

Some observations and suggestions on Subwoofers, Surround sound & such.

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During the past 10 years, instead of the traditional left and right speakers for stereo effect, people have started using a subwoofer and 2 small (satellite) speakers. This scheme is a result of the discovery that with very low frequency sounds, the human ear cannot tell the direction from which the sound originates. By separating the very low frequency part of the music spectrum from the middle and high frequencies, we can use a sub-woofer for the very low frequency part only and above all hide it behind a sofa or curtain. The Bose audio company (already known for making full-range speakers within a relatively smaller enclosure) was quick to capitalize on this idea. Their small satellite speakers which reproduce the mid and high frequencies create the illusion that the entire spectrum of frequencies is reproduced by those little speakers. This has an aesthetic appeal especially to those, who do not like to see big loudspeakers in their living room - or for that matter anything except classy curios, carpets and couches. Incidentally companies other than Bose (e.g., YAMAHA) produce equally good subwoofer/satellite systems often at lower prices.

It should be noted that any receiver or amplifier with 2 outputs for left and right is sufficient for this setup. Subwoofers come with a cross-over network which separates the mid and high frequencies and provides the signals which go to the left and right satellite speakers. However aside from the aesthetic appeal, is this system really superior to the usual two (full-range) speaker system? The answer depends on (1) the low frequency response of the stereo speakers you already have and (2) the kind of music you usually listen to.

Here is a crude method for measuring (or rather judging) the frequency response of the combination of your speaker system and your own ears. (If you are older than 55 years you might want to ask a younger person to listen along with you.) You need a CD player whose output is connected - in some way - to a stereo cassette tape deck (or some device which has an input level control and meters or little lights to indicate sound level). The output from such a deck must be fed to the loudspeakers through

your stereo system or other amplifier. You can get a Test CD (for about 7 dollars) which has pure tones from 20 cycles to 20,000 cycles recorded at constant level. Play this CD and for each tone adjust the input level in your cassette deck so that the level shown by the meter or LED indicators is the same for each tone. When you go down to 40 cycles and are still able to hear the tone (with the Bass control turned up partially if necessary), your speakers are good enough for most purposes and you do not need a subwoofer system. At low frequencies you must make sure that you are hearing that pitch (40 cycles), not its 2nd harmonic (80 cycles). If you do not hear anything, it might be due to the response characteristics (or limitations) of your own ears. The same is true at the high end of the audio spectrum also. So it helps to have another person listen in as well. (For myself, I could not hear anything beyond 10,000 cycles while my children kept going up to 13 Kc or so.)

Referring to types of music, in my testing with and without a subwoofer I found that you do not need it for Classical Indian music. Even with Western classical music, it made a difference only for a small percentage of 40 varied samples. So, I do not use a subwoofer. However the subwoofer system is known to make a difference in the case of light rock music and Disko type music, where they have special effects and considerable amount of bass content.

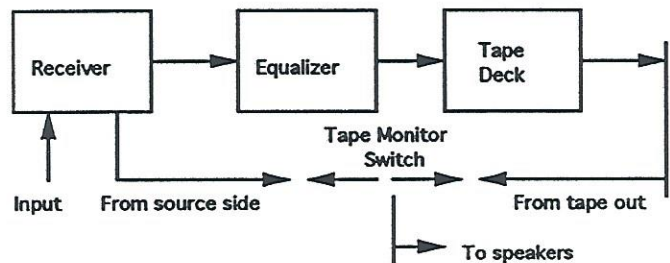
The case for surround sound is much stronger. Almost any kind of music gets embellished by the use of a good surround sound system. In concerts, people in general try to come early and sit in the front few rows if possible. While this is advantageous in the case of a Dance performance, it is not quite so for a music performance. Firstly from the front row, the sound may be too loud. Secondly the sound energy from the front would dominate over the effect of reverberation, which (depending on the hall) adds another dimension (or component) to the total sound heard. In Poquessing Middle School auditorium, where many a Sruti concert has been held in the past, I have found that when sitting way behind in the middle section, the

effect was much better compared to sitting in row one.

