



How Many 9-Volt Batteries...?

The evolution to modern wireless

By Jack Alexander

For such a long time, wireless microphones as applied to live sound mucked things up – very much. Early wireless systems produced loud RF explosions for no apparent reason, at the most inopportune moments.

Also, you could hear the limiters and companders pumping, producing feedback instability that was highly non-linear with respect to time (the mess just came or went with no rhyme or reason) and frequency.

I particularly hated a certain product line viewed for a while as “state of the art” that had horrific instability between 630 Hz and 1.6 kHz. (Remember, at one time the Model-T was “state of the art” too.)

I recall leaning against a sidfill stack, trying to explain to Steve Lawrence why a particular manufacturer, known for making great TVs, did not have the wireless mic thing completely figured out. The same sidefills being used as my leaning post regularly had to be tweaked with massive cuts at the offending frequencies (usually 800 Hz and 1 kHz) – though the instability came and went.

It drove Lawrence and his wife (co-performer Edie Gourmet) nuts. They’d bought these wireless mics and didn’t really want me throwing the purchase in their faces. Thus, there was the assumption that either the engineer or the sound system was messed up – most certainly not the wireless.

The cheapo RF of that era was essentially un-useable. You made well sure that the wired backup was in a

neat cable pile downstage center, and often had another wired backup just in case. Music stores viewed such hardware as a golden opportunity, and gleefully sold this dreck to unsuspecting artists who saw wireless as a status symbol.

The first system that was actually stable and sounded halfway good was the Vega R-42, set up with a (Shure) SM87 head. Mighty pricey, but solid. We never had enough of them, but multiplexed Vega systems could always be rented from the coasts for big events with big budgets.

As time marched, other players entered the game, including the outfit that manufactures the only RF system now allowed anywhere near me. This gear always works, and you pay dearly for it. Meanwhile, wireless has also migrated to in-ear personal monitoring (IEM) and line level feeds – ultimately, the only copper in performance situations will be in the power distro.

It’s sounding much better, though still not equivalent in sound quality to hard wired. It probably never will, either – too many chips (and what-not) that will in some degree obscure resolution.

Not that anyone will care in a world where the young listen to MP3. As convenience drives the use of MP3, so does convenience and production reality drive the acceptance of RF technology.

The fact that one can shove a wireless lavalier mic under a wig or use a mini-prosthesis to get it near the artist’s mouth in louder (dance/rock) situations creates pro-



duction opportunities impossible in a hard-wired environment.

IEM would be a harder sell without the freedom of wireless, and my favorite motivational speakers and CEOs would be so, well, limited, if they were still tethered.

There is a contemporary composer who was once quoted as viewing big-voice opera singers as "freaks." He crowed about the glories of wireless and body-mounted mics as providing him total control of his art form.

In his world, the modestly (un)talented singer is the norm, to be processed and controlled like Velveeta – pawns in an anti-musical game that isn't about performance but presentation, music as commodity, with the only real "artist" the composer/D.J./programmer. No real singers need apply.

Anyone familiar with the state of

theatre sound is already well aware of the consequences of all this: too loud, too tinny, too processed. And spiking the stage with foots, overheads, and scenery mics is so messy.

This means getting people who can actually sing, and getting the band to back it down, and employing real engineers for the run instead of just for cue writing, where the heavy lift-

blasted through cheesball loudspeakers strewn about the seating area.

Wireless systems actually sound O.K. now, but the monster they've unleashed has not helped the sound quality of the shows or the quality of the performances. A lot of people have gainful employment designing, manufacturing, distributing, selling, renting and using these things, so this too makes them O.K.

Some wireless is better than others: do the research and buy/rent accordingly. Just keep in mind what's been lost and what still could be lost if we

You made well sure that the wired backup was in a neat cable pile downstage

ing with feedback management and the mix is done.

Some people would be out of a job fast if they actually had to mix a show every night that was an actual (live – remember that?) performance, not a collage of RF debris modestly enlivened with digital treatment and

overdo this.

Now let's see – how many 9-volt batteries do I have to meter and label while everyone else is at dinner... ■

Professor Alexander instructs on topics allied to performance audio at Columbia College in Chicago. Reach him at jalexander@colum.edu.

Shure SLX

www.shure.com

U.S. List Price: \$760 to \$1263

Components: SLX4 diversity receiver, SLX1 bodypack transmitter and choice of several handheld transmitters outfitted with SM58, SM86, Beta 58A, Beta 87A and Beta 87C capsules.

