FUEL/AIR DATA COMPUTER

(ADC 200)

P/Ns:
962820-1, 962820-2, 962820-3
962820-1A, 962820-2A, 962820-3A

INSTALLATION MANUAL

REV R

Shadin Avionics
6831 Oxford Street
St. Louis Park, MN 55426
USA

Sales: (800)-328-0584
Customer Service: (800)-388-2849
www.shadin.com

P/N: IM2820

PAGE CONTROL CHART

11.0 INSTALLATION DRAWINGS AND INSTALL KIT PARTS LISTS

Drawing No.	Description/Part Number	DATE	REV
4005-642	Installation, Sine/Square Wave Converter, P/N 631201	03/03/10	B
4028-005	Installation, OAT Probe Assembly Kit, P/N 681201-1	02/14/05	C
4028-411	Installation, Mounting Tray, P/N 542801A	12/30/99	B
4028-604	Installation, ADC200 Frequency/Level Int. FF, P/N 962820-1	08/31/95	–
4028-605	Installation, ADC200 Sine wave FF, P/N 962820-2	08/31/95	–
4028-606	Installation, ADC200 DC FF, P/N 962820-3	08/31/95	–
4028-607	Installation Wiring, Fuel/Air data Computer (ADC200) to OAT/Heading System	09/13/95	A
4028-608	Installation Wiring, Fuel/Air data Computer (ADC200) to Fuel System	09/13/95	A
4028-943	Installation Wiring, F/ADC200, 2000 to Navigational Receivers with RS-232	01/17/05	C
4028-944	Installation Wiring, Loop-Back Harness for F/ADC200, 2000, D-Sub Connector	09/19/05	C
4028-946	Installation Wiring, F/ADC200, 2000 to Navigational Receivers with RS-422, RS-485	03/11/03	A
4028-947	Installation Wiring, F/ADC200, 2000, Shadin Fuel Flow Indicators to Bendix/King Navigational Receiver	03/11/03	A
4028-948	Installation Wiring, F/ADC200, 2000 and Shadin Converter to Eventide Argus	02/14/05	A
4028-A80	Label, ADC 200/2000 Access Cover, P/N 712801	02/14/05	A
4070-005	Installation, Serial to Argus 5000/7000 Converter, P/N 937000-03	02/14/05	B
N/A	Parts List, OAT Probe Assembly Kit, P/N 681201-1	04/06/07	H
N/A	Parts List, Install Kit, F/ADC 200, P/N IK9628	04/06/07	D
4028-B94	Installation Wiring, F/ADC 200, 2000 Shadin FF Indicators to Garmin 430/530	04/29/11	B

11.0 INSTALL DRAWINGS AND INSTALL KITS PARTS LISTS (continued)

Drawing No.	Description/Part Number	DATE	REV
	AIRCRAFT SPECIFIC		
4028-818	Installation Wiring, F/ADC-200, 2000 w/Analog FF to Beech KingAir Indicators	03/11/03	B
4028-819	Installation Wiring F/ADC200, 2000 Sine FF to Mitsubishi MU-300 & Model 400 Beechjet	02/14/05	B
4028-909	Installation Wiring, ADC 200(2000) to Mitsubishi MU-2 w/Foxboro PC-620 System	02/14/05	B
4028-936	Installation Wiring, F/ADC200, 2000 or DigiData with DC FF to Cessna Citation 500, 501, 550, S550, 551, 552	02/14/05	A
4028-937	Installation Wiring, F/ADC200, 2000 or DigiData with DC FF to Cessna Citation 525 Jet	02/14/05	A
4028-938	Installation Wiring, F/ADC200, 2000 or DigiData with Digital FF to BomBardier LearJet 24, 25D	01/17/05	A
4028-939	Installation Wiring, F/ADC200, 2000 with Sine FF to Rockwell Commander 690 and 695	02/14/05	A
4028-940	Installation Wiring, F/ADC200, 2000 or DigiData with DC FF to Raytheon Beechjet 400A Aircraft	02/14/05	A
4028-941	Installation Wiring, F/ADC200, 2000 or DigiData with DC FF to Westwind 1124 Models	02/14/05	A
4028-942	Installation Wiring, F/ADC200, 2000 to Fairchild SA226 Series Aircraft	01/17/05	A
4028-949	Installation Wiring, F/ADC200, 2000 to Aerospatiale AS365N2 Dauphin	02/14/05	A
4028-950	Installation Wiring, F/ADC200, 2000 to Aerospatiale AS332 Super Puma	02/14/05	A
4028-A29	Installation Wiring, F/ADC200, 2000 or DigiData with DC FF Piper Cheyenne PA31T	01/17/05	C

REVISION LOG

REV.	DATE	APP'D	CHANGE
–	6/08/95	RR	Release
A	9/12/95	SES	Miscellaneous updates
B	6/09/97	KCL	4 stage loop back procedure, Report to 4028B, Expand Index
C	6/23/97	KCL	Revise Limitations Section
D	3/27/98	KCL	Format change, SSEC listing, software configuration update, new installation DWGs.
E	12/09/98	KCL	Update pages 1-1, 9-9, 10-2, DWG 4028-944 and 4070-005 and include DWG's 4028-A29 and 4028-A80.
F	3/16/99	KCL	Updated Drawings 4028-411 and 4028-A29, and Install Kit P/N IK9628
G	1/31/00	EDJ	Added Bendix B & Garmin, Format G, to page 9-7. Added one more Ragen Indicator/Transmitter to page 11-31.
H	9/18/00	EDJ	Page 1-1 & 1-3 changed to add Garmin 430/530 GPS. Page 2-1 changed by OAT tolerance, IVS changing to 10,000 fpm, and Pitot and IAS set to 18 knots for low speed. Page 2-6 & 2-7 changed by correcting LearJet HS-125 to Raytheon Hawker HS-125 and moving to page 2-7. Page 5-1 changed by adding TSO paragraph. Page 5-2 & 8-1 changed by OAT kit. Page 5-4 changed by adding Sandel hdg source. Page 9-1 & 9-2 changed by SW version numbers. Pages 9-5 & 9-8 (blank pages) removed. Pages 9-9 to 9-12 added for loopback procedure 3. New page 9-8 changed to remove Switch 4 ARINC setting. Page *iv* changed by OAT kit, 4028-411, 4028-943, and 4028-B94.
J	11/03/00	KCL	Add sections 2.8 and 2.9. Update sections 2.0, 5.1 and 5.7.
K	08/30/02	EDJ	Added P/N 681201-1 OAT probe installation and parts list to page *iv* drawing list. Corrected page 10-3 Table 2. Added pages 9-13 to 9-21. Page 9-13 became 9-22.
L	02/25/05	ZK	Changed Company name. Removed 681201A-1 dwg, parts list, and 93.00.79 Loopback procedure. Corrected Table 1 page 10-2, 4028-A29, 4028-938, 4028-942, and 4028-943. Incorporated updated IK9628 and P/N 681201-1 Parts list. Updated Section 11.0.
M	09/22/05	ZK	Updated 4028-944 and section 2.2. Corrected typos on pages 2-3, 5-1 and 10-5.
N	04/06/07	ZK	Changed Company name. Updated 681201-1 and IK9628 parts list.
P	04/29/08	EDJ	Updated all sections with P/N 962820-1(A), -2(A), & -3(A), updated Section 2.2, 2.7, 3.0, and 9.0. Added Antonov and Yak-40 SSEC information in Section 2.6.4.
R	04/29/11	ZK	Updated Drawings 4028-B94 and 4005-642.

The information in this manual is subject to change without notification. To ensure complete and current updates, note the Revision Log above and call Technical Assistance for updated information.

1.0 OVERVIEW

1.1 The Manual

This manual is designed to facilitate the installation of the Shadin Fuel/Air data Computer (ADC 200).

1.2 Product Information

The Shadin ADC 200 system is designed to provide a **combined** source of fuel and air data. Listed below are the navigational systems that the ADC 200 has been designed to be compatible with.

Receives Serial Data from:

Magellan
Skynav 5000

ARNAV	Trimble	Bendix King
STAR 5000	2000/2000A	KLN90
FMS 7000	2100/3000	KLN90A
R5000	3100/2101	KLN90B
		KLN89/89B
		KLN900

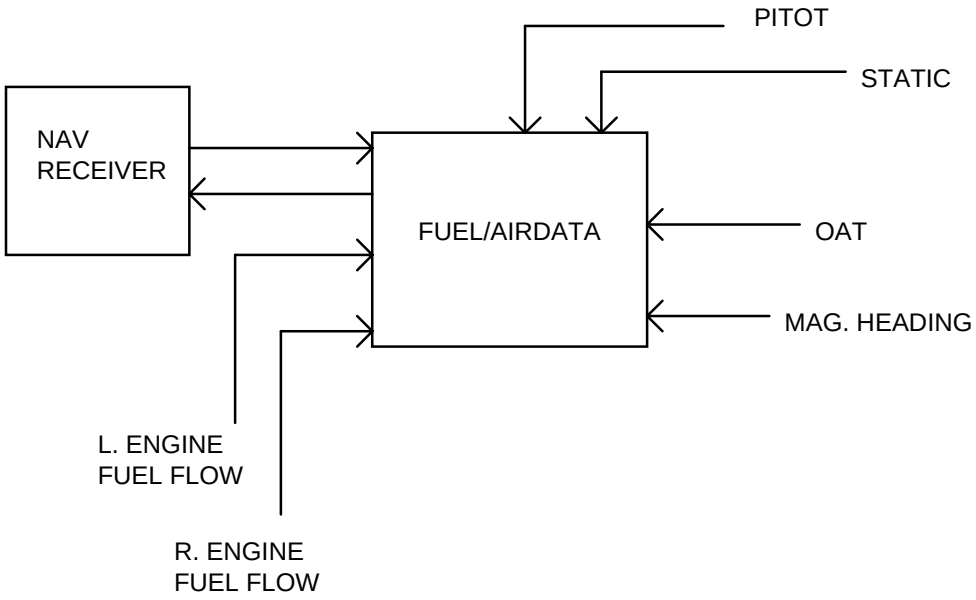
Garmin	BFGoodrich	IIMorrow
150, 155, 155XL, 165	Pronav LNS 6000	611, 612, 618
230, 230XL		NMS 2001
300, 300XL		800, 820, 360
430, 530		GX50, 55, 60

Transmits Serial Data to:

ARNAV	Magellan	Note: To find out which particular receiver models have Air data receive capability, contact the manufacturers.
Bendix/King	Trimble	
Garmin		

1.3 System Configuration

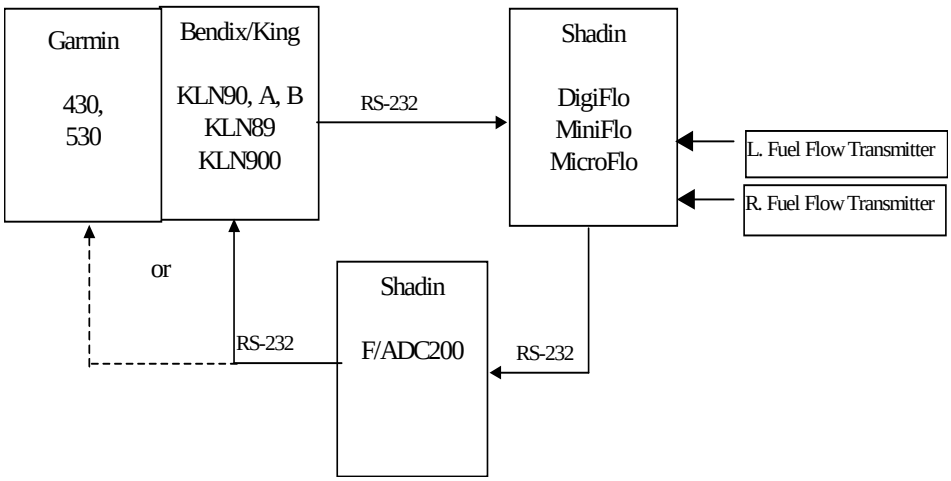
The Fuel/Air data system is a remote mounted box, which is connected to the GPS receiver via serial data. It is also connected to the pitot and static line, OAT probe, fuel flow sensors and the aircraft heading source.



SYSTEM CONFIGURATION

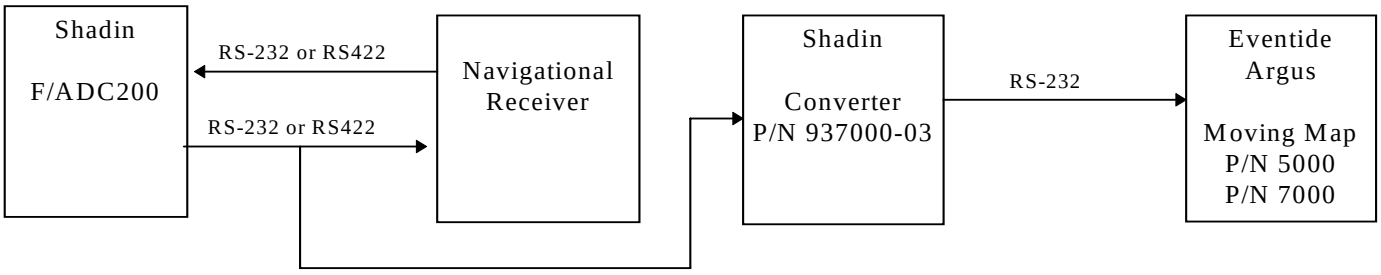
1.4 Fuel Totalizer Configuration

Shown below is an optional system configuration utilizing a Shadin Fuel Flow Indicator. Note that the only navigational receivers supported in this configuration are the Bendix/King KLN series and the Garmin 430/530. Consult Drawing Number 4028-947 contained in section 11 for installation information on the Bendix/King KLN series, and Drawing Number 4028-B94 for the Garmin 430/530.



1.5 F/ADC200, Argus Moving Map Configurations.

Shown below is the system configuration that supports output to a Eventide Argus moving map using the Shadin serial to serial data converter P/N 937000-03. The fuel and Air data are displayed on the Eventide-Argus moving map. Consult Drawing numbers 4070-005 and 4028-948 contained in section 11.



2.0 FUEL AND AIR DATA SYSTEM SPECIFICATIONS

2.1 Input Data Range

Pitot	18 to 350 kt.
Static	-1000 to 55,000 ft.
OAT	-60°C to, +60°C
Heading	0 - 360°
Fuel Flow	1 to 450 GPH Range Selected
K Factor	500 to 130000 PPG Continuous

2.2 Output Data Range

PARAMETER	Accuracy*	RANGE
IAS	**Table A**	20 to 350 kts.
P.ALT	**Table B**	–1000 to 50000 ft.
OAT	±1.5°C per TSO	–60°C to +60°C
TRUE HEADING	±2°	0 - 360 degrees
MAGNETIC HEADING	±1°	0 - 360 degrees
IVS	**Table C**	± 10,000 ft./min.
TAS	**Table A**	20 - 600 kts.
MACH	**Table D**	.2 - .95
WIND SPEED	±5 kts.	5 - 360 kts.
WIND DIRECTION	±10°	0 - 360 degrees
FUEL FLOW	±2%	1-450 GPH

* Listed accuracies are after warm-up is complete per the ambient temperatures listed in Section 2.6.1

This table is used as the tolerance for both IAS and TAS. For values between table rows, linearly interpolate between the adjacent table points.

AIRSPEED KNOTS	TOLERANCE ± KNOTS
50	5.0
80	3.0
100	2.0
120	2.0
150	2.0
200	2.0
250	2.4
300	2.8
350	3.2
400	3.6
450	4.0

Table A - Calibrated Airspeed Tolerance

This table is used as the tolerance for pressure altitude. Note that for an altitude between points in the tables, the tolerance is linearly interpolated between the adjacent table points.

ALTITUDE FEET	TOLERANCE ± FEET
0	25
1000	25
2000	25
3000	25
4000	25
5000	25
8000	30
11000	35
14000	40
17000	45
20000	50
30000	75
40000	100
50000	125

Table B -Pressure Altitude Tolerance

This table is used as the tolerance for vertical speed. For values between table rows, linearly interpolate between the adjacent table points.

VERTICAL SPEED FPM	TOLERANCE ± FPM
20000	1000
6000	300
4000	200
2000	100
1000	50
500	45
200	45
100	45
50	45
0	45
-50	45
-100	45
-200	45
-500	45
-1000	50
-2000	100
-4000	200
-6000	300
-20000	1000

Table C- Vertical Airspeed Tolerance

This table is used as the tolerance for MACH Number. For values between table rows, linearly interpolate between the adjacent table points.

ALTITUDE	TOLERANCE	
FEET	**MACH**	**± MACH**
0	.3	.012
	.4	.012
	.5	.010
	.6	.0075
10,000	.4	.012
	.5	.010
	.6	.0075
	.7	.005
20,000	.4	.012
	.5	.010
	.6	.0075
	.7	.005
30,000	.6	.0075
	.7	.005
	.80	.005
	.90	.005
	.95	.0075
40,000	.70	.005
	.80	.005
	.90	.005
	.95	.0075
50,000	.75	.005
	.90	.005
	.95	.0075
	1.00	.015

Table D - MACH Tolerance

2.3 Dimensions (including mounting rack)

Size: 6.3"L x 3.5"H x 3.1"W
Weight: 20 oz.

2.4 Power Requirements

System Power required: 28 VDC @ 1300 mA 14 VDC @ 900 mA

2.5 Output Data

Electric Format: RS-422 or RS-232

2.5.1 Serial Output Data Parameters

Fuel Group	**Air data Group**	
Left Fuel Flow	Aircraft Type	Density Altitude
Right Fuel Flow	MACH Number	Drift Angle
Fuel Used Total	True Air Speed (TAS)	Magnetic Heading
Total Fuel Used	Indicated Air Speed (IAS)	Pressure Altitude
Fuel Used Right	Wind Direction and Speed	Rate of Turn
Fuel Used Left	Vertical Speed	
Fuel Remaining	True Air Temperature	
NM/Gal (ground)	Outside Air Temperature (OAT)	
Fuel to Destination		
Fuel at Destination		

Note: Not all parameters will be available to all navigational receivers. Contact the manufacturer for display capabilities.

2.6 Limitations

2.6.1 Warm-up time

The Fuel/Air data System requires a warm-up time that varies with ambient temperature:

70°C ambient	5 minutes warm-up required
15°C ambient	10 minutes warm-up required
-20°C ambient	15 minutes warm-up required
-40°C ambient	20 minutes warm-up required

If the ADC has been configured for a fuel flow delay, fuel flow and thus fuel used information shall be unavailable at startup for the duration of the selected delay.

2.6.2 Supplemental equipment

All Shadin F/ADC(s) and ADC(s) are not designed to replace factory installed Air data fuel flow systems or other gauges. They are not intended to be used as a primary system to drive altimeters or airspeed indicators. The F/ADC fuel section is not a fuel quantity system and therefore reports only what was manually entered by the operator.

2.6.3 Static Source Error Correction (SSEC), Pitot Source Error Correction (PSEC)

For certain models of aircraft, the Fuel/Air data System will make corrections to pressure altitude by compensating for static source error. For some of these models, the Fuel/Air data System will make corrections to indicated airspeed by compensating for pitot source error.

The System does not provide true and absolute readings for all circumstances. It makes no altitude corrections when the uncorrected IAS is below 100 knots, and it makes no airspeed corrections when the uncorrected IAS is below 150 knots. It does not account for other factors, such as the current useful weight, that contribute to static source error and pitot source error. Rather, the Fuel/Air data System performs calculations based solely on indicated airspeed and pressure altitude. The SSEC / PSEC corrections were derived from specific aircraft data referred to in section 2.6.4. To configure the Shadin F/ADC for a specific aircraft model refer to section 9.

2.6.4 SSEC/PSEC LISTING

Antonov An-12 (SSEC only)

Airplane Flight Manual, An-12, 1991, MCA USSR approved 02/05/1992	Sect. 1 General Information Subsect. 1.5. S&DSECs	Page 9

Antonov An-24 (SSEC only)

Airplane Flight Manual, An-24, 2001, Ukrainian SAA approved 03/29/2002	Sect. 6 Flight Characteristics Subsect. 6.7 S&DSECs	Page 81

Antonov An-26 (SSEC only)

Airplane Flight Manual, An-26, 2001, Ukrainian SAA approved 03/29/2002	Sect. 6 Flight Characteristics Subsect. 6.10 S&DSECs	Page 53

Antonov An-30 (SSEC only)

Airplane Flight Manual, An-30, 1982, MCA USSR approved 12/25/1979	Sect. 6 Airplane Characteristics Subsect. Flight Characteristics	Page 31

Beechcraft Beechjet-400 (SSEC only)

Airplane Flight Manual, BeechJet 400,	Section 6, Performance	Page 6-14
FAA approved 1/86	Altitude Correction	Figure 6-8
Revision A9 14/92	Copilot System	

Boeing 707-321B Advanced

SSEC

Airplane Flight Manual, Boeing 707,	Section IV, Performance	Page 19
FAA approved 3/27/69, D6-1588	Altitude Calibration	FLAPS UP
Revision 2/4/69	Pilot & Copilot	

PSEC

Airplane Flight Manual, Boeing 707,	Section IV, Performance	Page 18
FAA approved 9/20/66, D6-1588	Airspeed Calibration	FLAPS UP
	Pilot & Copilot	

Cessna 500 (SSEC only)

Airplane Flight Manual, Cessna/Citation Model 500,	Section IV, Performance	
FAA approved Aug 7/74	Altitude Correction	Figure 4-7
Revision 53 - Dated 11 Dec 85	Pilot & Copilot system	Page 4-17.1

2.6.4 SSEC/PSEC LISTING (Continued)

Cessna 501 (SSEC only)

Airplane Flight Manual, Cessna/Citation I SP Model 501, Section IV, Performance

FAA approved	Altitude Correction	Figure 4-5
Original	Pilot & Copilot system	Page 4-15

NOTE: Uses same Hardware configuration as Cessna 500

Cessna 525 (SSEC only)

Airplane Flight Manual Model 525

	Altitude Correction	Rept FT525-4
	Pilot & Copilot system	Page 47

Cessna 550 (SSEC only)

Airplane Flight Manual, Cessna/Citation II Model 550, Section IV, Performance

FAA approved	Altitude Correction	Figure 4-5
Original	Pilot & Copilot system	Page 4-15

Cessna 560 (SSEC only)

Airplane Flight Manual, Model 560, S/N 259 & Below, Section IV, Performance

FAA approved	Altitude Correction	Figure 4-5
Original	Pilot & Copilot system	Page 4-17

Cessna 560 (SSEC only)

Airplane Flight Manual, Model 560 , S/N 260 & Up, Section IV, Performance

FAA approved	Altitude Correction	Figure 4-5
56FMA-00	Pilot & Copilot system	Page 4-19

Cessna Citation S550 (SSEC only)

Airplanes -0115 through -0160 Except Airplanes Incorporating SBS550-32-7 and Airplanes -0001 through-0114 Incorporating SBS550-32-1 but not SBS550-32-7.

