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| Traveler Title | P1 Cavity RF Incoming Inspection Traveler |
| Traveler Abstract | This traveler collects data from incoming RF inspection measurement. |
| Traveler ID | P1-TUNE-CAV-RFIN |
| Traveler Revision  | R1 |
| Traveler Author | D. Forehand |
| Traveler Date | 3-Sep-20 |
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| D3 Emails | drury,areilly,forehand,overton |
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| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| 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. |
| [FEL3\_cryomodule\_HOM\_Summary\_for\_Admiral\_rebuild .xlsx](file:///C%3A%5CDocuments%20and%20Settings%5Covertonr%5CMy%20Documents%5CFEL3_cryomodule_HOM_Summary_for_Admiral_rebuild%20.xlsx) | [C100 Cavity Probe Calibration Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-41438/C100_Cavity_Probe_Calibration%5B1%5D%5B1%5D%5B1%5D%5B1%5D.pdf) | [C100 HOM Filter Tuning Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-41439/C100_HOM_Filter_Tuning_Procedure%5B1%5D%5B1%5D%5B1%5D%5B1%5D.pdf) |  |  |
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| Revision Note |  |
| R1 | Initial release of this Traveler. |

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| Step No. | Instructions | Data Input |
| 1 | This is the initial RF inspection of the F100 cavities upon arrival from the cryomodule dis-assembly.* The cavity will need to be measured for frequency and field flatness.
* Record all seven mode frequencies.
* Perform a beadpull at the pi-mode frequency using the No Touch Bead Pull method
 | [[CAVSN]] <<CAVSN>>[[TechnicianStep1]] <<SRFCVP>>[[BeadpullResults]] <<FILEUPLOAD>>[[Pi\_modeFreqStep1]] <<FLOAT>>MHz[[ModeFreq\_6Pi\_7]] <<FLOAT>>MHz[[ModeFreq\_5Pi\_7]] <<FLOAT>>MHz[[ModeFreq\_4Pi\_7]] <<FLOAT>>MHz[[ModeFreq\_3Pi\_7]] <<FLOAT>>MHz[[ModeFreq\_2Pi\_7]] <<FLOAT>>MHz[[ModeFreq\_Pi\_7]] <<FLOAT>>MHz[[TimeDate1]] <<TIMESTAMP>> |
|  | * Take bead-pulls of the TE111-5 and 6 and TM111-21 and TM110-8, 10, and 11 high order modes and record frequencies
* Save a copy of this file and upload it to the traveler.
* Refer to FEL3 cryomodule HOM summary for reference of frequency of modes.
 | [[BeadpullResults]]<<FILEUPLOAD>>[[Time\_Date1]] <<TIMESTAMP>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 2 | The cavity is received at this point with electro-polishing all complete. * Measure all seven modes and record their frequencies in MHz using the NO Touch BeadPull method.
* Take a bead-pull using the Pi-mode frequency and record the results.
 | [[TechnicianStep2]] <<SRFCVP>>[[TimeDate2]] <<TIMESTAMP>>[[Bead\_pullResults]] <<FILEUPLOAD>>[[Pi\_modeFreqStep2]] <<FLOAT>>MHz[[ModeFreq\_6Pi\_7\_Step2]] <<FLOAT>>MHz[[ModeFreq\_5Pi\_7\_Step2]] <<FLOAT>>MHz[[ModeFreq\_4Pi\_7\_Step2]] <<FLOAT>>MHz[[ModeFreq\_3Pi\_7\_Step2]] <<FLOAT>>MHz[[ModeFreq\_2Pi\_7\_Step2]] <<FLOAT>>MHz[[ModeFreq\_Pi\_7\_Step2]] <<FLOAT>>MHz |
| Set field probe Qext to 1E12 IAW [C100 Cavity Probe Calibration Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-41438/C100_Cavity_Probe_Calibration%5B1%5D%5B1%5D%5B1%5D%5B1%5D.pdf) and record the results and length of probe tip as measured from the face of the feed-through flange. | [[TechnicianStep2a]] <<SRFCVP>>[[Time\_Date2]] <<TIMESTAMP>>[[FieldProbe]] <<SN>>[[ProbeTipLength]] <<FLOAT>>[[FieldProbeQext]] <<SciNot>> |

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| **Step No.** | **Instructions** | **Data Input** |
| 3 | * Measure the depths of both HOM filters with a used aluminum gasket in place on the HOM feed-through flange and record the results. The gasket should measure 0.085 ± 0.002 in.
* Subtract 0.020 in. from filter depth to determine length of probe tip.
* Set HOM probe tip to determined length to ensure a 0.020 in.gap
 | [[TechnicianStep3]] <<SRF>>[[TimeDate3]] <<TIMESTAMP>>[[HOMA\_Filter\_Depth]] <<FLOAT>>in.[[Subtract 0.020 from filter depth to determine HOMA probe tip length]] <<NOTE>>in.[[HOMB\_Filter\_Depth]] <<FLOAT>>in.[[Subtract 0.020 from filter depth to determine HOMB probe tip length]] <<NOTE>>[[HOMA\_ProbeTip\_Length]] <<FLOAT>>in.[[HOMB\_ProbeTip\_Length]] <<FLOAT>>in. |
| * Tune HOM filters IAW with [C100 HOM Filter Tuning Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-41439/C100_HOM_Filter_Tuning_Procedure%5B1%5D%5B1%5D%5B1%5D%5B1%5D.pdf) and record all data.
* Send cavity to CMM for measurements and FPC flange polishing
 | [[Field\_Probe\_Attenuation]] <<FLOAT>>dB[[HOMA\_TunedAttenuation]] <<FLOAT>>dB[[HOMAQext]] <<SCINOT>>[[HOMB\_TunedAttenuation]] <<FLOAT>>dB[[HOMBQext]] <<Scinot>>[[Comments]] <<COMMENT>> |

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| **Step No.** | **Instructions** | **Data Input** |
| 4 | At this point, the cavity is hanging in the test stand and ready to be inserted into dewar for 2K testing. The following steps will verify that the HOM filters are still de-tuned for the resonance of the cavity. An amplified signal will be necessary to take these measurements. The network analyzer should be set up for - 10dBm power level.* Incident power is always coupled through the testing tophat feedthrough located on the FPC.
* Measure the S21 resonance of the cavity through the FP. Set the marker to search Max to measure this frequency and record.
* Measure and record the attenuation of the signal from the FPC to the FP. This number represents a Qext set at 1E12 for the FP.
* Now change the port 2 cable to HOM filter A. Measure and record the attenuation with the marker set at the resonance of the cavity.
* If there is no visible peak at F0, the A filter is still sufficiently de-tuned.
* If there is a visible peak at the resonant frequency the HOM filter A can still be tuned to reject this signal. Use the tuning tool provided to tune the HOM filter can until the peak disappears into the noise floor of the signal on the analyzer. Record the attenuation at F0 after tuning is complete.
* Record Qext of the filter after tuning is complete. Repeat above 3 steps for HOM filter B.
 | [[Technician\_Step4]] <<SRF>>[[TimeDate4]] <<TIMESTAMP>>[[WarnCavityFO]] <<FLOAT>>MHz[[FieldProbe\_Attenuation]] <<FLOAT>>dB[[HOMA\_Attenuation]] <<FLOAT>>dB[[HOMA\_Tuned\_Attenuation]] <<FLOAT>>dB[[HOMA\_Qext]] <<SCINOT>>[[HOMB\_Attenuation]] <<FLOAT>>dB[[HOMB\_Tuned\_Attenuation]] <<FLOAT>>dB[[HOMB\_Qext]] <<SCINOT>> |