

**S-100**  
**S-1B**  
**S-2B**  
**SATELLITE SPEAKER**  
**OPERATION MANUAL**



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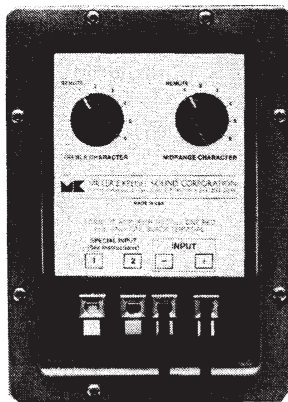
### A. BASIC WIRING

The backplate of the Satellites contains four speaker terminals rather than the usual two. The terminals labelled "SPECIAL INPUT" are not used. The only terminals used are the right hand pair, labeled "INPUT." The Positive (+) lead from your amplifier should be connected to the RED (+) terminal and the Negative (-) lead should be connected to the BLACK (-) terminal. See Figure 1.

NEVER CONNECT THE AMPLIFIER LEADS TO BOTH RED TERMINALS OR TO BOTH BLACK TERMINALS AT THE SAME TIME. THIS WILL PROBABLY DAMAGE YOUR AMPLIFIER AND YOUR SPEAKERS. THIS DAMAGE WILL NOT BE COVERED UNDER WARRANTY.

FIGURE 1

BASIC WIRING



(+) lead from amp or subwoofer

(-) lead from amp or subwoofer

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### B. VARIATIONS OF SOUND

Your Satellites are designed to reproduce sound with high transient accuracy and very wide dynamic range. Because of their high efficiency and high power handling capacity, they will give outstanding results with virtually any high-fidelity amplifier or receiver in a wide variety of listening environments.

Achieving the ideal tonal balance, however, involves many variables. Factors such as listening rooms, different types of music and recordings, associated components (electronics and phono cartridges), and individual preferences are all crucial to the final determination of the right tonal balance.

For this reason, your Satellites offer you a wide latitude of choice in determining the best balance for your needs. The back panel of your Satellites contains two switches, labeled "MIDRANGE CHARACTER" and "TREBLE CHARACTER." These switches allow you to alter the character of the sound to fit your particular needs.

#### 1. MIDRANGE CHARACTER

The "MIDRANGE CHARACTER" switch is the primary control for altering the tonal characteristic of your Satellites. While the major effect of this control is in the midrange, each position of the switch shifts the tonal balance over the entire audible spectrum. The positions are labeled 1 through 6. The lower numbered positions have a warmer sound, with a tendency toward a recessed midrange and reduced efficiency. The higher numbered positions have a brighter, more forward sound with greater efficiency and a wider dynamic range. All positions have the same power handling capacity.

**POSITION 1** Gives a very warm mid-bass sound with subdued midrange brightness akin to the sound of the finest British Monitor speakers with significantly wider dynamic range. (Sometimes referred to as the "English Sound.")

**POSITION 2** Gives a warm mid-bass sound very similar to Position 1 with a brighter sound in the upper midrange and slightly greater efficiency.

**POSITION 3** Gives still greater efficiency with sound virtually dead center between the extremes of Positions 1 and 6. In comparison to Position 2, it has additional brightness through the midrange while retaining a warm mid-bass.

**POSITION 4** Gives a sound most readily compared to Positions 5 and 6. Its sound is noticeably fuller than that of either of these positions with a warmer mid-bass and less upper midrange brightness.

**POSITION 5** Very close in sound to Position 6 with slightly less midrange brightness and efficiency.

**POSITION 6** Gives a bright, forward sound with great efficiency. Particularly useful for producing maximum sound power levels with low-powered amplifiers. Similar in sound to the best German loudspeakers. (Sometimes referred to as the "German Sound.")

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We highly recommend that you experiment with these variations to find the best sound in your listening room. Remember that efficiency changes as you switch between variations. As Satellite efficiency increases, the subwoofer "BASS LEVEL" control must be advanced to a matching level. When you are making comparisons, it is a good idea to turn the system volume down before you switch. After the switch, turn the volume up to a level that seems subjectively equal. This will help you make a valid comparison, as the ear tends to prefer the louder of two compared sounds.

Try starting with Position 3. This Position gives a sound midway between the extremes. If the sound is too bright or lacking in bass, try the lower numbered positions. If the sound is dull or lacking in dynamics, try the higher positions. Again, we recommend experimenting to find the sound best suited for you.

## 2. TREBLE CHARACTER

The "TREBLE CHARACTER" switch provides a slight rolloff of the upper midrange and treble frequencies (in Positions 1 through 5) according to carefully shaped contours. These contours minimize excessive brightness originating in your associated components or inherent in the program material. It is not a tweeter level control.

