PA32 MODEL.
- FOR MOD IDENTIFICATION SEE TABLE BELOW

MOD #	DESCRIPTION	APPLICABLE REV
1	PCB'S W/O CONFORMAL COAT	E, F

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/32 .X ±.02 .XX ±.01 .XXX ±.005	AVIDYNE CORPORATION PROPRIETARY INFORMATION		AVIDYNE CORPORATION 55 Old Bedford Road Lincoln, MA 01773	
	APPROVALS	DATE	DATA ACQUISITION UNIT SPECIFICATION CONTROL DRAWING	
MATERIALS	DRAWN BY E. SHEASBY	7/15/04		
FINISH	CHECKED P. LYNCH	7/15/04		
DO NOT SCALE DRAWING		SIZE D	DWG. NO. 200-00041-XXX	REV. 14
		SCALE	SHEET 9 OF 9	