

# The Church Amplifier

## Solve all problems at once...

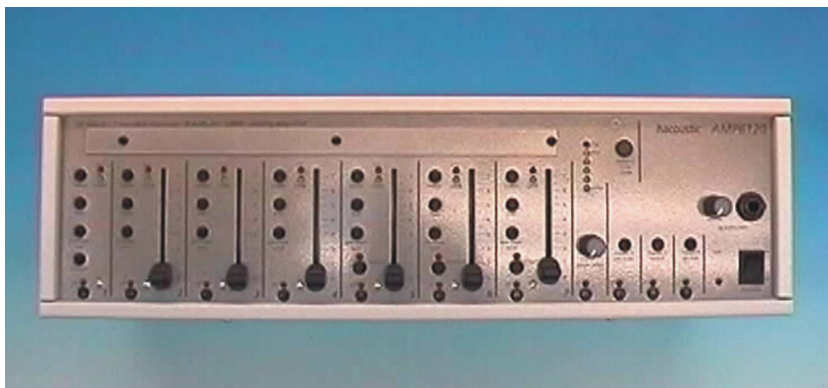
All problems, that are so familiar when installing and adjusting sound systems in churches, will be solved by just choosing the AMP6120 from Hacoustic.

In this 4th generation church amplifier all of Hacoustic's 20 years of experience is at your service. Hacoustic amplifiers have been in use since 1980 all over Europe in thousands of churches.

## Intelligibility problems caused by long reverberation time...

The AMP6120 can be completed with the unique VOX-circuitry, which allows only one microphone to be switched-on at a time. This prevents, that the speaker signal or reflected sounds from walls or ceilings, which are delayed as a result of the distance to the microphone, are picked up again by microphones, thus amplifying the natural room reverberation.

The Hacoustic VOX is not just a noise gate, simply switching any microphone on when it receives a sound pressure that exceeds a certain level. Our VOX compares the signal levels of all microphones and decides which microphone should be open. This "decision making process", is executed by electronic circuitry, designed after numerous tests and years of experience in real churches.



## Different sound levels with various speakers...

The overall sound level depends on the voice of the speaker, the distance to the microphone, location of loudspeakers and microphones, etc. The optional compressor/limiter-board provides compensation of the problems, caused by this type of sound pressure fluctuations.

The board is designed for use in churches, this to prevent nasty side effects such as "pumping" and "robot-voices", which are usual by many compressor systems.

Our compressor is not adding any noise or hum, even when it is increasing the gain to the maximum.

The level adjustment is always smooth and the working of the unit will not be noticed.

Actually, you won't notice the advantages of this unit, but you immediately miss it after you remove it.

## Tone adjustments required...

When using different types of microphones, combined with persons having different voice types, who often vary the distance to the microphones, differences in equalization occur. These problems can be compensated for each input channel using the highly effective separate bass and treble controls.

## Distortion caused by too high input levels...

Too high input levels often cause distortion, which can be prevented. At the Hacoustic AMP6120 each input is equipped with a logarithmic level control at the rear. The -20dB LED and the CLIP LED for each channel at the front help to prevent unnecessary distortion and guaranty maximum headroom.

## Too much noise or no treble...

For maximum intelligibility a clear sound with much treble is required. Many amplifiers are not designed to perform properly.

The tone control is not effective to boost treble enough. Or the treble boost also results in the noise of a waterfall out of the speakers.

No amplifier can beat our AMP6120 when it comes to crystal clear sound without any background noise.

## Hum and other noises...

The discrete circuitry of the Hacoustic AMP6120 is not adding any hum or other noise. The unit is powered by a toroidal transformer, which is not producing any unwanted radiation.

## Radio channels over the loudspeakers...

All Hacoustic amplifiers are RF-shielded; radio waves cannot reach the inside of the unit. RF-radiation that is received over the speaker- or microphone wires is filtered at the amplifier's terminals by special designed circuits.

The unit is CE-approved and meets the German BZT-standards.

## Condenser microphones do not work...

Finally, studio quality microphones are affordable. But the amplifier should provide phantom power to connect condenser microphones. Otherwise you need an expensive, separate power supply.

The AMP6120 has (switchable) phantom power on each microphone input.