Program material (tapes, broadcasts, and discs) varies widely in terms of both high frequency content and high frequency distortion. Many commercial recordings have excessive distortion or have artificially boosted highs. Because the Satellites reproduce high frequencies with exacting clarity, these recordings may be difficult to enjoy. The six contour positions of this control will allow you to compensate for these variations and derive maximum enjoyment from any sound source. Do not hesitate to use this control for fear of having sound that is not "flat." Few recordings can claim to be "flat," and this control is highly useful for removing the artificial boosting of highs often employed.

The lower numbered switch positions give the greatest attenuation. Position 1 gives the maximum attenuation of highs and Position 6 bypasses the circuit. Each intermediate position is carefully shaped to give an audibly different attenuation contour.

## C. PLACEMENT OF THE SATELLITES

Proper placement of the Satellites is essential to realize their full performance. There are four basic factors:

1. The Satellites should be at the proper height.
2. The Satellites should be away from walls and other reflecting surfaces.
3. The S-1B sounds best when vertically oriented.
4. The Satellites should be separated by the proper distance.

## 1. PROPER HEIGHT

Because of the careful design of M&K Satellite cabinets and crossovers, they are capable of very fast and accurate transient response. In order to hear transients reproduced with maximum fidelity, your ear must be at the same height as the area between the tweeter(s) and woofer(s). If your ear is above or below this area, you will still hear very high quality sound, but if you move your ears into the correct plane, you will hear an unmistakable "focus" of imaging and transients, much as a fine microscope resolves a sharp image at its point of optimum focus. We highly recommend use of the M&K Satellite Speaker Stands as they are designed to place the Satellite at the correct height and to facilitate other placement requirements.

To get the right part of the speaker cabinet in the same plane as your ear, it is acceptable to angle the speaker cabinet to fire up or down. The M&K stands have provision for tilting the speaker for this purpose.

## 2. LOCATION AWAY FROM ROOM SURFACES

The Satellites should be located away from walls, the floor, furniture, and other reflecting surfaces. These will act as baffles, reflecting sound from the speaker to your ear with a slight time delay. This time delay will blur the sonic image and interfere with transient performance. Avoid using the speaker on a shelf that protrudes in front of the speaker. If you must place the speaker on a shelf, place it so that the front edge of the speaker is flush with or slightly in front of the edge. In the ideal set-up, the speaker will be several feet from the nearest surface, but in most listening rooms some compromise is necessary.

## 3. VERTICAL ORIENTATION OF S-1B

The S-1B Satellite is designed for optimum performance when oriented vertically. Turning it on its side will affect its imaging capability and limit its horizontal dispersion. The S-100 and S-2B can be oriented either horizontally or vertically.

## 4. SEPARATION BETWEEN SPEAKERS

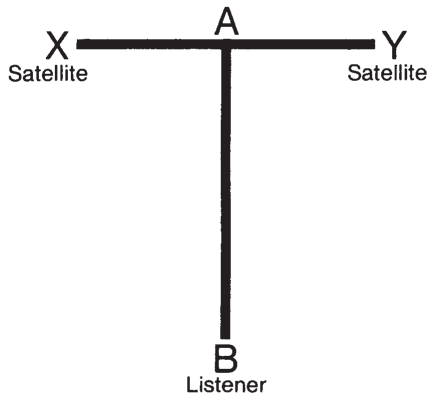
For the best left to right imaging, the Satellites should be separated by the proper distance. Use the following formula. Picture a line drawn between the

fronts of the speaker cabinets (Line XY of Figure 2). Measure the distance from the center point of this line (Point A) to your main listening position (Point B). The separation of the speakers should be equal to that distance ( $XY = AB$ ).

If your room dimensions make this spacing impractical, follow the formula as closely as you can. You can further fine tune the spacing by playing a record with vocals prominently recorded with an image centered between the speakers. Move the speakers closer together and farther apart in small increments until you hear the sharpest cohesive image of instruments and voices from right to left. Listen especially to eliminate any sense of a hole in the middle. You may also wish to angle the speakers inward slightly. This may improve the sharpness of the sonic image.

**FIGURE 2**

**SEPARATION BETWEEN SPEAKERS**



**D. CORRECT PHASE RELATIONSHIPS WITH A SUBWOOFER**

In any system utilizing a subwoofer separate from Satellite speakers, a simple test must be performed to insure optimal bass blending. Because your ears will not be the same distance from both the Satellites and the subwoofer, there is a possibility that the difference in time that each speaker's bass signal takes to reach your ear may cause bass cancellation in the region where the speakers overlap. To find the correct phase relationship, you must reverse the relative phase between the Satellites and the subwoofer.

First play music through your system, listening carefully to the mid-bass region, (100-200 Hz). This is the area where electric or string basses and drums predominate. Then reverse the positive and negative speaker leads for BOTH channels. This is done on the back of both Satellite speakers or at the subwoofer "TO SPEAKERS" terminals, but never at both locations. The Positive (+) lead should be switched to the Negative (-) terminal and vice versa. Both channels are switched in identical fashion. Now listen to your system again, concentrating on the mid-bass. If you hear less bass, the original connections were correct. If you hear more bass, the new connections are correct.

