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| Traveler Title | C100R Cryomodule Commissioning | | | |
| Traveler Abstract | Commisioning of a C100R Cryomodule after installation in the linac tunnel. This traveler controls and documsnets the final in situ testing of a C100R Cryomodule. This cryomodule will then be turned over to Accelerator Operations | | | |
| Traveler ID | C100R-CM-COMM | | | |
| Traveler Revision | R1 | | | |
| Traveler Author | M. Drury | | | |
| Traveler Date | 25-Oct-19 | | | |
| NCR Emails | Drury,areilly | | | |
| Approval Names | M. Drury | A. Solopova | A. Reilly |  |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | 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. | | | |
| CP-C100-COM-CM-CAV-EMAX  C100 Maximum Gradient and Operating Gradient Determinations | CP-C100-CM-CRY-VALV-Qo  C100 Valve Operation for Qo vs. Eacc Measurement | CP-C100-CM-COM-8CAV  C100 eEight Cavity Run | CP-C100-COM-CM-CAV-Qo  C100 Qo vs. Eacc Measurement |  |
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| Revision Note |  |
| R1 | Initial release of this Traveler. |

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| Cryomodule Serial Number | [[CMSN]] <<CMSN>> |
| **Table of Contents** | |
| 2 | Cavity Serial Numbers |
| 3 | Low Power RF Initial Cold Frequencies |
| 4 | Low Power RF Cavity Tuning |
| 4 | Low Power RF Final Cold Frequencies and Passbands |
| 6 | Low Power RF: HOM Measurements |
| 7 | Interlock Checkout |
| 13 | High Power RF: Emax Determination: Qext’s and Probe Calibrations |
| 17 | High Power RF: Emax Determination: Emax |
| 19 | High Power RF: Emaxop Determination (One Hour Run) |
| 20 | High Power RF: Field Emission Survey |
| 21 | High Power RF: Qo vs. Eacc Measurements |
| 23 | High Power RF: Static Heat Load |
| 24 | High Power RF: Microphonics |
| 25 | High Power RF: Eight Cavity Run |

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| **Step No** | **Instructions** | **Data Inputs** |
| 1 | Record the date and location of cryomodule installation.  Example : Injector – Inxx  North Linac NLxx  South Linac SLxx | [[InstallationTechnician]] <<SRF>>  [[InstallationTime]] <<TIMESTAMP>>  [[InstallationZone]] <<TEXT>>  [[InstallationComment]] <<COMMENT>> |
| 2 | Record the CavitySN’s for each cavity position. (Note: Cavity 1-Supply side, Cavity 8-Return side) | [[CAVSN1]] <<CAVSN>>  [[CAVSN2]] <<CAVSN>>  [[CAVSN3]] <<CAVSN>>  [[CAVSN4]] <<CAVSN>>  [[CAVSN5]] <<CAVSN>>  [[CAVSN6]] <<CAVSN>>  [[CAVSN7]] <<CAVSN>>  [[CAVSN8]] <<CAVSN>> |

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| **Step No** | **Instructions** | | | | | **Data Inputs** | | |
| **Initial Cold Frequencies** | | | | | | | | |
| 3 | Record the initial cavity frequencies: | | | | | [[InitFreqTech]] <<SRF>>  [[InitFreqCompletion]] <<TIMESTAMP>>  [[InitFreqComments]] <<COMMENT>> | | |
| Cavity | **1/7pi (MHz)** | **2/7pi (MHz)** | **3/7pi (MHz)** | **4/7pi (MHz)** | **5/7pi (MHz)** | | **6/7pi (MHz)** | **Pi (MHz)** |
| 1 | [[C1InitFreq17]] <<FLOAT>> | [[C1InitFreq27]] <<FLOAT>> | [[C1InitFreq37]] <<FLOAT>> | [[C1InitFreq47]] <<FLOAT>> | [[C1InitFreq57]] <<FLOAT>> | | [[C1InitFreq67]] <<FLOAT>> | [[C1InitFreqPi]] <<FLOAT>> |
| 2 | [[C2InitFreq17]] <<FLOAT>> | [[C2InitFreq27]] <<FLOAT>> | [[C2InitFreq37]] <<FLOAT>> | [[C2InitFreq47]] <<FLOAT>> | [[C2InitFreq57]] <<FLOAT>> | | [[C2InitFreq67]] <<FLOAT>> | [[C2InitFreqPi]] <<FLOAT>> |
| 3 | [[C3InitFreq17]] <<FLOAT>> | [[C3InitFreq27]] <<FLOAT>> | [[C3InitFreq37]] <<FLOAT>> | [[C3InitFreq47]] <<FLOAT>> | [[C3InitFreq57]] <<FLOAT>> | | [[C3InitFreq67]] <<FLOAT>> | [[C3InitFreqPi]] <<FLOAT>> |
| 4 | [[C4InitFreq17]] <<FLOAT>> | [[C4InitFreq27]] <<FLOAT>> | [[C4InitFreq37]] <<FLOAT>> | [[C4InitFreq47]] <<FLOAT>> | [[C4InitFreq57]] <<FLOAT>> | | [[C4InitFreq67]] <<FLOAT>> | [[C4InitFreqPi]] <<FLOAT>> |
| 5 | [[C5InitFreq17]] <<FLOAT>> | [[C5InitFreq27]] <<FLOAT>> | [[C5InitFreq37]] <<FLOAT>> | [[C5InitFreq47]] <<FLOAT>> | [[C5InitFreq57]] <<FLOAT>> | | [[C5InitFreq67]] <<FLOAT>> | [[C5InitFreqPi]] <<FLOAT>> |
| 6 | [[C6InitFreq17]] <<FLOAT>> | [[C6InitFreq27]] <<FLOAT>> | [[C6InitFreq37]] <<FLOAT>> | [[C6InitFreq47]] <<FLOAT>> | [[C6InitFreq57]] <<FLOAT>> | | [[C6InitFreq67]] <<FLOAT>> | [[C6InitFreqPi]] <<FLOAT>> |
| 7 | [[C7InitFreq17]] <<FLOAT>> | [[C7InitFreq27]] <<FLOAT>> | [[C7InitFreq37]] <<FLOAT>> | [[C7InitFreq47]] <<FLOAT>> | [[C7InitFreq57]] <<FLOAT>> | | [[C7InitFreq67]] <<FLOAT>> | [[C7InitFreqPi]] <<FLOAT>> |
| 8 | [[C8InitFreq17]] <<FLOAT>> | [[C8InitFreq27]] <<FLOAT>> | [[C8InitFreq37]] <<FLOAT>> | [[C8InitFreq47]] <<FLOAT>> | [[C8InitFreq57]] <<FLOAT>> | | [[C8InitFreq67]] <<FLOAT>> | [[C8InitFreqPi]] <<FLOAT>> |

