

Wilson Benesch

The torus Infrasonic Generator



Owners Manual

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SAFETY INSTRUCTIONS FOR THE TORUS INFRASONIC GENERATOR

- 1) Please read these instructions carefully and keep them for future reference.
- 2) Please heed all warnings.
- 3) It is strongly advised that the Torus system is installed, by a suitably trained person, to avoid causing damage or injury resulting from an incorrect installation.
- 4) Do not use this apparatus near water or allow it to get wet.
- 5) The Torus creates a stray static magnetic field. Do not place any object that may be damaged by this magnetic field (e.g. cathode ray tube televisions or computer monitors, audio and video tapes and swipe cards) within 0.5m (2 feet) of the appliance. The appliance may cause distortion of cathode ray tube images beyond this distance.
- 6) Do not place Torus Infrasonic Generator on a stand or table; it may fall causing injury to a child or adult, and damage to the unit. The spikes are very sharp on the base and should always be mated to the floor surface.
- 7) Refer all servicing to qualified service personnel. If the unit develops a fault of any sort please refer repair back to your dealer.
- 8) The Torus Infrasonic Generator is very heavy (34 kilograms). To avoid risk of injury, please take care when handling.
- 9) Whenever connecting the Torus Amplifier to the Torus Infrasonic Generator, ensure that the amplifier is turned off.
- 10) Do not over-tighten the terminals on the Torus Infrasonic Generator as this will lead to damage of the polymer terminal mount.

UNPACKING

**Caution: The Torus and it's packaging are very heavy (36KG)
please take care when lifting**

The easiest way to unpack the Torus Infrasonic Generator to avoid damage is as follows:

- Open the carton flaps right back and invert the carton and contents.
- Lift the carton away from the product.
- We recommend that you retain the packaging for future use.

In addition to this manual, the carton should contain:

1 Infrasonic Generator

1 Terminal Spanner

1 Pair of terminal link leads

CONNECTING YOUR TORUS INFRASONIC GENERATOR

Always switch off your system before disconnecting or connecting any wires.

The following guide will allow you to connect the Torus Infrasonic Generator in standard configuration. Alternate Torus System configurations for more than one Torus Infrasonic Generator and/or more than one Torus Amplifier are covered on page 31 of this manual.

First ensure that your system is off before disconnecting or connecting any wires. A good quality loudspeaker cable that is low in inductance, capacitance and resistance is required to connect the Torus Infrasonic Generator to the Torus Amplifier. We would recommend a cable that is terminated with spades, but the Torus terminals also accept banana plugs and bayonet plugs if required. For the Torus Infrasonic Generator to work at full capacity both speaker coils must be connected. If the loudspeaker cable to be used is single wired then the supplied red and black link wires must be employed as shown in figure 4 below. Using the provided spanner gently nip the nuts tight but **DO NOT OVERTIGHTEN AS THIS WILL LEAD TO DAMAGE OF THE POLYMER TERMINAL MOUNT ITSELF.**

