

# satellite speakers

## operation manual

**S-100B**

**S-1C**

**S-90**

**S-80**

**SX-7**



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## 1. INTRODUCTION

Congratulations! Your new M&K Satellite speaker system will give you years of unmatched enjoyment and excitement while listening to your favorite musical and audio/video sources.

We encourage you to read this owner's manual, as there is a great deal of information provided here to help you achieve the best possible performance.

If you have any questions about your speaker system, please contact your M&K dealer or call the M&K factory directly at (310) 204-2854, from 8:30 AM to 5:00 PM Pacific Time, Monday through Friday. We will be happy to help you with any question, no matter how simple or complex it may be.

This manual gives you basic hook-up instructions first, followed by more detailed technical, installation, and service information. For specific hook-up and usage information, please find the section that refers to your Satellite model. For the S-100B, see page 3; for the S-90; page 6, for the S-80; page 8; and for the S-1C, page 10.

## 2. PLACEMENT OF YOUR SATELLITE SPEAKERS

Your M&K Satellites can be installed in a wide variety of locations. Their compact size gives you great flexibility in installation. They can be placed on stands, shelves, or bookcases, or more permanently mounted using brackets, direct attachment to a wall, or a ceiling suspension system.

If you do wish to mount your Satellites permanently using wood screws, their cabinet thickness is 3/4". Be sure to use hardware shorter than 3/4" in length to avoid making a hole in the sealed cabinet that would adversely affect its sound quality.

You can place the Satellites virtually anywhere in the room, but certain locations are better than others. In general, locate them away from obstructions that would interfere with the direct path from the speakers to your ears (such as walls, furniture, lighting, plants, etc.). They will sound better when they are around ear height, or when angled towards your favorite listening location. In general, they sound best when they are not sitting directly on the floor.

M&K speaker stands are designed to set M&K Satellite speakers at the right height for the average person and chair, and they also allow you to use spiked feet and to add mass to the stand to improve the Satellites' sound (by filling the stand upright with sand or buckshot, etc.). Your M&K dealer has more information on these stands.

The S-100B, S-90, and S-80s can be used with OmniMount® Systems brackets, without the use of wood screws, because their cabinets have integral threaded hardware in patterns for OmniMount® brackets. These brackets offer tremendous flexibility for installation in a wide variety of environments. For more information, see Section 14 (page 19), or contact OmniMount® at (602) 829-8000.

For more detailed information on placement of your speakers, see Section 7 (page 13).

### **SPECIAL NOTE - TV SHIELDED SATELLITE SPEAKERS**

If you place your Satellite speakers close to a television set (about 2 feet), the speaker magnets may cause distortion of the television's picture. For these applications, M&K makes special TV Shielded versions of the S-100B, S-90, and S-80. The S-1C is made only in a shielded version. Shielded Satellites are identified by markings on the shipping carton and by a label on the back panel of the speaker. Unless your Satellites are Shielded, allow 2 - 3 feet of clearance around any television.

If you do own a pair of Shielded Satellites, please note that in some installations, a small amount of residual magnetism may cause a slight geometric or color distortion of the picture on your television set. If you do get this distortion, try moving the Satellite speaker slightly until the problem disappears. If you have difficulty solving any magnetic problems, please contact the M&K factory.

## 3. S-100B SPEAKER HOOK-UP & USAGE

The sound quality that you get from your Satellites can be affected by the type of speaker wire that you use to connect them. While it is possible to use speaker wire as thin as 22 gauge to hook your Satellites up, we recommend using the largest diameter wire that you can. This means a minimum of 18 gauge wire. Over 10 feet, you should use 16 gauge, and for more than 30 feet, we recommend using 14 gauge or heavier. The smaller the number, the thicker the wire.



There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend using as high quality a cable as fits your budget. Using better quality cables will improve the sound of your Satellites.

M&K Satellites are not designed for bi-wiring. Do not use the four input terminals to bi-wire your Satellites, as this may damage your amplifier and speakers. If you wish to bi-amplify your Satellites in combination with an M&K Powered Subwoofer, see Section 11 (page 18) for more details.

### **S-100B HOOKUP**

There is one set of terminals on the backplate, one Red terminal and one Black terminal. Connect the Positive (+) lead from your amplifier or receiver to the RED (+) INPUT terminal, and the Negative (-) lead from your amplifier or receiver to the BLACK (-) INPUT terminal. See Figure 1 (page 5).

### **S-100B VARIATIONS OF SOUND**

Your M&K Satellites reproduce sound with exceptional transient accuracy and a very wide dynamic range. Because of these qualities, they give outstanding results with any high quality amplifier or receiver in virtually any listening environment.

However, getting the best tonal balance in any given room involves many variables. Therefore, your S-100B Satellites allow you to alter their tonal balance in order to get the ideal sound quality at your favorite listening location (where it counts!), through the use of two three-position switches.

The best way to find the ideal setting for these switches is to listen to some familiar music with the switches in the NORMAL position, and then listen to how the sound changes as you set the switches to the other positions.

If you find the sound to be too bright or harsh-sounding, try the TREBLE CONTOUR switch in the MID TWEETER or LOW TWEETER position. You can also try setting the MIDRANGE CONTOUR switch to MID or LOW EFFICIENCY. If the sound lacks brilliance or sounds bass-heavy, set the TREBLE CONTOUR switch to HIGH TWEETER or set the MIDRANGE CONTOUR switch to MID EFFICIENCY or NORMAL.

It is not possible to tell in advance which settings will produce the ideal response (which is a flat frequency response at your ears), because this is dependent on your room, its size, its furnishings, your listening location, and more. The switch choices, however, can help you create the ideal response in your room. Therefore, set the switches for the best sound balance for your ears and your room, giving you maximum enjoyment from your speakers.

### **S-100B MIDRANGE CONTOUR SWITCH**

The MIDRANGE CONTOUR switch is the primary control for altering the tonal balance of your Satellites. Its major effect is in the midrange, but it does shift the balance over the entire audible spectrum.

The NORMAL position gives the flattest anechoic frequency response, and works well in many rooms and installations. Start with this position. If you find the sound quality to be too forward or too bright, there are two additional choices of tonal balance, MID EFFICIENCY and LOW EFFICIENCY. Relative to NORMAL, the MID position is mellower, with less high frequency energy and a more recessed sound. The LOW EFFICIENCY position has an even warmer mid-bass sound and a more distant perspective.

When you are locating the speaker directly on a surface such as a wall, floor or ceiling, you may find that using the SPECIAL INPUT terminals gives the best response. This is because this position is designed to account for the increase in midbass response that occurs when a speaker is directly against a room surface. (This is referred to as  $2\pi$  space, as opposed to a speaker located out in a room, which is known as  $4\pi$  space. The SPECIAL INPUT terminals should be tried first for  $2\pi$  conditions, and the regular INPUT terminals should be tried first for  $4\pi$  conditions).

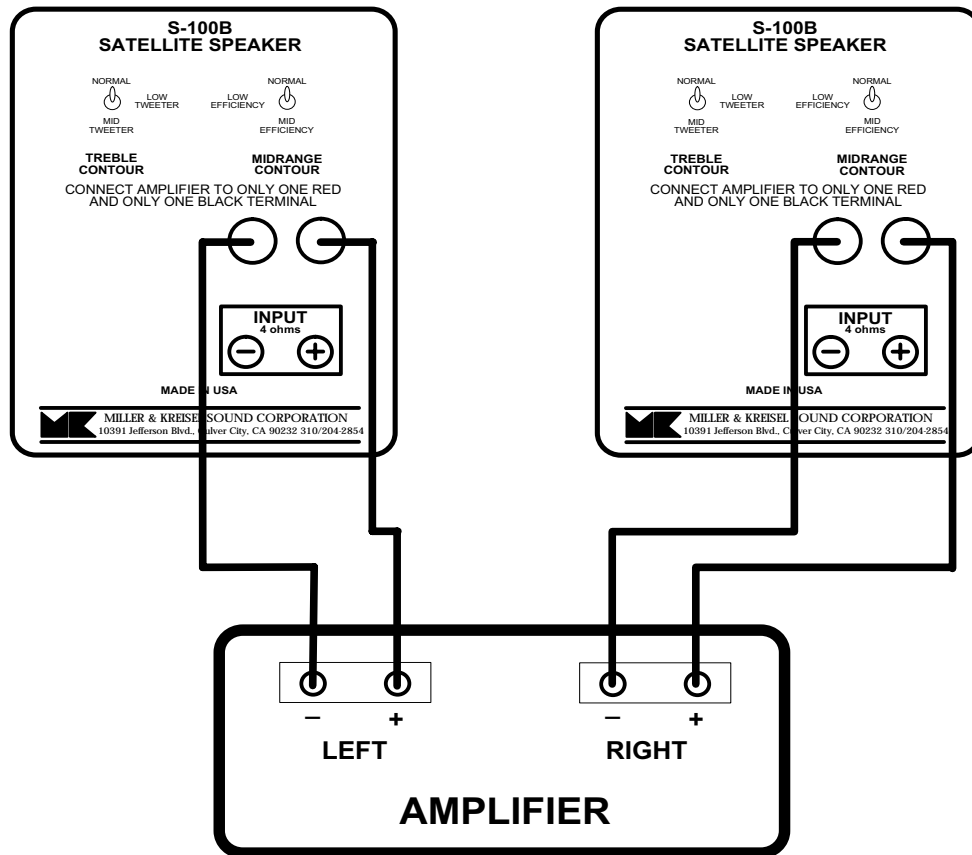
If you are optimizing your system's response with a third-octave equalizer and calibrating the equalizer by using a third-octave analyzer, use the SPECIAL input terminals. The SPECIAL terminals will give you maximize output and dynamic range, while placing the least demand on your power amplifier.