Section IV - Performance, Standard Charts		Pages 4-17, 4-18
FAA approved	Altimeter Position Correction	Figure 4-5
Revision 37	Pilot & Copilot	

2.6.4 SSEC/PSEC LISTING (Continued)

Douglas DC-8

SSEC

Airplane Manual, Douglas DC-8, Section IV, Performance		Page 20
FAA approved	Altitude Correction	
DAC-33161 10/1/66	Pilot & Copilot system	

PSEC

Airplane Manual, Douglas DC-8, Section IV, Performance		Page 11
FAA approved	Airspeed Correction	
DAC-33161 10/1/66	Pilot & Copilot system	

Falcon 10 (SSEC only)

Airplane Flight Manual, Section 6. Performance, 7 Position Error		Page 6-27
FAA approved 10/17/73	Position Error	
Revision 14, 6/6/78	Pilot & Copilot	

Falcon 20-C, D, E (SSEC only)

Maintenance Instruction Manual, 34-18-03		Page A48
Sept 1/77	Altitude Correction	
CS-143	Copilot system	

Falcon 20-F (SSEC only)

Maintenance Instruction Manual, 34-18-03		Section 5
DTM30528	Altitude Correction	Subsection 20
DGAC Approved	Copilot system	Page 4

2.6.4 SSEC/PSEC LISTING (Continued)

Falcon 50

SSEC

Airplane Flight Manual, Section 5. Performance		Page 5.25.2
DGAC approved	Copilot (for A/C equipped with one ADC)	
Revision 24		

PSEC

Airplane Flight Manual, Section 5. Performance		Page 5.25.2
DGAC approved	Pilot (normal) and Copilot MACH Indicators	
Revision 24		

LearJet 24 (SSEC only)

Airplane Manual, LearJet Model 24, Section IV, Performance		
FAA approved 3/17/66	Altitude Correction	Figure 4-10
Revised 7/19/68	Pilot & Copilot system	Page 4-16

LearJet 25D (SSEC only)

Airplane Manual, LearJet 25D/F AFM, Performance		
FAA approved 10/14/86	Altitude Correction	Figure 5-10
FM-018 Release A	Copilot system	Page 5-18

LearJet 35 (SSEC only)

Flight Manual, LearJet 35, Normal System, Flaps up, Gear up		Page 5-18
FAA approved, 4/30/76	Altitude Position Correction	Figure 5-10
Reissued 2/25/81	Pilot's Altimeter- STBY & Copilot's Altimeter	

LearJet 55 (SSEC only)

Gates LearJet 55, APM, Performance Data, Flaps up, Gear up		Page 5-20
FAA approved, 3-17-81	Altitude Position Correction	Figure 5-11
Change 13		

Lockheed Jetstar (SSEC only)

Airplane Flight Manual, Performance Data, Weight = 32,000 Lb., Clean Configuration: Leading Edge Flaps up, Trailing Edge Flaps up, Landing Gear up		Page 4-25
FAA approved, 12/14/76	Altimeter Installation Correction	Figure 4-15

2.6.4 SSEC/PSEC LISTING (Continued)

Mitsubishi MU-300 (SSEC only)

Airplane Flight Manual, Diamond IA, Section 6, Performance		
FAA approved Jan 11/84	Altitude Correction	Figure 6-8
	Copilot system	Page 6-20

Raytheon Hawker HS-125-3A (SSEC only)

Airplane Manual,		Section 5
Document No. H.S.1.10	Static Position Error	Figure 5-4
CAA Approved	Correction to Altimeter	Page 13

Raytheon Hawker HS125-700A (SSEC only)

125 Crew Manual, First Officer, Section 2, Flaps Retracted		Page 2-30
	Static Position Correction to Altimeter	Figure 6
Revision :G, 4/77		

Sabreliner 60 (SSEC only)

Sabreliner Pilot's Manual, SR 75-064, Weight = 16,000 Lb.		
9/1/76	Altitude Calibration	Figure 7-2

Sabreliner 65 (SSEC only)

Pilots Manual, SR-78-028		
	Altitude Correction	Figures 7-1 through 7-5
	Pilot & Copilot system	265-65-7-31,32A,33

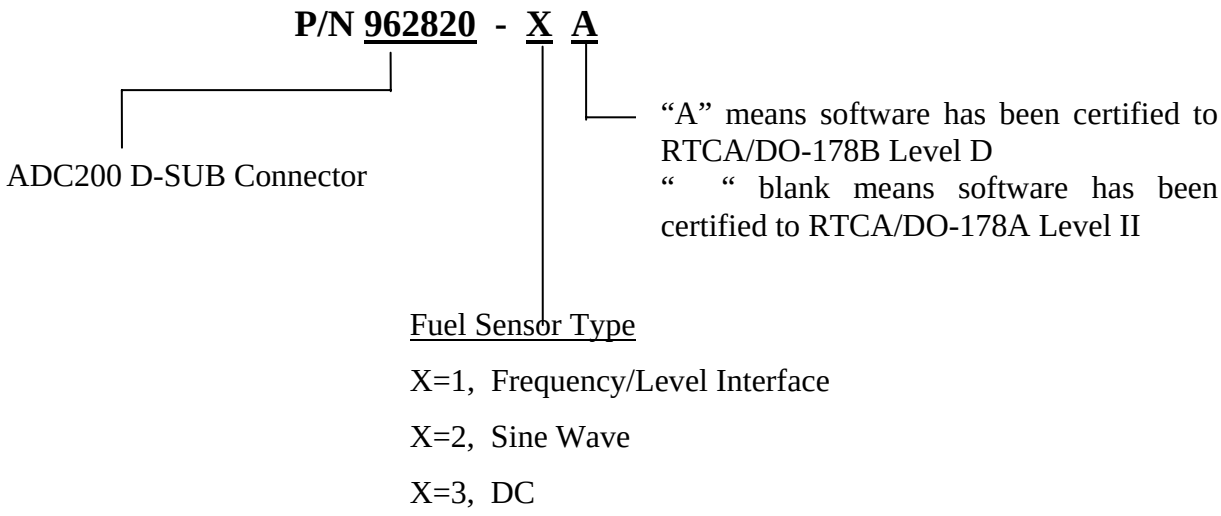
Westwind 1124A (SSEC only)

Airplane Flight Manual, 1124A , Section V, Performance		
CAA approved	Altitude Correction	
Figures 5-13, Flaps 0	Copilot system	Pages V-25
NOTE: Gross Weight averaged at 18,750 lbs.		

Yak-40 (SSEC only)

Airplane Flight Manual, Sect. 7.1.3.		Page 7
Yak-40, 1995	Altitude correction	

2.7 Part Numbering Scheme



2.8 Electrical Interface Specifications

The specifications for the heading and fuel flow interfaces are listed in this section.

2.8.1 Heading Interface

The heading interface follows the ARINC 407 standard (line voltage of 11.8 Vrms).

Synchro Leg	Input Impedance
H	10 kohm
X	17 kohm
Y	17 kohm

2.8.2 Fuel Flow Interfaces

There are three basic types of fuel flow interfaces supported. The interface type is defined in the ADC2000 part number. Refer to section 2.7 for the part numbering scheme.

2.8.2.1 Digital Fuel Flow Interface

The are two possible installations for the digital fuel flow interface, the first is that the ADC is connected to a dedicated fuel flow transmitter, and the second is that the ADC is connected into a fuel flow system.

Dedicated Transmitter

Fuel Flow Interface Input Impedance 47 kohm

Shared Transmitter

Under normal operating conditions the voltage swing (the signal amplitude) can be calculated using $Vs = [R/(R + 47\ k)]*5\ Vdc - 0.5Vdc$, where R is the input impedance of the aircraft fuel flow indicator.

For example with an input impedance R = 1 Mohm, the voltage swing Vs = 4.27 Vdc

With the fuel flow information encoded in frequency and not amplitude, the loading effects do not produce an error provided the aircraft indicator can detect the signal transitions.

2.8.2.2 Sine Wave Fuel Flow Interface

The interface source signal amplitude varies with frequency. Listed in the table below are the input impedance vs. peak to peak input voltages of the ADC2000 under normal operating conditions.

Input Impedance	Input Voltage
2 Mohm	Input voltage less than or equal to 1.0 Vpp
24.5 kohm	Input voltage greater than 1.0 Vpp

Maximum Input Voltage 10 Vpp

2.8.2.3 DC Voltage Fuel Flow Interface

The DC voltage fuel flow interface has a differential input. The specifications under normal operating conditions are listed below.

Positive input greater than 100 Mohm
Negative input greater than 100 Mohm

Maximum Input Voltage 10.2 Vdc

2.9 Statistical Specifications

2.9.1 Mean Time Between Failures

MTBF: 17,660 hours

3.0 CERTIFICATION

TSO -C106, -C44a

Environmental Categories RTCA/DO-160B

Temp. ALT	F2
Temp. Variation	B
Humidity	A
Shock & Vibration	P, K, S, M, N, O
Magnetic Effect	B
Power Input	B
Voltage Spike	B
AF Conducted Susceptibility	B
Induced Signal Susceptibility	B
RF Susceptibility	A
RF Emission	B

Software Certification

P/N 962820-1, 962820-2, and 962820-3 conforms to level II as defined by RTCA/DO-178A.

P/N 962820-1A, 962820-2A, and 962820-3A conforms to level D as defined by RTCA/DO-178B.

4.0 PLACING AN ORDER

Please know the aircraft year and model number, its serial number, and the engine make and model number when you call to place orders. Information on the fuel flow system previously installed in the aircraft and any communication interface (RS-232 or RS-422) information may also prove useful.

We may request a wiring diagram of the aircraft's fuel flow system and transducer and/or K-factors.

5.0 INSTALLATION PROCEDURE

5.1 General

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only if performed under 14 CFR part 43 or the applicable airworthiness requirements.

All work must conform to AC 43.13-1B; latest release.

5.2 F/ADC Location Selection

The Fuel Air data Computer should be mounted in a dry, temperature stable location with enough distance from motors, pulse generating equipment, relays and cables carrying high DC or AC current to avoid interference with low level signals of the OAT and fuel flow.

The equipment may be installed in non-pressurized and non-controlled temperature locations.

In considering the location, keep in mind that the F/ADC requires signals from the fuel flow, the OAT probe, heading system and the pitot and static lines. Placement in the front section of the aircraft is favorable, in order to avoid running all of these signals to the tail of the aircraft.

5.3 Mounting the F/ADC

The computer should be mounted per Drawing 4028-604, -605, -606, and Drawing 4028-411, using the recommended hardware. Any orientation is acceptable. Make sure that the computer is not the lowest point in the pitot and static system, to reduce the chances of collecting moisture or water in it. Form a water trap, if necessary.

5.4 Mounting the OAT Probe

1. Refer to Drawing 4028-005 and OAT Probe Assy Kit P/N 681201-1. Use the supplied stiffener to support the probe. Keep the probe away from transmitting antennas and static ports of autopilots to avoid interference.

2. Refer to Drawing 4028-607: +5V is supplied to the OAT probe from (red wire) J1:15. The OAT signal is the white (or black) wire from J1:14.

3. The sun shield must be installed for proper indication of OAT.

4. For single engine installation, avoid mounting the OAT probe on the belly of the aircraft to avoid erroneous reading due to the presence of hot exhaust gases.

5. Below is an OAT °C to microampere conversion chart. The amperage can be measured by connecting an ammeter in series between the signal wire of the OAT probe and the ADC200. This information is provided for trouble shooting purposes only.

OAT ºC	Input µA		OAT ºC	Input µA		OAT ºC	Input µA		OAT ºC	Input µA
-60	213		-20	253		+20	293		+60	333
-50	223		-10	263		+30	303			
-40	233		0	273		+40	313			
-30	243		+10	283		+50	323			

1°C = 1 µA

5.5 Connection to the Fuel Flow Sensor

1. If the aircraft is not equipped with a fuel flow source, refer to the STC covering the installation of the fuel flow transducer on the engine.

2. When connecting to any fuel transducer, Shadin recommends using a 3 conductor, 22 gauge, shielded wire with the shield terminated at the Air Data only.

3. Note that for single engines all fuel flow types should use left side inputs only.

4. *Install the transducers according to the engine STC, using Drawing 4028-608 (Freq. Option) to connect the fuel flow transducer to the computer.

5. *If the aircraft is equipped with a digital fuel flow transducer (P/N 680501), use Drawing 4028-608 (High-Level Option) and the STC drawing covering the installation.

6. Before hooking to an existing fuel system in a turbine or jet application, consult all installation drawings contained in this manual.

7. *If the aircraft is equipped with a DC fuel flow system, use Drawing 4028-608 (DC Fuel Flow Option) and the STC covering the installation.

8. *If the aircraft is equipped with a sine wave pickup coil type of fuel flow transducer, use Drawing 4028-608 (Sine Wave Signal). Use the Converter, P/N 631201. Note that if this is a new installation, use part number 962820-2(A) ADC200.

9. Install the sine to square converter, P/N 631201, between the fuel flow transducer and the F/ADC as depicted in 4028-608 and 4005-642.

10. Make sure that the system is initialized with the proper transducer K factor for a digital or sine systems and with the proper airframe make and model for the DC fuel flow systems. See the attached tables in section 10.0.

* Consult section 11 for specific aircraft installation wiring drawings.

5.6 Connection to the Heading Source

The system is designed to interface with any ARINC-407 heading system (X,Y,Z) with no effect on the heading system or the bootstrap.

XYZ Heading ARINC 407	FUEL Air Data J1	Collins 328A-2A 2P1	Collins HSI331A P1	Collins MCS 65 P1	Collins 328A-5	King KI525A P2	King KSG105 P1	Sperry Gyro-syn Comp. P1	Sigma-Tek DG	Sandel SN3308	
										P1	P2
X	5	11	S	25	32	s	t	L	A		25
Y	4	4	T	40	22	v	p	M	B		6
Z	7	3	U	24	12	t	k	K	D	4	
H	6	26	V	6	53	r	c	H	E		4
C	7	22	W	5	57	u	f	J	H	4	

The C wire (AC common) and the Z wire must be connected together at the source (bootstrap).

5.7 Connection to the Pitot and Static Lines

The pitot static line should be cut and a tee installed, to tap into these lines. Use the appropriate type of fittings to match the type installed in the aircraft. Refer to CFR part 43, appendix E for approved practices in installing and verifying these connections.

PITOT/STATIC adapter helpful hints

To make an adapter for the Shadin ADC200, the following parts could be used. It is recommended to use all aluminum fittings.

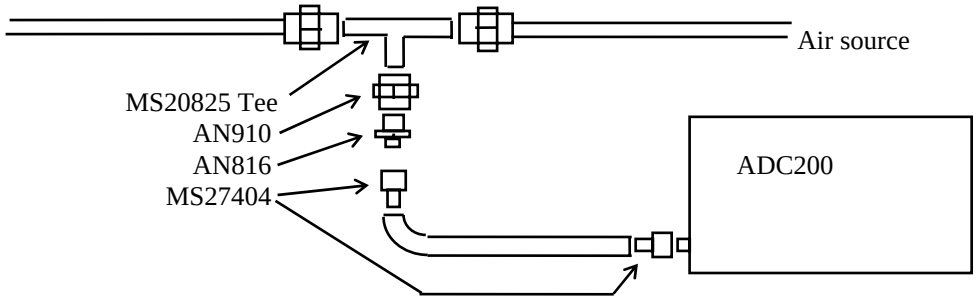
Existing Pitot/Static lines ⟶ AN910-1D ⟶ AN816-2D ⟶ #2 Hose(with female fittings)

AN910 DASH NUMBER		PIPE
BRASS	ALUM. ALLOY	SIZE
-1	-1D	1/8”
-2	-2D	1/4”
-3	-3D	3/8”
-4	-4D	1/2”
-6	-6D	3/4”
-8	-8D	1”

AN816 DASH NUMBER		TUBE	PIPE
STEEL	ALUM. ALLOY	O. D.	THREAD
-2	-2D	1/8”	1/8”
-3	-3D	3/16”	1/8”
-4	-4D	1/4”	1/8”
-5	-5D	5/16”	1/8”
-6	-6D	3/8”	1/4”
-8	-8D	1/2”	3/8”
-10	-10D	5/8”	1/2”
-12	-12D	3/4”	3/4”
-16	-16D	1”	1”

MS20825 TEE		TUBE	PIPE
STEEL	ALUM. ALLOY	O. D.	THREAD
-2	-2D	1/8”	1/8”
-3	-3D	3/16”	1/8”
-4	-4D	1/4”	1/8”
-5	-5D	5/16”	1/8”

HOSE: Stratoflex 193-2 or Aeroquip 306-2 with MS27404 (P/N 311-2D) on each end.



5.8 Connection to the Navigation Management System

1. Use the appropriate installation wiring diagram (4028-943 or -946) to connect the Fuel Air data Computer's Connector J2 to the navigation management system.

2. A 2 amp. circuit breaker should be used for powering the system. Mark the C/B "F/ADC" by engraving, painting or other approved method.

3. Keep the cables away from power cables, DME and transponder cables.

4. Refer to the specific Nav Receiver Installation Manuals for details.

5.9 Post Installation Checkout

1. The pitot and static system must be checked for leaks.

2. Operate the Navigation Management System; select the altitude and airspeed pages. Use the static and pitot test system to check the accuracy of the readout in the Navigation Management System pages.

3. Select heading page. Slew compass through 360°. The error should be within $\pm$1°.

4. Select the OAT page. Compare to the reported ambient temperature. The error should be $\pm$2°C.

5. Run the engines and select the fuel flow page. Compare the fuel flow readout with the engine manufacturer's fuel flow charts under the ambient temperature and pressure conditions.

6.0 OPERATING INSTRUCTIONS

1. Power the avionics DC buss and the Navigation Management System.

2. After the warm-up period density altitude and PALT are available. IAS will be available but will be out of range until actual airspeed is available. Winds aloft will be available if IAS > 40 Kts and magnetic heading is within 40° of magnetic track.

3. Fuel Flow, Fuel Used, Fuel Remaining, Heading and OAT will be available after power-up.

4. Refer to the specific Nav Receiver Operator's Manual for page selection of various data.

7.0 INITIALIZATION

1. The system requires initialization of K factor for fuel flow transducers or aircraft model for DC fuel flow sensors. Refer to Table 1 **analog** for fuel flow and Table 2 or Table 3 for **digital or sine** fuel flow.

2. Refer to the specific Navigational Receiver Operator Manuals for the serial port set up.

8.0 MAJOR COMPONENTS OF THE SYSTEM

1. Nav Receiver Input/Output
2. Fuel/Air data Computer
3. Outside Air Temperature Probe, P/N 681201( )

9.0 CONFIGURING THE AIR DATA

Part number 962820-X(A) (X= 1 or 2 or 3) Air data Computer needs to be configured to program it for the particular installation. The procedures contained in this Installation Manual are for software versions 93.00.16 to 93.00.29, 93.00.51 to 93.00.71, 93.00.77, and 93.00.82 and above. There are two methods to accomplish this task. The first method is to follow the procedures as set forth in the 'ADSETUPF User Manual'. The second method is to manually enter the information by performing a ‘Loop-Back’ procedure.

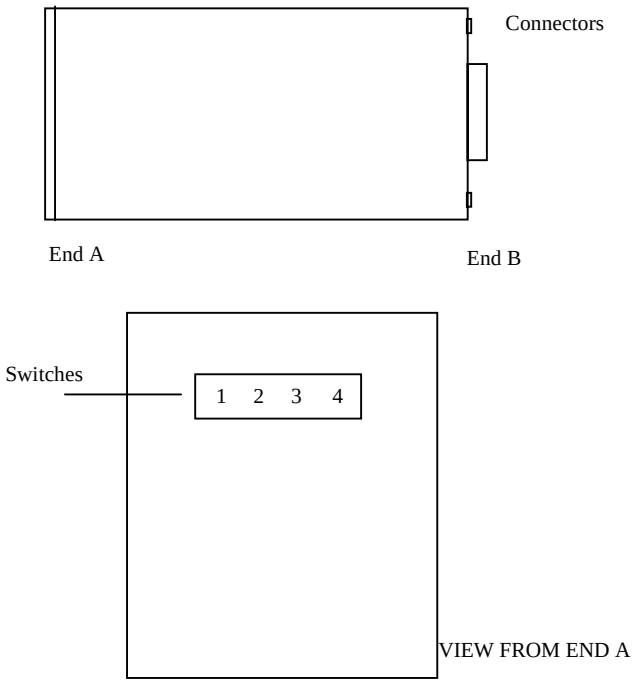
9.1 Configuring with 'ADSETUP User Manual'

The 'ADSETUPF User Manual' is a configuration utility that allows setting the ADC configuration by running a program on a PC. The PC is connected to the unit via the serial communication port. Following the steps as set forth in the user manual allow the Air data to be configured. See the 'ADSETUPF User Manual' for more details.

9.2 Configuring Manually (Loop-Back)

The switches that are available from the backside of the unit need to be set to the appropriate positions as determined by the switch settings listed below. After the correct switch positions have been selected, the unit is powered using the 'Loop-Back' harness (consult drawing number 4028-944 contained in section 11). The purpose of the 'loop back' harness is to tie the RS-232 transmit and receive ports together. This allows the software, when the unit is powered on, to read the switch positions. Switch 1 is set to different positions to select the separate stages that the loopback is performing. There are 5 different ‘loopback’ procedures. Use ‘loopback’ procedure 1 for Software Versions 93.00.16-93.00.29. Use ‘loopback’ procedure 2 for software versions 93.00.51-93.00.71. Use ‘loopback’ procedure 3 for software versions 93.00.77. Use 'loopback' procedure 4 for software version 93.00.82 and above. Note that procedure 1 has 2 stages. Procedure 2, and 3 have 4 stages and procedure 4 has 5 stages. Remember to cycle power between stages and that the F/ADC is to be powered on for 1 minute for each stage.

The following figure shows the approximate switch positions:



Loop-back Procedure 1 for Software Version 93.00.16 - 93.00.29

Stage 0 Loopback Configuration:

Switch 1 is set to 0 to indicate that the stage 0 loopback is being performed.

SWITCH 2		Fuel Units and Engine Type:	
0	-	Gallons	Single Engine
1	-	Liters	" "
2	-	Lbs 5.8	" "
3	-	Lbs 6.71	" "
4	-	Kilograms	" "
5	-	Lbs 6.5	" "
6	-	Lbs 6.3	" "
7	-	(not used)	" "
8	-	Gallons	Twin Engine
9	-	Liters	" "
A	-	Lbs 5.8	" "
B	-	Lbs 6.71	" "
C	-	Kilograms	" "
D	-	Lbs 6.5	" "
E	-	Lbs 6.3	" "
F	-	(DO NOT USE)	

SWITCH 3		9600 BAUD Loran Input Type:
0	-	Trimble
1	-	ARNAV
2	-	Bendix or IIMorrow Apollo NMS2001, 800, 820
3	-	Garmin
4	-	Northstar
5	-	Foster
6	-	IIMorrow 611, 612 and 618
7	-	Shadin Flow Meter
8-E	-	(DO NOT USE)
F	-	Use this position to make selection on SWITCH 4

SWITCH 4		Other Loran Input Type:
0	-	Northstar, 1200 BAUD
1	-	Foster, 1200 BAUD
2	-	IIMorrow 611, 612, 618; 1200 BAUD
3-F	-	(DO NOT USE)

Stage 1 Loopback Configuration:

Switch 1 is set to 1 to indicate that the stage 1 loopback is being performed.

SWITCH 2 PALT Correction (static pressure correction by model):

- 0 - None
- 1 - MU-300
- 2 - Cessna Citation 501
- 3 - Cessna 525
- 4 - Cessna 550
- 5-F - (DO NOT USE)

SWITCH 3 Loran Output Type:

- 0 - Format Z - Trimble and Garmin
- 1 - Format X - ARNAV
- 2 - Generic
- 3 - Surveyor
- 4 - Bendix C - Bendix/King and F/ADC without Baro Interface
- 5 - Bendix D - Bendix/King and F/ADC with Baro Interface
- 6 - Shadin S - IIMorrow GX50, 55, 60
- 7-F - (DO NOT USE)

SWITCH 4 Altimeter Selection for Baro DC Input:

- 0 - None (Use this selection)
- 1 - Type 1 (Not available)
- 2 - Type 2 (Not available)
- 3 - Type 3 (Not available)
- 4 - Type 4 (Not available)
- 5 - Type 5 (Not available)
- 6 - Type 6 (Not available)
- 7 - Type 7 (Not available)
- 8-F - (not used)

Loopback Procedure 2 for Software Version 93.00.51-93.00.71

Stage 0 Loopback Configuration:

Switch 1 is set to 0 to indicate that the stage 0 loopback is being performed.

SWITCH 2		Fuel Units and Engine Type:	
0	-	Gallons	Single Engine
1	-	Liters	" "
2	-	Lbs 5.8	" "
3	-	Lbs 6.71	" "
4	-	Kilograms	" "
5	-	Lbs 6.5	" "
6	-	Lbs 6.3	" "
7	-	(not used)	" "
8	-	Gallons	Twin Engine
9	-	Liters	" "
A	-	Lbs 5.8	" "
B	-	Lbs 6.71	" "
C	-	Kilograms	" "
D	-	Lbs 6.5	" "
E	-	Lbs 6.3	" "
F	-	(DO NOT USE)	

SWITCH 3		9600 BAUD Loran Input Type:
0	-	Trimble
1	-	ARNAV
2	-	Bendix or IIMorrow Apollo NMS2001, 800, 820
3	-	Garmin
4	-	Northstar
5	-	Foster
6	-	IIMorrow 611, 612 and 618
7	-	Shadin Flow Meter
8-E	-	(DO NOT USE)
F	-	Use this position to make selection on SWITCH 4

SWITCH 4		Other Loran Input Type:
0	-	Northstar, 1200 BAUD
1	-	Foster, 1200 BAUD
2	-	IIMorrow 611, 612, 618; 1200 BAUD
3-F	-	(DO NOT USE)

Stage 1 Loopback Configuration:

Switch 1 is set to 1 to indicate that the stage 1 loopback is being performed.

SWITCH 2 OAT Probe Type:

- 0 - Shadin OAT Probe
- 1 - ARINC 575 (DO NOT USE)
- 2 - Rosemount 500 Ω (DO NOT USE)
- 3-F - (DO NOT USE)

SWITCH 3 Loran Output Type:

- 0 - Format Z - Trimble and Garmin
- 1 - Format X - ARNAV
- 2 - Generic
- 3 - Surveyor
- 4 - Bendix C - Bendix/King and F/ADC without Baro Interface
- 5 - Bendix D - Bendix/King and F/ADC with Baro Interface
- 6 - Shadin S - IIMorrow GX50, 55, 60
- 7 - Bendix B – (fuel only)
- 8-F - (DO NOT USE)

SWITCH 4 Altimeter Selection for Baro DC Input:

- 0 - None (Use this selection)
- 1 - Type 1 (Not Available)
- 2 - Type 2 (Not Available)
- 3 - Type 3 (Not Available)
- 4 - Type 4 (Not Available)
- 5 - Type 5 (Not Available)
- 6 - Type 6 (Not Available)
- 7 - Type 7 (Not Available)
- 8 - (DO NOT USE)
- 9 - Type 9 (Not Available)
- A-F - (DO NOT USE)

Stage 2 Loopback configuration:

Switch 1 is set to 2 to indicate that the stage 2 loopback is being performed.

