

## PSA Spectrum Analyzer Firmware Revision History

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### Purpose:

The purpose of this document is to provide an overview of the important changes made with each PSA Series Spectrum Analyzer firmware and measurement personality revisions. It is not a complete listing of all resolved defects.

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### A.08.06 June 27, 2005

This package contains all measurement personalities.

Support Added for the following new PSA Options:

- Option 140 40 MHz Bandwidth Digitizer
- Option 217 Wireless LAN Measurement Personality

Features Added or Enhanced:

- Options 122 and 140 are now available for the E4443A and E4445A
- On-line-help, Trace math, Normalization, and Trace Importation
- Support for the E4447A
- Spectrum Emission Mask  
Support for ETSI EN 301 893 V1.2.3 (RLAN)
- Programming Code Compatibility Suite  
Support for QPD SCPI added  
Additional legacy commands added:  
8566/8568: Q0 (QPD off); Q1 (QPD on); OL (Learn String)  
856x: TH command
- Flexible Digital Modulation Analysis:  
More powerful analysis features  
Demodulation bits, Equalization filter displays, EV Spectrum, etc.  
Increase EQ taps for faster equalization  
ZigBee 2450M, VDL Mode3, APCO25 Phase 1  
Internal preamp (option 1DS) support  
DVBQAM Modulation Formats  
Additional Reference Filters
- cdma1xEV-DO:  
Subtype 2 (the new 1xEV-DO rev.A; revLink HDR) support  
Adaptive Modulation Coding signal support in symbol analysis  
Demodulated bits represent channel information  
Independent I/Q analysis  
Added view selections with Peak/Average Result Metrics and CDP with active channel table.  
MAC Channel Walsh code length on Code Domain View
- GSM/EDGE:  
Polar Modulation Analysis

Resolved Defects:

- Correct CISPRAuto-RBW in span 0 Hz now selected
- 321.4 MHz Key Label Changed
- Pwr Supply (Dither) key (On, Off) added to Service Menu
- System error when setting WB IF Capture Time
- System Error given if you :read:wav0?, readSTB, and then device clear
- Spurious Emissions:  
Memory Fault while using front panel Range Table.
- Spurious Emissions Mask:  
Trace is skewed if Scale/Div is adjusted to zoom.

- Adjacent Channel Power  
Combined view turns the Graticule off, does not turn it back on after exit with Meas Off
- Multi Carrier Power  
Coupling between Ref Carrier Mode and Ref Carrier Freq Mode missing.
- Programming Code Compatibility Suite  
Span now changes when signal tracking is on (PSA may take multiple sweeps to achieve required span.)  
8566/8568:  
Hold off of GPIB controller on recognition of a 'TS' command  
RBW/VBW limitation to 1-3-10 step  
856x:  
PEAKS command returns results not formatted correctly  
Changed default sweep auto coupling rules to Best Dynamic Range
- All Comms Measurement Personalities  
Channel Power causes a crash when sweep time = 50 ms  
Invalid waveform bandwidth selection with Flat RBW Filter  
Default values for SPEC:FREQ:SPAN and SPEC:FFT:WIND:LENG changed.
- W-CDMA  
SSCH power is not correct  
Total Absolute Power is averaged in linear fashion when AVG is set to ON  
DPCCH Demod bits are inverted when Compressed Mode is tested.  
Demod Bits for packed mode does not work when Tx Diversity is selected.  
Sync function in CDP/RHO is improved for Multi-Carrier condition.
- Flexible Digital Modulation Analysis:  
Sync word search now working with QAM128, FSK, and OQPSK format.  
1<sup>st</sup> symbol of OQPSK signal is missed with using External Trigger.  
Memory Fault error caused by wide IFBW setting with low Symbol Rate and long Meas Interval.  
CONF:EVM changes IF path to Narrow if analyzer set to IF Path Wide.  
EVM incorrect when measuring short length burst.  
Auto scaling of EVM not working correctly when FSK is selected.  
Max of Quad Skew and IQ Gain Imbalance now takes negative values.  
Trigger timing shifts as IFBW increases.  
EQ Filter Length limited to 9
- cdma1xEV-DO:  
Auto-scale for PvT does now working  
'Meas Offset' in CDP Demodbits is misleading  
Specification for Frequency Error Range corrected.
- GSM/EDGE:  
PFER shows odd phase error at the last point  
Backward compatibility issue for ORFS:LIST  
ORFS does not take into account Absolute limit in Modulation Swept mode.  
ORFS6? and EORF6? now initialized so previous data does not remain when data length is shorter.  
Customer test limit with skipped offsets not working.