For the smoothest transition between your Satellites and subwoofer, try moving the Satellite speakers in and away from your listening position making changes in small increments. This will integrate the output of the separate speakers to "focus" the sound much as a camera lens can be adjusted to resolve the sharpest image. When you hear the best image localization of instruments and have maximum mid-bass impact, you have found the optimum location.

**E. USING THE SATELLITES AS FULL RANGE SPEAKERS**

M&K Satellites are capable of a very high level of performance as full range speakers. All but the very deepest bass will be reproduced with the same sharp imaging, transients, and wide dynamic range heard in a full Satellite-Subwoofer System. The power handling of the Satellites is great enough that they may be used with high power amplifiers delivering an unclipped musical signal.

We strongly recommend use of the lower numbered "MIDRANGE CHARACTER" positions when operating Satellites full range, as they give the greatest amount of low and mid-bass energy relative to other frequencies.

## F. CLIPPING AND SPEAKER DAMAGE

One facet of speaker performance rarely discussed is speaker damage and its causes. Despite the improved performance of today's loudspeakers, certain characteristics of the relationship between the speakers, the amplifiers, and the person operating the volume control mean that blown speakers are a fact of audio life.

Your Satellites have unusually high power handling, particularly for Satellite speakers. However, like all speakers, they can be damaged by virtually any audio amplifier on the market. While the actual number of M&K Satellites returned for service is quite small, the vast majority returned have failed, not because of manufacturing defects, but because they have been overdriven, usually by an amplifier driven into clipping distortion. This sort of damage is considered abuse and is not necessarily covered under warranty.

Most returned speakers have blown tweeters. Tweeters are, by their nature, more prone to damage than midranges and woofers because of the quantity and thickness of the wire used in their voice coils. When a speaker is overdriven, the resultant high heat generated in the voice coil is more easily dissipated in the heavier voice coil of a midrange or woofer.

Normally, this poses no additional risk to tweeters because the energy distribution is such that the tweeter is fed significantly less power than the other drivers (typically only 20 to 25 percent of that fed to the woofer). However, it is possible to alter this balance in such a way as to risk damage to the tweeters. If you boost your tone controls or use the loudness contour switch, you significantly increase the power being fed to the speaker. A small increase in volume level (3 db) requires a doubling of power. Boosting of tone controls not only pushes the speaker drivers harder but quickly drains the amplifier's available power and advances the onset of amplifier clipping.

Clipping takes place when the playback levels are set so that the demands of the music are greater than the power output capability of the amplifier. When this occurs, the amplifier "clips" off the tops of the signal waveforms. A sine wave fed to the input of a clipping amplifier (looks like a smooth arc) will resemble a square wave at the amplifier's output (the smooth arc is cut in the middle and now has right angle edges.) As this takes place, the amplifier adds high frequency distortion signals that are not part of the input. These signals, called odd-order harmonics, are multiples of the original signal. For example: A 1000 Hz signal fed to a clipping amplifier will result in output at 3000, 5000, 7000 and at intervals of every 2000 Hz to well beyond the audible spectrum. Some of these distortion products are nearly as high in level as the original signal. This distortion puts an enormous strain on tweeters, particularly when it occurs above 20 KHz, where the power handling capacity of many tweeters falls off sharply.

This extra strain posed by clipping shows how a small amplifier is often more likely to damage a speaker than a large amplifier. Because the small amp clips at a low volume level, its tendency is to clip more often and harder. Small amplifiers are often less stable than larger, more expensive amps, and may produce even more distortion when driven to clipping. If you are using a relatively small amp, it is important that you carefully listen for the onset of clipping when you are listening at high volume levels. You should listen for a breaking-up of the sound that is most immediately noticeable in the bass. The sound will become harsh and grating and be uncomfortable to listen to.

Using common sense is the easiest way to avoid speaker damage through clipping. Boost your tone controls judiciously. Avoid extreme boosts of the treble and bass controls, especially when listening at high volume levels. Also, switch the loudness contour out at high volumes. Listen carefully for the distortion described above and turn the volume down slightly at the first sign of distortion. This should assure you of a long, trouble-free life from your Satellites.

## G. CABINET MAINTENANCE

Several different cabinet finishes are offered by M&K. Cabinet maintenance is a matter of proper care for the materials used.

If the cabinet is oak or walnut veneer, treat it as you would any high quality furniture. Rubbing the wood periodically with an oil or polish such as "Olde English" or "Danish Oil Finish" will enhance its appearance and protect its beauty for as long as you own it.

If the cabinet is black lacquer over oak veneer or a black spackle finish, no maintenance is required as the exterior surface is painted. If the surface is damaged, it can be touched up with matching black paint.

If the cabinet is finished in graphite lacquer, no maintenance is required. If you need touch-up paint for repairs, please contact the factory.