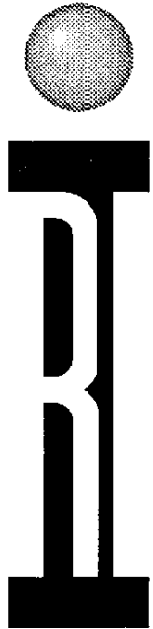


# RI 7100A Microwave Test System On-Site Training Seminar

.....

## Installation & Maintenance



**Roos Instruments**

# Training Seminar Outline

---

- **Introduction**
- **Preparing for the System Installation**
- **System Configuration**
- **System Setup & Startup**
- **System Operation**
- **System Software Backup**
- **Diagnostics and System Recovery**
- **Preventative Maintenance**



# Training Seminar Outline (Continued)

---

- **Repair Policy**
- **Other Topics**



# RI 7100A Microwave Test System

---

- **ATE System**
- **0.1 - 8 GHz**
- **Production & Device Characterization**
- **High Speed & High Volume Testing**
- **Simple, Modular Hardware**
- **Object Oriented Software**
- **Graphical User Interfaces**



# System Components

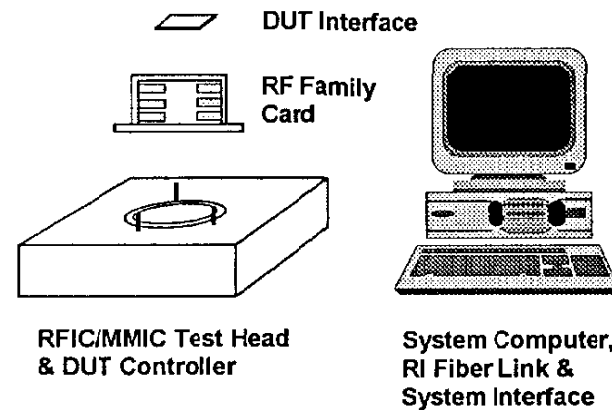
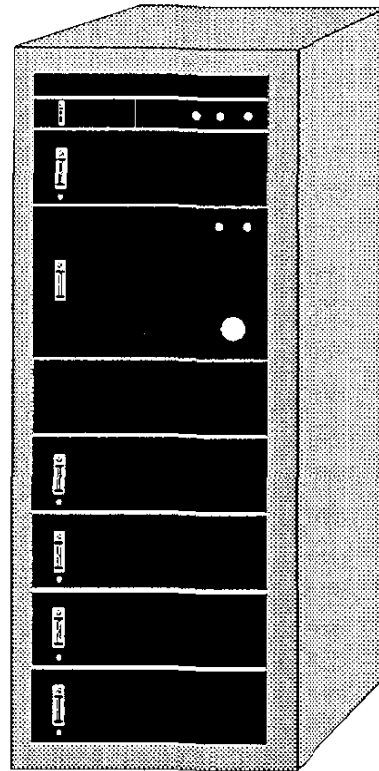
---

- **System Rack & System Instruments**
- **RFIC/MMIC Test Head**
- **Test Fixtures/RF Family Cards & DUT Interface**
- **System Computer & System Software**

# Test System Block Diagram



System Receiver  
System Local Oscillator  
  
RF System Matrix  
  
Source 1 (RF Stimulus)  
Source 2 (RF Intermod)  
System Power Supply



# System Software

---

- **Graphical User Interfaces**
- **Test Panels & Buttons**
- **Copy & Paste Buttons to Create Test Plans**
- **On Screen Help**



## Typical System: Physical Characteristics

---

- **Weight:** 940 lbs (426 kg)
- **AC:** 100, 120, 200, 240 Vac  
50 - 60 Hz, 3000 VA maximum
- **AC Receptacles Required**  
System Rack: Two 10A Line Receptacles  
System Computer: two Standard Line Receptacles
- **Operating Conditions:** 18 to 30 degrees C  
Non-Operating Conditions: 0 to 40 degrees C
- **Special Plumbing & Gas Requirements:** None





# General Comments

---

- **System Installation is Provided by Roos Instruments**
- **The System is on Rollers and can be moved**
- **Please Leave Room for Access to the Back of the System**
- **The Test System is connected to the System Computer by the RI Fiber Link - RIFL (2 fiber cables)**
- **Please Follow ESD Procedures**



# Equipment List

---

- **RF Family Card/Test Fixture and DUT Interface**
- **RFIC/MMIC Test Head & Programmable DUT Controller**
- **System Receiver**
- **RF/Microwave Stimulus Sources**
- **RF System Matrix & System Power Supply**
- **System Rack & Test Head Manipulator**
- **System Computer w/RIFL Interface**
- **System Software**



# RF Family Card/Test Fixture & DUT Interface

---

- **Functions:**
  - Custom DC, LF & RF Signal Conditioning**
  - Specialized Signal Routing to Test Head**
  - Physical Interface to Part Handler or Prober**
- **Typical Configuration Contains:**
  - DUT Interface and Fixturing**
  - RF/Microwave Switches**
- **Connections:**
  - DUT Contacts**
  - DC, LF & Digital Inputs/Outputs to the DUT Controller**
  - RF Inputs/Outputs to Test Head's RF Test Ports**



# RFIC/MMIC Test Head

---

- **Functions:**
  - RF Signal Routing - DUT to Sources & System Receiver**
  - RF Signal Separation - S Parameters**
  - Provide Noise Source - Noise Figure**
- **Contains:**
  - RF Switching**
  - Ovenized S Parameter Test Sets**
  - RF Noise Sources**
  - RF Pre-Amps**
  - RIFL Interface and Switch Control**



# RFIC/MMIC Test Head (Continued)

---

- **Connections:**

- RF Stimulus Sources (1 thru 3, via RF System Matrix)**

- System Receiver (Rec, Low Band Rec, via System Matrix)**

- Four RF Test Ports (2, 3, 6 & 7)**

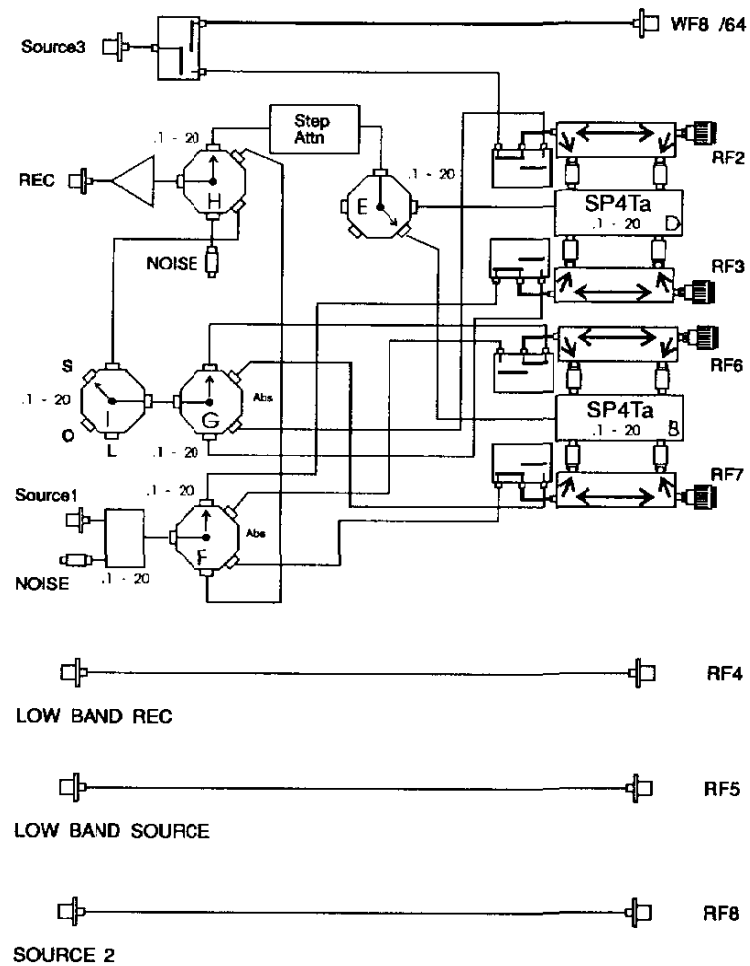
- Two LF Test Ports (4 & 5)**

- RIFL Interface (2 connections)**

- DC Power Connector**



# 4 Port RF Test Head Block Diagram



# RI 7100A Test Head Switch Definitions

.....  
Switch Descriptions

- B Single Pole 4 Throw switch for incident and reflected signals for RF6 & RF7
- D Single Pole 4 Throw switch for incident and reflected signals for RF2 & RF3
- F Source switch to connect Source 1 or Noise Source RF3, 6, 7 or switch I
- G Receive switch to connect direct RF2, 3, 6 and 7 to switch I
- H Receive Select switch from switch B or D (coupled ports), switch I, G or system cal noise source
- I Bi-State Load switch for L1 and L2

## Port Coupler Switch

RF2 connected to source 3 or switch G (Receive)

RF3 connected to switch F (noise source or source 1) or switch G (Receive)

RF6 connected to switch F (noise source or source 1) or switch G (Receive)

RF7 connected to switch F (noise source or source 1) or switch G (Receive)



# RF System Matrix

---

- **Functions:**

  - RF Signal Conditioning

  - Combine RF Intermod Tones

- **Contains:**

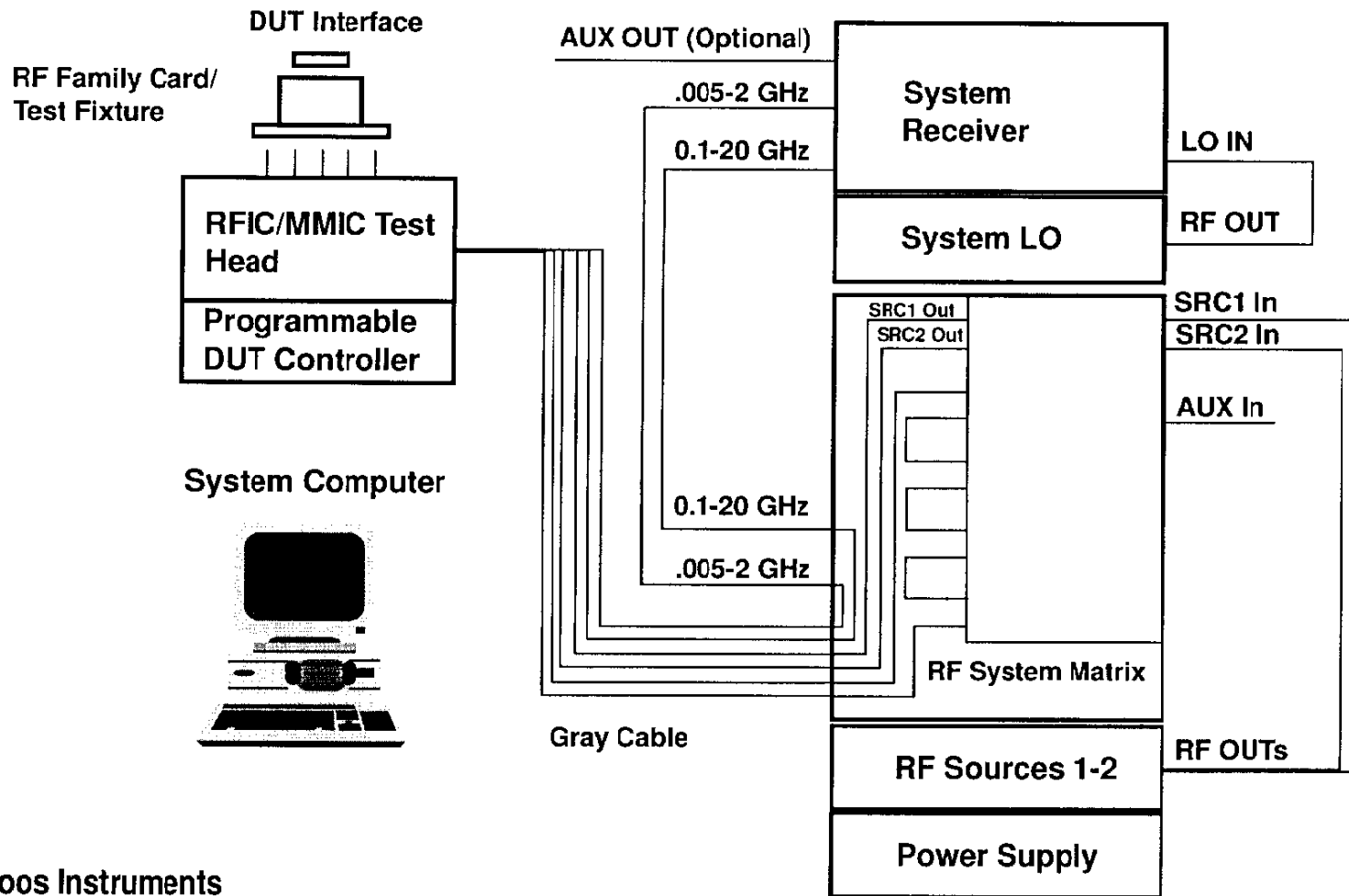
  - Six Plug-in RF Slots

  - One Dual Attenuator/Amplifier/Combiner Module





# RF System Matrix - RF Connections



## RF System Matrix (Continued)

---

- **Connections:**

- Rec Input from Test Head (Gray Cable)**

- SRC1-3 Outputs to Test Head (Gray Cable)**

- RF Output to System Receiver (Front Panel)**

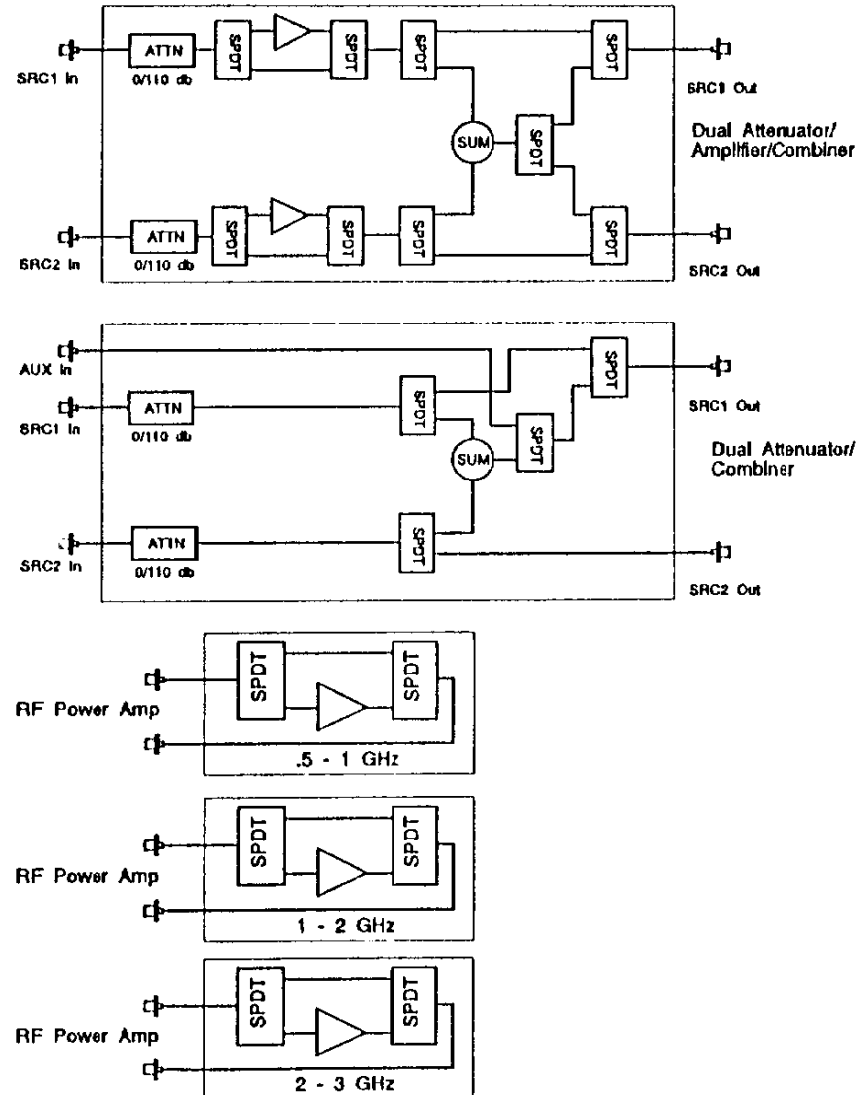
- RF Source Inputs ( RF Sources 1-3, Rear Panel)**

