TORNA

GRAPHIC EQUALIZER · SPECTRUM ANALYZER

MODEL TR-83

OWNER'S MANUAL

SUBVERSELAB

1. INTRODUCTION

TR-83

TORNA is a twelve-band graphic equalizer for each channel, with a spectrum analyzer in the middle. It is modelled part by part from a 1983 service schematic: the input stage, the twelve resonators of each channel, the slide pots and the way they are wired, the output stage and its supply rails, and the analyzer's twelve filters, detectors and display ladder. It is built for the mix bus and the master bus.

> The bands are broad, overlapping and work on each other, so a few sliders move the whole balance of a mix. What a parametric EQ does with ten numbers, TORNA does with a hand on the faders.

THREE STEPS

1. Insert TORNA on a bus or the master and watch the analyzer: it reads the output.
2. Move the sliders. LEFT and RIGHT are separate banks; press LINK to move them together, or start from a preset with ◀ PRESET ▶.
3. Press EQ IN/OUT to compare, and trim the level with OUTPUT.

LATENCY: 64 SAMPLES

TORNA runs inside at four times the session rate and reports 64 samples of latency to the host at every sample rate (44.1 to 192 kHz). With EQ OUT and with POWER off the signal takes the same time, so the delay never changes.

2. INSTALLATION

MACOS & WINDOWS

SYSTEM REQUIREMENTS

- **macOS 11 or later** (Apple Silicon and Intel, one universal build): standalone app, VST3 and AU (Audio Unit).
- **Windows** (64-bit): standalone app and VST3.
- Channel layouts: mono → mono, stereo → stereo.
- Any host that loads VST3 or AU effects. TORNA needs no internet connection and no activation once installed.

MACOS — STEPS

- Run the installer package (`.pkg`) you downloaded. It is signed with a Developer ID and notarised by Apple.
- Choose what to install: the VST3 plug-in (`/Library/Audio/Plug-Ins/VST3/TORNA.vst3`) and the Audio Unit (`/Library/Audio/Plug-Ins/Components/TORNA.component`) and the standalone app (`/Applications/TORNA.app`).
- Restart your DAW, or force it to rescan its plug-in list.

WINDOWS — STEPS

- If Windows blocks the downloaded files: right-click the zip, choose **Properties**, tick **Unblock**, then extract.
- Copy the `.vst3` folder to `C:\Program Files\Common Files\VST3\`.
- Put the standalone app (`TORNA.exe`) in any folder you like and start it from there.
- Rescan plug-ins in your DAW.

Getting TORNA: buy it on subverselab.com/plugins/torna, then sign in with the e-mail you paid with; the download appears there and on your Account page. No licence key to type.

3. PANEL TOUR

TR-83

The front panel.

1. **LEFT bank** — twelve sliders, 16 Hz to 32 kHz, ±12 dB. The red window in each cap lights while EQ is IN.
2. **Spectrum analyzer** — LEFT and RIGHT keys choose what it reads, LEVEL sets its sensitivity; twelve band columns and TOTAL.
3. **Equalizer graphic** — the true response of both channels, computed from the circuit as you move a slider (left bright, right thinner), with the moved slider's value on its top line. Under it, the ◀ PRESET ▶ keys.
4. **RIGHT bank** — the right channel's twelve sliders.
5. **Left key strip** — POWER, EQ IN/OUT, ATT −6 dB, NOR/REV, LINK.
6. **INPUT and OUTPUT** — level before and after the equalizer, ±12 dB.
7. **Right key strip** — MEMORY A, B, C; COPY L ▸ R, R ▸ L, FLAT; ANALYZER (reads OUT or IN); SIZE.
8. **Footer** — ? opens short help over the panel; REAR turns the unit round to its rear plate; the SubverseLab mark opens subverselab.com.

