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| Traveler Title | LCLS-II cavity HOM measurements and tuning | | | |
| Traveler Abstract |  | | | |
| Traveler ID | L2HE-CMA-HOM-TUNE | | | |
| Traveler Revision | R0 | | | |
| Traveler Author | Peter Owen | | | |
| Traveler Date | 27-Oct-2021 | | | |
| NCR Informative Emails | Owen,Forehand,Wilson | | | |
| NCR Dispositioners |  | | | |
| D3 Emails |  | | | |
| Approval Names | P. Owen | D. Forehand | K. Wilson |  |
| 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- L2PRD-CAV-HOM-TUNE](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-125564/CP-%20L2PRD-CAV-HOM-TUNE)\_R3 | Use procedure and traveler revision 2 for notch tuning, revision 3 for dB tuning |  |  |  |
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| Revision Note |  |
| R0 | Small changes from L2 traveler L2PRD-CAV-HOM-TUNE-R5. Changes only done for steps 1-10, these will propogate to all cavities. |

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| Step No. | Instructions | Data Input |
| 1 | Record workstation number  Record CMSN | [[Work\_Station1]] {{4,5}} <<SELECT>>  [[CMSN]] <<CMSN>>  [[RecordDate]] <<TIMESTAMP>>  [[RecordSRF]] <<SRF>>  [[Populate cavity serial numbers when CMSN is selected]] <<NOTE>> |

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| Step No. | Instructions | Data Input | |
| 2 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS1]] <<FLOAT>>  [[CAVSN1]] <<CAVSN>> | |
| 3 | FPC to FP  Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C1\_Pi\_9\_Mode]] <<FLOAT>> MHz | [[C1\_Attenuation1]]<<FLOAT>>dB |
| [[C1\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation2]]<<FLOAT>>dB |
| [[C1\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation3]]<<FLOAT>>dB |
| [[C1\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation4]]<<FLOAT>>dB |
| [[C1\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation5]]<<FLOAT>>dB |
| [[C1\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation6]]<<FLOAT>>dB |
| [[C1\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation7]]<<FLOAT>>dB |
| [[C1\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation8]]<<FLOAT>>dB |
| [[C1\_Pi\_Mode]]<<FLOAT>>MHz | [[C1\_Attenuation9]]<<FLOAT>>dB |
| 4 | Measuring HOM 1 – PT:  Did HOM1 require retuning?  Record calculated frequency of HOM1 notch filter | [[C1\_H1\_Tune]]<<YESNO>>  [[C1\_H1\_Notch]]<<FLOAT>> MHz | |
| 5 | Measuring MC – HOM 2:  Did HOM2 require retuning?  Record calculated frequency of HOM2 notch filter | [[C1\_H2\_Tune]]<<YESNO>>  [[C1\_H2\_Notch]]<<FLOAT>> MHz | |
| 6 | Upload 3 \*.csv files from HOM Survey software, one for each measurement direction | [[C1\_UploadFiles]] <<FILEUPLOAD>> | |
| 7 | Upload cavity peaks file (\*.xlsx) from HOM Survey software | [[C1\_UploadPeaks]] <<FILEUPLOAD>> | |
| 8 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# need folder for HE | [[C1\_FilesUploaded]] <<YESNO>> | |
| 9 | Comments | [[C1\_Comments]] <<COMMENT>> | |

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| Step No. | Instructions | Data Input | | |
| 10 | Record workstation number | [[Work\_Station2]] {{4,5}} <<SELECT>> | | |
| 11 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS2]] <<FLOAT>>  [[CAVSN2]] <<CAVSN>>  [[TUNEdate2]] <<TIMESTAMP>>  [[FIELDNAME\_SRF2]] <<SRF>> | | |
| 12 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C2\_Pi\_Mode]] <<FLOAT>> MHz | [[C2\_Attenuation1]]<<FLOAT>>dB | [[C2\_AveragingUsed1]] <<YESNO>> |
| [[C2\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation2]]<<FLOAT>>dB | [[C2\_AveragingUsed2]] <<YESNO>> |
| [[C2\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation3]]<<FLOAT>>dB | [[C2\_AveragingUsed3]] <<YESNO>> |
| [[C2\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation4]]<<FLOAT>>dB | [[C2\_AveragingUsed4]] <<YESNO>> |
| [[C2\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation5]]<<FLOAT>>dB | [[C2\_AveragingUsed5]] <<YESNO>> |
