



SOUND PERFORMANCE LAB



Manual



Charisma

Model 9733

Dual-Channel Tube Processor



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CHARISMA

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Manual

by Hermann Gier and Paul White

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Dear customer,

Thank you for the confidence you have shown towards SPL electronics GmbH by purchasing the SPL CHARISMA. You have decided to use a tool of high performance which sets you in the position to have faster success and a better sound quality in your music productions. As a typical SPL unit the CHARISMA combines exemplary specifications and high manufacturing standard with excellent sound quality to provide you a precious component for studio purposes.

Please read this manual carefully to ensure you have all the information you need to use the CHARISMA.

We wish you every success with your new CHARISMA.

Your SOUND PERFORMANCE LAB-Team

I would like to start with my thanks to all our staff, who created what is to be described here. The importance of their exceptional qualification and talents cannot be overestimated.

A very special "thank you" goes to Manfred Reckmeyer, whose longterm experience in tube technology including custom modifications of tube gear for many artists made this product possible.

Our products are often tested and compared in many publications and by our customers themselves and constantly valued with best results. I would like to pass on this broad appreciation to those, who deserve it – my excellent colleagues.

Hermann Gier

Charisma

Contents

Foreword

Thanks

Introduction

CHARISMA is a 2-channel tube processor designed to improve the power, punch, dynamics and the subjective loudness of the signal being processed.

Designed to introduce a subjective tonal warmth and a smooth bottom end into digitally recorded material, CHARISMA is a joint development between SPL and Manfred Reckmeyer, the designer responsible for the development of the 8-channel CHARISMA.

CHARISMA represents a solution that far exceeds the mere simulation of tape saturation, and CHARISMA's tube saturation characteristics can be fully controlled by the user. The concept of operation is simple. Each CHARISMA channel has three potentiometers: DRIVE sets the drive level to the tubes, CHARISMA adjusts the tube saturation characteristic, and OUTPUT sets the output signal level.

CHARISMA also helps to prevent overload and clipping on digitally or analogue recorded tracks. You should use CHARISMA while recording before your digital recorder in order to clip-protect your recording (e. g. limiting peaks from live-recorded drums or reducing sharp "esses" from vocals). CHARISMA gives your signals more clarity, transparency and presence. Each part of the mix, instrument or vocal can easier be distinguished and located. Using CHARISMA on single instruments alone lets those signals stick out of the mix. CHARISMA also helps you to place vocals in a denser playback and maintaining their presence.

We will start with general safety hints, followed by the connections on the rear panel. We then take a look at the controls on the front and go on with practical tips for the usage of CHARISMA.

Operation safety

The housing of CHARISMA has the standard 19"-EIA format and occupies 1U (44 mm) in your rack. When installing the unit in a 19"-rack, the rear side of the unit needs some support, especially in a touring case.

CHARISMA should not be installed near units which produce strong magnetic fields or extreme heat. Do not install CHARISMA directly above or below power amplifiers or digital processors. This eliminates problems which could result from interfering high-frequencies such as clock frequencies, MIDI or SMPTE control signals.

Check that the voltage details quoted on the back panel are the same as your local mains electricity supply. Use a minus (-) screwdriver to set the voltage selector to the voltage for the area in which the unit will be used.

Never cover up the ventilation slots on the top of the unit. If, during operation, the sound is interrupted or indicators no longer illuminate, or if abnormal odor or smoke is detected, or if liquids are spilled on the unit, immediately disconnect the power cord plug and contact your dealer.

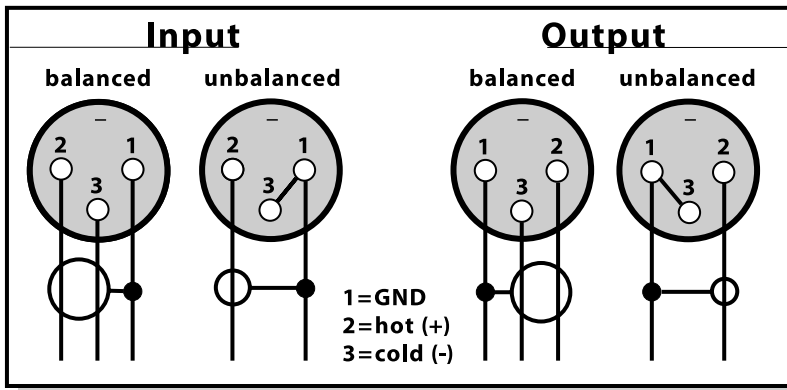
Only clean your CHARISMA with a soft, lint-free cloth. Use only standard cleaning agents. Never use alcohol or paint thinner, because they may damage the finish.