### A.07.13 March 1, 2005

This package contains all measurement personalities.

#### Features Added or Enhanced:

- Support for option 215 External Source Control

#### Resolved Defects:

- 80 MHz Bandwidth Digitizer:  
Power-on self-test failure.
- Improves 10 Hz residual sidebands for RBW  $\leq$  7 Hz
- Instrument crash during long repeated Spurious Emissions measurements.
- Intermittent alignment failure on instrument bootup.



- GSM/EDGE:  
ORFS switching for mobile handsets gives false failure.

### A.07.08 December 16, 2004

This package contains all measurement personalities.

#### Resolved Defects:

- W-CDMA:  
A crash happens in changing capture length at single trigger.  
3 frame captured data is clipped as 2 frame data  
Mod Accuracy: SSCH power is not correct (same as PSCH).
- Flexible Digital Modulation Analysis:  
PI/4 DQPSK Constellation Rotates several degrees forward and reverse in phase.  
EDGE filter selections doesn't work in some sequences.
- GSM/EDGE:  
EDGE EVM WSoD Crash when valid burst not found  
ORFS Switching for MS gives FAIL flag but no offset are failures.

### A.07.06 Nov 1, 2004

This package contains all measurement personalities.

#### Features Added or Enhanced:

- Flexible Digital Modulation Analysis:  
Support added for 80MHz Wideband Digitizer, option 122  
Support added for Microwave Preselector Bypass, option 123  
Measurement Intervals extended; Max: 20000 symbols at 1 pps, 10000 at 2 pps, 5000 at 4 pps, and 4000 at 5 pps.  
Pi/4 DQPSK now supports Carrier Lock Wide
- GSM/EDGE:  
EVM frequency lock range improved  
Pvt now supports setting a mask with Ext Trigger and a Trigger delay.  
In ORFS measurement, a delta-to-limit result column has been added.  
Support added for trigger to T0 measurement in EDGE EVM.  
Support added for multi-carrier tolerant filter in EDGE EVM and GSM PFER.  
Test limits user interface added to EDGE EVM, GSM PFER, and ORFS  
Sync type added to support Tx diversity (Antenna-2)
- W-CDMA:  
Statistical results (Max/Worst hold, RMS average) added for RHO measurements  
Limit fail color added to RHO table view  
When the DPCH with non-zero tDPCH is selected for analysis, "First Slot Number" is now DPCH-based.  
Active channel detection improved  
CDE measurement added to Code Domain  
Symbol EVM Analysis capability enhanced  
UE Phase discontinuity measurement supported in Power Control  
Transient Period (25us) Include/Exclude mode added to Mod Accuracy Uplink  
TSTD Antenna-1/2 sync modes added to Mod Accuracy Downlink  
PICH special handling enhanced for Mod Accuracy Downlink

#### Resolved Defects:

- Peak search fails to find peak for equal signals near LO.
- Pre-ADC BPF soft key makes numeric value an active function.
- Flexible Digital Modulation Analysis:  
FSK Burst is not measuring burst signal correctly  
Transition to OQPSK from other formats with Points/Symbol=1 causes fatal error.  
Actual search length is shorter than specified value.  
Trigger Offset is not properly reflected in Trigger Delay function.  
Symbol index of Peak Mag Error not correct with some setups.