SWITCH 2 Fuel Filter Type:

0 - Injector
1 - Carburetor

SWITCH 3	AND SWITCH 4	CORRECTION For SSEC/PSEC Select:	F/ADC Software Version:
0	0	- No correction	ALL
0	1	- MITSUBISHI MU-300	93.00.29 and up
0	2	- CESSNA CITATION 500/501	93.00.29 and up
0	3	- CESSNA 525	93.00.29 and up
0	4	- CESSNA 550	93.00.29 and up
0	5	- Citation 560 SN <=259	93.00.29 and up
0	6	- Citation 560 SN >=260	93.00.29 and up
0	7	- Citation 650	93.00.29 and up
0	8	- Sabreliner 65	93.00.29 and up
0	9	- WestWind 1124A	93.00.29 and up
0	A	- LearJet 24	93.00.29 and up
0	B	- Raytheon Hawker HS 125-3A	93.00.29 and up
0	C	- Falcon 20-F	93.00.29 and up
0	D	- Falcon 20-C, D, E	93.00.29 and up
0	E	- LearJet 25D	93.00.29 and up
0	F	- Douglas DC-8	93.00.58 and up
1	0	- Beechjet 400	93.00.63 and up
1	1	- Boeing 707-321B	93.00.63 and up
1	2	- Cessna Citation S550	93.00.63 and up
1	3	- Falcon 10	93.00.63 and up
1	4	- Falcon 50	93.00.63 and up
1	5	- Raytheon Hawker HS125-700A	93.00.63 and up
1	6	- LearJet 35	93.00.63 and up
1	7	- LearJet 55	93.00.63 and up
1	8	- Sabreliner 60 (SSEC Only)	93.00.63 and up
1	9	- Lockheed Jetstar II	93.00.63 and up
1	A-F	- Reserved for future (DO NOT USE)	

Stage 3 Loopback configuration:

Switch 1 is set to 3 to indicate that the stage 3 loopback is being performed.

SWITCH 2, K-FACTOR TABLE SELECTION:

For F/ADC 962820-1(A) and 962820-2(A) only.

0 - Standard K-FACTOR Matrix 0 - (Table 2 in this manual)
1 - Alternate K-FACTOR Matrix 1- (Table 3 in this manual)
2-F - (DO NOT USE)

SWITCH 3, FUEL FLOW DELAY TIME

0 - No Delay
1 - 5 Second Delay
2 - 10 Second Delay
3 - 15 Second Delay
4 - 20 Second Delay
5 - 25 Second Delay
6 - 30 Second Delay
7 - 35 Second Delay
8 - 40 Second Delay
9 - 45 Second Delay
A-F - (DO NOT USE)

Loopback Procedure 3 for Software Version 93.00.77.

Stage 0 Loopback Configuration:

Switch 1 is set to 0 to indicate that the stage 0 loopback is being performed.

SWITCH 2		Fuel Units and Engine Type:	
0	-	Gallons	Single Engine
1	-	Liters	" "
2	-	Lbs 5.8	" "
3	-	Lbs 6.71	" "
4	-	Kilograms	" "
5	-	Lbs 6.5	" "
6	-	Lbs 6.3	" "
7	-	(not used)	" "
8	-	Gallons	Twin Engine
9	-	Liters	" "
A	-	Lbs 5.8	" "
B	-	Lbs 6.71	" "
C	-	Kilograms	" "
D	-	Lbs 6.5	" "
E	-	Lbs 6.3	" "
F	-	(DO NOT USE)	

SWITCH 3		9600 BAUD Loran Input Type:
0	-	Trimble
1	-	ARNAV
2	-	Bendix or IIMorrow Apollo NMS2001, 800, 820
3	-	Garmin
4	-	Northstar
5	-	Foster
6	-	IIMorrow 611, 612 and 618
7	-	Shadin Flow Meter
8-E	-	(DO NOT USE)
F	-	Use this position to make selection on SWITCH 4

SWITCH 4		Other Loran Input Type:
0	-	Northstar, 1200 BAUD
1	-	Foster, 1200 BAUD
2	-	IIMorrow 611, 612, 618; 1200 BAUD
3-F	-	(DO NOT USE)

Stage 1 Loopback Configuration:

Switch 1 is set to 1 to indicate that the stage 1 loopback is being performed.

SWITCH 2 OAT Probe Type:

- 0 - Shadin OAT Probe
- 1 - ARINC 575 (DO NOT USE)
- 2 - Rosemount 500 Ω (DO NOT USE)
- 3-F - (DO NOT USE)

SWITCH 3 Loran Output Type:

- 0 - Format Z - Trimble and Garmin
- 1 - Format X - ARNAV
- 2 - Generic
- 3 - Surveyor
- 4 - Bendix C - Bendix/King and F/ADC without Baro Interface
- 5 - Bendix D - Bendix/King and F/ADC with Baro Interface
- 6 - Shadin S - IIMorrow GX50, 55, 60, CNX80
- 7 - Bendix B – (fuel only)
- 8 - Garmin G
- 9-F - (DO NOT USE)

SWITCH 4 Altimeter Selection for Baro DC Input:

- 0 - None (Use this selection)
- 1 - Type 1 (Not Available)
- 2 - Type 2 (Not Available)
- 3 - Type 3 (Not Available)
- 4 - Type 4 (Not Available)
- 5 - Type 5 (Not Available)
- 6 - Type 6 (Not Available)
- 7 - Type 7 (Not Available)
- 8 - (DO NOT USE)
- 9 - Type 9 (Not Available)
- A-F - (DO NOT USE)

Stage 2 Loopback configuration:

Switch 1 is set to 2 to indicate that the stage 2 loopback is being performed.

SWITCH 2 Fuel Filter Type:

0 - Injector
1 - Carburetor

SWITCH 3	AND SWITCH 4	CORRECTION For SSEC/PSEC Select:	F/ADC Software Version:
0	0	- No correction	ALL
0	1	- MITSUBISHI MU-300	93.00.29 and up
0	2	- CESSNA CITATION 500/501	93.00.29 and up
0	3	- CESSNA 525	93.00.29 and up
0	4	- CESSNA 550	93.00.29 and up
0	5	- Citation 560 SN <=259	93.00.29 and up
0	6	- Citation 560 SN >=260	93.00.29 and up
0	7	- Citation 650	93.00.29 and up
0	8	- Sabreliner 65	93.00.29 and up
0	9	- WestWind 1124A	93.00.29 and up
0	A	- LearJet 24	93.00.29 and up
0	B	- Raytheon Hawker HS 125-3A	93.00.29 and up
0	C	- Falcon 20-F	93.00.29 and up
0	D	- Falcon 20-C, D, E	93.00.29 and up
0	E	- LearJet 25D	93.00.29 and up
0	F	- Douglas DC-8	93.00.58 and up
1	0	- Beechjet 400	93.00.63 and up
1	1	- Boeing 707-321B	93.00.63 and up
1	2	- Cessna Citation S550	93.00.63 and up
1	3	- Falcon 10	93.00.63 and up
1	4	- Falcon 50	93.00.63 and up
1	5	- Raytheon Hawker HS125-700A	93.00.63 and up
1	6	- LearJet 35	93.00.63 and up
1	7	- LearJet 55	93.00.63 and up
1	8	- Sabreliner 60 (SSEC Only)	93.00.63 and up
1	9	- Lockheed Jetstar II	93.00.63 and up
1	A-F	- Reserved for future (DO NOT USE)	

Stage 3 Loopback configuration:

Switch 1 is set to 3 to indicate that the stage 3 loopback is being performed.

SWITCH 2, K-FACTOR TABLE SELECTION:

For F/ADC 962820-1(A) and 962820-2(A) only.

0 - Standard K-FACTOR Matrix 0 - (Table 2 in this manual)
1 - Alternate K-FACTOR Matrix 1- (Table 3 in this manual)
2-F - (DO NOT USE)

SWITCH 3, FUEL FLOW DELAY TIME

0 - No Delay
1 - 5 Second Delay
2 - 10 Second Delay
3 - 15 Second Delay
4 - 20 Second Delay
5 - 25 Second Delay
6 - 30 Second Delay
7 - 35 Second Delay
8 - 40 Second Delay
9 - 45 Second Delay
A-F - (DO NOT USE)

Loopback Procedure 4 for Software Version 93.00.82 and above

Stage 0 Loopback Configuration:

Switch 1 is set to 0 to indicate that the stage 0 loopback is being performed.

SWITCH 2		Fuel Units and Engine Type:	
0	-	Gallons	Single Engine
1	-	Liters	" "
2	-	Lbs 5.8	" "
3	-	Lbs 6.71	" "
4	-	Kilograms	" "
5	-	Lbs 6.5	" "
6	-	Lbs 6.3	" "
7	-	(not used)	" "
8	-	Gallons	Twin Engine
9	-	Liters	" "
A	-	Lbs 5.8	" "
B	-	Lbs 6.71	" "
C	-	Kilograms	" "
D	-	Lbs 6.5	" "
E	-	Lbs 6.3	" "
F	-	(DO NOT USE)	

SWITCH 3		9600 BAUD Loran Input Type:
0	-	Trimble
1	-	ARNAV
2	-	Bendix or IIMorrow Apollo NMS2001, 800, 820
3	-	Garmin
4	-	Northstar
5	-	Foster
6	-	IIMorrow 611, 612 and 618
7	-	Shadin Flow Meter
8-E	-	(DO NOT USE)
F	-	Use this position to make selection on SWITCH 4

SWITCH 4		Other Loran Input Type:
0	-	Northstar, 1200 BAUD
1	-	Foster, 1200 BAUD
2	-	IIMorrow 611, 612, 618; 1200 BAUD
3-F	-	(DO NOT USE)

Stage 1 Loopback Configuration:

Switch 1 is set to 1 to indicate that the stage 1 loopback is being performed.

SWITCH 2 OAT Probe Type:

- 0 - Shadin OAT Probe
- 1 - ARINC 575 (DO NOT USE)
- 2 - Rosemount 500 Ω (DO NOT USE)
- 3-F - (DO NOT USE)

SWITCH 3 Loran Output Type:

- 0 - Format Z - Trimble and Garmin
- 1 - Format X - ARNAV
- 2 - Generic
- 3 - Surveyor
- 4 - Bendix C - Bendix/King and F/ADC without Baro Interface
- 5 - Bendix D - Bendix/King and F/ADC with Baro Interface
- 6 - Shadin S - IIMorrow GX50, 55, 60
- 7 - Bendix B – (fuel only)
- 8 - Garmin G
- 9-F - (DO NOT USE)

SWITCH 4 Altimeter Selection for Baro DC Input:

- 0 - None (Use this selection)
- 1 - Type 1 (Not Available)
- 2 - Type 2 (Not Available)
- 3 - Type 3 (Not Available)
- 4 - Type 4 (Not Available)
- 5 - Type 5 (Not Available)
- 6 - Type 6 (Not Available)
- 7 - Type 7 (Not Available)
- 8 - (DO NOT USE)
- 9 - Type 9 (Not Available)
- A - (DO NOT USE)
- B - Type 11 (Not Available)
- C-F - (DO NOT USE)

Stage 2 Loopback configuration:

Switch 1 is set to 2 to indicate that the stage 2 loopback is being performed.

SWITCH 2 Fuel Filter Type:

0 - Injector
1 - Carburetor

SWITCH 3	AND SWITCH 4	CORRECTION For SSEC/PSEC Select:	F/ADC Software Version:
0	0	- No correction	ALL
0	1	- MITSUBISHI MU-300	93.00.29 and up
0	2	- CESSNA CITATION 500/501	93.00.29 and up
0	3	- CESSNA 525	93.00.29 and up
0	4	- CESSNA 550	93.00.29 and up
0	5	- Citation 560 SN <=259	93.00.29 and up
0	6	- Citation 560 SN >=260	93.00.29 and up
0	7	- Citation 650	93.00.29 and up
0	8	- Sabreliner 65	93.00.29 and up
0	9	- WestWind 1124A	93.00.29 and up
0	A	- LearJet 24	93.00.29 and up
0	B	- Raytheon Hawker HS 125-3A	93.00.29 and up
0	C	- Falcon 20-F	93.00.29 and up
0	D	- Falcon 20-C, D, E	93.00.29 and up
0	E	- LearJet 25D	93.00.29 and up
0	F	- Douglas DC-8	93.00.58 and up
1	0	- Beechjet 400	93.00.63 and up
1	1	- Boeing 707-321B	93.00.63 and up
1	2	- Cessna Citation S550	93.00.63 and up
1	3	- Falcon 10	93.00.63 and up
1	4	- Falcon 50	93.00.63 and up
1	5	- Raytheon Hawker HS125-700A	93.00.63 and up
1	6	- LearJet 35	93.00.63 and up
1	7	- LearJet 55	93.00.63 and up
1	8	- Sabreliner 60 (SSEC Only)	93.00.63 and up
1	9	- Lockheed Jetstar II	93.00.63 and up
1	A	- Antonov (AN 12)	93.00.85 and up
1	B	- Antonov (AN 24)	93.00.85 and up
1	C	- Antonov (AN 26)	93.00.85 and up
1	D	- Antonov (AN 30)	93.00.85 and up
1	E	- Yakovlev (YAK 40)	93.00.85 and up

Stage 3 Loopback configuration:

Switch 1 is set to 3 to indicate that the stage 3 loopback is being performed.

SWITCH 2, K-FACTOR TABLE SELECTION:

For F/ADC 962820-1(A) and 962820-2(A) only.

0 - Standard K-FACTOR Matrix 0 - (Table 2 in this manual)
1 - Alternate K-FACTOR Matrix 1- (Table 3 in this manual)
2-F - (DO NOT USE)

SWITCH 3, FUEL FLOW DELAY TIME

0 - No Delay
1 - 5 Second Delay
2 - 10 Second Delay
3 - 15 Second Delay
4 - 20 Second Delay
5 - 25 Second Delay
6 - 30 Second Delay
7 - 35 Second Delay
8 - 40 Second Delay
9 - 45 Second Delay
A-F - (DO NOT USE)

Stage 4 Loopback configuration:

Switch 1 is set to 4 to indicate that the stage 4 loopback is being performed. Refer to the OAT probe calibration certificate for the Ta, Tb, Tc calibration code selection.

SWITCH 2, OAT Ta CALIBRATION CODE SELECTION:

0-F - Refer to calibration certificate for "A" code selection 0 to F.

SWITCH 3, OAT Tb CALIBRATION CODE SELECTION

0-F - Refer to calibration certificate for "B" code selection 0 to F.

SWITCH 4, OAT Tc CALIBRATION CODE SELECTION

0-F - Refer to calibration certificate for "C" code selection 0 to F.

Note: Switch 2, 3, and 4 are set to position 0 (zero), if the OAT probe does not have a calibration code marking, (i.e. A=0, B=0, C=0).

SELECT NO DELAY

Only under special circumstances should a fuel flow delay time other than "No Delay" be selected. Read the following paragraphs for a description of these special circumstances.

On a few aircraft installations which have digital fuel flow and use a very low K factor (858 pulses per gallon), there has been a problem with the Air data reporting a large jump in fuel used as well as a corresponding decrease in fuel remaining at engine startup. This is not considered to be a Shadin Air data problem, but rather has been defined as an aircraft problem involving noise on the digital fuel flow signal.

A solution for this problem is to use the Air data fuel flow delay feature. This feature suppresses the fuel flow (and its affect on fuel used and remaining) for a startup delay time each time the engine starts. Fuel flow delay time is selectable in the Air data loopback mode, with selections of 0, 5, 10, 15, 20, 25, 30, 35, 40, and 45 seconds delay available.

If a fuel flow delay is needed, start by reconfiguring the ADC to use a large delay (i.e. 45 seconds). If the large fuel flow mitigated the problem, try reducing the delay until the problem returns. Then use the least amount of fuel flow delay that suppresses the problem.

When a fuel flow delay time is selected the Air data checks for fuel flow below 15 pph. If the fuel flow is below 15 pph, the Air data considers the engine to be off and returns a fuel flow of 0. Then as soon as the fuel flow exceeds 15 pph, the Air data continues to return a fuel flow of 0 until the delay time has expired. In a twin engine, the Air data zeroes both fuel flows during the startup delay for each engine.

SPECIAL OPTIONS

Only under special circumstance should SPECIAL OPTION 1 be selected. Read the following paragraphs for a description of the special circumstance.

Because the IAS range on the Air data computer is valid from 20 to 350 knots ARINC 429 labels 206 and 210 are transmitted with NCD status and stop being transmitted almost simultaneously if the IAS is less than 20 knots. In order to interface with certain avionics equipment which exhibit warnings if a valid IAS or TAS label is not received, SPECIAL OPTION 1 was implemented.

When the Air data computer is configured with SPECIAL OPTION 1 the Arinc 429 labels 206 and 210 are transmitted with OK status and a value of zero knots if the actual IAS is less than 20 knots.

10.0 SETTING THE K FACTOR

The process of setting the K Factor is needed to match the F/ADC to the aircraft fuel flow system characteristics. To set the K Factor into the F/ADC you must first determine whether it is an Analog, Digital or Sine Fuel Flow unit.

P/N	FUEL FLOW TYPE
962820-1(A)	Digital
962820-2(A)	Sine Wave
962820-3(A)	Analog

Use the switch settings from the appropriate table to set the K Factor.

For Digital or Sine units (P/N (s) 962820-1(A) and -2(A)) use the Digital K Factor Settings Tables.

Switch 1 & 2 selects the left K Factor
Switch 3 & 4 selects the right K Factor

Due to possible fuel flow system peculiarities, switch 1 & 2 and switch 3 & 4 do not necessarily need to be set to the same setting. For a one engine system, use switches 1 & 2.

For Analog units (P/N 962820-3(A)) use the Analog K Factor Settings Table.

Switch 1 & 2 selects the main engine K Factor
Switch 3 & 4 selects the offset.

The offset is simply the value represented by switches 3 & 4 in the Analog K Factor Settings Table below. For example, if you wanted an offset of 0, the switch settings would be 0,0. If you wanted an offset of 416, the switch settings would be 0, 1. If you wanted an offset of 1094, the switch settings would be 0, 4.

Configuration is now complete.

Analog K Factor Settings Table

Standalone Air data MKII Analog Fuel Flow Chart							
Manufacturer	Model	SW1	SW2	SW3	SW4	K-Factor	Offset
Beech	KingAir B200	0	0	0	1	77000	416
Beech	KingAir A100	0	1	0	2	26150	875
Beech	KingAir C90	0	1	0	2	26150	875
Beech	KingAir F90	0	0	0	1	77000	416
Beech	KingAir C90A	0	0	0	1	77000	416
Beech	KingAir 200	0	0	0	1	77000	416
Beech	BeechJet	0	2	0	0	11540	0
Beech	KingAir B100	0	3	0	2	26150	875
Beech	Beech 600	0	4	0	0	38460	0
Beech	Beech 750	0	5	0	0	30770	0
Beech	Beech 800	0	6	0	0	28850	0
Cessna	Citation, Ametek Gauge 02C208E	0	C	0	0	16270	0
Cessna	Citation, Simmons Gauge 393002-009	1	C	0	0	14300	0
Cessna	Citation II/SII	0	C	0	0	16270	0
Cessna	Citation III	0	D	0	4	9620	1094
Cessna	Model 525	0	E	0	0	21980	0
Piper	Cheyenne III	1	9	0	0	41960	0
Piper	Cheyenne IV	1	1	0	0	46150	0
LearJet	LearJet	0	7	0	0	15380	0
LearJet	Model 36 (5V)	0	2	0	0	11540	0
LearJet	Model 36 (10V)	0	8	0	0	23080	0
Boeing	Boeing-737-300	0	9	0	3	1790	0
British Aero	BAE ATP	0	7	0	0	15380	0
British Aero	BAE-125-800	0	A	0	0	8240	378
British Aero	HS-125	0	B	0	0	10490	0
Canadian	CL600	0	F	0	0	6590	0
Canadian	CL601	1	0	0	0	5130	0
Dornier	DO-228	1	1	0	0	46150	0
Daussault	FALCON 10	0	2	0	0	11540	0
Daussault	FALCON 20	1	2	0	0	7690	0
Daussault	TFE-371	1	2	0	0	7690	0
Swearngen	MERLIN	0	4	0	0	38460	0
Gulfstream	GULFSTREAM II	1	3	0	0	2880	0
Gulfstream	GULFSTREAM III	1	4	0	0	2310	0
Aerospatiale	PUMA	1	5	0	0	76920	0
DHC	DHC DASH 8	1	6	0	0	19230	0
IAI	ASTRA 1125	1	7	0	5	9230	2188
IAI	WESTWIND 1124	1	8	0	0	10490	0
Sikorsky	S-76A	1	1	0	0	46150	0
Sikorsky	S-76B	0	6	0	0	28850	0
Sabre	SABRE 65	1	7	0	5	9230	2188

Table 1

Matrix 0 - Digital K Factor Settings

PPG	SW1	SW2	PPG	SW1	SW2	PPG	SW1	SW2
860	D	D	8800	5	0	15300	E	F
5000	6	B	9000	5	1	18000	3	0
5050	6	C	9200	5	2	18200	3	1
5100	6	D	9400	5	3	18400	2	2
5150	6	E	9600	5	4	18600	3	3
5200	6	F	9800	5	5	18800	3	4
5250	7	0	10000	5	6	19000	3	5
5300	7	1	10100	5	7	19200	3	6
5600	6	0	10200	5	8	19400	3	7
5650	6	1	10300	5	A	19600	3	8
5700	6	2	10400	5	B	19800	3	9
5750	6	3	10500	5	C	20000	3	A
5800	6	4	10600	5	D	20200	3	B
5850	6	5	10700	5	E	20400	3	C
5900	6	6	10800	5	F	20600	3	D
5950	6	7	10900	D	6	20800	3	E
6000	6	8	11000	D	7	21000	3	F
6380	C	B	11100	D	8	21200	4	0
6400	C	C	11200	D	9	21400	4	1
6420	C	D	11300	D	A	21600	4	2
6440	C	E	11400	D	B	21800	4	3
6460	C	F	11500	D	C	22000	4	4
6480	D	0	14500	D	E	22200	4	5
6500	D	1	14600	D	F	22400	4	6
6520	D	2	14700	E	9	22600	4	7
6540	D	3	14800	E	A	22800	4	8
6560	D	4	14900	E	B	23000	4	9
6580	D	5	15000	E	C	23200	4	A
6660	6	A	15100	E	D	23400	4	B
7640	5	9	15200	E	E	23600	4	C

Table 2

Matrix 0 - Digital K Factor Settings (Continued)

PPG	SW1	SW2	PPG	SW1	SW2	PPG	SW1	SW2
23800	4	D	29800	F	B	40000	9	4
24000	4	E	30000	F	C	40200	9	5
24200	4	F	30200	F	D	40400	9	6
24400	B	A	30400	F	E	40600	9	7
24600	B	B	33800	6	9	40800	9	D
24800	B	C	37000	B	9	41000	9	E
25000	B	D	37200	B	8	41200	9	F
25200	B	E	37400	B	7	41400	1	0
25400	B	F	37600	B	6	41600	1	1
25600	C	0	37800	B	5	41800	1	2
25800	C	1	38000	8	0	42000	1	3
26000	C	2	38100	8	1	42200	1	4
26200	C	4	38200	8	2	42400	1	5
26400	C	5	38300	8	3	42600	1	6
26600	C	6	38400	8	4	42800	1	7
26800	C	7	38500	8	5	43000	1	8
27000	C	8	38600	8	6	43200	1	9
27200	C	9	38700	8	7	43400	1	A
27400	C	A	38800	8	8	43600	1	B
27600	F	0	38900	8	9	43800	1	C
27800	F	1	39000	8	A	44000	1	D
28000	F	2	39100	8	B	44200	1	E
28200	F	3	39200	8	C	44400	1	F
28400	F	4	39300	8	D	44600	2	0
28600	F	5	39400	8	E	44800	2	1
28800	F	6	39500	8	F	45000	2	2
29000	F	7	39600	9	0	45200	2	3
29200	F	8	39700	9	1	45400	2	4
29400	F	9	39800	9	2	45600	2	5
29600	F	A	39900	9	3	45800	2	6

Table 2 continued

Matrix 0 - Digital K Factor Settings (Continued)

PPG	SW1	SW2	PPG	SW1	SW2	PPG	SW1	SW2
46000	2	7	57700	A	7	93000	7	2
46200	2	8	57800	A	8	94000	7	3
46400	2	9	57900	A	9	95000	7	4
46600	2	A	58000	A	A	96000	7	5
46800	2	B	58100	A	B	97000	7	6
47000	2	C	58200	A	C	98000	7	7
47200	2	D	58300	A	D	99000	7	8
47400	2	E	58400	A	E	100000	7	9
47600	2	F	58500	A	F	101000	7	A
49000	9	8	58600	B	0	102000	7	B
49100	9	9	58700	B	1	103000	7	C
49200	9	A	58800	B	2	104000	7	D
49300	9	B	58900	B	3	105000	7	E
49400	9	C	60000	B	4	106000	7	F
49500	E	2	77000	0	0			
49700	E	3	78000	0	1			
50000	E	4	79000	0	2			
50200	E	5	80000	0	3			
50400	E	6	81000	0	4			
50500	E	7	82000	0	5			
50800	E	8	83000	0	6			
55500	C	3	84000	0	7			
55550	F	F	85000	0	8			
57000	A	0	86000	0	9			
57100	A	1	87000	0	A			
57200	A	2	88000	0	B			
57300	A	3	89000	0	C			
57400	A	4	90000	0	D			
57500	A	5	91000	0	E			
57600	A	6	92000	0	F			