Before connecting CHARISMA switch the power off at all connected units.

CHARISMA is fitted with both XLR-connectors and TRS stereo jacks for balanced operation, though the jacks may be used with unbalanced connections simply by plugging in mono jack-plugs. The level difference that normally occurs when a balanced input or output is used unbalanced is automatically compensated for.

Should the need arise to use the XLR connectors in an unbalanced system, pin 3 of the XLRs should be grounded. Inserting a mono jack also unbalances the XLRs:



Both output stages operate in parallel, so it is possible to connect two different destination units simultaneously, for example to record to two different media at the same time or split the output between a mixer and effects processor. However, only one type of input (jack or XLR) should be connected at a time – the CHARISMA is not intended to be used as a mixer!

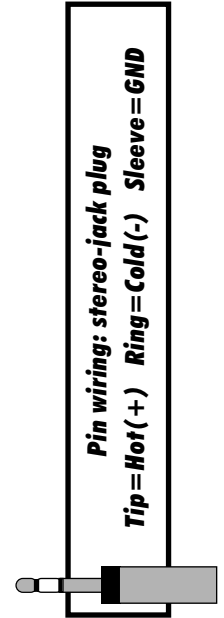
To ensure optimal signal quality, SPL has developed a new hybrid-component balanced input/output stage using all laser-trimmed resistors with a tolerance of 0.01%. This approach has resulted in an exceptionally high CCMR (common mode rejection); 100dB at 1kHz and 80dB at 10kHz. As a precaution, before connecting the CHARISMA switch off the power to the unit and to all connected units.

Other rear panel connections and switches:

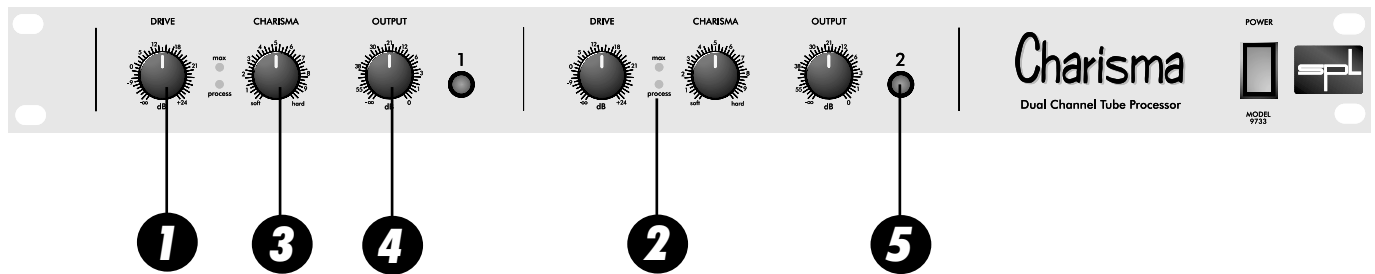
- Voltage selector: 220-240V/50Hz or 100-120V/60Hz
- CSA/UL approved 3-pole power plug
- GND-Lift switch

Included in the packaging are:

- 3-wire, U-ground, power cord
- Owner's Manual
- Warranty card
- SPL catalogue



Control elements



Drive

Setting the drive level to the tubes

1

The DRIVE control sets the drive level to the tubes. DRIVE values can be adjusted between $-\infty$ dB and +24 dB.

You have control over the tube's onset of saturation to find the optimum point of processing. The higher the DRIVE, the more tube harmonics are being generated. At the same time, limiting gets stronger, increasing the density of the tube distortion.

Start off with the DRIVE set at 0 dB. Now the input level is equivalent to the level driving the tube electronics. When you increase the value, you will get a more intense tube processing and the output volume rises. To compensate this use the OUTPUT control (4).