- Peak Mag Error is very large when Points/Symbol is 10.
- I/Q Offset Include/Exclude in Advanced settings does not work correctly.
- GSM/EDGE:
  - :READ:PFER? And :READ:EEVM? now waits until a valid signal is present.
  - Marker readout is now shown on “Swp Spectrum” and “Limit Modulation” traces.
  - EDGE PVT mask for sync burst is now GMSK.
  - Limit mask values now consistent with standards for PCS 1900 MS, PvT test limits
- W-CDMA:
  - RHO7? now returns correct values when symbol rate is 480/960ksps.
  - Mod Accuracy STTD time offset measurement now limits capture length to 1 slot.
- cdma2000:
  - There now is active channel detection for larger power deltas between pilot and other channels
  - Log Code Mask default change to “0000000000”

#### A.06.05 September 2, 2004

This package contains all measurement personalities.

Resolved Defects:

- Option 122 80 MHz Bandwidth Digitizer:
  - IP forwarding was not properly configured and could cause network issues.

#### A.06.04 August 18, 2004

This package contains all measurement personalities.

Added Optional Measurement Personalities:

- Option 122 80 MHz Bandwidth Digitizer
- Option 123 Switchable Microwave Preselector Bypass
- Option 124 Y-Axis Video Out (HP 8566/68B compatibility)
- Option 241 Flexible Digital Modulation Analysis

Features Added or Enhanced:

- Faster speed: ACP, power-up, mode switching
- EMI quasi-peak detector w/CISPR & Mil Std. Bandwidths
- Code Compatibility:
  - Agilent 856x and 859x portables
- Support for N5530S Measuring Receiver Software
- Support for option 235 Wide BW Digitizer External Cal Wizard
- S-DMB System E Radio Standard now supported by Channel Power, Adjacent Channel Power, and Occupied Bandwidth Measurements
- Spurious Measurement:
  - FCC Part 15 Subpart F Radio Standard supported
  - UWB Indoor Radio Standard supported
- Added Dual Trace Display
  - Sweep points and detector now selectable per Range
  - Amps, dBmA, dBuA, dBuV/m, dBuA/m, dBpT, and dBG units added to Y axis units

Resolved Defects:

- Preselector peaking in bands 5 and 6 incorrect.
- Marker delta amplitude function not working correctly in Basic mode.
- Incorrect image saved to file if trace screen is stale or overwritten.
- Channel Integration Bandwidth and Frequency Offset in Adjacent Channel Power and Multi Carrier Power is too narrow, increased from 20 Hz to 500 MHz.
- MODE key choices disappear when battery dies.
- Frequency span not set correctly if FREQ:SPAN is sent immediately after CALC:MARK:TRCK ON
- Limit lines drawn incorrectly in time domain.
- Counter Error in spans >1.5 GHz
- FFT Noise Marker accuracy improved.
- Preset restores display if display has been turned off.



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- Video trigger line does not update correctly when display scale is set to linear.
- GET now conforms to the IEEE488-75 standard.
- Delta Marker sign value reversed in Transmit Power, Pwr vs Time, and Spectrum Emission Mask measurements.
- Noise Figure:  
Limit lines Pass/Fail Test incorrect if Limit freq range < Sweep range  
Setting conf:nfg, changing RBW, and then doing a cal, invalidates the cal when the result sweep takes place.  
Switching Preamp on/off breaks the following cal cycle  
Cannot set start frequency >2.87 GHz after a Restore Meas Defaults
- Phase Noise:  
Log Plot markers not being updated correctly in single swept mode.

### A.05.07 March 19, 2004

This package contains all measurement personalities.

#### Resolved Defects:

- E4446 and E4448 only. Above 26.4 GHz the preselector may not center properly.

### A.05.06 November 20, 2003

This package contains all measurement personalities.

