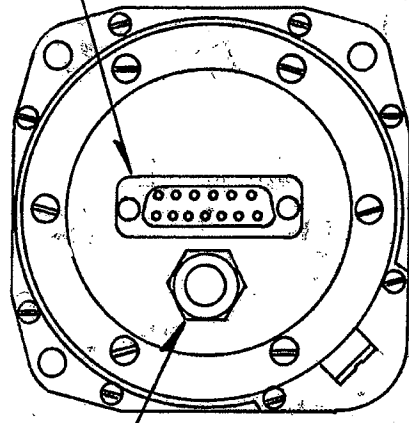


3- 0.170 HOLES ON 3.50 BC

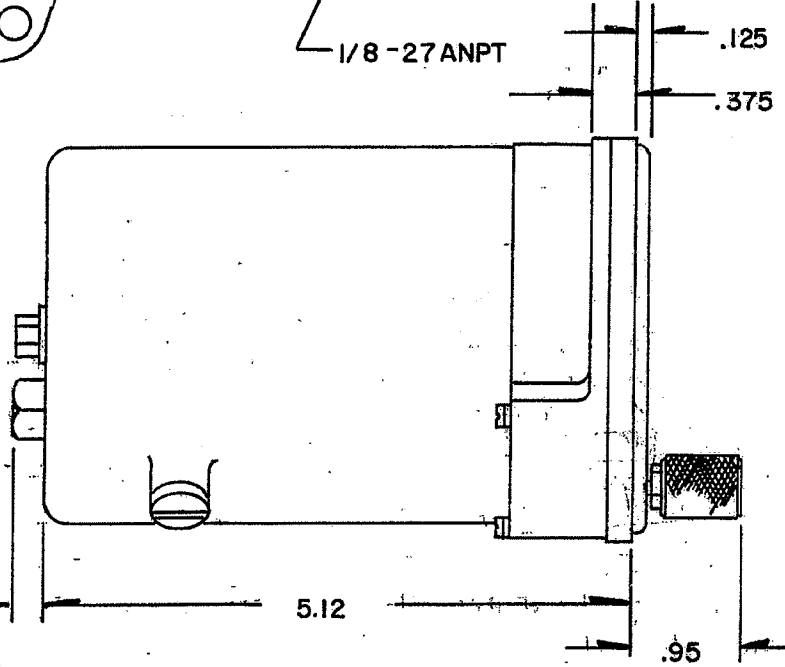
DAH-15P-201 (CANNON)



1/8-27 ANPT

.125

.375



.45

5.12

.95


J1

- 1 D4
- 2 A1
- 3 A2
- 4 A4
- 5 B1
- 6 SIG COMM
- 7 OPEN
- 8 +27.5 VDC
- 9 B2
- 10 B4
- 11 C1
- 12 C4
- 13 C2
- 14 +13.75 VDC
- 15 GROUND

INTERCONNECT WIRING

WEIGHT - 1.9 LBS.

						PREP. BY	C. NELSON	3/30/70
C	10/9/62	Correct Hys (Para. 3.2) Ftr Disc. (Para. 3.3) & NOTE (P.2)	D	3/6/69	CORRECTED VIB REQ. (Para. 2.23)	APPR. BY	W. L. D.	3/31/76
B	4/23/78	Correct 10 Kft. Ftr. Disc. (Para. 3.3) & Para. setting (P. 2, E. 7)	A	2-7-79	ADD -P33, P34, P37, & P38	CHECKER	T.K.	
REV. DATE			CHK.	REV. DATE		CHK.	NAME	DATE