- RIFL Interface (2 connections, Rear Panel)**

- AC Power (1 Connection per Module, Rear Panel)**



# RF System Matrix Modules Available



# System Receiver

---

- **Function:**

- Down Convert RF Signals to IF**

- Perform all RF Signal Measurements**

- **Process:**

- Down Convert RF Signals**

- Condition IF Signals**

- Create I & Q Signal Components**

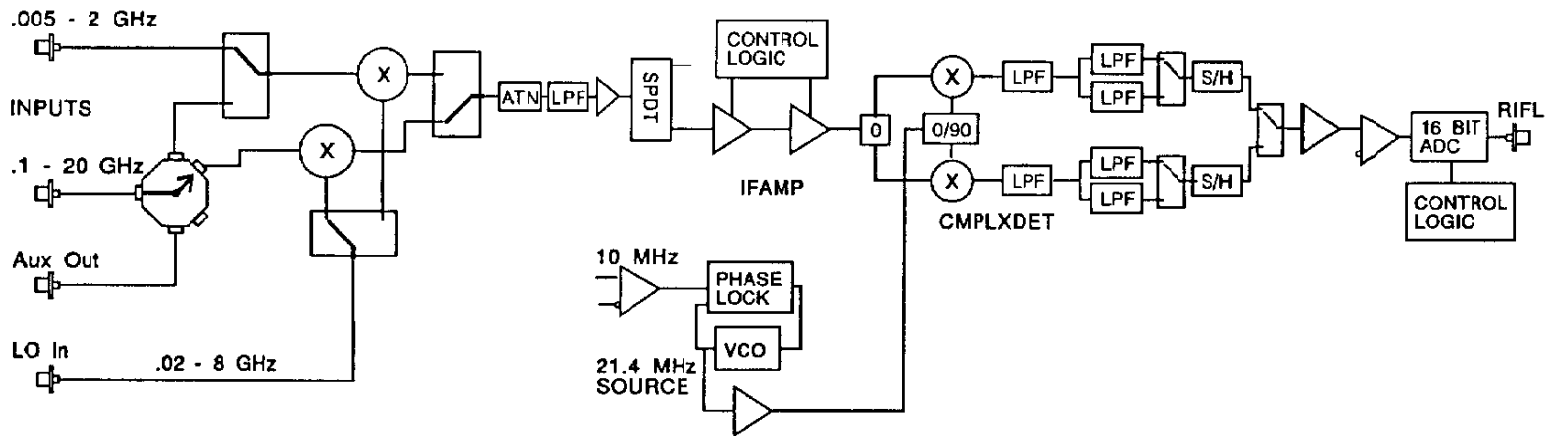
- Condition I & Q Signals**

- Sample and Digitize I & Q Signals**

- Send Digitized Data to System Computer (via RIFL)**



# System Receiver Block Diagram



## System Receiver (Continued)

---

- **Contains:**

- RF/Microwave Down-Converter (Mixers & Switches)**

- Aux Output to External Spectrum Analyzer (Optional)**

- Mother Board w/plug-in Receiver Modules**

- RIFL Interface Module**

- RIFL to GPIB Decoder Module (Optional)**

- Power Supplies**



## System Receiver (Continued)

---

- **Connections:**

- 0.1 - 20 GHz Input from Test Head (via RF Matrix)**

- 0.005 -2 GHz Input from Test Head (via RF Matrix)**

- LO Input from System LO (System Local Oscillator)**

- AUX OUT to External Spectrum Analyzer (Optional)**

- RIFL Interface (2 Connections)**

- GPIB Interface (Optional)**

- AC Power Receptacle**



# RF/Microwave System Sources

---

- **Function:**  
RF Stimulus to DUT or System Local Oscillator
- **Typical Settings:**  
RF Level, Frequency, RF ON/OFF
- **Connections:**  
RF Output to:
  - 2 Sources to Test Head (via RF System Matrix)
  - 1 Source to System Receiver (System LO)RIFL Interface  
AC Power Receptacle





# Programmable DUT Controller

---

- **Functions:**
  - DC Bias (Force & Sense)**
  - DUT Control Signals**
  - DC & LF Measurement**
  - LF Stimulus Signals (Including I & Q Tones)**
- **Contains Application Specific Plug-in Modules:**
  - CW & Pulsed Bias**
  - Digital Control Lines**
  - DC Voltage Measurement**
  - Base Band Analyzer**
  - Arbitrary Waveform Synthesizer**
  - Low Noise Clock Output (/64 Output)**



# Programmable DUT Controller (Continued)

---

- **Connections:**

- DC, Digital & LF I/O to Test Fixture (via Test Head)**

- Packaged Part Handler &/or Prober Control Interface**

- DC Input from Power Supply in System Rack**

- RIFL Interface**



# System Computer

---

- **Functions:**

- User Interface**

- System Management**

- Test Plan Generation & Execution**

- Measurement Control and Signal Processing**

- Data Analysis**

- **Contains:**

- IBM Compatible Personal Computer**

- OS/2 Operating System**

- RI System Software & SQL Relational Data Base**

- System/RIFL Interface**



## System Computer (Continued)

---

- **Connections:**

- RIFL Interface**

- Input/Output Ports (mouse, keyboard & printer)**

- Modem Interface (Optional)**

- Computer Network Interface (Optional)**

- 2 AC Power Receptacles**



# System Setup and Start-up: Check List

---

- **Verify that all Instruments are Present (See Check List)**
- **Verify that all Cable Connections are Properly Connected (See Check List)**
- **Verify that the Test Fixture, Test Head and Part Handler (or On-Wafer Prober) are Properly Connected**
- **Perform System Turn-on (See Check List)**
- **Perform Software Start-up (See Check List)**
- **Perform System Verification (See Check List)**



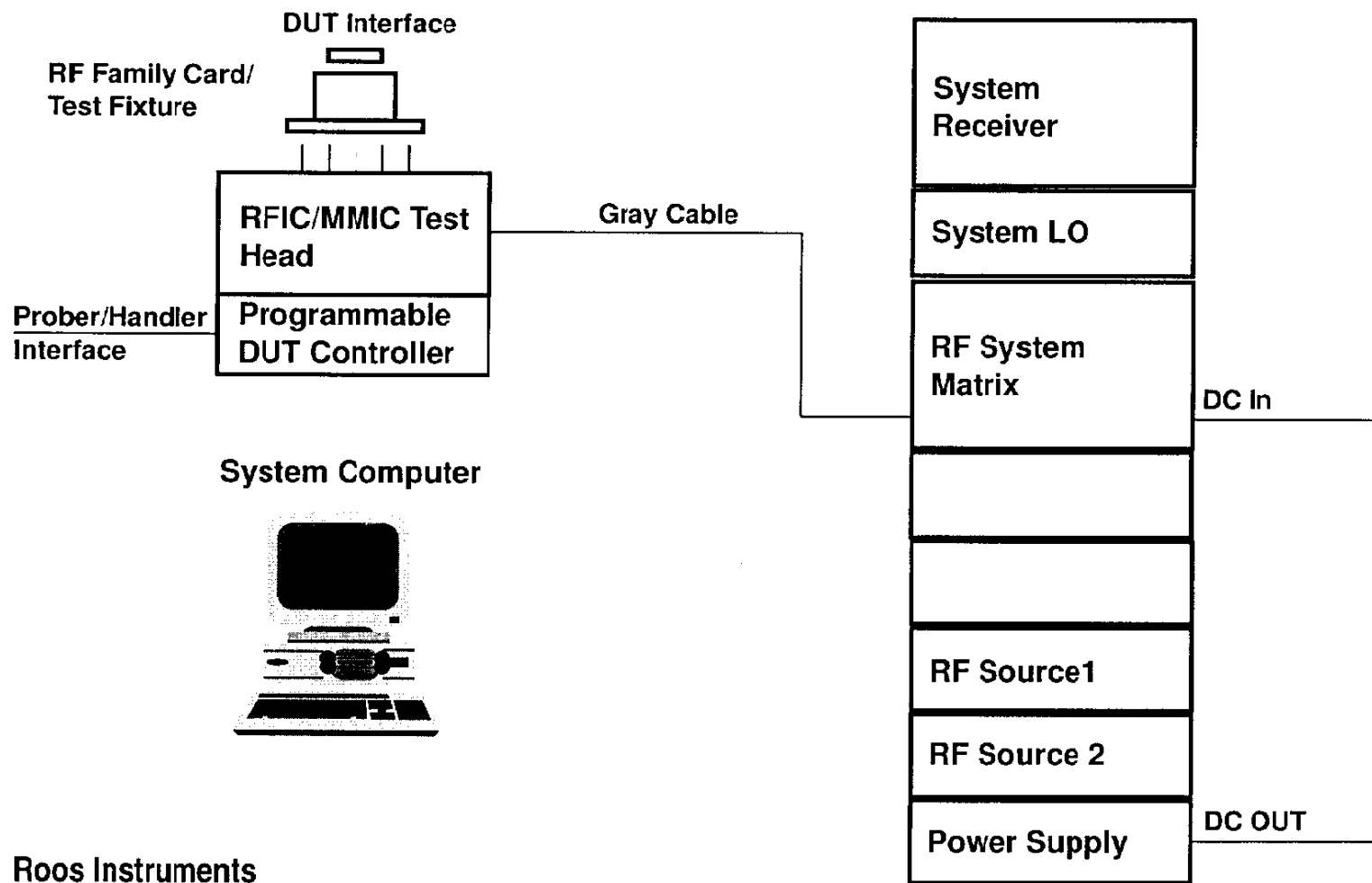
# System Instrumentation: Check List

---

- **RF Family Card/Test Fixture and DUT Interface**
- **RFIC/MMIC Test Head & Programmable DUT Controller**
- **System Receiver**
- **4 RF/Microwave Sources**
- **RF System Matrix & System Power Supply**
- **System Rack & Test Head Manipulator (Optional)**
- **System Computer**
- **System Software**
- **RIFL Interface (Plug-in card in the System Computer)**



# DC, LF & Digital Control Connections



# System Cable Connections: Check List

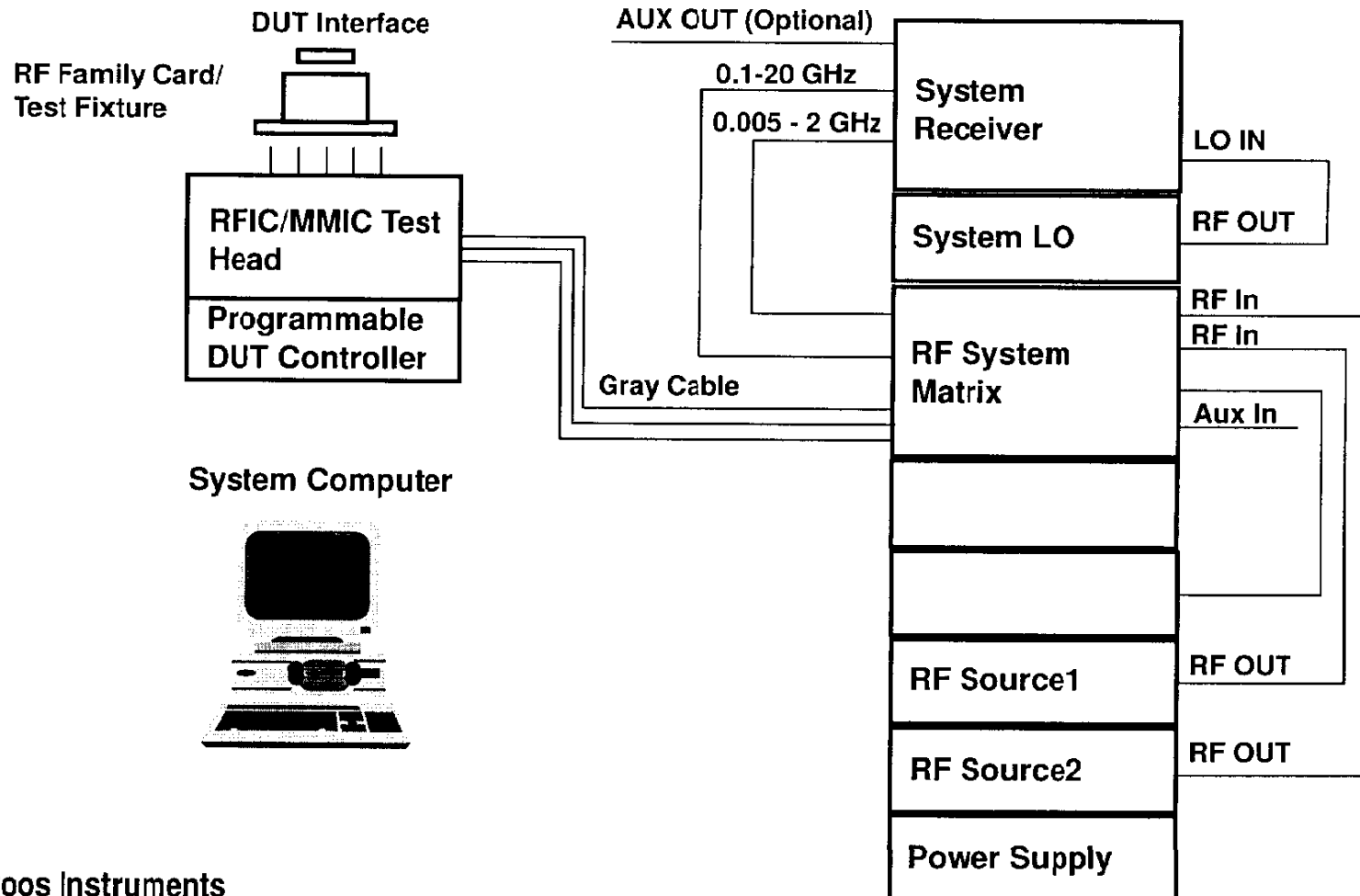
---

- **RF & IF**
- **DC, LF & Digital**
- **10 MHz Time Base/Frequency Reference**
- **RIFL**
- **GPIB**
- **AC and/or DC Power**

