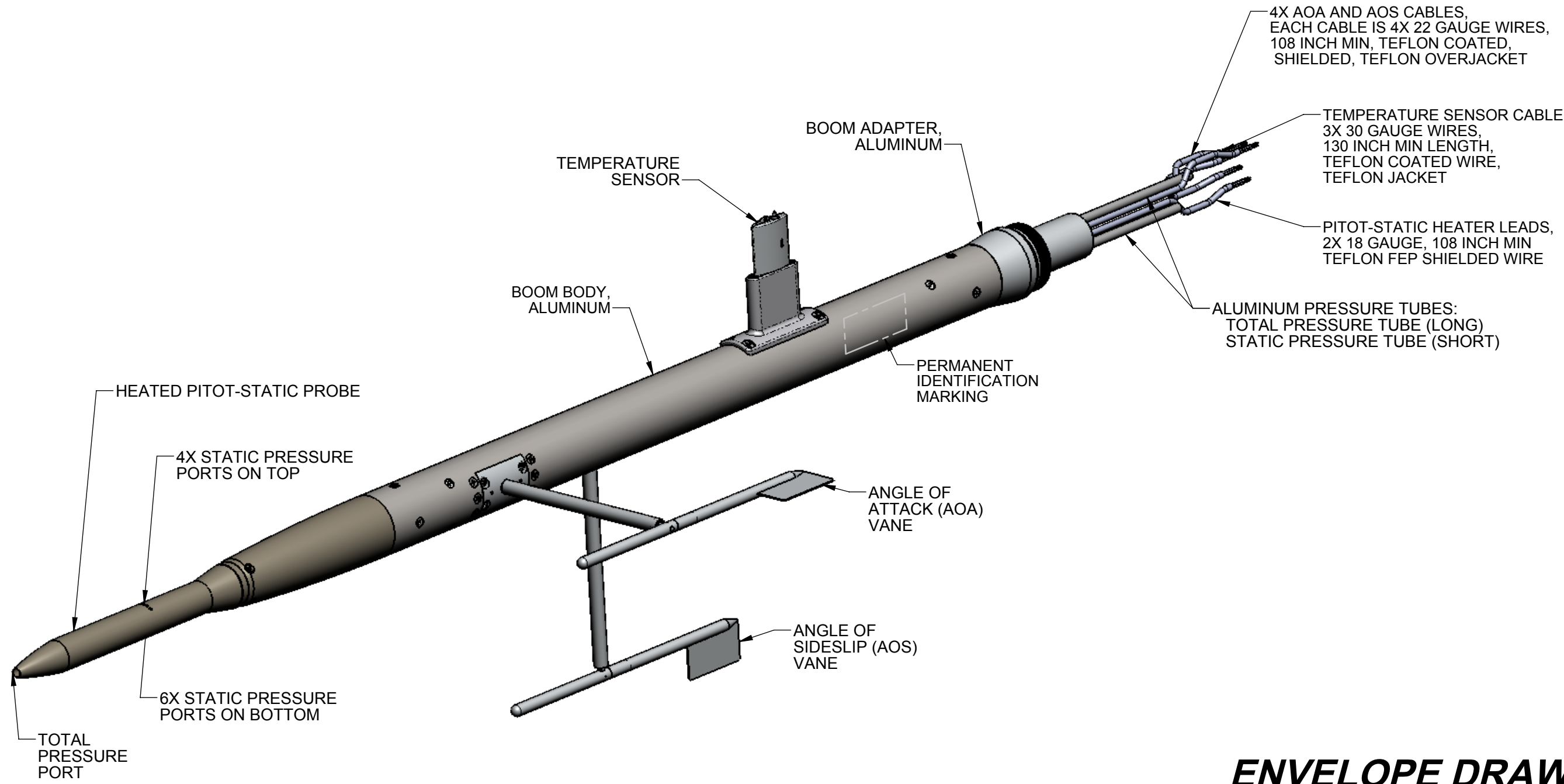


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8 7 6 5 4 3 2 1

D
C
B
A



ENVELOPE DRAWING

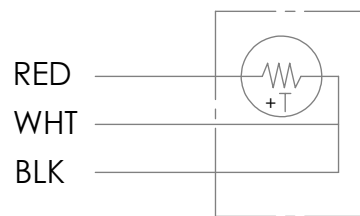
SPA PN 4453-01

| | | | |
|---|-----------|---|----------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: | |  AIR DATA BOOM | |
| DECIMALS | ANGLES | | |
| X.X ± 0.03 | X° ± 30' | APPROVALS | DATE |
| X.XX ± 0.01 | | DRAWN | B.P. 02-24-09 |
| X.XXX ± 0.005 | | CHECKED | DIGITAL - ON FILE |
| DO NOT SCALE DRAWING | | ENG | DIGITAL - ON FILE |
| MATERIAL | SEE NOTES | SIZE | CAGE CODE |
| FINISH | SEE NOTES | B | 34851 |
| CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE | | DWG. NO. | 4453 |
| | | REV. | - |
| | | SCALE | CAD FILE: |
| | | SHEET | 1 OF 2 |

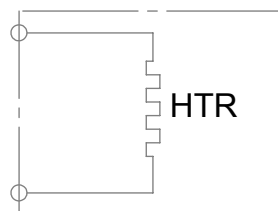
8 7 6 5 4 3 2 1

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TEMPERATURE SENSOR WIRING



PITOT-STATIC PROBE WIRING



NOTES:

1.0 BOOM OVERALL SPECIFICATIONS

- 1.1 OPERATING TEMPERATURE RANGE: -65° TO +125°C
- 1.2 WEIGHT: WITHOUT BOOM ADAPTER OR WIRING: 4.5 LB NOMINAL
