



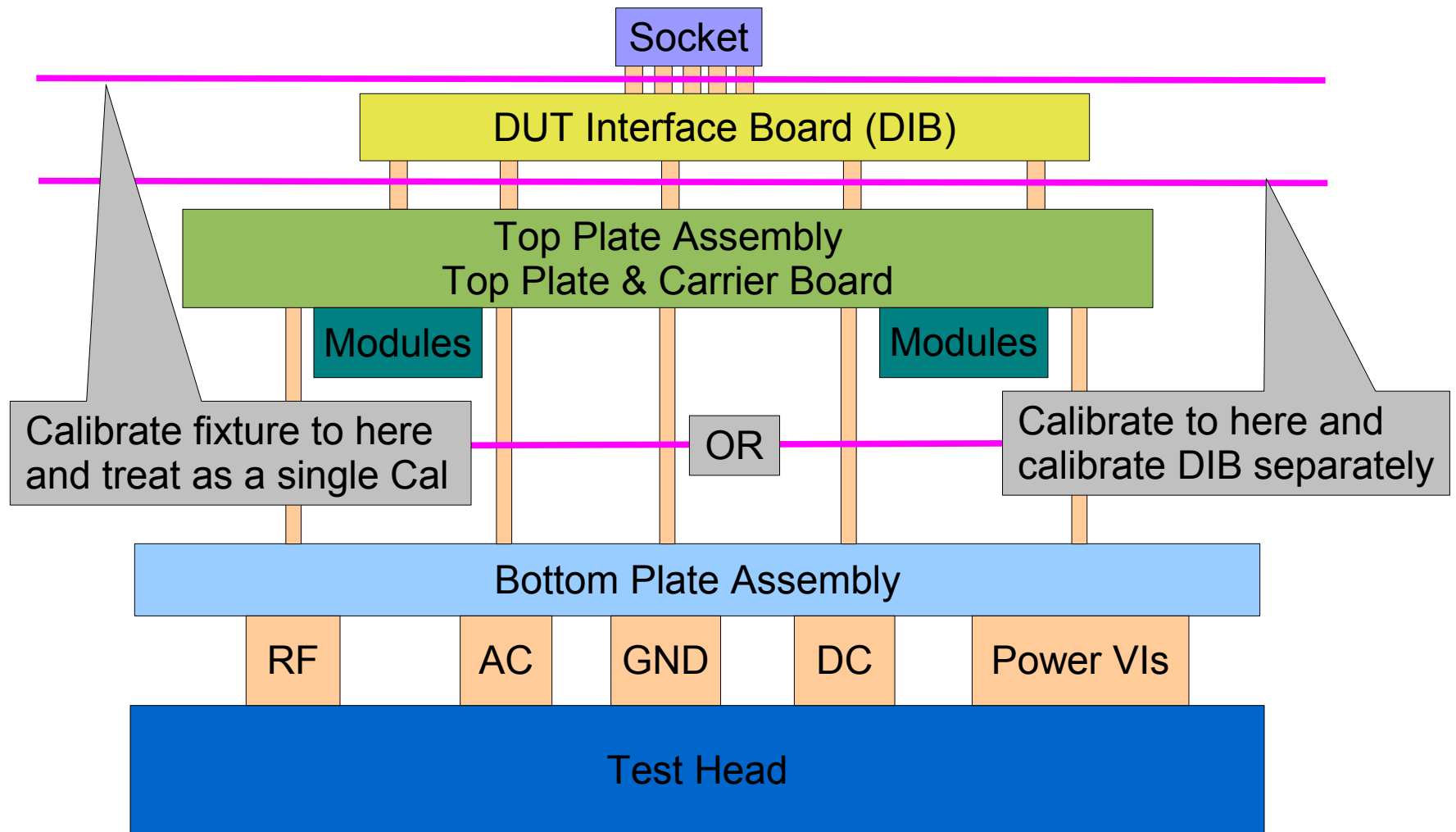
Fixture Calibration

Calibration Types

- Direct
 - Uses a primary NIST traceable standard (OSL, Power Meter, O-scope).
- Implied
 - Uses a secondary standard (one calibrated resource to calibrate another).



