

USER MANUAL VERS. 2.0



PHYSICALLY MODELED
32 BIT FLOATING POINT RESOLUTION







MASTERING SOFTWARE ANALOG BY DESIGN

USER MANUAL
VERS. 2.0

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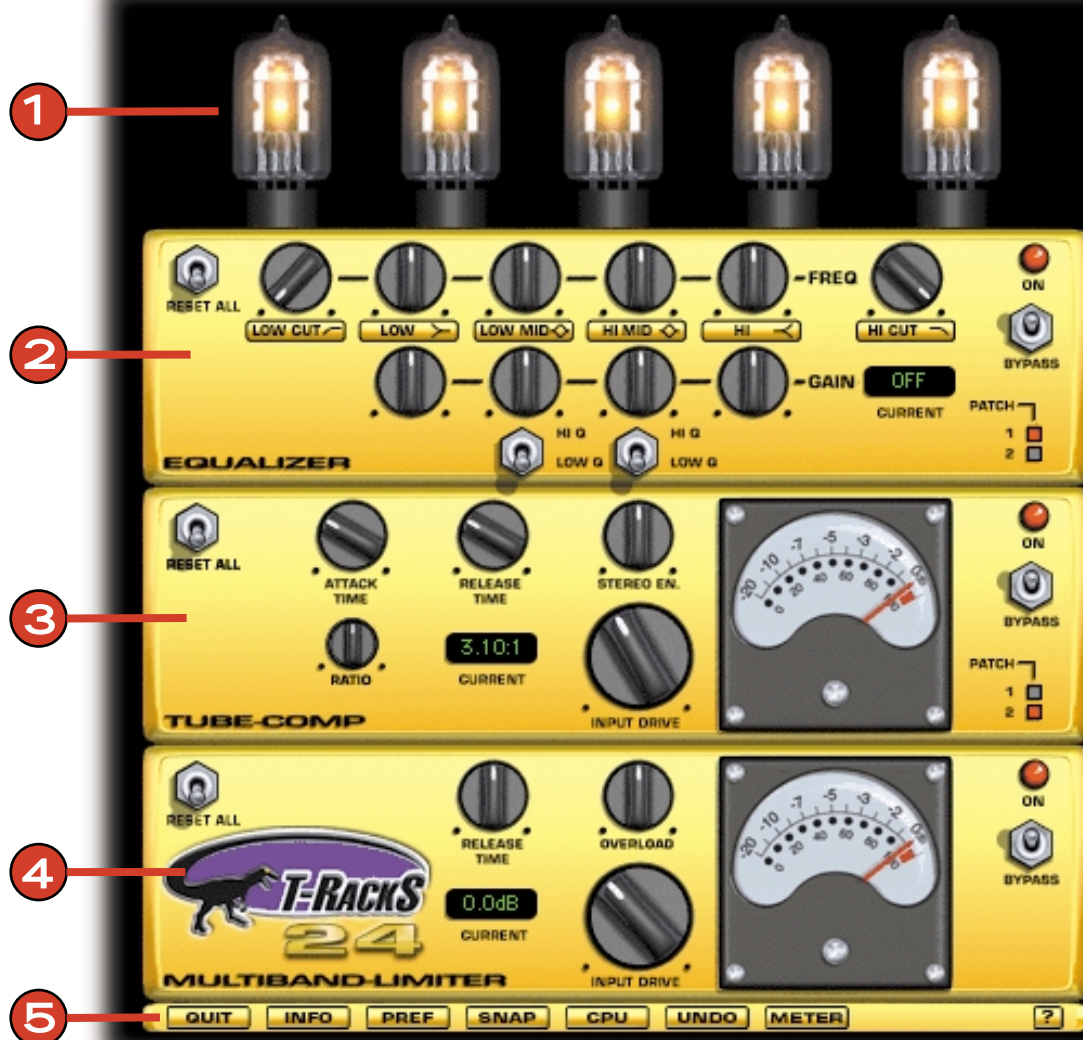
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II Interface





LEGEND

- 1 Tubes
- 2 Equalizer
- 3 Compressor
- 4 Limiter
- 5 Console
- 6 Control Panel
- 7 Scope
- 8 Output stage

1 What is T-RackS?

1.1 Description

T-Racks is a new type of real-time software sound processor that offers amazing sound performance with a similar working environment to that of a high end mastering station, right on your desktop.

It's a suite of 4 sound processors exclusively developed for mastering including:

- a state-of-the-art six band stereo parametric equalizer
- a classic mastering tube stereo compressor/leveler
- a multiband mastering stereo limiter
- an adjustable soft-clipping output stage



All the effects modules emulate a classic analog sound and have been specially engineered for working on final mixes, with all controls accurately designed for mastering, just like the highly acclaimed high-end vintage audio gear T-RackS is modeled after.

The working principles of T-RackS algorithms are based on the circuit schematics of real analog hardware devices, and our proprietary filter design theory. We started looking at the schematics of some top-notch analog vintage circuits. A mathematical model of each circuit was studied and then converted into a DSP algorithm. In addition, we decided that T-RackS should use floating point calculations for the most accurate analog signal simulation. These types of calculations allow noise-free signal while emulating the non-linearities that affect signals in the analog domain.



The 3 audio processors can be patched this ways:
T-RackS works on audio files available on the hard-disk, in both real-time or off-line.



1.2 What's new in T-RackS® 24.

The new T-RackS® 24 contains monstrous improvements:

- **NEW** 24 bit files reading/writing capability

T-RackS now can read and write 24 bits audiofiles with wav, aiff and sd2 format supported.

Now it's possible to mixdown the song in 24 bits and put it into T-RackS at full resolution.

It's also possible to process single Protools 24 bits audio-tracks, for example. T-RackS will perform an outstanding high end quality dithering to bring the deepness and fullness of the 24 bits into a beautiful 16 bits, for CD mastering.

- **ENHANCED** Multiband Peak Limiter algorithm

The sound of the Multiband Peak limiter has been greatly enhanced.

Now you can get even more transparent, more accurate and more detailed sound from T-RackS exclusive algorithm, improved to match the vast majority of users needs.

- **NEW** Output Stage with soft-clipping shaper

For astoundingly musical and smooth performance and to create warm, saturated mastering effects, the new variable clipping shape offers complete control and precision over the output stage, substituting the old "hard/soft" switch. The new variable-shape clipping stage, with pre and post levels, allows for very high loudness, even without compression or limiting. The saturation shape is continuously variable from digital hard clipping to ultra smooth tape-like saturation. Useful for obtaining overloaded effect masters but without a single over!

- **NEW** Ratio control on the Compressor

The highly acclaimed, beautiful and well known T-RackS compressor has been furthermore improved with the ratio control. This makes the unit even more flexible and "musical" because it can be adapted to be more "decise" (higher ratios) to squeeze, for example, a vocal track, or softer (lower ratios) to gently compress an acoustic mix.

- **NEW** internal parameters ajustement

Ever wanted to change the way T-RackS is internally adjusted and calibrated? Now you can!

T-RackS 24 is provided with a set of files that define most of its internal setup. It's possible, for example, to change the multiband limiter single bands levels, thresholds or attack times. Change the sidechain low frequency cutoff on the compressor, or the global internal patching. A large variety of special "internal settings" will be provided to give a wide range of different sonic characters. T-RackS 24 users will be also



able to share these settings online through a new T-RackS pro-mastering web area.

- **NEW** x10 magnifier on the Peak Meter

The Peak Meter led can now be used to view only the range between -7.2 dB and 0 dB.

This gives an accuracy of 1/10 dB in the upper range. Very useful to precisely set the output level of the soft clipping stage at, for example, -0.2 dB.

- **NEW** "over" LED

NEW "over" LED precisely shows when the master has "overs".

