SPL

Manual
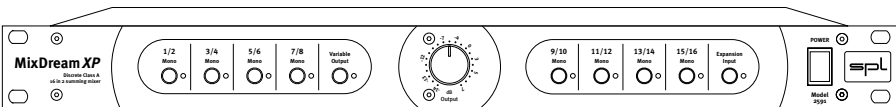

MixDream XP
Model 2591

Analog 16:2 summing unit

Version 1.0, 5/2005

Designer: Ruben Tilgner

This manual 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.

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CE Declaration of Conformity

Manufacturer: SPL electronics GmbH

Type of Equipment: Audio Signal Processor

Product: MixDream XP, Model 2591

Compliance Engineer: Wolfgang Neumann

Test Basis:
EN 50081-1:1992, EN 50082-1:1992, EN 60065:1993, EN 61000-3-3:1995, EN 60065:2002, EN 55013:2001, EN 55020:2002, EN 61000-3-2:2000, 73/23 EWG; 93/68 EWG.

We herewith declare, that the construction of the MixDream XP, model 2591, is in compliance with the standards and regulations mentioned above.

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Introduction

The MixDreamXP design plan provides for stereo mixdown at the analog level. This concept offers high-grade analog summing without panorama and fader controls, in turn allowing an engineer to retain the entire scope of his computer automation. In use, the MixDreamXP requires almost no departures from an engineer's usual working mode, so that all his trusted DAW features and familiar working routines remain available while the MixDreamXP seamlessly expands his aural mixing palette.

One MixDreamXP can sum up to 16 audio tracks to a stereo signal, and should the need arise for more than 16 tracks, several MixDreamXP may be linked together. Owners of a MixDream, model 2384, can expand this unit with the cost effective MIxDreamXP at an identical quality level and by the way, that's where the suffix "XP" comes from (=Expansion).

The MixDreamXP discrete class A technology is based on the same 60-volt rails (+/- 30V) of the MixDream model 2384. Newly developed circuitry, based on the most modern analog components, guarantees an extremely high slew rate, a very low noise level of -97 dBu and a dynamic range of 125 dB. Thus the MixDreamXP easily reaches the technical level of the best analog consoles.

Analog vs. Digital Summing

Nowadays, many are asking whether analog summing is better than digital summing. But perhaps the real question is whether digital summing better than analog summing? We at SPL don't know of anyone who says so. We do know that summing with the MixDreamXP creates an amazing signal depth, precise localization and a wonderful stereo imaging. Moreover, the addition of individual instruments results in soft and pleasant transitions.

These are analog summing results that we appreciate from past decades of the best analog technology. The MixDreamXP now allows DAW users to exploit this potential with maximum comfort and uncompromising quality, ensuring that nothing can stand in the way of the engineer's having the best of both analog and digital worlds.

MixDreamXP Advantages—An Overview

- High-grade analog summing on just 1U rack space for amazing signal depth, precise localization and a wonderful stereo imaging
- No analog mixing console necessary
- No loss of computer automation
- Lower DAW processor utilization rates
- Latency free monitoring
- Surround capable (from up to 3 MixDream XP units)
- Channel capacity expandable through linked units
- Cost-effective expansion for the MixDream model 2384

Special Features

Connection of Sampler, Keyboards etc.

Along with DAW audio tracks and effects machines or processors in the insert loops, samplers, keyboards and expanders may also be connected directly to the MixDreamXP. Then the Midi tracks need only be added in the DAW project, the outputs (for example, from a keyboard) are then routed directly to the MixDreamXP.

Mono Controls

To save converter channels, all channels may be switched to Mono so that two signals can be converted by a paired D/A.

