



# Hydrophone

ASF-1 MKII



experience quality.



## ASF-1 MKII

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## 1. Introduction

- Nearly 400 million square kilometers of our planet are covered with water
- Only 1% of the habitat water is explored
- About 1000 species underwater communicate in an acoustic way
- **Listen to a new World**

Since 2005 Sonar Surround set the goal to make this unknown world audible in high-quality.

With new award-winning and patent registered techniques they were able to record the first underwater surround recordings ever.

With the 15th of August 2010 Sonar Surround became a part of Ambient Recording GmbH. Since the fusion, Ambient continuously developed new underwater products to be able to offer a complete underwater workflow.

The ASF-1 MKII is completely designed and manufactured by Ambient Recording in response to all the requests for a professional-quality, yet affordable hydrophone designed specifically for use with standard audio gear. The result is an extremely natural sounding, low noise underwater microphone.

### »Crystal clear, low noise audio from infra- to ultrasound«

With the development of the Ambient "Sound Fish" we focused on high audio quality with best handling. Therefore we designed a linear, low distortion microphone offering a linear frequency response from 7Hz- 20kHz.

### »Works with standard 48V Phantom power«

Following our idea to create an underwater microphone for professional sound recordists, we worked hard to build a hydrophone which can be fed directly from standard 48V Phantom power. Thus, this microphone works right out of the box with all professional audio gear using standard XLR connections. No adapters are required!

### »Waterproof up to 100m«

The ASF-1 MKII is machined out of high-quality aluminum-brass and can easily withstand the water pressure of 100m depth. Additionally, sensors got encapsulated by a special polyurethane elastomer, known for its long term resistance against seawater.

## ASF-1 MKII

### 2. Package Contents

- ASF-1 MKII
- BC20 (hydrophone case)
- AHK-10 (10m underwater cable)
- Manual

### 3. Safety Instructions

For your own safety and trouble-free use of the Ambient Sound Fish please carefully read the instructions below. Always keep a copy of these instructions and hand them out with the unit to other users.

This unit is intended for use in water. When all receptacles are connected correctly and locked tight, it is sealed to be waterproof down to a depth of up to 100m. Anyway, always long-term test the sealing in shallow water and replace damaged sealing gaskets before actual field usage. Always make sure that the receptacles are kept dry and clean. It is recommended to use a small amount of silicone based lubricant on the thread to ensure waterproofness. Note that the lubricant needs to be removed thoroughly after each use. Switch off the Phantom Power before disconnecting the hydrophone connector and dry the hydrophone (including connection) systematically.

Seawater is a very aggressive medium. Even though the ASF-1 MKII is only manufactured with materials offering a good seawater resistance, the unit has to be cleaned immediately after use in sea or chlorine water with plenty of fresh water to avoid irrevocable damage. Sea water could cause superficial corrosion that might change the color of the housing. This is a natural process which won't damage the unit nor affect the usability. If the corrosion is starting to dissolve the metal, stop using the ASF-1 MKII immediately and check if the housing is connected to any ground.

#### (More info in "4. Powering")

Never use the hydrophone within acids or bases. Never bend the acoustic sensitive membrane in any way. Keep out of hot environments and never expose to direct sunlight. Do not throw the hydrophone or expose to mechanical impact. Do not expose to hard vibrations.

Temperature changes apply stress to crystals on the piezo. Just like an instrument, give it a minute to acclimatize for best results. Especially when you go „fishing“ in cold water.

Only use genuine accessories (such as cables) supplied by an authorized dealer. Always check integrity and proper compatibility with all units connected to. Never open the unit. Inappropriate and unauthorized access will void the warranty and imply possible risks of harm to the user.

Follow the legal requirements for recycling electronic equipment when disposing the unit.

**ATTENTION !**

**Highly sensitive sensor !  
Protect from any kind of shock !  
DO NOT BEND !**



## 4. Powering / Electrolysis

The ASF-1 MKII can be powered by 48V Phantom Power supplied by professional audio mixers & recorders.

