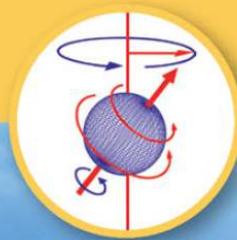


SereneSound

For Clinical MRI

INSTALLATION / OPERATION MANUAL



Resonance Technology, Inc.

18121 Parthenia Street | Northridge, CA 91325
818.882.1997 | 800.428.MRTV
www.fmri.tv | www.mrvideo.com

Part Number: RTC-SS Rev 8

Notes:

TABLE OF CONTENTS:

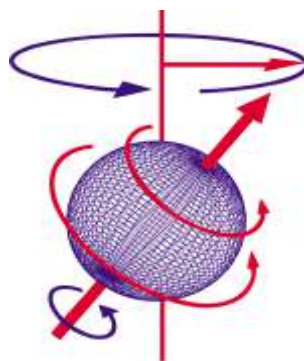
	Page
Introduction	1
Safety Instructions	2-3
Block Diagram	4
Checking Materials	5-6
Room Layout and Installation Overview	7
How to Connect the Transducer Power Cables.....	8
Running the MR Laser Link Cable	9
Components Interconnection	10-12
Control Room Setup	13
Patient Setup	14
Operation and Troubleshooting.....	14-15

Introduction

Congratulations on your purchase of the Serene Sound Digital MRI-compatible system. This device represents more than 24 years of development and state-of-the-art engineering. We are confident this product will give you the tools you need for comforting the patient while undergoing MRI scans. This user/installation manual outlines how to properly care for and operate this system.

Thank you for choosing to purchase this system from Resonance Technology, Inc. the leader in fMRI and MRI patient comfort systems.

Suggestions on how to improve this system are always welcome.



Sincerely,

Mokhtar Ziarati

Resonance Technology, Inc.
President and CEO

SAFETY INSTRUCTIONS



Resonance Technology, Inc., patient safety is our top priority. If the headset becomes damaged, stop using the headset immediately and notify Resonance Technology, Inc. Customer Service for assistance at (818) 882-1997 or (800) 428-6788. Use of broken components can cause injury to the clinician or the patient.

USE RESTRICTIONS

Caution: Seizures.

If you have a history of temporary spasms, unconsciousness, or epileptic seizures, consult your doctor before using this system. Use of this product by such individuals may cause spasms, unconsciousness or seizures. If you experience these symptoms, stop the using this system immediately and consult your doctor.

System: Warranty and Shelf life

The system comes with a one year warranty on all parts and labor, and a shelf life of two years starting from the day of its original installation. Resonance Technology, Inc. suggest a maintenance call every six months after the one year original warranty period to check up on frequently used items such as the patient audio headset and the Technologist Rremote Control. This way you will make the best use of this system for your facility and your patients.

HEALTH CONCERNS

Caution: Sound Volume.

Avoid using the audio headset on patients at high volume. Hearing expert's advice against continuous loud and extended audio play. If your patients experience ringing in their ears, reduce the audio volume or discontinue use the system use until the patient feels comfortable.

This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied or reproduced without prior written consent of Resonance Technology Inc. Information contained in this document is covered by one or more of the following U.S. patents 5627902, 5877732, 5432544, 5412419

SAFETY INSTRUCTIONS



WARNING: Inspect system components that come in contact with the patient prior to use. Discontinue product usage if any damage is visible or presents other potential hazards. Use of broken components can cause injury to the clinician or the patient.

WARNING FOR MRI

Caution: MRI Environment Hazards.

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

Take care that ferromagnetic materials be kept at least three meters away from the magnet and that no installation shall be done near the filter panel if a scan is in progress.

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

For questions regarding installation procedures or technical support, call Resonance Technology, Inc. via telephone Mondays through Fridays, 8 a.m. to 5 p.m. Pacific Standard Time at (818) 882-1997 and via email at support@mrivideo.com

Resonance Technology, Inc. will not be liable for any injury or property damage that occurs as a result of improper installation procedures or improper use of this system. By agreeing to this notice, users certify that they are familiar with basic MRI safety procedures and that they have read and understand this notice.

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

WARNING FOR ELECTRONIC PRODUCTS

Caution: Electric Shock.

Failure to observe all operating and maintenance instructions may cause damage to your product, property damage, or injury or death from electric shock, fire or other causes.

Caution: Do Not Disassemble.

Only trained, authorized personnel should perform any required service on this product. Failure to comply with this warning may result in property damage, injury or death from electric shock, fire or other causes.