In this case such signals are characteristically chosen which would receive a more central placement in the stereo mix (e.g. kick, snare, lead vocal, bass). All channel pairs must otherwise be panned hard left/right in the mix (see „mono switches" on page 10).
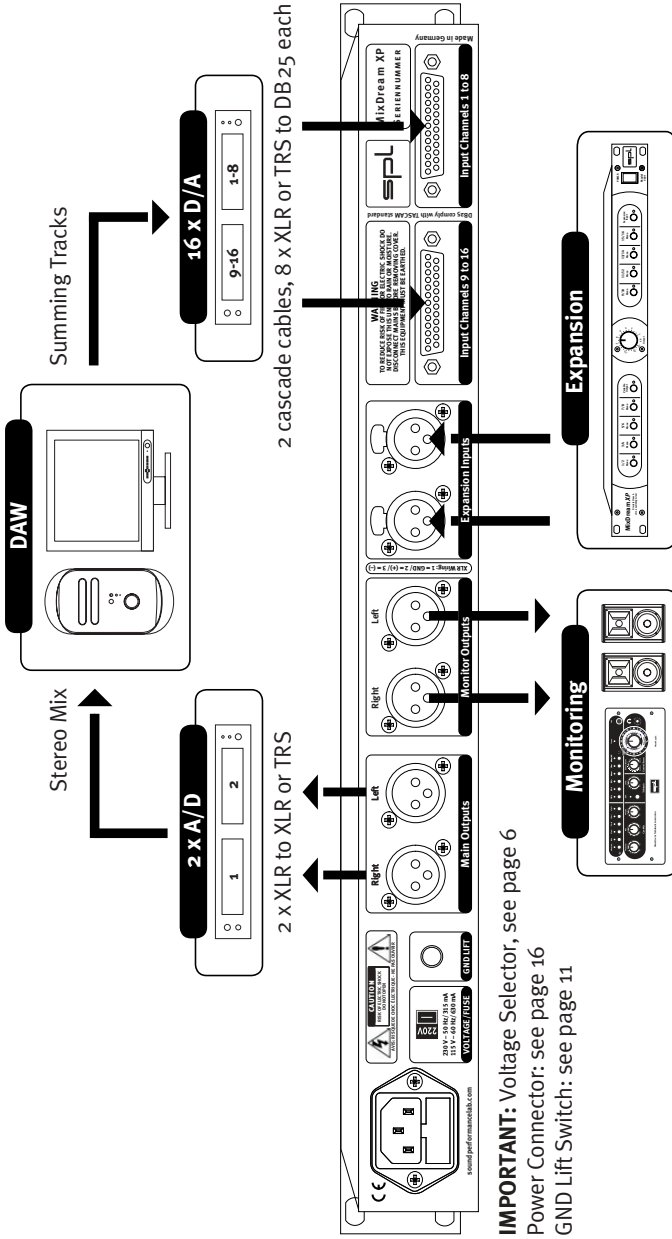
Before You Begin

It makes good sense to think about where you place your MixDream XP before connecting it. It should be positioned so that you can easily reach it, but there are other considerations. Try not to place it near heat sources or in direct sunlight, and avoid exposure to excessive vibrations, dust, heat, cold or moisture. It should also be kept away from transformers, motors, power amplifiers and digital processors.
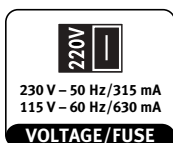
IMPORTANT: Adjust the voltage setting on the rear panel so that it corresponds to your local power conditions! Before connecting the MixDream XP or any other equipment turn off all power!

220V

230 V – 50 Hz/315 mA
115 V – 60 Hz/630 mA
VOLTAGE/FUSE

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
AVIS: RISQUE DE CHOC ÉLECTRIQUE - NE PAS OUVRIR

- Do not open the case. You may risk electric shock and damage to your equipment.

- Leave repairs and maintenance to a qualified service technician. Should foreign objects fall inside the case, contact your authorized dealer or support person.

- To avoid electric shock or fire hazards, do not expose your unit to rain or moisture.

- In case of lightning, unplug the unit.

- Always unplug the cable by pulling on the plug only; never pull on the cable.

- Never force a switch or knob.

- Use a soft, lint-free cloth to clean the case. Avoid cleaning agents as they may damage the unit. if necessary, use an acid-free cleaning oil instead.