- **NEW** mono, stereo and difference monitoring

NEW mono, stereo and difference monitoring to check the master for mono-compatibility and stereo image coherence, like in high-end consoles.

- 8 **NEW** amazing "vintage" skins

From gold to copper, chrome to brass, lizard to 2nd hand, army styled, and Techno ...

- **NOW** more than 50 presets

A quick start for all the pros and all the beginners. A lot of really usable presets, with a "tutorial" meaning too.

- **NOW** dongle-free

T-RackS 24 is now copy-protected with a challenge-code system which can be immediately obtained online.

No more hardware dongle, no more conflicts with your parallel or usb devices.

2 Requirements



2.1 Mac

Minimal requirements: Power Macintosh®: 180 MHz PPC603e or 120 MHz PPC604e with 7.5 or later system software, 32 MB ram, 10MB free hard disk space.

Suggested requirements: 233 or faster PPC604e or G3 Power Macintosh®, 80MB free hard disk space.
Digital I/O audio card is needed for high-quality mastering.

2.2 PC

Minimal requirements: Intel® 200 MHz MMX™ (only) Pentium® PC with Windows® 95, Windows® 98, NT™ 4.0, NT™ 5.0 operating systems, 32 MB ram, 10MB free hard disk space and high quality sound card.

Suggested requirements: Intel® 266 MHz Pentium® II PC with Windows® 95, Windows® 98, NT™ 4.0, NT™ 5.0 operating systems, 64 MB ram, 80MB free hard disk space.
Digital I/O audio card is needed for high-quality mastering.

Screen settings: Best display with 800x600 resolution, high colors (16 bit) on the PC and thousands of colors on the Mac.

3 Installation / Authorization

3.1 Installation - Mac

- Connect the hardware key supplied with your copy of T-RackS to the ADB port of your Mac (or the USB).
- Insert the T-RackS CD-ROM in your CD-ROM drive. Double click on the Install T-RackS icon. This will guide you through the rest of the installation procedure.
- Keep your registration card available during registration and put it in a safe place.
- Remember to complete and send in your registration form immediately (you can also do it on-line), to have access to free technical support and updates.

UnInstallation: Drag the T-RackS folder into the trash and empty it.

Installation - PC

3.2

- Connect the hardware key supplied with your copy of T-RackS to the parallel port of your PC
- Insert the T-RackS CD-ROM into your CD-ROM drive. Double Click on the Setup.exe icon. This will guide you through the rest of the installation procedure.
- Keep your registration card available during registration and put it in a safe place.
- Remember to complete and send in your registration form immediately (you can also do it on-line), to have access to free technical support and updates.

UnInstallation: Click on the start menu button, select T-RackS from the Programs directory, and then click on Uninstall T-RackS.



3.3 Authorization

Mac / PC

The new T-RackS 24 requires an authorization code for full installation. Follow this procedure for installation and authorization of your new T-RackS.

- Insert the T-RackS CD-ROM in your CD-ROM drive. Double click on the Install T-RackS24 icon (Mac) or Setup.exe (PC). This will guide you through the rest of the installation procedure.

- Keep your registration card available; you will need it during the authorization process.

- Launch T-RackS. The authorization window will appear, including:

- 1) a **Digital ID** field
- 2) a **Serial Number** field
- 3) an **Authorization Code** field

T-RackS - Authorization form

How to authorize your T-RackS (please read carefully):

Thanks for having purchased T-RackS!

Your new T-RackS requires an authorization code for full installation. Keep your registration card available; you will need it during the authorization process. Follow this procedure for the authorization of your new T-RackS.

- Click on the "Obtain authorization code" button in this window. This will automatically launch your browser and connect you to the T-RackS registration page (<http://www.t-racks.com/TRReg.html>).
- Fill in all fields of the registration form on the web, including your Serial Number and Digital ID. (you can copy it from the authorization window and paste it in the registration form). Remember to include a valid e-mail address in the form since this will be used to send your Authorization Code.
- Open your e-mail program and download the e-mail corresponding to the address you've inserted in the registration code. You'll receive your Authorization Code instantly.
- Insert your Serial Number in the Serial Number field in this authorization window.
- Copy and paste your Authorization Code in the Authorization Code field in this authorization window.

Digital id: 9BMVXXKH-R7IL-MBDS-FRDS-79NKHMH

Serial number:

Authorization code:

- Click on the "Obtain authorization code" button in the window. This will automatically launch your browser and connect you to the T-RackS registration page (<http://www.t-racks.com/TRReg.html>)



- Fill in all fields of the registration form, including your **Serial Number** and **Digital ID**, (you can copy it from the authorization window and paste it in the registration form). Remember to include a **valid e-mail address in the form** since this will be used to send your **Authorization Code**.

- Open your e-mail program and download the e-mail corresponding to the address you've inserted in the registration code. You'll receive your **Authorization Code** instantly.

- Insert your **Serial Number** in the **Serial Number** field in the authorization window.

- Copy and paste your **Authorization Code** in the **Authorization Code** field in the authorization window.

- Click **OK**. At this point your T-RackS will be authorized.

- You'll automatically enter in the full working version of T-RackS. **Remember to write down your authorization code.**

Should you need to install T-RackS in another machine you will need a new **Authorization Code**. In this case contact support@t-racks.com . Special multiple-license prices are available by writing to sales@t-racks.com .

If you don't have on-line access, fill in the **Authorization Code Request Form** included with your CD and fax it to +39-59-2861671 to receive your **Authorization Code** within 24 hours of your fax (standard business European time).

If you do not have access to e-mail or a fax fill in the **Authorization Code Request Form** and mail it to:

IK Multimedia Production srl
Via dell'Industria 46, 41100 Modena, Italy

You'll be notified of your authorization code by return mail within 15 days.

IMPORTANT for MAC USERS: if you move or delete the Preferences file created with the authorization process, you will be asked to re-enter the authorization code.

4 Mastering with T-RackS

This section will guide you through the basics of using T-RackS.

4.1 Intro

Mastering is the final stage of processing made on a stereo mix before going to press on audio CDs, movie soundtracks, multimedia soundtracks, and so on. Its purpose is to obtain the maximum possible sound quality from the original mix by "sweetening" it with equalization, compression and limiting.

Furthermore, mastering is essential to balance and create a pleasing continuity from one track to the next. For a final CD master to be perfect, it **MUST** be coherent, with equal loudness, image and tone contour from track to track. The only way to accomplish this is through mastering.

IMPORTANT: Special care must be taken to have the most accurate speaker system possible. You have to be absolutely sure of what you're hearing when you're mastering your tracks. The accuracy of audio monitoring is A KEY FACTOR for successful mastering.

4.2 Opening a file



Once you've opened T-RackS by double-clicking on its icon, click on the open button on the T-RackS control panel to open a sound file. The open dialog box will appear.

Here you can locate and load your audio file using standard dialog box controls.

The PREVIEW check box allows you to listen to the audio file before loading it. If it's checked you will start to hear to the file as soon as you click on its name in the list.

With the PRESET pop-up you can apply a preset to the audiofile while previewing. This is very useful to make comparisons on all the songs of an album with the appropriate master before processing.

To start, be sure to open a file selecting NONE in order not to load a saved preset.



IMPORTANT: Before starting your mastering session with T-RackS, please be sure to follow these guidelines to get the most out of your valuable time and effort.

1) The audio file MUST BE a 16 or a 24 bit wave file (.WAV for PC) or a 16 bit AIFF file (for Mac) In the Mac version you can load also a Sound designer II file. Audio files can be stereo or mono. Sample rate doesn't have to be 44.1 kHz but remember that this is the sampling frequency required for audio CDs. You can also load and process audio files at 48 or 32 kHz samplerate. Even 22 kHz is supported, and in this case the Equalizer will adapt its curves for the 11 kHz reduced bandwidth.