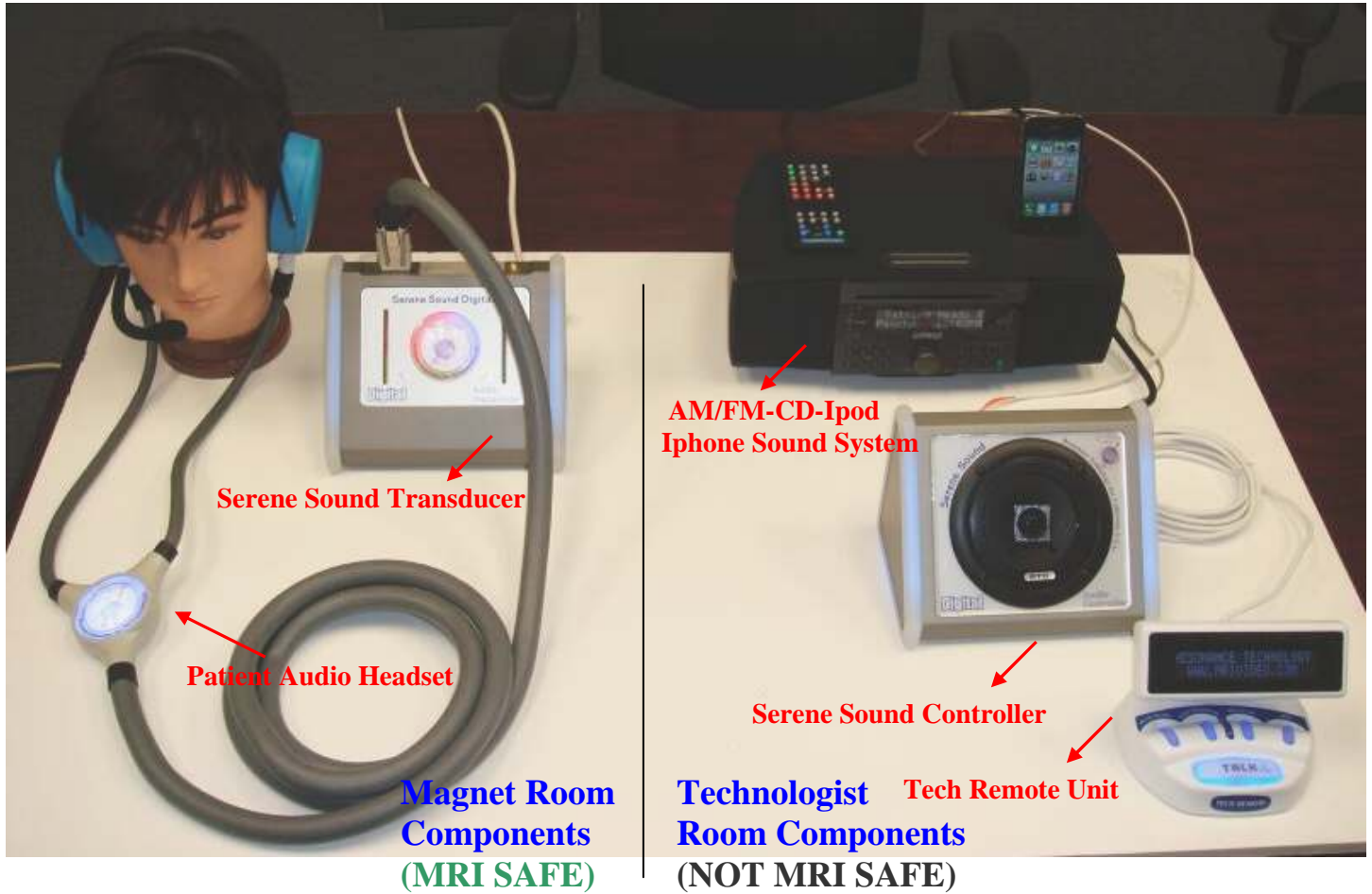
Caution: Avoid Extreme Heat, Wet, Humid, Dusty and Smoky Environments.

This product may be deformed by high temperature, direct sunlight and dropping or other mechanical shock. Do not expose the unit to rain or moisture.

Caution: Unplug the Product When Not in Use.

Always unplug this product when not in use for extended periods, such as during vacations and MRI maintenance.

