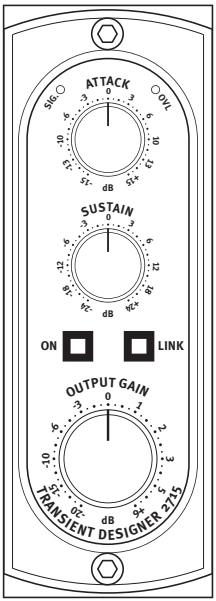
Manual



Transient Designer

RackPack Module, Model 2715

Dynamic Envelope Processor

Version 1.2 – 5/2011

Designer: Vincenzo Triolo

This user's guide contains a description of the product. It in no way represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product at the time of packaging with this document.

Sound Performance Lab (SPL) continuously strives to improve its products and reserves the right to modify the product described in this manual at any time without prior notice. This document is the property of SPL and may not be copied or reproduced in any manner, in part or fully, without prior authorization by SPL.

SPL electronics GmbH, Sohlweg 55, 41372 Niederkruechten, Germany
Phone. +49 (0) 2163 983 40
Fax +49 (0) 2163 983 420
Email: info@spl.info
Internet: spl.info

CE Declaration of Conformity

Manufacturer: SPL electronics GmbH, Type of Equipment: Audio Signal Processor, Product: RackPack/Transient Designer, Model 2715, Compliance Engineer: Wolfgang Neumann
Test Basis: EN50081-1:1992, EN50082-1:1992, EN60065:1993, EN61000-3-3:1995, EN60065:2002, EN55013:2001, EN55020:2002, EN61000-3-2:2000, 73/23 EWG; 93/68 EWG.
We herewith declare, that the construction of the Transient Designer, Model 2715, is in compliance with the standards and regulations mentioned above.

Notes on environmental protection

At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment. The "wheelie bin" symbol on the product, user's manual and packaging indicates that. The materials can be re-used in accordance with their markings. Through re-use, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment. Your local administrative office can advise you of the responsible waste disposal point.

WEEE Registration: 973 349 88

Contents

Important Security Information

Please note and retain this information. Carefully read and follow all of the safety and operating instructions before you use the machine. Be doubly careful to follow all warnings and special safety instructions noted in this manual and on the unit. The following information refers to modules built into the RackPack frame.

Connections: Only use the connections as described. Other connections can lead to health risks and equipment damage.

Water And Humidity: Do NOT use this machine anywhere near water (for example near a wash basin or bath, in a damp cellar, near swimming pools, or the like). In such cases there is an extremely high risk of fatal electrical shocks!

Insertion Of Foreign Objects Or Fluids: NEVER allow a foreign object through any of the machine's chassis openings. You can easily come into contact with dangerous voltage or cause a damaging short circuit. NEVER allow any fluids to be spilled or sprayed on the machine. Such actions can lead to dangerous electrical shocks or fire!

OPENING THE DEVICE: Open the device only to fit or exchange modules. The fitting and/or exchange of modules should only be carried out by qualified persons. In the light of possible physical damage or injuries any manipulation is at your own risk. In order to avoid any residual voltage, the device should be disconnected from any power source at least 5 minutes prior to opening it. If you handle the device improperly or ignore the manual (part of the delivery of the RackPack frame) you risk to damage the device or expose yourself to an electric shock. In these cases SPL electronics GmbH denies any responsibility.

Electrical Power: Run this machine ONLY from sources which can provide proper power at the prescribed rating. When in doubt about a source, contact your dealer or a professional electrician. To be sure you have isolated the machine, do so by disconnecting the power cord from your wall connection. Be sure that the power cord plug is always accessible. When not using the machine for a longer period, make sure to unplug it from your wall power socket.

Power Cord Protection: Make sure that your power cord is arranged to avoid being stepped on or any kind of crimping and damage related to such event. Do not allow any equipment or furniture to crimp this power cord.

Power Connection Overloads: Avoid any kind of overload in connections to wall sockets, extension or splitter power cords. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

Lightning: Before thunderstorms or other severe weather, disconnect the machine from wall power (but to avoid life threatening lightning strikes, not during a storm). Similarly, before any severe weather, disconnect ALL the power connections of other machines and antenna and phone/internet cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Air Circulation: Chassis openings offer ventilation and serve to protect the machine from overheating. NEVER cover or otherwise close off these openings. NEVER place the machine on a soft surface (carpet, sofa, etc.). Make sure to provide for a mounting space of 4-5 cm/2 inches when mounting the machine in racks or cabinets.

Controls And Switches: Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

Repairs: Unplug the machine and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have gotten in to the housing, or in cases when the machine may have fallen and shows any sign of having been damaged. This also applies to any situation in which the machine has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered.
In cases of damage to the power cord or its plug, first consider turning off the main circuit breaker before unplugging the power cord.

Replacement/Substitute Parts: Be sure that any service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock, or other dangers, including further equipment damage.

Safety Inspection: Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired machine is in all respects up to factory standards.

Cleaning: In cleaning, do NOT use any solvents, as these can damage the chassis finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning oil). Disconnect the machine from your power source before cleaning.