| [[C2\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation6]]<<FLOAT>>dB | [[C2\_AveragingUsed6]] <<YESNO>> |
| [[C2\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation7]]<<FLOAT>>dB | [[C2\_AveragingUsed7]] <<YESNO>> |
| [[C2\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation8]]<<FLOAT>>dB | [[C2\_AveragingUsed8]] <<YESNO>> |
| [[C2\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C2\_Attenuation9]]<<FLOAT>>dB | [[C2\_AveragingUsed9]] <<YESNO>> |
| 13 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C2\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C2\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C2\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C2\_Difference1]] <<FLOAT>> dB | | |
| 14 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C2\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C2\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C2\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C2\_Difference2]] <<FLOAT>> dB | | |
| 15 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C2\_MC-PT]] <<FILEUPLOAD>>  [[C2\_MC-HOM2]] <<FILEUPLOAD>>  [[C2\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 16 | Upload cavity peaks file from FNAL software | [[C2\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 17 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C2\_FilesUploaded]] <<YESNO>> | | |
| 18 | Comments | [[C2\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 19 | Record workstation number | [[Work\_Station3]] {{4,5}} <<SELECT>> | | |
| 20 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS3]] <<FLOAT>>  [[CAVSN3]] <<CAVSN>>  [[TUNEdate3]] <<TIMESTAMP>>  [[FIELDNAME\_SRF3]] <<SRF>> | | |
| 21 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C3\_Pi\_Mode]] <<FLOAT>> MHz | [[C3\_Attenuation1]]<<FLOAT>>dB | [[C3\_AveragingUsed1]] <<YESNO>> |
| [[C3\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation2]]<<FLOAT>>dB | [[C3\_AveragingUsed2]] <<YESNO>> |
| [[C3\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation3]]<<FLOAT>>dB | [[C3\_AveragingUsed3]] <<YESNO>> |
| [[C3\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation4]]<<FLOAT>>dB | [[C3\_AveragingUsed4]] <<YESNO>> |
| [[C3\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation5]]<<FLOAT>>dB | [[C3\_AveragingUsed5]] <<YESNO>> |
| [[C3\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation6]]<<FLOAT>>dB | [[C3\_AveragingUsed6]] <<YESNO>> |
| [[C3\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation7]]<<FLOAT>>dB | [[C3\_AveragingUsed7]] <<YESNO>> |
| [[C3\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation8]]<<FLOAT>>dB | [[C3\_AveragingUsed8]] <<YESNO>> |
| [[C3\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C3\_Attenuation9]]<<FLOAT>>dB | [[C3\_AveragingUsed9]] <<YESNO>> |
| 22 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C3\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C3\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C3\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C3\_Difference1]] <<FLOAT>> dB | | |
| 23 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C3\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C3\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C3\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C3\_Difference2]] <<FLOAT>> dB | | |
| 24 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C3\_MC-PT]] <<FILEUPLOAD>>  [[C3\_MC-HOM2]] <<FILEUPLOAD>>  [[C3\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 25 | Upload cavity peaks file from FNAL software | [[C3\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 26 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C3\_FilesUploaded]] <<YESNO>> | | |
| 27 | Comments | [[C3\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 28 | Record workstation number | [[Work\_Station4]] {{4,5}} <<SELECT>> | | |
