

SPICA TC-50

OWNERS MANUAL

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## MANUAL ORGANIZATION

Assuming you are anxious to start listening to music through your new TC-50s right away, this manual has been organized to first help you get your system up and running quickly (Basic Setup), and then perform some of the fine-tuning procedures that are necessary for optimum performance (Setup Detail). In order to avoid unnecessary detail for those of you who are replacing the speakers in your present system, information on choosing an optimum location for the TC-50s is left out of the Basic Setup section, and is covered in depth in Setup Detail. If you are setting up your system for the first time or in a new location, it would be wise if you read this section before setting up. The section on Fine Points treats a variety of topics, such as amplifiers, speaker wire, and a few other goodies. Should you have any questions, call your dealer or drop us a note - we're here to help.

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## INTRODUCTION

Thanks for choosing the SPICA TC-50 speaker system. Your new TC-50s are among the most sophisticated compact speakers available, and will provide you with many years of listening pleasure. The creative use of computer aided design and optimization have yielded solutions that are unobtainable from 'classical' engineering techniques, and the TC-50 is the elegant result. We are confident that you will be more than pleased with this affordable addition to your system.

Check to make sure that you received one each of the following materials.

- > 2 TC-50 speakers (the box will feel rather light if these are missing)
- > product registration card
- > this manual

Notify your dealer immediately if any of these are missing.

Some of the 'tools' you will need for setup are:

- > MEASURING TAPE (for physical placement)
- > WIRE STRIPPERS or RAZOR BLADE (optional, for speaker wire prep)
- > A HELPFUL FRIEND (optional, for general purposes)

As an additional benefit of the advanced design concepts incorporated into the TC-50s, many aspects of their setup and integration into your listening room are well-defined, eliminating much of the trial and error approach commonly encountered in setting up speaker systems. Although parts of the setup procedure are somewhat technical, we have made every effort to present them as simply as possible. Please read and follow the instructions carefully.

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## BASIC SETUP

### Getting it Up

- <> Turn off your power amplifier or receiver.
- <> Most specialty speaker wires come already prepared for connection. If you are using more conventional wire, then, using wire strippers or a razor blade, strip 3/4" of the insulation from the wire, twist the strands of the wire together tightly, and form a hook shape on the exposed wire ends.
- <> Loosen the red plastic insulating knob on the back panel of the TC-50 by turning it counter-clockwise a few turns. Bring the "+" lead of the speaker wire up to the red post and place it around the post so that the hook wraps clockwise around the post. Turn the knob clockwise as tight as you can by hand. Do not use pliers or any tools to tighten the knob, as it might strip the threads.
- <> Repeat this process for the black "-" binding post, and then again for the other TC-50.
- <> DO NOT ALLOW BARE WIRE FROM ONE INPUT TO TOUCH THE OTHER INPUT OR ITS BARE WIRE LEAD. Serious damage to your amplifier will result if you do.
- <> Follow the amplifier manufacturer's instructions regarding speaker wire connection to the amplifier, making sure that the "+" output of each channel is connected to the red input on each TC-50.
- <> Orient the TC-50s so that they point directly at your favorite listening area. This is sometimes referred to as "toeing them in". Avoid placing the speakers on opposite sides of the room facing each other, if possible.
- <> When powering up your system, make it a habit to always turn on your receiver or amplifier last. When shutting the system off, turn the volume control down all the way and turn the amplifier off first. This practice will avoid possible damage to the TC-50s caused by the "pops" and "clicks" that some pieces of audio equipment put out when turned on or off.

### Breaking it In

Every mechanico-electrical device has a 'break-in' period, during which the moving parts become more supple and the electrical parts become more stable. For the TC-50s, this takes place gradually over the first eight hours of use. During this period, you will notice that the sound becomes sweeter, more natural, and more spacious. One way of breaking them in is to leave your system on while you are, for instance, away at work for the day, using an FM radio station as program material, with the system playing at a moderate volume. When you return in the evening, most of the break-in will be completed.

Your system is now ready for use. Some aspects of its performance can be fine-tuned, however, and we highly recommend that you take this opportunity to read the rest of this manual, so that you might gain the maximum sonic benefit that the TC-50s have to offer.

