

satellite speakers

operation manual

S-125

S-85

S-125C

S-85C



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DO NOT REMOVE THE SPECIAL ACOUSTIC FOAM ATTACHED TO THE FRONT BAFFLE AND/OR GRILLE OF YOUR SPEAKERS.

This foam is a critical part of your loudspeaker system and plays an important role in its high level of performance. It focuses the radiation of the tweeters, minimizes cabinet diffraction, and provides the flattest possible frequency response.



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.

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, through direct attachment to a wall, or with a ceiling suspension system.

If you want to mount your Satellites permanently using wood screws, their cabinet thickness is 3/4". 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 left and right 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.). Center channel speakers should be located close to the television screen (see Home Theater Usage on page 7). Your speakers will sound better when they are around ear height, or when angled towards your listening location. They sound better when they are not sitting on the floor.

M&K speaker stands are designed to set M&K Satellite speakers at the right height and to easily adjust their angle of sound radiation. Your M&K dealer has more information on these stands.

Your Satellite speakers 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 12 (page 11), or contact OmniMount at (602) 829-8000.

For more detailed information on placement of your speakers, see Section 4 (page 6).

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. 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.

In some rare instances, Shielded Satellites may have a small amount of residual magnetism at a specific angle that may cause a slight geometric or color distortion of the picture on your television set. M&K center channel speakers have M&K's Ferromagnetic Shielding System to prevent this. If you do get this distortion, try moving the Satellite speaker slightly until the problem disappears. If you cannot solve any magnetic problems, contact the M&K factory.

3. SPEAKER HOOK-UP & USAGE

The back panel of your Satellite 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 of 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.

Your 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 9 (page 11) for more details.

HOOKUP (BOTH REGULAR & CENTER CHANNEL SPEAKERS)

There are four 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 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 MAXIMUM OUTPUT/NORMAL OUTPUT terminals and the LOW CUT (HIGH PASS FILTER)/WIDE RANGE terminals.

The Positive (+) lead from your amplifier or receiver should be connected to one of the RED (+) INPUT terminals (either MAXIMUM OUTPUT or NORMAL OUTPUT), and the Negative (-) lead from your amplifier or receiver should be connected to one BLACK (-) INPUT terminal (LOW CUT [HIGH PASS FILTER] or WIDE RANGE). See Figure 3.

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.

VARIATIONS OF SOUND

Your M&K 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 M&K 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 two combinations of input terminals to connect the speakers to your amplifier.

The terminals are labelled MAXIMUM OUTPUT and NORMAL OUTPUT. Both positions have the same power handling capacity, but the MAXIMUM OUTPUT position plays the loudest, and works best with low powered amplifiers.

Bear in mind that the MAXIMUM OUTPUT terminal requires a higher setting of the subwoofer level. Conversely, if you switch to the NORMAL OUTPUT terminal, the subwoofer level should be set lower.

We recommend that you experiment with the terminals, starting out by using the NORMAL OUTPUT and the WIDE RANGE terminals. If the sound is too dull or boomy-sounding, try switching to the MAXIMUM OUTPUT terminal. If you have a very large power amp and are hearing distortion or speaker "bottoming" at high volumes, try the LOW CUT (HIGH PASS FILTER) terminals.

We provide the multiple terminals because we cannot predict in advance exactly what response the speaker will produce in your room. The choices available through the terminals, however, can allow you to create a virtually ideal response for your room. Hence, you should use the terminals that best balance the sound for your ears and your room, so that you get maximum enjoyment from your speakers.

MAXIMUM OUTPUT / NORMAL OUTPUT TERMINALS

The NORMAL OUTPUT terminal gives a warm "musical" sound very similar in character to the finest British-manufactured monitor speakers, but with a significantly wider dynamic range. Sometimes referred to as the "English Sound." This should be used in most installations, including mounting on stands, shelves, mounting brackets, etc.

