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Produced by the NASA Center for Aerospace Information (CASI)
DESIGN, FABRICATION, AND TEST
OF A TRACE CONTAMINANT
CONTROL SYSTEM

APPENDIXES A AND B

PREPARED UNDER

CONTRACT NO. NAS-1-11526

BIOTECHNOLOGY ORGANIZATION

LOCKHEED MISSILES & SPACE COMPANY, INC.

SUNNYVALE, CALIFORNIA
Appendix A

NONMETALLIC MATERIALS LIST
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## CREW SYSTEMS DIVISION SSP ETC LSS MATERIALS REVIEW BOARD

### NONMETALLIC MATERIALS MASTER LOG

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**Remarks or Recommendations:**

- Covered with Teflon Slewing
- Covered with Teflon Slewing

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**Notes:**

- [Original Page of Poor Quality]

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**Reference:**

- SCC Form 1053 (Apr 72)
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## Trace Contaminant Control System

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**Note:** This table represents various materials used in trace contaminant control systems. Each material is identified by its generic name, manufacturer and specification, intended usage, and specific dimensions. The board decision column indicates whether the material is accepted or not, along with any comments or recommendations.
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### Trace Contaminant Control System

#### Regenerable Bed

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<td>Adsorbent</td>
<td>F</td>
<td>Cabin Air</td>
<td>50 1/60x10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Fiberglass</td>
<td>Johns Nanville Micro - Fiber Web Code 110-A</td>
<td>Filter</td>
<td></td>
<td></td>
<td>0.1 x100</td>
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<tr>
<td>LINE NO.</td>
<td>WAIVER DELETE NUMBER</td>
<td>MATERIAL GENERIC NAME</td>
<td>MANUFACTURER AND MATERIAL SPECIFICATION</td>
<td>MANUFACTURER'S MATERIAL DESIGNATION</td>
<td>INTENDED MATERIAL USAGE</td>
<td>USAGE CATEGORY</td>
<td>USAGE ENVIRONMENT</td>
<td>WT. (lbs)</td>
<td>EXP. AREA (in²)</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
<td>-----------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------</td>
<td>-------------------------</td>
<td>----------------</td>
<td>------------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Lithium Hydroxide</td>
<td>Poette Mineral, 36 mesh LiOH</td>
<td>Absorbent</td>
<td>F</td>
<td>Cabin Air</td>
<td>5</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Viton</td>
<td>Viton, &quot;O&quot; ring</td>
<td>&quot;O&quot; ring</td>
<td>&quot;O&quot; ring</td>
<td>&quot;O&quot; ring</td>
<td>&quot;O&quot; ring</td>
<td>1.0</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>3</td>
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<td>Fiberglass</td>
<td>Johns Manville, Code LiOH</td>
<td>Filter</td>
<td>Fiberglass</td>
<td>&quot;O&quot; ring</td>
<td>&quot;O&quot; ring</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>SRV NO.</td>
<td>MATERIAL GENERIC NAME</td>
<td>MANUFACTURER AND MATERIAL SPECIFICATION</td>
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<td>INTENDED MATERIAL USAGE</td>
<td>USAGE CATEGORY</td>
<td>USAGE ENVIRONMENT</td>
<td>MT.</td>
<td>EXP. AREA</td>
<td>BOARD DECISION</td>
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<tr>
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<td>-----------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------</td>
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</tr>
<tr>
<td></td>
<td>Viton</td>
<td>Viton</td>
<td>&quot;O&quot; ring</td>
<td>F</td>
<td>Cabin Air</td>
<td>&lt;1.0</td>
<td></td>
<td>&lt;10</td>
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</tr>
</tbody>
</table>

**Notes:**
- Sealed and Nomex first
- Connectors used throughout
Appendix B

TRACE CONTAMINANT CONTROL SYSTEM
ENGINEERING DRAWINGS
## Trace Contaminant Control System Engineering Drawings

<table>
<thead>
<tr>
<th>Dwg. No.</th>
<th>Rev.</th>
<th>Title</th>
<th>No. of Sheets</th>
<th>Size</th>
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<tbody>
<tr>
<td>CC-100</td>
<td></td>
<td>TCCS Layout</td>
<td>1</td>
<td>J</td>
</tr>
<tr>
<td>CC-101</td>
<td>D</td>
<td>Heat Exchanger Assy. IHCO</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-102</td>
<td>A</td>
<td>Brazed Assy - Catalyst Bed</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-103</td>
<td>A</td>
<td>Catalytic Oxidizer Case</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-104</td>
<td>A</td>
<td>Brazed End Plate Assy.</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-105</td>
<td>B</td>
<td>Washers</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>CC-106</td>
<td>A</td>
<td>Spring, Heater</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>CC-107</td>
<td>C</td>
<td>Heater Electric</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-108</td>
<td>A</td>
<td>Catalyst Retainer</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-109</td>
<td>A</td>
<td>Positioner, Heater</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>CC-110</td>
<td></td>
<td>Thermal Insulation IHCO</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-111</td>
<td>B</td>
<td>Pre- and Post-Sorbent Canister</td>
<td>3</td>
<td>E</td>
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<tr>
<td>CC-112</td>
<td>A</td>
<td>Sol. Valve - 1 inch D.C.D.</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-113</td>
<td></td>
<td>Regenerable Bed Canister</td>
<td>3</td>
<td>E</td>
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<tr>
<td>CC-114</td>
<td>B</td>
<td>Regenerable Bed Blower B.C.D.</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>CC-115</td>
<td>A</td>
<td>Fixed Bed Fan B.C.D.</td>
<td>1</td>
<td>B</td>
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<tr>
<td>CC-116</td>
<td></td>
<td>Thermocouple Assy. - Regen. Bed</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>CC-117</td>
<td></td>
<td>Canister, Fixed Bed</td>
<td>2</td>
<td>E</td>
</tr>
<tr>
<td>CC-118</td>
<td>B</td>
<td>Frame</td>
<td>1</td>
<td>R</td>
</tr>
<tr>
<td>CC-119</td>
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<td>Duct, Pre-Sorbent to Cat. Ox.</td>
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<td>C</td>
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<tr>
<td>CC-120</td>
<td>B</td>
<td>Duct, Cat. Oxy to Post-Sorb.</td>
<td>1</td>
<td>D</td>
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<tr>
<td>CC-121</td>
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<td>Threaded Flange (for 2&quot; valve)</td>
<td>1</td>
<td>C</td>
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<tr>
<td>CC-122</td>
<td>A</td>
<td>Duct, Blower-to-Valve</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>CC-123</td>
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<td>Duct, Post-Sorbent Exit</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-124</td>
<td>B</td>
<td>Duct, Delivery</td>
<td>1</td>
<td>E</td>
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<tr>
<td>CC-125</td>
<td>A</td>
<td>Web-Brkt, TCCS Component Mtg.</td>
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<td>D</td>
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<td>Cradle Assy - Component Support TCCS</td>
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<tr>
<td>CC-127</td>
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<td>Brkt - Equip. Mtg.</td>
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Trace Contaminant Control System Engineering Drawings (continued)