Hook Up

Fitting A Module

The fitting and/or exchange of modules should only be carried out by qualified persons. Please read the manual of the RackPack frame. It contains all information needed to fit a module as well as all safety and notes and warnings. If you don‘t have the manual at hand, you can download it like all SPL product manuals from our website http://www.soundperformancelab.com.

Symbols And Notes

IN THIS MANUAL A LIGHTNING SYMBOL WITHIN A TRIANGLE WARNS YOU ABOUT THE POTENTIAL FOR DANGEROUS ELECTRICAL SHOCKS – WHICH CAN ALSO OCCUR EVEN AFTER THE MACHINE HAS BEEN DISCONNECTED FROM A POWER SOURCE.

AN EXCLAMATION MARK (!) WITHIN A TRIANGLE IS INTENDED TO MAKE YOU AWARE OF IMPORTANT OPERATIONAL ADVICE AND/OR WARNINGS THAT MUST BE FOLLOWED. BE ESPECIALLY ATTENTIVE TO THESE AND ALWAYS FOLLOW THE ADVICE THEY GIVE.

The symbol of a lamp directs your attention to explanations of important functions or applications.

Attention

Do not attempt any alterations to this machine without the approval or supervision of SPL electronics GmbH. Doing so could nullify completely any and all of your warranty/guarantee rights and claims to user support.

Scope Of Delivery

The scope of delivery comprises:

- The module
- This manual
- A flat ribbon cable to connect and a jumper connector to configure two Transient Designer modules for LINK mode.
- Two Philips screws to mount the module to the back panel (if module is delivered separately from the frame). Further screws needed for mounting the module remain when you remove front and rear covers from the RackPack frame.

The new Transient Designer provides a revolutionary concept for level-independent dynamic processing. In this it differs in principle from common compressors that are based upon processing signals of a specific level. Working with the Transient Designer is very simple: Attacks can be amplified or attenuated and sustain may be prolonged or shortened. However, the possibilities for studio and live application are seemingly endless.

Technical foundation is **SPL's Differential Envelope Technology** (DET) which allows level-independent dynamic processing by calculating differences in generated envelopes. These envelopes are always tracking the curve of the original signal to provide optimal results in every moment of the music.

Thanks to the level-independent processing DET the setting of a threshold is needless. Other common controls of dynamic processing, such as ratio or parameters for time-constants are automated and optimized adaptively in a musical manner according to the characteristics of the input signal.

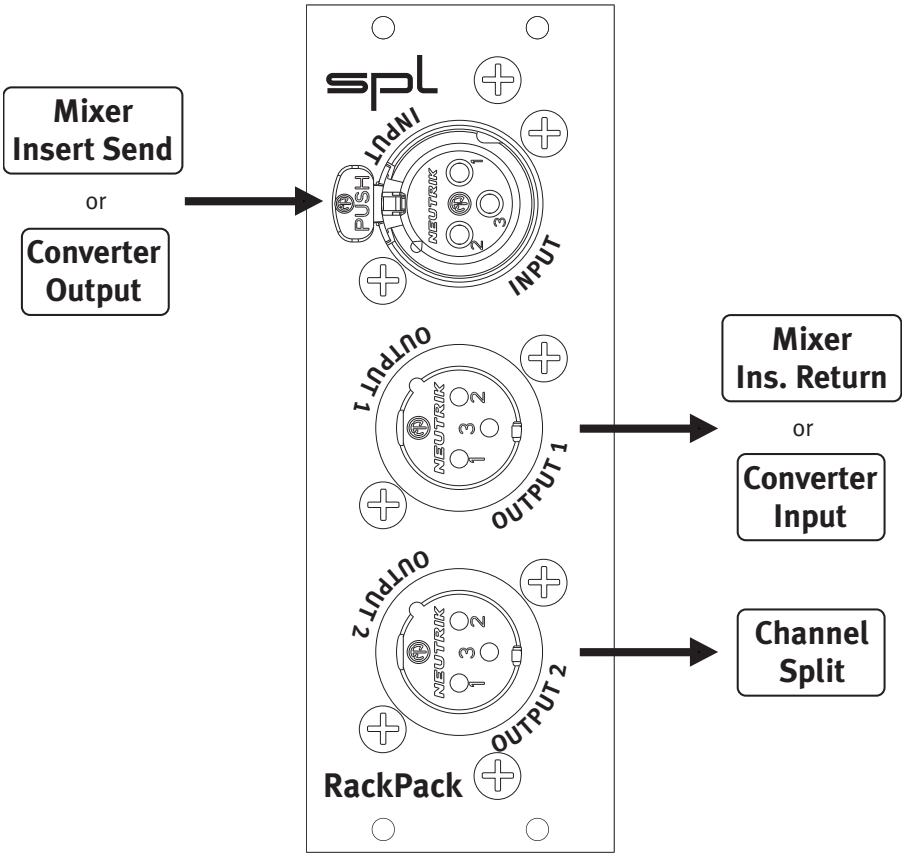
So only two controls per channel are required to allow the user to completely reshape the attack and sustain characteristics of a sound: attack can be amplified or attenuated by up to 15dB while sustain can be amplified or attenuated by up to 24 dB.

Thus, in a very obvious and simple way, the Transient Designer opens a whole new dimension in dynamic processing with entirely new, stunning and vast possibilities for dynamic manipulation and processing that cannot even be duplicated with several daisy-chained, conventional compressors or other dynamics devices.

