

URL: https://www.johnbaprawski.com/wp-content/uploads/2026/03/EEsof_OmniSys_History.pdf

The following is a history of the EEsof OmniSys product.

EEsof OmniSys was the first EDA (Electronic Design Automation) tool focusing on system-level RF/microwave design and communication link analysis. EEsof was the pioneering EDA company founded in 1984. John Baprawski joined EEsof February 1987 and was hired by Bill Childs R&D manager and co-founder (along with Charles J. ("Chuck") Abronson) of EEsof. John Baprawski was hired to specifically start the EEsof RF system/communications software product direction and led the development of EEsof OmniSys. The definition and features in OmniSys was based on John Baprawski's prior 14 years work experience at Hughes Aircraft Company designing and creating terrestrial and satellite microwave communication systems. John Baprawski led the RF/Comm system simulation product development at EEsof and was the R&D Manager until his retirement from EEsof in 2009.

The original RF System Budget Analysis tool, part of the EEsof OmniSys suite of tools, was defined and developed by John Baprawski along with coworker Niranan Kanaglekar who created the associated S-Parameter/Noise Parameter engine. The RF System Budget Analysis Tool was the first EDA frequency domain based Radio Frequency (RF) system design and simulation tool that combined S-Parameters and RF/microwave behavioral models with initial release in 1988.

Today, the technology from OmniSys is part of Keysight's (formerly HP/Agilent) EEsof Electronic Design Automation (EDA) suite used for designing communication systems, especially for RF, microwave, and wireless applications, focusing on modeling complex signal flows, impairments, and physical layer (PHY) designs before they become physical hardware. While the specific "OmniSys" branding is older, its functionality lives on within modern Keysight tools.

Key Milestones in the evolving OmniSys product.

- **1988:** Introduced the first full linear and large signal Scattering (S) parameters and noise parameters in the RF System Budget Analysis tool.
- **1989:** Introduced extensive RF/microwave nonlinearity behavioral modeling using parameters for 1-dB gain compression (P1dB), third order intercept point (TOI), saturation level (PSat), gain compression at saturation (GSat), AM-to-AM, AM-to-PM conversion models, table based nonlinear models, and more.
- **1989:** Introduced the generation and tracking of intermodulation distortion, IMD, products from nonlinearities and mixers into the RF/microwave system simulation software Spurious Signal Analysis tool.

- **1990:** Introduced the first RF circuit cosimulation with RF system simulation software.
- **1992:** Introduced the first RF envelope time domain system simulator for RF/Comm system design and simulation.
- **1994:** Introduced the first system simulation tool combining RF and DSP.
- **1995:** Introduced hardware instrument links for RF/comms systems analysis within the system simulation software.
- **1997:** Introduced the first EDA commercial use of University of California (UC) Berkeley's Ptolemy (data flow simulation software) with OmniSys integration into the Advanced Design System (ADS) simulation software product. Jose Luis Pino was the key architect/lead for the Ptolemy integration.
- **1997:** Introduced into ADS Ptolemy, with continued success through the present, the EEsof Comms/Wireless modeling libraries based on industry released wireless communications standards. The wireless library design team was set up in Beijing, China in 1997, and was the first new product R&D team in China for Hewlett Packard. EEsof member Dingqing Lu was the key person who went to China to identify and select candidates for the design center.
- **1998:** Introduced ADS Ptolemy RF/Comm/Wireless system cosimulation with Circuit Envelope simulation technology.
- **1999:** Introduced in ADS Ptolemy the DSP implementation path including cosimulation with digital Hardware Description Languages (HDL).
- **2008:** Initial product launch of SystemVue ESL (electronic system level) software product including data flow simulation technology as the EDA product providing superior Digital Signal Processing (DSP) and Radio Frequency (RF) system level codesign.
- **2023:** The legacy OmniSys based RF Budget System Analysis tool was retired from the Keysight ADS product (35+ years since its introduction) with reliance on the Keysight SpecraSys tool for RF system budget analysis.
- **2026:** The legacy, easy to use, OmniSys based RF System Budget Analysis tool was recreated by John Baprawski and made available for free use on the web site.
<https://www.rfsystembudget.com>
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Key Aspects of EEsof OmniSys:

- **Purpose:** To simulate and analyze entire RF/microwave communication systems, including transmitters, receivers, and wireless links, to predict performance and test algorithms.

- **Integration:** It's technology is a core part of the [Keysight EEsof EDA](#) family, working alongside circuit design (ADS, Genesys) and electromagnetic (EMPro, Momentum) tools.
- **Capabilities:** Handles complex signal impairments (amplitude, phase, frequency), noise, and various communication standards for aerospace, defense, and commercial wireless.
- **Legacy:** EEsof OmniSys was a key tool for system-level design in the early days of digital/RF integration, that evolved into Keysight's ADS and SystemVue products for modern ESL (Electronic System Level) design.

In essence, think of EEsof OmniSys as the precursor to today's advanced system-level simulation platforms from Keysight, allowing engineers to design and verify complex communication systems digitally before building them.

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