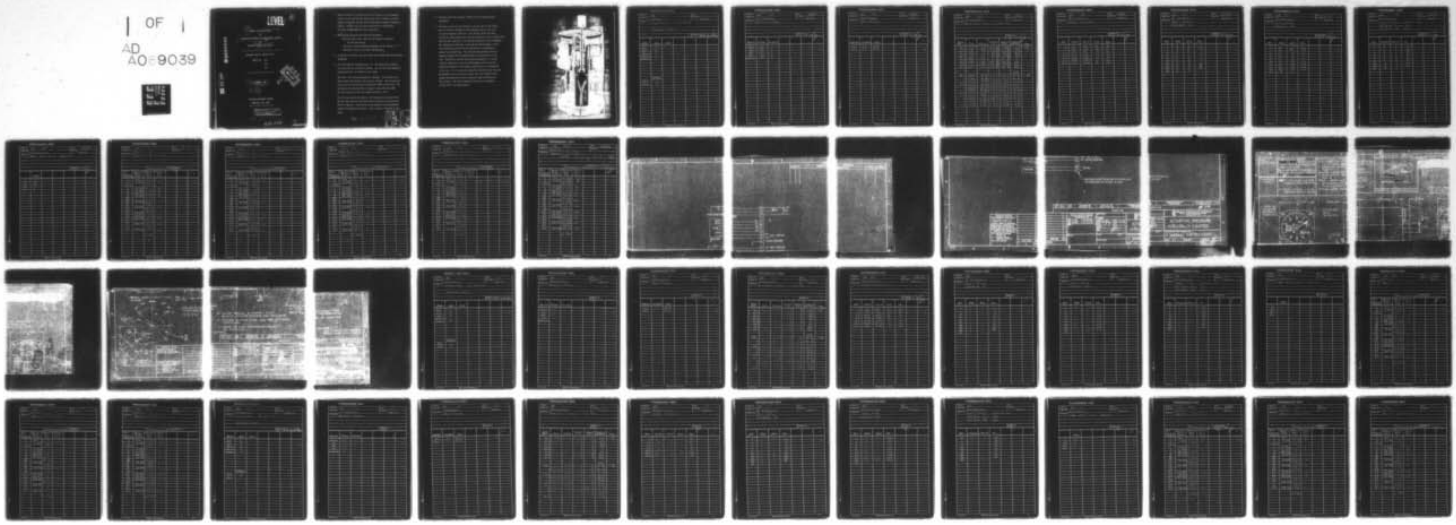
AD-A069 039 KOLLSMAN INSTRUMENT CO MERRIMACK NH F/G 1/4
REPORT OF INVESTIGATION OF ALTIMETERS RETURNED FROM NWSC, CRANE--ETC(U)
NOV 76 N00164-75-C-0279
UNCLASSIFIED NL



(4)

(6) REPORT OF INVESTIGATION

OF

ALTIMETERS RETURNED FROM NWSC CRANE, INDIANA.

ON

CONTRACT: (15) N00164-75-C-0279

KOLLSMAN TYPE NO. A45782 10 001

SERIAL NO. 103

105

106

(11) NOVEMBER 1976

(12) 51p.

KOLLSMAN INSTRUMENT COMPANY

MERRIMACK, NH 03054

411 186

LB

Enclosure (2)

1. Contract N00164-75-C-0279 called for the delivery of six altimeters similar to the type AAU-32/A except they were to contain a resolver output of indicated altitude and a potentiometer output of barometric setting. The six units were built and tested as required and delivered ~~to NWSC Crane~~ for their evaluation.

2. NWSC testing indicated three units had problems;

   #103 had scale error -35° C out of tolerance conditions at nine test points,

   #105 had a reversed phasing arrangement on the resolver, and

   #106 had a seizure of the baro setting knob.

3. At receipt at Kollsman, the three units were retested for the functions designated.

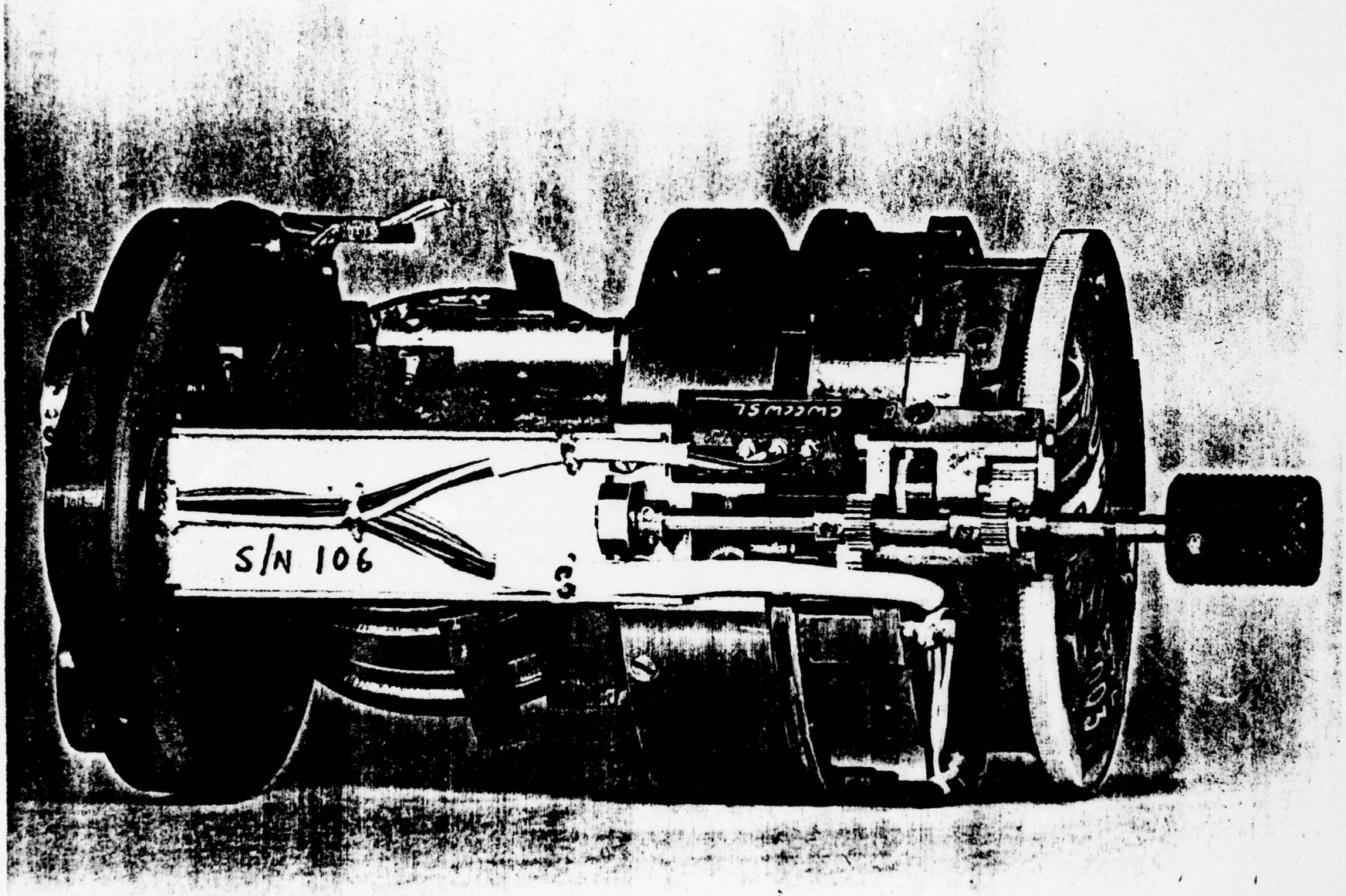
4. Unit #103 required recompensation; i.e., the thermostatic bimetals were reset and the calibration checked. The unit has been completely retested and data is attached to this report.

   Unit #105 - The reversed phasing was confirmed. The resolver excitation leads were reversed, and the unit retested. The resolver had the lead colors reversed and a conventional VTVM had been used. The testing has now been modified to require a phase-sensitive VTVM for that testing, so that this problem should not recur.

   Unit #106 was opened and checked. The bearing for the lower end of the knob shaft had not been lubricated and had thus seized the knob shaft as reported. This portion of the altimeter was disassembled, reworked and completely retested. The test data is attached to this report.

5. The units have been returned to NWSC for their evaluation and acceptance.

6. The sump on the case was extended to the rear face of the instrument to allow for assembly of the mechanism into the case with all parts completely installed. This design liberty was taken because the added length above the amount specified in Mil-A-81851 (AS) made the unit identical to the AAU-32/A specified in Mil-A-81852(AS). The installation provisions of the AAU-32/A had undergone a fleet-wide installation survey and the specification was amended to permit the extended sump. This installation procedure permits a complete checkout of the mechanism prior to installation in the case. With both a resolver and a baro potentiometer, it is particularly important to have the relationship of the electrical elements correlated to the display elements prior to installation in the case. It is also worth noting that the static port was also positioned as for the AAU-32/A because the 4.750 length of case showed some problems of static connections upon installation in the aircraft. The outline drawing of the unit is included to clarify both of the above points.


