



# Phase Noise Testing Using Frequency Discriminator

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- Test Conditions
- Measurements
- Calculations



# Global Defaults

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

File Edit Test Plan Tester Limits Options Help Debug

Test Plan Settings

- Global Defaults
- Disconnect Settings
- Connect Sequence

Test Section: Sweep VCO for Vpp and Zero Intercept

- Conditional Statement
- Section Defaults

Compile

Run

Repeat

DutControl

Device Power 1

Vcc 3

DutControl

Vcc 3

0

Fixture

Fixture Power

ON

Receiver

Frequency

0.1 Mhz

DutControl

Device Power 2

open

DutControl

Vcc 5

5.8

Fixture

Head Rf 4

DutRf4

Receiver

Input

.005 - 2 Input

RecLo

Fast Settle

ON



# Disconnect Settings

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

File Edit Test Plan Tester Limits Options Help Debug

Test Plan Settings  
Global Defaults  
**Disconnect Settings**  
Connect Sequence  
Test Section: Sweep VCO for Vpp and Zero Intercept  
Conditional Statement  
Section Defaults  
Test Section: CDC V10

Compile  
Run  
Repeat

DutControl Vcc 3  
0

DutControl Vcc 5  
0

System Pause  
0



# Connect Sequence

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

File Edit Test Plan Tester Limits Options Help Debug

Test Plan Settings

- Global Defaults
- Disconnect Settings
- Connect Sequence**
- Test Section: Sweep VCO for Vpp and Zero Intercept
- Conditional Statement
- Section Defaults

Compile

Run

Repeat

DutControl Vcc 3

0

DutControl Vcc 5

0

System Sequence Delay

500000



# Sweep VCO Output Frequency vs Tune Voltage

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

File Edit Test Plan Tester Limits Options Help Debug

Connect Sequence  
Test Section: Sweep VCO for Vpp and Zero Intercept  
Conditional Statement  
Section Defaults  
**Test: Sweep SRC X10**  
Test: Calc X10  
Test: Intercept X10  
Test Section: Measure Phase Noise Expanded

Compile  
Run  
Repeat

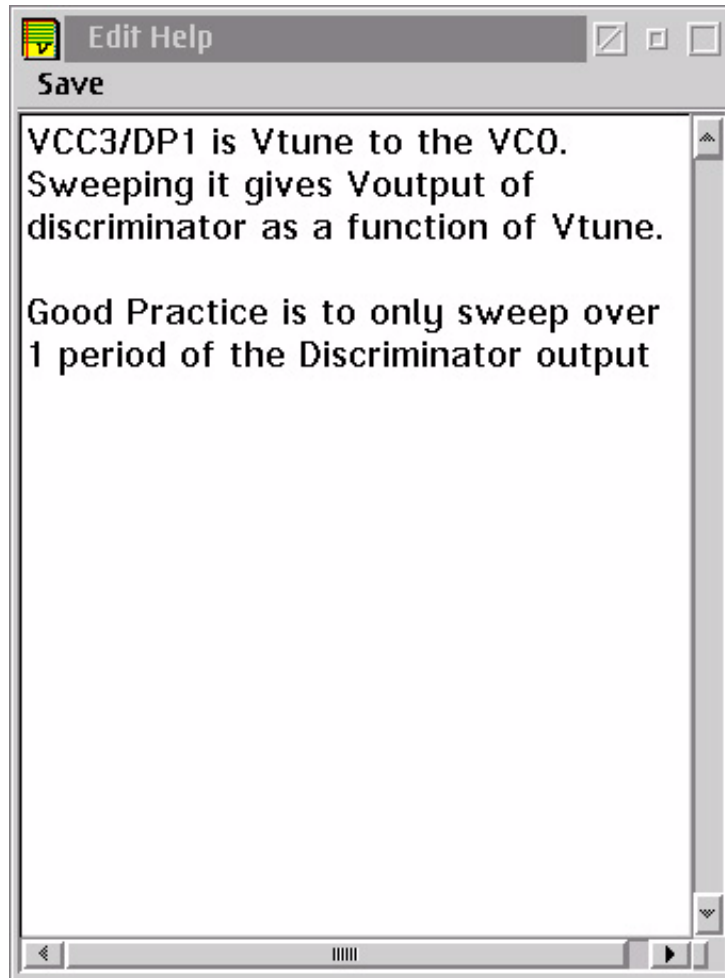
```
graph LR
    VCC3[VCC 3] --> MEAS[MEAS Voltage]
    MEAS --> SaveVolts[System Save Volts X 10]
    MEAS --> LocalVar[System LOCAL VAR SAVE X 10]
    MEAS --> InstrState[INSTR STATE SOURCE Vcc3]
    InstrState --> IndexedBy[INDEXED BY VCC3 X10 Vtune sweep]
    IndexedBy --> Measure[MEASURE X10 Volts vs Vtune]
```

NOTE



# Sweep VCO Output Frequency vs Tune Voltage

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# Voltage Calculations

The screenshot shows a software interface for editing a test plan. The main window title is "Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b". The menu bar includes File, Edit, Test Plan, Tester, Limits, Options, Help, and Debug. The test sequence is as follows:

- Connect Sequence
- Test Section: Sweep VCO for Vpp and Zero Intercept
- Conditional Statement
- Section Defaults
- Test: Sweep SRC X10
- Test: Calc X10** (highlighted)
- Test: Intercept X10
- Test Section: Measure Phase Noise Expanded

On the right side of the main window, there are three green buttons: "Compile", "Run", and "Repeat".