The MID and LOW EFFICIENCY positions trade efficiency and output for a warmer, mellower sound. If your room has a lot of reflective surfaces or you have an otherwise bright-sounding system, try these positions. Some listeners will prefer one of these to the NORMAL position in any room, so we suggest that you at least make a comparison.

All positions have the same power handling capacity, but their output varies (from highest to lowest) as follows: SPECIAL input terminals, NORMAL, MID EFFICIENCY, and LOW EFFICIENCY. Bear in mind that as you switch to a higher efficiency, it requires a higher setting of the subwoofer level. Conversely, when you switch to a lower efficiency, the subwoofer level should be set lower.



**FIGURE 1**  
**WIRING WITH THE S-100B**



### S-100B TREBLE CONTOUR SWITCH

The TREBLE CONTOUR switch slightly rolls off the upper midrange and treble frequencies when set to the MID and LOW position. These carefully shaped contours minimize brightness due to room conditions, other electronics, or the source material. It does more than a simple tweeter level control.

The LOW position gives the greatest reduction of high frequencies. The MID position gives a lesser reduction of the highs, while the NORMAL position does not reduce high frequencies at all.

This control is useful not only to match your room environment and speaker location, but also because audio and audio/video program material varies widely in terms of high frequency level and distortion. For example, many recordings and film soundtracks have artificially boosted, excessive high frequencies that will be clearly reproduced by the exacting and extended high frequency reproduction of your M&K Satellites, and the MID and LOW TWEETER positions will help these recordings.

Don't hesitate to set this switch to MID or LOW for fear of the sound not being "flat". Few recordings are actually "flat", due to equalization in the recording process, and artificial alteration of high frequencies is common.

## 4. S-90 SPEAKER HOOK-UP & USAGE

The sound quality that you get from your Satellites can be affected by the type of speaker wire that you use to connect them. While it is possible to use speaker wire as thin as 22 gauge to hook your Satellites up, we recommend using the largest diameter wire that you can. This means a minimum of 18 gauge wire. Over 10 feet, you should use 16 gauge, and for more than 30 feet, we recommend using 14 gauge or heavier. The smaller the number, the thicker the wire.

There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend using as high quality a cable as fits your budget. Using better quality cables will improve the sound of your Satellites.

If you wish to bi-amplify your Satellites in combination with an M&K Powered Subwoofer, see Section 11 (page 18) for more details.

### S-90 HOOKUP

There is one set of terminals on the backplate, one Red terminal and one Black terminal. Connect the Positive (+) lead from your amplifier or receiver to the RED (+) INPUT terminal, and the Negative (-) lead from your amplifier or receiver to the BLACK (-) INPUT terminal. See Figure 2 (page 7).

### S-90 VARIATIONS OF SOUND

Your M&K Satellites reproduce sound with exceptional transient accuracy and a very wide dynamic range. Because of these qualities, they give outstanding results with any high quality amplifier or receiver in virtually any listening environment.

However, getting the best tonal balance in any given room involves many variables. Therefore, your S-90 Satellites allow you to alter their tonal balance in order to get the ideal sound quality at your favorite listening location (where it counts!), through the use of two three-position switches.

The best way to find the ideal setting for these switches is to listen to some familiar music with the switches in the NORMAL position, and then listen to how the sound changes as you set the switches to the other positions.

If you find the sound to be too bright or harsh-sounding, try the TREBLE CONTOUR switch in the MID TWEETER or LOW TWEETER position. You can also try setting the MIDRANGE CONTOUR switch to NORMAL or LOW EFFICIENCY. If the sound lacks brilliance or sounds bass-heavy, set the TREBLE CONTOUR switch to HIGH TWEETER or set the MIDRANGE CONTOUR switch to NORMAL or SPECIAL.

It is not possible to tell in advance which settings will produce the ideal response (which is a flat frequency response at your ears), because this is dependent on your room, its size, its furnishings, your listening location, and more. The switch choices, however, can help you create the ideal response in your room. Therefore, set the switches for the best sound balance for your ears and your room, so that you get maximum enjoyment from your speakers.

### S-90 MIDRANGE CONTOUR SWITCH

The MIDRANGE CONTOUR switch is the primary control for altering the tonal balance of your Satellites. Its major effect is in the midrange, but it does shift the balance over the entire audible spectrum.

The NORMAL position gives the flattest frequency response in most rooms and installation conditions. This should be the starting position for you in determining the optimum setting for your system. Relative to this position, you will find the SPECIAL position to be brighter and more forward-sounding, and the LOW EFFICIENCY position to be mellower and more recessed-sounding.

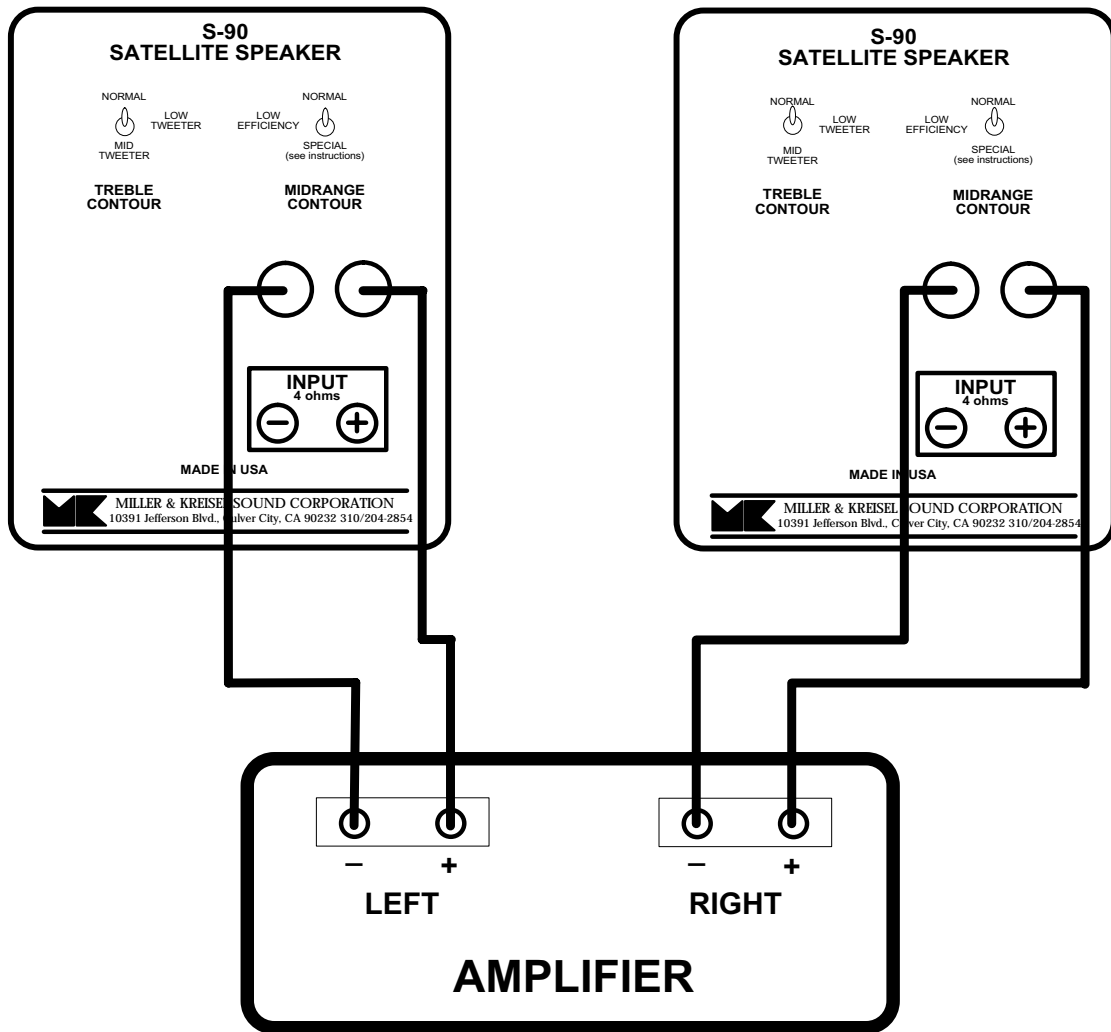
When you are locating the speaker directly against a wall or directly against the floor or ceiling, you may find that the SPECIAL position gives the best response. This is because this position is designed to account for the increase in midbass response that occurs when a speaker is directly against a room surface. (This is referred to as  $2\pi$  space, as opposed to a speaker located out in a room, which is known as  $4\pi$  space. The SPECIAL position should be used for  $2\pi$  conditions, and the NORMAL position should be used for  $4\pi$  conditions).