Summing Tracks

16 x D/A

1-8   9-16

2 cascade cables, 8 x XLR or TRS to DB25 each

DAW

Stereo Mix

2 x A/D

2   1

2 x XLR to XLR or TRS

Expansion

Monitoring

MixDream XP
SERIENNUMMER
Made in Germany

Input Channels 1 to 8

DB25 comply with TASCAM standard

Input Channels 9 to 16

WARNING
TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK DO
NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.
DISCONNECT MAINS BEFORE REMOVING COVER.
THIS EQUIPMENT MUST BE EARTHED.

Expansion Inputs

XLR Wiring: 1 = GND / 2 = (+) / 3 (–)

Monitor Outputs

Left   Right

Main Outputs

Left   Right

CAUTION

VOLTAGE/FUSE
230 V - 50 Hz/355 mA
115 V - 60 Hz/630 mA
230V

GND LIFT

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C€

IMPORTANT: Voltage Selector, see page 6
Power Connector: see page 16
GND Lift Switch: see page 11

Connect the Main Outputs of a second MixDream XP
to the Expansion Inputs of the first one.
IMPORTANT: see page 10 for further information.

Monitoring outputs for any stereo monitoring chain.
Recommended: SPL MTC 2381 Monitoring
Controller with Talkback and Cue-Mixing.

**Pin wiring of all input and output connectors on page 8.**

SPL

The MixDream XP enclosure is EMC-safe and effectively shielded against HF interference. Nonetheless, you should carefully consider where you place the unit to avoid electrical disturbances.

The MixDream XP and all devices to be connected should be turned off before connections are made. Always turn volume down or mute your speakers when disconnecting or repatching audio cables to avoid damage to your speakers and ears.

The following graph shows the correct wiring for connecting unbalanced signals to the balanced XLR I/O connectors:
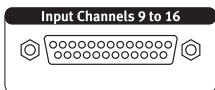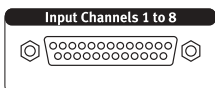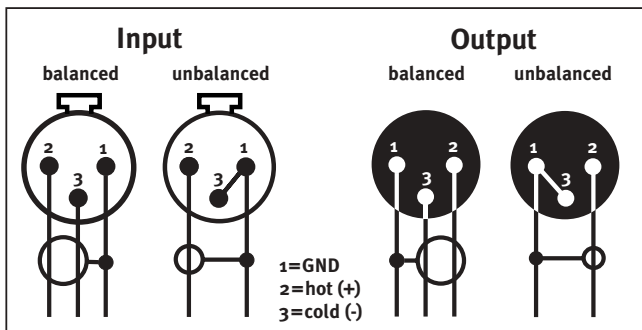
Input Channels

The MixDream XP has 16 electronically balanced inputs that are connected over two DB 25 connectors. Readily configured cascade cables from XLR or 1/4 inch TRS to DB 25 are available in many audio stores.

Usually the analog outputs of a D/A converter that transmit the summing tracks from the DAW are connected here. These connectors conform to the Tascam standard with pin layout as pictured below:
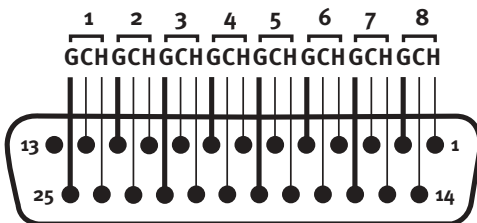
G= GROUND (Masse), C=COLD (-), H=HOT (+)

Main Outputs

The Main Outputs provide a stereo mixdown for a recording device through electronically balanced XLR outputs. Here as a rule you will route the stereo mix through an A/D converter for re-recording as a new DAW track.
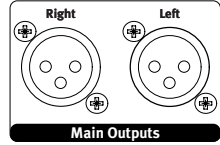
Monitor Outputs

The Monitor Outputs run parallel with the Main Outs and provide for separate monitoring of the stereo mixdown through electronically balanced XLR outputs.
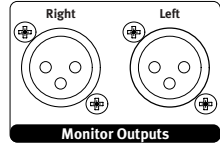
TIP: SPL's Monitor & Talkback Controller MTC 2381 offers all necessary control functionality for DAW monitoring at this stage.

IMPORTANT: Since Main and Monitor Outs function in parallel, using a non-balanced connection in one results in both outputs being unbalanced.