A new feature of the Transient Designer module for the RackPack series is the **output gain control** that enables you to compensate changes in the level of the processed signal. This ensures a simple and safe adjustment of levels for any following device – especially A/D converters.

The Transient Designer uses the excellently specified **THAT 2181-VCAs**, which are particularly natural and transparent sounding and renowned for minimal distortion values. The 2181 processes highest amplitudes without damping of high frequencies or reducing bass.

Each channel is equipped with a **relay hard bypass** to ensure the switching audio signals directly from input to outputs in the case of a power failure. Signal flow is always maintained.

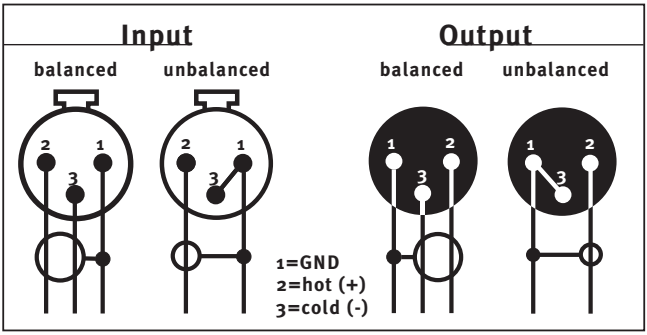

Mixer
Insert Send
or
Converter
Output
spl
INPUT
PUSH
NEUTRIK
1
2
3
INPUT
OUTPUT 1
NEUTRIK
1
2
3
OUTPUT 1
Mixer
Ins. Return
or
Converter
Input
OUTPUT 2
NEUTRIK
1
2
3
OUTPUT 2
Channel
Split
RackPack

The Transient Designer is fitted with one XLR input and two XLR outputs for balanced operation.

Pin-wiring of all XLR sockets:
Pin 1 = GND, Pin 2 = hot (+), Pin 3 = cold (-)

Discrete balancing stages for both in- and output provide high common mode rejection and are capable of driving long cables (depending on the capacity of the cables and the following input balancing stages).

The illustration shows the correct pin-wiring of the balanced XLR sockets if an unbalanced wiring is required.



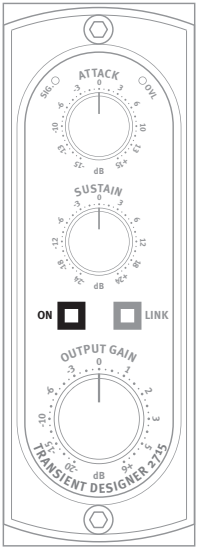
Lundahl I/O Transformers

The Input and Output 1 stages may be transformer-balanced if ordered (please refer to page 26 for detailed information). Otherwise, all inputs and outputs are balanced electronically. Output 2 cannot be fitted with a transformer. It is actively decoupled and allows for the input signal to be split into two output signals.

Channel Split

The channel split option through Output 2 always provides alternatives in processing or routing of the input channel. While one output may be used directly for mixing, the second output can be routed in any other way—for example to further RackPack modules, to a same module for LINK mode operation, to other effect units etc.

A very interesting LINK mode application for Transient Designer modules is described under “Applications/The Transfer Of Dynamic Structures” on page 16.



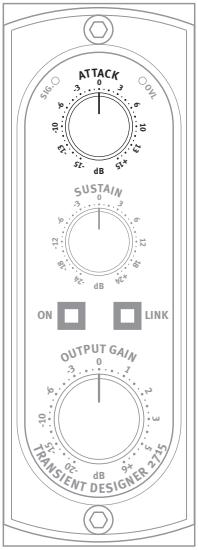
On

With the ON button you can turn the device on or off. The ON button is illuminated when the device is active.

Relay hard bypass circuits ensure signals to be directly switched from input to output in the case power failures – this “Power Fail Safety“ feature guarantees signal flow in any situation.

If you operate a Transient Designer module in LINK-Mode, the ON button of the master module controls both modules. The LINK and ON buttons of the Transient Designer module that is currently in LINK mode will thus be illuminated as well—although they have not been activated.

For more information on the LINK mode and the fitting of the LINK cable please refer to “Link Mode”, page 12.



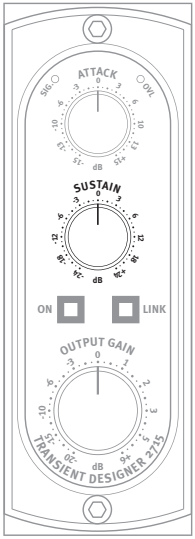
Attack

With the ATTACK control you can amplify or attenuate the attack of a signal by up to 15 dB. For more information on the operation of the ATTACK control please refer to “Technology” on page 19 cont.

The ATTACK control circuitry uses two envelope generators. One follows the shape of the original curve and adapts perfectly to the dynamic gradient. The second envelope generator produces an envelope with a slower attack. From the difference of both envelopes the VCA control voltage is derived. Positive ATTACK values emphasize attack events, negative ATTACK values smooth out the attack envelopes of sound events.

For an extensive description and explanation of the possible applications of the ATTACK control please refer to “Applications” on page 14 cont.

