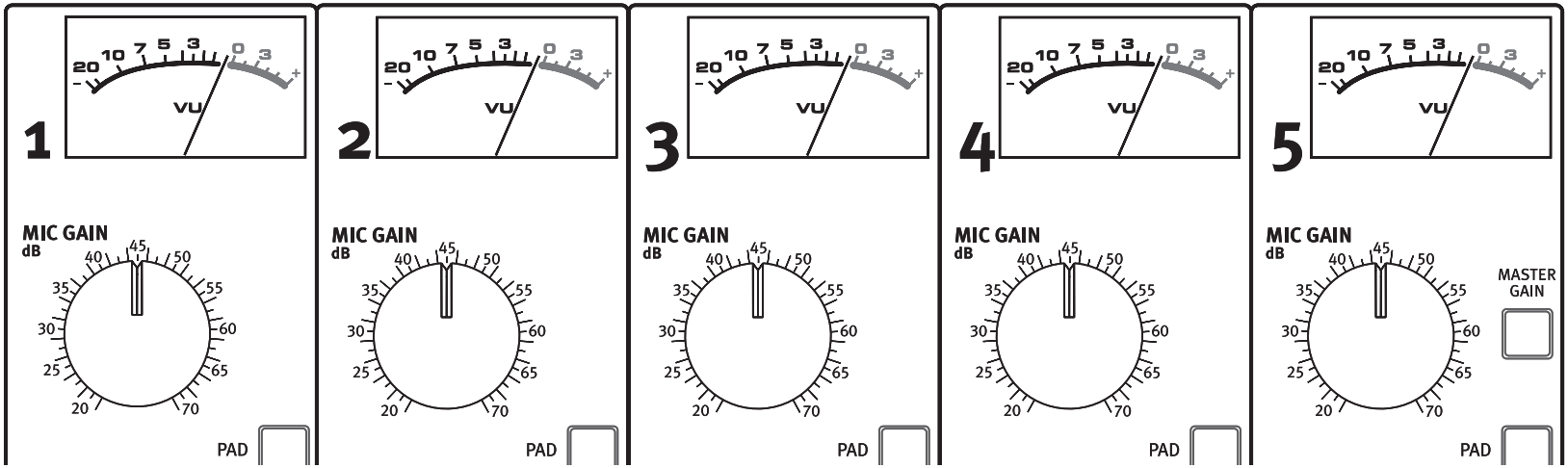

Manual

Version 1.0 E – 12/2003

R&D: Wolfgang Neumann

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.

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Special thanks to:

Gerd Jüngling from ADT, who kindly provided the circuitry for the surround panning matrix. Dirk Brauner Röhrengerätemanufaktur for the good collaboration.

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Introduction

Dear customer,

thanks for using the Atmos 5.1 system. We wish you have as much fun working with it as we had during the development of this extraordinary recording equipment.

The complete Atmos 5.1 system includes Atmos 5.1 controller, the Adjustable Surround Microphone 5 (ASM 5), a separate power supply unit and a multicore cable (length ca. 25 meters/27.5 yards).

The Atmos 5.1 system allows to record the original event and all of its authentic spatial content with highest precision. It demonstrates the significant difference between discrete surround recordings and artificial surround mixes with breath-taking results. To reliably achieve these amazing results, the Atmos 5.1 provides everything you need to record virtually any audio event.

Due to its analog structure, the audio signals are compatible with any common surround format—DVD-A, DVD-V, SACD, AC3, DTS, MLP... you name it, Atmos 5.1 can deliver it.

With its ingenious ASM 5 „star frame“ array based on Brauner VM1 mic elements and custom-designed, hand-built Atmos 5.1 controller, this unique system offers an unparalleled combination of uncompromising audio quality and ultimate flexibility.

Most importantly, the Atmos 5.1 system is a breeze to use and can be set up in minutes, arming you for the most convincing 5.1 recordings you‘ve ever experienced.

Atmos 5.1 – the complete miking and system for surround recordings

The Atmos 5.1 is a fully-featured stand-alone surround miking system for surround productions in any known format.

The ASM 5 surround microphone combines five microphones elements in an ideal setup for surround recordings. Each one is directly assigned to one of the five surround channels and can be processed discretely with the Atmos 5.1 controller. All microphone elements are movable and their polar patterns can be set up individually, e g. to effectively compensate for disadvantageous room acoustics.

The Atmos 5.1 features a complete panorama matrix, an LFE section and a monitoring section, thus all you need to create a surround mix. An External Inputs section allows to integrate additional stereo mixes in a surround mix—either for the insertion of additional microphones or to upgrade stereo consoles with surround capabilities.

The Atmos 5.1 system operates fully analog to ensure independence from any storage or transmission format.

The ASM 5 surround microphone

The ASM 5 is based on Brauner VM1 mic elements. Three microphone elements are assigned to the L/C/R channels, two further mics are used two capture the information for the rear surround channels. Together they form a perfectly balanced surround microphone.

Each microphone head can be moved by +/- 90° horizontally, the polar patterns can be adjusted remotely from the Atmos 5.1's ASM5 Pattern Control—infintely variable for each capsule from omnidirectional through cardioid/hypercardioid to figure-of-eight. A pad switch allows to reduce the microphone's sensitivity by -16 dB.

The I/Os of both the ASM 5 and the Atmos 5.1 are built upon transformers to drive wirings of up to 250 meters/275 yards. The ASM 5 can be installed on usual microphone stands.

Atmos 5.1 controller

The Atmos 5.1 is equipped with five matched high precision microphone preamps featuring SPL's triple gain stages to capture the superb sound of Brauner's ASM 5 microphone in the most transparent, noiseless and uncoloured way.