The MAXIMUM OUTPUT terminal gives a bright, forward sound with great efficiency and a wider dynamic range, with a slightly rising high frequency characteristic. Particularly useful for producing maximum sound power levels, especially with low-powered amplifiers. Sometimes referred to as the "German Sound." It is particularly useful when the Satellites are used as surround speakers, as its high frequency contour makes for better highs at the listeners' ears when the speakers are not directly aimed at the listeners. It also works very well when the speaker is mounted flush against a large surfaces such as a wall, and sometimes when a Center channel speaker is on top of a large rear-projection television. As always, we recommend experimentation.

LOW CUT (HIGH PASS FILTER) / WIDE RANGE TERMINALS

The 5 1/4" woofer(s) and 1" tweeter of your Satellites have very high power handling. But it is possible to overdrive the woofer with deep bass signals, especially when you use a high powered amplifier. This is the reason for the LOW CUT (HIGH PASS FILTER) terminal. This terminal has a built-in filter that reduces (rolls off) the speaker's bass output below 80 Hz (at 6 dB per octave), but it does reduce the mid-bass output of the speaker slightly.

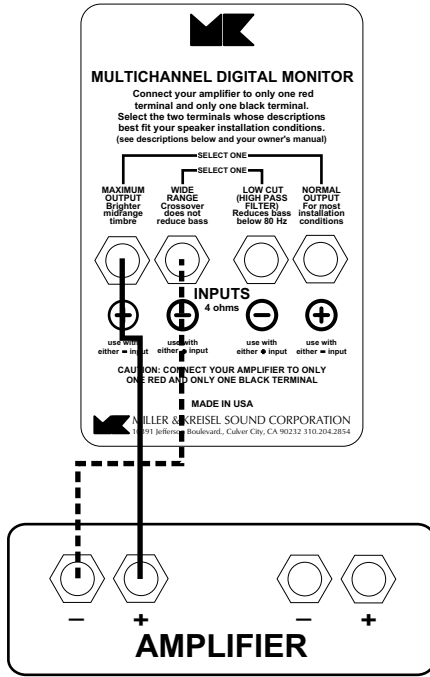
Therefore, for most systems, we recommend using the WIDE RANGE terminal. This gives you the natural rolloff of the speaker and will give you the best sound quality in almost all cases.



FIGURE 1 SPEAKER WIRING

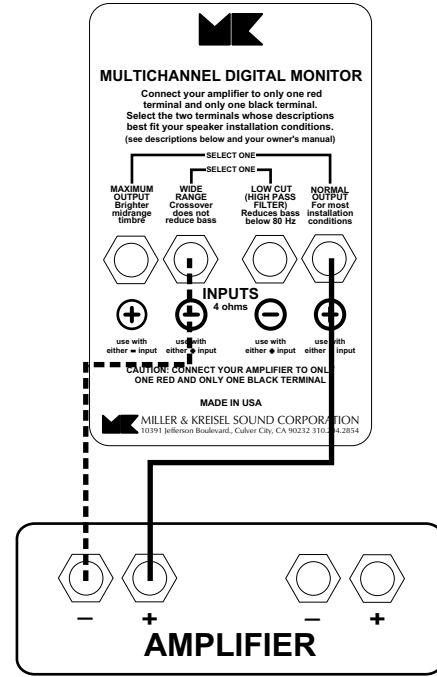
The four diagrams below show all possible wiring configurations for the S-125, S-125C, S-85 and S-85C. See page 4 for a detailed discussion of the effect these configurations have on the sound of the speakers.

MAXIMUM OUTPUT / WIDE RANGE



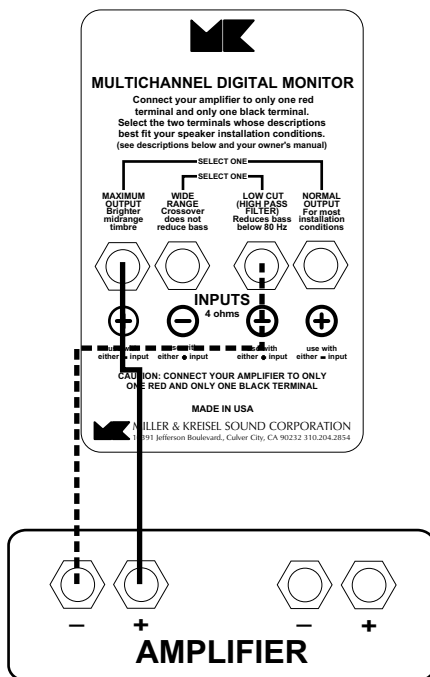
(only one channel is shown)