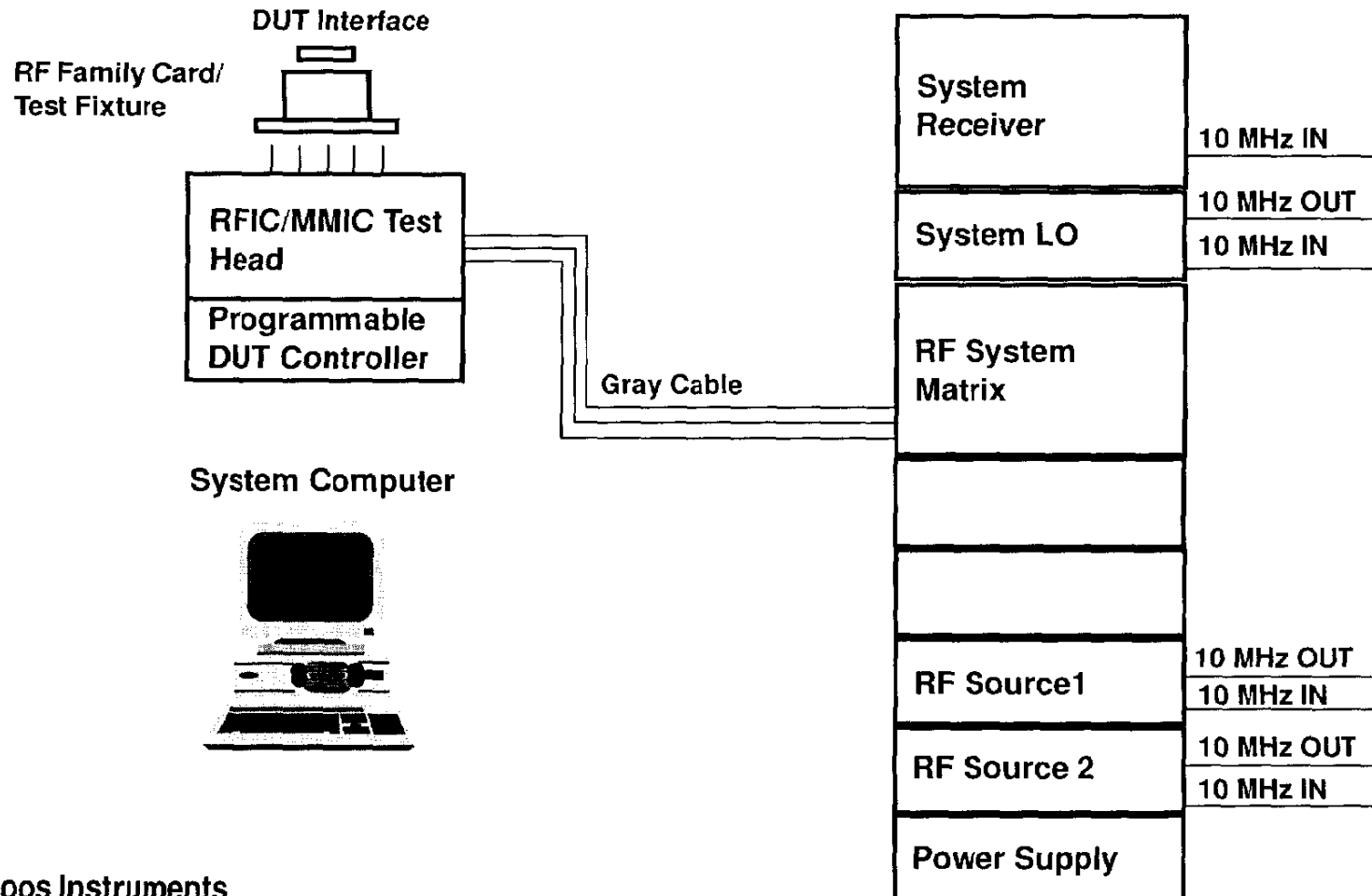




# RF and IF Signal Connections



# 10 MHz Time Base/Frequency Reference



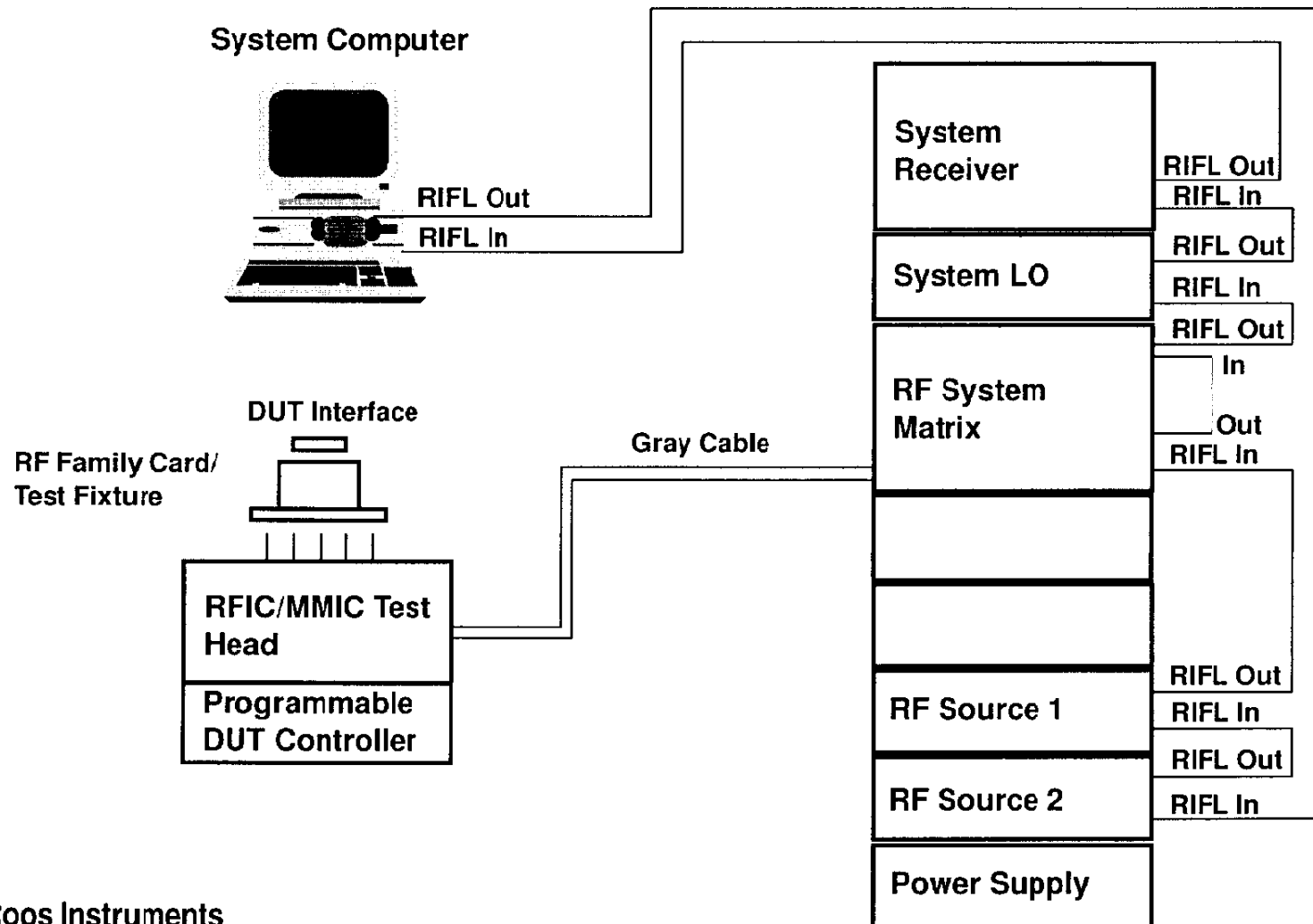
# RI Fiber Link (RIFL) Connections

---

- **Connect:**
  - Blue Cable Connectors to Blue Sockets**
  - Gray Cable Connectors to Gray Sockets**
- **Comments:**
  - RIFL Out: Gray Sockets**
  - RIFL In: Blue Sockets**

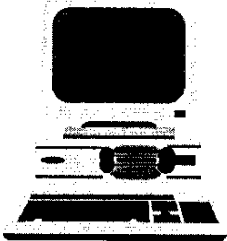


# RIFL Connections (Continued)



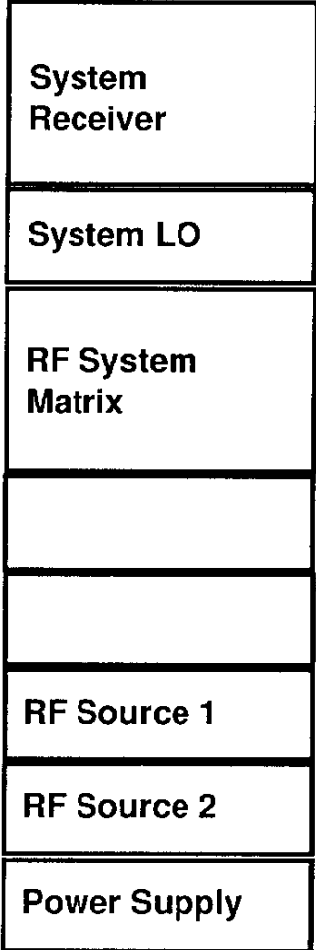
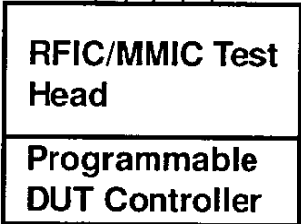
# GPIB Connections

System Computer



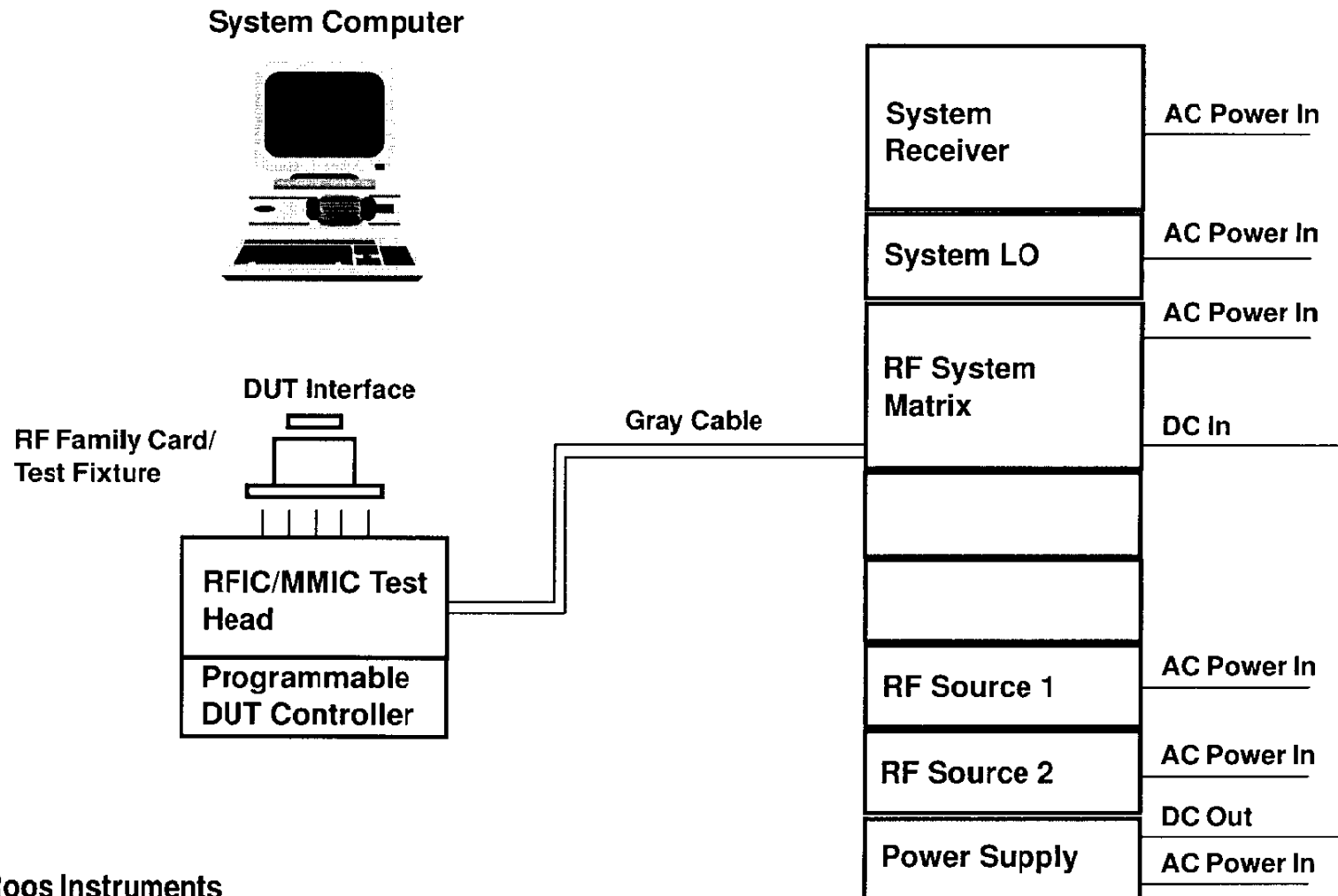
DUT Interface

RF Family Card/  
Test Fixture

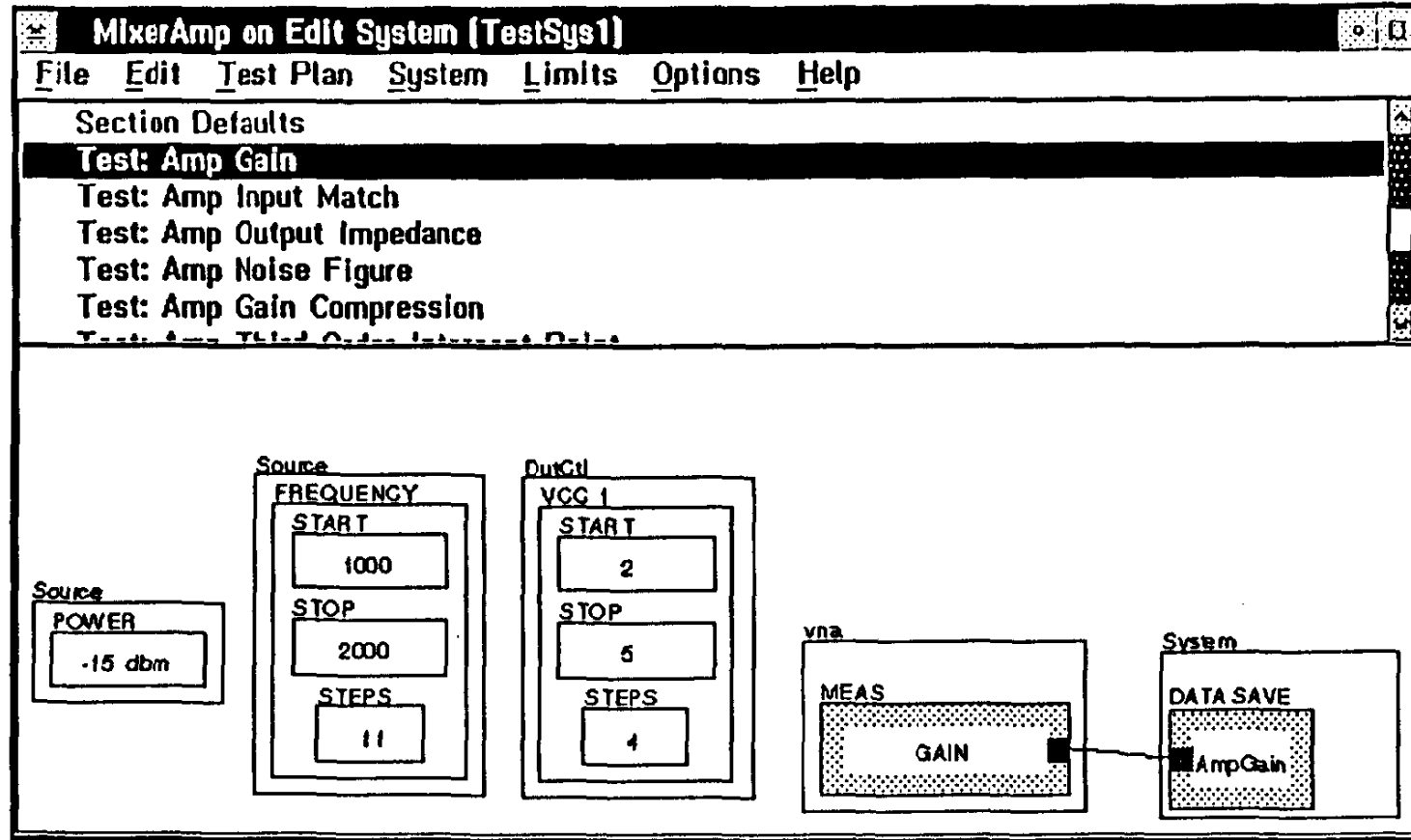


GPIB  
to External GPIB  
Instruments

# AC and DC Power Connections



# Typical Test Plan



# Measurement Buttons

The screenshot shows the 'RoosA Viewer' software interface. On the left is a tree view with the following items: Prober, Receiver, Rfl, Source, System, TestHead, and vna. The 'vna' item is selected. In the center is a list of measurement types: 'measurements', 'amplifier meas' (which is highlighted), and 'uncorrected meas'. On the right is a help window titled 'MEAS GAIN' with the text: 'Use this button to perform a set of 2 port, error corrected, S parameter measurements and extract the linear magnitude of S21'. Below these elements is a grid of seven measurement buttons, each with a 'MEAS' label above it:

- GAIN
- Harmonics
- Output Match
- Input VSWR
- Reverse Gain
- Fwd GAIN
- Input Match



