Technical Service Bulletin 030616

Calibration of DCX HPA Power Meters

Procedure 030616: Calibration of DCX HPA Power Meters.	
Applicability	All DCX transmitters. (Does not include DCX Paragon transmitters)
Prerequisites	Correct IOT beam voltage (030611). Correct IOT tuning (030615). Transmitter operating at or near full power.
Equipment Required	Average power meter.
Comments	Additional procedure (030617) exists for calibration of DCX system power meters.

NOTE: Calorimetric calibration is not covered in this procedure. The user should consult their system manual or proof of performance documentation for more information on calorimetric calibration. This procedure assumes that the calibration of the system precision directional coupler is trustworthy.

1. Perform zeroing and calibration of average power meter per manufacturer's instructions. Average power meter calibration typically consists of following steps:

    a. Disconnect sensor head from directional coupler.
    b. Deactivate "offset" function.
    c. Electronically "zero" meter.
    d. Connect sensor head to output of power meter internal test source.
    e. Activate internal test source on power meter.
    f. Electronically "cal" meter.
    g. Meter should agree with nominal rating of internal source printed on meter (typically 0dBm or1mW).
    h. Enter frequency-dependent "cal factor" printed on sensor head.
    i. Activate "offset" function.
    j. Program offset value to exactly match magnitude of dB coupling value printed on system precision directional coupler, but with a positive value (e.g. –40.05dB coupler = +40.05dB offset on power meter.

    NOTE: Consult average power meter instruction manual for more specific instructions.

2. Connect average power meter to system precision direction coupler. Precision directional coupler will have coupling value listed to one or two decimal places (e.g. -50.76 dB).
3. Select RF pattern such that output of HPA whose forward power meter is to be calibrated is directed to system test load and all other HPAs are extinguished.
4. Read HPA average power output directly from power meter.

5. Adjust ADAPT exciter power level until desired reading in kW is obtained on average power meter.

6. Calibrate HPA forward power meter by issuing following commands via HPA control panel: **Information Access > System Operations > HPA Maintenance > Password = 55555 > Meter Calibrations > RF Power > Begin Procedure > Forward > Vision > Direct Entry**

7. Use **Up** and **Down** menu options to modify power level meter reading displayed on screen. Press **Save** once correct meter reading (100%) is obtained.

8. Locate forward and reverse power sample cables from directional coupler at IOT RF output stack. Forward sample cable is attached to 10dB attenuator on coupler port closer to IOT output flange. Cable without 10dB attenuator is reverse sample cable.

9. Select **Reverse** menu option on subsequent menu to commence reverse power meter calibration.

   CAUTION: The reflected power trip threshold will be disabled for the duration of this portion of the calibration procedure, up to a limit a two minutes.

10. Swap forward and reverse power sample cables from directional coupler at IOT RF output stack. Do not swap 10 dB attenuator. Attenuator must remain on forward sample port throughout procedure.

11. HPA reverse power meter should read 10%.

12. Select **Begin** menu option to access reverse meter calibration page.

13. Use **Up** and **Down** menu options to modify power level meter reading displayed on screen. Press **Save** once correct meter reading (10%) is obtained.

14. Press **OK** to exit menu.

15. Restore proper sample cable connections.

16. Locate dual -36dB N-type directional coupler section at output of IPA driver stage. (on air plenum at rear of HPA cabinet)

17. Connect average power meter to either port of dual directional coupler.

18. Change offset value on average power meter to -36 dB.

19. Read driver average output power directly from meter.

20. Calibrate HPA forward power meter by issuing following commands via HPA control panel: **Information Access > System Operations > HPA Maintenance > Password = 55555 > Meter Calibrations > RF Power > Begin Procedure > Drive**

21. Use **Up** and **Down** menu options to modify power level meter reading displayed on screen. Press **Save** once correct meter reading (10%) is obtained.

22. Press **OK** to exit menu.

23. Procedure complete.