

THE ALTMANN SUPERLATIVE DA CONVERTER







1) The Altmann Superlative 24 Bit / 96 kHz Digital to Analog Converter



The manufacture of the Altmann Superlative DA Converter is expensive, because it requires manual work.

2) The different models of the Altmann Superlative DA Converter.

I manufacture different models of the Altmann Superlative Converter. On the title, you see the complete machine which is the DA-MR.

"M" means multiple digital inputs. This are 7 inputs: 2x RCA, 2x Toslink, 1x ST glassfiber, 1x BNC and 1x XLR. The digital inputs are switchable via the "Source" rotary-switch on the front panel.

"R" means high quality volume control.

Through this feature, the Altmann DA-MR can be employed as a digital preamplifier, and is to control a power amplifier.

The Volume control is done in the analog domain with a potentiometer, that is also accessed from the front panel.

The standard version of the Altmann DA-MR includes an Alps "Black Beauty" RK 40 Potentiometer.

The selected version, the DA-MRS includes an expensive RK 50 potentiometer.

I did not choose a digital volume control, because it is inferior to the analog volume control, that I have implemented in the Altmann Superlative DA converter.



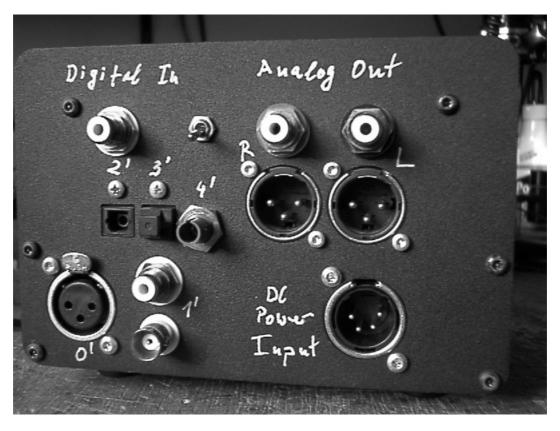
The fully equipped version, the Altmann DA-MR splits up into 3 smaller versions:





the Altmann DA-M, with multiple switchable digital inputs, but without volume control. the Altmann DA-R, with high-quality volume control and 2 digital inputs: 1x RCA and 1x Toslink the Altmann DA, with 2 digital inputs: 1x RCA and 1x Toslink, but without volume control.

All models have analotg RCA and XLR (Neutrik, swiss) outputs.



The Altmann DA-MR has 7 digital nputs and 2 analog stereo output pairs.

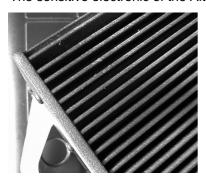
All models can also be manufactured with selected components (-S).

3) The housing, the power supply, the output circuit and the overtone-filter.

Many manufacturers of DA converters use big housings and much digital electronics.

In this way, one can make a very bad microphone, but not a good DA converter.

The sensitive electronic of the Altmann Superlative DA Converter is packaged differently:



In a stiff aluminium profile, which is fastened with 12 screws between a 4mm massive-steel frontplate and a 2 mm steel rear plate.

The bottom of the housing is dampened.

This case is comparably small. Therefore, the surface it offers for disturbing sound-waves is small also.

A comfortable handle is mounted on the front plate, which promotes troublefree transportation.



The Power Supply of the Altmann Superlative DA Converter is incorporated into a second housing of the same quality.

I will now open the housing of the Altmann Superlative DA Converter for you.

The housing is filled with foam.

The electronic circuitry is very well isolated.

Sound-waves that emanate from the inner walls of the housing, are absorped by the foam.

A nylon-shaft connects the knobs for the high-quality volume control and the source switch with the potentiometer and the rotary switch, which are located near the rear panel, in order to achieve short signal lengths.



Each nylon shaft is precision machined and has its own lead-through. This ensures accurate volume control. At the same time, the shaft prevents damage to the potentiometer due to high torque.

The printed circuit board of the Altmann Superlative DA converter is attached to the rear-plate and is connected to the housing by a silicone bearing.

The high quality printed circuit board is made in Germany by a manufacturer with space approval.





For a superlative digital to analog conversion, a good power supply is obligatory.

Why is this so, since the signal is operated digitally, and all there is to do is to distinguish between 1 and 0?

A 16 bit DA converter is able to generate 65536 different voltage steps.

The maximum output amplitude of a good converter is +-5 Volt. That means, the maximum voltage stroke is about 10 Volt.