Below the test sequence is a data flow diagram. It consists of several interconnected blocks:

- LOCAL VAR SOURCE** (System): Contains "x 10".
- CALC** (System): Contains "peak to peak".
- Save Volts** (System): Contains "X 10 Pk2Pk".
- CALC** (System): Contains "max Value".
- Save Volts** (System): Contains "X 10 Max".
- CALC** (System): Contains "min Value".
- Save Volts** (System): Contains "X 10 Min".
- LOCAL VAR SAVE** (System): Contains "Vpp".

Arrows indicate the flow of data from the source block through the calculation and save blocks. A "NOTE" is present in the bottom left corner of the diagram area.

An "Edit Help" window is open in the foreground, titled "Save", with the text: "Calculate Vpp is discriminators output swing."



# Intercept Calculation

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

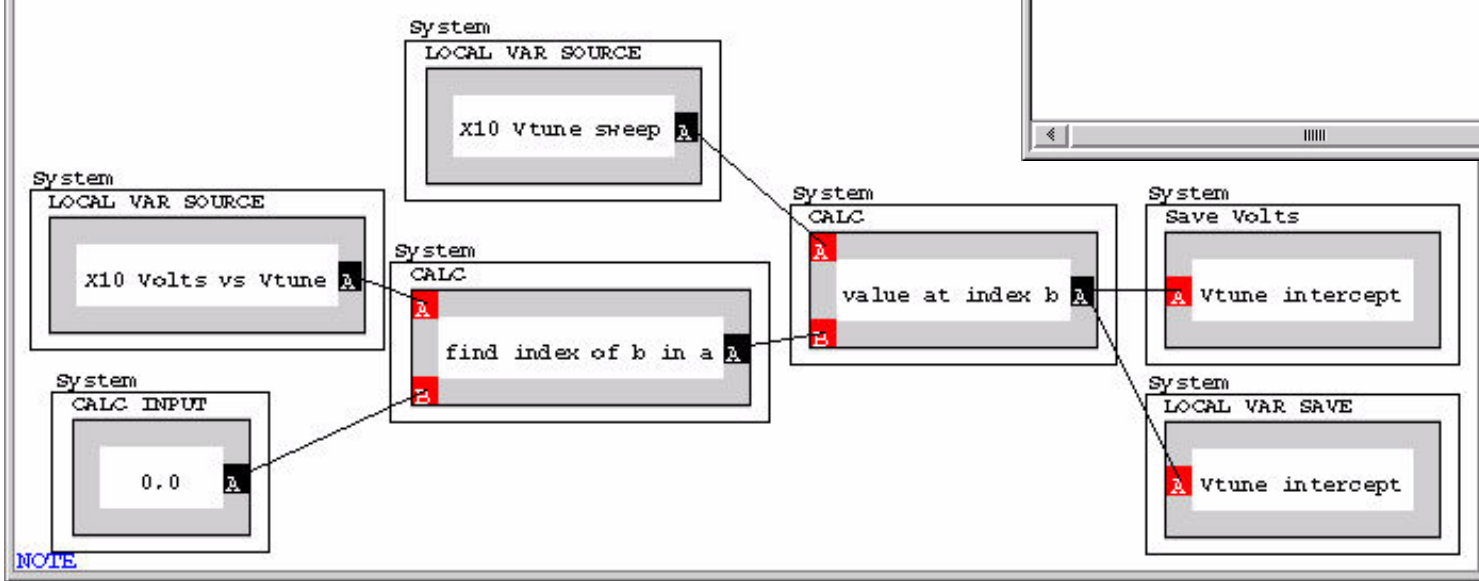
File Edit Test Plan Tester Limits Options Help Debug

Connect Sequence  
Test Section: Sweep VCO for Vpp and Zero Intercept  
Conditional Statement  
Section Defaults  
Test: Sweep SRC X10  
Test: Calc X10  
**Test: Intercept X10**  
Test Section: Measure Phase Noise Expanded

Edit Help

Save

This finds the zero crossing for orthogonality of the discriminator. This Vtune point will be set for the phase noise measurement







# Measure Phase Noise, Section Defaults Set Intercept Voltage

Discriminator\_Phase\_Noise\_Pk\_RF\_X10\_comp\_1b

File Edit Test Plan Tester Limits Options Help Debug

Section Defaults  
Test: Sweep SRC X10  
Test: Calc X10  
Test: Intercept X10  
Test Section: Measure Phase Noise Expanded  
Conditional Statement  
Section Defaults  
Test: Measure Phase Noise Expanded RMS RF

Compile  
Run  
Repeat

DutControl  
VCC 3  
Vtune intercept

DutControl  
Vcc 5  
5.8





# Measure Phase Noise from 10 kHz to 1 MHz Offset