Torus Connections for Single Wired or Bi-Wired Loudspeaker Cable

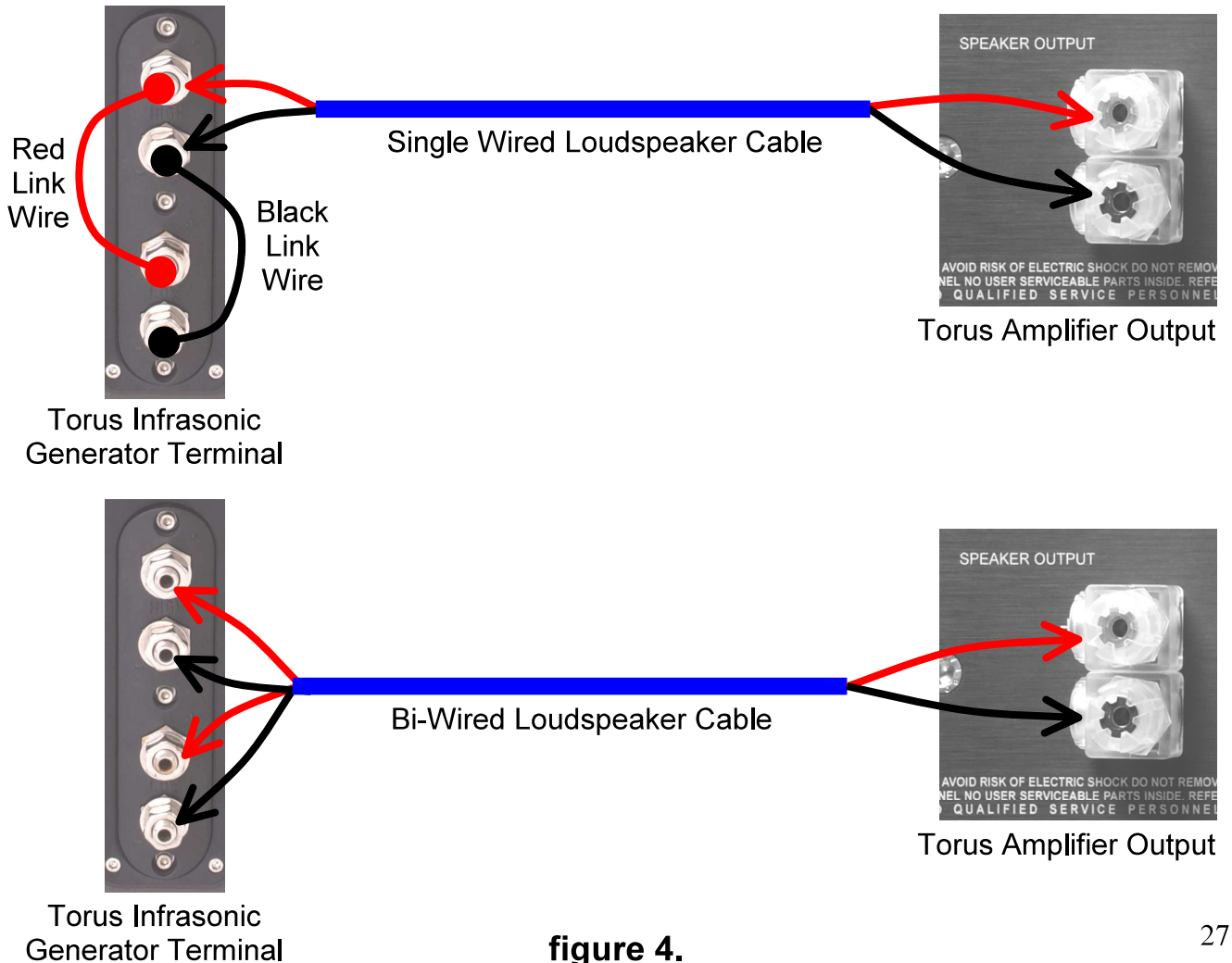


figure 4.

CONNECTING YOUR TORUS INFRASONIC GENERATOR

USING THE TORUS INFRASONIC GENERATOR WITHOUT THE TORUS AMPLIFIER

To achieve the best results, it is strongly recommended that the Torus Infrasonic Generator is driven by the Torus Amplifier. It is designed and built for this purpose and offers the user many controls to help integrate the Torus Infrasonic Generator seamlessly into any two channel and/or A.V. system. These controls include variable phase adjustment, gain, crossover frequency adjustment and a parametric E.Q. for rolling off the signal below four preset frequencies. These controls are detailed on pages 21 and 22 of the Torus Amplifier manual.

When employing one infrasonic Generator, whilst driving it with a standard amplifier may be possible, without the right signal processing offered by the Torus Amplifier or an A.V. multi channel amplifier, only bass energy from either the left or right hand channels could be sent to the Infrasonic Generator which may lead to an imbalance on some program material. Standard amplifiers will also not provide crossover frequency adjustment controls and this will make the task of integrating the Torus with your main loudspeakers a much more difficult task.

A multi channel power amplifier, fed by a multi channel preamplifier with a dedicated subwoofer channel would be the most suitable option in the absence of the dedicated Torus Amplifier. A suitable multi channel system should mix bass energy from all relevant channels to a mono signal, to get the best balance between all of the channels. Some multi channel systems may also offer further options for adjusting the signal sent to the dedicated subwoofer channel.

If you have not purchased the Torus Amplifier, the Torus Infrasonic Generator can be connected to the terminals of a suitable amplifier in the same way as the Torus Amplifier as shown in figure 4 on the previous page.

POSITIONING YOUR TORUS INFRASONIC GENERATOR

The Torus Infrasonic Generator weighs 34KG so due care must be taken when positioning the unit. It is advised that the positioning of the Infrasonic Generator is undertaken by more than one person to avoid injury.

As the Infrasonic Generator produces only low frequency sound, directional concerns are less important than the room as a whole, which is discussed below.

