

# NACT TUTORIAL 2

## RF POWER METER SLOPE AND INTERCEPT

---

**Applies to: NACT MODE ONLY**

**Prerequisite: Tutorials 0 and 1**

This tutorial takes you through the steps necessary to determine and save the slope and zero intercept point for the RF Power Meter power curve. This procedure should be done before using the NACT for DUT testing to assure the accuracy of the power level readings (dBm).

Definitions:

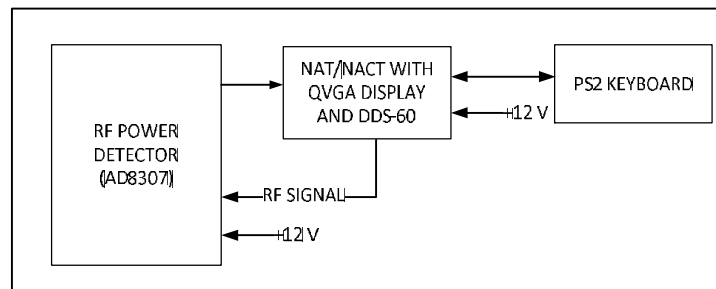
- **NAT – Network Analyzer Terminal:** Requires PHSNA Arduino (UNO/NANO microcontroller) based controller (or equivalent) with communication over the serial interface. The DDS is under control of the PHANA firmware and the PHSNA firmware reads power levels from the RF Power Meter. The NAT firmware emulates an ASCII terminal and an Excel spreadsheet running the PLX-DAQ macro.
- **NACT – Network Analyzer Controlling Terminal:** Does not require a separate controller, uses an on-board DDS-60 to interface direct to the DUI and reads power levels direct from the RF Power Meter. Use of the serial interface is not required. The NACT firmware does everything the NAT firmware does plus all the pertinent functions of the PHSNA controller firmware.

In general, the term NAT will apply to the generic terminal/controller running the Version 3 firmware. NACT functions are activated by the NA Controller mode op mode which is new to Version 3

The minimum requirements for this tutorial are:

- NAT running firmware Version 3.0 or later.
- Logarithmic RF Power Meter such as the RF Power meter designed by W7ZOI and W7PUA used by the PHSNA
- PS2 Keyboard
- A 20 dB attenuator (see Appendix A of the NAT USER GUIDE EXTENSION FOR V3)

For this tutorial, the RF output from the DDS is connected direct to the RF Power Meter input, there is no DUT requirement. Other than the required hardware listed above, there are no other prerequisites for this tutorial.



# NACT TUTORIAL 2

## RF POWER METER SLOPE AND INTERCEPT

---

1. Connect the DDS-60 output direct to the RF Power Meter input, no DUT.



2. Power on all components.
3. Create a PLX data form as follows:
  - a. Press Scroll Lock to enter Command mode.
  - b. Press F1 to display the data entry form
  - Set up the F1 PLX form to cover a frequency range of 1 MHz to 31 MHz with 50 KHz frequency increments and op modes specified for NAC (Network Analyzer Controller, if appropriate) and Signal generator modes.  
Enter the following on the form:

**page one:**

TITLE – SETUP

FILE NAME – leave blank

FREQ LO – 1000

FREQ HI – 31000

FREQ ST – 50000

leave the rest of page one blank and press Page Down to display page two

**page two:**

AUTO DELAY(ms) – 0

XTAL PREFIX – leave blank

OP MODES – CS

# NACT TUTORIAL 2

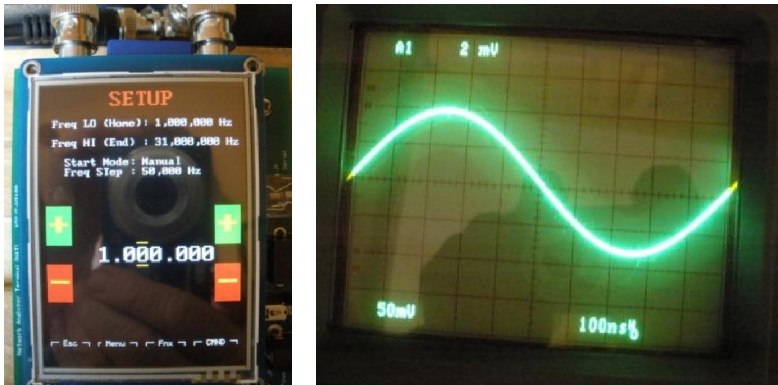
## RF POWER METER SLOPE AND INTERCEPT

---

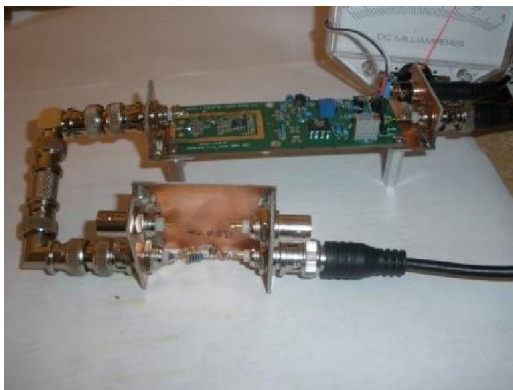
- Press Enter to save the form to EEPROM.



- Press Alt-C to make sure calibration buffer is cleared.
- Press F1 to activate the form.  
You should now see the sig gen screen and the DDS output should be 1 MHz.



- Press Ctrl-S to capture the first power point reading.
- Insert the 20 dB attenuator in series with the RF power source.



## NACT TUTORIAL 2

# RF POWER METER SLOPE AND INTERCEPT

---

9. Press Enter to capture the second power point reading. The firmware will now calculate values for the slope and intercept point and save them to EEPROM.
10. Press Space to take another reading using the new slope and intercept values. The power level reading should be approximately -20 dBm.



11. Remove the 20 dB attenuator from the circuit and connect the DDS output directly to the RF Power Meter input.
12. Press Space again to take another reading. The power level should be approximately 0 dBm.

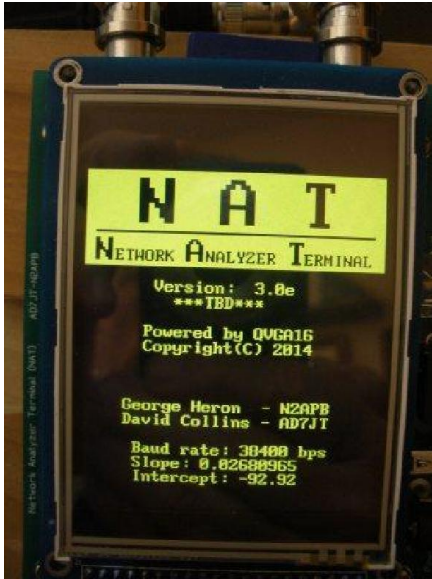


## NACT TUTORIAL 2

### RF POWER METER SLOPE AND INTERCEPT

---

13. Cycle power on the NACT and, when the splash screen is displayed, place your finger on the screen. The splash screen will remain displayed as long as you hold your finger on the touch screen. Observe the new slope and zero intercept point are now displayed at the bottom of the splash screen.



14. Take your finger off the splash screen to let the NACT finish powering up. This ends the tutorial.