

# Agilent PSA Spectrum Analyzer Firmware Revision History

---

## 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. See [History Details](#) for expanded listing.

---

### 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" affects 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

#### 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 1out 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.
- 

#### **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.
- 

#### **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.
- 

### **A.01.09**

**Resolved Defects:**

- Improvement in the accuracy of long averaged detection sweeps.
- 

### **A.01.08**

**Resolved Defects:**

- Improvements made to the FFT mode including auto-coupling, spans, and signal locking.
- 

### **A.01.04 January 5, 2001**

This was the first code shipped to customers.

---

## **A.04.04 History Details**

*Note: Agilent does not warrant the accuracy of the following list of enhancements, defect fixes, or changes. This list is provided for informational purposes only and may not be complete.*

### **Spectrum Analysis Measurements**

- Added new standard DVB-T (L/SECAM/NICAM, I/PAL/NICAM & G/PAL/NICAM)  
Defaults added for Power Stat CCDF measurement.  
Masks added to Channel Power measurement.
- Added new standard 802.11g (W-LAN)  
Defaults added to Spectrum Emission Mask measurement
- Added new standard IS-95C  
Defaults added for Channel Power, Occupied Bandwidth, Adjacent Channel Power and Power Stat CCDF measurements.  
Added offset to edge concept to Adjacent Channel Power measurement.  
Added band class 0 and 1 defaults to IS-95C Adjacent Channel Power measurement.

- Update to standard names
  - Change IS-95 to IS-95A
  - Change cdma2000SR1 to cdma2000 MC-1X
  - Change cdma2000SR3-MC to cdma2000 MC-3X
  - Change cdma2000SR3-DS to cdma2000 DS
- Added Retain Parameters functionality
  - Allows base instrument parameters to be retained when switching between measurements.
- Added Enable All Measurements functionality
  - Allows all measurement and radio standard combinations

## 1xEV-DO changes for this release

### New Features:

#### ***Code Domain Power:***

- Added I/Q Combined Bar Menu to allow for Separate CDP view. When I/Q Combined Power Bar is On, the I and Q power is consolidated
- Automatic Preamble detection
- Data Channel Active detection mode
- Half slot Meas Interval / Offset
- Added MS Code Domain Power Measurement
- Support for Multi-carrier measurements through a 1.2 MHz band pass filter (0.1 dB ripple)
- Ability to flexibly set I/Q long code mask

#### ***Mod Accuracy***

- Added Reverse link Support
- Automatic Preamble detection support
- Channel Type Preamble Support
- Data Channel Active Detection Mode
- Updated Results metrics view
- Calculation and limits for the following parameters: Max MAC Interactive Power, Max Data Active Power, Min Data Active Power
- Support for Multi-carrier measurements through a 1.2 MHz band pass filter (0.1 dB ripple)
- Ability to flexibly set I/Q long code mask.

## **ACPR**

- Change in table to reflect “Offset to Edge” labeling

## **Bug Fixes / Changes:**

- 280: Fixed the Total Active Channel power from the read:cdp? command from sometimes being positive.
- 392: CDP: Fixed Max & Min Active Power values in combined mode from being incorrect.
- 396: Mod Accuracy: Fixed problem where PASS/FAIL flag did not indicate FAIL if Freq Err results are past fail limit.
- 403: CDP/TCDP: Meas interval offset value can now only be less than Capture Interval
- 363: CDP: 1xEV fwd-link CDP, Symbol I/Q vector of Data channel is now consistent with selection from MeasOffset and MeasInterval
- 346: RHO: Fixed correlation problem when data channel type is 8PSK or 16QAM.
- 184: CDP: CALCulate:CDPower:WCODe:ORDer now uses enum value Hadamard in addition to incorrect value of HADMrD
- 195: Err number of 'Valid 1xEV burst not found' changed to 605 instead of 105.
- 428: CDP/Rho: Fixed input overload when input is a bursted signal. Input attenuation now set based on peak mode instead of average mode
- 258: SEM & ACP: Meas BW set to 100 when start = stop frequency

## **W-CDMA changes for this release:**

### **New Features:**

#### ***Code Domain Power:***

- Support for Compressed Mode
- Ability to set Time Offset for DPCH over range 0 to 149 (tDPCH:1 = 256 chips)
- Support for Sync type PRACH Message for MS
- Support for DPCH slot formats SF0 through SF5 for MS (Previously only support SF0 and SF2)
- PRACH Preamble Signature Detection and ability to manually set PRACH Signature between 0 and 15
- DTX – Tri-state data representation for I/Q demod bits
- 3 Frame Full Mode support
- STTD Antenna-2 CPICH support – Provides synchronization scheme with STTD Antenna 2 CPICH.

