Daking Audio

Comp II
Compressor-Limiter
User Manual V.1

http://www.daking.com/

Safety Considerations

• Read, follow and keep these instructions.

• Heed all warnings. Install in accordance with the manufacturer's instructions.

• Protect device from liquids and spills.

• Clean only with a soft, dry cloth

• Do not block any ventilation openings.

• Do not install near any heat sources such as radiators, heat registers, stoves or other devices (including amplifiers) that produce heat.

• Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

• Protect the power cord and all connecting cables from being walked on or pinched, particularly at plugs, receptacles, and the point where they exit from the device.

• Only use attachments or accessories specified by the manufacturer.

• Unplug this device when unused for long periods of time.

• Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. Servicing is required when the apparatus has been damaged, such as when a power-supply cord or plug is damaged, objects have fallen into the apparatus, the apparatus has been exposed to moisture, does not operate normally, or has been dropped.

• Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

1.0 About Daking Audio

Congratulations! You've purchased a Comp II, a very high-end piece of gear! The Comp II uses discrete transistor Class A circuits, VCAs, THAT Corporation differential amps and printed circuit board-mounted switches. Signal capacitors are precision polypropylene or ultra low-leakage electrolytic types. Our boards are assembled on a mil-spec assembly line. The chassis are stainless steel for maximum RF and hum rejection and a long-lasting finish. Every unit is hand-finished, tested, burned in, and tested again in a second facility.

Also, we just couldn't stand to use plastic knobs, so we designed our own anodized, engraved aluminum knobs that give a much more precise and quality feel. We designed our gear to be gear you'll own for life, not some passing fancy you'll leave in the dust once you figure out what the good stuff sounds like. This IS the good stuff.

　　-Geoff Daking

1.1 In The Box

•Daking Audio Comp II 19" rack-mount single-space Compressor-Limiter

•Outboard power supply with attached connecting cable

•Power cable

•.050" hex wrench for knob set screws

1.2 What Is a Compressor-Limiter?

A compressor is a device that helps control the dynamic range of a track you're recording or mixing. Example: if you're recording a vocal and the singer is going from very soft to very loud, a compressor can make the loud parts not quite as loud. Then you can turn up the overall level of the vocal to hear the soft parts better. As a result your vocal will have a more consistent level in your mix, while still retaining its expressiveness. Compressors are also frequently used on guitars, bass, piano, and other instruments for the same reason - to record a consistent level that will hold its place better in your mix. Used sparingly a compressor is transparent - the listener can't hear it working. Used poorly it can suck all the life out of whatever you're recording, and that can't be undone by any amount of later processing. Some people will use compression aggressively as an effect, and that's perfectly valid if it's what you want. Always listen and keep an eye on the gain reduction meter. Try aiming for -3dB to -5dB of compression as a starting place when recording a vocal. Remember: you can add more compression later, but you can't take it away.

When mixing many engineers use a stereo compressor to run the entire mix through. It can make your mix more aggressive and more alive sounding, more integrated. "Glue" is a term many engineers use for mix compression. Again, too much compression can ruin your mix, so use your ears.

A limiter is a compressor with a higher ratio (greater than 10:1) that literally puts a limit on how loud you can make something. It comes from the days of radio when there was a legal limit to how loud a broadcast could be, but radio stations still wanted to seem as loud or louder than their competitors. A limiter raises the average level of a track or mix while not letting the peaks go beyond a fixed level - into the red, for instance. Like compression, limiting can make your mix more exciting or ruin it completely. Listen!

There are four basic types of compressors: Tube, Optical, FET and VCA. You may be familiar with our popular FET Compressor, the FET III. VCA compressors don't have a great reputation among professional engineers for good reason - they are mostly feed-forward designs utilizing cheap RMS detector chips and low-quality monolithic current-to-voltage convertors. The Comp II is a very different, more complex VCA design that uses feedback, a peak detector and an all-discrete Class A follower. We use the VCA like a FET to get the sound we all love without the thermal instability and other problems associated with FETS.

1.3 Front Panel

Compression Knob

The Compression knob controls how much you compress the signal, from Less to More. What is happening is that as you turn the control towards More you are lowering the threshold at which compression begins. The lower the threshold the more you compress a given signal. If the meter in the Comp position shows too much compression with the Compression knob fully down then the level coming into the compressor is too high and should be turned down at the stage before. For instance, at the output of the mic preamp before the Comp II when recording vocals.