Sustain



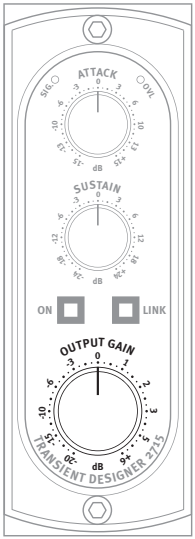
With the SUSTAIN control you can amplify or attenuate the sustain of a signal by up to 24 dB. For more information on the operation of the SUSTAIN control please refer to "Technology" on page 20 cont.

The SUSTAIN control circuitry also uses two envelope generators. One follows the shape of the original curve and adapts perfectly to the dynamic gradient. The second envelope generator produces an envelope with a longer sustain. From the difference of both envelopes the VCA control voltage is derived. The gradient of the control voltage matches the time flow of the original signal.

Positive SUSTAIN values lengthen the sustain, negative SUSTAIN values shorten the sustain.

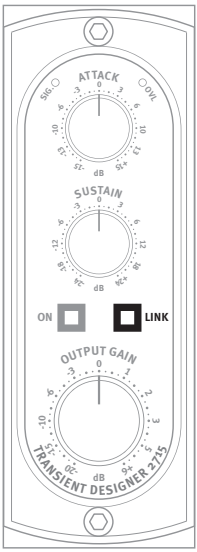
For an extensive description and explanation of the possible applications of the SUSTAIN control please refer to "Applications", page 14 cont.

Output Gain



The OUTPUT GAIN control allows you to reduce the output signal by up to -22dB or boost it by up to +6dB. This ensures that following devices receive an optimized level. The centered 12-o'clock position of the control equals odB output gain.

IMPORTANT: In LINK mode, the master module does NOT transfer OUTPUT GAIN settings to the slave-module. You ALWAYS have to set the output values of both modules manually.



Link Mode

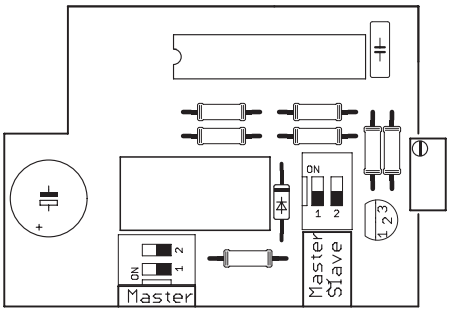
You can operate two Transient Designer modules at a time by activating the LINK mode. You can only run two modules in the LINK mode at a time. Main applications may be stereo processings. Another interesting example is the transfer of a rhythmical pattern or structure from one channel to another (see "The Transfer Of Dynamic Structures" on page 16).

When operated in LINK mode, both modules are operated by the master module's control voltage. This ensures a coherent stereo operation. In LINK mode, all controls of the master module—including the ON and LINK switch—control the slave module. The master also controls all switch illuminations on the slave. All controls of the slave module are inactive in LINK mode. **IMPORTANT: The only exception is the Output Gain control which always has to be set manually at each module.**

If you press the LINK button of the slave module without establishing the LINK mode through the master module, you will find that the LINK LED of the master module will not illuminate. This tells you that you have pressed the wrong LINK button since the controls of the master module control both devices in LINK mode.

Configuring Modules For LINK Mode

On the circuit board of the module you can see two twin dip switches.



One switch is positioned vertically. Below this dip switch you see labels: the left switch is the "Master" switch, the right switch is the "Slave" switch. On a master module, set the left switch upwards and the right switch downwards. On a slave module, set the switches the opposite way: left switch downwards, right switch upwards.

The other twin dip switch is positioned horizontally. On a master module, set both dips switches to the right. On a slave module, set both dip switches to the left.

Now connect both modules with the flat ribbon cable which is provided with each module that can be driven in LINK mode (for further details on this connection please refer to the RackPack frame manual).

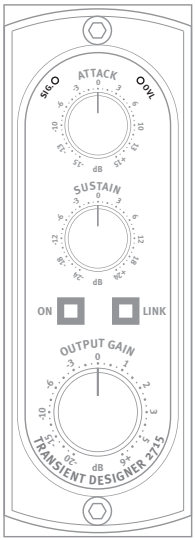
Since the modules are configured as master or slave with the dip switches on the circuit board, you have to decide upon their placement within the RackPack before you install them. It is customary that the left module serves as master and the right module serves as the slave.

If two properly connected modules can not be run in LINK mode, chances are that the dip switches are in the wrong position. The switches in both modules could be in the same position for example (upon delivery the switches of all modules are set to activate the module's master mode).

Check the position of the dip switches on both modules and change them according to the configuring information on page 12.

Signal LED

The SIG. LED indicates that an audio signal reaches the input with a level above -20 dB. This LED helps the operator especially in complex setups to determine immediately whether the Transient Designer actually receives any signal.



Overload LED

The OVL LED indicates a potential internal overload. It begins indicating approximately 3 dB ahead of any expected overload to leave headroom for peak levels.

Overloads must be avoided to exclude audible distortions. The gaining is still perfect in most cases when the OVL LED is illuminating shortly since there's still a headroom of 3 dB for peak levels.

