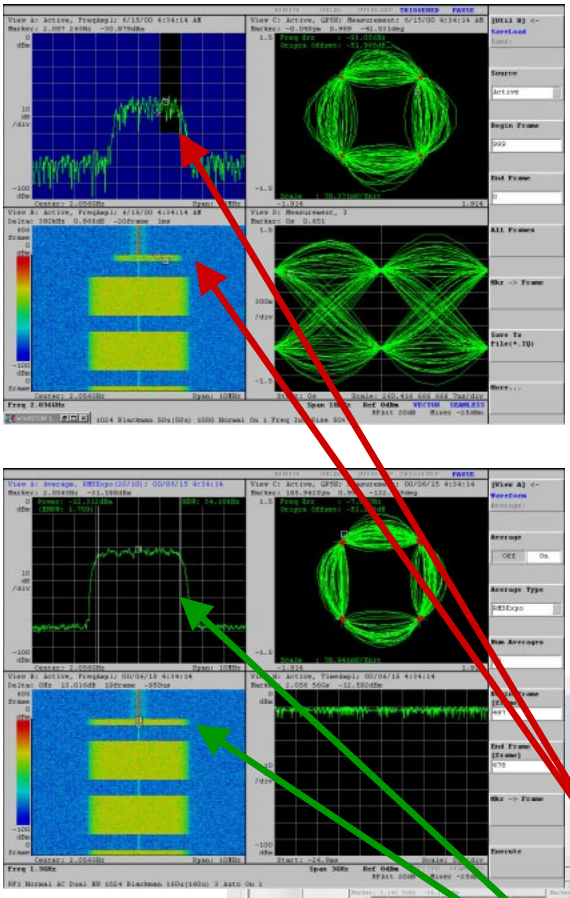
For Engineers Developing Mobile Communication Equipment!

Wireless Communication Analyzer WCA380/330 Series is the best testing tool, suitable for analysis / debugging of signals used in mobile communication equipment (W-CDMA, PDC, cdma-One, etc.).

Detection / Verification of Faulty Random Access Channel (RACH) Signal



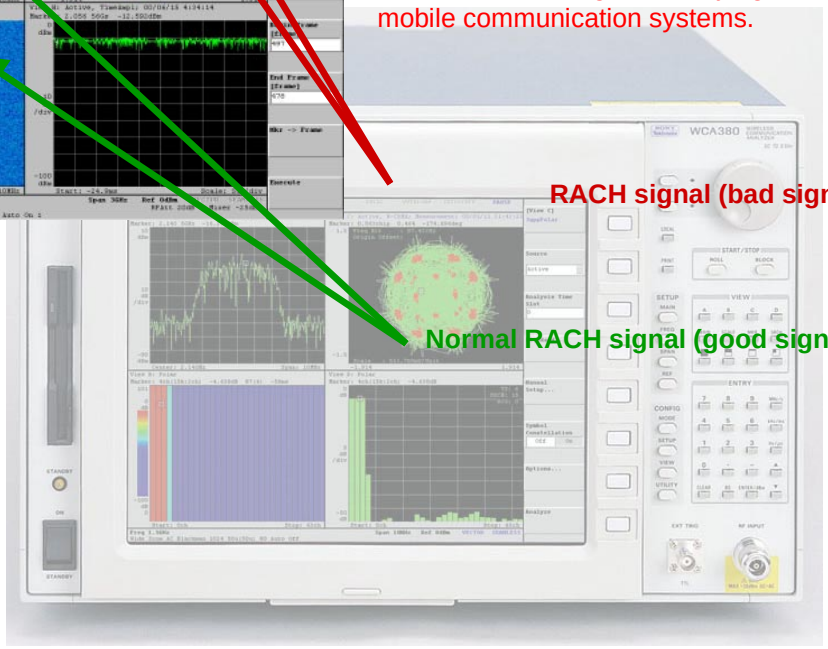
Does your cellular phone ring up correctly at any time?

In 3GPP mobile station and base station, the communication process starts by transmitting a RACH signal first. Once the base station reads the RACH signal correctly, the normal communication route is established between the mobile station and the base station.

If the accuracy of the RACH signal is not satisfactory, the waveform is not pure enough (i.e. noisy), or the receiver's sensitivity margin is poor, there will be an error and the RACH signal will not be read correctly. The wireless phone system will not operate properly and there will be difficulty in placing calls.

These are the significant design issues for new models of wireless phones and significant for determining the sensitivity of both the mobile stations and the base stations in their standby states.

Wireless Communication Analyzer WCA380/330 is the ideal tool for testing and verifying these features of mobile communication systems.