#### Added Optional Measurement Personalities:

- Option 210 HSDPA (requires Option BAF W-CDMA)
- Option 211 TD-SCDMA
- Option 214 1xEV-DV (requires Option B78 cdma2000)

#### Features Added or Enhanced:

- Support for Option AYZ External Mixing
- Improved and added several warning and error messages
- Auto coupling improved.

#### Resolved Defects:

- On power-up, +605 error displayed (data corrupt and restoring NVRAM copy of data) when CPU battery is depleted.
- Instrument lockups due to various combinations of RBW, sweep time, detector, and gate delay settings.
- When Auto Sweep Time is set to Accy, there is no constraint on the sweep rate causing inaccurate results.
- Frequency errors when gating with a wide span and manually setting RBW.
- Preselector fails to center properly with points per sweep set to >601, or span >1.3 GHz with Delta Marker on, or below 3.2 GHz.
- Error in zero span when using average detector.
- :CALC:DATA:COMP commands not functioning correctly.
- Amplitude variance at beginning of sweep when changing parameters in zero span and the LO is in dual loop mode.
- LO settling time not sufficient in zero span when Phase Noise Optimization is set to Fast Tune.
- Time and date format now survives a power cycle.

### A.04.12 September 12, 2003

This package contains all measurement personalities.

#### Features Added or Enhanced:

- Support for Gated Sweep.

#### A.04.07 Feb 28, 2003

This package contains all measurement personalities.

##### Features Added or Enhanced:

- Phase Noise improvement for 1<sup>st</sup> LO.

##### Resolved Defects:

- GSM/EDGE:  
Trace misalignment of 1 symbol with respect to GSM PFER when Burst Align=1/2 bit offset.  
Intermittent mask failures for PvT Multislot measurements.  
GSM PvT and EDGE PvT crash when Trig Source is Free Run and all slots are on.  
GSM PFER measurement I/Q Measured Polar Vector sometimes crashes if synchronization is not established with the given signal data.
- W-CDMA:  
If the P-Scramble code is set to > 7, the SSCH Power result is not correct.
- Cdma1xEV-DO:  
Pilot offset value changes with the ChanType Pilot or Overall Rho settings.  
Rho Result Metrics for Ch level and Code number with Overall setting miscalculated.  
The Auto “Input Atten” can take on negative values when the input signal level is too low.  
The “Ext RF Atten” effects the input attenuator value.  
The “Max Total Pwr” excessively increments the “Ext RF Atten” when the “Ext RF Atten” is set to any value except 0 dB.  
TCDP, "Restore Meas Default" key doesn't work correctly

#### A.04.06 February 11, 2003

This package contains all measurement personalities.

##### Resolved Defects:

- The detector mode in ACP measurements could inadvertently be set to normal.

#### A.04.05 REL 001 December 16, 2002

##### Added Optional Measurement Personalities:

- Option 219 Noise Figure Personality

##### Features Added or Enhanced:

- DVBT and IS-95 added to Spectrum Analysis Radio Standards.
- 802.11a, 802.11g radio Standards added to SEM Measurement
- Option 266 is now compatible with other measurement personalities.
- More compatibility commands added to Option 266 8566/68 Series Code Compatibility.
- FFT sweep time estimates improved.
- Display enhancements:  
Limit lines now have a lower limit of -140 dBm.0  
Active Function Positioning  
Annotations can now be blanked  
Graticule can be turned on and off.
- GSM/EDGE:  
TxSpur now available for GSM450, 480, 850, and 700.  
Speed improvements
- W-CDMA:  
calc:data:comp? can now average dBm values.  
Total power added to “One Slot CDP” query.  
Support for Compressed Mode
- Cdma1xEV-DO:  
Added Reverse link support for Mod Accuracy  
Automatic Preamble detection
- Cdma2000: :  
OFFSET to Edge support for ACPR and SEM



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### Resolved Defects:

- Frequency Count errors in band 5 (26.4GHz to 31.15 GHz.)
- 1<sup>st</sup> IF Overload message caused by turning the Preamp on and then off.
- Changing the Stop Frequency, changes the Start Frequency.
- Trigger to t0 measurement may return reading that is off by ~200 ns in 1 out of 300 readings.
- IF Output frequency jitter when analyzer is set to zero span, continuous sweep, and RBW $\geq$ 220 kHz.
- Analyzer may hang when in FFT Mode and span is set to 1GHz or 2 GHz.
- Marker Peak Threshold not working when the amplitude scale type is changed.
- Messages, such as “Preparing Display...” may remain on screen even after the condition has gone away.
- Clear Write doesn't erase the trace data.
- GSM/EDGE:  
Demod RMS Magnitude and Phase result incorrect when Burst Sync=RFAmptd.
- W-CDMA:  
Modulation Accuracy Frequency Error Result returns value from wrong slot.  
CDP tDPCH auto detection doe not work in long mode.  
Channel power at Q-axis in quad view is incorrect.  
Symbol Power vs. Time gives incorrect power reading for uplink measurement.  
Frame period incorrect after doing “Factory” preset and changing from Spectrum Analysis Mode to W-CDMA mode.
- Cdma2000:  
Channel power at Q-axis in quad view is incorrect.  
Long Code Mask not working for Reverse Link (MS).
- CdmaOne:  
No Y scale/division readout for timing <1  $\mu$ s.
- cdma1xEV-DO:  
All errors reported with error number +1101.

### A.03.05 REL 011    October 24, 2002

This package contains all measurement personalities except Option 266.

#### Resolved Defects:

- W-CDMA:  
Code Domain power quad view channel power measurements results may be in error up to 0.45 dB.

### A.03.04 REL 010    July 8, 2002

This package contains **Option 266 only**.

See A.03.04 REL 009 for base firmware history.

### A.03.04 REL 009    July 8, 2002

This package contains all measurement personalities except Option 266.

#### Resolved Defects:

- GSM/EDGE:  
PK EVM and 95% EVM for severely impaired EDGE signals

### A.03.03 REL 008    May 30, 2002

This package contains **Option 266 only**.

See A.03.03 REL 007 for base firmware history.

#### Added Optional Measurement Personalities:

- Option 266 8566/68B Code Compatibility
- This package does not support other measurement personalities.

### A.03.03 REL 007 May 30, 2002

This package contains all measurement personalities except Option 266.

#### Added Support for new instruments:

- E4446A (3 Hz – 44 GHz)
- E4448A (3 Hz – 50 GHz)

#### Features Added or Enhanced:

- Amplitude Corrections
- 64Mb Flash Memory Support
- 89600 Support
- Limit Lines
- Variable Sweep Points
- Spectrum Analysis Measure, many enhancements including:
  - Multi Carrier Power: Now supports up to 12 carriers
  - Spectrum Emission Mask: Support for 802.11a/b and HiperLAN
- All Comms Apps: Now supports high crest factor signals.
- GSM/EDGE ORFS switching speed improvement
- Option 1DS PreAmp: Turned ON for W-CDMA, cdma2000, cdma1xEV-DO
- W-CDMA: Pre-defined Test Model update for Code Domain and Mod Accuracy to conform to latest 3GPP standard.
- W-CDMA SEM: Reference signal power measurement improvement
- Cdma2000 SEM: Default setting improvement