Room boundaries interact and reinforce low frequency energy. You should see your room as an extension of your Infrasonic Generator. Output will be reinforced when placed close to any substantially constructed wall. Simple dry stud wall will have much less of an effect.

The more reinforcement you derive from the room the less energy will be required by the Infrasonic Generator and therefore the amplifier will not be required to work as hard. Ultimately there is no substitute for investing time to achieve the ideal marriage of room to Infrasonic Generator. Live recordings are especially useful for making decisions about placement as they contain large amounts of ambisonic information that are ideal for assessing if the Generator is working effectively.

For ultimate phase linearity, especially where music reproduction is the primary goal, the best position for the Infrasonic Generator is adjacent to the center line of the coils in your loudspeakers drive units, as shown in figure 5 over the page. However, room effects may act against this important consideration. With this in mind the diagram in figure 5 below should only be used as a reference point from which to start. It is important to note that the more the Infrasonic Generator is displaced from this center line the more you will need to account for phase differences that will be attributable to this displacement, phase adjustments can be made using the control detailed on pages 21 and 22 . Only in the most unusual circumstances will it be found that the best place for the Generator is behind the listening position.

If you are employing more than one Infrasonic Generator, information on setting up and positioning multiple Torus systems is covered in the next section of this manual.

POSITIONING YOUR TORUS INFRASONIC GENERATOR

Should you find that you are experiencing high outputs at particular frequencies there are steps that can be taken to reduce these. A frequency sweep can be used to explore the room's response. In conjunction with a sound meter a measured response can be more accurate but this should always be compared with listening tests. There are two modes in any one rectangular room relating directly to the dimensions of the length and width of the room. These will define the frequency at which the room will be excited. At this point the sound pressure levels will be highest. However, this is also dependent upon the listening position within the field and if you move around you will find the levels will change in a predictable way. You will quickly find that there are also two null points that will be half way between the length of each of the room's dimensions. It is this kind of process that enables you to understand the unique characteristics of your listening room.

A useful technique when looking for the optimum location is to place the Generator at the most common seating position. By working methodically through a range of frequencies, record the measurements around the perimeter of the room where the Torus might be located to ascertain the loudest signal. This process will assist in building up a picture of where the room is augmenting the output or not. One way of using this information would be to determine three possible options, the loudest, least loudest and a middle position. This will provide a much clearer idea of adjusting the generators location over a period of time with listening tests with music.

Today, there are many sources available on the internet, where you can download frequency sweep tracks, which can be burnt to a disc or recorded onto your computer and played through your system. There are Applications for mobile phones available for download to help with this process also. Please be careful when working with any of these measurement procedures. Always begin the test with the amplifier in the lowest level of output then increase slowly. Always progress through the tests with caution and double check volume levels as good practice. It is very easy to damage the system if care is not exercised at all times.

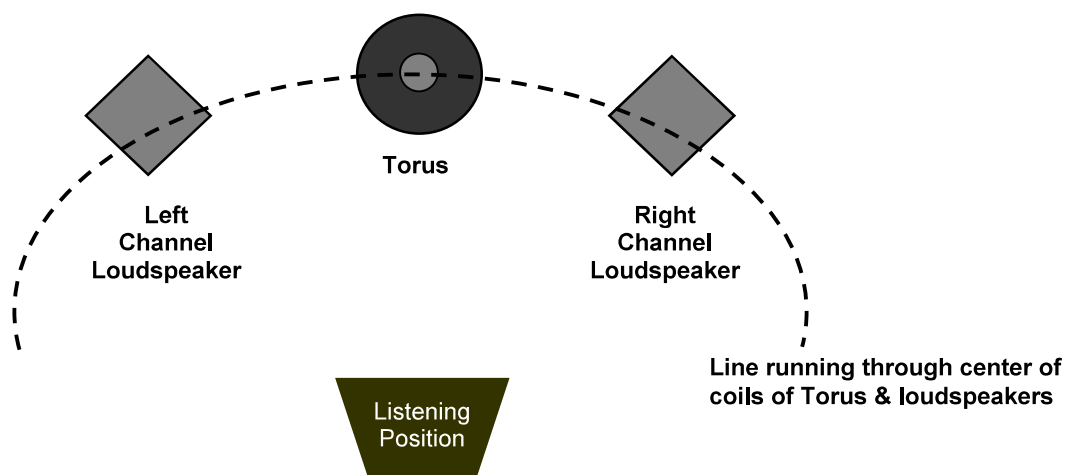


figure 5.

