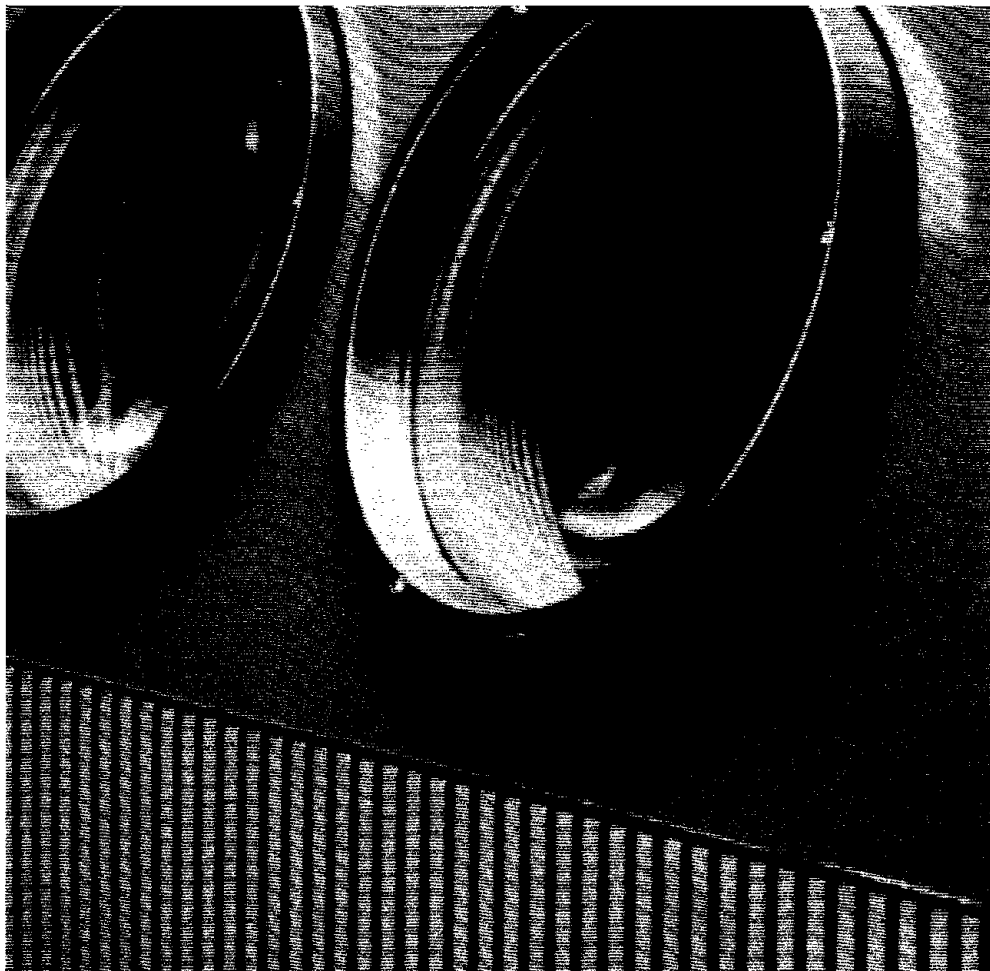
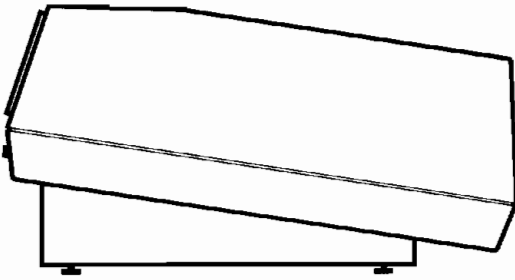
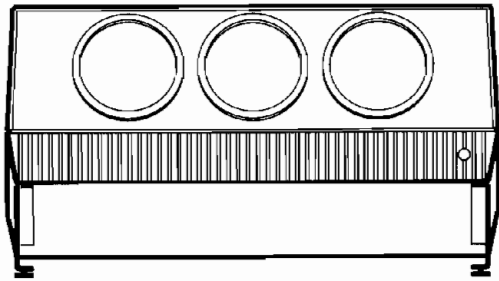
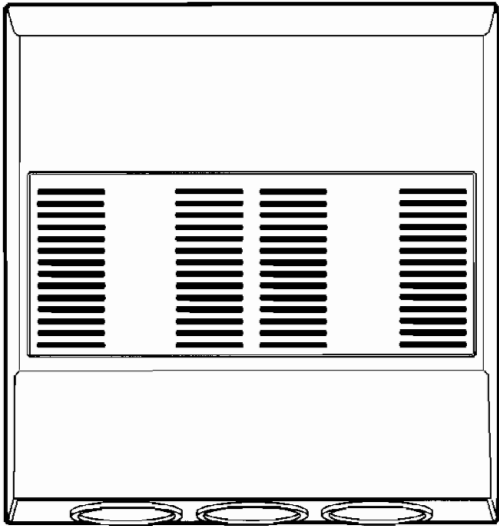


harman/kardon

VPM 500



Video Projection Monitor Instruction Manual



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SECTION I:

I N T R O D U C T I O N

Congratulations on selecting the world's finest video projection monitor. The VPM500 is your key to a new realm of video enjoyment. Your viewing room will be transformed into a true Home Theater where you will experience a visual impact that no regular television can deliver. Details and nuances unseen on even the finest 26-inch monitor will be visible to you — including some you probably weren't supposed to see! In short, your VPM500 will soon become your picture window on a new wide and colorful world of entertainment.

Harman Kardon's engineering expertise sets the VPM500 apart from other video viewing systems and offers you many unique features and user benefits:

- A bright, sharp picture, free from the annoying lines found on smaller sets and rear projection TV's.
- An easy-to-use remote control unit which duplicates all console functions including tone and picture controls.
- The ability to enjoy different screen sizes from 6-foot diagonal measurement to 16-feet and over!
- A compact, high-tech styled console which fits any room decor.
- State-of-the-art design and durable construction which will last for decades.

Because the VPM500 is so unique, its set-up and operation differ from regular TV's. We suggest you read this manual carefully before your first viewing experience.

As you carefully unpack your VPM500, inspect it for signs of damage. If any is evident, notify the delivery carrier immediately. Also take a moment to fill out the warranty card and mail it back immediately.

The Rest of Your Home Theater

While the VPM500 is the centerpiece of your new Home Theater, you *will* need several other components.

Since the VPM500 is a true monitor, it does not include a television tuner. You will need an outboard TV tuner, video-cassette recorder or even the video output from one of the new generation of monitor/receiver televisions. Your Harman Kardon dealer will advise you on the source which best fits your needs.

The small speakers inside the VPM500 console are sufficient for low level monitoring purposes but were not designed to sonically match the scale of your new video image. Almost any small to medium sized stereo speakers may be connected

to the VPM500's external speaker terminals and placed on each side of the screen to deliver wide-image full range sound. You may also use your existing stereo system and speakers. This will be covered in Section II of this manual.

The VPM500 may be projected directly on a white wall of almost any size. However, a brighter picture is obtained with a commercial projector screen. This may be free-standing, retractable or fixed to the viewing wall. Section II also contains a discussion of the possible screen choices.

Safety Precautions and Liability

The following "warnings" and "cautions" (complete with an authentic "thereof") are very important, though rather stern in tone. Please read them before proceeding to the section on setting up your VPM500.

CAUTION: Do not attempt to open the projector console. There are no user replaceable parts inside. Refer all service and internal adjustments to a qualified technician.

WARNING: To prevent fire or shock hazard, do not expose the VPM500 to rain or moisture.