The microphone preamps also feature SPL's ServoDrive-Technology which detects voltage differences (DC-offset) between the positive and negative paths of the amplifying stages. Any offset increases noise and distortion and therefore compromises the signal quality. ServoDrive minimizes DC-offsets to values between omV and 2mV. The recorded signal contains less noise and distortion and improved tonal transparency.

Further features include Lundahl input transformers, pads, phase reverse, phantom power, low cut filters, a switchable insert and tape send/returns. All switches are luminated. High quality switches and relays with gold plated contacts are used throughout.

Motorized gain controls

An important feature of the Atmos 5.1 are its motorized gain controls. While changing the preamplification the relative loudness relationships between all five microphones are maintained.

A Master Gain switch enables motorized control over all five microphones preamplifiers by just turning one control. This is especially important when re-adjustment of the preamplification becomes necessary during recording to avoid negative effects on the spatial coherence and phase stability.

The Atmos 5.1 unit and the PSU should not be installed near units which produce strong magnetic fields or extreme heat. Do not install the units directly above or below power amplifiers. Especially the ventilated PSU should be installed at a place with sufficient air circulation.

The ASM 5 has to be placed the way that the LCR heads of the microphone (those closer to the microphone center/90° angle) are facing the sound source. Be sure to place the microphone as high as necessary to avoid ground reflections and comb filtering effects. Usually the best position for the ASM 5 is right on the crossing between the direct sound field and the diffuse sound field.

BEFORE switching on the PSU, you have to connect the ASM 5 via the multicore lead to the Atmos 5.1 unit. Pay attention to fit the bayonet joints properly. Proceed in the same way to connect the Atmos 5.1 unit to the PSU. Check that the voltage details quoted on the PSU back panel correspond to your local mains electricity supply. Use a minus (-) screwdriver to set the voltage selector to the required voltage.

By the way ... the PSU uses two 1,6 A slow fuses.

On the Atmos 5.1 unit, please check the positions of the ASM 5 Pattern Controls. We recommend to start with the cardioid pattern characteristic for all five microphones (controls in center position).

Please check the position of the External Mic Input switches on the back panel of the Atmos 5.1. If these switches are depressed, the corresponding channels of the ASM 5 are deactivated. Depress them only to activate external microphones connected to the XLR inputs.

Now switch on the PSU. Check the 9 LEDs on the front panel of the PSU. They indicate that all 9 voltages are generated properly. Chassis ground and AC ground can be disconnected with the Ground Lift switch (GND LIFT) on the back panel. This can help to eliminate hum. An AC power cord is included to feed the IEC-spec, 3-prong connector.

After switching in the PSU, proceed as follows:

1) Turn the Mic Gain of Channel 5 (master) control fully counter clockwise (o dB).
2) Press the Channel Lock button at Channel 5 (all other channels follow automatically to o dB).
3) Set the Master Mic Gain control to the 12 o'clock position (all other mic gain controls follow precisely). Now the VU meters indicate modulation.
4) Set the Fader controls to the o dB position (used for monitoring only, see "Standard Recording Setup").
5) Press the Direct button on every channel to route the signal directly to the Master and Monitoring Outputs.
6) In the Monitor section, set the control to the 12 o'clock position. The L/R switch has to be activated for 5.1 monitoring.

Control elements

Input Section

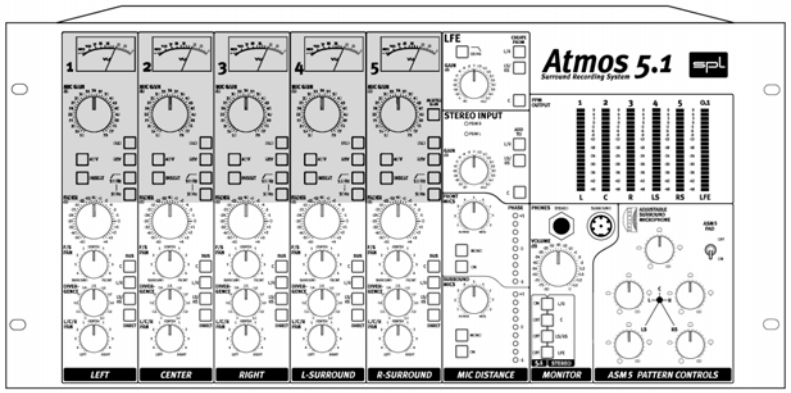
Gain settings can be adjusted individually for each channel. The MIC Gain control of channel 5 can be specified as Master Gain control to control all 5 gain settings at a time—the motorized potentiometers ensure coherent gain settings for all channels with highest precision.

The microphone inputs are equipped with phantom power supply, switchable insert, pad (-25 dBu), phase reverse and high pass filter (100 Hz/50 Hz).

For direct recordings of the preamplified signals recording devices like a multitrack recorder can be connected to the insert Tape Send. Signals coming back from the recorder can be connected to the insert Tape Return, for example to use the panorama matrix or further Atmos 5.1 features.

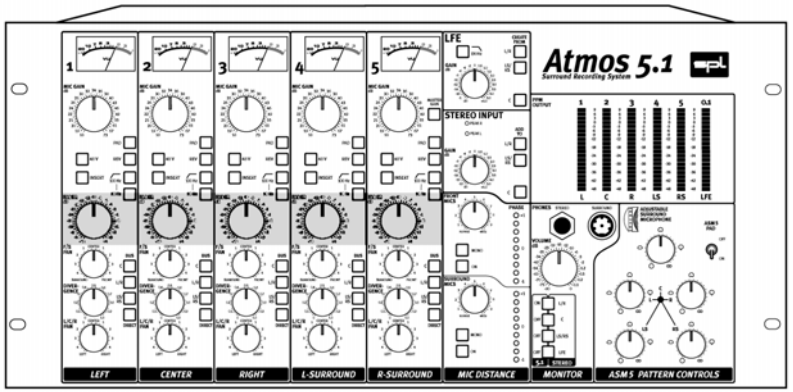
The VU meters display the input level of each channel after the preamplifier stages.