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## SETUP DETAIL

### Why Bother?

Unlike the other components in your audio system, how well the speakers perform is dependent in part upon their placement, both within the room and with respect to your optimum listening location. In normal use, sometimes you will be sitting listening to the music, virtually participating in every nuance, while at other times you will be using the system more for background music, not giving it your complete attention. These two circumstances relate directly to the two placement considerations mentioned. Proper placement of the speakers within your room will achieve the most natural and consistent tonal balance throughout the room. Proper placement of the speakers with respect to your chosen listening seat will achieve the most lifelike stereo imaging. The goal of proper speaker placement is to optimize the performance of each of these parameters. We recommend that you favor those guidelines that correspond to the conditions in which you will be using the speakers the most.

Obviously, there will be other considerations to take into account in your setup, such as aesthetics and maximizing the available space. Since you are more aware of those for your room than we are, we will concentrate our recommendations on obtaining the best performance from your system.

### What to Put the Speakers On

While the TC-50s may perform satisfactorily when placed on a shelf against a wall, they were designed to perform at their best when placed on rigid stands away from the walls. When choosing a stand, look for:

- > Rigidity. Flexibility is not desirable here.
- > Freedom from resonances. Some rigid stands ring like a bell when tapped.
- > Proper height. This is explained in detail below.
- > Provision for additional dampening. Some stands provide an access to allow the tubes to be filled with sand or lead shot, which can be beneficial.
- > Spikes on top and bottom. They will improve the coupling of the speaker to the stand and floor, improving bass response and overall clarity.

The Hercules stand, made by Chicago Speaker Stand, was designed specifically for the TC-50, and is highly recommended.

### Placement Within the Room

The methodology behind room placement is basically simple geometry - finding the line between two points, measuring how long the line is, comparing it to the length of other related lines, and so on. These lines, or **paths** as we will call them, all originate at one of the speakers, and eventually arrive at your ears, that is, your listening seat. Some of them are **direct paths** from the speaker to your ears, while some of them are **reflective paths**, bouncing off of the floor or walls before arriving at your ears. We will be using these terms in the explanations that follow.

The direct paths primarily affect the imaging abilities of your system, while the reflective paths affect the tonal balance, especially in the bass and lower midrange. There are 4 major reflective paths in any room, off of the following surfaces:

- > Floor. This one is normally the shortest path, and hence causes the most problems. Carpeting helps a lot.
- > The wall behind the speakers.
- > The nearest side wall.
- > The wall behind the listening position.

The ceiling is not as much of a problem, because our hearing is basically oriented to horizontal perception. A low ceiling would definitely be a candidate for the list, though.

Generally speaking, the TC-50 should be at least one foot away from the rear wall, and as far as possible from the side walls. Most importantly, the reflective paths (see above) off of each of these surfaces should be as unequal as possible. The smoothest possible tonal balance throughout the room is achieved when this can be done.

Equally important is that the speakers be placed symmetrically within your room. For example, if one speaker is 3 feet away from its side wall, then the other speaker should also be placed 3 feet away from the side wall nearest it.

Figure 1 on the next page shows an example of symmetrical placement with unequal path lengths, viewed from above.

One situation to avoid is placing a speaker in a corner of the room at an equal distance from the side and rear walls. This will make your system sound 'tubby' or bass-heavy, and not very spacious at all. The more 'out in the open' the speaker placement is, the more open and spacious the sound will be.

Another problem is related to what are called 'standing waves'. Most rooms are rectangular in shape, with three sets of parallel surfaces. Imagine, if you will, three strings, each stretched between the opposing surfaces in your room, and each having the same amount of tension applied. If you were to pluck these strings, they would produce sound at three different tones, with the lowest tone being produced by the longest string. The tones that correspond to the dimensions of your room are **supported** by the surfaces, just like the strings. These tones will have a tendency to be accentuated in your room, compared to others. Furthermore, if one of the reflective paths is the same length as one of your room's dimensions, that tone is accentuated even more. Hence the importance of having varied path lengths in your setup geometry.

A common question is whether the speakers should be set up along a long or short wall in the room. In smaller rooms, where the longest distance between opposing walls is 15 feet or less, setup along the long wall will probably give the best results. In larger rooms, setup along a short wall is preferable.