CAUTION: To prevent electrical shock, do not use the AC power cord with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

NOTE: The installer and owner are responsible for the installation of the projector and screen safely and securely in compliance with all applicable codes. Harman Kardon is not responsible for the installation of its products or any hazard or liability which might occur due to improper installation thereof. Improper installation could result in personal injury and/or property damage. Read all instructions carefully before proceeding.

Proper performance depends on factors not associated with conventional sets including proper installation and careful alignment of the projector and screen surface. Proper lighting control is necessary and varies with the type of screen used in your installation. Picture quality varies with the source and nature of the video signal ("garbage in, garbage out," as the computer people say...).

Now that *that's* been said, it's time to take the first steps to turn your viewing room into a true Home Theater.

SECTION II:

SETTING UP THE VPM500

The Home Theater Concept

Think of the last time you were in a theater which had a good sound system and 70 millimeter projector. It was the combination of good sight AND sound that made the experience enjoyable. Properly set up, the VPM500 and good stereo speakers can provide you with an equally exciting experience, including the same

gigantic picture (since you are closer to the screen). Not to mention being able to make your own popcorn and take time out to answer the phone if necessary. However, it takes careful advance planning to get the full Home Theater experience.

The Role of the Qualified Installer

If you choose to place your VPM500 on the floor, you should be able to set up your VPM500 without the assistance of an installer by following the simple instructions in this manual.

On the other hand, if you're not a do-it-yourselfer, you may wish the whole job

(including cable connections) to be handled by someone else. You must also use a qualified installer if you choose to ceiling mount your VPM500. Your Harman Kardon dealer can provide or recommend sources for this service. If an installer is setting up your VPM500, you can skip ahead to Section IV.

Viewing Considerations

First consider where you want to sit while watching the VPM500. You'll probably want to invite friends over to share the enjoyment of movies and sporting events, so consider provisions for more viewers than you would a normal TV set. Depending on how much of the rest of your audio/video system is remote control, you should also consider proximity to VCR and stereo system controls so that it is easy to operate them while watching the VPM500.

Also consider proximity to a 3-prong electrical outlet.

At the same time, decide on the wall and screen size on which the VPM500 will project. This may vary from 57.6"H x 43.2"W (6-foot diagonal measurement) to 9' x 12' (15-foot diagonal measurement), and also affects distance from the VPM500 to the screen. This is covered in depth farther on in this section.

Physical Placement Considerations

Lighting. Room light levels have a direct effect on the perceived brightness of the projected picture, especially if you want a large picture size, such as ten feet diagonal measurement. As in a theater, low lighting will create a more effective viewing environment. If your viewing room has windows behind or to the side of the viewers' position, they should be equipped with blinds or light-blocking drapes to allow good daytime viewing. You should also avoid very light colored floor surfaces which can reflect light up into the screen and back toward the viewer.

Floor or ceiling? The VPM500 comes ready for use on the floor. Floor mounting gives more flexibility and allows you to experiment with placement. Once you are satisfied with its location, you may consider permanent ceiling mounting using the special bracket supplied with your VPM500. Overhead installation is a job for a qualified professional, and you should consult with your Harman Kardon dealer before undertaking this type of mounting. Appendix 3 in this manual discusses ceiling mounting further.

Screens. You may project the VPM500 directly on to a flat white wall. If you do, the wall should be pure white, not off-white, eggshell or other shades. If you are repainting, look for "ceiling white," "ultra-white," "decorator's white" or consult your paint store for a totally flat latex containing no tints whatsoever. If you choose wall projection, you should mask out a 2-inch area around the picture to avoid disturbing effects in the overscan area. (See fig. 1.)

We recommend a commercial screen, however, because their special surfaces reflect more light. Minimum recommended screen size is a 6-foot diagonal (43.2" x 57.6"). The largest size projection surface we recommend is 12' x 16'.

Projection screens are available from camera shops, photographic supply houses, audio-visual dealers, or from your Harman Kardon dealer. They come in two general types and three different mounting configurations. Beaded or "pin head" screens provide a slight focusing effect which looks good with floorstanding VPM500's. Metallic-coated screens yield a good result with ceiling mounted projectors. The screen may be wall-mounted, ceiling mounted or on a tripod. We don't recommend that latter, since screen alignment is very critical and a moveable screen can get bumped very easily.

The cost of a screen is almost always directly proportional to its ability to disperse a bright image at a wide angle. The more expensive a screen, the wider the angle of viewing, allowing more people to sit side-by-side and still see a bright picture. (See fig. 2.) The maximum angle you require will be determined by your room layout: If the room is long and narrow, you may not need a screen with extreme wide angle capabilities.

If the screen you purchase is larger on one dimension than the VPM500's projected image, you should mask the edge with black paper, cloth or non-reflective tape to give crisp, exact definition to the picture's boundaries.

Speaker placement. At this time, make sure that the speakers you have chosen for use with the VPM500 will fit on each side of the screen without creating shadows.

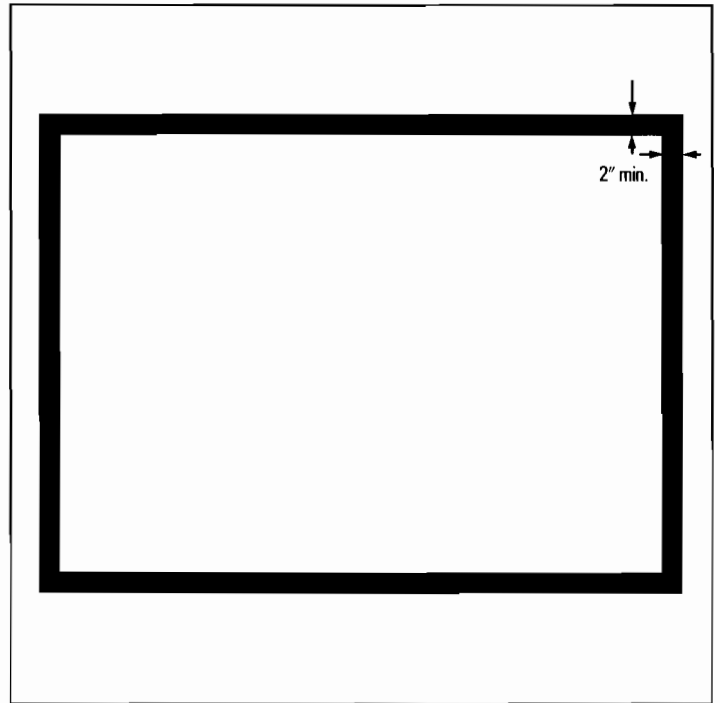


Figure 1 Recommended picture frame to avoid disturbing effects in overscan area

Screen-to-VPM500 distances. Other projection TV's allow only a few fixed screen sizes. One of the unique advantages of the VPM500 is its ability to offer an infinitely variable number of screen sizes between a 4-foot and 15-foot diagonal measurement,

allowing you more flexibility in where the VPM500 projector can be placed on the floor. Some of the possibilities and relationships between screen size and projector distance are shown in the following chart:

| SCREEN SIZE | | | PROJECTOR DISTANCE | NOTES |
|----------------------|----------------|--------------|--------------------|-------|
| Diagonal Measurement | Width & Height | | | |
| FT. | INCHES | INCHES | INCHES | |
| 6 | 72 | 57.6 x 42.2 | 80 | ** |
| 7 | 84 | 67.2 x 50.4 | 94 | * |
| 10 | 120 | 96 x 72 | 135 | ** |
| 12 | 144 | 115.2 x 86.4 | 163 | ** |
| 15 | 180 | 144 x 108 | 205 | ** |
| 20 | 240 | 192 x 144 | 275 | ** |

* The VPM500 is precisely focused and aligned at the factory for installation on the floor or ceiling, with a flat screen for a 7-foot image and 94-inch projector-to-screen to be 12.2 inches above the floor (when the VPM500 is floor-mounted), or requires the top of the screen to be 12.2 inches below the ceiling (when the VPM500 is ceiling mounted). Large variations from these screen positions will require re-alignment by a qualified technician.