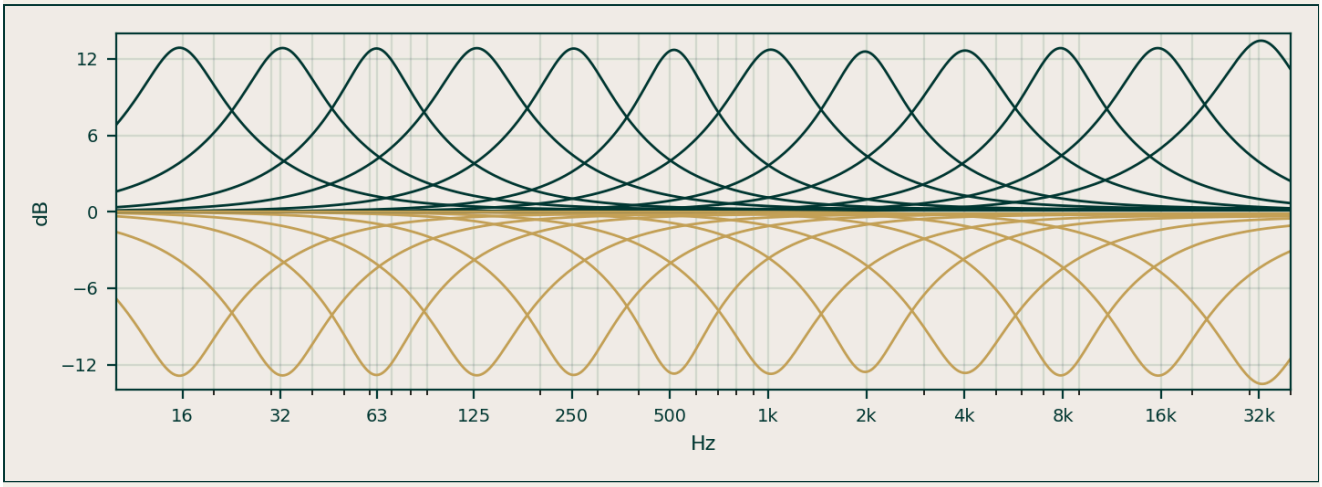
4. CONTROLS

FULL REFERENCE

CONTROL	RANGE · DEFAULT	WHAT IT DOES
Sliders 16 Hz … 32 kHz	–12 … +12 dB · 0	The panel marks. The ends are the pots' ends; a mark in between gives that share of the end's gain at the band's centre. The sliders work on each other, as on the circuit they come from.
POWER	on / off · on	Off passes the signal untouched, with the same 64 samples of delay.
EQ IN/OUT	in / out · in	Out takes the equalizer out of the path; every cap light goes dark. The change is a short crossfade, so it does not click.
ATT –6 dB	off / on · off	The input attenuator: –5.65 dB, flat from 10 Hz to 20 kHz. Use it when a hot bus drives the output stage into its rails.
NOR/REV	nor / rev · nor	Reverses the curve: every boost becomes the matching cut and back. The REVERSE lamp lights.
LINK	off / on · off	On: the right bank takes the left bank's settings and the two move together.
INPUT	–12 … +12 dB · 0	Level into the equalizer.
OUTPUT	–12 … +12 dB · 0	Level after the equalizer.
LEVEL (analyzer)	LOW … HIGH	The analyzer's sensitivity. It changes the display only, never the sound.
LEFT / RIGHT (analyzer)	on / on	Which channel the analyzer reads; with both pressed it reads both together.
ANALYZER	OUT / IN · OUT	Read the signal after the equalizer (OUT) or before it (IN).
MEMORY A · B · C	—	Press to recall all 24 sliders; hold for one second to store the current ones (pressing an empty memory stores too). Saved with the project.
COPY L ▸ R · R ▸ L · FLAT	—	Copy one bank to the other, or return every slider to 0 dB. The sliders glide to their new places.
◀ PRESET ▶	—	Step through the factory presets, then your own. Hold ▶ for one second to save the 24 sliders as a user preset.
SIZE	75 % / 100 % · 75 %	Window size.

A double-click on a slider returns it to the preset or memory loaded last, or to 0 dB. Undo and redo: Cmd+Z / Cmd+Shift+Z on macOS; Ctrl+Z / Ctrl+Shift+Z or Ctrl+Y on Windows.

THE TWELVE BANDS AT THEIR ENDS



Each band alone at full boost (green) and full cut (gold), all others at 0 dB, from the model of the circuit.

5. THE SPECTRUM ANALYZER

HOW TO READ IT

Twelve band-pass filters with a Q of about 10, one per slider, each followed by a peak detector and read in turn by the display. The ten segments are marked –24, –18, –15, –12, –9, –6, –3, 0, +3 and +6; from –18 to 0 each segment lights within 0.3 dB of its mark. A column falls back with a time constant of about a quarter of a second.

- **TOTAL** is the whole signal, unfiltered, and LEVEL does not move it: it shows the bus's level, not its balance.
- **LEVEL** sets the band columns' sensitivity. Set it so the loudest columns of your mix reach 0 at its loudest passage.
- The 32 kHz column reads what lies above the audible band. At 44.1 and 48 kHz there is little there, and it mostly stays dark.