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<th>Size</th>
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<tr>
<td>CC-129</td>
<td>A</td>
<td>Cover Panels</td>
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<td>CC-130</td>
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<td>Brkt - Mtg., Fixed Bed</td>
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<td>E</td>
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<td>CC-131</td>
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<td>Shelf, Electronics</td>
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<td>D</td>
</tr>
<tr>
<td>CC-132</td>
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<td>Duct, Vacuum to Valve</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-133</td>
<td></td>
<td>Brkt Assy - Vac. Valve</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-134</td>
<td></td>
<td>Brkt, Blower Sol. Valve</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>CC-135</td>
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<td>Brkt, Pre-Sorb. Sol. Valve</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>CC-136</td>
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<td>Brkt, Delivery Duct</td>
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<td>E</td>
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<tr>
<td>CC-137</td>
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<td>Brkt, Blower</td>
<td>1</td>
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<td>CC-201</td>
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<td>TCCS Cable Layout</td>
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</tr>
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<td>CC-202</td>
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<td>TCCS Controller</td>
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<td>CC-203</td>
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<td>TCCS Power Supply Monitor Circuits</td>
<td>1</td>
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<td>CC-204</td>
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<td>TCCS Over-Current Over Temp Shutdown Circuits</td>
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<td>TCCS ΔP Circuits</td>
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<td>TCCS Vacuum Sensor Circuits</td>
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<td>D</td>
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<td>CC-207</td>
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<td>TCCS Temperature Circuits</td>
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<td>TCCS Relay Assembly</td>
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<td>CC-209</td>
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<td>TCCS Control Panel Circuits</td>
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<td>CC-210</td>
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<td>TCCS Clock Monitor &amp; Reset Circuits</td>
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<td>CC-211</td>
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<td>TCCS Control Panel</td>
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</table>
CC-100 TCCS LAYOUT
NOTES

1. APPLY .003 TO .004 COATING OF ALUMINUM OXIDE
   ON ALL 2434 TO SURFACES MARKED ( )
   DIMENSIONS APPLY AFTER COATING APPLIED.

2. THESE DIAMETERS MUST BE CONCENTRIC
   WITHIN .020 TIR.

3. THIS HEAT EXCHANGER ASSY. MUST MEET
   PERFORMANCE REQUIREMENTS LISTED SEPARATELY.

4. MATERIALS COMATIBLE WELDING OR BRAZING
   METHODS TO BE SELECTED TO WITHSTAND THE
   FOLLOWING TEMPERATURES: 1000°F MAX AT:

<table>
<thead>
<tr>
<th>TEMP (°F)</th>
<th>NO. OF CYCLES</th>
<th>NO. OF EXCURSIONS</th>
<th>TIME (HOURS)</th>
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<tr>
<td>700</td>
<td>1200</td>
<td>6</td>
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<td>1200</td>
<td>1200</td>
<td>30</td>
<td>2</td>
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<tr>
<td>1200</td>
<td>70</td>
<td>20</td>
<td>10</td>
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</table>

5. OPEN AREA APPROX. 2 X 1.62 X 3.24 SQUARE INCHES.

6. OPN AREA APPROX. 1.90 SQUARE INCHES.

7. NO CORE IN THIS AREA.

8. WAVINESS MUST BE LESS THAN .0005 PER
   2 INCHES OF CIRCUMFERENCE, OR .002 T.I.R.
   AROUND ENTIRE CIRCUMFERENCE.
1.19 MAX 3.42 4.05
2.50 MAX 6.30

Added equally .020 dia as shown

1.20 MAX 2.50

1.33 MAX 2.00

2.25 4.05

1.19 MAX 3.42

1.19 MAX 3.42 4.05
2.50 MAX 6.30

Added .50 dia hole

DELETED, BEADS & T.B.D.
ADDED IN 4 OUT DUCTS
ADDED ITEM G

DELETED BEADS & T.B.D.
ADDED IN 4 OUT DUCTS
ADDED ITEM G

ADDED .50 dia hole

2.50

1.33 MAX 2.00

2.37

5.0 DIA HOLE

1.50 DIA HOLE

1.19 MAX 3.42

1.19 MAX 3.42 4.05
2.50 MAX 6.30

Added .50 dia hole

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ADDED ITEM G

DELETED BEADS & T.B.D.
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ADDED ITEM G

ADDED .50 dia hole

2.50

1.33 MAX 2.00

2.37

5.0 DIA HOLE

1.50 DIA HOLE

1.19 MAX 3.42

1.19 MAX 3.42 4.05
2.50 MAX 6.30

Added .50 dia hole

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ADDED ITEM G

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2.50

1.33 MAX 2.00

2.37

5.0 DIA HOLE

1.50 DIA HOLE

1.19 MAX 3.42

1.19 MAX 3.42 4.05
2.50 MAX 6.30

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2.50

1.33 MAX 2.00

2.37

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1.19 MAX 3.42 4.05
2.50 MAX 6.30

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1.33 MAX 2.00

2.37

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DELETED BEADS & T.B.D.
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2.50 MAX 6.30

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2.50 MAX 6.30

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ADDED ITEM G

DELETED BEADS & T.B.D.
ADDED IN 4 OUT DUCTS
ADDED ITEM G

ADDED .50 dia hole

2.50

1.33 MAX 2.00

2.37

5.0 DIA HOLE

1.50 DIA HOLE
NOTES
1. SO1 ASSY. TO BE FURNACE BRAZED USING BRAZE METAL HAVING MELTING POINT OF 1750°F OR MORE.
2. THIS DIM. TO BE DETERMINED SO AS TO PROVIDE PROPER BRAZE JOINT CLEARANCES.
3. ITEM(3) MUST BE BRAZED TO ITEMS (1) AND (2) WITH BRAZE METAL COMPLETELY FILLING THE JOINT ALONG ENTIRE LENGTH OF EACH MATING SURFACE.
4. ITEM(4) MUST BE WELDED OR BRAZED TO ITEMS (1) AND (2) FOR FIRM RETENTION AROUND BOTH CIRCUMFERENCES.
5. THESE DIAM. TO BE CONCENTRIC WITHIN .020 T.I.R.
6. THESE EDGES MUST LIE IN SAME PLANE WITHIN .005.
7. AFTER COMPLETION OF BRAZING, APPLY .003 TO .005 COATING OF ALUMINUM OXIDE PER AMS 2436 TO SURFACES MARKED (6) NOT INCLUDING 45° CHAMFERS.
NOTES

1. HOLE DIAS. IN ITEM 1 TO BE DETERMINED TO PROVIDE PROPER BRAZING CLEARANCES FOR ITEMS 2 AND 3. MELTING TEMP CF BRAZE METAL MUST BE 1750°F OR HIGHER.