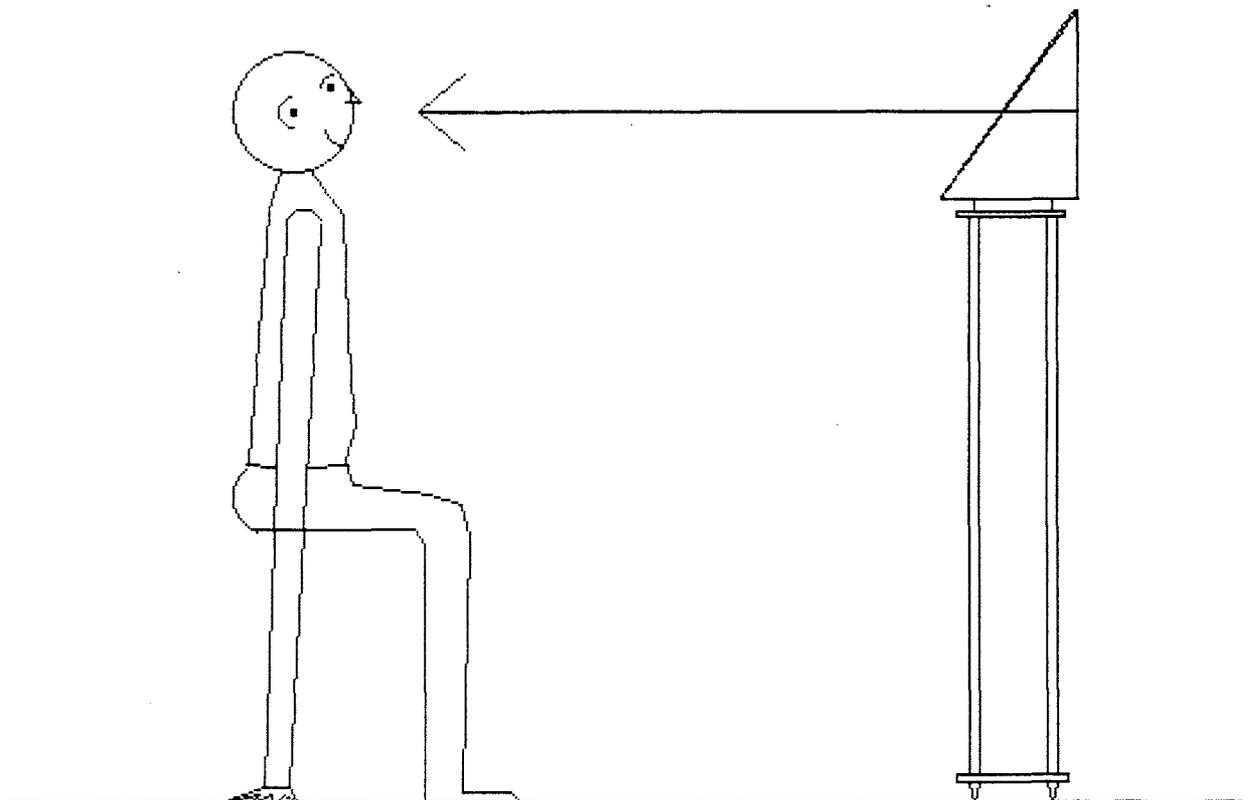
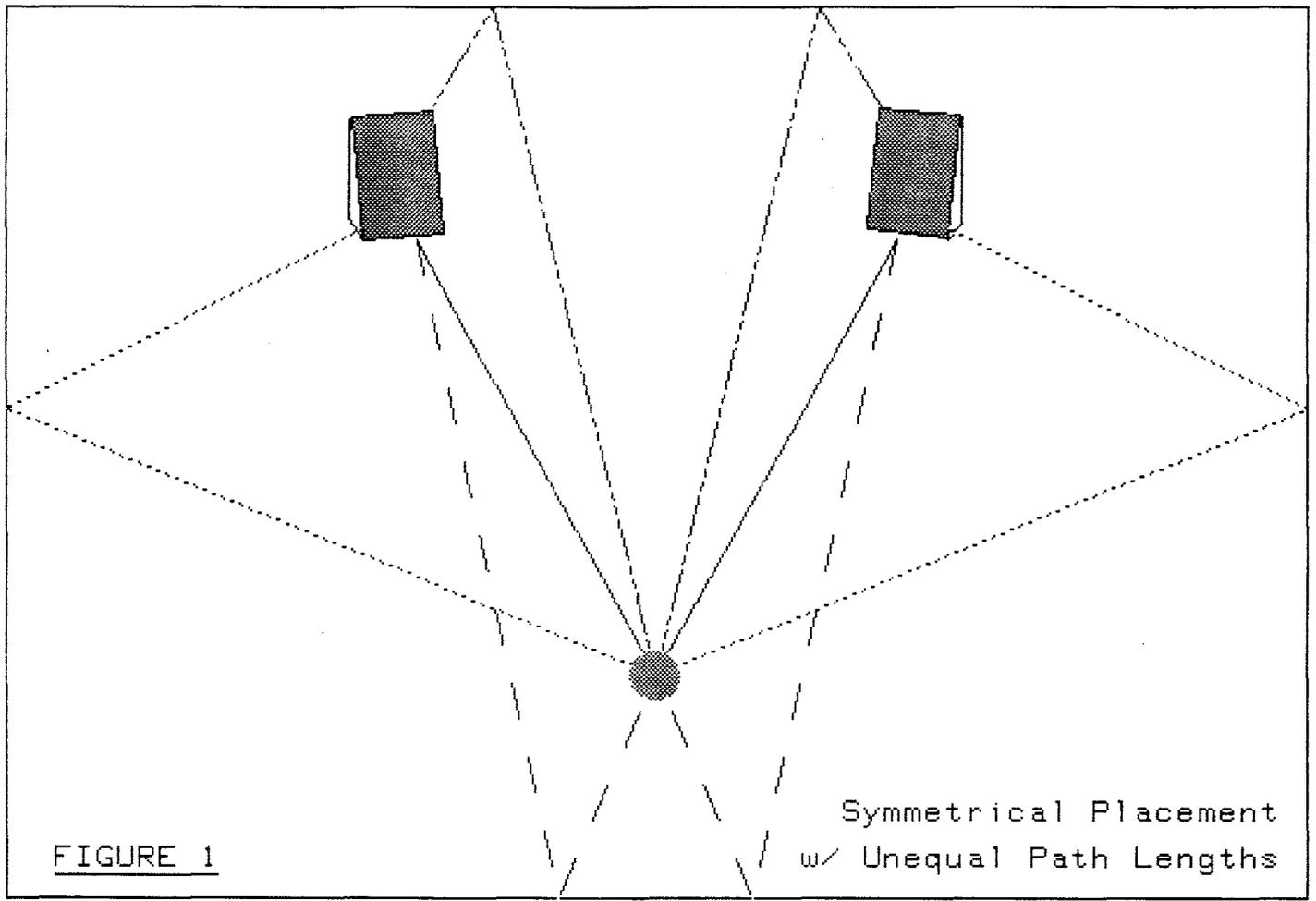


