

Load #54

LIGO-E990180-00-X

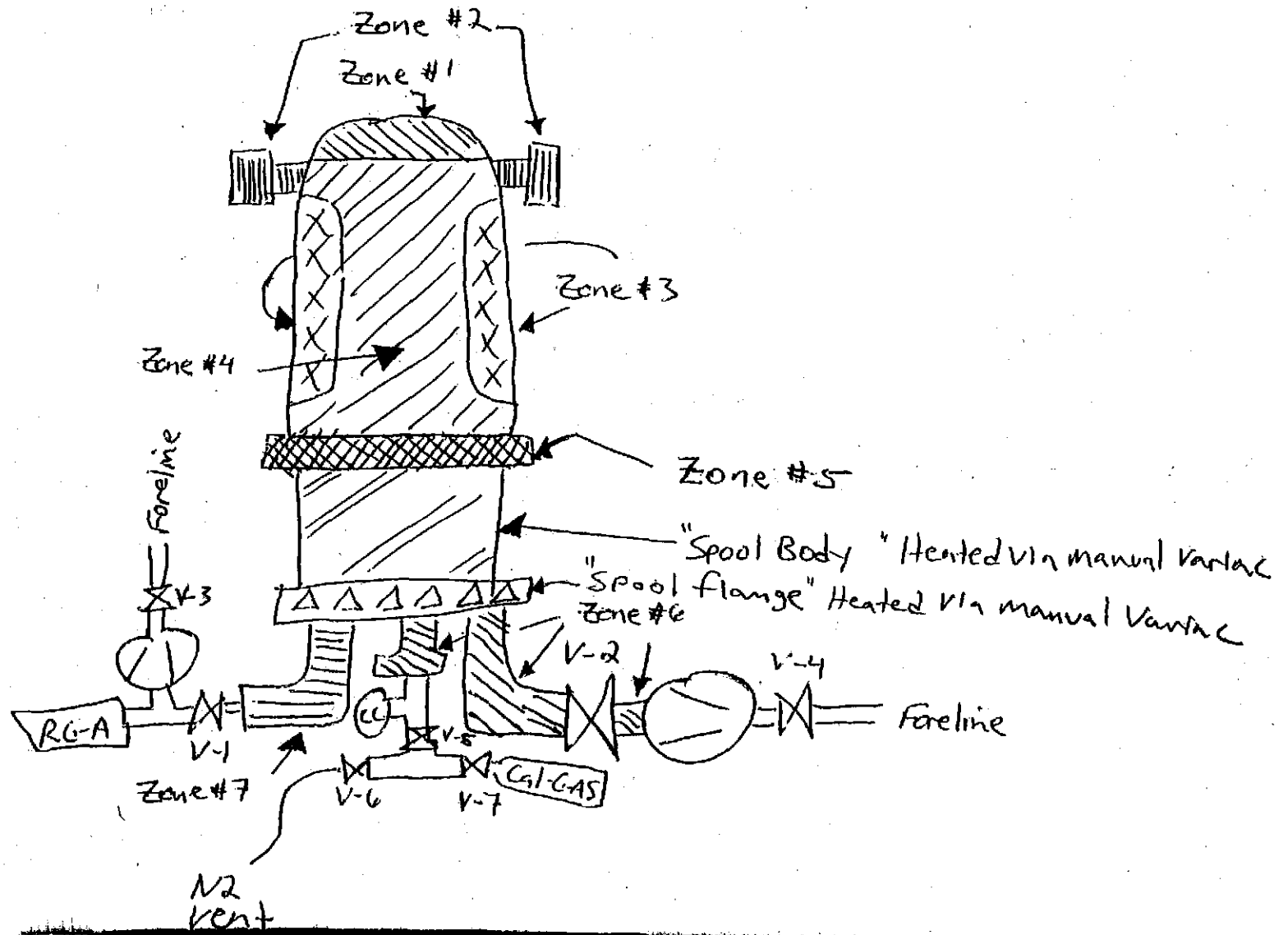
## Summary of LHO Vacuum Bake Oven A RGA Data Generation

The individual parts which comprise a "load" are cleaned as per LIGO-E960022 or as allowed by waiver(s) and loaded into the bake oven. The oven is then pumped down through the main pump "arm" (through V-2, RGA arm is valved off at this point). A heating profile is programmed and baking of the system begins. A typical "heating profile" consists of ramping up to material type soak temperature, soaking for approximately 48 hours, ramping down to approximately 70C, soaking and then ramping down to near room temperature. While soaking at 70C, an RGA background scan is taken. V-1 is then opened and V-2 closed. Enough time is allowed for the system to come into pressure equilibrium and then an elevated load temperature RGA scan is taken. V-1 is then closed and V-2 opened. Following this elevated temperature scan, the load is ramped down to near room temperature and the baking portion of the process is complete. Throughout the baking, temperature data is taken to verify the actual temperatures in the various "heat zones" of the bake oven system.

Once at near room temperature, another RGA background (V-1 closed) scan is taken. Next, V-1 and the cal-gas are opened and V-2 closed. After a 30 minute pressure equilibration time, a "calibration" scan is taken. The calculated pressure of Argon (constituent of the "mixed" calibration gas) is determined using the leak rate of Argon and the pump speed of the RGA arm port as seen by the oven chamber and compared (ratio) to the maximum amp value measured for Argon in the calibration scan. This "torr/amp" ratio becomes the Calibration Factor for the given load, converting measured current to pressure.

Finally, the cal-gas is valved out and enough time is allotted to allow all traces of it to be pumped away. A "post-bake" scan is then taken. Approval of the post-bake scan is a collective "pass/fail" determination made by either Dennis Coyne (CalTech) or Stan Whitcomb (CalTech). The data collected during the "elevated temperature scan" is entered into a spreadsheet which then calculates what the outgassing rates of AMUs 41, 43, 53, 55 and 57 ought to be at room temperature. These calculations are used to determine the room temperature outgassing rates when the signals are below the RGA's sensitivity (noise floor).

Refer to the LHO Bake Oven A logbook for the actual ordered events of the load # of interest.