BOOM ADAPTER: .60 LB NOMINAL
ELECTRICAL WIRING: 1.07 LB NOMINAL

2.0 VANE SPECIFICATIONS (AOA AND AOS VANES):

2.1 POTENTIOMETER SPECIFICATIONS

- 2.1.1 TYPE: CONDUCTIVE PLASTIC
- 2.1.2 RESISTANCE: 10K OHMS ±10%
- 2.1.3 LINEARITY: ±.5%
- 2.1.4 RESOLUTION: INFINITE SIGNAL OUTPUT
- 2.1.5 ELECTRICAL ANGLE: 180° 1- 82° MAX
- 2.1.6 POWER RATING THROUGH RESISTIVE ELEMENT AT 70° C: 1.0 WATT
- 2.1.7 WIPER CURRENT: 10 mA MAX PEAK, 1mA MAX CONTINUOUS
- 2.1.8 MECHANICAL TRAVEL: 360° CONTINUOUS
- 2.1.9 MECHANICAL LIFE: 50 MILLION CYCLES
- 2.1.10 APPLICABLE SPECIFICATION: MIL-PRF-39023

2.2 VANE OPERATING SPECIFICATIONS

- 2.2.1 AOA MECHANICAL FUNCTIONAL OPERATING RANGE: -60° TO +60°, WHERE "+" IS "NOSE UP".
- 2.2.2 AOS MECHANICAL FUNCTIONAL OPERATING RANGE: -60° TO +60°, WHERE "+" IS "NOSE RIGHT".
- 2.2.2 CALIBRATION DATA: A DATASHEET SHALL BE PROVIDED WITH CALIBRATION DATA IN 5° INCREMENTS OVER THE OPERATING RANGE.
- 2.2.3 CALIBRATION ACCURACY (MEASUREMENT AND LINEARITY INCLUSIVE): +/- .25° OVER THE OPERATING RANGE.