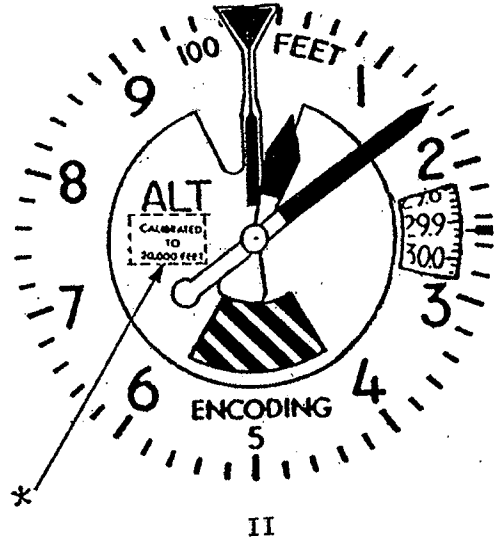
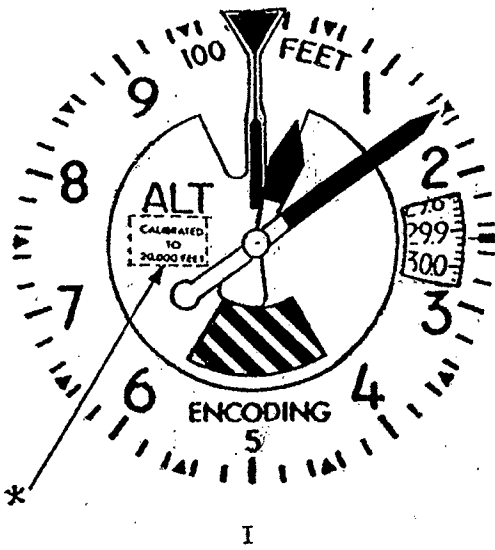
UNITED INSTRUMENTS, INC.

 3625 COMOTARA AVE.
 WICHITA, KS 67226

TITLE: ALTIMETER - ENCODER

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* NOTE: CALIBRATED RANGE SHALL APPEAR IN WHITE ON 20,000, 25,000, AND 30,000 FT. DIALS.

UNITED INSTRUMENTS, INC		DIAL CONFIGURATION	RANGE	ENCODING COLOR	BARO. SCALE
PART NO.	CODE NO.				
5035P-P22	P.22	I	35,000	ORANGE	IN.Hg
5035P-P23	P.23	II	35,000	WHITE	IN.Hg
5035P-P24	P.24	II	35,000	WHITE	MB
5035P2-P25	P.25	I	20,000	ORANGE	IN.Hg
5035P2-P26	P.26	II	20,000	WHITE	IN.Hg
5035P2-P27	P.27	II	20,000	WHITE	MB
5035P-P28	P.28	I	35,000	ORANGE	MB
5035P2-P30	P.30	I	20,000	ORANGE	MB
5035P3-P33	P.33	II	30,000	WHITE	IN.Hg
5035P3-P34	P.34	II	30,000	WHITE	MB
5035P4-P37	P.37	II	25,000	WHITE	IN.Hg
5035P4-P38	P.38	II	25,000	WHITE	MB

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1.0 GENERAL

1.1. PURPOSE:

This specification defines standards of minimum performance and conditions under which these standards apply for the Model 5035 Altimeter – Encoder.

1.2. DESCRIPTION:

The Model 5035 Altimeter – Encoder is for use on aircraft to indicate the height of the aircraft above a reference point, generally mean sea level, assuming standard conditions of temperature and pressure. The altimeter measures the existing barometric pressure. Since atmospheric pressure varies with altitude, this pressure is indicated on the dial in feet of altitude. The altimeter may be manually adjusted to variances in barometric pressure.

The internal encoder provides altitude signals in accordance with ICAO altitude code requirements. The code output is unaffected by the knob rotations associated with usual altimeter operation.

The sensing element (diaphragm assembly) and gear train are encased in a die cast aluminum case. The altitude is indicated in a three pointer display. An increase in altitude results in a clockwise rotation of the pointers. The gear train driving the pointer also drives the encoder, thus permitting accurate correlation. Electrical power failure or circuit component failure cannot impair the ability of the altimeter to function normally.

1.3. OPERATING LIMITS:

The Model 5035 Altimeter operates through a maximum calibrated range of -1,000 to 35,000 feet. Encoder output resolution is 100 feet. Input voltage variation should not exceed plus or minus 15 percent. The signal output to common closed circuit voltage drop will not exceed 0.7 VDC at 0.005 AMP.

1.4. BAROMETRIC SCALE ADJUSTMENT:

The barometric scale setting is adjustable by means of an adjustment knob located in the lower left hand corner of the altimeter. Due to the variances in the barometric pressure, it is necessary to set the barometric scale to the existing barometric pressure. The existing barometric pressure may be obtained from the weather station or control tower. Rotation of the knob for barometric scale adjustment results in rotation of the pointers on the altitude dial. An increase in barometric scale will result in an increase in the altitude as indicated on the dial. This relationship of pointers to barometric scale is based on standard conditions of pressure and temperature. Mechanical stops are provided to prevent incorrect readings of the pressure scale when the limits of the barometric scale are exceeded.