2) If you have to process the audio file with other effects like reverbs, stereo image corrections, phase coherency adjustments, spectral enhancers, and so-on, **be sure to do this before mastering with T-RackS.**

T-RackS should ALWAYS be the LAST processing device used in the audio production work-flow. This is a must for obtaining the best quality from your T-RackS masters.

3) Take care that the audio file you import into T-RackS is at a sufficient (digital) level. Take a look at the peak meter; if it reads too low (-6 dB or less) run a Normalization process, using other sound editing software, with a ceiling at -0.1 dB. If the original file's peak level is within -4 or -3 dB, then leave the file as is and import it directly into T-RackS.

Normalization is not an "absolutely perfect" process and could be avoided if desired.

4) DO NOT use digital resolution optimizer processes, like dithering or noise shaping, or other limiter/expanders before using T-RackS. T-RackS will add dithering (if you want) at the final stage. Dithering must be applied only at the END of the production work-flow, just before pressing the master CD. It will really help your mixes to sound richer and deeper, but only if you apply it correctly at the end.

5) If you are making an album consider that all your mastered mixes should sound roughly similar in loudness and tone. The listener will enjoy your work more if the various tracks sound coherent. You can accomplish this with T-RackS, but it's very important that you know what you're starting with. First, spot check all the tracks before the mastering session and listen to the levels. Each song should have the same apparent loudness. If this is not yet the case, adjust your monitor volume to correct the differences.

Don't worry if all of the songs don't peak at 0 dB. It's more important that you perceive equal volume before beginning the



session. T-RackS' compressor and limiter will eventually give you perfect 0 dB levels. Listen for inconsistencies in EQ. These are the areas you'll focus on with T-RackS' equalizer module.

6) Before you begin, your sound file must be edited and trimmed, using other sound editing software.

Once you've accomplished these steps, you can move on to your mix!

4.3 Playing a file

To play your loaded file, click the PLAY button in the transport buttons section to hear your mix and see time moving in the duration display. If you experience some clicks and/or stops during playback, open the preferences window by clicking on the PREF button on the console and set the buffer size to a value that plays your file correctly.



Always use the lowest setting at which the clicks disappear. T-RackS opens with each of the audio-processors in bypass mode, so your mix will not be effected initially.



You may enable loop play by clicking on the LOOP button in the transport buttons section .



You can set loop duration by dragging the two small loop markers (LE-LS) that appear on the timeline when you enable loop play. The loop duration will be highlighted in green.

T-RackS also lets you put marker points within the mix so you



can jump quickly between various mix locations, i.e. verse and chorus, using the jump previous next marker buttons.



You can stop and restart playback by clicking on the transport buttons. By dragging the slider (even during playback) you'll be able to forward through your mix.

4.4 Equalizing your master

Let's start equalizing your mix with the Equalizer module. Here you can apply frequency enhancements and/or corrections to your track.

T-RackS' Equalizer section consists of a six band stereo parametric EQ, specially designed to achieve high-end performance in a precise mastering environment. First, switch ON the EQ by clicking on the ON/bypass switch. The red LED will light, and the EQ will switch ON with default settings. Each of T-RackS' six filters has different filter shaping, all specially developed for EQ mastering.

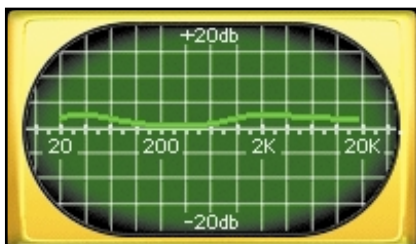


You'll find (from left to right):

- 1) 4th order High-pass filter, from 15 Hz to 5 kHz.
- 2) Low shelving type filter, from 30 Hz to 200 Hz.
- 3) Low-mid peaking type filter, from 33 Hz to 5.5 kHz, with Lo and HiQ adjustments.
- 4) High-mid peaking type filter, from 200 Hz to 18 kHz, with Lo and HiQ adjustments.
- 5) High shelving type filter, from 750 Hz to 8 kHz.
- 6) 4th order Low-pass filter, from 200 Hz to 20 kHz.

In the top row of knobs you will find all the Frequency controls,

in the lower row you will find all the Gain controls.



Use frequency knobs to find the frequencies you want to enhance /correct and use gain accordingly depending on the filter type.



You can easily check your modifications with the frequency response displayed on the scope-screen to the right.



The RESET ALL switch resets all knobs and switches to default settings for a flat response.

By clicking on a knob while holding down the CTRL key you will set that knob to its default (flat) value.



The CURRENT numeric display will show the gain (dB) or frequency (Hz or kHz) value of the currently selected knob. Use the single band ON/OFF switches to activate/deactivate a single band's effect.



The Hi/Lo Q switches on the mid bands control the bandwidth of these filters: Wide band (Lo Q) or Narrow band (Hi Q). (see chapter 6). Setting the PATCH switch to position 1 means that the equalizer is at the beginning of the audio chain, pre-compressor (default position). For more description on the equalizer's individual controls please refer to chapter 6.

4.5 Compressing your master

Once you've reached satisfactory equalization you can begin to apply compression.

If you're not absolutely sure about the EQ, go ahead with compression anyway. You can make further adjustments to the EQ once you have applied compression.

Compression will make your mix sound louder, more cohesive, and will give it greater punch and acoustic power. This module effectively emulates a tube compressor, so the mix will always sound warm with that in-the-face sound typical of the highly acclaimed hardware devices T-RackS is modelled after.



First, activate the compressor by clicking on its bypass switch. The red LED will light up and with the default settings you will immediately hear the mix sound louder.

By raising the input drive you'll increase compression; lowering input will reduce it. This is not a conventional "threshold and ratio" compressor. This is a very soft-knee unit with a "no threshold" characteristic. This means that there isn't a particular level at which compression begins. You will see compression on the GAIN REDUCTION VU even at very low levels. This is a gentle compression type and it's perfect for mastering. Old tube compressors work this way.



The VU meter indicates the level of compression in dB. When compression does not occur, the VU shows 0 dB. The ratio knob makes the compressor more versatile, giving a variable character to compression, from gentler to heavier. Attack and Release Time knobs will set the time constants of the compressor. Stereo Enhancement affects the Stereo width of the Mix, enlarging or reducing it. At 0 dB it will not affect the stereo imaging.

Setting the PATCH switch to position 2 means that the compressor comes after the equalizer in the audio path (default position).



For a description of the Compressor's individual controls please refer to chapter 7.

4.6 Limiting your master

T-RACKS 24 limiter has been enhanced with a new multiband algorithm that delivers a more detailed and accurate performance. It will reduce unwelcome peaks in the mix, giving it an even louder, more brick-wall quality sound.



Click on the bypass switch to activate the limiter. The red LED will come on.

The input drive knob controls the amount of signal that drives the multiband limiter input. Higher values produce a louder signal, meaning peaks will be limited more frequently.

The analogue VU shows the amount of gain reduction in dB. When limiting does not occur the VU shows 0 dB.

Being a multiband limiter, this VU shows the average of the

limiting by the three bands. The T-RackS 24 limiter is externally adjustable in its internal parameters, like individual bands trimming, using the T-RackS 24 internal settings feature described later in this manual.



The release time knob controls the speed of limiting in the recovery phase. This is the time the limiter will take to return to unity gain after peak limiting. The overload control lets you decide how to reduce peaks in your mix. A lower value will result in a more frequent gain reduction action by the limiter and a higher value will result in a less frequent limiting action but in a more recurring analogue-like clipping.

For a description of the Limiter individual controls please refer to chapter 8.

4.7 Output stage

The T-RackS 24 output stage is completely new.



You have a variable-shape clipping stage that you can use to increase the loudness of the master, cutting out unwelcome peaks.

