



## Strictly Summing

Systems That Take Your Mix "Out Of The Box"

**FEATURE**

by [Barry Rudolph](#)

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After amplification, summing and mixing are two of the oldest and most basic audio processes — going back to the early radio broadcast days when the announcer's microphone signal and the record player's output were combined for transmission. Summing and mixing have always been inseparable, interrelated processes: Control the individual signal levels (mix) and then combine and amplify them on a mix bus (sum). While summing and mixing audio signals have always required an audio mixing console, the recent and rapid adoption of digital audio workstations, with integrated digital summing and mixing facilities, has challenged the console's sole dominance — even its continued existence as the centerpiece in a modern recording studio.

While the sonic arguments for and against mixing DAW productions (out of an external analog mixer vs. "mixing inside the box") continue, a new class of products has emerged in the form of small, analog summing-only boxes. Using an external summing unit divides the mixing process into digital mixing within the DAW and external analog summing.

## WHY SEPARATE SUMMING?

A growing number of proponents of summing their DAW mixes in analog say they're much happier with the overall sound of their mixes. Claims of a "more open, clear and punchier sound" are common, with the main consensus that (given a high-quality summing unit) the mix sounds like it was done on a very expensive Neve, API or SSL analog console. The best of both digital and analog worlds, the rising popularity of this method is self-evident: The DAW's wonderful mix automation, plug-in processing and editing features allow for individual

track level adjustments, muting, soloing and effect treatments, while external analog summing frees the DAW's CPU (and ancillary DSP chips) from the processing overhead required to perform internal digital summing.

Another concomitant feature of external analog sum mixing is that the session sample rate is no longer critical when it comes to the final stereo mix master. If you want to leave all of your options open for future release formats (analog 2-track; 44.1, 48, 88.2 or 96 kHz; MO; SACD/DSD; DVD-A; or Blu-Ray) or just don't know what the final delivery format will be, you can work on your project at whatever sample rate you like and wait to output your mixes in whatever form is required. Furthermore, the mix audio, now at +4dB analog line-level, is fully accessible for additional euphonic processing without extra deleterious A/D, D/A or sample-rate conversions.

## **SUMMING BOXES DEFINED**

For the purposes of this article, summing boxes are defined as stand-alone units that accept any number of audio outputs from a DAW's analog I/O and sum, or add, them together to create a stereo mix. For the most part, these summing units do not have individual input level controls, nor do they have effect sends, mute, solo buttons or other controls that would define them as line-level mixers. These are strictly summing blocks. Ideally, a summing unit is an inert box — as sonically transparent as possible and without mixing controls — so that the repeatability of your DAW mix is certain.

## **SUMMING IN ACTION**

Within the DAW program, instead of assigning and mixing all channels (tracks) to the internal digital stereo mixing bus, each track(s) would be assigned to an individual analog output of the system's I/O unit or soundcard. These outputs would connect to the external summing unit's inputs, where they would each be electrically added together to build a stereo mix. In the case of large mixes with many tracks, stem mixing — a *rigueur du jour* in film and TV production — is used, in which groups of instruments are subgrouped and routed to pairs of stereo I/O outputs, although there are no technical reasons why a 72-channel or bigger summing box could not be used for large mixes.

The following are brief descriptions of eight summing units on the market today. Models come in all price ranges and from the simplest to the most elaborate, each with unique feature sets to fit any audio chain and workflow method.



*Boutique Audio*

**Boutique Audio** ([www.boutiqueaudio.com](http://www.boutiqueaudio.com)) has taken over the Inward Connections line. Its summing unit is a 1U rackspace box featuring 16 differential balanced input channels, each with its own panpot. There are eight XLR connectors for the first eight channels and two DB25 connectors for inputs 1 through 16. The stereo bus master control has custom-wound Cinemag transformer outputs and ¼-inch TRS insert points for outboard processing. A front panel switch toggles the inserted processing in/out. All amplifiers are discrete Class-A SPA690 amplifier blocks, and up to three units can be linked together for 48 total DAW channels. Frequency response is 1 Hz to 200 kHz,  $\pm 0.5$  dB; THD @ 0.002%, 10 Hz to 20 kHz; signal-to-noise at unity gain is -110 dB; IMD is 0.005%; clip point is +26 dBm; and input impedance is over 10M ohms. The unit sells for \$3,600 MSRP; a meter bridge is optional.