** The VPM500 can be precisely focused and aligned for this screen size and screen-to-projector distance (along with many others) by a qualified technician. The customer should not attempt to focus or align the VPM500 to this specification without a technician.

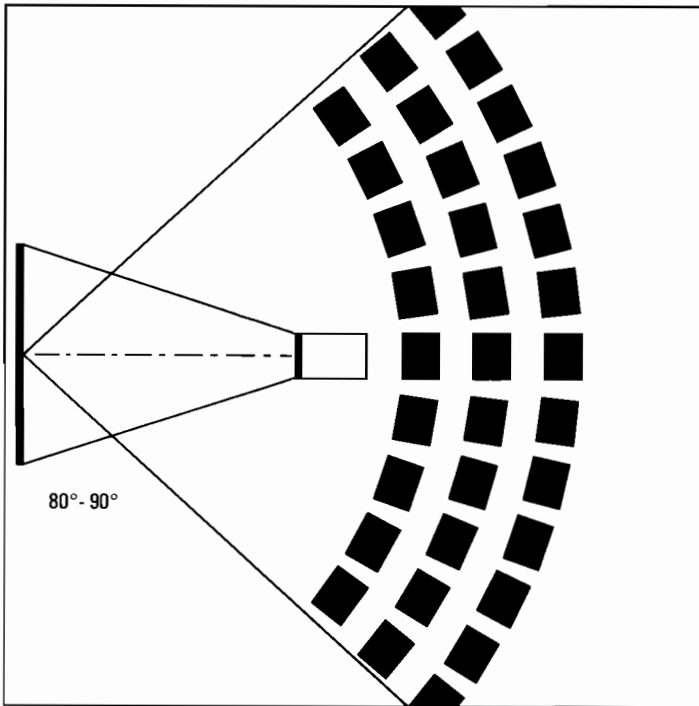


Figure 2

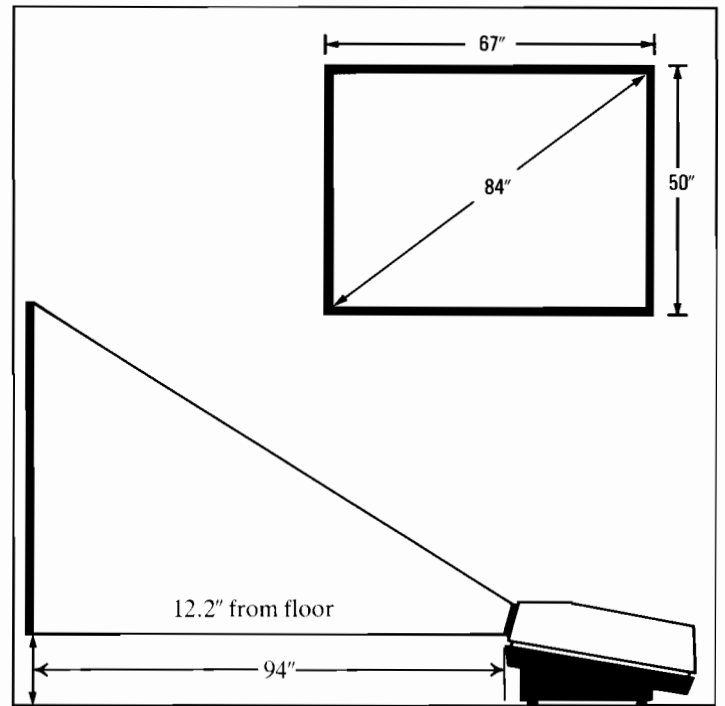


Figure 3

If the factory preset 7-foot screen dimensions fit your viewing needs, you can now proceed with the details of set-up.

Note that when viewed from above, the VPM500 must be **EXACTLY PERPENDICULAR TO** the screen and **EXACTLY ON** its centerline. One good way to determine this is to measure the distance from each bottom corner of the screen to the center of the point of the left and right VPM500 projection tubes using a steel tape measure. Each distance should match to within 1/16 of an inch.

Use the same measuring tape to establish the exact distance from the bottom of the screen to the bottom rim of the center VPM500 projection tube.

When the VPM500 is correctly set up, mark its position with small pieces of tape for easy repositioning should it ever get moved.

VPM500 Set-up Final Checklist

Before you hook up and operate your VPM500, double check the following:

- Is the projector the **EXACT** correct distance from the screen?
- Is the projector **EXACTLY** in front of the vertical centerline of the screen?
- Is the projector **EXACTLY** parallel with the screen (perpendicular to the screen's vertical centerline?)
- Is the screen surface parallel to the wall surface and is the bottom of the screen parallel to the floor?
- Is the screen exactly 12.2 inches from the floor?
- Will the VPM500's power cord reach to a 3-prong outlet?
- Is there a means of darkening the room for daytime viewing?

Once these questions are addressed, you're ready to hook up your VPM500.

SECTION III:

H O O K I N G U P T H E V P M 5 0 0

A note on not falling flat on your face. A floor-mounted VPM500 is going to have at least two and as many as eight cables running to various parts of your room. Since you will be viewing the VPM500 in a darkened room, and since it is almost a given that many of your friends and family will be enjoying the Home Theater experience with you, safe cable arrangement is extremely important.

If possible, try to run cables and hook-up wires in such a way as to avoid pratfalls. Under carpeting or rugs is a good approach. If this is not possible, consider flat cable guides, available at hardware and building supply stores, to conceal cables and provide a flatter, less trippable surface to tread on.

Video source quality. The VPM500 magnifies not only the dramatic visual impact of video, but also flaws in picture quality which may not have been visible on smaller sets. Therefore it is important to make sure that your video source is of good quality.

Your TV antenna is an extremely important component in the VPM500 signal chain. If you have previously relied on an inside antenna, this may be the time to invest in a good line-of-sight exterior, all-channel antenna with high quality 75-ohm cable. If your existing outdoor antenna is small or over ten years old, you should consider investing in a larger, more modern one, or at least placing the antenna on a higher mast, adding a rotator and/or checking the signal path for deteriorated cable and other aging problems.

If cable TV service is available in your area, this may be the time to have it installed. The minimal monthly cost will repay you handsomely in added big screen video subject matter. If remote control cable boxes are available, by all means get one to save steps once you're settled in front of the VPM500.

Needless to say, the quality of the tuner (either the tuner in your VCR or a separate component) used to receive these broadcast sources will also directly affect your VPM500's performance. If you are using the tuner in a VCR, it is desirable to have a model with remote control, including enough presets to cover all the stations you normally watch.

An excellent source of high quality video and stereo sound is the laser video disc. Its quality is significantly better than that of commercial video tapes and can be truly appreciated on the VPM500.

Much of your viewing will probably be videocassettes, either pre-recorded or taped from broadcast channels. Once again, their quality (or lack thereof) will be far more obvious on the VPM500. If you usually record in the 6-hour mode, you may want to buy a few more blank tapes and stick to the higher quality 2-hour or 4-hour modes. Make sure you buy a good grade of blank tape, too. Economizing on a cheap offbrand will be painfully obvious when viewed over the VPM500.