Vitals: UHF system operating between 524 MHz and 865 MHz; 960 selectable frequencies across 24 MHz bandwidth; up to 20 compatible sys-

tems can be used at same location; transmitter output varies by frequency range – 30 mW/15 dBm at 524 MHz to 10 mW/10 dBm at 865 MHz; auto frequency selection; transmitters offer frequency and power lockout; includes Shure's Audio Reference Companding.

Cool: Infrared link automatically synchronizes transmitters and receivers.



Telex S.A.F.E. 1000

www.telex.com



U.S. List Price: \$1950

Components: SAFE 1000 receiver, SAFE-WT bodypack transmitter and SAFE-HT handheld transmitter.

Vitals: UHF system; A Band – 680 MHz to 704 MHz; B Band – 722 MHz to 746 MHz; 950 possible channels, programmable in 25 kHz steps; DSP "PosiPhase" true diversity; up to 16 systems can

operate simultaneously from the pre-set channels (for more than 16, Telex helps with coordination and channel selection); ClearScan automatic group and channel selections.

Cool: Digitally encrypted transmission cannot be intercepted by scanners or other wireless receivers, even other SAFE-1000 receivers.



REAL WORLD



Sennheiser Evolution EM 500G2

www.sennheiser.com



U.S. List Price: \$1876

Components: EM 500G2 half-rack receiver and SKM 935 G2 handheld transmitter (several other bodypack and handheld options also available).

Vitals: UHF system (518 MHz to 554 MHz, 626 MHz to 662 MHz, 740 MHz to 776 MHz, 786 MHz to 822 MHz and 830 MHz to 866 MHz); autoscan for simple

and secure frequency selection; up to 20 switchable presets (re-programmable to any of 1440 available frequencies within a 36 MHz switching bandwidth); assignable alphanumeric names for each of the presets.

Cool: "Soundcheck mode" that allows an artist or engineer to perform on-stage level and RF check.

Audio-Technica Artist Elite 5000 Series

www.audio-technica.com

U.S. List Price: \$3999

Components: AEW-5255 dual receiver and dual AEW-T1000 UniPak bodypack transmitters as well as a selection of dual handheld transmitters with condenser or dynamic elements.

Vitals: UHF system, available in two frequency bands – 541.500 MHz to 566.375 MHz and 655.500 MHz to 680.375 MHz; 200 selectable channels per band; two independent receivers in

a single housing; on-board Ethernet interface for monitoring and controlling system parameters with included software; IntelliScan automatically finds and sets best available frequencies on both channels and all linked receivers.

Cool: Dual compander circuitry processes high and low audio frequencies separately for enhanced sound quality.



MIPRO ACT Series

www.avalex.com/mipro



U.S. List Price: \$915 to \$1150

Components: ACT-707F receiver main-frame holds 1 to 4 ACT-707MC receiver modules, ACT-707TM bodypack transmitter and ACT-707HM condenser handheld transmitter.

Vitals: UHF system, 620 MHz to 960 MHz; PLL synthesized technology – 100 channels preset in each 24 MHz bandwidth can be set manually or PC-controlled; 16

non-interference channels in each of nine different groups can also be set manually or via PC-control. MIPRO software can access up to 961 user-defined frequencies; efficient modular design allows hot-swapping receiver modules; 10 mW transmitter RF output.

Cool: Pressing the ACT button on the receiver's built-in scanner finds a clear UHF frequency.

AKG WMS 400

www.akg.com

U.S. List Price: \$658 to \$1238

Components: SR 400 receiver, PT 400 bodypack transmitter and HT 400 transmitter with either D 880 dynamic or C 900 condenser mic element.

Vitals: UHF system; frequency database and frequency search for automatic tuning within seconds; 50 mW

transmitter RF output; up to 12 channels can be used simultaneously within each sub-band; provides 1200 selectable frequencies; comes with charging system for the transmitters.

Cool: Infrared transmission link for downloading frequency data to transmitter.





REAL WORLD



Lectrosonics Digital Hybrid Wireless

www.lectrosonics.com



U.S. List Price: \$1534 (\$329 each additional module)

Components: Venue modular receiver hosts up to six modules (two module versions offered); choice of several handheld and bodypack transmitters.

Vitals: UHF system, operates in several frequency blocks in the 537.600 MHz to 767.900 MHz range; 256 synthesized frequencies per module; switched, radio and frequency diversi-

ty; DSP-based pilot tone controls audio muting (squelch); setup options and adjustments via front panel or an attached computer via LecNet2 software; built-in antenna multicoupler.

Cool: Sending the digital audio bit-stream via analog FM eliminates channel noise and enhances audio quality; up to six receiver modules in a 1U package.