Expansion Inputs

This is another stereo input based on electronically balanced XLR connectors. It can be activated with the Expansion Input switch at the right set of switches on the front. Usually the Main Outputs of another MixDreamXP are connected here to enable summing of up to 32 channels, but of course any (stereo) summed signal can be connected here.
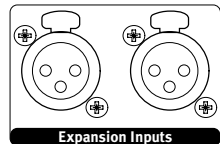
IMPORTANT: The Expansion Inputs of the summing MixDreamXP must be connected to the Main Output of the second MixDreamXP—never connect both Expansion Inputs!

TIP for owners of the MixDream 2384: A MixDreamXP should always be used for Mixdream 2384 expansion. This way you can always make use of the processing stages of the MixDream 2384 for the final stereo mix (Stereo Expander, Limiter, Master Insert, Output Transformers).

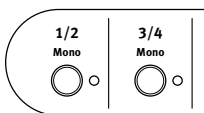*MixDream XP*

Control Elements
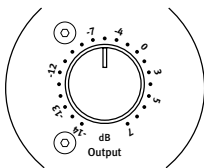
Output Control

The Output control regulates the MixDreamXP output level (at the Main Outs). Its range extends from -14 dB to +7 dB. With this Output Control final levels can be ajdusted to accommodate subsequent A/D converters. Because the Main Outputs and Monitor Outputs run in parallel, both outputs are regulated globally via this control.
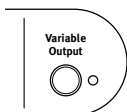
Variable Output Switch

The Output Control is activated by the Variable Output switch situated among the front-left group of switches. When this Variable Output switch is deactivated, the Input Level remains unaltered (Unity Gain).

Mono Switches

All MixDreamXP channel pairs (1/2 through 15/16) are by default panned hard left/right. This configuration is the only sensible way in which each signal contributing to the stereo sound canvas can retain its placement and automated characteristics.

However, for mono signals (such as kick, snares, lead vocals or bass that should appear in the middle of a mix), it would be a waste to use (in hard L/R panned channels) what would amount to two required converters for a mono result. In such cases, each channel pair can be switched to mono mode (red status LED), so that, for example, there might be a (mono) kick on channel 1, snare on channel 2 and bass on channel 3, etc. **IMPORTANT:** Panning for such instruments in the sequencing program should place the kick hard left, the snare hard on the right, and so on.
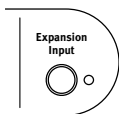
Expansion

The Expansion Inputs provide an additional XLR stereo input (see page 9 for details) and can be activated by the Expansion Inputs Switch in the front-right group of switches. Typically this stereo input would provide for linking with another MixDream XP unit.

MixDream XP

GND Lift Switch (Rear Panel)

The GND Lift switch separates internal ground from chassis ground. The switch can be activated to eliminate ground loop humming which may occur if the MixDreamXP is connected to units with a different ground potential. The switch should normally be in the GND position to maintain the shielding effect of the metal housing.

Applications and Modes of Operation

Summing

Tracks destined for analog summing are routed from the DAW to the MixDreamXP via A/D converters. Identical converters are ideal to exclude level and sound differences.

Although you may often wish to sum more than 16 tracks, a general recommendation to reduce track numbers is to route those tracks to a common output bus of the sequencing program which are not played back simultaneously in your arrangement. This way you avoid digital summing and your production benefits from the full potential of 100% analog summing.

With mono signals one should switch these to mono mode to confine them to single D/A converter, thereby avoiding the waste of having to use a D/A pair for one mono track (see „Mono Switches" on page 10). **IMPORTANT:** In the DAW such signals must be panned hard left or right.

Summing of Subgroups

To reduce track numbers, there are two other options besides the above mentioned „Summing" tip:

Well, you could buy additional MixDreamXP (which we confess would make us happy—and we're sure would not disappoint you) or sum your grouped tracks with the MixDreamXP itself.

For example, if you've done a chorus backup in 16 solo tracks, you can adjust your panning in the DAW and the MixDreamXP sums a stereo mix which is recorded again—the sound benefits of analog summing are larger than the disadvantage of a further A/D-D/A conversion.