NORMAL OUTPUT / WIDE RANGE



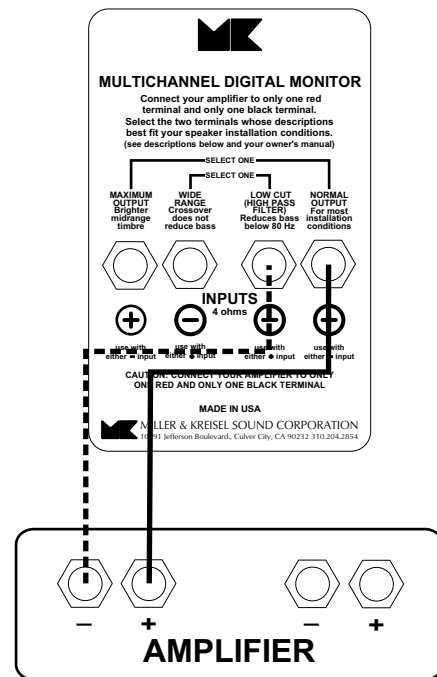
(only one channel is shown)

MAXIMUM OUTPUT / LOW CUT (HIGH PASS FILTER)



(only one channel is shown)

NORMAL OUTPUT / LOW CUT (HIGH PASS FILTER)



(only one channel is shown)

If you have a separate electronic high-pass filter (such as the M&K VF-80 or HP-80), always use the WIDE RANGE terminals, as you do not want to have this combination of dual filters operating. This also applies if your amplifier or controller has built-in high-pass filters (such as THX-approved components and AC-3 units).

4. S-125C & S-85C CENTER CHANNEL USAGE

Because the S-125C and S-85C center channel speakers are designed to match their left and right channel counterparts, the instructions in section 3 apply identically to both speaker versions. These center channel speakers are designed to be oriented horizontally and located above or below your television screen. The front baffle of these speakers is angled so that its sound can be focused towards your ears when you are seated in the main listening position. When the speaker sits on top of a television set, place it so that it aims down. When it is underneath or below the screen, place it so that it aims up. For a more discussion of center channel speaker placement, see page 8.

CAUTION: If you are feeding your subwoofer with speaker wires from your amplifier's left and right channels (not with an RCA - RCA cable from the processor's SUBWOOFER OUTPUT), you **MUST** set the processor's center channel switch to the NORMAL position. If you do not, the center channel bass will not be fed to the subwoofer. You should still use the LOW CUT (HIGH PASS FILTER) terminal, as the combination of both filters will be about 12 dB/octave.

5. OPTIMIZING SPEAKER PLACEMENT

The sound quality produced by your 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.

The left and right channel speakers can be oriented either horizontally or vertically (if you have the S-125s, the preferred orientation is vertical, but horizontal orientation is acceptable. When oriented vertically, the angle on the front baffle should point towards the center of the room, not to the side walls (see Figure 2 on page 7). When oriented horizontally, the angle on the front baffle should point down if the speaker will be above your head when you are listening, and up if the speaker will be below your head. The Center channel speaker is designed for horizontal orientation (tweeter and woofer drivers next to each other), and should be angled towards your listening position.

Three 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.

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, the tweeters should be at the same height from the floor as your ears, when you are sitting in your main listening position.

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.