If you are considering a new VCR, shop for a good quality model with HQ circuitry, such as the Harman Kardon VCD2000 or VCD4000. HQ provides a noticeable picture quality improvement on tapes you record yourself, and yet is totally compatible with pre-recorded videocassettes. A 4-head deck is not totally necessary since the extra heads are used to improve special effects and somewhat improve the 6-hour mode. However there is one feature most often found on higher quality decks, like the Harman Kardon VCD2000 and VCD4000 which will greatly enhance your Home Theater Experience: VHS Hi-fi. Since you will be pairing the VPM500's superb picture with full-range stereo sound, you can take full advantage of VHS Hi-fi's ability to deliver sound quality almost as good as Compact Discs! If you record concerts or can receive MTS stereo broadcasts, the increased frequency response and dynamic range of VHS Hi-fi is more than worth the small added cost of this feature. Also, most new videocassette movie releases have a VHS Hi-fi soundtrack as well as the regular one, allowing you to see blockbuster films with blockbuster sound, just like in the theater.

There is one more element in your signal chain which becomes more critical with the VPM500's fantastic powers of resolution. The cable which runs from your video source to the VPM500 is terminated in standard "RCA phono" plugs, just like the connections on your stereo. This leads to the temptation to simply buy an inexpensive audio cable. Unfortunately, the video signal running to the VPM500 is of a much higher frequency than audio and is more prone to signal loss through low grade wire. For the best possible picture, we suggest investing in high quality cables intended for video use.

The VPM500 and your hi-fi system. To enjoy the Home Theater experience, you need nothing more than a good video signal source, your VPM500 and a stereo speaker on each side of the screen. However, there are several reasons to consider interconnecting the VPM500 with your existing stereo if it is in the same room.

The first of these is convenience. If you own a receiver or integrated amplifier which includes video inputs and switching, you can take advantage of these features to switch video inputs and dub between VCR's or laser disc players.

But the main reason to consider interconnection is the ability to use your existing stereo speakers, amplifier and its tone controls to provide more power and enhanced sound for your Home Theater. And you don't even need a receiver with special video inputs for this, since the VPM500 has its own set of audio outputs which can be routed back into a spare input on your receiver or amp. Of course in either case, your stereo system's speakers must be placed on each side of the VPM500's screen. We will discuss two different approaches to incorporating your existing system farther on.

One possible negative factor to consider is the fact that completely by-passing the VPM500's audio inputs (that is, connecting the outputs of your VCR or video tuner directly to your hi-fi system rather than directly to the VPM500) robs you of the convenience of remotely controlling volume, tone and balance. In this case, the solution is one of the new generation of remote control receivers, making sure your stereo system is within arm's length of your favorite viewing position or investing in a VCR that has its own remote-controlled volume, such as the Harmon Kardon VCD4000.

Video Connections

First locate the input sockets on the left side of the VPM500's back panel. (See fig. 4.)

Direct video source to VPM500. Connect a video cable from the VIDEO OUT socket on your VCR or video tuner to the top VIDEO INPUT (A) socket on the VPM500.

If you wish to directly connect either a second VCR or laser disc player, run another cable from its VIDEO OUT socket to the lower VIDEO INPUT (B) socket on the VPM500. (See fig. 5.)

Now proceed to the paragraphs marked **Audio Connections** farther on in this section.