The insert Tape Return can also be used like a usual line input for external sources, e g. to use all Atmos 5.1's features for a surround mix.



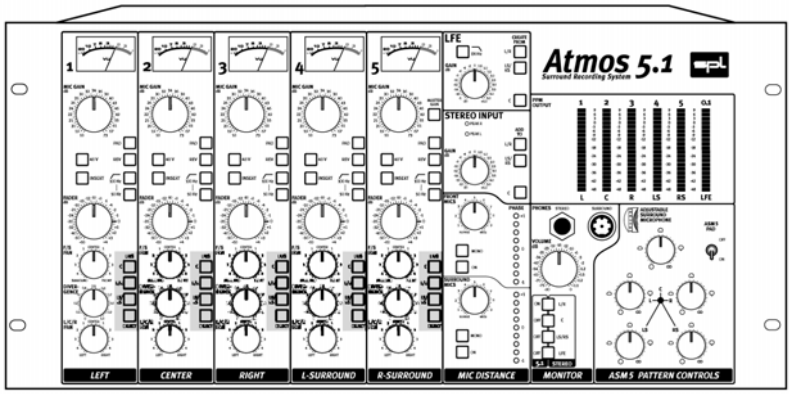
Fader

The fader allows adjustments of the signal level that is routed either to the direct channel outputs, to the panorama matrix or to the outputs.



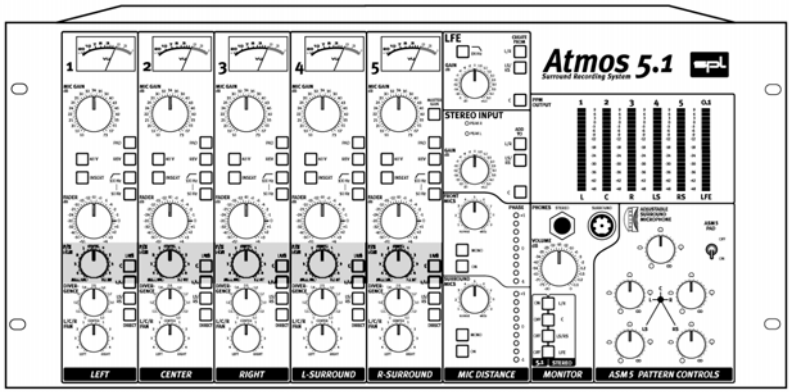
5.1 Routing

The Atmos 5.1 controller offers a complete routing and panorama matrix. With the routing selectors the signals can be assigned to any of the the surround busses, with the panorama matrix they can be positioned exactly. The Direct switch allows to bypass the panorama matrix, routing the signal to the output of a surround bus.



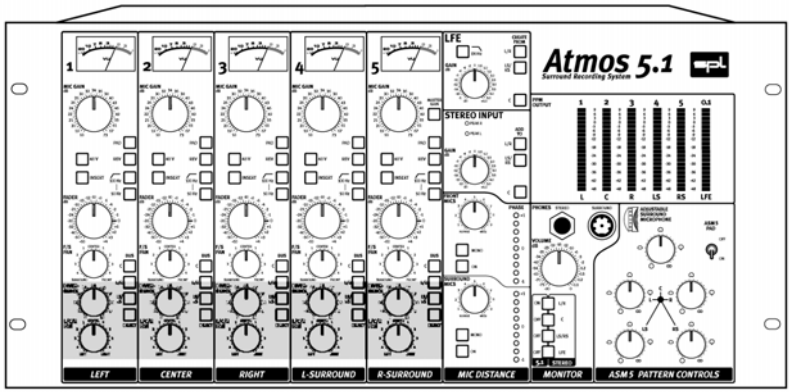
F/S Pan

Front/Surround Pan blends the signal from the front to the rear channels or vice versa.



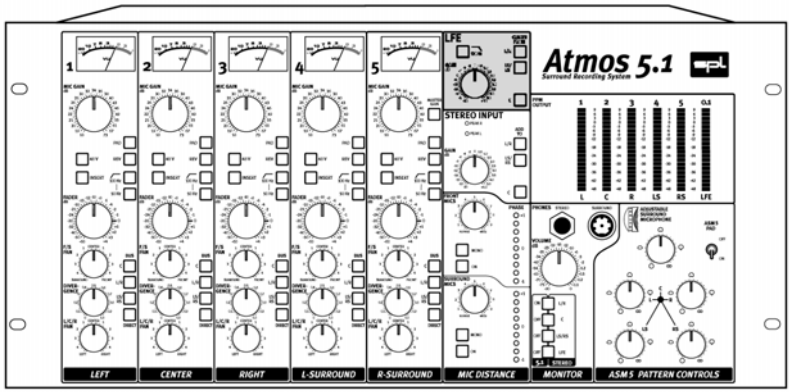
L/C/R Pan and Divergence

L/C/R panning determines the position of a signal in the L/C/R panorama. The divergence control allows to attenuate the L and R channels in relation to the center channel.