FIGURE 2

THE IMAGINARY PERPENDICULAR LINE

## Placement Relative to the Listening Position

In phase-coherent systems (as in life in general), TIMING IS OF THE ESSENCE. And in matters pertaining to sound, time translates directly into distance, because sound moves through air at a given speed. In the introduction to this section, we hinted at the fact that, while smooth tonal balance can be achieved over a wide range in your room, the magic of nearly holographic imaging can only occur at one point in space. In order to reproduce a stable and lifelike stereo image with the TC-50s, two things are necessary:

- 1> The distance from each TC-50 to your listening position should be the same.
- 2> The height and tilt of each speaker should be the same, and adjusted according to the instructions that follow.

Here's how to do it. For convenience in explanation, we will refer to your listening position as a chair.

- <> Find the point at ear height at the center of your chair, and mark it with a piece of masking tape.
- <> Using a tape measure, find the distance from one TC-50 to your mark.
- <> Find the distance to the other TC-50, and move it toward or away from you until it is the same distance as the first TC-50.

As for the height and tilt, take a peek at Figure 2. It shows a line drawn perpendicular to the back of the TC-50 from a point halfway up the cabinet. The object is to have this line point right at your ears when seated in your chair. This happens automatically when (a) the distance from this point on the cabinet to the floor is the same as the distance from your ears to the floor, and (b) the TC-50s are placed on a flat surface. Lets see if this is the case.

- <> Measure the distance from the floor to the point on your chair that you marked earlier.
- <> Measure the distance from the floor to the point halfway up the back of the TC-50 cabinet.
- <> If the two measurements are the same (within, say, one half inch), no tilt is necessary, and you can skip the rest of this section.

