



GainStation 1

BY MONTE MCGUIRE

A channel strip with A/D that combines simplicity with color

The recording channel in a box has become a very popular product now that many people record directly to a DAW. The SPL GainStation 1 is just such a device, designed to amplify and process a mic (or instrument, or line-level device) and prepare its signal for a recording channel, thus simplifying the recording process and saving a little money compared to using a chain of dedicated processors.

First look

Unlike many available recording channels, the GainStation 1 has relatively few features and controls. It is primarily a mic preamp/instrument DI, offering nothing in the way of equalization or comprehensive dynamics. However, a variety of tonal colors can be obtained from an input impedance switch and the combination of a clean solid-state stage with a more colored tube stage. Lastly, a simple but effective limiter can be switched into the output, offering a surprisingly useful form of compression.

The GainStation 1 is a relatively compact device. Unlike most preamps, it has an almost square 3U high front panel that is one quarter of the width of a typical piece of rackmount gear. While four of the shoebox-sized processors can be attached to a rack chassis available from SPL, the GainStation is meant to live outside of an equipment rack. SPL claims that its unique form factor lets it be placed closer to a microphone, allowing shorter mic cables to be used, which can improve sound quality. It's also suitable for high-quality field recording.

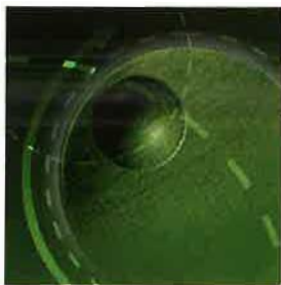
The GainStation 1 that was sent to me had the A/D converter option fitted, making this a complete mic-to-recorder processor, capable of working directly with a digital recorder or interfacing with other analog gear and outboard converters. This converter can be operated at the standard 44.1 kHz and 48 kHz sample rates as well as the newer 88.2 kHz and 96 kHz rates.

There is also an option to have a high-quality Lundahl input transformer added to the preamp. This option increases the gain of the preamp by 7 dB and potentially changes the tonal quality of the preamp, but since the review model did not have this option, I won't comment on it any further.

Input impedance

Input impedance switches are becoming more common on fully-featured preamps today, since they are usually relatively inexpensive to add to a design and can change the way a mic interacts with a preamp, changing its tonal balance in sometimes not-so-subtle ways. Some mics such as modern transformerless condensers are affected very little by the impedance of the mic amp to which they are connected, but other mics, especially dynamic mics, can be greatly influenced by the input impedance characteristics of a preamp.

The GainStation offers a choice of 10 Kohm, 1200 ohm, and 200 ohm input impedance settings. I found that dynamic microphones such as an SM57 sound most "correct" at the 1200 ohm setting, a little brighter than they should on the 10 K setting and positively odd at the 200 ohm setting. Most ribbon mics like the Coles 4038 and the RCA 44 sound brightest and most



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honest at the 10 K setting, a little duller on the 1200 ohm setting and too bandlimited to be interesting on the 200 ohm setting.

Other than these general observations, there aren't too many rules, and it's worth trying all three positions to find the best setting. Note that this switch will change the level coming from the mic, so be careful that you don't automatically pick the loudest setting just because louder usually sounds better. Try to base your decision on the tonal characteristics of the impedance setting, and use the gain knobs to even out the level differences to make a more realistic decision.

Solid state and tube gain

Aside from the usual polarity, phantom and highpass switches, all that remains are three rotary gain controls. The leftmost control varies the gain of the clean solid state gain stage. This gain stage is the first stage that the input signal sees, and it's commendably quiet and well behaved. I found this stage to sound very deep and clear—perhaps a little brighter or clearer than it should sound, but not in an unpleasant way at all—and basically still in the “completely clean” ballpark.

This stage can be varied from 10 dB to 63 dB of gain, quite a healthy range. Due to the high internal operating voltages of the discrete solid state circuitry, it also has remarkably high headroom, with an overload point somewhere around +34 dBu, a value so high that it can actually pose a danger to some downstream equipment.