MixDream XP

Applications and Modes of Operation

MixDream XP in Mastering Applications

Your MixDreamXP is predestined for mastering applications, as we've planned its superior sound quality for just such occasions.

Two applications are especially interesting: 1) discrete Mastering, and 2) upsampling to SACD/DVD-A formats.

1) Normally a studio mastering engineer requires that a stereo file be made available for his or her work. But in such a mixdown, any problems (for example, significant variations in volume among instrumental subgroups) will mean equally significant limitations to your final mastering options. Instead, however, if one masters from a discrete mix with single tracks or subgroups, each of these can be adjusted just as easily and quickly in the mastering process—to the extent that even individual groups can be tweaked with different processing. Your final result is clearly better and the time needed, minimal—especially since it is less likely that a new mix will be called for.

2) Multichannel sessions can be summed in the infinite resolution of analog signal processing equipment, something that may also be of special importance when an engineer wishes to upsample to SACD or DVD-A.

Linking Several MixDream XP

An expansion connector provides for a second MixDreamXP input should 16 channels not suffice. **IMPORTANT:** The **Main Outputs** of the second MixDreamXP must be connected to the Expansion Inputs of the first unit; **do not connect both Expansion Inputs.**
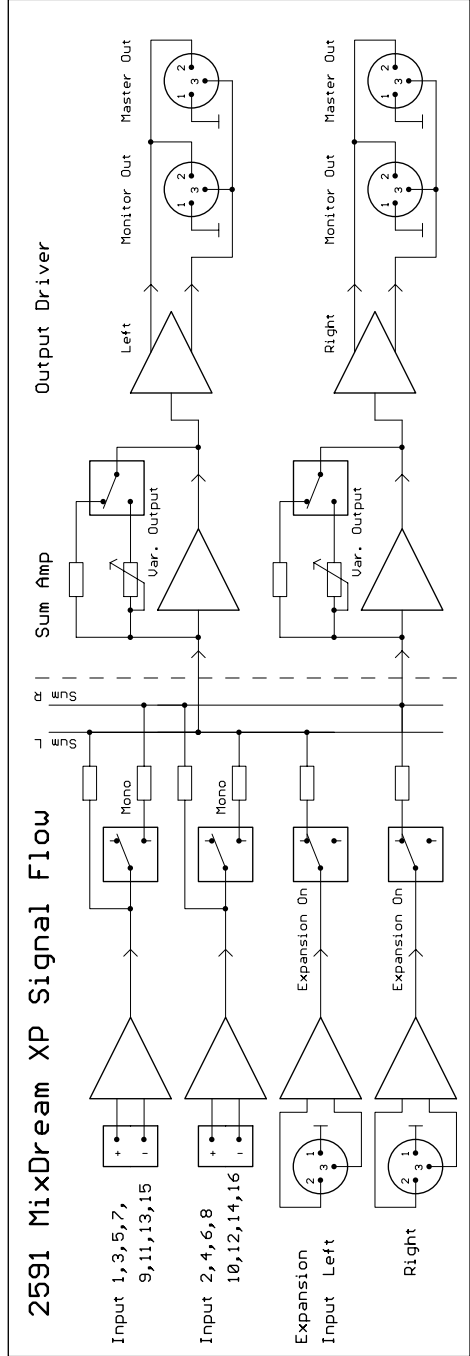
If more than two MixDreamXP are to be summed, we recommend to employ a further MixDreamXP as master—otherwise the signals from the first MixDreamXP (to cite a "worst case scenario") would unnecessarily be summed in each following unit.
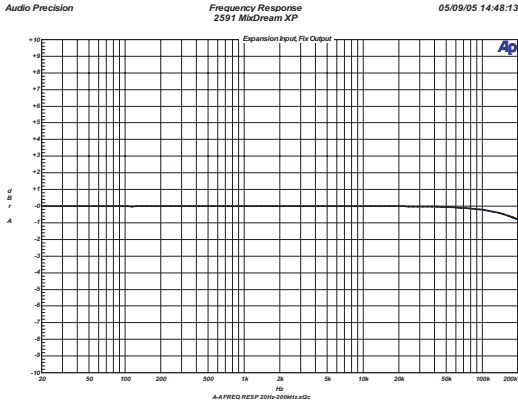
In such a chain One MixDreamXP is connected to the Expansion Inputs while all other units are connected to the usual (DB25) Input Channels (see graphic on the next page).