## Too much bass during speech...

When a speaker talks too close to the microphone, the proximity effect is enhancing the low frequencies. This will decrease intelligibility.

In the AMP6120 each microphone input is equipped with a switchable low cut filter to prevent this problem.

## Unadjustable units...

Some amplifiers have no more rotary or slide controls at all. They are adjustable using push buttons and a display. Like your video recorder at home, but most people need the manual time after time just to re-adjust the most simple things. Some processor controlled equipment has programmable presets, that can be chosen with a numeric code. But if the situation requires another setting? Then you need to be a skilled electronic engineer. And still, a simple change of setting, such as switching off a microphone, or changing the

equalization slightly, often turns out to be impossible. Then you have to call in a sound engineer with a programming device. What an expensive way to make a simple adjustment! At the Hacoustic AMP6120 you will find "old fashioned" slide controls, to make adjustment fast and in a common sense way. Controls that should not be used every day are hidden or you need a screwdriver to adjust.

#### **Modular systems...**

Some manufacturers offer modular amplifiers. These units have to be configured like a kit.

Using the parts that are really required for the specific system, a technician builds up the unit that serves the purpose exactly. A very expensive approach, because all those modules cost a lot of money, and so is the assembling.

If your system has to be extended later, you have to buy additional modules. These expansion modules often turn out to be very expensive, but by that time you have no other choice; only this expensive part will fit into the unit you already have. And then your supplier also has to send a technician to install the additional module, generating high travel and labour costs. The Hacoustic AMP6120 is very complete, with standard 10 inputs and 4 output channels. It is rare, that our AMP6120 will not meet the requirements.

If you compare prices you will conclude, that our very complete amplifier will be cheaper than a very simple modular unit. It is that easy to decide for Hacoustic.

#### **Microphone transformers...**

Sometimes a transformer balanced input is required. But most of the time the standard electronically balanced inputs are sufficient.

At Hacoustic you buy (the relatively expensive) transformer only when you really need it. You are not paying for unnecessary parts.

Transformers can be added at any time, even without opening the cabinet.

#### **Lack of output power...**

The output power, that is really needed in a church, is limited. Unless music is required. Then deep and natural bass reproduction is of importance.

The AMP6120 has more than enough output power, even when many sound columns are connected.

If separate music loudspeakers are connected, combined with a CD-player, you will be surprised by the natural sound of this unit. Play an organ-CD and you will hear a real organ.

#### **Missing speaker adjustments...**

Many amplifiers have only 100V and 8 Ohms adjustments.

If you install the AMP6120 it would be rare not having the most adequate speaker impedance available. You will find terminals for 4, 8 and 16 Ohms, and for 50, 70 and 100V.

#### **All the outputs you ever wanted**

Most amplifiers have only one line output to connect additional equipment. At the Hacoustic AMP6120 you will find as many as 7 outputs!

For every use you will find an output, which can be adjusted separately and can be monitored with the headset. Most outputs are designed and configured specifically in the way you always wanted it to be.

#### **Output Master 1 (power amplifier)**

The rotary control at the front adjusts the level, that is sent to the built-in power amplifier. The signal is available at 2

connectors "Master 1 out" at the rear.

This signal is also available at the LED-bar and at the headphone outputs during normal operation.

#### **Output Master 2 (pre-fader)**

Every input channel is equipped with a control "Pre-fader send". With this control the signal of that channel is sent to Master 2, independent from the slide controls and the tone controls.

Ideal for connecting an inductive loop amplifier, that should not be affected by the tone control.

It is also possible to adjust microphones in a different way to this output as for the built-in power amplifier.

#### **Output Master 3 (tel. line)**

This output is meant to connect a telephone line to distribute the signal to the homes within the parish.

The output is able to supply output levels up to +12dBV, for connecting a telco transformer.

Usually this output is used in combination with the ambiance microphone.

#### **Output Master 4 (record)**

More and more services are recorded on compact cassette, MiniDisc or CD-recordable.

This output has 3 separate connectors at the rear.

Usually this output is used in combination with the ambiance microphone.

#### **Insert**

For the Master 1 output an insert is provided. This allows to separate the mixer output and the power amplifier input. Connectors are cinch.

