



Match M 5.4DSP + M 2.1AMP: a 5-channel DSP amplifier and a bass amplifier

Sound upgrade goes micro

With the tiny M 5 and M 2 amplifiers, Match has made it possible to supply a complete hi-fi system in the most compact way. We are going to shed some light on what is possible with the new Match M 5.4DSP and M 2.1AMP amplifiers.

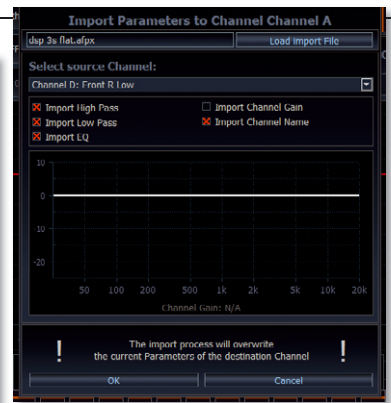
Since its inception, the Match brand has been all about plug and play sound upgrades. Starting quite ahead of their time with the completely new type of PP amplifiers, Match shaped what we know today as the DSP amplifier category. In addition to the affordable PP amplifiers and the „large“ UP ... DSP amplifiers, two new models are now available in the M series. Leaving aside all the other awesome perks: the Match M amplifiers are very, very small. Despite the housing size of just 11 x 8.5 x 3.5 cm, they are still fully-fledged power amplifiers with lots of power. The new M 5.4DSP includes 4 satellite channels and a stronger subwoofer channel, which also runs full-range and is therefore also suitable for a center. For this kind of application, the M 5.4DSP is programmed in the standard mode at the factory. A special feature is that „Augmented Bass Processing“ is already available for the subwoofer and can therefore be easily found even by inexperienced users. This is a game changer for the bass sound, considering the limited output power. These and all other functions are enabled after activating the VCP, so that the full 9 DSP channels are at your disposal. In addition to the 5 built-in amplifier channels, there are also 4 processed outputs to control additional amplifiers. This makes the M 5.4DSP a full-fledged control center even for full-blown audio systems - only that it is small enough to fit in the palm of your hand. The highlight of the M 5.4DSP is the option to choose between MidPower and HighPower mode. In MidPower mode, the amplifier is limited in power, but is still 100% plug and play capable via the original vehicle wiring harness. The HighPower mode offers more power, but requires a separate power supply



Main window containing crossovers, EQs, time alignment, phase and channel levels



Only with DSP PC-Tool: fully automatic time alignment using proprietary signals and algorithms



The import function now allows partially importing input and output settings. EQs, crossovers, gain and channel names can be selectively imported

from the battery. The M 5.4DSP still has the latest 32-bit controller, which enables all the conveniences such as the ACO platform including ISA and VCP. The M 5.4DSP is therefore not limited in its DSP options; it offers the full range of DSP functions of the top Match models. The only restrictions are the limitation to four inputs and the frequency range up to 22 kHz.

The second new amplifier is called M 2.1AMP and it comes in the same format to match the M 5.4DSP. The highlight is that the M 2.1AMP can be used both as a stereo and as a mono amplifier. With its HiRes frequency range of up to 40 kHz and absolutely impeccable measurement results, it is a fully-fledged stereo power amplifier. When set to mono it drives a subwoofer with 350 W into 2 ohms. This is made possible by a newly developed technical platform with an extremely high-clocked step-up converter in combination with a proprietary Class HD concept and the use of new double-sided FETs, which can dissipate excessive heat in two directions, resulting in an impressive 96 % efficiency. To achieve a record-breaking power density, a two-channel amplifier IC is used and the critical components are fixed in a special way. As with some amplifier ICs, in the M 2.1AMP Match also works with contact pressure in order to ensure optimal heat dissipation, in this case with an aluminum crossbar and a dynamic, spring-loaded coupling, for which a spring was specially developed by the H&R spring specialist. The same contact pressure is guaranteed through the entire temperature range from -40 ° C to 120 ° C and it does not decline over time.