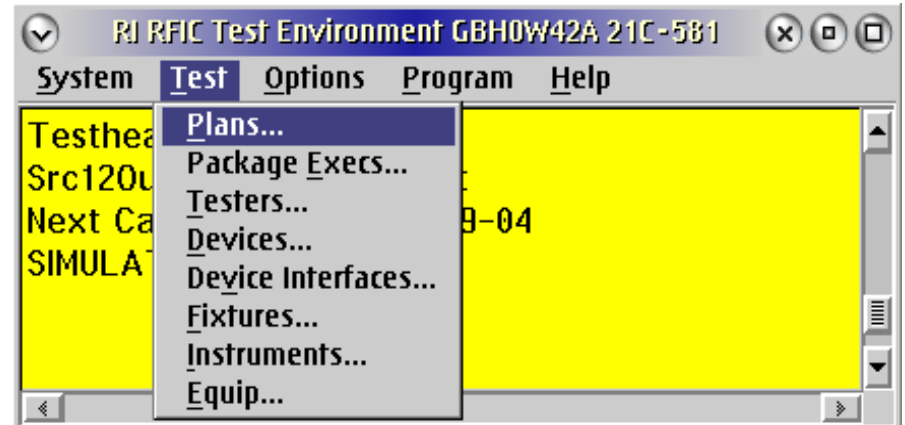
Fixture Calibration





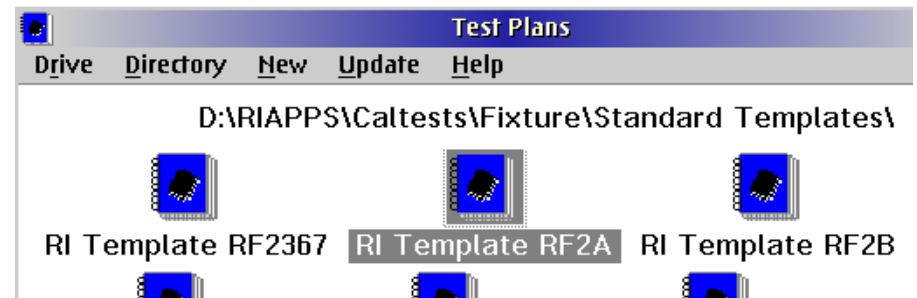
Cal Plan Creation Using Templates

1. Go to main environment window and pull down the “Test” menu.
2. Choose “Plans....”.



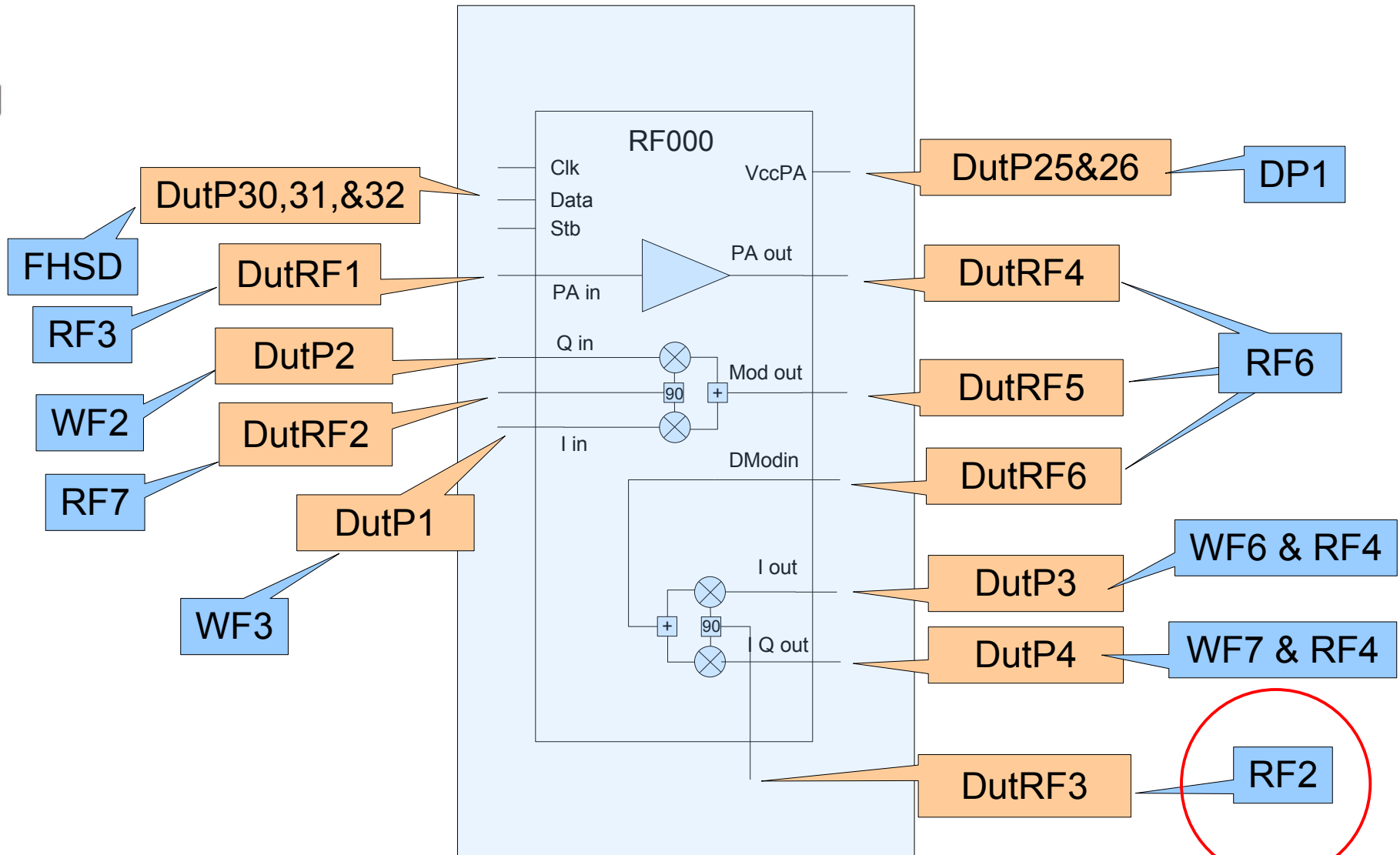
3. When in the Test Plans window change directory to: RIAPPS\testplan\Caltests\Fixture\Standard Templates

4. From the listed templates choose the one that most represents the port you want to calibrate.
5. Copy it to a name that represents your device. Ex. RF000_RF2