TORUS SYSTEM CONFIGURATIONS USING MORE THAN ONE TORUS

The versatility of the Torus system enables more than one Torus Infrasonic Generator to be employed, opening up the possibilities and configuration options available to the user.

Using more than one Torus in a single installation can improve the performance in the following ways:

- Stereo channels can be maintained (If the systems are configured in this manner).
- Higher sound pressure levels can be achieved.
- The effects of low frequency room resonance's can be more easily smoothed out.

Reading through the following options you will see that there are many more possibilities over and above the few listed here, should you wish to employ more than one Torus System, the configurations outlined here will give you an indication of what is possible. A combination of the following set-ups is something that could be considered.

Two Torus Systems in Stereo Operation: (High Level lead & Inputs)

Two Torus systems can be employed to maintain stereo left and right channels. The diagram below shows the high level lead connections required in order for each Torus to reproduce the bass energy present in the left and the right channels exclusively.

As detailed on page 18 of the Torus Amplifier Manual, the High level method of connection should NOT be undertaken with bridged mono amplifiers or class D digital amplifiers. It is recommended in this case, that low level connections should be used as shown over the page.

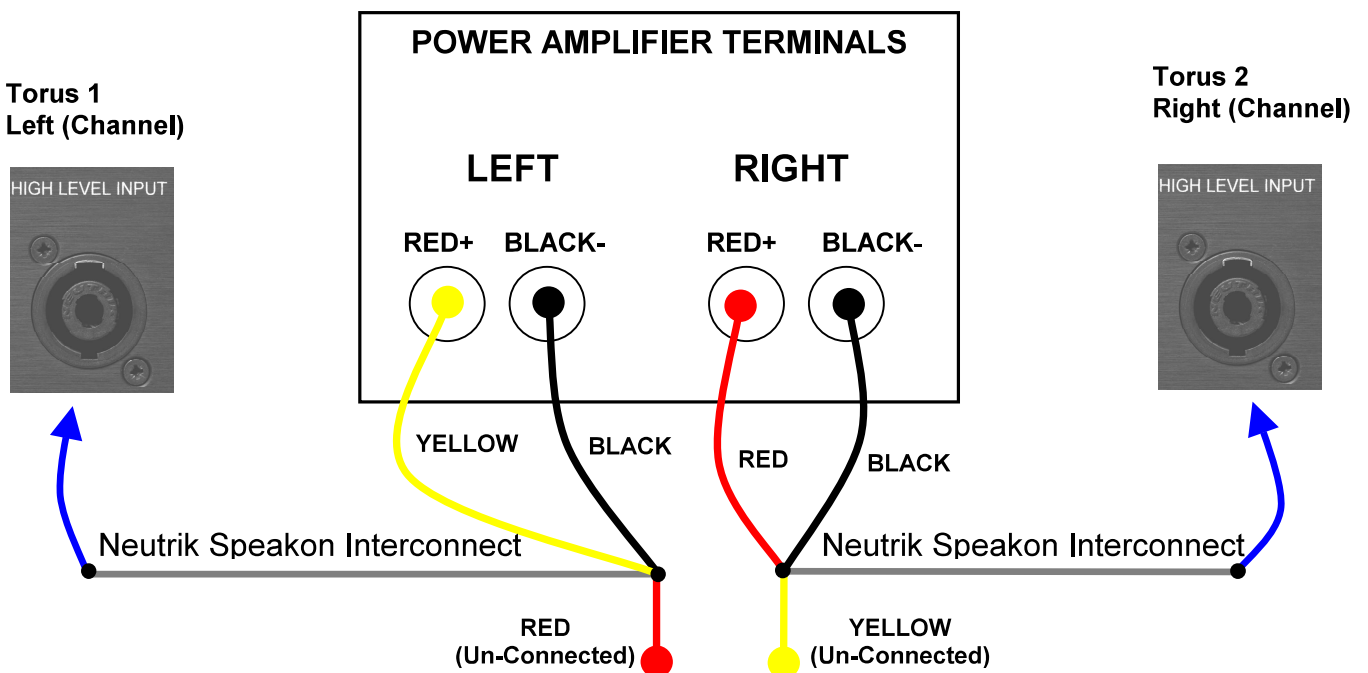


figure 6.

Two Torus Systems in Stereo Operation: (Low Level lead & Inputs)

The diagram below shows the low level connections required in order for each Torus to reproduce the bass energy present in the left and the right channels exclusively.