Permanent illumination of the OVL LED indicates overloads with possible audible distortions. Reduce the Output Gain control if the OVL LED illuminates permanently until the OVL LED goes out or flashes shortly.

The Transient Designer is ideally suited for use in professional recording, in project or home studios and sound reinforcement applications.

For the first time you can manipulate and control the attack and sustain characteristics of a signal regardless of level in the most intuitive and simple way. Usually equalizers are used to separate instruments in a mix – the tonal aspect of the signal is considered, but not the temporal aspect.

The Transient Designer opens this further dimensions in signal processing. By manipulating the attack and sustain curves of a sound event, the mix can be made to sound more transparent. Instruments can be mixed at lower levels while still maintaining their positions in the mix—but occupying less space.

During a remix or in general after miking you can arrange new positions of instruments. Reduce ATTACK and increase SUSTAIN to move signals back into the mix that are too present. Additionally the FX parts of too dry signals are strengthened.

Applied to single instruments or loops the Transient Designer allows you to create entirely new sounds and/or effects.

The following examples are given as suggestions and examples. The described procedures with specific instruments can of course be transfered to others which are not mentioned here.

Drums & Percussions

Processing drum and percussion sounds is probably the Transient Designer's most typical range of application, both from samples to live drum sets:

- Emphasize the attack of a kick drum or a loop to increase the power and presence in the mix.
- Shorten the sustain period of a snare or a reverb-flag in a very musical way to obtain more transparency in the mix.
- When recording a live drum set, shorten the toms or overheads without physically damping them. Usual efforts to damp and mike are reduced remarkably. Since muffling of any drum also changes the dynamic response, the Transient Designer opens up a whole new soundscape.
- Miking live drums is considerably faster and easier because you can correct the apparent 'distance' of the microphone by simply varying the ATTACK and SUSTAIN values.

- The Transient Designer is a perfect alternative to noise gates in live drum miking. Adaptively reacting to the duration of the original signal, the sustain is shortened more musically than with fixed release times and a drumset is freed from any crosstalk quickly and effectively.
- Create unusual dynamic effects including new and interesting pan effects. For example, patch a mono loop through two channels of the Transient Designer and pan fully left and right in the mix. Process the left channel with increased ATTACK and reduced SUSTAIN while you adjust the right channel the opposite way and you get very special stereo loop sounds. You have to try this to appreciate what it sounds like, but expect to hear a lot of unusual stereo movement.
- Enjoy an amazingly simple integration of drum sounds into a mix. If the acoustic level of a snare is expanded to approximately +4 dB by increasing the attack value, the effective increase of peak levels in the overall mix is merely about 0.5 dB to 1 dB.

Drums: Ambience

If your drums happen to sound as if the room mics have been placed in a shoe closet, the Transient Designer can immediately turn that sound into the ambience of an empty warehouse. Just send the stereo room mics through two Transient Designer modules in LINK mode and crank the ATTACK control to emphasize the first wave.

Now slowly increase SUSTAIN values to bring up a “all-buttons-in-1176-sound“ room tone—but without pumping cymbals. For a solid and driving rhythm track just fine-tune the SUSTAIN control to make sure that the room mic envelope ends more or less exactly on the desired upbeat or downbeat.

Guitars

Use the Transient Designer on guitars to soften the sound by lowering the ATTACK. Increase ATTACK for in-the-face sounds, which is very useful and works particularly well for picking guitars. Or blow life and juice into quietly played guitar parts.

Distorted guitars usually are very compressed, thus not very dynamic. Simply increase the ATTACK to get a clearer sound with more precision and better intonation despite any distortion.

Heavy distortion also leads to very long sustain. The sound tends to become mushy; simply reduce SUSTAIN to change that. If you, however, want to create soaring guitar solos that would make even David Gilmour blush, just crank up the SUSTAIN control to the max and there you go.

With miked acoustic guitars you can emphasize the room sound by turning up SUSTAIN. If you want the guitars to sound more intimate and with less ambience, simply reduce SUSTAIN.

The Transfer Of Dynamic Structures

This application requires two modules in the basic and four modules in stereo mode. Feed a master module with a kick drum track and select high ATTACK values. Don‘t care about the output signal, it is not used or plugged anywhere.

Now feed the second module with a keyboard track for example. Run this second module as slave in LINK mode. The attack of the kick drum will now be applied to the keyboard track. If you vary the ATTACK or the SUSTAIN of the master module you can easily optimize the results.

This method is also very useful to make kick drum and bass fit together like a hand and glove. The bass simply receives the attack of the kick drum. If kick drum and bass are already tight, added ATTACK on the kick drum track emphasizes the transfer of drum attacks to the bass track. If kick drum and bass are less tight, SUSTAIN variations on the kick drum track allow you to “catch” the bass and get it closer and tighter to the kick drum.

Bass: Staccato vs. Legato

Speaking of bass: Imagine a too sluggishly played bass track ... you may not have to re-record it: Reduce the SUSTAIN until you can hear clear gaps between the downbeats—the legato will turn into a nice staccato, driving the rhythm-section forward.

The Re-Invention Of Reverb

With all reverb applications mentioned below, the left and right channels of the Transient Designer are connected to the DAW or console and panned hard to left and right (or where they would have been panned to without the Transient Designer) to achieve the same stereo image.