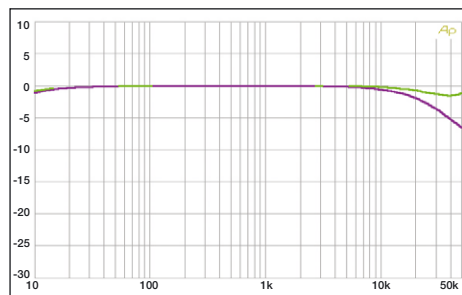
The prime application for our combination of M 5.4DSP and M 2.1AMP is the sound upgrade of a 'regular' factory sound system. With its four high-level inputs, the M 5.4DSP takes the signal directly from the factory radio and distributes it to the channels via DSP. The M 5.4DSP takes over the front and rear doors

and the center. Via the processed outputs, woofers such as a BMW or Mercedes front woofers can be fully supplied with power. A second M 2.1AMP can eventually take over an extra retrofit subwoofer.

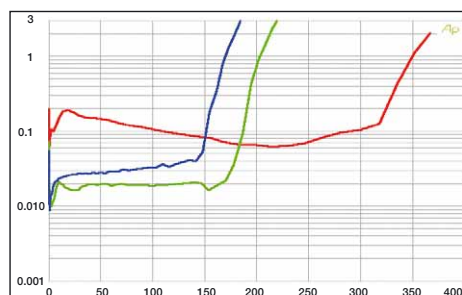
Software

The DSP functions are of course controlled via the in-house "DSP PC-Tool", which happens to be the most extensive and powerful tool present on the market today. In addition to 30 EQs per channel, time correction for both inputs and outputs and of course freely programmable crossovers, there is VCP (Virtual Channel Processing) with the option of processing channel groups as virtual channels between inputs and output channels. For example, a three-way front system with six output channels for the right and left si-

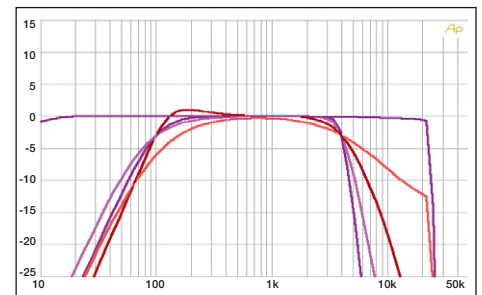
des can be managed by the virtual channels in front left and right. The runtimes of the individual loudspeakers and the crossing of tweeters, mid-range and woofers are carried out with the output channels, and this is also where the peculiarities of the installation background are brought to a balance. The



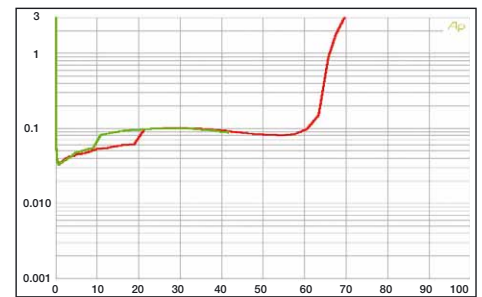
In stereo mode, the M 2.1AMP reaches 40 kHz at -6 dB, and the mono mode (green) runs even smoother.



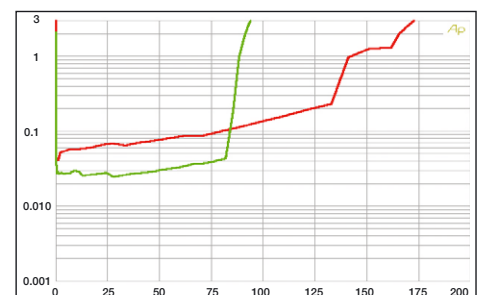
The stereo mode (blue) delivers clean 2 x 170 W at 4 ohms. In the mono mode, the M 2.1AMP easily nails 200 W at 4 ohms and 350 W at 2 ohms.