Use the SPECIAL position if you are optimizing your system's response with a third-octave equalizer and calibrating the equalizer by using a third-octave analyzer. The SPECIAL position will always maximize output and dynamic range, while placing the least demand on your power amplifier.

The LOW EFFICIENCY position trades efficiency and output for a warmer, mellower midbass sound. If you have a room with a lot of reflective surfaces or an otherwise bright-sounding system, try this position. Some listeners will prefer this position to the NORMAL position in any room, so we suggest that you at least make that comparison.

All positions have the same power handling capacity, but because of their greater efficiency, the NORMAL will be louder than the LOW EFFICIENCY, and the SPECIAL position will play the loudest. Bear in mind that as you switch

**FIGURE 2**  
**WIRING WITH THE S-90**



to a higher efficiency, it requires a higher setting of the subwoofer level. Conversely, when you switch to a lower efficiency, the subwoofer level should be set lower.

### S-90 TREBLE CONTOUR SWITCH

The TREBLE CONTOUR switch gives you control of the upper midrange and treble frequencies when set to the HIGH or LOW positions. These carefully shaped contours control brightness to account for room conditions, other electronics, or the source material. It is more sophisticated than a simple tweeter level control.

The LOW position produces an attenuation of high frequencies, while the NORMAL position provides a slight rising characteristic of the high frequencies when measured on-axis. The MID position provides a flat on-axis response to beyond 20 KHz.

This control is useful not only to match your room environment and speaker location, but also because audio and audio/video program material varies widely in terms of high frequency level and distortion. For example, many recordings and film soundtracks have artificially boosted, excessive high frequencies that will be clearly reproduced by the exacting and extended high frequency reproduction of your M&K Satellites, and LOW TWEETER will help these recordings. Many absorptive, "dead" rooms seem to soak up high frequency energy and excitement, and in these cases, NORMAL should be used.

Don't hesitate to set this switch to NORMAL or LOW for fear of the sound not being "flat". Few recordings are



actually "flat", due to equalization in the recording process, and artificial alteration of high frequencies is common.

## 5. S-80 SPEAKER HOOK-UP & USAGE

The back panel of your S-80 speakers contains two pairs of speaker terminals (instead of the usual single pair). Therefore it is extremely important that you follow these instructions carefully, to avoid any possible damage to the speakers or your amplifier, and to get the best possible sound.

The sound quality that you get from your Satellites can be affected by the type of speaker wire that you use to connect them. While it is possible to use speaker wire as thin as 22 gauge to hook your Satellites up, we recommend using the largest diameter wire that you can. This means a minimum of 18 gauge wire. Over 10 feet, you should use 16 gauge, and for more than 30 feet, we recommend using 14 gauge or heavier. The smaller the number, the thicker the wire.

There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend using as high quality a cable as fits your budget. Using better quality cables will improve the sound of your Satellites.

M&K Satellites are not designed for bi-wiring. Do not use the four input terminals to bi-wire your Satellites, as this may damage your amplifier and speakers. If you wish to bi-amplify your Satellites in combination with an M&K Powered Subwoofer, see Section 11 (page 18) for more details.

### S-80 HOOKUP

There are two pairs of terminals on the backplate. Depending on which combination of the four terminals you use to connect your amplifier, you can alter the tonal quality of your S-80 speakers to better match your room, electronics, or personal preference.

These "Variations of Sound" let you achieve much smoother and flatter frequency response in your room, at your listening position. See below for a discussion of the HIGH EFFICIENCY/LOW EFFICIENCY inputs and the HIGH TWEETER/LOW TWEETER inputs.

The Positive (+) lead from your amplifier or receiver should be connected to one of the RED (+) INPUT terminals (either HIGH TWEETER / LOW TWEETER), and the Negative (-) lead from your amplifier or receiver should be connected to one BLACK (-) INPUT terminal (HIGH EFFICIENCY / LOW EFFICIENCY). See Figure 3 (page 9).

**VERY IMPORTANT: NEVER CONNECT THE AMPLIFIER LEADS TO BOTH RED TERMINALS OR TO BOTH BLACK TERMINALS AT THE SAME TIME. YOU MAY DAMAGE YOUR AMPLIFIER AND SPEAKERS. ANY RESULTING DAMAGE IS NOT COVERED UNDER WARRANTY.**

### S-80 VARIATIONS OF SOUND

Your S-80 Satellites reproduce sound with exceptional transient accuracy and a very wide dynamic range. They will give you outstanding results with any high quality amplifier or receiver in virtually any listening environment.

However, getting the best tonal balance in any given room involves many variables. Therefore, your S-80 Satellites allow you to alter their tonal balance in order to get the ideal sound quality at your favorite listening location (where it counts!), by using one of four combinations of input terminals to connect the speakers to your amplifier.

The inputs are labelled HIGH EFFICIENCY and LOW EFFICIENCY. Both positions have the same power handling capacity, but the HIGH EFFICIENCY position plays the loudest, and works best with low powered amplifiers.

Bear in mind that the HIGH EFFICIENCY input requires a higher setting of the subwoofer level. Conversely, if you switch to the LOW EFFICIENCY input, the subwoofer level should be set lower.

We recommend that you experiment with the inputs, starting out by using the HIGH EFFICIENCY and HIGH TWEETER input terminals. If the sound is too bright or harsh-sounding, try switching to the LOW TWEETER input. If it still seems too bright, try the LOW EFFICIENCY input with either HIGH TWEETER or LOW TWEETER.

There is no single ideal or "flat" input combination, because we cannot predict in advance exactly what response will produce that in your room. The choices available through the inputs, however, can allow you to create a virtually ideal response for your room. Hence, you should use the inputs that best balance the sound for your ears and your room, so that you get maximum enjoyment from your speakers.

### S-80 HIGH EFFICIENCY / LOW EFFICIENCY INPUTS

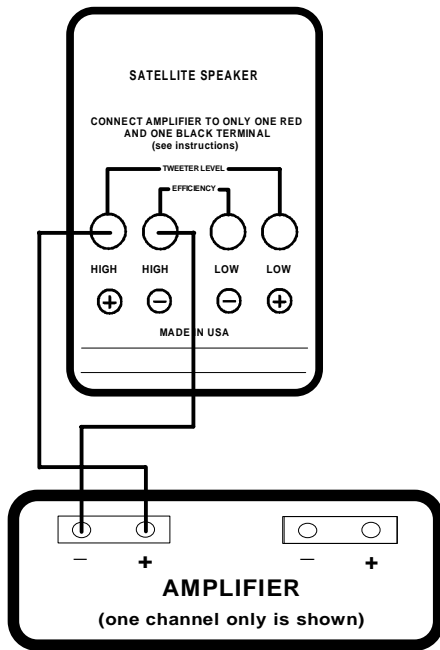
The LOW EFFICIENCY input gives a very warm "laid-back" midbass sound with subdued or recessed midrange. Even though it is very similar in character to the finest British-manufactured monitor speakers, it has a significantly wider dynamic range. Sometimes referred to as the "English Sound."



