Agilent Technologies

ESA Series Firmware Revision History

Note: Instruments must have Option B72 (expanded memory) to install version A.08.02 or newer firmware. Option B72 has been standard in all new ESA analyzers since the end of 2001, and has always been standard in the EMC analyzers.

Revision A.11.00

New Features for ESA:
- Addition of Narrow Bandwidth Option 1DR for L-Series
- Addition of Color Display Option 049 for L-Series

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.06.03 (released with A.10.00)

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:
- Repaired Help text for Resolution Bandwidth and Normalize Ref Trace functions.

Revision A.10.00

New Features for ESA:
- Ability to move the Active Function data entry location on-screen

New Features for EMC:
- Same as ESA

ESA Power Suite Utilities:
- Version A.06.03

- New pre-set radio standards for DVB-T, 802.11g and IS-95C
- Support for Digital Video Broadcast (DVB-T) to measure channel power and CCDF
- Support for wireless LAN IEEE 802.11g in spectrum emissions mask measurement
- Support for cdmaOne IS-95C to measure channel power, ACP, OBW and CCDF

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:
- Fixed a problem for External Mixing (Option AYZ) where External Preselected Mixers did not get properly centered using the Preselector Center function.
- Fixed a problem where the APC 3.5 Input (Option BAB) for E4408B instruments was not being displayed on the Show System screen.
- Fixed a problem where the instrument could hang upon power on if using Power Up Last State under certain conditions.
- Fixed problem on the 1.5 GHz instruments where the Input Overload could be tripped when Auto Alignment process was executing.
- Fixed a problem where the VGA output did not correctly format the VSync Pulse Width, preventing certain external VGA monitors and VGA to PAL converters from functioning properly.

Revision A.09.02

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.05.05
- Fixed frequency tuning issue with Multi Carrier Power measurement for IS-95 standard.

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:
- None
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Revision A.09.01

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.05.03 (released with A.09.00)

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:
- Corrected a problem that would cause a system crash if the Tracking Generator alignment was run while doing a multiband sweep, without having the Option 1DS RF Preamp installed

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Revision A.09.00

New Features for ESA:
- Support for Special Handling Option H26

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.05.03
- Multi Carrier Power measurement enhanced to measure up to 12 carriers
- Added RBW method to Multi-Carrier Power measurement
- Support for 802.11a/b and HiperLAN/2 in Spectrum Emissions Mask measurement
- RRC Filtering added to Channel Power and SEM measurements
- TETRA support added
- Allow the changing of the center frequency without resetting the Resolution Bandwidth and Video Bandwidth back to the default values for Channel Power and Occupied Bandwidth measurements.
- Modified the Harmonic Distortion measurement to work with center frequency offsets.

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:

- Improved Preselector Centering
- Corrected a System Crash that could occur while using Trace Averaging
- Improved situations where the Option B7D DSP was being 'hard reset', this is to improve "DSP code fail" errors.
- Eliminated Auto Align interaction with Option 299 (Modulation Analysis Personality). This prevents momentary high Phase Error during EVM measurements on low symbol rate formats.
- Repaired problem on 1.5 GHz instruments (E4401B, E4411B, E7401A) where the Alignment Signal would not supply the correct amplitude.
- Corrected problem where State, or State + Trace, files saved under revision A.07.05 could not be recalled with later revisions.
- Corrected problem where the Marker could not be placed on Traces 2 or 3 following a Recall of a Save-all Trace.
- Corrected a small RAM memory leak that would occur when using Markers on functions in the Measure key. This could cause the instrument to consume all RAM after extended periods of time.
- Repaired problem of remote control configuration of Segmented Sweep with the Tracking Generator ON.
- Repaired problem where "Tracking Peak Needed" message would be displayed with the Tracking Generator ON in Segmented Sweep, while the Tracking Peak is valid.
- Removed a start of sweep offset from the Option AYX Fast ADC in the fastest Zero Span sweep times. The maximum offset of 300 nanoseconds occurred at the fastest sweep time (a 20 microsecond sweep time, 401 point trace).
- For Option B7B (TV Trigger) turned off the TV Monitor when the remote control preset command (either *RST or :SYSTem:PRESet) is executed.
- Improved Signal Track operation under circumstances where Delta Marker is in use. Namely, Peak Search will allow the Delta Marker to find a signal peak and track the signal.
- Fixed a problem in Option BAH (GSM Personality) where the Detector was Auto Coupling to Sample when it should have remained in Peak.
- Fixed problem where the Standby Key did not power down the instrument and the message "Shutdown in process" was displayed on the status line.