**LHO VACUUM BAKE OVEN A:  
CONTENTS LOAD #54**

**3/8 x 1.00 SOCKET HEAD SCREW-OVL PT AG/SS S/N N/A**

**MIRROR TABLE CLAMP PART NUMBER 990443**

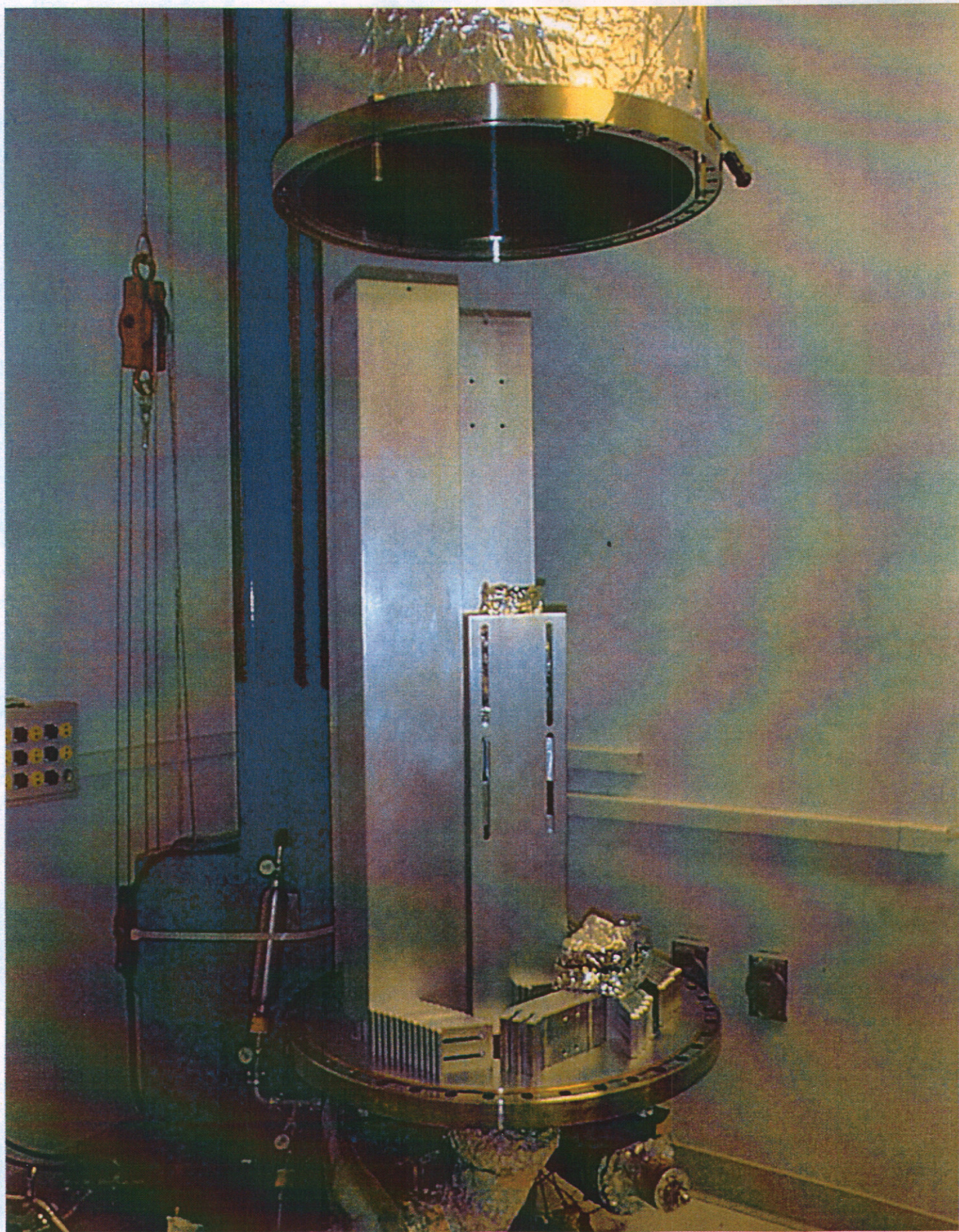
**LIFTING ARMS S/N N/A**

**LIFTING ARM PEDISTALS S/N N/A**

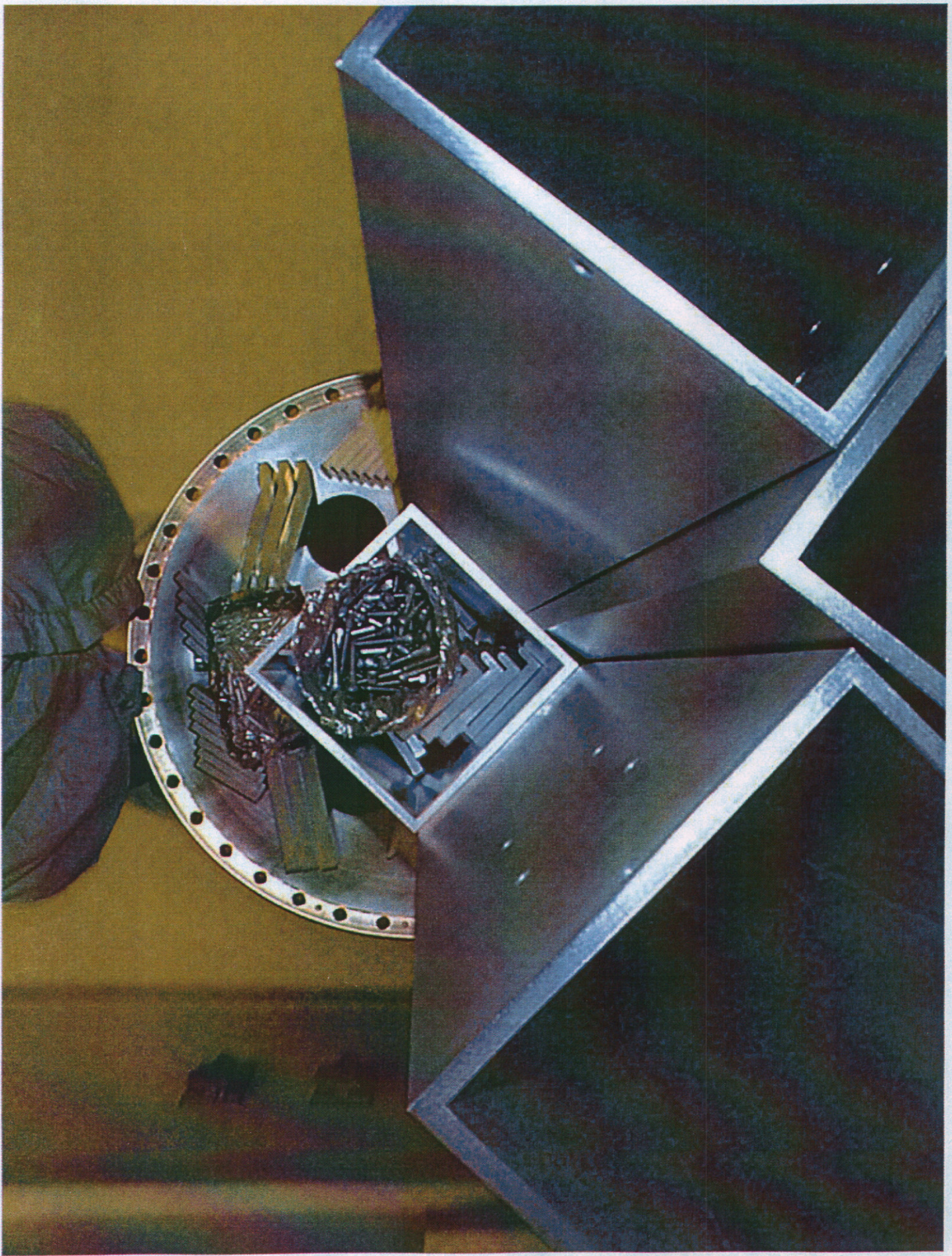
**1/4-20 X 1 1/2 SHOULDERED SHCS S/N N/A**