A frequency range up to 22 kHz, crossovers with different characteristics (high pass) and different slopes.



The MidPower mode reaches up to 43 W, where the M 5.4DSP is slacking off. The high power mode delivers identical distortion, but runs all the way up to 66 W.



Channel 5 of the M 5.4DSP already supplies 90 W at 4 ohms, the 163 W at 2 ohms is also sufficient for small subwoofers.



On the left we have a M 5.4DSP with controller, converters and DSP, on the right a M 2.1AMP with an aluminum traverse with the H&R spring underneath

crucial equalization can easily be managed with the virtual front channels, for the entire front system and across all crossover frequencies. With the virtual channel, the entire three-way side can also be „shifted“ using time correction or the level can be adjusted using the gain control. The FX sound effects now also act on the virtual front, center and rear channels, with which two-way centers can also be perfectly controlled.

Algorithms for optimizing the center, front and bass can be activated in the FX(effects) menu. First of all, the existence of the Real Center is a blessing, the center canal signal is calculated here by real audio processing.

So the Real Center is not a makeshift solution like a mono sum or a wrongly polarized sum of left and right. There is a clarity expander for the center and front, which affects the mid-range playback, for example the reproduction of voices. The front can also be „pulled apart“ to expand the stage illusion. The bass processing includes the SubXpander, which adds low tones to the music by generating subharmonics for existing frequencies. There is also a dynamic bass boost that enhances the bass depending on the playback volume. This is very helpful, for example, with factory systems with woofers and subwoofers that only have

limited capacities. For all FX functions there are adjustment knobs that can be used to specifically adjust intensity and function. The latest measurement functions of the PC tool are also supported. The well-known RTA (real-time frequency response measurement with optional microphone) can automatically set the EQs if desired. Tolerance thresholds and the number of setting attempts are adjustable. This ensures that a decent result is always achieved even when using relatively inaccurate microphones. In addition to the acoustic measurement, there is also the ISA (Input Signal Analyzer), an electrical measurement function for the analog inputs. For example, if you have connected the loudspeaker lines of the vehicle to the DSP inputs, you can determine how much signal is coming in. The PC Tool offers a frequency response measurement of all input channels so that you can see immediately whether a working full-range signal is present. In addition, sums of several inputs can be measured, so you can track down hidden all-pass filters that remain inconspicuous in the individual measurement. This electrical measurement of the inputs saves the installer a lot of time in troubleshooting and DSP tuning, because the input EQs (and the input time alignment) can be set simultaneously with the measurement and with an immediate success control. There is also the ATM (Automatic Time Measurement), which enables fully automatic time alignment of the entire system. The advantage here is that the measurement signal is played as a sound file like a piece of music via the head unit; this feature is available for all vehicles. The measurement is then carried out with the company's own measurement signals programmed in-house and with lots of audio processing, whereby the running time of all loudspeakers in the system is compared with a reference loudspeaker and then calculated.

The input sensitivity can be adjusted with the software. In the range from 2.8 to 11 volts, all inputs are set simultaneously, which is a quick and easy solution. Also included is the expanded import function for setups, which is now also available for the inputs. This makes life easier, especially for professionals, because customized setups can be transferred fully or partially to a new device. The existing subwoofer settings of a twelve-channel setup can, for example, be assigned to any two channels with a single click. The transmission of high-pass, low-pass, EQ, gain and name between any available channels are possible for inputs and outputs – very handy for power users.