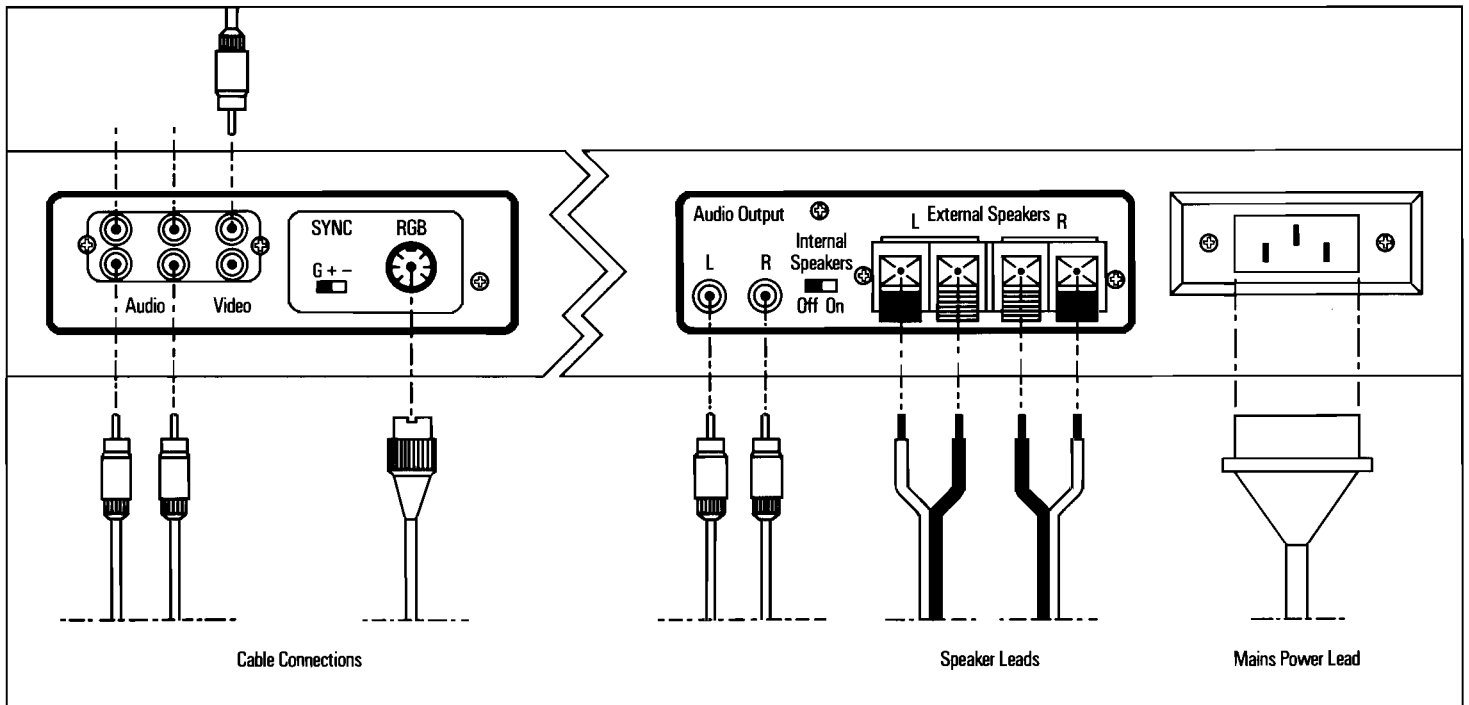


Figure 4

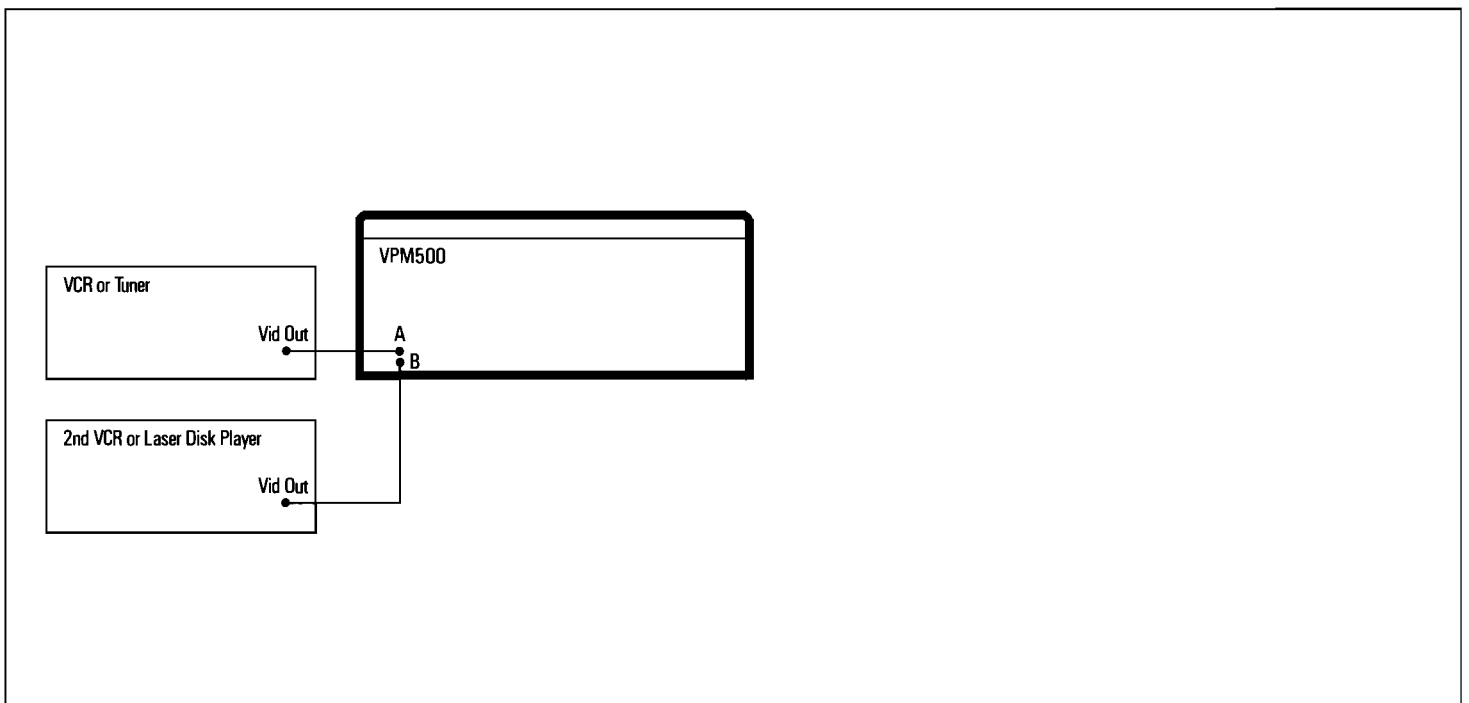


Figure 5

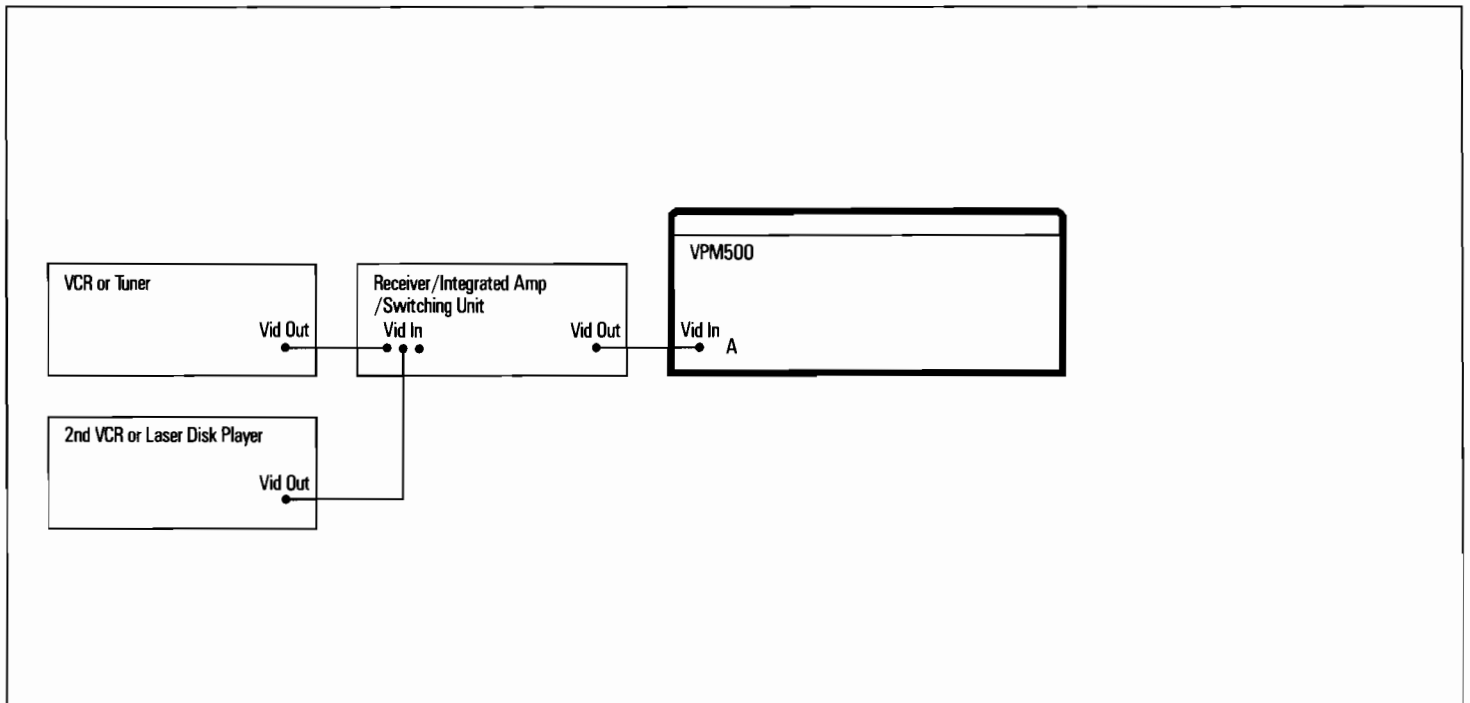


Figure 6

Audio-video receiver/switcher to VPM500. If you are interconnecting your video source (s) with a component, the procedure is much the same. Connect a video cable from the VIDEO OUT socket on your receiver, integrated amplifier or switching unit to the top VIDEO INPUT (A) socket on the VPM500.

Any other video inputs may be routed through the same component if it has more than one input. Otherwise, connect either a second VCR or laser disc player directly to the VPM500 by running another cable from its VIDEO OUT socket to the lower VIDEO INPUT (B) socket on the VPM500. (See fig. 6.)

RGB video connections. The VPM500 may be used as a giant display screen for personal computers with RGB color outputs. This connection is covered in Appendix 2 farther on.

Using a TV as a source. While it means having two video screens in one room, there are times when you may want to use a modern monitor/receiver which has video and audio outputs, especially if your VCR tuner is not capable of receiving MTS stereo broadcasts. These state-of-the-art sets have extremely good tuners and all have sophisticated direct-access remote control channel selection. Treat their hook-up the same as you would any other video source.

Audio Connections

Sound from a video source can get to your speakers four ways: 1) directly from the video source, through the VPM500's built-in amp and out to speakers, 2) From your video source through an A/V receiver or integrated amp to speakers, 3) From a video source to the VPM500, to the AUX input of a regular amp or receiver and from there to speakers, 4) From a video source to an A/V switcher, to the VPM500 and to external speakers. (See fig. 7.)

Each method of audio hook-up uses standard audio hook-up patch cords like the ones you use with your stereo system. Methods 1, 3 and 4 may require fairly long cable runs. If a standard 1-meter cable does not reach, your Harman Kardon dealer can provide you with longer audio hook-up cables. Try not to exceed 20' total length, however, excluding speaker wires which can be longer.