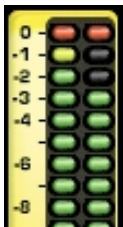
Start by lowering the OUTPUT level to a level low enough to ensure a clip-free output. Then adjust the LEVEL of the clipping stage until you hear (and see on the meters) the desired loudness without too much distortion.

You can adjust the clipping shape with the SAT control, from ultra soft (analogue-like) up to digital straight hard clipping. Once LEVEL & SAT controls are set to give the sound you desire you can precisely adjust the OUTPUT level to have a close to 0 dB master without overs.

During these operations observe the SAT and OVER leds. SAT lights up when the signal is in the non-linear zone of the

clipping stage, meaning some peak is being cut by the clipper.

OVER lights up when digital clipping in the final output stage is detected. It's important to avoid overs because they're not allowed in the standard CDs preparation process. Always check the OVER leds, your master should be as close as possible to the 0 dB level but without overs.



For high resolution and sample accurate digital metering, open the big meter by clicking on the METER button on the console. You can choose between two peak hold characteristics: temporary and permanent, by clicking on the PEAK button in the Meter Panel. When you're adjusting the OUTPUT level, after the LEVEL and SAT controls are set, it's a good idea to switch to the X10 zoom mode on the meter. This will show only the upper 7 dBs of the master digital level with a 1/10 of dB resolution.

Always try to set your master at a level between -0.6 dB and -0.1 dB with the OUTPUT control.

If the original mix has L/R level calibration problems you can use the BALANCE control to adjust them. This is a very fine Balance control with a range of +/- 6 dB.

For a description of Output Stage's individual controls please refer to chapter 9.

4.8 Presets menu

T-T-RackS comes with presets for the entire suite and for the single modules.

Clicking on the Preset display will show the list of available presets in the default T-RackS "Presets" folder that appears in the same directory as the program.



Clicking on the green arrow in the Preset display will open a pop-up menu where you will find commands to Load, Save, Save as and Delete preset files.

You can Save and Load preset files wherever you want on the disk, i.e. in your mix project folder.

The Preset pop up menu will only show presets saved in the T-T-RackS "Presets" folder. If you want your presets to appear there you need to save them in this presets folder or drag your files there using the program manager or finder.



- Each preset file includes:
- All the T-RackS knobs and switches settings, including the OUTPUT level
 - All the BYPASS switch settings, except for the globalBYPASS
 - The 8 snapshot settings

T-RackS 24 includes a set of 50 presets. Use them as a template for the entire suite or for single modules (this is new for T-RackS 24). They're very useful for learning some tricks on the modules settings, so you can use them as a tutorial too.

Loading a single module preset will not affect the other modules settings.

4.9 Snapshots

T-RackS allows you to take up to 8 setting snapshots by clicking on the SNAP button in the console.



When the snapshot window appears, clicking on TAKE will take a snapshot of all current processor settings. To recall a snapshot simply click on it. The reset button will delete all the existing snapshots. To delete a single snapshot, click on it while holding the CTRL key. Next time you will click TAKE, the first free snapshot will be used.



The snapshots are extremely useful to compare various master settings on the fly during the song.

If you are in "Real-time Processing" mode (see prefs below) you can use these snapshots for instant-recall of various T-RackS settings while writing the song to hard disk.

4.10 Undo



Clicking on the UNDO button on the console will undo the last operation.

4.11 Finalizing and processing your master

Once all controls are set and you've reached "the perfect master" click on the process button.



You'll be asked to name your master in the dialogue box and the process will start once you click OK. You can choose the processed file bit depth in this file save dialogue box.

If you're going to audio CD always select 16 bits in this box and dithering ON in the T-RackS preferences. If you're processing individual tracks and you want to maintain the 24 bit depth of the original audiofile, select 24 bits.



If you have selected Real-time Processing ON in the preferences menu, you can monitor your new master as it is being written to the hard disk.

ANY T-RackS control movement will affect the mastered file, in real-time, so you can literally "follow" the song with the controls during processing. If you are an experienced mastering engineer, you will love this feature and may prefer to always process in real-time. You may also use the snapshots while processing this way.



If you have selected Real-time Processing OFF in the preferences menu, the processing will occur in faster-than-real-time mode. This will allow you to write a mastered file faster, but will not allow you to monitor it, and therefore only permits one group of settings on your T-RackS console.

4.12 24 Bits files handling tips

You can now use the **24 bits resolution** for the audiofiles that will be mastered using T-RackS.

This will give superior openness and depth to the mix because of the higher resolution. Music with a wide dynamic range (jazz, classical, acoustic) will sound a lot better if mixed in 24 bits.

What's important is **NOT** to use 16 bits dithering on a 24 bits audiofile when mixing. This would inevitably cause all the 24 bits sound qualities to be lost. Always dither the mix to 24 bits (with your digital audio sequencer or with your A/D converters) if the audiofile you're going to master is 24 bits.

You can save the T-RackS processed file in 16 or 24 bits regardless of the input resolution. This allows T-RackS to provide a high quality resolution reduction system, fundamental for making standard audio CDs from 24 bits audiofiles.

Keep the internal T-RackS dithering ON while processing 24 bits to 16 bits audiofiles for optimum 24 to 16 bits conversion. The output file resolution can be selected in the process dialogue box. Select the required output resolution independently of that of the original file.

Always remember to set the output resolution to 16 bits if the media you're going to use is standard audio CD. This is very important because if you attempt to write a CD with 24 bits audiofiles, the burning software could try a conversion and, of course, this will not result in mastering quality.

4.13 Performance

Real-time T-RackS DSP algorithms are complex and require quite a few CPU cycles. To check consumption, click on the console's CPU button to activate the CPU meter.



4.14 Preferences

Use the Preferences window (by clicking on the console's PREF button) to set:



- "Dithering On / Off" In the ON position, dithering will be applied to the sound file.
- "Audio buffer size" Set this to the minimum value you can to avoid clicks and stops during playback.
- "Interface" Lets you change the color of the interface's front panel.
- "Real-time process On / Off" Sets the processing mode. If set to ON, real-time processing is enabled.

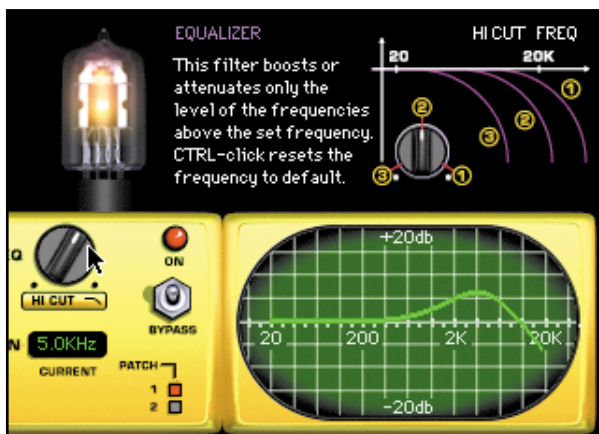


4.15 On screen help

Clicking on the console's HELP button will display help dialogs at the upper right corner of the screen.



When dragging the mouse over the various controls and knobs you'll get more information about that device.



T-RackS' operation will not be affected.

5 Control panel



This section will give you a detailed overview of all T-RackS' controls.

5.1 OPEN

Open the audio file. The open dialog box will appear.



Here you can locate and load your audio file with the standard dialog box.

The PREVIEW check box allows you to listen to the audio file before loading it. If it's checked you will start to hear to the file as soon as you click on it's name in the list.

STOP will stop preview. With the PRESET pop-up you can apply T-RackS preset settings to the audio file as you listen. Loading an audio file with a preset selected will load that file AND the selected preset. The unwanted loading of a preset can be undone by clicking on the UNDO button. To open a file with T-RackS current settings select NONE in the presets menu.

DEFAULT will load the audio file and reset T-RackS settings to the default position. If you want your preset appear in the preview window simply save your preset into the presets folder. After loading the sound file, its name will appear in the file display and the preset's name will appear in the preset display.