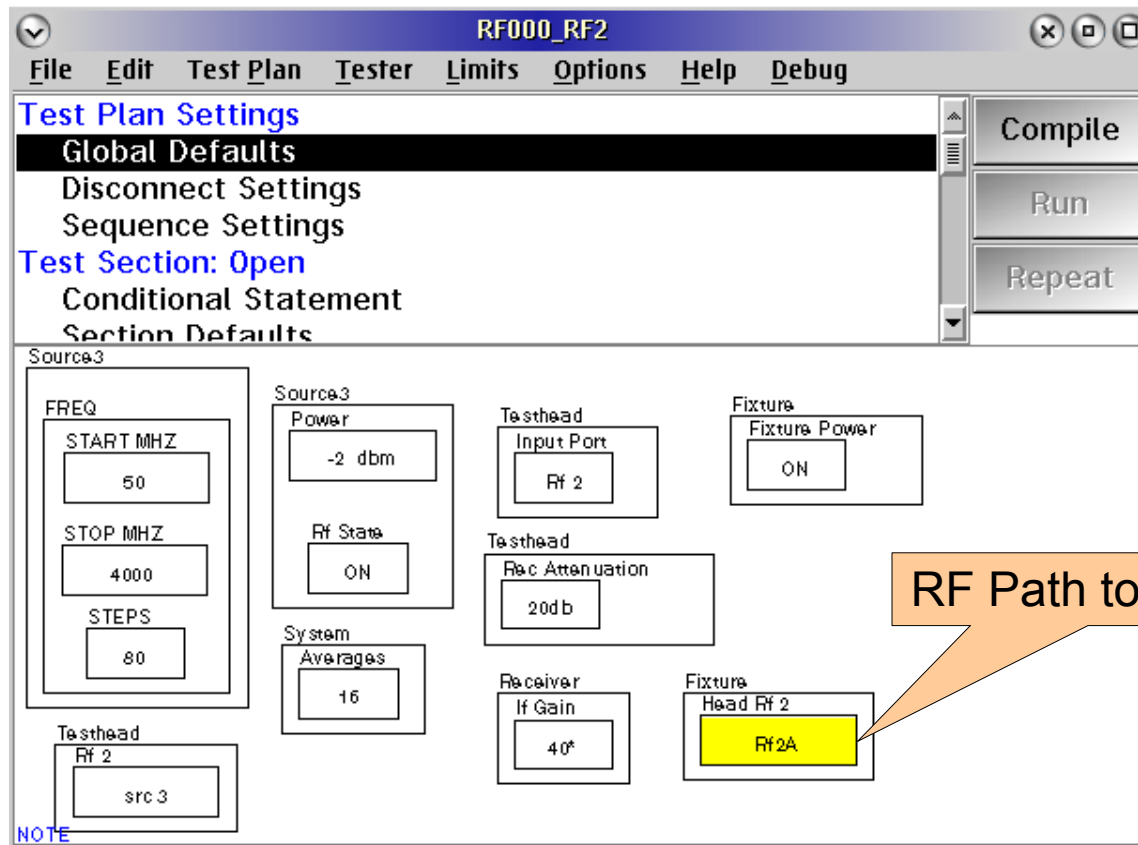
Student Fixture Block Diagram





Editing the Port Template RF000 Fixture

6. Open the new test plan in the edit mode. Also make sure that the fixture file is active.
7. Start in the Global Defaults and edit the RF path button.





Editing the Port Template RF000 Fixture

8. Go to the “Open” test section and redefine the path to be calibrated.

The screenshot shows the RF000_RF2 software interface. The main window has a menu bar (File, Edit, Test Plan, Tester, Limits, Options, Help, Debug) and a left sidebar with a tree view containing: Sequence Settings, Test Section: Open, Conditional Statement, Section Defaults, Test: open (highlighted), Test Section: Short, and Conditional Statement. On the right are buttons for Compile, Run, and Repeat. An orange callout box with the text "RMBC then select from list" points to the "Test: open" section. Below the sidebar is a block diagram with components: Fixture (RESET CAL, PathRf2Rf2A), Source3 (INSTR STATE SOURCE, Frequency), vna (MEAS, S11 Only), and System (CALC, add1). A "Cal Data" dialog box is open, showing a list of paths: PathRf2DutRf3Demod_LO, PathRf3DutRf1PA_IN, PathRf6DutRf4PA Out, PathRf6DutRf5Mod Out, PathRf6DutRf6DModin, PathRf7DutRf2Mod_LO, PathWf2DutP2Q_In, and PathWf3DutP1I_In. The dialog has "select" and "cancel" buttons at the bottom.



Editing the Port Cal Plan RF000 Fixture

9. Go to the “Calc” test section and redefine the “Cal Data” data save button.

The screenshot shows the RF000_R test plan editor. The 'Test: calc' section is selected. A context menu is open over the 'calc' test block, with 'CalVarName' highlighted. A 'Select Cal Data Name' dialog box is open, showing a list of data names with 'PathRf2DutRf3Demod_L0' selected. Callouts indicate the steps: 'RMBC then select CalVarName' and 'Select Cal Data Name'.