2.0. STANDARD TEST CONDITIONS

2.1. ATMOSPHERIC CONDITIONS:

Unless otherwise specified, all tests required by this specification shall be conducted at an atmospheric pressure of approximately 29.92 inches of mercury and at the ambient temperature of approximately 25° C and at a relative humidity of not greater than 85 percent.

2.2. VIBRATION TO MINIMIZE FRICTION:

Unless otherwise specified, all tests for performance may be conducted with the instrument subjected to a vibration of 0.002 to 0.005 inch double amplitude at a frequency of 1,500 to 2,000 cycles per minute.

2.3. POSITION:

Unless otherwise specified all tests shall be made with the altimeter mounted in its normal operating position.

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3.0. INDIVIDUAL PERFORMANCE REQUIREMENTS

3.1. SCALE ERROR:

With the barometric pressure scale at 29.92 IN.Hg (1013.25 MB), the altimeter shall be subjected successively to pressure corresponding to the altitude specified in Table I up to the maximum calibrated range of the altimeter being tested. The reduction in pressure shall be made at a rate not in excess of 20,000 feet per minute to within approximately 2,000 feet of the test point. The test point shall be approached at a rate compatible with the test equipment. The altimeter shall be kept at the pressure corresponding to each test point for at least one minute, but not more than ten minutes, before the reading is taken. The error at all test points must not exceed the tolerances specified in Table I. Following a minimum delay of four hours, this test may be repeated and the altimeter shall meet tolerances as specified in Table I.

3.2. HYSTERESIS:

The hysteresis test shall begin not more than fifteen minutes after the altimeter's initial exposure to the pressure corresponding to the upper limit of the scale error test prescribed in paragraph 3.1. While the altimeter is at this pressure, the hysteresis test shall commence. Pressure shall be increased at a rate simulating a descent in altitude at the rate of 5,000 to 20,000 feet per minute until within 3,000 feet of the first test point of 10,000 feet for 5035P2 and 5035P4 series units, or 18,000 feet for 5035P and 5035P3 series units. The test point shall then be approached at a rate of approximately 3,000 feet per minute. Within 10 seconds after the pressure has been stabilized at the test point, the instrument indication shall be within 100 feet of the scale error reading obtained in Scale Error test. The altimeter shall be kept at this pressure for at least 5 minutes, but not more than 15 minutes, before the reading is taken. The pressure shall be increased further, in the same manner as before, until the pressure corresponding to the second test point of 8,000 feet for 5035P2 and 5035P4 series units, or 14,000 feet for 5035P and 5035P3 series units, is reached. The altimeter shall be kept at this pressure for at least one minute, but not more than 10 minutes, before the test reading is taken. After the reading has been taken, the pressure shall be increased further in the same manner as before, until atmospheric pressure is reached. The reading of the altimeter at either of the two test points shall not differ by more than 75 feet from the reading of the altimeter for the corresponding altitude recorded during the scale error test prescribed in paragraph 3.1.

3.3. AFTER EFFECT:

Not more than five minutes after the completion of the hysteresis test prescribed in paragraph 3.2, the reading of the altimeter (corrected for any change in atmospheric pressure) shall not differ from the original reading by more than 30 feet.

3.4. FRICTION:

The altimeter shall be subjected to a steady rate of decrease of pressure of approximately 750 feet per minute. At each altitude listed in Table II, the altimeter reading will be noted before and after vibration. The difference will not exceed the tolerance shown.

3.5. CASE LEAK:

The leakage of the altimeter case, when the pressure within it corresponds to an altitude of 18,000 feet, shall not change the altimeter reading by more than 100 feet per minute.

3.6. POSITION ERROR:

With atmospheric pressure applied to the instrument, the difference between pointer indication when the instrument is in normal operating position and when it is in any other position shall not exceed 20 feet.

3.7. BAROMETRIC SCALE ERROR:

At constant atmospheric pressure, the barometric pressure scale shall be set at each pressure (falling within its range of adjustment) listed in Table III and shall cause the pointer to indicate the equivalent altitude difference shown in Table III with a tolerance of 25 feet.

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3.8. **POINTER OSCILLATION:**

There shall be no more than 20 feet of pointer oscillation when the instrument, at its normal operating position, is subjected to vibration listed in paragraph 4.4.

C

3.9. **ENCODER SIGNAL ERROR TEST**

3.9.1 With the barometric scale set exactly on 29.92 IN.Hg (1013.25 MB) and vibration applied to remove friction, paragraph 2.2, connect the Altimeter - Encoder to a suitable encoder-transponder tester. Connect the static pressure port to a controlled pressure source.