**1/4-20 X 1 1/4 FULLY THREADED SHCS S/N N/A**











# LIGO PROCESS TRAVELER

DCC Number: **E990308-00-X**  
 Date Prepared: **8/6/99**

|                                 |     |                    |  |               |         |                |
|---------------------------------|-----|--------------------|--|---------------|---------|----------------|
| Originator                      |     | Cognizant Engineer |  | Ext./Phone#   | Project | Account Number |
| Michael Smith                   |     | Michael Smith      |  | 2062          | COS     | 5F515          |
| Dwg/Part Number                 | Rev | Part Description   |  | Serial Number | Qty     |                |
| D990443                         | B   | clamp, table       |  | 020-150       | 130     |                |
| Used In (next higher assembly): |     |                    |  |               |         |                |
|                                 |     |                    |  |               |         |                |

**Data Package, Receiving/Inspection Remarks:**

| Inspection Required Y/N | Visual Damage Y/N | Comments | Name/Initials | Date Comp. |
|-------------------------|-------------------|----------|---------------|------------|
|                         |                   |          |               |            |

**Process Flow:**

| # | Operation     | Start Date | Work Area | Instructions  | Name/Initials | Date Comp.         |
|---|---------------|------------|-----------|---|---------------|--------------------|
| 1 | Control Point | NA         | NA        |   | NA            | NA                 |
| 2 | Clean         |            | LHO       | per LIGO-E960022, as applicable   | B. Weaver     |                    |
| 3 | wrap and bag  |            | LHO       | per LIGO-E960022  | B. Weaver     |                    |
| 4 | Vacuum Bake   |            | LHO       | per LIGO-E960022  | B. Weaver     | 8-20-99<br>8-30-99 |
| 5 | Control Point |            | LHO       | Review/approve RGA:<br>VBO Load# <u>52</u> scan # <u>082699C.RGA</u><br>VBO Load# <u>54</u> scan # <u>082099C.RGA</u><br>VBO Load# _____ scan # _____<br>VBO Load# _____ scan # _____<br>VBO Load# _____ scan # _____<br>VBO Load# _____ scan # _____<br>Note: attach RGA scan(s) to this traveler. | B. Weaver     | 9/14/99            |

*N.B.: A copy of this traveler must be submitted to the DCC each time the original is shipped with the associated part(s) and when the traveler has been completed.*

# LIGO PROCESS TRAVELER

DCC Number: **E990308-00-X**

| #   | Operation                        | Start Date | Work Area           | Instructions |                    |        | Name/<br>Initials | Date<br>Comp. |
|---|----------------------------------|------------|---------------------|--------------|--------------------|--------|-------------------|---------------|
| 6   | Box for shipment to<br>LLO & CIT |            | Valley<br>Engravers |              |                    |        |                   |               |
|   |                                  |            |                     | No.          | Qty per<br>package | Part   |                   |               |
|   |                                  |            |                     | 1            | 20                 | clamps |                   |               |
|   |                                  |            |                     | 2            | 120                | clamps |                   |               |
|   |                                  |            |                     | 3            | 10                 | clamps |                   |               |
| (see also qty. for each shipping destination below) |                                  |            |                     |              |                    |        |                   |               |

# LIGO PROCESS TRAVELER

DCC Number: **E990308-00-X**

| #   | Operation | Start Date  | Work Area   | Instructions     | Name/Initials | Date Comp. |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
|---|-----------|---|---|------------------|---------------|------------|--|--|------------------|-----|-----|-----|---|----|--|--|--------|---|-----|--|--|--------|---|--|--|----|--------|--|--|
| 7   | Ship      |   | Valley Engravers  |                  |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
|   |           | <table border="1"> <thead> <tr> <th rowspan="2">No.</th> <th colspan="3">Ship Qty.</th> <th rowspan="2">Part Description</th> </tr> <tr> <th>LHO</th> <th>LLO</th> <th>CIT</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> <td></td> <td></td> <td>clamps</td> </tr> <tr> <td>2</td> <td>120</td> <td></td> <td></td> <td>clamps</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td>10</td> <td>clamps</td> </tr> </tbody> </table> |   |                  | No.           | Ship Qty.  |  |  | Part Description | LHO | LLO | CIT | 1 | 20 |  |  | clamps | 2 | 120 |  |  | clamps | 3 |  |  | 10 | clamps |  |  |
| No.   | Ship Qty. |   |   | Part Description |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
|   | LHO       | LLO   | CIT   |                  |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
| 1   | 20        |   |   | clamps           |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
| 2   | 120       |   |   | clamps           |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
| 3   |           |   | 10  | clamps           |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
|   |           | LHO:  | Attn: Betsy Weaver, COS<br>LIGO Hanford Observatory (LHO)<br>Specific Purpose: beam dump BSC8 |                  |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
|   |           | LLO:  | Attn: Jonathan Kern<br>LIGO Livingston Observatory (LLO)<br>Specific Purpose: beam dump BSC8  |                  |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |
| END: Go to Traveler associated with next higher assembly processing |           |   |   |                  |               |            |  |  |                  |     |     |     |   |    |  |  |        |   |     |  |  |        |   |  |  |    |        |  |  |

**Special Instructions (Handling/Packaging Constraints, Remarks, etc.) or Notes:**

| DATE   | NAME       | DESCRIPTION  |
|--------|------------|--|
| 8/6/99 | Mike Smith | Attention: Betsy Weaver, hold cleaned baked parts for use by COS.  |
| 8/20   | B. Weaver  | S/N 098, 049, 033, 072, 043, 093, 100, 106, 114, 035<br>101, 120, 089, 045, 031, 065, 024, 122, 044, 111, 084<br>066, 083, 081, 059, 080, 090, 131, 135, 061, 138, 069 Baked in VBO Load 52. |
| 8/30   | B. Weaver  | Rest of clamps baked in VBO Load 54.   |



# LIGO PROCESS TRAVELER

DCC Number: **E990308-00-X**  
Date Prepared:

**Table 1: ACTION ITEMS CON'T.**

| DATE | NAME | DESCRIPTION |
|------|------|-------------|
|      |      |             |
|      |      |             |
|      |      |             |
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|      |      |             |
|      |      |             |
|      |      |             |

*N.B.: A copy of this traveler must be submitted to the DCC each time the original is shipped with the associated part(s) and when the traveler has been completed.*