S/N 106

PERFORMANCE DATA

Subject S/N 12	Date 1/4
Type No. A45982100001	Job No. 100127
Remarks EXAMINATION OF PRODUCT	
LIGHTING TEST	
	Signature R. McNichols

PART	ACC	REJ				
DIAL	✓					
CASE	✓					
POINTER	✓					
STATIC PORT	✓					
CONNECTOR	✓					
	LIGHTING					
RED	✓					
WHITE	✓					

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A 4528210001	Job No. 100127
Remarks POSITION ERROR	
	Signature H. Chung

POSITION	READING	DIFFERENCE				
NORMAL	250'	—				
90°	250'	0				
180°	255"	+5"				
270°	245"	-5"				
DIAL FACE UP	245"	-5"				

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A45782.10001	Job No. 100127
Remarks BARO TORQUE	
	Signature (100) C. Chung

DIRECTION	OZ IN READING	TOL.				
C.W	3.0	5 ± 2				
C.C.W	3.5	5 ± 2				

PERFORMANCE DATA

Subject S/N 103	Date 11/3/76
Type No. A 4578210001	Job No. 100127
Remarks BARO SCALE ERROR & BARO BIT	
	Signature S. Chang

TEST POINT	C.W.	C.C.W.	CORRECTED C.W.		CORRECTED C.C.W.		CORRECT DIFFERENCE	TOL
28.1	-1295	-1295	-1720	-7	-1720	-7	-1,727	± 25
28.5	-920	-920	-1345	+5	-1345	+5	-1,340	
29.0	-430	-430	-855	-8	-855	-8	-863	
29.5	+25	+30	-400	+8	-395	+3	-392	
29.72	+425	+430	0	0	+5	+5	0	
30.5	+950	+950	+525	-6	+525	-6	531	
30.9	+1320	+1320	+895	+2	+895	+2	893	
31.0	+1415	+1415	+990	+7	+990	+7	983	
							V/R	
28.1	90.942	90.945	+.042		+.043		90.90	± .83
.4	81.229	81.224	+.109		+.104		81.12	
.7	71.655	71.673	+.025		+.043		71.63	
29.0	62.173	62.147	+.075		+.047		62.10	
.2	52.708	52.723	+.078		+.093		52.63	
.6	43.384	43.381	+.114		+.111		43.27	
29.72	33.459	33.445	+.129		+.115		33.33	
30.0	30.993	30.993	+.093		+.093		30.90	
.3	21.744	21.743	+.014		+.013		21.73	
.6	12.557	12.568	-.043		-.032		12.60	
.9	3.464	3.445	-.106		-.125		3.57	
31.0	0.605	0.605	+.035		+.035		0.57	

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A/S78810001	Job No. 100127
Remarks STATIC FRICTION	
	Signature (OK 103) D. Clancy

ALT	VIB OFF	VIB ON	DIFF	Tol.		
.5	500	540	40	70'		
1.5	1500	1545	45	70'		
2.5	2500	2545	45	70'		
3.5	3500	3550	50	70'		
12.5	12500	12565	65	70'		
22.5	22500	22565	65	120'		
32.5	32500	32580	80	180'		

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A 4578210001	Job No. 100127
Remarks STOP + JUMP	
VIBRATOR ON	
	Signature G. Chung

ALT	INC	DEC	TOL			
0	0	0	25'			
1	0	0	25'			
3	0	0	25'			
5	0	0	25'			
10	0	0	25'			
20	0	0	25'			
30	0	0	25'			
35	0	0	50'			
40	0	0	50'			
50	0	0				

PERFORMANCE DATA

Subject S/N 103	Date 11-6-76
Type No. A 45782 10001	Job No. 100127

Remarks
STOP + JUMP
VIBRATOR OFF

Signature (SK) D. Chung

ALT	INC	DEC	TOL			
0	45	55	300			
1	20	20	120			
3	20	25	120			
5	25	20	120			
10	75	75	250			
20	80	80	250			
30	110	100	350			
35	90	80	600			
40	165	125	600			
50	180	250				

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A45282100001	Job No. 100127

Remarks
STOP + TEMP VIBRATOR ON
45° DIAL DOWN INC
45° DIAL UP DEC

Signature J. Chung

ALT	45° DIAL DOWN	45° DIAL UP	TOL			
0	0	0	75'			
1	0	0	75'			
2	0	0	75'			
5	0	0	75'			
10	0	0	75'			
20	0	0	75'			
30	0	0	100'			
35	0	0	100'			
40	0	0				

PERFORMANCE DATA

Subject S/N 103	Date 11/8/76
Type No. A 45282/0001	Job No. 100127
Remarks CASE LEAK Room 20,500'	
	Signature (OK JDK) B. Cheung

	LEAK					
0	25'					
90°	15'					
180°	15'					
270°	6'					
	[illegible]	[illegible]				

PERFORMANCE DATA

Subject SN 102	Date 11/17/61
Type No. A45782 10 001	Job No.
Remarks Altitude Scale Error	
Temperature -35°C	Signature

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	-15 / -5	0			
0	7.031	-15 / 0	+5			
+0.5		-10 / +5				
1	14.063	-10 / 0	+10			
2	21.094	0 / +10	+15			
3	28.125	0 / +10	+20			
5	42.187	-5 / +5	+20			
8		-10 / 0				
10	77.344	-15 / 0	-25			
12		-35 / -30				
15	112.500	-50 / -40	-50			
18		-60 / -50				
20	147.656	-65 / -55	-40			
25	182.813	-95 / -85	-10			
30	217.969	-90 / -80	+10			
35		-55 / -50				
40	288281	-70 / -70	-40			
49		-205 / -200				
50	358.594	-365 / -360	+10			
		Up / Down				
	Position	0				

PERFORMANCE DATA

Subject SN 102	Date 11/10/61
Type No. A41578-2 10 001	Job No. 10020
Remarks Altitude Scale Error	
Temperature +45° C	Signature

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	0 / +5	0			
0	7.031	0 / +10	0			
+0.5		0 / +20				
1	14.063	0 / +10	+10			
2	21.094	+10 / +20	+15			
3	28.125	+15 / +25	+15			
5	42.187	+5 / +15	+10			
8		+5 / +10				
10	77.344	0 / +10	-25			
12		-15 / -5				
15	112.500	-30 / -15	-30			
18		-35 / -25				
20	147.656	-45 / -30	-45			
25	182.813	-60 / -55	-25			
30	217.969	-40 / -40	0			
35		-50 / -40				
40	288281	-30 / -15	-40			
45		-155 / -145				
50	358.594	-355 / -345	0			
		Up / Down				
	Set for	75'				

PERFORMANCE DATA

Subject SN 103	Date 11/5
Type No. A4578-2 10 001	Job No.
Remarks Altitude Scale Error	
Temperature +25° C	Signature V. Chang

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	0 / 0	0			
0	7.031	+5 / -5	0			
+0.5		-10 / +15				
1	14.063	0 / +5	+5			
2	21.094	+10 / +15	+5			
3	28.125	+15 / +25	+5			
5	42.187	+5 / +10	+5			
8		0 / +10				
10	77.344	0 / +10	-25			
12		-20 / -10				
15	112.500	-35 / -25	-50			
18		-40 / -30				
20	147.656	-45 / -30	-45			
25	182.813	-50 / -60	-25			
30	217.969	-50 / -55	0			
35		-45 / -50				
40	288281	-40 / -30	-30			
45		-170 / -160				
50	358.594	-365 / -355	0			
		Up / Down				
	Pool Look	20				

