

# Maximize Base Station Maintenance and Testing Efficiency for Higher Quality Wireless Networks

## Overview

As carriers roll out advanced wireless services, it is becoming more difficult to offer a high quality of experience to every wireless user. Industry experts often comment about the amount of stress on the network and required bandwidth for advanced data services. However, very little is said about the stress on network operations personnel to maintain these services. As wireless networks expand and offer more advanced features, the responsibilities and skill sets of the field service technician must grow. Carriers are having to invest more time and money in educating their technicians on how to properly maintain and test their networks, as well as develop consistent maintenance procedures that are easy to use.

**Customers that switch carriers commonly site dropped calls and poor coverage as common reasons. This is a direct reflection of the system performance.**

This whitepaper will present a new approach for quicker testing, identification and resolution of BTS problems in a reliable, consistent manner. Tektronix has designed an advanced testing method that blends the knowledge and skills of your best engineers and technicians with customized testing procedures. This testing method will increase your network performance through a simple and consistent approach to testing and ultimately increase the quality of service to your customers.

**Is it possible to increase your field maintenance team's productivity?**

## Is this your situation?

**Integrated tools are designed to increase efficiency... but integrated does not always mean "easy to use".**

Looking to increase your Average Revenue Per User (ARPU)? The wireless industry is faced with the daunting task of keeping voice users happy while at the same time, providing advanced data services to key users who are requiring more bandwidth.

Testing the new signal standards is getting more complex. Tools that integrate numerous capabilities to increase efficiency may not be easy to use. How do you ensure that each technician will run the same tests, use the same parameters, or even draw the same conclusion about what the results are telling them? What you need is a way to ensure consistent testing among all your technicians

## Do you have consistent installation and maintenance techniques?

It is extremely common for two competent technicians to approach impairment testing very differently. Both may come to the same conclusion, but mean time to repair (MTTR) and steps to find a resolution may vary drastically. It is up to you to provide guidance on acceptable testing policies and results parameters.

**How do you ensure base station technicians are running the same tests consistently?**

**Are all of the required tests being performed?**

For example, two technicians go out into the field to do testing on a base station. The return loss measurement fails. They report the result to engineering, but engineering also wants the results from the distant to fault (DTF) measurement. The technicians must now go out again to do the DTF measurement, which costs time, quality on the network, and potentially, customers.

Tektronix understands the need for technicians to be able to make consistent, repeatable measurements. We are the leader in designing and incorporating the complete “tool-box” concept into your test equipment. This concept is based on the need for multi-function test equipment, like the NetTek, that incorporates both wireless and wire-line test functionality. We are the first company in the industry to incorporate advanced, customizable productivity software built into the test set. This will assist in wireless testing; including built-in assistance with proper connections, measurement configuration, and results interpretation.

**Tektronix has the answer!**

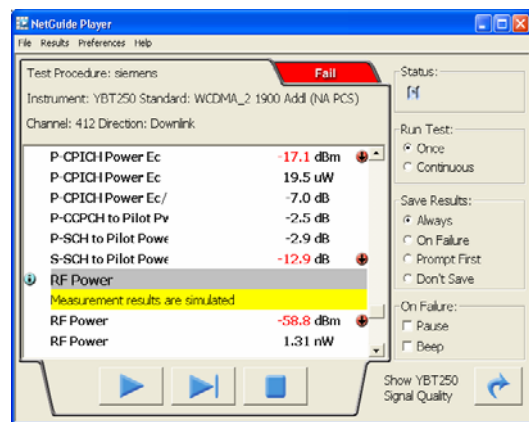
## Introducing NetGuide

NetGuide is a productivity enhancement application software that can create customized procedures around how you use the YBT250 BTS transmitter tester and YBA250 antenna analyzer. It was created to allow companies to design and set up customized test procedures and problem analysis in an easy to use format. This robust assistant utilizes the strengths of your experienced technicians and engineers to provide a complete and consistent test solution. The goal is to solve the problem of inconsistent testing and incorrect test result analysis through an advanced system that walks the technician through the sequence of measurements while providing both the assistance and the reporting that are unique to your requirements and systems.