The middle gain knob controls a switchable tube stage that offers a very different sonic character, one that complements the solid state stage quite well. The tube stage offers a gain range of 1 dB to 26 dB, and is activated by turning its gain control clockwise. When this stage's gain knob is set to minimum, the tube stage is completely removed from the audio path by means of high-performance gold contact relays, thus preserving the low noise and distortion of the clean solid state stage.

The final knob is an output attenuator that controls the level sent to the output jack as well as the optional A/D converter. This stage offers only a relatively small 6 dB of makeup gain since it is designed to be used primarily as an attenuator to allow some flexibility with internal gain staging. For example, the middle tube stage can be run at high signal levels to obtain distortion while the final output level can be attenuated to suit a particular recording device.

While there are a lot of possible combinations available with this three-knob arrangement, in operation it's not as complicated to use as it may seem. As a starting point, set the output level knob to 0 dB, turn the tube stage off and set the basic amount of gain needed with the first knob. If

it was easy to dial in a relatively small amount of coloration. While the transition from tube stage to no tube stage can sound abrupt, I didn't find myself setting the tube gain stage control all that low in practice, so there is some useful overlap available.

Limiters

The final feature is a deceptively simple limiter, activated by a small three-position switch that selects among bypass, peak, and FET mode. Bypass mode removes it from the circuit completely, peak mode activates a very fast form of limiting that's essentially a soft clipper, and FET mode adds a gentler, more compressor-like gain reduction to the fast peak clipper.

There is no threshold control for this limiter, but its action can be altered by changing the preamp gain(s) and the output level. If the preamp gains are turned up and the output level is turned down, threshold will essentially be lowered. It sounds complicated, but it's actually fairly simple to operate in practice. You turn the limiter on, turn up the gain so that you're hitting threshold as much as you'd like and then adjust the output level control to make the signal whatever level you want to send to your recording device.

The limiter in peak mode did not do much for me, but it could be useful for situations where it is absolutely necessary not to overload an A/D converter. In practice, the peak limiter did sound more polite than clipping the built-in converter, but not if you really dive into it hard. It's



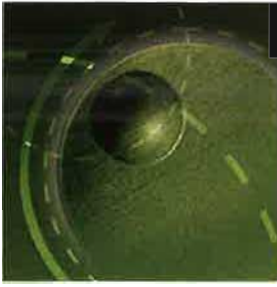
tube coloration is needed, then the tube stage gain should be turned up and the clean gain stage turned down to compensate.

I found this system to be relatively simple to use in practice, and it offered a great tonal flexibility. The bright and clear solid state stage is well complemented by the slightly cloudy, midrangy and thicker tube stage, and it's not hard to find a nice balance between the two stages that suits a wide variety of sounds and mics. Add to this the potential of the input impedance switch, and you have a great deal of tonal flexibility without having any actual eq available.

On many solo instruments I found myself using the tube stage more often than I would have imagined, as

useful for shearing off a few troublesome peaks, but it's not going to replace a real digital limiter.

FET mode, however, made me very happy, and I found a lot of uses for it. The odd part about FET mode is that it's only available when the tube amplifier is in circuit. Otherwise, only the peak mode of the limiter is engaged. This isn't really too much of an issue, but it would have been nice to have this feature available, independent of the tube amplifier, if it were easy to provide, because it works so well. [SPL notes: "The FET mode only works when the Tube stage is engaged, as the transistor doing the limiting is directly connected to the tube. So the Tube stage has to be engaged; otherwise it does not work."—Ed.]



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FET mode offers only the choice to engage it or disengage it. But, for being as automatic and non-adjustable as possible, it turned out to be quite useful. It has a very well chosen attack and release time as well as a gradual knee and variable ratio that seems to work quite well for vocals and solo instruments. I'd go so far as to say that it works well enough that a real compressor or limiter following the GainStation 1 might not be needed at all.