► Specifications Match M 5.4DSP

Dimensions (L x W x H in mm) 110 x 85 x 35 mm

- Inputs**
- 4-channel high level
 - 1 x digital S/PDIF (optical)
 - Sensitivity 5 – 11 V

- Outputs**
- 4-channel RCA (3 V)
 - Remote-out

DSP-Software (V 4.77a)

Equalizer

- Inputs:**
- param., 5 bands per channel
- Virtual channels:**
- param., 30 bands per channel
- Outputs:**
- param., 30 bands per channel, +6 – -15 dB
 - 20 – 20k Hz, 1 Hz increments, Q 0,5 – 15
 - Shelf 25 – 10k Hz, Q 0,1 – 2
 - Allpass filters 1st or 2nd order, f and Q adjustable

Crossovers

- Outputs:**
- 20 – 20k Hz, 1 Hz increments
 - Bessel, Butterworth, Chebychev, Linkwitz, User, 6-42 dB/Okt.

Time and level

- Samplerate 48 kHz,
- 7 mm increments (0,02 ms)

- Inputs:**
- 0 – 5,20 ms, 256 samples
- Virtual channels:**
- 0 – 354 cm (10,40 ms), 512 Samples

- Outputs:**
- 0 – 708 cm (20,82 ms), 1024 Samples
 - Phase 0, 180° (fullrange),
 - 0 – 360° (22,5° increments)
 - Adjustable level increments 0,1 – 1 dB

Features

- 10 Setups with fast switchover
- User-defined routing of in- and output ports
- SCP control connector for programmable remote controls and accessories
- Start-stop capability up to 6V
- Signal-dependent switching to digital input
- Automatic putting through of all vehicle tones
- Power save mode
- (configurable) ADEP.3 error protection circuit for factory radios with speaker recognition
- RTA real-time frequency curve measurement (with optional microphone)
- FX menu with dynamic bass, center and front processing
- ISA for measuring, summing and correcting inputs
- Time Machine for taking back and restoring adjustments
- Device Monitor (temperature and voltage monitoring)
- ATM fully automatic time alignment
- Automatic input gain setting using proprietary signals
- Easy import of existing setups
- Standard programming or VCP, 8 virtual channels, user-defined routing, EQ, time alignment and FX-Processing

Optional accessories

- Wired remote control (programmable)
- Display remote control director with memory, USB, etc.
- Smart remote control Conductor
- WIFI Control for wireless programming
- Measurement microphone MTK1
- Plug&play harness kits



In the ISA, any inputs and their sums can be measured. EQ (with allpass) and time alignment are adjusting the incoming signal

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The numerous integration features such as power save mode for CAN vehicles or bypass circuits for diagnostic programs of some factory radios and a freely configurable source management with automatic switching of sources and vehicle tones are especially commendable. The in-house ADEP.3 system is able to bypass the loudspeaker diagnostics of some vehicles, thus bypassing error codes or even switching off channels.

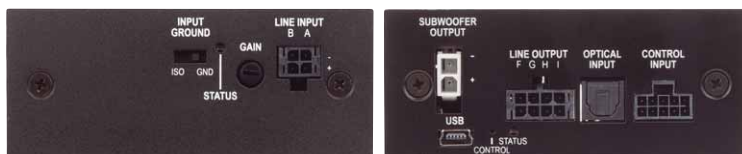
Measurements and sound

The M 5.4DSP starts with 4 x 43 W in MidPower mode and with 4 x 66 W in HighPower. There is also 90 W at 4 ohms on channel 5 and a full 163 W at 2 ohms. The distortions are kept within limits and always remain below 0.1%. The M 2.1AMP impresses in stereo and mono mode at 4 ohms with even lower distortion values below 0.03% and 0.02%. And check out this performance! We measure a full 2 x 170 W at 4 ohms, which is more than enough for a underseat woofer or any component system. With 206 W at 4 ohms in mono, the M 2.1AMP already proves very diligent, but at 2 ohms (or 2 x 4 ohms) the tiny box pushes the promised 350 W without complaining - a superb performance! In terms of sound, the small M amplifiers don't have to be shy when compared to the larger amps. The M 5.4DSP drives a two-way system clearly and cleanly with a remarkable sound quality. Voices and instruments sound natural and the tonal balance is done very neatly. In addition, there are astonishing reserves for dynamic jumps. With a three-way system, the M 2.1AMP is added to the woofers in stereo mode. Levels that meet the highest demands can now be achieved without any problems. It sets crisp and, if necessary, hard-hitting bass that is a pure delight. The M 2.1AMP is also fully convincing on the subwoofer, it has even heavier chunks under control and plays precisely and dynamically. On our part, there are no more wishes left unfulfilled.