Table 2 continued

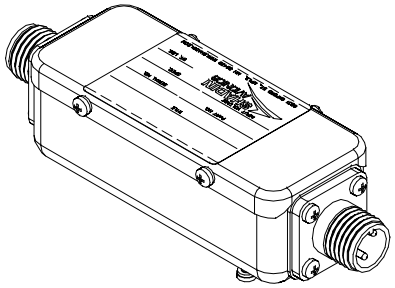
Matrix 1 - Alternate Digital K-Factor Setting Table (software version 93.00.61+)

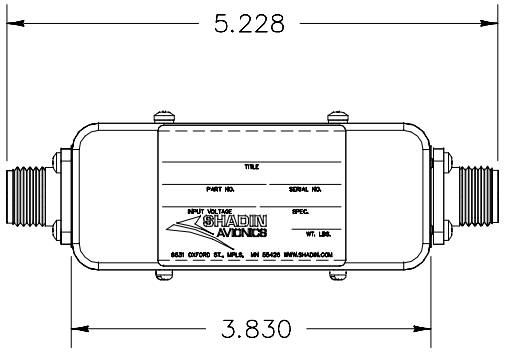
PPG	SW1	SW2	PPG	SW1	SW2	PPG	SW1	SW2
200	1	0	1940	8	0	16100	4	E
400	1	1	2000	3	D	16300	4	F
440	1	2	2200	3	E	16500	5	0
490	1	3	2400	3	F	16600	5	1
510	1	4	2600	4	0	16800	5	2
520	1	5	2800	4	1	17000	5	3
530	1	6	3000	4	2	17200	5	4
540	1	7	3200	4	3	17400	5	5
550	1	8	3400	4	4	17600	5	6
560	1	9	3600	4	5	17800	5	7
570	1	A	3610	0	0	30600	6	3
580	1	B	3650	0	1	30800	6	4
590	1	C	3690	0	2	31000	6	5
600	1	D	3730	0	3	31200	6	6
610	1	E	3760	0	4	31400	6	7
620	1	F	3800	0	5	31600	6	8
630	2	0	3800	4	6	31800	6	9
640	2	1	3840	0	6	32000	6	A
650	2	2	3880	0	7	32200	6	B
660	2	3	3920	0	8	32400	6	C
670	2	4	3960	0	9	32600	6	D
680	2	5	4000	0	A	32800	6	E
690	2	6	4000	4	7	33000	6	F
700	2	7	4040	0	B	33200	7	0
710	2	8	4080	0	C	33400	7	1
720	2	9	4120	0	D	33600	7	2
730	2	A	4160	0	E	34000	7	3
740	2	B	4200	0	F	34200	7	4
750	2	C	4200	4	8	34400	7	5
760	2	D	4400	4	9	34600	7	6
770	2	E	4700	4	A	34800	7	7
780	2	F	11700	5	8	35000	7	8
790	3	0	11900	5	9	35200	7	9
800	3	1	12100	5	A	35400	7	A
810	3	2	12400	5	B	35600	7	B
820	3	3	12600	5	C	35800	7	C
840	3	4	12800	5	D	36000	7	D
850	3	5	13000	5	E	36400	7	E
880	3	6	13500	5	F	36800	7	F
900	3	7	14000	6	0			
1000	3	8	14200	6	1			
1200	3	9	14400	6	2			
1400	3	A	15500	4	B			
1600	3	B	15700	4	C			
1800	3	C	15900	4	D			

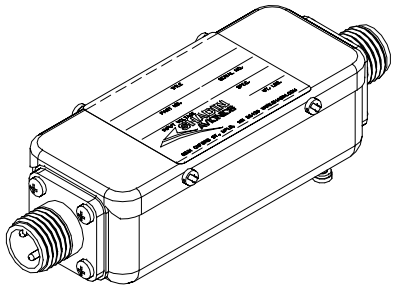
Table 3

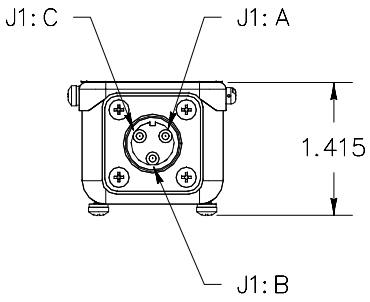
SECTION 11.0

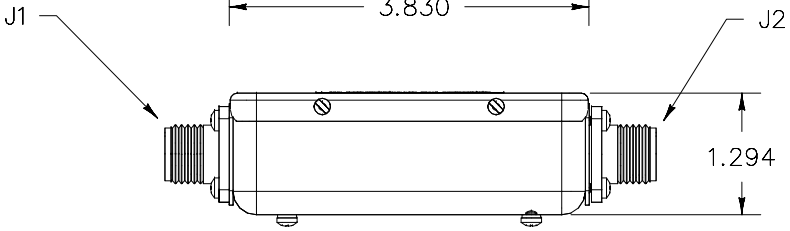
INSTALLATION DRAWINGS AND INSTALL KIT PARTS LISTS

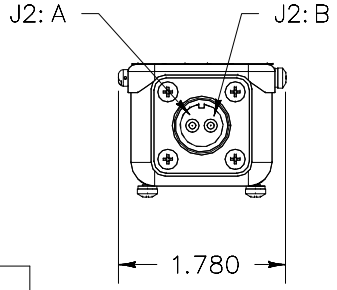












CONNECTIVITY TABLE		
PIN	J1	J2
A	FUEL FLOW POWER INPUT	AC FUEL FLOW SIGNAL
B	FUEL FLOW SIGNAL	AC FUEL FLOW SIGNAL
C	FUEL FLOW GROUND	N/A

NOTES:

1. ALL DIMENSIONS FOR REFERENCE ONLY.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
1003/001	B	3/3/10	HWL	HWL	UPDATED LABEL TO SHOW CURRENT COMPANY LOGO
0211/004	A	3/3/03	PAB	BAL	ADDED DIMENSIONS & ISOMETRIC VIEW; REDRAWN
9508/053	–	8/30/95	DDF	SES	BASELINE RELEASE

3D CAD FILE AVAIL: YES SCALE: 1 : 2

DRAWING DATE 6/8/95
DRAFTER DDF
APPROVED SES
FILE NAME 631201BJ.DWG
DIRECTORY 631201
SHEET 1 OF 1

SHADIN AVIONICS
MINNEAPOLIS, MN 55426

INSTALLATION, SINE WAVE TO SQUARE WAVE CONVERTER

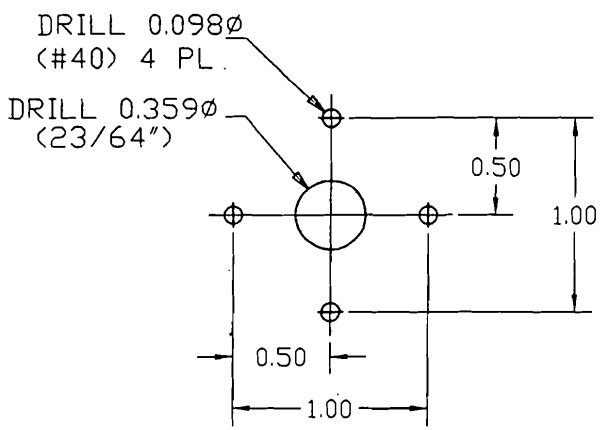
DRAWING NO. 4005-642 | SIZE A | P/N 631201 | REV B

NOTES:

1. REFERENCE P/N 681201-1 OAT PROBE ASSEMBLY KIT
2. AVOID INSTALLING OAT PROBE IN OR NEAR:
   - PROP AIRSTREAM
   - ENGINE EXHAUST FLOW PATH
   - CABIN HEATERS EXHAUST FLOW PATH
   - TRANSMITTING ANTENNAS (DME, TXP, COMM.)
   - DARK PAINTED AREAS

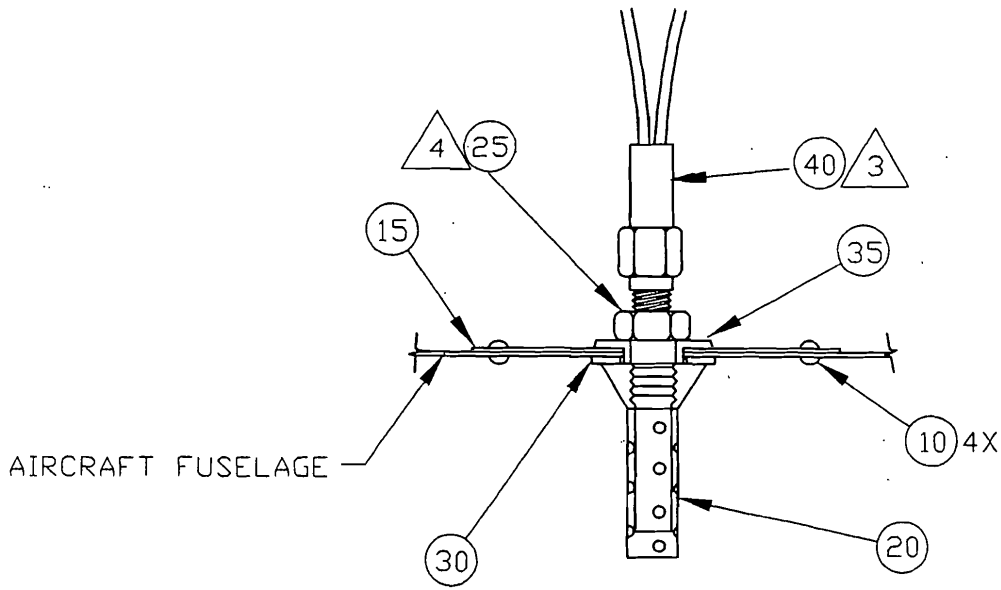
△3 OAT PROBE, P/N 681201

△4 TORQUE NUT, FN 25, TO 1.3 IN-LBS (MAX)



DETAIL A

MOUNTING HOLE DETAIL



ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	C	2-14-05	PAB	[illegible]	UPDATED TITLE BLOCK & NOTE 4; ADDED "KIT" TO TITLE
0111/001	B	11/14/01	PAB	KCL	STANDARDIZED DWG FORMAT TO MIMIC DWG NO. 4012-177
0002/036	A	3/11/96	WMP	PG	CONVERT TO CAD; ADD NOTES 1 AND 3
N/A	-	4/8/91	DAP	SES	BASELINE RELEASE

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES: ±0.01

FINISH: N/A

MATERIAL: N/A

SCALE: NONE

DRAWING DATE: 4/8/91
DRAFTER: DAP
APPROVED: SES
FILE NAME: 681201-1C.IDWG
DIRECTORY: 681201-1
SHEET 1 OF 1

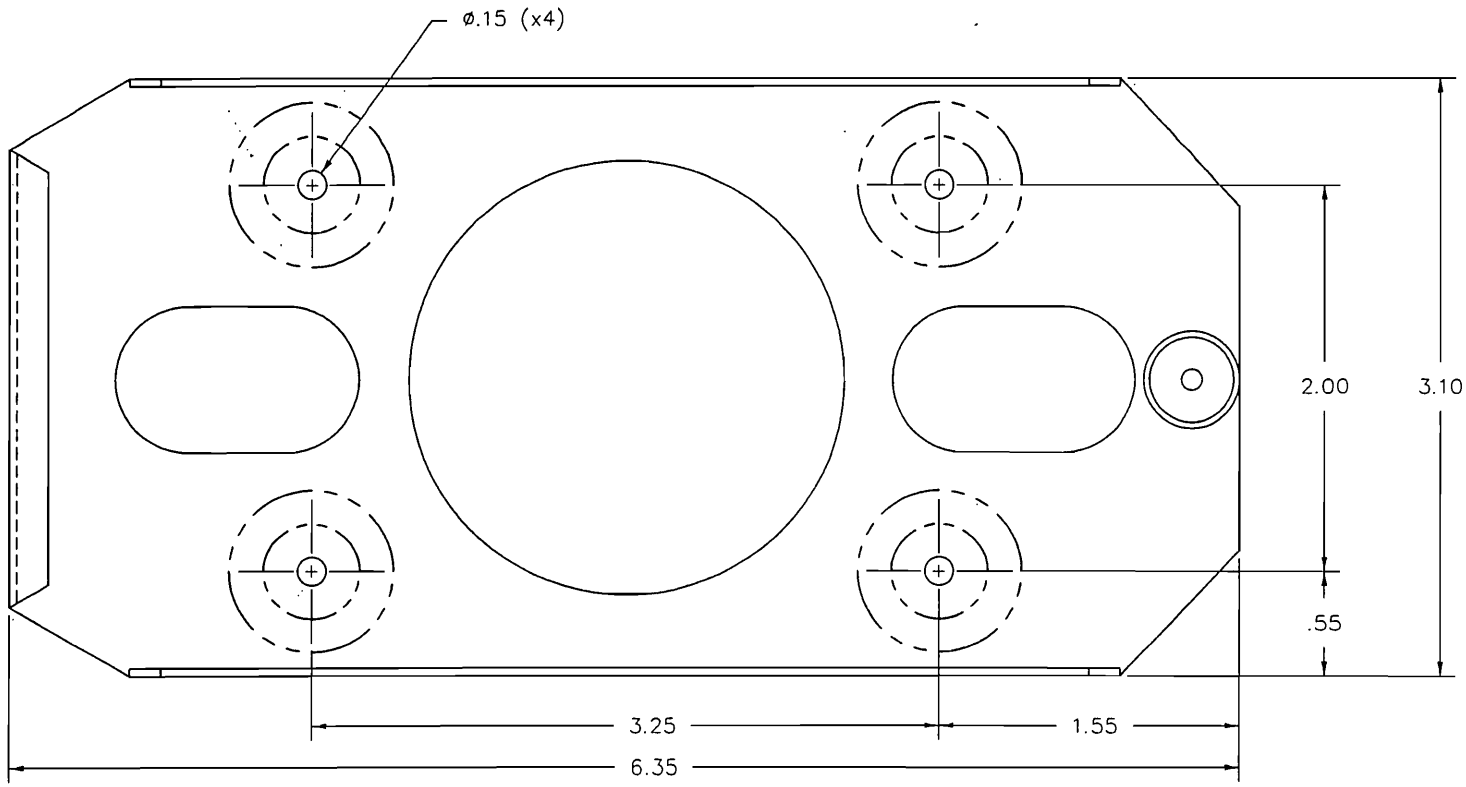
SHADIN MINNEAPOLIS, MN 55426

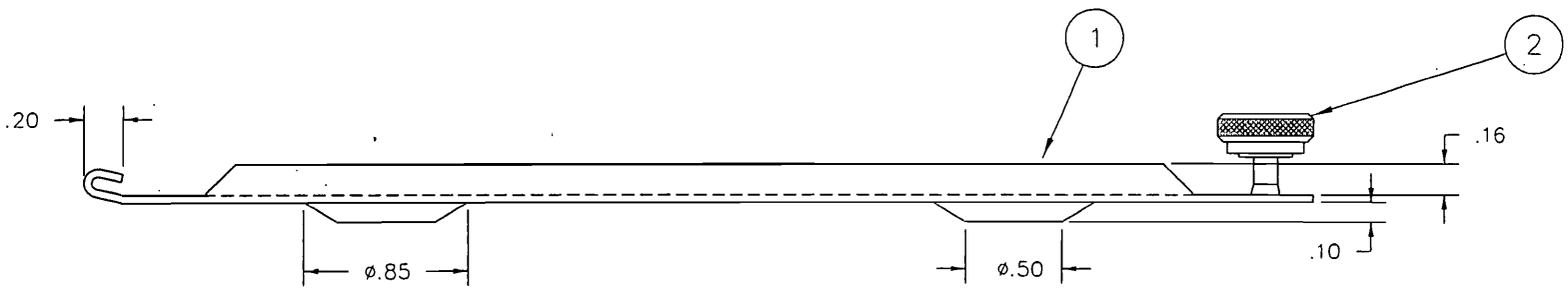
INSTALLATION, OAT PROBE ASSEMBLY KIT

DRAWING NO. 4028-005 | SIZE A | P/N681201-1 | REV C

LIST OF MATERIAL

F/N	QTY	PART NO.	DESCRIPTION
1	1	542801A	MOUNTING TRAY
2	1	512014-1	KNURLED KNOB





MOUNTING HARDWARE REQUIRED: QTY

(AN526-632-8) SCREWS	4
(AN960-6) LOCKWASHERS	4
(AN364-632) NUTS	4

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9912/020	B	12/30/99	LJM	KCL	ADDED P/N TO TITLE BLOCK
9902/020	A	3/2/99	CMG	PG	UPDATED TRAY USED
-	-	10/12/94	DAP	SES	BASELINE RELEASE

3D CAD FILE AVAIL: YES

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES: X.X - ±0.1
X/X ± 1/64 X.XX - ±0.01
∠ - ±1° X.XXX - ±0.005

FINISH: N/A

MATERIAL: N/A

SCALE: 1 : 1

DRAWING DATE 10/12/94
DRAFTER DAP
APPROVED SES
FILE NAME 542801ABJ.DWG
DIRECTORY 542801A
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION, MOUNTING TRAY

DRAWING NO. 4028-411 | SIZE A | P/N 542801A | REV B

NOTES

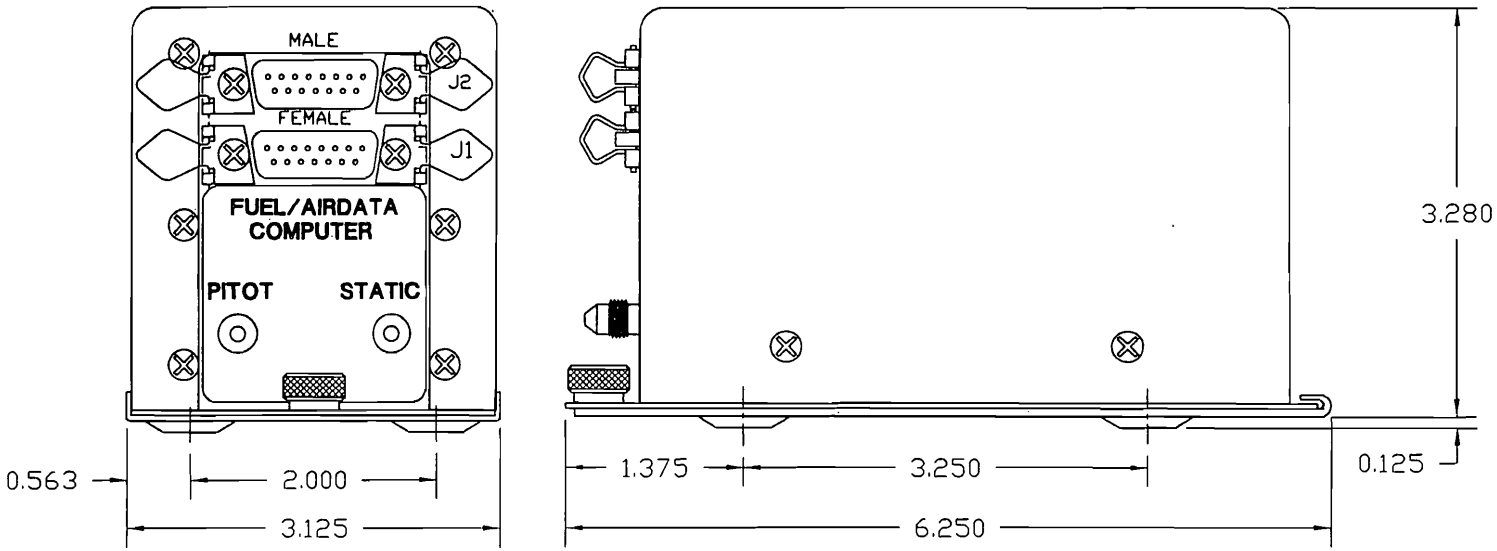
1. USE RS-232 OR RS-422, BUT NOT BOTH.
2. ALL DIMENSIONS ARE REFERENCE ONLY.

J1 PINOUT

1. FUEL FLOW, RIGHT - POWER
2. FUEL FLOW, RIGHT - SIGNAL
3. FUEL FLOW RIGHT - GROUND
4. HEADING Y
5. HEADING X
6. 26V 400Hz, H
7. 26V 400Hz, Z, C
8. NC
9. FUEL FLOW, LEFT - POWER
10. FUEL FLOW, LEFT - SIGNAL
11. FUEL FLOW LEFT - GROUND
12. NC
13. NC
14. OAT - (Signal)
15. OAT + (+5V)

J2 PINOUT

1. 12 - 28v DC POWER INPUT
2. NC
3. RX+, RS-422
4. RX-, RS-422 (1)
5. RX, RS-232 (1)
6. TX, RS-232
7. NC
8. NC
9. GROUND
10. NC
11. TX+, RS-422 (1)
12. TX-, RS-422 (1)
13. NC
14. SIGNAL GND
15. NC



MATING CONNECTORS:

P2
230050 - CONN, SHELL, FEMALE
230055 - CONN, PINS, FEMALE
230038 - CONN, HOOD, 15 PIN

P1
230051 - CONN, SHELL, MALE
230054 - CONN, PINS, MALE
230038 - CONN, HOOD, 15 PIN

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9506/011	-	8/31/95	WMP	SES	BASELINE RELEASE

SCALE: NONE

DRAWING DATE 2/16/95
DRAFTER WMP
APPROVED SES
FILE NAME 962820-1-J.DWG
DIRECTORY 962820
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION, ADC200 FREQ/LEVEL INT FF

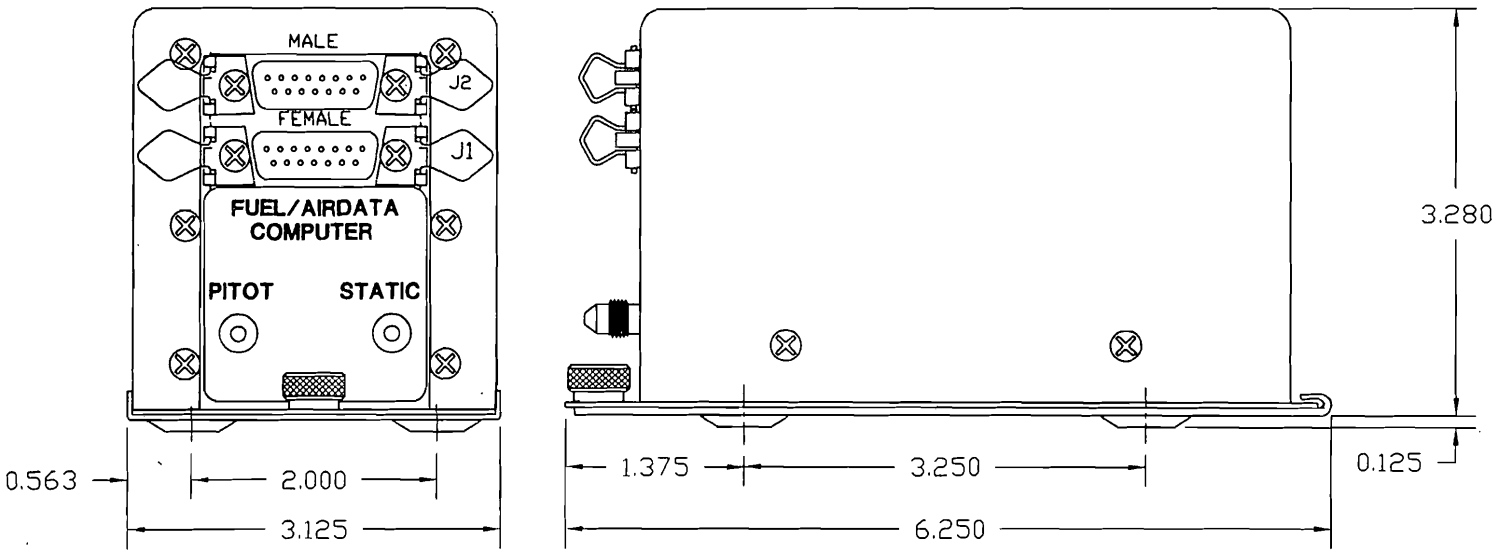
DRAWING NO. 4028-604 | SIZE A | P/N 962820-1 | REV —

NOTES

1. USE RS-232 OR RS-422, BUT NOT BOTH.
2. ALL DIMENSIONS ARE REFERENCE ONLY.

J1 PINOUT
1. FUEL FLOW, RIGHT - (-)
2. FUEL FLOW, RIGHT - (+)
3. FUEL FLOW RIGHT - GROUND
4. HEADING Y
5. HEADING X
6. 26V 400Hz, H
7. 26V 400Hz, Z, C
8. NC
9. FUEL FLOW, LEFT - (-)
10. FUEL FLOW, LEFT - (+)
11. FUEL FLOW LEFT - GROUND
12. NC
13. NC
14. OAT - (Signal)
15. OAT + (+5V)

J2 PINOUT
1. 12 - 28v DC POWER INPUT
2. NC
3. RX+, RS-422
4. RX-, RS-422 (1)
5. RX, RS-232 (1)
6. TX, RS-232
7. NC
8. NC
9. GROUND
10. NC
11. TX+, RS-422 (1)
12. TX-, RS-422 (1)
13. NC
14. SIGNAL GND
15. NC



MATING CONNECTORS:

P2
230050 - CONN, SHELL, FEMALE
230055 - CONN, PINS, FEMALE
230038 - CONN, HOOD, 15 PIN

P1
230051 - CONN, SHELL, MALE
230054 - CONN, PINS, MALE
230038 - CONN, HOOD, 15 PIN

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9506/011	-	8/31/95	WMP	SES	BASELINE RELEASE

SCALE: NONE

DRAWING DATE	2/16/95
DRAFTER	WMP
APPROVED	SES
FILE NAME	962820-2-J.DWG
DIRECTORY	962820
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION, ADC200 SINEWAVE FF

DRAWING NO.	SIZE	P/N	REV
4028-605	A	962820-2	—

NOTES

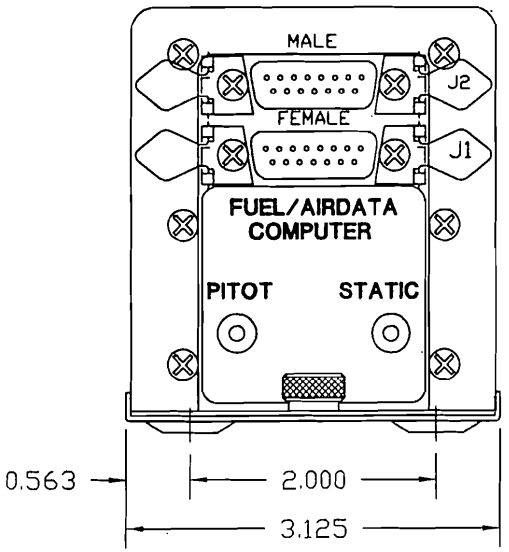
1. USE RS-232 OR RS-422, BUT NOT BOTH.
2. ALL DIMENSIONS ARE REFERENCE ONLY.