# LIGO PROCESS TRAVELER

DCC Number: E99180-00-X  
 Date Prepared: 8/24/99

|                   |                           |                    |                |                       |
|-------------------|---------------------------|--------------------|----------------|-----------------------|
| <b>Originator</b> | <b>Cognizant Engineer</b> | <b>Ext./Phone#</b> | <b>Project</b> | <b>Account Number</b> |
| Betsy Weaver      | JDoug Cook                | (509) 372-8107     | SUS            | 5F518                 |

| Dwg/Part Number                 | Rev | Part Description                            | Serial Number | Qty |
|---------------------------------|-----|---|---------------|-----|
|                                 |     | Teflon Blocks                               |               | 2   |
|                                 |     | Lifting Arms                                |               | 3   |
|                                 |     | Lifting Arm Pedistals                       |               | 3   |
|                                 |     | 1/4-20 x 1 1/2" <i>Standard SHTOS</i>       |               | 150 |
|                                 |     | 1/4-20 x 1 1/4" <i>Fully threaded SHTOS</i> |               | 150 |
| Used In (next higher assembly): |     |   |               |     |

|                    |                           |
|--------------------|---------------------------|
| <b>Vendor Name</b> | <b>PO/Contract Number</b> |
|                    | P                         |

**Data Package, Receiving/Inspection Remarks:**

| Inspection Required Y/N | Visual Damage Y/N | Comments | Name/Initials | Date Comp. |
|-------------------------|-------------------|----------|---------------|------------|
|                         |                   |          |               |            |

**Process Flow:**

| # | Operation                                      | Start Date | Work Area | Instructions  | Name/Initials                | Date Comp. |
|---|--|------------|-----------|---|------------------------------|------------|
| 1 | Clean & Vacuum Bake per LIGO Vacuum Prep. Form |            | LHO       | Clean as Class A Hardware as per E960022.<br><i>*CLASS B</i>  | B. Rivera<br><i>B.RIVERA</i> |            |
| 2 | Control Point                                  |            | NA        | NA  |                              |            |
| 3 | Wrap & Tag vacuum clean parts per E960022-A    |            | LHO       | VBO Load# <u>54</u> Scan# <u>083079C (CA)</u><br>VBO Load# _____ Scan# _____<br>VBO Load# _____ Scan# _____ | B. Rivera<br><i>B.R</i>      | 9/14/99    |

*N.B.: A copy of this traveler must be submitted to the DCC each time the original is shipped with the associated part(s) and when the traveler has been completed.*



# LIGO PROCESS TRAVELER

DCC Number: E99180-00-X

| #   | Operation | Start Date | Work Area | Instructions  | Name/Initials | Date Comp. |
|---|-----------|------------|-----------|---|---------------|------------|
| 4   |           |            | LHO       | <b>Note: Copy this traveler and give to the DCC</b> | NA            |            |
| END: Go to Traveler associated with next higher assembly processing |           |            |           |   |               |            |

**Special Instructions (Handling/Packaging Constraints, Remarks, etc.) or Notes:**

| DATE | NAME      | DESCRIPTION   |
|------|-----------|---|
| 8/19 | B. Rivera | Cleansed & Airbaked Teflon Blocks & Lifting Arm Pedistals as per E960022-CLASS B. |
| 8/31 | B. Rivera | Cleansed & Baked Lifting Arms as CLASS A.   |
|      |           |   |
|      |           |   |
|      |           |   |
|      |           |   |
|      |           |   |
|      |           |   |

# LIGO PROCESS TRAVELER

DCC Number: **E990324-00-X**  
 Date Prepared: **8/17/99**

| Originator                             | Cognizant Engineer | Ext./Phone#                                       | Project       | Account Number |
|--|--------------------|---|---------------|----------------|
| Michael Smith                          | Michael Smith      | 2062  | COS           | 5F515          |
| Dwg/Part Number                        | Rev                | Part Description                                  | Serial Number | Qty            |
|  |                    | <b>Beam Dump Assemblies, BSC4</b>                 |               | NA             |
| TOP-1616-NA                            |                    | 3/8-16 X 1.00 SOCKT SET SCRW-OVL PT AG/SS         |               | 40             |
| <b>Used In (next higher assembly):</b> |                    | D990230, BSC Beam dump Installation, top assembly |               |                |

**Data Package, Receiving/Inspection Remarks:**

| Inspection Required Y/N | Visual Damage Y/N | Comments                             | Name/Initials | Date Comp. |
|-------------------------|-------------------|--------------------------------------|---------------|------------|
| y                       |                   | Inspect for breakage during shipment |               |            |

**Process Flow:**

| # | Operation     | Start Date | Work Area | Instructions   | Name/Initials         | Date Comp. |
|---|---------------|------------|-----------|--|-----------------------|------------|
| 1 | Control Point | NA         | NA        |  | NA                    | NA         |
| 2 | Clean         |            | LHO       | per LIGO-E960022, as applicable  | B. Weaver             |            |
| 3 | wrap and bag  |            | LHO       | per LIGO-E960022   | B. Weaver             |            |
| 4 | Vacuum Bake   |            | LHO       | per LIGO-E960022   | K. Ryan               | 8/30/99    |
| 5 | Control Point |            | LHO       | Review/approve RGA:<br>VBO Load# <u>54</u> scan # <u>083099C.RGA</u><br>VBO Load# _____ scan # _____<br>VBO Load# _____ scan # _____<br><br>Note: attach RGA scan(s) to this traveler. | K. Ryan<br><i>KRW</i> | 9/14/99    |

*N.B.: A copy of this traveler must be submitted to the DCC each time the original is shipped with the associated part(s) and when the traveler has been completed.*



# LIGO PROCESS TRAVELER

DCC Number: **E990324-00-X**

| #   | Operation   | Start Date  | Work Area | Instructions  | Name/<br>Initials | Date<br>Comp.   |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
|---|---|-------------|-----------|---|-------------------|-----------------|------|-----|------------------|-------------|-----|-------|-----|--|--|--|-------------|------|---|------|--|--|--|
|   | Box for shipment to LHO   |             |           | Ship in LIGO-provided container<br><table border="1"> <thead> <tr> <th>No.</th> <th>Qty per package</th> <th>Part</th> </tr> </thead> <tbody> <tr> <td>ALL</td> <td></td> <td>TOP-1616-NA</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table><br>(see also qty. for each shipping destination below)  | No.               | Qty per package | Part | ALL |                  | TOP-1616-NA |     |       |     |  |  |  |             |      |   |      |  |  |  |
| No.   | Qty per package   | Part        |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| ALL   |   | TOP-1616-NA |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
|   |   |             |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| 7   | Ship  |             |           | <table border="1"> <thead> <tr> <th rowspan="2">No.</th> <th colspan="3">Ship Qty.</th> <th rowspan="2">Part Description</th> </tr> <tr> <th>LHO</th> <th>LLO</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td>all</td> <td></td> <td></td> <td></td> <td>TOP-1616-NA</td> </tr> </tbody> </table><br><table border="1"> <tr> <td>LHO:</td> <td>Attn: Betsy Weaver, COS<br/>LIGO Hanford Observatory (LHO)<br/>Specific Purpose: beam dump BSC8</td> </tr> <tr> <td>LLO:</td> <td>Attn: Jonathan Kern<br/>LIGO Livingston Observatory (LLO)<br/>Specific Purpose: beam dump BSC8</td> </tr> </table> | No.               | Ship Qty.       |      |     | Part Description | LHO         | LLO | Other | all |  |  |  | TOP-1616-NA | LHO: | Attn: Betsy Weaver, COS<br>LIGO Hanford Observatory (LHO)<br>Specific Purpose: beam dump BSC8 | LLO: | Attn: Jonathan Kern<br>LIGO Livingston Observatory (LLO)<br>Specific Purpose: beam dump BSC8 |  |  |
| No.   | Ship Qty.   |             |           | Part Description  |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
|   | LHO   | LLO         | Other     |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| all   |   |             |           | TOP-1616-NA   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| LHO:  | Attn: Betsy Weaver, COS<br>LIGO Hanford Observatory (LHO)<br>Specific Purpose: beam dump BSC8 |             |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| LLO:  | Attn: Jonathan Kern<br>LIGO Livingston Observatory (LLO)<br>Specific Purpose: beam dump BSC8  |             |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |
| END: Go to Traveler associated with next higher assembly processing |   |             |           |   |                   |                 |      |     |                  |             |     |       |     |  |  |  |             |      |   |      |  |  |  |