One further MixDream XP is always connected to the Expansion Inputs.
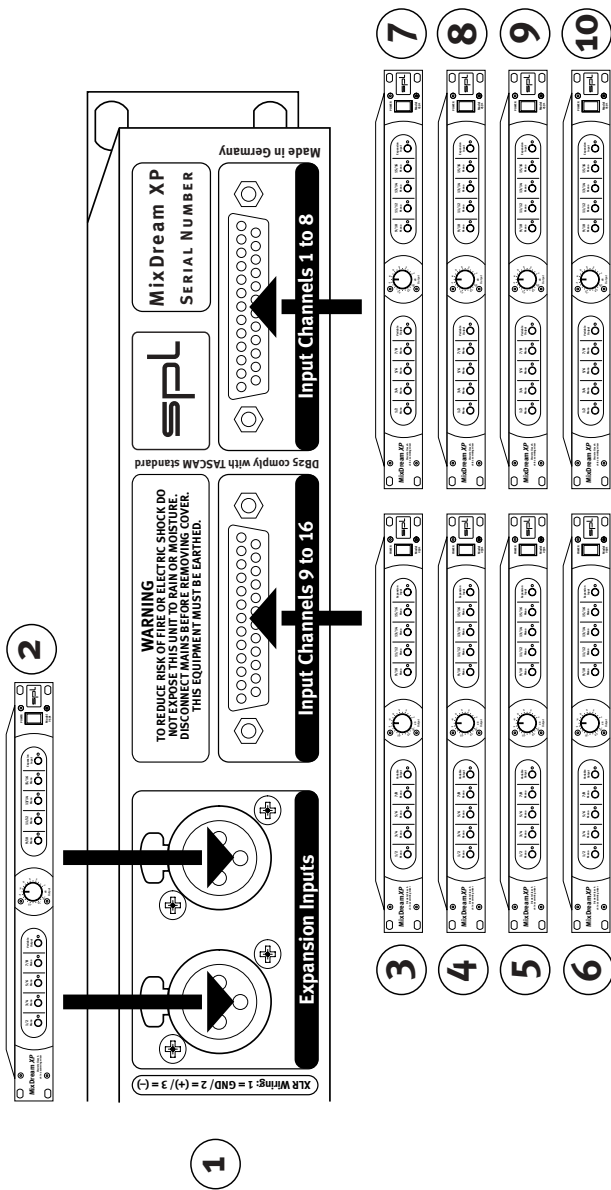
From up to two further units the Input Channels of a "Master" MixDream XP are used in addition to the Exp. Inputs. Do not connect the units in a chain through the Exp. Inputs, as the signals of further units would unnecessarily be summed again. Three units provide a total of 46 channels for summing (50 incl. the free Exp. Inputs used as signal inputs). The maximum configuration comprises 10 MixDream XP and sums 144 channels (162 incl. the free Exp. Inputs used as signal inputs).

Block Diagram

2591 MixDream XP Signal Flow

Input 1,3,5,7,
9,11,13,15

Input 2,4,6,8
10,12,14,16

Expansion
Input Left

Right

Sum L   Sum R

Sum Amp

Output Driver

Var. Output

Left

Right

Monitor Out   Master Out

Mono

Mono

Expansion On

Expansion On

Audio Precision

Frequency Response
2591 MixDream XP

05/09/05 14:48:13

Expansion Input, Fix Output

A-A FREQ RESP 20Hz-200kHz.xGc

Well, we think this is „linear frequency response" in the word's best possible sense: even at 200kHz the fall-off is below -1dB.

And mind you, typical frequency response measurements are related to a -3dB fall-off.