2. AFTER BRAZING, APPLY .003 TO .004 (TOTAL BOTH COATS) OF PURE ALUMINA OVER NICKEL ALUMINIDE BASE PER AMS-2436 TO SIDE & BOTTOM SURFACES OF THE TWO BLIND HOLES. DIMENSIONS APPLY AFTER COATING APPLIED.

3. PRESS FIT, AFTER NOTES 1,2,4 & 7 ARE MET.

4. SURFACE FINISH & FLATNESS APPLY INWARD FROM BOLT CIRCLE TO 2 1/4 DIA. PERFORM THIS FINAL GRINDING AFTER NOTES 1,2 ARE COMPLETED. SEE NOTE 7.

5. VAPOR DEGREASE PER LAC-0170.

6. -SO3 ASSY IS IDENTICAL TO -SO1 ASSY EXCEPT THAT ITEMS 2 & 3 ARE.

7. FLATNESS REQUIRED INWARD FROM BOLT CIRCLE TO 2 1/4 DIA : WAVINESS LESS THAN .0005 PER 3 INCHES OF CIRCUMFERENCE. OR .001 T.I.R. AROUND ENTIRE CIRCUMFERENCE. THEIR HOLES ARE OMITTED.

SECTIONAL VIEW AA
12 Holes thru 0.212 Dia 
Φ0.020 Dia Equally Spaced

| QTY | QTY CODE | ID | IDENT CODE | PART OR IDENTIFYING NO | NOMENCLATURE OR DESCRIPTION | MATERIAL DESCRIPTION OR NOTE | MATERIAL SPECIFICATION | ZONE | ITEM | MATERIAL DESCRIP- |
|-----|----------|----|------------|-------------------------|----------------------------|--------------------------------|--------------------------|------|-----|ITION TION OR NOTE | SPECIFICATION | NO. |
| 1   | 1        | -7 | INDEX PIN  | .125 DRILL ROD           | STAINLESS STEEL             |                               |                          |      |     |                  | ANGLES = ± 2 DEG | 1   |
| 1   | 2        | -5 | LARGE TUBE | OMEGA ENG. CO. ING | INC 516-6               |                               |                          |      |     |                  |                          | 3   |
| 2   | 3        | -3 | SMALL TUBES| STAMFORD (CO) INCONEL TUBE EACH 3 H. LONG | INC 14-6               |                               |                          |      |     |                  |                          | 4   |
| 1   | 1        | CC-104-1 | PART OR IDENTIFYING NO | DISC .250 THICK INCONEL X-75D | AMS-5542               |                               |                          | 1    |     |                  |                          | 2   |

INTERPRET DWG PER UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:
FRACTIONS ± 1/16
DECIMALS: .X = ± .1
.XX = ± .03
.XXX = ± .010
ANGLES = ± 2 DEG

DATE 11-28-72
LOCKHEED MISSILES & SPACE COMPANY
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
SUNNYVALE, CALIFORNIA

BRAZED END PLATE ASSY.

IHCO TCCS

REV 1

SIZE CODE IDENT DRAWING NO. CC-104
SCALE 'FULL'
NOTES
1. VAPOR DEGREASE PER LAC-0170.
2. DIAS. A & B CONCENTRIC .030 TIR.
<table>
<thead>
<tr>
<th>ZONE LTR</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPD</th>
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<tbody>
<tr>
<td>A</td>
<td>3.250 WAS 3.25; 5,000 WAS 5.00</td>
<td>7/14/73</td>
<td></td>
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<tr>
<td></td>
<td>ADD NOTE 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>MAT'L. WAS .010 ANNEALED COPPER PER QQ C-576</td>
<td>7/23/73</td>
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**PARTS LIST**

<table>
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<tr>
<th>QTY</th>
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<th>NOMENCLATURE OR DESCRIPTION</th>
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<tr>
<td>1</td>
<td>CC-105 -1</td>
<td>WASH - 2</td>
<td>STAINLESS STEEL .006 SHEET (ELC OPTIONAL)</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

**UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES, TOLERANCES ON:**

- FRACTIONS = ± 1/16
- DECIMALS: .X = ± .1
  - .XX = ± .03
  - .XXX = ± .010
- ANGLES = ± 2 DEG

**DR:** 11-29-72

LOCKHEED MISSILES & SPACE COMPANY
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
SUNNYVALE, CALIFORNIA

WASHERS

IH CO

TCCS

**SCALE:** NONE

**APPLICATION:** CCA/CEI

**APPD:**
CIRCUMSCRIBED
DIA = .430

ACTIVE TURNS = 1
SOLID HEIGHT = .022
SPIRAL: RIGHT OR LEFT HAND
NOTES

1. Insulation must withstand 1500°F
REQUIREMENTS

Cylinder temperature 1000°F

Power 70 watts at 120 volts RMS, 400 Hz.

Without leads = 184 lb.
ITEM 2 - 3 DETAIL

ITEM 3 - 5 DETAIL

NOTES:

1. Outside dia of Item 1 must be concentric to inside dia of Item 2; within .020.
2. Resistance weld Item 3 to Items 1 and 2 at spots spaced 1/8 inch apart around circumference of each.
3. Weld per LAC 1421 Class C.
4. Vapor degrease per LAC 0170.
<table>
<thead>
<tr>
<th>QTY</th>
<th>CODE</th>
<th>PART IDENT</th>
<th>NOMENCLATURE</th>
<th>MATERIAL SPECIFICATION</th>
<th>ZONE</th>
<th>ITEM NO.</th>
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<tbody>
<tr>
<td>1</td>
<td>-3</td>
<td>SMALL RING</td>
<td>PLATE</td>
<td>TYPE 316 STAINLESS STEEL</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>-5</td>
<td>SCREEN</td>
<td>30 MESH .013 DIA WIRE</td>
<td>TYPE 316 S.S.</td>
<td>3</td>
<td>3</td>
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<tr>
<td>12</td>
<td>-7</td>
<td>0-80 SCREW</td>
<td>1/8 LONG</td>
<td>RING LISTED</td>
<td>TYPE 305 (F-R)</td>
<td>4</td>
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<tr>
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<td>30 MESH .013 DIA WIRE</td>
<td>TYPE 316 S.S.</td>
<td>3</td>
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<tr>
<td>1</td>
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<td>SMALL RING</td>
<td>PLATE</td>
<td>TYPE 316 STAINLESS STEEL</td>
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**INTERPRET DWG PER**

UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:
- FRACTIONS ±1/16
- DECIMALS: .X = ± .01
- .XXX = ± .001
- ANGLES = ± 2 DEG

DATE: 3-8-72

LOCKHEED MISSILES & SPACE COMPANY
A SUBSIDIARY OF LOCKHEED AIRCRAFT CORPORATION
SUNNYVALE, CALIFORNIA

CATALYST RETAINER

HCO

CC-108

D

REV

Sheet 1 of 1

FOLDOUT FRAME B-13
NOTES:
1. SOLVENT CLEAN PER LAC-0170.
**Parts List**

<table>
<thead>
<tr>
<th>PARTS</th>
<th>QTY</th>
<th>CODE</th>
<th>desc</th>
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<tr>
<td>-13 SPACER</td>
<td>1</td>
<td>CC-109-1</td>
<td>-3</td>
<td>2.5G NUT</td>
<td>( \frac{3}{32} ) DIA ROD</td>
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<tr>
<td>-5 WASHER</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>TYPE 304 CRES</td>
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<tr>
<td>-9 WASHER</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>QQ-S 763</td>
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<tr>
<td>148D OD X 0.015W</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2.250 O.D. x 0.015 Wall</td>
</tr>
<tr>
<td>304 TUBE</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>TO 20 CRES SHT</td>
</tr>
</tbody>
</table>

**Thread**

# 2-5/16 UNC

**Limited Calendar Life**

C41 A 525 WAS 750; 12.50 WAS 1.500/2400

**Limited Operating Life**

C41 A 525 WAS - 750; 12.50 WAS 1.500/2400
1. PARTICLES OF THIS MATERIAL ARE HAZARDOUS TO BREATHE. THEREFORE WHILE MACHINING, FILTER MASK SHOULD BE WORN & DEBRIS SHOULD BE CONTINUOUSLY DRAWN AWAY BY VACUUM.
2. THIS MATERIAL IS ABRASIVE. USE CARBALTOL TOOLS OR GRINDING WHEELS.
3. ITEM 3 WITH HOLES, ITEM 7 OMIT HOLES.

ORIGINAL PAGE IS OF POOR QUALITY
ITEM 4 - DETAIL HALF SCALE

ITEM 5 - DETAIL HALF SCALE

ITEM 6 - DETAIL HALF SCALE

<table>
<thead>
<tr>
<th>ITEM</th>
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<tr>
<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-7</td>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
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<tr>
<td>2</td>
<td>-1</td>
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**FOLDOUT FRAME 2**

**REVISIONS**

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<tr>
<td>3H</td>
<td>A</td>
<td>2.00 WAS 2.00</td>
<td>2-9-73</td>
<td>530</td>
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<tr>
<td>3F</td>
<td>ABD</td>
<td>7.80 DIA</td>
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</table>
ITEM (22) DETAIL

ITEM (21) DETAIL

ITEM (20) DETAIL

ITEM (19) DETAIL

ITEM (18) DETAIL

ITEM (17) DETAIL

ITEM (16) DETAIL

ITEM (15) DETAIL

ITEM (14) DETAIL

ITEM (13) DETAIL

ITEM (12) DETAIL

ITEM (11) DETAIL

ITEM (10) DETAIL

ITEM (9) DETAIL

ITEM (8) DETAIL

ITEM (7) DETAIL

NOTES

1. WELD PER LAC 3853-050200.
2. MACHINE FLANGE AFTER WELDING & WELD INSPECTIONS HAVE BEEN COMPLETED.
3. GRIND OR MACHINE TO PROVIDE I.D. OF 0.070 MIN.
4. SPOTWELD ITEM 21 TO ITEM 23 AT APPROX 1/4 INCH INTERVALS AROUND CIRCUMFERENCE.
5. CLEAN ALL METAL SUBASSEMBLIES AND PARTS PER LAC 0170 AFTER COMPLETION OF WELD INSPECTION AND OTHER MFG. OPERATIONS.
12.09 NOTE:
THESE SURFACES MUST BE PARALLEL WITHIN 1/8".

ITEM (14), -27 SUBASS'Y.

ITEM (27) - 15° TO FACILITATE WELDING.

ITEM (31), -61 SUBASS'Y.
ITEM (20), .59 DETAIL

ITEM (31), .61 SUBASS'Y.
REQUIREMENTS

1. WHEN CLOSED, (ENERGIZED) MUST BE VACUUM TIGHT TO .000001 TORR ON LOW PRES. SIDE.
2. EQUIP WITH POSITION INDICATOR SWITCH TO SIGNAL WHETHER VALVE IS SEATED OR OPEN.
3. POWER: 100 TO 104 VOLS, DIRECT CURRENT.
4. FLUID: AIR, TEMP. 290°F MAX.
5. AMBIENT TEMP: 125°F MAX.
6. VALVE BODY MAT'L: ALUMINIUM.
7. DIFFERENTIAL PRESSURE WHEN VALVE IS CLOSED: 10 P.S.I. IN ONE DIRECTION,
   15 P.S.I. IN OTHER DIRECTION.
8. ELECTRIC LEAD WIRES TO BE TEFON OR KAPTON INSULATED, EACH 3 FT. LONG:
   2 COIL LEADS, 1 GROUND TO VALVE FRAME OR BODY, 3 SWITCH LEADS.
9. DESIGN FOR CONTINUOUS DUTY (ENERGIZED).
10. CV = 12 MINIMUM.
11. VALVE MUST OPERATE IN ALL ORIENTATIONS.
**LIMITED CALENDAR LIFE** | **LIMITED OPERATING LIFE**
---|---

<table>
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<th>APPD</th>
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<tr>
<td>A</td>
<td>ADD: REQT 11.7&quot; MAX WAS 11.1/8&quot;</td>
<td>(w)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>11/2&quot; MAX WAS 11/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>WAS 11/2&quot;</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>SCALE &quot;NONE&quot; WAS &quot;FULL&quot;</td>
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<tr>
<td></td>
<td>NOTE 3 WAS 100 V.D.C.</td>
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**NOTE 3 WAS 100 V.D.C.**

---

**INTERPRET DWG PER**

**UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES TOLERANCES ON:**

<table>
<thead>
<tr>
<th>FRACTIONS</th>
<th>DECIMALS</th>
<th>ANGLES</th>
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</thead>
<tbody>
<tr>
<td>± 1/16</td>
<td>± .1</td>
<td>± 2 DEG</td>
</tr>
</tbody>
</table>