Using the insert, effect units such as equalizer and feedback destroyer, can be connected.

#### **Ambiance microphone**

The unique VOX-circuit provides only 1 microphone to be on at the time. When there is no speech, all microphones are automatically switched off.

Ideal for the sound system inside the church, but a disadvantage when making recordings and for the people at home connected over the telephone line.

To solve this problem, an ambiance microphone can be connected to channel 1. The VOX is programmed to switch on microphone 1 automatically as soon as all other microphones are switched off.

With the routing switches microphone 1 can be sent to any, or any combination of the Master outputs 1-4. Normally, microphone 1 will not be sent to Master 1, but it might be sent to all other Masters.

In that case the ambiance sound is heard over the telephone line, in the hearing aids and in the recording, but not through the church speakers.

#### **Pre-fader listening (pfl)**

Every input and every output can be monitored with the pfl-switches, using a headset.

All pfl-buttons are pulse-contacts, controlling logical circuitry to switch the audio signal, the LED's and the LED-bar. For example, pushing pfl-3 will switch channel 3 to the headphone, the LED-bar reading to channel 3 and the pfl-LED of pfl-3 to light up. This status will remain until another pfl-button is depressed, than switching over to the new channel to be monitored.

When no pfl-button is depressed for a specific time, the system will switch back to monitoring Master 1.

**Headphone jack**

A 6,3mm stereo jack at the front is available to connect a headphone. The volume control for the headset is located next to the connector. The headphone signal is also available at a cinch connector at the rear.

**Routing matrix**

Every input channel is equipped with micro-switches to adjust the routing. The micro-switches are hidden behind a cover, which can be opened with a screwdriver. Every input channel can be routed to Master 1 and/or Master 3 and/or Master 4. This allows to send the ambience microphone to Master 3 (tel. line) and Master 4 (record), but not to Master 1 (power ampl.).

**Mute switch**

With the Mute-switch the level of Master 1 is decreased 20dB as long as the button is depressed. A great feature when feedback occurs. By pushing the button, the feedback stops, without changing any setting of the unit. This function is also available for remote control, using the Options connector at the rear.

**XLR-connectors**

For microphone connection professional XLR-connectors are available. This allows to connect microphones with sturdy, adequately shielded microphone cables.

**SMD-technology**

The Hacoustic AMP6120 is almost completely built up using SMD-technology (surface mounting devices). The thousands of components on the circuit boards are placed with computer controlled assembly machines with an accuracy of 1/10,000mm. Soldering takes place using automated reflow-techniques. Technology, originating from space-lab and computer manufacturing, to guaranty maximum reliability at moderate production costs.

**Options**

For a typical church, an AMP6120 will be equipped with a 3 channel VOX and a compressor/limiter. However, these units are optional and can be installed whenever they are required.

The VOX consists of a main board, which allows to convert 2 microphone channels into voice controlled channels. A maximum of 5 extension boards can be inserted to configure a 7 channel voice activated mixing amplifier. On the main board of the VOX can be programmed if MIC 1 has to act as an ambience microphone.

**External Master control**

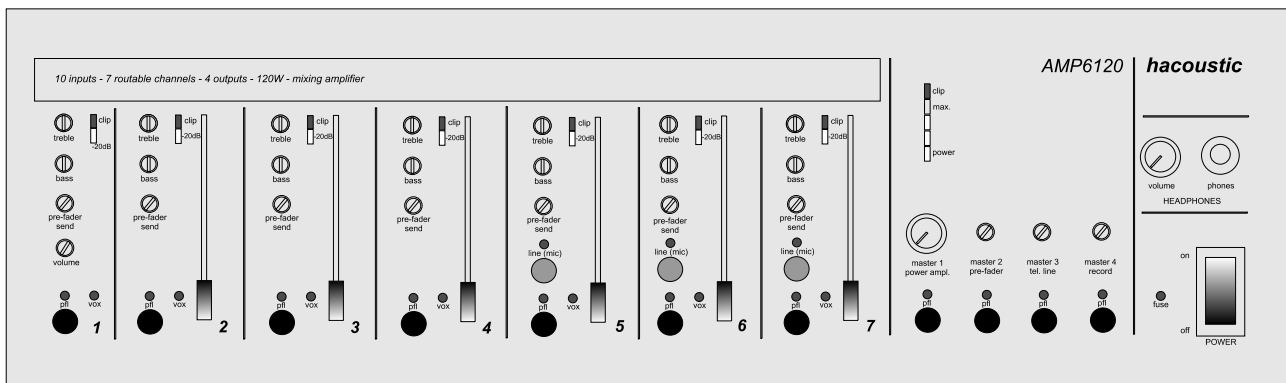
The volume of Master 1 can be remote controled, connecting an (optional) control unit with up to 100m of cable to the options connector.

