

## **Main Injector RF Station Feedback Gain Measurement**

- 1** Call Control Room to insert 2D event into timeline. The Recycler \$2D event is used because it stays at 8 GeV for a period of seconds.
- 2** On *Modulator External Interlock Control Unit*, disable *Repeated RF ENV Faults*.
- 3** Turn on Network Analyzer (Agilent 8753ES) and push *PRESET* button.
- 4** Connect 16 ns cable to Port 1.
- 5** Connect 16 ns cable to Port 2.
- 6** Connect the two cables with bullet.
- 7** Set center frequency to 52.814 MHz.
- 8** Set span to 1 MHz.
- 9** Set number of points to 1601 (*Sweep Setup -> Number of Points*).
- 10** Set power level to -26 dBm.
- 11** Set channel 1 to S21 measurement (from *Measure* menu).
- 12** Confirm *Channel 1 FORMAT* is *LOG MAG*.
- 13** Turn dual channel on (*Display -> Dual/Quad Setup -> ON*).
- 14** Set format to real on channel 2 (Activate Channel 2, *Format -> More -> Real*).
- 15** Set *Cal -> Calibrate Menu -> Response -> Thru*.
- 16** Set *Sweep Setup -> Trigger Menu -> Ext Trig On Sweep*.
- 17** Set *Sweep Setup -> Trigger Menu -> Single*.
- 18** Set marker at 52.802 MHz.
- 19** Connect *IRM Trigger I:BL01TR = 1.5 s, I:BL01EV = 45*, to external trigger on Network Analyzer.
- 20** Confirm *I:SD01L* is set to 0.25V.
- 21** On *Solid State Driver Metering Chassis* insert 32 dB (20+6+6) attenuator to *RF In* port.
- 22** Connect Port 1 to *Feedback Out* on Rack panel.

**23** Connect Port 2 to cable disconnected from *Feedback Out* on previous step.

**24** Change the Local Station Phase Shifter on Station #1 from  $9^\circ$  to  $0^\circ$ .

**25** Take measurement (*Sweep Setup -> Trigger Menu -> Single*).

**NB:** Any adjustments in cable length should be made on the back of the *Beam Loading Fundamental Mode Card* between the Delay In and Delay Out ports.

**26** Print out results (*Copy -> Print Color*).

**27** Disconnect Ports 1 and 2.

**28** Reconnect *FB Out* to *Feedback Out* on Rack panel.

**29** Remove 32 dB attenuator from *RF In*.

**30** Enable *Repeated RF ENV Faults* on *Modulator Internal Interlock Control* unit.

**31** Return the Local Station Phase Shifter to  $9^\circ$ .

### Sample Result:

