



**Advanced Test Equipment Rentals**  
**www.atecorp.com 800-404-ATEC (2832)**



## JD745A/JD785A CellAdvisor™ Base Station Analyzers

	JD745A	JD785A
Spectrum Analyzer	100 kHz to 4 GHz	9 kHz to 8 GHz
Cable and Antenna Analyzer	5 MHz to 4 GHz	5 MHz to 6 GHz
RF Power Meter	10 MHz to 4 GHz	10 MHz to 8 GHz



# Introduction



JD745A Base Station Analyzer



JD785A Base Station Analyzer

A JD745A/JD785A Base Station Analyzer is the optimal test tool for installing and maintaining cell sites. It contains all the features and capabilities required for field testing cell sites for all 2G to 4G wireless technologies.

Equipped with one-button standards-based measurements for wireless signals, the analyzer offers a full scope of BTS conformance tests. Its combined functionality includes spectrum analysis, cable and antenna analysis, an RF/optical power meter, interference analysis, a channel scanner, E1/T1 analysis, and signal analysis.

Standard features include:

- Spectrum analyzer
- Cable and antenna analyzer
- RF power meter

Advanced features include:

- Interference analysis
- Channel scanner
- 2-port transmission
- CW signal generator
- E1 and/or T1 analysis
- GPS receiver
- Built-in bias tee
- Optical power meter
- Signal analysis of cdmaOne/cdma2000, EV-DO, GSM/GPRS/EDGE, WCDMA/HSPA+, TD-SCDMA, Mobile WiMAX, LTE/LTE Advanced — FDD and TDD

Highlights and capabilities include:

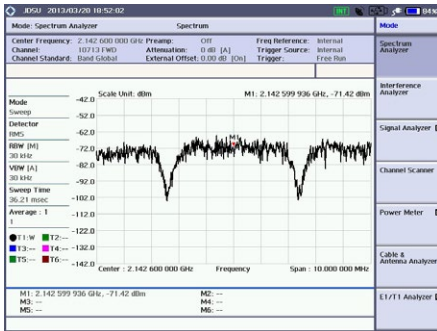
- Full LTE test capabilities
- LTE MBMS\* (multimedia broadcast multicast service)
- Passive intermodulation (PIM) detection\*
- Dual spectrum\*
- Spectrum replay
- Dual spectrogram\*
- Remote control
- Coverage mapping
- Remote wireless connectivity via Bluetooth®

\* JD745A only

# Features



The outdoor display mode enables easier reading in direct sunlight.



Outdoor display mode

## Easy User Interface

The analyzer provides a consistent, intuitive interface throughout its various functions, giving users a common, easy-to-use menu structure.

The analyzer's built-in help system guides users through each measurement task. They can save a screenshot of any function as a graphic file for report generation and save traces for post-analysis to the instrument's internal memory or to an external USB memory device. Stored data can be easily transferred to a PC using the USB or Ethernet port.

Users can edit file names using the instrument's rotary knob that also conveniently functions as an enter button when selecting alphanumeric characters.

## Designed for Field Use

The compact, lightweight analyzer is especially convenient for users who perform field measurements.

Its bright, multimode, 8-inch color display enables clear visibility indoors and outdoors.

The operating temperature ranges from  $-10$  to  $55^{\circ}\text{C}$ ; and, its rugged bumper protects the instrument to external impacts exceeding the MIL-PRF-28800F class 2 specification.