3.0 TEMPERATURE SENSOR SPECIFICATIONS

- 3.1 THE TEMPERATURE SENSOR HAS A SINGLE PLATINUM TEMPERATURE SENSING ELEMENT. THE TEMPERATURE-RESISTANCE CHARACTERISTICS ARE IN ACCORDANCE WITH DIN-EN60751, CLASS B, WITH ELEMENT RESISTANCE OF 500 OHMS AT 0 °C. SEE THE TEMPERATURE-RESISTANCE TABLE FOR NOMINAL OUTPUT CHARACTERISTICS. THE RESISTANCE-TEMPERATURE RELATIONSHIP IS AS FOLLOWS:

$$\text{FOR THE RANGE } -200\text{ }^{\circ}\text{C to } 0\text{ }^{\circ}\text{C: } R = R_0 [1 + AT + BT^2 + C (T - 100) X T^3]$$

$$\text{FOR THE RANGE } 0\text{ }^{\circ}\text{C to } 850\text{ }^{\circ}\text{C: } R = R_0 (1 + AT + BT^2)$$

WHERE::

$$R_0 = \text{RESISTANCE AT } 0\text{ }^{\circ}\text{C (} = 500.0\text{ ohm)}$$

$$T = \text{TEMPERATURE IN } ^{\circ}\text{C}$$

$$A = 3.9083 \times 10^{-3}$$

$$B = -5.775 \times 10^{-7}$$

$$C = -4.183 \times 10^{-12}$$

STATIC CALIBRATION ACCURACY: ± (.30 + .005 X|T|) WHERE "T" IS TEMPERATURE IN °C.

- 3.2 AERODYNAMIC OPERATION (RECOVERY FACTOR COMPENSATION): BELOW IS THE EQUATION FOR RELATING THE MEASURED TEMPERATURE TO THE OUTSIDE STATIC TEMPERATURE.

$$TS = TM / (1 + R X .2 X MACH ^2)$$

WHERE: TM = MEASURED TEMPERATURE FROM SENSOR IN KELVIN

TS = OUTSIDE STATIC TEMPERATURE IN KELVIN

R = RECOVERY FACTOR

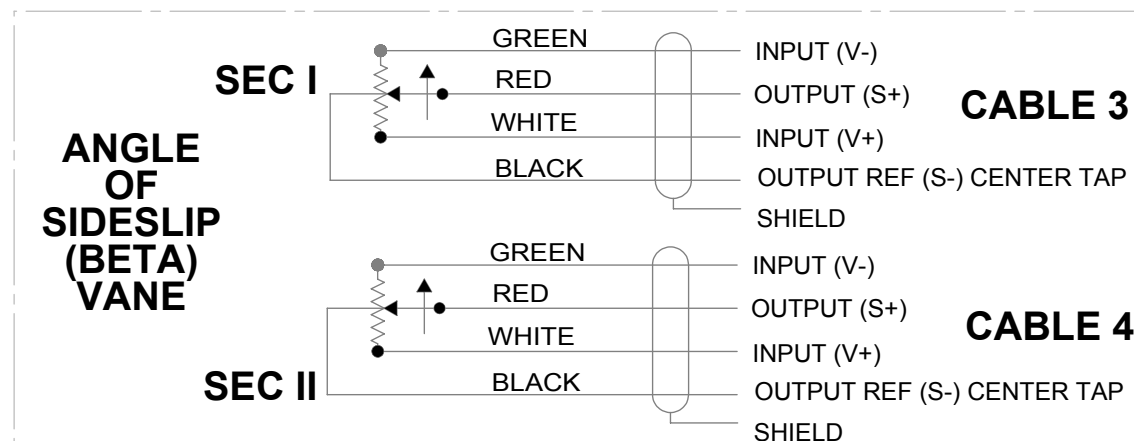
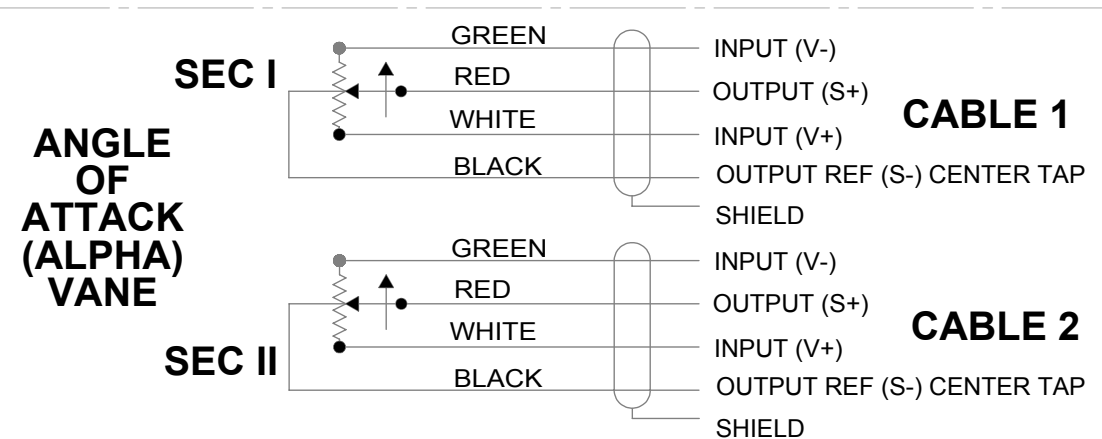
R = .93 (BASED ON WIND TUNNEL TESTING TO MACH .85)