10 Volt divided by 65536 gives 0,0001526 Volt.

Therefore, the smallest signal, a 16 bit DA converter can generate, is 0,0001526 Volt.

But what happens, if the power supply generates a ripple of only 0,001 Volt? Then, the lower 4 bit will not be reproduced properly.

This means, that a DA converter, that is *theoretically able* of doing 16 bit, will most likely resolute only 12 bit. In real life it is often worse, than estimated above, because the maximum output voltage is smaller, and the power supply not even able to guarantee 0,001 Volt accuracy.

In fact, too many CD-players are only able to achieve 10 bit resolution. Details of the signal are simply lost.

In order to do a real 16 bit digital to analog conversion, the power supply fluctuations should be below 0,0001 Volt.

On this planet, very few people had the opportunity to hear a true 16-bit conversion by now. Don't even think about 24 bit.

A true 24-bit converter is able to generate 16777216 different voltages. The smallest signal will then have an amplitude of 0,00000059 Volt, ca. 0,6 µVolt, if the maximum output is about 10 Volt.

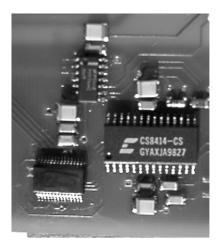
It is therefore desirable, to have a power supply, that is ripple free in terms of µ-Volt.

In reality, most DA converters are able to *save* 12 from 24 bit for analog reproduction. Above this rating, many devices go into trouble, especially in integrated CD players that have several motors, that contaminate the power supply.

A DA converter with a large-scale digital electronic cannot operate from clean current.

Such a device is not a true 24 bit DA converter. It is a toy.

A true 24 bit DA converter must be designed differently.



A very clean power supply is necessary. And the current *must remain clean* in the entire process of conversion.

This is only possible with a *small digital circuit layout*. Some digital stuff is needed for conversion. You must only use the most important parts, in order to keep the current clean.

The Altmann Superlative DA converter has a very small digital circuit (3x4 cm): a receiver, a digital filter, a hex-inverter, that's it.

The jitter processing (with Altmann JISCO) is accomplished externally in order to keep the current clean.





If you want to make clean power, you need a good transformer.

The "Altmann Cushion Transformer" is made in Germany according to stringend specifications.



The "Altmann Cushion Transformer" is mounted to the aluminium profile of the power supply housing by a central screw, while it "sits" in a polyurethane cushion. This construction ensures absolute silence.

The demanded values for current and voltage have to be generated precisely, if hereafter, the voltage regulation and filtering must function as desired.

This is the back view of the power supply. The dual fused mains plug and power switch.

The power output is accomplished with a 4-pole swiss Neutrik connector and cable.

The filtering of the current works according to the reservoir-principle. If you want to have a smooth surface on a reservoir, you must not generate swirls.

Only a *small and regular* current is allowed to leave the reservoir, else ripple is generated.





The power supply of the Altmann Superlative DA converter employs 2 x 3 reservoires (big capacities with regulation), that are connected sequentially, with a steady decrease in potential.

At the outcome of this procedure a big volume with a totally undisturbed surface is generated.

The total filter capacity of the Altmann Superlative DA converter sums up to ca. 70.000 μ-Farad.

The necessary prerequisite for a true 24-bit conversion is extremely clean current.



Further current filtering is done inside the housing of the converter.

The power supply of the Altmann Superlative DA converter has a high safety standard.

Both power lines are fused and switched seperately.

PTCs shut the system down on overload.

Suppressor diodes protect connected devices from overvoltage conditions.





The power supply of the Altmann Superlative DA converter has a lamp on the front panel. You can replace the bulb after removing the lens.





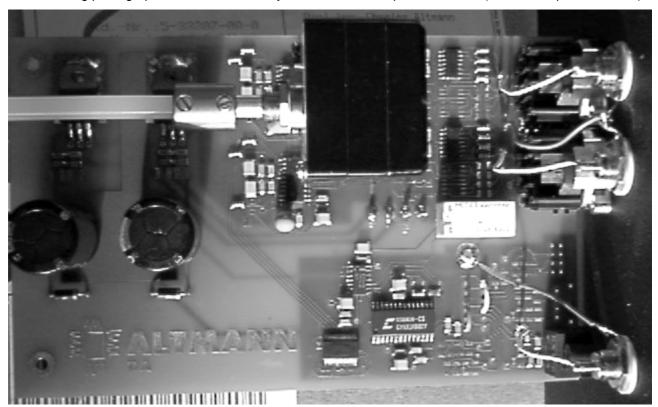
It is also immensely important how the current is distributed on the converter printed circuit board.