Serene Sound System Components



Note: The antenna shown in the Serene Sound Transducer unit is an option for future system features that may not be included with your system. If the antenna is missing proceed using the system since none of the system functions are affected in any way.

Checking Materials

Your Serene Sound system comes complete with all the necessary components for full installation at your site. The following checklist is provided for verification:

Part Number	Quantity	Description
- Main Items -		
RTC-660-170-370-000	1	Serene Sound Controller
RTC-660-050-535-000	1	Serene Sound Controller Power Supply
RTC-660-050-540-000	1	Serene Sound Transducer
RTC-650-050-005-000	1	Power Supply (For Transducer)
RTC-661-050-005-000	1	Switching Power Supply
RTC-650-050-260W-000	1	Linear Power Supply (optional)
RTC-LPS	1	Linear Power Supply Installation/Operation Manual (optional)
RTC-650-020-000-000	1	Technologist Remote Control
RTC-650-062-000-000	1	Audio Headset
RTC-651-060-621-000	1	Headset Headband
RTC-ALS-SFA	1	Stereo System
RTC-SS	1	Installation / Operation Manual (This manual)
Part Number varies	1	Filter Plate
RTC-650-300-605-000	1	9pin D-Sub Filter
- Accessories -		
RTC-ALS-HEC	50	Headset Earpiece Covers
RTC-ALS-TWR	20	Tie Wraps
RTC-ALS-TWH	20	Tie Wrap Holders
RTC-650-060-052-000	10	Headset Microphone Cushions
RTC-651-000-453-000	1	Patient Headrest
RTV-108	1	Silicone Glue Tube
RTC-ALS-HDH	1	Headset Hook
17304	1	Cable Bundler
- Cables -		
RTC-101-102-001-101	1	MR Laser Link Cable
RTC-101-950-003-000	1	RG-59 Antenna Cable - 35 feet
RTC-330-170-404-000	1	Mini Stereo to Mini Stereo Cable (male)
ATS300SP	1	"T" FM Transformer for radio antenna
RTC-101-210-001-101	1	Transducer DC Power Cords (3m)
RTC-101-245-001-001	1	Transducer DC Power Cord (10m)
RTC-101-306-003-000	2	Hospital Grade Power Cords (USA)
RTC-ALS-HGC	2	Hospital Grade Power Cords (Europe, etc)

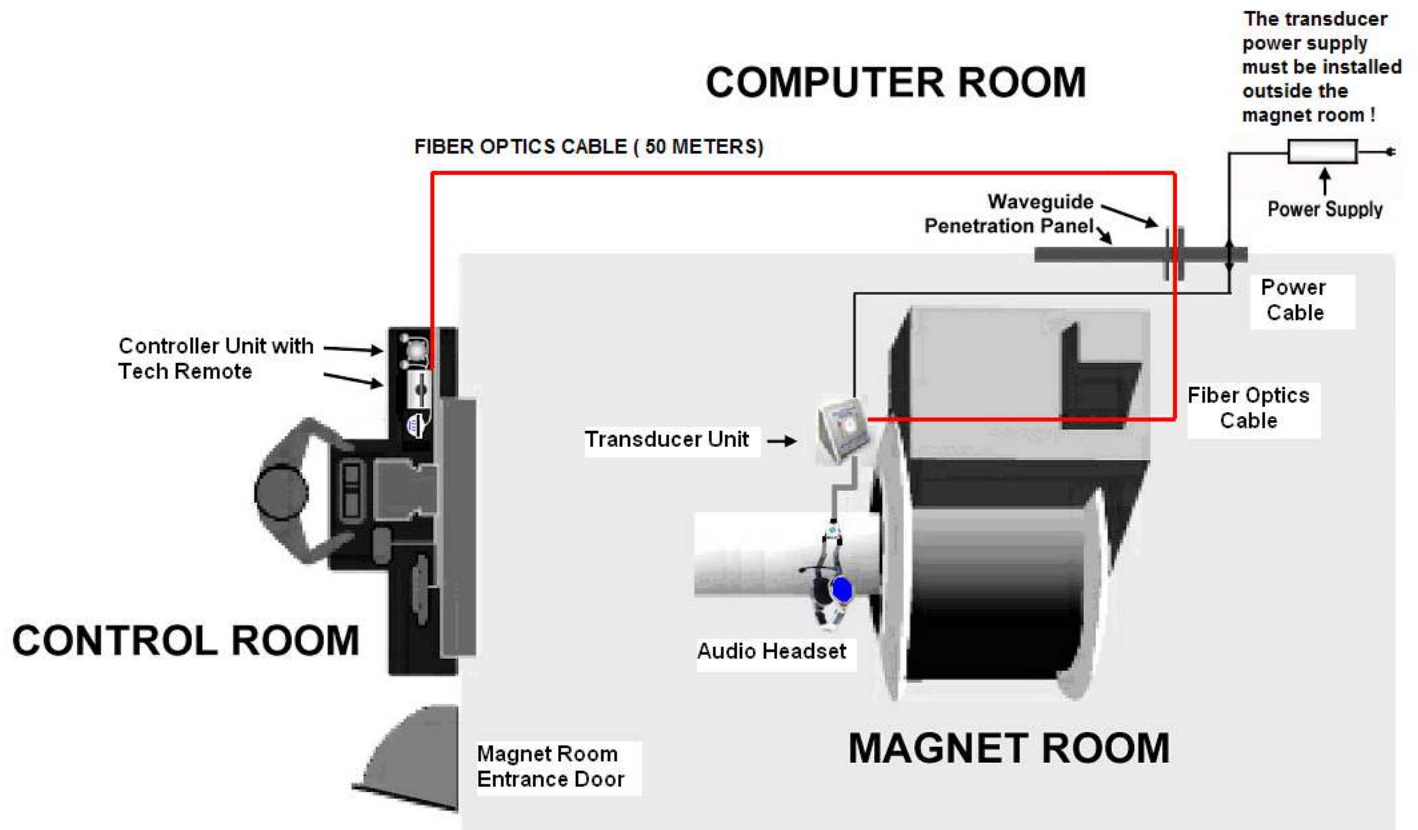
Checking Materials (continued)