PERFORMANCE DATA

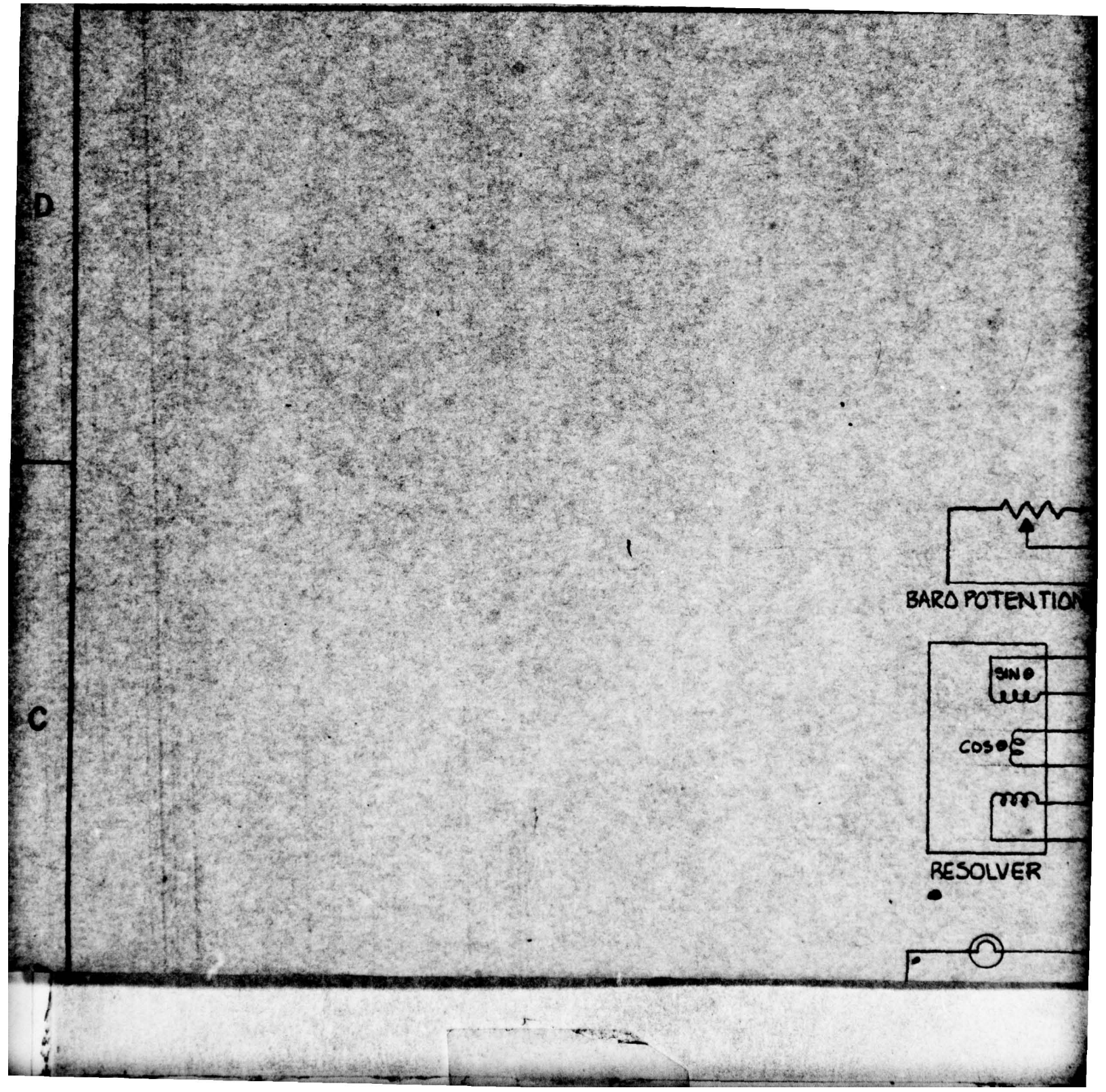
Subject SN 103	Date 11/30/72
Type No. A45782 10 001	Job No.
Remarks Altitude Scale Error	
Temperature 25°C	Signature (SK 10-72) C. Olsen

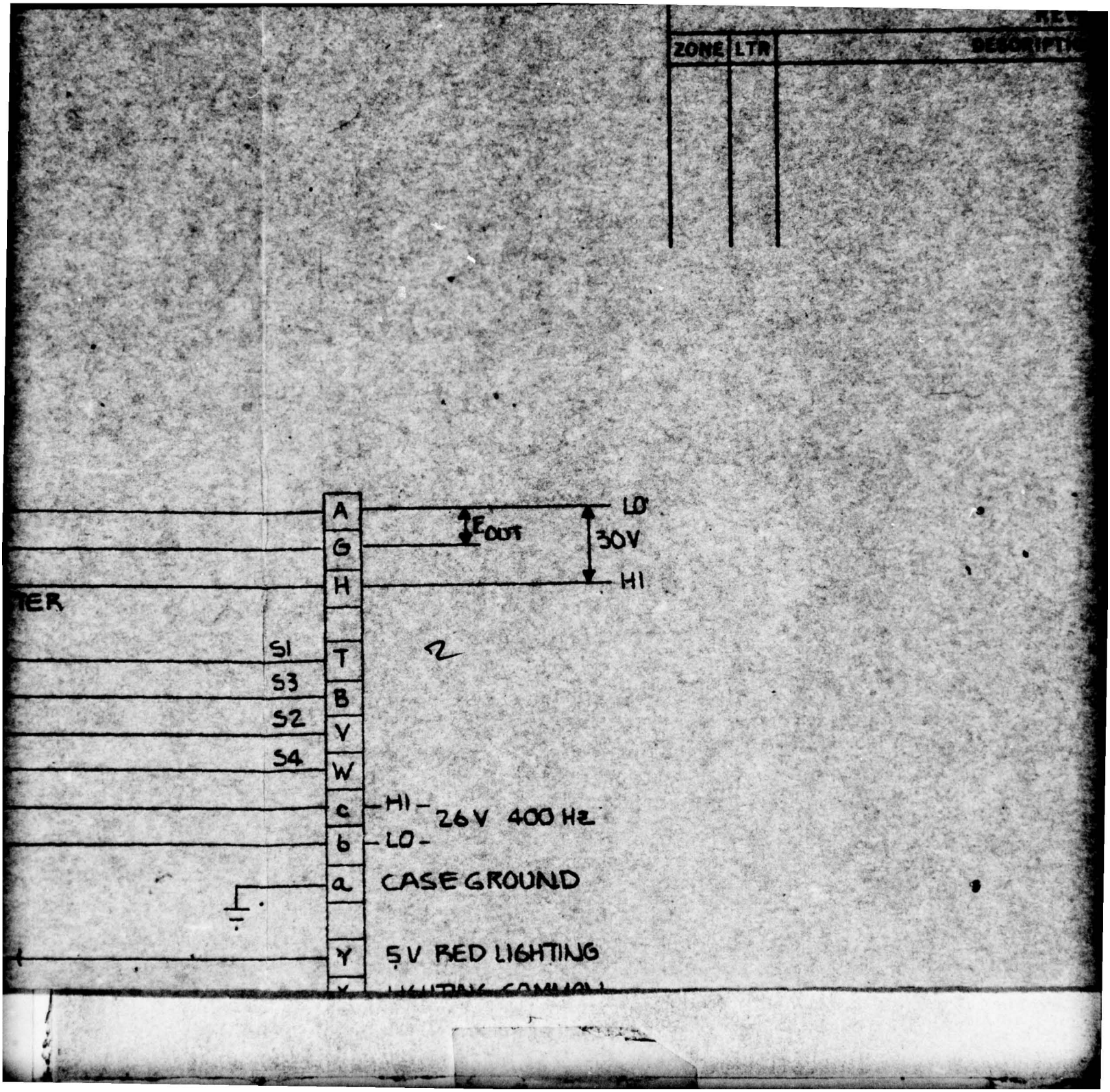
Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	0 / +5				
0	7.031	0 / +10		Set Check w/o/ps		
+0.5		0 / +15				
1	14.063	0 / +20				
2	21.094	+10 / +20				
3	28.125	+15 / +30				
5	42.187	+5 / +15				
8		0 / +10				
10	77.344	0 / +10				
12		-20 / -10				
15	112.500	-30 / -20				
18		-40 / -30				
20	147.656	-45 / -35				
25	182.813	-70 / -60				
30	217.969	-70 / -60				
35		-60 / -50				
40	288281	-35 / -25				
45		-160 / -140				
50	358.594	-360 / -335				
		Up / Down				