Always and everywhere the same reverb presets – boring, aren't they? Try looping the left and right output of your reverb through two linked Transient Designer modules. Now crank the master ATTACK control to the max and reduce SUSTAIN to a bare minimum. The intensity of the reverb is now much higher in the beginning while the reverb time is reduced.

The opposite can be just as intriguing: manipulate a reverb pattern so that it takes on a pyramidal slope. Turn the ATTACK all the way to the left and SUSTAIN all the way to the right. Now the beginning of the reverb is strongly reduced whereas the sustain blossoms and seems almost endless (obviously that will only happen if the decay of the reverb in the actual reverb device has been set to a sufficient value—a signal must always be present as long as the sustain time lasts.)

You can also create a reverb effect that moves from one channel to the other. Reverb presets with a long decay or a long pre-delay and especially those that have flamboyant reflections set to appear after the beginning of the diffuse reverberation tail are predestined for that. Insert the left and the right channel of the reverb through two Transient Designer modules that are NOT running in LINK mode this time. Turn the ATTACK fully right on one module and reduce SUSTAIN slightly (about -1.5 dB). On the other module turn the ATTACK fully left and the SUSTAIN to the 3-o'clock position (about +12 dB).

These settings preserve the original complexity of the reflections in the reverb but the maximum intensity of the effect will move from the left to the right in the mix while the reverb will maintain it's presence in both channels. You can make this effect even more dramatic by setting all controls to their most extreme positions, but you run the danger of ending up with an lopsided effect that appears out of balance.

Backings

A common problem especially with tracks that are recorded and mixed in different studios: Backings lack of ambience, and finding a reverb that "matches" takes time ... so simply emphasize the original ambience by turning up the Transient Designer's SUSTAIN control.

And the opposite problem, too much ambience, is similarly simply solved with the opposite processing—just reduce SUSTAIN.

Keyboards & Sampler

Sounds in keyboards and samples are usually highly compressed and maintain only little of natural dynamics. Increase the ATTACK values to re-gain a more natural response characteristic. The sounds occupy less space in the mix and appear more identifiable even at lower volumes.

Post Production

When dealing with overdubs in movies you can easily add more punch and definition to effect sounds from any sample library.

The same applies to outdoor recordings that suffer from poor microphone positioning—simply optimize them afterwards.

Mastering

Like with any good thing, you also have to know where not to use it. For example, using a Transient Designer in mastering is not recommended, as it is rarely a good idea to treat a whole mix at once. Instead, treat individual elements within the mix.

Of course you don't have to know how the Transient Designer works in order to use it. However, since it offers a completely novel signal processing, nothing shall be concealed from the more curious users.

Differential Envelope Technology (DET)

SPL's DET is capable of level-independent envelope processing and thus makes any threshold settings unnecessary. Two envelopes are generated and then compared. From the difference of both envelopes the VCA control voltage is derived. The DET ensures that both low and loud signals (pianissimo to fortissimo) are treated the same way.

Both ATTACK and SUSTAIN control circuitries operate simultaneously and don't affect each other.

The ATTACK Control Circuitry

The ATTACK control circuitry uses two envelope generators. The first one generates a voltage (Env 1) that follows the original waveform. The second envelope generator creates the envelope Env 2 with a slower attack envelope.

Diagram 1: Generated Envelopes (Attack)

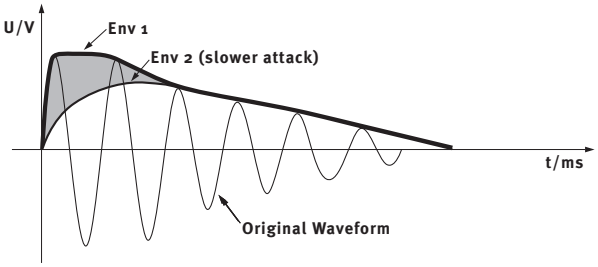


Diagram 1 illustrates the original curve and the two created envelopes that control the ATTACK processing. Envelope generator Env 1 follows the original waveform. Env 2 is generated with reduced attack.

Diagram 2: Calculated Control Voltage (Attack)

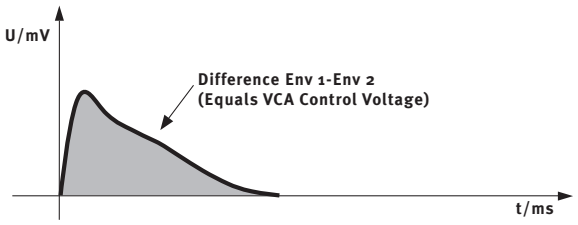


Diagram 2 shows the difference between Env 1 and Env 2 that defines the control voltage of the VCA. The shaded area marks the difference between Env 1 and Env 2 that controls the control voltage of the VCA. The amplitude of the attack is increased if positive ATTACK values are set. Negative ATTACK values reduce the level of the attack transient.