**Incorporate pictures, diagrams, hints, tips and information on how to troubleshoot specific problems.**

When implemented properly, technicians will no longer have to refer to a user's manual or remember every detail from a training class they may have taken a year ago. This is not a generic procedure designed by engineers in a lab, but a complete system that allows senior technicians or engineers the ability to customize and add notes or information that are available to anyone running the test, helping new and less experienced technicians learn and perform their job properly. NetGuide has a built-in editor so as more problems are discovered and documented; the entire sequence can be modified, refined, and updated by your experts and transferred to all of your NetTeks.

NetGuide is designed to combine the strengths of experienced technicians, engineers, and equipment manufacturers to increase efficiency, documentation, and the flow of information. Knowledge and skills from seasoned professionals can be incorporated into test procedures for your NetTek test equipment. These procedures can be used by all technicians to test and troubleshoot base station systems and report-out on test results, as well as process problems, back to the test designers. Modifications to the tests are quickly made and new tests can be distributed, ensuring fewer dropped and no service calls as well as maximum data throughput.



## Two Parts of NetGuide

The system architecture for NetGuide is designed in two parts: NetGuide Editor and NetGuide Player. NetGuide Editor will be used to create customized installation and maintenance test procedures that can be executed using the NetGuide Player.

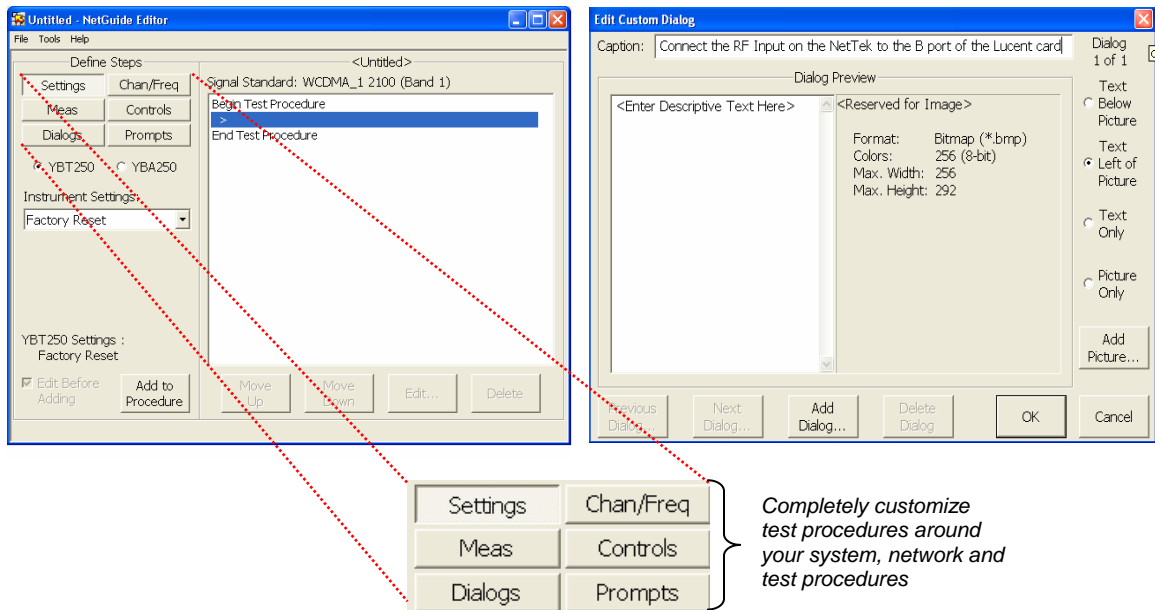
## NetGuide Editor

**Design a test procedure in minutes**

The innovative NetGuide Editor program enables lead technicians and engineers the ability to create customized test procedures. No other embedded integrated solution in the industry allows for the creation of scripts that combine company specific content with key knowledge. These specific, customized dialogues can include demonstrations, help menus, pictures, acceptable measurements, and reporting. All other systems in the industry only provide generic information that typically does not help a technician perform testing or analysis of the results. Additionally, the troubleshooting tips within a generic system may not pertain to your actual system or network architecture.