System LOCAL VAR SOURCE open A

System LOCAL VAR SOURCE term A

System LOCAL VAR SOURCE short A

System Select Inspect Edit Note... Delete Group Selected Settings... Edit Actions... **CalVarName** View Data

System CALC calc A

Fixture CAL DATA PathRf2Rf2A

Select Cal Data Name

PathRf2DutRf3Demod_L0
PathRf3DutRf1PA_IN
PathRf6DutRf4PA Out
PathRf6DutRf5Mod Out
PathRf6DutRf6Modin
PathRf7DutRf2Mod_L0
PathWf2DutP2Q_In
PathWf3DutP1I_In

select cancel

RMBC then select CalVarName

Select Cal Data Name



Editing the Port Cal Plan RF000 Fixture

10. Go to the “Global Defaults” section and adjust the frequency span, frequency steps, power, averages, and IF gain to suit the specific application.

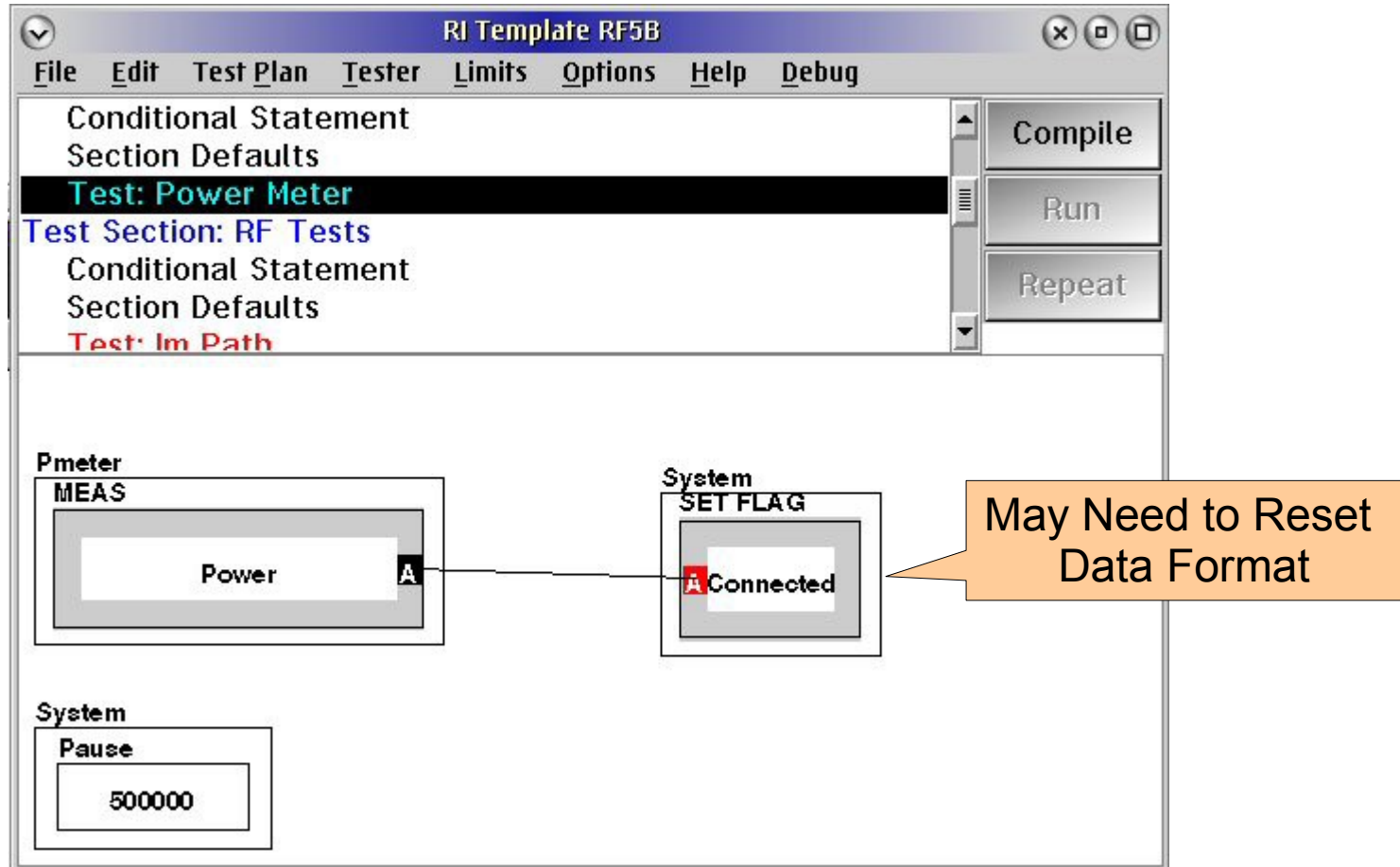
The screenshot shows the 'RF000_RF2' software window with the 'Global Defaults' section selected. The interface includes a menu bar (File, Edit, Test Plan, Tester, Limits, Options, Help, Debug) and buttons for Compile, Run, and Repeat. The main area contains several configuration panels:

- Frequency Span and Steps:** A panel with input fields for START MHZ (50), STOP MHZ (4000), and STEPS (80).
- Power Level:** A panel with a Power input field set to -2 dbm and an Rf State checkbox checked (ON).
- Averages:** A panel with an Averages input field set to 16.
- IF Gain:** A panel with an If Gain input field set to 40°.
- Testhead:** A panel with an Input Port set to Rf 2 and a Rec Attenuation set to 20db.
- Fixture:** A panel with a Fixture Power checkbox checked (ON) and a Fixture Head Rf 2 dropdown menu set to Rf 2A.
- System:** A panel with a Testhead dropdown menu set to Rf 2 and a Source3 dropdown menu set to src 3.

Callout boxes with orange backgrounds and white text point to these specific settings: 'Frequency Span and Steps' points to the START, STOP, and STEPS fields; 'Power Level' points to the Power field; 'Averages' points to the Averages field; and 'IF Gain' points to the If Gain field.



On Power Meter Cals





Other Things to Look For

- Look for warnings in the main message window and adjust the IF Gain and RF source power as needed.

Receiver

If Gain

40*

Source3

Power

-2 dbm

Rf State

ON

System

OPERATOR PAUSE

Connect open to RF2

- Edit the Operator Pause as needed.



Checking the Port Cal Data RF000 Fixture

1. Go to “Fixtures” from the pull down menu in the main window.

1. Activate
2. RMBC
3. Calibration Inspect

- Deactivate
- Calibrate
- Calibration Inspect**
- Save Calibration
- Get Serial Number
- Become Passive
- Copy
- Edit
- Serial Number

Inspecting Cal Table for: Fixture

Calibration Entry

PathRf2DutRf3Demod	RiFrVs2pS(0.10.00.01.00.01.00.00.00.0 20000.00.00
PathRf3DutRf1PA_In	
PathRf6DutRf4PA Out	
PathRf6DutRf5Mod Out	
PathRf6DutRf6Modin	
PathRf7DutRf2Mod_LO	
PathWf2DutP2Q_In	
PathWf3DutP1I_In	

Path Definition

Cal Data (default)



Viewing the Port Cal Data RF000 Fixture

2. High light the path definition and with a RMBC choose “View”.

Path Definition

Cal Data

View

- Add Item
- Update Table
- View**
- Remove Item
- initialize Item
- Reset Item
- Save Item...
- Load Item...
- Convert To Spline
- Convert From Spline

3. Choose “Rectangular from the viewer.

Select Viewer

- Moving Strip Chart
- Polar
- Rectangular**
- Smith Chart
- Strip Chart
- Validation Plot