Output Knob

The Output knob controls the amount of gain added to the signal after compression. It goes from ~, no output, to 11. Since a compressor lowers the peaks, the Output control raises the average level of the signal to compensate. This is called "gain make-up".

Attack

Attack controls the speed at which the Comp II responds to peaks in the signal. Slow allows transients to go through uncompressed but reduces the gain of what follows. Fast grabs the transients as well as the sustain of the signal. Slow can be more subtle, fast more aggressive.

Release

Release is the speed at which the compressor, having compressed a peak, gets ready to catch the next peak. Fast is fast release, obviously, and is generally more aggressive. Auto adjusts the release time automatically depending on the gain and the timing of the peaks in the signal you feed in. Which one you use is a matter of taste - use whichever sounds better to you when applied to the particular signal you're compressing.

Ratio

Ratio determines how aggressively the compressor responds to the signal you put in. Comp is a lower ratio and therefore compresses less. The signal will maintain a greater dynamic range while still having peaks controlled. Limit is a higher ratio that compresses more. Your input signal will have a smaller dynamic range but higher average level. See Appendix I for a graph showing how various compression ratios effect the signal output.

Bypass

Bypass turns compression off. Use it to compare the uncompressed and compressed signal while setting up the compressor to record a track.

Meter and Meter button

The meter does double duty depending on the position of the Meter switch. In the Comp position the meter shows you how much the peaks are being reduced by the compressor. The needle sits at zero and moves to the left to show gain reduction in negative numbers: -3 means the signal is being reduced by 3dB, -5 means 5dB of gain reduction and so on. This will tell you if you're compressing too much or not enough. No matter how well you think you can hear a compressor working, you should always monitor the gain reduction meter to be sure.

With the switch in the Output position the meter is a normal VU meter that shows you the output level of the compressor. If the level is too high or too low you can adjust the level with the Output knob. With practice you will learn how to set levels for all of the gear in your input chain. This is called "gain-staging" and is key to getting quiet, distortion-free tracks.

Note that the Compression and Output controls are interactive - if you add more compression the output level will go down, if you reduce the amount of compression the output level will go up. It is usual for engineers to switch the meter control back and forth between Comp and Output several times while getting sounds to make sure the meter shows you have the amount of compression you want as well as the output level you want. Also it's wise to keep in mind that singers tend to get excited and will sing harder when you hit record than when you were getting sounds. Leave some room for that, and pay close attention to make sure their levels aren't out of control.

Stereo

In the Mono position the Comp II is two completely independent compressors that can be used at the same time on different signals. In Link mode the compressor listens to both sides of a stereo signal. Whichever channel has the higher input gain from moment to moment will determine how much you compress the stereo signal. In Link mode you must still set the front panel controls for both channels - in most cases they would be set the same. This is how you would use the Comp II on a stereo mix, for instance.

1.4 Back Panel

Audio Inputs and Outputs

The back panel contains balanced XLR inputs and outputs for each channel, as well as a balanced 1/4" TRS output connector for each channel which is wired in parallel to the XLR output. If you want an unbalanced output you can use a 1/4" TS cable (a guitar cable) in the TRS jack. If you use both an XLR cable and a 1/4" TS cable at the same time keep in mind you will be making the XLR output unbalanced because they are in parallel. Always use high-quality connectors and cables to wire your Comp II into your system. Wiring is not the place to skimp.

Power Inlet

There is a power inlet on the back panel for connection to the power supply included with the unit. Please run power cables away from foot traffic, in a place where they're not likely to be kicked out or tripped over.

1.5 Specifications

• Differential input and output amps

• Class "A" amplifier for Gain Make-Up

• All-metal construction with stainless steel chassis for noise immunity

• Custom aluminum knobs

• Power supply included

• Frequency response: 20Hz - 65kHz

• Inputs: 2 x XLR, Outputs: 2 x XLR, 2 X TRS

• THD at +4dBu input and no compression at 1kHz: Typical 0.02%, Max 0.035% (22-22kHz, Un-Wtd)

• THD at +4dBu input and 2dB of compression at 1kHz: Typical 0.02%, Max 0.035% (22-22kHz, Un-Wtd)

• Noise: less than -80dBu, 22-22kHz

• 1U 19" rack-mount case: 17" (43.18cm) width, 8.375" (21.27cm) depth, 1.625 (4.13cm) height.