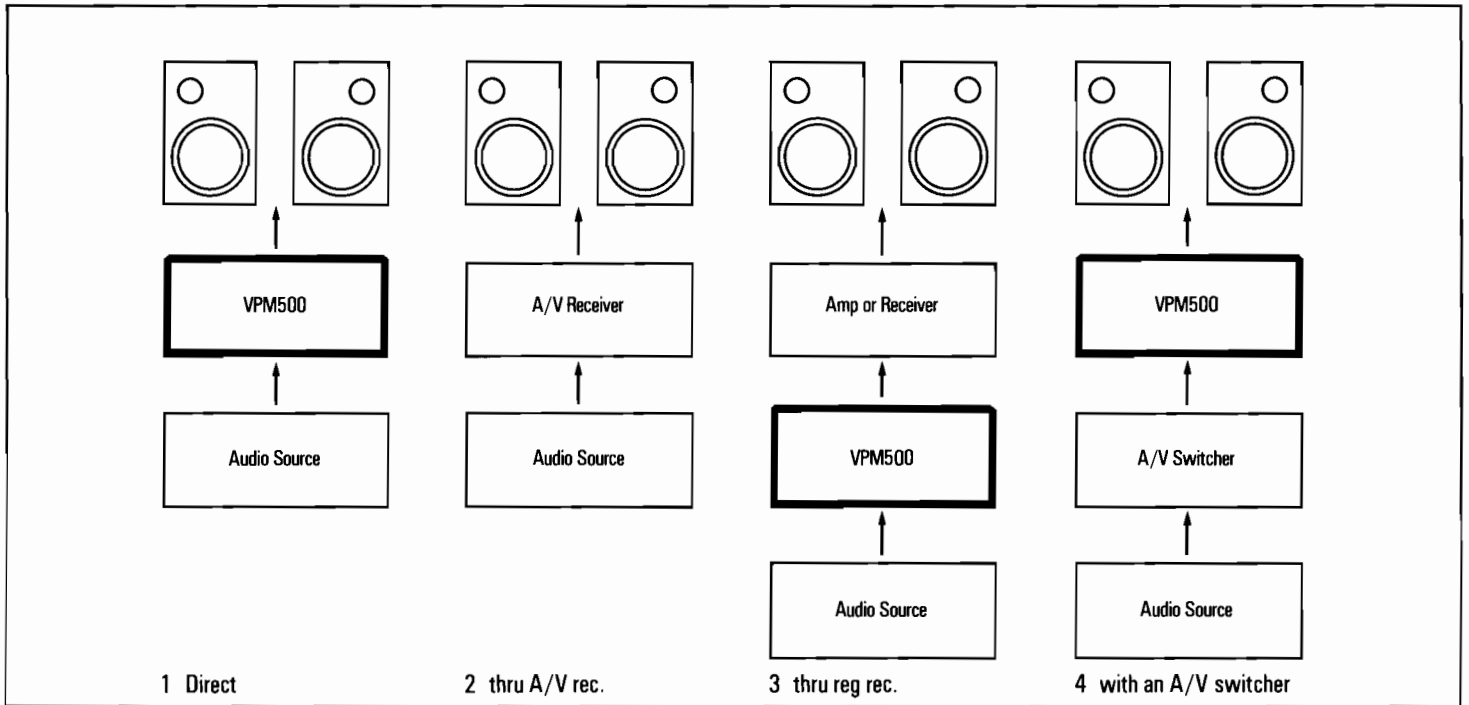


Figure 7

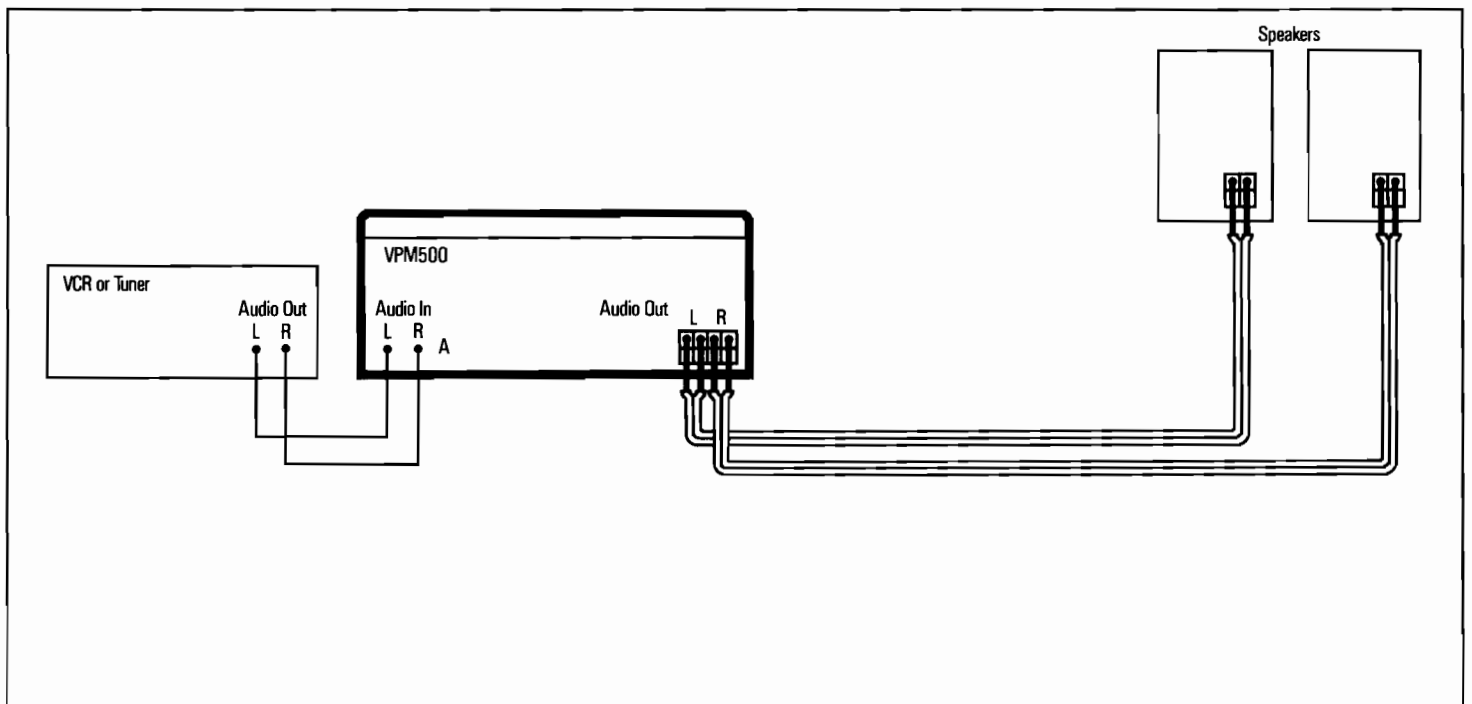


Figure 8

Direct source to VPM500. Run a hook-up cable from your VCR or video tuner's AUDIO OUT socket(s) to the top AUDIO IN sockets on the VPM500.

If your video source has a single, mono AUDIO OUT socket, use only the RED plug on the patchcord set and connect only its corresponding RED plug on the other end to the VPM500's TOP RIGHT

AUDIO IN socket. (See fig. 8.) If your VCR or tuner is a stereo unit, make sure that its left and right channel outputs correspond to the left and right input sockets on the VPM500. A good practice is to use RED for RIGHT and BLACK/GREY/WHITE for LEFT channels. Skip the next paragraphs and read *Speaker Hook-up*.