Diagram 3: Processed Waveforms (Attack)

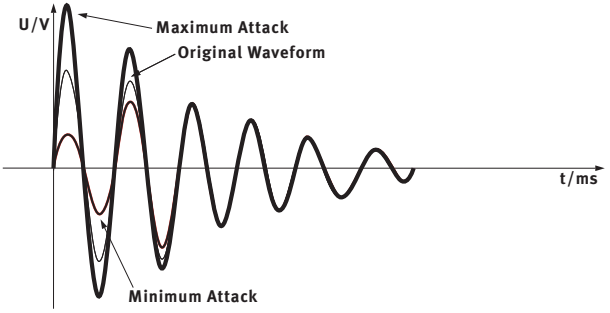


Diagram 3 displays the processed waveforms with maximum and minimal ATTACK to compare against the original waveform in diagram 1.

The SUSTAIN Control Circuitry

The SUSTAIN control circuitry also plays host to two envelope generators. The envelope tracker Env 3 again follows the original waveform. The envelope generator Env 4 maintains the level of the sustain on the peak-level over a longer period of time.

The control voltage of the VCA is again derived from the difference between the two voltages. Sustain amplitude is increased for positive SUSTAIN settings and reduced for negative settings.

Diagram 4: Generated Envelopes (Sustain)

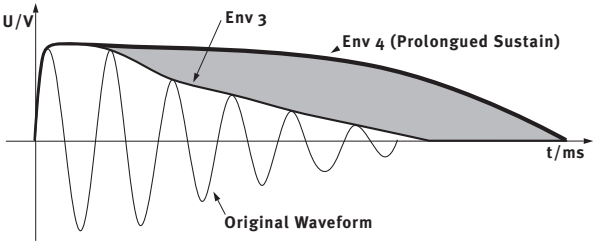


Diagram 4 illustrates the original waveform and the envelope creation to control the SUSTAIN processing. Envelope generator Env 1 follows the original waveform, Env 2 is generated with prolongued sustain.

Diagram 5: Calculated Control Voltage (Sustain)

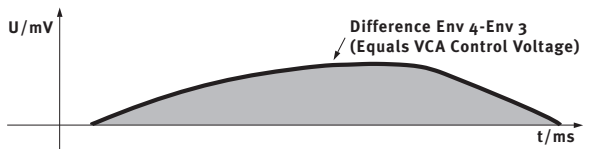


Diagram 5 shows the difference between Env 4 and Env 3 that defines the control voltage of the VCA.

Diagram 6: Processed Waveforms (Sustain)

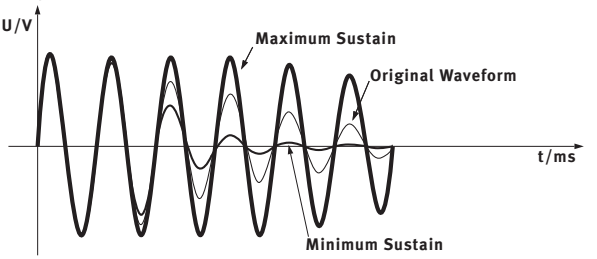


Diagram 6 displays the processed waveforms with maximum and minimal sustain to compare against the original waveform in diagram 4.

Specifications

Audio

Frequency Response	10 Hz - 70 kHz
CMRR (at 1 kHz with 0 dBu input level/unity gain)	-80 dBu
THD&N (0 dBu input level/unity gain)	0,019%
Noise (A-weighted)	-89 dBu
Dynamic Range	111,0 dB

Input

XLR connector, electronically balanced,
optionally transformer balanced

Impedance	ca. 20 kOhm
Max. Input Level	+21 dBu

Outputs

XLR connectors, electronically balanced,
Output 1 optionally transformer balanced