5.2 SESSION POP-UP



Click on the green arrow in the file display to open the SESSION POP-UP menu. When you click on SAVE, T-RackS saves the SESSION file, with the same name as the current audio file



(.trs extension), and places it in the same folder as the audio file.

The session file contains marker points, loop points and fade in-out time data that can be recalled when you LOAD the session file. With AUTO set to ON, it will automatically load the session file with the audio file, as long as the session file is in the same folder as the audio file.

To save the SESSION file open the pop-up and select "SAVE"
To recall the SESSION file open the pop-up and select "LOAD"
If you set "AUTO ON," the SESSION file will be automatically loaded with the sound file, with the corresponding Markers, Loop and Fades. If you set "AUTO OFF" the SESSION file will not be recalled automatically. You may load the session file independently. You can load only one SESSION file per audio file.

5.3 FADE IN

Click on fade-in button to select the desired fade-in time and shape (linear or logarithmic). Fade-in will be ON as soon as you select one of the shapes (it will be highlighted in green).



The fade-in button will remain lit to show you that a fade-in is active, even when you close the fade-in editing window. To change a fade time, click and drag on the time display. Clicking on seconds will change seconds. Clicking on fractions of seconds will fine tune your fade-in time. To turn the fade-in off, simply open the window again and click on the activated fade-shape icon to deselect it. Maximum fade-in time is 60 seconds.

5.4 FADE OUT

Click on fade-out button to select the desired fade-out time and shape (linear or logarithmic). Fade-out will be ON as soon as you select one of the shapes (it will be highlighted in green).



The fade-out button will remain lit to show you that a fade-out is active, even when you close the fade-out editing window. To change a fade time, click and drag on the time display. Clicking on seconds will change seconds. Clicking on fractions

of seconds will fine tune your fade-out time. To turn the fade-out off, simply open the window again and click on the activated fade-shape icon to deselect it. Maximum fade-out time is 60 seconds.

5.5 MARKERS

Clicking on MARK will set a marker in the current time-line position of the audio-file. You can jump quickly between markers by using the JUMP PREVIOUS/NEXT marker buttons. To select a marker click on it. The duration display will indicate its time position and number (M1-M8).



You can move it with your mouse or using keyboard arrows. To delete a marker, click on it and press cancel on the keyboard or drag it out of the T-RackS timeline.

5.6 TRANSPORT BUTTONS



STOP PLAY LOOP BACK PREV. NEXT

These are the buttons you use to play, stop, return to the beginning of the audio file, jump from a marker to another and activate the loop-play. If you activate the loop-play mode by clicking on the appropriate button, the loop markers will appear at the top and at the end of the timeline. You can set the loop-play area by dragging these markers. The timeline will highlight in the loop-zone.

5.7 PROCESS

The PROCESS button saves your mastered mix as an audio file. You'll be asked to name your master in the dialog box. The process will start after clicking on OK.

If you have selected Real-time Processing ON in the preferences menu, you will monitor the mix as it is being written to hard disk. Any T-RackS control movements will be written to the mastered file, in real-time. You may also use the snapshots to recall settings that will affect the file.



If Real-time Processing is OFF, you'll see the progression of the process indicated in the duration display.
To stop an already launched process press ESC on your keyboard.

5.8 FILE DISPLAY

Displays the loaded file name. The green arrow on the right will open the session pop-up menu (see ab.)



5.9 DURATION DISPLAY

The duration display contains three indications (from left to right): Play Position, Duration of the loaded file, Selected marker or loop marker position, in hours : minutes : seconds.



6 Equalizer section



T-RackS Equalizer section consists of a six-band parametric EQ, specially designed to achieve high-end performance in a mastering environment.



It consists of:

- 1) 4th order High-pass filter, from 15 Hz to 5 kHz.
- 2) Low shelving type filter, from 30 Hz to 200 Hz.
- 3) Low-mid peaking type filter, from 33 Hz to 5.5 kHz, with Lo and HiQ adjustments.
- 4) High-mid peaking type filter, from 200 Hz to 18 kHz, with Lo and HiQ adjustments.
- 5) High shelving type filter, from 750 Hz to 8 kHz.
- 6) 4th order Low-pass filter, from 200 Hz to 20 kHz.

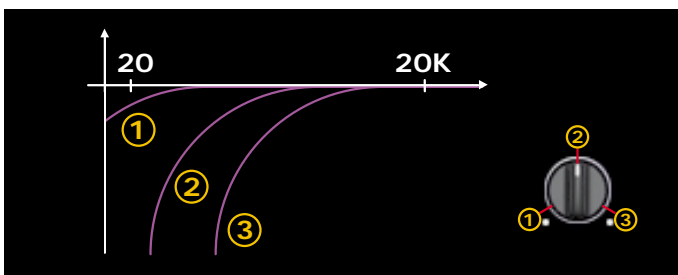
6.1 RESET ALL

This button resets all the Equalizer controls. To reset a single knob click on it while holding the CTRL key. You can UNDO this function with the UNDO button on the console.

6.2 LOW CUT

FREQ control

This knob adjusts this frequency of the high pass filter. This means that only the frequencies higher than the value set will pass-through the filter. Adjusting the knob clockwise will increase the cut-off frequency.



Sweep range is from 15 Hz to 5 kHz.

While sweeping through the frequency range you can check



the value (in Hz) looking at the EQ's current numeric display.

LOW CUT band ON/OFF

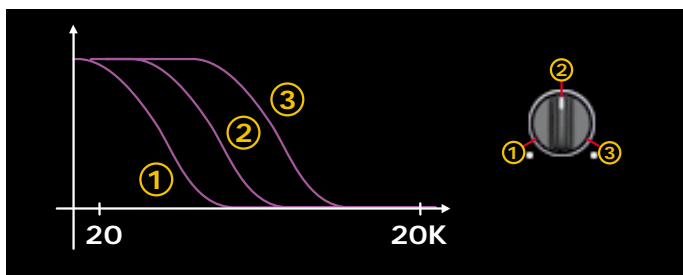
Use this button to turn On and Off the band filter.

When the filter is active the button is normal, when the filter is OFF the button is shaded.

6.3 LOW

FREQ control

This knob adjusts the frequency range of low-shelving filter. All frequencies up to this value will be boosted or reduced. You can set the cutoff frequency anywhere from 30 Hz to 200 Hz. While sweeping through the frequency range you can check the value (in Hz) looking at the EQ current numeric display.



GAIN control

Use this control to boost or reduce the level of this filter. Clockwise rotation will boost the band and vice versa. The current value is displayed in dB. The range is from -15 dB to +15 dB.

LOW band ON/OFF

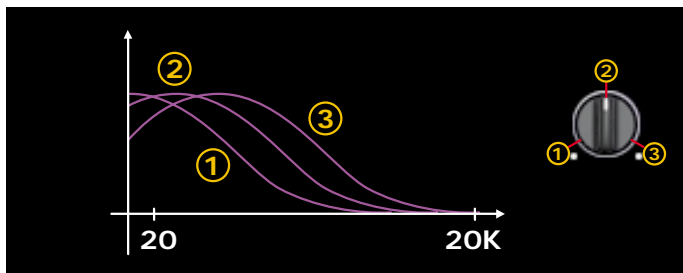
Use this button to turn the filter On and Off.

When the filter is active, the button normal, when the filter is OFF the button is shaded.

6.4 LOW MID

FREQ control

This knob adjusts the center frequency of the Low-Mid peaking filter. This filter will boost or reduce a portion of the audio spectrum around the set center frequency. You may set the center frequency anywhere from 33 Hz to 5.5 kHz. While sweeping through the frequency range you can check the value looking at the current EQ numeric display.