A surround sound system tends to simulate this ambience in the living room. And when used while watching a movie on a Video tape, it simulates the effect of direction and movement as well. There are 2 types, Simple Matrix surround system and the proprietary Dolby Pro Logic surround system (not related to the Dolby Noise reduction system). The latter has almost become the standard, because this 'logic' is encoded into most of the stereo music broadcasts, stereo TV broadcasts, Video tapes and music CDs to-day. Unlike the case of the subwoofer sound system, here we need a receiver which can decode the Pro Logic signal and provide 5 distinct outputs for 5 loudspeakers, 3 in front and 2 in the rear. The rear speakers can be wired by concealing the wire under the carpet and routing it back up through the hollow wall. An alternate method is to use a wireless system for the 2 rear speakers. A typical SONY Pro Logic surround receiver allows us to set the time delay between the outputs from the front and rear speakers (created by Digital Signal Processing). If the incoming signal is encoded with Dolby Pro Logic, the effect is very realistic. Most Walt Disney Videos for children are produced with Dolby Surround. If you use such Videos without a Pro Logic sound system, you are losing half of the fun. However, with almost any kind of stereo recording, such receivers provide simulated surround sound using 4 loudspeakers instead of five.

Such modern Dolby Pro Logic surround receivers have too many controls compared to the old standard stereo receivers. So they tend to omit some good features we used to get before. It is here that Consumer Reports magazine came in handy with its table of features of different makes of equipment. This magazine, for the past several years devoted practically the entire March issue each year to a complete discussion of Audio and Video equipment. However just from this

year (1996) they discontinued that practice. One such missing feature in a receiver is a Tape Monitor button (or switch). When setting up a recording (say from a Reel-to-Reel tape) this button, when pressed in, caused the signal from the output terminals of the Tape Deck to be heard on the loudspeakers instead of the signal directly from the source. On an elementary level, it enabled one to check if the program to be recorded really reached the tape deck and was no different from the source program. On a slightly more technical level, consider the following diagram, showing an Frequency equalizer inserted on the path from the receiver to the tape deck input terminals, for purposes of compensating for some deficiencies in the source program and then recording on a cassette.



In this case the Tape Mon. switch helps us compare the music before and after equalization. There are receivers which have all these features. One has to look carefully for them. They may cost more, of course.

I have saved the March issues of CR from 1993 to 1995. Anyone needing information from these (or about the Test CD) can contact me.

[Sankarn is a member of Sruti's Technical Committee.]

A Bibliography of Indian Music

[The following is a bibliography of Classical Music of India, which we hope, our readers will find useful. The list has been compiled from book-stores, references from books, university libraries, web pages, and of course from other music enthusiasts. Information about contents, publishers, distributors, etc. is given wherever available. Readers are welcome to add to the list.]

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21.	Rudrapatnam Brothers (R.N. Thyagarajan & R.N. Tharanathan)	1991	2	\$10.00
22.	T.K. Govinda Rao N. Shashidhar and Satish Pathakota	1990	2	\$10.00
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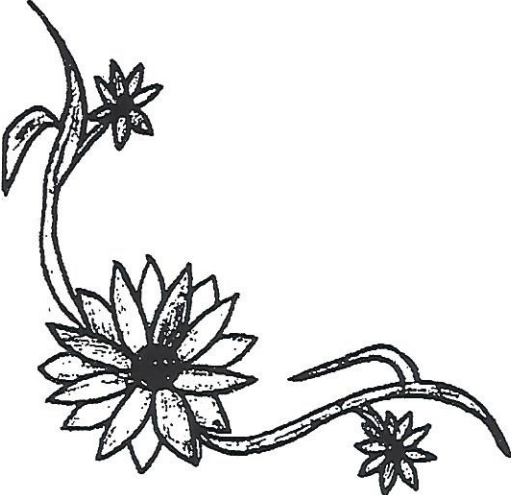
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Recording Secretary
Prabha Subramaniam
(610)-356-5181

Corresponding Secretary
S.G. Ramanathan
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Member-at-large
Ponnal Nambi
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Member-at-large
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