3.9.2 The altitude code error is determined by noting the altitude indication of the Altimeter - Encoder pointers at the instant of the code transition to the next consecutive altitude code. To obtain accurate reading of the pointers at the instant of transition, the rate of change of the pointers when approaching the transition point must not exceed 1,000 feet per minute and not less than 500 feet per minute.

3.9.3 Apply pressure to successively test the altitude code transition at the points shown in Table IV.

CAUTION

The barometric scale must be set exactly on 29.92 inches of mercury (1013.25 MB) to synchronize the pointers with the altitude code output.

4.0. **ENVIRONMENTAL CONDITIONS**

When installed in accordance with United Instruments, Inc. instructions, the Altimeter - Encoder will function in the following environmental ranges.

4.1. **TEMPERATURE:** -30°C to 50°C

4.2. **ALTITUDE:** -1,000 to 35,000 feet

4.3. **HUMIDITY:** 0% to 95 % at 32°C

4.4. VIBRATION:	<u>Frequency</u>	<u>Max. Double Ampl.</u>	<u>Max. Accel.</u>
	5 to 50 Hz	.020 inch	1.5 g's
	50 to 500 Hz	----	0.5 g's

5.0. **INSTALLATION INSTRUCTIONS**

The aircraft static system must meet the requirements of FAR Part 43, App. E. The altimeter connection to the static system must include a flexible hose or tubing to provide vibration isolation.

5.1. **FITTING:**

The threads of the 1/8-27 ANPT fitting to be inserted should be coated to prevent seizing or leaking.

5.2. **ELECTRICAL CONNECTOR:**

The Cannon connector, DAH-15P-201, mates with Cannon socket DA-15S or equivalent.

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TABLE I
SCALE ERROR

<u>ALTITUDE (FEET)</u>	<u>EQUIVALENT PRESSURE (INCHES OF MERCURY)</u>	<u>TOLERANCE (+/- FEET)</u>
-1,000	31.018	20
0	29.921	20
500	29.385	20
1,000	28.856	20
1,500	28.335	25
2,000	27.821	30
3,000	26.817	30
4,000	25.842	35
6,000	23.978	40
8,000	22.225	60
10,000	20.577	80
12,000	19.029	90
14,000	17.577	100
16,000	16.216	110
18,000	14.942	120
20,000	13.750	130
22,000	12.636	140
25,000	11.104	155
30,000	8.885	180
35,000	7.041	205

TABLE II
FRICITION

<u>ALTITUDE (FEET)</u>	<u>TOLERANCE (+/- FEET)</u>
1,000	70
2,000	70
3,000	70
5,000	70
10,000	80
15,000	90
20,000	100
25,000	120
30,000	140
35,000	160

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TABLE III

PRESSURE - ALTITUDE DIFFERENCE

PRESSURE (INCHES OF MERCURY)	ALTITUDE DIFFERENCE (FEET)	PRESSURE (MILLIBARS)	ALTITUDE DIFFERENCE (FEET)
28.10	- 1,727	950	- 1,766
28.50	- 1,340	965	- 1,337
29.00	- 863	980	- 913
29.50	- 392	995	- 495
29.92	0	1013	0
30.50	+ 531	1030	+ 461
30.90	+ 893	1045	+ 863
30.99	+ 974	1050	+ 996

TABLE IV

ALTITUDE CODE OUTPUT ERROR

ALTITUDE CODE OUTPUT (IN FEET)	POINTER INDICATION	
	INCREASING ALTITUDE (IN FEET)	DECREASING ALTITUDE (IN FEET)
0	-50 +/-50	50 +/-50
1,000	950 +/-50	1,050 +/-50
2,000	1,950 +/-50	2,050 +/-50
3,000	2,950 +/-50	3,050 +/-50
4,000	3,950 +/-50	4,050 +/-50
6,000	5,950 +/-50	6,050 +/-50
8,000	7,950 +/-50	8,050 +/-50
10,000	9,950 +/-50	10,050 +/-50
16,000	15,950 +/-50	16,050 +/-50
20,000	19,950 +/-50	20,050 +/-50
25,000	24,950 +/-50	25,050 +/-50
30,000	29,950 +/-50	30,050 +/-50
35,000	34,950 +/-50	35,050 +/-50

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