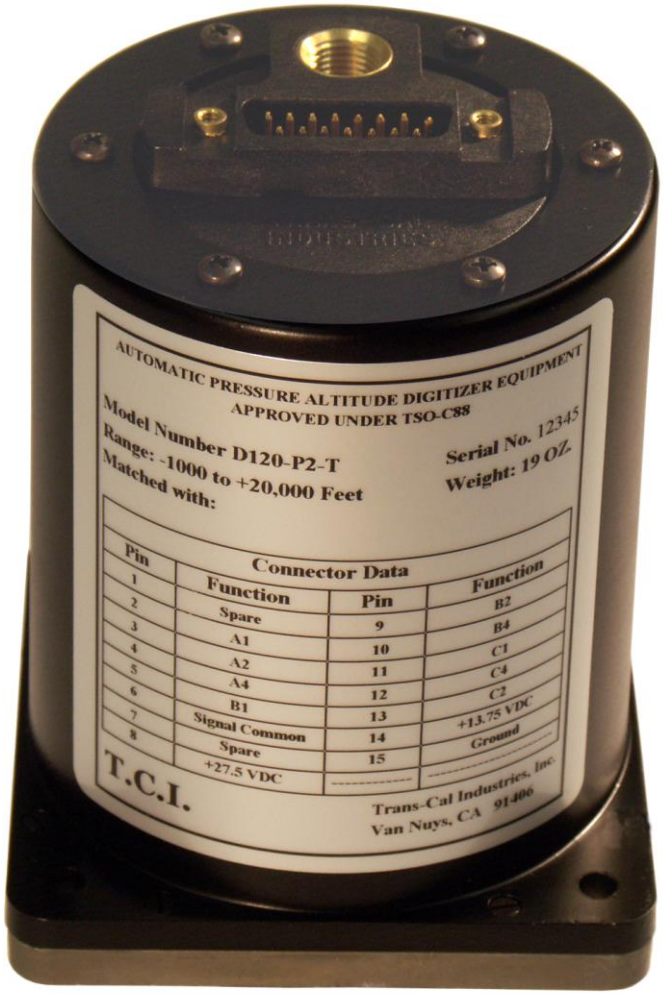
Trans-Cal Industries, Inc.

Model D120-P2-T (K) DIGITIZER

INSTALLATION INSTRUCTIONS



MANUAL 7421-IN TRANS-CAL INDUSTRIES, INC.
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August 10, 2006 Document Number:7421-IN Rev. D

INSTALLATION INSTRUCTIONS

INTRODUCTION:

The instrument you are preparing to install is a precision HIGHLY SENSTIVE device that requires caution in handling and installation. Careful attention to proper installation will permit this instrument to perform properly for many years.

INSTALLATION:

The PREFERRED position for mounting the TCI digitizer is on the instrument panel using a vacant standard instrument cutout space. This permits the connection to the static line, and the electrical connections to be short and compact. The next mounting position most acceptable would be any structural member attached to, or adjacent to, the instrument panel, provided that the installation is STRUCTURALLY sound. If a bulkhead position is chosen,, an auxiliary plate and spacers will be required to provide a FLAT surface above the insulation. ALL INSTALLATIONS REQUIRE A FLAT SURFACE FOR MOUNTING THE DIGITIZER BASE; BENDING OR TWISING THE BASE CAN RESULT IN DISTURBING THE UNIT'S CALIBRATION. Do not use any mounting technique that would expose the unit to shock or excessive vibration. DO NOT use "riv-nuts". DO NOT drill through mounting holes.

WIRING:

The unit requires one DA-15S mating connector, properly wired, with #26AWG (minimum) wire of sufficient length to reach the transponder. Solder wires into terminals, insulate and secure. Identify pin connections either by number, letter or color of wire. Interconnect wiring as indicated by TCI drawing E100124. Connect +12VDC or +28VDC to the proper pin. Connect the unit to the aircraft's power using a .5 amp fuse. NOTE: Pin 6 (signal common) provides an isolated signal ground which permits the unit to be "strobed". For non-strobed installations, pin 6 MUST be connected go ground (pin 15). CAUTION!!!: IMPROPER DIGITIZER OPERATION IS USUALLY TRACED TO FAULTY WIRING!!