**Microphone mute**

It is possible to switch off certain microphones automatically, using the microphone mute option. When a choir is singing or a brassband is playing behind the altar, the high sound level will activate microphones and amplify the sound of the musicians. Since the microphones are adjusted and the overall system is designed for maximum intelligibility and not for music reproduction, the result will not be very nice. It is better, to switch off the speech microphones during live music. This is also the case, when somebody sings at maximum voice level into a microphone during live music; his voice will be too loud and it will overrule all other microphones. The home audience (over the telephone line) and at the tape-recording only this voice will be heard. The microphone mute option prevents this problem. With an additional microphone the level of the organ, the choir or the musicians is measured; when it exceeds a certain level a pre-programmed number of microphones automatically switches off. When the music stops, speech microphones are ready for use almost instantly.

**Power amplifier protection**

The power amplifier of the AMP6120 has quite some spare power; in a church this power rarely will be required. If high endurance is expected, or when the ambience temperature can be very high, the unit can be equipped with the optional temperature controlled cooler. The power amp has advanced protection circuitry, protecting the unit against overheating, low impedance, short circuit and open output. The Fuse-LED at the front will indicate, that certain protection circuitry has switched off the power amplifier section. When the FUSE-LED lights up, the unit has to be switched-off for approx. 10 seconds to reset the protection circuitry.



#### Technical Specifications Hacoustic AMP6120:

<i>Output power:</i>	120W RMS
<i>Speaker adjustments:</i>	4/8/16 Ohm; 50/70/100V
<i>Line outputs (master 1):</i>	0dB and +6dB in 600 Ohm (cinch)
<i>Line outputs (master 2):</i>	0dB in 600 Ohm (cinch)
<i>Tape record (master 3):</i>	0dB in 600 Ohm (3x cinch)
<i>Pre-fader send:</i>	0dB in 600 Ohm (cinch)
<i>Master 4 (church teleph.):</i>	+12dB in 600 Ohm (cinch)
<i>Headphones output:</i>	0,7 Watt in 500 Ohm (stereo jack at front)
<i>PFL-monitor:</i>	0dB in 600 Ohm (cinch)
<i>Routing per channel:</i>	master 1; master 3; master 4; pre-fader send; monitor
<i>Mic 1 t/m 7 (excl trafo):</i>	adjustable -20dB to -52dB
<i>Mic 1 t/m 7 (incl trafo):</i>	adjustable -32dB to -64dB
<i>Input imp. microphone:</i>	2kOhm
<i>Phantom power:</i>	15V; switchable per microphone (jumper)
<i>Line inputs (5 t/m 7):</i>	adjustable -10dB tot -15dB
<i>Input imp. line inputs:</i>	10kOhm
<i>Low cut per channel:</i>	-6dB/octave at 100Hz
<i>Signal to noise ratio:</i>	94dBA
<i>Distorsion:</i>	0,3% at 1kHz at RMS-power
<i>Frequency range:</i>	20Hz-20kHz (+0,5dB/-2dB)
<i>Treble control:</i>	+12dB/-15dB at 10kHz
<i>Bass control:</i>	+15dB/-20dB at 80Hz
<i>LED's:</i>	output level with 5-segment LED-bar input level -20dB (green) clip level 0dB (red) VOX active (re) pfl on (red)
<i>Power consumption:</i>	250VA at full power
<i>Mains voltage:</i>	220-240V/50-60Hz
<i>Dimensions (HxBxD):</i>	128x440x208mm
<i>Weight:</i>	9,8kg
<i>Options:</i>	19" rack mount RMK4000 automatic voice activated microphones (VOX) compressor/limiter equalizer

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