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| **Step No** | **Instructions** | | | | | **Data Inputs** | | |
| **Cavity Tuning** | | | | | | | | |
| 4 | Tune each cavity to 1497 MHz: ± 1 kHz  Tune in the cavities in the following order:  4, 5, 3, 6, 2, 7, 1, 8.  Repeat a second time in same order.  Record the final frequencies and associated loaded Q’s. | | | | | [[CavTuneTech]] <<SRF>>  [[FinalFreqCompletion]] <<TIMESTAMP>>  [[FinalFreqComments]] <<COMMENT>> | | |
| **Cold Tuned PassBand Frequencies** | | | | | | | | |
| Cavity | **1/7pi (MHz)** | **2/7pi (MHz)** | **3/7pi (MHz)** | **4/7pi (MHz)** | **5/7pi (MHz)** | | **6/7pi (MHz)** | **Pi (MHz)** |
| 1 | [[C1Freq17Pi]] <<FLOAT>> | [[C1Freq27Pi]] <<FLOAT>> | [[C1Freq37Pi]] <<FLOAT>> | [[C1Freq47Pi]] <<FLOAT>> | [[C1Freq57Pi]] <<FLOAT>> | | [[C1Freq67Pi]] <<FLOAT>> | [[C1FreqPi]] <<FLOAT>> |
| 2 | [[C2Freq17Pi]] <<FLOAT>> | [[C2Freq27Pi]] <<FLOAT>> | [[C2Freq37Pi]] <<FLOAT>> | [[C2Freq47Pi]] <<FLOAT>> | [[C2Freq57Pi]] <<FLOAT>> | | [[C2Freq67Pi]] <<FLOAT>> | [[C2FreqPi]] <<FLOAT>> |
| 3 | [[C3Freq17Pi]] <<FLOAT>> | [[C3Freq27Pi]] <<FLOAT>> | [[C3Freq37Pi]] <<FLOAT>> | [[C3Freq47Pi]] <<FLOAT>> | [[C3Freq57Pi]] <<FLOAT>> | | [[C3Freq67Pi]] <<FLOAT>> | [[C3FreqPi]] <<FLOAT>> |
| 4 | [[C4Freq17Pi]] <<FLOAT>> | [[C4Freq27Pi]] <<FLOAT>> | [[C4Freq37Pi]] <<FLOAT>> | [[C4Freq47Pi]] <<FLOAT>> | [[C4Freq57Pi]] <<FLOAT>> | | [[C4Freq67Pi]] <<FLOAT>> | [[C4FreqPi]] <<FLOAT>> |
| 5 | [[C5Freq17Pi]] <<FLOAT>> | [[C5Freq27Pi]] <<FLOAT>> | [[C5Freq37Pi]] <<FLOAT>> | [[C5Freq47Pi]] <<FLOAT>> | [[C5Freq57Pi]] <<FLOAT>> | | [[C5Freq67Pi]] <<FLOAT>> | [[C5FreqPi]] <<FLOAT>> |
| 6 | [[C6Freq17Pi]] <<FLOAT>> | [[C6Freq27Pi]] <<FLOAT>> | [[C6Freq37Pi]] <<FLOAT>> | [[C6Freq47Pi]] <<FLOAT>> | [[C6Freq57Pi]] <<FLOAT>> | | [[C6Freq67Pi]] <<FLOAT>> | [[C6FreqPi]] <<FLOAT>> |
| 7 | [[C7Freq17Pi]] <<FLOAT>> | [[C7Freq27Pi]] <<FLOAT>> | [[C7Freq37Pi]] <<FLOAT>> | [[C7Freq47Pi]] <<FLOAT>> | [[C7Freq57Pi]] <<FLOAT>> | | [[C7Freq67Pi]] <<FLOAT>> | [[C7FreqPi]] <<FLOAT>> |
| 8 | [[C8Freq17Pi]] <<FLOAT>> | [[C8Freq27Pi]] <<FLOAT>> | [[C8Freq37Pi]] <<FLOAT>> | [[C8Freq47Pi]] <<FLOAT>> | [[C8Freq57Pi]] <<FLOAT>> | | [[C8Freq67Pi]] <<FLOAT>> | [[C8FreqPi]] <<FLOAT>> |

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| **Cold Tuned Loaded Q’s** | | | | | | | |
| Cavity | **1/7pi** | **2/7pi** | **3/7pi** | **4/7pi** | **5/7pi** | **6/7pi** | **Pi** |
| 1 | [[C1QLInst17]] <<SCINOT>> | [[C1QLInst27]] <<SCINOT>> | [[C1QLInst37]] <<SCINOT>> | [[C1QLInst47]] <<SCINOT>> | [[C1QLInst57]] <<SCINOT>> | [[C1QLInst67]] <<SCINOT>> | [[C1QLInstPi]] <<SCINOT>> |
| 2 | [[C2QLInst17]] <<SCINOT>> | [[C2QLInst27]] <<SCINOT>> | [[C2QLInst37]] <<SCINOT>> | [[C2QLInst47]] <<SCINOT>> | [[C2QLInst57]] <<SCINOT>> | [[C2QLInst67]] <<SCINOT>> | [[C2QLInstPi]] <<SCINOT>> |
| 3 | [[C3QLInst17]] <<SCINOT>> | [[C3QLInst27]] <<SCINOT>> | [[C3QLInst37]] <<SCINOT>> | [[C3QLInst47]] <<SCINOT>> | [[C3QLInst57]] <<SCINOT>> | [[C3QLInst67]] <<SCINOT>> | [[C3QLInstPi]] <<SCINOT>> |
| 4 | [[C4QLInst17]] <<SCINOT>> | [[C4QLInst27]] <<SCINOT>> | [[C4QLInst37]] <<SCINOT>> | [[C4QLInst47]] <<SCINOT>> | [[C4QLInst57]] <<SCINOT>> | [[C4QLInst67]] <<SCINOT>> | [[C4QLInstPi]] <<SCINOT>> |
| 5 | [[C5QLInst17]] <<SCINOT>> | [[C5QLInst27]] <<SCINOT>> | [[C5QLInst37]] <<SCINOT>> | [[C5QLInst47]] <<SCINOT>> | [[C5QLInst57]] <<SCINOT>> | [[C5QLInst67]] <<SCINOT>> | [[C5QLInstPi]] <<SCINOT>> |
| 6 | [[C6QLInst17]] <<SCINOT>> | [[C6QLInst27]] <<SCINOT>> | [[C6QLInst37]] <<SCINOT>> | [[C6QLInst47]] <<SCINOT>> | [[C6QLInst57]] <<SCINOT>> | [[C6QLInst67]] <<SCINOT>> | [[C6QLInstPi]] <<SCINOT>> |
| 7 | [[C7QInst17]] <<SCINOT>> | [[C7QLInst27]] <<SCINOT>> | [[C7QLInst37]] <<SCINOT>> | [[C7QLInst47]] <<SCINOT>> | [[C7QLInst57]] <<SCINOT>> | [[C7QLInst67]] <<SCINOT>> | [[C7QLInstPi]] <<SCINOT>> |
| 8 | [[C8QLInst17]] <<SCINOT>> | [[C8QLInst27]] <<SCINOT>> | [[C8QLInst37]] <<SCINOT>> | [[C8QLInst47]] <<SCINOT>> | [[C8QLInst57]] <<SCINOT>> | [[C8QLInst67]] <<SCINOT>> | [[C8QLInstPi]] <<SCINOT>> |