Max/Process LEDs

PROCESS = processing starts
MAX = max. saturation

2

The PROCESS LED illuminates when CHARISMA starts its tube processing. The tubes are starting to generate their typical sound and harmonical structure.

The MAX LED indicates that the processing has reached its maximum position. Now the tube is fully saturated and the typical limiting effect occurs. Increasing the DRIVE results in more tube distortion.

Examples:

– with snare or kick drum you can use heavy distortion (MAX LED illuminates)

– with layer sounds you should be very careful! Only use very little distortion if any (PROCESS LED rarely)

IMPORTANT: When you start to process a sound with heavy transients and attack, like a snare or a kick drum, you can drive the tubes into heavy saturation before you start to hear the tube's distortion. When the PROCESS LED starts to illuminate you hardly hear a change. Drive the tubes into heavier distortion so that the MAX LED illuminates frequently and the tube processing becomes audible.

On the other hand, when you process layer sounds or almost sinewave-like sounds you will sometimes hear the tube's distortion even before the PROCESS LED illuminates. The CHARISMA effect is sometimes unpleasant on layer sounds! So, set the DRIVE level depending on the character of the sound you want to process. Our hearing detects overtones on sinewave-like signal immediately as unpleasant distortion, whereas squarewave-like sounds can be heavily distorted and still remain pleasing to the ear.

Note: Do not set the DRIVE controls to identical scale settings and expect the tubes to act identical when different source characteristics are present at the inputs. Trust your hearing.

This unique control varies the tube sound and allows you to create varying sound characteristics from SOFT to HARD.

Creating different tube sounds results in varying harmonical structures and adjustments in the SOFT control range bring in the harmonical distortion and the tube limiting very slowly (you can compare this with the soft-knee characteristic of a limiter). In comparison to the HARD control range the SOFT effect starts off at relatively low levels. The sound becomes smooth and warm, is a little softer, and contains more harmonic distortion than the HARD sound.

In the HARD control range CHARISMA operates comparable to the hard-knee characteristic of a limiter. The processing starts with full effect at one point whereupon the signal is sharply limited, and at this point, the sound becomes punchy and crispy.

Depending on the selected characteristic and intensities, a readjustment of the DRIVE control may further emphasize the desired effect.

The OUTPUT control sets each channel's output gain to compensate for the level increase when the DRIVE control has added level to drive the tube circuitry.

Use a peak meter to set the OUTPUT level correctly. If you insert the CHARISMA on your console or patchbay without having control over the peak level you will end up with less peak level although the loudness is the same. This is because of the limiting effect of the tubes. CHARISMA is designed to increase loudness by maintaining the same peak level and to improve bit resolution on digital recording systems.

The bypass switch switches each CHARISMA channel in and out of processing (hard-bypass), and the bypass switch is labelled according to channel number.

CHARISMA can be used everywhere, where audio signals might benefit from the excellent tube sound. The CHARISMA concept is ideal for use in conjunction with digital multitrack or hard-disk recorder systems, but it can equally be used with analogue tape or DASH machines.

Making use of the typical tube harmonics and saturation sounds, as well as the natural tube limiting effect, while recording, is of benefit to almost any signal – indeed there's almost no limit to the applications. The sonic implications can best be characterized as gaining more presence, punch, and warmth.

In the MIDI studio, CHARISMA is ideal for processing single tracks such as keyboard or sampler sounds as well as vocals. In this application, the CHARISMA is inserted into the mixer's channels inserts or directly between the source and the desk.

The most flexible way to use CHARISMA in the studio is to wire it

3

Charisma

Selecting the sound character of the tube processing

4

Output

Monitor the peak level to set the OUTPUT level correctly!

5

Bypass

Applications

into the patchbay. That way you can decide, whether it should be used while recording or later during mixdown – or simply inserted into specific channels. Processing subgroups is another interesting application. Using CHARISMA while recording to digital is the most beneficial application as the tube limiting prevents clipping.

Standard Processing

**Creating effects like tape saturation,
Increasing loudness,
Improving presence.**

You control the sound of CHARISMA with the DRIVE and CHARISMA controls. The OUTPUT control is used to compensate for the level increase when the DRIVE control is set higher than 0dB.