Bench performance

On the test bench, the GainStation 1 performed admirably. The clean gain section was truly clean, with very low distortion figures. Most of the distortion residual is hum and harmonics at most levels and gain settings, so it's necessary to use an FFT analyzer to see the actual distortion products inside of the noise. Over most of the operating range, the actual distortion products range from 0.0003% to 0.0005%, and this is respectably low. Thankfully, the distortion products from this stage were almost exclusively second harmonic, the most benign possible, with very little else ever observed. Distortion does rise slightly at higher frequencies, but not by that much.

Overall, while the distortion performance is quite commendable, it's not quite as low as some of the very cleanest mic amps, and this may account for some of the perceived brightness of the GainStation 1. Mind you, this brightness isn't extreme at all, and I mention it because it's just about the only way that the solid state preamp section deviates from being truly neutral.

The noise performance is very good, but I did find the hum and harmonics to be a little bothersome at times. Practically, it's not going to ruin a recording or perhaps even be noticeable at all, except under unusual circumstances. However, compared to other high-end preamps, the level of hum and harmonics from the GainStation 1 is probably 10–20 dB higher than it should be, and it'd be nice if this weren't so. [SPL reports that this is symptomatic of the very early unit we received for review; newer GainStations have

improved transformer shielding both inside and out and are much quieter.—Ed.]

The measured frequency response of the GainStation 1 is extremely flat, perhaps flatter than just about any preamp I have measured. The low end is especially extended and flat, probably because of the use of DC servo amplifiers rather than coupling caps to remove DC offsets from the various amplifier stages. As a consequence, I could only measure the unit's -0.1 dB down points easily and found them to be 11 Hz and 50 kHz; my analyzer won't let me go out far enough to find the -3 dB points.

While this extended response is great sonically, it's sometimes a nuisance operationally, since random clicks and noises could result when changing gains and operating switches. Basically, changing gain will upset the amplifier's DC balance, and this will require a little time (a couple of seconds) before the DC servos can rezero this completely. During this time, any controls that are operated with DC on them will make more



noise than they will once the DC has settled. Operationally, this isn't a big deal, but if you do encounter this, realize that it's not a defect, but rather a consequence of the unit's extremely extended low-frequency response. I'm glad SPL focused on sonics rather than operational convenience, and this behavior should not be considered a defect.

Studio performance

My listening tests were done first with a microphone and my own voice, and this proved very informative. While it appears to be a simple and straightforward preamp, the GainStation 1 is capable of a wide range of sounds, and it is certainly worth experimenting with to see what works well and what does not.

The range of coloration from the tube stage proved to be very interesting, and while it has nothing to do with actual eq, the effects of this stage can often sound a lot like eq.

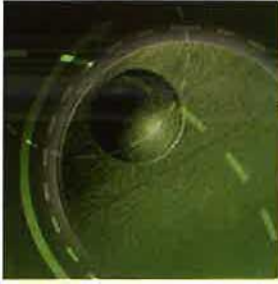
Experimenting with one of the many inexpensive Chinese large-capsule condenser mics, a modified Marshall V63M, I found that adding a little bit of tube gain provided some midrange emphasis that balanced out the high-frequency emphasis inherent to this mic, making a very well balanced overall sound.

Being able to add a controllable amount of tube coloration is also a nice thing. Often, tube coloration is a take-it-or-leave-it proposition, with some amplifiers and microphone electronics having too much or too little coloration for a given situation. The controls of the GainStation 1 allow this effect to be very easily adjusted, and in the case of the inexpensive Marshall V63M mic, I was very impressed with the overall sound.

Once I got a handle on the range of sounds it could produce, I enlisted the GainStation 1 for tracking some keyboard overdubs. Since I had only one channel available, I used it for a mono clavinet part played on a Kurzweil that would probably respond well to some sort of distortion.

The GainStation 1 has a 1/4" direct input, and while I haven't mentioned much about it so far, it does seem to do its job fairly well. However, I didn't find that it could do anything extraordinary with an electronic keyboard's output and that using a transformer DI ahead of the XLR input actually sounded a little better. This is probably because of the extra coloration from the transformer DI. You can get this sort of coloration within the GainStation 1 if you order it with the optional Lundahl transformer; our review unit wasn't so equipped, but if this seems like an appealing application you should remember that the option's available.