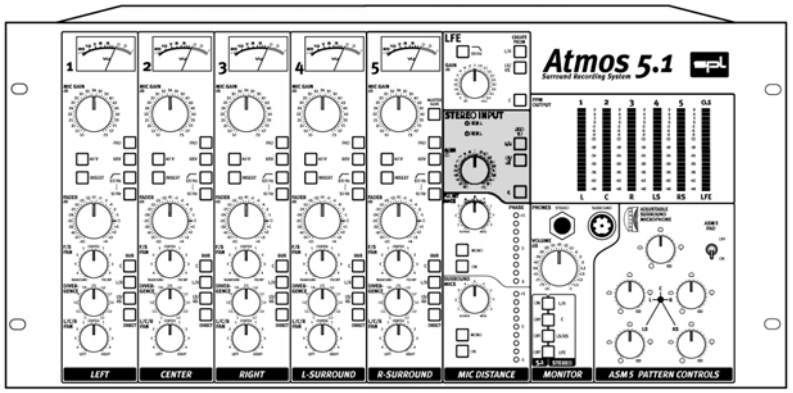
LFE signals

The LFE signal can be composited from the front, surround, and centre channels. A 24 dB Butterworth low-pass filter at 130Hz can be activated to only let those frequencies pass up to where localisation begins. In the mixing/premastering stage the frequency can be reduced to the value required for i.e. AC3 or DTS encoding. If the low-pass filter is not activated, a mono composite of the selected mic inputs can be send to a separate sub/LFE processor.



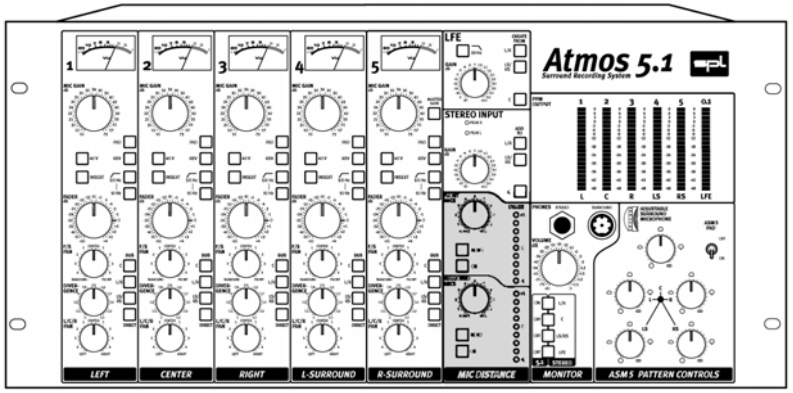
Stereo In/Out

Two additional balanced inputs are provided to mix a stereo source from additional room mics or from a multichannel sub mix to the front, centre and surround channels. The stereo outs allow the stereo source to be processed or recorded with further units.



Mic Distance

Two switchable allpass stereo width controls can be used to influence the stereo width of each coherent channel pair (L and R, LS and LR). This way, variable distances between the microphone heads can be simulated electronically. The Mic Distance section is equipped with a hard bypass and a mono switch. Two phase meters display the L/R & SL/SR correlation (either with Mic Distance control active or in bypass).

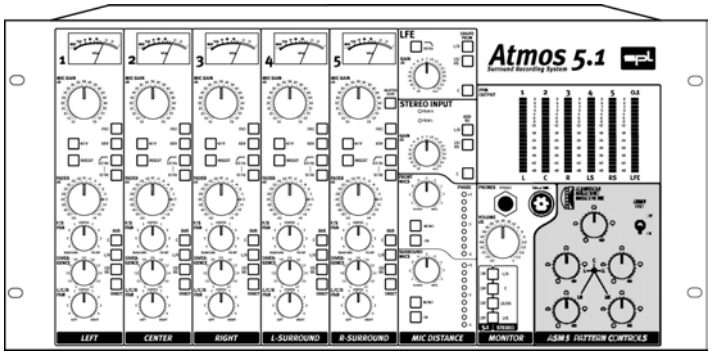


Control Elements

ASM 5 Pattern Control

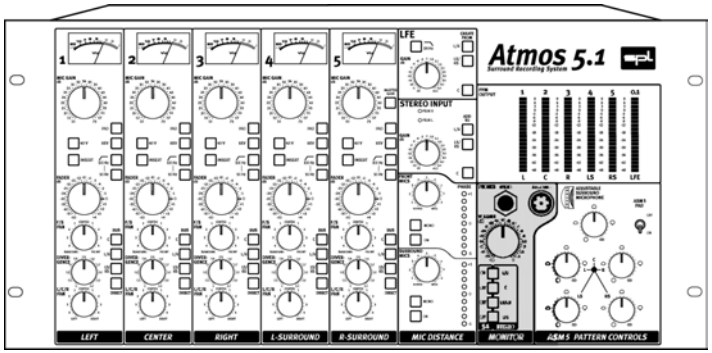
The ASM 5 provides infinitely variable adjustments of the polar pattern characteristic for each microphone from omnidirectional up to figure-of-eight. These adjustments can be made remotely from the Atmos 5.1 and can be monitored while recording.

A pad reduces the microphone‘s sensitivity by -16 dB.



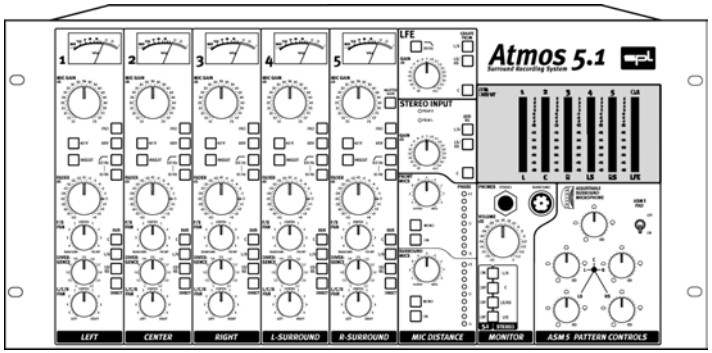
Monitoring

Both during recording and mixing the monitoring volume can be adjusted by the aid of an electronic circuitry that ensures precise, coherent volume control of all six channels. The Monitor Volume control also sets the volume for headphones connected to the front. The 5.1/Stereo switches determine which channels are monitored.