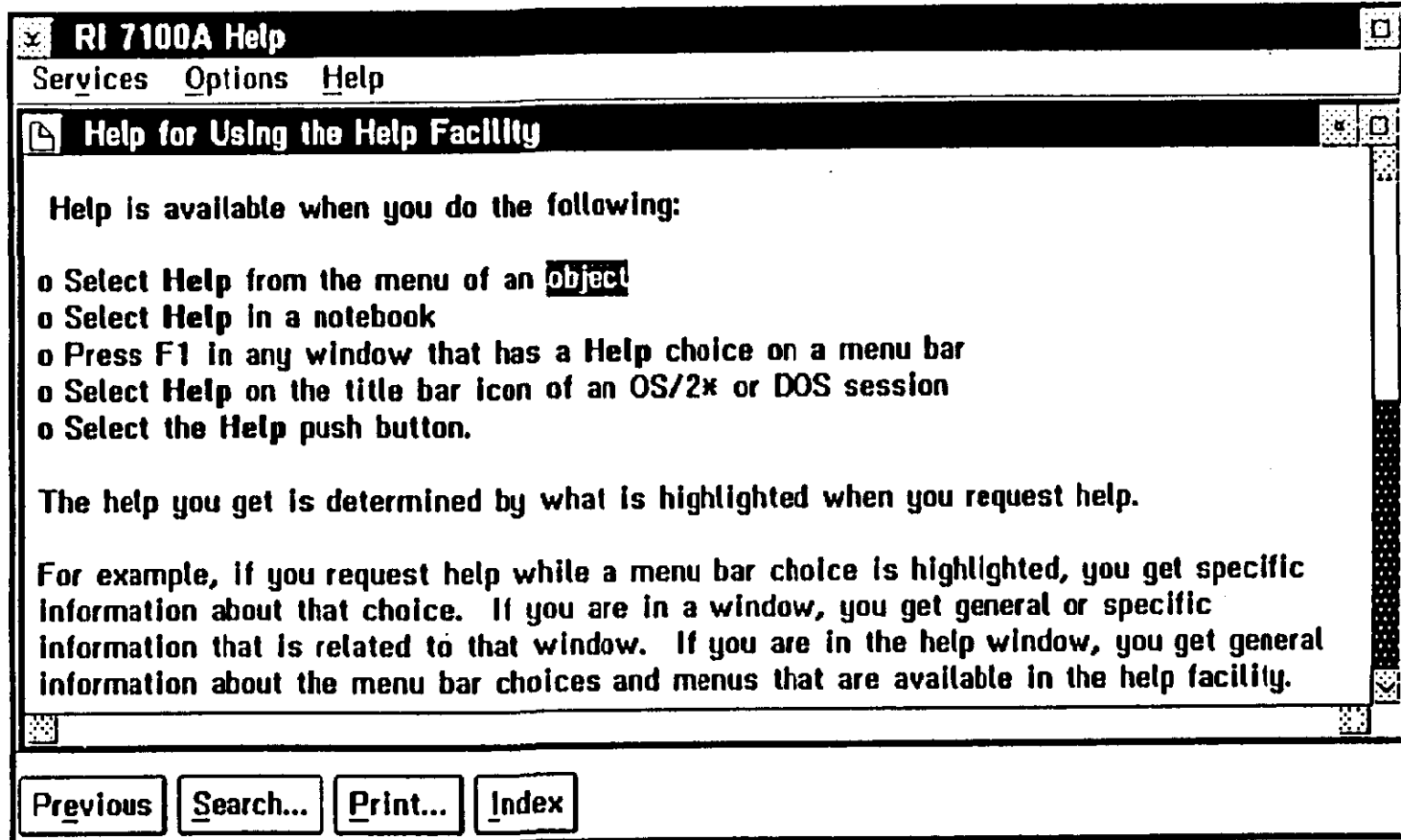


# Measurement State Buttons

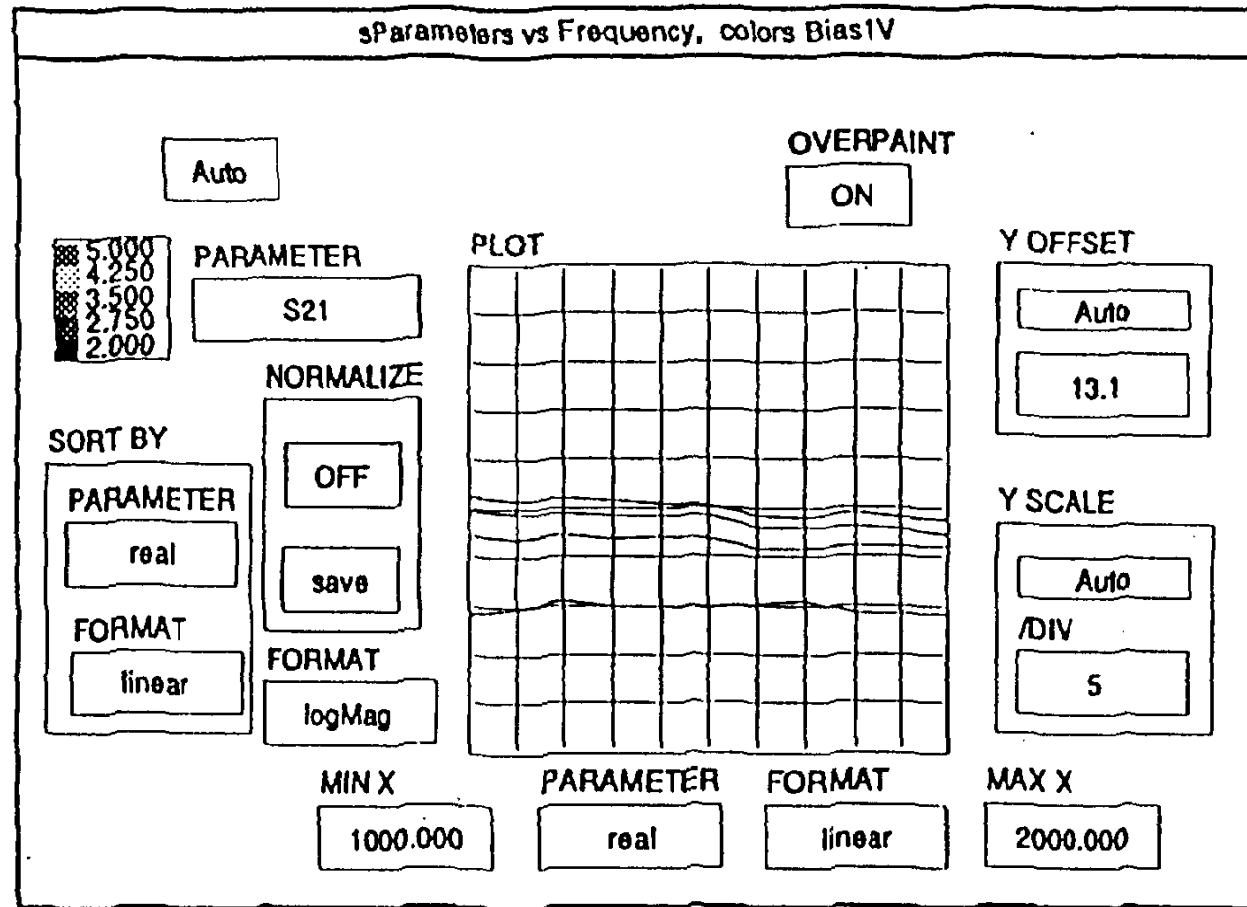
The screenshot shows the 'RoosA Viewer' software interface. On the left is a vertical menu with options: Prober, Receiver, Rfl, Source (highlighted), System, TestHead, and vna. The main area is divided into two sections. The top section contains a dropdown menu with 'state' and 'calibration' options, and a text box titled 'POWER' with the following text: 'Set the power at the device to a dbm value. Resolution is 0.1 dbm and the range is set by the step attenuator value. The ALC range is typically 40 db.' The bottom section contains several control buttons: 'MASTER' (empty), 'FREQUENCY' (10 Mhz), 'MASTER SCALE' (1), 'POWER' (-15 dbm), 'MASTER OFFSET' (10 Mhz), 'ATTN' (-20 to +20), 'RF STATE' (ON), 'TRACKING' (OFF), and 'ALC MODE' (fast).

# On-Screen Help

.....



# RI Data Viewer



## System Turn-on: Check List

---

- Turn on the System Rack
- Turn on the Computer Peripherals
- Turn on the System Computer



# Software Start-up: Check List

---

- **Open the RI Application**
  - Select Ri Apps Icon & Double-Click mouse button 1
  - System: Opens RI Application & Displays Msg Window
  
- **Logon to the System**
  - Select Menu Choices: System & Logon...
  - System Opens: Users Container Window
  - Select your User Name & Double-Click mouse button 1
  - System will turn your User Name Object *Red*



## Software Start-up: Check List (Continued)

.....

- **Start the System**

Select the Title Bar on the RI Message Window

System: Message Window is now the Active Window

Select the Menu Choices: System & Start-up

System: Presets the System Instrumentation

System will display the Status of each Instrument and  
"Fiber link connected &/or Hardware Mode" if OK



# Software Start-up: Check List (Continued)

.....

- **Starting the System (Continued)**

  - Check the Status of each instrument**

    - All of the Instrument Displays should be on**

    - All of the RIFL Status Indicators should be**

      - RIFL is OK**

      - Blinking Red Light - RIFL is Active**

      - Red Light - RIFL is Blocked**

      - Light Off - Instrument Off**

    - If the System Displays an Error &/or Warning message**

      - Correct the Problem Discovered**

      - Select the Menu Choices: System & Start-up again**

- **System Start-up is Complete**



# Automated Testing: Check List

---

- **Verify and/or Perform System Setup & Start-up**
- **Configure DUT Interface & Test Fixture for DUT**
- **Open: Handler Container Window & Select Handler**
- **Open: Test Exec Container Window**
- **Open: DUT's Package Test Exec**
- **Enter 1st Part's: Lot, Sublot and Part #**
- **Select Green Button, Automated Testing will Begin**
- **Halt Testing: Select Red Stop or Pause Button**
- **Resume Testing: Select Green or Button**





# System Software Recovery

---

- **First Choice:**

**Press & Hold the Ctrl Key and Press the Break Key**

**Halts RI Apps Program & Displays Error Dialog Box**

**Select Ok to close the Error Dialog Box**

**Select the RI Message Window**

**Select Menu Choices: System & Quit...**

**Select Yes to close RI Apps**

**Perform System Software Start-up**

**Perform Automated Testing Procedure**

**Repeat the Testing of the Last Part**



## Recommended Responses (Continued)

---

- **Second Choice:**

**Press & Hold the Ctrl Key and Press the Esc Key**

**System displays Error Dialog Box after many seconds**

**Select OK to Close the Ri Apps Program**

**Perform System Software Start-up**

**Perform Automated Testing Procedure**

**Repeat the Testing of the Last Part**



# System Software Recovery

---

- **First Choice:**

**Press & Hold the Ctrl Key and Press the Break Key**  
**Halts RI Apps Program & Displays Error Dialog Box**  
**Select Ok to close the Error Dialog Box**  
**Select the RI Message Window**  
**Select Menu Choices: System & Quit...**  
**Select Yes to close RI Apps**  
**Perform System Software Start-up**  
**Perform Automated Testing Procedure**  
**Repeat the Testing of the Last Part**



## Recommended Responses (Continued)

---

- **Second Choice:**

**Press & Hold the Ctrl Key and Press the Esc Key**

**System displays Error Dialog Box after many seconds**

**Select OK to Close the Ri Apps Program**

**Perform System Software Start-up**

**Perform Automated Testing Procedure**

**Repeat the Testing of the Last Part**



## Recommended Responses (Continued)

---

- **Last Choice:**
  - Press and Hold Ctrl & Alt and Press the Delete Key**
  - This Reboots the Computer**
  - Perform System Software Start-up**
  - Perform Automated Testing Procedure**
  - Repeat the Testing of the Last Part**
- **Note: The System saves each part's test data after all of the tests have been performed**



# Documenting Software Errors

---

- **If you find a Software Bug, Please help us by Faxing the following information about the bug to Roos Instruments:**
  - Description of the Bug Found**
  - Procedure to Duplicate the Bug**
- **An Error Log Fax Sheet is Provided in Your Notebook**



# Re-Booting the Entire System Software

---

- Insert the Emergency Boot Disk 1 into Floppy Drive A
- Turn On the System Computer or press the Reset switch
- Insert the Emergency Boot Disk 2 into Floppy Drive A when Prompted
- Insert the Emergency Boot Disk 3 when [A:\] is displayed
- Insert the Back-up Tape with the Last System Back-up
- Enter the command SR & press the Enter key
- Follow the instructions provided by the system



## Re-Booting the System Software (Continued)

.....

- **The System will begin restoring the System Software and Data Base Files. This process takes approximately 30 seconds/MByte**
- **Remove the Tape and Disk when finished**
- **Press and Hold Ctrl & Alt and Press the Delete Key to restart the System**





# Suggested Preventative Maintenance Schedule

---

- **Daily and/or After System Start-up**

- Check Connections:**

- Part Handler/On-Wafer Prober**

- Test Fixture/Family Card**

- Test Head Connections**



# Suggested Preventative Maintenance Schedule

---

- **6 Month Intervals**
  - Perform DC Calibration**
  - Perform Source Power Calibration**
  - Perform Receive Power Calibration**
  - Perform Test Head Calibration**
  - Perform Noise Source Calibration**



# Calibration Test Plans

---

- **Calibration Requires Admin Privileges or Higher**
- **Each Physical Instrument has a Separate Set of Cal Tests**
- **System Calibration is required every 6 months**
- **RI will Perform the Calibrations for the First Year**
- **The Cal Test Exec leads the Operator thru the Cal Procedure**
- **Required Calibration Standards:**
  - RF Power Meter, 5 1/2 Digits DVM & System Calibration Kit**



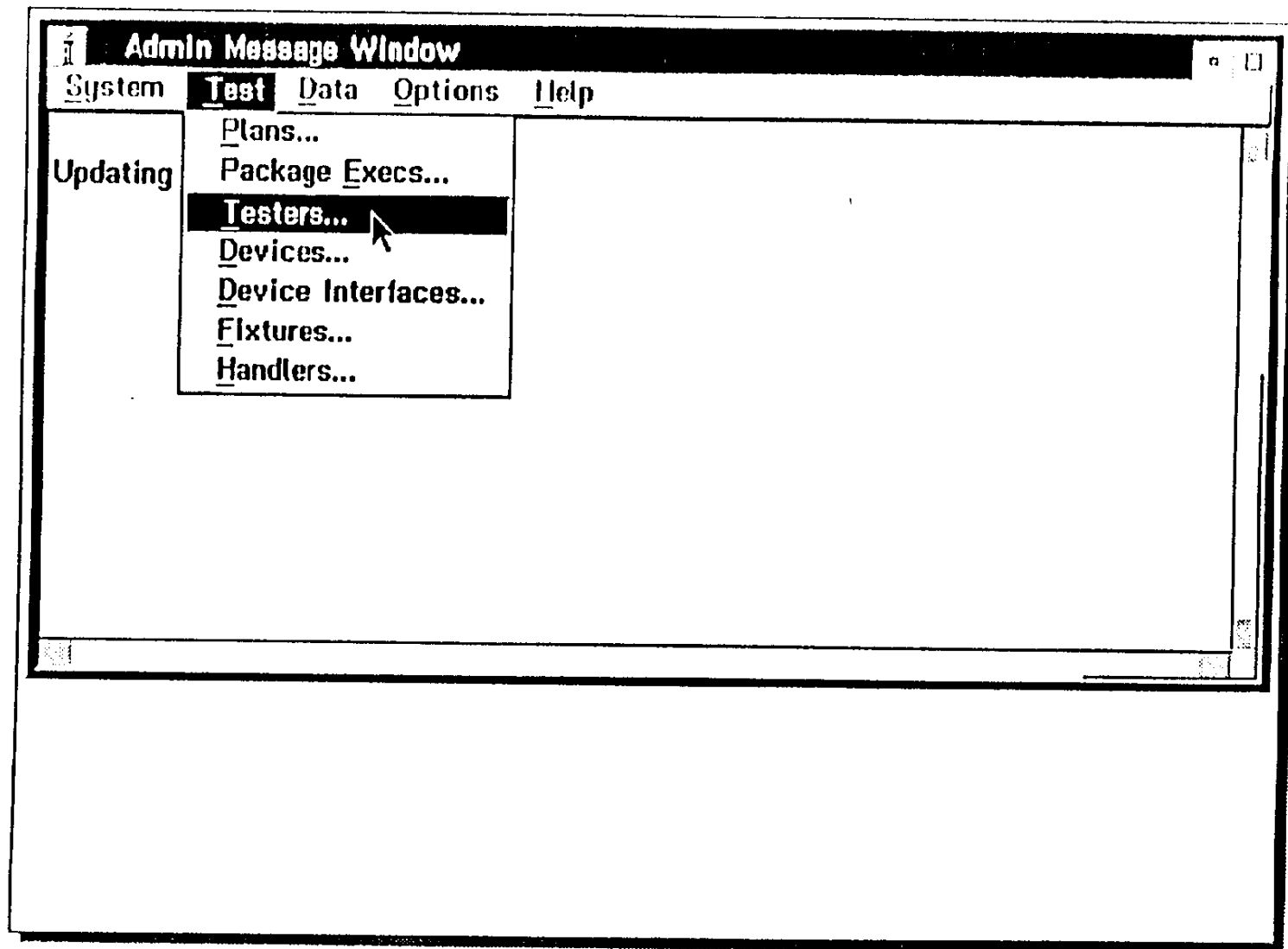
# System Calibration Procedure

---

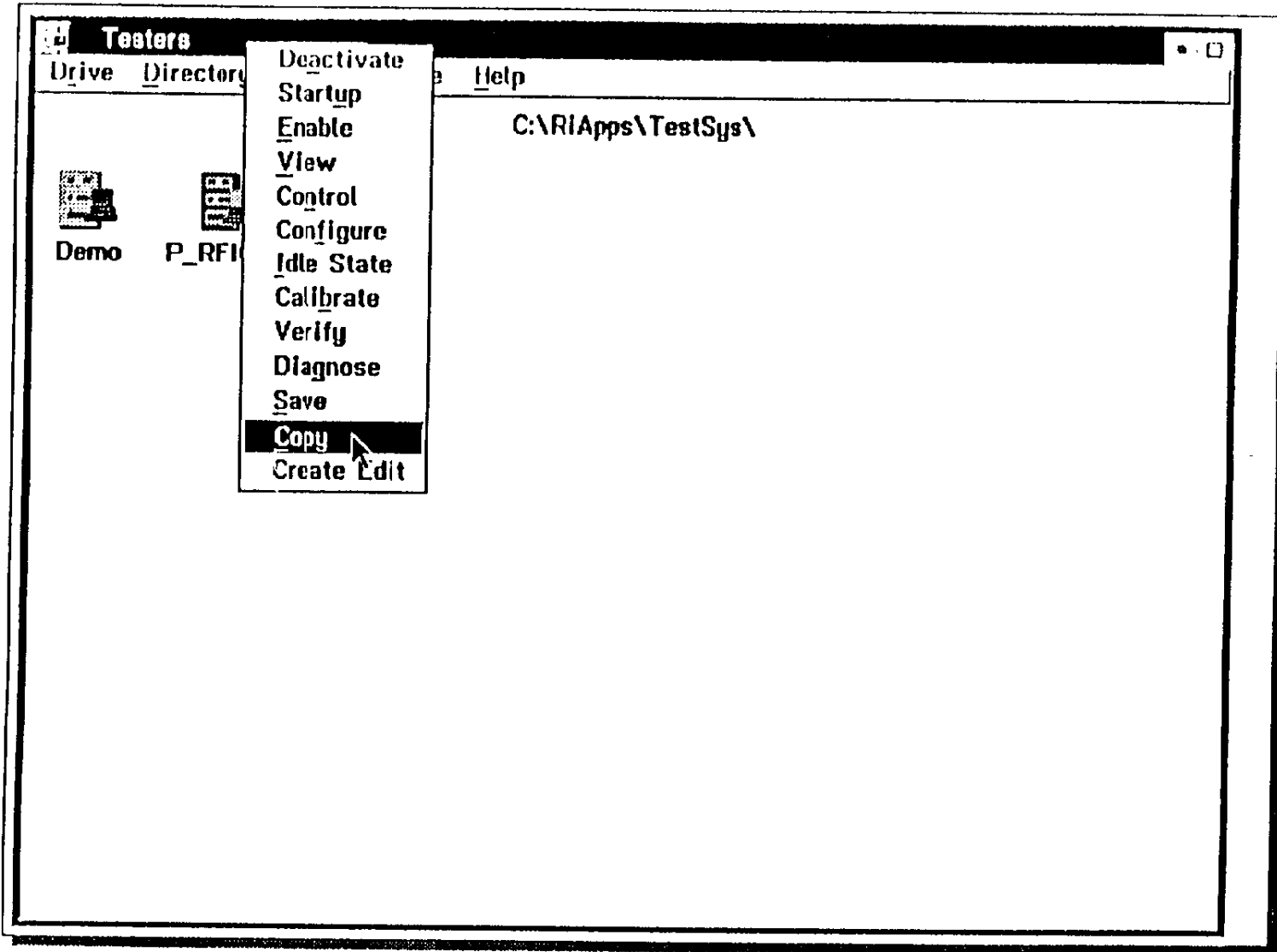
- Logon to Tester with Admin or Higher Privileges
- Open Tester Container Window & Copy Tester
- Add the Power Meter to the Test System Configuration
- Activate the Calibration Fixture
- Open the Calibration Test Executive
- Calibrate One Instrument or RF Test Port at a Time  
(Select and Run Cal & Verify Test Plans in the Order Shown)  
(Carefully Follow the Operator Prompts on the Monitor)
- The System will Automatically Save Calibration Data