6. PRESETS AND MEMORIES

STARTING POINTS

A preset sets all 24 sliders, the same on both banks; the sliders glide to their new places and the preset's name shows in the top line of the EQUALIZER GRAPHIC. The bands overlap, so the real curve can rise above the slider marks.

Factory presets: FLAT, MASTER SMILE, MASTER GENTLE, MIX BUS CLEAN, LOW END WEIGHT, VOCAL PRESENCE, DRUM BUS, AIR, LOUDNESS, BRIGHT HI-FI, WARM, RADIO.

YOUR OWN PRESETS

Hold ▶ for one second: the current sliders are saved as USER 01, USER 02 and so on, and the graphic reads SAVED with the name. User presets come after the factory ones and are shared by every project. They are files in `~/Library/SubverseLab/TORNA/Presets` on macOS and `%APPDATA%\SubverseLab\TORNA\Presets` on Windows; to delete one, delete its file there.

MEMORIES

MEMORY A, B and C hold three settings of all 24 sliders inside the project: hold a key for one second to store, press it to recall.

7. THE REAR PLATE

REAR

The rear plate (REAR key in the footer; FRONT turns it back).

SWITCH	POSITIONS · DEFAULT	WHAT IT DOES
LINE LEVEL	1 V / 2 V / 4 V · 2 V	What 0 dBFS means in volts at the input. The circuit is linear up to its rails, so this only moves the point where the output stage clips: +19, +13 or +7 dB above full scale.
CAP LIGHTS	ON / DIM / OFF · ON	The red lights in the slider caps. Panel only; saved with the project.

8. RECIPES

BUS STARTING POINTS

MASTER: THE EIGHTIES SMILE

16 Hz → 32 kHz: +3, +4, +3, +1, –1, –2, –2, –1, +1, +3, +4, +3

Low end and top lifted, the middle eased. Trim OUTPUT so EQ IN and EQ OUT are equally loud before you judge it.

MIX BUS: LESS MUD

125 Hz –2 · 250 Hz –3 · 4 kHz +1.5

The broad low-mid bands take out the boxy part of a dense mix without thinning the bass.

VOCAL BUS: PRESENCE

125 Hz –3 · 250 Hz –2 · 2 kHz +2 · 4 kHz +4 · 8 kHz +2

DRUM BUS: BODY, LESS BOX

63 Hz +6 · 125 Hz +2 · 500 Hz –4 · 4 kHz +3 · 8 kHz +2

FINDING A PROBLEM BAND

One slider to +12, NOR/REV to compare

Push a slider up to hear where a resonance lives, then press NOR/REV: the same slider now cuts by the same amount.

9. SPECIFICATIONS

MEASURED

ITEM	VALUE
Formats / Platform	macOS 11 or later (Apple Silicon and Intel): standalone app, VST3, AU · Windows (64-bit): standalone app, VST3
Bands	12 per channel: 16, 32, 63, 125, 250, 500 Hz, 1, 2, 4, 8, 16, 32 kHz; ±12 dB at the slider ends
Latency	64 samples at every sample rate, reported to the host
Sample rates	44.1 to 192 kHz; the curve stays within 0.2 dB of the circuit model at every rate
At flat	−0.18 dB at 1 kHz, 0.14 dB of ripple from 20 Hz to 20 kHz: the circuit's own; OUTPUT trims it
EQ OUT	Within 0.002 dB of the input from 20 Hz to 20 kHz at 44.1, 48 and 96 kHz
Distortion	0.0000 % THD at 0 dBFS, flat and with a band at +12 dB
Output stage	Clips like the circuit's ±13.3 V rails, about 13 dB above full scale at LINE LEVEL 2 V; the clip is anti-aliased (inharmonic products 78 dB below the signal)
Switches	EQ IN/OUT, NOR/REV and ATT change without a click (residue 65–84 dB below the signal)
DC	Removed at the input, as by the circuit's coupling capacitors
Analyzer	12 band-pass filters (Q ≈ 10) and TOTAL, 10 segments −24 … +6, fall time constant 0.26 s
CPU (stereo, development machine)	37 × real time at 44.1 kHz, 19 × at 96 kHz, 9 × at 192 kHz
Version	1.0.0

GOOD TO KNOW

- The analyzer only draws: LEVEL, LEFT, RIGHT and ANALYZER never change the sound.
- LEFT and RIGHT banks are separate channels. On a mono track the LEFT bank shapes the signal.