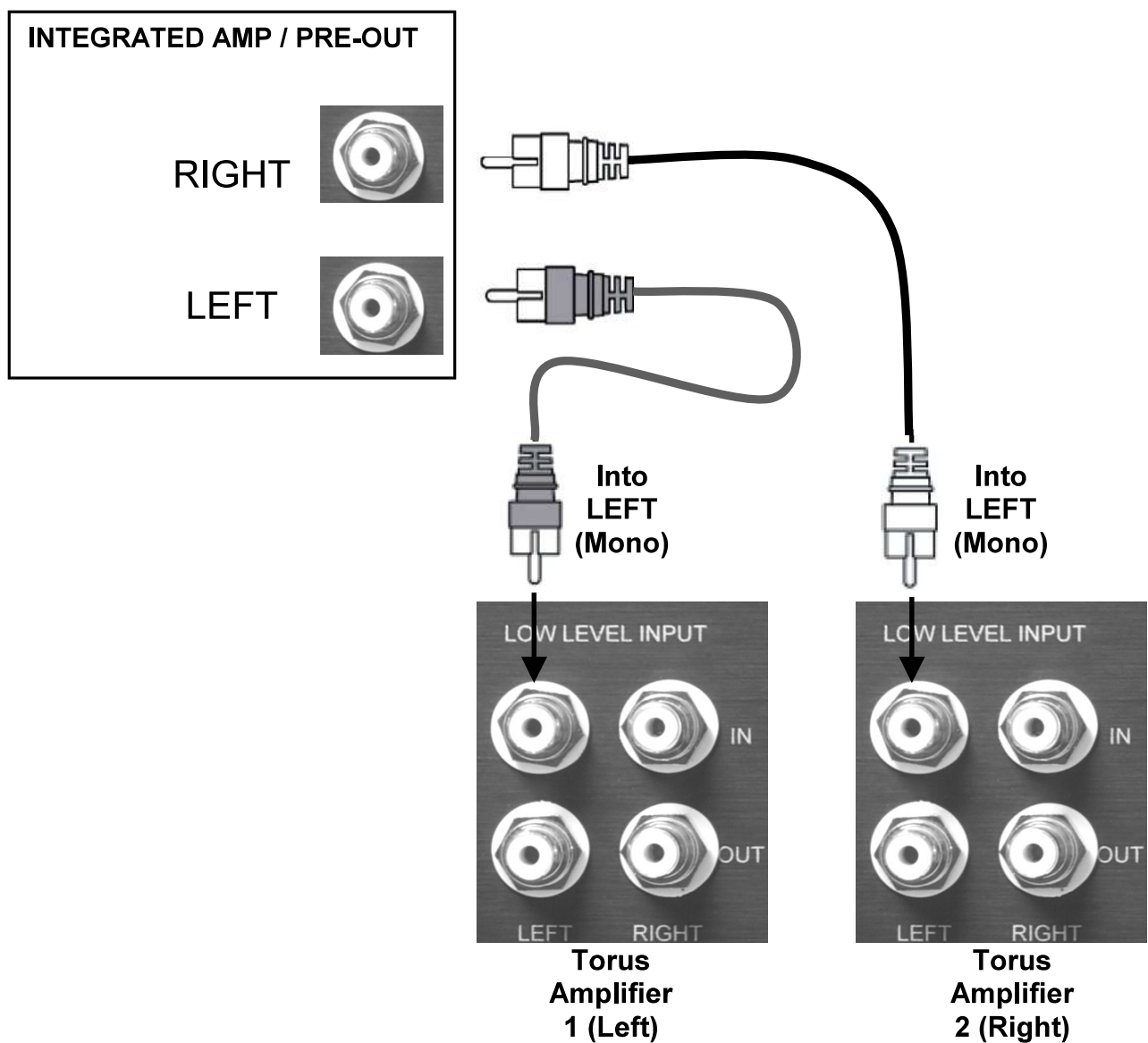


figure 7.

Two Torus Systems in Stereo Operation: (Infrasonic Generator Connections & Positioning)

Both the left and right Torus Infrasonic Generators should be connected with loudspeaker cable, as detailed on page 27 of this manual, to their respective Torus Amplifiers. This connection is the same whether using high or low level connections or both.

Each Infrasonic Generator should be positioned next to your respective front left and front right channel speakers so that they are adjacent to the center line of the coils in your loudspeakers drive units. The diagram in figure 8 below shows the ideal positioning for two Torus Systems in stereo configuration, however the effects of the room on the placement of the Infrasonic Generators should be considered, as discussed on pages 29 and 30 of this manual.