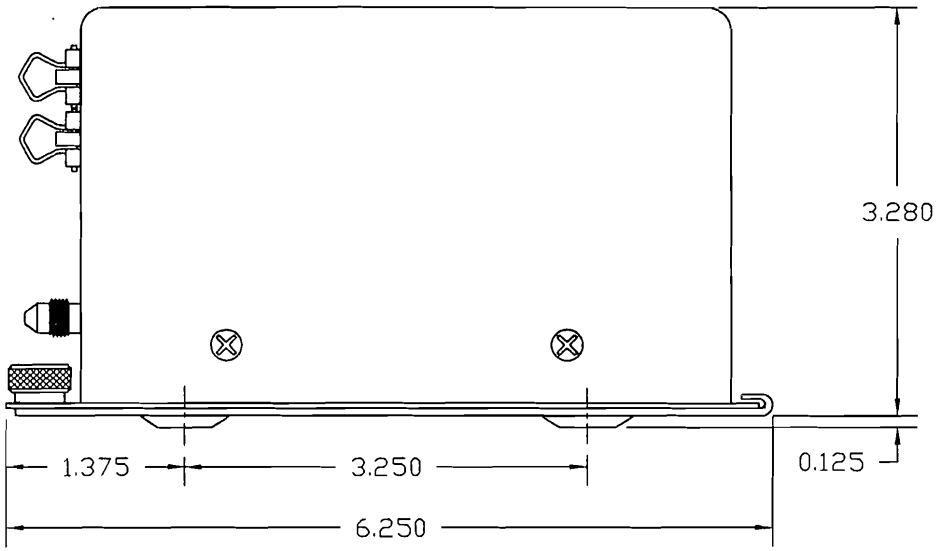
J1 PINOUT

1. FUEL FLOW, RIGHT - (-)
2. FUEL FLOW, RIGHT - (+)
3. FUEL FLOW RIGHT - GROUND
4. HEADING Y
5. HEADING X
6. 26V 400Hz, H
7. 26V 400Hz, Z, C
8. NC
9. FUEL FLOW, LEFT - (-)
10. FUEL FLOW, LEFT - (+)
11. FUEL FLOW LEFT - GROUND
12. NC
13. NC
14. OAT - (Signal)
15. OAT + (+5V)

J2 PINOUT

1. 12 - 28v DC POWER INPUT
2. NC
3. RX+, RS-422
4. RX-, RS-422 (1)
5. RX, RS-232
6. TX, RS-232
7. NC
8. NC
9. GROUND
10. NC
11. TX+, RS-422 (1)
12. TX-, RS-422
13. NC
14. SIGNAL GND
15. NC





MATING CONNECTORS:

P2
230050 - CONN, SHELL, FEMALE
230055 - CONN, PINS, FEMALE
230038 - CONN, HOOD, 15 PIN

P1
230051 - CONN, SHELL, MALE
230054 - CONN, PINS, MALE
230038 - CONN, HOOD, 15 PIN

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9506/011	-	8/31/95	WMP	SES	BASELINE RELEASE

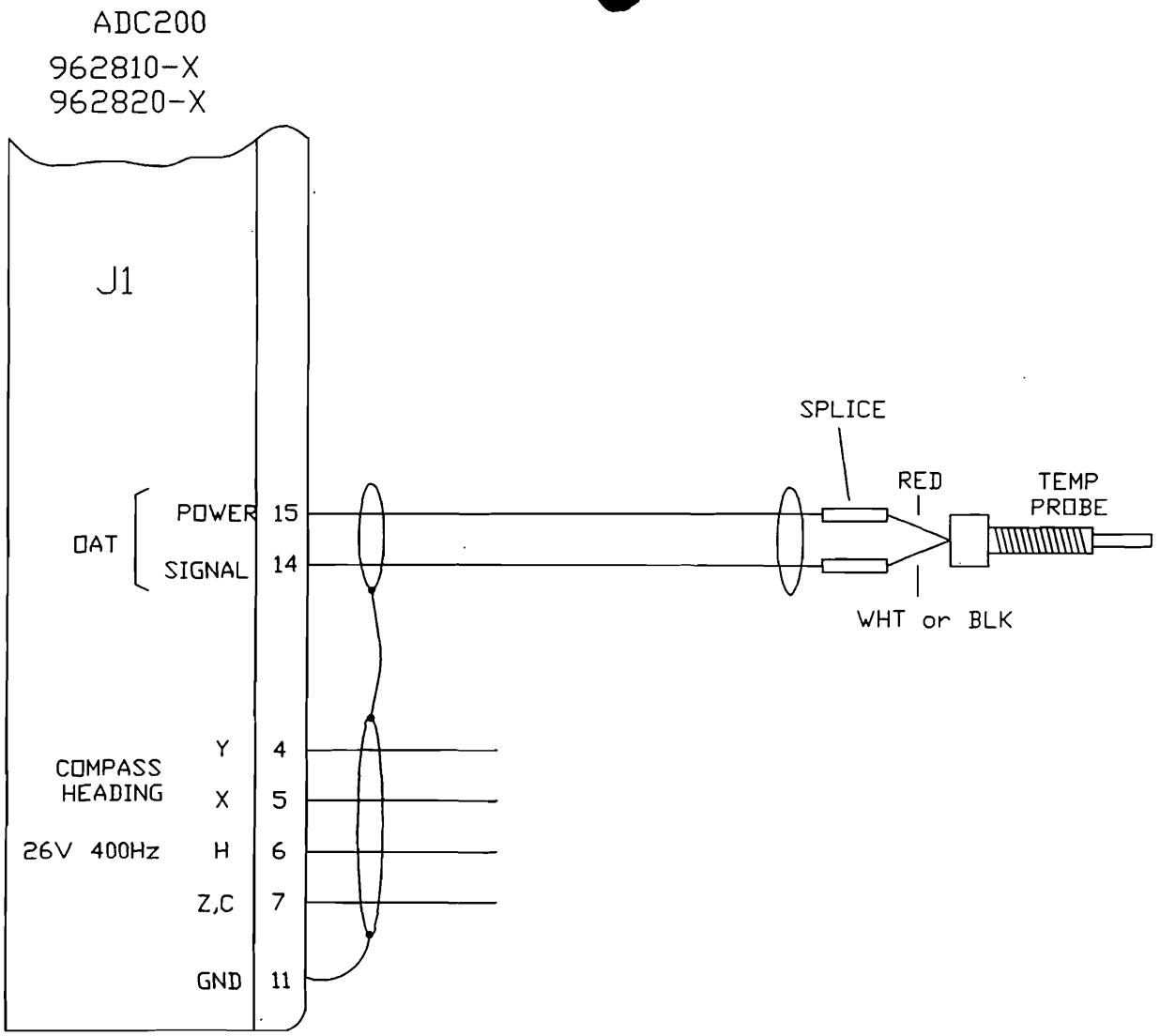
SCALE: NONE

DRAWING DATE	2/16/95
DRAFTER	WMP
APPROVED	SES
FILE NAME	962820-3-J.DWG
DIRECTORY	962820
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION, ADC200 DC FF

DRAWING NO.	SIZE	P/N	REV
4028-606	A	962820-3	—



ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9509/015	A	9/13/95	WMP	SES	ADD GND
9506/011	-	8/31/95	WMP	SES	BASELINE RELEASE

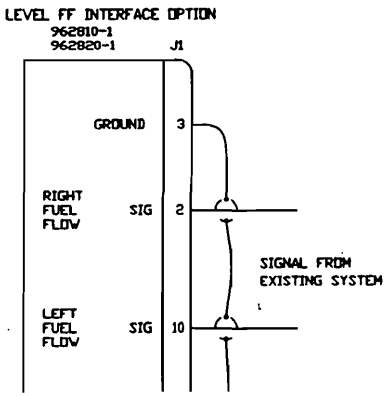
SCALE: NONE

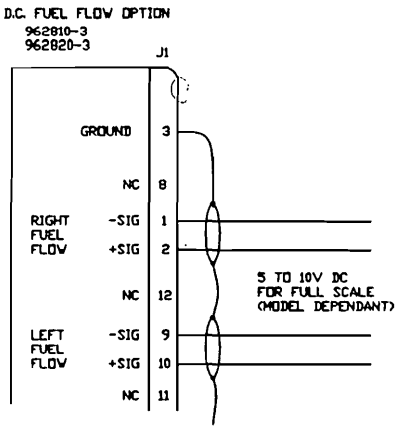
DRAWING DATE 12/6/94
DRAFTER WMP
APPROVED SES
FILE NAME 4028-607AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

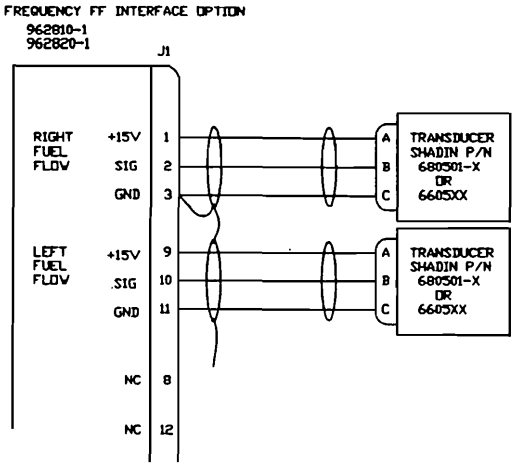
SHADIN MINNEAPOLIS, MN 55426

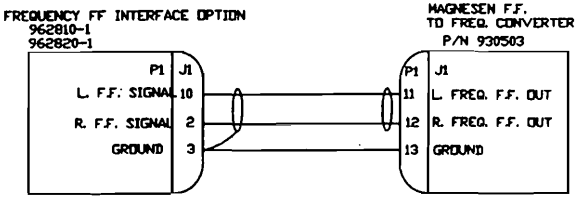
INSTALLATION WIRING, FUEL AIRDATA COMPUTER (ADC200) TO OAT/HEADING SYSTEM

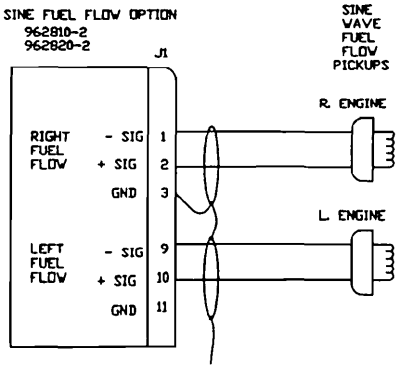
DRAWING NO. 4028-607 | SIZE A | P/N | REV A

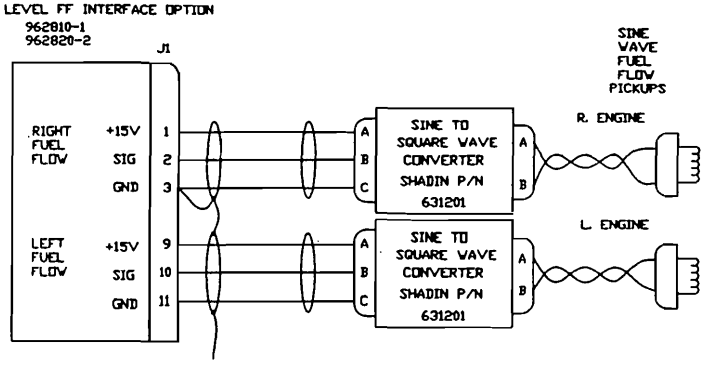












ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
9509/015	A	9/13/95	WMP	SES	CORRECT P/N ON LEVEL FF INTERFACE OPTION
9506/011	-	8/31/95	WMP	SES	BASELINE RELEASE

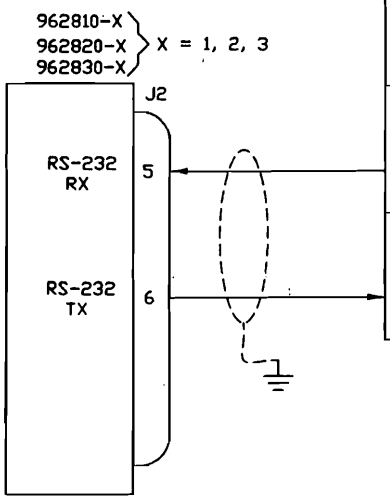
SCALE: NONE

DRAWING DATE 12/6/94
DRAFTER WMP
APPROVED SES
FILE NAME 4028-608AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, FUEL/AIRDATA COMPUTER (ADC200) TO FUEL SYSTEM

DRAWING NO. 4028-608 | SIZE A | P/N | REV A



CNX 80	GARMIN 430, 530	BENDIX/ KING KLN90 KLN90B	BENDIX/ KING KLN89	GARMIN 150, 155, 155XL, 165, 250, 250XL 300, 300XL	LNS 6000	BENDIX/ KING KLN 900	FOSTER 7000	IIMORROW 360	IIMORROW NMS2001	IIMORROW 820	IIMORROW GX 50, 60	ARNAV FMS7000, R5000 STAR5000	MAGELLAN SKYNAV 5000 A	MAGELLAN SKYNAV 5000 B	IIMORROW GX 55
TX 22	TX 56	TX 13	TX 2	TX 24	TX 25	TX 6	TX A	TX 8/1	TX (SOFTWARE SELECT) 19/37	TX 6	TX 5	TX 3	TX 12	TX 25	TX 6
RX 21	RX 57	RX 36	RX 1	RX 17	RX 26	RX 38	RX R	RX 20/14	RX 21/38	RX 7	RX 4	RX 4	RX 11	RX 23	RX 7

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/006	C	11/7/05	PAB	ZdL	ADDED CNX 80
0211/047	B	2/7/03	PAB	BAL	DEL PIN 9, ADDED GND
0009/006	A	9/6/00	PAB	EDJ	ADD GARMIN 430/530 GPS
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

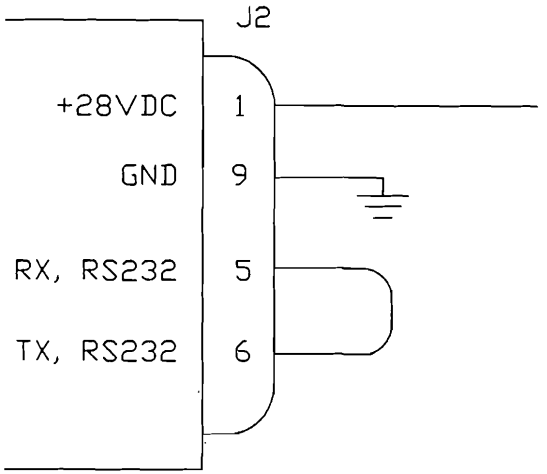
NOT TO SCALE

DRAWING DATE 3/25/98
DRAFTER SRB
APPROVED PAB
FILE NAME 4028-943CJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000
TO NAV RECEIVERS W/RS-232

DRAWING NO. 4028-943 | SIZE A | P/N ——— | REV C



NOTES:

1. CONSULT INSTALLATION MANUAL FOR F/ADC PROGRAMMING INSTRUCTIONS.
2. MATING CONNECTOR: 15 PIN FEMALE D-SUB (SHADIN PN 230050C) OR EQUIVALENT

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0509/028	C	9/19/05	PAB	[illegible]	CORRECTED PIN OUT J2:5 & 6; EDITED NOTE 2
0501/032	B	2/14/05	PAB	WMP	UPDATED TITLE BLOCK
9809/022	A	9/28/98	DLR	KCL	CORRECTED PIN OUT
9803/025	-	3-26-98	SRB	KCL	BASELINE RELEASE

NOT TO SCALE

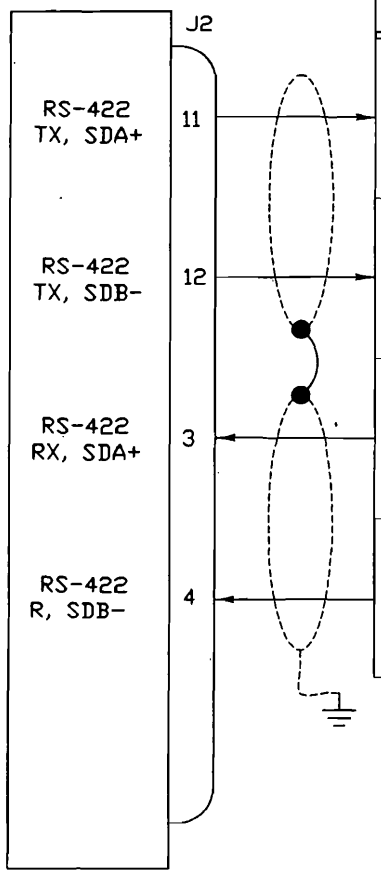
DRAWING DATE	3/25/98
DRAFTER	SRB
APPROVED	KCL
FILE NAME	4028-944CJ.DWG
DIRECTORY	4028
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, LOOP BACK HARNESS FOR F/ADC200, 2000, D-SUB CONNECTOR

DRAWING NO.	SIZE	P/N	REV
4028-944	A	———	C

962810-X
962820-X
962830-X
} X = 1, 2, 3



	TRIMBLE 1000, 2000, 3000	TRIMBLE 2100, 2101, 3100	NORTSTAR M1A M2 M3 60/600
RS-422 TX, SDA+ 11	RX, SDA+ 16	RX, SDA+ 7	N/A
RS-422 TX, SDB- 12	RX, SDB- 4	RX, SDB- 8	N/A
RS-422 RX, SDA+ 3	TX, SDA+ 15	TX, SDA+ 37	TX, SDA+ 11
RS-422 R, SDB- 4	TX, SDB- 3	TX, SDB- 5	TX, SDB- 6

NOT TO SCALE

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0211/047	A	3/11/03	PAB	BAL	DEL PIN 9; ADDED GND
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

DRAWING DATE 3/25/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-946AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

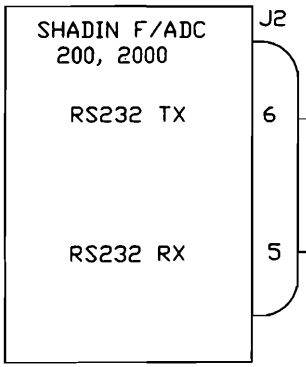
SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000
TO NAV RECEIVERS W/RS-422, RS-485

DRAWING NO. 4028-946 | SIZE A | P/N ——— | REV A

BENDIX/KING

KLN90,A,B	KLN89	KLN900
P901	P891	P9002
36	1	38
13	2	6



SHADIN FUEL FLOW METER

DIGIFLO P/N 91053XT	DIGIFLO P/N 91053XP	MINIFLO P/N 91204X	MICROFLO 91204XT-38D
J	5	6	6
H	12	9	9

NOTES:

1. CONFIGURE SHADIN F/ADC 200 I/O FOR FLOWMETER/BENDIX C.
2. CONFIGURE SHADIN F/ADC 2000 I/O FOR FLOWMETER/BENDIX C OR FLOWMETER/BENDIX D IF USING THE BARO-METRIC INTERFACE.
3. CONFIGURE SHADIN FUEL FLOW METER I/O FOR ON/AIRDATA.
4. FUEL FLOW TRANSDUCER SIGNAL(S) ARE CONNECTED TO THE SHADIN FUEL FLOW METER. NO FUEL SIGNAL CONNECTION TO THE ADC.
5. MINIMUM SOFTWARE LEVEL:
   - DIGIFLO 60.10.77
   - MINIFLO 60.01.77
   - MICROFLO 60.08.77
   - ADC 200/2000 93.XX.77

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0211/047	A	3/11/03	PAB	BAL	ADDED NOTES 4 & 5; ADDED FUEL FLOW METER SW VERSIONS
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

NOT TO SCALE

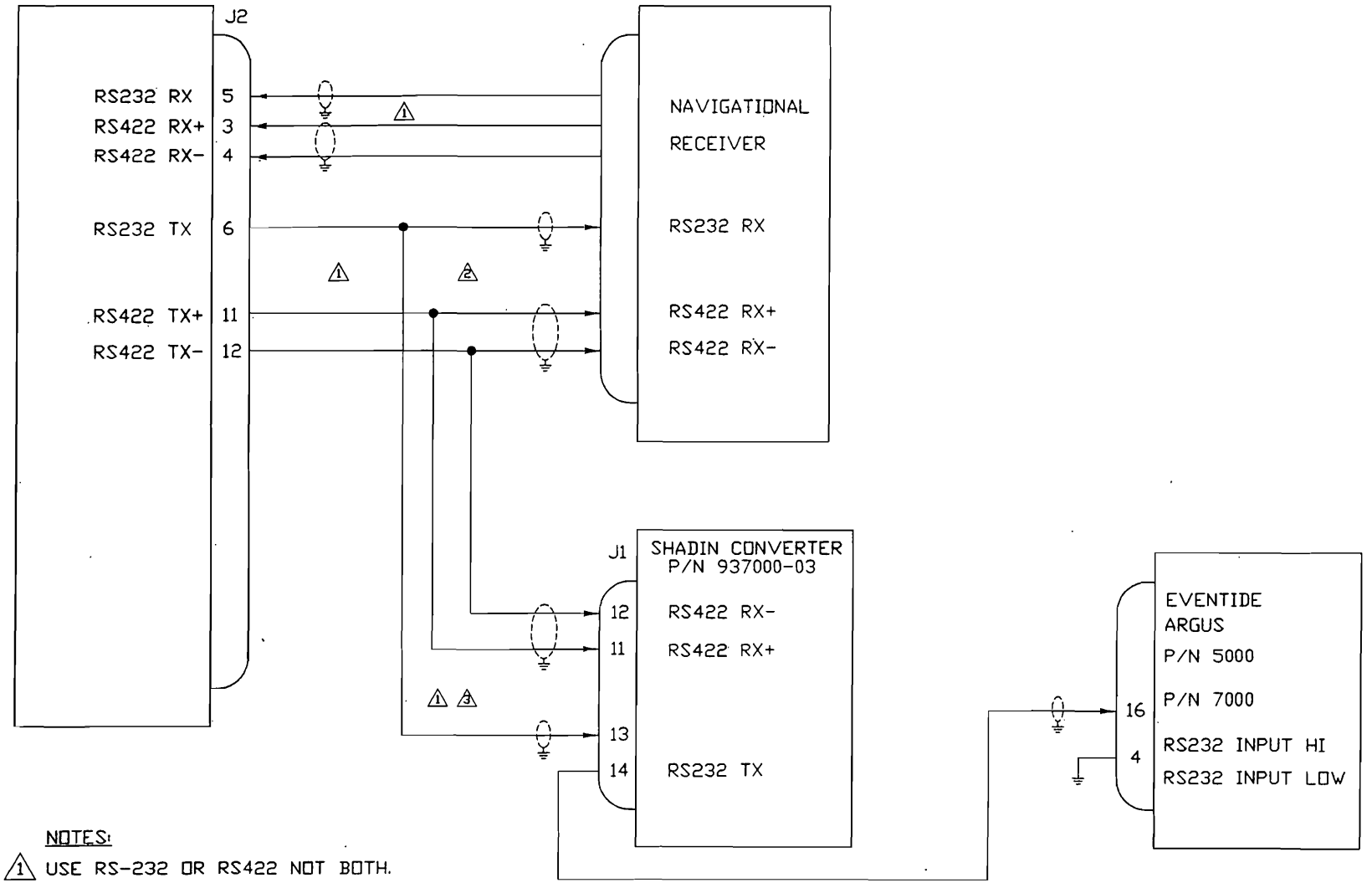
DRAWING DATE 3/25/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-947AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000, SHADIN FUEL FLOW INDICATORS TO BENDIX/KING NAV. RECEIVER.

