



# PHOENIX™

## Music & Communication System Installation and Operation Manual



Please scan the QR code to view the video on the proper technique for the insertion of foam earplugs into the ear canal.

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# PHOENIX™

## Music & Communication System

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# Introduction

Thank you for purchasing the Phoenix™ MRI Music & Communication System. This product has been manufactured and tested to the highest standards and is guaranteed MR Conditional up to 3 Tesla.

This product is undergoing a UL certification process and follows ISO 9001:2015 standards. This product is manufactured at a factory that is ISO 13485:2016 certified.

To ensure that you obtain maximum benefit from the Phoenix™ MRI Music & Communication System, please take a few minutes to read the enclosed information regarding installation, operation, service, and maintenance. After reading this manual, store it in a safe place for future reference.

If you have any problems in the meantime or would like any advice about this or any other MR products from Magnacoustics, please contact us at:

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Protect From  
Direct Sunlight



Protect From Rain  
and Humidity



MRI Conditional  
Up to 3 Tesla



Read  
User Manual



Manufacturer



# 1. Safety Information

## 1.1 MRI Safety Definition for MRI As Defined by International Standards ASTM F2503-13



### MR SAFE

An item that poses no known hazards resulting from exposure to any MR environment. MR SAFE items are composed of materials that are electrically nonconductive, non-metallic, and nonmagnetic.



### MR CONDITIONAL

An item with demonstrated safety in the MR environment within defined conditions. At a minimum, address the conditions of the static magnetic field, the switched gradient magnetic field and the radiofrequency fields. Additional conditions, including specific conditions of the item, may be required.

Supplementary marking - additional information that, in association with marking as "MR CONDITIONAL" states via additional language the conditions in which an item can be used safely within the MR environment.



### MR UNSAFE

An item which poses unacceptable risks to the patient, medical staff or other persons within the MR environment.

## 1.2 General Safety Information and Intended Use

The Phoenix™ MRI Music & Communication System must only be operated by personnel properly trained in MRI safety.

The Phoenix™ MRI Music & Communication System must only be operated by personnel properly trained in identifying interference problems such as artifacts, streaks, and distortions in image data. It is required that personnel handling the Phoenix™ MRI Music & Communication System are familiar with the safety instructions given in the manual and other documentation provided to ensure safe operation of the system and associated equipment.

The Phoenix™ MRI Music & Communication System comes with a two-year warranty on all parts and labor. Magnacoustics Inc. suggests a maintenance call every six months, after the two-year original warranty period, to check up on frequently used items such as the patient audio headset and the Interface Unit.

### 1.3 Health Concerns

Avoid using the audio headset on patients at a high volume. Magnacoustics' auditory experts advise against continuous loud and extended audio play. If patients experience ringing in their ears, reduce the audio volume or discontinue use of the system until the patient feels comfortable.



#### **Warning!**

If any of the components become damaged, stop using the system immediately and notify Magnacoustics Inc. customer service for assistance. Use of broken components can cause injury to the clinician or the patient.

### 1.4 Electrical safety



#### **Warning!**

Electric components in the device require several hundred volts to operate properly. To prevent potentially lethal electric shock, it is essential to disconnect the device from its power source during installation, and prior to servicing or repair. Some capacitors will remain charged with dangerous voltage levels even after the power is off. To prevent any possible electric shock, please wait several minutes for all capacitors to become completely discharged before proceeding.



#### **Warning!**

Do not operate the device near water, where it can become moist, or near excessive heat. Operation under such conditions could result in failure of the system, possible electric shock, or fire. Don't handle the power cable with wet hands. High voltages present could cause lethal electric shock.





**Warning!**

Should any foreign substances enter the device such as liquid, metal chips or dust, immediately turn off power to the Interface Unit. Under no circumstances shall tools or foreign objects be inserted into the device, as this could result in failure of the device, electric shock, or fire.



**Warning!**

If smoke, noxious odors or unusual noise should come from the device, immediately turn off power to the system and contact your local distributor or Magnacoustics Inc. service team.



**Warning!**

Do not damage the power cable of the device. Do not attempt to modify the power cable should it malfunction. Should the power cable become damaged or frayed, it must be replaced. Please contact Magnacoustics service team for support.



**Warning!**

Do not operate the Phoenix™ MRI Music & Communication System if any cables are damaged.