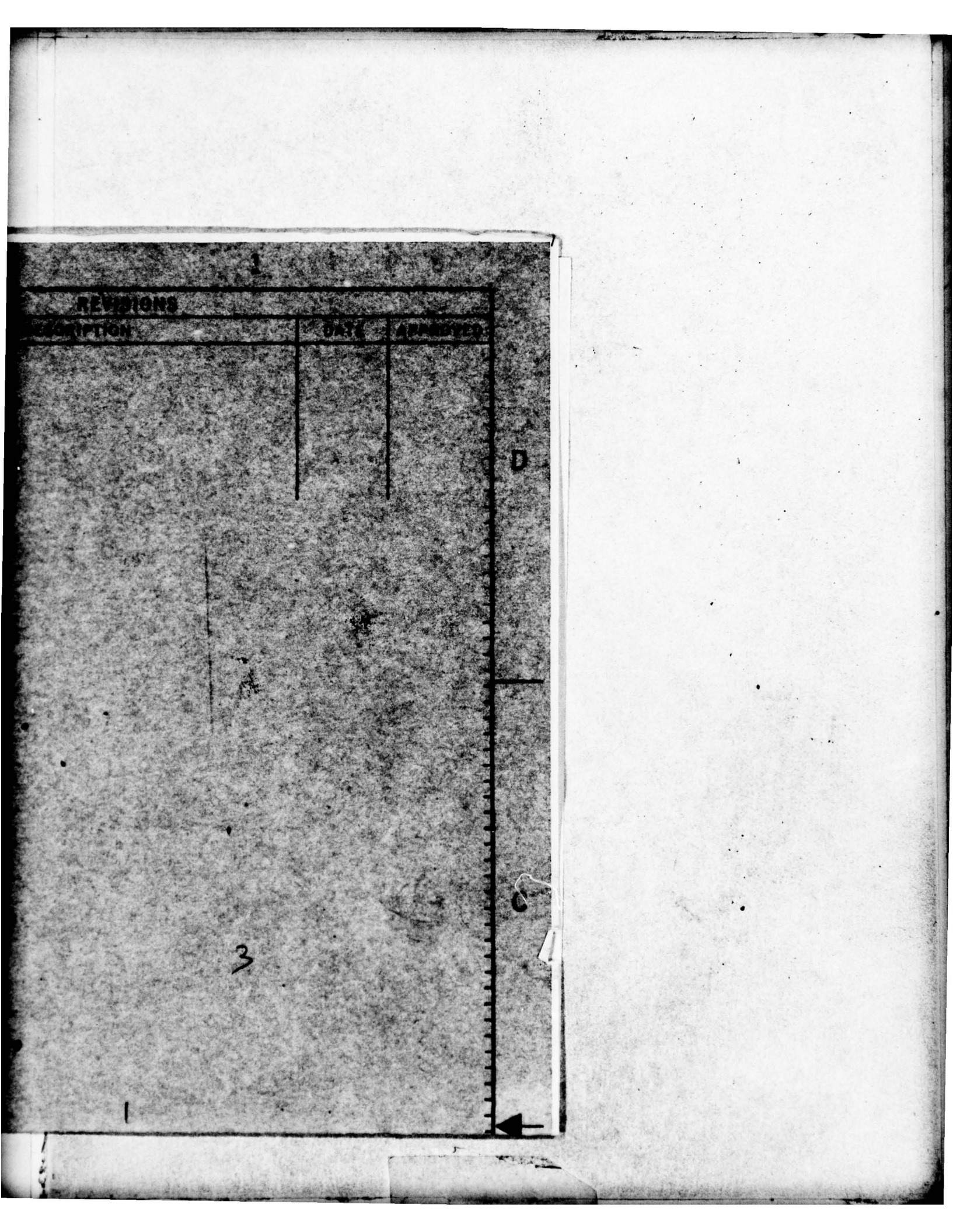
PERFORMANCE DATA

Subject SN 105	Date 12/6/76
Type No. A45782 1C 601	Job No.
Remarks Altitude Scale Error	
After Re-Soldering Resolver Solo	
Temperature +25°C	Signature R Colmer

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			0
-1	0.0	0 / +5	-5			
0	7.031	0 / +5	0			
+0.5		0 / +5				
1	14.063	-5 / 0	0			
2	21.094	0 / +5	0			
3	28.125	0 / +5	0			
5	42.187	+20 / +35	+5			
8		+15 / +25				
10	77.344	0 / +10	+15			
12		0 / +10				
15	112.500	-10 / 0	+30			
18		-25 / -15				
20	147.656	-15 / 0	+20			
25	182.813	-40 / -20	+5			
30	217.969	-35 / -25	0			
35		+15 / +25				
40	288281	+45 / +50	+5			
45		-35 / -25				
50	358.594	-160 / -145	-5			
		Up / Down				


D
C
BARO POTENTION
SIN θ
COS θ
RESOLVER


ZONE
LTR
A
G
H
T
B
V
W
c
b
a
Y
LO
E_{OUT}
30V
HI
S1
S3
S2
S4
HI - 26V 400 Hz
LO -
CASE GROUND
5V RED LIGHTING


REVISIONS
DESCRIPTION
DATE
APPROVED
D
C
3
1

VIBRATOR

B

4

A

GENERAL NOTES
FOR GENERAL MACHINING STANDARDS REFER TO LATEST ISSUE OF KES-2A.2
PARENTHETICAL IDENTITIES OF SYMBOLS, DWG. AND DOCUMENT NOS. ARE FOR KOLLSMAN USE ONLY.

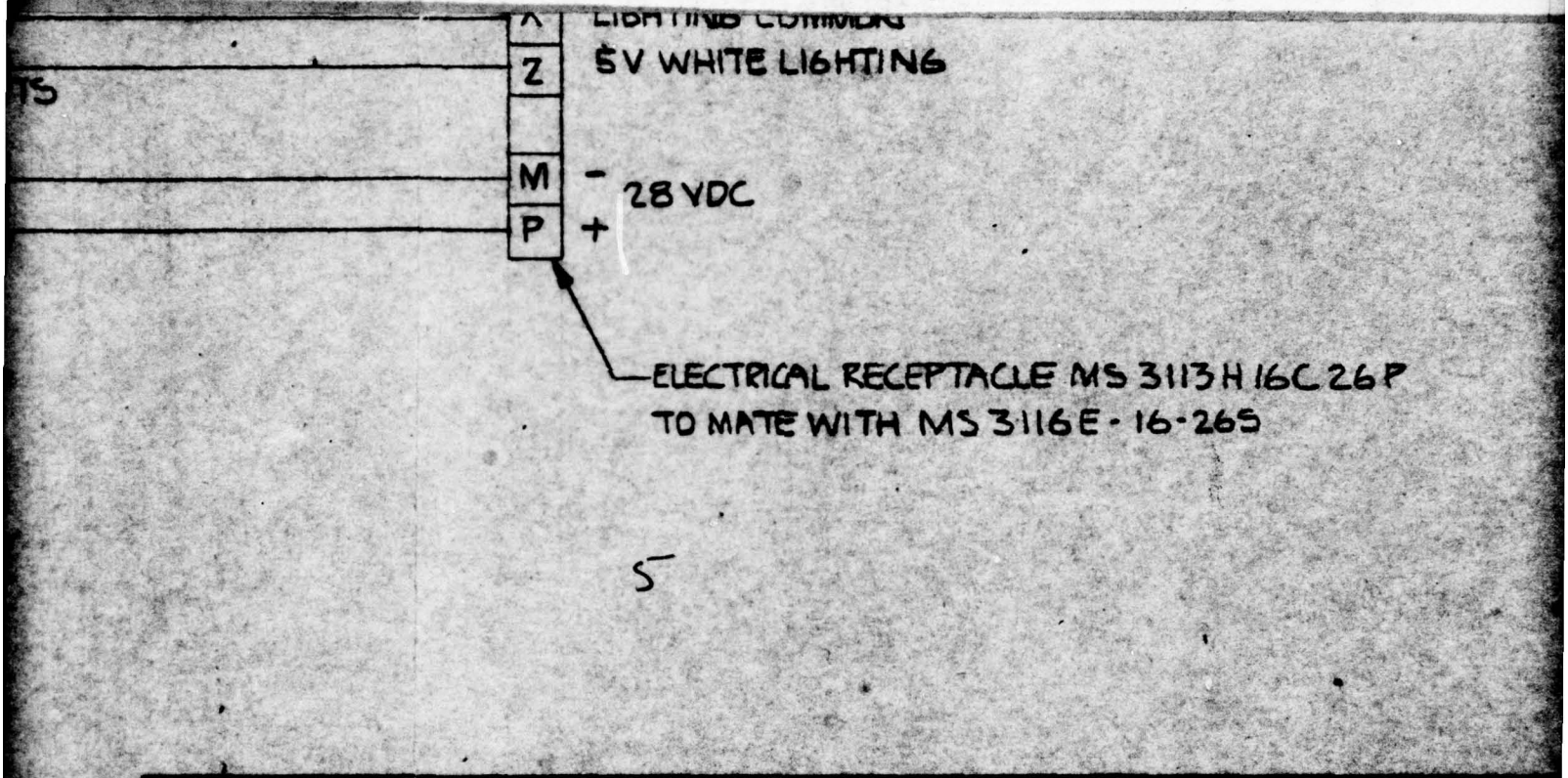
PARTS LIST SYMBOLS
SD = SEE SPEC OR SOURCE CONTROL DWG
PL = ASSEMBLY DWG SEE ASSOCIATED PARTS LIST
BM = BULK MATERIAL

NEXT ASSY	
	APP

AD 0462

4

3



5

FIND NO.	QTY REQ.	CODE IDENT	DRAWING OR DOCUMENT NO.	PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT	
		TOLERANCES ON		RELEASE DATE	
		2 PL DEC. ± .02	± . FRAC. ±1/64 ±	DWN J Sackel	DATE 3/21/76

S 3113 H 16C 26P
E-16-26S

B

NO.	NOMENCLATURE OR DESCRIPTION	KOLLSMAN PART NO. REFERENCE ONLY	SYM

PARTS LIST

DEC 7 1976

Kollsman Instrument Company
Division of Sun Chemical Corporation
Syosset, New York