Conclusion

The new Match amplifiers M 5.4DSP and M 2.1AMP are perfectly suited for the smallest of spaces in a factory system to give the best possible performance. The M 5.4DSP already has enough boost to supply a small system on its own. Thanks to 9 DSP channels and the powerful software, it is also a perfect control center for complex audio systems. The M 2.1AMP offers a perfect performance supplement in the same micro format, which can also be operated in stereo or mono mode.

Elmar Michels



The M 2.1AMP only has a ground lift switch and sensitivity controls to operate. The M 5.4DSP is a full package with Molex sockets, digital input and control port

Amplifier	Match M 2.1AMP	Match M 5.4DSP
Price	400 Euro	600 Euro
Distributor	Audiotec Fischer Schmallenberg 02972 9788 0	Audiotec Fischer Schmallenberg 02972 9788 0
Hotline		
Internet www.	audiotec-fischer.com	audiotec-fischer.com

Ratings			
Sound	40 %	1,1	1,3
Bass	8 %	1,0	1,5
Neutrality	8 %	1,0	1,0
Transparency	8 %	1,0	1,5
Spatial imaging	8 %	1,5	1,0
Dynamics	8 %	1,0	1,5
Lab	35 %	1,3	1,9
Power	20 %	1,5	2,5
Damping factor	—	—	—
Signal-to-noise ratio	5 %	1,0	1,0
Noise	10 %	1,0	1,5
Practice	25 %	1,6	0,6
Features	15 %	2,0	0,5
Build quality electronics	5 %	1,0	0,5
Build quality mechanics	5 %	1,0	1,0

Specifications

	1 / 2	5
Channels	2	5
Power 4 Ohm	2 x 170	4 x 66 + 90
Power 2 Ohm	0	163
Power 1 Ohm	0	—
Bridged Power 4 Ohm	206	—
Bridged Power 2 Ohm	350	—
Sensitivity max. mV	940	3200
Sensitivity min. V	4,8	12,3
THD+N (<22 kHz) 5 W	0,018	0,047/0,03
THD+N (<22 kHz) Halblast	0,030	0,101/0,045
Signal-to-noise ratio dB(A)	93	91/86
Damping factor 20 Hz	67	—
Damping factor 80 Hz	67	—
Damping factor 400 Hz	66	—
Damping factor 1 kHz	63	—
Damping factor 8 kHz	17	—
Damping factor 16 kHz	5	—

Features

Low pass	—	10 – 20k Hz
High pass	—	10 – 20k Hz
Band pass	—	10 – 20k Hz
Bass boost	—	-15 – 6 dB/10 – 20k Hz
Subsonic filter	—	via DSP
Phase shift	—	0, 180°/LZK via DSP
High-level inputs	—	•
Separate gain control (Autosense)	—	• DC
RCA outputs	—	• , 4CH, prozessiert
Start/stop capable	• (6 V)	ü (6 V)
Dimensions (L x W x H in mm)	110 x 85 x 35	110 x 85 x 35
Others	Mono/stereo mode, ground lift	digital input, 9-channel DSP, plug&play

Top Class 1,3
CAR & HiFi 6/21
Price-Performance: very good

„A sleek and flexible performance enhancer or simply a great power amplifier for your own needs.“

Top Class 1,3
CAR & HiFi 6/21
Price-Performance: excellent

„A tiny but powerful control center for the entire system.“