### Electrolysis

Electrolysis is a tough problem while working with electrical equipment in a wet environment. To avoid any kind of electrolysis, the metal parts of the ASF-1 MKII are not and should not be connected to the audio ground of the unit. If the ground of the mixer / recorder is connected to the ground of the boat and the audio ground of the hydrophone would be connected to the hydrophone metal housing, the ASF-1 MKII would become the cathodic protection of the ship. This would cause immediate irrevocable damage to the unit.

## ASF-1 MKII

### 5. Unit Description



- 1 Underwater hydrophone receptacle
- 2 Aluminium bronze hydrophone body
- 3 Acoustic sensor with special formulated PUR membrane
- 4 Underwater connector, AHS-SX1X0C  
**Please avoid bending the cable at the end of the connector!**
- 5 10m underwater cable: seawater resistant, low current profile, squirted with conductive material to avoid for microphonic effects with pressure
- 6 XLR-3M connector

## 6. Mains Hum

When using the ASF-1 MKII indoor, some general details have to be considered:

- The ASF-1 MKII is working with highly sensitive piezo sensors and therefore also sensitive to electromagnetic and electrostatic fields.
- Water picks up electrostatic radiation. Therefore, electronic devices known for electromagnetic radiation should be kept away from the water to be recorded in. (switching power supplies, fluorescent lamps, CRT displays or TV sets, ...)
- To avoid the hydrophone from picking up hums, the water you are recording in should be grounded.
- Often, the easiest way is to connect the audio ground of your mixer / recorder with the water. **ATTENTION: Never do so when recording from a boat and your mixer / recorder is connected to the electric ground of the vessel.** If you are experiencing inducted mains hum ALWAYS disconnect the ground of your mixer / recorder from the power supply ground (e.g. use battery power instead) before you connect the audio ground with the water.

## 7. Underwater Acoustics

The acoustic underwater differs in many ways from the airborne sound we are used to. The sound velocity underwater is varying between 1450 and 1550 m/sec depending on temperature, salinity and depth. This results in 4 to 4.5 times bigger wave lengths as well as in a special sound phenomenon called the SOFAR, also known as Underwater Sound Channel. Horizontally sound can travel over huge distances whereas vertical propagation is strongly attenuated. Here are some useful advices:

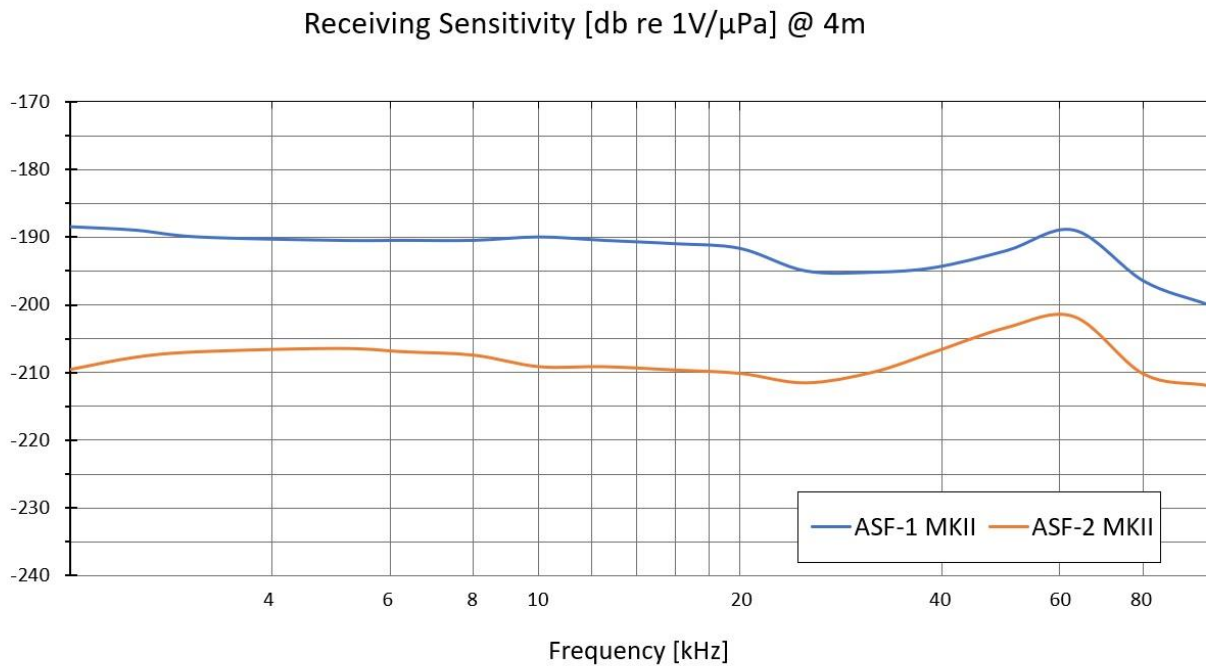
- Sound Channels (USC, SSC,...) can be avoided by knowing their local depth.
- To avoid the noise from braking waves on the boat carcass, take long enough cables to go down deep enough or prepare to record in greater distance to the vessel.
- Take time for detailed micro-phasing when recording in pools or artificial environments as bigger wave lengths underwater lead to greater distances between sound maxima and minima.
- Never forget how far low frequencies can spread underwater. Therefore, avoid touristic areas for documentary shots.
- Water owns a reflection factor close to 1. Thus airborne sound virtually can't couple directly into water. This phenomenon can be used. If barriers reach close to the water surface (reefs, wave-breakers, e.g.) you can use them as acoustic barriers, independent of the current depth. This way you may find acoustic cover in a pool with 1m depth behind an 80cm wooden block, even though the wavelength underwater wouldn't suggest this.



## ASF-1 MKII

### 8. Acoustic Specifications

Usable frequency range:	7Hz to 100kHz
Horizontal directivity:	omnidirectional $\pm 3,5$ dB at 100kHz
Vertical directivity:	270° $\pm 3$ dB at 15kHz
Receiving sensitivity:	-192dB re 1V/ $\mu$ Pa



*Calibration data obtained by Bundeswehr "Technical Center for Ships and Naval Weapons, Maritime Technology and Research" (WTD 71) in September 2021. Specifications here represent the average of three measured ASF-1 MKII units.*

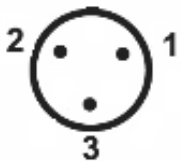
## 9. Physical specifications

Dimensions (L / W / H):	175 x 26 x 26 mm (incl. cable connector)
Weight:	0.27 kg (without cable)
Power consumption:	8 mA (@ 48V supply)
Max depth:	100 m
Operating temperature:	-5°C to +50°C (23°F to 122°F)
Housing material:	Aluminium bronze (CuAL10Ni5Fe4)
Encapsulating material:	Seawater resistant PUR system

### Connectors:

XLR-3M

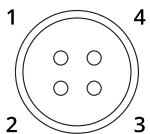
Neutrik XLR 3-pin male (solder site)



- pin 1: ground
- pin 2: audio Hot
- pin 3: audio Cold

AHS-SX1X0C

Ambient hydrophone connector (solder site)