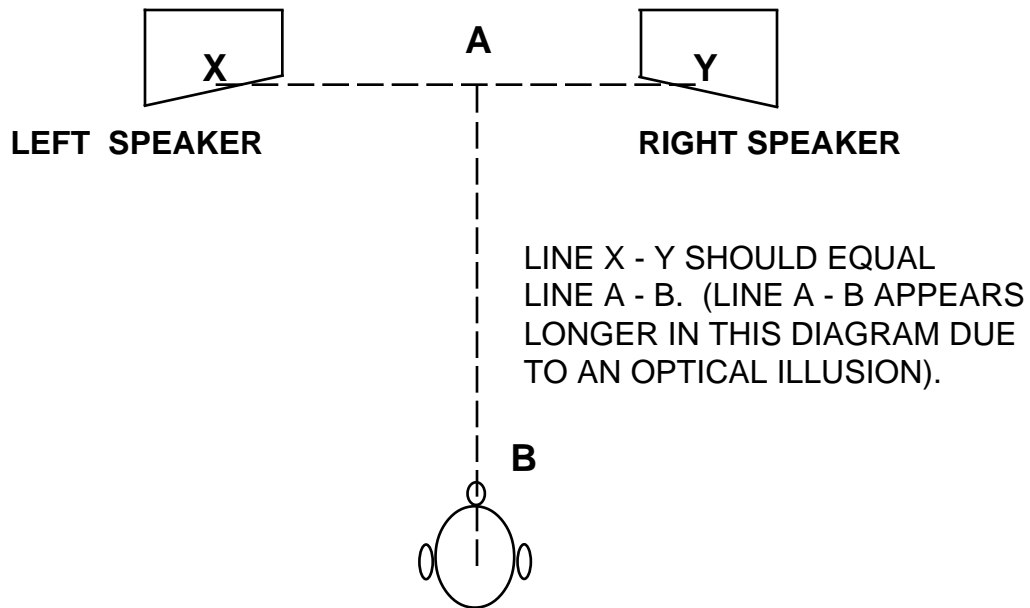
If you have a helper move the speakers while you sit and listen, you should be able to hear the difference when the speakers are in the best location by listening for the brightest high frequencies and for the best "focus" of sound, where you hear the sharpest sonic imaging of voices and instruments.

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. Objects close to the speaker will reflect sound, and this reflected sound arrives at your ear slightly later than the direct sound, which blurs sonic imaging and makes transients seem muted.

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.

FIGURE 2
SEPARATION BETWEEN LEFT & RIGHT SPEAKERS



If the speakers are on a television set or shelves, locate them on the front edge, 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 10 feet apart. See Figure 2 above.

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 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. The angled front baffles of your Satellites also provide this benefit.

6. HOME THEATRE USAGE

TIMBRE-MATCHING

One of the most important factors in achieving excellent Home Theatre performance is timbre-matching. On film soundtracks, specific sounds are often moved from left to right or from front to back in the room. When the speakers reproducing these sounds have dissimilar 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 come from three critical elements: similar or identical drivers; similar or identical crossovers; and similar or identical frequency response. In full M&K systems, these elements have been addressed. You can be assured that the system can achieve the full potential of Home Theatre sound.

If the other speakers are not M&Ks, don't worry; M&K's unique tonal balance controls allow the M&K speakers to be adjusted to emulate the sound of the other speakers. Here's how:

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

Switch the controls on the back panel of the M&K speaker until 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 you're all set. If you have any questions, please give us a call and we'll be happy to discuss this with you.

The other factor critical to achieving excellent Home Theatre performance is level-matching the three front and two surround channels. This is even more important than timbre-matching.

We strongly recommend that you purchase a Radio Shack Sound Level Meter (available for less than about \$40, and get the analog meter, not the digital) and use it to measure the output of the speakers when playing the test tones generated by your processor or receiver. **WHENEVER POSSIBLE, DO NOT CALIBRATE LEVELS BY EAR!** Using a meter is an inexpensive way to be certain that your system is calibrated properly.

When M&K Satellites are being used in a Home Theatre system, placement becomes extremely 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 or 5.1 channel AC-3 system, but if you are not using a Center channel, the instructions for the other four channels will still apply.

CENTER CHANNEL

The Center channel speaker in a Pro-Logic or AC-3 system is the most important speaker in the system. This speaker often produces more output than the left and right speakers *combined*. This speaker should be of the highest possible quality, and as similar as possible in response and radiation pattern to the left and right speakers. Three identical speakers are best, unless the center channel is designed to work with a set of left and right speakers.