**DATE 2-9-73**

**LOCKHEED MISSILES & SPACE COMPANY**

**SOLENOID VALVE-TCCS**

**SOLINGLY OPEN, 2 WAY**

**DESIGN CONTROL DWG.**

**APPLICATION**

<table>
<thead>
<tr>
<th>CODE IDENT</th>
<th>DRAWING NO.</th>
<th>REV</th>
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<tr>
<td>CCA/CEI</td>
<td>CC-112</td>
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**APPD**

**APPD**

**APPD**

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**APPD**

**APPD**

**APPD**

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**APPD**

**APPD**

**APPD**

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**APPD**
NOTES

1. SELECT PREMIUM TUBING FOR BEST ROUNDNESS
   AVAILABLE (ITEM 3).
2. DIP BRAZE ITEMS 3, 4 & 6 TO ITEM 5 USING
   ALLOY HAVING MELTING POINT ABOVE 700°.
   DO NOT HEAT TREAT AFTER BRAZING.
   FINS (ITEMS 3 & 4) ARE TO HAVE CONTINUOUS METAL CONTACT WITH CYLINDER.
   (ITEM 5) OVER THEIR ENTIRE LENGTH.
   FLANGE BRAZE MUST BE VACUUM TIGHT.
   MACHINE FLANGE AFTER DIP BRAZING.
   MACHINE "CE OF FLANGE FIRST", AND 138 X
   75° ON BACKSIDE LAST.
   WELD PER LAC 3853-050200, VACUUM TIGHT.
   SPOTWELD ITEM 8 TO ITEM 9 AROUND
   CIRCUMFERENCES AT INTERVALS OF 1/4 IN. OR
   LESS. THEN ANODIZE PER LAC 0494 TYPE 1.
3. ITEM 7 MUST BE IN PLACE BEFORE ITEM 22
   IS WELDED TO ITEM 2.
4. ANODIZE PER LAC 0494 TYPE 1, THEN GRIND
   OFF ANODIZE LOCALLY FROM ITEM (10) TO
   ENABLE WELDING IT TO ITEM (13) AT 3
   OR 4 PLACES.
5. MACHINE FLANGE AFTER WELDING.

ORIGINAL PAGE IS
OF POOR QUALITY
ITEM 1 - 50I ASSY.

ITEM 4 - 3 DETAIL

(REGEN. BED)

ITEM 3 - 1 DETAIL

THE DIMENSIONS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION OR MANUFACTURING.

ITEM 22 WHEN GRIND M(10) TO 13 AT 3
ITEM 6 - 7 DETAIL (HALF SCALE)

ITEM 7 - 9 SUBASS'Y.

ITEM 9 - 13 DETAIL

ITEM 10 - 17 DETAIL

ITEM 20 - 35 DETAIL

ITEM 21 - 303 SUBASS'Y.

HELIX: RT. OR LEFT HAND ENDS: SQUARED, GROUND FREE TURNS: \( \frac{5}{16} \) WIRE: .177 DIA x .002 TYPE 302 CRE Spring Tempered

2.500 TYPE 302 CRE SPRING TEMPER

2.35' THESE SURFACES MUST BE PARALLEL WITHIN \( \frac{1}{8} \)

ORIGINAL PAGE IS OF POOR QUALITY
ITEM 10 - 15 DETAIL
HALF SCALE

ITEM 11 DETAIL

ITEM 12

ITEM 29 SUBASS'Y.

2.35 THESE SURFACES MUST BE PARALLEL WITHIN \( \frac{1}{16} \)

FOLDOUT FRAME
ITEM (22), -305 SUBASSYS

CHAMFER JOINTS AS REQ'D TO FACILITATE WELDING.
NOTES

1. LOCKHEED WILL FURNISH THE GAMAH FLANGES TO DYNAMIC AIR ENG. INC.
2. PERFORMANCE SPECS. TO BE SPECIFIED ELSEWHERE
   JOINTS TO BE SEALED USING GASKET OR OTHER MEANS
3. F202/0.4 OR F1185-1008X FLANGE
   GAMAH - DIV. OF STANLEY AVIATION
   DENVER, COLO. - TYP 2 PLACES
4. ELECTRIC LEAD WIRES TO BE TEFLOW OR KAPTON INSULATED, EACH 3 FEET LONG.
   FURNISH ONE ADDITIONAL WIRE GROUNDED TO MOTOR BODY
5. DO NOT USE CADMIUM OR ZINC PLATING, OR ODOROUS PAINT.

CROSS SECTION VIEW

1.28

.75

1.00 OD APROX. .049 WALL 6061 AL.

DELETE FLANGES IF POSSIBLE

MODEL COSO H. FAN - CENTRIFUGAL
   DYNAMIC AIR ENG. INC.

LMSC - SUNNYVALE, CALIF.

REGENERABLE BED BLOWER

CC-114 - B REV. 4-11-73 (W)
SCALE 1/2 3/19/73 R.B.M
DYNAMIC AIR ENG., INC. VANE AXIAL FAN M3192A-1A

OMIT FLANGES IF POSSIBLE

5. DO NOT USE CADMIUM OR ZINC PLATING, OR ODOROUS PAINT.

4. ELECTRIC LEAD WIRES TO BE TEFLOM OR KAPTON INSULATED, FURNISH ONE ADDITIONAL WIRE GROUNDED TO MOTOR BODY.

3 JOWTS TO BE SEALED USING GASKET OR OTHER MEANS

2 PERFORMANCE SPECS. TO BE SPECIFIED ELSEWHERE

1 LOCKHEED WILL FURNISH THE GAMA FLANGES TO DYNAMIC AIR ENG. INC.
F1185-300BX
GAMAHL DIV. OF STANLEY
AVIATION DENVER COLO.
Typ. 2 Places

3.00 O.D.
.049 Wall (Approx.)
6061 Al. Typ
2 Places

KAPTON
ONE BODY
OTHER MEANS
ELSEWHERE

FIXED BED FAN
CC-115-A REV. 3-27-73 QW
LMSG. SUNNYVALE, CALIF
SCALE 1/2 3-14-73 RBM
PURCHASE FROM CONAX - SUBSIDIARY OF ESTERLINE CORP. BUFFALO, N.Y.
LOCAL REP: INSTRUMENT LABORATORY
644 EMERSON ST. PALO ALTO, CALIF. 94303 PHONE 415.328.1040

NOTES:
### Parts List

<table>
<thead>
<tr>
<th>QTY</th>
<th>CODE IDENT</th>
<th>PART OR IDENTIFYING NO.</th>
<th>NOMENCLATURE OR DESCRIPTION</th>
<th>MATERIAL DESCRIPTION OR NOTE</th>
<th>MATERIAL SPECIFICATION</th>
<th>ZONE</th>
<th>ITEM NO.</th>
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</table>

**UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:**

- FRACTIONS = ± 1/16
- DECIMALS: .X = ±.1
  
  .XX = ±.03
  
  .XXX = ±.010

- ANGLES = ± 2 DEG

**DATE:** 16 MARCH 1978

**LOCKHEED MISSILES & SPACE COMPANY**

A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION

SUNNYVALE, CALIFORNIA

**THERMOCOUPLE ASSY**

**REGENERABLE BED**

**SIZE**

<table>
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<td>C</td>
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**SCALE:** 1/4

**SHEET:** 10/1

**ASSY USED ON APPLICATION:**

- CONTR
  
  - CCA/CEI

**APPLICATION:**

**FIRST**: 25

**ENGINEERING**: 7C5S

**APPLICATION**: CCA/CEI

**PARTS LIST**: KP-SS12-UQ-DH-T-MPG-125-A-T-17 THERMOCOUPLE ASSY
ITEM 2 (-1) DETAIL
SCALE 1/8

ITEM 23
DETAIL - 305 ASSY
SCALE 1/8

SECTION A/B

SECTION B/A/B

DETAIL ITEM 19 (-3T) SPRING
SCALE 1/8

NECK: RT OR LEFT HAND
41/4: SQUARED, GROUND
FREE TIGHT: 4
WIRE: .312 DIA. 302 GREY
SPRING TEMPER
TOP VIEW

FRONT VIEW

NOTE:
WELD GUSSETS INTO ALL CORNERS AS SHOWN EXCEPT THESE TWO.

ORIGINAL PAGE IS OF POOR QUALITY
### Notes:
1. Weld per LA 1851-090300. Weld all possible edges in contact. Notch as needed to fit.
2. Interrupted weld beads 1/8" long, spaced 2" inches along both edges.

### Parts List
<table>
<thead>
<tr>
<th>Item</th>
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<th>Material Specification</th>
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<td>1</td>
<td>CC-11B-501 FRAMES</td>
<td>6082T6</td>
</tr>
<tr>
<td>2</td>
<td>Angle 1&quot; x 1&quot; x 1/8&quot;</td>
<td>6082 T6</td>
</tr>
<tr>
<td>3</td>
<td>Plate 1/8&quot; thick</td>
<td>6082 T6</td>
</tr>
<tr>
<td>4</td>
<td>Plate 1/8&quot; thick</td>
<td>6082 T6</td>
</tr>
<tr>
<td>5</td>
<td>Gusset 3/8&quot; thick</td>
<td>6082 T6</td>
</tr>
<tr>
<td>6</td>
<td>Plate 1/8&quot; thick</td>
<td>6082 T6</td>
</tr>
</tbody>
</table>

### Diagram
- **Side View**
- **Back View**
- **Typ. All B Corners**

### Dimensions
- 30.45" REF.
- 9.75"
NOTES:

1. WELD PER LAC 3853-050200.
2. CLEAN PER LAC 0170 AFTER COMPLETION OF WELD INSPECTION AND OTHER MFG. OPERATIONS.
3. CHAMFER ITEMS 15° TO FACILITATE WELDING.
4. TOP SURFACE OF BOSS MUST BE PERPENDICULAR TO AXIS OF THREAD WITHIN ¼° AND MUST HAVE 32° COUNTERSINK.

THREAD 7/16-20 UNF. ONLY BREAK SHARP EDGE AT START OF THREAD. DO NOT COUNTERSINK.
### Section A-A

#### Parts List

<table>
<thead>
<tr>
<th>Item</th>
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<td>4</td>
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<tr>
<td>1</td>
<td>Tubing</td>
<td>1 Inch O.D. X .049 Wall</td>
<td>304 ELC OR 321 OR 347</td>
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<td>3</td>
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<tr>
<td>2</td>
<td>Flange</td>
<td>GAMAH F20010C</td>
<td>15-5 P.H. CRES</td>
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<td>2</td>
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<td>1</td>
<td>Duct</td>
<td>CC-119-501</td>
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**Tolerances:**
- Fractions = ± 1/16
- Decimals: .X = ± .1
- .XX = ± .03
- .XXX = ± .010
- Angles = ± 2 deg

**Separation and Drilling:**
- 20 UNF 4
- K Sharp
- Start of Do Not Sink.
NOTES:

1. CHAMFER ITEMS 2 to facilitate welding.

2. THREAD 1/8-20 UNF. ONLY BREAK SHARP EDGE AT START OF THREAD. DO NOT COUNTERSINK. TOP SURFACE OF BOSS MUST BE PERPENDICULAR TO AXIS OF THREAD WITHIN 1/4 DEGREE.

3. WELD PER LAC 3853-0502C0.

4. CLEAN PER LAC 0170 AFTER COMPLETION OF WELD INSPECTION AND ALL MFG.

5. BEFORE WELDING ITEM 5 IN PLACE, DRILL THRU 1/8 DIA.
<table>
<thead>
<tr>
<th>ZONE</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPD</th>
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<td>1.50 RADIUS WERE 1.75 REF.</td>
<td>5/14/67</td>
<td>(Aw)</td>
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<td>GD-B</td>
<td>ADD ITEM 5, ADD 55 &amp; 2 DMS, ADD NOTE 5</td>
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<th>CC-120-S01</th>
<th>DUCT</th>
<th>ITEMS 2,3,4</th>
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**SPECIFIED DIM. ARE IN INCHES, TOLERANCES ON:**

**FRACTIONS = ± 1/16**
**DECIMALS: X = ± .1**
**XXX = ± .03**
**ANGLES = ± 2 DEG**

**THE DRAWING PER**

**LOCKHEED MISSILES & SPACE CORPORATION**

SANTA RITA ROAD, SUNNYVALE, CALIFORNIA
Hex Flats 2.50 TYP

Notes:
1. Weld per LAC 3853-050200
2. Clean per LAC 0170 after completion of weld inspection & MFG. operations.
<table>
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<th>CODE IDENT</th>
<th>PART OR IDENTIFYING NO.</th>
<th>NOMENCLATURE OR DESCRIPTION</th>
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<tr>
<td>4</td>
<td>MFM 5700-A-200</td>
<td>FLAT PIPE FLANGE</td>
<td>AEROQUIP-MARMAN</td>
<td>GOBI TG</td>
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<td>4</td>
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<td>THRD. FLANGE</td>
<td>ITEMS 2, 3</td>
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</table>

**Parts List**

- **Threaded Hex**: 3 Dia. Bar, GOBI TG, GoB1 TG

**Tolerances**

- Fractions: ±1/16
- Decimals: .X = ±.1, XXX = ±.03
- XXX = ±.010
- Angles = ±2 deg

**Dimensions**

- DR. AW

**Application**

- CCA/CEI

**Lockheed Missiles & Space Company**

A Group Division of Lockheed Aircraft Corporation

Sunnyvale, California

**Threaded Flange**

**Scale**: FULL
NOTES

1. Top surface of boss must be perpendicular to axis of thread within 1/4° & must have 32\% finish.

2. Weld per LAC 3853-050200.

3. Clean per LAC 0170 after completion of weld inspection & MFG. operations.

4. Only break sharp edges at start of thread, do not countersink.

SECTION A-A

UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:

- Fractions = ± 1/16
- Decimals: .XX = ± .03
- .XXX = ± .010
- Angles = ± 2 DEG

QTY REQD CODE IDENT PART OR IDENTIFYING NO.