- pin 1: ground
- pin 2: audio hot
- pin 3: audio cold

## ASF-1 MKII

### 10. Available Accessories

#### AHK: Underwater cable

AHK-II-10: 10m underwater cable

AHK-II-20: 20m underwater cable

AHK-II-30: 30m underwater cable

*Different lengths on request*



#### AHK-ERD10

Grounding cable for all ASF models; 10m cable length

*Different lengths on request*



#### DS: Directivity Sphere

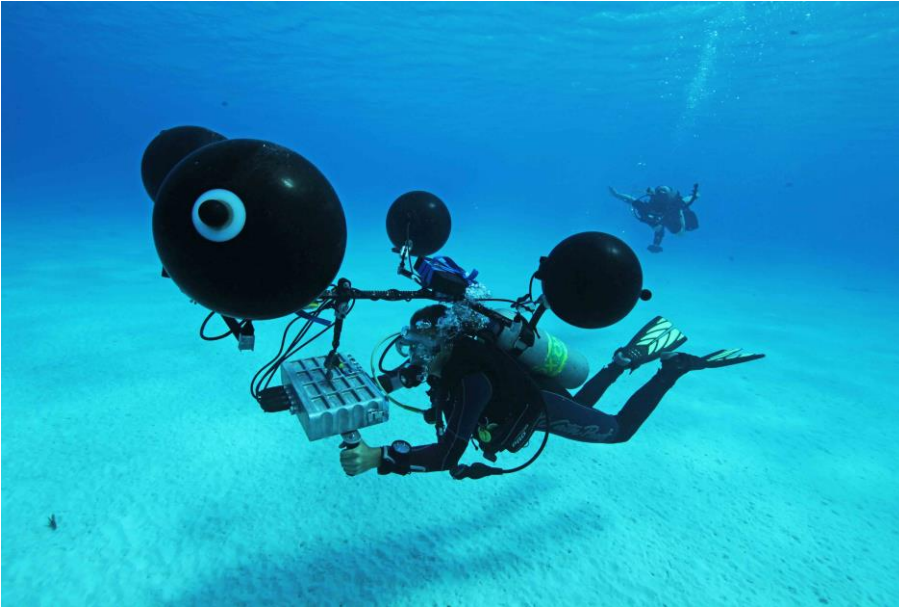
Gives omni directional hydrophones a directivity close to a super cardioid



#### RS-2: Underwater stereo bar



RS-5: Underwater surround rig



SD-UW: Underwater housing for Sound Devices 7-series recorder



For more information or sound examples, visit us on <http://www.ambient.de/en/products/ambient-recording/underwater.html>.

## ASF-1 MKII

### 11. Warranty & Approvals

#### Warranty

Ambient Recording GmbH warrants the ASF-1 MKII hydrophone against defects in materials and workmanship for a period of ONE (1) year from date of original retail purchase. This is a non-transferable warranty that extends only to the original purchaser. Ambient Recording GmbH will repair or replace the product at its discretion at no charge. Warranty claims due to severe service conditions will be addressed on an individual basis. THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. AMBIENT RECORDING GMBH DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AMBIENT RECORDING GMBH IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY. Because some jurisdictions do not permit the exclusion or limitations set forth above, they may not apply in all cases.

For all service, including warranty repair, please send the ASF-1 MKII, along with proof of purchase date to your retailer, or, if not applicable, to:

*Ambient Recording GmbH  
Schleissheimer Str. 181 C  
DE – 80797 Muenchen, Germany*

Please obtain a return authorization through the contact form on our website before sending in a unit.



Approvals



CE Conformity Statement:

Declaration of Conformity

According to ISO/IEC Guide 22

Manufacturer's Name: Ambient Recording GmbH  
Manufacturer's Address: Schleissheimer Str. 181 C  
DE – 80797 Muenchen, Germany

declares that the product:

**ASF-1 MKII**

is in conformity with:

- EN 60950-1:2006 + A11:2009+A1:2010+A12:2011+AC:2011 + A2:2013
- EMC Directive: 2004 / 108 / EC, 2014 / 30 / EC
- The unit described in this Conformity Statement fulfills the specifications of the directive 2011/65/EU of the European Parliament and the Council of the European Union from 8th of July in 2011 for the limited usage of certain dangerous substances in electronic devices.

Updated October 2021

Philipp Schwab

Ambient Recording GmbH



experience quality.

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**Highly sensitive sensor !  
Protect from any kind of shock !  
DO NOT BEND !**

*MADE IN GERMANY*

*Ambient Recording GmbH*

Schleissheimer Straße 181 C | DE - 80797 Munich | vox +49 89 360 55 10-0 | fax +49 89 651 85 58  
www.ambient.de | info@ambient.de  
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