## Automatic Measurements

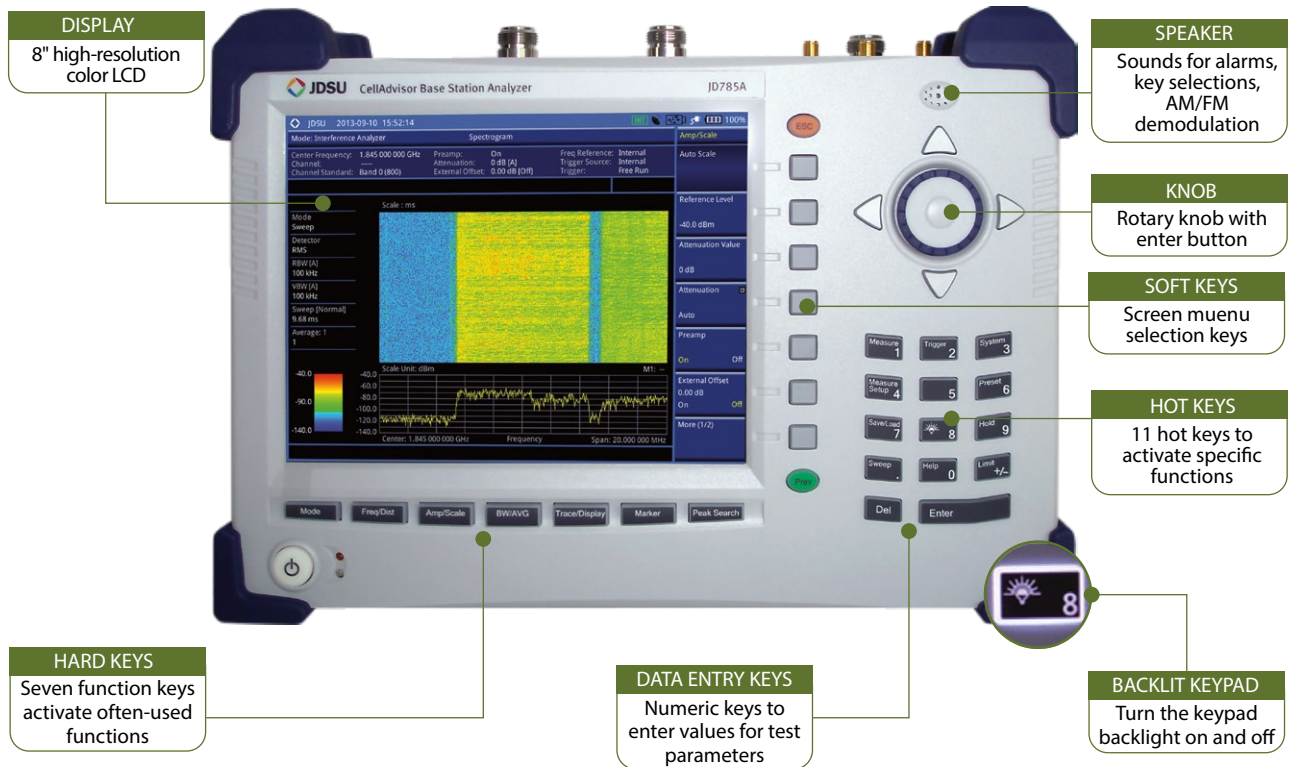
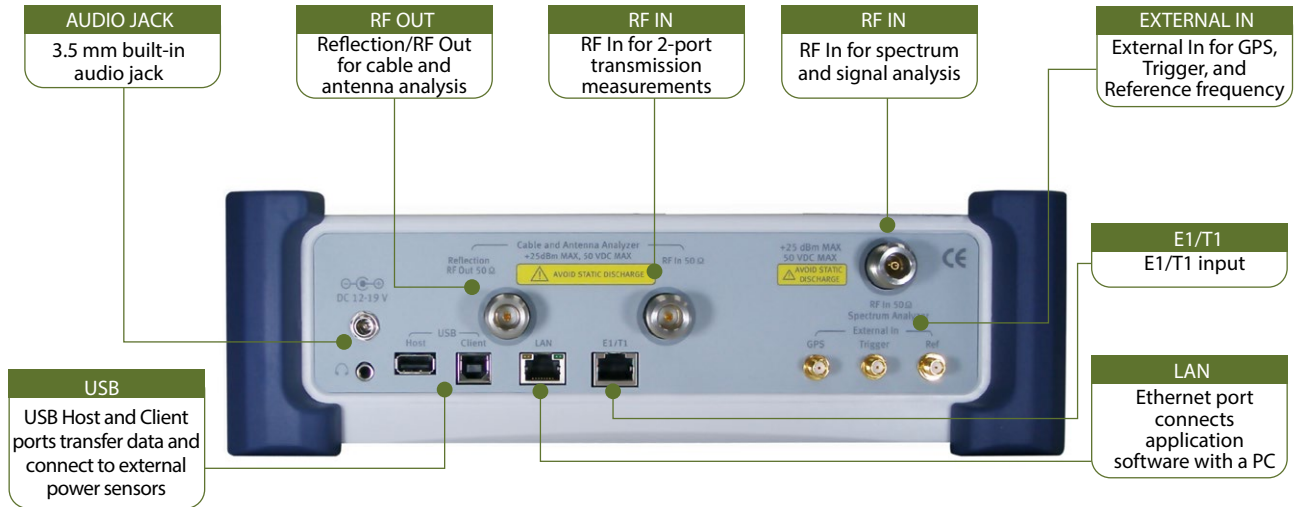
The analyzer's Auto Measure function affords complete signal profiling covering RF characterization and modulation quality parameters for up to 10 different carriers.

Auto Measure can be easily executed so the instrument automatically configures and tests every aspect for all carriers regardless of their frequency or modulation type. The analyzer's configurable channel scanner can track on one measurement screen the power levels for each of 20 carriers operating at different frequencies or modulation types.

## Multilanguage User Interface

A graphical user interface adapts to different languages for localization worldwide.

# Integrated Functionality



<b>Spectrum Analyzer</b> 100 kHz to 4 GHz (JD745A) 9 kHz to 8 GHz (JD785A) Built-in pre-amplifier Zero span with gate sweep	Locates and identifies various signals.  Detects signals as low as –160 dBm/–165 dBm with better than 1 dB measurement accuracy. Triggers pulse or burst signals such as WiMAX, GSM, and TD-SCDMA.
<b>Cable and Antenna Analyzer</b> 5 MHz to 4 GHz (JD745A) 5 MHz to 6 GHz (JD785A)	Provides cable and antenna characterization for proper power transfer from the radio to the antenna.  Locates failure points for effective troubleshooting. Verifies conformance to cable specifications.
<b>RF Power Meter</b> 10 MHz to 4 GHz (JD745A) 10 MHz to 8 GHz (JD785A)	Integrated RF power meter eliminates the need for a separate instrument and measures power with or without a power sensor.
<b>2-Port Transmission Measurements</b> (option 001)	Verifies passive and active devices such as filters and amplifiers.
<b>Bias Tee</b> (option 002)	Supplies up to 32 VDC built-in bias to active devices such as amplifiers.
<b>CW Signal Generator</b> (option 003)	Provides a sine wave or continuous wave (CW) source for measurements such as those used for isolating a repeater.
<b>E1/T1 Analyzer</b> (option 004, 005)	Comprehensive backhaul testing isolates problems related to incoming traffic from fixed networks.
<b>Wireless Connectivity*</b>	Provides remote control and monitoring capability with JDRemote (option 006) via Bluetooth interface.
<b>GPS Receiver and Antenna</b> (option 010)	Provides geographical location and highly-accurate frequency, and time for precise measurements.
<b>Interference Analyzer</b> (option 011)	Provides the required spectrogram and multisignal RSSI parameters to properly monitor, identify, and locate interference signals. In addition, it can generate a variable audible tone based on signal strength.
<b>Channel Scanner</b> (option 012)	An intuitive graphical representation of the signal's power for each of the 20 user-definable carriers (frequencies or channels) enables quick identification of improper power levels.
<b>Optical Power Meter</b> (option 013)	Measures optical power for all single-mode and multimode connectors via an optional optical power sensor (MP60 or MP80).
<b>Signal Analyzer</b> (options 020 to 029)	Provides 3GPP/3GPP2/IEEE802.16 conformance testing for RF characteristics as well as modulation analysis of 2G to 4G wireless technologies.
<b>Over-the-Air Analyzer</b> (options 040 to 049)	Characterizes transmission quality at any location providing reflective measurements and identifying signals transmitted from various sites.



# Spectrum Analyzer

The analyzer is the most flexible general purpose spectrum analysis test tool for monitoring and analyzing the RF spectrum. The spectrum analysis function performs these one-button standards-based wireless-signal power measurements:

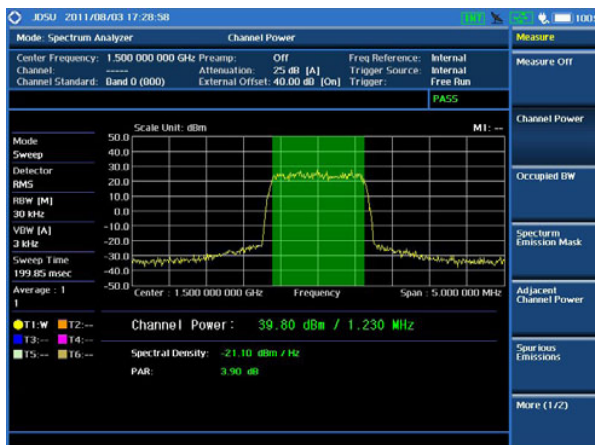
- Channel Power
- Occupied Bandwidth
- Spectrum Emission Mask
- Adjacent Channel Power
- Spurious Emissions
- Field Strength
- AM/FM Audio Demodulation
- Route Map
- PIM Detect\*
- Dual Spectrum\*

## Capabilities

- Built-in preamplifier
- Zero span with gated sweep
- AM/FM audio demodulation
- Multiple detectors: normal, RMS, sample, negative, peak
- Advanced marker: frequency counter, noise marker
- Limit line
- Up to 6 markers and 6 traces

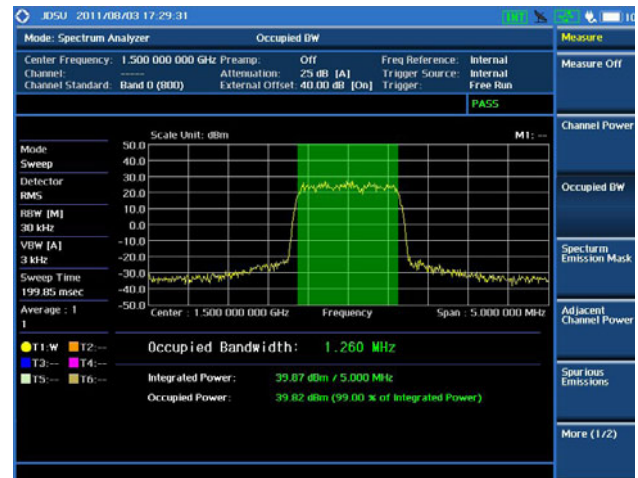
## Measurements

**Channel Power** measures the power level, spectral density, and peak-to-average ratio (PAR) of the signal in a specified channel bandwidth, showing pass/fail for the defined power



RF test — Channel Power

**Occupied BW** measures the frequency bandwidth that contains the specified percentage of the power, the total integrated power, and the occupied power with pass/fail results for the defined bandwidth.



RF test — Occupied Bandwidth

**Adjacent Channel Power (ACP)** measures the amount of RF power leakage in adjacent channels and its ratios, with pass/fail results for the defined test condition.



RF test — Adjacent Channel Power

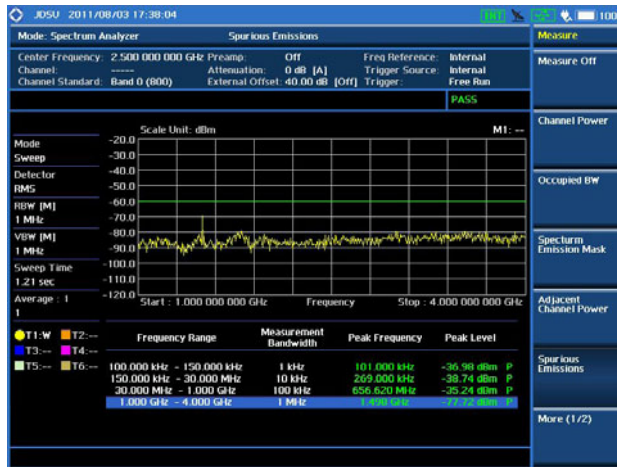
**Spectrum Emission Mask (SEM)** compares the total power level within the defined carrier bandwidth and the given offset frequencies to defined mask limits with pass/fail results.

\* JD745A only



RF test — Spectrum Emissions Mask

**Spurious Emissions** measurements identify and determine the power level of spurious emissions in certain frequency bands, showing pass/fail results based on the defined mask limits.



RFTest — Spurious Emissions

**Field Strength** quickly and conveniently measures and analyzes field strength to user-definable multisegment lines. Measuring field strength is easy once the user specifies the antenna factors in the analyzer.

**AM/FM Audio Demodulation** identifies interfering signals. The AM/FM signal can be demodulated into the instrument's built-in speaker or through a headset.

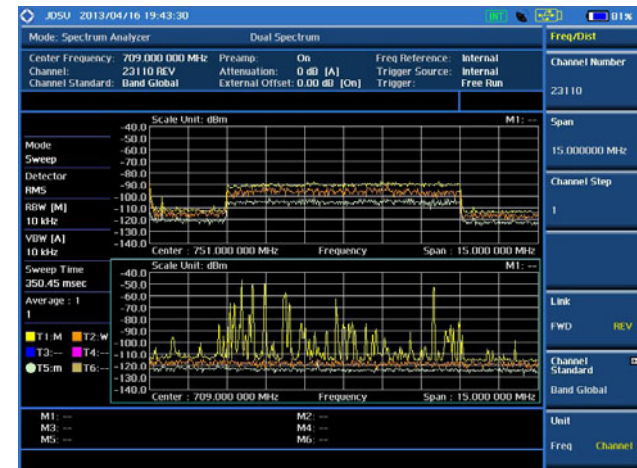
The spectrum analyzer can simultaneously operate with the CW signal generator. It easily fulfills the >100 dB guideline required for measuring repeater and antenna isolation.

**PIM Detection\*** identifies passive intermodulation in the uplink band caused when signals are combined and transmitted on a single nonlinear feed line.



RF test — PIM Detection

**Dual Spectrum\*** lets users view the spectrum activity for two different uplink and downlink spectrum bands on one screen simultaneously rather than switching between screens.



RF test — Dual Spectrogram

\* JD745A only

# Cable and Antenna Analyzer

The analyzer performs cable and antenna measurements to verify the base station's infrastructure, including feed lines, connectors, antennas, cables, jumpers, amplifiers, and filters.