Electro-Voice RE-2

www.electrovoice.com

U.S. List Price: \$1090 to \$4320 ("Six Pack")
Components: RE-2 receiver, BPU bodypack transmitter and HTU-2 handheld transmitter.

Vitals: UHF system, synthesized PLL; A Band – 648 MHz to 676 MHz, B Band 696 MHz to 724 MHz; operates over a 24 MHz bandwidth; "ClearScan" for

selecting the clearest available channels; programmable in 25 kHz steps for more than 950 possible frequencies; patented "phase diversity;" 30 mW RF output power from transmitters.

Cool: Lockout feature prevents accidental channel changes.



Sabine SWM7200 2.4 GHz

www.sabine.com



U.S. List Price: \$1300 to \$2760 (networked)

Components: SWM7200 receiver, bodypack transmitter and SWM7000 handheld transmitter with Audix dynamic and Sabine condenser capsule choices. (One and two-channel receivers available.)

Vitals: ISM band system, 2400 MHz to 2483.5 MHz; PLL synthesized system with 70 pre-programmed frequencies;

true diversity; "Targeted Input Processing" – automatic feedback control, compressor/limiter and de-esser; 10 independent digital notch filters controlled automatically from 20 Hz to 20 KHz and switchable to parametric filters. 25 mW RF output power from transmitters.

Cool: Mic "SuperModeling" allows the user to dial favorite "virtual" mic capsules.

Peavey U302 & U1002

www.peavey.com

U.S. List Price: \$680 (PCX U1002 is \$800 to \$900)

Components: PCX U-302 receiver and handheld transmitter (headset, bodypack and guitar transmitter versions also available. At press time, Peavey debuted the PCX U1002 (pictured here), a 100-channel system.

Vitals: UHF system, 900 MHz; synthesized PLL design; pre-programmed with 30 switchable frequencies; true

diversity; frequency tracking and muting circuit; plenty of front-panel control options and indicators; "Pilotone" and "Noise Lock" dual squelch circuitry; 10 mW to 50 mW RF output power from transmitters.

Cool: The new PCX U1002 automatically searches for non-interfering channels to resolve abrupt changes in frequency.





REAL WORLD



Nady Systems UHF-16

www.nady.com



U.S. List Price: \$450 (with handheld transmitter)

Components: Half-rack UHF-10 receiver, UB-16 bodypack transmitter and UH-16 handheld transmitter.

Vitals: UHF system; 16 channels switchable in pre-programmed bands up to 26 MHz wide in the 726 MHz to 865 MHz range (country dependent); PLL system with frequency stability of

less than 0.005 percent; transmitter RF output of 1 mW to 50 mW maximum; receiver offers dual conversion super-heterodyne with DigiTRU diversity; user-selectable Tone Squelch for protection from RF interference.

Cool: Cost-effective with 120 dB dynamic range and up to 500 feet operating range.

Sony UWP Series

www.sony.com

U.S. List Price: Starting at \$699

Components: UWP-S rack-mount receiver or UWP-X modular receiver; selection of bodypack and handheld transmitters (with dynamic mic capsules).

Vitals: UHF system operating in 798 MHz to 822 MHz and 838 Mz to 862 MHz ranges; PPL synthesizer control;

space diversity reception; tone squelch circuitry; plenty of LCD read-outs on components for status monitoring; pre-programmed for simultaneous multi-channel operation; camera-mount transmitter also available.

Cool: User-selectable transmitter RF output of 5 mW to 30 mW.



Samson Synth 32

www.samsontech.com



U.S. List Price: \$550 (base price)

Components: R32 half-rack receiver, T32 bodypack transmitter and H32 handheld transmitter (several choices of lavalier and headset mics, and mic capsules).

Vitals: UHF system operates in the 800 MHz range; PLL synthesized and "VCO" technology to cut spurious

admissions; true diversity; 32 selectable frequencies in both the receiver and transmitter; operation of at least six systems on the same channel; squelch circuitry mutes wide-band noise; transmitter RF output of 10 mW.

Cool: "Surface acoustic wave" filters to further enhance audio and noise reduction.

Vega U2020

www.clearcom.com

U.S. List Price: \$1313 (combo system)

Components: R-2020 receiver, BT-2020 bodypack transmitter and HT-2020 handheld transmitter (components can be packaged as "combo," and wide range of popular mic capsules available).

Vitals: UHF system operating in 708 MHz to 728 MHz and 728 MHz to 748

MHz ranges; frequency synthesis; true diversity; 20-plus systems can work at same location; antennas can be front- or rear-mounted; 30 dB level and 30 dB switchable pad; squelch control; transmitter RF output of 50 mW.

Cool: 380 available, usable frequencies; transmitter range of up to 1000 feet.

