

## Calibration Coefficient Installation for ICM TRL-CALIBRATION KITS Series TRL-300x on HP8720

### PREFACE:

This procedure is valid for series TRL-300x calibration kits (3 Line Standards).

(This example uses the TRL-3004B calibration kit)

### INSTRUCTION CRITERIA:

- Comments and suggestions are contained in parenthesis
- Screen menu keys are in *ITALICS*
- Data or hard keys are in **BOLDFACE**

### EQUIPMENT:

**HP 8720 with disk drive**

**ICM TRL-3004A P/N A0105088B**

**Standard Definitions for TRL-3004B for HP8720**

**5/16" Torque Wrench**

**ICM Application Note 111 "Mainframe/TRL Calibration Trouble  
Shooting Guide"**

For background information on the H P8720 Network Analyzer, please refer to the HP operating manual.

## **START INSTALLATION:**

Select **CAL** (located in RESPONSE area of front panel)

Select *CAL KIT* [...]

Depress *MODIFY*[...]

## **DEFINING THRU STANDARD:**

- Depress *DEFINE STANDARD* (screen will display CALIBRATION STANDARD # x)

Enter **4** then **x1** (located in ENTRY area of front panel)

- Depress *DELAY/THRU*
- Depress *MODIFY STD. DEFINITION*
- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*

Enter **0** then **x1**

- Depress *OFFSET LOSS*

Enter **0** then **x1**

- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY*

Enter **0** then **x1**

- Depress *MAXIMUM FREQUENCY*

Enter **26.51 G/n**

- Depress *COAX*
- Depress *STD OFFSET DONE*
- Depress *LABEL STD*
- Depress *ERASE TITLE*

The label is created by the operator using the rotary knob and screen menu keys  
(For this example, use **T H R U**)

- Depress *DONE*
- Depress *STD DONE* (defined)

### **DEFINING SHORT STANDARD:**

- Depress *DEFINE STANDARD*

Enter **1** then **x1**

- Depress *SHORT*
- Depress *MODIFY STD. DEFINITION*
- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*

Enter - **0.0795 G/n** (Active area should read -79.5pS)

- Depress *OFFSET LOSS* (should read 0), otherwise enter 0 then x1
- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY* (should read 0), otherwise enter 0 then x1
- Depress *MAXIMUM FREQUENCY*

Enter **26.5 G/n** (should read 26.5 GHz)

- Depress *COAX*
- Depress *STD OFFSET DONE*
- Depress *LABEL STANDARD*
- Depress *ERASE TITLE*
- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **S H O R T**)
- Depress *DONE*
- Depress *STD DONE (DEFINED)*

### **DEFINING MATCH or LOAD STANDARD**

- Depress *DEFINE STANDARD*

Enter **5** then **x1**

- Depress *LOAD*
- Depress *MODIFY STD. DEFINITION*

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- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*

Enter **0.001 G/n** (Active area should read 1 pS)

- Depress *OFFSET LOSS* (should read 0), otherwise enter 0 then x1
- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY* (should read 0), otherwise enter 0 then x1
- Depress *MAXIMUM FREQUENCY*

Enter **0.501** then **G/n** (Active area should read 501 MHz)

- Depress *COAX*
- Depress *STD OFFSET DONE*
- Depress *LABEL STD*
- Depress *ERASE TITLE*

The label is created by the operator using the rotary knob and screen menu keys  
(For this example, use **MATCH**)

- Depress *DONE*
- Depress *STD DONE* (defined)

### **DEFINING LINE 1 STANDARD**

- Depress *DEFINE STANDARD*

Enter **6** then **x1**

- Depress *DELAY/THRU*
- Depress *MODIFY STD. DEFINITION*
- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*
- Enter **0.1135 G/n** (Active area should read 113.5 pS)
- Depress *OFFSET LOSS* (should read 0), otherwise enter 0 then x1
- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY*

Enter **0.499** then **G/n** (Active area should read 499 MHz)

- Depress *MAXIMUM FREQUENCY*

Enter **3.5** then **G/n** (Active area should read 3.5 GHz)

- Depress *COAX*
- Depress *STD OFFSET DONE*
- Depress *LABEL STANDARD*
- Depress *ERASE TITLE*
- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **LINE 1**)
- Depress *DONE*
  