#### ***Mod Accuracy***

- Sync type PRACH now supported
- Support for DPCH Slot Formats SF0 through SF5 for MS (Previously supported SF0 and SF2)
- PRACH Preamble Signature Detection
- Ability to set the following MS limits: Peak Code Domain error, Rho Limit, RMS EVM, and Freq Error
- Code Domain Power and Active Channel Table View
- New Results Metrics View
- STTD one key measurement solution



### **QPSK EVM:**

- HPSK EVM (12.2 kbps RMC UL) constellation support
- Max value of Meas interval is expanded up to 2560 chips (1 slot) [previously was 512 chips]
- Origin offset handling – allows user to exclude IQ offset or not.

### **Spectrum Emission Mask**

- Added RRC filter and Alpha selection

### **New Power Versus Time Measurement**

### **New Power Control Measurement**

- Slot Power Measurement
- PRACH power measurement

### **Bug Fixes / Changes:**

- 459: RHO: Freq Error now calculated over 1 slot instead of 5 slots
- 12: CDP: Delta Marker for Symbol Power trace now gives correct units of dB
- 14: Fixed truncation of last three characters of Demod bits: Channel info string.
- 351: RHO: Fixed averaging problem for active channel table when in Exp mode.
- 375: CDP: Fixed problem of PICH slot boundary not always being detected correctly.
- 409: RHO: READ:RHO 8? values are now averaged instead of returning last iteration
- 141: RHO: In symbol based sync menu, changing Symb Rate or Code Number now causes a restart of the measurement.
- 156, 165: SEM: Values 1,2 and 4 in the results from READ:SEM? command now report the correct -999 value.
- 348, 158: CDP: Unit of channel power in Quad view now changes depending on meas type parameter. Now shows dBc for relative measurement .
- 343: RHO: Averaging method for CPICH improved
- 158: CDP: For the SCPI command, :CONF:CDP[1]?, value 6 description changed from "Average Power" to "Channel Power"
- 305: RHO: Changed CPICH Power accuracy default fail limit from 2.9db to 100.0dB
- 192: ACP: Fixed Attenuation setting for instruments with option H54 (reduced LO emissions option)
- 26: Added missing command /enum :CALC:RHO:ASET:THR
- 307: CDP Uplink. Fixed problem of channel power at Q-axis in quad view being incorrect.

### **GSM/EDGE enhancements:**

### **New Features:**

#### **GSM Phase and Freq:**

- Speed improvement through new measurement engine
- Ability to turn trace data on or off
- Ability to turn I/Q origin offset on or off

### **GSM ORFS:**

- Speed Improvement by capturing a slot length of data instead of a frame length of data when "Timeslot" is ON and using External trigger
- Speed Improvement by using hardware peak detection for ORFS Switching

### **GSM and EDGE PVT:**

- PVT trigger to T0 time. Provides the accurate timing information from trigger to T0 position for GSM/EDGE. (:READ:PVTime 10?)

### **GSM and EDGE TX Spur**

- GSM450, 480, 850, 700 bands now supported

### **Bug Fixes / Changes:**

- 150: GSM and EDGE ORFS: Increased Input Attenuator Margin
- 307: Changed default RF Burst Trigger Level from -20.0 dB to -25.0 dB
- 360: EDGE EVM: Updated for RF Amplitude = Burst Sync mode the RMS Mag and RMS Phase calculation.
- 362: EDGE EVM RF burst peak level setting now changes correctly when a new value is entered.
- 48: ORFS: SCPI command CALC:ORFS:MARK[n]:TRAC now accepts correct SPEM enum value in addition to incorrect SSM enum for Swept spectrum trace.
- 425: EDGE EVM: Updated calculation of Max Mag Error, Max Phase Error, and Mas Frequency Error.

## **CDMA2000 changes for this release:**

### **New Features:**

#### **Code Domain Power and Mod Accuracy:**

- Support for Multi-carrier measurements through a 1.2 MHz band pass filter (0.1 dB ripple)

#### **ACPR and SEM:**

- OFFSET to Edge support. This specification defines the offset frequency ( $\Delta f$ ) as the distance from (carrier) center frequency to closer measurement edge frequency

### **Bug Fixes / Changes:**

- 348, 158: CDP: Unit of channel power in Quad view now changes depending on meas type parameter. Now shows dBc for relative measurement
- 184: CDP: CALCulate:CDPower:WCODE:ORDER now uses enum value Hadamard in addition to incorrect value of HADMrd
- 26: Added missing command /enum :CALC:RHO:ASET:THR
- 207: Fixed problem of measurement not working after changing long code mask.
- 307: CDP Uplink. Fixed problem of channel power at Q-axis in quad view being incorrect.

## **cdmaOne changes for this release:**

## **New Features:**

### ***Spur Close:***

- Updated measurement to conform to the latest standard information (3GPP2 C.S0010 (BTS) and C.S0011 (MS))
- Added TX Spur 4 MHz Limit Category setting to Spur Close
- Added new Radio Standard Band Class settings
- Updated Channel Tuning Plan

### ***ACPR***

- Added support for IS-97D and IS-98D
- Added new Radio Standard Band Class settings
- Updated Channel Tuning Plan

## **Bug Fixes / Changes:**

- 144: Fixed Y scale/division on screen readout for Timing if <1us
- 68: Fixed Spur Close Mask on center segment for channels 685 through 742