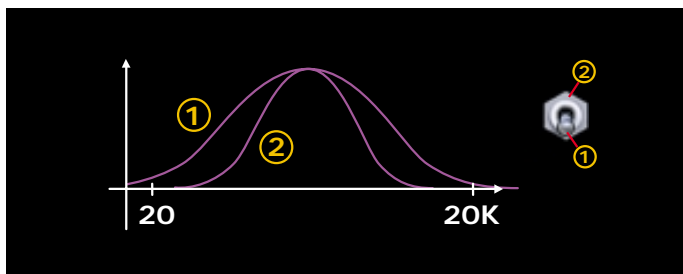


GAIN control

Use this control to boost or reduce the effect of this filter. Clockwise rotation will boost the filter and vice versa. Look at the current EQ numeric display to check the value (in dB). Range is from -15 dB to 15 dB.

HiQ and LoQ switch

This switch lets you choose between two bandwidth characteristics. LO Q position will give you a wider and more musical response (wide-band). Hi Q position will give you a narrower and more selective response (narrow-band).



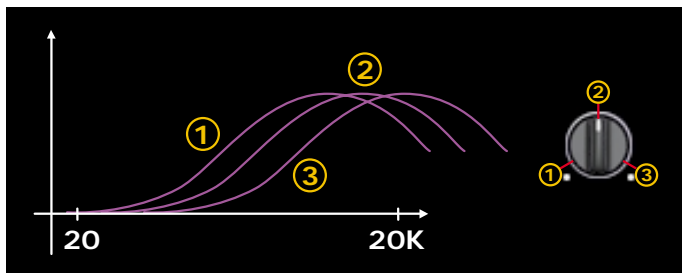
LOW MID band ON/OFF

Use this button to turn On and Off the band filter. When the filter is active the button normal, when the filter is OFF the button is shaded.

6.5 HI MID

FREQ control

This knob adjusts the center frequency of the Hi-Mid peaking filter. This filter will boost or reduce a portion of the audio spectrum around the center frequency you set. The range is from 200 Hz to 18 kHz. While sweeping through the frequency range you can check the value (in Hz - kHz) by looking at the current EQ numeric display.

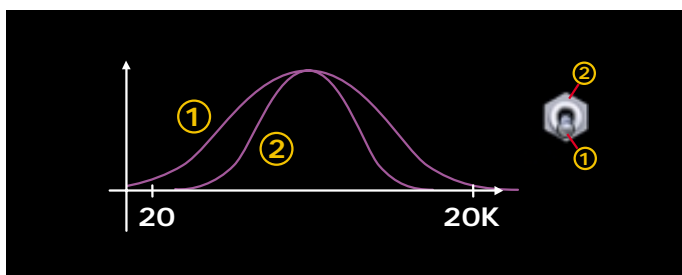


GAIN control

Use this control to boost or reduce the level of this filter. Look at the current EQ numeric display to check the value (in dB) you're setting. The range is from -15 dB to 15 dB.

HiQ and LoQ switch

This switch lets you choose from two bandwidth characteristics. LO Q position will give a wider and more musical response (wide-band). Hi Q position will give a narrower and more selective response (narrow-band).



HI MID band ON/OFF

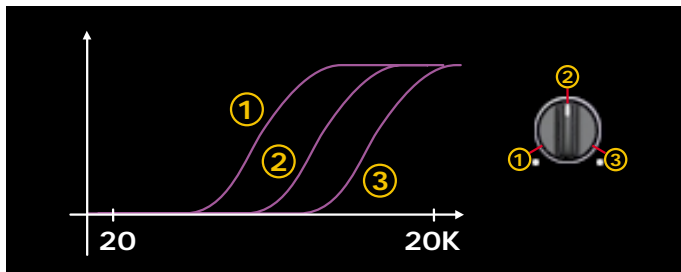
Use this button to turn the band filter On and Off. When the filter is active the button is normal, when the filter is OFF the button is shaded.

6.6 HI

FREQ control

This knob adjusts the frequency range of the high shelving filter. All frequencies above this value will be boosted or reduced.

It ranges from 750 Hz to 8 kHz. While sweeping through the frequency range you can check its value (in Hz) with the current EQ numeric display.



GAIN control

Use this control to boost or reduce the level of this filter. Clockwise rotation will boost its effect and vice versa. Look at the current EQ numeric display to check the value (in dB) you're setting. Its range is from -15 dB to +15 dB.

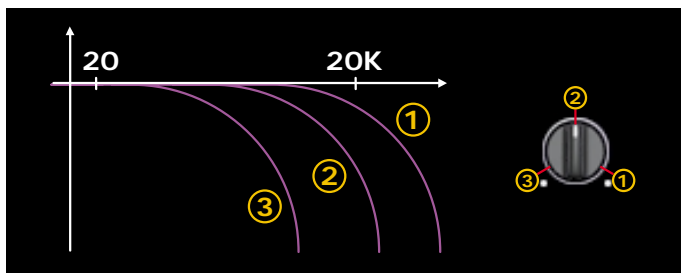
HI band ON/OFF

Use this button to turn the band filter On and Off. When the filter is ON the button is normal, when the filter is OFF the button is shaded.

6.7 HI CUT

FREQ control

This knob adjusts the cut-off frequency of the lo-pass filter. This means that only frequencies lower than this value will pass-through the filter. Adjusting the knob clockwise will increase the cut-off frequency. Its range is from 200 Hz to 20 kHz. While sweeping through the frequency range you can check the value (in Hz - kHz) looking at the current EQ numeric display.



HI CUT button

Use this button to turn the band filter On and Off. When the filter is active the button normal, when the filter is OFF the button is shaded.



6.8 PATCH

This is where you set the order of the EQ and Compressor modules in the audio chain. Switching this setting lets you position the EQ either pre-compression or post-compression. The Limiter is always placed at the end of the audio chain.

6.9 BYPASS/ON switch

This switch allows you to bypass the Equalizer module. When the LED is lit, the Equalizer is ON. To turn OFF the EQ module click the switch so that the LED is OFF.

7 Compressor section



The T-RackS tube compressor emulates that classic, analog, hi-end vintage gear used in mastering applications. This will give you that big, warm, in-face sound typical of these highly acclaimed hardware devices.



7.1 RESET ALL

This resets all the Compressor controls. To reset a single knob click on it while holding the CTRL key. You can UNDO this function with the UNDO button on the console.

7.2 ATTACK TIME

Adjust this control to change the speed of compression in the attack phase.

With higher values, transients will pass unaltered through the compressor.

With lower values the gain reduction will respond quicker and transients will be more affected. Value range is from 15 ms to 80 ms. While adjusting, check the Compressor's current numeric display to see the attack time value you're setting.

7.3 RELEASE TIME

Adjust this control to change the speed of compression in the release phase. Using higher values, the recovery time will be longer and the compression will be less noticeable.

Using lower values, the recovery time will be shorter and the average loudness will be higher. Value range is from 70 ms to 1.5 s.

While adjusting check the Compressor's current numeric display to see the release time value you're setting.

7.4 STEREO ENHANCEMENT

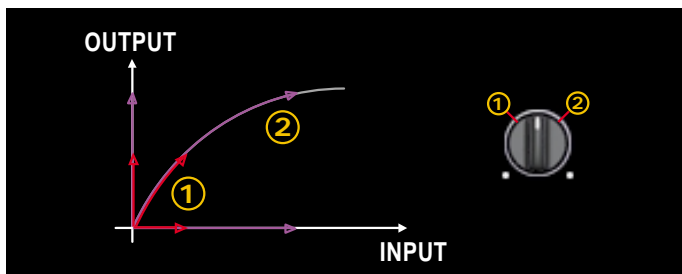
This control will affect the stereo imaging of your mix. Turning it up you will increase the stereo width and vice versa. While adjusting this knob check the value you're setting (in dB) in the Compressor's current numeric display. Value range is from -5 to +5 dB, where 0 dB has no effect.