24 VOLT INSTALLATIONS:

DO NOT connect digitizer power (pin 14) to transponder "POWER" or the transponder "DIGITIZER POWER". ON ALL 24 volt installations using 12 volt transponders pin 8 on the digitizer MUST be connected to the 24 volt avionics buss through a 1 amp fuse.

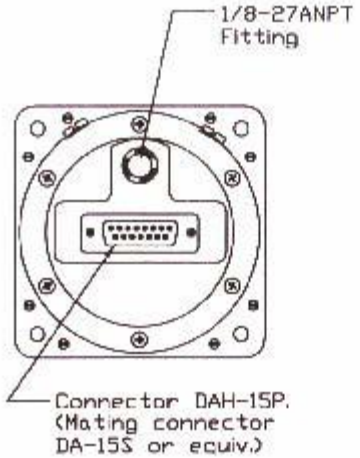
PLUMBING:

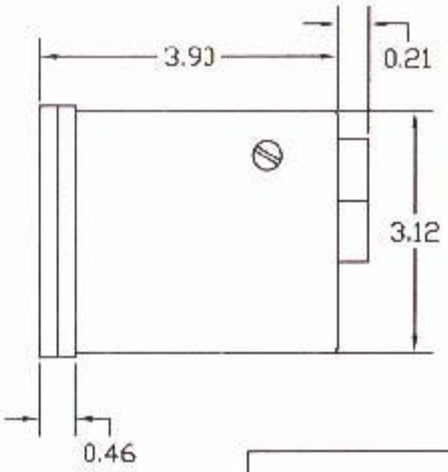
Install an appropriate 1/8-27 ANPT fitting in the digitizer static port. Use caution in tightening the fitting and support the unit, using a wrench on the hex fitting, to prevent twisting the digitizer's top. DO NOT OVER TORQUE!!!

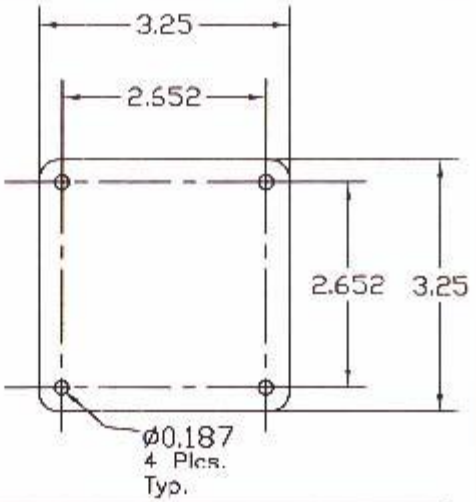
METHOD A: Remove fitting from altimeter and install a "T" connection. Replace soft tubing to altimeter using approved soft tubing.

METHOD B: Cut soft tubing attached to the altimeter, install a TCI "Universal Tee", then use soft tubing to connect from "T" to digitizer

When all connections are made, secure wiring and plumbing with appropriate clamps.

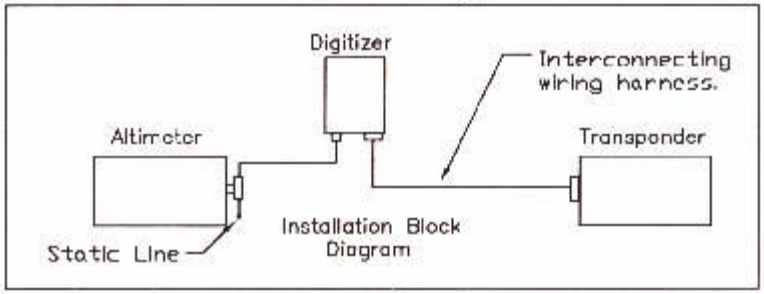






Connector Data			
Pin	Function	Pin	Function
1	D4*	9	B2
2	A1	10	B4
3	A2	11	C1
4	A4	12	C4
5	B1	13	C2
6	Strobe	14	13.75 VDC
7	Spare	15	Ground
8	27.5 VDC		

*Units operating above 30,700 feet only.