PPM Meters

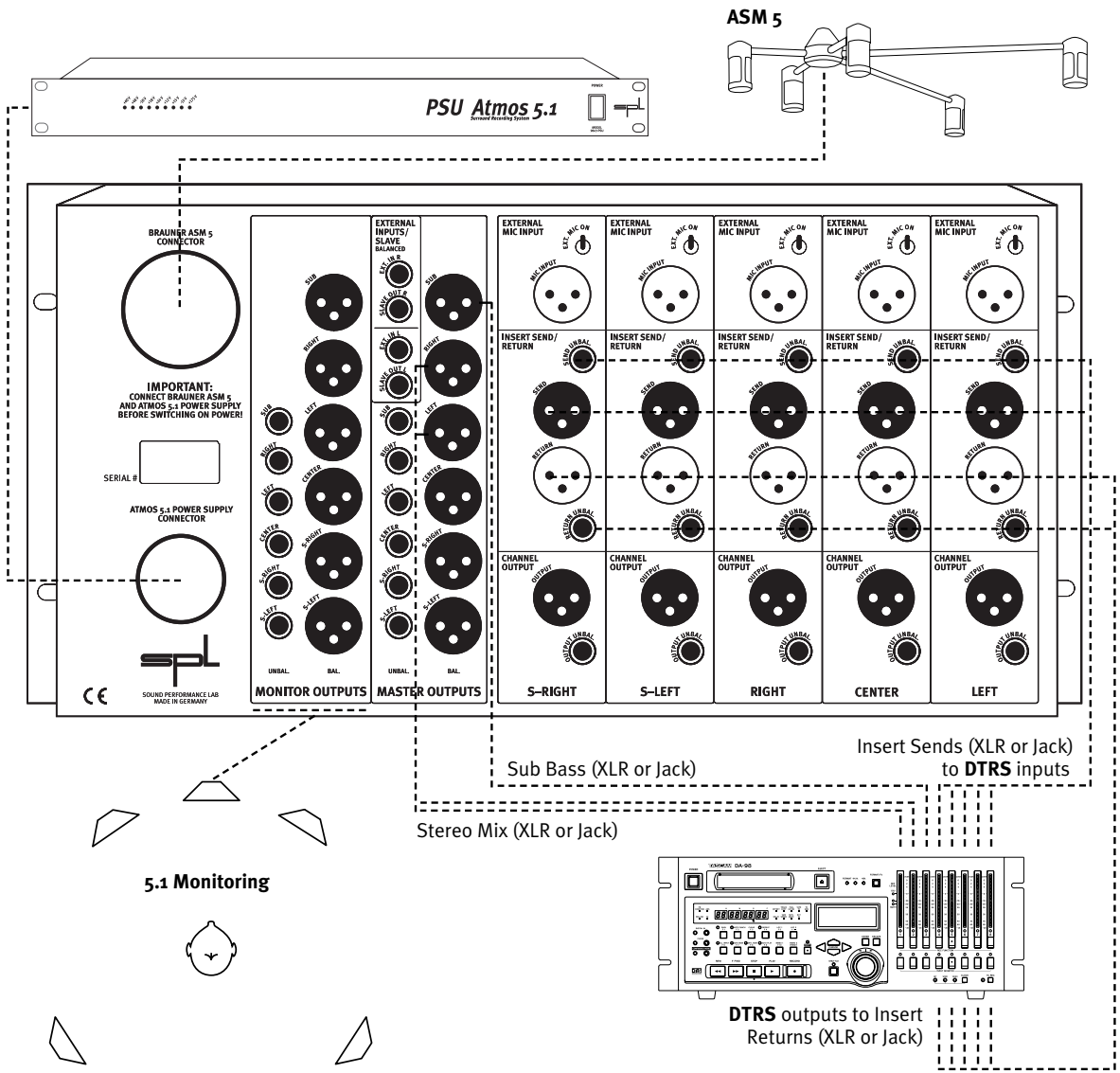
The PPM meters display the levels at the output of each bus. Values range between -48 dBu und +9 dBu and are displayed in steps of 3 dB.



The Standard Recording Setup is the basic configuration for “purist” 5.1 recordings. The DTRS is connected right after the preamp stage to record unprocessed microphone signals. Additionally the 6th recorder’s channel can be used to record the sub bass signals, the 7th and 8th channel can be used to record a stereo mixdown.

This setup can be modified or extended in many ways, for example by connecting an analogue multitrack recorder to the master outputs (up to two recorder simultaneously via XLR and Jack) for recordings of the processed signals – while the DTRS still is recording as described above (e. g. backups).