7.5 INPUT DRIVE

This knob controls the amount of signal that drives the compressor's input.

This is a no threshold point leveler so the amount of compression is determined by the strength of input signal, like the old tube levelers.



While adjusting you can check your setting (in dB) by looking at the Compressor's current numeric display. Range is from -10 dB to + 15 dB.

7.6 GAIN REDUCTION VU

This analog VU shows the amount of Gain reduction in dB.

When compression does not occur, the VU shows 0 dB. When compression is affecting the signal the VU indicates the level of compression in dB.

7.7 PATCH

This is where you set the order of the EQ and Compressor modules in the audio chain. Switching this setting lets you position the EQ either pre-compression or post-compression. The Limiter is always placed at the end of the audio chain.

7.8 BYPASS/ON switch

This switch allows you to bypass the Compressor module.

When the LED is lit, the Compressor is ON. To turn OFF the Compressor module, click the switch so that the LED is OFF.



7.9 RATIO control

Use this control to define the character of the compression. Lower values give a gentler and less noticeable compression effect, more suitable for 2-tracks mixes and acoustic sounds. Higher values give a more effective compression effect with, at times, all the side-effects you might expect from an over-compression process. These effects are sometimes desirable, that's why T-rackS's compressor ratio control sweeps up to a value of 5. If you are not sure which ratio control value is suitable for your needs, start setting this control at 2 - 3.

In the 1.1 version this value is internally preset to 3.1.

8 Limiter section

This three-band peak limiter can make the mix even louder by reducing unwanted peaks. The peak limiting action is made separately on the three bands (low, mid, high). No access is provided for the user to these three bands. Use this device to obtain that "Brick Wall" sound from your mix. You will have a very loud master, without clipping, though as with any of these processes, use care not to over-do it.

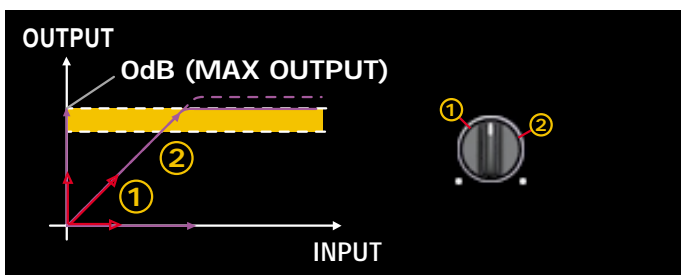


8.1 RESET ALL

This resets all the Limiter controls to their default values. To reset a single knob click on it while holding the CTRL key. You can UNDO this function with the UNDO button on the console.

8.2 OVERLOAD

This control will affect the way Limiter reduces peaks. Setting this knob to a lower value will result in more frequent gain reduction by the limiter. Setting this knob to a higher value will result in less frequent gain reduction, but in more frequent clipping. Obviously setting this control at higher values will give you more loudness, but more clipping across the 0 dB level.

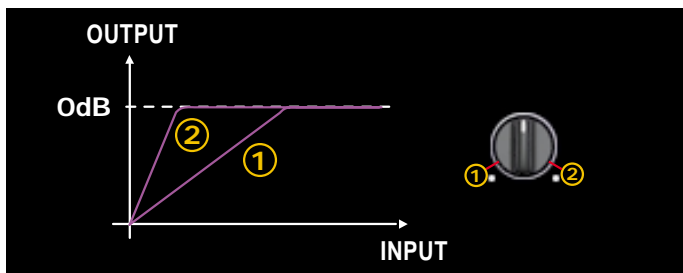


8.3 RELEASE TIME

Adjust this control to change the speed of limiting in the release phase. This is the amount of time the limiter will take to return to normal gain after a peak limiting has occurred. While adjusting, check the current Limiter numeric display to see the release time you're setting. Value range is from 60 ms to 1.6 seconds.

8.4 INPUT DRIVE

This knob controls the amount of signal that drives the multiband limiter input. Unlike the compressor module, this one has an exact threshold point where it starts to limit the signal. If you drive more signal through the limiter input, more peaks will be limited and the sound will be louder. If you want to preserve more peaks, set this control to a lower value. Values range is from -10 dB to +15 dB. While adjusting Input Drive, check the values (in dB) by looking at the current Limiter numeric display.



8.5 GAIN REDUCTION VU

This analog VU shows the amount of Gain reduction in dB. When limiting does not occur the VU shows 0 dB. When limiting is affecting the signal, the VU indicates the level of limiting in dB. This VU shows the average value of limiting by all three spectral bands.

8.6 BYPASS/ON switch

This switch allows you to bypass the Limiter module. When the LED is lit, the Limiter is ON. To turn OFF the Limiter module, click the switch so that the LED is OFF.

9 Output stage

The output stage contains the master level control and program peak meters that let you set and check the level of your master. You can choose between two peak meter types:

- 1) The small three-LED program meter (PPM) which is permanently visible on the output stage.
- 2) The large, sample accurate digital peak meter that you can see when clicking on the METER button on the Console.



With the OUTPUT control you can set the MASTER LEVEL of your mix. The output section has to do the job of fitting the ultra-high digital resolution of the internal T-RackS

audio into the 16 bit standard required by today's audio CDs. In the Preferences menu, you may choose whether you want to use DITHERING. Dither is a small amount of digital noise that is applied to the sound to improve fidelity, particularly at low signal levels. It allows digital to analog converters to work more efficiently, with lower distortion at very low levels. Using Dither may help your CDs sound more articulated, deep and transparent.

9.1 LEVEL control

In T-RackS 24 we have added a clipping stage at the output. This is useful every time you need to cut out all the peaks that keep the average level of a master too low. Peak clipping is very often used in professional mastering because it's in most cases more transparent than peak limiting (which you obtain with the Limiter).

The LEVEL control adjusts the pre-level of this clipping stage. This is the level of the signal injected into the clipper and will determine the quantity of saturation applied to the audio.

Tip: lower the OUTPUT level until it is clip-free and then make all the adjustments with the LEVEL control. You can raise the OUTPUT level later, once the input LEVEL of the clipper is OK.

9.2 SAT control

The clipping shape of this stage is adjustable. It's continuously variable from a straight digital hard clip (fully clockwise) to ultra soft non-clipping mode (fully counterclockwise).

Depending on music styles, the clipping can be less noticeable either with softer or harder shapes; that's why this control is continuously adjustable. Only your ears can detect the optimal clipping shape for the piece of music you're mastering. In any case, if you're not sure, start with a middle value, say 3 dB, this is a good starting point.

SAT LED:

when the signal is in the non-linear zone (saturation) the SAT led lights up.

9.3 OUTPUT control

This is the main master level fader. Once the clipping stage is well adjusted, set this control to make the master peak as close as possible to the 0 dB digital output level. A well-made master is OVER free but peak is often very close to 0 dB. Nowadays rock and pop music need very loud masters, you can obtain this using the clipper with a lot of drive and setting the OUTPUT level so that the level is very close or equal to 0 db but never higher.

Use the x10 button on the peak meter to help obtain better detail in the upper range of the meter. A special section in this manual focuses on the x10 switch.

9.4 OVER leds

These two leds (separate for left and right channels) light up ONLY when a digital over in the master has occurred. In theory they should never turn on. Adjust the OUTPUT control to ensure they stay off, with as high a level as possible. Remember this simple rule: when mastering, 0 dB is the goal, overs are the worst possible scenario. Some playback equipment even goes crazy when continuously playing 0dB samples (overs).

9.5 Balance

This makes a fine adjustments between the Left and Right channels. It can fix unbalanced mixes by adjusting one channel level in respect of the other by +/- 6 dB.