DATE 3/26/76
DATE
DATE
PRODUCT ENG

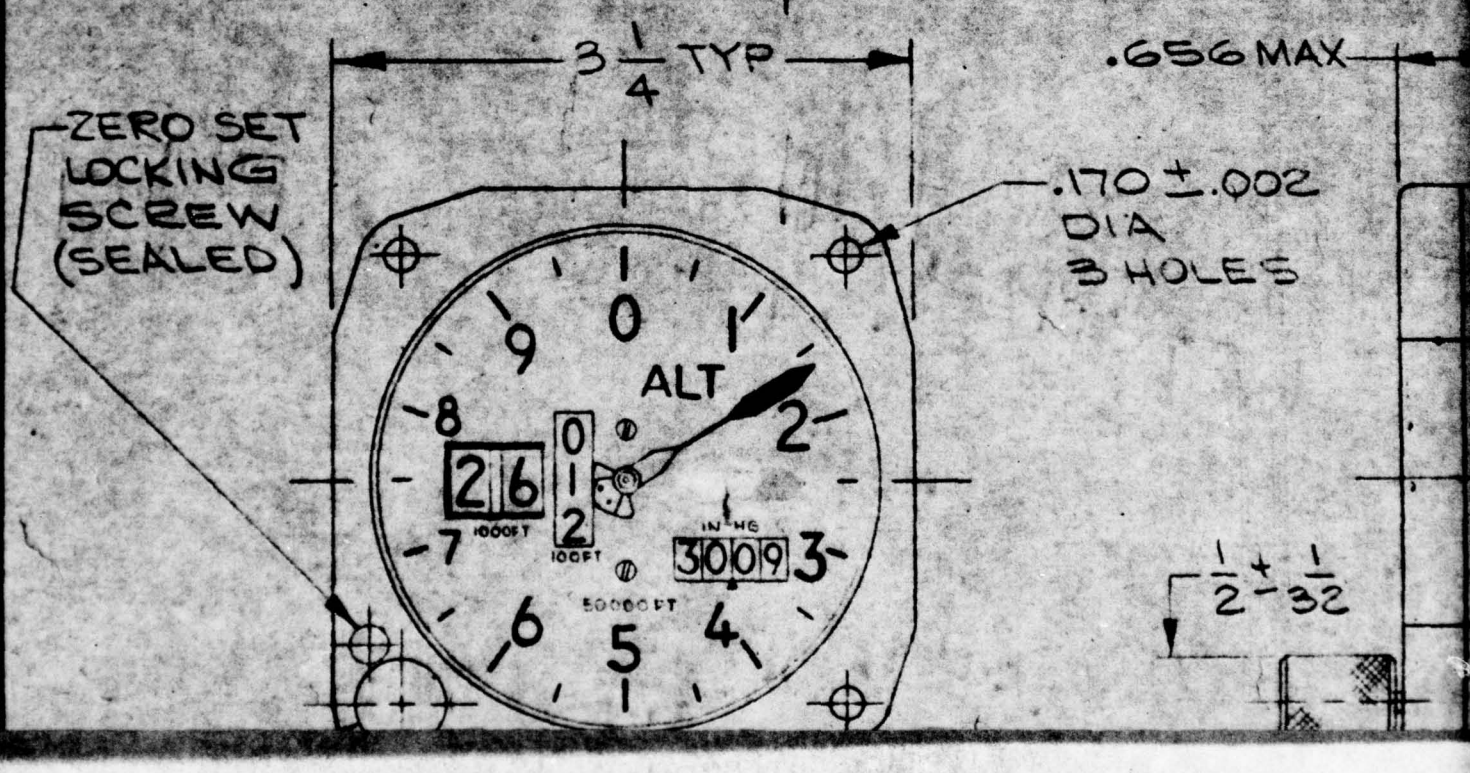
ALTIMETER, PRESSURE INTEGRALLY LIGHTED

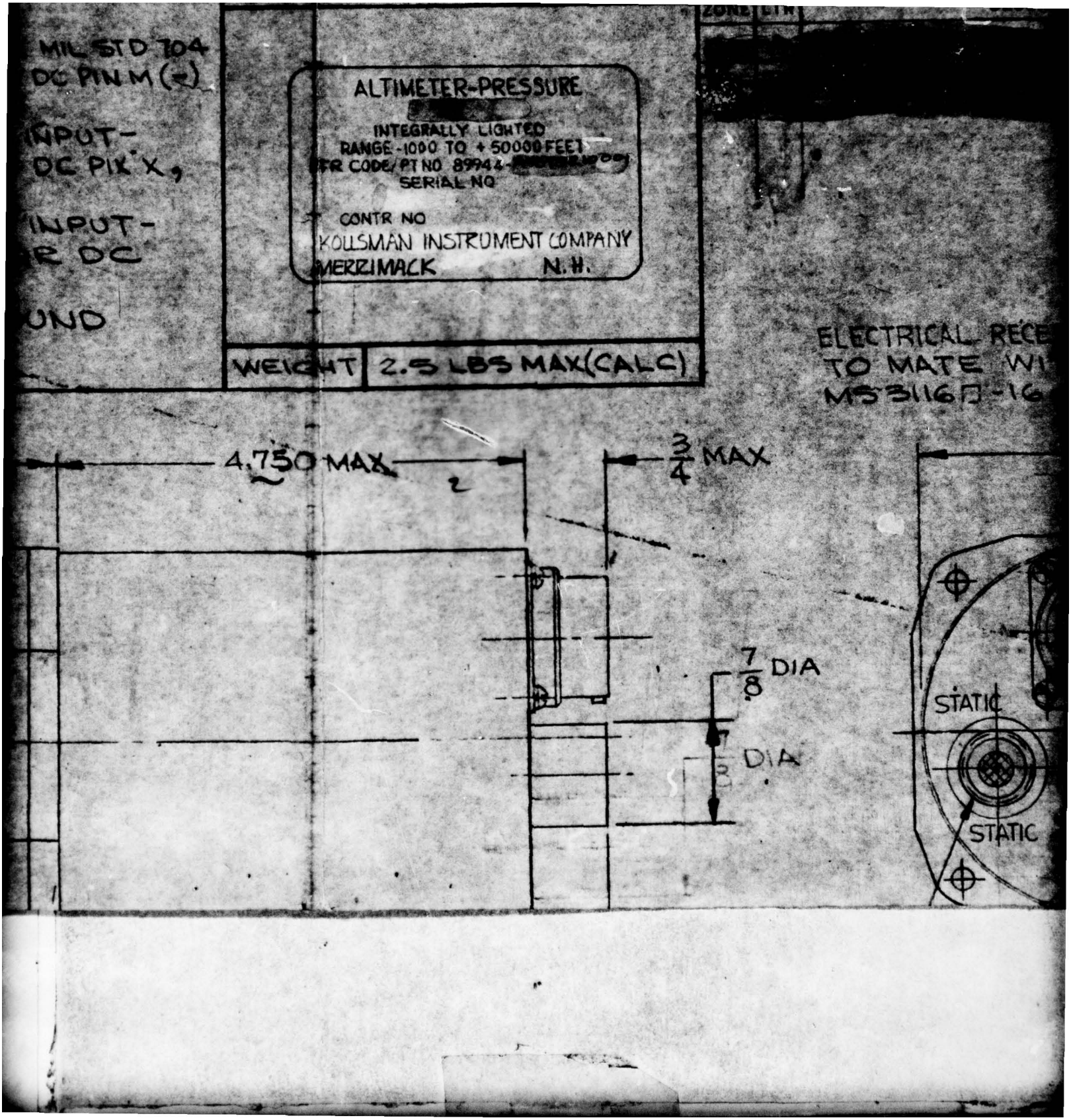
A

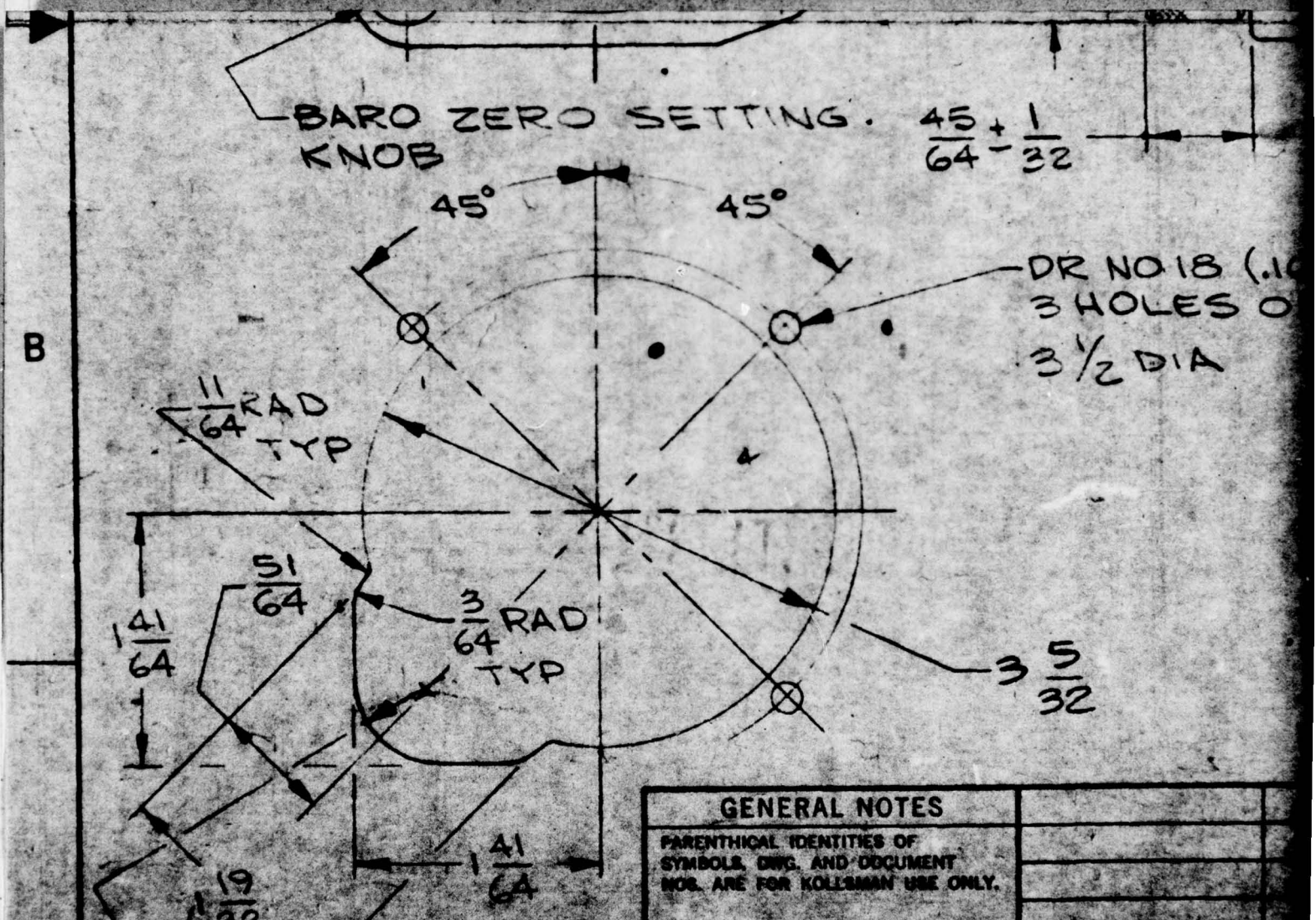
DATE	SIZE	CODE IDENT NO.	DWG NO.
	C	89944	A4578210001
	SCALE ~	WEIGHT	SHEET 1

4	3
DIAL FINISH	MARKINGS: EXCEPT "50000 FT" FLAT WHITE, COLOR 37875, FED STD 595 BACKGROUND: FLAT BLACK COLOR 37038, FED STD 595 & 50000 FT BLACK
POINTER FINISH	■ FLAT WHITE, COLOR 37875, FED. STD 595 ▭ FLAT BLACK, COLOR 37038, FED. STD 595

ELECTRICAL DATA
VIBRATOR INPUT –
DC POWER, PER
CATEGORY B 28V
PIN P (4)
WHITE LIGHTING
5 VOLTS AC OR
PIN Z
RED LIGHTING
5 VOLTS AC O
PIN X, PIN Y
PIN (Q) CASE GRO




MIL STD 704
DC PIN M(=)
INPUT-
DC PIK X,
INPUT-
R DC