## Capabilities

- Reflection
  - Voltage standing-wave ratio (VSWR)
  - Return loss
- DTF
  - VSWR
  - Return loss
- Cable loss (1-port)
- Port phase
- Smith chart
- 2-port transmission measurements (option 001)
  - Scalar measurements
  - Vector measurements

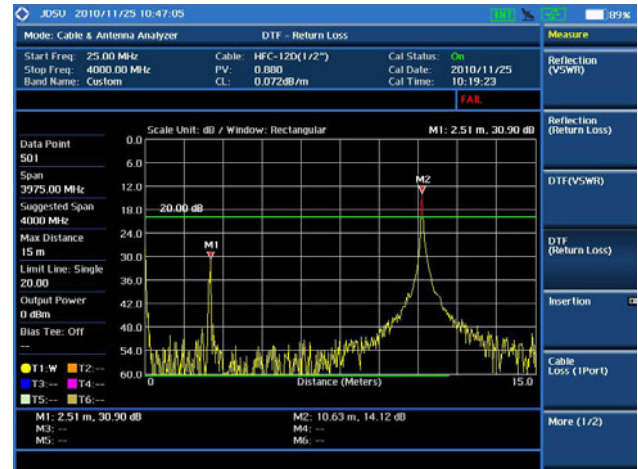
## Measurements

**Reflection – Return Loss** measures complete cell-site transmission line impedance performance across a specific frequency range in VSWR or return loss.



Cable and antenna test — Return Loss

**DTF – Return Loss** measures fault locations in the cell-site transmission system indicating signal discontinuities in VSWR or return loss. This distance-to-fault measurement precisely pinpoints the location of such things as damaged or degraded antennas, connectors, amplifiers, filters, and duplexers.



Cable and antenna test — Distance to Fault

**Cable Loss (1 port)** measures the signal loss through a cable or other devices over a defined frequency range by connecting one end of the cable to the instrument measurement port and terminating the other end of the cable with a short, or leaving it open altogether.



Cable and antenna test — Cable Loss



**Smith Chart** measures impedance and phase to properly tune RF devices.

Smith Chart also displays impedance-matching characteristics in cable and antenna systems or filter and duplexer devices.



Cable and antenna test — Smith Chart

**1 port Phase** measures  $S_{11}$  phase to tune antennas and to phase-match cables.



Cable and antenna test — 1-Port Phase

**2 Port Measurement (Scalar)** (option 001) have vector and scalar measurements. Scalar measurement provides greater dynamic range (>100 dB); vector measurement provides greater accuracy and faster test time.



Cable and antenna test — 2-port Measurement

**Insertion Gain/Loss** measures the characteristics of passive and active devices such as filters, jumpers, splitters, and amplifiers and verifies antenna or sector-to-sector isolation.

**2 Port Phase in Vector Measurements** measure  $S_{21}$  phase to characterize transmission devices such as filters and amplifiers.

The optional built-in bias-tee supplies power to active devices through the instrument's RF In port, eliminating the need for an external power supply.

# Power Meters

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The analyzer is equipped with an RF power meter and optionally an optical power meter.

The RF power meter performs two different methods of power measurement. The first is an internal power measurement for standard power testing without the assistance of external power sensors and the second interfaces with an external power sensor for high-accuracy power measurements.

The optical power meter measures optical power for single-mode and multimode connectors via an external optical power sensor.

## RF Power Meter (standard)

### Internal Power Measurement

- Frequency range: 10 MHz to 4 GHz/8 GHz
- Dynamic range: -120 to +20 dBm/+25 dBm
- Measurement type: RMS or peak

### External Power Measurement

- JD732B: Terminating power sensor (average)
- JD734B: Terminating power sensor (peak)
- JD736B: Terminating power sensor (average and peak)
  - Frequency range: 20 MHz to 3.8 GHz
  - Dynamic range: -30 to +20 dBm
- JD731B: Directional (through line) power sensor
  - Frequency range: 300 MHz to 3.8 GHz
  - Dynamic range: average 0.15 to 150 W, peak 4 to 400 W
  - Measurement:
    - ▷ Forward average power
    - ▷ Reverse average power
    - ▷ Forward peak power
    - ▷ VSWR
- JD733A: Directional (through line) power sensor
  - Frequency range: 150 MHz to 3.5 GHz
  - Dynamic range: average/Peak 0.1 to 50 W
  - Measurement:
    - ▷ Forward average power
    - ▷ Reverse average power
    - ▷ Forward peak power
    - ▷ VSWR

## Optical Power Meter (optional)

### Miniature USB 2.0 Optical Power Sensors

- MP-60
  - Wavelength range: 780 to 1650 nm
  - Dynamic range: 1300, 1310, 1490, 1550 nm: -50 to +10 dBm  
850 nm: -45 to +10 dBm
- MP-80
  - Wavelength range: 780 to 1650 nm
  - Dynamic range: 1300, 1550 nm: -35 to +23 dBm; 850 nm: -30 to +23 dBm

The power meter analysis has user-definable pass/fail limits and displays test results in dBm and watts. Power measurements can be set as absolute measurements displayed in dBm or as relative measurements displayed in dB.



Terminating RF power sensor



Directional RF power sensor



Optical power sensor



Power meter test (RF or optical)

The analyzer displays power levels in two formats, as a real-time value in an analog meter and as a power-level trend through time in a histogram chart.

JD730-series high-precision RF power sensors measure RF power connected via USB to the analyzer.

The analyzer controls terminating power sensors (JD732B, JD734B, and JD736B), making it a highly accurate RF power meter for out-of-service applications up to 3.8 GHz with a measurement range of -30 to +20 dBm.

The analyzer controls directional power sensors (JD731B and JD733A) measuring output power and impedance matching for in-service systems. These power sensors can handle up to 150 W of power, eliminating the need for attenuators.

The analyzer controls optical power sensors (MP-series) to measure optical power quickly and easily in single-mode or multimode.

This optical power meter offers a well-organized solution for fiber inspection.

# Interference Analyzer



The Interference Analyzer (option 011) function is extremely effective for locating and identifying periodic or intermittent RF interference. Interference signals derive from several kinds of licensed or unlicensed transmitters that cause dropped calls and poor service quality.