To avoid an imbalance between the left and right hand channels the crossover frequency and gain levels should be set at the same values on each Torus Amplifier. These controls are detailed on pages 21 and 22 of the Torus Amplifier manual.

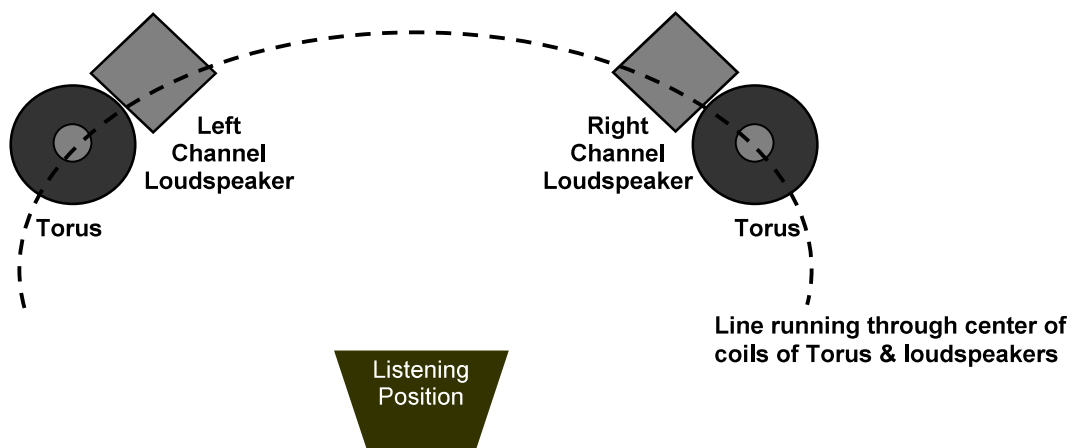


figure 8.

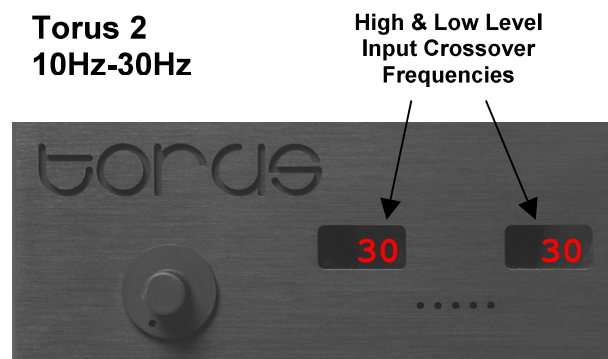
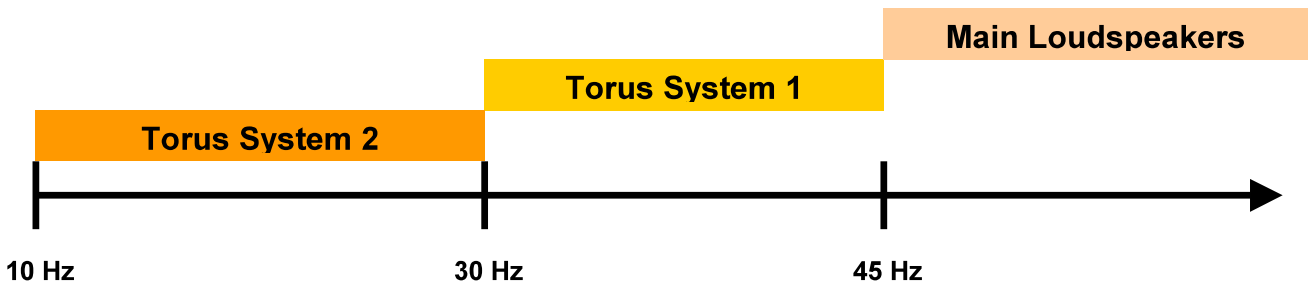
Two Torus Systems Stagger Tuned: (Amplifier Settings)

Using the crossover frequency control on the Torus Amplifier and the Parametric Equalizer on the underside of the Torus Amplifier, one or more Torus Systems can be setup to operate within a set frequency range.

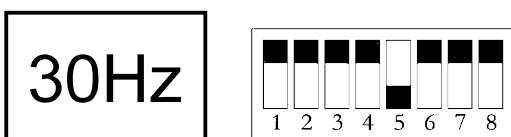
This configuration will give a flatter response throughout the bass frequencies, as each system is setup to work within a more narrow frequency range, putting less demand on the Torus Amplifier.