Now, there is no such line on the TC-50 cabinet, and you would have thought we were nuts if we had put one there. So, instead, we will use the bottom of the cabinet as our sight-line, which happens to be parallel to this line, and apply a 'fudge-factor' to make it work.

Because they are widely available and perform well, we will assume that you are using fixed-height speaker stands with adjustable cone points on the speaker mounting surface. These cone points can be used to tilt the speaker slightly forward or backward as needed. To tilt forward, raise the rear set of cone points; for backward tilt, raise the front set. Follow the manufacturers instructions for making this adjustment. If your TC-50s are set up on shelves or other pieces of furniture, you can tilt the speakers (if necessary) without harming the surface of your furniture by using small pieces of modeling clay, obtainable at toy stores and crafts shops.

- <> Using your measuring tape, find the point on your chair that is 7.5 inches below the point you marked previously, and mark it with a piece of tape.
- <> Sighting along the bottom edge of the TC-50 cabinet, adjust the tilt of the speaker so that the point just marked on your chair lines up directly with it.
- <> Repeat this procedure for the other TC-50.

## FINE POINTS

If you have followed the setup instructions in order, your setup is now complete. Spend some time sitting and listening to a variety of music through your new system. Notice how different the quality of each recording is, how easy it is to pick out individual voices and instruments even in complex material, how warm and rich the sound is, and how totally unfatiguing the TC-50s are to listen through. With well recorded music, the magic of the TC-50 becomes evident in its ability to reproduce warm, natural tonal balance while at the same time presenting a realistic image of the space that the music was recorded in. If you are using the TC-50 in conjunction with a stereo video cassette system, you're in for a real treat!

### Amplifiers

The job of the power amplifier, whether it is a separate component or part of a receiver, is basically twofold. First, to make the signal coming from your source (record, CD, whatever) strong enough (and without distortions of any kind) to cause sound to come out of the speakers. Second, it must be able to overcome the constantly changing electrical conditions (called 'impedance' or 'load') that a speaker presents to an amplifier. Although it is beyond the scope of this manual to discuss why, it is a fact that some amplifiers do this better than others. Here are some things to look for when comparing power amplifiers and receivers:

- > High instantaneous current capacity.
- > Wide full power bandwidth.
- > Constant damping factor over the widest possible frequency range.
- > Low transient intermodulation distortion (TIM). This is much more important than the usually quoted harmonic distortion.
- > Compatability with speaker impedances of 4 ohms or less.

How much power you will need depends on how loud you like to play your music. For soft to normal volume levels, 25 to 50 watts will be just fine. If you really like to 'wick it up' sometimes, then the more power available, the better. Most damage to speakers happens because of insufficient power being available for the volume level being demanded. With percussive music, it is not uncommon that the peak power required will exceed the average power by a factor of ten or more! To illustrate the point, let's say your 50 watt amplifier is cruising along delivering 7 watts average to the TC-50s. Along comes a passage where the drummer smacks a cymbal and kicks his bass drum at the same time that everyone else in the band is coming down hard on a note. 70 watts would be needed to reproduce it cleanly, but only 50 are there. The result is something that not only sounds grundgy, but it also builds up heat in the woofer and tweeter of the TC-50. If that happens a few times a minute, well, everything starts sounding fuzzy, and your speakers need repairing. The moral is: have more power than you need to play as loud as you want to, and use it with discession.

When using the TC-50 with receivers that allow for switching between two sets of speakers, if you wish to have both sets on at the same, do so only at low volume levels. Your unit may not be able to safely handle the load of both sets of speakers at higher power levels, and damage could result to both the receiver and the speakers.

Generally speaking, separate components tend to perform better than integrated receivers. There are some wonderful exceptions to this rule, however; consult your dealer for further information.

## Speaker Wire

Although their cost may seem high, quality speaker wire makes a significant contribution to the total performance of your system, especially if the distance between power amplifier and speaker is great. The usual 'zip cord' will tend to make the system sound dull and lifeless in the trebles, mushy in the bass, and generally hamper the amplifier's ability to control the speaker. There are quite a number of excellent speaker wires available, with more appearing all the time. Wires from companies such as Straight Wire, Kimber Cable, and others, provide excellent performance at reasonable cost. Ask your dealer for advice.

- > Use the shortest length of wire possible between amp and speakers.
- > For systems set up for careful listening, both speaker wires should be the same length. Unequal length wires can create subtle (or not-so-subtle, depending on your attentiveness) imbalances in tonal 'colors' and dynamics between the two speakers.