Audio Precision

FFT Spectrum Analysis
2591 MixDream XP

05/09/05 14:41:38

Expansion Input   Noise Spectrum

A-A FFT Noise .xGc
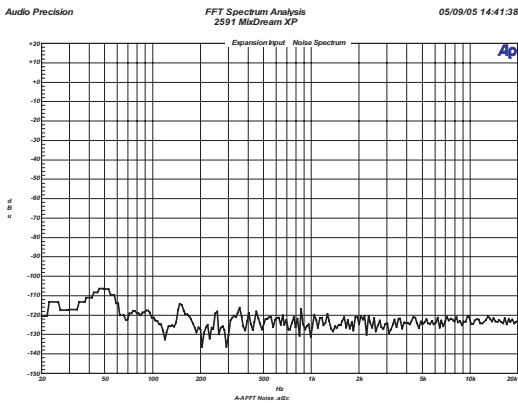
The FFT Spectrum Analysis above shows the spectrum of noise components. We have a very low overall level here, in particular without ugly „spikes".
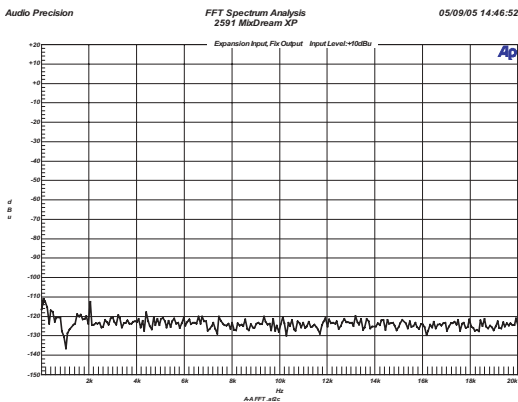
The analysis below shows distortion components at an input level of +10dBu. There is no distortion present above the MixDreamXP's outstanding, low (THD+N = -103dB) noise level.

Audio Precision

FFT Spectrum Analysis
2591 MixDream XP

05/09/05 14:46:52

Expansion Input, Fix Output   Input Level:+10dBu

A-A FFT.xGc

Power Supply

No effort or expense was spared here. We don't know of anyone who makes good coffee with great beans and bad water, and we don't know of anyone who makes great sounding audio equipment with mediocre power supplies. The best parts cannot give you a sound without dependable power.

The MixDreamXP is equipped with an internal power supply. Two +/-15 VA transformers are capable of providing adequate current regardless of any demands you can put on it, even when running the MixDreamXP pedal to the metal.

The MixDreamXP power transformer is also heavily shielded to minimize hum. The +/-30V (=60V rail) power is derived from high quality linear regulators whose noise level borders on the immeasurable. Extremely fast rectifier diodes and 14.000 microFarrad capacitors insure that there is enough available current at all times and for every imaginable peak. Additional 100nF/250V MKP stabilizing condensers are present to insure further that any conceivable peak loads will not affect your mix.
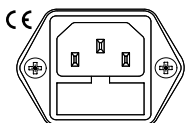
Power connection must be provided by the included standard IEC three-pole (computer) cable. The power chain (cable connections and transformer) conforms to appropriate VDE, UL and CSA standards. Fuses are rated at 315mA for 230V and 630 mA at 115V operation.

Specifications

Frequency range:	‹1Hz-200 kHz (-1 dB)
THD+N: 20-22kHz, Input Level +10 dBu	-103 dBu
Noise Level: 20-22kHz, A-weighted	-97 dBu
Max. Input Level:	+28 dBu
Max. Output Level: @ 1kHz, THD+N -95 dB	+28 dBu
Dynamic range: 20-22kHz, A-weighted	125 dB
Crosstalk L-R: @ 1kHz, Input Level +10 dBu	-90 dB
CMRR: @ 1kHz, Input Level +10 dBu	‹70 dB
Input Impedance:	10 kOhm
Output Impedance:	65 Ohm
Power Consumption:	36 W

Dimensions and Weight

Standard EIA 19 inch Housing, 1 U

Dimensions (W x H x D):	482 x 44 x 237 mm ca. 19 x 1.76 x 9.5 inch
Weight:	3,55 kg/7.81 lb

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Guarantee

SPL products are guaranteed for a period of one year against faults in materials or workmanship. Refer to your local supplier for full sales and guarantee terms.