4.0 PITOT-STATIC PROBE SPECIFICATIONS:

- 4.1 CONFIGURATION PER AN5816-2
- 4.2 AERODYNAMIC PERFORMANCE PER MIL-T-5420
- 4.3 HEATER OPERATING VOLTAGE: 28 VOLT
- 4.3 HEATER MAXIMUM CONTINUOUS POWER CONSUMPTION: 180 WATTS AT 28 VOLTS
- 4.4. PEAK / SPIKE CURRENT: 15-AMP MAX SPIKE AT POWERUP DROPS TO LESS THAN 8 AMPS WITHIN 1 MINUTE

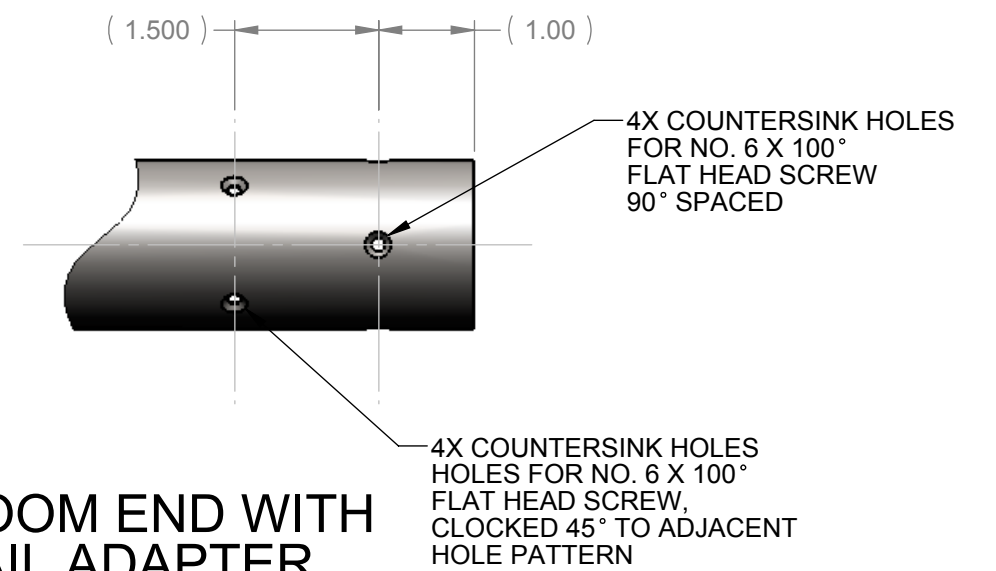
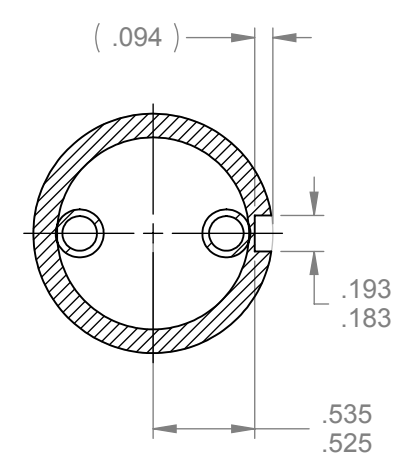
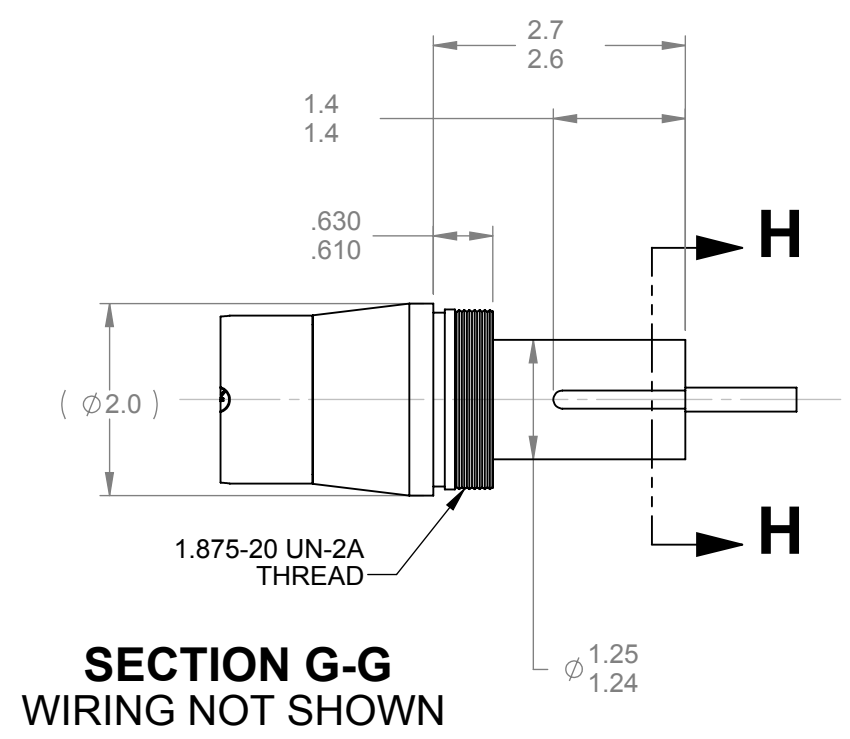
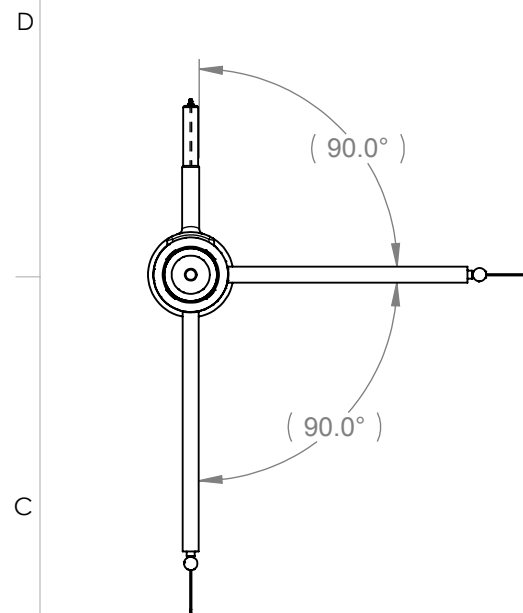
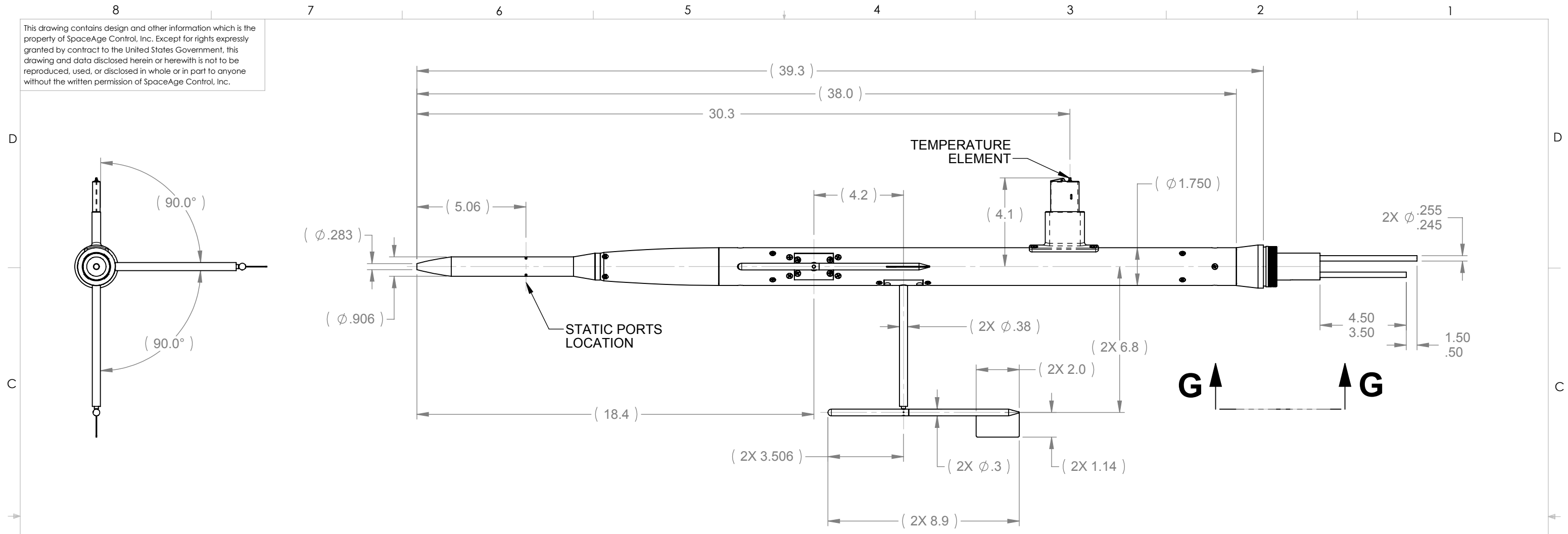
5.0 MAINTENANCE REQUIREMENTS (MINIMUM):