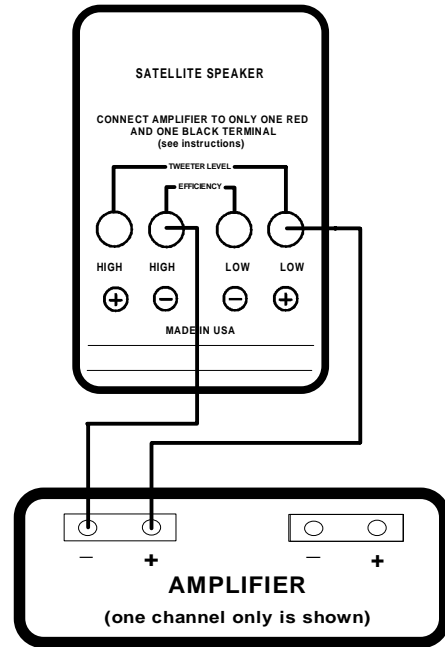


### FIGURE 3 WIRING WITH THE S-80

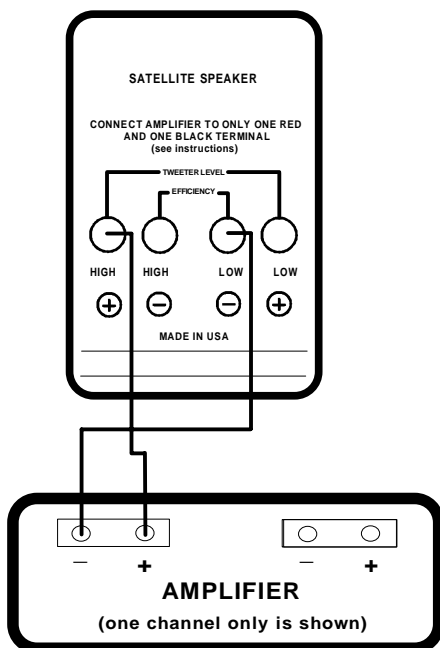
HIGH EFFICIENCY / HIGH TWEETER



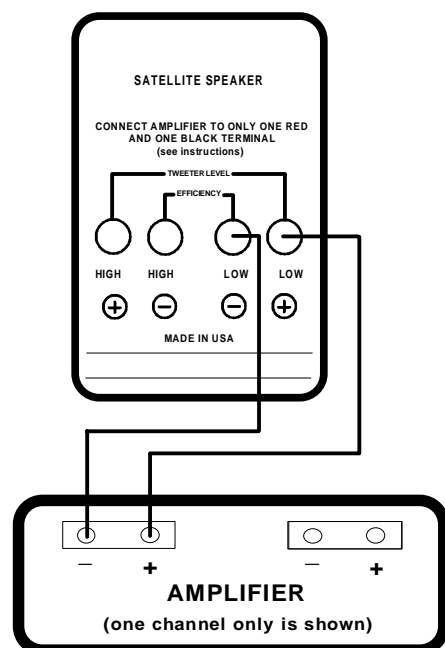
HIGH EFFICIENCY/LOW TWEETER



LOW EFFICIENCY / HIGH TWEETER



LOW EFFICIENCY / LOW TWEETER





The HIGH EFFICIENCY input gives a bright, forward sound with great efficiency and a wider dynamic range. Particularly useful for producing maximum sound power levels, especially with low-powered amplifiers. Sometimes referred to as the "German Sound."

### **S-80 HIGH TWEETER / LOW TWEETER INPUTS**

The LOW TWEETER input provides a rolloff of the upper midrange and treble frequencies in a carefully shaped contour, in order to minimize brightness due to room conditions, other electronics, or the source material. It does more than a simple tweeter level control.

The LOW TWEETER input reduces the high frequencies, while the HIGH TWEETER input has no reduction of high frequencies at all. LOW TWEETER is useful not only to match your room environment and speaker location, but also because audio and audio/video program material varies widely in terms of high frequency level and distortion.

Don't hesitate to use the LOW TWEETER for fear of the sound not being "flat". Few recordings themselves are "flat", due to equalization in the recording process, and artificial alteration of high frequencies is common.

## **6. S-1C SPEAKER HOOK-UP & USAGE**

### **SPECIAL NOTE**

Because your S-1C Satellites have a specially controlled vertical radiation pattern, it is very important that you install them so that they are properly oriented relative to your ears.

The idea is to have the space between the lower tweeter and the upper woofer at the same height as your ears when you are listening. If you have the speakers mounted above or below this height, you must angle the speakers so that the tweeters are aimed at your ears when you are in the main listening position.

### **HOOK-UP & USAGE**

The back panel of your S-1C speakers contains two pairs of speaker terminals (instead of the usual single pair). Therefore it is important to follow these instructions carefully, to avoid any possible damage to the speakers or your amplifier, and to get the best possible sound. The second pair of terminals is provided to allow you to bi-wire the S-1C. The bi-wiring technique is discussed below.

Sound quality can be affected by the type of speaker wire that you use. While it is possible to use speaker wire as thin as 22 gauge to hook your Satellites up, we recommend using the largest diameter wire that you can. This means a minimum of 18 gauge wire. Over 10 feet, you should use 16 gauge, and for more than 30 feet, we recommend using 14 gauge or heavier. The smaller the number, the thicker the wire.

There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend using as high quality a cable as fits your budget. Using better quality cables is especially important with a speaker the quality of the S-1C.

As mentioned above, the S-1C Satellites allow for bi-wiring, with two pairs of speaker terminals on its back panel. For instructions on bi-wiring, see BI-WIRING THE S-1C on page 12. If you wish to *bi-amplify* your Satellites in combination with an M&K Powered Subwoofer, see Section 11 (page 18) for more details.

### **S-1C HOOKUP**

There are two pairs of terminals on the backplate, each with one Red terminal and one Black terminal. One set is labelled NORMAL INPUT / BI-WIRE WOOFER INPUT, and the other set is labelled BI-WIRE TWEETER INPUT. Under normal conditions, use only the terminals labelled NORMAL INPUT (the top two terminals), and make sure that the toggle switch between both pairs of terminals is set to the NORMAL position. The BI-WIRE TWEETER INPUT terminals should be used only when you are bi-wiring (see Page 12 under BI-WIRING THE S-1C).

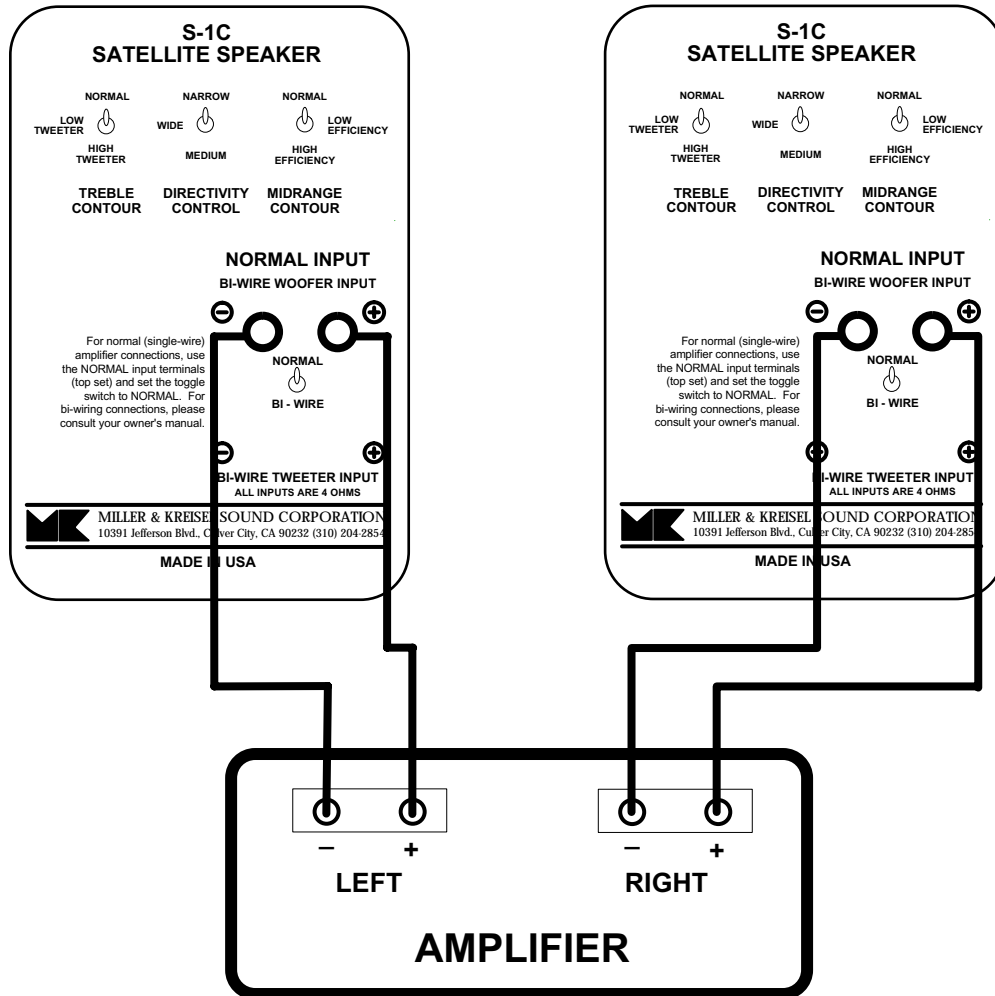
Connect the Positive (+) lead from your amplifier or receiver to the RED (+) INPUT terminal, and the Negative (-) lead from your amplifier or receiver to the BLACK (-) INPUT terminal. See Figure 4 above.