*Dangerous Music 2-Bus LT*

One of the first companies to offer a dedicated summing unit, **Dangerous Music** ([www.dangerousmusic.com](http://www.dangerousmusic.com)) makes two models: the 2-Bus and 2-Bus LT. The 2-Bus LT is a 16x2 summing unit in a single rackspace. The LT takes in eight stereo pairs and automatically routes them to the left and right sides of its stereo bus. Eight mono buttons are provided to sum or “collapse” any individual pair down to mono — equally to the left and right buses. This convenient feature is for “forcing” normally center-panned audio tracks like kick and snare drums — coming in from DAW outputs 1 and 2 — to the center of the mix.

Connecting the LT to your DAW is easy by using DB25 connector cables wired in standard Tascam DA-88 pin-out. The LT also has a pair of rear panel XLR jacks for linking multiple units for more than 16 inputs or for external stereo effect returns such as reverb to the LT's master bus. Full +4dBm XLR stereo output connectors are also provided to feed a monitor unit (such as the Dangerous Monitor) or your existing console's monitoring section. A second pair of +4dBm outputs feed your analog stereo mixdown machine. MSRP is \$1,500.



*Dangerous Music 2-Bus*

The Dangerous Music 2-Bus is a two-rackspace unit with all of the features of the LT but with slightly better performance specs and 16 separate XLR input connectors instead of two DB25 connectors. The XLR connectors make wiring up a normalised input patchbay for 16 insert effect paths an easy task. There are also +6dB boost buttons for each stereo stem to “jump” the level up of any stereo pair(s) over others when needed. Options include a stereo insert loop path on the output for outboard processing and the replacement of the +6 buttons with simple mute buttons. Frequency response is 1 Hz to 100 kHz,  $\pm 0.2$  dB; THD is 0.005% in the audio band; IMD is measured at 0.005% IMD60 4:1; noise floor is at -81dBu total energy in the audio band; and max output level is +26 dBu.

The 2-Bus features a premium, stepped stereo output attenuator custom-made by NASA-supplier Janco Corp. for completely repeatable stereo bus level setting. The stereo output bus has a 10dB range adjustable in 0.5dB steps. All of the Dangerous gear features Burr-Brown op amps and hermetically sealed Arrowmat relays with silver contacts to switch audio. The 2-Bus sells for \$2,999 MSRP.



*InnerTUBE Audio Sumthang*

**InnerTUBE Audio** ([www.innertubeaudio.com](http://www.innertubeaudio.com)) offers Sumthang, a tube-based 8-input stereo summing box that features custom-wound, nickel-core, transformer-balanced inputs and outputs; dual Sifam VU output meters; a stereo output volume control (or optional stepped attenuator); and the ability to cascade multiple units to handle additional input channels. Optional 8- and 16-channel expander units run from a single external power supply. It's interesting to note that like all of InnerTUBE's product line, Sumthang uses only octal tubes (8-

pin tubes with ceramic, bakelite or phenolic bases holding the glass tube itself; in this case, two 12SL7s and two 12V6s), which is said to be better-sounding than glass-only tubes. List price is \$2,500.



The Commander from **Nautilus Master Technology** ([www.nautiluspro.com](http://www.nautiluspro.com)) is a discrete Class-A design that sums 12 channels to stereo. Mastering-style stereo bus functions include a four-way assignable stereo insert for external analog mix bus processing, separate L/R mutes, a Mono button, VU meters and meter range control. Stretching our survey's definition between a simple summing unit and a line-level mixer, it has eight analog XLR/TRS inputs with pan and mute controls. There are also two dedicated stereo pair inputs that can be used for effects returns or for expanding up to 36 total channels with the upcoming Commander expansion units.

