

Cellular Antenna Quick Start Guide

Agilent Technologies

8712ET/ES and 8714ET/ES

Agilent Part Number 08714-90022

Printed in USA June 2000

Supersedes October 1998

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This quick start guide provides basic instructions on how to verify the performance of cellular antenna systems. Refer to the *Option 100 Fault Location and Structural Return Loss Measurement User's Guide Supplement* for more detailed information. Also, please refer to your analyzer's *User's Guide* for safety, warranty, and assistance information.

NOTE

This quick start guide assumes the use of an 8712ET or 8714ET. If you are using an 8712ES or 8714ES, some key presses and displays will be slightly different.

To Make a Fault Location Measurement

1. Choose the measurement parameters or recall an instrument state.

PRESET **BEGIN** **Cable** **Fault Location**

Start Distance **XX** **ENTER** **Stop Distance** **XX** **ENTER**

2. Reduce the interference.

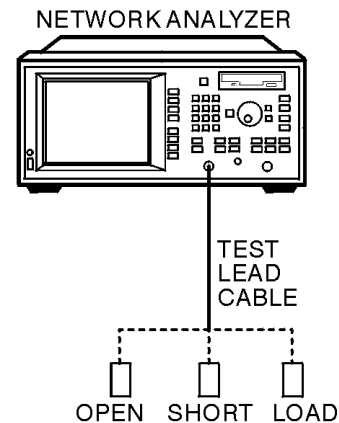
BEGIN **Cable** **Fault Location**
Band Pass **Center Frequency** **900**
MHz

FREQ **Fault Loc Frequency**
Band Pass Max Span **300** **MHz**

AVG **System Bandwidth**
Narrow 250 Hz

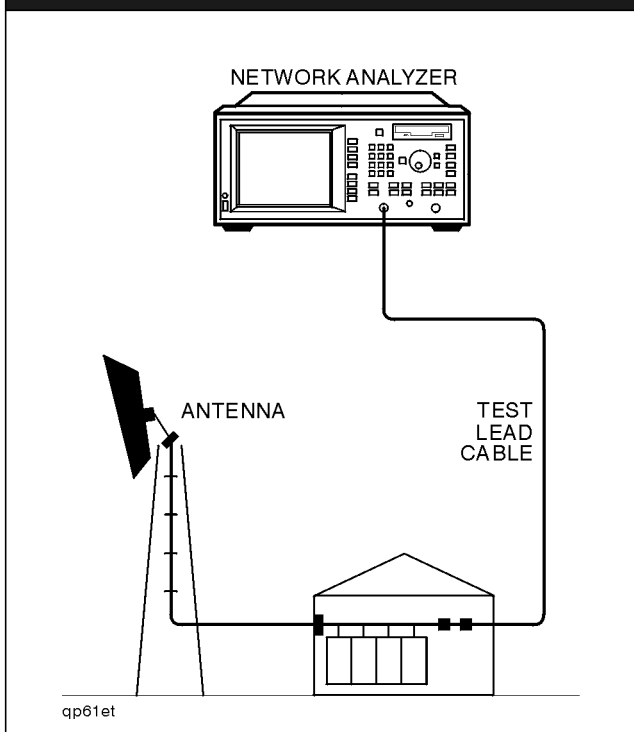
3. Calibrate the analyzer.

CAL **Full Band Cal**



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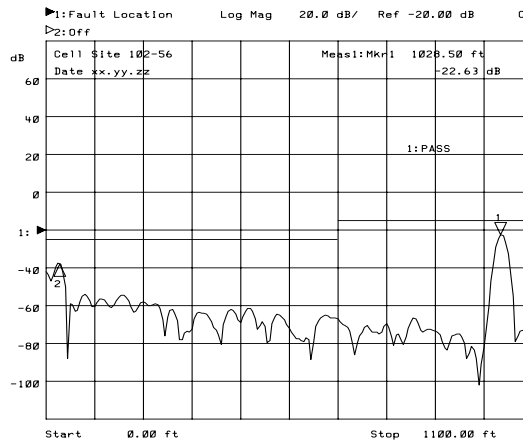
4. Connect the equipment.