### **S-1C VARIATIONS OF SOUND**

Your M&K Satellites reproduce sound with exceptional transient accuracy and a very wide dynamic range. Because of these qualities, they give outstanding results with any high quality amplifier or receiver in virtually any



**FIGURE 4  
WIRING WITH THE S-1C**



listening environment.

However, getting the best tonal balance in any given room involves many variables. Therefore, your S-1C Satellites allow you to alter their tonal balance in order to get the ideal sound quality at your favorite listening location (where it counts!), through the use of two three-position switches.

The best way to find the ideal setting for these switches is to listen to some familiar music with the switches in the NORMAL position, and then listen to how the sound changes as you set the switches to the other positions.

If you find the sound to be too bright, try the TREBLE CONTOUR switch in the NORMAL or LOW TWEETER position. You can also try setting the MIDRANGE CONTOUR switch to NORMAL or LOW EFFICIENCY. If the sound lacks brilliance or sounds bass-heavy, set the TREBLE CONTOUR switch to HIGH TWEETER or set the MIDRANGE CONTOUR switch to HIGH EFFICIENCY or NORMAL.

It is not possible to tell in advance which settings will produce the ideal response (which is a flat frequency response at your ears), because this is dependent on your room, its size, its furnishings, your listening location, and more. The switch choices, however, can help you create the ideal response in your room. Therefore, set the switches for the best sound balance for your ears and your room, giving you maximum enjoyment from your speakers.

### **S-1C MIDRANGE CONTOUR SWITCH**

The MIDRANGE CONTOUR switch is the primary control for altering the tonal balance of your Satellites. Its major effect is in the midrange, but it does shift the balance over the entire audible spectrum.

The NORMAL position gives the flattest anechoic frequency response, and works best in many rooms and installations. Start with this position. If you find the sound quality to be too forward or too bright, try setting the switch

to the LOW EFFICIENCY position. Relative to NORMAL, the LOW EFFICIENCY position has a warmer, mellower mid-bass sound with a more distant perspective.

When you are locating the speaker directly on a surface such as a wall, floor or ceiling, you may find that HIGH EFFICIENCY position gives the best response. This is because this position best matches the increase in midbass response that occurs when a speaker is directly against a room surface. (This is referred to as  $2\pi$  space, as opposed to a speaker located out in a room, which is known as  $4\pi$  space. The HIGH EFFICIENCY position should be tried first for  $2\pi$  conditions, and the NORMAL position should be tried first for  $4\pi$  conditions).

If you are optimizing your system's response with a third-octave equalizer and calibrating the equalizer by using a third-octave analyzer, use the HIGH EFFICIENCY position. It will give you maximize output and dynamic range, while placing the least demand on your power amplifier.

The LOW EFFICIENCY position trades efficiency and output for a warmer, mellower sound. If your room has a lot of reflective surfaces or you have an otherwise bright-sounding system, try this position. LOW EFFICIENCY is sometimes referred to as the "English sound." Some listeners will prefer it to the NORMAL position in any room, so we suggest that you at least make a comparison.

All positions have the same power handling capacity, but their sensitivity varies (from highest to lowest) as follows: HIGH EFFICIENCY, NORMAL, and LOW EFFICIENCY. Note that as you switch to a higher efficiency, the subwoofer level needs to be set higher. Conversely, when you switch to a lower efficiency, the subwoofer level should be set lower.

### **S-1C TREBLE CONTOUR SWITCH**

The TREBLE CONTOUR switch gives you control of the upper midrange and treble frequencies when set to the HIGH or LOW positions. These carefully shaped contours control brightness to account for room conditions, other electronics, or the source material. It is more sophisticated than a simple tweeter level control.

The LOW position produces an attenuation of high frequencies, while the HIGH position provides a slight rising characteristic of the high frequencies when measured on-axis. The NORMAL position provides a flat on-axis response to beyond 20 KHz.

This control is useful not only to match your room environment and speaker location, but also because audio and audio/video program material varies widely in terms of high frequency level and distortion. For example, many recordings and film soundtracks have artificially boosted, excessive high frequencies that will be clearly reproduced by the exacting and extended high frequency reproduction of your M&K Satellites, and LOW TWEETER will help these recordings. Many absorptive, "dead" rooms seem to soak up high frequency energy and excitement, and in these cases, HIGH TWEETER should be used.

Don't hesitate to set this switch to HIGH or LOW for fear of the sound not being "flat". Few recordings are actually "flat", due to equalization in the recording process, and artificial alteration of high frequencies is common.

### **S-1C DIRECTIVITY CONTROL SWITCH**

An important design element of the S-1C is its specially controlled vertical radiation pattern. This improves stereo imaging by reducing the amount of sound that it radiates above and below the speaker. When this sound reflects from a recording console or the room's floor and ceiling, it then arrives at your ear later than the direct signal (because of the time delay of the reflections). The delay of these reflected signals "blurs" the sound, producing a poor stereo image.

In the S-1C, this performance enhancement is achieved through its vertical tweeter array and matching cabinet foam treatment. To further improve on this, a brand-new feature in the S-1C is its DIRECTIVITY CONTROL switch. This unique three-position switch allows you to vary the amount of control applied to the high frequency radiation pattern.

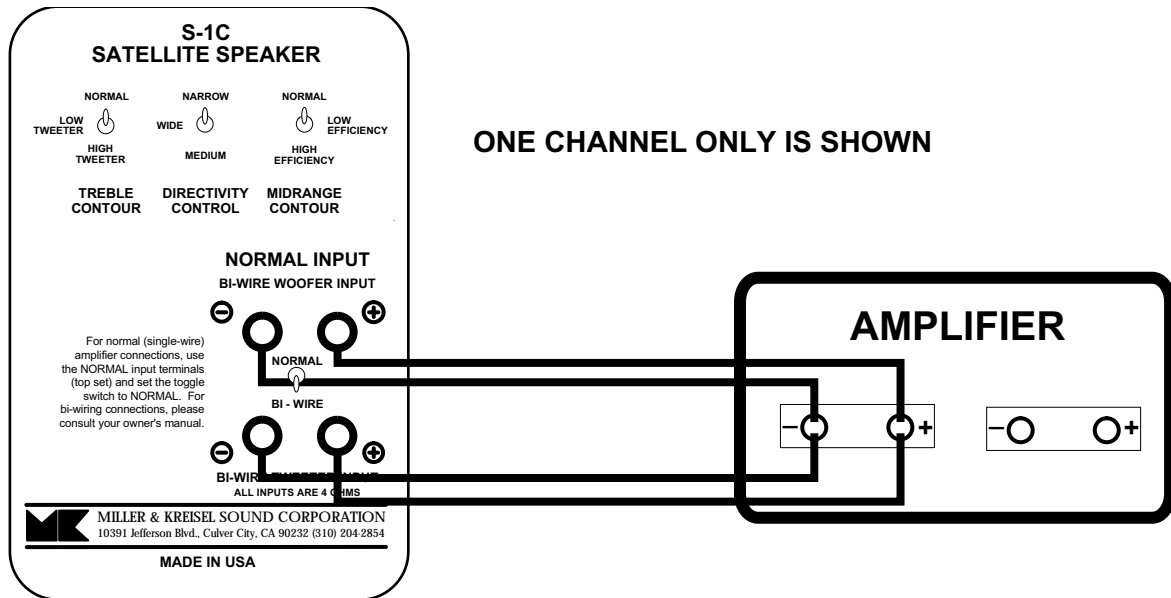
In the WIDE position, the greatest amount of high frequency sound is allowed to radiate toward the floor and ceiling. The NORMAL position produces the sharpest forward imaging through maximum attenuation of the high frequency energy radiated toward the floor and ceiling, and the MID position falls in-between these two extremes.

The optimum setting for your system will depend on your room, your personal preference, and even the source material that you are listening to. You may find that you prefer one setting for two-channel stereo and a different one for multi-channel (four or five channel surround) listening. If you do most of your listening seated in one location, the NORMAL position may be your preference. If you spend a great deal of time listening to the system standing, as well as sitting, the WIDE position may work best. This is ultimately a subjective judgment, so we recommend that you experiment to find the position that works best for your purposes.

### **BI - WIRING THE S-1C**

Bi-wiring is an advanced audiophile technique that can improve the sound quality that you hear from your S-1C Satellites. It requires two sets of speaker wires running from the amplifier to EACH speaker, so it can be expensive.

**FIGURE 5  
BI - WIRING WITH THE S-1C**



In better quality systems, however, it can make an audible difference, and the superior sound quality of the S-1C makes it a good candidate for bi-wiring.

Bi-wiring can improve the sound of your system for a variety of reasons, including lower wire resistance and inductance, among others. Bi-wiring can be done with a single stereo amplifier driving a pair of S-1Cs, or it can be done with a pair of amplifiers driving them.

