Cellular Antenna Quick Start Guide
HP 8712ET/ES and HP 8714ET/ES

HP Part Number 08714-90022
Printed in USA October 1998

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 HP 8712ET or HP 8714ET. If you are using an HP 8712ES or HP 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.

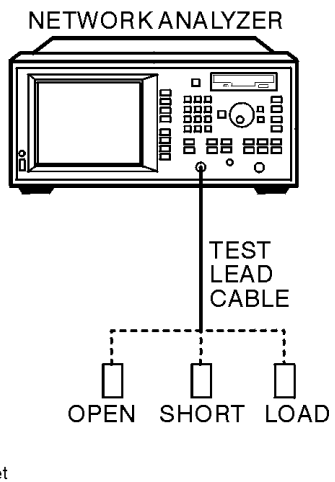
BEGIN **Cable** **Fault Location**
Band Pass **Center Frequency** 900 **MHz**

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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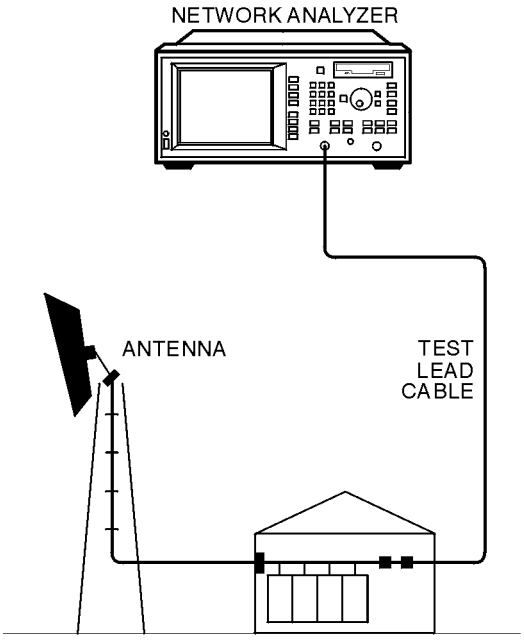
4. Connect the equipment.



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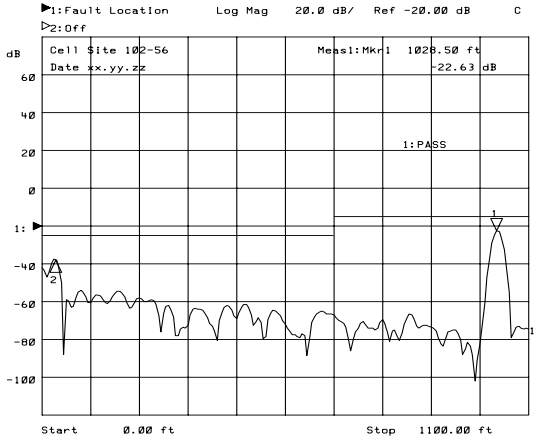
5. Interpret the measurement / save results.

(MARKER) **Marker Search** **Max Search** **Mkr –> Max**

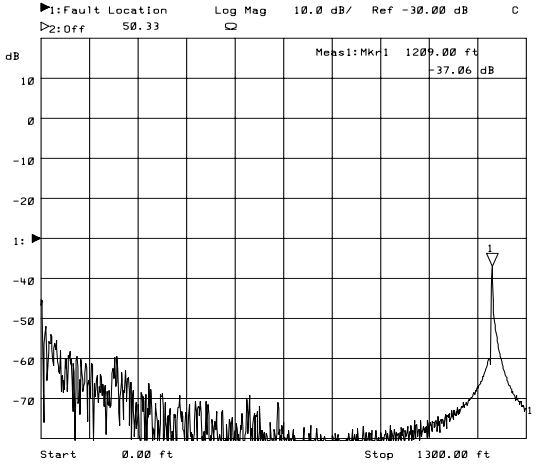


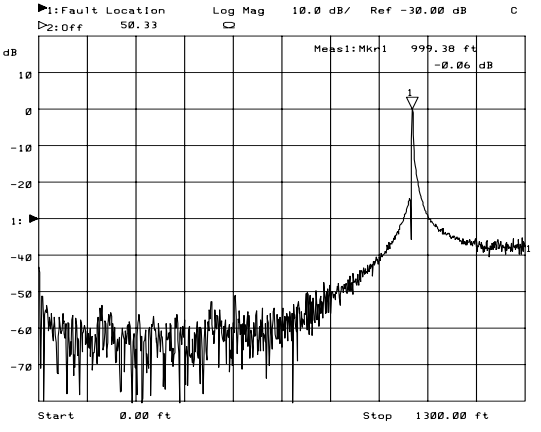
(SAVE RECALL) **Define Save** **Data ON** **Prior Menu** **Save State**

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	Solution
The measured amplitude and distance of a 1000 ft. cable are wrong. (Cable is not terminated in this example.)	Change the "velocity factor" and "cable loss" values to the values specified by the cable manufacturer.