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| **Step No** | **Instructions** | | | **Data Inputs** | | |
| 5 | Complete the **HOM Survey** for Cavities 1 – 8 as described in C100-CMTF-CM-CAV-LPRF-HOM. Upload the completed spreadsheet. Note whether each cavity meets specification. If a cavity does not pass the HOM Survey, an NCR must be generated. | | | | | |
| **Cavity** | **Operator** | **Time Complete** | **File Upload** | | **Pass / Fail?** | **Comments** |
| **1** | [[C1InstHOMTech]] <<SRF>> | [[C1InstHOMComplete]] <<TIMESTAMP>> | [[C1InstHOMFile]] <<FILEUPLOAD>> | | [[C1InstHOMPass]] <<YESNO>> | [[C1InstHOMComments]] <<COMMENT>> |
| **2** | [[C2InstHOMTech]] <<SRF>> | [[C2InstHOMComplete]] <<TIMESTAMP>> | [[C2InstHOMFile]] <<FILEUPLOAD>> | | [[C2InstHOMPass]] <<YESNO>> | [[C2InstHOMComments]] <<COMMENT>> |
| **3** | [[C3InstHOMTech]] <<SRF>> | [[C3InstHOMComplete]] <<TIMESTAMP>> | [[C3InstHOMFile]] <<FILEUPLOAD>> | | [[C3InstHOMPass]] <<YESNO>> | [[C3InstHOMComments]] <<COMMENT>> |
| **4** | [[C4InstHOMTech]] <<SRF>> | [[C4InstHOMComplete]] <<TIMESTAMP>> | [[C4InstHOMFile]] <<FILEUPLOAD>> | | [[C4InstHOMPass]] <<YESNO>> | [[C4InstHOMComments]] <<COMMENT>> |
| **5** | [[C5InstHOMTech]] <<SRF>> | [[C5InstHOMComplete]] <<TIMESTAMP>> | [[C5InstHOMFile]] <<FILEUPLOAD>> | | [[C5InstHOMPass]] <<YESNO>> | [[C5InstHOMComments]] <<COMMENT>> |
| **6** | [[C6InstHOMTech]] <<SRF>> | [[C6InstHOMComplete]] <<TIMESTAMP>> | [[C6InstHOMFile]] <<FILEUPLOAD>> | | [[C6InstHOMPass]] <<YESNO>> | [[C6InstHOMComments]] <<COMMENT>> |
| **7** | [[C7InstHOMTech]] <<SRF>> | [[C7InstHOMComplete]] <<TIMESTAMP>> | [[C7InstHOMFile]] <<FILEUPLOAD>> | | [[C7InstHOMPass]] <<YESNO>> | [[C7InstHOMComments]] <<COMMENT>> |
| **8** | [[C8InstHOMTech]] <<SRF>> | [[C8InstHOMComplete]] <<TIMESTAMP>> | [[C8InstHOMFile]] <<FILEUPLOAD>> | | [[C8InstHOMPass]] <<YESNO>> | [[C8InstHOMComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| **High Power Checklist** | | |
| 6 | Attach the spreadsheet containing **Cable and Coupler Attenuations** for the forward and reflected power paths.  \*\* NOTE: When naming the Excel files, **use letters and numbers only, no symbols, no spaces**. In place of a space, you may use a dash or underscore. \*\* | [[CableCalTechnician]] <<SRF>>  [[CableCalDate]] <<TIMESTAMP>>  [[CableCalComment]] <<COMMENT>>  [[CableCalibrationFile]] <<FILEUPLOAD>> |

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| **Step No** | **Instructions** | | **Data Inputs** |
| 7 | **IR Detectors (Warm Window Temperatures):** Record the baseline IR voltage (cavities at 2K with no RF) below, set the trip levels at 4 Volts. Test the interlock by applying heat to the detector for each cavity. If the heat is insufficient to raise the voltage to the trip level, lower the trip level to below the sensor voltage. Verify that each detector generates a fault and disables RF. Record the results in the table below.  **\*\*Do Not Attempt to Supply High Power RF to Cavity if ithe associated IR Detectors and Interlock are not Functioning Correctly!\*\*** | | [[InstIRIntlkInspector]] <<SRF>>  [[InstIRIntlkCheckComplete]] <<TIMESTAMP>>  [[InstIRIntlkComments]] <<COMMENT>> |
| **Vacuum Side IR Detectors** | | | |
| **Cavity** | **Baseline Voltage (V)** | **Interlock Test (check if passed)** | |
| **1** | [[C1InstVacIRBaseVolts]] <<FLOAT>> | [[C1InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **2** | [[C2InstVacIRBaseVolts]] <<FLOAT>> | [[C2InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **3** | [[C3InstVacIRBaseVolts]] <<FLOAT>> | [[C3InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **4** | [[C4InstVacIRBaseVolts]] <<FLOAT>> | [[C4InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **5** | [[C5InstVacIRBaseVolts]] <<FLOAT>> | [[C5InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **6** | [[C6InstVacIRBaseVolts]] <<FLOAT>> | [[C6InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **7** | [[C7InstVacIRBaseVolts]] <<FLOAT>> | [[C7InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **8** | [[C8InstVacIRBaseVolts]] <<FLOAT>> | [[C8InstVacIRIntlkPass]] <<CHECKBOX>> | |
| **Air Side IR Detectors** | | | |
| **Cavity** | **Baseline Voltage (V)** | **Interlock Test (check if passed)** | |
| **1** | [[C1InstAirIRBaseVolts]] <<FLOAT>> | [[C1InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **2** | [[C2InstAirIRBaseVolts]] <<FLOAT>> | [[C2InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **3** | [[C3InstAirIRBaseVolts]] <<FLOAT>> | [[C3InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **4** | [[C4InstAirIRBaseVolts]] <<FLOAT>> | [[C4InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **5** | [[C5InstAirIRBaseVolts]] <<FLOAT>> | [[C5InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **6** | [[C6InstAirIRBaseVolts]] <<FLOAT>> | [[C6InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **7** | [[C7InstAirIRBaseVolts]] <<FLOAT>> | [[C7InstAirIRIntlkPass]] <<CHECKBOX>> | |
| **8** | [[C8InstAirIRBaseVolts]] <<FLOAT>> | [[C8InstAirIRIntlkPass]] <<CHECKBOX>> | |