The following list details placement of all equipment components:

Part Number	Quantity	Description
		- Control Room -
RTC-660-170-370-000	1	Serene Sound Controller
RTC-660-050-535-000	1	Serene Sound Controller Power Supply
RTC-101-306-003-000	1	Hospital Grade Power Cord
RTC-650-020-000-000	1	Technologist Remote Control
RTC-ALS-SFA	1	Stereo System
RTC-660-000-072-101	1	Installation / Operation Manual (This manual)
RTC-101-950-003-000	1	RG-59 Antenna Cable - 35 foot
ARX-Mini315	1	3.5mm Mini Stereo cable
ATS300SP	1	"T" FM Transformer for radio antenna
		- Inside the Magnet Room -
RTC-660-050-540-000	1	Serene Sound Transducer
RTC-101-245-001-001	1	Transducer DC Power Cord (10m long)
RTC-650-062-000-000	1	Patient comfort Audio Headset
RTC-101-102-001-001	1	MR Laser Link Cable
RTC-ALS-HDH	1	Headset Hook
		- On the penetration panel Outside the Magnet Room -
RTC-101-102-001-101	1	MR Laser Link Cable
RTC-101-210-001-101	1	Transducer DC Power Cords (3m)
RTC-650-300-605-000	1	DB-9 D-Sub Filter
Part Number varies	1	Filter Plate

Room Layout and Installation Overview

Below is the standard setup for the Serene Sound system. Your individual installation may vary, but will generally be distributed in three areas: 1) Control Room, 2) Computer Room and 3) Magnet Room.