Set-up positions

*Set the DRIVE to zero and CHARISMA to center position.
Set the OUTPUT control fully clockwise (0dB).*

Input and output levels should be identical now. Check this by depressing the bypass switch, labeled with the channel number.

Getting started

Turn the DRIVE control slowly clockwise. You start to drive the tube into saturation. The level increases. Compensate this by turning the OUTPUT control counter clockwise.

The PROCESS LED illuminates when the processing starts. Depending on the source characteristic you will hear the CHARISMA process much more intense with sinewave-like/layer sounds. When processing these sounds the PROCESS LED should illuminate rarely. When processing squarewave-like/transient sounds you can drive the tubes harder. The PROCESS LED may illuminate constantly and the MAX LED may also light up frequently. The MAX LED tells you that the maximum saturation of the tube is reached.

Now, check the peak level meters on your playing and recording unit and set the OUTPUT controls in a way that identical levels are shown on both units. Switching on CHARISMA's channels will give the aural impression that the processed signal is louder than the unprocessed. If this effect is not impressive enough, turn the DRIVE control a little further clockwise.

The Charisma-control

After setting the DRIVE control, start to vary the CHARISMA control. This control varies the tube sound from HARD to SOFT.

In the SOFT position the processing curve looks similar to that of a soft-knee limiter curve. The tube processing comes in softly with a gently rounded curve, whereas in the HARD position the programme material is treated more dramatic. This can be compared with the processing curve of a hard-knee limiter.

A specific CHARISMA control setting may make it necessary to readjust the DRIVE control. If you use a SOFT setting, the proces-

sing starts earlier, which means you can hear the effect already at lower DRIVE levels in comparison to HARD settings. A medium DRIVE level may already be sufficient to drive the tubes hard enough.

In a HARD setting you will find yourself using higher DRIVE levels, because the processing starts later than in a SOFT setting, but it is very efficient immediately.

When recording to a digital media it is essential to avoid clipping and the tube limiting is a great tool for this purpose. Critical peaks are smoothed resulting in increased subjective loudness while controlling the electrical level.

Traditionally, drums have been recorded to analogue tape – even digital drum tracks are frequently copied to analogue tape purely to capture the sound of tape saturation. With CHARISMA, you can achieve the same analogue warmth, punch and power without the inconvenience or noise of an analogue tape machine. Even sampled drums really start to sound much more like real drums.

Choose an extreme HARD setting (fully clockwise) for kick drums or snares. You effectively prevent dips on your digital recorder while you also have control about the kick of the bass drum or the ouch of the snare. It is interesting to use CHARISMA on room tracks when recording live drums. Choose a SOFT setting with a high DRIVE level. This will open up your drum room.

Acoustic guitars benefit from the CHARISMA effect with improved transparency and clarity, yet the recorded instrument retains the same liveliness and character as the original. Electronic basses become better focused, or you can add just a hint of deliberate distortion to help make them stand out in a busy mix.

When recording vocals, the CHARISMA allows the voice to stand out in the mix without increasing the actual level – any good studio mic effectively becomes a valve mic. Intelligibility is greatly enhanced by the tube harmonics, and you can even make a clean voice sound smoky by driving the CHARISMA a little harder. That's something a tube mic doesn't allow you to do.

It is often a good trick to use a compressor before the CHARISMA when processing vocals. This will help you finding an appropriate DRIVE level.

Producers of dancefloor/trance/ambient music will find CHARISMA a remarkable creative tool for distorting bass drums, snare- and lead sounds absolutely free from noise and hum – a clear advantage over the guitar-preamps. Even original 303/808 bass and drum sounds gain additional kick and authority. CHARISMA lets you produce really 'in your face' sounds.

Tip offs

Avoiding clipping when recording digital.

Capturing the sound of analogue for digitally recorded drums.

Controlling the kick of the bass drum and the ouch of the snare.

Improving drum room sound.

Making acoustic guitars and electronics basses stand out in busy mix.

Giving extra charisma to vocals. Improving intelligibility.

Making a tube mic out of your standard mic.

Creating heavily distorted 'in your face' sounds.

Extreme Processing

Tip offs

Creating rough sounds,
Creating new harmonics,
Processing synth sounds.