G. Parulo 11/73	TRANS-CAL INDUSTRIES, INC.
C.Dering 11/73	Dimensional Drawing - Digitizer
J. Ferrem 11/73	Model D120-P2-T
	E-100124

SPECIFICATIONS FOR ALTITUDE DIGITIZERS
MODEL D120-P2-T (K)
TSO-C88 F.A.A. APPROVED

1.0 GENERAL DESCRIPTION:

Trans-Cal Industries (TCI) has designed a low cost altitude reporting system that will meet and satisfy all the requirements of TSO-C88. The system is completely independent of the pilot's altimeter and consists of a temperature compensated pressure sensitive dual aneroid capsule, associated mechanical linkages and an encoder module. The encoder module is an optical type utilizing Gallium Arsenide (GaAs) light emitting diodes, a code disc, solid state detector and associated electronics.

2.0 GENERAL SPECIFICATION:

2.1 TSO-C88 This digitizer conforms to the applicable requirements of Technical Standards Order C-88 for combination devices.

2.2 Range
The digitizer has an active code range of -1000 feet up to +35,000 feet.

2.3 Code Output The digitized altitude output format is in accordance with U.S. national standards for common system component characteristics for the I.F.F. Mark (SIF)/Air Traffic Control Radar Beacon System SIF/ATCRBS and the international (ICAO) standard code for SSR pressure altitude transmission.

2.4 Accuracy The digitizer reproduces the pressure altitude input in digital form with a tolerance of +/75 feet, measured at the transition points against a NIST traceable standard, or is matched within +/-125 feet of the primary flight altimeter. Units operating in excess of 30,000 feet must be factory matched to the primary flight altimeter.

2.5 Identification
The following is legibly and permanently marked on the nameplate:

Trans-Cal Industries, Inc. Van Nuys, CA 91406
Automatic pressure altitude digitizer equipment
Range (as applicable)
Model (as applicable)

3.0 MECHANICAL SPECIFICATION:

3.1 Physical characteristics ---------in accordance with outline drawing.

3.2 Weight ----- 19.0 oz.

3.3 Pressure Datum-----the digitized information is referenced to 29.92 in Hg. Absolute (1013.25 millibars)

3.4 Operating Range -------1000 feet up to +35,000 feet.

4.0 ELECTRICAL SPECIFICATION:

4.1 Input Power:

Pin 14 10-15 VDC at 120 ma. Max.

Pin 8 22-30 VDC at 150 ma.Max.

Pin 15 Ground.

4.2 Dielectric strength ------ 200 VAC, 60Hz for 1 minute.

4.3 Insulation resistance ------ 200 VDC, 10 megohms minimum output.

4.4 Output logic levels:

Logic “1” 2.5 VDC to VCC max.
Logic “0” 0.0 to 0.7 VDC

4.5 Output circuitry:
Compatible with TTL (fanout of 2) DTL,, ECL, MOS and CMOS logic systems.

4.6 Illumination source:
Gallium arsenide (GaAs) solid state light emitting diodes.

5.0 ENVIRONMENT SPECIFICATION:

5.1 Temperature:
Operating: -30 degrees C to +50 degrees C
Non-operating: -65 degrees C to +70 degrees C

5.2 Humidity:
0 to 95% relative humidity at +32 degrees C

5.3 Altitude:
Will not be adversely affected when subjected to a pressure range equivalent to –1200 feet to +35,000 feet

5.4 Vibration:

5 to 50 cps: .020 double amplitude 1.5 Gs max.

50 to 500 cps: 1.5 Gs max.