The main goal here was to add a little saturation, and being able to add a little tube gain to the otherwise clean sound of the GainStation 1 was very helpful. The overall track turned out well, with enough saturation to satisfy me and not too much to annoy the client.



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Vocals

The next test was to try some lead vocals with a female singer I've tracked before, a task at which the GainStation 1 should perform well. Of all the mics and preamps available to me, the one that sounds best with this particular singer is the BLUE B7 capsule on an AKG C451E body into a Groove Tubes Vipre preamp. For some reason, this combination matches her dynamics well, and provides just enough saturation to sound full and present, but not enough so that it gets mushy or too thick.

I initially found the 451/B7 combination to be a little too bright on the GainStation 1, so I switched the C451 body to a C61. This mic body uses a NuVistor vacuum tube instead of the FET inside of the 451, and generally has a smoother, less aggressive but still large and detailed sound. This proved to be a very workable combination, somewhat brighter than with the Vipre but in a very pleasant way. The sound was just as full and present as with the Vipre, but with a slightly different emphasis. Overall, I was quite happy with the sound of the GainStation 1 on vocals, as it was able to provide the forwardness and brightness that I normally use the 451 for.

I switched in the built-in FET limiter and found it to be very useful for vocals. I set the controls so that we were only touching the limiter during the loudest peaks, but still found it quite useful to have. I did end up using a McDSP Compressor Bank on the monitor side of the recording channel, but having the FET limiter in line made it a lot easier to get the vocals to sit right in the vocalist's headphone mix, making for a much happier vocalist!

DI and A/D

Next, I decided to try using the $\frac{1}{4}$ " DI on something that might actually take advantage of a quality DI, namely a Fender Jazz Bass. While the DI didn't offend me, it didn't send chills up my

spine either, and I found that an inexpensive Rapco transformer DI ahead of the XLR input provided just as satisfying a sound, plus or minus a few personal preference points.

To its credit, the GainStation DI didn't make the bass sound like something that it wasn't, and it could certainly handle aggressive dynamics quite well, so don't infer that the DI isn't useful or that it's low quality. I simply found it to be very clean, much like the standard XLR input stage, so there's no special attraction to using the DI as opposed to using a transformer DI with the XLR impedance set to 10 K. Having the FET limiter in circuit is something most ordinary DIs can't do, of course, and this produces a sound that you may find quite appealing for bass tracking.

I didn't end up using the GainStation converters in any sessions, because I normally like to use a set of converters that I'm used to and of which I have multiple channels, so that I can track several channels at the same time without different converter latency issues. But a listening test after my sessions proved that the A/D converter option worked as promised with no big surprises.

The quality of the converter was quite good, on par with other competent, modern converters and certainly a good value. I don't think they'll win any awards or offer any compelling reason to use these over other more specialized (read: expensive) converters, but by the same token, they are quite convenient and will probably

perform a lot better than many low-end models out there. The convenience of being able to run, for example, a lightpipe from the GainStation to a soundcard and have essentially a complete, high-quality record path is quite nice.

In summary

I found myself very happy with the sounds I heard from SPL's GainStation 1, and considering how much it can do and how little it costs relative to other gear in the same league, I think it's a great value. It's not often that a relatively inexpensive preamp can offer sounds as large and present as these while still offering a great deal of tonal flexibility.

While there are a few very specialized preamps out there that can do a slightly better job on certain specific tasks, the GainStation 1 seems to be able to do a really first-rate job on quite a wide range of applications. The built-in FET limiter is deceptively simple to operate, and it sounds quite good.

I think the GainStation 1 would be a great choice for vocal and instrumental overdubs, especially those that would benefit from a little euphonic distortion from the tube stage. If the GainStation 1 was a recordist's only way to get sound into his or her recorder, the result would probably be some great-sounding tracks.

Price: \$1099; with A/D, \$1199; Lundahl transformer, add \$159

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