**Special Instructions (Handling/Packaging Constraints, Remarks, etc.) or Notes:**

|  |                  |
|--|------------------|
| Attention: Betsy Weaver, Jonathan Kern, hold cleaned and baked parts for COS assembly. | 8/23/99 M. Smith |
|  |                  |
|  |                  |
|  |                  |
|  |                  |
|  |                  |
|  |                  |
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# LIGO PROCESS TRAVELER

DCC Number: E98-00-X

Date Prepared:

| Originator    | Cognizant Engineer | Ext./Phone# | Project | Account Number |
|---------------|--------------------|-------------|---------|----------------|
| Michael Smith | Michael Smith      | 2062        | COS     | 5F515          |

| Dwg/Part Number                        | Rev | Part Description   | Serial Number | Qty | Rec. 8/2 | VBO load | VBO Load |
|--|-----|--------------------|---------------|-----|----------|----------|----------|
|  |     | PO Mirror Assembly |               |     |          |          |          |
| D990443                                | B   | MIRROR TABLE CLAMP | 001-020       | 20  | 20       |          |          |
| <b>Used In (next higher assembly):</b> |     | PO Mirror Assembly |               |     |          |          |          |

| Vendor Name      | PO/Contract Number |
|------------------|--------------------|
| Valley Engravers | P                  |

**Data Package, Receiving/Inspection Remarks:**

| Inspection Required Y/N | Visual Damage Y/N | Comments | Name/Initials | Date Comp. |
|-------------------------|-------------------|----------|---------------|------------|
| Y                       | N                 |          | B. Weaver     | 8/2/99     |

**Process Flow:**

| # | Operation                                      | Start Date | Work Area | Instructions   | Name/Initials | Date Comp. |
|---|--|------------|-----------|--|---------------|------------|
| 1 | Clean & Vacuum Bake per LIGO Vacuum Prep. Form |            | LHO       | per E960022-A  | B. Weaver     | 8/30/99    |
| 2 | Control Point                                  |            | NA        | Review/approve RGA scan # <u>083899110A</u><br>VBO load # <u>154</u> | B. Weaver     | 9/14/99    |
| 3 | Wrap & Tag vacuum clean parts per E960022-A    |            | LHO       | _____ per package  |               |            |
| 4 |  |            | LHO       | <b>Note: Copy this traveler and give to the DCC</b>                  |               |            |

END: Go to Traveler associated with next higher assembly processing

*N.B.: A copy of this traveler must be submitted to the DCC each time the original is shipped with the associated part(s) and when the traveler has been completed.*

**ACTION ITEMS**

**Special Instructions (Handling/Packaging Constraints, Remarks, etc.) or Notes:**

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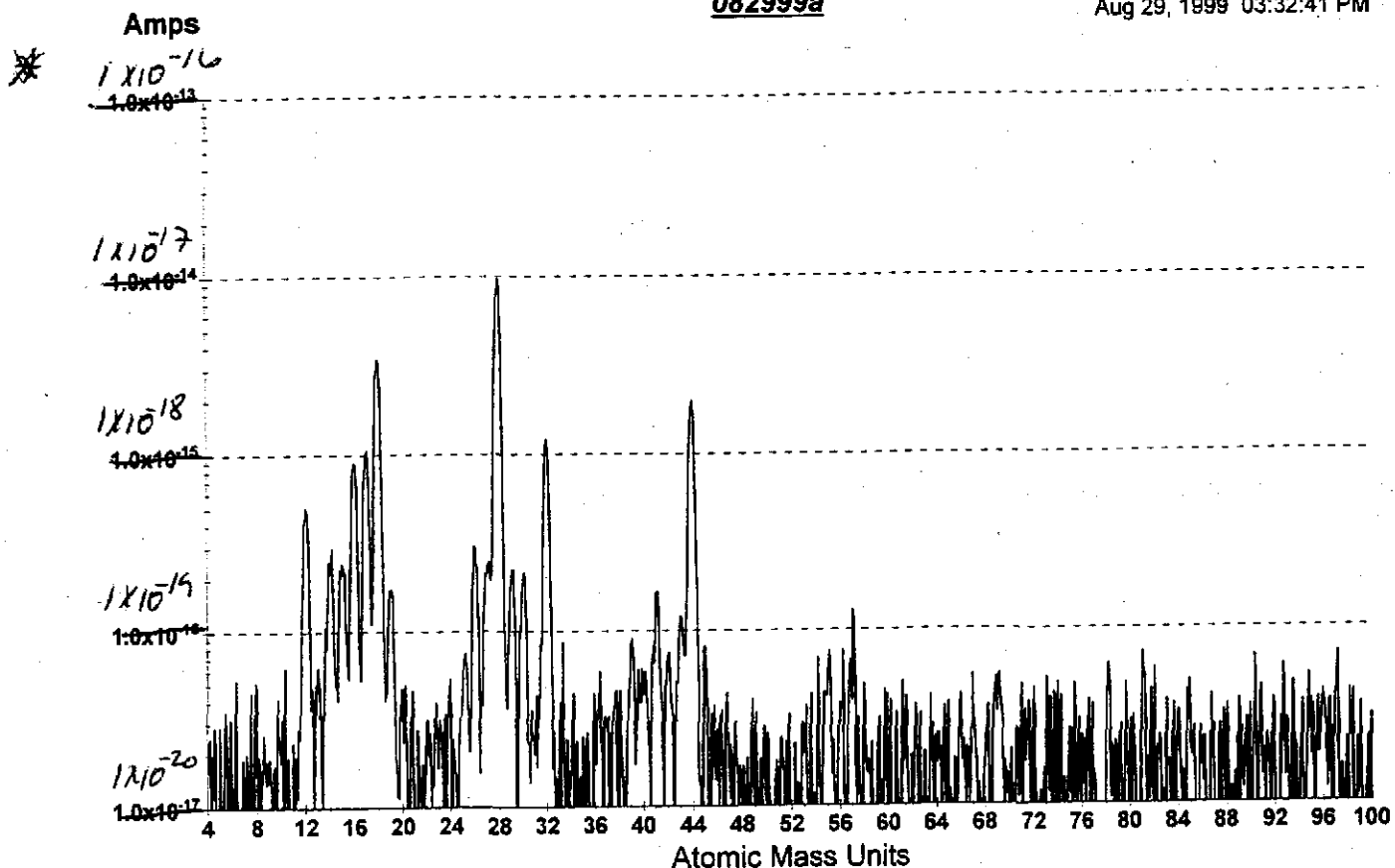
# LHO VACUUM BAKE OVEN A LOAD #54 ELEVATED TEMPERATURE BACKGROUND