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| **Step No** | **Instructions** | **Data Inputs** |
| 8 | **Test Arc Detectors** for Cavities 1-8. Verify that each detector generates a fault and disables RF. Check off each working arc detector interlock. Note any problems in the comment block.  **\*\*Do Not Attempt to Supply High Power RF to Cavity if the associated Arc Detector and Interlock are not Functioning Correctly!\*\*** | [[InstArcIntlkInspector]] <<SRF>>  [[InstArcIntlkCheckComplete]] <<TIMESTAMP>>  [[InstArcIntlkComments]] <<COMMENT>>  [[C1InstArcIntlkPassed]] <<CHECKBOX>>  [[C2InstArcIntlkPassed]] <<CHECKBOX>>  [[C3InstArcIntlkPassed]] <<CHECKBOX>>  [[C4InstArcIntlkPassed]] <<CHECKBOX>>  [[C5InstArcIntlkPassed]] <<CHECKBOX>>  [[C6InstArcIntlkPassed]] <<CHECKBOX>>  [[C7InstArcIntlkPassed]] <<CHECKBOX>>  [[C8InstArcIntlkPassed]] <<CHECKBOX>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 9 | Record the **Beamline Vacuum** prior to the start of high power operations. | [[InstInitBLVacuumInspector]] <<SRF>>  [[InstInitBLVacuumCheckComplete]] <<TIMESTAMP>>  [[InstInitBLVacuumCheckComments]] <<COMMENT>>  [[InstInitBLVacuum]] <<SCINOT>> |
| 10 | Record the **Waveguide Guard Vacuums** prior to the start of high power operations. | [[InstInitWGVacuumInspector]] <<SRF>>  [[InstInitWGVacuumCheckComplete]] <<TIMESTAMP>>  [[InstInitWGVacuumCheckComments]] <<COMMENT>>  [[C1InstInitBLVacuum]] <<SCINOT>>  [[C2InstInitBLVacuum]] <<SCINOT>>  [[C3InstInitBLVacuum]] <<SCINOT>>  [[C4InstInitBLVacuum]] <<SCINOT>>  [[C5InstInitBLVacuum]] <<SCINOT>>  [[C6InstInitBLVacuum]] <<SCINOT>>  [[C7InstInitBLVacuum]] <<SCINOT>>  [[C8InstInitBLVacuum]] <<SCINOT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 11 | Test **Beamline Vacuum** interlock by turning off the associated Ion Pump Power Supply. Verify that a fault is generated and RF is disabled **for all eight cavities**. Check the box if the interlock works correctly. Note any problems in the comment block.  **\*\* Cavities must be in RF On state for interlock checks. Disconnect RF drive cables until all interlock checks have been successfully completed. \*\***  **\*\* Do Not Attempt to Supply High Power RF to any Cavity if Beamline Vacuum Interlock is Not Working Properly. \*\*** | [[InstBLVacIntlkInspector]] <<SRF>>  [[InstBLVacIntlkCheckComplete]] <<TIMESTAMP>>  [[InstBLVacComment]] <<COMMENT>>  [[InstBLVacIntlkPassed]] <<CHECKBOX>> |
| 12 | Test **Waveguide Vacuum** interlocks by turning off the associated Ion Pump Power Supply. Verify that a fault is generated and RF is disabled for the **correct cavity**. Check off each working interlock. Note any problems in the comment block.  **\*\* Cavities must be in RF On state for interlock checks. Disconnect RF drive cables until all interlock checks have been successfully completed. \*\***  **\*\* Do Not Attempt to Supply High Power RF to Cavity if its Waveguide Vacuum Interlock is Not Working Properly. \*\*** | [[InstWGVacIntlkInspector]] <<SRF>>  [[InstWGVacIntlkCheckComplete]] <<TIMESTAMP>>  [[InstWGVacIntlkComments]] <<COMMENT>>  [[InstWG1VacIntlkPassed]] <<CHECKBOX>>  [[InstWG2VacIntlkPassed]] <<CHECKBOX>>  [[InstWG3VacIntlkPassed]] <<CHECKBOX>>  [[InstWG4VacIntlkPassed]] <<CHECKBOX>>  [[InstWG5VacIntlkPassed]] <<CHECKBOX>>  [[InstWG6VacIntlkPassed]] <<CHECKBOX>>  [[InstWG7VacIntlkPassed]] <<CHECKBOX>>  [[InstWG8VacIntlkPassed]] <<CHECKBOX>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 13 | Verify that **Geiger-Mueller tubes** are connected and correctly positioned around cryomodule:  **This step requires tunnel access and should be done prior to lockup.**  Standard setup (for 10 channel system )is as follows :   * Channel 1 at FPC for Cavity 1 * Channel 2 at FPC for Cavity 2 * Channel 3 at FPC for Cavity 3 * Channel 4 at FPC for Cavity 4 and 5 * Channel 5 at center, top of the cryomodule. * Channel 6 at FPC for Cavity 6 * Channel 7 at FPC for Cavity 7 * Channel 8 at FPC for Cavity 8 * Channel 9 on supply side beamline * Channel 10 on return side beamline. | [[InstGMTubeInspector]] <<SRF>>  [[InstGMTubeInspectComplete]] <<TIMESTAMP>>  [[InstGMTubeComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 14 | **Maximum Gradient Determination: Qext’s**  After initial tuning of RF to Cavity, measure the **Qext’s** of the **Fundamental Power Coupler, and Field Probe.** See the procedure CP-C100-COM-CM-CAV-EMAX for instructions.  Record those values in the appropriate fields in the table below. | [[C1InstQextMeasTech]] <<SRF>>  [[C1InstQextMeasComplete]] <<TIMESTAMP>>  [[C2InstQextMeasTech]] <<SRF>>  [[C2InstQextMeasComplete]] <<TIMESTAMP>>  [[C3InstQextMeasTech]] <<SRF>>  [[C3InstQextMeasComplete]] <<TIMESTAMP>>  [[C4InstQextMeasTech]] <<SRF>>  [[C4InstQextMeasComplete]] <<TIMESTAMP>>  [[C5InstQextMeasTech]] <<SRF>>  [[C5InstQextMeasComplete]] <<TIMESTAMP>>  [[C6InstQextMeasTech]] <<SRF>>  [[C6InstQextMeasComplete]] <<TIMESTAMP>>  [[C7InstQextMeasTech]] <<SRF>>  [[C7InstQextMeasComplete]] <<TIMESTAMP>>  [[C8InstQextMeasTech]] <<SRF>>  [[C8InstQextMeasComplete]] <<TIMESTAMP>> |