## Tester Calibration Procedure - Opening the Testers Container Window



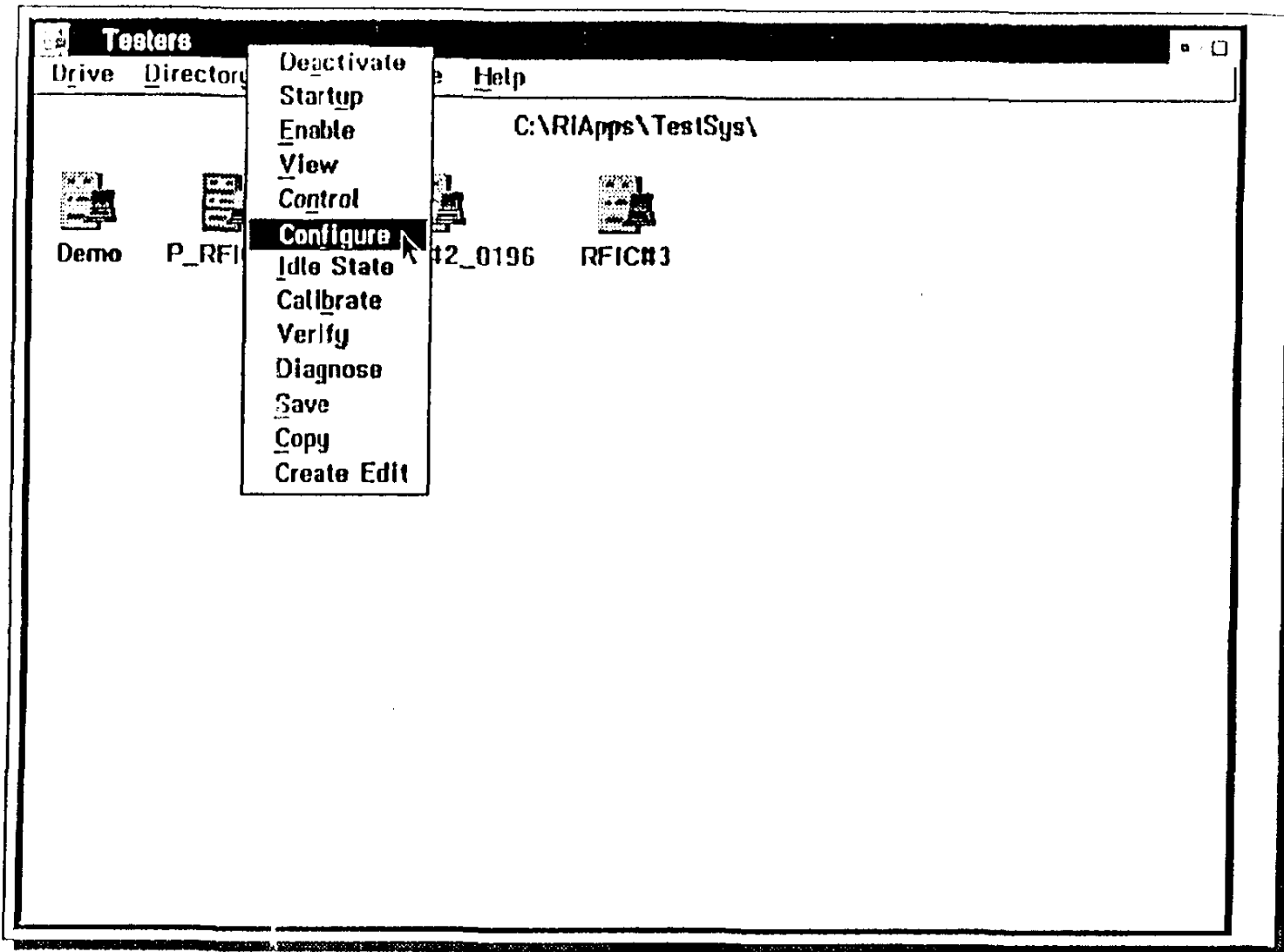
## Creating a Backup Copy of the Tester



Entering the Tester Backup Copy Name

The image shows a standard Windows-style dialog box. At the top left corner, there is a small icon of a window with a close button. The title bar of the dialog box is dark and contains the text "New Name:". Below the title bar is a single-line text input field with a black border, containing the text "P\_RFICH#2\_0196". At the bottom of the dialog box, there are two buttons: "OK" on the left and "Cancel" on the right. A mouse cursor is positioned over the "OK" button.

## Opening the Tester Configuration Manager Window





## Adding a Calibration Instrument to the Tester

The screenshot shows a software window titled "P\_RFICW2 Configuration". The window has a menu bar with "Instrument", "Tester", and "Help". Below the menu bar is a list of instruments with columns for "Calibration", "Description", "Enable", "Permanent", "In Service", "Save", and "Load...". The "Load..." button is highlighted with a mouse cursor. Below the instrument list is a "Testhead" section with the text "RI7221A 4 port Standard Testhead 0".

Calibration	Description	Enable	Permanent	In Service	Save	Load...
2C .01 to 20 Ghz Complex Receiver 0	10B .01 - 20 GHz Rf source 0					
	Optic Link Controller 0					
	B .01 - 20 GHz Rf source 0					
	B .01 - 20 GHz Rf source 0					
	B .01 - 20 GHz Rf source 0					
	2611A Src1 and 2 Output 0					
	Resources 0					

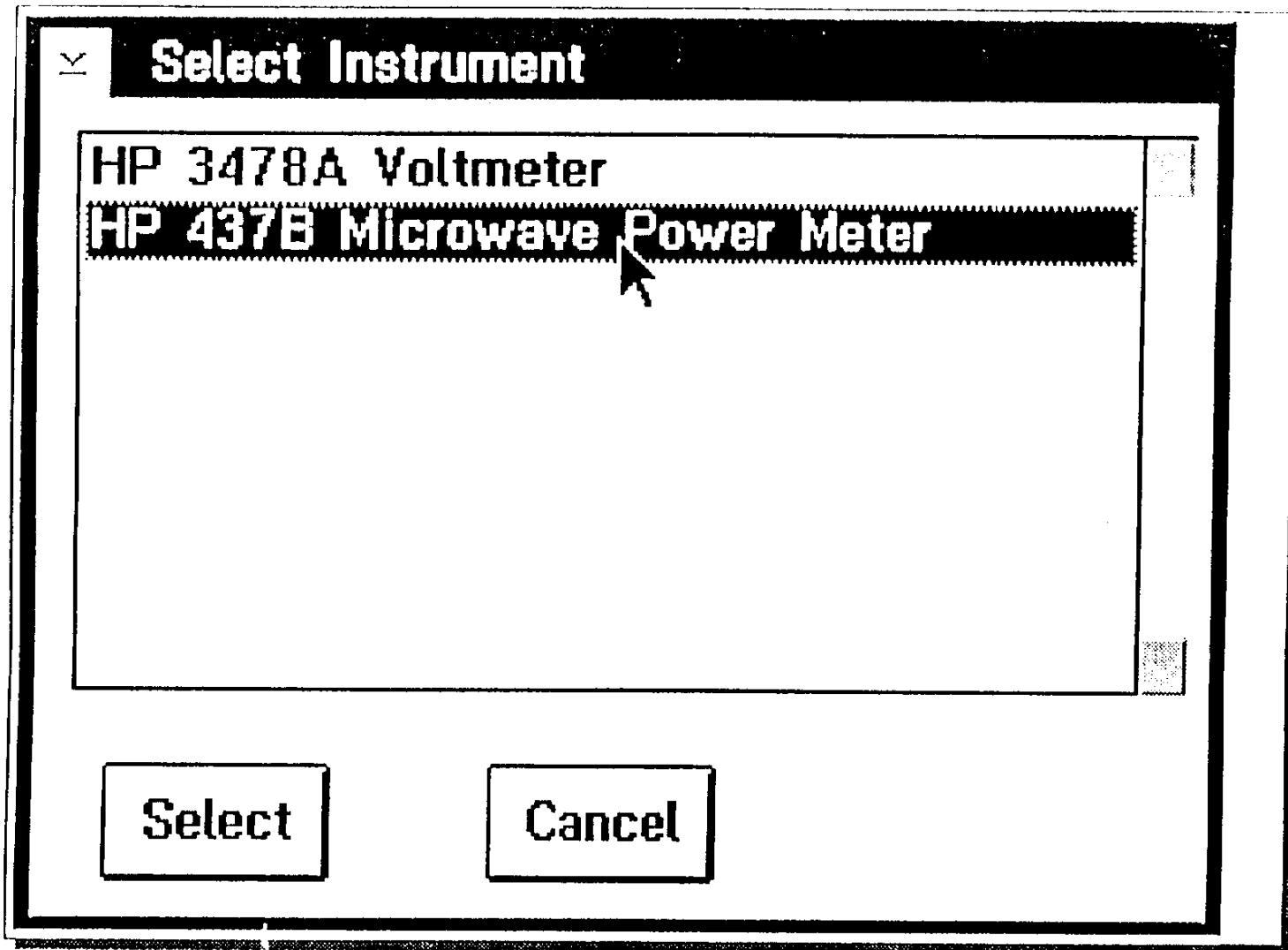
Testhead RI7221A 4 port Standard Testhead 0

Use this button to select the name of the test head in the system. This is used to obtain state and calibration information.

NODE  
2

HEAD  
Src12Output

Adding a RF Power Meter to the Tester



## Selecting the RF Power Sensor to Use with the RF Power Meter

**P\_RFICW2 Configuration**

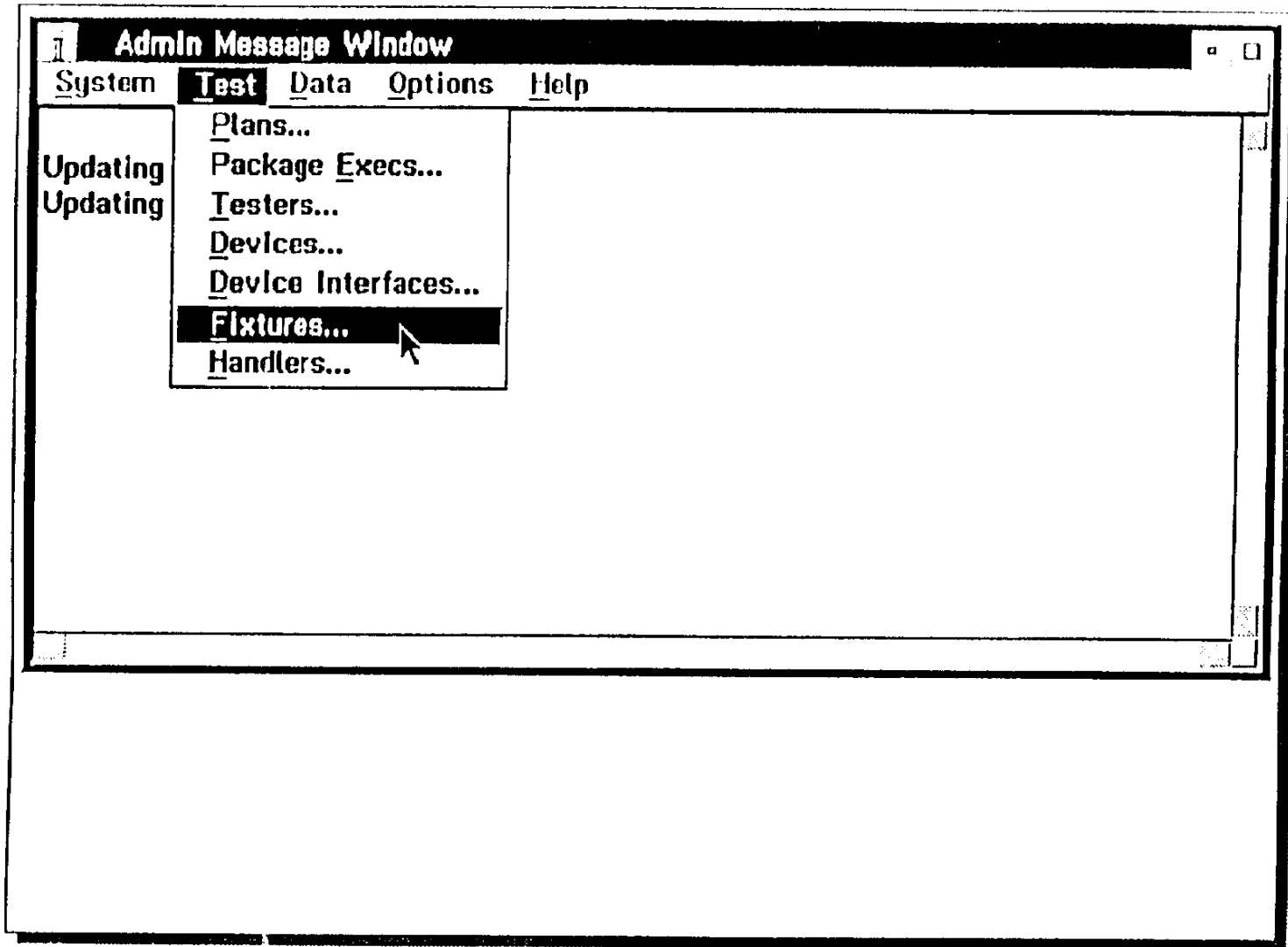
Instrument Tester Help

DutControl RI7413B RFIC Dut Control 0  
gainCompression RI7800A Gain Compression Meter 0  
GpiB RI7300A Mainframe with GPIB Controller 0  
Intermod RI7805B Intermod Inst 0  
noiseFigure RI7801A Virtual Noise Figure Meter 0  
**Pmeter HP 437B Microwave Power Meter Transient 0**  
Receiver RI7322C .01 to 20 Ghz Complex Receiver 0  
ReceiverLo RI7710B .01 - 20 GHz Rf source 0  
RIIL RI125 Fiber Optic Link Controller 0

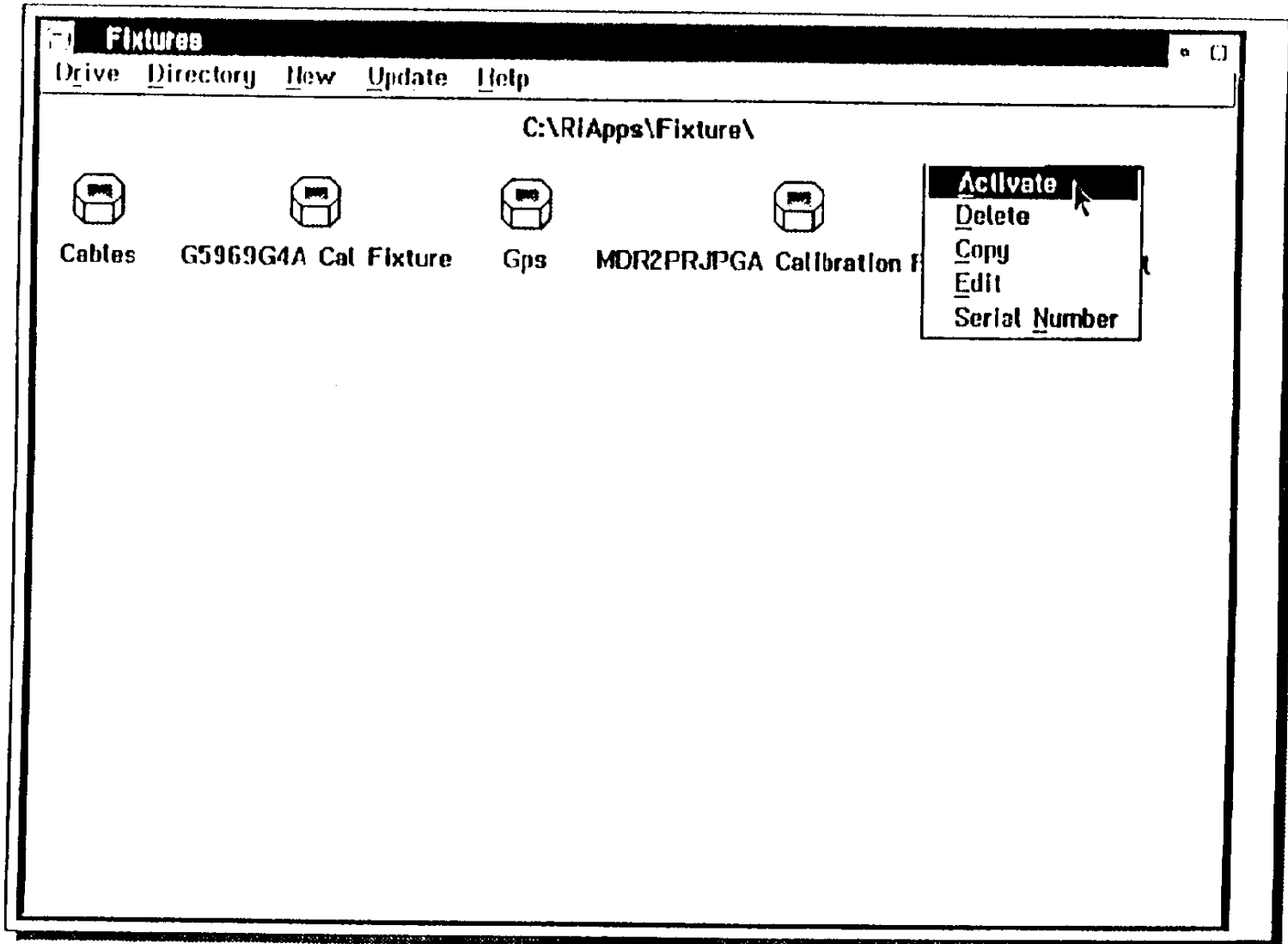
NODE	SENSOR 1
8	331BA89416
GPIB	SENSOR 2
13	331BA89416

Use this button to select the name of the sensor table to use whenever the testplan refers to sensor 1