DRAWING NO. 4028-947 | SIZE A | P/N ——— | REV A

F/A[illegible], 2000
P/N 962810-X
P/N 962820-X } X = 1, 2, 3
P/N 962830-X



NOTES:

1. USE RS-232 OR RS422 NOT BOTH.
2. CONNECT SHADIN CONVERTER P/N 937000-03 IN PARALLEL WITH NAVIGATIONAL RECEIVERS SERIAL DATA INPUT.
3. CONSULT DRAWING NUMBER 4070-005 FOR WIRING AND STRAPPING INFORMATION.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-18-05	PAB	KCL	UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

NOT TO SCALE

DRAWING DATE 3/25/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-948AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000 AND SHADIN CONVERTER TO EVENTIDE ARGUS

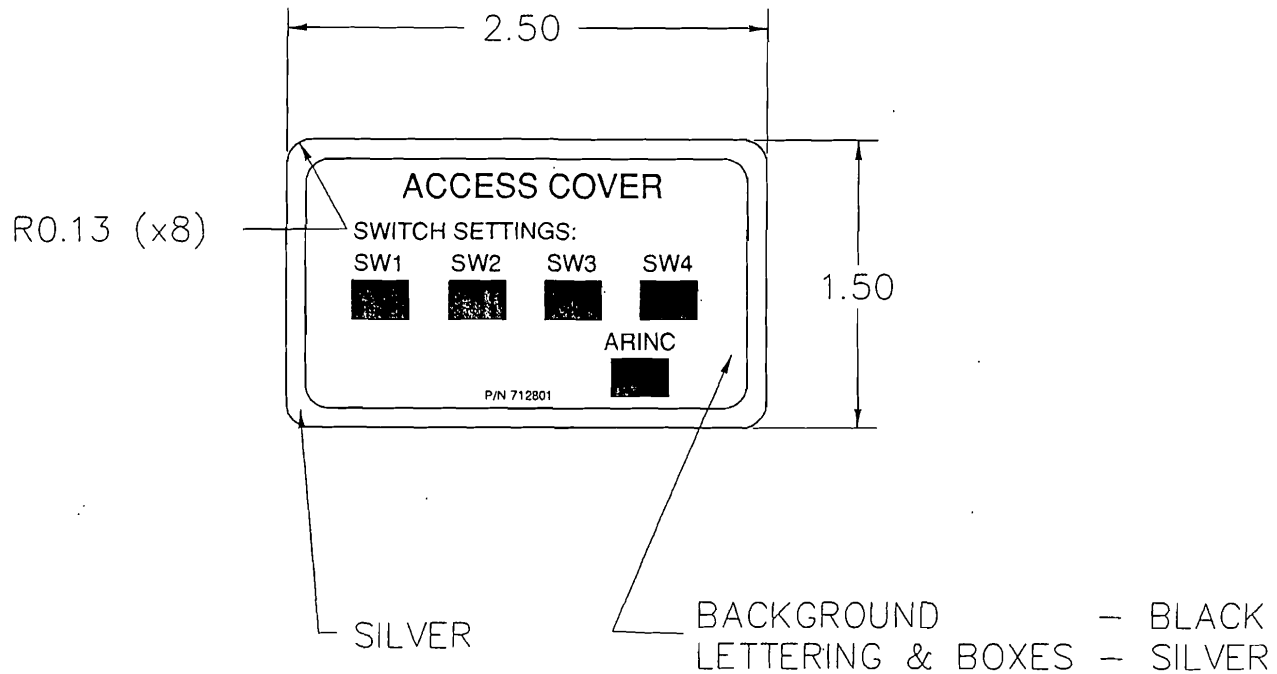
DRAWING NO. 4028-948 | SIZE A | P/N ——— | REV A

MANUFACTURING NOTES:

1. MATCH FONT STYLE AND SIZES. ALL OTHER DIMENSIONS AS SHOWN.
2. SWITCH SETTING BOX DIMENSIONS ARE AS FOLLOWS:
   WIDTH = .295
   HEIGHT = .200

APPLICATION NOTES:

A. IF CONFIGURATION IS NECESSARY PRINT SWITCH SETTINGS IN SPACE PROVIDED. PRINT "N/A" WHEN SWITCHES ARE NOT USED. (MANUFACTURER IGNORE)



ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	8.19.05	PAB		UPDATED TITLE BLOCK
9812/002	–	12/3/98	PAB	KCL	BASELINE RELEASE

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES: X.X – ±0.1
X.XX – ±0.01
X.XXX – ±0.005

FINISH: N/A

MATERIAL: 3M 7983

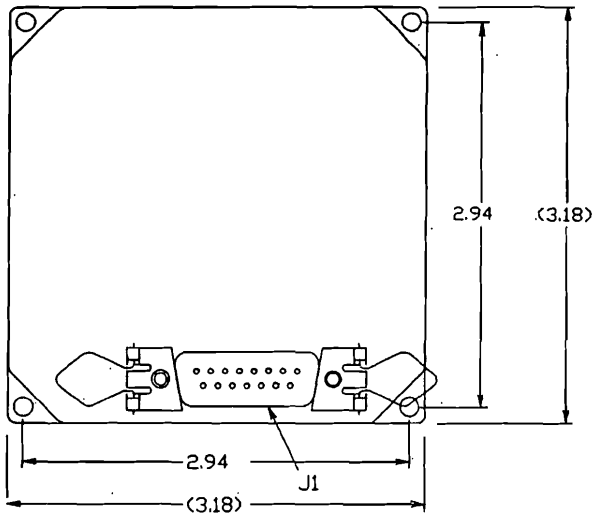
SCALE: FULL

DRAWING DATE 12/2/98
DRAFTER PAB
APPROVED KCL
FILE NAME 712801A.DWG
DIRECTORY 71XXXX
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

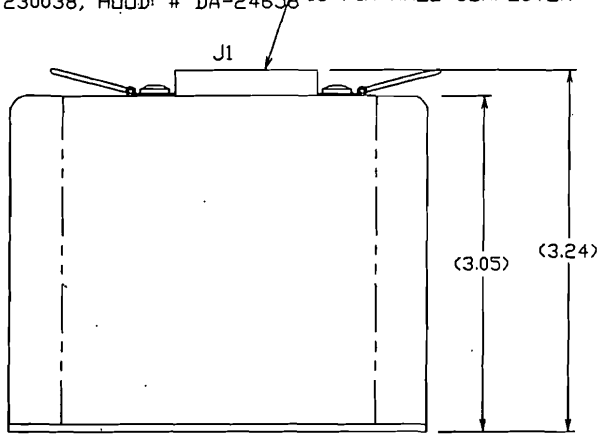
LABEL, ADC200/2000 ACCESS COVER

DRAWING NO. 4028-A80 | SIZE A | P/N712801 | REV A



MATING CONNECTOR:
SHADIN P/N 230036, 17-DA15S
SHADIN P/N 230038, HOOD: # DA-24658

15 PIN MALE CONNECTOR



SELECTOR TABLE
RS232 RX : TIE J1:7 TO J1:1
RS422 RX : DEFAULT (NO JUMPER REQ'D)
SINGLE ENGINE : J1:7 TO J1:2
TWIN ENGINE : DEFAULT (NO JUMPER REQ'D)

WEIGHT: 8 oz.
POWER CONSUMPTION:
210 ma. @ 28v DC

1. THE CONVERTER CAN BE MOUNTED IN ANY ORIENTATION
2. 4" SPACING IS REQUIRED ABOVE CONNECTOR
3. NO COOLING IS REQUIRED
4. THE CONVERTER CAN BE INSTALLED IN A PRESSURIZED OR NON-PRESSURIZED AREA, PROVIDING TEMPERATURE DOES NOT DROP BELOW -20°C
5. 1 AMP CIRCUIT BREAKER IS REQUIRED
6. NO SHOCK MOUNT REQUIRED
7. USE HARDWARE PROVIDED IN INSTALL KIT P/N IK9337 TO ASSEMBLE MATING CONNECTOR.

CONNECTOR KEY

PIN	FUNCTION	
1	RS232 OR RS422 SELECT	SEE SELECTOR TABLE
2	TWIN OR SINGLE ENGINE SELECT	
3	N.C.	
4	N.C.	
5	N.C.	
6	N.C.	
7	SELECT POWER (OUTPUT)	
8	+14 TO 28 V DC POWER IN	
9	N.C.	
10	SIGNAL GROUND	
11	RS422 RX+	FROM SHADIN ADC (USE RS-232 OR RS-422, NOT BOTH)
12	RS422 RX-	
13	RS232 RX	
14	RS232 TX, TO ARGUS 5000/7000	
15	POWER GND	

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	B	4-7-98	PAB		UPDATED TITLE BLOCK; "CONVERTER" WAS "TXMTR"
9801/025	A	10/12/98	DMD	PG	ADDED NOTE 7, CORRECTED HEIGHT, PROVIDED SHADIN P/N FOR MATING CONN.
9707/023	–	7/15/97	PAB	PG	BASELINE RELEASE

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES
TOLERANCES: X.X = ±0.1, X.XX = ±0.01
FINISH: N/A
MATERIAL: N/A
SCALE: NONE

DRAWING DATE: 7/14/97
DRAFTER: PAB
APPROVED: PG
FILE NAME: 937000-03B.DWG
DIRECTORY: 937000-03
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION, SERIAL TO ARGUS 5000/7000 CONVERTER

DRAWING NO. 4070-005 | SIZE A | P/N 937000-03 | REV B

Shadin Avionics
Filename: 681201-1HP.doc
DIRECTORY: 681201-1

Report: 4032D
ECO Date: April 4, 2007
Rev: H
Sec.: IX

ECO #: 0704/002
Release date: 4-6-07
Approved: ZK

PARTS LIST

Part #: **681201-1**
Drawing #s: 4028-005 Rev C
Description: **OAT PROBE ASSEMBLY KIT**

FN	P/N	QTY.	DESCRIPTION	MFG.	MFG.#	DESIGNATION	COMMENTS
10	511201	4	RIVET, AN4703-4 or MS20470AD3-4				
15	543216	1	OAT STIFFENER RING	SHA	4032-082		
20	670503	1	SHIELD, Temp Sensor Assy	SHA	4005-265		
25	670504	1	NUT, Temp Sensor	SHA	4005-266		
30	670505	1	WASHER, Flat OAT	SHA	4005-303		
35	670506	1	WASHER, Shoulder OAT	SHA	4005-304		
40	681201	1	OAT PROBE	SHA	4005-794		

10 items

Shadin Avionics
FILE NAME: IK9628DP.DOC
DIRECTORY: Install Kits

Report: 4028
ECO Date: April 4, 2007
Rev: D
Sec.: IX

ECO # 0704/002
Release date: 4-6-07
Approved: ZK

PARTS LIST

Drawing #s: N/A

Part #: **IK9628**
Description: **INSTALL KIT, F/ADC 200**

FN	P/N	QTY.	DESCRIPTION	MFG.	MFG.#	DESIGNATION	COMMENTS
5	230019H-1	4	SPRING LATCH CLIP	SHA	4028-074		
10	230050C	1	CONN, 15Pin, D-Sub, F Crimp, w/Contacts	POS	M24308/2-2 (RD15F10000-50)	P1	
15	230051C	1	CONN, 15 Pin, D-Sub M Crimp, w/Contacts	POS	M24308/4-2 (RD15M10000-50)	P2	
20	230038	2	CONN, Hood 15 Pin D Sub	CIN	DA-24658		
22	239001	1	TOOL, Insertion/Extraction	DAN	M81969/1-02		
25	511002	4	SCREW, 4-40 x ¼"L, Phil Pan HD SS	MCM	91772A106		
30	512007	4	NUT, 4-40 3/16 x 1/16 SS	AFT	HNSP188 04C000		
35	512014-1	1	KNURLED KNOB	SHA	4028-132		
40	541001	4	WASHER, #4 Split Lock SS	MCM	92147A005		
45	542801A	1	MOUNTING TRAY	SHA	4028-B05		

23 items

SHADIN FUEL FLOW METER			
DIGIFLO P/N 91053XT	DIGIFLO P/N 91053XP	MINIFLO P/N 91204X	MICROFLO 91204XT-38D
J	5	6	6
H	12	9	9

NOTES:

1. CONFIGURE SHADIN F/ADC 200/2000 I/O FOR FLOWMETER/GARMIN G.
2. CONFIGURE SHADIN FUEL FLOW METER I/O FOR ON/AIRDATA.
3. CONFIGURE GARMIN 430/530 I/O FOR CHANNEL 1 TO SHADIN FADC/AVIATION.
4. MINIMUM SOFTWARE LEVEL

ADC 200/2000	93.XX.77
GARMIN 430	2.17
GARMIN 530	2.02
DIGIFLO-L	60.10.84
MINIFLO-L	60.01.83
MICROFLO-L	60.08.86

5. FUEL FLOW TRANSDUCER SIGNAL(S) ARE CONNECTED TO THE SHADIN FUEL FLOW METER. NO FUEL SIGNAL CONNECTED TO THE ADC.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
1104/005	B	4/29/11	HWL	ZK	CHANGED SOFTWARE LEVEL IN NOTE 4
0211/047	A	3/11/03	PAB	BAL	CHANGED TABLE TO NOTE 4; ADDED NOTE 5; UPDATED SW VERSIONS OF FLOW METERS
0008/028	-	9/12/00	PAB	EDJ	BASELINE RELEASE

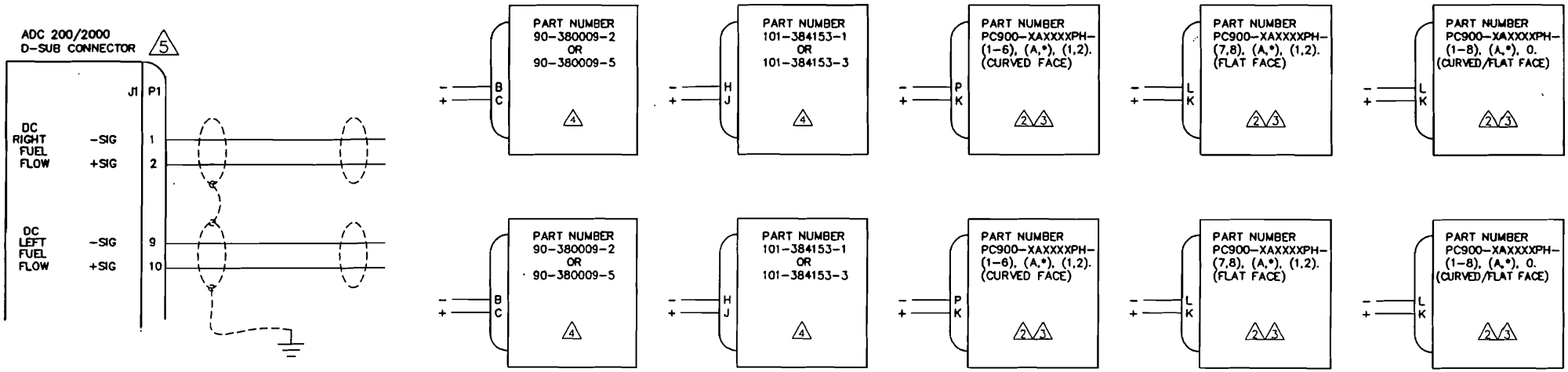
NOT TO SCALE

DRAWING DATE 8/21/00
DRAFTER PAB
APPROVED EDJ
FILE NAME 4028-B94BJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN AVIONICS
MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000, SHADIN FUEL FLOW INDICATORS TO GARMIN 430/530

DRAWING NO. 4028-B94 | SIZE A | P/N ——— | REV B



NOTES:

1. THIS SCHEMATIC IS USED FOR KNOWN BEECH KING AIR MODELS. SOME INDICATORS ARE NOT LISTED BUT MAY BE INTERFACED. CALL SHADIN TECH SUPPORT IF YOU DO NOT SEE THE PART NUMBER OF YOUR INDICATOR LISTED. INDICATOR PART NUMBERS POSSESSING A PREFIX OF "PC900-" ARE XOTECHNOLOGIES TYPE INDICATORS. THE LAST DIGIT REPRESENTS THE INDICATOR AUXILIARY RATE OUTPUT (1 NUMBER). SHADIN SUPPORTS THE "-1" MODELS ONLY.

2. XOTECHNOLOGIES INDICATOR P/N PC900-XAXXXXPH-XX0 IS NOT SUPPORTED. THE AUXILIARY RATE OUTPUT OF THIS UNIT IS 0-1 mA. INDICATOR P/NS THAT END WITH A "-XX2" WILL ENCOUNTER A DEGRADATION IN PERFORMANCE DUE TO THE AUX. RATE OUTPUT OF 0-5.333 VDC. INDICATOR P/NS ENDING WITH AN "*" ARE UNKNOWN.

3. THE FOLLOWING XOTECHNOLOGIES INDICATOR P/NS POSSESS A K-FACTOR KNOWN TO SHADIN:

			ADC200/2000 SWITCH SETTINGS			
PART NUMBER	K-FACTOR/OFFSET	AUX RATE OUTPUT	SW1	SW2	SW3	SW4
PC900-1A0600-XX1	38,460/0	0-5 VDC	0	4	0	0
PC900-1A0750-XX1	30,770/0	0-5 VDC	0	5	0	0
PC900-1A0800-XX1	28,850/0	0-5 VDC	0	6	0	0

4. THE FOLLOWING BEECH INDICATOR P/NS POSSESS A K-FACTOR KNOWN TO SHADIN:

		ADC200/2000 SWITCH SETTINGS			
PART NUMBER	K-FACTOR/OFFSET	SW1	SW2	SW3	SW4
90-380009-2	77,000/416	0	0	0	1
90-380009-5	77,000/416	0	0	0	1
101-384153-1	30,777/0	0	5	0	0
101-384153-3	30,777/0	0	5	0	0

5. THE J1 CONNECTOR OF THE ADC 200 AND ADC 2000 HAVE THE SAME FUEL FLOW PIN LOCATIONS.

6. USE SHIELDED WIRE BUT GROUND ONLY ON ADC UNIT END TO PREVENT A GROUND LOOP.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0211/047	B	3/11/03	PAB	BAL	UPDATED NOTES 1-6; CORRECTED TITLE; GROUNDED SHIELDS
9803/022	A	3/26/98	SRB	KCL	CHANGED NOTE 3 : 90-380009-5 FRO 26,150/416, REMOVE P/N 9628X0-3
9706/007	-	6/13/97	PAB	KCL	BASELINE RELEASE

SCALE: NONE

DRAWING DATE 6/9/97
DRAFTER PAB
APPROVED KCL
FILE NAME 4028-818BJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

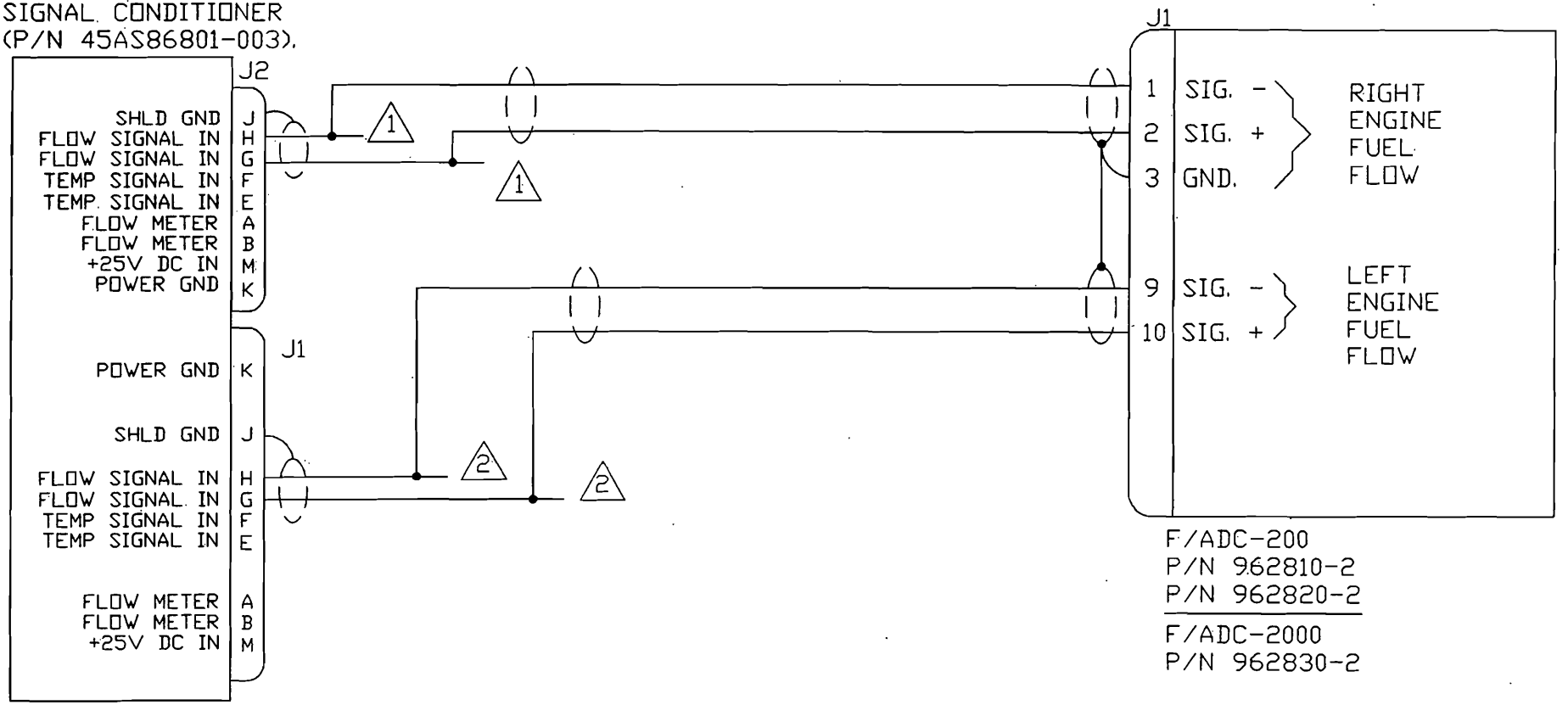
INSTALLATION WIRING, F/ADC 200/2000 W/ ANALOG F.F. TO BEECH KING AIR INDICATORS D-SUB CONNECTOR

DRAWING NO. 4028-818 | SIZE A | P/N ——— | REV B

NOTES

1. FROM RIGHT ENGINE FF TRANSMITTER.
2. FROM LEFT ENGINE FF TRANSMITTER.
3. F/ADC SWITCH SETTINGS

AIRCRAFT'S FUEL FLOW SIGNAL CONDITIONER (P/N 45AS86801-003).