Defects Repaired Specifically for EMC:

- Fixed problem where the instrument would hang if Preset is invoked while the instrument is performing "Adjusting Ref Level".

Revision A.08.04

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- A.04.04 (released with A.08.02)

EMI Measurements:
- Version A.07.00 (released with A.08.02)

Defects Repaired for both ESA and EMC:
- Corrected a problem with Preslector Centering in 26.5GHz instruments, which could result in an incorrectly centered Preselector. This could potentially cause an Amplitude Error, or a Frequency Response test failure.
- Fixed a System Crash, which could occur after running many Zero Span measurements for features available under the Measure Key or as optional personalities (available via the Mode Key).

Revision A.08.02

New Features for ESA:
- Average (RMS) Detection available in all configurations of instruments, and DSP enhanced if Option B7D is installed. (Average Detection available in Resolution Bandwidths greater than 300 Hz, enhanced with B7D in Resolution Bandwidths greater than 10 kHz.)
- Log Frequency Scale
- 1 Hz and 3 Hz Resolution Bandwidths with Option 1DR and 1D5
- Burst Carrier Trigger with Option B7E having board Part Number E4401-60224
- Diagnostic reporting of SCPI syntax errors (Verbose SCPI)
- Faster Sweep Times with Peak Detector
- Selectivity of Phase Noise vs. Sweep update rate
- Full Screen display control via SCPI command
- User Interface improvements:
  - Limit Lines, Amplitude Corrections, and Normalize Menus
  - Marker "Band Pair" softkey renamed to "Delta Pair"
  - Gate ON/OFF selection is consolidated to Gate Setup Menu
- Added ability to select the Printer Page Size.

Functional Changes from Previous Versions:

- The Expanded Memory configuration (Option B72) is required on all instruments.
- Preset Type of "Mode" is now the default. The result is that a front Panel PRESET or SCPI "SYST:PRES" places all instrument parameters to the default settings for the current Mode. Since the default Power-up type is Preset, unless the Power-up type is set to User Preset, the instrument will power-up in the mode under which power was removed. The behavior of *RST is unchanged; it performs a Factory Preset.
- Auto/Man mode has been added to:
  - Detector
  - VBW/RBW Ratio
  - Average Type.
- Auto Couple immediate action hardkey has been changed to bring up a menu instead of the immediate action. The "Auto All" softkey in the menu performs the prior function of Auto Couple immediate action hardkey.
- Removal of Auto Mode for:
  - Resolution Bandwidth in Zero Span
  - Sweep Time in Zero Span
- The 1.5GHz Tracking Generator 'Reverse Power Protection' has been added to the SCPI Status Subsystem.
- The digits of precision have been increased to 12 digits for:
  - SENS:FREQ:CENT?
  - SENS:FREQ:STAR?
  - SENS:FREQ:STOP?
  - SENS:FREQ:SPAN?
  - DISP:WIND:TRAC:Y:OFFS?
  - CALC:MARK:FCO:X?

New Features for EMC:

- All the aforementioned ESA features, with the exception of features that require Options not available on the ESA-EM: Burst Carrier Trigger, DSP enhanced Average Detection.

ESA Power Suite Utilities:

- Version A.04.04
- Added Multi-Carrier Power Measurement
- Added Spurious Emissions Measurement
- Added Third Order Intercept Measurement
- Added Spectrum Emissions Mask Measurement

EMI Measurements:

- Version A.07.00

Defects Repaired for both ESA and EMC:

- Detector selection in FM Demod was ignored resulting in Sample Detector being employed.