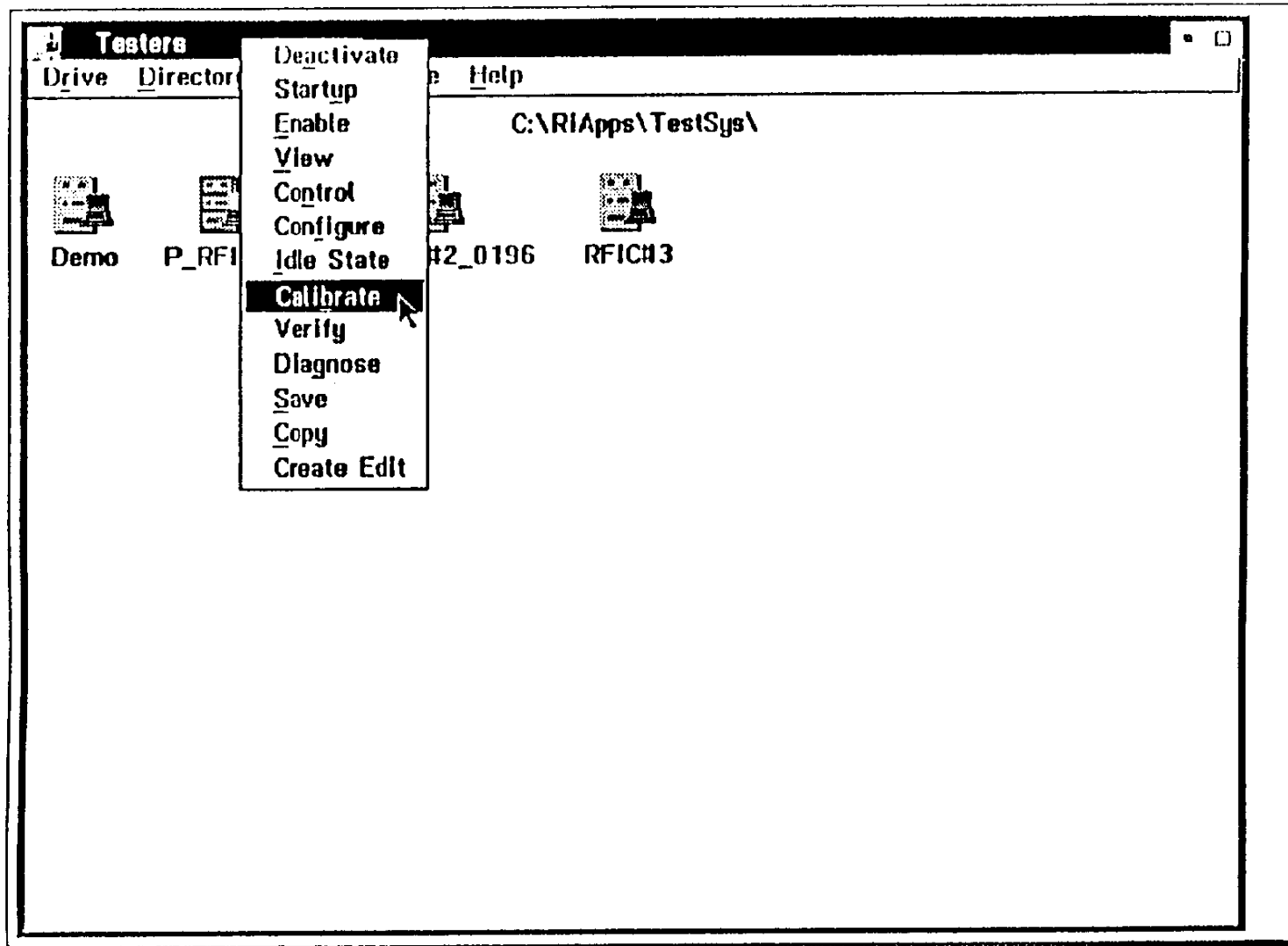
## Opening the Fixture Container Window



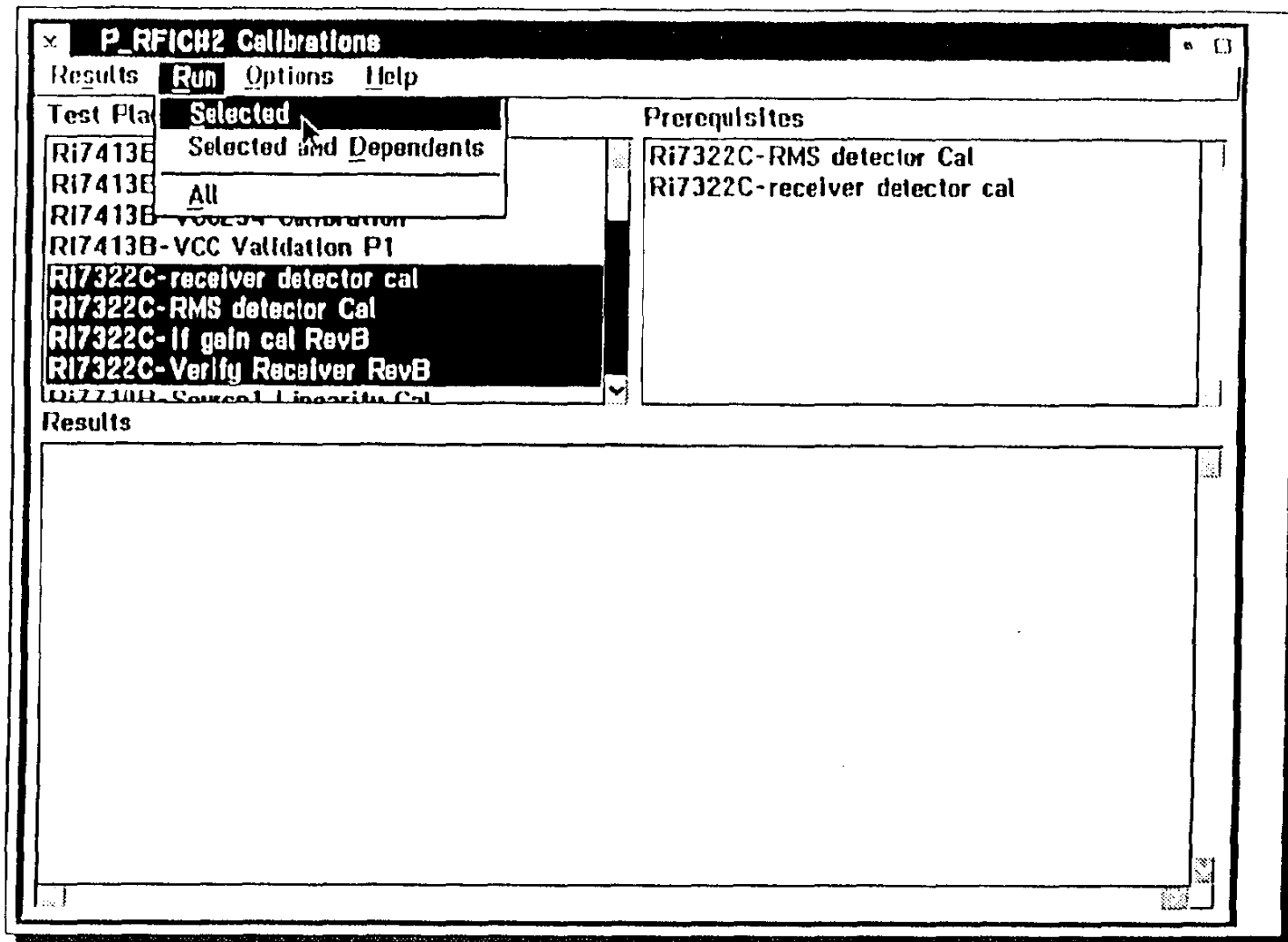
## Activating the Calibration Fixture



## Opening the Calibration Test Exec for the Tester



## Selecting and Running the Calibration & Verification Test Plans



The System Checks to Make Sure that You are Using the Correct Standards

**Do cal kit serial numbers match?**

**Open Serial #: 502023**

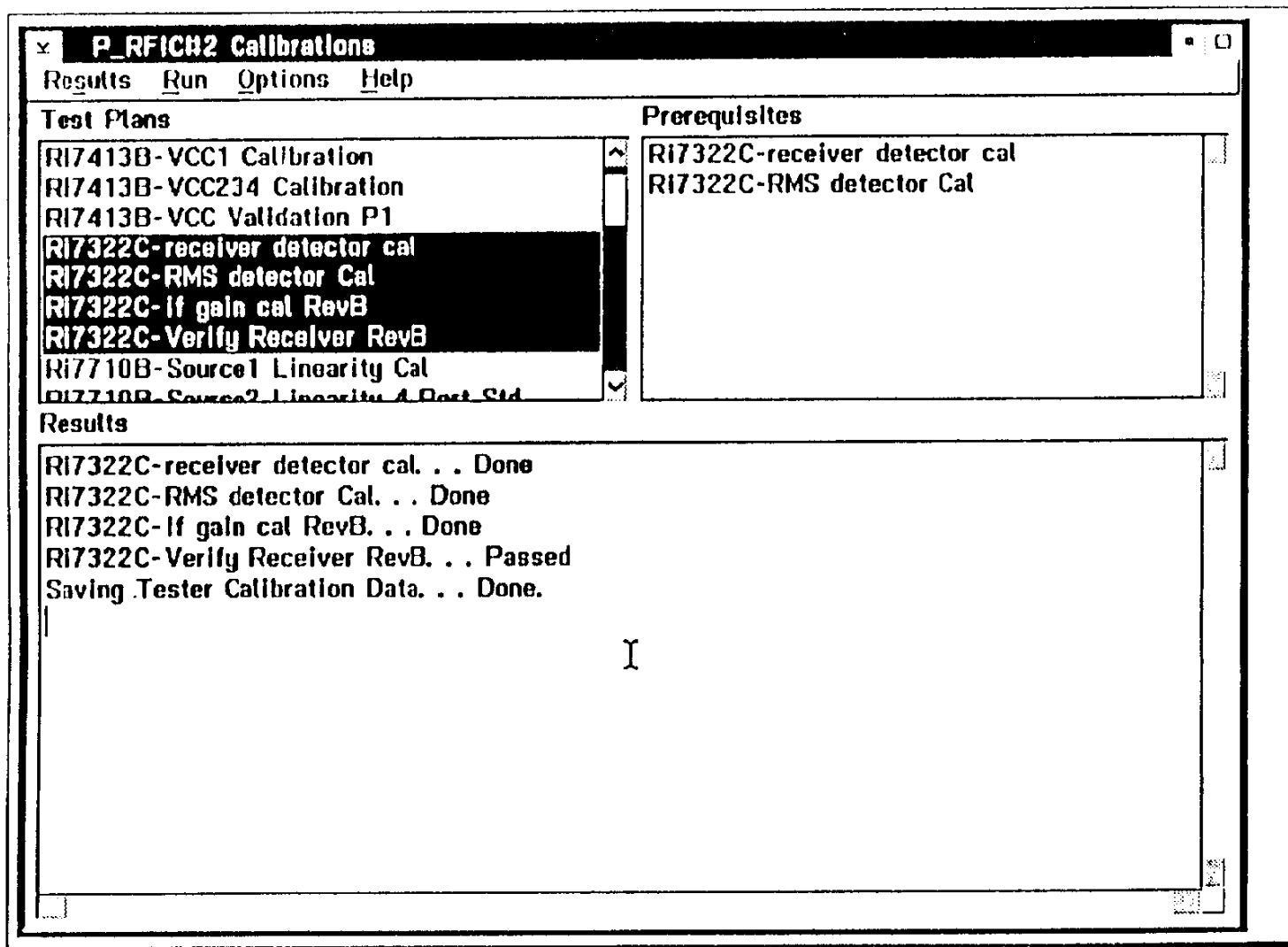
**Short Serial #: 501015**

**Noise Source Serial #: B509**





## The Cal Test Exec Runs Each Test Plan Selected and Saves the Cal Data



The Test Exec Will Display all the Data or Only Failed Data

**P\_RFIC12 Calibrations**

Results Run **Options** Help

Test Plans	Prerequisites
Ri7413B- ADC	Ri7322C-receiver detector cal
Ri7413B- VCC	Ri7322C-RMS detector Cal
Ri7413B- VCC	
Ri7413B- VCC Validation P1	
Ri7322C-receiver detector cal	
Ri7322C-RMS detector Cal	
Ri7322C-If gain cal RevB	
Ri7322C-Verify Receiver RevB	
Ri7322C-Source Linearity Cal	

Context Menu:  
Show All Results  
**Show Fails Only**  
Auto Save

**Results**

- Ri7322C-receiver detector cal. . . Done
- Ri7322C-RMS detector Cal. . . Done
- Ri7322C-If gain cal RevB. . . Done
- Ri7322C-Verify Receiver RevB. . . Passed
- Saving Tester Calibration Data. . . Done.

# Verification Test Plans

---

- **Verification Testing Requires Supervisor Privileges or Higher**
- **The Verify Test Exec leads the Operator thru the Verify Process**
- **Required Verification Standards: System Calibration Kit**



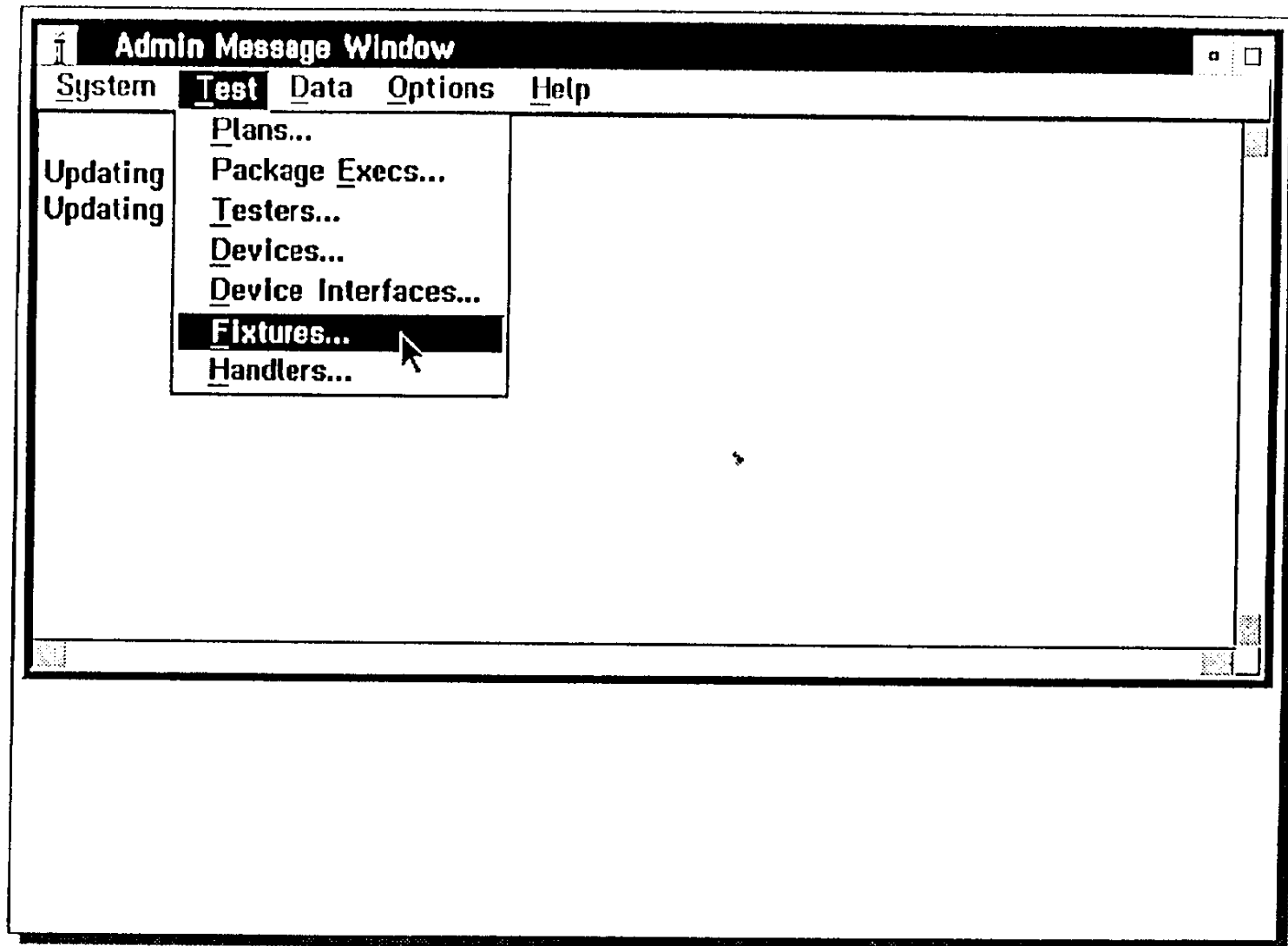
# System Verification Procedure

---

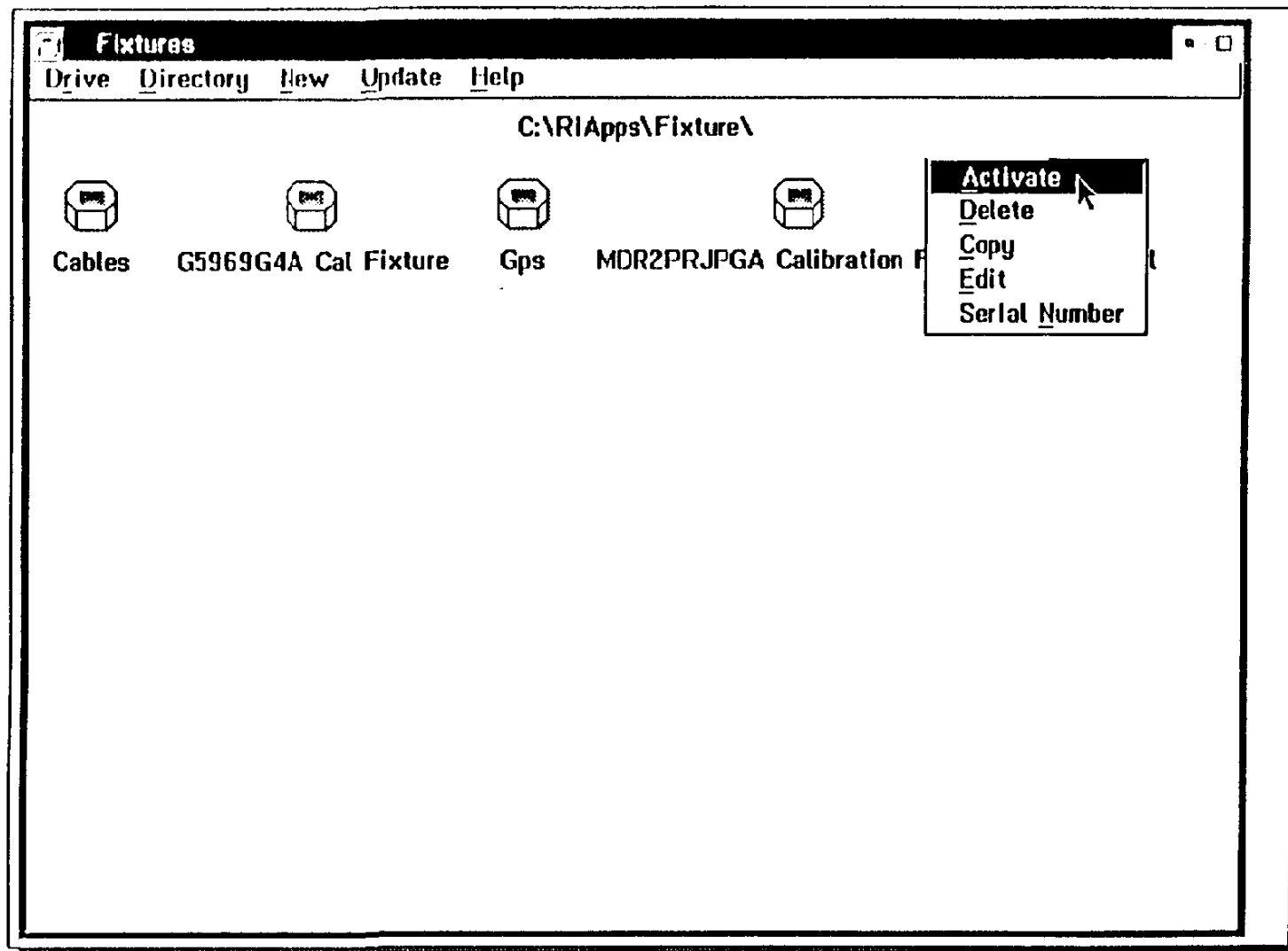
- Logon to Tester with Supervisor or Higher Privileges
- Activate the Calibration Fixture
- Open the Verification Test Executive
- Run all of the Verification Test Plans  
(Select: Run & All)
- If Tester Fails Verification, Re-Check Connections & Verification Standards and Re-run Verification Tests
- If Tester Fails Verification a 2nd Time, Follow Diagnostic Procedure