Output 1

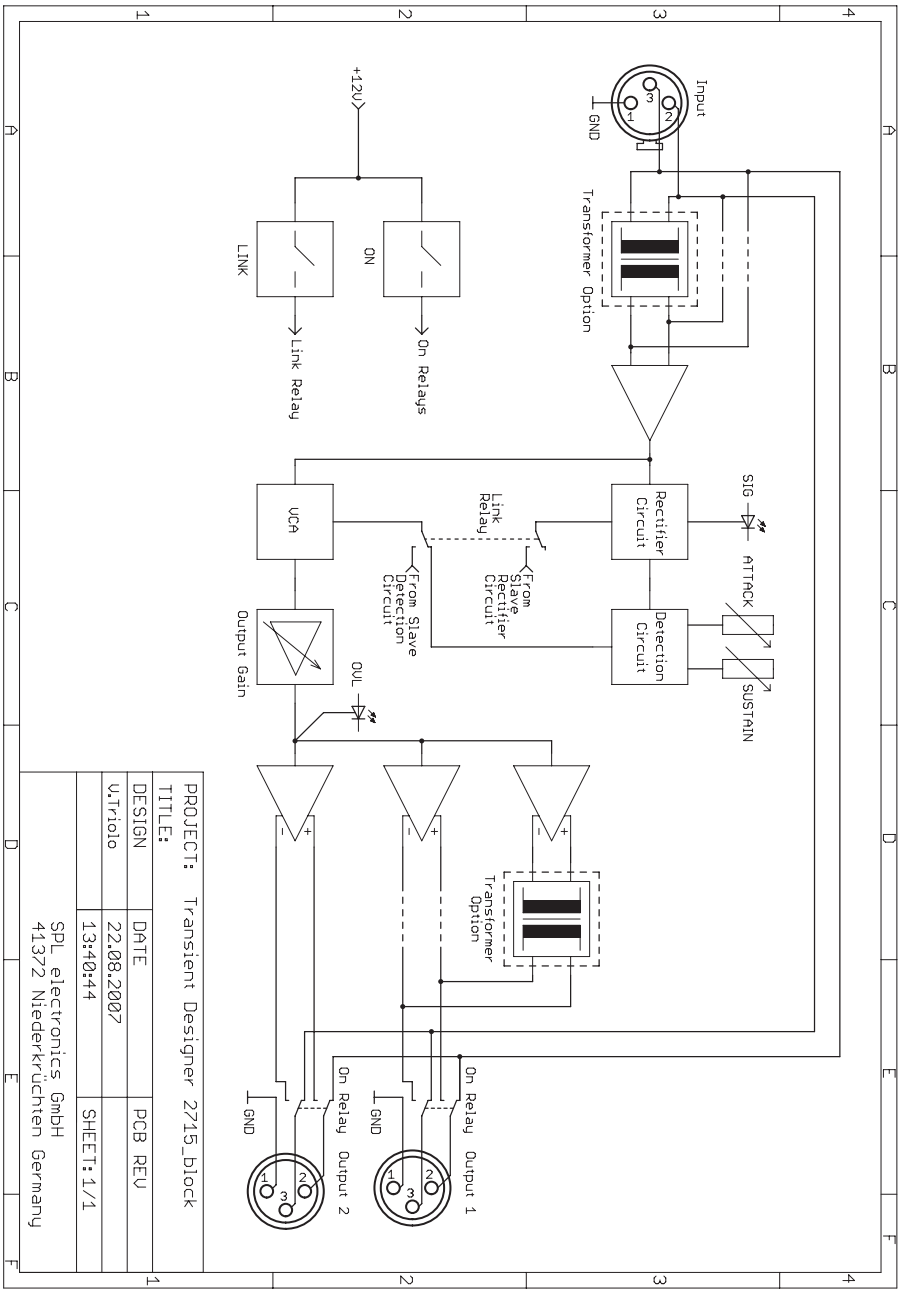
Impedance	ca. 150 Ohm
Max. Output Level	+22 dBu

Output 2

Impedance	ca. 150 Ohm
Max. Output Level	+22 dBu

Dimensions & Weight

Height x Width x Depth	132 mm x 46,9 mm x 315 mm/ 5.17 x 1.85 x 12.40 inches
Weight	0,45 kg/0.99 lbs
Weight with Transformers	0,65 kg/1.43 lbs


Input
GND
Transformer Option
+12V
LINK
ON
Link Relay
On Relays
VCA
Link Relay
From Slave Detection Circuit
From Slave Rectifier Circuit
Rectifier Circuit
Detection Circuit
SIG
ATTACK
SUSTAIN
Output Gain
OVL
Transformer Option
GND
On Relay Output 2
GND
On Relay Output 1
PROJECT: Transient Designer 2715_block
TITLE:
DESIGN
v.Triolo
DATE
22.08.2007
13:40:44
PCB REV
SHEET: 1/1
SPL electronics GmbH
41372 Niederkrüchten Germany

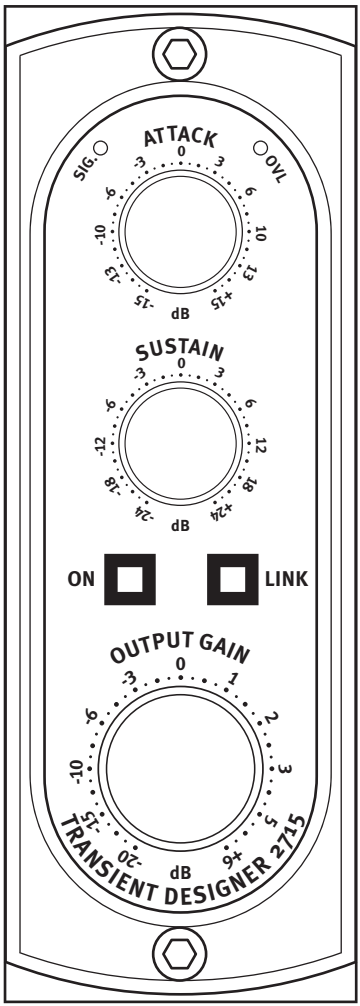
As an option, the Transient Designer RackPack module can be fitted with input and output transformers from Lundahl. The transformer options can only be ordered by purchase, a later upgrade is not possible.

Information On Lundahl I/O Transformers

Transformers have a pleasant sound characteristic, especially the low end sounds rounder and more full-bodied. The top end benefits from a softer and silky atmosphere without being emphasized.

Further advantages are aspects of improved operational safety: galvanic insulation excludes the transmission of damaging currents. Electromagnetic, high frequency or digital interferences have no influence on the signal quality, hum potentials are cancelled out.

From our listening experience we can recommend Lundahl I/O transformers in any case, and their improved operational safety is an advantage that can not be overestimated in any critical or complex studio, broadcast or sound reinforcement installation.



Artist:

. . . . . .

Album:

. . . . . .

Title:

. . . . . .

Engineer:

. . . . . .

Track(s)/Group(s):

. . . . . .

Date:

. . . . . .