UND
ALTIMETER-PRESSURE
INTEGRALLY LIGHTED
RANGE -1000 TO +50000 FEET
FR CODE/PT NO 89944-
SERIAL NO
CONTR NO
KOLLSMAN INSTRUMENT COMPANY
MERRIMACK N.H.
WEIGHT
2.5 LBS MAX(CALC)
ELECTRICAL RECE
TO MATE WI
MS3116
-16
4.750 MAX
3/4 MAX
7/8 DIA
DIA
STATIC
STATIC



GENERAL NOTES
PARENTHICAL IDENTITIES OF SYMBOLS, DWG. AND DOCUMENT NOS. ARE FOR KOLLSMAN USE ONLY.

PARTS LIST SYMBOLS
CD = SEE SPEC OR SOURCE CONTROL DWG
PL = ASSEMBLY DWG SEE ASSOCIATED PARTS LIST
BM = BULK MATERIAL

NEXT ASSY

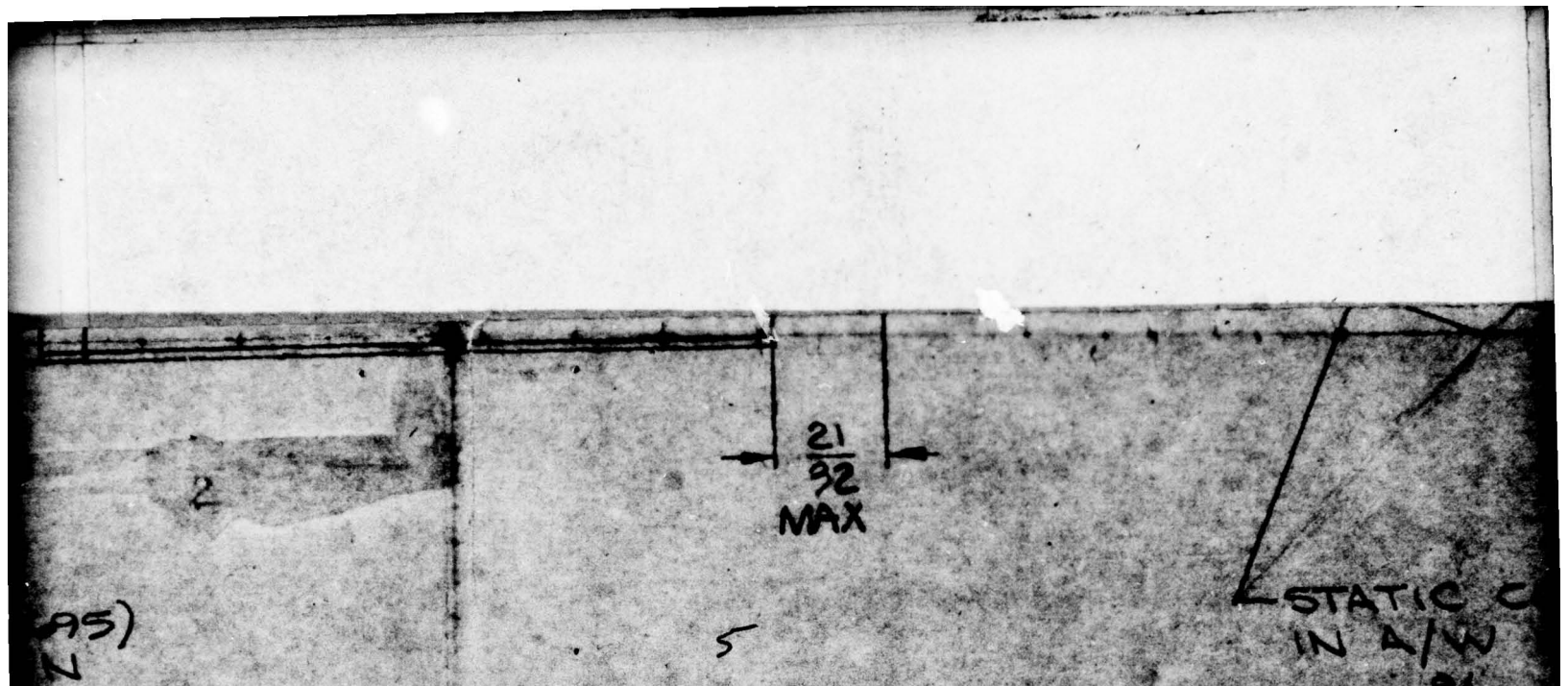
AP

B

A

4

3



95)
N

3- CASE, BEZEL & KNOB: FLAT BLACK, COLOR 37038 FED. STD 595.

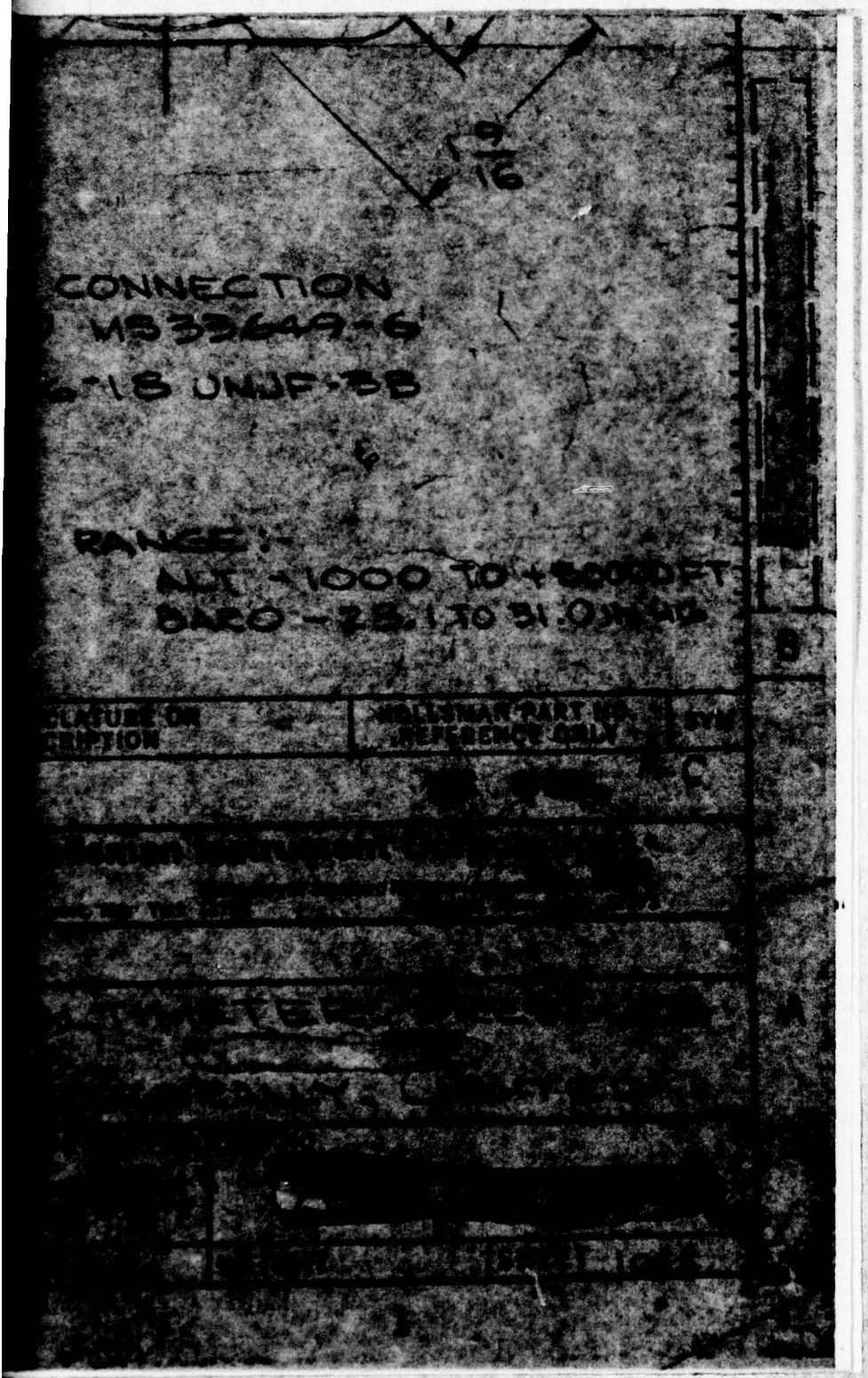
2- COVER GLASS HAS LOW REFLECTANCE COATING

1- CASE IN A/W MS33549, EXCEPT AS SHOWN.