5. Interpret the measurement / save results.

MARKER Marker Search Max Search

Mkr -> Max



SAVE RECALL Define Save Data ON

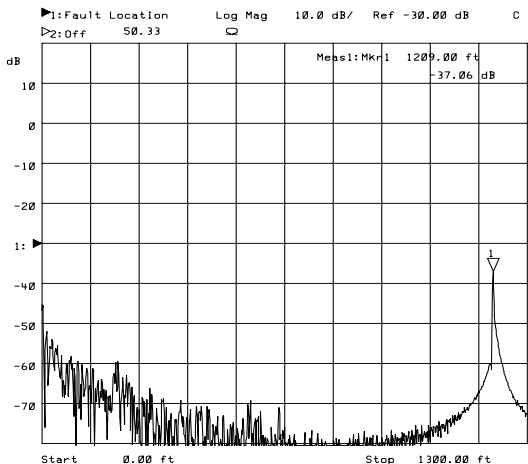
Prior Menu Save State

If Measurement Results Were Poor

The following results indicate a specific problem you may encounter. Refer to your *Option 100 User's Guide Supplement* for more information.

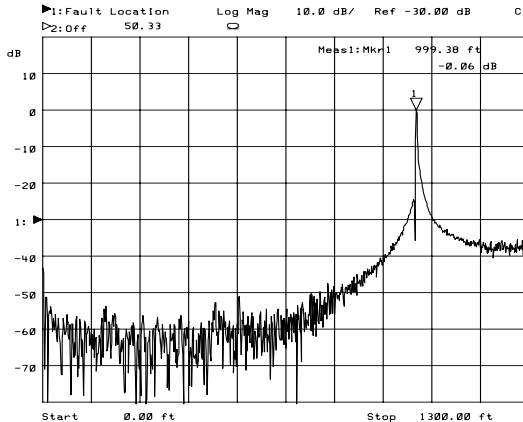
Problem

The measured amplitude and distance of a 1000 ft. cable are wrong. (Cable is not terminated in this example.)



Solution

Change the "velocity factor" and "cable loss" values to the values specified by the cable manufacturer.



CAL Velocity Factor Cable Loss

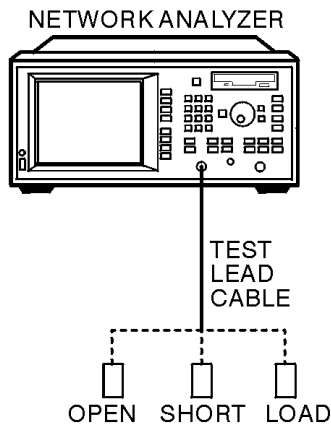
To Make a Return Loss Measurement

1. Choose the measurement parameters or recall an instrument state.

PRESET **MEAS 1** **Reflection** (or **S11**) **AVG** **System Bandwidth** **Narrow 250 Hz**

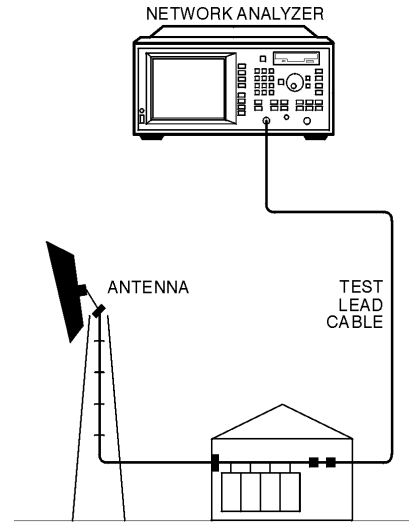
2. Calibrate the analyzer.

CAL **1-Port** (or **User 1-Port**)



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3. Connect the equipment.

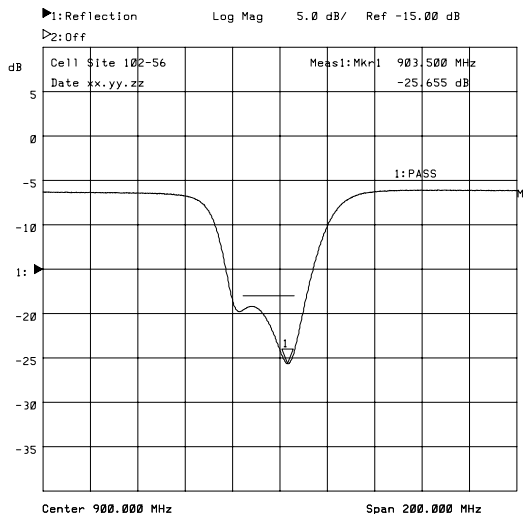


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4. Interpret the measurement / save results.