ENCODER/TRANSPONDER CONNECTIONS

The following encoder/transponder interconnections are provided as a quick reference only, and though they are accurate to the best of our knowledge, always consult the latest installation, operation and service bulletins from the transponder manufacturer. Note also that additional transponder wiring may be required to enable “MODE C” operation.

TCI PIN	FUNCTION	KING 76A,78A,79	76,78	750A
1	Spare / D4	8	-	V
2	A1	M	6	G
3	A2	K	7	H
4	A4	J	9	J
5	B1	E	4	K
6	Strobe	Ground	Ground	B
7	Spare	-	-	-
8	28VDC	-	-	-
9	B2	C	1	L
10	B4	B	2	M
11	C1	D	3	P
12	C4	H	10	S
13	C2	L	8	R
14	14VDC	-	-	-
15	Ground	-	-	-

TCI PIN	FUNCTION	NARCO 50, 50A, 150	NARCO 5, 6, 6A	CESSNA 359A, 459A, 859A	BENDIX TRP-2060
1	Spare / D4	-	-	10	-
2	A1	7	2	14	4
3	A2	6	4	13	6
4	A4	8	8	15	8
5	B1	12	9	19	9
6	Strobe	5	12	11	Ground
7	Spare	-	-	-	-
8	28VDC	-	-	-	-
9	B2	10	10	17	10
10	B4	9	11	16	11
11	C1	14	1	21	3
12	C4	13	5	20	7
13	C2	11	3	18	5
14	14VDC	-	-	-	-
15	Ground	-	-	-	-

TCI PIN	FUNCTION	BENDIX TR641A/B	WILCOX 1014A	EDO-AIRE RT-777	GENAVE BETA-5000	RADAIR 250
1	Spare / D4	N	C	15	-	15
2	A1	A	K	7	4	7
3	A2	B	C	5	5	6
4	A4	C	W	3	6	13
5	B1	D	T	12	7	9
6	Strobe	S	Ground	2	3	19
7	Spare	-	-	-	-	-
8	28VDC	-	-	-	-	-
9	B2	E	L	13	8	10
10	B4	F	D	14	9	11
11	C1	H	P	8	10	14
12	C4	K	Z	4	12	12
13	C2	J	F	6	11	16
14	14VDC	-	-	-	-	-
15	Ground	-	-	-	-	-

WARRANTY REGISTRATION

Trans-Cal Industries warrants each Model D120-P2-T altitude encoder/digitizer to be free of defects in workmanship and materials for a period of 42 months after purchase. This warranty applies to the *original purchaser* of the instrument. Additionally, Trans-Cal Industries warrants its infrared solid state illumination sources for a period of five years, provided that upon examination at the factory, no evidence of over voltage is found.

Trans-Cal's obligation under this warranty is limited to repairing or replacing any unit returned to Trans-Cal during the life of this warranty provided:

(1) the defective unit is returned to us, **transportation prepaid,**

(2) prior approval is obtained from Trans-Cal,

(3) the unit has not been damaged by misuse, neglect, improper operation, accident, alteration or improper installation.

Trans-Cal DOES NOT reimburse labor costs on warranty repairs. Trans-Cal Industries will be the sole judge as to the cause of the malfunction and where the responsibility lies. No other obligation or liability is expressed or implied.

For the above warranty to become effective, the attached registration card must be completed and returned to Trans-Cal Industries, properly filled out and signed by the dealer selling or installing the equipment.

MODEL NO: D120-P2-T SERIAL NO._____

AIRCRAFT:_____NUMBER:_____

OWNER:_____

ADDRESS:_____

CITY:_____STATE:_____ ZIP:_____

DEALER:_____ INSTALLATION

DATE:_____

I hereby certify the above instrument was installed in accordance with the instructions of Trans-Cal Industries, and the installation was done in a workmanship like manner. I further certify the instrument was properly working on the above date.

SIGNED:_____

PRINT NAME:_____