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INTERPRET DWG PER

CONTR

CCA/CEI
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<td>G001T6</td>
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<td>AERQUIP-MARUMAN</td>
<td>G001T6</td>
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</table>

**PARTS LIST**

**UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:**
- FRACTIONS = ± 1/16
- DECIMALS: .X ± ± .1
- X.X ± ± .03
- X.XX ± ± .010
- ANGLES = ± 2 DEG

**DRAWING NO.**
- LOCKHEED MISSILES & SPACE COMPANY
- A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
- SUNNYVALE, CALIFORNIA
- DUCT, BLOWER-TO-VALVE
- SIZE: C
- CODE: CC-122
- DRAWING NO.: CC-122-A
- REV: A
- SCALE: FULL
- SHEET 1 OF 1

**REVISIONS**

- ZONE/TR
- DESCRIPTION
- DATE
- APPD
- A

**ADD ITEM 7 & SECT. B-B**

**SECTION A-A**

**SECTION B-B**
NOTES

1. THREAD 1/8-20 UNF. ONLY BREAK SHARP EDGE AT START OF THREAD, DO NOT COUNTERSINK. TOP SURFACE OF BOSS MUST BE ⊥ TO AXIS OF THRD. WITHIN ±0.005" AND MUST HAVE ±0.003".

2. WELD PER LAC 3855-050300.

3. CLEAN PER LAC 0170 AFTER ALL OTHER OPERATIONS ARE COMPLETED.

ORIGINAL PAGE IS OF POOR QUALITY
NOTES

1. Thread 3/4-2.4 UNF, only break sharp edges at start of thread, do not countersink. Top surface of boss must be perpendicular to axis of thread within ±1/8" and must have 7/16" finish.

2. Weld per LAC 3853-050300.

3. Clean per LAC 0170 after completion of all MFG, operations & weld inspection.

4. Thread 3/4-16 UNF, only break sharp edges at start of thread, do not countersink. Top surface of boss must be perpendicular to axis of thread within ±1/8" and must have 7/16" finish.
TYPICAL WELD DETAIL (FULL SCALE)
FOR FLANGE-TO-TUBE AND TUBE-TO-TUBE

SECTION C-C (FULL SCALE)

SIDE VIEW

ORIGINAL PAGE IS OF POOR QUALITY
**REVISIONS**

LIMITED CALIBER LIFE | LIMITED OPERATING LIFE
--- | ---
7C | 7C

**REMARKS**

ADD 0.40 DIM. RAISE
UPPER 4.4 R SEMICIRCLE

**NOTE**

SAME AS ITEM 1 EXCEPT AS SHOWN

**DETAIL**

SCALE 1/2

**DIMENSIONS**

- 3.550: 3/36
- 6.30
- 1.25

**NOTES**

- HOLE 13 PLACES
- ADD 0.40 DIM. RAISE
- UPPER 4.4 R SEMICIRCLE

**PARTS LIST**

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<tr>
<th>PARTS</th>
<th>CODE</th>
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<th>QTY</th>
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**DRAWING**

- CC-125
- TCCS
- CONN

**DRAWING NO.**

- CC-125
- D

**SCALE**

- 1/2

**FOLDOUT FRAME**

B-35
NOTES:

1. MATCH WITH HOLES IN 2E-155-1 & 2E-155-2
2. INSTALL MECHANICAL FASTENERS PER LAC0581
3. FAB PER LAC-1341
4. WELD PER LAC-8865-050500

- 301 CRADLE ASSY

- 303 CRADLE ASSY

FITTED WITH M30X35X40 KNOT-AND-HEAD ON FLANGE FACE
B. INSTALL MECHANICAL FASTENERS FOR LAC-0581
   FAB FOR LAC-1841

1. MATCH WITH HOLE IN CC-125-1 & 3

NOTES

ORIGINAL PAGE IS OF POOR QUALITY
ITEM 1: TOP PANEL

ITEM 2: BOTTOM PANEL

ITEM 3: REAR PANEL

ITEM 4: FRONT PANEL

ITEM 5: LEFT END PANEL

ITEM 6: (ON BACK SIDE)

ITEM 7: (ON BACK SIDE)

ITEM 8: RIGHT END PANEL

BREAK ALL CORNERS 1/8"
28 PLACES

FOLDOUT FRAME
NOTES

1. FRONT SIDE OF ALL PANELS SHOULD BE KEPT FREE OF SCRATCHES, DISCOLORATION, ETC.

2. AFTER MACHINING & BEFORE BONDING, FINISH ITEMS 1 THRU 6 PER LAC-0458-010000.

3. AFTER IRIDATING, BOND MATT SECTIONS TO PANELS PER LAC 3013-040300. SOLVENT CLEAN AREAS TO BE BONDED FIRST.

ITEM 118 (ON BACK SIDE)

ITEM 4 FRONT PANEL

ITEM 5 LEFT END PANEL

ITEM 6 RIGHT END PANEL

ITEM 7 (ON BACK SIDE)

SECTION AA (FULL SCALE)

ITEM 8 FRONT PANEL

ITEM 9 LEFT END PANEL

ITEM 10 RIGHT END PANEL

ITEM 11 (ON BACK SIDE)

SECTION AA (FULL SCALE)

ITEM 12 FRONT PANEL

ITEM 13 LEFT END PANEL

ITEM 14 RIGHT END PANEL

ITEM 15 (ON BACK SIDE)
NOTES:

1. IRIDITE ITEMS 1, 2 & 3 INDIVIDUALLY PER LAC 0498-010000.

2. AFTER IRIDITING, WELD PER LAC 3853-050300. INTERRUPTED BEADS, ¼ LONG, SPACED 3 INCHES APART.
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<th>QTY</th>
<th>CODE IDENT</th>
<th>PART OR IDENTIFYING NO.</th>
<th>NOMENCLATURE OR DESCRIPTION</th>
<th>MATERIAL DESCRIPTION OR NOTE</th>
<th>MATERIAL SPECIFICATION</th>
<th>ZONE</th>
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<td>SHELF .125 THICK</td>
<td>G061 T6</td>
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</table>