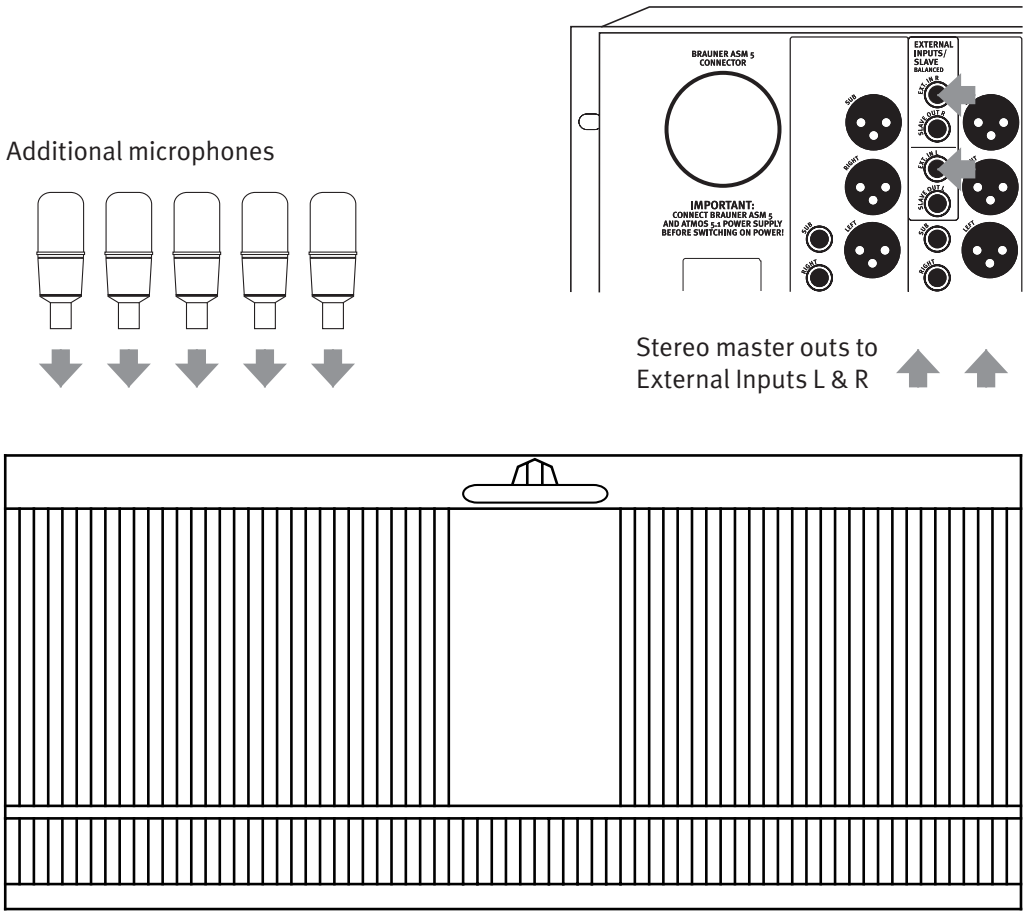
When using a stereo headset, the L/R, C, SL/SR and SUB channels can be monitored individually (see Monitor section).



Integration of additional microphones/stereo submix

The Atmos 5.1 controller allows to integrate additional microphones as stereo or surround submix. During monitoring, the level settings for the ASM 5 determine the mix relation between ASM 5 and additional microphones.

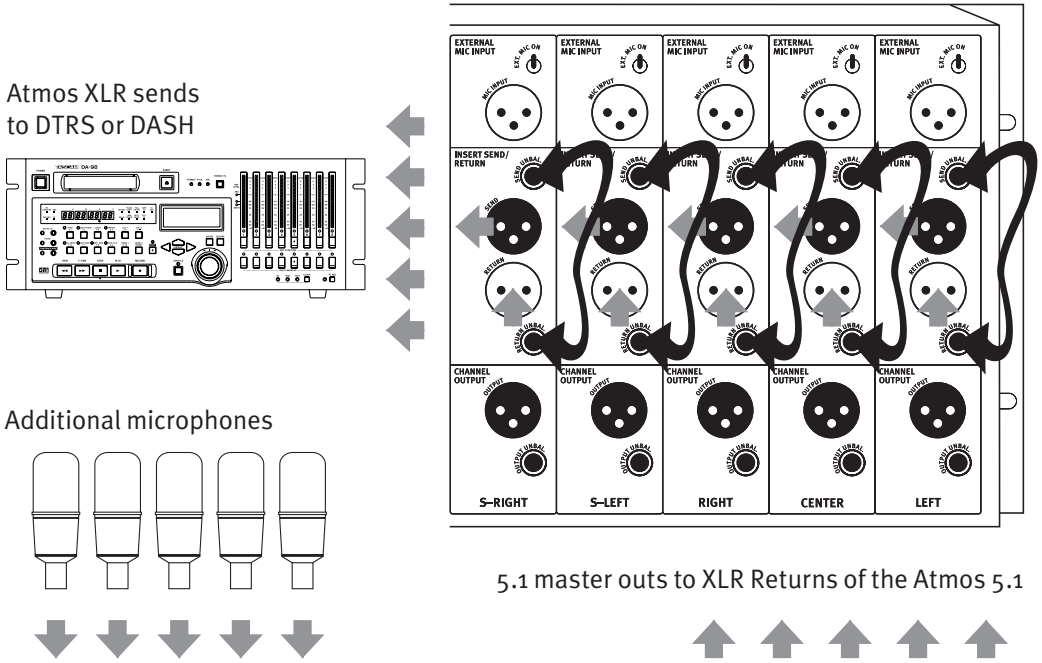
In general additional stereo mixes can be connected to the External Inputs. For integration of additional microphones as a stereo mix, an external sub mixer, connected to the External Inputs L&R, is needed to create the mix.