To bi-wire with a single amplifier, run two sets of speaker wires to each speaker. Each amplifier channel will have two sets of wires connected to it. One set of wires should be connected to the lower set of terminals on the S-1C backplate (labelled NORMAL INPUT / BI-WIRE WOOFER INPUT), and the other set of wires should be connected to the upper set of terminals on the S-1C backplate (labelled BI-WIRE TWEETER INPUT.) **The toggle switch located between both pairs of terminals must be set to the BI-WIRE position.**

In all cases, the Positive (+) lead of each wire running from your amplifier or receiver should be connected to the RED (+) INPUT terminals, and the Negative (-) lead of each wire running from your amplifier or receiver should be connected to the BLACK (-) INPUT terminals. See Figure 5 above.

To bi-wire with two amplifiers, you will also run two sets of speaker wires to each speaker, but there will be only one set of wires connected to each amplifier channel. We recommend against trying this without guidance from your dealer or the M&K factory. There are a large number of variables that can lead to possible amplifier damage as well as sonic problems with this type of wiring. **With two amplifiers, it is critical that the toggle switch located between both pairs of terminals is set to the BI-WIRE position, or amplifier damage may occur.**

## 7. OPTIMIZING SPEAKER PLACEMENT

The sound quality produced by your Satellite speakers can be significantly enhanced by careful attention to their placement. While we understand that you may not redesign your room to accommodate your speakers, coming as close as possible to the ideal placement will give you much better sound.

Four factors are important in getting the best sound. They are:

- A. Height (or angle).
- B. Location away from room walls or reflecting surfaces.
- C. Separation between Left and Right speakers.
- D. Cabinet orientation (horizontal or vertical).

### A. HEIGHT (OR ANGLE)

Your M&K Satellites will always deliver sound superior to conventional speakers, regardless of where you locate them. However, because they are designed for very fast and accurate transient response, they achieve even better sound quality, and the flattest frequency response when properly oriented relative to your ear.

Ideally, your Satellite speakers' tweeters should be at the same height from the floor as your ears, when you are sitting in your main listening position. For the **S-100B**, measure from the floor to the center tweeter, and for the **S-1C**, measure from the floor to the space between the two tweeters.

If you have the speakers mounted above or below this height, we recommend that you angle the speakers so that the tweeters are aimed at your ears when you are in the main listening position.

If you have a helper move the speakers while you sit and listen, you should be able to hear the difference when the speakers are in the best location by listening for the brightest high frequencies and for the best "focus" of sound, where you hear the sharpest sonic imaging of voices and instruments.

### B. LOCATION AWAY FROM REFLECTING SURFACES

Your Satellites should be located, whenever practical, away from walls, the floor, furniture, or any other reflecting surfaces. Do the best you can in your room. Objects located close to the speaker will reflect the sound radiated from the speaker to your ear with a slight time delay compared to the direct sound reaching your ear. This time delay will blur the sonic imaging and interfere with transient performance.

The delay is very slight, so instead of hearing an echo, you hear a "blurred" sound with less clarity that is not as sharp and distinct as it should be. This time delay also affects frequency response and sonic imaging.

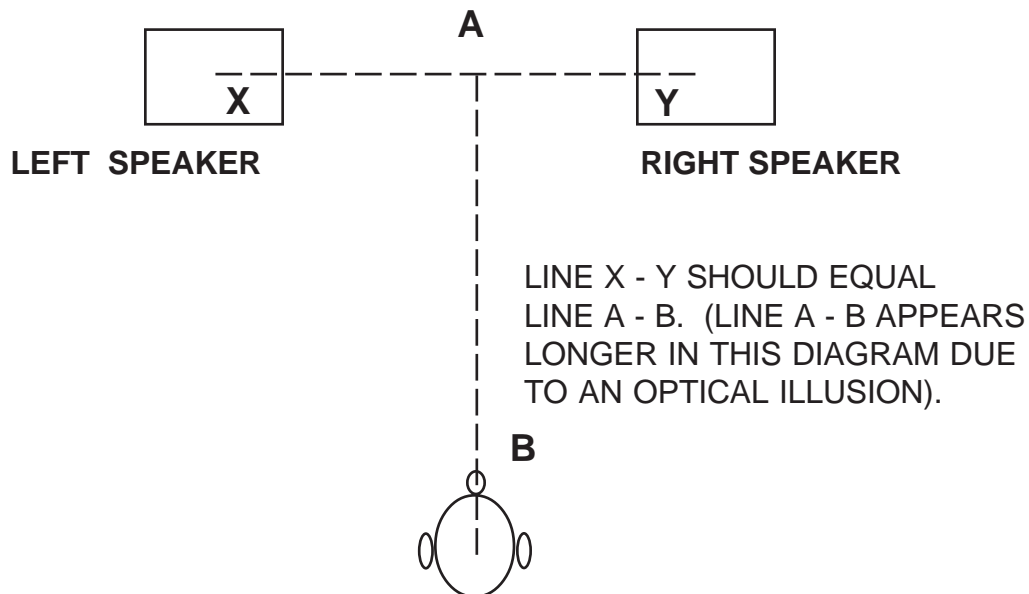
If the speakers will be sitting on shelves, locate them on the front edge of the shelf, so there is no flat surface directly in front of them. If the speakers will sit close to walls or other large objects, leave as much space as possible between the speaker and the object. Ideally, your Satellites will be several feet from the nearest surface, but in most rooms compromise is necessary.

### C. SEPARATION BETWEEN LEFT AND RIGHT SPEAKERS

Here is a formula for achieving the ideal left to right stereo imaging. Think of a triangle formed by the locations of the Left and Right speakers and your listening position. Ideally, the subtended angle formed should be between 45 and 50 degrees. Roughly, this means that the Left and Right speakers should be separated by about the same distance that you are sitting back from the speakers. In other words, if the distance from your listening position to the point directly between the speakers is 10 feet, place the speakers so their centers are about 10 feet apart. See Figure 6 below.

The length of line A - B should be about the same as the length of line X - Y. (They may not seem to be the same

**FIGURE 6**  
**SEPARATION BETWEEN SPEAKERS**







in this diagram due to an optical illusion).

Try to follow the formula as close as you can. You can fine tune the placement by listening to a source with an image (such as a vocalist) centered between the speakers. When listening in stereo (no Center Channel speaker), move the speakers closer together or farther apart in small increments until you hear the sharpest and most cohesive image, especially in the phantom center. You may also want to angle (or "toe-in") the speakers slightly. This often improves the sharpness of the stereo image, reduces room colorations, and provides a wider seating area.

#### **D. CABINET ORIENTATION (HORIZONTAL OR VERTICAL)**

The performance of the **S-90** or **S-80** Satellites is essentially identical whether they are oriented horizontally or vertically. The performance of the **S-100B** and **S-1C**, however, does change according to their orientation.

The **S-90** and **S-80** cabinets are trapezoidal in shape (their front baffles are narrower than their rear baffles), so when they are placed on their sides (horizontally), they point down. If your Satellites will be placed above the main listening position, this should require no compensation. If they are level or below the main listening position, you will need to put a wedge or spacer underneath the speaker so that it points up towards you.

The **S-100B** and **S-1C** Satellites are designed for controlled vertical dispersion and wide horizontal dispersion. By controlling the vertical dispersion, we limit the amount of sound that would otherwise be reflected with a time delay from the floor and ceiling (for the reasons discussed in B. above).

For the **S-1C** Satellites, this means that they should always be vertically oriented (with the tweeters either on the top or the bottom). When they are vertical, the controlled dispersion is in the correct plane. If they are oriented horizontally (on their sides), listeners right or left of a direct line from the center of the speaker will hear a compromised sound quality, an irregular frequency response, and other problems. While this may be acceptable for background listening, we strongly recommend that you do not place them on their sides for careful listening.

For the **S-100B** Satellites, the best orientation is with the tweeters in a vertical line, to the outside, so that the 5" woofers are towards the center. This provides wide horizontal dispersion and limited vertical dispersion, giving you the best stereo imaging and overall sound. However, the vertical dispersion of the **S-100B** is not controlled to the degree of the **S-1C**, so it is acceptable to place it with the tweeters in a horizontal line either above or below the 5" woofers. The best **S-100B** sound, however, is with the tweeters vertical.

## **8. HOME THEATRE USAGE**

### **TIMBRE-MATCHING**

One of the most important factors in achieving excellent Home Theatre performance is known as timbre-matching. This is important because on film soundtracks, specific sounds are frequently moved from left to right or from front to back in the room. When the speakers reproducing these sounds do not have similar characteristics, there will be an audible discontinuity when the sound shifts from one speaker to another.