**Warning!**

Switch off and unplug the Phoenix™ MRI Music & Communication System during lightning storms or when unused for long periods of time.



**Warning!**

To avoid risk of electric shock, this equipment must only be connected to outlets that are at the same ground potential as the scanner. Improper grounding can damage the equipment.

**1.5 Warnings for MRI**



**Caution!**

Installation of materials inside the MRI suite must be done with extreme caution.



### **Caution!**

In addition, no persons with ferromagnetic devices, such as pacemakers or joints replacement, should enter the MRI suite at any time. Extreme, high magnetic fields inside the magnetic room have the potential to dislodge items at high velocities and can result in serious injury, or death.



### **Caution!**

For questions regarding installation procedures or technical support, call Magnacoustics team or contact via email at [support@magnacoustics.com](mailto:support@magnacoustics.com).



### **Caution!**

Only system components explicitly designed for use inside the MRI suite should be placed inside the magnet room. Components not designed for MRI use may present a projectile hazard and can become airborne, causing serious injury, damage, or death.

## **2. General Information**

### **2.1. Inspection of Delivered Goods**

Each Phoenix™ MRI Music & Communication System has been thoroughly tested prior to shipping and is ready for immediate use. Upon receipt, please report any transportation damage or missing accessories immediately to Magnacoustics Service team. In case of transportation damage, please contact the shipping company to file a claim. For faster support, please have all shipment details ready along with the Phoenix™ MRI Music & Communication System serial number and damage description. It is recommended to keep and store the original crate/box used to ship the Phoenix™ MRI Music & Communication System for all future transportation needs.

### **2.2 Power Connection Information**

The Phoenix™ MRI Music & Communication System operates on the line voltages 90-250V AC and 50/60 Hz. It is not necessary to double check line voltages or change any fuses. The equipment should be near the power outlet in the technical room of the MRI suite and the outlet should be easily accessible.

Stabilizing circuits ensures satisfactory performance within supply variations specified. If the supply voltage at your location is not 90-250V AC, please consult Magnacoustics service team at [support@magnacoustics.com](mailto:support@magnacoustics.com).

Always use the power supply cord supplied in the original shipping carton.

If the enclosed power cord cannot be used due to a different standard in your country, use a power cord that conforms to the following regional standards:

- United States (UL)
- Germany (VDE)
- Canada (CSA)
- United Kingdom (BASEC/BS)
- Switzerland (SEV)
- Japan (MITI)

In other regions, please use an AC power cord that complies with the country's safety regulations.

## 3. System Overview and Installation Guide

### 3.1 Parts Included

#### 1. MRI Phoenix™ Amplifier





2. MRI transducer



3. MagnaCoil™ pneumatic in-ear headset



4. MagnaPlugs™ 50 Standard pairs & 10 Mini pairs



5. MagnaMuff+™ pneumatic over-the-ear headset



6. MagnaCovers™ 50 pairs



7. Technologist microphone



**8. iPad (optional)**



**9. iPad stand (optional)**



**10. Shielded electrical sound cable for tech room 75 ft (CBP1)**



**11. Shielded electrical sound cable for MRI room 40 ft (CB2)**



**12. Clear Siamese headset tubing**



**13. AC adapter and cable**



#### 14. USB drive with sample MRI music



#### 15. RCA to AUX cable (optional)



### 3.2 System Overview

The Phoenix™ MRI Music & Communication System is designed to be MR Conditional and is manufactured and tested to the highest standards. It is designed to be used with all MRI scanners up to 3 Tesla magnetic field strength.

**1. MRI Phoenix™ Amplifier:** Through easy and accessible controls, the Phoenix™ MRI Music & Communication System offers one-way patient communication and full flexibility of audio settings. A Bluetooth device can be easily connected to the amplifier in the Bluetooth Input mode. Thanks to its two input channels, the amplifier allows a wide variety of audio devices to be connected through a 3.5 mm mini jack. On-board MP3 circuit allows the technician to directly play music and control audio from a USB drive and easily switch the audio input source. There are two integrated speakers on the amplifier which allow the technicians to hear the sound/music given to the patient. The sound level for the technician and the patient can be controlled individually and simultaneously. There is a MUTE circuit in the amplifier to stop the music automatically and allow the patient to hear the technician's instructions given via microphone when the technician turns the microphone on. Certain scanners can be connected to the amplifier which allows the technician to send auto-voice commands and after the auto-voice commands music continues to play.