(CAL) **Velocity Factor** **Cable Loss**

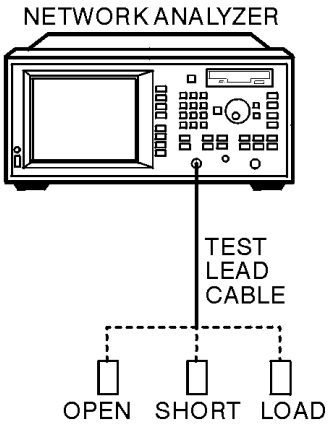
To Make a Return Loss Measurement

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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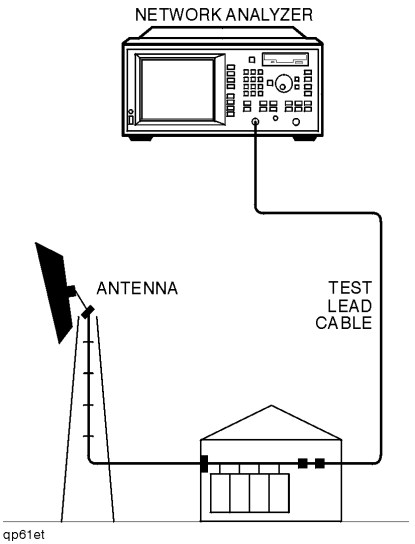
3. Connect the equipment.



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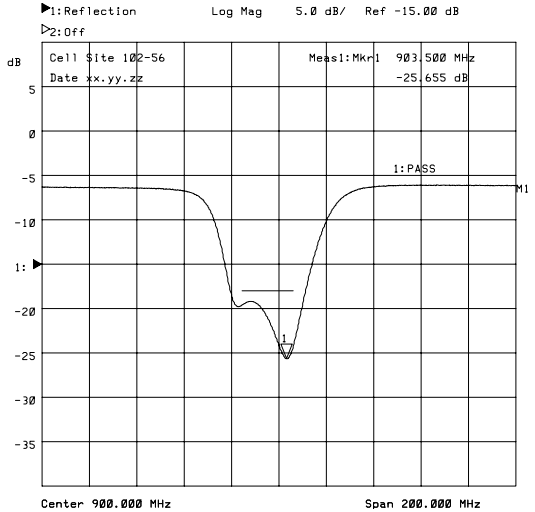
4. Interpret the measurement / save results.

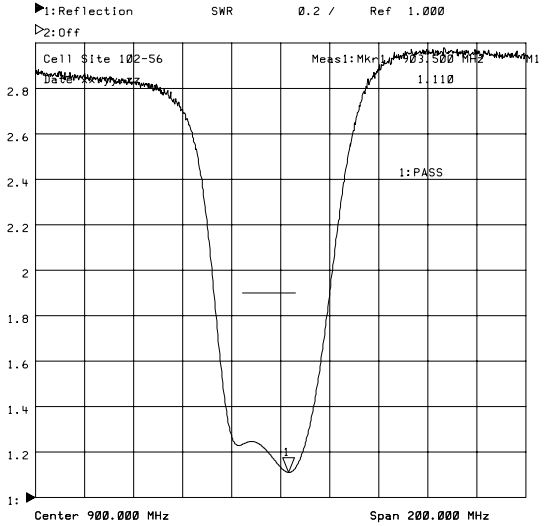
MARKER **Marker Search** **Min Search** **Mkr –> Min**



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**

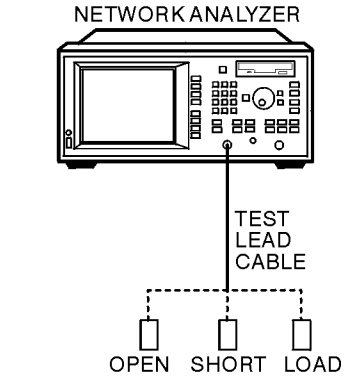
To Make an Insertion Loss Measurement

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**)



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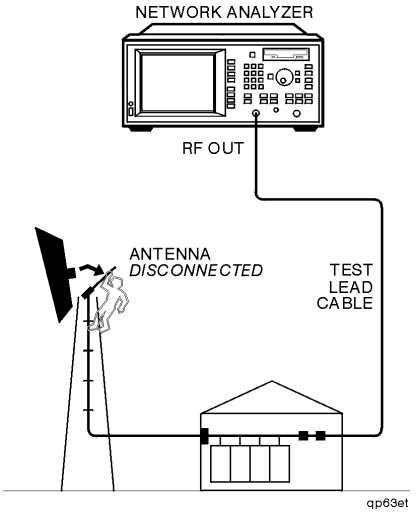
3. Connect the equipment.



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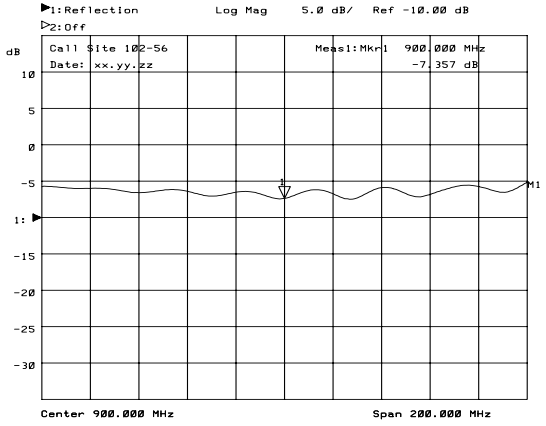
4. Interpret the measurement / save results.

MARKER | 900 | **MHz**



SAVE RECALL | **Define Save** | **Data ON**
Prior Menu | **Save State**

5. Calculate insertion loss and end of cable.

Insertion Loss Calculation

= marker value ÷ 2

= 7.36 dB ÷ 2 = 3.68 dB

End of Cable Calculation

$= \lambda \div 2$

where:

λ (wavelength) $= c \times V_f \div \Delta f$

Δf = 10 MHz between bumps

V_f (velocity factor) ≈ 1.0

$c \approx 10^9$ ft/sec

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

= 100 ft ÷ 2 = 50 ft