

SOUNDCRAFT

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D.O.G.S. – White Paper

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Introduction.

D.O.G.S is an acronym for Direct Out Gain Stabiliser, this is a form of ‘gain stabilization’ that may be used to maintain a fixed gain between a variable gain input stage (such as an analogue microphone amplifier) and the direct out of the channel allowing a degree of gain adjustment on the console to accommodate personal preference or needs on the day whilst effectively isolating any devices attached to the direct output from these gain changes.

Background.

It has often been necessary to share the signal from a single microphone to multiple consoles or destinations; in the analogue domain this was only really possible with an analogue splitting system that feeds the separate input amplifiers found in each console.

With the advent of digital stageboxes and digital snakes came the desire to have just one stagebox and split or re-distribute the signals in the digital domain to save the cost of having two stageboxes and having to split the source to those two stage boxes. Digital console systems today allow this digital split to be done but ‘sharing’ of the mic amp can cause conflict or unrest as engineers are uncomfortable that one operator may increase / decrease mic amp gain thereby affecting the levels and mixes on other consoles within a system.

Why D.O.G.S. is different.

The D.O.G.S. system addresses the issue in a unique way, it achieves the desired result whilst addressing the limitations of existing state of the art solutions. Most significantly D.O.G.S. compensation happens in the console designated as the 'master' the benefits of this are:

- Compensation happens very quickly, there is no need to transfer messages between systems.
- Perfect synchronization since there are no other system components impacted or affected by the D.O.G.S. system.
- Cross platform use, any product connected to the direct outputs of a console with the DOGS system (such as a multi-track recorder) can benefit from the D.O.G.S. system.
- It is possible to distinguish between gain changes made by the user and gain changes made by the automation system and act differently upon the different scenarios.

How D.O.G.S. works.

At the point that D.O.G.S. is enabled all Direct Out gain levels are set to UNITY with the signal take-off point for the direct out signal typically at the earliest point in the signal chain after the mic amp.

When a user adjusts a mic amp gain the direct out is offset the opposite number of dB thereby keeping the system gain from Source to Direct Out unchanged. D.O.G.S. works on the premise that gain settings stored in cues are 'generally' correct and gain changes required to any pre-stored cue or scene are not major; when changing to a new cue it is assumed this gain is also 'OK' and so the D.O.G.S. offset is cleared ready to be offset again if required.

What D.O.G.S. is not.

DOGS was designed to stop gain changes applied by the user affecting other equipment connected to the console configured as the gain control master and in this scenario it works exactly as intended. D.O.G.S. should not be confused with other functions such as:

- Gain offset, a system to apply a permanent offset to stored gain settings required for example as a result of a lavalier mic being placed in a different position in the performance as to the rehearsal.
- Gain / trim compensation where a channel gain is linked to its digital trim allowing an overloading input gain to be turned down whilst the corresponding digital trim is turned up to maintain preset gain between input and channel.

Are there any limitations?

There are two practical limitations:

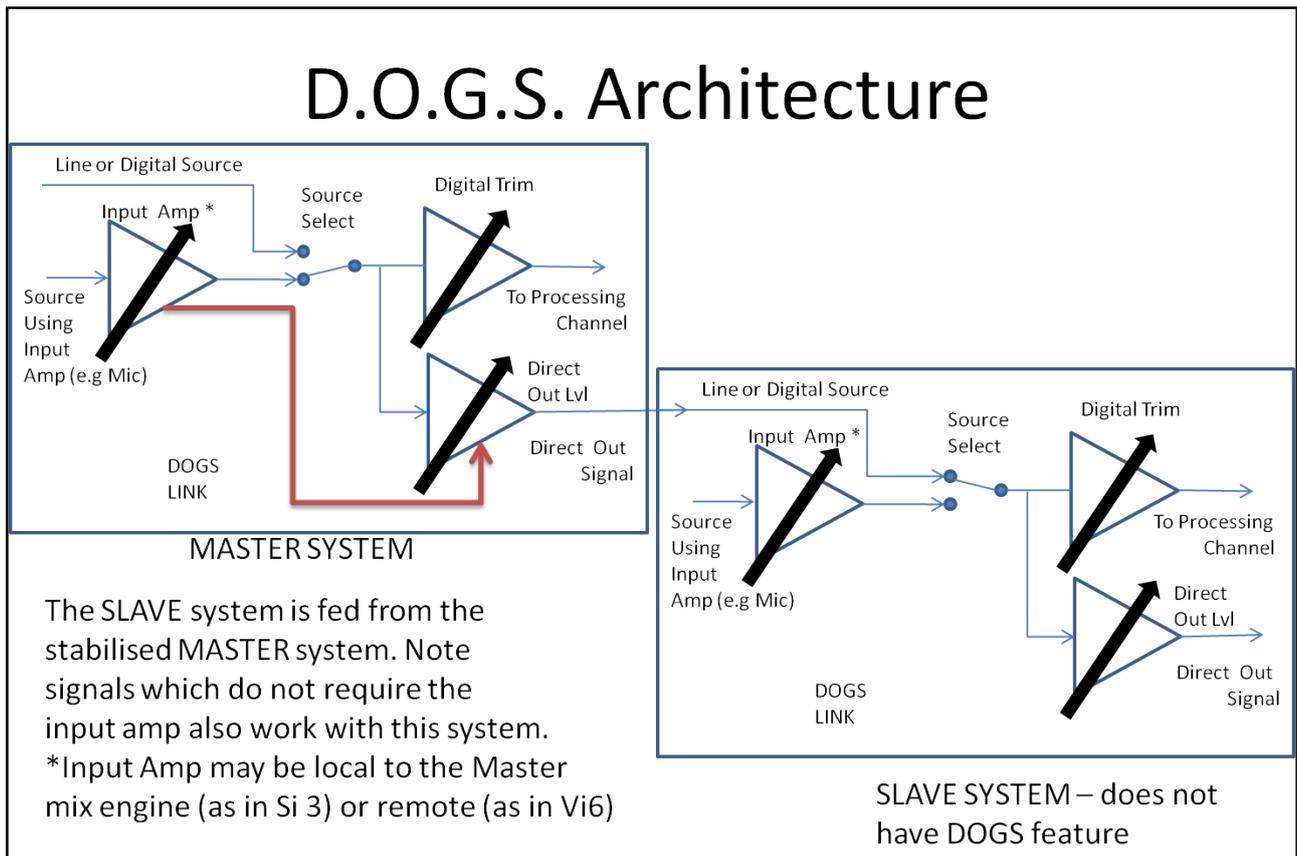
- Tolerances of analogue components used in the analogue gain stages result in gain steps that are not all exactly equal whilst digital gain steps are always exact. This scenario can result in minor discrepancies e.g. mic gain 1 is moved +10dB, the actual change, as a result of tolerances and available component values, is +9.8dB. As the direct output is offset by the exact -10dB resulting in a net gain error of 0.2dB is present at the direct out. Since the same gain change on channel 2 may result in a gain of +10.2dB it is not practical to attempt to compensate for this.
- Extreme gain changes would require large digital offset gain changes which are undesirable and thus the offset that can be applied is limited.

Is D.O.G.S. patent protected?

A patent has been filed; if not contested full patented rights will be granted.

What does the architecture look like?

The following diagram illustrates how the D.O.G.S. system works. Note the diagram illustrates the slave system as a mixing console but this could be any device.



Where can I see D.O.G.S. working?

There are videos available on the Soundcraft YouTube page.

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