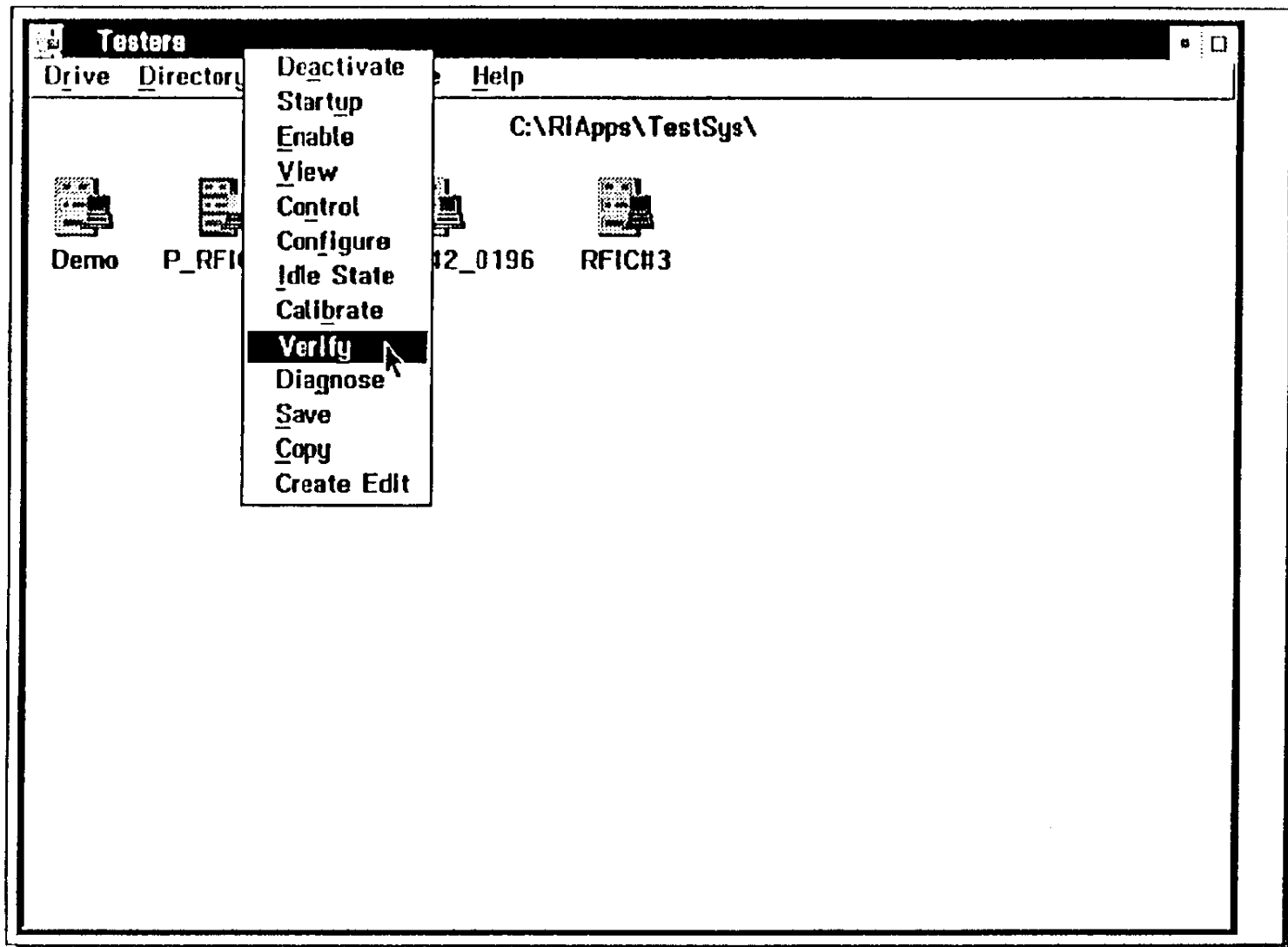
## Verification Testing - Opening the Fixtures Container Window



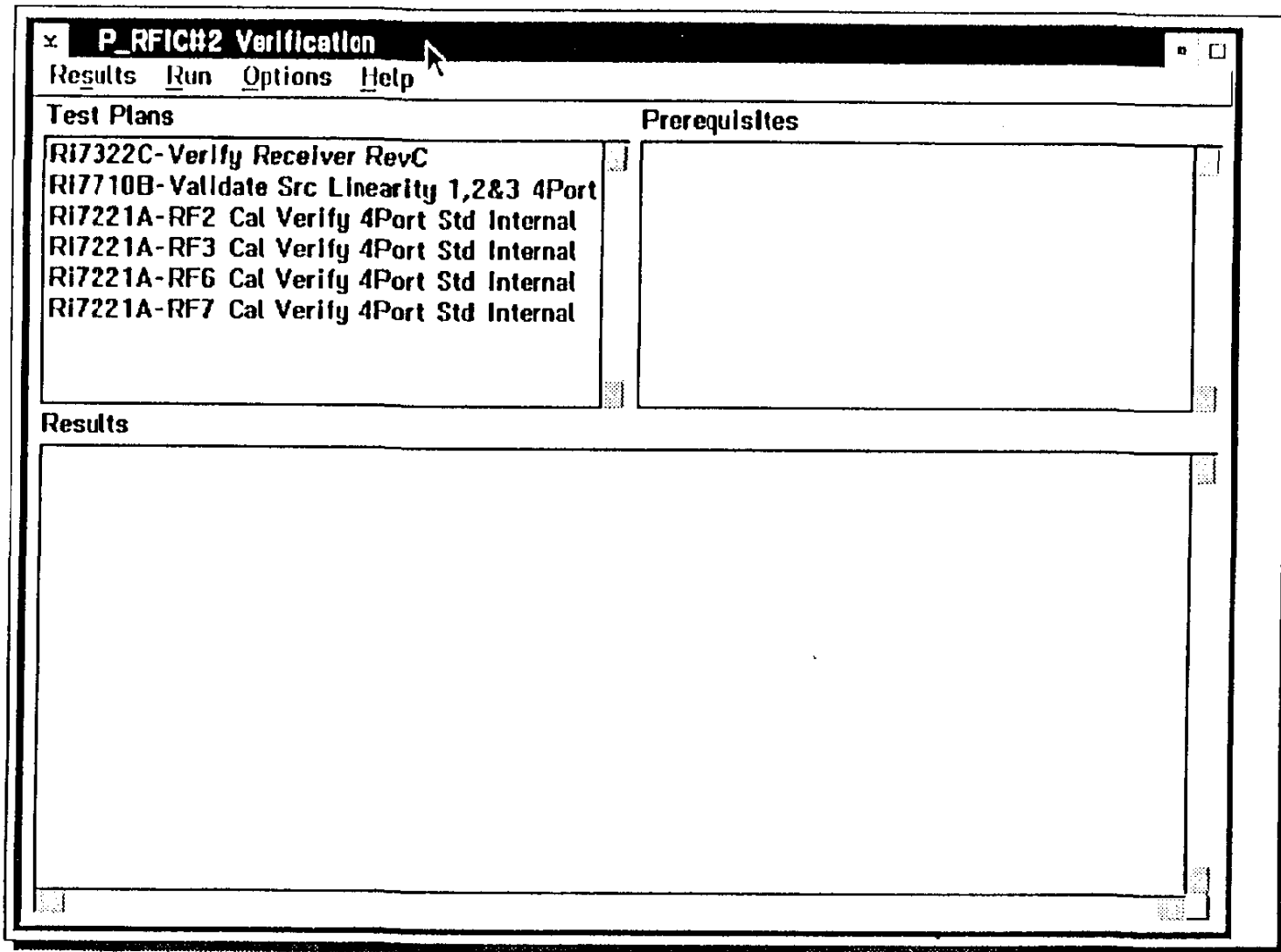
## Verification Testing - Activating the Calibration Fixture



## Opening the Verification Test Exec



## Verification Test Exec and Test Plans





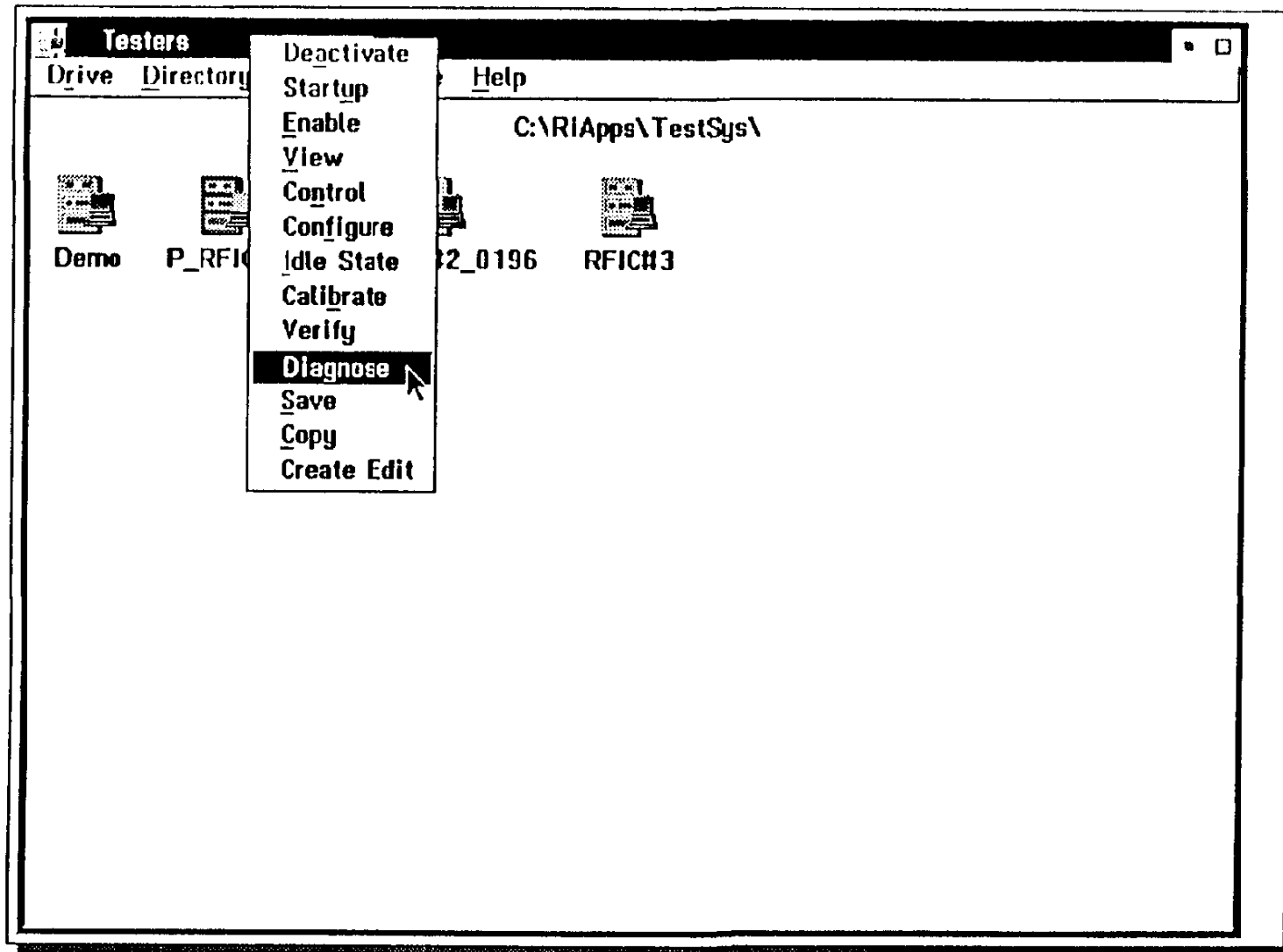
## Running All of the Verification Test Plans

The screenshot shows a software window titled "P\_RFICH2 Verification" with a menu bar containing "Results", "Run", "Options", and "Help". The main area is divided into two panes: "Test Plans" and "Prerequisites".

Test Plan	Selected	Prerequisites
Ri73220	Selected and Dependents	
Ri7710E	All	3 4Port
Ri7221A		RF3 Cal Verify 4Port Std Internal
Ri7221A-RF3		Cal Verify 4Port Std Internal
Ri7221A-RF6		Cal Verify 4Port Std Internal
Ri7221A-RF7		Cal Verify 4Port Std Internal

Below the panes is a "Results" section, which is currently empty.

## System Diagnostic Testing - Opening the Diagnostic Test Exec



# System Diagnostics - Things to Consider

---

- **Carefully Review the Error Messages Provided**
- **Determine if a Single Point Failed or Multiple Points Failed**
- **Look for Common Errors or Related Errors**
- **Carefully follow any Operator Prompts Provided**
- **Use the F1 Help text &/or Use the Menu Choices: File & Interpret to obtain more Information**
- **Recheck all Connections and Source Displays**



## System Diagnostics (Continued)

---

- **Re-connect the DUT**
- **Verify that the Fixture Connections are securely fastened to the Test Head**
- **Run the Test Plan or Test Exec Again**
- **Perform the System Diagnostic Procedure**
- **Don't Hesitate to ask for our Help**



# System User Diagnostics Tools

---

- **Menu Choice: Help or F1 - Help Windows**
- **Error Messages in the Message Window**
- **User/Operator Prompts**
- **Diagnostics Test Executive**
- **Multiple Data Viewers for Inspecting Test Results & Calibration Data**
- **Test System Manual Control Panels**
- **Error.log file**