Timbre-matched speakers have very similar tonal characteristics and sound, which are achieved through three critical elements: similar or identical drivers; similar or identical crossovers; and similar or identical frequency response. If you have only M&K speakers in your system, these elements have been addressed and you can be assured that your system can achieve the full potential of Home Theatre sound.

If your other speakers are not M&Ks, don't worry; M&K's unique Variations of Sound allow you to adjust your M&K speakers to match your other speakers. Read the Variations of Sound section for your Satellite speakers (S-100B, page 4; S-90, page 6; S-80, page 8; S-1C, page 10) for details.

First, set up a listening comparison between your new M&K speaker and your existing speaker. Connect one speaker as the front right channel speaker and the other as the front channel left speaker. Place them as close together as possible, and compare their sound by alternately rotating the balance control fully to the right and left.

Set the controls on the back panel of the M&K speaker so that it sounds as similar as possible to the other speaker. Set the other M&K speaker identically (unless you are adding just one as a center channel) and proceed with hooking up your system. If you have any questions, please give us a call and we'll be happy to discuss this with you.

### **CHANNEL BALANCING**

The other factor critical to achieving excellent Home Theatre performance is level-matching the three front and two surround channels. This is actually even more important than timbre-matching. If your dealer has calibrated your system on installation, you don't need to worry about this step. We just ask that you PLEASE don't try to readjust it.

But if you are doing the calibration yourself, a small investment will allow you to do the same job as a professional and get superb surround sound performance. We strongly recommend that you purchase a Radio Shack Sound Level





Meter (available for less than about \$40) and use it to measure the output of the speakers when playing the test tones generated by your processor or receiver. See your processor or receiver's instruction manual for how to perform the calibration. **NEVER CALIBRATE LEVELS BY EAR!** This meter is a small investment relative to the price of your system, and it is the only way that you can make sure you get the maximum benefit from your investment.

### **SPEAKER PLACEMENT**

If your M&K Satellites are being used in a Home Theatre system, placement becomes even more important, as you will be balancing four or five (or more) speakers rather than two. The following guidelines are for a five-channel Pro-Logic system, but if your system is not Pro-Logic (does not have a Center channel speaker), ignore the references to the Center channel. The instructions for the other four channels will still be correct.

### **CENTER CHANNEL**

The Center channel speaker in a Pro-Logic system is the most important channel in the system. Very often, this channel produces more output than the left and right channels *combined*. Therefore, this speaker should be of the highest possible quality, and as similar as possible in frequency response and radiation pattern to the Left and Right speakers. Three identical speakers will give you the most accurate sound.

In addition, it is important to have as much amplifier power as possible for the Center channel. As a minimum, we recommend that the three front channels be identical in power output. Preferably, the Center channel will have the greatest amount of power. If you have less power in the Center channel, understand that this will be the limiting factor in the total output capability of the system when watching and listening to video sources.

M&K Satellites, with their compact size and adjustable tonal balances, are ideal for Center channel use. Because of their Variations of Sound capabilities, they will blend with a very wide range of speakers and can be acoustically balanced to provide a smooth front channel soundfield. M&K Satellites are also offered with optional magnetic shielding to allow them to be used close to a television set.

The Center channel speaker should be located as close as physically possible to the television or projection screen. This usually means that it will be just above or just below the screen, which is ideal. If that is not possible, then just to the left or the right of the screen is next best.

If the television is not in the center of the room (or not centered between the Left and Right speakers), the proper location for the Center channel speaker is still as close as possible to the television screen -- even if that means it is outside either the Left or Right speaker. Remarkably good results can be found in unusual configurations, as long as the Center channel speaker is as close as possible to the screen.

If you have a direct-view television, this may make magnetic shielding very important. See Section 2 (page 3) for a discussion of magnetic shielding in M&K Satellite speakers.

### **FRONT CHANNELS**

The Left and Right front channel speakers in a Home Theatre system can be placed in the same fashion as the Left and Right speakers in a stereo setup, and this is what we recommend. Some listeners, however, may prefer the Left and Right speakers closer together in order to better match the sonic image and screen image sizes.

For example, with a 20" direct-view television, you would want the speakers closer together than you would with a 100" projector. One recommendation is to separate the speakers by 1.5 times the diagonal screen size.

There is a great deal of latitude in this area, as it is really one of personal preference (especially if you use the system to listen to music without video). If you find a sonic image much wider than your screen disconcerting, try moving the Left and Right speakers closer together.

It is also preferred that the speakers be in roughly the same plane as the television screen. If they are much higher or lower than the screen, the effect can be distracting. If this is not practical, angling the speakers to aim at the listening position can help.

When using a Center channel speaker in a Pro-Logic system, you will have a great deal of extra flexibility in placing the Left and Right speakers, as the Center channel speaker will tie most dialog and effects directly to the screen.

### **SURROUND (REAR) CHANNELS**

The Surround channel speakers can be placed in a wide variety of locations in your room to give good performance. In general, the surround speakers should be either adjacent to or behind the main listening position, and located higher than the listener's heads. They can be mounted on either the side walls or on the back wall, flush to the wall, on shelves, on brackets, etc.

A typical location might be speakers on the side walls of the room, one foot from the ceiling and two or three feet from the back wall. This would be appropriate in a room with 8 or 9 foot ceilings, and a main listening position three



to five feet or more from the back wall. An alternate location in this room might be on the back wall of the room, at the same height, a few feet from the corners. Symmetrical arrangements work best.

It is best to locate them at least a few feet away from the nearest listener's head. If the speaker is located too close to a listener, its sound will become too directional and may distract that listener. Ideally, the surround speakers should not call attention to themselves and should not be audible as separate sources of sound.

If they must be located very close to the listeners, pointing the speakers at the room walls or ceiling can help to reduce the directional effect. Sometimes this produces a desirable result even in rooms where the surround speakers are an adequate distance from the listeners' heads.

Some listeners prefer to use multiple pairs of surround speakers. While this is not necessary, it can provide a broader and deeper surround effect, with better coverage in very large rooms. When using multiple pairs of surround speakers, a symmetrical installation pattern works best. For example, if you are using two pairs of S-80 Satellites for the surround channel, one pair should be mounted on the back wall of the room, mounted equidistant from the back corners, with the other pair mounted on the side walls of the room, equidistant from the same back corners.

The surround channels can be installed in a wide variety of locations, but this fact can mean that they also present the greatest challenges and difficulties in installation. This discussion is intended only to be the most general of guides to their installation. If you have further questions, please discuss them with your M&K dealer or call us at the M&K factory, and we will be happy to discuss them with you in detail.

### SUBWOOFER

Subwoofer location for Home Theatre systems is essentially the same as for music systems. See our Subwoofer operation manual for more details. Remember to leave 2 - 3 feet of clearance between any television and subwoofer, unless the subwoofer is magnetically shielded.

The preferred connection for the subwoofer is a subwoofer output from the amplifier or controller. This insures that a full bass signal is being fed to the subwoofer. If you do not have such a subwoofer output jack, connect the subwoofer to the front Left and Right channel amplifier outputs (do not use the Center channel).

**VERY IMPORTANT:** When the Subwoofer is connected to the Left and Right amplifier outputs, and the controller is in Pro-Logic mode, the switch on the Pro-Logic control unit labelled Center channel WIDE/NORMAL **must** be set to the NORMAL mode. If the switch is set to the WIDE mode, the bass content of the Center channel will not be fed to the Subwoofer, and you will lose a significant amount of bass.

## 9. SATELLITE/SUBWOOFER PHASING TEST

In any system using a subwoofer separate from Satellite speakers, a phasing test must be performed to insure good bass blending. This test insures optimum sound in the critical bass frequencies where your Subwoofer and Satellite speakers overlap.

Play a familiar CD, LP, or tape with steady, consistent bass content through your system. Listen carefully to the "mid-bass" region of 75 - 125 Hz. This is the part of the spectrum where electric or string basses and drums predominate. Then, reverse the Positive and Negative speaker inputs on the back of BOTH Satellite speakers.

You can do this at the back of both Satellite speakers, or at the Subwoofer's TO SPEAKERS terminals, but never at both locations. The lead that was on the Positive (+) terminal should be switched to the Negative (—) terminal, and vice versa. When switching speaker wires, take care to protect your amplifier. Make sure that the wires do not touch each other when you are making the switch. As a safety measure, we suggest that you turn the amplifier off before making the switch.

Now listen to the same musical passage as you did earlier, concentrating on the mid-bass region. If you hear less bass, the original connections were correct. If you hear more bass, the new connections are correct.

You need to perform this test because when Satellite speakers are located separate from a Subwoofer, each speaker is at a different distance from your ear. In some cases, the difference will be just enough so that the output from the Subwoofer arrives out of phase with the output of the Satellites. When this happens, that critical mid-bass is actually cancelled. You should re-do this test any time you move your speakers.