- In the 3 GHz Tracking Generator, corrected the 'Source Unleveled' condition which occurred when the TG was used at low frequencies with Auto Alignment enabled.
- In the 3 GHz Tracking Generator, corrected the condition where multiple 'Tracking Peak Needed' messages are displayed on the screen.
- Intermittent Speaker ON/OFF behavior, particularly where Audio is emitted from the speaker when the key indicates OFF.
- Corrected problem where Audio was not enabled with Option 106 when FM Demod was ON.
- Corrected the SCPI 'long form' of the command :TRACe:MATH:PEAK:SORT AMPLitude|FREQuency.
- Transitioning Marker Delta Noise from ON to OFF correctly updates the amplitude value of the Reference Marker.
- Corrected problem where the Marker Delta Frequency was not being updated in Single Sweep when the marker was relocated to a new trace position.
- Corrected problem with N dB Points marker Result in Segmented Sweep.
- Modified behavior of Delta Pair and Span Pair Markers in Segmented Sweep when mixed Zero Span and non-Zero Span segments are in use.
- Prevented the File Rename operation from creating filenames which could not be loaded or deleted (previously it permitted lower case characters).
- When recalling an instrument State, Trace + State, or Setup, from a previous firmware version to the current, any features not present in the previous firmware version are set to their default values.
- Ensured that instrument state is saved prior to completing the Power Off process (from the front panel Standby key).
- Corrected a "Printer Interface" error which is reported when the firmware is upgraded on an instrument without I/O capabilities (GPIB or RS-232).
- Corrected problem with Preselector Centering where the Marker Peak portion of the process would not find the peak of a signal.
- Corrected problem where Limit Line files were not saved correctly (the Amplitude Units in the Header of the file did not match the values in the data portion of the file).
- Corrected problem where the use of the Save hardkey did not save to the A: drive on the first occurrence following a Directory Selection from the File System.
- Corrected problem where the "System, Alignments, Align Now, All needed" message would be displayed if the instrument was in Power-on Last state and the Tracking Generator was on.
- Added checks for "Invalid Suffix" on several SCPI commands to conform with SCPI Standards.

Defects Repaired Specifically for EMC:
- Printing of Signal List has been reformatted to allow more information to fit on the page.
- Improved consistency of Signal List marker.

Revision A.07.05

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.03.06 (released with A.07.02)

EMI Measurements:
- Version A.03.00 (released with A.06.00)

Defects Repaired for both ESA and EMC:
- For 1.5 GHz instruments (E4401B, E4411B, and E7401A), fixed problem which could be manifested in two circumstances with Auto Alignment ON: 1) the instrument's noise floor would raise on the screen, or 2) after running for a period of time, the "System, Alignments, Align Now All" message would appear on screen.

Revision A.07.04

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- Version A.03.06 (released with A.07.02)

EMI Measurements:
- Version A.03.00 (released with A.06.00)

Defects Repaired for both ESA and EMC:
- Fixed problem where the GPIB Input Buffer was not appropriately 'held-off' upon receipt of a Device Clear. This would cause the instrument to continue to process commands that were pending in the input buffer.
- Fixed problem where Recalling a State, Trace + State, or Setup, from a firmware version prior to A.06.00 to A.06.00 (or later) would incorrectly restore the Detector setting. This would result in Sample Detector to be used for all measurements regardless of the detector indicated.

- Fixed problem where a System crash or "freeze" could occur after an extended period of operation under remote control. Particularly with standard memory configuration instruments (non-Option B72).
- Fixed problem where a System crash could occur if the Sweep Points were changed at the instant a display update is in process.
- Fixed problem where a System crash could occur if very large or very small values of Marker Noise are displayed in the Marker Table.