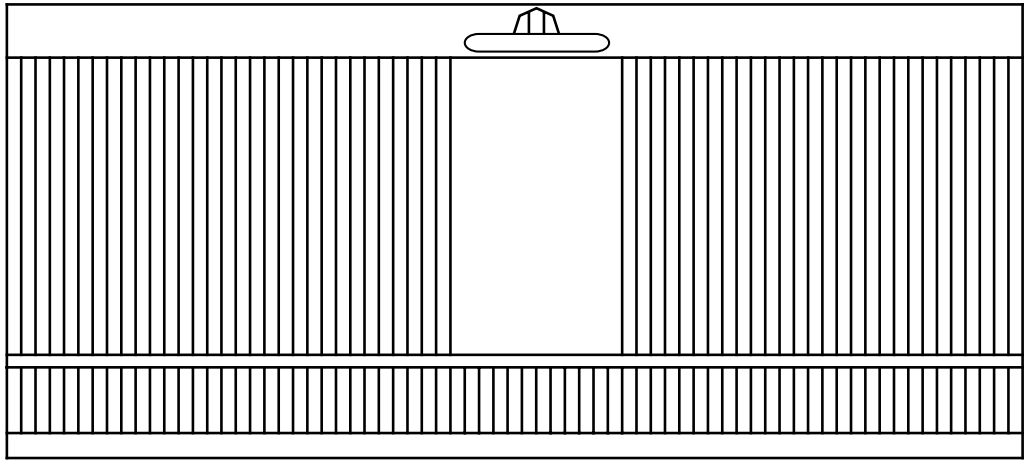


For insertion of additional surround submixes, the Insert Send and Insert Return sockets on the Stmos 5.1 rear panel must be connected with a short patch cable. The Insert buttons of the Iput section on the front panel need to be depressed.

The additional surround mix is created on a mulitchannel-ready submixer and and connected to the XLR Insert Returns of the Atmos 5.1 controller.

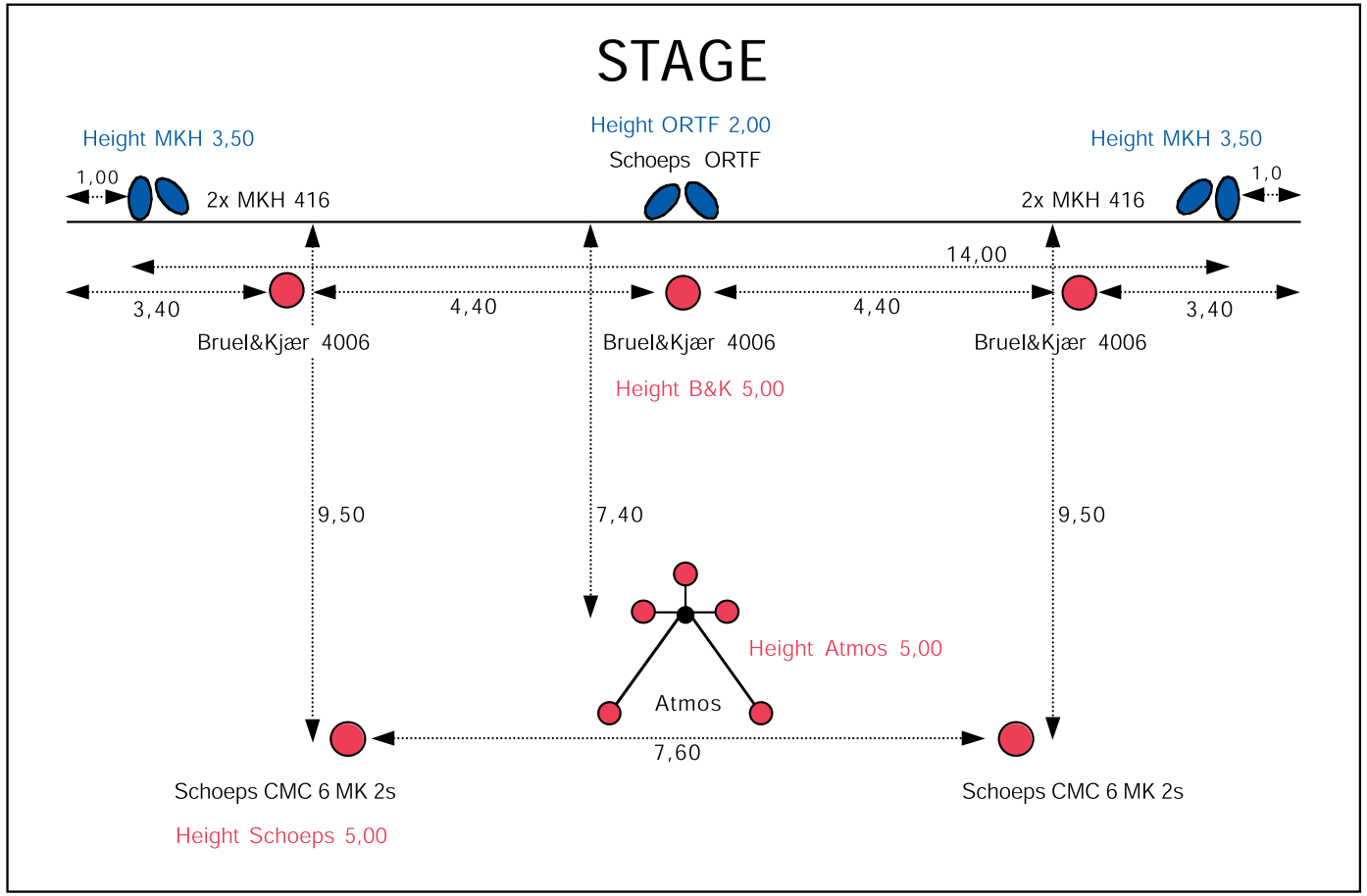
The signals can be sent to a DTRS/DASH via the XLR Insert Sends on the Atmos 5.1.