The power supply is connected directly to the analog output section. Hereafter, a +- 5 Volt regulation and filtering for the DA-chips takes place.

At last, the small digital section is supplied.

Only this way, the Altmann Superlative DA converter is able to ensure its unrivalled measuring performance in terms of signal to noise ratio -130dB and crosstalk -115--135dB.

The following photograph shows the assembly of the Altmann Superlative DA-R (with RK 40 potentiometer).

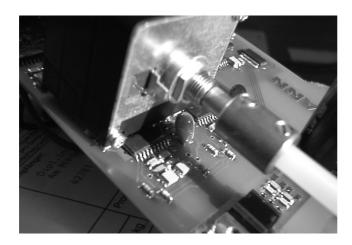




The power supply of any active component is multiple filtered with chip capacitors.

The electronic assembly of the Altmann Superlative converter employs more than 80 capacitors, more than 30 for the DA converter chips. The external power supply is made with 22 capacitors, summing up to more than 100 in total.

The DA converter chips are the PCM1704 from Burr-Brown. The unsurpassed performance of the Altmann Superlative DA converter cannot be accomplished with any other converter chips.



The potentiometer of the DA-R is mounted directly above the converter chips. In this way, the signal path from the converter chips to the output jacks is only 5 cm or 2 inches long.

I use only one PCM1704 per channel, with a maximum sampling frequency of 800 kHz, since 2 or more converter cannot do it better, than one.

Even with symmetrical output, it is better to use one line with 10 Volt peak-to-peak than 2 lines with only 5 Volt.

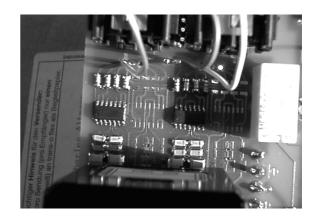
This way, the maximum output amplitude will have a double distance from the ripple of the power supply. The symmetrical output is therfore impedance matched with one hot line.

The analog output circuit of the Altmann Superlative DA converter is powerful, in order to have a precise bass reproduction.

On the right, you see the output circuit. It works with reduced feedback, and therfore cannot be messed up by signals reflecting from the attached line cable.

Later, I have applied a patent for a similar design (Altmann SPLIF -> split feedback).

All traces that carry an analog signal are rounded. This serves as a regular inductivity and therefore reduces reflections.



The digital filter of the Altmann Superlative DA converter is a Burr-Brown DF1704, in accurate timing mode.







The Altmann Superlative DA converter employs an overtone filter.

Why?

In a digital electronic assembly, there are many square signals.

Nature does not use square signals.

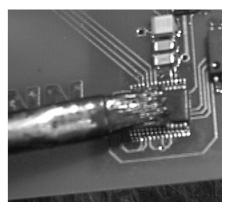
Therefore, square signals, respectively their overtone distribution sound unnatural.

.

A small digital circuit section generates less unnatural overtones.

Overtones are always very weak, but the hearing is extremely sensitive to them.

Therefore, the unnatural overtones must be filtered out of the digital components.



In the Altmann Superlative DA converter, the unnatural overtones are filtered out of the digital components with a specially developed coating.

The effectiveness of this technique can be proved by measuring the FFT overtone spectrum.

It can more easily be proved, by just listening to the music.



I custom manufature the Altmann Superlative DA Converter "one-at-a-time" with extreme care and attention.

The emphasis here as always is making the highest quality product capable of resplendent, impressive performance.

Order System:

Standard: no guaranteed completion time
Express-180: 6 month completion time
Express-60: 60 days completion time

Presently the standard order system is closed, and no orders are being accepted for this system. The express-180 order system is limited to the number of orders that can be accepted. So before you plan to use this order system, please check with me concerning the status and availability of the system.

Please check out the latest price list.



Beneath the Altmann Superlative DA converter, I have developed other audio products:

The Altmann UPCI - Ultra Precision Clock Injector- (patent applied for). This is a jitter filter.

The Altmann JISCO - Jitter Scrambling Decorrelator (patent applied for)

This is a Jitter Scrambler, that also processes DVD, Dolby Digital, DTS, and other signal formats. www.jitter.de

The Altmann SPLIF - Split Feedback - Amplifier Topology (patent applied for). There is a DIY instruction on the internet.

www.altmann.haan.de

thanks for joining me,

Charles Altmann.