## NetGuide Editor provides the ability for the following:

- Create complete, customized test procedures by including demonstration setups, running measurements and reporting the results.
- Set pass/fail parameters for each selected test.
- Create step-by-step dialogs with pictures and diagrams. This can be used to show anything from physical cable connections to base station specific information.
- Provide dialogs for troubleshooting assistance (customized help) in the event of a failed test.
- Document and report information back to engineering or management.



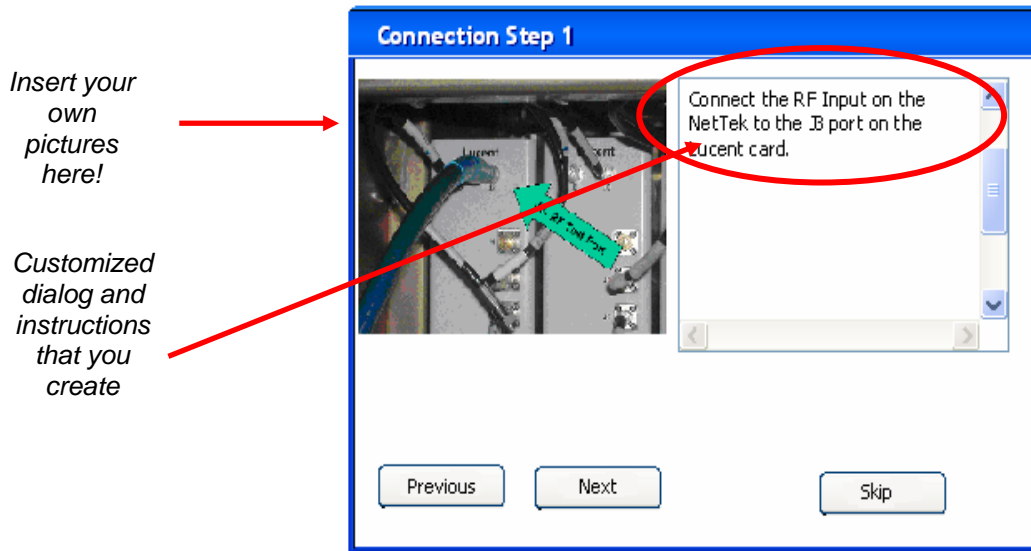
## NetGuide Player:

Once a test procedure has been designed, it is loaded into the player program and resides on the NetTek portable analyzer. This may then be incorporated as the company testing procedure. When testing is required, the technician simply launches the appropriate test application based on the specific BTS equipment or other parameters.

This means that there is no chance of missing a specific test. All tests are done consistently and the results are compared against acceptable company parameters.

**There is no chance of missing a specific test!**

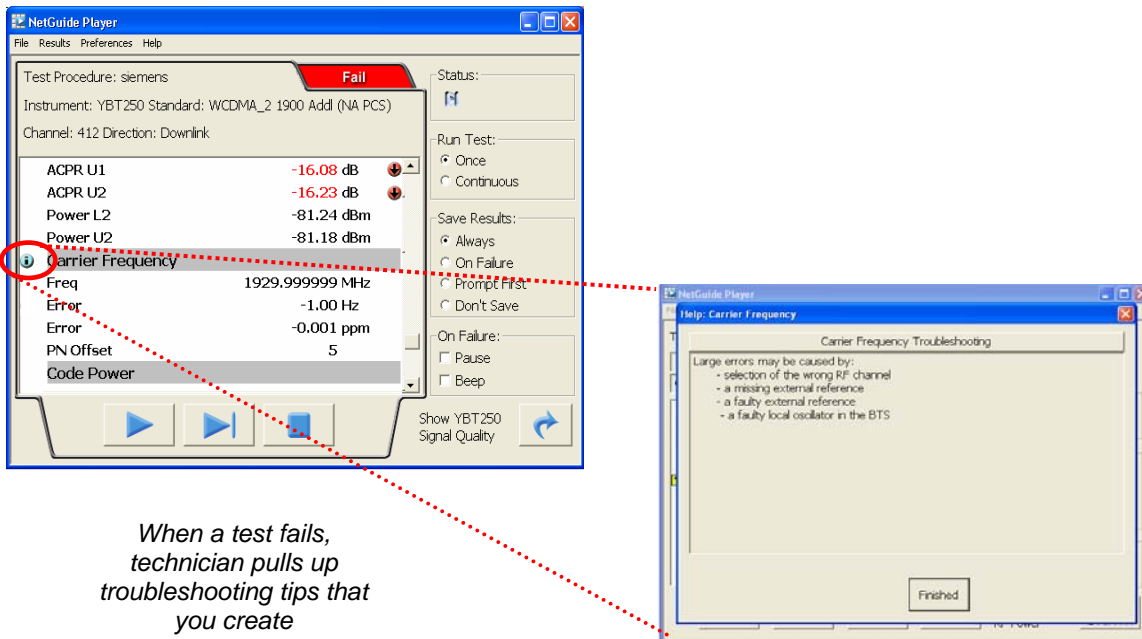
In the diagram below, you see an example of the initial connection procedure for a test. The picture would not be a generic diagram, but an exact picture of the radio and connections needed for a specific base station. Specific instructions are also entered so that there is no confusion.