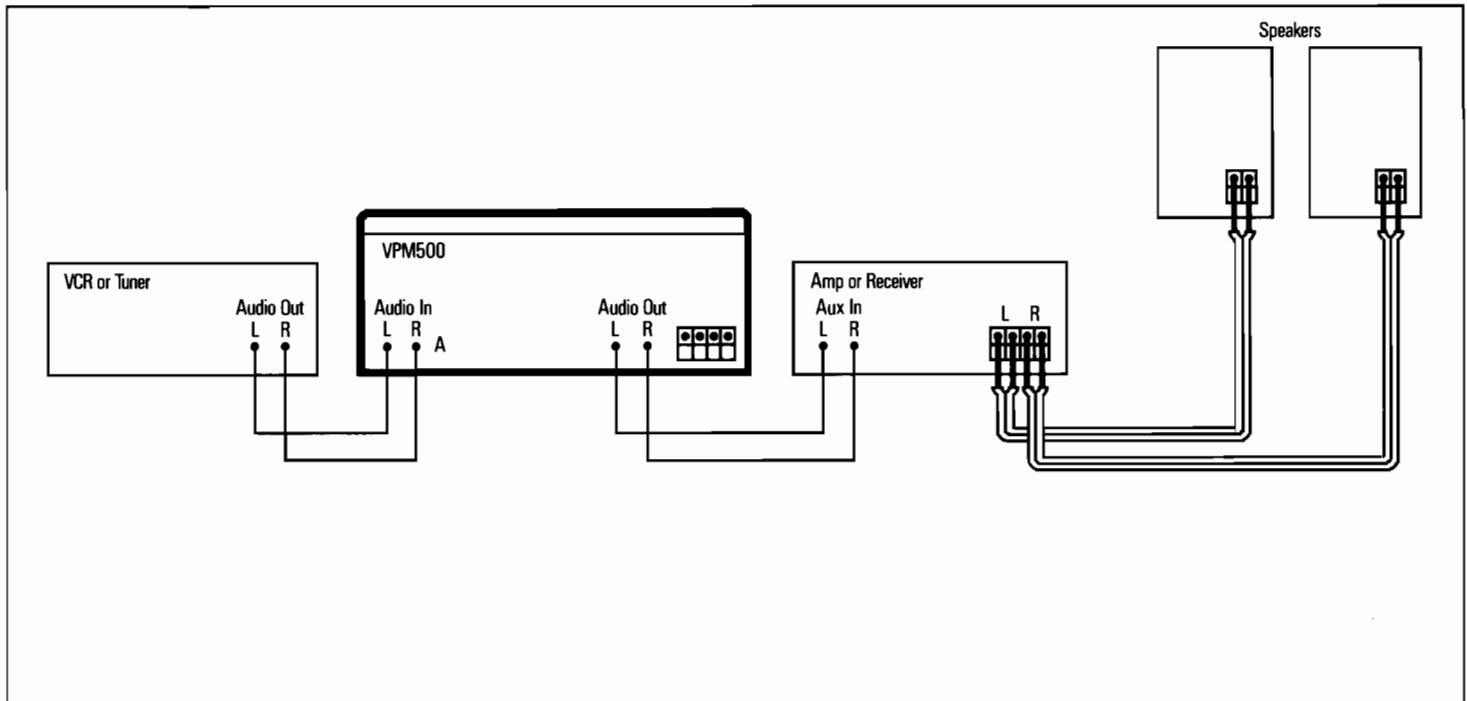


Figure 9

Audio/video receiver to VPM500. With this hook-up method, you will not be using the AUDIO INPUT's on the VPM500 and, unless you have a remote controlled receiver or integrated amplifier, won't be able to use the VPM500's remote control for volume, tone and balance adjustments.

Regular receiver with the VPM500. This approach takes advantage of the fact that the VPM500 has audio line outputs as well as speaker outputs. This allows you to use the VPM500's remote volume, tone and balance controls, but still get the extra power of your existing receiver or integrated amp.

Run an audio hook-up cable from the AUDIO OUT sockets on your video source to the top AUDIO IN sockets on the VPM500.

Now connect another cable from the VPM500's AUDIO OUT sockets (farther to the right on the back of the projector) back to the AUX inputs on your receiver or amp. (See fig. 9.)

Make sure that LEFT and RIGHT channels match at all four connection points. A good practice is to use RED for RIGHT and BLACK/GREY/WHITE for LEFT channels.

Speaker Hook-up

First position your speakers on each side of the VPM500 screen.

Hook-up wire. We recommend you use speaker hook-up wire no thinner than 18 gauge. You may use standard "zip cord" available at hardware and building supply stores, or consult your Harman Kardon dealer for special high-grade speaker cables. Make sure that the hook-up wires are exactly the same length for each speaker.

Separate the two conductors for a distance of about one inch, and strip off $\frac{3}{8}$ " of

insulation from both ends of each conductor. Tightly twist the exposed wire to ensure that no stray filaments of wire stick out.

Next identify the speaker wire's + and - conductors. Almost all double stranded wire has a means of differentiating one strand from the other. This could be a different color conductor, a strand of yarn in one conductor or ribs on one part of the insulation. IT DOES NOT MAKE ANY DIFFERENCE WHICH OF THE TWO STRANDS OF WIRE GO TO (+) AND (-) ON THE SPEAKERS AND AMPLIFIER, AS LONG AS BOTH SPEAKERS ARE DONE IDENTICALLY.

Direct VPM500 speaker connection. The VPM500 contains a 10 watt per channel power amplifier which will drive almost any stereo loudspeaker at realistic levels.

First locate the output panel on the back of the VPM500. Locate the switch marked EXTERNAL SPEAKERS and switch it to the ON position. You'll also see two sets of EXTERNAL speaker output terminals much like the ones on your stereo. One set is marked LEFT and one set RIGHT. Each set has a + and - terminal.

Connect the corresponding + and - conductors to the VPM500 and speakers.

We repeat, it is important to hook both speakers up in an identical manner — red-to-red and black-to-black — so that they are "in phase." (Hooking them up "out of phase" results in a thin sound with poor stereo image and a lack of bass).

Make sure that the two speaker wire conductors do not touch or short out against a metal surface. It only takes one fine piece of wire out of place to cause a short.

Now proceed to Section IV.

Stereo system speaker hook-up. Needless to say, your speakers are already hooked up if you have chosen to route your video source's audio through it.

Make sure that your existing speakers are placed on each side of the VPM500 screen. If you need longer speaker wires to affect this, make sure they are the same length, even if you have to coil up some of the shorter one behind your amp or receiver.

Finally, remember to switch the VPM500's INTERNAL speaker switch to the OFF position and connect the AC cord to an outlet which will accept a 3-prong connector.

External amplifier hook-up. If you want more power for your Home Theater speakers, but are using the VPM500 in a room away from your stereo system, you can take advantage of the AUDIO OUTPUT jacks on the projector. These can be used to provide a signal to a separate amplifier.

Run an audio hook-up cable from the VPM500's AUDIO OUTPUT jacks to the INPUT jacks on the amplifier. Make sure that left and right channels match on both the projector and amp. Now run speaker cables from the amplifier to the speakers on each side of the VPM500 screen.

The AUDIO OUTPUT jacks may also be used to provide a signal to powered speakers.

Advanced Home Theater Audio Hook-ups.

The final ingredient in the *ne plus ultra* deluxe Home Theater is Surround Sound. If you've been in a theater equipped with Dolby Surround Sound, you know how exciting these added sonic effects can be. Videocassette and laser disc movie soundtracks contain this encoded rear channel information which can be decoded and played through a second set of speakers. While Surround Sound is a great addition to any video system, the VPM500's eye-filling visual impact gives room-filling sound an even more realistic context.

