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| Traveler Title | C100R (CEBAF 12 GeV Cryomodule Upgrade) VTA HOM Survey |
| Traveler Abstract | This traveler documents the VTA HOM survey of C100 7-cell cavities |
| Traveler ID | C100R-VTA-HOM |
| Traveler Revision  | R1 |
| Traveler Author | P. Owen |
| Traveler Date | 1-Apr-2022 |
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| Approval Signatures |  |  |  |  |
| Approval Title | Author | Reviewer | Reviewer | Project Manager |

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| References | List and Hyperlink all documents related to this traveler. This includes, but is not limited to: safety (THAs, SOPs, etc), drawings, procedures, and facility related documents. |
|  | [VTA\_HOM\_SURVEY](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-254358/VTA_HOM_SURVEY_PROCEDURE%20Jun2019.docx)[\_PROCEDURE](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-254358/VTA_HOM_SURVEY_PROCEDURE%20Jun2019.docx) | [CavID HOMSurveyDD-MM-YYYY TEMPLATE.xlsx](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-254359/CavID%20HOM%20Survey%20DD-MM-YYYY_TEMPLATE.xlsx) | [HOM\_Processed\_Data.xlsm](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-254357/HOM_Processed_Data.xlsm) |

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| Revision Note |  |
| R1 | Initial release of this Traveler.  |
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| **Step No.** | **Instructions** | **Data Input** |
| 1 | Input C100 CEBAF 7-cell cavity ID. | [[CAVSN]] <<CAVSN>>[[SpecialHandling]] <<COMMENT>> |
| 2 | Record if cavity has Helium vessel. | [[HeliumVessel]] <<YESNO>> |
| 4 | Record Test Date, Dewar No, Top Plate ID. | [[TestDate]] <<TIMESTAMP>>[[Dewar]]{{3,4,5,7,8}} <<SELECT>>[[VTATSSN]]<<TEXT>> |
| 5 | Record cavity vacuum pressure, if so instrumented. If during cooling down a lambda leak of 5x10-6 mbar or greater at 2.07K is identified:* choose option No for Cavity Vacuum OK
* record pertinent information in the Cavity Vacuum Comment
 | [[CavityVacuum]] <<SCINOT>> (mbar)[[CavityVacuumOK]] <<YESNO>>[[CavityVacuumComment]] <<COMMENT>> |
| 6 | Record Dewar helium bath liquid level, temperature and Dewar pressure. Do not continue unless Dewar LHe level is above the end group. Start cavity testing at (29+/-0.1) Torr which correspond to about 2.07K. | [[DewarLHeLevelcm]] <<FLOAT>>(cm)[[DewarTempK]] <<FLOAT>>(K)[[DewarPressureTorr]] <<FLOAT>>(Torr) |
| 7 | Record and process the HOM data as specified in the VTA\_HOM\_SURVEY\_PROCEDURE* Connect a 4-port network analyzer to the cavity
	+ Port 1 – FPC
	+ Port 2 – HOMA
	+ Port 3 – HOMB
	+ Port 4 – FP with amplifier
* Connect the analyzer to the instrument network
* Run the HOM survey LabView program from one of the production RF system computers
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| 8 | At 2.07K measure key HOM frequencies and QL per [HOM Test Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-48112/CP-C100-CAV-VTRF-HOM%20Procedure%5B1%5D.pdf). Pass/fail criterion: Loaded Qs (or QL externals) which are less than the listed values in the Excel template CavID HOM Survey DD-MM-YYYY TEMPLATE.xlsx will be acceptable.  | [[TestOperatorHOMs]] <<VTAOPS>>[[TestOperatorHOMs\_Other]] <<VTAOPS>> |

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| **Step No.** | **Instructions** | **Data Input** |
| 9 | Record the cavity mode frequencies at the right (passbands). Example of cavity mode frequencies: |  |
| 1\_7Pi = 1473.640 MHz | [[Freq\_1\_7Pi]] <<FLOAT>>(MHz) |
| 2\_7Pi = 1476.920 MHz | [[Freq\_2\_7Pi]] <<FLOAT>>(MHz) |
| 3\_7Pi = 1481.776 MHz | [[Freq\_3\_7Pi]] <<FLOAT>>(MHz) |
| 4\_7Pi = 1487.129 MHz | [[Freq\_4\_7Pi]] <<FLOAT>>(MHz) |
| 5\_7Pi = 1492.041 MHz | [[Freq\_5\_7Pi]] <<FLOAT>>(MHz) |
| 6\_7Pi = 1495.468 MHz | [[Freq\_6\_7Pi]] <<FLOAT>>(MHz) |
| 7\_7Pi = 1496.707 MHz | [[Freq\_7\_7Pi]] <<FLOAT>>(MHz) |
| 10 | Upload Excel file with HOMs measurement data at 2.07K using file name as CavID\_ HOM survey dd-mmm-yy.xlsx | [[HOMsfile]] <<FILEUPLOAD>> |
| Notes on HOM measurements- record information about HOM measurements, performances, limitations and other observations.Eg. Unexpected noise in the data or issues with the software | [[HOMsComment]] <<COMMENT>> |
| 11 | Upload Excel file with processed HOM data, CavID\_ HOM processed\_dd-mmm-yy.xlsxThis file is generated using both the Mathematica Polfit script, and Excel macro HOM Processed\_dd-mmm-yy.xlsm. How to process the data is covered in CP-C100-CAV-VTRF-HOM-POLFIT.  | [[HOMprocessedfile]] <<FILEUPLOAD>> |
| 12 | Close the Traveler? | [[Close]] <<YESNO>> |