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| **Step No** | **Instructions** | | | **Data Inputs** | |
| 15 | **Qext Measurements:** Record Qext’s for each coupler on each cavity in the table below. Attach waveform log files when appropriate. | | | | |
| **Cavity** | **QextFPC** | **QextFieldProbe** | **Waveform Files** | | **Comments** |
| **1** | [[C1InstQextFPC]] <<SCINOT>> | [[C1InstQextFP]] <<SCINOT>> | [[C1InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C1InstQextComments]] <<COMMENT>> |
| **2** | [[C2InstQextFPC]] <<SCINOT>> | [[C2InstQextFP]] <<SCINOT>> | [[C2InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C2InstQextComments]] <<COMMENT>> |
| **3** | [[C3InstQextFPC]] <<SCINOT>> | [[C3InstQextFP]] <<SCINOT>> | [[C3InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C3InstQextComments]] <<COMMENT>> |
| **4** | [[C4InstQextFPC]] <<SCINOT>> | [[C4InstQextFP]] <<SCINOT>> | [[C4InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C4InstQextComments]] <<COMMENT>> |
| **5** | [[C5InstQextFPC]] <<SCINOT>> | [[C5InstQextFP]] <<SCINOT>> | [[C5InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C5InstQextComments]] <<COMMENT>> |
| **6** | [[C6InstQextFPC]] <<SCINOT>> | [[C6InstQextFP]] <<SCINOT>> | [[C6InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C6InstQextComments]] <<COMMENT>> |
| **7** | [[C7InstQextFPC]] <<SCINOT>> | [[C7InstQextFP]] <<SCINOT>> | [[C7InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C7InstQextComments]] <<COMMENT>> |
| **8** | [[C8InstQextFPC]] <<SCINOT>> | [[C8InstQextFP]] <<SCINOT>> | [[C8InstPulsedWaveforms]] <<FILEUPLOAD>> | | [[C8InstQextComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 16 | **Maximum Gradient Determination: Gradient Calibration**  After measuring the Qext’s, calculate the **Gradient Calibration (RxxxGGPRB)** for each cavity. See the procedure CP-C100-COM-CM-CAV-EMAX for instructions.  Record those values in the appropriate fields in the table below | [[C1GmesCalMeasTech]] <<SRF>>  [[C1GmesCalMeasComplete]] <<TIMESTAMP>>  [[C2GmesCalMeasTech]] <<SRF>>  [[C2GmesCalMeasComplete]] <<TIMESTAMP>>  [[C3GmesCalMeasTech]] <<SRF>>  [[C3GmesCaltMeasComplete]] <<TIMESTAMP>>  [[C4GmesCalMeasTech]] <<SRF>>  [[C4GmesCalMeasComplete]] <<TIMESTAMP>>  [[C5GmesCalMeasTech]] <<SRF>>  [[C5GmesCalMeasComplete]] <<TIMESTAMP>>  [[C6GmesCalMeasTech]] <<SRF>>  [[C6GmesCalMeasComplete]] <<TIMESTAMP>>  [[C7GmesCalMeasTech]] <<SRF>>  [[C7GmesCalMeasComplete]] <<TIMESTAMP>>  [[C8GmesCalMeasTech]] <<SRF>>  [[C8GmesCalMeasComplete]] <<TIMESTAMP>> |

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| **Step No** | **Instructions** | | **Data Inputs** | |
| 17 | **Gradient Calibration:** Record Gradient Calibrations for each cavity in the table below. Record the gradient at which calibration was determined. | | | |
| **Cavity** | **Gradient Calibration** | **Calibration Gradient (MV/m)** | | **Comments** |
| **1** | [[C1GmesCal]] <<SCINOT>> | [[C1GmesForCal]] <<FLOAT>> | | [[C1GmesCalComments]] <<COMMENT>> |
| **2** | [[C2GmesCal]] <<SCINOT>> | [[C2GmesForCal]] <<FLOAT>> | | [[C2GmesCalComments]] <<COMMENT>> |
| **3** | [[C3GmesCal]] <<SCINOT>> | [[C3GmesForCal]] <<FLOAT>> | | [[C3GmesCalComments]] <<COMMENT>> |
| **4** | [[C4GmesCal]] <<SCINOT>> | [[C4GmesForCal]] <<FLOAT>> | | [[C4GmesCalComments]] <<COMMENT>> |
| **5** | [[C5GmesCal]] <<SCINOT>> | [[C5GmesForCal]] <<FLOAT>> | | [[C5GmesCalComments]] <<COMMENT>> |
| **6** | [[C6GmesCal]] <<SCINOT>> | [[C6GmesForCal]] <<FLOAT>> | | [[C6GmesCalComments]] <<COMMENT>> |
| **7** | [[C7GmesCal]] <<SCINOT>> | [[C7GmesForCal]] <<FLOAT>> | | [[C7GmesCalComments]] <<COMMENT>> |
| **8** | [[C8GmesCal]] <<SCINOT>> | [[C8GmesForCal]] <<FLOAT>> | | [[C8GmesCalComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | **Data Inputs** |
| 18 | **Maximum Gradient Determination: Emax**  Record Emax and the limiting condition in the table below. See the procedure, CP-C100-COM-CM-CAV-EMAX for instructions. | [[C1EmaxComTech]] <<SRF>>  [[C1EmaxComComplete]] <<TIMESTAMP>>  [[C2EmaxComTech]] <<SRF>>  [[C2EmaxComComplete]] <<TIMESTAMP>>  [[C3EmaxComTech]] <<SRF>>  [[C3EmaxComComplete]] <<TIMESTAMP>>  [[C4EmaxComTech]] <<SRF>>  [[C4EmaxComComplete]] <<TIMESTAMP>>  [[C5GmesComTech]] <<SRF>>  [[C5GmesComComplete]] <<TIMESTAMP>>  [[C6EmaxComTech]] <<SRF>>  [[C6EmaxComComplete]] <<TIMESTAMP>>  [[C7EmaxComTech]] <<SRF>>  [[C7EmaxComComplete]] <<TIMESTAMP>>  [[C8EmaxComTech]] <<SRF>>  [[C8EmaxComComplete]] <<TIMESTAMP>> |