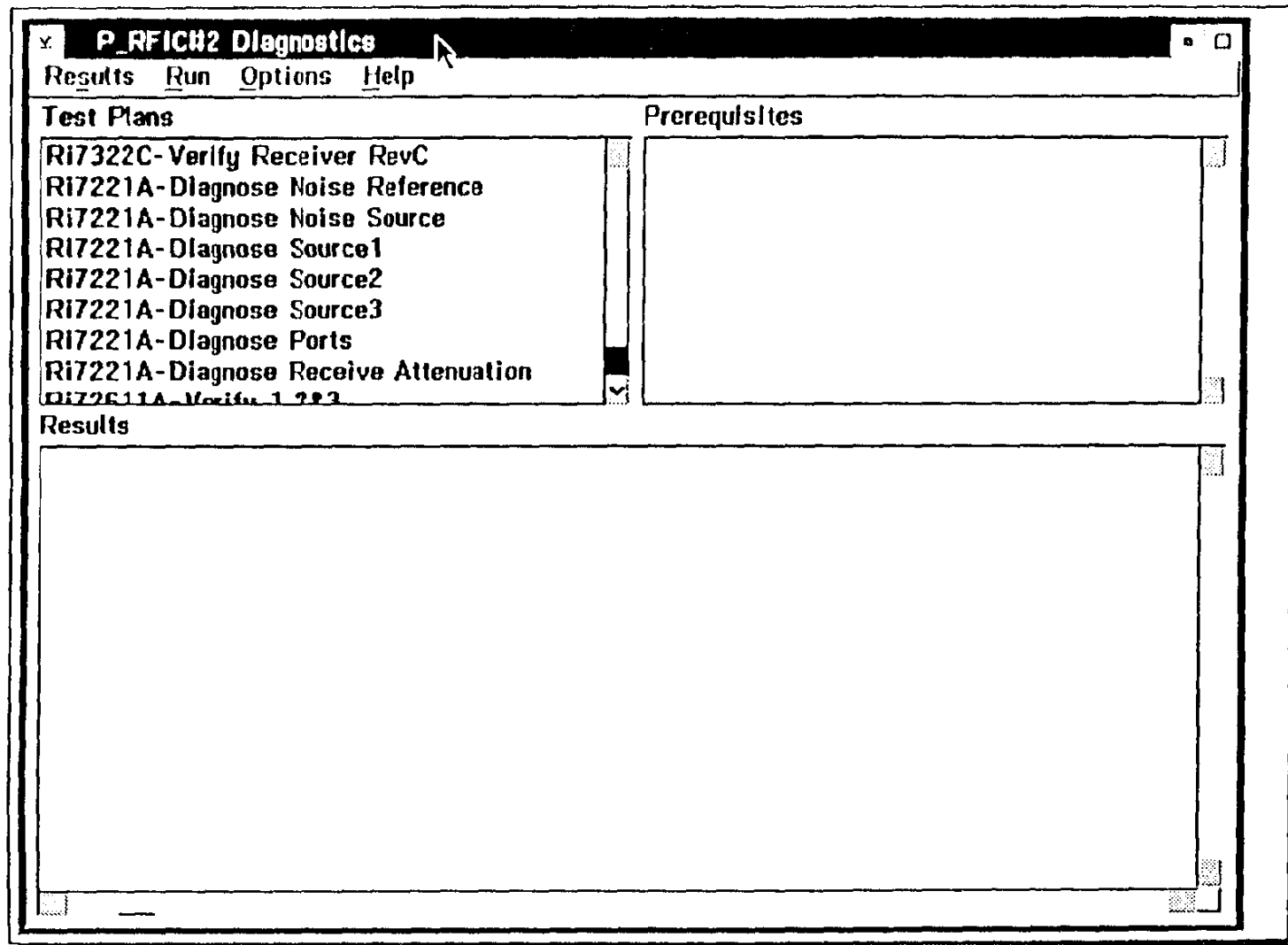
# System Diagnostic Procedure

---

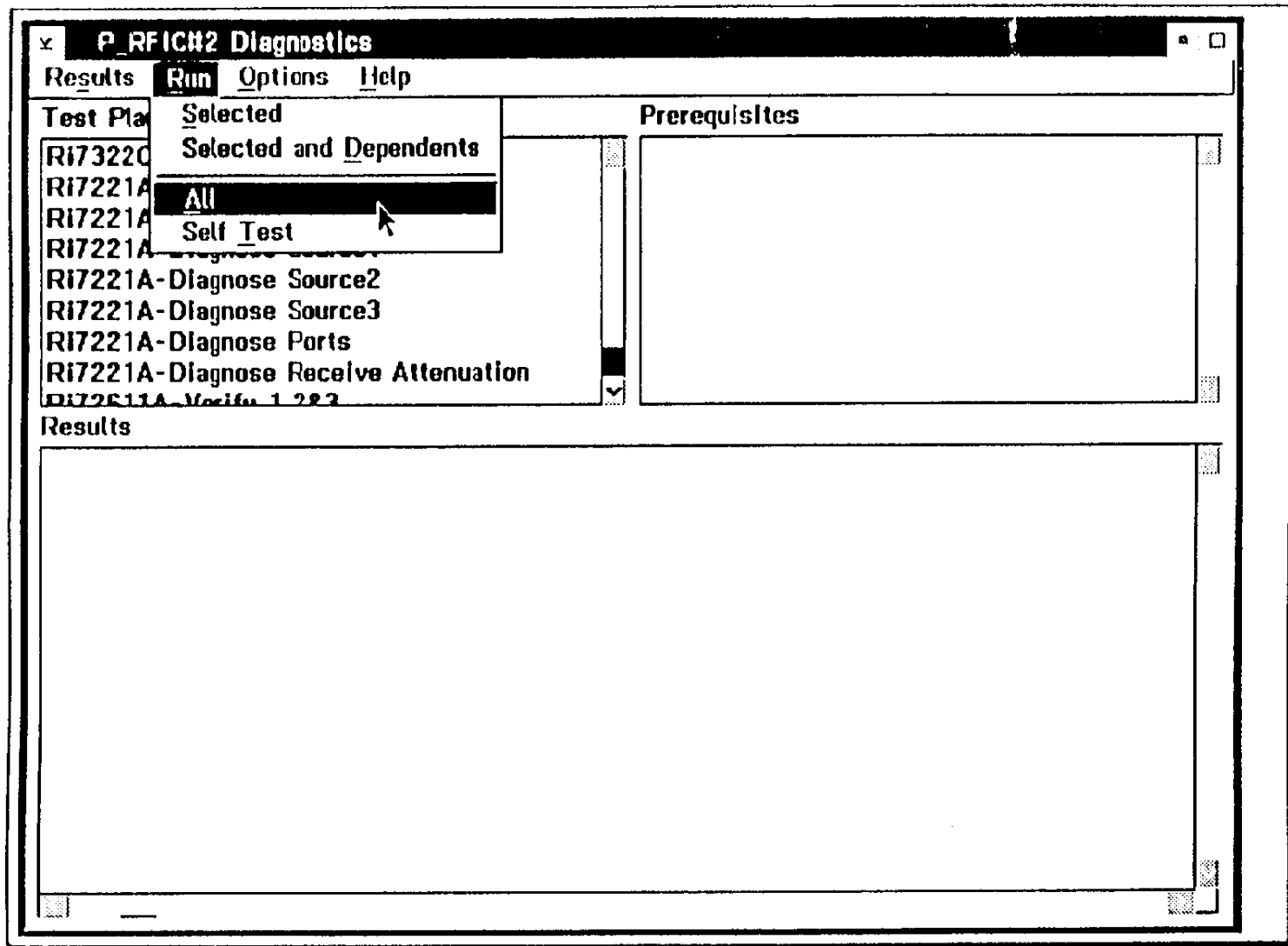
- Logon to Tester with Admin or Higher Privileges
- Open Tester Container Window
- Select the Tester
- Open the Tester's Diagnostic Test Executive
- Run all of the Diagnostic Test Plans  
(Select: Run & All)  
(Carefully Follow the Operator Prompts on the Monitor)
- Report Failures to Roos Instruments



## Diagnostic Test Executive and Test Plans

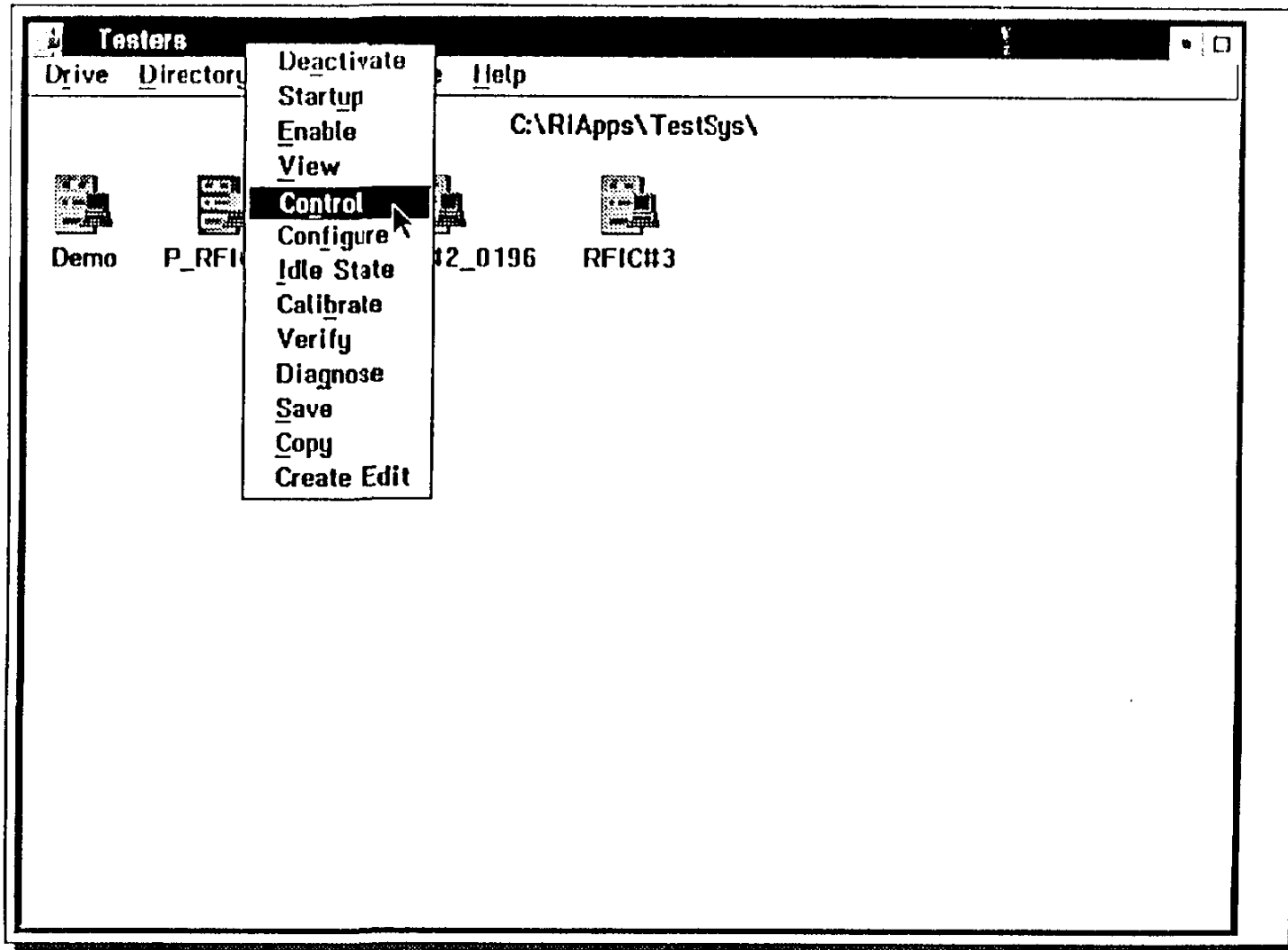


## Running All of the Diagnostic Test Plans





## Manually Controlling the Tester - Opening the Tester Control Panel



## Manual Control of the Programmable DUT Controller

**P\_RFIC82 Controller**

Tester Instrument Help

**Dut**

- DutControl
- gainCompression
- Gpib
- Intermod
- noiseFigure
- Receiver
- ReceiverLo
- Rfll
- Source1

**control panel**

device power control

---

**FIXTURE POWER**

OFF

**POWER CURRENT MEAS RANGE**

4 amp

**CURRENT MEAS RANGE**

1 amp

**VCC 1**

0

**VCC 1 MODE**

voltage

**ICC1**

0.01941

**VON**

0

**VOFF**

0

**CONTROL 1**

OFF

**GTL6 / STB 2**

OFF

**VCC 2**

0

**VCC 2 MODE**

voltage

**ICC2**

-63.6 u

**CONTROL 2**

OFF

**GTL6 / CLK**

OFF

**POWER V 1**

0

**POWER I 1**

0

**POWER ICC**

0.0024717

**CONTROL 3**

OFF

**GTL7 / DATA**

OFF

**POWER V 2**

0

**POWER I 2**

0

**POWER ICC**

3.3424

**CONTROL 4**

OFF

**GTL8 / STBI**

OFF

**VOLTAGE MEAS RANGE**

10 volt

**VOLTAGE MEAS MODE**

single

**VMEASURE PIN**

1

**VOLTAGE**

2.1986

**POWER V 3**

0

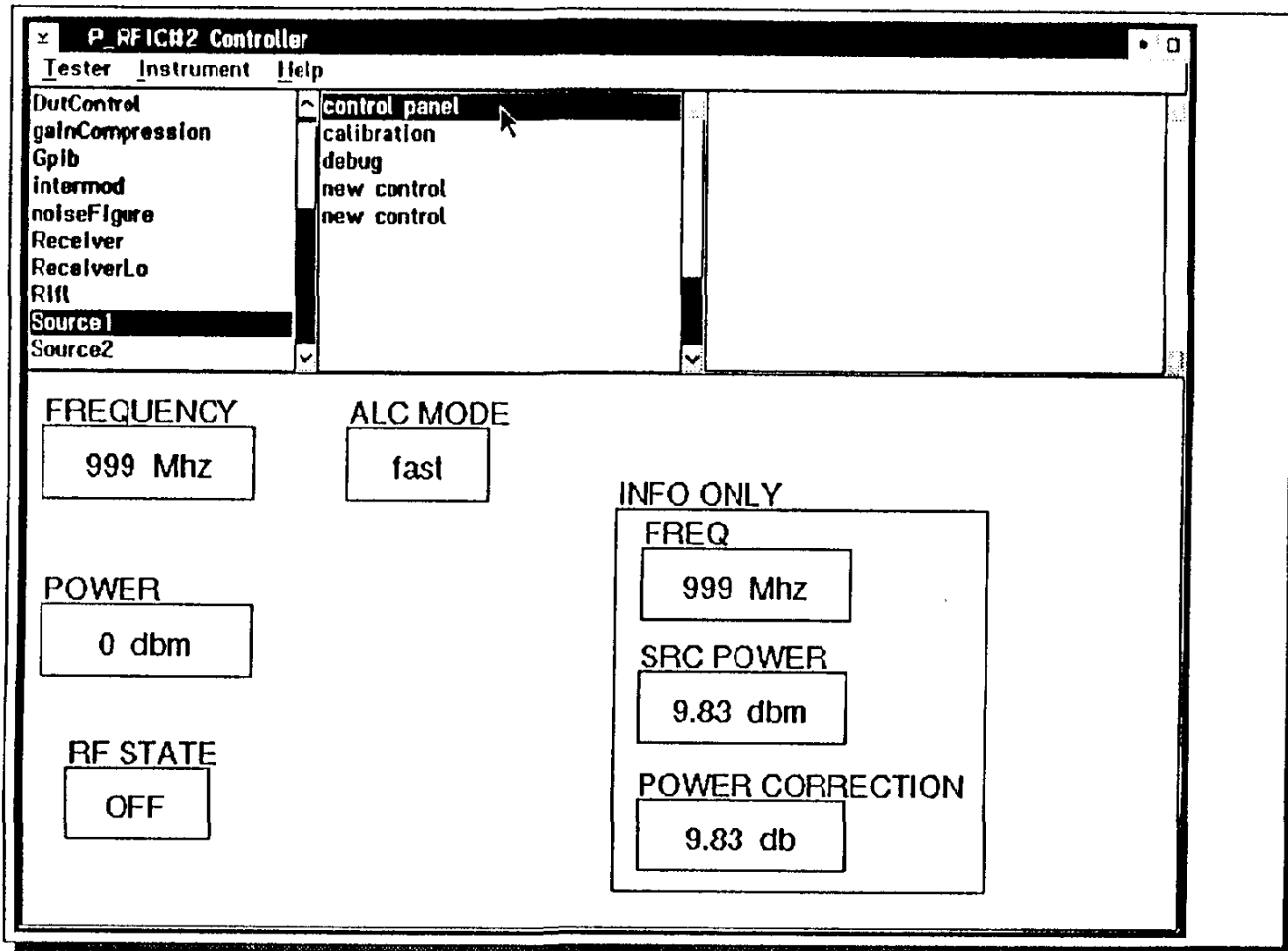
**POWER I 3**

0

**POWER ICC**

3.4316

## Manual Control of the RF Sources



## Manually Setting the Signal Paths in the RFIC Test Head

The screenshot displays the 'P\_RFIC#2 Controller' software window. The top menu bar includes 'Tester', 'Instrument', and 'Help'. A tree view on the left lists components: Receiver, ReceiverLo, Rf1, Source1, Source2, Source3, Src12Output, System, Testhead (selected), and vna. The main area shows a control panel with the following settings:

- SOURCE 1**: RF 3
- SOURCE 1 MODE**: source
- RECEIVE MODE**: s parameters
- NOISE SRC**: OFF
- NOISE REFERENCE**: OFF
- REC ATTENUATION**: 0db
- INPUT PORT**: Rf 3
- LOAD STATE**: load
- OUTPUT PORT**: Rf 6
- PARAMETER**: a1

Additionally, there are four 'receive' blocks associated with RF ports: RF 2, RF 7, RF 3, and RF 6.

## Measuring Signals with the System Receiver

The screenshot shows a software window titled "P\_RFIC87 Controller" with a menu bar containing "Tester", "Instrument", and "Help". A tree view on the left lists components: Receiver, ReceiverLo, RIII, Source1, Source2, Source3, Src12Output, System, Testhead, and vna. The "Receiver" component is selected, and its "control panel" is visible, showing "calibration". Below the tree view, a control panel displays the following settings and measurements:

FREQUENCY	IF GAIN	V MAG DBM
1000 Mhz	0	-88.984
INPUT	IF BW	V NOISE DBM
.1 - 2 (.1 - 20 Input)	wide	-62.032

## Manually Setting the RF Source Modules

The screenshot displays the **P\_RFIC#2 Controller** software interface. At the top, there is a menu bar with **Tester**, **Instrument**, and **Help**. Below the menu bar is a tree view on the left containing the following items: **Intermod**, **noiseFigure**, **Receiver**, **ReceiverLo**, **Rfl**, **Source1**, **Source2**, **Source3**, **Src12Output** (highlighted), and **System**. To the right of the tree view is a **control panel** with a **calibration** option. The main area of the interface contains several control panels for RF source settings:

- SOURCE 1 ATTN**: 0db
- SOURCE 2 ATTN**: 0db
- SOURCE OUTPUT M**: Sources
- SOURCE 3 MODE**: LO
- INTERMOD FREQ SPACING**: 0 Mhz
- INTERMOD POWER SPACING**: 0 db

A **Sources** dropdown menu is open, showing the following options:

- intermod to src 1
- intermod to src 2
- aux to src 1
- aux to src 2

# Repair Process

---

- **Follow System Computer's User Diagnostics**
- **Reconfigure Microwave Sources if Necessary**  
**All of the Microwave Sources are Identical**
- **Request Replacement Part from RI**
- **RI to Provide Replacement Part**
- **RI Module Exchange Program Support Provided**
- **Service Support also Available from Wiltron**



# Software Management: Things to Consider

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- **System Data Base: IBM DB2/2**  
Please consider taking in a DB2/2 Class.





End of Training



Enjoy Using the Systems



Roos Instruments