F/ADC-200
P/N 962810-2
P/N 962820-2

F/ADC-2000
P/N 962830-2

3

SIG COND. P/N	K-FACTOR	SW1	SW2	SW3	SW4
45AS86801-003	5150 PPG	6	E	6	E

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	B	3-17-05	PAB		UPDATED TITLE BLOCK
9803/025	A	3/26/98	SRB	KCL	CHANGE TITLE, CHANGE FILE NAME FROM 4028-819-.DWG
9711/021	-	1-8-98	DMD	KCL	BASELINE RELEASE

DO NOT SCALE

DRAWING DATE 12/17/97
DRAFTER DMD
APPROVED KCL
FILE NAME 4028-819BJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

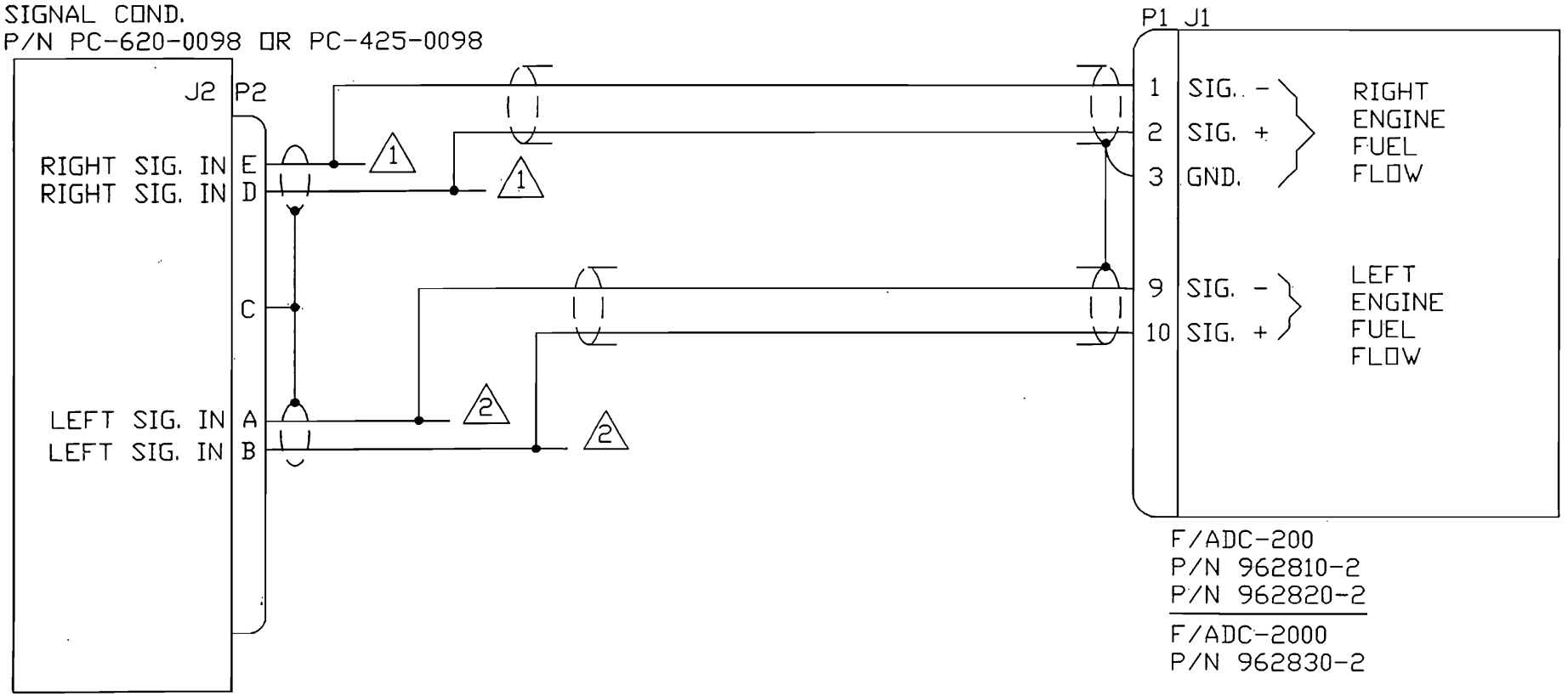
SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC 200, 2000 SINE FF TO MITSUBISHI MU-300 AND MODEL 400 BEECHJET

DRAWING NO. 4028-819 | SIZE A | P/N ——— | REV B

NOTES

1. FROM RIGHT ENGINE FF TRANSMITTER.
2. FROM LEFT ENGINE FF TRANSMITTER.



SIG COND. P/N	K-FACTOR	SW1	SW2	SW3	SW4
PC-620-0098	33800	6	9	6	9

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	B	2/4.05	PAB	KCL	UPDATED TITLE BLOCK
0007/031	A	7/19/00	PAB	RH	ADD 'OR PC-425-0098'
9711/021	-	1/8/98	DMD	KCL	BASELINE RELEASE

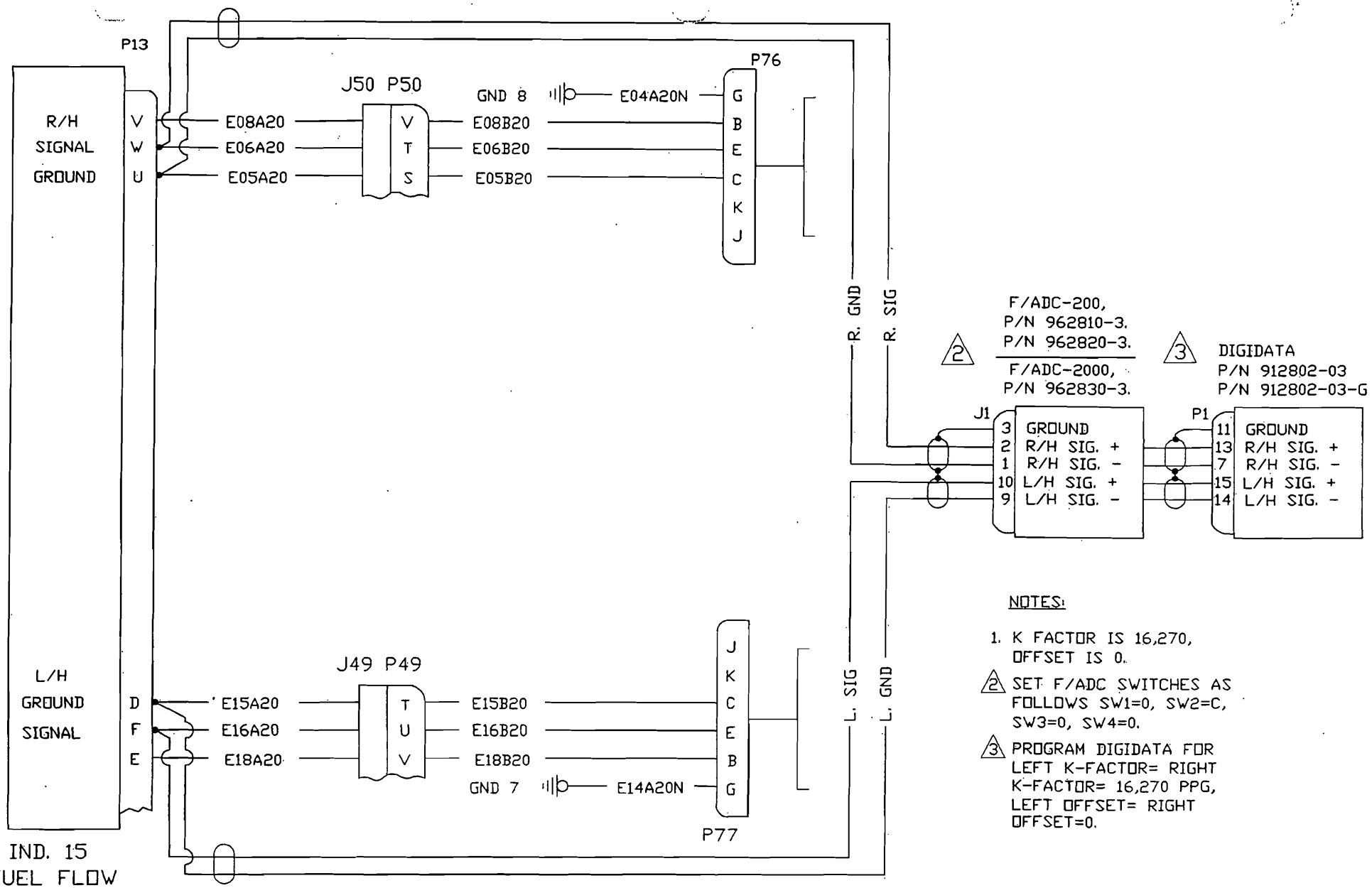
DO NOT SCALE

DRAWING DATE 12/17/97
DRAFTER DMD
APPROVED KCL
FILE NAME 4028-909BJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING:
F/ADC-200(2000) TO MITSUBISHI MU-2 W/FOXBORO PC-620 SYSTEM

DRAWING NO. 4028-909 | SIZE A | P/N | REV B



NOTES:

1. K FACTOR IS 16,270, OFFSET IS 0.
2. SET F/ADC SWITCHES AS FOLLOWS SW1=0, SW2=C, SW3=0, SW4=0.
3. PROGRAM DIGIDATA FOR LEFT K-FACTOR= RIGHT K-FACTOR= 16,270 PPG, LEFT OFFSET= RIGHT OFFSET=0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-17-15	PAB		UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

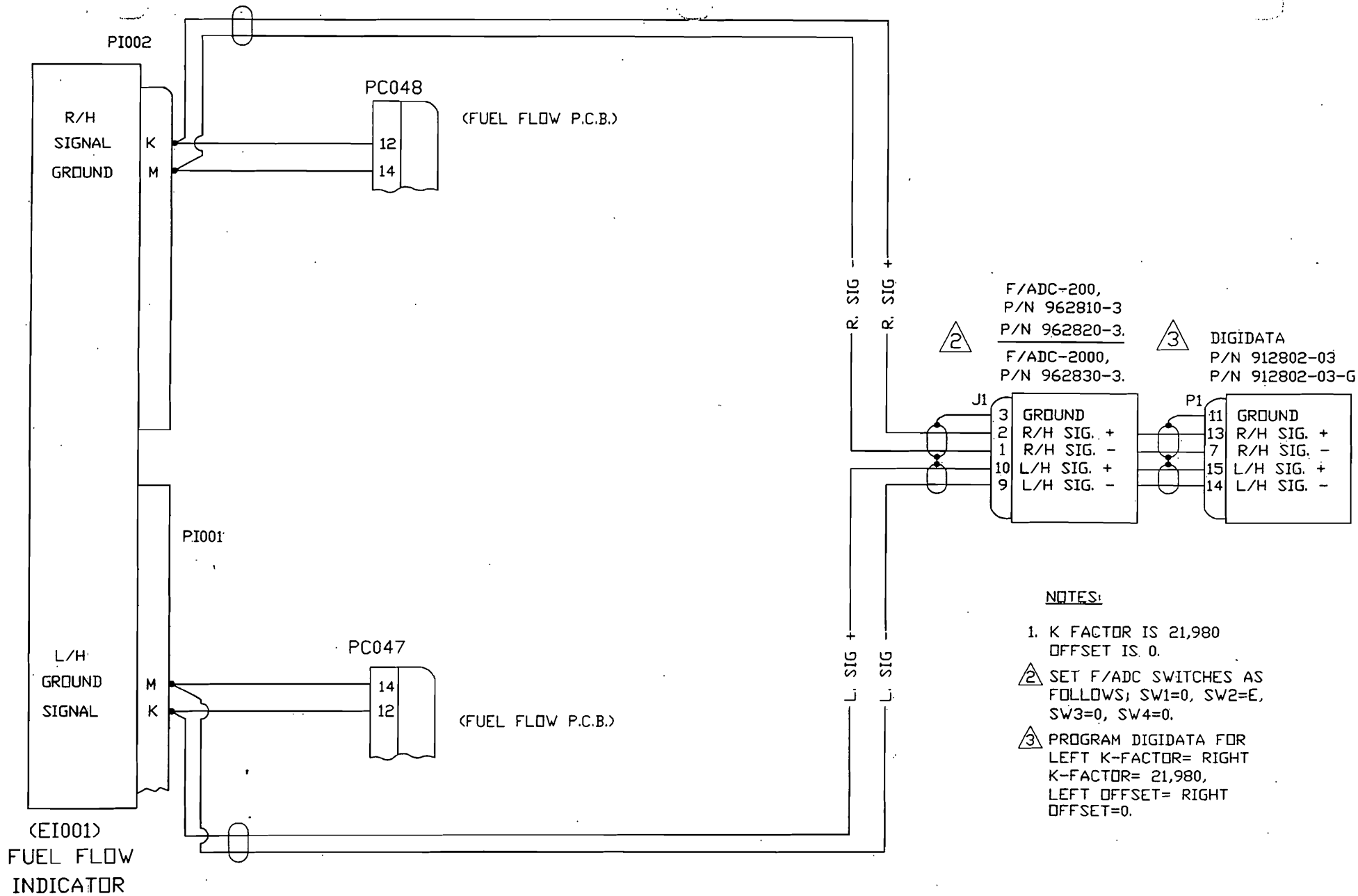
NOT TO SCALE

DRAWING DATE	3/24/98
DRAFTER	SRB
APPROVED	KCL
FILE NAME	4028-936A.DWG
DIRECTORY	4028
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000 OR DIGIDATA WITH DC FF TO CESSNA CITATION 500, 501, 550, S550, 551, 552.

DRAWING NO.	SIZE	P/N	REV
4028-936	A	———	A



NOTES:

1. K FACTOR IS 21,980
   OFFSET IS 0.
2. SET F/ADC SWITCHES AS FOLLOWS; SW1=0, SW2=E, SW3=0, SW4=0.
3. PROGRAM DIGIDATA FOR LEFT K-FACTOR= RIGHT K-FACTOR= 21,980, LEFT OFFSET= RIGHT OFFSET=0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-19-98	PAB		UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

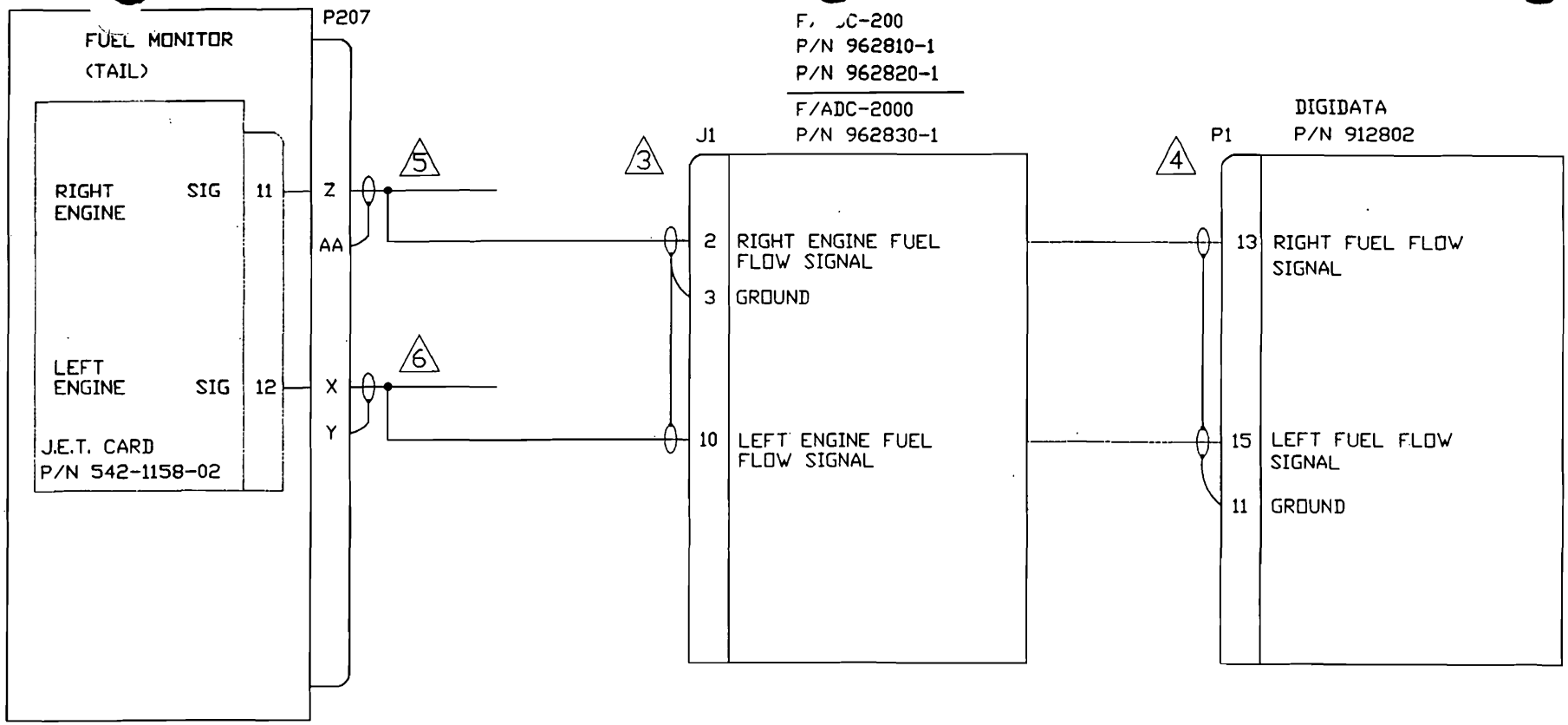
NOT TO SCALE

DRAWING DATE 3/24/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-937A.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000 OR DIGIDATA WITH DC FF TO CESSNA CITATION 525 JET

DRAWING NO. 4028-937 | SIZE A | P/N ——— | REV A



NOTES:

1. THIS INSTALLATION APPLICABLE TO AIRCRAFT WITH J.E.T. FUEL MODULE PART NUMBER 542-1158-02 ONLY. J.E.T. MODULE NOS. 542-1158-01 MAY BE CHANGED TO 542-1158-02 BY J.E.T. SB542-1158-7B.
2. K-FACTOR IS 860.

(3) SET F/ADC SWITCHES AS FOLLOWS; SW1=D, SW2=D, SW3=D, SW4=D.

(4) PROGRAM THE DIGIDATA FOR LEFT K-FACTOR = RIGHT K-FACTOR = 860 PPG, LEFT OFFSET = RIGHT OFFSET = 0.

(5) J.E.T. CARD PIN 11 CORRESPONDS TO FUEL MONITOR PIN Z.

(6) J.E.T. CARD PIN 12 CORRESPONDS TO FUEL MONITOR PIN X.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/006	A	1/17/05	PAB	KCL	CORRECTED NOTES 1, 5, & 6
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

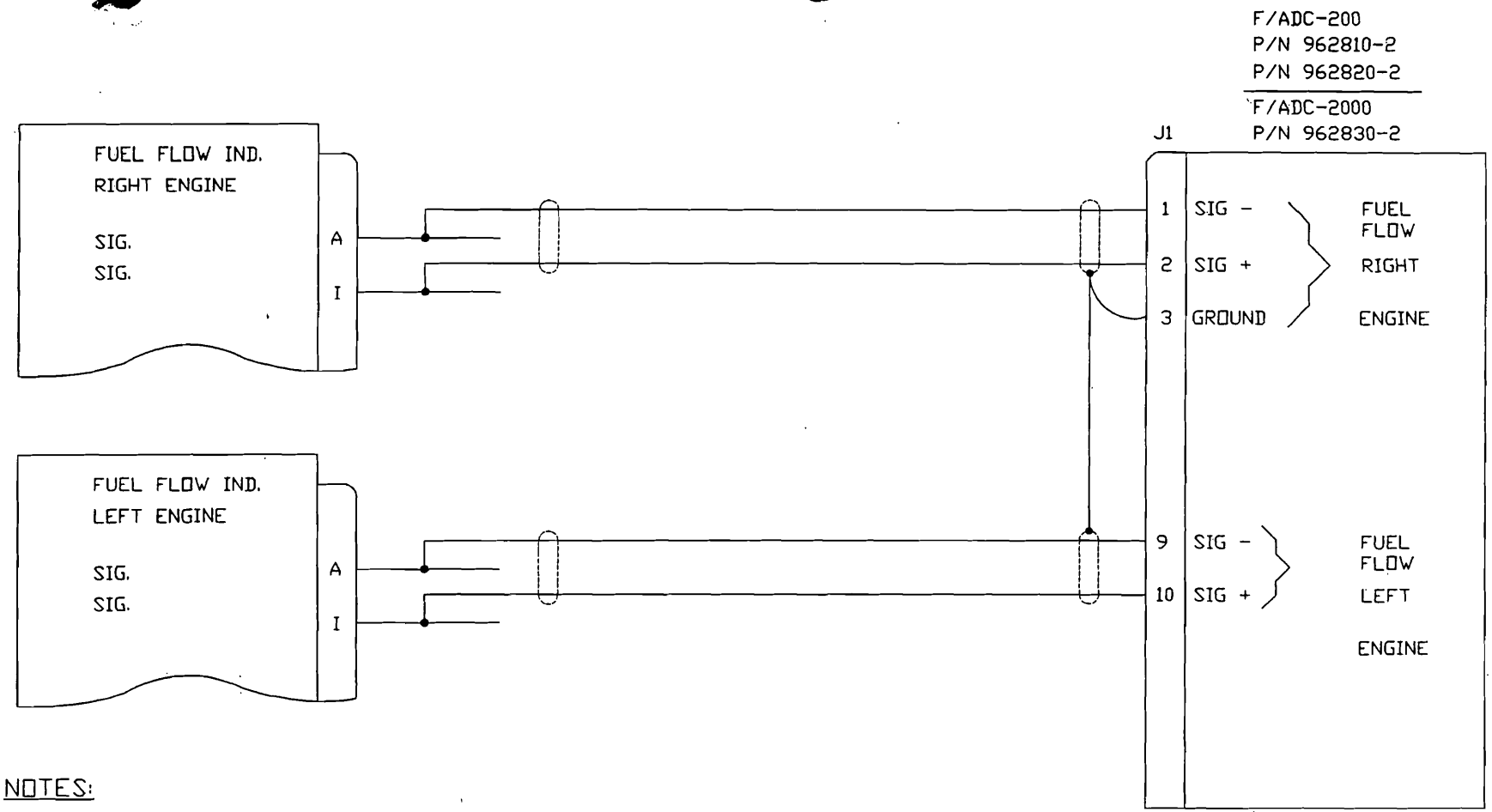
NOT TO SCALE

DRAWING DATE	3/24/98
DRAFTER	SRB
APPROVED	KCL
FILE NAME	4028-938AJ.DWG
DIRECTORY	4028
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC200, 2000 OR DIGIDATA WITH DIGITAL FF TO BOMBARDIER LEARJET 24, 25D.

DRAWING NO.	SIZE	P/N	REV
4028-938	A	———	A



NOTES:

1. FOR AIRCRAFT WITH THE FOLLOWING INDICATORS/TRANSMITTERS;
   A. INDICATOR PART NOS. 850590-1, 850590-507, DSF1549 OR D5154-9.
   B. TRANSMITTER PART NOS. 850590-513, 850590-515, TFF2905-11 OR 151906-001.
2. K-FACTOR IS 27.6 (27,600 PPG).
3. SET F/ADC SWITCHES TO: SW1 = F, SW2 = 0, SW3 = F, SW4 = 0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-14-05	PAB	KCL	UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

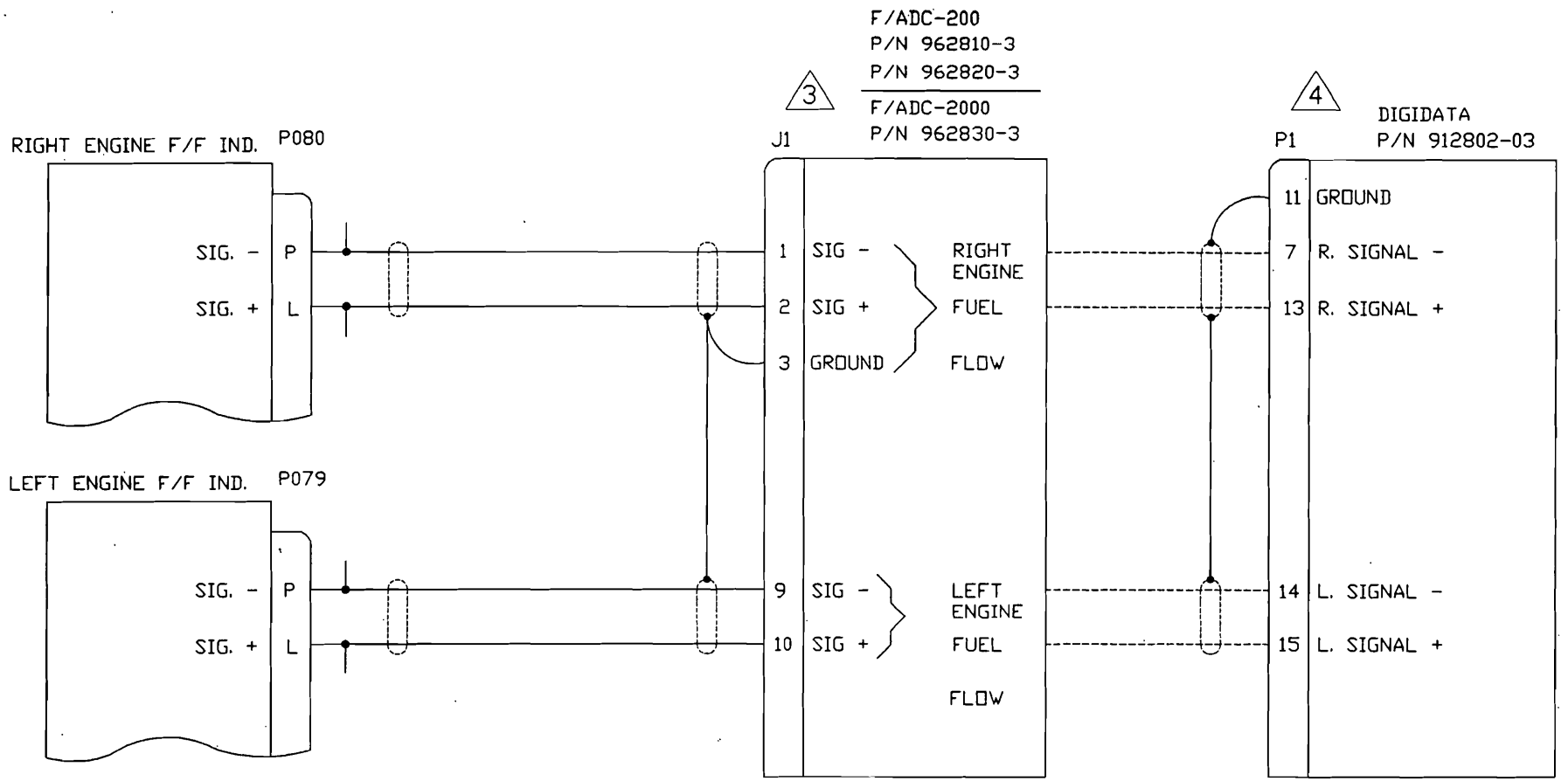
NOT TO SCALE

DRAWING DATE 3/24/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-939AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 WITH SINE FF TO ROCKWELL COMMANDER 690 AND 695

DRAWING NO. 4028-939 | SIZE A | P/N ——— | REV A



NOTES:

1. FOR AIRCRAFT SERIAL NOS. RK-45, RK-49 AND AFTER WITH FUEL INDICATOR PART NO. PC900-3B2000-PH1.
2. K-FACTOR IS 11.54 (11,540 PPG), OFFSET IS 0.