- 5.1 PROTECTIVE ACCESSORIES SUCH AS TOTAL HEAD PROBE COVER AND VANE COVER SHOULD BE INSTALLED WHENEVER THE AIR DATA BOM IS NOT IN USE. THESE ACCESSORIES WILL PROTECT THE PRODUCT FROM DAMAGE AS WELL AS KEEP IT CLEAN.
- 5.2 PRESSURE OR LEAK TESTING OF THE PRESSURE SYSTEM SHOULD BE CONDUCTED ANNUALLY
- 5.3 BEFORE EACH FLIGHT, CHECK FOR NOSE TIP DAMAGE THAT MAY CAUSE MEASUREMENT ERRORS.
- 5.4 BEFORE EACH FLIGHT, VERIFY SCREWS ARE TIGHT AND AIRCRAFT MOUNTING POINT IS SECURE.



| TEMPERATURE (°C) | NOMINAL RESISTANCE (Ω) | TOLERANCE (+/- °C) | RESISTANCE TOLERANCE | |
|------------------|------------------------|--------------------|----------------------|---------|
| | | | MIN (Ω) | MAX (Ω) |
| -60 | 381.64 | 0.60 | 380.44 | 382.83 |
| 40 | 421.35 | 0.50 | 420.36 | 422.34 |
| -20 | 460.80 | 0.40 | 460.01 | 461.59 |
| 0 | 500.00 | 0.30 | 499.41 | 500.59 |
| 20 | 538.97 | 0.40 | 538.19 | 539.74 |
| 40 | 577.70 | 0.50 | 576.74 | 578.67 |
| 60 | 616.21 | 0.60 | 615.06 | 617.36 |
| 80 | 654.48 | 0.70 | 653.15 | 655.82 |
| 100 | 692.53 | 0.80 | 691.01 | 694.04 |
| 120 | 730.34 | 0.90 | 728.64 | 732.04 |
| 140 | 767.92 | 1.00 | 766.05 | 769.79 |
| 160 | 805.27 | 1.10 | 803.22 | 807.32 |
| 180 | 842.39 | 1.20 | 840.17 | 844.61 |
| 200 | 879.28 | 1.30 | 876.89 | 881.67 |

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