*Insert your own pictures here!*

*Customized dialog and instructions that you create*

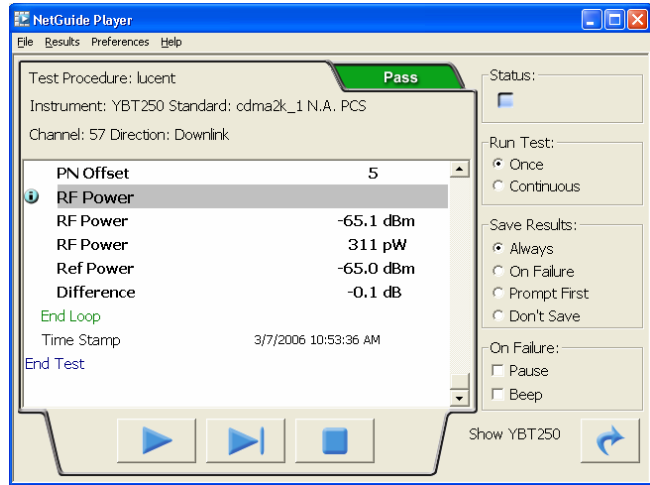
When a test fails, the user can simply click on the question marks to obtain additional help on what their next steps should be based on help that your experts have designed.



*When a test fails, technician pulls up troubleshooting tips that you create*

## Benefits of Tektronix NetGuide:

- Integrated, customized testing procedures for your network
- Consistent, repeatable testing by all technicians
- On-board troubleshooting analysis assistance.
- Built-in reporting allows verification and documentation of measurements
- Shared knowledge between all technicians and engineers



Currently, any time there is a problem or failure, your technicians are the first responders. These technicians diligently approach the problem with complex tools, but depending on the knowledge level of a technician, they may not be able to solve the issue in the most efficient manner. The classic example is resetting a complete radio when the problem may have simply been a bad connector. NetGuide will help the technician tackle common problems by using and building upon a common knowledge base.

With test equipment, when a test fails, it is not clear what should be done to alleviate the problem. The technician must interpret the test results and try to come up with a solution. NetTek fixes this issue by deploying technicians armed with test applications and integrated troubleshooting parameters *designed by you*. You no longer have to doubt test results or wonder if the test equipment was configured properly. NetGuide's user configured knowledge base and guided test procedures will help keep technicians on track and help them resolve problems more efficiently.

**When a test fails, the problem is isolated and repaired immediately!**

## Summary

Tektronix has designed the NetGuide to be an innovative productivity enhancement tool that adds ease-of-use and repeatability to your measurement routines. With the NetGuide, you have the power to control all aspects of the testing process to ensure consistent and accurate testing on your network. No expensive programmers or consultants are required to easily migrate to the next level of testing. In a very short period of time you can design your own testing routines that are sure to increase your base station testing efficiency.