3 SET F/ADC SWITCHES TO: SW1 = 0, SW2 = 2, SW3 = 0, SW4 = 0.

4 PROGRAM DIGIDATA FOR LEFT K-FACTOR = RIGHT K-FACTOR = 11,540 PPG, LEFT OFFSET = RIGHT OFFSET = 0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-14-05	PAB		UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

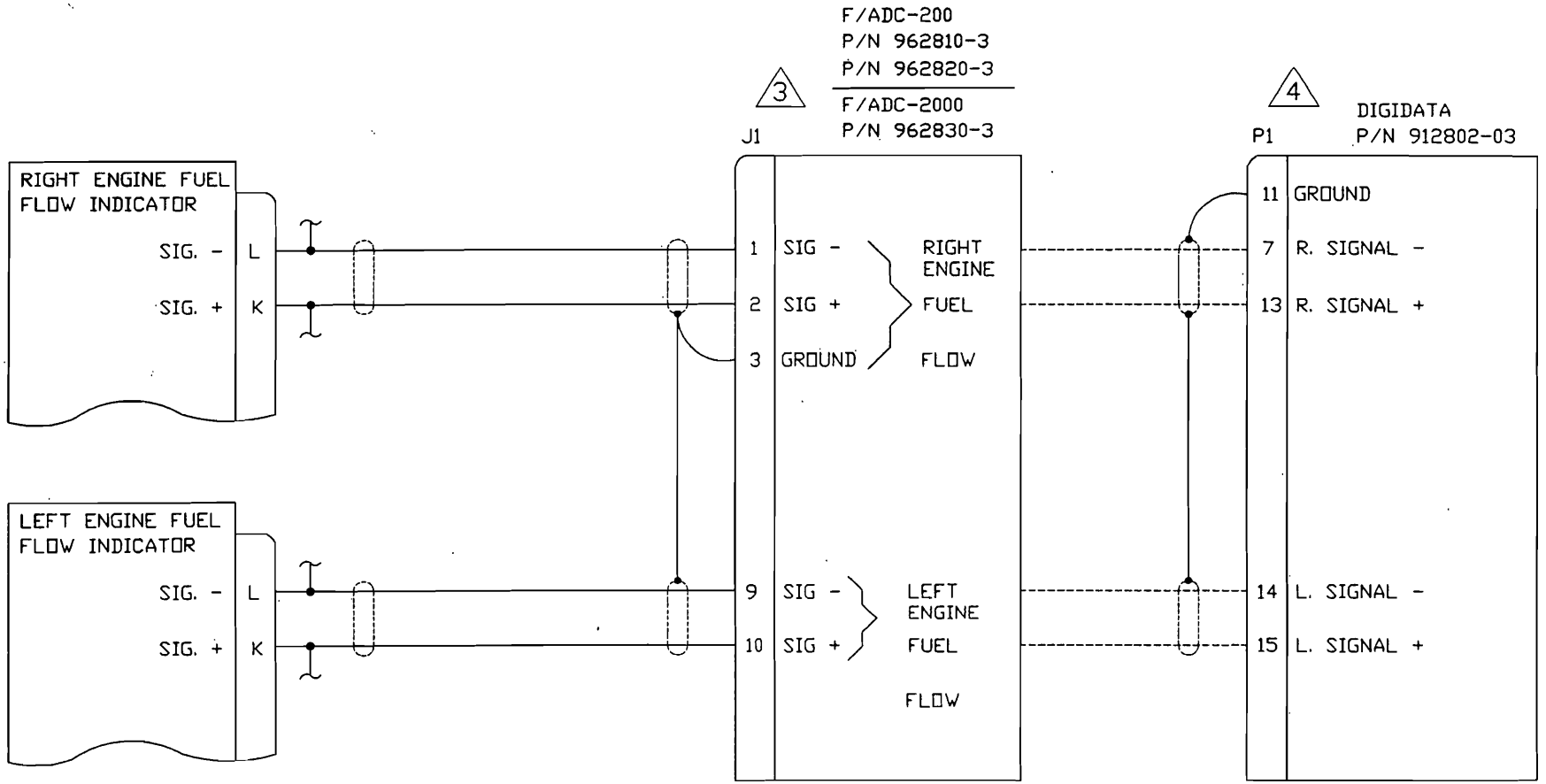
NOT TO SCALE

DRAWING DATE 3/24/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-940AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 OR DIGIDATA WITH DC FF TO RAYTHEON BEECHJET 400A AIRCRAFT

DRAWING NO. 4028-940 | SIZE A | P/N ——— | REV A



NOTES:

1. FOR AIRCRAFT WITH THE FOLLOWING INDICATOR/TRANSMITTERS;
   A. INDICATOR PART NO. (RAGEN) 1291-2
   B. TRANSMITTER PART NO. (GULL) 151-909-001
2. K-FACTOR IS 10.49 (10,490 PPG), OFFSET IS 0.
3. SET AIRDATA SWITCHES AS FOLLOWS; SW1 = 1, SW2 = 8, SW3 = 0, SW4 = 0.
4. PROGRAM DIGIDATA FOR LEFT K-FACTOR = RIGHT K-FACTOR = 10,490 PPG, LEFT OFFSET = RIGHT OFFSET = 0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-19-05	PAB	KCL	UPDATED TITLE BLOCK
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

NOT TO SCALE

DRAWING DATE	3/25/98
DRAFTER	SRB
APPROVED	KCL
FILE NAME	4028-941AJ.DWG
DIRECTORY	4028
SHEET	1 OF 1

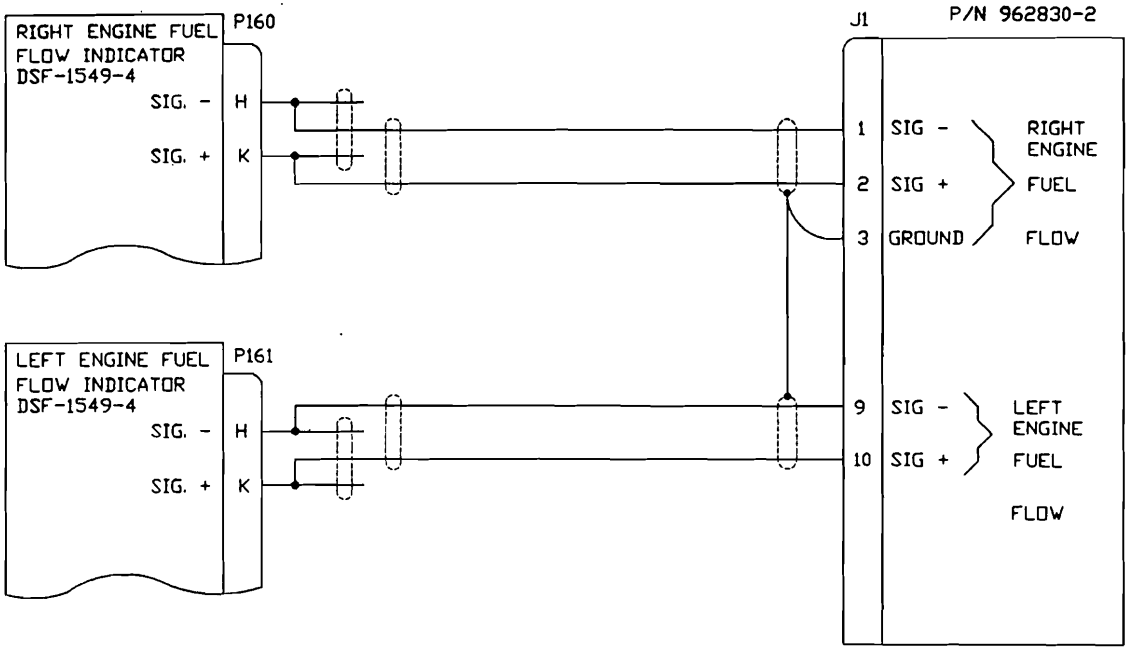
SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 OR DIGIDATA WITH DC FF TO WESTWIND 1124 MODELS

DRAWING NO.	SIZE	P/N	REV
4028-941	A	———	A

F/ADC-200
P/N 962810-2
P/N 962820-2

F/ADC-2000
P/N 962830-2



DSF-1549-2

FLOW TURBINE (FROM PROB)	A
COMPENSATOR (ENVIRONMENT)	B
SIGNAL GROUND	C
CASE GROUND	D
DC POWER INPUT (APPROX. 28 VDC)	E
TOTALIZER LOW (-)	F
TOTALIZER OUTPUT (+)	G
TEMP SENSOR	H
SIGNAL GROUND	I
DC GROUND	J

DSF-1549-4

5V LIGHT RETURN	A
28 VDC POWER INPUT	B
28 VDC POWER RETURN	C
CASE GROUND	D
COMPENSATOR (ENVIRONMENT)	E
SIGNAL GROUND	F
TOTALIZER GROUND	G
SIGNAL GROUND	H
TOTALIZER OUTPUT	J
FLOW TURBINE (FROM PROB)	K
TEMP SENSOR	L
5 VDC LIGHT (+)	M

DSF-1549-5

FLOW TURBINE (FROM PROB)	A
COMPENSATOR (ENVIRONMENT)	B
GROUND	C
CASE GROUND	D
DC POWER INPUT (APPROX. 28 VDC)	E
SIGNAL GROUND	F
TOTALIZER OUTPUT	G
TEMP SENSOR	H
DC GROUND	J

NOTES:

1. FOR AIRCRAFT WITH FUEL FLOW INDICATOR PART NOS. DSF-1549-2, -4, -5. SEE TABLE FOR INDICATOR PINOUTS.
2. K-FACTOR IS 26.8 (26,800 PPG).
3. SET AIRDATA SWITCHES AS FOLLOWS; SW1 = C, SW2 = 7, SW3 = C, SW4 = 7.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/006	A	1/17/05	PAB	KCL	CORRECTED PINOUTS & NOTE 1
9803/025	-	3/26/98	SRB	KCL	BASELINE RELEASE

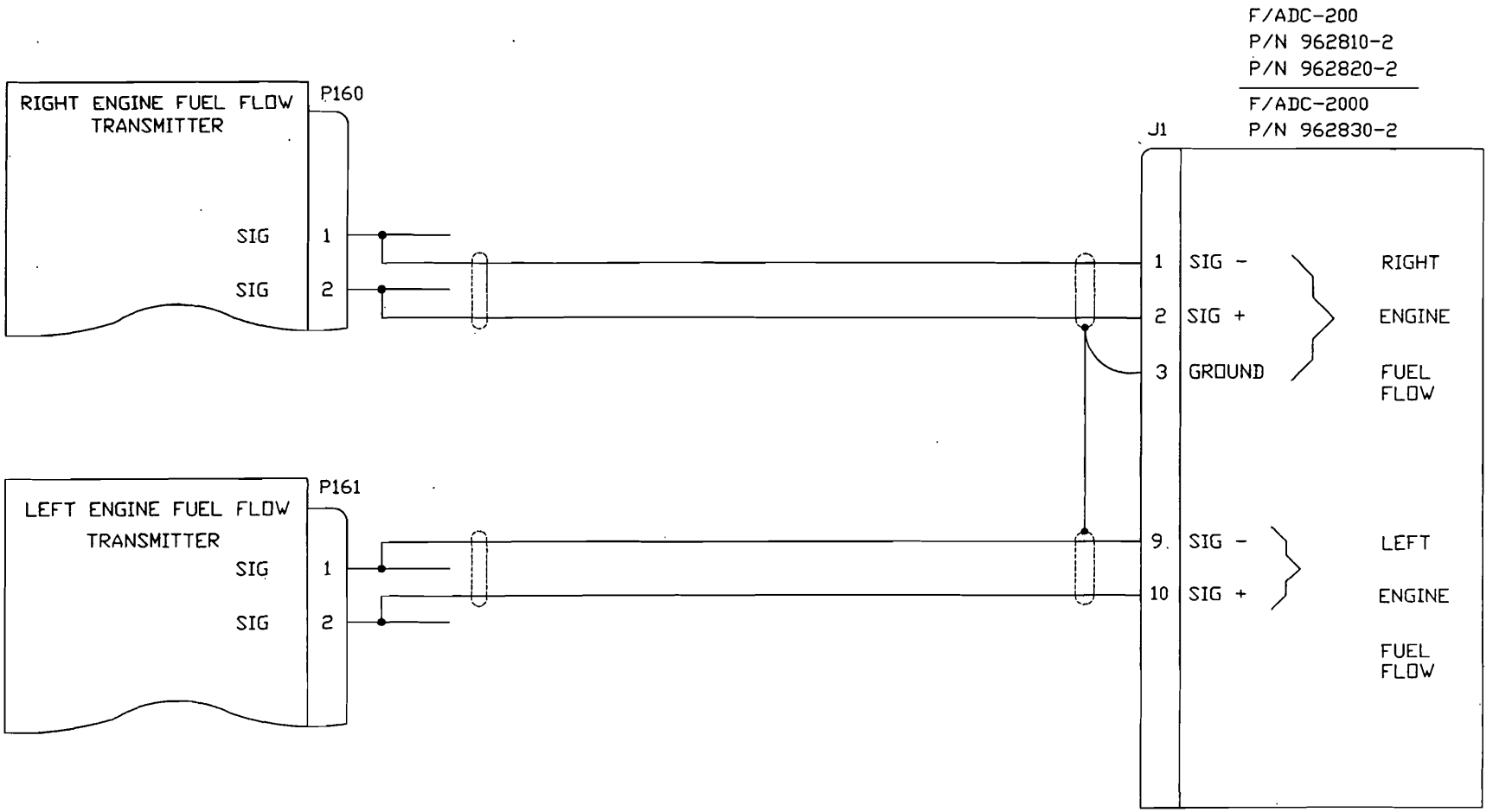
NOT TO SCALE

DRAWING DATE 3/25/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-942AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 TO FAIRCHILD SA226 SERIES AIRCRAFT.

DRAWING NO. 4028-942 | SIZE A | P/N ——— | REV A



NOTES:

1. FOR AIRCRAFT WITH FAURE-HERMAN FUEL FLOW TRANSMITTERS, PART NO. TN(A)S-1024-118.
2. CONFIGURE THE F/ADC FOR THE ALTERNATE DIGITAL K-FACTOR TABLE: MATRIX 1. K-FACTOR IS 3.88 (3,880 PPG).
3. SET AIRDATA SWITCHES AS FOLLOWS; SW1 = 0, SW2 = 7, SW3 = 0, SW4 = 7.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2-14-05	PAB		UPDATED TITLE BLOCK
9803/041	-	3/26/98	SRB	KCL	BASELINE RELEASE

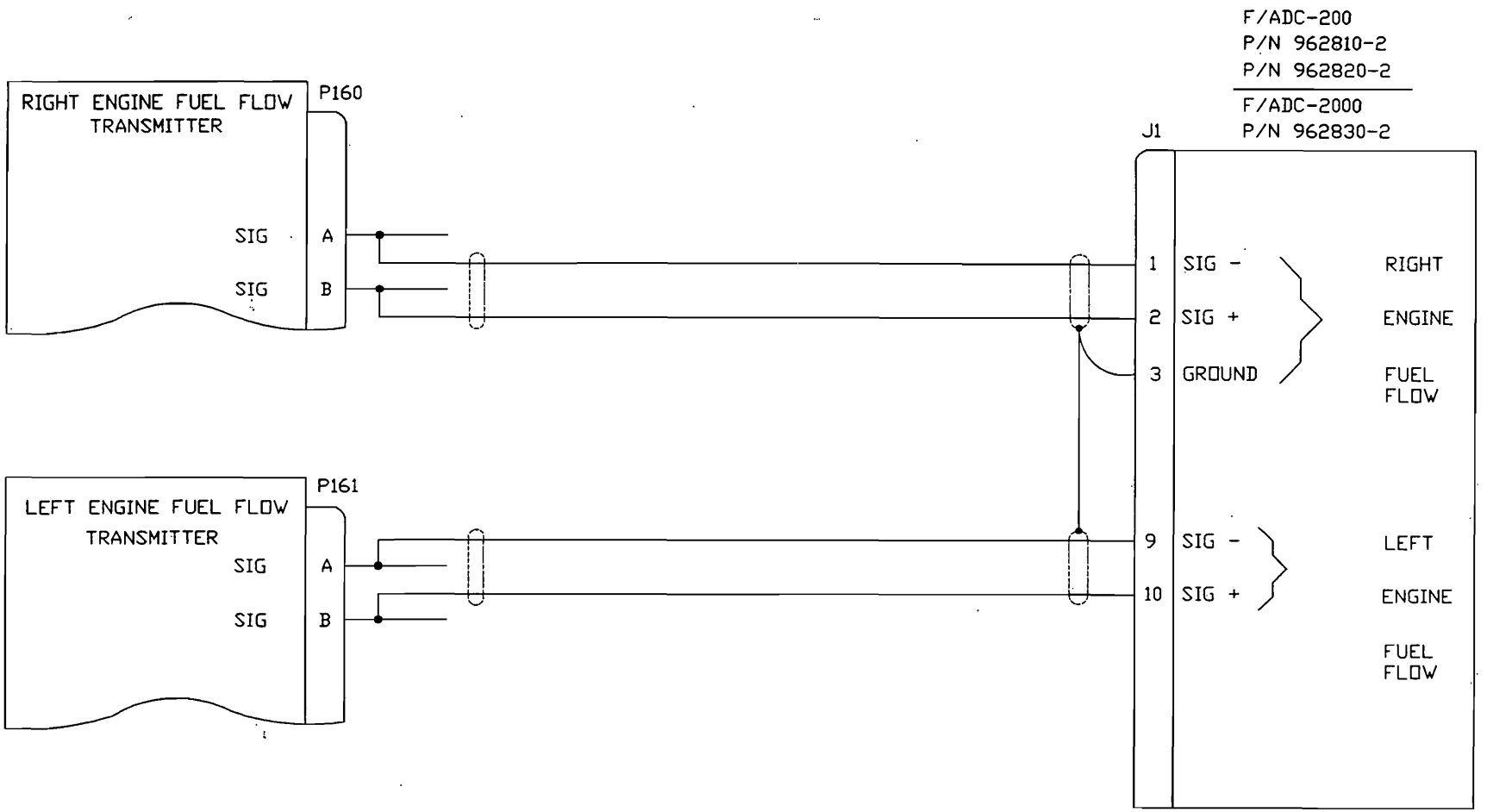
NOT TO SCALE

DRAWING DATE 3/26/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-949AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 TO AEROSPATIALE AS365N2 DAUPHIN.

DRAWING NO. 4028-949 | SIZE A | P/N ——— | REV A



NOTES:

1. FOR AIRCRAFT WITH FAURE-HERMAN FUEL FLOW TRANSMITTERS, PART NO. TN(A)S-512-231-1.
2. CONFIGURE THE F/ADC FOR THE ALTERNATE DIGITAL K-FACTOR TABLE; MATRIX 1. K-FACTOR IS 1.94 (1,940 PPG).
3. SET AIRDATA SWITCHES TO; SW1 = 8, SW2 = 0, SW3 = 8, SW4 = 0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/032	A	2.4.05	PAB		UPDATED TITLE BLOCK
9803/041	-	3/26/98	SRB	KCL	BASELINE RELEASE

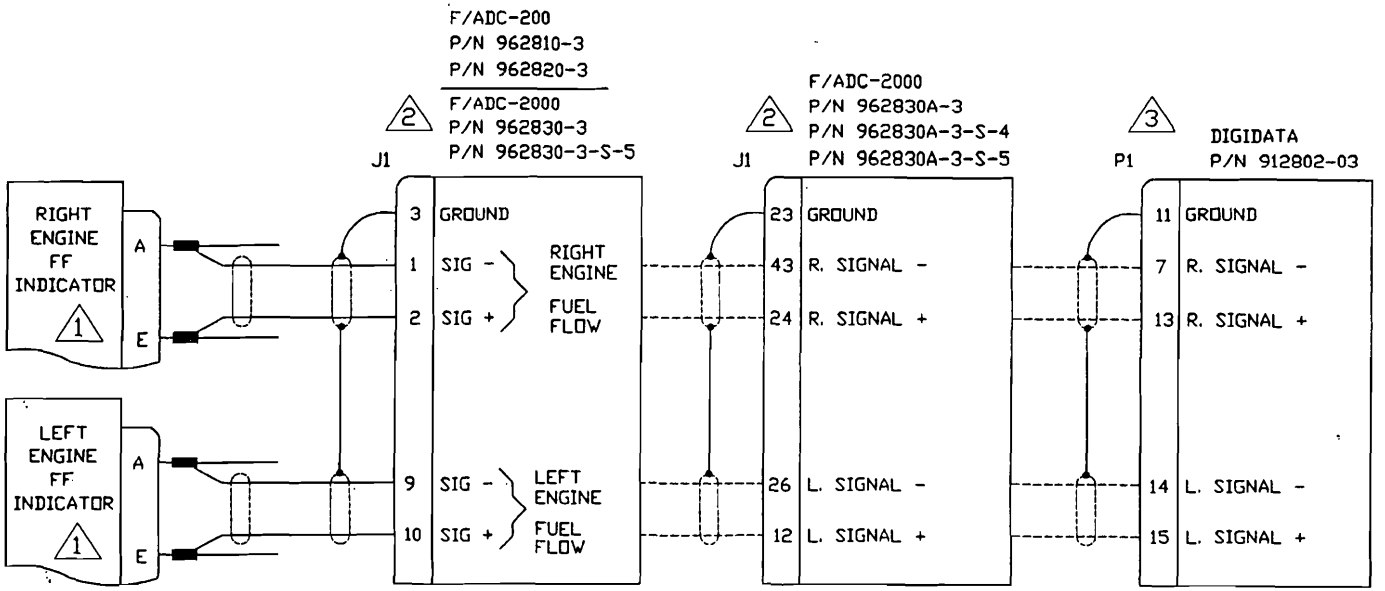
NOT TO SCALE

DRAWING DATE 3/26/98
DRAFTER SRB
APPROVED KCL
FILE NAME 4028-950AJ.DWG
DIRECTORY 4028
SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 TO AEROSPATIALE AS332 SUPER PUMA

DRAWING NO. 4028-950 | SIZE A | P/N ——— | REV A



RAGEN P/N 3265013-0601

	J1
FLOW SIGNAL FROM FLOWMETER	E
FLOW SIGNAL TO TOTALIZER	G
INTERNAL TEST POINT	J
+28 VDC INPUT	B
REF SUPPLY TO TOTALIZER	F
REF SUPPLY TO FLOWMETER	C
28 VDC RETURN	A
INTERNAL TEST POINT	D
SIGNAL RETURN TO TOTALIZER	H
CASE GROUND	K

RAGEN P/N 3265013-0801

	J1
FLOW SIGNAL FROM FLOWMETER	E
FLOW SIGNAL TO TOTALIZER	G
ALT FLOW SIGNAL TO TOTALIZER	J
+28 VDC INPUT	B
REF SUPPLY TO TOTALIZER	F
REF SUPPLY TO FLOWMETER	C
28 VDC RETURN	A
SIGNAL RETURN FROM FLOWMETER	D
SIGNAL RETURN TO TOTALIZER	H
CASE GROUND	K

RAGEN P/N 3265013-1201

	J1
FLOW SIGNAL FROM FLOWMETER	E
FLOW SIGNAL TO TOTALIZER	G
ALT FLOW SIGNAL TO TOTALIZER	J
+28 VDC INPUT	B
REF SUPPLY TO TOTALIZER	F
REF SUPPLY TO FLOWMETER	C
28 VDC RETURN	A
SIGNAL RETURN FROM FLOWMETER	D
SIGNAL RETURN TO TOTALIZER	H
CASE GROUND	K

NOTES:

1. FOR AIRCRAFT WITH THE FOLLOWING INDICATOR/TRANSMITTERS; SEE TABLE FOR INDICATOR WIRING.
   INDICATOR PART NO. (RAGEN) 3265013-0601 w/TRANSMITTER PART NO. (RAGEN) 3268011-0101.
   INDICATOR PART NO. (RAGEN) 3265013-0801 + 3265013-1201 w/TRANSMITTER PART NO. (RAGEN) TFF-2905-9 OR PIPER P/N 489-487.
2. SET AIRDATA SWITCHES AS FOLLOWS; SW1 = 1, SW2 = 1, SW3 = 0, SW4 = 0.
3. PROGRAM DIGIDATA FOR LEFT K-FACTOR = RIGHT K-FACTOR = 46,160
   PPG, LEFT OFFSET = RIGHT OFFSET = 0.

ECO #	REV.	DATE	BY	APP'D	DESCRIPTION
0501/006	C	1/17/05	PAB	[illegible]	ADD IND 3265013-0801, & RAGEN P/N TABLES
0001/016	B	1/31/00	LJM	EDJ	ADD IND 3265013-1201, XMTR TFF-2905-9 TO NOTE 1.
9901/015	A	1/20/99	DMD	KCL	ADD P/NS 962830A-3-S-5, 962830-3-S-5
9808/012	-	8/7/98	DMD	KCL	BASELINE RELEASE

NOT TO SCALE

DRAWING DATE	8/7/98
DRAFTER	DMD
APPROVED	KCL
FILE NAME	4028-A29CJ.DWG
DIRECTORY	4028
SHEET	1 OF 1

SHADIN MINNEAPOLIS, MN 55426

INSTALLATION WIRING, F/ADC-200, 2000 OR DIGIDATA WITH DC FF PIPER CHEYENNE PA31T

DRAWING NO. 4028-A29 | SIZE A | P/N ——— | REV C