• Unit weight: 5.35 lbs. (2.45 kg)

• Box weight: 8.70 lbs. (3.95 kg)

• Box dimensions: L: 29" (73.66cm) (736.6mm)
                            W: 14" (35.56cm) (355.6mm)
                            H: 6" (15.24cm) (152.4mm)
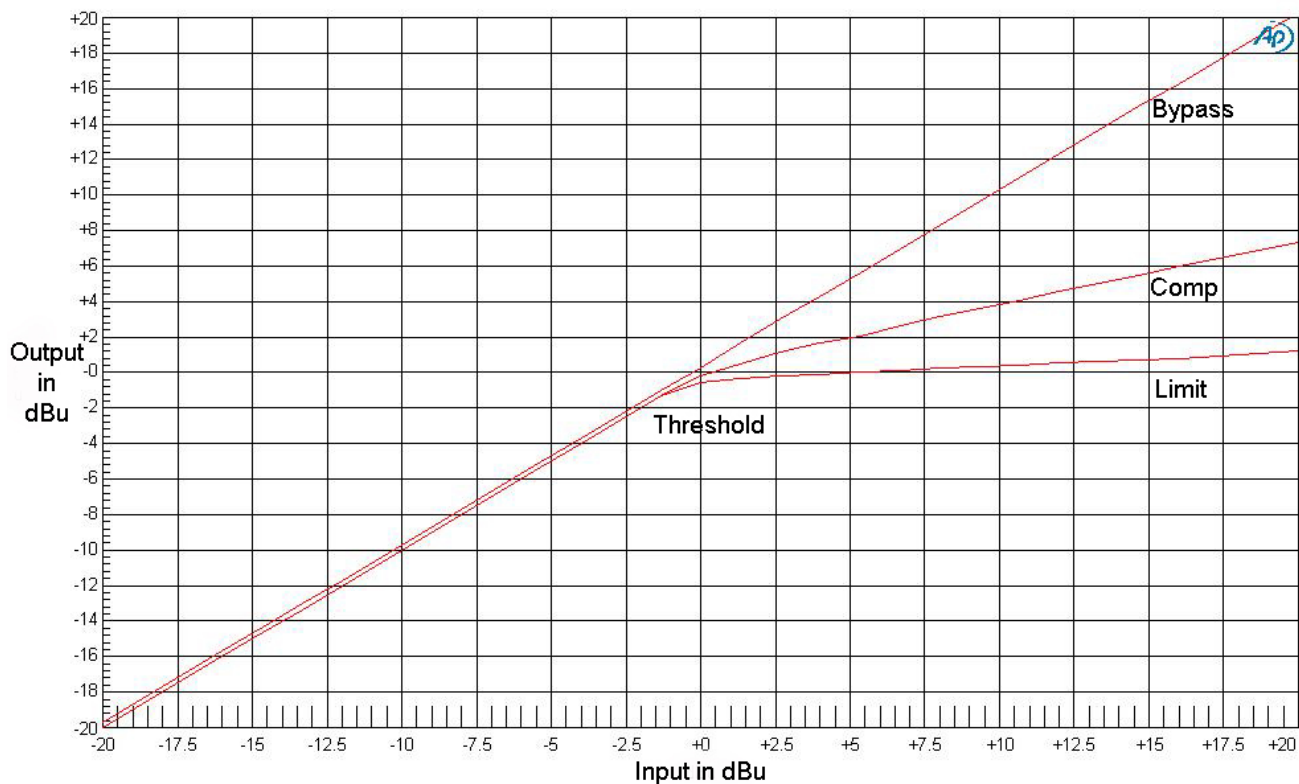
Specifications are subject to change without notice.

Appendix I

Graph showing Comp II ratio response in Comp mode, Limit mode, and Bypass:

Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Red	Solid	1	Anlr.Level A	Left	Slow Attack, Auto Release, Ratio = Limit, Comp Level set at 1:00
2	1	Red	Solid	1	Anlr.Level A	Left	Slow Attack, Auto Release, Ratio = Comp, Comp Level set at 1:00
3	1	Red	Solid	1	Anlr.Level A	Left	Bypass

Compressor Test of Comp2.at27