There are no hard and fast rules here and experimentation is the key, as the settings that work best will depend on your room and the equipment that you are partnering the Torus with.

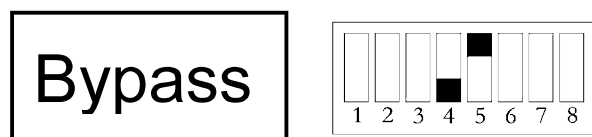
The example in figure 9 below shows the setup for two Torus systems, where the signal crosses over from the main system loudspeakers at 45Hz to Torus 1 and then crosses over from Torus 1 at 30Hz to Torus 2 which operates all the way down with no frequency roll off selected from the parametric EQ.



Torus 1
Parametric EQ Switch Settings



Torus 2
Parametric EQ Switch Settings



For bypass, switch 4 must be set to the OFF position and Switch 5 to the ON position. When in bypass mode switches 1,2,3,6,7 and 8 have no effect.

figure 9.

Two Torus Systems Stagger Tuned: (Connections & Positioning)

This configuration can be set-up using the High &/Or Low level connections which are detailed on page 18 of this manual. Both Torus Infrasonic Generators should be connected with loudspeaker cable, as detailed on page 27 of this manual, to their respective Torus Amplifiers.

Each Infrasonic Generator should be initially positioned next to the respective front left and right channel speakers so that they are adjacent to the center line of the coils in your loudspeakers drive units. The diagram below in figure 10 shows this placement, however, this should be considered a starting point and does not take into consideration the effects your room may have when placing the Infrasonic Generators in these locations.

Experimentation with the placement of the second of the two Infrasonic Generators may help to smooth the effects of low frequency room resonance's, ideally with the aid of a frequency sweep as detailed on page 29. If the second Torus Infrasonic Generator is moved, the phase control may need to be adjusted on the second Torus amplifier to compensate and ensure that the signals are time aligned. The phase control is detailed along with the other amplifier controls on pages 21 and 22 of the Torus Amplifier manual.

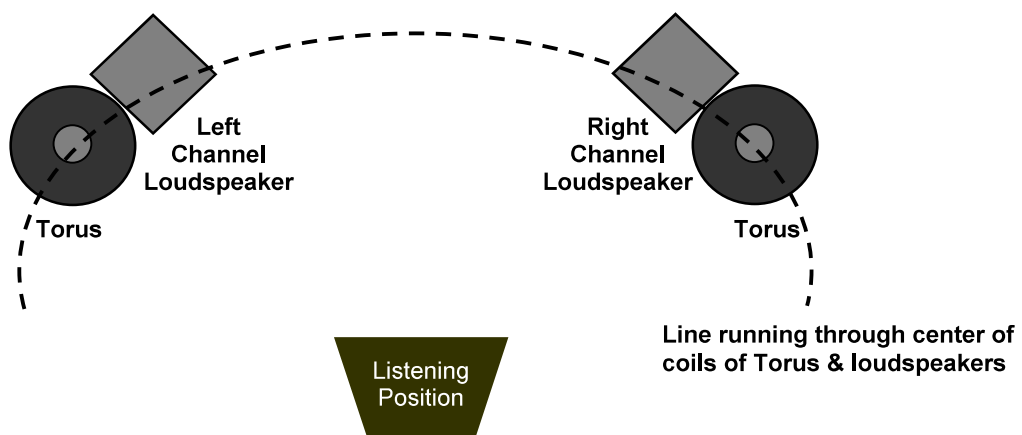


figure 10.

Two Torus Infrasonic Generators One Torus Amplifier: (Speaker Cable Connections)

One Torus Amplifier can be used to power two Torus Infrasonic Generators, when connected as shown below, the Torus Amplifier will see the same load it would see when connecting just one Torus Infrasonic Generator. Larger volumes of air can be moved with the addition of another Torus Infrasonic Generator and the system will achieve greater accuracy as a result. Higher sound pressure levels can be reached and the placement of two Infrasonic Generators in different locations can help to smooth out the effects of low frequency room resonance's.

In this configuration the High and Low level connections are unaffected and remain the same as detailed on page 18 of the Torus Amplifier manual.