A unique feature is the ability to switch from the 12-channel summing section to an auxiliary stereo source for A/B comparison with previously recorded mixes or other CD/SACD stereo references. The separate level controls for each stereo source ensure accurate and true sonic comparisons. The Commander has two RMS VU meters that make good adjuncts to your DAW's level meters. Like Boutique Audio's unit, the Commander uses discrete, Class-A SPA690 amplifier blocks throughout. List is \$3,995.



*Roll Music Folcrom RMS216*

Closest to the “ideal and inert” summing box, the **Roll Music** ([www.rollmusic.com](http://www.rollmusic.com)) RMS216 Folcrom is the simplest unit in this survey. It requires no power supply and is essentially a passive-resistive summation circuit housed in a single-space 1U box and without internal amplifiers. Audio undergoes no additional processing or coloration but loses about 30 to 40 dB of level, which must be “made up” — restored to a proper +4dBm line-level. Roll Music recommends using a good-quality microphone stereo preamplifier for this — a piece of gear that usually goes unused during mixdowns. In effect, Folcrom allows you to sculpt your mix's overall sound through your choice and setup of this mic pre — be it an old-style tube model or a very pristine transformerless modern unit.

Folcrom's 16 input channels take fully balanced lines coming from your DAW over two standard 8-channel DB25 cables and connectors. The front panel has a row of pushbutton switches to assign each channel to the left, right or center (or none) of the stereo mix bus. The output of the Folcrom comes out of a stereo pair of balanced XLR connectors on the rear panel. Specs include a max input level of +42 dBv (at which point, the resistors start to heat up); output impedance is 150 ohms balanced, recommended load impedance is 1,300 ohms and output level will be -35 dB nominal; frequency response is 0 to 500 kHz, while crosstalk at 1 kHz is -90 dB. MSRP is \$795.



**SPL's** ([www.spl-usa.com](http://www.spl-usa.com)) MixDream Model 2384 is a 16x2 analog summing/mixer unit in a 2U cabinet and is the most elaborately featured summing system in this survey. The Class-A amplifiers, running on a  $\pm 30$ -volt supply, promise loads of headroom with a  $-97$ dBu (A-weighted, all channels active) noise floor and a dynamic range of more than 125 dB.

There are 16 relay-controlled (I/O bypass) balanced inserts for using analog effects on the individual channels. Multiple MixDreams can be linked together for more inputs or for 6-channel surround sound applications. Other features include a built-in adjustable peak limiter, stereo expansion control, master inserts and switchable output transformers from Lundahl, proprietary differential amplifiers for each input and a discrete, low-noise power supply. MSRP is \$3,795.



The **Tube-Tech** ([www.tube-tech.com](http://www.tube-tech.com)) SSA 2A Stereo Summing Amplifier uses eight tubes and is powered by a solid-state power supply. The SSA 2A performs summing of up to eight stereo pairs of input channels down to a single stereo output. The unit also has four mono inputs ready for hard-center — panned tracks such as kick, snare, bass and lead vocals. The two-rackspace unit has a 23-step gold-plated output attenuator with a master gain control range of  $-10$  dB to  $+10$  dB and features two large, lighted VU meters.

Expandable to 16 stereo inputs, the SSA 2A's electronically balanced inputs can handle super-hot levels up to  $+30$  dBu — more than any available DAW I/O can output. Maximum

output level is +26 dBU for less than 1% THD+N @ 40 Hz (distortion is more typically <0.01%), and frequency response is rated at -3 dB for 5 Hz to 50 kHz. The fully balanced output section uses a floating transformer with static screen. At \$3,895 MSRP, the SSA 2A is for anyone interested in summing their DAW mixes using tubes only.

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