## SCAN

V-1 Closed

082999a

Aug 29, 1999 03:32:41 PM



*\* Known Software "Bug" of not updating axis  
when switching between screens*

*KAR*

*10-12-99*

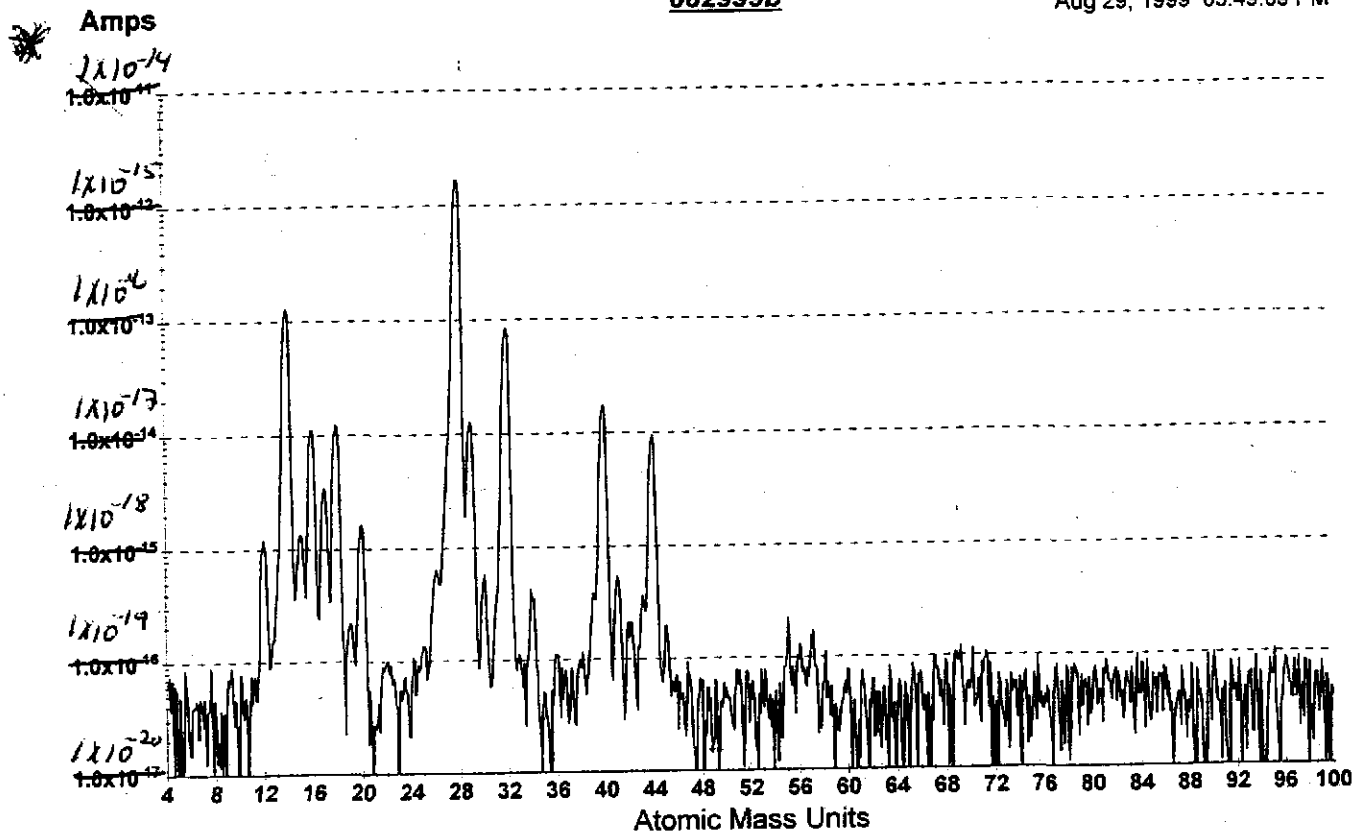


# LHO VACUUM BAKE OVEN A LOAD #54 ELEVATED TEMPERATURE SCAN

V-1 Open, Cal-Gas and V-2 Closed, 50°C

082999b

Aug 29, 1999 03:49:09 PM



\* Known Software "Bug" AXIS intermittently fails to update when alternating between displays.

KAR  
10-12-99

## LHO Bake Oven A Load # 54

**1<sup>st</sup> Order Desorption Outgassing Rate Estimates using  $Q_{low} = SP_{low} = SP_{high} [e^{-(E_s/kT_{high})}] / [e^{-(E_s/kT_{low})}]$**