| 29 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS4]] <<FLOAT>>  [[CAVSN4]] <<CAVSN>>  [[TUNEdate4]] <<TIMESTAMP>>  [[FIELDNAME\_SRF4]] <<SRF>> | | |
| 30 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C4\_Pi\_Mode]] <<FLOAT>> MHz | [[C4\_Attenuation1]]<<FLOAT>>dB | [[C4\_AveragingUsed1]] <<YESNO>> |
| [[C4\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation2]]<<FLOAT>>dB | [[C4\_AveragingUsed2]] <<YESNO>> |
| [[C4\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation3]]<<FLOAT>>dB | [[C4\_AveragingUsed3]] <<YESNO>> |
| [[C4\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation4]]<<FLOAT>>dB | [[C4\_AveragingUsed4]] <<YESNO>> |
| [[C4\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation5]]<<FLOAT>>dB | [[C4\_AveragingUsed5]] <<YESNO>> |
| [[C4\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation6]]<<FLOAT>>dB | [[C4\_AveragingUsed6]] <<YESNO>> |
| [[C4\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation7]]<<FLOAT>>dB | [[C4\_AveragingUsed7]] <<YESNO>> |
| [[C4\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation8]]<<FLOAT>>dB | [[C4\_AveragingUsed8]] <<YESNO>> |
| [[C4\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C4\_Attenuation9]]<<FLOAT>>dB | [[C4\_AveragingUsed9]] <<YESNO>> |
| 31 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C4\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C4\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C4\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[C4\_Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C4\_Difference1]] <<FLOAT>> dB | | |
| 32 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C4\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C4\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C4\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C4\_Difference2]] <<FLOAT>> dB | | |
| 33 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C4\_MC-PT]] <<FILEUPLOAD>>  [[C4\_MC-HOM2]] <<FILEUPLOAD>>  [[C4\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 34 | Upload cavity peaks file from FNAL software | [[C4\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 35 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C4\_FilesUploaded]] <<YESNO>> | | |
| 36 | Comments | [[C4\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 37 | Record workstation number | [[Work\_Station5]] {{4,5}} <<SELECT>> | | |
| 38 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS5]] <<FLOAT>>  [[CAVSN5]] <<CAVSN>>  [[TUNEdate5]] <<TIMESTAMP>>  [[FIELDNAME\_SRF5]] <<SRF>> | | |
| 39 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C5\_Pi\_Mode]] <<FLOAT>> MHz | [[C5\_Attenuation1]]<<FLOAT>>dB | [[C5\_AveragingUsed1]] <<YESNO>> |
| [[C5\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation2]]<<FLOAT>>dB | [[C5\_AveragingUsed2]] <<YESNO>> |
| [[C5\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation3]]<<FLOAT>>dB | [[C5\_AveragingUsed3]] <<YESNO>> |
| [[C5\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation4]]<<FLOAT>>dB | [[C5\_AveragingUsed4]] <<YESNO>> |
| [[C5\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation5]]<<FLOAT>>dB | [[C5\_AveragingUsed5]] <<YESNO>> |
| [[C5\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation6]]<<FLOAT>>dB | [[C5\_AveragingUsed6]] <<YESNO>> |
| [[C5\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation7]]<<FLOAT>>dB | [[C5\_AveragingUsed7]] <<YESNO>> |
| [[C5\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation8]]<<FLOAT>>dB | [[C5\_AveragingUsed8]] <<YESNO>> |
| [[C5\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C5\_Attenuation9]]<<FLOAT>>dB | [[C5\_AveragingUsed9]] <<YESNO>> |
| 40 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C5\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C5\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C5\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C5\_Difference1]] <<FLOAT>> dB | | |