Revision A.07.03

New Features for ESA:
- None

New Features for EMC:
- None

ESA Power Suite Utilities:
- Versions A.03.06 (released with A.07.02)

EMI Measurements:
- Version A.03.00 (released with A.06.00)

Defects Repaired for both ESA and EMC:
- Fixed problem where amplitude accuracy may be degraded following an Align TG.
- Fixed problem where Traces 2 and 3 were not visible after power-up until a Preset is executed.
- Fixed Adjacent Channel Power problem when measuring NADC signal.
- Fixed problem where Recall Setup, of a setup saved while in a Mode, caused inability to change Modes.
- Fixed problem where the system would crash (White Screen) if Sweep Points were decreased while N dB Points is in use.
- Fixed problem where N dB Points result would not updated as the marker is moved in Single Sweep.
- Reverted N dB Points behavior back to which predates firmware Release 6 (it was changed in Release 6 to coincide with the documented behavior): If a marker is active when N dB Points is turned ON, the N dB Results will be obtained based on the active marker. If no marker is active when N dB Points is turned ON, a peak search will be performed and the N dB Results will be obtained based on the highest signal (ignoring the LO Feedthru). The documentation will be changed to reflect the behavior.

Revision A.07.02

New Features for ESA:

- Support for Option 290 (8590 Series Programming Code Compatibility)

New Features for EMC:

- None

ESA Power Suite Utilities:

- Version A.03.06
- Added Burst Power Measurement
- Added Power Statistics (CCDF)Measurement
- Added Quick Setups for Popular Cell Comms Formats and Bluetooth
- Added ACPR Enhancements
  - Multiple offsets
  - Noise Correction
  - Bar Graph View
  - RRC Filtering
- Detector changed to SAMPLE and sweeptime changed to AUTO for NADC Base Station ACP measurements.
- Default Res BW for NADC (Mobile and Base Station) ACP measurements changed to 1 kHz.
- Adj Channel Power measurement title changed to Adj Channel Power - Peak Method when Radio Std set to NADC and Device set to MS.
- Improved behavior in low-memory situations.
- Fixed crash caused by changing number of trace points during reference revel optimization.

EMI Measurements:

- Version A.03.00 (released with A.06.00)

Defects Repaired for both ESA and EMC:

- Fixed problem where AM Demod did not dwell in Tune & Listen mode
- Fixed the anomalous "Query Unterminated" SCPI error occurrences

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Revision A.06.00

New Features for ESA:

- Support for Option 106 and the Bluetooth Measurement Personality
- Support for Option UKB (Low Frequency Extension) in 26.5 GHz models (E4407B & E7405A)
- Support for Option 120 (ACPR Dynamic Range Extension)
- Support for Option 060 (Reduced Emissions)
- Added Front Panel access to the "IF Gain Auto/Fixed" mode of the Narrow Resolution Bandwidths (< 1 kHz). Fixed IF Gain reduces sweep time,

thus increasing throughput when a fixed dynamic range is acceptable. (Firmware Revision A.05.00 enabled this capability via the Remote interface :DISPlay:WINDow:TRACe:Y[:SCALe]:LOG:RANGe:AUTO)

- Added dBuA and Amp units to the available choices of Amplitude Units.
- Refined algorithm for ignoring the LO Feed through while using the Marker Peak Search function.
- Added new printers to the list of supported printers.
- Frequency Offset lower frequency limit is extended to match to upper limit (-500 THz).

New Features for EMC:

- All the aforementioned features for ESA, plus the accumulation of features that were introduced in ESA with Firmware Revisions A.05.00, A.04.00, and A.03.00.

ESA Power Suite Utilities:

- Version A.02.01

EMI Measurements:

- Version A.03.00

Defects Repaired for both ESA and EMC:

- Limit Line Margins did not scale correctly in Linear Amplitude Scale.
- GPIB Device Clear did not conform to IEEE 488.2.
- Limit Lines recalled from memory restore to destination Limit Line Number.
- Corrected a System Crash (White Screen) when remotely setting numerous frequency parameters without invoking a sweep or measurement.
- The power up alignment is now also performed if the instrument is configured to power up in User Preset or Last State.
- Recall of State with Segmented Sweep did not erase previous Segmented Sweep Table.
- Remote command :CALC:MARK:MODE? query is consistent when there is no marker turned on.
- Signal level significantly above the Reference Level in Narrow Resolution Bandwidths, in Linear Amplitude Scale, caused displayed trace to wrap from top of screen to bottom.
- SCPI command AVERage:CLEar correctly resets the Trace Averaging counter when in Single Sweep mode.
- Markers are now turned off when transitioning to or from Segmented Sweep.
- SCPI command STATus:PREset resets all appropriate registers.
- SCPI operation of N dB Points corresponds to what is documented in the Programmer's Guide.
- SCPI CONF? Correctly reports the current configuration.
- Switching windows with large frequency offset operates correctly.