**2. Transducer:** The innovative design of the outer case of the transducer provides an amazing capability to focus audio signal to the headphones with minimum loss in audio quality. Located in the heart of the transducer, there is a completely non-magnetic speaker specially designed for the MRI environment that provides 50W of incredible sound. The transducer is built from non-magnetic materials and MRI conditional up to 3 Tesla magnetic field strength.

**3. MagnaCoil™ Headset:** The MagnaCoil™ provides unparalleled MRI hearing protection and has been independently tested and rated 30db NRR tested to ANSI specifications. The flexible slim design ensures that they can be used in all head coils for neck, head and brain scans. The MagnaCoil™ works in conjunction with MagnaPlugs™ providing 30db of noise attenuation and delivers clear sound and speech directly into patients' ear canals. The MagnaCoil™ is comfortable and easy to use.

**4. MagnaPlugs™:** MagnaPlugs™ provide 30db NRR of noise suppression ensuring your patient's hearing is always protected while allowing clear music and speech to be delivered directly into their ear canal, protecting your patients and your practice. There are two sizes, standard and mini, to ensure a comfortable fit.

**5. MagnaMuff+™:** Comfortable, non-magnetic headphones reduce MRI scanner noise for greater sound quality, providing 29 decibels of noise reduction, (29 dB NRR) meeting OSHA requirements. The headphones feature an adjustable headband that fits both pediatric and adult head sizes.

**6. MagnaCovers™:** Available disposable cloth MagnaCovers™ provide sanitary protection.

**7. Technologist Microphone:** Push to talk - with the push of a button the channel is cleared, pausing the music, and allowing the technician to speak clearly and directly into the patient's headset. Music resumes upon button's release.

**8. iPad (Optional):** The Phoenix™ MRI Music & Communication System comes with an optional iPad, providing the opportunity to customize the scan for each patient. Patients can stream their favorite music, podcast, or video to instantly distract them and give them a sense of control of their environment. Enjoy multiple apps like Pandora, iHeart Radio, YouTube, and Spotify plus built-in features to send your patient on an auditory and visual journey far away from the noisy clinical scanning room. A calm patient



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### 3.3 System Specifications

#### Sound Control Unit

Power	60 W
Onboard Speakers	2x10 W
Inputs	2x Aux, Microphone, USB Disc
MUTE Circuit	Yes
Dimensions	31 x 26 x 10 cm

#### Microphone

Characteristics	Uni-direction
Frequency bandwidth	80 - 12000 Hz
Impedence	600 $\Omega$ $\pm$ 30%
Sensitivity	-72dB $\pm$ 3dB
Cable Length	4 m
Weight	811 gr

#### MRI Speaker

Power	100 W
Frequency bandwidth	800 Hz - 20kHz
Mean Sensitivity	93dB @ 1m/1 W
Typical impedance	0,8 $\mu$ f
Weight	214 gr

### 3.4 Installation

#### STEP 1

The transducer is placed in front of the MRI scanner, right next to the MRI bed.

#### STEP 2

The clear Siamese tubing has pneumatic male connectors located at the tips of the soundhoses. These are connected to the pneumatic female connectors on the transducer.



#### STEP 3

Either the MagnaCoil™ or the MagnaMuff+™ is connected to the open end of the clear Siamese tubing.



## STEP 4

One end of the shielded electrical sound cable (40 ft) (CBP2) is connected to the transducer, and the other is connected to the penetration panel (an RF Filter can be used as needed).



## STEP 5

The 6 mm jack on the shielded electrical sound cable (75 ft) (CBP1) is connected to the Phoenix™ Amplifier and the other end is connected to the penetration panel.





## STEP 6

The technologist microphone is connected to the microphone input on the front panel of the Phoenix™ Amplifier.



## STEP 7

Through the AC adapter cable, Phoenix™ Amplifier is connected to an electrical outlet



### 3.5 Phoenix™ Amplifier Connection Diagram

Located on the back panel of the Phoenix™ Amplifier are two input jacks. The left input jack labeled MRI Speaker is for the shielded electrical sound cable, which is responsible for transmitting the voice signal over to the MRI room. The right input jack is the main input for the AUX connector, for an external sound source. Located at the back panel of the Phoenix™ Amplifier, on the left there is the power connector. The AC adapter cable connects the Phoenix™ Amplifier to an electrical outlet. USB drive input is located on the front panel, on the right side. The Technologist microphone input is located on the front panel, on the left side.