| 41 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C5\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C5\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C5\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C5\_Difference2]] <<FLOAT>> dB | | |
| 42 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C5\_MC-PT]] <<FILEUPLOAD>>  [[C5\_MC-HOM2]] <<FILEUPLOAD>>  [[C5\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 43 | Upload cavity peaks file from FNAL software | [[C5\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 44 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C5\_FilesUploaded]] <<YESNO>> | | |
| 45 | Comments | [[C5\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 46 | Record workstation number | [[Work\_Station6]] {{4,5}} <<SELECT>> | | |
| 47 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS6]] <<FLOAT>>  [[CAVSN6]] <<CAVSN>>  [[TUNEdate6]] <<TIMESTAMP>>  [[FIELDNAME\_SRF6]] <<SRF>> | | |
| 48 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C6\_Pi\_Mode]] <<FLOAT>> MHz | [[C6\_Attenuation1]]<<FLOAT>>dB | [[C6\_AveragingUsed1]] <<YESNO>> |
| [[C6\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation2]]<<FLOAT>>dB | [[C6\_AveragingUsed2]] <<YESNO>> |
| [[C6\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation3]]<<FLOAT>>dB | [[C6\_AveragingUsed3]] <<YESNO>> |
| [[C6\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation4]]<<FLOAT>>dB | [[C6\_AveragingUsed4]] <<YESNO>> |
| [[C6\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation5]]<<FLOAT>>dB | [[C6\_AveragingUsed5]] <<YESNO>> |
| [[C6\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation6]]<<FLOAT>>dB | [[C6\_AveragingUsed6]] <<YESNO>> |
| [[C6\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation7]]<<FLOAT>>dB | [[C6\_AveragingUsed7]] <<YESNO>> |
| [[C6\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation8]]<<FLOAT>>dB | [[C6\_AveragingUsed8]] <<YESNO>> |
| [[C6\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C6\_Attenuation9]]<<FLOAT>>dB | [[C6\_AveragingUsed9]] <<YESNO>> |
| 49 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C6\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C6\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C6\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C6\_Difference1]] <<FLOAT>> dB | | |
| 50 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C6\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C6\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C6\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C6\_Difference2]] <<FLOAT>> dB | | |
| 51 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C6\_MC-PT]] <<FILEUPLOAD>>  [[C6\_MC-HOM2]] <<FILEUPLOAD>>  [[C6\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 52 | Upload cavity peaks file from FNAL software | [[C6\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 53 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C6\_FilesUploaded]] <<YESNO>> | | |
| 54 | Comments | [[C6\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 55 | Record workstation number | [[Work\_Station7]] {{4,5}} <<SELECT>> | | |
| 56 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS7]] <<FLOAT>>  [[CAVSN7]] <<CAVSN>>  [[TUNEdate7]] <<TIMESTAMP>>  [[FIELDNAME\_SRF7]] <<SRF>> | | |
| 57 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C7\_Pi\_Mode]] <<FLOAT>> MHz | [[C7\_Attenuation1]]<<FLOAT>>dB | [[C7\_AveragingUsed1]] <<YESNO>> |
| [[C7\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation2]]<<FLOAT>>dB | [[C7\_AveragingUsed2]] <<YESNO>> |
| [[C7\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation3]]<<FLOAT>>dB | [[C7\_AveragingUsed3]] <<YESNO>> |
| [[C7\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation4]]<<FLOAT>>dB | [[C7\_AveragingUsed4]] <<YESNO>> |
| [[C7\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation5]]<<FLOAT>>dB | [[C7\_AveragingUsed5]] <<YESNO>> |
| [[C7\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation6]]<<FLOAT>>dB | [[C7\_AveragingUsed6]] <<YESNO>> |