- Spectrum analyzer
  - Sound indicator
  - AM/FM audio demodulation
  - Interference ID
  - Spectrum recorder
- Spectrogram
- Receive signal strength indicator (RSSI)
- Interference finder
- Spectrum replayer
- Dual spectrogram\*

## Measurements

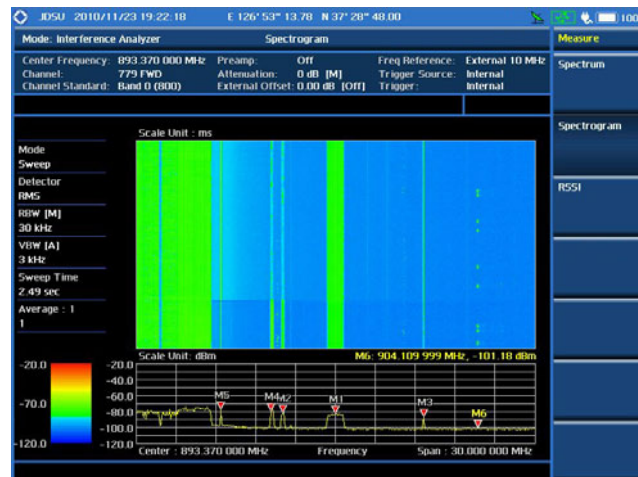
A spectrum analyzer capable of performing spectrum clearance, capturing just the events where the received signal exceeds the defined power limit.

Audible Tone volume is proportional to the signal's power strength. In addition, a built-in AM/FM audio demodulator conveniently identifies AM/FM signals.

Interference ID automatically classifies interfering signals and lists the possible signal types corresponding to the signal selected.

Spectrogram captures spectrum activity over time and uses various colors to differentiate spectrum power levels.

The spectrogram is effective for identifying periodic or intermittent signals. Post-processing analysis can be made for each measurement over time using a time cursor.



Interference analysis test — Spectrogram



**RSSI** is a multisignal tracking metric that is particularly useful for measuring power-level variations over time.

The RSSI measurement lets you assign a power limit line for audible alarms and increase alarm counters every time a signal exceeds a defined limit line.

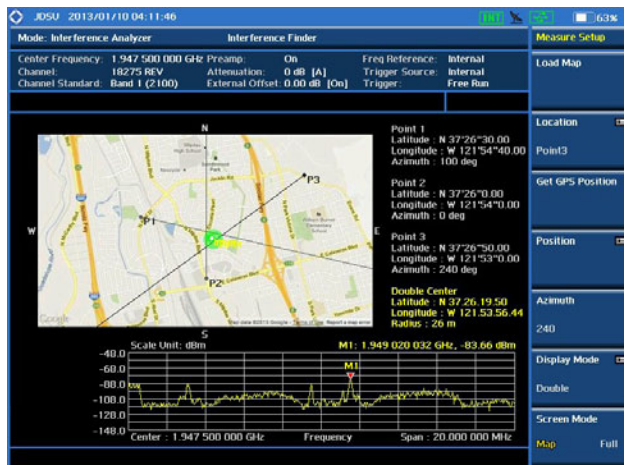
For long-term analysis, the Spectrogram and RSSI measurements can be automatically saved into an external USB memory. Post-analysis can be performed with JDViewer application software.



Interference analysis test — RSSI

**Interference Finder** is an automatic triangulation algorithm that uses GPS coordinates to locate possible interference sources based on three measurements.

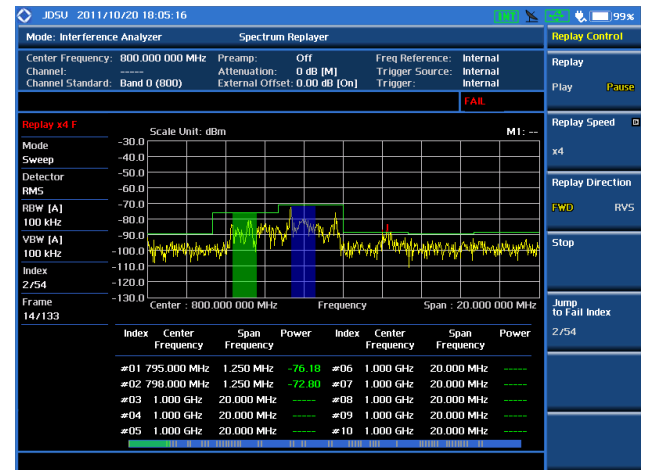
The interference finder calculates possible interference locations using its inscribed circle or circumscribed circle based on measured intersection points.



Interference analysis test — Interference Finder

**Spectrum Replayer** lets users retrieve and replay recorded spectrum analyzer traces in interference analysis mode. These traces can be played back in the Spectrogram or RSSI.

Users can configure the limit line to create failure points when signals exceed it. The failure points are clearly displayed on the trace timeline for quick access during playback.



Interference analysis test — Spectrum Mask/Replayer

**Dual Spectrogram\*** captures the spectral activities for two different bands over time to identify periodic or intermittent band signals.



Interference analysis test — Dual Spectrogram

\* JD745A only

# Signal Analyzer

The Signal Analyzer performs 3GPP/3GPP2/IEEE802.16-standard RF compliance testing for power and spectrum as well as modulation analysis. It performs standards-based measurements with a single-button push, indicating pass/fail based on standards or user-defined limits.

The Auto Measure capability lets users easily set up test scenarios with programmed measurement schedules such as start time, test duration, test cycles, and test metrics. Then, based on the user-defined conditions, the analyzer tests up to 10 different carriers and automatically saves the corresponding results.

The Over The Air (OTA) Analyzer function provides OTA measurements to quickly perform base station characterization. This measurement capability is especially useful for testing cell sites without interrupting service are those that are not easily accessible.