#### FRONT PANEL



Technologist microphone

USB drive with sample MRI music



# BACK PANEL



AC adapter and cable



RCA to AUX cable



Shielded electrical sound cable for tech room 75 ft (CBP1)



# 4. Phoenix™ MRI Music & Communication System Controls

## 4.1 Front Panel:

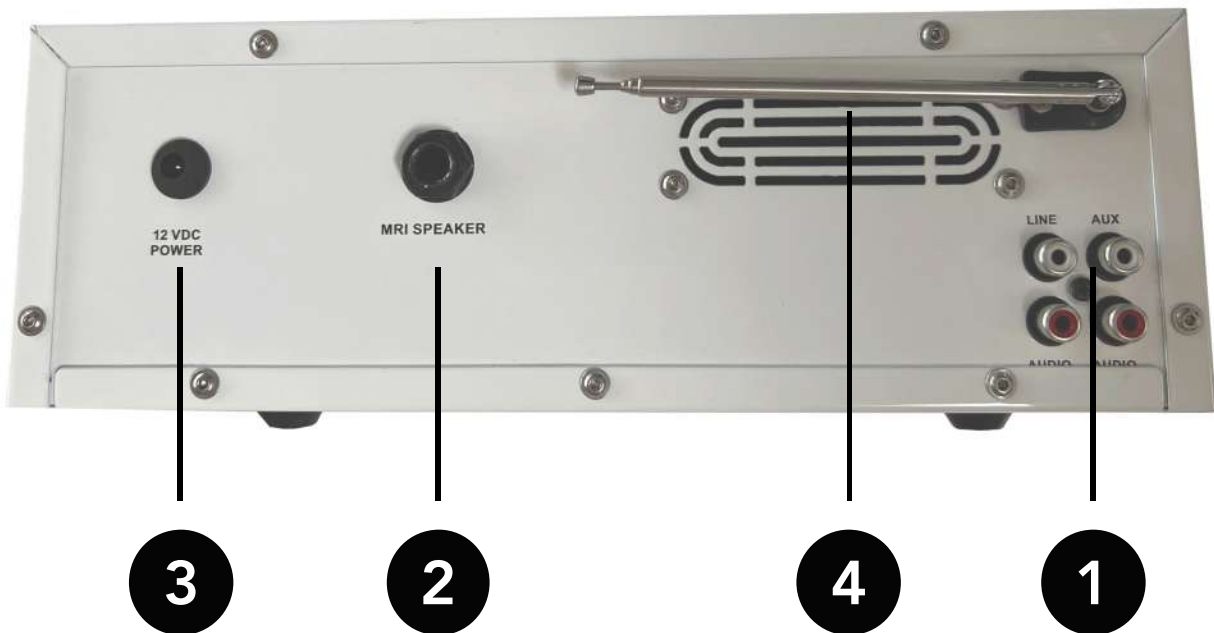
1. **MASTER VOL:** Adjust sound level of all audio inputs simultaneously
2. **MIC VOL:** Adjust sound level of microphone
3. **PATIENT:** Adjust sound level delivered to the patient inside MRI scanner
4. **CONTROL ROOM:** Adjust sound level in technical room
5. **BASS:** Adjust bass of the sound delivered to the patient
6. **TREBLE:** Adjust treble of sound delivered to the patient
7. **PLAY/STOP:** Play/stop MP3 audio from USB drive and Bluetooth
8. **REWIND:** Rewind the audio on USB drive
9. **FAST FORWARD:** Forward the audio on USB drive
10. **USB:** USB drive
11. **POWER:** Switch the main power on and off





## 4.2 Back Panel:

1. **AUX:** connects an external audio source like PC, iPod, ext.
2. **MRI SPEAKER:** connects the transducer to the Phoenix™ Amplifier
3. **POWER:** connects the Phoenix™ Amplifier to an electrical outlet
4. **FM Antenna:** amplifies signal for FM transmissions



## 5. Contact

Please contact [support@magnacoustics.com](mailto:support@magnacoustics.com) or call us at **516-239-0042** if you have any questions or to get assistance with technical problems.

For sales related questions, please contact your sales rep, or contact us at [sales@magnacoustics.com](mailto:sales@magnacoustics.com)

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