If you want to experiment further, move the Satellite speakers either towards or away from your listening position, making changes in small increments. This will "focus" the system's sound to its optimum. When you hear the best combination of stereo image localization and maximum impact and output in the mid-bass, you have the ideal location.



## 10. SPEAKER DAMAGE & HOW TO AVOID IT

An important factor to consider with any loudspeaker system is the potential for speaker damage. Even though your M&K Satellites have extremely high power handling ability (especially for Satellite speakers), they still can be damaged by relatively low powered amplifiers.

While very few M&K Satellites are actually returned for service, the vast majority of those returned are not for manufacturing defects. Instead, they are returned because they have been overdriven, almost always because the amplifier or receiver used was driven into clipping distortion. This damage is considered abuse, and is not necessarily covered under warranty.

This clipping distortion occurs when the demands of the music are greater than the amplifier's available power. It can occur at 20 watts with a small amplifier, or at 400 watts with a large amplifier. When this happens, the amplifier's output waveform (which should look like a smooth arc) is "clipped" off, exhibiting a flat top instead of the arc.

This flat top contains multiples of the original amplified frequencies, sometimes at higher levels than the original signal itself. For tweeters, this can be very damaging, as this distortion is well above the audible range (where you are unable to hear it), and where the tweeter is most vulnerable to damage.

When an amplifier clips, its sound becomes harsh and grating, and a break-up is often audible in the bass frequencies. It will become uncomfortable to listen to, especially when compared to a slightly lower volume level. When you are listening at high volume levels, be aware of the onset of clipping distortion, and turn the volume down slightly if the sound takes on the character described above.

When tone controls or equalizers are used to boost frequencies, the problem occurs much more rapidly. Even a small boost of low or high frequencies can easily double the power requirement and lead to amplifier clipping at moderate levels. Therefore, you should use your tone controls judiciously, avoiding extreme boosts of the bass and treble controls, especially when you are listening at high volume levels.

The best way to avoid speaker damage is to use common sense. Use moderate boosts of tone controls or equalizers, at the very most. Listen carefully for any harshness and break-up, especially at high volume levels, and turn down the volume when needed. If you cannot get enough volume, you may need to consider a higher-powered amplifier. If you have any questions about this, please contact M&K, and we will be happy to discuss it with you further.

## 11. BI - AMPLIFYING YOUR SATELLITES WITH M&K HIGH PASS FILTERS

One excellent way to improve the sound of your Satellite speakers (and protect them if you listen at high volume levels to music with substantial deep bass output), is by using an M&K High-Pass Filter. The M&K LP-1S and VF-100 High-Pass Filters improve the performance of any system that allows for separation of its preamp and power amp stages, by filtering the bass signal fed to the main amplifier and Satellite speakers.

These filters will give you greater dynamic range, lower distortion, and an increased maximum output level. If you have any questions about the suitability of your components, please contact your M&K dealer or the factory.

To use these filters with an integrated amp or receiver, the amp/receiver MUST have back panel RCA jacks labelled Preamp/Main Output AND Power Amp/Main Input (or Front Out/Front In). There may be a switch or jumper connections between them. If you can use one of these filters, you simply connect one set of shielded RCA - RCA interconnect cables between the receiver, amp or preamp's Main Output and the LP-1S or VF-100, with a second set between the LP-1S or VF-100 and the Main Input of the receiver or amplifier, and a third set from the LP-1S or VF-100 to the Subwoofer. See the instruction sheet that comes with the High-Pass Filter for more information.

## 12. IF YOU NEED SERVICE

Contact your dealer or M&K with a complete description of the problem. Please have the unit's model and serial numbers (found on the back of the cabinet), date of purchase, and your dealer's name. You can call M&K between 8:30 AM and 5:00 PM Pacific Time, Monday through Friday, at (310) 204-2854. If you call outside these hours, leave a message, and we will return your call promptly.

**DO NOT RETURN YOUR SPEAKERS TO THE FACTORY FOR SERVICE WITHOUT OBTAINING PRIOR AUTHORIZATION**



All M&K Satellite speakers carry a five year limited parts and labor warranty. This warranty is transferable to new owners up to five years from the date of original purchase. It does not cover abuse, misuse, repairs by unauthorized service stations, speakers without M&K serial numbers, speakers not sold by authorized M&K dealers, and those damaged in shipping or by accident. If you have any questions about the warranty, please contact M&K.

## 13. CABINET MAINTENANCE

The genuine oak veneer or painted black cabinets of your M&K Satellites have a furniture-grade finish that will maintain its attractive appearance with proper care.

Treat the cabinet as you would any piece of fine furniture. If your cabinet is natural oak, rubbing the wood periodically with an oil or polish will enhance its beauty and protect its finish as long as you own it. If your cabinet is painted black oak or Glass Bead black, regular dusting and cleaning is all that is required. Matching black paint can be used if necessary to repair any surface damage.

## 14. SELECTING THE RIGHT OMNIMOUNT® BRACKET

The S-100B, S-90, and S-80 Satellites all contain threaded inserts to be used in conjunction with brackets offered by OmniMount® Systems. For the S-90, the location of the Omnimounts varies according to production date. Some S-90s have the inserts on the back baffle of the cabinet and other S-90s have the inserts on the bottom of the cabinet. See page 20 for which bracket to use for each configuration.

The brackets offer tremendous flexibility for installation in a wide variety of environments, and are available in several configurations for standard wall mounting. Always use only the OmniMount® Series listed for each speaker to insure safe installation of the speaker.

The machine screws for mounting the bracket to the S-100B and S-90 speakers can be found in any hardware store, along with screws appropriate for properly wall-mounting the bracket and speaker. Your hardware store can help you make the right selection. For more information, including alternate mounting configurations such as ceiling mounts, contact OmniMount® at (602) 829-8000.

For more detailed information on these OmniMount® brackets, see Figure 7 on Page 20.

## 15. SPECIFICATIONS

IMPEDANCE:	4 ohms (all M&K Satellites are 4 ohms)	
MINIMUM POWER:	10 watts RMS	
RECOMMENDED POWER:	50 - 200 watts RMS or more (see below)	
MAXIMUM POWER:	S-100B, S-1C:	400 watts RMS unclipped peaks
	S-90, S-80:	200 watts RMS unclipped peaks
FREQUENCY RESPONSE:	S-1C:	77 Hz - 20 KHz ± 2 dB
	S-100B:	77 Hz - 20 KHz ± 2 dB
	S-90:	72 Hz - 20 KHz ± 2 dB
	S-80:	87 Hz - 20 KHz ± 2 dB
DIMENSIONS (H x W x D):	S-1C:	21" x 7 3/4" x 10 1/2"; 20 lbs.
	S-100B:	12" x 10 1/2" x 8 1/2"; 22 lbs.
	S-90:	12" x 11 5/8" x 9 3/4"; 16 lbs.
	S-80:	10 1/2" x 8" x 6 1/2"; 9 lbs.

## FIGURE 7 SELECTING THE RIGHT OMNIMOUNT® BRACKET

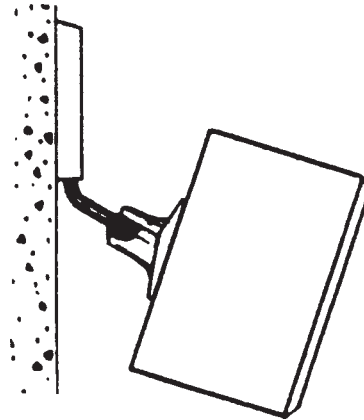
### S-100B

#### S-90

(when threaded inserts are on the back of the S-90)

#### USE OMNIMOUNT® 75-WA

Four threaded inserts are located on the back baffle of the cabinet. Mount the bracket to the speaker using 5/8" long 1/4" x 20 pan head or round head machine screws. Use only an OmniMount® Series 75 mounting bracket.

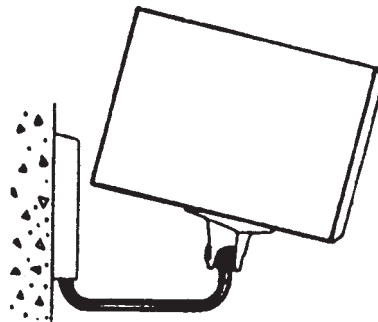


### S-90

(when threaded inserts are on the bottom of the S-90)

#### USES OMNIMOUNT® 75-WB

Four threaded inserts are located on the bottom (or top, when the speaker is inverted) of the cabinet. Mount the bracket to the speaker using 5/8" long 1/4" x 20 pan head or round head machine screws. Use only an OmniMount® Series 75 mounting bracket.



### S-80

#### USES OMNIMOUNT® 53-RST

A single 3/8" threaded insert is located on the back baffle of the cabinet. Use only an OmniMount® 53 RST (special order) bracket.