The Signal Analyzer provides these measurement capabilities:

- Spectrum analysis
- RF analysis
- Modulation analysis
- Auto measure



Modulation analysis can be performed for these wireless technologies:

- cdmaOne/cdma2000 (option 020)
- EV-DO (option 021)
- GSM/GPRS/EDGE (option 022)
- WCDMA/HSPA+ (option 023)
- TD-SCDMA (option 025)
- Mobile WiMAX (option 026)
- LTE - FDD (option 028)
- LTE Advanced - FDD\* (option 030)
- LTE - TDD (option 029)
- LTE Advanced - TDD\* (option 031)



Over-the-air (OTA) analyses include:

- cdmaOne/cdma2000 (option 040)
- EV-DO (option 041)
- GSM/GPRS/EDGE (option 042)
- WCDMA/HSPA+ (option 043)
- TD-SCDMA (option 045)
- Mobile WiMAX (option 046)
- LTE - FDD (option 048)
- LTE - TDD (option 049)

# Signal Analyzer Detailed Feature Matrix

Features		Technology			
		GSM/GPRS/EDGE (Option 022)	WCDMA/HSPA+ (Option 023)	LTE/LTE Advanced - FDD (Option 028/030*)	LTE/LTE Advanced - TDD (Option 029/031*)
<b>RF Analysis</b>	Channel power	■	■	■	■
	Occupied bandwidth	■	■	■	■
	Spectrum emission mask	■	■	■	■
	ACP(L)R		■	■	■
	Multi-ACP(L)R		■	■	■
	Spurious emissions	■	■	■	■
<b>Modulation Analysis</b>	Power vs. time				
	Slot	■			■
	Frame	■		■	■
	Mask				
	Timogram				
	Constellation	■	■	■ MBMS**	■
	Code domain power		■		
	Mid-amble power				
	Code power				
	Code error				
	RCDE*		■		
	Codogram		■		
	RCSI		■		
	CDP table		■		
	Spectral flatness				
	EVM vs. subcarrier				
	EVM vs. symbol				
	Data channel			■ MBMS**	■ MBMS**
	Control channel			■ MBMS**	■ MBMS**
	Subframe			■ MBMS**	■ MBMS**
	Frame			■ MBMS**	
	Time alignment error			■	■
	Data allocation map			■ MBMS**	■ MBMS**
Auto measure	■	■	■	■	
Power statistics CCDF		■	■	■	
Carrier Aggregation			■	■	
<b>OTA Analysis</b>	Scanner	(Option 042) Channel/Frequency	(Option 043) Channel/Scramble	(Option 048) Channel/ID	(Option 049) Channel/ID
	Multipath profile	■	■	■	■
	Preamble power trend				
	Modulation analyzer	■			
	Code domain power		■		
	Sync-DL ID vs. tau				
	Sync-DL ID analyzer				
	Control channel			■	■
	Datagram			■	■
	Route map		■	■	■

\* JD745A only

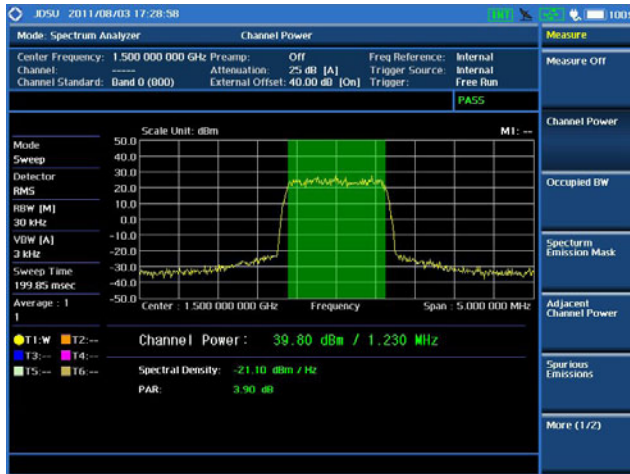
\*\* JD745A with MBMS enabled only

Features (continued)		Technology			
		cdmaOne/cdma2000 (Option 020)	EV-DO (Option 021)	TD-SCDMA (Option 025)	Mobile WiMAX (Option 026)
<b>RF Analysis</b>	Channel power	■	■	■	■
	Occupied bandwidth	■	■	■	■
	Spectrum emission mask	■	■	■	■
	ACP(L)R	■	■	■	■
	Multi-ACP(L)R	■	■	■	■
	Spurious emissions	■	■	■	■
<b>Modulation Analysis</b>	Power vs. time				
	Slot		Idle/Active	■	
	Frame			■	■
	Mask			■	
	Timogram			■	
	Constellation	■	■	■	■
	Code domain power	■	■		
	Mid-amble power			■	
	Code power			■	
	Code error			■	
	Codogram	■	■		
	RCSI	■	■		
	CDP table	■	■		
	Spectral flatness				■
	EVM vs. subcarrier				■
	EVM vs. symbol				■
	Data channel				
	Control channel				
	Subframe				
	Frame				
	Time alignment error				
	Data allocation map				
Auto measure	■	■	■	■	
Power statistics CCDF	■	■		■	
<b>OTA Analysis</b>	Scanner	(Option 040) Channel/PN	(Option 041) Channel/PN	(Option 045) Sync-DL ID	(Option 046) Preamble
	Multipath profile	■	■	Sync-DL ID	■
	Preamble power trend				■
	Modulation analyzer				
	Code domain power	■	■		
	Sync-DL ID vs. tau			■	
	Sync-DL ID analyzer			■	
	Control channel				
	Datagram				
	Route map	■	■	■	■



## RF Analysis

**Channel Power** measures a signal's total RF power, spectral density, and peak-to-average ratio (PAR) in a specified channel bandwidth.



RF analysis — Channel Power

**Occupied BW** measures the frequency bandwidth containing 99 percent of the power for total integrated and occupied power.



RF analysis — Occupied Bandwidth

**Spectrum Emission Mask** compares the total power level within the defined carrier bandwidth and the given offset frequencies on each side of the carrier frequency against allowable standards.



RF analysis — Spectrum Emissions Mask

**Adjacent Channel Power Ratio or Adjacent Channel Leakage Ratio** measures RF power leakage in adjacent channels and its ratios per specified standards.



RF analysis — Adjacent Channel Power

**The Spurious Emissions** measurement identifies and determines spurious emissions power levels in certain frequency bands.

## Modulation Analysis

**Power vs. Time (Frame)** verifies, with LTE-TDD, WiMAX, and GSM, that the transmitter output power has the correct amplitude, shape, and timing according to the standards.