CHARISMA can be used with extreme settings: For example, set the DRIVE maximum and create richest Hammond organ sound. Give clean guitars more bite or even softly distort them, or make vocals rough and dirty.

You can run your favorite samples and synth sounds through CHARISMA and give them the final edge. Give your TB 303 clone the bite of the original 303. By widening the harmonical spectrum you have unlimited possibilities to boost and refresh synth sounds or create new ones.

Power Supply

Special care has gone into the design of the power supply of the CHARISMA. The power supply is the heart of an electronic system: The better it is, the better the whole system works and—in an audio system—the better it sounds.

This power supply is based around a custom made 15VA toroidal transformer and is designed to minimize induced hum and noise due to the non existence of an air-gap.

The primary voltage may be selected between 230V/50 Hz and 115V/60 Hz by means of a recessed slide switch on the rear panel.

The rear panel ground-lift switch may be used where ground loops are causing hum problems. When the GND LIFT switch is set to off, the circuit ground is no longer connected to the chassis ground. The power cord connector is a 3-wire, U-ground, standard IEC mains connector for a detachable power cord (enclosed). Transformer, power cord and mains connector have VDE, UL and CSA approvals. The fuse has a value of 315 mA.

On the secondary side of the power supply, an RC combination is used to filter out noise and hum voltages from the mains side. Both half-waves are smoothed with 2200 μ F capacitors in the positive and negative voltage path. Both paths use precision voltage regulators, as deviations of only a few millivolts can result in audible changes such as a diffuse sound pattern.

Input & output stages

Instrumentation amplifier, electronically balanced
(differential) transformerless

Jack type	TRS
XLR type	NC3
Nominal input level	+6dB
Input impedance	= 220 kOhms
Output impedance	< 600 Ohms
Max. input level	+24dBu
Reference level	variable (Drive)
Minimum load ohms	600 Ohms
Hard bypass switch	yes

Measurements

Frequency Response	30 Hz - 40 kHz (40 kHz = -3 dB)
CCMR (common mode rejection)	-100 dBu @100 Hz -100 dBu @1 kHz - 80dBu @ 10 kHz - 70dBu @ 20 kHz
THD & N (total harmonic distortion & noise)	0,41% @1 kHz K2 max. 35%
S/N CCIR 468-2	-89dBu

Power Supply

Toroidal transformer	15 VA
Fuse	315 mA
Ground lift switch	yes
Voltage selector	yes

Dimensions

Housing	Standard EIA 19"/1U 482 x 44 x 237mm
Weight	3,4 kg

Subject to change without notice.

Specifications

Warranty

SPL electronics GmbH (hereafter called SPL) products are warranted only in the country where purchased, through the authorized SPL distributor in that country, against defects in material or workmanship. The specific period of this limited warranty shall be that which is described to the original retail purchaser by the authorized SPL dealer or distributor at the time of purchase.

SPL does not, however, warrant its products against any and all defects:

1) arising out of materials or workmanship not provided or furnished by SPL, or 2) resulting from abnormal use of the product or use in violation of instructions, or 3) in products repaired or serviced by other than authorized SPL repair facilities, or 4) in products with removed or defaced serial numbers, or 5) in components or parts or products expressly warranted by another manufacturer.

SPL agrees, through the applicable authorized distributor, to repair or replace defects covered by this limited warranty with parts or products of original or improved design, at its option in each respect, if the defective product is shipped prior to the end of the warranty period to the designated authorized SPL warranty repair facility in the country where purchased, or to the SPL factory in Germany, in the original packaging or a replacement supplied by SPL, with all transportation costs and full insurance paid each way by the purchaser or owner.

All remedies and the measure of damages are limited to the above services. It is possible that economic loss or injury to person or property may result from the failure of the product; however, even if SPL has been advised of this possibility, this limited warranty does not cover any such consequential or incidental damages. Some states or countries do not allow the limitations or exclusion of incidental or consequential damages, so the above limitation may not apply to you.

Any and all warranties, express or implied, arising by law, course of dealing, course of performance, usage of trade, or otherwise, including but not limited to implied warranties of merchantability and fitness for particular, are limited to a period of 1 (one) year from either the date of manufacture. Some states or countries do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state, country to country.

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