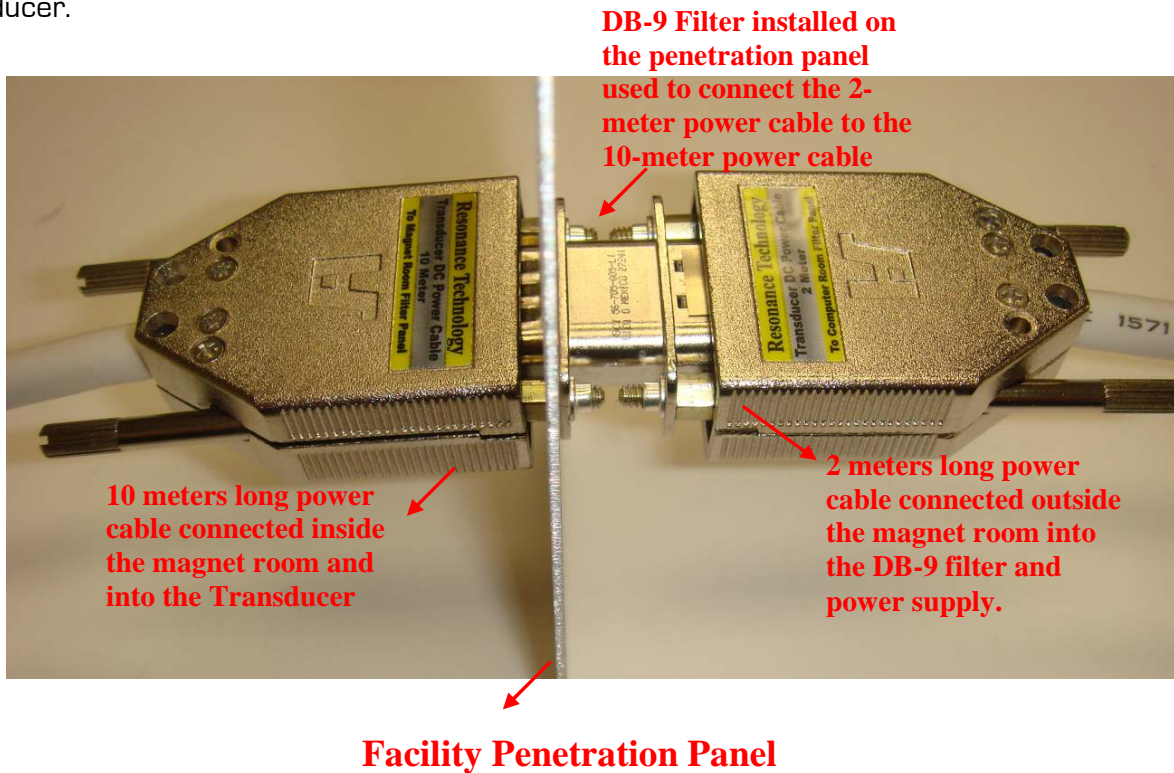


The Control Room setup consists of placement and connection of the Serene Sound Controller, Technologist Remote Control and AM/FM/CD/I-pod/I-phone Stereo system.

A single Laser Link Fiber Optics cable bundle will run from the Serene Sound Controller through the penetration panel wave-guide to the Serene Sound Transducer. With the exception of the headset, all Magnet Room Serene Sound components must be placed to the side of the magnet shroud and never in line with the bore. Additionally, these components should be placed in a lightly trafficked area.

How To Connect The Transducer Power Cables

In order to connect the Transducer power cable to the power supply outside the magnet room, you need to use a DB-9 filter provided with the system. Make sure to connect the two meter long cable to both the power supply and penetration panel and connect the 10 meter long cable to both the penetration panel and the Transducer.



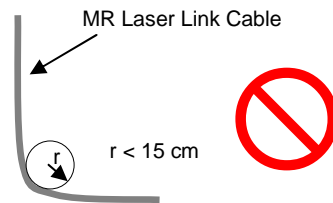
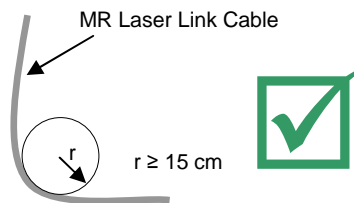
The Transducer Power Supply must always be installed outside the magnet room.

Running the MR Laser Link Cable

The MR Laser Link cable is fed through the wave-guide in the Penetration Panel and then routed to the Transducer unit inside the magnet room.

Caring For the Fiber Optics Cable:

Note: Take care to ensure the cable is not bent in radius of less than 15cm.



Components Interconnection

A. Magnet Room

Place the Serene Sound Transducer in a secure area away from traffic as illustrated below. Install the audio headset firmly into the Transducer using the bracket provided. Make sure that the audio headset connector is connected all the way into the Transducer audio socket for proper installation.