- Depress *STD DONE (defined)*

### **DEFINING LINE 2 STANDARD**

- Depress *DEFINE STANDARD*

Enter **7** then **x1**

- Depress *DELAY/THRU*
- Depress *MODIFY STD. DEFINITION*
- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*

Enter **0.045** **G/n** (Should read 45 pS)

- Depress *OFFSET LOSS* (should read 0), otherwise enter 0 then x1
- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY* Enter **1.99** then

**G/n** (Active area should read 1.99 GHz)

- Depress *MAXIMUM FREQUENCY* Enter **16.1** then

**G/n** (Active area should read 16.1 GHz)

- Depress *COAX*
- Depress *STD OFFSET DONE*

- Depress *LABEL STANDARD*
- Depress *ERASE TITLE*
- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **LINE 2**)
- Depress *DONE*
  
- Depress *STD DONE (defined)*

### **DEFINING LINE 3 STANDARD**

- Depress *DEFINE STANDARD*

Enter **8** then **x1**

- Depress *DELAY/THRU*
- Depress *MODIFY STD. DEFINITION*
- Depress *SPECIFY OFFSET*
- Depress *OFFSET DELAY*

Enter **0.029 G/n** (Should read 29 pS)

- Depress *OFFSET LOSS* (should read 0), otherwise enter 0 then x1
- Depress *OFFSET Z0* (should read 50 Ohms), otherwise enter 50 then x1
- Depress *MINIMUM FREQUENCY* Enter **5.99** then

**G/n** (Active area should read 5.99 GHz)

- Depress *MAXIMUM FREQUENCY* Enter **26.51** then

**G/n** (Active area should read 26.51 GHz)

- Depress *COAX*
- Depress *STD OFFSET DONE*
- Depress *LABEL STANDARD*
- Depress *ERASE TITLE*
- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **LINE 3**)
- Depress *DONE*

- Depress *STD DONE (defined)*

**CLASS ASSIGNMENTS:**

- Depress *SPECIFY CLASS*
- Depress *MORE*
- Depress *MORE*
- Depress *TRL THRU*

Enter **4** then **x1**

- Depress *TRL REFLECT*

Enter **1** then **x1**

- Depress *TRL LINE OR MATCH*

Enter **5** then **x1 6** then **x1 7** then **x1 8** then **x1**

- Depress *SPECIFY CLASS DONE*
- Depress *LABEL CLASS*
- Depress *MORE*
- Depress *MORE*
- Depress *TRL THRU*
- Depress *ERASE TITLE*

- The label is created by the operator using the rotary knob and screen menu keys  
(For this example, use **T H R U**)

- Depress *DONE*
- Depress *TRL REFLECT*
- Depress *ERASE TITLE*

- The label is created by the operator using the rotary knob and screen menu keys  
(For this example, use **SHORT**)

- Depress *DONE*
- Depress *TRL LINE OR MATCH*

~ ERASE TITLE

- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **L123+MATCH**)
- Depress *DONE*
- Depress *LABEL CLASS DONE*
- Depress *TRL/LRM OPTION* (Verify that *LINE Z0* and *SET REF. THRU* are underlined, otherwise Depress *LINE Z0* and *THRU*)
- Depress *RETURN*
- Depress *LABEL KIT*
- Depress *ERASE TITLE*
- The label is created by the operator using the rotary knob and screen menu keys (For this example, use **TRL-3004B**)
- Depress *DONE*
- Depress *KIT DONE (MODIFIED)*
- Depress *SAVE USER KIT*, (instrument will beep but no other menu will appear)
- Depress *RETURN*
- Depress *CAL KIT [TRL-3004B]*
- Depress *SELECT CAL KIT*
- Depress *USER KIT*
- Depress *RETURN*
- Depress *RETURN*
- **IT IS SUGGESTED THAT THE OPERATOR SAVES THIS CAL KIT TO DISK.**
- Push **SAVE/RECALL** (located in INSTRUMENT STATE area of front panel)
- Depress *SELECT DISK*
- Insert a Floppy disk (must be double sided and formatted)
- Depress *INTERNAL DISK*
- Depress *RETURN*
- Depress *SAVE STATE* (display will show *SAVING: INSTRUMENT STATE*, then *SAVING: CAL KIT*.)
- **END OF PROCEDURE**