Modulation analysis — Power vs. Time

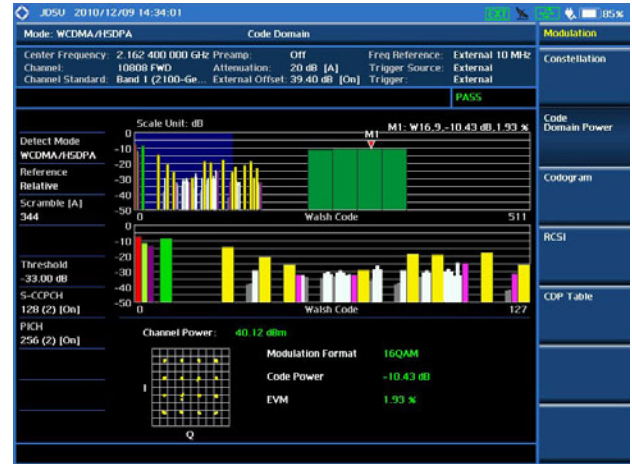
**Constellation** provides with multimedia broadcast/multicast services (MBMS\*), modulation quality metrics (EVM) for data and/or control channels, at its corresponding modulation scheme, such as GMSK, QPSK, 16 QAM and 64 QAM.



Modulation analysis — Data Constellation

**Code Domain** measures with CDMA/EVDO and WCDMA/HSPA+, spread code channel power levels across the RF channel, normalized to total power.

Code domain power (CDP) shows the signal's physical channels indicating the various spread factors using different colors to easily differentiate the traffic types carried within the signal.



Modulation analysis — Code Domain Power

**Code Power** provides the power data for an individual code channel and layer for a specified time slot. It displays the power of the 16 codes of a specified signal.

**Code Error** shows the power data and error data for an individual code channel and layer for a specified time simultaneously.

**Relative Code Domain Error\*\*** is computed by projecting the error vector onto the code domain at a specified spreading factor.



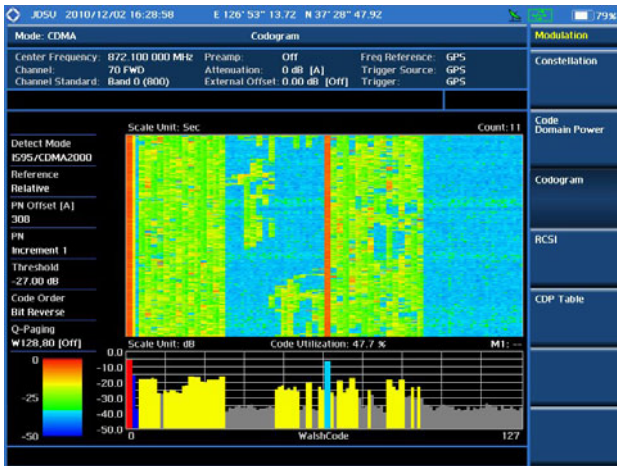
Modulation analysis — Relative Code Domain Error

\* JD745A with MBMS enabled only

\*\* JD745A only

## Modulation Analysis (continued)

**Codogram** or **Datagram** displays code power variations over time to give a clear view of each channel's traffic load at any given time.



Modulation analysis — Codogram

**RCSI** (received code strength indicator) shows, with CDMA/EVDO and WCDMA/HSPA+, power variations over time for control channels.

The analyzer can automatically save codogram and RCSI measurements into external USB memory for long-term analysis or for post-analysis with JDViewer application software.



Modulation analysis — RCSI

**Spectral Flatness** measures, with Mobile WiMAX, the constellation's flatness energy per the standards.



Modulation analysis — Spectral Flatness

**EVM vs. Subcarrier** shows, with Mobile WiMAX, the error vector magnitude representing the average constellation error for OFDMA subcarriers.

**EVM vs. Symbol** shows, with Mobile WiMAX, the error vector magnitude representing the average constellation error for OFDMA symbols.

**Complementary Cumulative Distribution Function (CCDF)** characterizes the statistical power level distribution at any given time.

**Data Channel** measures, with LTE and MBMS\*, selected resource block or control channel constellation and modulation quality at any subframe.



Modulation analysis — Data Channels

\* JD745A with MBMS enabled only



## Modulation Analysis (continued)

**Subframe** measures, with LTE and MBMS\*, the data and control channel power and modulation quality in any subframe.



Modulation analysis — Subframe

**Frame** measures, with LTE and MBMS\*, the power and modulation quality for all data and control channels in a frame.



Modulation analysis — Frame

**Time Alignment Error** for LTE/MIMO measures MIMO time differences of up to 4 transmission branches.



Modulation analysis — Time Alignment Error

**Data Allocation Map** measures, with LTE and MBMS\*, the power level for all resource blocks across subframes and shows data utilization within a frame.



Modulation analysis — Data Allocation Map

\* JD745A with MBMS enabled only



## Modulation Analysis (continued)

**Auto Measure** performs with only one key press that lets users easily and quickly check the RF and modulation parameters. All base stations are uniformly tested with the same procedure which provides virtually no errors due to test variability. Additionally, this function reduced human errors which also improve efficiency. Predefined tests allow users at all skill levels, to obtain consistent and accurate results.



RF and Modulation analysis — Auto Measure

**Carrier Aggregation** performs up to 5 interband and/or intraband component carriers, performing a complete characterization in each carrier including power level, modulation quality in data, and control channels.



Modulation analysis — Carrier Aggregation

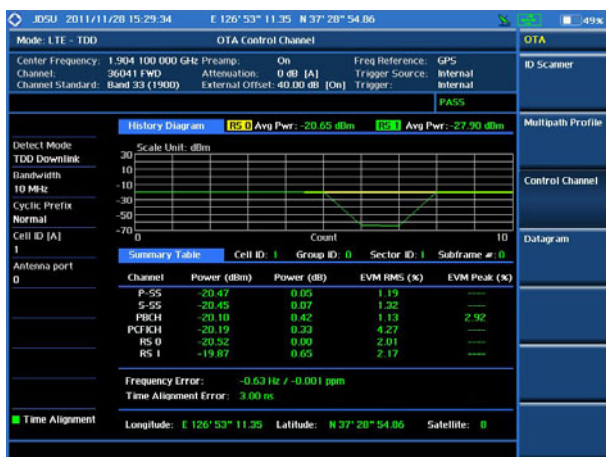
## OTA Analysis

**ID (Channel Scanner)** measures the strongest of 6 received cell identifiers, providing all relevant information such as PCI, RSRP, and RSRQ.



