Fredenstein
Professional Audio

F602
TUBE COMPRESSOR

Operating Manual

Fredenstein F602 Tube Compressor

The F602 Compressor is a true variable transconductance (often falsely called “variable mu”) high performance tool for professional recording and mastering engineers. The F602 features the original remote cutoff double triode tube used in many vintage designs (Gates, Fairchild, and GE to name a few) called 6386LGP. The signal path is very short and delivers the smoothness you would expect from a great piece of vintage equipment. The innovative transformer-less input circuit yields clarity while the Lundahl output transformer adds character. The extreme low output impedance with its high current design allows even the most difficult and complex loads to be driven without sonic impact. A wet (compressed) and try (uncompressed) mixer further enhances the flexibility of the F602 Tube Compressor. In addition a true hard bypass, which also works, if the unit is powered down, was implemented as well as a standby switch allowing to shutdown the tube circuitry if the F602 is not in use while the rack is still powered, therefore extending the tube life cycle.
Up to ten units can be linked together to form a true multichannel compressor. The engineer can easily change the compression characteristics by tuning threshold, ratio, attack and release times as well as selecting an automatic release mode, which adjusts the release time dynamically according to the source material and input level. The main compression behavior can be switched between hard- and soft-knee. Up to 20dB of make-up gain is provided to compensate for the gain reduction. The VU meter is selectable between gain reduction and output level. A clip LED indicates output levels above +24dBu.
The whole package is delivered a single space API 500 series form factor. Due to the high power-consumption of about 8W, not all lunch-boxes and racks are suitable for this module. Of course, Fredenstein boxes and racks are well equipped to handle these loads. As all Fredenstein products, the F602 is designed by a German-American team and manufactured in Taiwan.

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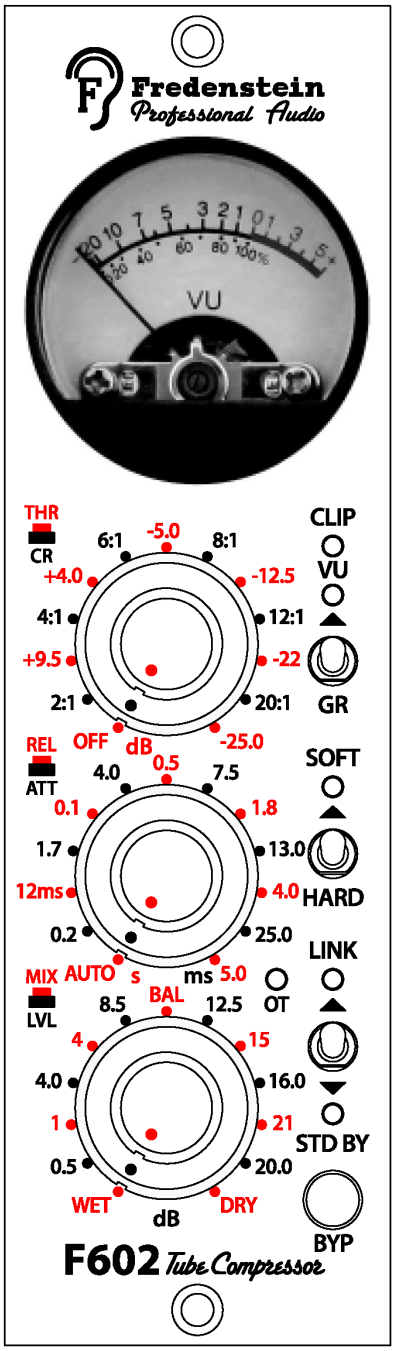
Overview:



Rotary Controls:

THR	:	Threshold Control
CR	:	Compression Ratio
REL	:	Release Time Control
ATT	:	Attack Time Control
MIX	:	Wet / Dry Mixer
LEVEL	:	Make-up Gain Control

Switches:

VU : if the VU-switch is in the upper position (LED is on), the VU meter shows the output level instead of gain reduction.

SOFT : if the SOFT-switch is in the upper position (LED is on), the compressor works in the soft knee mode.

LINK : Enables multichannel link capability indicated by a blue LED.

STANDBY : Powers down the tube to increase its life expectancy, if not in use. Indicated by a yellow LED.

BYPASS : True hard bypasss function, also active when powered down

Indicators:

CLIP : Lit, if output level exceeds +24 dBu

OT : Internal Temperature exceeds 76 ºC, the unit automatically activates standby mode.

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Installation:

Please power down your rack or box first, before inserting the F602. Since the F602 uses the link interconnect in the box or rack, it cannot coexist with any other third-party modules using the same link interconnect (PIN 6 on the edge connector). If you are using a Fredenstein Bento box, please turn off the compressor link switches to any third party module(s), only turn the link switches on between F602 modules.
Other third party equipment not using the link interconnect, such as most Mic-Pres and EQs etc, can be used simultaneously with the F602 in any enclosure. The power requirements are maximum +16V, +250mA and -16V -200mA. Please make sure, in case you don't use a Fredenstein Bento, that your box or rack can support the required currents. Please consult your third party documentation in case of any doubt. To prevent high internal temperatures leading to over temperature shutdowns, please make sure you have enough airflow through your lunchbox or rack.

To understand the function of the F602, let's discuss first some terms:

Hard-Knee characteristics means the compressor will evenly compress all signal above the Threshold as set by the Compression Ratio control. Soft-Knee means that the compressor will start softly when the Threshold is almost reached with a reduced Compression Ratio. Then it will increase the Compression Ratio until the Gain Reduction reaches 3 dB and the full Compression Ratio is applied.

When using very fast release times < 100 ms, you will get audible artifacts on low frequency signals, so be careful when tracking a bass or using it as a buss compressor on a mix as an example not to choose an ultra fast release time unless you want artifacts for artistic reasons.

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User Controls:

Threshold Control:
Determines the input level at which the compressor is activated. If turned completely counter clockwise, a switch engages and the compression is turned off.

Compression Ratio:
The amount of increase in output level relatively to the threshold level. Minimum is 2:1, maximum is 20:1 (limiting).

Release Control:
If the signal drops below threshold, the release time determines how fast the compressor falls back to 0 dB gain reduction. If turned completely counter clockwise, a switch engages and the release time is set to automatic mode depending on the program material. The range is 12 ms to 5s.

Attack Control:
Determines how fast the compressor reacts to signals above threshold.

Mix Control:
The mix control allows the user to select a ratio between the compressed and uncompressed signal. If turned completely counter clockwise, a switch engages and only the compressed signal will be on the output, if turned completely clockwise only the uncompressed (input) signal is present on the output.

Level Control:
Make-up gain can be applied in the range of 0 to + 20dB to compensate for the gain reduction.

Technical Data:

Reference Level	:	0 db = +4 dBu (American Studio Standard)
Make-up Gain	:	0 to +20 dB
Threshold	:	-25 dB to +9 dB
Attack Time Range	:	250 us to 15.5 ms
Release Time Range	:	12 ms to 5 s
Compressions Ratio	:	2:1 to 20:1
Frequency Response	:	20Hz – 20,000Hz, +/- 1dB
Distortion	:	< 0.01%
S/N Ratio	:	> 90dB at 0dB gain
Input Impedance	:	> 10KOhm
Max. Input Level	:	+ 24 dBu
Output Impedance	:	20 Ohm
Max. Output Current	:	+/- 200 mA
Max. Output Level	:	+ 26 dBu
Power Consumption	:	+16 V +250 mA, -16V -200 mA

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