NOTES

FIND NO.	QTY REQ.	CODE IDENT	DRAWING OR DOCUMENT NO.	PART NO. OR IDENTIFYING NO.	NOMENCL. DESCR.

PARTS LIST


9/16
CONNECTION
MS33649-6
-18 UNJF-3B
RANGE:-
ALT -1000 TO +
DEG -28.1 TO 31.0
B
A

PERFORMANCE DATA

Subject S/N 105	Date 11/7
Type No. A 45782 10001	Job No. 100127
Remarks EXAMINATION OF PRODUCT	
LIGHTING TEST	
	Signature (S K) [illegible]

PART	ACC	REJ.				
DIAL	✓					
CASE	✓					
POINTER	✓					
STATIC PORT	✓					
CONNECTOR	✓					
	LIGHTING					
RED	✓					
WHITE	✓					

PERFORMANCE DATA

Subject S/N 105	Date 4/6
Type No. A 4523210001	Job No. 100127
Remarks POSITION ERROR	
	Signature (SK)

POSITION	READING	DIFFERENCE				
NOMINAL	350	0				
90°	350	0				
180°	355	5				
270°	355	5				
DIAL FACE UP	350	0				

PERFORMANCE DATA

Subject S/N 105	Date 11/12
Type No. A457821.0001	Job No. 100127
Remarks Band Torque	
	Signature

DIRECTION	OZ IN READING	TOL.				
C.W	3.0	5 ± 2				
C.C.W		5 ± 2				

PERFORMANCE DATA

Subject S/N 105	Date 11/1-
Type No. A 1578210001	Job No. 100127
Remarks ZERO SCALE ERROR & ZERO POT	
	Signature

TEST POINT	C.W.	C.C.W.	CORRECTED C.W.		CORRECTED C.C.W		CORRECT DIFFERENCE	TOL
28.1	-1,[illegible]	-1,[illegible]	-[illegible]	[illegible]	-[illegible]	-2	-1,727	± 25
28.5	-1,[illegible]	-1,[illegible]	-1,33[illegible]	[illegible]	-1,[illegible]	[illegible]	-1,340	
29.0	-[illegible]	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-863	
29.5	-[illegible]	-[illegible]	-[illegible]	[illegible]	-[illegible]	[illegible]	-392	
29.92	-[illegible]	-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	
30.5	+[illegible]	+[illegible]	+[illegible]	[illegible]	+[illegible]	[illegible]	531	
20.9	-1,[illegible]	-[illegible]	-[illegible]	[illegible]	+[illegible]	[illegible]	893	
31.0	+1,[illegible]	+1,[illegible]	+[illegible]	[illegible]	-[illegible]	[illegible]	983	
							V/R	
28.1	[illegible]	[illegible]	+.[illegible]		-.[illegible]		90.90	± .83
.4	[illegible]	[illegible]	+.[illegible]		-.[illegible]		81.12	
.7	[illegible]	[illegible]	-.[illegible]		-.[illegible]		71.63	
29.0	[illegible]	[illegible]	-.[illegible]		-.[illegible]		62.10	
.3	[illegible]	[illegible]	-.[illegible]		-.[illegible]		52.63	
.6	[illegible]	[illegible]	+.[illegible]		+.[illegible]		43.27	
29.92	[illegible]	[illegible]	+.[illegible]		+.[illegible]		22.33	
30.0	[illegible]	[illegible]	+.[illegible]		+.[illegible]		30.90	
.3	[illegible]	[illegible]	+.[illegible]		+.[illegible]		21.23	
.6	[illegible]	[illegible]	+.[illegible]		+.[illegible]		12.60	
.9	[illegible]	[illegible]	-.[illegible]		-.[illegible]		3.57	
31.0	[illegible]	[illegible]	+.[illegible]		+.[illegible]		0.57	

PERFORMANCE DATA

Subject S/N 105	Date 11/12/76
Type No. A/57821000/	Job No. 100127
Remarks STATIC FRICTION	
	Signature E. Cleary

ALT	VIB OFF	VIB ON	DIFF	Tol.		
.5	5°00	5°45'	45'	70'		
1.5	15°00	15°45'	45'	70'		
2.5	25°00	25°45'	45'	70'		
3.5	35°00	35°45'	45'	70'		
12.5	125°00	125°65'	65'	90'		
22.5	225°00	225°75'	75'	130'		
32.5	325°00	325°95'	95'	180'		

PERFORMANCE DATA

Subject S/N 105	Date 11/[illegible]
Type No. A 4578210001	Job No. 100127
Remarks STOP + JUMP	
VIBRATOR ON	
	Signature (OK) [illegible]

ALT	INC	DEC	TOL			
0	0	0	25'			
1	0	0	25'			
3	0	0	25'			
5	0	0	25'			
10	0	0	25'			
20	0	0	25'			
30	0	0	25'			
35	0	0	50'			
40	0	0	50'			
50	0	0				

PERFORMANCE DATA

Subject S/N 105	Date 11/6
Type No. A 15283 10001	Job No. 100127
Remarks STOP + JUMP	
VIBRATOR OFF	
	Signature (SK)

ALT	INC	DEC	TOL			
0	60	[illegible]	300			
1	[illegible]	5	120			
3	[illegible]	10	130			
5	[illegible]	35	130			
10	70	50	350			
20	90	70	350			
30	150	[illegible]	350			
35	125	110	600			
40	125	125	600			
50	295	210				

PERFORMANCE DATA

Subject S/N 105	Date 11/12
Type No. A 4528210001	Job No. 100127

Remarks STOP + JUMP VIBRATOR ON
45° DIAL DOWN INC
45° DIAL UP DEC

Signature

ALT	45° DIAL DOWN	45° DIAL UP	TOL			
0	0	0	75'			
1	0	0	75'			
3	0	0	75'			
5	0	0	75'			
10	0	0	75'			
20	0	0	75'			
30	0	0	100'			
35	0	0	100'			
40	0	0				

PERFORMANCE DATA

Subject S/N 105	Date 4/12
Type No. A 1578210001	Job No. 100127
Remarks CASE LEAK Room 20,500'	
	Signature

	LEAK					
0	20'					
90°	10'					
180°	0'					
270°	0'					
	7K	30'				

PERFORMANCE DATA

Subject SN 105	Date 11/8/76
Type No. A4576-2 [illegible]	Job No. 100127
Remarks Altitude Scale Error	
Temperature -35°C	Signature [illegible]

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	+35 / +40	-10			
0	7.031	+35 / +40	-			
+0.5		+35 / +40				
1	14.063	+30 / +35	-10			
2	21.094	+35 / +40	-10			
3	28.125	+25 / +30	-10			
5	42.187	+60 / +65	-5			
8		+55 / +60				
10	77.344	+40 / +45	+10			
12		+40 / +45				
15	112.500	+25 / +30	+20			
18		+10 / +15				
20	147.656	+15 / +20	-20			
25	182.813	-10 / -5	0			
30	217.969	-15 / -5	-5			
35		+35 / +40				
40	288 281	+60 / +70	+5			
45		-25 / -15				
50	358.594	-140 / -140	-10			
		Up / Down				
	Scale	0				

PERFORMANCE DATA

Subject SN [illegible]	Date [illegible]
Type No. A41578-2 10 [illegible]	Job No.
Remarks Altitude Scale Error	
Temperature +45 °C	Signature [illegible]

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	-5 / +5	-5			
0	7.031	-5 / +5	-5			
+0.5		-5 / +5				
1	14.063	-10 / 0	-5			
2	21.094	-5 / +5	-5			
3	28.125	-5 / -5	-5			
5	42.187	+20 / +30	0			
8		+20 / +25				
10	77.344	0 / +15	+10			
12		+5 / +20				
15	112.500	-10 / +5	+20			
18		-20 / -5				
20	147.656	-10 / +5	+20			
25	182.813	-20 / -20	0			
30	217.969	-25 / -20	-10			
35		+25 / +20				
40	288 281	+40 / +65	-5			
45		-20 / -10				
50	358.594	-140 / -140	-10			
		Up / Down				
	[illegible]	25'				