MARKER **Marker Search** **Min Search**

Mkr -> Min



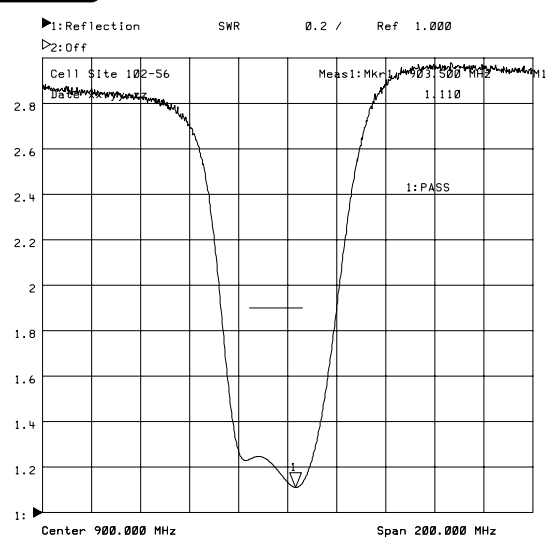
SAVE RECALL **Define Save** **Data ON**

Prior Menu **Save State**

5. View SWR / save results.

FORMAT **SWR** **SCALE** **Scale/Div** **0.2**

ENTER



SAVE RECALL **Save State**

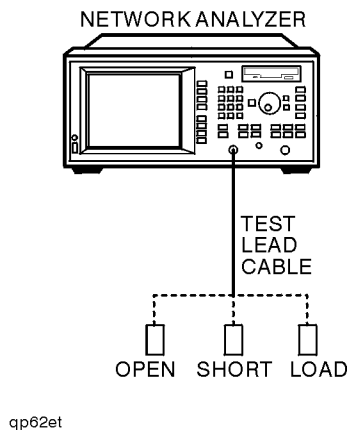
To Make an Insertion Loss Measurement

1. Choose the measurement parameters or recall an instrument state.

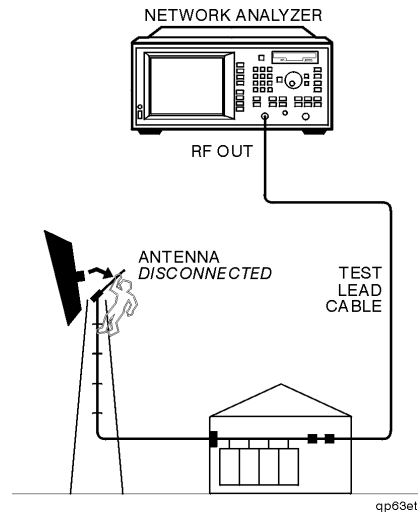
PRESET MEAS 1 Reflection (or S11) AVG
 System Bandwidth Narrow 250 Hz

2. Calibrate the analyzer.

CAL 1-Port (or User 1-Port)

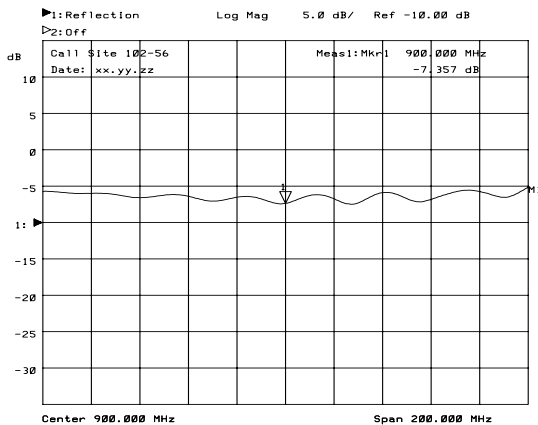


3. Connect the equipment.



4. Interpret the measurement / save results.

MARKER 900 MHz



SAVE RECALL Define Save Data ON
 Prior Menu Save State

5. Calculate insertion loss and end of cable.

Insertion Loss Calculation

$$= \text{marker value} \div 2$$

$$= 7.36 \text{ dB} \div 2 = 3.68 \text{ dB}$$

End of Cable Calculation

$$= \lambda \div 2$$

where:

$$\lambda \text{ (wavelength)} = c \times V_f \div \Delta f$$

$$\Delta f = 10 \text{ MHz between bumps}$$

$$V_f \text{ (velocity factor)} \approx 1.0$$

$$c \approx 10^9 \text{ ft/sec}$$

$$\lambda = 10^9 \text{ ft/sec} \div 10^7 \text{ cycles/sec} = 100 \text{ ft}$$

$$= 100 \text{ ft} \div 2 = 50 \text{ ft}$$