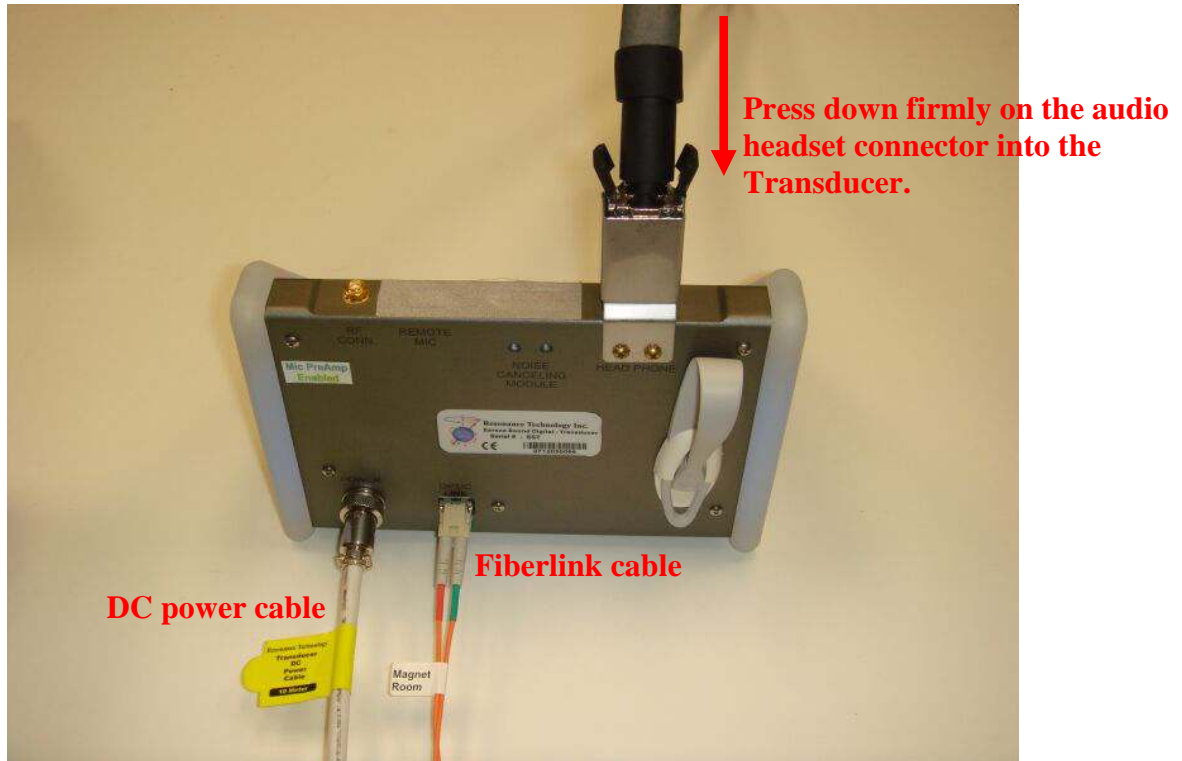


Press down firmly on the audio headset connector into the Transducer.



Magnet Room (cont'd)

Attach the MR Laser Link connectors to the Transducer as illustrated below. Match the cable colors to those on the unit's labels.

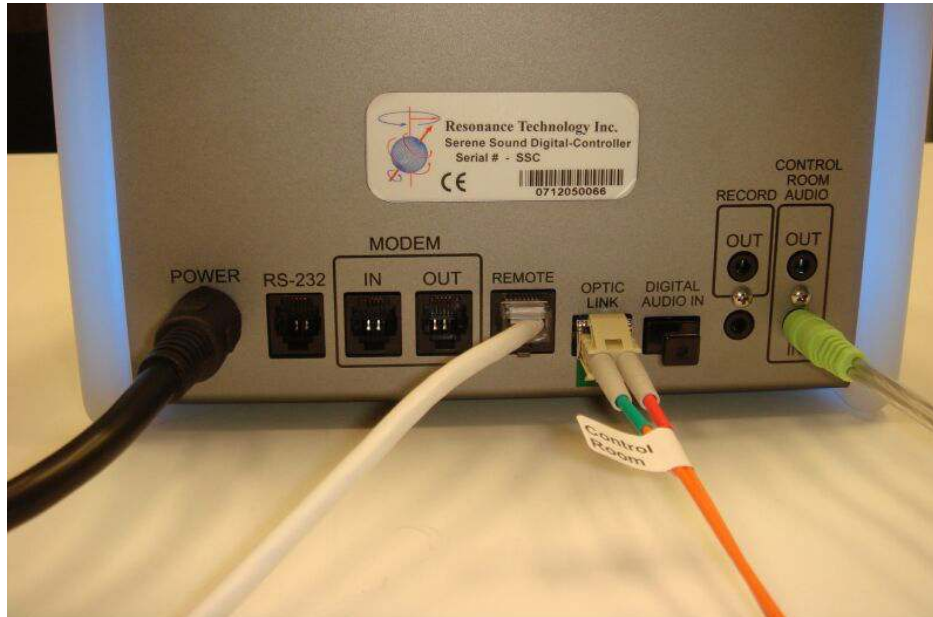


Note: Remember not to bend the individual cables smaller than a 15 cm radius.



B. Control Room

Connect all appropriate cables to the Controller as illustrated below.