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| **Step No** | | **Instructions** | | | | **Data Inputs** | |
| 19 | | **Maximum Gradient Determination:** After determining Emax, record the value in the table below and select a limiting condition. See the procedure, CP-C100-COM-CM-CAV-EMAX. Use the File Upload to document any interesting conditions or behaviors encountered during this procedure. | | | | | |
| **Cav** | **CnEmaxLimit** | | **Emax (MV/m)** | **Limit** | **File Upload** | | **Comments** |
| **1** | [[C1EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C1InstEmax]] <<FLOAT>> | [[C1InstEmaxLimit]] <<TEXT>> | [[C1InstEmaxFile]] <<FILEUPLOAD>> | | [[C1InstEmaxComments]] <<COMMENT>> |
| **2** | [[C2EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C2InstEmax]] <<FLOAT>> | [[C2InstEmaxLimit]] <<TEXT>> | [[C2InstEmaxFile]] <<FILEUPLOAD>> | | [[C2InstEmaxComments]] <<COMMENT>> |
| **3** | [[C3EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C3InstEmax]] <<FLOAT>> | [[C3InstEmaxLimit]] <<TEXT>> | [[C3InstEmaxFile]] <<FILEUPLOAD>> | | [[C3InstEmaxComments]] <<COMMENT>> |
| **4** | [[C4EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C4InstEmax]] <<FLOAT>> | [[C4InstEmaxLimit]] <<TEXT>> | [[C4InstEmaxFile]] <<FILEUPLOAD>> | | [[C4InstEmaxComments]] <<COMMENT>> |
| **5** | [[C5EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C5InstEmax]] <<FLOAT>> | [[C5InstEmaxLimit]] <<TEXT>> | [[C5InstEmaxFile]] <<FILEUPLOAD>> | | [[C5InstEmaxComments]] <<COMMENT>> |
| **6** | [[C6EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C6InstEmax]] <<FLOAT>> | [[C6InstEmaxLimit]] <<TEXT>> | [[C6InstEmaxFile]] <<FILEUPLOAD>> | | [[C6InstEmaxComments]] <<COMMENT>> |
| **7** | [[C7EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C7InstEmax]] <<FLOAT>> | [[C7InstEmaxLimit]] <<TEXT>> | [[C7InstEmaxFile]] <<FILEUPLOAD>> | | [[C7InstEmaxComments]] <<COMMENT>> |
| **8** | [[C8EmaxLimit]] {{-0-,Arc Fault,IR Fault, Cavity Quench,End Group Quench,BLVac Fault,WGVac Fault,Power Limited,Heat Load Limited,Admin Limit,Other}} <<SELECT>> | | [[C8InstEmax]] <<FLOAT>> | [[C8InstEmaxLimit]] <<TEXT>> | [[C8InstEmaxFile]] <<FILEUPLOAD>> | | [[C8InstEmaxComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | | | **Data Inputs** | | | |
| 20 | **Maximum Operating Gradient Determination: One Hour Run:** After completing each **OneHour Run**, record the requested information in the table below. See the procedure, CP-C100-COM-CM-CAV-EMAX for instructions. | | | | | | |
| **Cavity** | **Operator** | **Time Completed** | **Emaxop**  **(MV/m)** | | | **File Upload** | **Comments** |
| **1** | [[C1InstEmaxopTech]] <<SRF>> | [[C1InstEmaxopComplete]] <<TIMESTAMP>> | [[C1InstEmaxop]] <<FLOAT>> | | | [[C1InstEmaxopFile]] <<FILEUPLOAD>> | [[C1InstEmaxopComments]] <<COMMENT>> |
| **2** | [[C2InstEmaxopTech]] <<SRF>> | [[C2InstEmaxopComplete]] <<TIMESTAMP>> | [[C2InstEmaxop]] <<FLOAT>> | | | [[C2InstEmaxopFile]] <<FILEUPLOAD>> | [[C2InstEmaxopComments]] <<COMMENT>> |
| **3** | [[C3InstEmaxopTech]] <<SRF>> | [[C3InstEmaxopComplete]] <<TIMESTAMP>> | [[C3InstEmaxop]] <<FLOAT>> | | | [[C3InstEmaxopFile]] <<FILEUPLOAD>> | [[C3InstEmaxopComments]] <<COMMENT>> |
| **4** | [[C4InstEmaxopTech]] <<SRF>> | [[C4InstEmaxopComplete]] <<TIMESTAMP>> | [[C4InstEmaxop]] <<FLOAT>> | | | [[C4InstEmaxopFile]] <<FILEUPLOAD>> | [[C4InstEmaxopComments]] <<COMMENT>> |
| **5** | [[C5InstEmaxopTech]] <<SRF>> | [[C5InstEmaxopComplete]] <<TIMESTAMP>> | [[C5InstEmaxop]] <<FLOAT>> | | | [[C5InstEmaxopFile]] <<FILEUPLOAD>> | [[C5InstEmaxopComments]] <<COMMENT>> |
| **6** | [[C6InstEmaxopTech]] <<SRF>> | [[C6InstEmaxopComplete]] <<TIMESTAMP>> | [[C6InstEmaxop]] <<FLOAT>> | | | [[C6InstEmaxopFile]] <<FILEUPLOAD>> | [[C6InstEmaxopComments]] <<COMMENT>> |
| **7** | [[C7InstEmaxopTech]] <<SRF>> | [[C7InstEmaxopComplete]] <<TIMESTAMP>> | [[C7InstEmaxop]] <<FLOAT>> | | | [[C7InstEmaxopFile]] <<FILEUPLOAD>> | [[C7InstEmaxopComments]] <<COMMENT>> |
| **8** | [[C8InstEmaxopTech]] <<SRF>> | [[C8InstEmaxopComplete]] <<TIMESTAMP>> | [[C8InstEmaxop]] <<FLOAT>> | | | [[C8InstEmaxopFile]] <<FILEUPLOAD>> | [[C8InstEmaxopComments]] <<COMMENT>> |
| **Total Energy Contribution with all Cavities Running at Emaxop:**  [[Sum C1InstEmaxop through C8InstEmaxop, multiply sum by 0.7 and enter result in CMInstMaxEnergy]] <<NOTE>> | | | | | [[CMInstMaxEnergy]] <<FLOAT>> MeV | | |