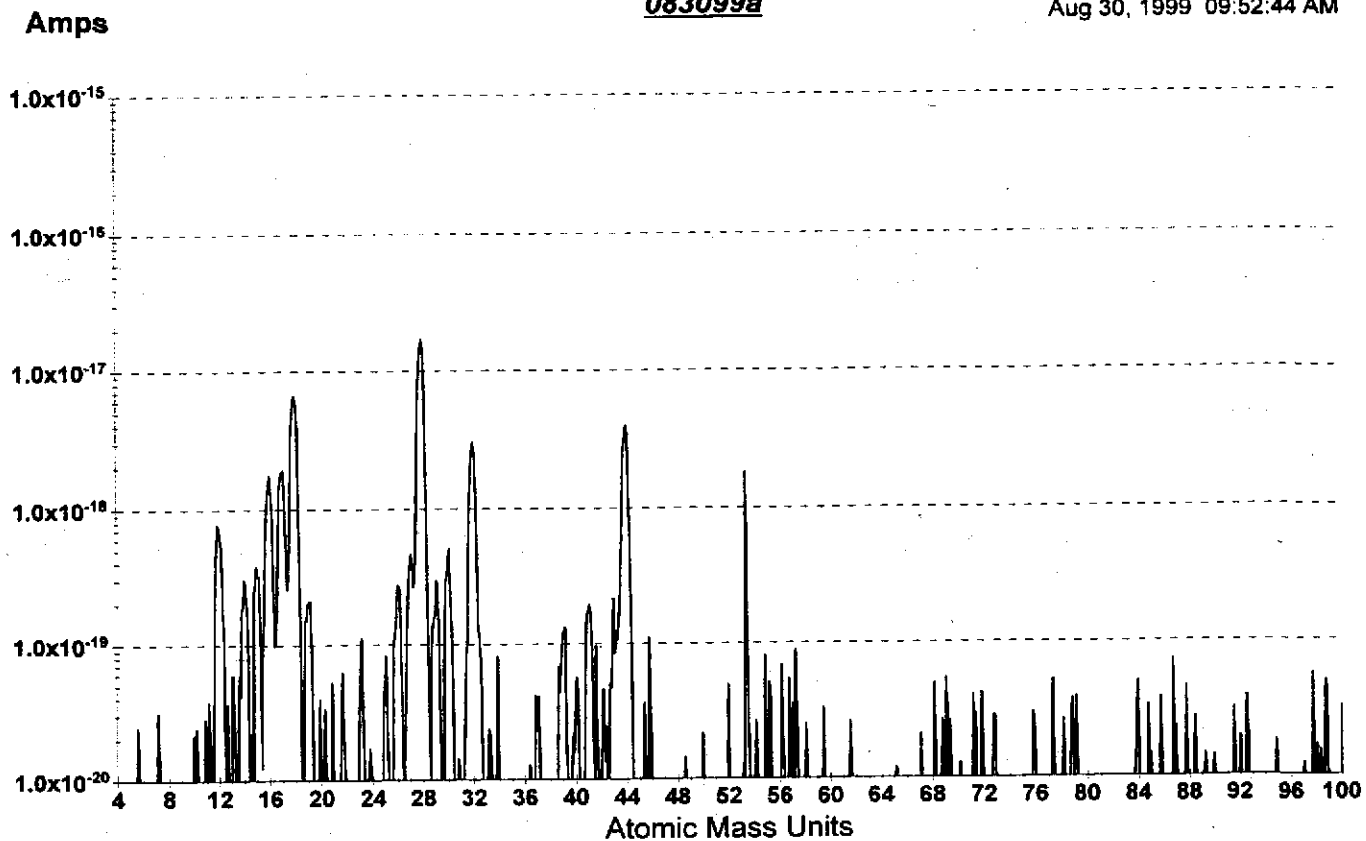
| Number of<br>units in bake<br>load | Pump Speed<br>(L/sec) | AMU | RGA                             | RGA current           | Calibration Factor<br>CF (torr/amps) | High Temp (K) | Low Temp (K) | Es/k  | Extrapolated  |
|------------------------------------|-----------------------|-----|---------------------------------|-----------------------|--------------------------------------|---------------|--------------|-------|---|
|                                    |                       |     | background<br>current<br>(amps) | (amps) @ High<br>Temp |                                      |               |              |       | outgassing rate<br>(torr*L/sec) @<br>T <sub>low</sub> |
| 1                                  | 5                     | 41  | 1.60E-19                        | 5.30E-19              | 2.00E+07                             | 3.23E+02      | 3.00E+02     | 13000 | 1.69E-12  |
| 1                                  | 5                     | 43  | 1.20E-19                        | 3.60E-19              | 2.00E+07                             | 3.23E+02      | 3.00E+02     | 8000  | 3.59E-12  |
| 1                                  | 5                     | 53  | 0.00E+00                        | 6.10E-19              | 2.00E+07                             | 3.23E+02      | 3.00E+02     | 13000 | 2.79E-12  |
| 1                                  | 5                     | 55  | 6.30E-20                        | 2.20E-19              | 2.00E+07                             | 3.23E+02      | 3.00E+02     | 15000 | 4.46E-13  |
| 1                                  | 5                     | 57  | 1.30E-19                        | 1.70E-19              | 2.00E+07                             | 3.23E+02      | 3.00E+02     | 15000 | 1.14E-13  |

# LHO Vacuum Bake Oven A Load #54 RGA Background

V-1 Closed, Room Temp

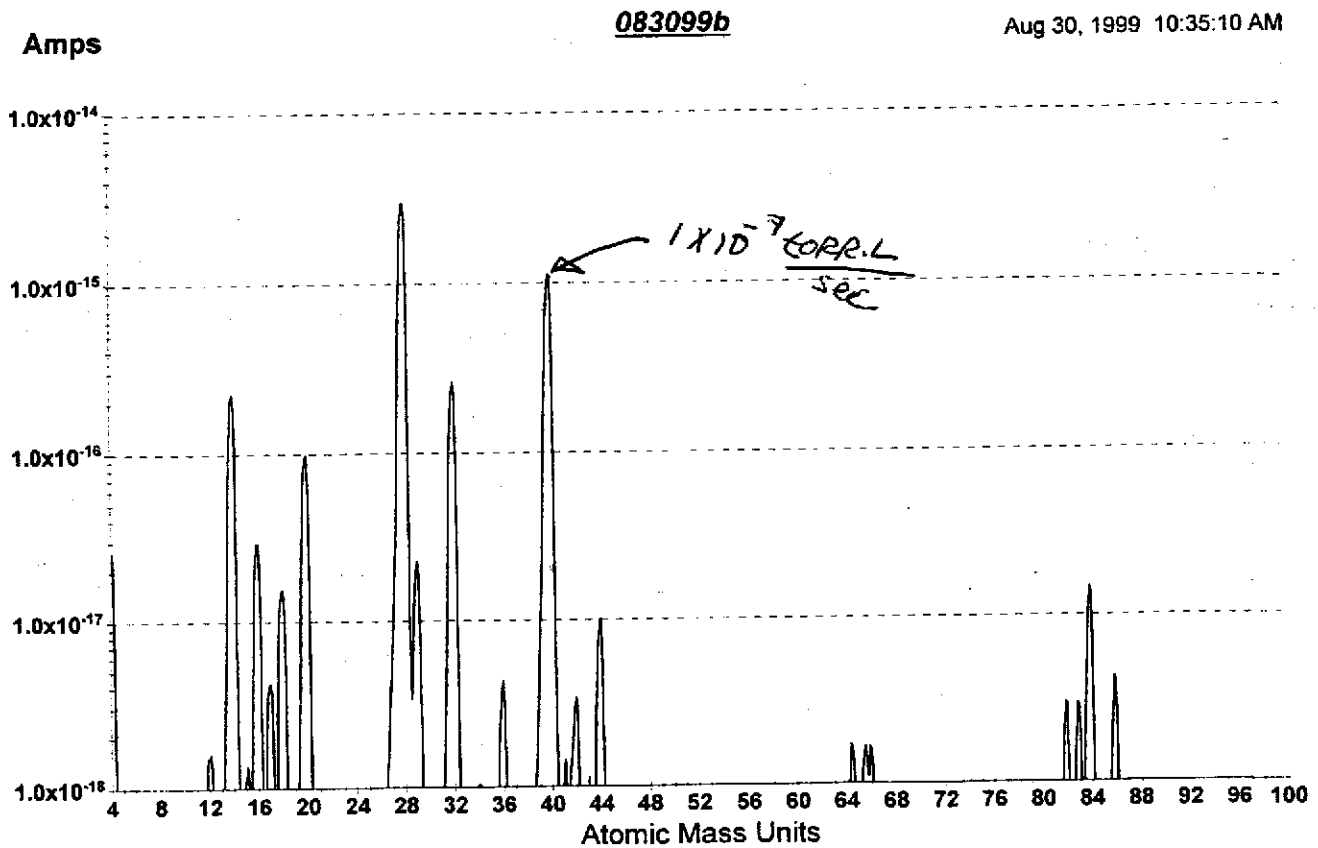
083099a

Aug 30, 1999 09:52:44 AM



# LHO Vacuum Bake Oven A Load #54 Calibration

V-1 and cal-gas open V-2 closed in pressure equilibrium at room temperature



CF defined as  $P_{(calc)} / I_{(meas)}$

$$P_{calc(40)} = (\text{leak rate}) / (\text{pump speed}) = (1.1E-7 \text{ torr}\cdot\text{L}/\text{sec})(0.86) / (5 \text{ L}/\text{sec}) = 1.8E-8 \text{ torr}$$