9.6 BYPASS/ON

This is the MAIN ON/Bypass switch. When the LED is lit, the entire T-RackS mastering suite is working. When you want to compare the original mix with the one you've mastered, click



this switch to bypass all processors. If the red LED is OFF, you're in bypass mode and you'll hear the original audio file exactly as it is on the disk. This is very useful for immediate A/B evaluation of what you've done with T-Rack2.

9.7 Presets menu

Displays the presets contained in the preset folder. These are the same ones that are displayed and previewed in the Open File dialog box.



Clicking on the preset button displays a scrolling menu from which you may select any of the available presets. Clicking on the green arrow will display the preset menu. LOAD will open an Open dialog to load a saved preset. SAVE save the current preset (different from default). SAVE... save the current present using a dialog box. DELETE delete the current preset. DEFAULT is not a preset but a default setting position that can't be saved or edited and appears at the top of the preset menu.

9.8 MONO / STEREO / DIFF switches

Using these buttons, you can switch the monitoring (and processing!) mode between Monoaural, Stereophonic and Difference.

The first two are self-explanatory, the third allows you to listen only to the difference between the two channels. This means that all the mono elements of the master will be removed, such as vocals, bass and kick drum (generally recorded in mono).

This control is very useful to check for phase coherency, reverbs, recording-heads alignment and phase problems in general.

Another crucial use of the difference listening mode is for precise adjustment of the balance of the mix. Set the listening mode to DIFF then adjust the balance until the bass, vocals, kick drums etc. have totally gone.

Mono mode is very useful too, for example to check for mono-compatibility of the master. If the music you're mastering is intended for radio or TV, always remember to check for mono compatibility.

10 Console

In the Console at the bottom of T-RackS are placed various buttons to access most of its windows and features.



10.1 QUIT



Quit T-RackS.
T-RackS will load the current preset next time it is launched.

10.2 INFO window



Opens the credit window.



10.3 PREF window



Open Preferences.



10.4 SNAP window

T-RACKS allows you to take up to 8 snapshots of its current settings by clicking on the SNAP button on the console.



The snap windows will appear.



Clicking on TAKE will take a snapshot of all current processor settings. To recall a snapshot simply click on it. The reset button will delete all existing snapshots. To delete a single snapshot, click on it while holding the CTRL key. The next time you click TAKE the first free snapshot will be used.

The snapshots are extremely useful to compare various mastering set-ups and control positions, even while monitoring and writing the song to hard disk in real time.

You can, for instance, create a snap for the verse and another for the chorus and switch between the two snaps while writing the master.

10.5 CPU window

This monitors the percentage of CPU consumption.





The Mac version will supply a percentage of processor consumption.



The PC version will indicate which processor is installed and the percentage of processor load. Three different optimizations have been included, MMX™, Pentium® II and Pentium® III which use different optimized sets of instructions.

10.6 UNDO window

Undoes the last operation.



10.7 PEAK METER window



Opens the Peak Meter window.

x10 switch

By turning this ON (red) the meter scale changes from -72 <-> 0 dB to -7.2 <-> 0 dB.

This is useful for checking that the levels that are very close to 0 dB. It can be used, for example, to set the ceiling of your master (with the OUTPUT control) precisely, for example, at -0.2 dB. When x10 is ON the resolution of T-RackS's peak meter is 1/10 dB in the upper range.



10.8 On screen help

Clicking on the console's HELP button will display help dialogs at the upper right corner of the screen.



When dragging the mouse over the various controls and knobs you'll get more information about that device. T-RackS' operation will not be affected.

11 Internal Settings

Adjustable internal settings

This new feature enables the user to adjust some of the internal T-RackS parameters such as, for instance, multiband peak limiter crossover points or bands time constants.

This allows expert users to sculpt the T-RackS sound as desired.

To modify T-RackS internal settings:

- T-RackS comes with a template file (a normal text file) called TR2InternalSettings.txt . The file is self-explanatory since all entries are accompanied by explanatory comments.
- You can edit the internal settings by changing the numeric value of the controls listed (i.e. from CompLowSC=64 < you can change this value). Explanations of the controls and relative values range are in lines marked by //. The lines marked by # must not be modified.
- To make the changes active, drag the text file containing the internal settings in to the T-RackS application window. This way T-RackS will be modified according to the user's parameters.

Important: each time T-RackS starts it recalls its original settings so, if you plan to use different internal settings for you projects, don't forget to recall them by dragging the file to the T-RackS window.

Tip: a neat way to keep your presets and internal settings is to save them in the projects folders. If you do this, every song (or project) will have its T-RackS preset(s) and, eventually, its T-RackS internal settings text file.

Here's the template (you don't need to copy it from here because you already have this file in the T-RackS application folder). Make a copy before editing it so you can recall the original each time you want without quitting the application.

Additional internal settings can be also found online where you can also post your own internal settings in order to share them with other T-RackS users. Your name and studio will be fully credited. To access more internal settings and post your own, go to: <http://www.t-racks.com/TRProMaster.html> .



11.2 T-RackS "TRInternalSettings.txt"

```
// EQ          1000
// Compr2000
// Limiter3000
// Out         4000
```

```
// Values definitions
```

```
#CompLowSC = 2010
```

```
#Patching = 4008
```

```
#LowAttack = 3010
```

```
#LowRelease = 3011
```

```
#LowDrive = 3012
```

```
#LowThreshold = 3013
```

```
#MidAttack = 3014
```

```
#MidRelease = 3015
```

```
#MidDrive = 3016
```

```
#MidThreshold = 3017
```

```
#HighAttack = 3018
```

```
#HighRelease = 3019
```

```
#HighDrive = 3020
```

```
#HighThreshold = 3021
```

```
#LowCrossover = 3022
```

```
#HighCrossover = 3023
```

```
// Values Settings:
```

```
CompLowSC = 64    // this adjusts the highpass frequency in
                  // the compressor sidechain. 0 is full
                  // band, 127 is 800Hz. Default is 64.
```

```
Patching = 0      // Limiter low freq. Attack time, 0 is
                  // slowest, 127 is fastest. 64 is the
                  // default.
```

```
LowAttack = 64     // Limiter low freq. Attack time, 0 is
                  // slowest, 127 is fastest. 64 is the
                  // default.
```

```
LowRelease = 64    // Limiter low freq. Release time, 0 is
                  // fastest, 127 is slowest. 64 is the
                  // default.
```



LowDrive = 64 // Limiter low freq. compressor drive.
// Sets the amount of low freq
// compression.

LowThreshold = 64 // Limiter low freq OVERLOAD control.
// Sets the balance between limiting and
// saturation of this band. 0 is full
// limiting, 127 is full saturation.

MidAttack = 64 // Limiter mid freq. Attack time, 0 is
// slowest, 127 is fastest. 64 is the
// default.

MidRelease = 64 // Limiter mid freq. Release time, 0 is
// fastest, 127 is slowest. 64 is the
// default.

MidDrive = 64 // Limiter mid freq. compressor drive.
// Sets the amount of mid freq
// compression.

MidThreshold = 64 // Limiter mid freq threshold control.
// Sets the balance between limiting and
// saturation of this band. 0 is full
// limiting, 127 is full saturation.

HighAttack = 64 // Limiter high freq. Attack time, 0 is
// slowest, 127 is fastest. 64 is the
// default.

HighRelease = 64 // Limiter high freq. Release time, 0 is
// fastest, 127 is slowest. 64 is the
// default.

HighDrive = 64 // Limiter mid freq. compressor drive.
// Sets the amount of high freq
// compression.

HighThreshold = 64 // Limiter high freq threshold control.
// Sets the balance between limiting and
// saturation of this band. 0 is full
// limiting, 127 is full saturation.

LowCrossover = 64 // Sets the low-mid crossover point
HighCrossover = 64 // Sets the mid-high crossover point

12 Support



For any question you may have please refer to the FAQ at:
<http://www.T-RackS.com/FAQ.html>
where you'll find answers to the most common questions.

For free support write at:
support@t-racks.com



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