## How Wide Thou Art

How far apart the TC-50s are relative to how far away from them you are sitting affects the imaging performance of your system. The wider they are apart, the wider the 'soundstage' will be. The closer they are, the better will be the resolution of imaging detail within the soundstage, i.e. between the speakers. The goal is to find the balance point between these two imaging characteristics that suits your tastes.

A good place to start is to make the distance between the speakers equal to two-thirds of the distance from your listening position to the speakers, and play around with spreading them apart and bringing them closer together until you find what you like. Remember also that moving the speakers alters the pattern of reflective paths discussed in the Setup Detail section, so tonal balance may be affected somewhat....

## System Polarity

Suppose you were standing in front of a mirror that turned everything reflected in it upside down. All the features of the image would be there, but they would be **inverted**. This is a visual analogy of what is called Polarity. The audio industry has not established any polarity standards, so some pieces of equipment invert the signal as it passes through them, and others do not. It is argued by some that, since the inversion status of each record, CD, etc. is unknown, proper system polarity is unimportant. For those of you who feel that it is, here's how to do it.

In order to determine the polarity of your system, you must find out which pieces in your system invert the signal, and which ones do not. This information is sometimes given in owners manuals. Otherwise, you can contact your dealer or the manufacturer, or look in AUDIO Magazine's Annual Equipment Directory (in each year's October issue), which lists the inversion status of some units. Once you have this information, it's easy to determine the polarity of your system and correct it, if necessary, by reversing the connections of the speaker wires to each TC-50.

Make a list of numbers that correspond to each piece of equipment in your system, including everything from the source to the speaker outputs of your receiver or power amplifier. If the unit inverts, give it a value of 1; if it does not, give it a value of 0. For VCRs and CD players, it is probably safe to

assume that they do not invert. Now add up all the numbers. If the result is an even number or 0, your system is positive polarity, and no change is required. If the result is an odd number, you should reverse the connections to each TC-50 at its input terminals.

### On Subwoofers, Loudness Switches, and Rumble Filters

There is a limit to the amount of deep bass that any compact speaker can reproduce. If you find that you live with the bass control boosted quite a bit, you may want to consider adding a subwoofer to your system.

The so-called 'loudness' control found on receivers (and some preamps) is intended to make the perceived tonal balance of music sound more natural when it is played at low volume levels. When engaged, the loudness control boosts the extreme bass and trebles. When playing your system at medium to high volume levels, MAKE SURE THE LOUDNESS CONTROL IS SWITCHED OFF.

If you are:

- > playing a record that is badly warped,
- > playing your system VERY loud, or
- > boosting the bass a bunch with your bass tone control,

then you should consider engaging the rumble filter on your preamp/ receiver if it has one. Other than that, there is really no reason to use it.

For further information on system setup and performance, we recommend that you read Laura Dearborn's "Good Sound" (a Quill paperback). It is enjoyable and informative reading, and picks up where manuals such as this must leave off...

### TECHNICAL SPECIFICATIONS

System Type	: Sealed box
System Resonance / Q	: 56 Hz, Total Q .78
Frequency Response (-3dB)	: 60 Hz - 17 kHz
Woofers	: 6.5" treated paper cone
Tweeter	: 1" impregnated cloth dome
Woofers Crossover	: 4th order Bessel response
Tweeter Crossover	: Computer derived, approx. 1st order response
Input Impedance	: 4 ohms nominal, minimum 3.6 ohms @ 4 kHz
Polarity	: Both drivers positive
Sensitivity	: 84dB @ 1 watt, 1 meter
Power Handling	: 50 watts continuous program, 100 watts peak
Size in inches(cm)	: 13(33.0)W 15.5(39.4)H 11.6(29.5)D
Net Weight in lbs(kg)	: 20(9.07) each

### WARRANTY

When purchased from an authorized SPICA dealer, SPICA warranties the TC-50 to be free from mechanical defects for five (5) years from the date of purchase. This warranty is valid for the original purchaser only. Your sales receipt is your proof of purchase. Items covered under warranty will be either repaired or replaced at SPICA's option. This warranty excludes damage caused by user abuse, carelessness, and fault conditions in associated equipment. SPICA reserves the right to make final determination of warranty coverage. SPICA makes no other warranties, either expressed or implied.