$$I_{(meas)} = 1E-15 \text{ amps}$$

$$CF = (1.8E-8 \text{ torr}) / (1E-15 \text{ amps}) = 2E7 \text{ torr}/\text{amps}$$



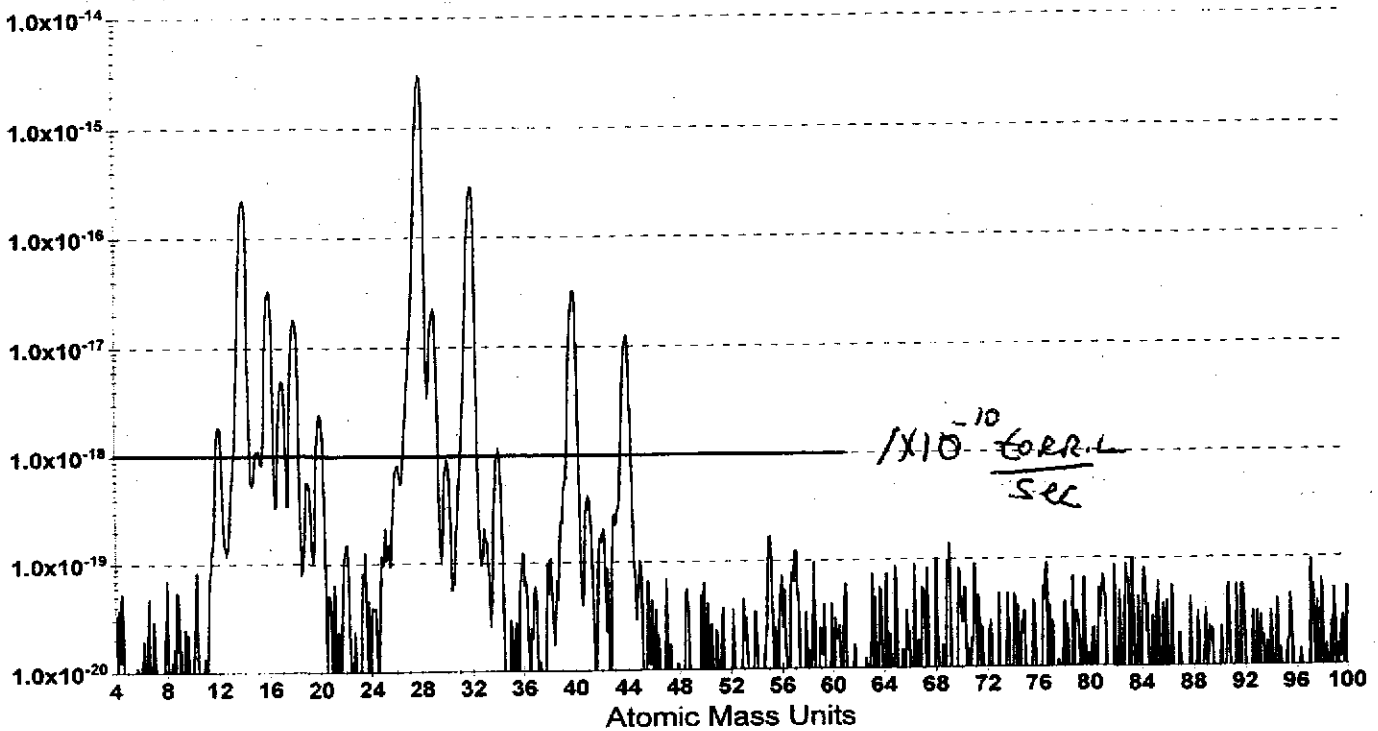
# LHO Vacuum Bake Oven A Load #54 Post-Bake Scan Room Temp

V-1 Open, Cal-Gas and V-2 Closed

083099c

Aug 30, 1999 11:22:12 AM

Amps



**Dennis Coyne, 06:04 PM 8/30/99 -0700, Re: scan approval load 54**

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X-POP3-Rcpt: brivera@apex  
Date: Mon, 30 Aug 1999 18:04:01 -0700  
From: Dennis Coyne <coyne@ligo.caltech.edu>  
Organization: Caltech/LIGO  
X-Mailer: Mozilla 3.01Gold (Win95; I)  
To: "Bartie J. Rivera" <rivera\_b@ligo-wa.caltech.edu>  
CC: whitcomb\_s@ligo.caltech.edu, coyne\_d@ligo.caltech.edu,  
ryan\_k@ligo.caltech.edu  
Subject: Re: scan approval load 54

Bartie,  
This load is acceptable. The next load should be a 200C bake.  
Dennis

Bartie J. Rivera wrote:

>  
> Hi Stan,  
>  
> I am faxing the scans for load 54 consisting of  
> c.o.s. structures and misc. fastners to 225-686-7189  
>  
> Thanks  
> Bartie

--  
Dennis Coyne (Detector Installation Manager)  
LIGO Laboratory, Caltech, Physics Department  
626.395.2034 @CIT / 225.686.3168 @Livingston / 509.372.8166 @Hanford  
cell 626.695.8350

**Stan Whitcomb, 11:52 AM 6/24/99 -0700, waiver for mixed loads**

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X-POP3-Rcpt: brivera@apex  
X-Sender: stan@acrux.ligo.caltech.edu  
X-Mailer: QUALCOMM Windows Eudora Light Version 3.0.5 (32)  
Date: Thu, 24 Jun 1999 11:52:36 -0700  
To: Kyle Ryan <ryan\_k@ligo-wa.caltech.edu>, brivera@ligo.caltech.edu  
From: Stan Whitcomb <stan@ligo.caltech.edu>  
Subject: waiver for mixed loads  
Cc: Dennis Coyne <coyne@ligo.caltech.edu>, ljones@ligo.caltech.edu

Kyle and Bartie,

There are several bake loads coming up over the next month that will be predominantly COS hardware. These loads will consist of a mixture of aluminum, stainless steel, and glass. This email is a waiver to bake these components together, using the bake schedule for aluminum per E960022.

stan