It is also important to have as much amplifier power as possible for the Center channel. As a minimum, the three front channels should be identical in power output, but it is better if the Center channel has more. If you have less power in the Center channel, this will be the limiting factor in the total output capability of the system when watching and listening to video sources.

All M&K Satellites, with their compact size and adjustable tonal balances, are ideal for Center channel use, but our center channel models have been optimized for their application. M&K's adjustable tonal balances allow our Satellites to acoustically balance with a wide range of other speakers to provide a smooth front channel soundfield. Our non-center channel Satellites have 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. It should be just above or just below the screen. If that is not possible, then just to the left or the right of the screen may still be acceptable.

If the television is not in the center of the room (or not centered between the Left and Right speakers), the Center channel speaker should still be as close as possible to the screen -- even if it is outside the left and right speakers (such as a TV located in a corner of the room outside the stereo spread of the left and right speakers). Good results can be achieved in unusual configurations when the Center speaker is as close as possible to the screen.

The Left and Right front channel speakers in a Home Theatre system should be placed the same as the left and right speakers in a stereo setup. Some listeners, however, may prefer to reduce the distance between the left and right speakers to bring the size of the acoustic image closer to the size of the screen image.

For example, with a 25" 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; another is to place the left and right speakers to create a 45 degree angle with the main listening position.

There is a great deal of latitude in this area, as it is one of personal preference (especially if you will listen to music without video).

It is also preferred that the speakers be equidistant from the listening position. Equidistant usually means that when the center speaker is on top of the television, the left and right speakers will sit in front of the set (they will be farther from the wall behind the TV than the center speaker). Ideally, the speakers should be at the same height as the screen, but it is much more important that all three speakers be at as close to each other's height as possible. If the center is much higher or lower than the other speakers, the effect can be distracting. Angling, or toeing-in the speakers, to aim at the listening position often improves imaging.



When using a Center channel speaker, you have 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 CHANNELS

The Surround channel speakers can be placed in a wide variety of locations in the 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.

The goal is to achieve an enveloping sound. The surround channels should seem to come from all around you, rather than seeming to come from behind you only or directly from a speaker.

This section discusses non-THX surround speakers. THX system requirements call for dipolar surround speakers mounted to the sides of the listening position above the listeners' heads. See M&K's THX surround speaker instruction manual and the THX Installation Guide for detailed instructions.

For non-THX surrounds, we recommend starting with speakers on the side walls of the room, two to three feet above the listeners' heads, either directly adjacent to the listening position or behind it. You can aim the speakers to fire towards each other (across the listening area), or you can aim them to fire towards the back wall at an angle. The surround speakers should not be in front of the main listening position if possible.

If you mount the surrounds on the side wall behind the listening position, they can be aimed towards each other or angled towards the back wall or the side wall surface directly behind them. By reflecting sound behind the listening position, you may increase the sense of envelopment in the sound.

If you want or need to mount speakers on the back wall of the room, there are several options. You can aim them so that they fire towards each other (so they fire along the back wall); you can aim them towards the front wall of the room; or you can angle them so they fire toward the side walls. Symmetrical arrangements work best.

The speakers should be a minimum of a few feet away from the nearest listener. 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 the surrounds must be located close to the listeners, aiming them at the room walls or even the ceiling can help to reduce any directional effect. As described above, this can produce a desirable result even in rooms where the surround speakers are an adequate distance from the listeners' heads.

If the surrounds cannot be placed on a wall, try placement on tables or the floor to the sides of the main listening position, firing up towards the ceiling. This can work very well in environments that do not allow permanent attachment of speakers to the walls.

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 or S-85 Satellites for the surround channel, one pair could 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 because they are usually mounted on the walls of the room, they can be a challenge to successfully install. If you have further questions, please 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.

7. 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 phase of either the subwoofer or BOTH Satellite speakers.

If your Subwoofer has a PHASE switch on its back panel, move it either from (+) to (—) or vice versa.