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| **Step No** | **Instructions** | | | **Data Inputs** | | |
| 21 | Complete the **Field Emission Survey (Fe vs. Eacc)** for each cavity**.** See the procedure, CP-C100-COM-CM-CAV-EMAX for instructions. Record the requested information and upload files in the table below.  Note any deviations from the standard GM tube layout in the comments. | | | | | |
| **Cavity** | **Operator** | **Time Completed** | **Field Emission Onset**  **(MV/m)** | | **File Upload** | **Comments** |
| **1** | [[C1InstFETech]] <<SRF>> | [[C1InstFEComplete]] <<TIMESTAMP>> | [[C1InstFEOnset]] <<FLOAT>> | | [[C1InstFEFile]] <<FILEUPLOAD>> | [[C1InstFEComments]] <<COMMENT>> |
| **2** | [[C2InstFETech]] <<SRF>> | [[C2InstFEComplete]] <<TIMESTAMP>> | [[C2InstFEOnset]] <<FLOAT>> | | [[C2InstFEFile]] <<FILEUPLOAD>> | [[C2InstFEComments]] <<COMMENT>> |
| **3** | [[C3InstFETech]] <<SRF>> | [[C3InstFEComplete]] <<TIMESTAMP>> | [[C3InstFEOnset]] <<FLOAT>> | | [[C3InstFEFile]] <<FILEUPLOAD>> | [[C3InstFEComments]] <<COMMENT>> |
| **4** | [[C4InstFETech]] <<SRF>> | [[C4InstFEComplete]] <<TIMESTAMP>> | [[C4InstFEOnset]] <<FLOAT>> | | [[C4InstFEFile]] <<FILEUPLOAD>> | [[C4InstFEComments]] <<COMMENT>> |
| **5** | [[C5InstFETech]] <<SRF>> | [[C5InstFEComplete]] <<TIMESTAMP>> | [[C5InstFEOnset]] <<FLOAT>> | | [[C5InstFEFile]] <<FILEUPLOAD>> | [[C5InstFEComments]] <<COMMENT>> |
| **6** | [[C6InstFETech]] <<SRF>> | [[C6InstFEComplete]] <<TIMESTAMP>> | [[C6InstFEOnset]] <<FLOAT>> | | [[C6InstFEFile]] <<FILEUPLOAD>> | [[C6InstFEComments]] <<COMMENT>> |
| **7** | [[C7InstFETech]] <<SRF>> | [[C7InstFEComplete]] <<TIMESTAMP>> | [[C7InstFEOnset]] <<FLOAT>> | | [[C7InstFEFile]] <<FILEUPLOAD>> | [[C7InstFEComments]] <<COMMENT>> |
| **8** | [[C8InstFETech]] <<SRF>> | [[C8InstFEComplete]] <<TIMESTAMP>> | [[C8InstFEOnset]] <<FLOAT>> | | [[C8InstFEFile]] <<FILEUPLOAD>> | [[C8InstFEComments]] <<COMMENT>> |

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| **Step No** | | **Instructions** | | | | **Data Inputs** | | | |
| 22 | | Complete **Qo Measurements** for each cavity. See the procedure, CP-C100-COM-CM-CAV-Qo for detailed instructions.  In the table below, record the value of Qo at 8.0 MV/m, 19.2 MV/m and at Emaxop.  Record the highest gradient (MV/m) at which the cavity still meets the specification for dynamic heat load to the primary circuit: (**30 Watts).** | | | | | | | |
| **Cavity** | **Operator** | | **Time Completed** | **Qo @ 8.0 MV/m** | **Qo @ 19.2 MV/m** | | | **Qo @ Emaxop** | **RF Heat Load @ Emaxop (W)** |
| **1** | [[C1InstQoTech]] <<SRF>> | | [[C1InstQoComplete]] <<TIMESTAMP>> | [[C1InstQoAt8]] <<SCINOT>> | [[C1InstQoAt19]] <<SCINOT>> | | | [[C1InstQoEmaxop]] <<SCINOT>> | [[C1InstRFHheat]] <<FLOAT>> |
| **2** | [[C2InstQoTech]] <<SRF>> | | [[C2InstQoComplete]] <<TIMESTAMP>> | [[C2InstQoAt8]] <<SCINOT>> | [[C2InstQoAt19]] <<SCINOT>> | | | [[C2InstQoEmaxop]] <<SCINOT>> | [[C2InstRFHheat]] <<FLOAT>> |
| **3** | [[C3InstQoTech]] <<SRF>> | | [[C3InstQoComplete]] <<TIMESTAMP>> | [[C3InstQoAt8]] <<SCINOT>> | [[C3InstQoAt19]] <<SCINOT>> | | | [[C3InstQoEmaxop]] <<SCINOT>> | [[C3InstRFHheat]] <<FLOAT>> |
| **4** | [[C4InstQoTech]] <<SRF>> | | [[C4InstQoComplete]] <<TIMESTAMP>> | [[C4InstQoAt8]] <<SCINOT>> | [[C4InstQoAt19]] <<SCINOT>> | | | [[C4InstQoEmaxop]] <<SCINOT>> | [[C4InstRFHheat]] <<FLOAT>> |
| **5** | [[C5InstQoTech]] <<SRF>> | | [[C5InstQoComplete]] <<TIMESTAMP>> | [[C5InstQoAt8]] <<SCINOT>> | [[C5InstQoAt19]] <<SCINOT>> | | | [[C5InstQoEmaxop]] <<SCINOT>> | [[C5InstRFHheat]] <<FLOAT>> |
| **6** | [[C6InstQoTech]] <<SRF>> | | [[C6InstQoComplete]] <<TIMESTAMP>> | [[C6InstQoAt8]] <<SCINOT>> | [[C6InstQoAt19]] <<SCINOT>> | | | [[C6InstQoEmaxop]] <<SCINOT>> | [[C6InstRFHheat]] <<FLOAT>> |
| **7** | [[C7InstQoTech]] <<SRF>> | | [[C7InstQoComplete]] <<TIMESTAMP>> | [[C7InstQoAt8]] <<SCINOT>> | [[C7InstQoAt19]] <<SCINOT>> | | | [[C7InstQoEmaxop]] <<SCINOT>> | [[C7InstRFHheat]] <<FLOAT>> |
| **8** | [[C8InstQoTech]] <<SRF>> | | [[C8InstQoComplete]] <<TIMESTAMP>> | [[C8InstQoAt8]] <<SCINOT>> | [[C8InstQoAt19]] <<SCINOT>> | | | [[C8InstQoEmaxop]] <<SCINOT>> | [[C8InstRFHheat]] <<FLOAT>> |
| **Total RF Heat Load with all Cavities Running at Emaxop**:  [[Sum C1InstRFHeat through C8InstRFHeat and Enter Result in CMInstRFHeat]] <<NOTE>> | | | | | | | [[CMInstRFHeat]] <<FLOAT>> | | |