**INTERPRET DWG PER** UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES. TOLERANCES ON:
- FRACTIONS ± 1/16
- DECIMALS ± .1
- XXX ± .03
- ANGLES ± 2 DEG

**DATE** 7-10-73

**LOCKHEED MISSILES & SPACE COMPANY**
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
SUNNYVALE, CALIFORNIA

**SHELF, ELECTRONICS**

**APPLICATION** CCA/CEI

**REV** D

**SCALE**: HALF

**FOLDOUT FRAME** 2
NOTES

1. WELD PER LAC 3853-050200. WELD MUST BE VACUUM TIGHT.

2. CLEAN PER LAC 0170 AFTER ALL MFG. OPERATIONS & PENETRANT WELD INSPECTION HAVE BEEN COMPLETED.
NOTES

1. WELD PER LAC 3853-05D300.
2. INSTALL RIVETS & PLATE NUTS PER LAC-0581.

WESTERN INDUSTRIES

4201 Industrial Rd.

BENNINGTON, VT 05201

(802) 447-0056

E-mail: INFO@WESTINDUS.COM

www.WESTINDUS.COM
NOTES

1. INSTALL RIVETS & PLATE NUTS PER LAC-0581.
### Parts List

<table>
<thead>
<tr>
<th>QTY</th>
<th>CODE</th>
<th>PART OR IDENTIFYING NO.</th>
<th>NOMENCLATURE OR DESCRIPTION OR NOTE</th>
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<td>ALUM.</td>
<td>2117-T4</td>
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### Tolerances

- Fractions = ± 1/16
- Decimals: ± .1
- XXX = ± .03
- XXXX = ± .010
- Angles = ± 2 DEG

### Additional Information

- Interpret Dwg Per
  - Unless otherwise specified, all dimensions are in inches. Tolerances on fractions = ± 1/16, decimals = ± .1, XXX = ± .03, XXXX = ± .010, and angles = ± 2 DEG.

- Designation: SUPPORT .125 SHEET GOGI TG ALUM.

- Lockheed Missiles & Space Company

- Sunnyvale, California

- Date: 7-30-73

- Bracket - Presorb Solenoid Valve TCCS

- Application: CCA/CEI

- Scale Full

- Drawing No.: CC-135

- Rev: D

- Designation: Support .125 Sheet GOGI TG Alum.
2 BASE

NOTES

4 PLATE NUTS PER

3) OR SPOTWELD ITEM 8
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**SECTION A-A**

**INTERPRET DWG PER**

- UNLESS OTHERWISE SPECIFIED DIM. ARE IN INCHES. TOLERANCES ON:
  - FRACTIONS = ± 1/16
  - DECIMALS: X = ± .1
  - XXX = ± .03
  - XXXX = ± .010
  - ANGLES = ± 2 DEG

**DATE** 8-27-75

LOCKHEED MISSILES & SPACE COMPANY
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
SUNNYVALE, CALIFORNIA

**BRACKET, BLOWER**

**FOLDOUT FRAME**
ONE OF FIVE IDENTICAL TIME CIRCUITS
Clock lines go to all 'A' inputs of the five time circuits.

Hours x 10

These lines go to the BCD output on the clock.

Minutes x 10

Numbers 1 to 9, 0 returns to the lower 8-bit output.
### Parts List

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**Interpretation of DWG Per**

- **Unless Otherwise Specified Dim Are in Inches:**
  - Tolerances:
    - Fractions: ± 1/16
    - Decimals: ± 0.001
    - ± 0.03
    - ± 0.01
  - Angles: ± 2 deg

**Applications**

- Next Assy: Used on CCA/CEI

**Designation**

- Parts list
- Lockheed Missiles & Space Company
- Sunnyvale, California
- Power Supply Monitor Circuits

**Designation**

- TC-03
- CC-203
- Sheet 1

**Scale**

- A
- B
- C

**Additional Notes**

- Date: 3/2/72
- Rev: DR B-51

Lockheed Aircraft Corporation
NOTE:

REMAINS CKTS FOR VALVES AND FANS TO BE IDENTICAL, EXCEPT NO LINES TO DRY OR PANEL METERS. TEMPS. CKTS SHOWN ON SEPARATE DRAWING.

ORIGINAL PAGE IS OF POOR QUALITY
<table>
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<th>QTY</th>
<th>ITEM NO.</th>
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<th>MATERIAL SPECIFICATION</th>
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<th>ITEM NO.</th>
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</thead>
</table>

**Remarks:**
- Interpreted from DWG PER
- Unless otherwise specified, dim are in inches, tolerances in 0.001.
- Fractions ± 1/16
- Decimals: ± 0.01
- X ± 0.03
- X ± 0.001
- ANGLES ± 2 DEG

**Designation:**
- LOCKHEED MISSILES & SPACE COMPANY
- A DIVISION OF LOCKHEED AIRCRAFT CORPORATION
- SUNNYVALE, CALIFORNIA

**Code:**
- Δp CIRCUITS

**Application:**
- CCA/CEI

---

**Legend:**
- D: SIZE
- APPD: CODE IDENT
- DRAWING NO.: 66-205
- SCALE: SHEET 1 OF 1
NOTES:
1. MAKE FROM THICKNESS
2. DIMENSION FROM DRAWING
3. ENGRAVE TO BE 2
4. DOTTED POSITION
5. THE 3/8 MOUNTING
6. IRIDIUM PAINT 0.5
7. ENGRAVED HOLES A LESS TH
NOTES:
1. MAKE FROM GODI-T6 ALUMINUM .125 INCH THICKNESS.
2. DIMENSIONS NOT SHOWN MAY BE SCALING FROM DRAWING.
3. ENGRAVE APPROX. AS SHOWN, LETTERS TO BE 3/16 INCH HIGH.
4. DOTTED LINES ARE TO SHOW METER POSITIONS ONLY, DO NOT ENGRAVE.
5. THE 3/8 INCH DIA. HOLES FOR METER MOUNTING ARE TO BE ON 1.5 INCH CENTRE.
6. IRIDIUM PER LAC 0438-030000. DO NOT PAINT. DO NOT FILE ENGRAVING.
7. ENGRAVED LETTERS TO CLEAR 1/4 INCH HOLES AND IS 1/32 INCH HOLE BY NOT LESS THAN 1/8 INCH.

DRILL THROUGH, 15/32 DIA.

DRILL THROUGH, 1/4 DIA. 30 PL.