Select

Select Cancel



Viewing the Port Cal Data RF000 Fixture

3. Adjust “Y Parameter” to data type and “Y Format” to data type.

The screenshot shows the Ri RIFrVsLog software interface. The window title is "Ri RIFrVsLog". The menu bar includes "Edit" and "Help". The "USER" field displays "admin on a RiTestSystem at 3-Oct-07 12:43:06 pm". The main area contains a graph with a pink line on a grid. Surrounding the graph are several control panels: "Y PARAMETER" (log), "Y CENTER" (Auto), "Y SCALE" (Auto), "SORT BY" (PARAMETER: frequency, FORMAT: MHz), "NORMALIZE" (OFF, save), "Y FORMAT" (log), "MIN X" (100.000), "PARAMETER" (frequency), "FORMAT" (MHz), and "MAX X" (2000.000). A "MEMO" field is at the bottom left. Callout boxes point to "Y Parameter", "Y Format", "Memo Field", "Auto Center", and "Auto Scale".

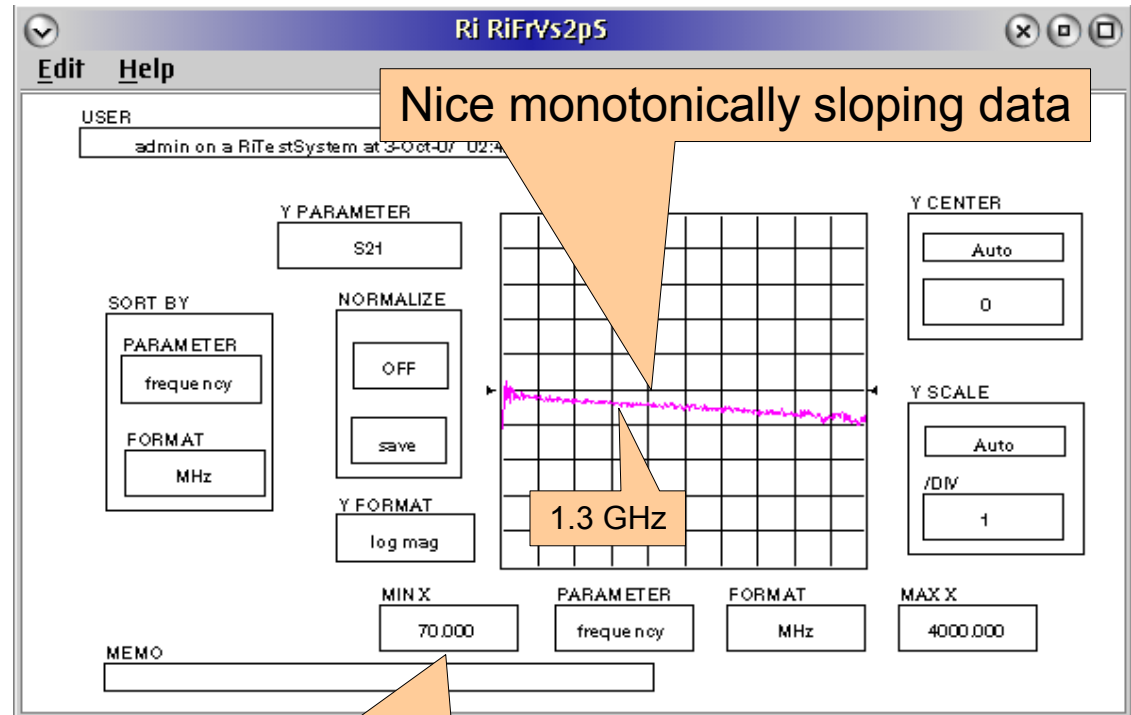
4. Check for proper frequency range, loss level, and/or power level to make sure it represents the application requirements.