A typical recording setup: SACD recording with Atmos 5.1 and additional microphones

Artist: dEUS, SACD Recording
Date: April 5, 2002, Venue: Rotterdam, Location: Schouwburg
Recording Engineer: Ronald Prent, Mobile Engineer: Peter Brandt



Red: Microphones hanging
Blue: Microphones on stands
All measures in meters

Frequency range

Mic Direct Out @ 18 dB Gain: 10 Hz-180 kHz (+/-3 dB, Phase –2°)
(Channel Out, Master Out, Monitor Out as above)

Mic Direct Out @ 60 dB Gain: 10 Hz-180 kHz (+/-3 dB, Phase –2°)
(Channel Out, Master Out, Monitor Out as above)

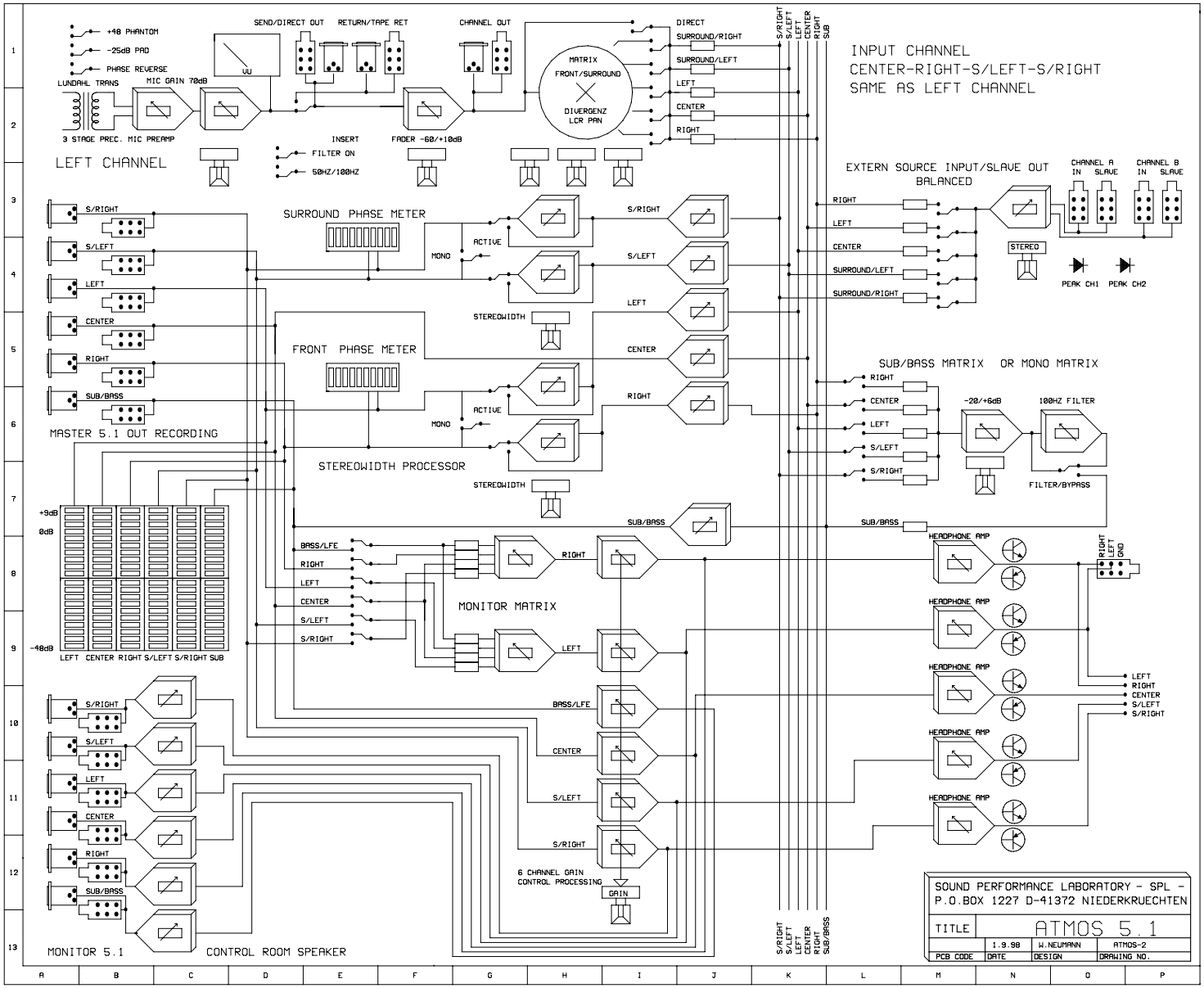
CMRR	100 Hz	1 kHz	10 kHz
18 dB Gain:	-79 dB	-79 dB	-60 dB
34 dB Gain:	-66 dB	-66 dB	-52 dB
60 dB Gain:	-45 dB	-45 dB	-32 dB
w. Pad -16 dB @ 18 dB Gain:	-90 dB	-90 dB	-79 dB

THD & N (Mic Direct Out)	1 kHz	10 kHz
60 dB Gain:	0,22 %	0,24 %
50 dB Gain:	0,07 %	0,07 %
40 dB Gain:	0,022 %	0,023 %
30 dB Gain:	0,007 %	0,007 %
18 dB Gain:	0,002 %	0,0023 %

THD & N (Monitor Out)	1 kHz
60 dB Gain:	0,24 %
50 dB Gain:	0,07 %
40 dB Gain:	0,03 %
30 dB Gain:	0,034 %
18 dB Gain:	0,031 %

S/N ratio (A-weighted)

150 Ohm generator, 22 Hz-22 kHz filter, 60 dB Gain@150 Ohm

Mic Direct Out:	-66,8 dB
Channel Out:	-66,8 dB
Master Out:	-66,8 dB
Monitor Out:	-66,8 dB
50 dB Gain@all:	-77,2 dB
40 dB Gain@all:	-85,8 dB
30 dB Gain@all:	-93,6 dB
18 dB Gain@all:	-96,4 dB
w. PAD -16 dB @ 18 dB Gain:	-97,5 dB

Block diagram