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| **Step No** | **Instructions** | | **Data Inputs** | |
| 23 | **Qo Measurements:** Record the highest gradient (MV/m) at which the cavity still meets the specification for dynamic heat load to the primary circuit: **(≤ 29 Watts at the linac operating temperature, ~2.08K)**.  If the cavity exceeds the heat load specification before reaching 19.2 MV/m, an NCR must be generated.  Process the data as necessary and upload the completed file.  Use the comment box to note any problems, etc. | | | |
| **Cavity** | **Maximum Gradient for Heat Specification (MV/m)** | **File Upload** | | **Comments** |
| **1** | [[C1InstEmaxHeatSpec]] <<FLOAT>> | [[C1InstQoFile]] <<FILEUPLOAD>> | | [[C1InstQoComments]] <<COMMENT>> |
| **2** | [[C2InstEmaxHeatSpec]] <<FLOAT>> | [[C2InstQoFile]] <<FILEUPLOAD>> | | [[C2InstQoComments]] <<COMMENT>> |
| **3** | [[C3InstEmaxHeatSpec]] <<FLOAT>> | [[C3InstQoFile]] <<FILEUPLOAD>> | | [[C3InstQoComments]] <<COMMENT>> |
| **4** | [[C4InstEmaxHeatSpec]] <<FLOAT>> | [[C4InstQoFile]] <<FILEUPLOAD>> | | [[C4InstQoComments]] <<COMMENT>> |
| **5** | [[C5InstEmaxHeatSpec]] <<FLOAT>> | [[C5InstQoFile]] <<FILEUPLOAD>> | | [[C5InstQoComments]] <<COMMENT>> |
| **6** | [[C6InstEmaxHeatSpec]] <<FLOAT>> | [[C6InstQoFile]] <<FILEUPLOAD>> | | [[C6InstQoComments]] <<COMMENT>> |
| **7** | [[C7InstEmaxHeatSpec]] <<FLOAT>> | [[C7InstQoFile]] <<FILEUPLOAD>> | | [[C7InstQoComments]] <<COMMENT>> |
| **8** | [[C8InstEmaxHeatSpec]] <<FLOAT>> | [[C8InstQoFile]] <<FILEUPLOAD>> | | [[C8InstQoComments]] <<COMMENT>> |
|  | [[CMMaxEnergyHeatSpec]] <<FLOAT>> | **Total Energy Gain with all Cavities Running at 29 W limit (MV):**  [[Sum C1InstEmaxHeatSpec through C8InstEmaxHeatSpec, multiply sum by 0.7. Enter Result in CMMaxEnergyHeatSpec]] <<NOTE>> | | |

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| **Step No** | **Instructions** | **Data Inputs** |
| 24 | Record the **Average Static Heat Load** (in Watts) to the primary (2K) helium circuit. See the procedure CP-C100-CM-CAV-QO for instructions. Upload the processed spreadsheet. Enter any requested information to the right.  **Specification: 25 Watts Nominal** | [[InstStaticHeatLoadOperator]] <<SRF>>  [[InstStaticHeatLoadCalcComplete]] <<TIMESTAMP>>  [[InstStaticHeatLoadComments]] <<COMMENT>>  [[InstStaticHeatLoad]] <<FLOAT>> (W)  [[InstStaticHeatLoadFile]] <<FILEUPLOAD>> |

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| **Step No** | **Instructions** | | | **Data Inputs** | |
| 25 | Complete **Microphonics Measurements** on Cavity 1-8. See the procedure CP-C100-CM-CAV-LPRF-MICR for detailed instructions. Upload the processed data file. | | | | |
| **Cavity** | **Operator** | **Time Completed** | **Upload File** | | **Comments** |
| **1** | [[C1InstMicroPhonicsTech]] <<SRF>> | [[C1InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C1InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C1InstMicroPhonicsComments]] <<COMMENT>> |
| **2** | [[C2InstMicroPhonicsTech]] <<SRF>> | [[C2InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C2InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C2InstMicroPhonicsComments]] <<COMMENT>> |
| **3** | [[C3InstMicroPhonicsTech]] <<SRF>> | [[C3InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C3InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C3InstMicroPhonicsComments]] <<COMMENT>> |
| **4** | [[C4InstMicroPhonicsTech]] <<SRF>> | [[C4InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C4InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C4InstMicroPhonicsComments]] <<COMMENT>> |
| **5** | [[C5InstMicroPhonicsTech]] <<SRF>> | [[C5InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C5InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C5InstMicroPhonicsComments]] <<COMMENT>> |
| **6** | [[C6InstMicroPhonicsTech]] <<SRF>> | [[C6InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C6InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C6InstMicroPhonicsComments]] <<COMMENT>> |
| **7** | [[C7InstMicroPhonicsTech]] <<SRF>> | [[C7InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C7InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C7InstMicroPhonicsComments]] <<COMMENT>> |
| **8** | [[C8InstMicroPhonicsTech]] <<SRF>> | [[C8InstMicroPhonicsComplete]] <<TIMESTAMP>> | [[C8InstMicroPhonicsFile]] <<FILEUPLOAD>> | | [[C8InstMicroPhonicsComments]] <<COMMENT>> |

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| **Step No** | **Instructions** | | **Data Inputs** | |
| 26 | **Eight Cavity Run:** Using the 29 W limit gradients determined in Step 23 as targets, complete an **Eight Cavity Run** as described in the procedure, CP-C100-CM-COM-8CAV. Record the actual set of gradients used to complete a successful run below. Process any logfile data and upload the completed file below. | | | |
|  | [[C1EightCavMaxGradient]] <<FLOAT>>  [[C2EightCavMaxGradient]] <<FLOAT>>  [[C3EightCavMaxGradient]] <<FLOAT>>  [[C4EightCavMaxGradient]] <<FLOAT>>  [[C5EightCavMaxGradient]] <<FLOAT>>  [[C6EightCavMaxGradient]] <<FLOAT>>  [[C7EightCavMaxGradient]] <<FLOAT>>  [[C8EightCavMaxGradient]] <<FLOAT>> | [[EightCavMaxGradientTech]] <<SRF>>  [[EightCavMaxGradientComplete]] <<TIMESTAMP>>  [[EightCavMaxGradientFiles]] <<FILEUPLOAD>>  [[EightCavMaxGradientComments]] <<COMMENT>> | | |
|  | Total Energy Gain with all Cavities Running at Eight Cavity Run Gradients (MV):  [[Sum C1EightCavMaxGradient through C8EightCavMaxGradient, multiply sum by 0.7. Enter Result in CMEightCavEnergy]] <<NOTE>> | | | [[CMEightCavEnergy]] <<FLOAT>> |