#### Resolved Defects:

- Amplitude reduction during multi-band sweeps
- Spectrum Analysis Measure:
  - Spurious Emissions lock-up when entering measurement many times.
  - Harmonic Distortion lock-up when sending CONF:HARM command followed by INIT:IMM using GPIB.
  - INITiate:CONTinuous ON command not working correctly.
- Phase Noise:
  - READ:LPL? Returns incorrect values for DEG/RAD and RES FM with 10kHz to 1MHz Spans.
  - Instrument goes into loop condition switching between Log Plot and Monitor Spectrum.
  - Log Plot Markers not functional after Power On Preset.
- GSM/EDGE:
  - PvT averaging, external trigger delay, and multi-slot midamble defects
  - Orfs frame trigger defects
- W-CDMA:
  - ACLR sweep and dynamic range defects
  - CDP tDPCH value and graph annotations for X-axis incorrect.
  - PICH symbol EVM does not function.
- Cdma2000:
  - CDP graph annotations for X-axis incorrect and marker resolution cannot be changed after device change without preset.
- cdma1xEV-DO:
  - RHO, I/Q Error measurement marker error
  - CDP total power not recalculated when needed.
  - :DISPlay:RHO:VIEW SCPI command not working correctly.
- CdmaOne:
  - Mod Accuracy, Time Offset measurement reports wrong value.
  - Spur Close measurement mask not correct.

### A.02.07 REL 010 April 26, 2002

#### Resolved Defects:

- Phase Noise: Residual FM measurement accuracy improvement



**A.02.07 REL 009 March 18, 2002**

## Resolved Defects:

- Auto Alignment causes crash during FFT measurements.

**A.02.05 REL 008 March 1, 2002**

## Resolved Defects:

- Crash when switching from CDMA2000 to GSM/EDGE mode, then selecting Data Bits view.
  - Crash when in channel power while changing center frequency and RBW.
  - W-CDMA correlation failures (error 503) with SCH sync mode in Mod Accuracy.
  - CdmaOne RHO measurement intermittently fails to correlate signal.
  - LO unlocks after setting phase noise optimization manually to  $f < 50$  KHz with span set to  $< 50$  MHz and then setting span to  $> 50$  MHz.
  - Instrument hangs after switching between modes during an Align All Now.
  - "Align All Needed" message not consistent with instrument alignment being needed.
  - LO loop optimization causing 1<sup>st</sup> LO unlock errors.
  - Calibrator display corrupted when setting attenuator with Trace set to Min Hold.
  - Amplitude loss while displaying two frequency band breaks simultaneously and narrowing RBW.
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**A.02.04 REL 004 January 1, 2002**

## Added Optional Measurement Personalities:

- Option 204 1xEV-D0 Measurement Personality

## Resolved Defects:

- Phase Noise Personality:  
Crash when using remote access to switch to log plot after power cycle.
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**A.02.04 REL 001 December 7, 2001**

## Added Optional Measurement Personalities:

- Option BAF W-CDMA Measurement Personality
- Option B78 cdma 2000 Measurement Personality
- Option 226 Phase Noise Measurement Personality
- Option BAC cdmaOne Measurement Personality
- Option 202 GSM (with EDGE) Measurement Personality
- Option BAE NADC/PDC Measurement Personality

## Added and Enhanced Standard Power Suite Measurements:

- Adjacent Channel Power
- Burst Power
- Channel Power
- Complimentary Cumulative Distribution Function (CCDF)
- Harmonic Distortion
- Multi Carrier Power (MCP)
- Occupied Bandwidth (OBW)
- Spectrum Emissions Mask (SEM)
- Spurious Emissions
- Third Order Intercept (TOI)

## Added Radio Standard Parameter Setups for Power Suite Measurements:

- IS-95
- J-STD-008
- NADC
- GSM/EDGE
- 3GPP W-CDMA

- cdma2000 SR1
  - cdma2000 SR3-MC
  - cdma2000 SR3-DS
  - PDC
  - Bluetooth
- Resolved Defects:
- Flatness corrections applied in linear scale.
  - Repaired signal drop on signal band crossings.
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#### **A.01.09**

- Resolved Defects:
- Improvement in the accuracy of long averaged detection sweeps.
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#### **A.01.08**

- Resolved Defects:
- Improvements made to the FFT mode including auto-coupling, spans, and signal locking.
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#### **A.01.04 January 5, 2001**

This was the first code shipped to customers.

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