- SCPI SYSTem:PRESet (or *RST) did not resume display updating if the display was previously disabled.
- On 1.5 GHz instruments (E4401B, E4411B, and E7401A), the Local Oscillator became unstable when tuning the instrument from high to low frequencies.
- In Segmented Sweep, Peak Searching a marker in a Zero Span segment could result in the marker leaving the segment. (In a Zero Span segment, markers are to remain within the segment.)
- Limit Lines: Reduced the smallest increment of time for Time Based Limits.
- Improved accuracy of Band Power and Noise Marker for Narrow Resolution Bandwidths.
- The Restart hardkey behaves similarly to Single Sweep when Trace Averaging is in use.
- Limit Lines: remote control setting for Relative Limit Lines incorrectly converted amplitude values.
- Fixed problem where Power-On User Preset or Power-On Last did not correctly restore Zone Span settings.
- Fixed problems with Linear Amplitude Scale in Peak Table and Marker Next Peak functions.
- Help Text: several corrections.

Defects Repaired Specifically for EMC:
- Corrected problem where Antenna Units and Amplitude Units were inconsistent when frequency ranges were changed via the Meas Setup menu.
- The Display Line takes into account the Quasi-Peak 10x gain.

Revision A.05.03

New Features for ESA:
- None

New Features for EMC:
- This revision is not available on EMC

ESA Power Suite Utilities:
- Version A.01.03 (released with A.05.00)

Defects Repaired for ESA:
- Reduced the incidents of SCPI "Query Unterminated" errors from GPIB.

Revision A.05.01

New Features for ESA:

- Support for the new display controller chip.

New Features for EMC:

- This revision is not available on EMC.

ESA Power Suite Utilities:

- Version A.01.03 (released with A.05.00)

Defects Repaired for ESA:

- Repair LO reclocking defect in 1.5 GHz instruments (E4401B, E4411B, and future release of E7401A). This manifested itself as "Align Now All, required" with noise floor near or at Top Of Screen.
- For Option AJ4: enabled Aux Video Out at all times (previously output was blanked when not sweeping).
- Frequency response corrections properly being applied at a center frequency of 100KHz, AC Coupled mode.

Revision A.05.00

New Features for ESA:

- Added Segmented Sweep
- Added support for Option UKB (Low Frequency Extension)
- In Zero Span, Sweep Points settable between 2 and 8192.
- Increased throughput with Marker use.
- Added new printers to the list of supported printers.
- Added nano-second units terminator (ns) for Time Units.

New Features for EMC:

- This revision is not available on EMC.

ESA Power Suite Utilities:

- Version A.01.03

Defects Repaired for ESA:

- Fixed problem where saving screen images failed when large number of Sweep Points and multiple Traces were in use.
- Fixed problem where turning Marker Table ON or OFF restarted Trace Averaging.
- Fixed problem where 3 GHz Tracking Generators would generate a "Source Unlevel" messages when sweeping from 10KHz to 100KHz.
- Fixed problem where Marker Resolution was insufficient with large values of Sweep Points.

- Fixed problem where Align TG did not take into account the user's selection of Reference Level.
- Fixed problem where Band Power Markers did not operate in Zero Span.
- Fixed problem with "rollover" values (near midnight) when entering Time and Date.
- Fixed problem where Reverse Window Meta Files were being stored as gif instead of wmf files.
- Grayed-out the Video Trigger softkey when RBW < 1kHz.
- Fixed some inaccuracies in the Help Text.