| [[C7\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation7]]<<FLOAT>>dB | [[C7\_AveragingUsed7]] <<YESNO>> |
| [[C7\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation8]]<<FLOAT>>dB | [[C7\_AveragingUsed8]] <<YESNO>> |
| [[C7\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C7\_Attenuation9]]<<FLOAT>>dB | [[C7\_AveragingUsed9]] <<YESNO>> |
| 58 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C7\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C7\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C7\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C7\_Difference1]] <<FLOAT>> dB | | |
| 59 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C7\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C7\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C7\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C7\_Difference2]] <<FLOAT>> dB | | |
| 60 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C7\_MC-PT]] <<FILEUPLOAD>>  [[C7\_MC-HOM2]] <<FILEUPLOAD>>  [[C7\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 61 | Upload cavity peaks file from FNAL software | [[C7\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 62 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C7\_FilesUploaded]] <<YESNO>> | | |
| 63 | Comments | [[C7\_Comments]] <<COMMENT>> | | |

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| Step No. | Instructions | Data Input | | |
| 64 | Record workstation number | [[Work\_Station8]] {{4,5}} <<SELECT>> | | |
| 65 | Record string ID, cavity position (1-8) and serial nuber | [[CAVPOS8]] <<FLOAT>>  [[CAVSN8]] <<CAVSN>>  [[TUNEdate8]] <<TIMESTAMP>>  [[FIELDNAME\_SRF8]] <<SRF>> | | |
| 66 | Follow HOM tuning procedure.  Record frequency (xxxx.xxx MHz) and attenuation (xx.xx dB) of each of 9 modes measured MC-PT | [[C8\_Pi\_Mode]] <<FLOAT>> MHz | [[C8\_Attenuation1]]<<FLOAT>>dB | [[C8\_AveragingUsed1]] <<YESNO>> |
| [[C8\_8Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation2]]<<FLOAT>>dB | [[C8\_AveragingUsed2]] <<YESNO>> |
| [[C8\_7Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation3]]<<FLOAT>>dB | [[C8\_AveragingUsed3]] <<YESNO>> |
| [[C8\_6Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation4]]<<FLOAT>>dB | [[C8\_AveragingUsed4]] <<YESNO>> |
| [[C8\_5Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation5]]<<FLOAT>>dB | [[C8\_AveragingUsed5]] <<YESNO>> |
| [[C8\_4Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation6]]<<FLOAT>>dB | [[C8\_AveragingUsed6]] <<YESNO>> |
| [[C8\_3Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation7]]<<FLOAT>>dB | [[C8\_AveragingUsed7]] <<YESNO>> |
| [[C8\_2Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation8]]<<FLOAT>>dB | [[C8\_AveragingUsed8]] <<YESNO>> |
| [[C8\_Pi\_9\_Mode]]<<FLOAT>>MHz | [[C8\_Attenuation9]]<<FLOAT>>dB | [[C8\_AveragingUsed9]] <<YESNO>> |
| 67 | Measuring HOM 1 – PT:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 9dB+/-1dB | [[C8\_Orinigal\_Pi\_Mode1]]<<FLOAT>> dB  [[C8\_Nominal\_Pi\_Mode1]]<<FLOAT>> dB  [[C8\_Final\_Pi\_Mode1]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C8\_Difference1]] <<FLOAT>> dB | | |
| 68 | Measuring MC – HOM 2:  Record original Pi mode attenuation  Record nominal Pi mode attenuation  Record final Pi mode attenuation  Tuned to  Spec is 11dB+/-1dB | [[C8\_Orinigal\_Pi\_Mode2]]<<FLOAT>> dB  [[C8\_Nominal\_Pi\_Mode2]]<<FLOAT>> dB  [[C8\_Final\_Pi\_Mode2]]<<FLOAT>> dB  [[Calculated difference between (Nominal) and (Original).]] <<NOTE>>  [[C8\_Difference2]] <<FLOAT>> dB | | |
| 69 | Upload 3 raw files from FNAL software, one for each measurement direction | [[C8\_MC-PT]] <<FILEUPLOAD>>  [[C8\_MC-HOM2]] <<FILEUPLOAD>>  [[C8\_HOM1-PT]] <<FILEUPLOAD>> | | |
| 70 | Upload cavity peaks file from FNAL software | [[C8\_Upload\_Peaks]] <<FILEUPLOAD>> | | |
| 71 | Upload all 3 files to the M:/asd/asddata/LCLS-II\_HOM/CM/CM##/cav# | [[C8\_FilesUploaded]] <<YESNO>> | | |
| 72 | Comments | [[C8\_Comments]] <<COMMENT>> | | |