PERFORMANCE DATA

Subject SN 105	Date 11/12
Type No. A4578-2 10 [illegible]	Job No.
Remarks Altitude Scale Error	
Temperature +25°C	Signature [illegible]

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	+10 / +10	-5			
0	7.031	+10 / +10	-5			
+0.5		+10 / +10				
1	14.063	+5 / +5	-5			
2	21.094	+10 / +10	-5			
3	28.125	+10 / +15	-5			
5	42.187	+35 / +40	0			
8		+30 / +40				
10	77.344	+15 / +25	+10			
12		+15 / +25				
15	112.500	+5 / +10	+25			
18		-5 / 0				
20	147.656	+5 / +10	+15			
25	182.813	-25 / -15	0			
30	217.969	-25 / -20	-5			
35		+30 / +35				
40	288.281	+50 / +60	0			
45		-20 / -20				
50	358.594	-145 / -145	-5			
		Up / Down				
	[illegible]	[illegible]				

PERFORMANCE DATA

•Subject S/N 106	Date
Type No. A 45782 10001	Job No. 100127
Remarks EXAMINATION OF PRODUCT	
LIGHTING TEST	
	Signature (SK) E. M. Nicholas

PART	ACC.	REJ.				
DIAL	✓					
CASE	✓					
POINTER	✓					
STATIC PORT	✓					
CONNECTOR	✓					
	LIGHTING					
RED	✓					
WHITE	✓					

PERFORMANCE DATA

Subject S/N 106	Date 11/12
Type No. A4578210001	Job No. 100127
Remarks POSITION ERROR	
	Signature

POSITION	READING	DIFFERENCE				
NORMAL	260	0				
90°	265	5				
180°	255	5				
270°	260	0				
DIAL FACE UP	260	0				

PERFORMANCE DATA

Subject S/N 101	Date 11/12
Type No. A-15782-10001	Job No. 100127
Remarks BARO TORQUE	
	Signature

DIRECTION	OZ IN READING	TOL.				
C.W	3.0	5 ± 2				
C.C.W	4.0	5 ± 2				

PERFORMANCE DATA

Subject S/N 106	Date 11/12
Type No. A/57821000 1	Job No. 100127
Remarks BARO SCALE ERROR + BARO POT	
	Signature

TEST POINT	C.W.	C.C.W.	CORRECTED C.W.		CORRECTED C.C.W		CORRECT DIFFERENCE	TOL.
28.1	-16.45	-16.50	-17.25	-2	-17.30	-2	-1,727	± 25
28.5	-12.40	-12.40	-13.40	-2	-13.40	-2	-1,340	
29.0	-7.55	-7.55	-8.15	-2	-8.15	-2	-863	
29.5	-3.10	-3.10	-3.50	-2	-3.50	-2	-392	
29.92	+.50	+.50	0	0	0	0	0	
30.5	+6.10	+6.10	+5.31	+1	+5.31	+1	531	
20.9	+9.05	+9.05	+8.15	+2	+8.15	+2	893	
31.0	+11.00	+11.00	+9.90	+2	+9.90	+2	983	
							V/R	
28.1	90.918	90.914	+.020		+.014		90.90	± .83
.4	81.217	81.215	+.097		+.095		81.12	
.7	71.651	71.636	+.011		-.001		71.63	
29.0	62.168	62.152	+.168		+.152		62.10	
.3	52.745	52.720	+.115		+.090		52.63	
.6	43.393	43.396	-.003		-.001		43.27	
29.92	33.471	33.499	-.028		-.000		33.37	
30.0	31.006	31.004	+.106		+.104		30.90	
.3	21.809	21.790	+.019		+.000		21.73	
.6	12.696	12.652	+.036		+.012		12.60	
.9	2.722	2.648	+.007		-.062		2.57	
31.0	0.595	0.594	+.015		+.014		0.57	

PERFORMANCE DATA

Subject S/N 106	Date 2/10
Type No. A/5728310001	Job No. 100127
Remarks STATIC FRICTION	
	Signature (S K)

ALT	VIB OFF	VIB ON	DIFF	Tol.		
.5	[illegible]	[illegible]	[illegible]	70'		
1.5	1500	[illegible]	[illegible]	70'		
2.5	2500	[illegible]	[illegible]	70'		
3.5	[illegible]	[illegible]	[illegible]	70'		
12.5	12500	12540	40	90'		
22.5	22500	[illegible]	55	120'		
32.5	32500	32610	110	180'		

PERFORMANCE DATA

Subject S/N 101	Date 11/2
Type No. A 4578210001	Job No. 100127
Remarks STOP & JUMP	
VIBRATOR ON	
	Signature

ALT	INC	DEC	TOL			
0	0	0	25'			
1	0	0	25'			
2	0	0	25'			
5	0	0	25'			
10	0	0	25'			
20	0	0	25'			
30	0	0	25'			
35	0	0	50'			
40	0	0	50'			
50	0	0				

PERFORMANCE DATA

Subject S/N 106	Date 11-12
Type No. A 45782 10001	Job No. 100127
Remarks STOP + JUMP	
VIBRATOR OFF	
	Signature

ALT	INC	DEC	TOL			
0	75	50	300			
1	80	[illegible]	120			
3	[illegible]	110	120			
5	60	[illegible]	120			
10	85	[illegible]	350			
20	110	[illegible]	350			
30	[illegible]	[illegible]	350			
35	150	[illegible]	600			
40	210	200	600			
50	[illegible]	[illegible]				

PERFORMANCE DATA

Subject S/N 116	Date
Type No. A45782100001	Job No. 100127
Remarks STOP + JUMP VIBRATOR ON	
45° DIAL DOWN INC	
45° DIAL UP DEC	
	Signature

ALT	45° DIAL DOWN	45° DIAL UP	TOL			
0	0	0	75'			
1	0	0	75'			
3	0	0	75'			
5	0	0	75'			
10	0	0	75'			
20	0	0	75'			
30	0	0	100'			
35	0	0	100'			
40	0	0				

PERFORMANCE DATA

Subject S/N 164	Date
Type No. A45282/0001	Job No. 100127
Remarks CASE LEAK Room 30,500'	
	Signature

	LEAK					
0	$3\frac{1}{2}$-1					
90°	$1\frac{1}{2}$-1					
180°	10'					
270°	5-1					
	3K	15'				

PERFORMANCE DATA

Subject SN 106	Date 11/8/71
Type No. A4578-2 10 001	Job No. 100127
Remarks Altitude Scale Error	
Temperature -35 °C	Signature C. Chaney

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	0 / +25	-5			
0	7.031	0 / +20	0			
+0.5		0 / +25				
1	14.063	+5 / +30	0			
2	21.094	+15 / +40	-5			
3	28.125	+15 / +35	+10			
5	42.187	+20 / +40	+25			
8		0 / +30				
10	77.344	-35 / 0	-5			
12		-25 / +10				
15	112.500	-30 / -5	-5			
18		-65 / -25				
20	147.656	-75 / -40	-25			
25	182.813	-120 / -60	-5			
30	217.969	-120 / -40	0			
35		-40 / +25				
40	28F 281	-45 / +40	0			
45		-115 / -10				
50	358.594	-200 / -210	0			
		Up / Down				
	Recheck	5°				

PERFORMANCE DATA

Subject SN 106	Date 11/30/61
Type No. A4578-2-10 C21	Job No.
Remarks Altitude Scale Error	
Temperature +45°C	Signature (SK)

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	-30 / -20	0			
0	7.031	-25 / -15	0			
+0.5		-20 / -10				
1	14.063	-10 / -5	0			
2	21.094	-5 / +5	0			
3	28.125	-5 / 0	0			
5	42.187	+5 / +10	+5			
8		-10 / 0				
10	77.344	-30 / -20	-20			
12		-20 / -10				
15	112.500	-30 / -20	-10			
18		-35 / -15				
20	147.656	-60 / -50	-15			
25	182.813	-60 / -45	-10			
30	217.969	-10 / -70	-10			
35		-80 / -10				
40	288 281	-5 / +15	0			
45		-50 / -35				
50	358.594	-225 / -220	+5			
		Up / Down				
	Cross Look	30				

PERFORMANCE DATA

Subject SN 106	Date 11/12
Type No. A4572 15 psi	Job No.
Remarks Altitude Scale Error	
Temperature +25°C	Signature (OK 100) J. Chaney

Test Altitude 1000 ft	Resolver Bridge Setting	Altimeter Scale Error feet	Resolver Error feet			
-1	0.0	-5 / -5	0			
0	7.031	- / 0	0			
+0.5		0 / 0				
1	14.063	0 / +5	+5			
2	21.094	+10 / +15	+5			
3	28.125	+10 / +20	+5			
5	42.187	+15 / +20	+15			
8		+5 / +10				
10	77.344	-15 / -5	-15			
12		-10 / 0				
15	112.500	-20 / -10	-5			
18		-50 / -40				
20	147.656	-50 / -40	-20			
25	182.813	-70 / -55	-5			
30	217.969	-50 / -60	-5			
35		-50 / -70				
40	288 291	0 / +20	0			
45		-15 / -40				
50	358.594	-240 / -225	+5			
		Up / Down				
	Overlock	30'				