OTA analysis — ID (Channel Scanner)

**OTA Control Channel** provides signal performance metrics for locations served by the base station, including multipath profile indicating reflected signal strength.



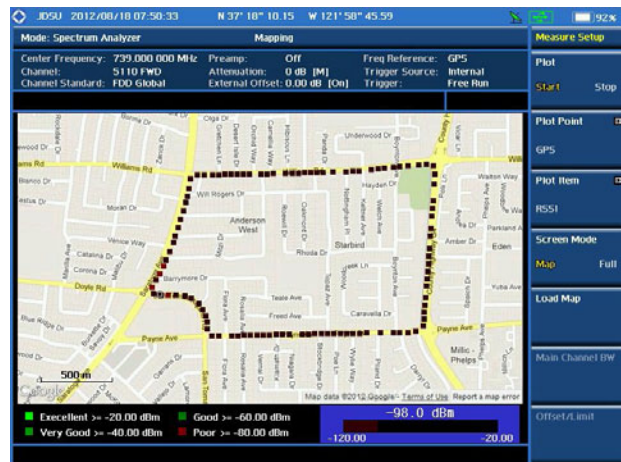
OTA analysis — Control Channels

**Datagram** measures, with LTE, the power level for all the resource blocks across time and shows data utilization over time.



OTA analysis — OTA Datagram

**Route Map** measures the OTA performance of a cell site in a defined service area by plotting the corresponding OTA metric in a map, which is then tracked with the instrument's GPS.

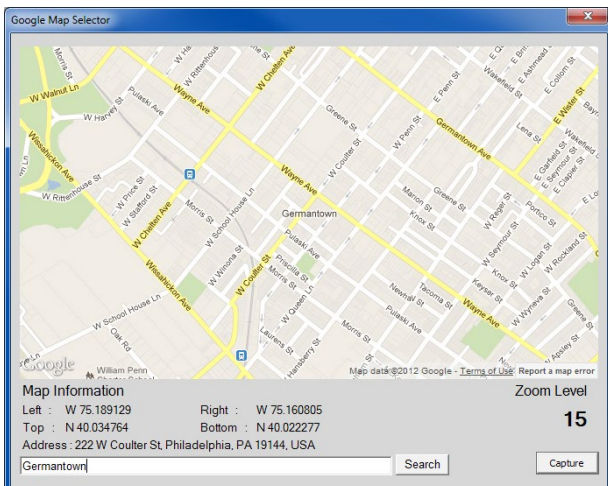


OTA analysis — Route Map

## OTA Analysis (continued)

**JDMapCreator** creates the desired map of interest from a picture file for indoor coverage, or geo-coded maps for outdoor coverage. This can then be loaded to the analyzer using a USB memory device.

The route map feature is included in Spectrum Analyzer mode and in Signal Analyzer OTA mode.



OTA analysis — JDMapCreator

# E1/T1 Analyzer

The analyzer conducts simple E1/T1 tests for the cell site's circuit-based backhaul interface.

The E1/T1 analyzer provides enough flexibility to configure the PDH signal, including its framing and coding, as well as the pattern the instrument will transmit.

In addition, the analyzer can automatically log events.

## E1 Analyzer (option 004)

### Monitoring/BERT

Signal, sync loss

Error count/rate

Alarm count

Loss count

## T1 Analyzer (option 005)

### Monitoring/BERT/loop

Signal, sync loss

Loss count

Alarm count

Error rate

### RX signal level

Signal, sync loss

$V_{p-p}$

$V_{p-p \max}$

$V_{p-p \min}$

$dB_{dsx}$



E1 monitoring



T1 RX signal level



E1 BERT



T1 BERT



# Channel Scanner

The Channel Scanner function (option 012) can measure up to 20 independent channels for any cellular technology at any channel or frequency.

The function simply shows the power level for each signal type.



Channel Scanner function

# Wireless Connectivity

Wireless connectivity (option 006, JD745A only) provides safer and easier long-distance testing with the instrument housed at the top of the tower and controlled remotely via Bluetooth. Tests are conveniently made from the ground.



Wireless Connectivity function

# GPS Receiver and Antenna

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The GPS receiver (option 010) gives the location (latitude, longitude, and altitude) and timing for highly-accurate frequency measurements to independently verify base-station timing.



Analyzer with GPS antenna

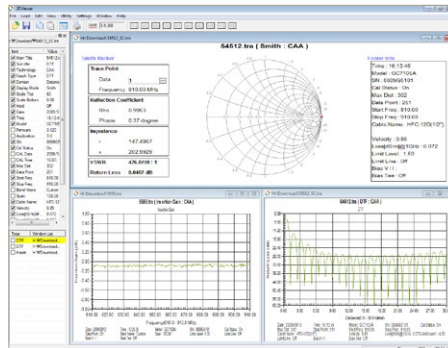
# Application Software

## JDViewer Features

- Communicates with the analyzer via LAN or USB
- Retrieves measured or saved measurements
- Exports measurement results
- Generates and prints configurable reports
- Creates a composite file of multiple spectrogram traces
- Analyzes measurement results allowing for assignment of multiple markers and limit lines
- Creates user-defined settings for channel power, occupied bandwidth, SEM, and ACLR
- Registers and edits user-definable cable types and frequency bands
- Creates automatic testing scenarios for GSM, CDMA/EVDO, WCDMA/HSPA+, Mobile WiMAX, and LTE
- Creates signal strength maps as well as over-the-air signal analysis maps for GSM, CDMA/EVDO, WCDMA/HSPA+, Mobile WiMAX, and LTE

The analyzer communicates with two Windows-based applications:

- JDViewer — for post-processing, report generation, personalized settings, and coverage map creation
- JDRemote — for full remote control



JDViewer VSWR, DTF, Smith chart



JDViewer spectrum, demodulation



JDViewer OTA mapping

## JDViewer Features

This capability permits full remote control of the instrument through a software client.



Analyzer with JDRemote





### Test & Measurement Regional Sales

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