Good Data / Bad Data RF000 Fixture

- RF3 to DUTRF thru path.
- No series devices.
- OSL calibration.
- 48MHz – 2GHz DUT test band.

Is this good cal data?



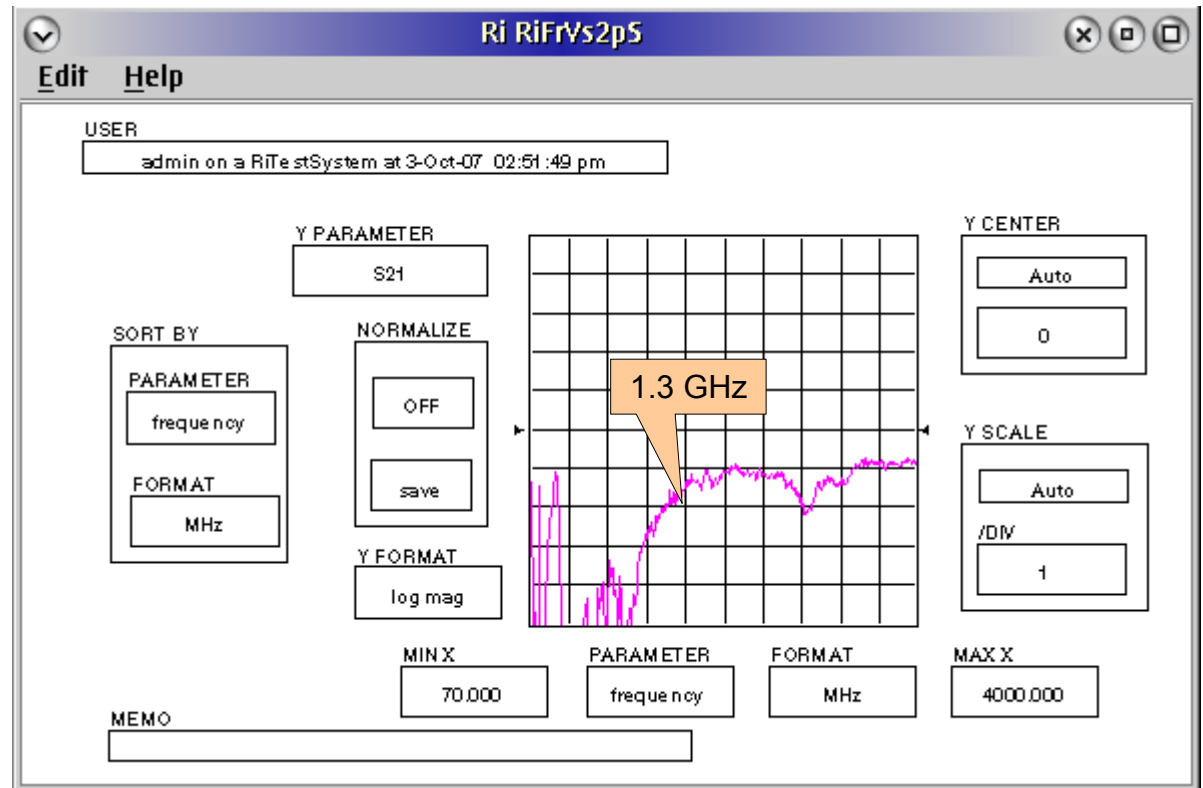
1. Fixture not calibrated to 48MHz.
2. Tester not calibrated to 48MHz.



Why Look at Cal Data? RF000 Fixture

- RF3 to DUTRF thru path.
- No series devices.
- OSL calibration.
- 48MHz – 2GHz DUT test band.

Customer complained of 2DB offset at 1.3GHz between pre an post calibration.





Remember

- Calibration plans are written from templates, copies of other cal plans, or from scratch and as such are prone to error.
- Calibration test plans must be verified good and debugged to represent the application specifics (frequency range, power, calibration type, etc...).
- It is absolutely necessary to look at the calibration data. **NEVER** assume it is correct.