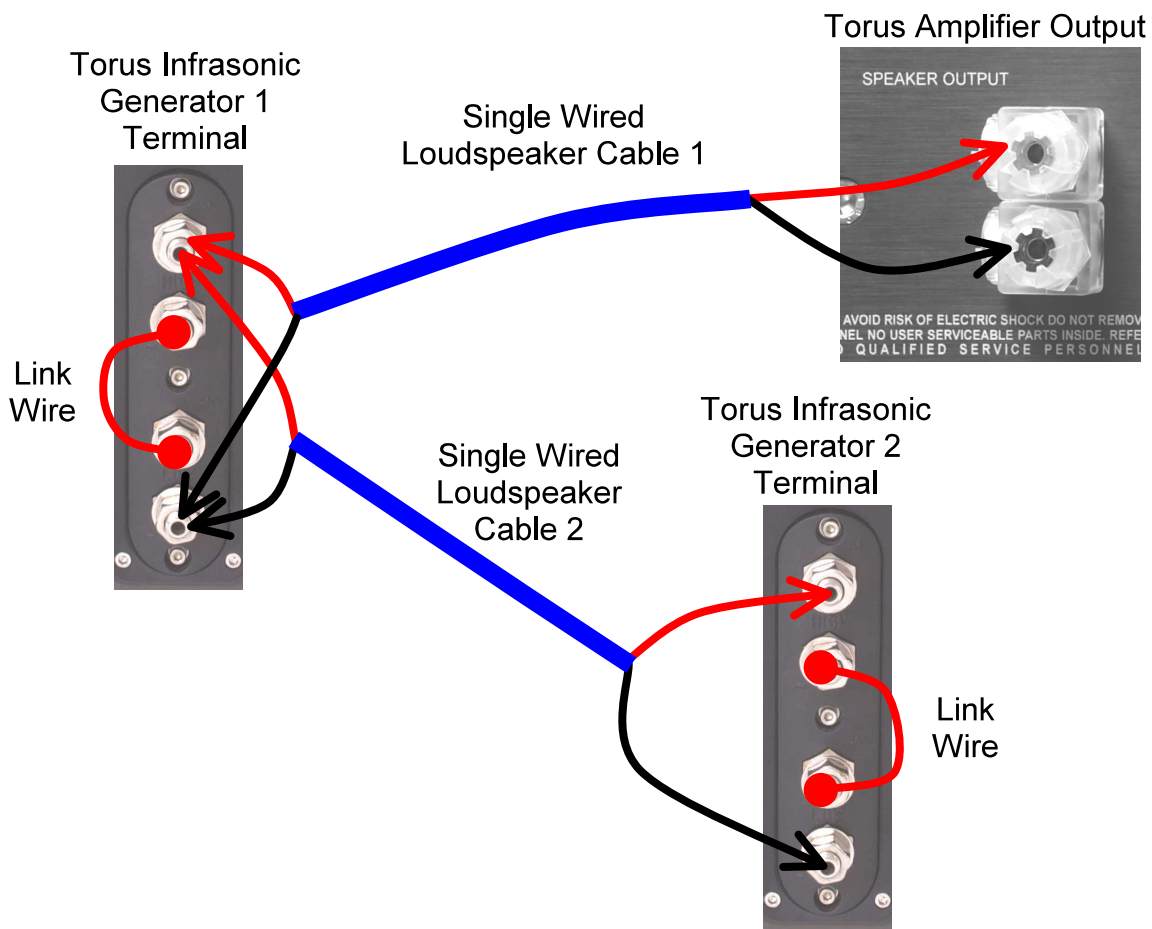


figure 11.

Two Torus Infrasonic Generators One Torus Amplifier: (Positioning)

As a starting point each Infrasonic Generator should be positioned next to the respective front left and right channel speakers, so that they are adjacent to the center-line of the coils in your loudspeakers drive units. Figure 8 on page 33 shows a diagram of this placement. For further experimentation, especially when seeking to address the effects of low frequency room resonance's, one of the pair of Infrasonic Generators should be auditioned in alternative locations, ideally with the aid of a frequency sweep as detailed on page 29.

TORUS INFRASONIC GENERATOR SPECIFICATIONS

Frequency Range:-

10 to 150 Hertz –6dB at 18 Hz

Internal Wiring:-

Multi stranded, silver-plated copper PTFE jacketed cable harness
Soldered with lead free solder throughout

Input Connections:-

Bi-wireable, in-house machined Rhodium plated copper alloy terminals

Impedance:-

Coils can be wired in series or parallel.
Each coil is 8 Ohms

Maximum SPL:-

100dB at 1 Metre

Power Handling:-

1000 watt peak program.

Dimensions:-

Height 300mm or 330mm including spikes
Diameter 450mm
Internal Volume 24 Litres
Weight 34Kg

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