- Connect the 5-pin Round Cable from the Controller Power Supply to the Controller connector labeled **POWER**.
- Connect the Hospital Grade Power Cord to the Controller Power Supply and into an available active AC power outlet.
- Connect the Technologist Remote Control to the Controller connector labeled **REMOTE**.
- Connect the mini stereo jack cable to the Controller connector Controller* labeled Control Room Audio **IN**.
- Connect the MR Laser Link cable to the Controller connector labeled **Optic Link**.

Note: Make sure to match the color of the MR Laser Link cables to the Controller's labels.

- Connect the mini stereo jack cable from record-out to computer audio input. This feature can be used to record the patients' headset microphone response into a computer microphone input. This is an optional feature.

Apply power to the Controller first and then turn on the Transducer Power Supply. Wait until the system is fully synchronized (logo lights rotating on the Transducer inside the Magnet Room).

*The Controller is IPOD and Iphone ready.

Control Room Setup

TECHNOLOGIST REMOTE CONTROL OPERATION:

Notice: Always adjust the audio input source to a level that will not cause distortion. Otherwise a crackling noise will be heard on the patient audio headset!

Wheel #1: Patient Audio Volume (scroll up and down to adjust)

Scrolling the wheel up increases the patient's headset volume.

Scrolling the wheel down decreases the patient's headset volume.

Technologist Microphone – Press and hold the talk button. Then scroll the adjustment wheel

This adjustment is to change the volume that the patient can hear during communication.

Wheel #2: Patient Microphone Volume (scroll up and down to adjust)

Scrolling the wheel up increases the volume of the patient's microphone volume heard in the control room.

Scrolling the wheel down decreases the volume of the patient's microphone.

Wheel #3: Main Volume (scroll up and down to adjust)

Scrolling the wheel up increases the control room volume (you need to connect external speakers to the Controller).

Scrolling the wheel down decreases the control room volume.

Wheel #4: Main Menu (scroll and press to select sub-menu items)

Pressing down on this wheel activates the system menu. Scrolling the wheel up or down rotates through the system functions. To set the patient microphone in AUTO or MANUAL mode always press on the TALK button to activate either mode. The MANUAL mode is used to mute the patient's microphone during scanning. To adjust your technologist microphone volume built into the technologist remote unit, simply press on the TALK button and at the same time scroll the wheel #1 to set the PTT volume to about 60 to 70. If your voice sounds too loud in the patient's audio headset lower the PTT volume.



Please Note: If the tech remote unit is not responding you can reset it to its original factory default settings by following these 5 simple steps:

1st: Set Patient Audio (Adjustment Wheel #1) to 1

2nd: Set Patient Microphone (Adjustment Wheel #2) to 2

3rd: Set the Main Volume (Adjustment Wheel #3) to 3

4th: Press and hold talk button for 15 seconds

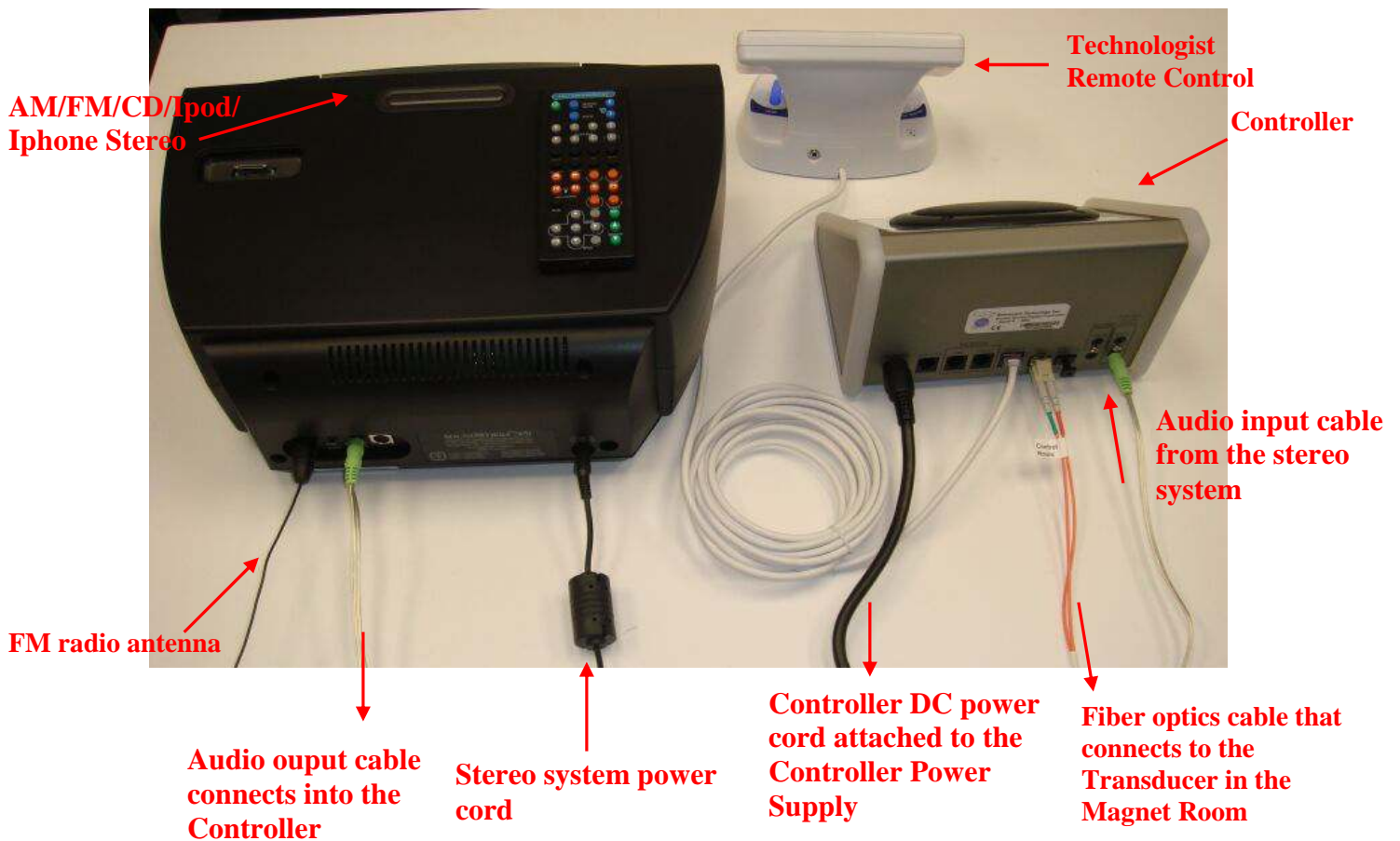
5th: Release the talk button. All the settings have been reset to the original factory defaults. You now have to re-adjust all the wheels settings.

Patient Setup

Make sure all cables have been connected securely into the Transducer and that the components do not impede walkways. Ensure that the Transducer is not placed directly in front of the magnet bore or directly under the bed. Before placing the headset on the patient, make sure that the technologist microphone volume has been set to a comfortable level for the patient. Place the audio headset over the patient's ears and adjust the headband. If necessary, position the headset microphone about one cm. away from the patient's mouth.

Operation

When operating normally, the logo lights on the Transducer are rotating and the sides of the Controller are blue. However, after two to three hours of non-operation, the system goes into a SLEEP mode and the system appears to be turned off. To wake up the system, just press down once on the TALK button of the Technologist Remote Control and wait for the system to synchronize completely. Remember to always communicate with the patient to adjust the headset audio volume. Always start at a low setting progressively to a higher setting until the patient can hear you clearly. Read the stereo system user manual for its operation. Below is an illustration how to connect the control room components:



System Troubleshooting

Note: When disconnecting power to the Controller, always disconnect the AC power cord that connects into the Controller Power Supply. Never disconnect the DC cable connector from the Controller. To re-connect power to the Transducer, just re-connect the AC power cord.

Symptom	Verify
No Synchronization	The fiber optics are in the right position on the Controller and Transducer.
No Audio	Check the mini-stereo cable properly connected on the Controller input. Verify the headset is properly seated in the Transducer.
No Microphone	On the Technologist Remote Control, check comm mode is auto or manual. Check microphone volume setting.
System Reboots	Unplug the power supply from the A/C outlet. Unplug the Controller; turn off the power supply for the Transducer.
If the system hangs up* or fails to respond to the Technologist Remote Control commands.	Power down the Controller for approximately 10 seconds and then power up again.
If the system still does not respond.	Power down the complete system for approximately 10 seconds, then power up the Controller first in the Control Room, then power up the Transducer in the Magnet Room. Wait for the logo lights to rotate on the Transducer and then use the system normally.

*System Hang up is when the system refuses to function normally.



If the system still fails to respond, contact Resonance Technology for technical assistance at (818)882-1997.