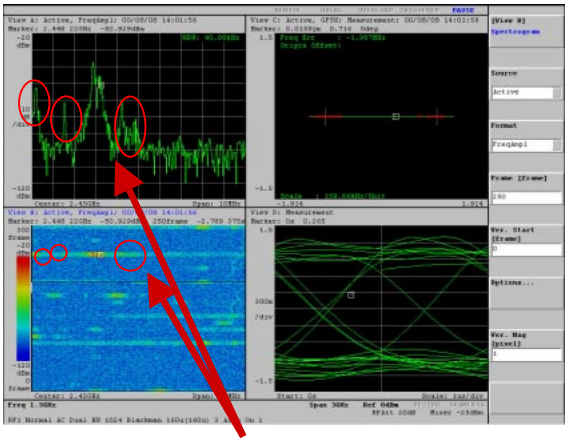
RACH signal (bad signal)

Normal RACH signal (good signal)

For Engineers Creating Bluetooth Technologies Solutions.

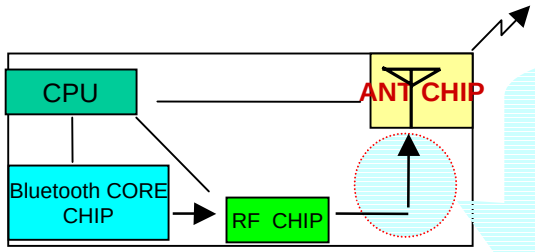
Wireless Communication Analyzer WCA series is the best solution for analysis/debugging of signals used in Bluetooth equipment.

Detection of Frequency Hopping (FH) Faults

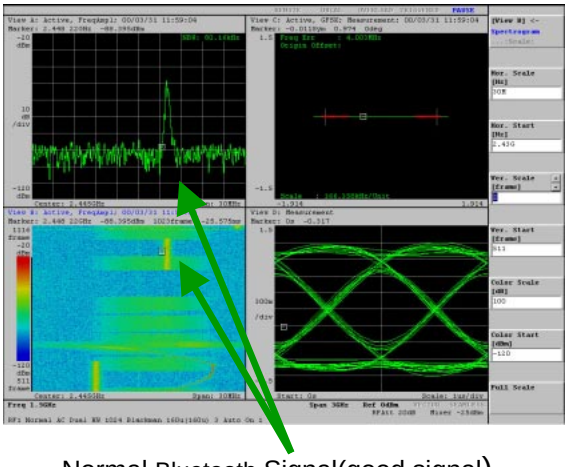


In-band spurious(bad signal)

Does your Bluetooth equipment connect correctly every time?
Do you experience a much lower than design data transfer rate in your Bluetooth applications? Do you have frequent communication errors?
In Bluetooth equipment, when a data transfer error occurs, the receiver unit requests the transmitter to resend the information. If the re-transmission again experiences a data transfer error, the transmitter must resend the information until it is received correctly. Because of the transfer error rate, the data transfer rate deteriorates rapidly.
One cause of this problem is the impurity of the hopping waveform in the Bluetooth signal. Signal impurity will cause the receiver to fail to recognize the data, resulting in an error.



Example: Antenna installation is faulty.
1) RF energy output from the transmitter reflects at the antenna terminal, and results in occurrence of spurious signals (i.e., it results in distortion of waveforms as shown in the upper-left diagram).
2) Reflected wave caused by antenna mismatching cancels the forward wave, and RF energy level output from the antenna decreases much.
↓
You have to check VSWR (**V**oltage **S**tanding **W**ave **R**atio) !



Normal Bluetooth Signal(good signal)

In the manufacturing process of Bluetooth Technology equipment, it is not cost effective to perform trouble shooting frequently. Although quantity has to be maintained while making sure the product cost is low. In order to maintain the desired performance and product cost, the Bluetooth transmitters must transmit a signal that is within tolerable limits and the receiver must have a sensitivity margin to acceptably recognized data within these limits.
Some manufacturers have already started to supply core chips for Bluetooth equipment. You will evaluate them to determine the best choices and combination for constructing Bluetooth Technology boards.
WCA series is the sole testing tool capable of checking and confirming Bluetooth Technology boards are able to transmit the best waveform possible.

Verification of signal interference, and consideration to sensitivity margin

Are you sure of the environment surrounding Bluetooth?

Bluetooth equipment operates in the 2.4 GHz band, which is a very convenient frequency band since no license is required in transmitting RF signals. Because there is no licensing in this frequency band, other wireless LAN and other wireless applications operate in the 2.4 GHz band. Powerful electromagnetic emissions from household appliances (such as microwave ovens) can also be detected in this band.

In developing Bluetooth Technologies equipment, it is important to establish very robust algorithms in receiving and recognizing Bluetooth signals in real world environments.

To accomplish this, it is necessary to determine two factors. First, the interferences on the Bluetooth signal from environmental interference must be determined. Second, the interferences on the Bluetooth signal from other Bluetooth signals must be determined.

The only device that allows you to test and verify your Bluetooth equipment is the Wireless Communication Analyzer WCA series.