If your Subwoofer does not have a PHASE switch, it takes a bit more work. You will have to change 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 connection (or switch position) was correct. If you hear more bass, the new connection (or switch) is 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.

8. 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.

9. 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 HP-80 and VF-80 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) for all of the channels you want to filter (including the center channel). You may have to operate a switch or remove jumper connections on the amplifier.

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 HP-80 or VF-80, with a second set between the HP-80 or VF-80 and the Main Input of the receiver or amplifier, and a third set from the HP-80 or VF-80 to the Subwoofer. See the instruction sheet that comes with the High-Pass Filter for more information.

10. 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.

11. CABINET MAINTENANCE

Treat the cabinet as you would any piece of fine furniture. Its painted black finish does not require any special maintenance; regular dusting with a lint-free cloth and periodic cleaning is all that is required. Matching black paint can be used if necessary to repair any surface damage.

12. USE WITH M&K STANDS & OMNIMOUNT® BRACKETS

The S-85 and S-85C Satellites contain a threaded (3/8") insert, located on the speaker's back baffle. Using the 3/8" screw provided with your S-85s, this allows the speaker to be securely fastened to an M&K ST-1 or ST-2 speaker stand, as well as to wall-mount brackets offered by OmniMount Systems. Both the M&K stands and the OmniMount brackets offer tremendous flexibility for installation in a wide variety of environments, and both are available in several configurations. Always use only the OmniMount Series listed for each speaker to insure safe installation of the speaker.

The S-125 and S-125C Satellites contain both the threaded (3/8") insert and 1/4" inserts (1/4-20) located on the speaker's back baffle (the S-125 has two and the S-125C has four). This gives you two options to mount the speaker to either the M&K ST-1 or ST-2 stands or to an OmniMount bracket.

See Figure 3 on page 12. For more information, including alternate mounting configurations such as ceiling mounts, contact OmniMount at (602) 829-8000.



13. SPECIFICATIONS

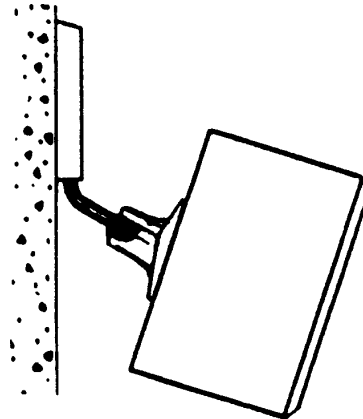
	<u>S-125 & S-125C</u>	<u>S-85 & S-85C</u>
IMPEDANCE:	4 ohms	4 ohms
MINIMUM POWER:	10 watts RMS	10 watts RMS
RECOMMENDED POWER: (applies to both models)	amplifiers with between 50 and 200 watts RMS or more (see below)	
MAXIMUM POWER: (applies to both models)	200 watts RMS unclipped peaks	
FREQUENCY RESPONSE:	77 Hz - 20 KHz \pm 2 dB	85 Hz - 20 KHz \pm 2 dB
DIMENSIONS (H x W x D):		
Left/Right speaker	18 1/2" x 6 1/4" x 8 1/4"	10 1/2" x 6 1/4" x 8 1/4"
Center Channel speaker	6 1/4" x 18 1/2" x 8 1/4"	6 1/4" x 10 1/2" x 8 1/4"
WEIGHT	16 lbs.	9 lbs.

FIGURE 3 USE WITH AN OMNIMOUNT[®] BRACKET

The drawings below are from the OmniMount catalog and are not intended to show the actual dimensions and specific mounting locations on the S-125 and S-85. Please see the back baffles of your speaker cabinets.

S-125 and S-125C USES OMNIMOUNT[®] 75-WA or 53-RST (see below)

Two threaded inserts are located at the bottom of 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 an OmniMount[®] Series 75 mounting bracket.



S-125 (not S-125C) or S-85 USES OMNIMOUNT[®] 53-RST

A single 3/8" x 16 threaded insert is located on the back baffle of the cabinet. Use only an OmniMount[®] 53 RST (special order) bracket.