The market abounds with outboard Surround Sound processors and your Harman Kardon dealer will be able to help you find one that fits your system and budget. Most


of these processors require an extra amplifier and all will require two extra modest-sized speakers to be placed to the rear of your viewing area.

Owning a VPM500 with its own built-in amplifier can save you money if you opt for the extra excitement of Surround Sound. Simply run the output of the processor into the VPM500's AUDIO INPUT's and run speaker wires from the EXTERNAL SPEAKER outputs back to the rear channel speakers. The built-in amplifier will provide more than enough power and soon you'll be ducking as space fighters swoop through your viewing room.

Video source, color, picture and sound adjustment functions are duplicated on the compact wireless remote control and on the projector console control board. In addition, the remote has extra buttons for

sound and picture enhancement. We will first briefly describe the function of each control and then give a further explanation of use with the wireless remote.

Video Controls

Power/Off is actually a slightly different function on the projector control panel than on the remote. The control board  POWER switch is the master on/off switch and controls power coming into the VPM500. It should be left ON and turned off only when the VPM500 is not being watched for long periods of time, such as during vacations. The remote control OFF button is used to put the VPM500 on "standby." The picture disappears, but certain circuitry inside the projector remains at ready, allowing the VPM500 to "remember" some of the previous settings from the last time it was on. It is perfectly normal to use this "standby" mode instead of the master power switch and in no way harms the VPM500 or consumes excess power. To turn the VPM500 on, you simply press your choice of Video A, Video B or RGB input buttons.

Video A/Video B/RGB selects which input source the VPM500 projects and cancels the "standby" mode. On the projector control board, this selection is done by pressing a single button one or more times to select the input sequentially; on the remote, there are separate buttons for each input, and at the beginning of a viewing session, they also turn the VPM500 on. Either way, the selected input is displayed with green, yellow and red LED indicators on the exposed part of the control board.

Picture adjustment controls (BRIGHTNESS, TINT and COLOR) are used just like on a conventional TV set. BRIGHTNESS controls the overall intensity of the VPM500's picture. Set it just high enough to make the darkest areas of the picture just about but not quite black so that there is a natural gradation between the lightest and darkest greys. Old black and white TV series re-runs make good test material. TINT changes the actual color of objects from reddish to greenish. Flesh tones make a good reference point for properly adjusting this balance. Also observe red objects, which will blaze out if there is too much overall color in the picture. COLOR adjusts the amount (but not the shade) of color in the picture. Again, flesh tones make a good adjustment subject.

When the adjustment is complete, press the "SET PRESET" button on the rear panel of the VPM500, behind the door near the power switch.

Picture preset. Needless to say, each of these controls is a matter of personal taste. So the VPM500 has provided you with a preset memory feature that lets you return to a previous setting just in case you can't recall it using each individual control, (or when someone else adjusted the picture to their taste). When you are satisfied with tint, color and brightness, press the preset button to memorize the setting. No matter what adjustments are made in the meantime, the set will return to your pre-setting when it is next turned on.

Color convergence adjustment controls and test button are for manually fine-tuning the VPM500's picture. They make use of the same controls as tint, brightness and color and are activated by pressing the button marked TEST. Instructions for their use are detailed further on.

Enhance, found only on the remote control allows you to sharpen a picture which is somewhat blurred or slightly out of focus. It can also be used to soften a picture which is overly hard-edged and distracting.

Volume adjusts the loudness of the audio. It is not operable if you have chosen to bypass the VPM500 in your sound chain by routing sound exclusively through your stereo system.

Balance. After you press the TEST button, the volume control becomes an audio balance control to adjust the amount of sound coming from right and left speakers. Cross lines appear in the projected picture, but are not part of the balance adjustment process. After you have adjusted audio balance so that sound is coming from the middle of the picture, press test again and the cross lines will disappear.

Mute (along with STEREO and HY-SON) is found only on the remote. It is handy for turning off the sound in order to answer a phone call, converse with other viewers or at least partially ignore long commercial breaks. When the button is pressed a second time, the sound resumes at its prior volume.

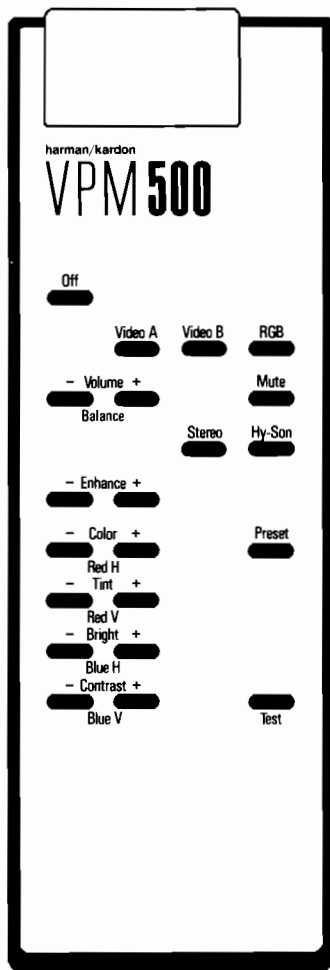
Stereo should be pressed when listening to a stereo sound source such as a VHS Hi-fi tape or MTS stereo TV broadcast. If you are using only a mono source, do not activate this button. Also note that the stereo function is temporarily deactivated when adjusting the balance control.

Hy-Son sonically enhances monophonic sound. On regular mono TV broadcasts and videocassettes it synthesizes a remarkably lifelike stereo effect. When used with stereo sources, it further widens the stereo effect. Experiment with this control and use it according to your own tastes.

Audio preset allows you to set the volume and balance controls so that they are at prearranged levels when the set comes on. When you are satisfied with your settings, touch the SET PRESET button.

Bass and treble controls are found only on the projector control panel. They let you adjust the tone quality of your speakers. Experiment with them using both music and dialogue to arrive at a setting which is most pleasing. Boosting both bass and treble will add impact to music and compensate for the narrow frequency range of broadcast television. Reducing both controls will make dialogue more understandable, especially good if a member of your family is slightly hard of hearing.

Remote Control Operation



Most of the time, you will be using the VPM500's compact wireless remote control unit to adjust picture and sound. There are infrared receptors on both the front and back of the VPM500 so you can either point the remote in the general direction of the projector's back side or aim it directly at the screen, where the signal will bounce off and return to the front receptor. Of course, neither receptor should be blocked by furniture.

- and +. If you have operated a TV remote control, you will note that the VPM500's remote also uses rectangular buttons which rock in two directions. The left (-) side decreases an effect; the right (+) side increases it.

Switching operations with the TEST button. To minimize the size and complexity of the VPM500 remote, several sets of controls use the same buttons. Picture control and Color Convergence are adjusted by the same set of buttons depending on whether you have pressed the TEST button. The TEST button also changes between volume and balance controls. When the TEST button is pushed, a cross line pattern appears in the center of the screen. It is used for color convergence adjustment and will disappear when the TEST button is pressed again or after 3 minutes.

NOTE: The functions active in the TEST mode (color convergence and balance) are not necessary in day-to-day use. They should be set initially and periodically checked (about once a month) but otherwise not used regularly.

Color Convergence Adjustment

Color video is composed of red, green and blue images. When the VPM500 is correctly adjusted, these three images are projected precisely on top of one another, and show only a very slight separation (if any) at the extreme sides of the screen. If the three images are out of convergence, you will see color outlines around objects. This is especially noticeable on black and white movies and TV reruns.

While the VPM500 has been engineered with the finest quality video circuitry, there will be times when you will need to readjust the convergence of the three projection tubes. You will also definitely need to converge the VPM500 image the first time you operate it. This is a simple operation which takes just seconds and can be done from the comfort of your armchair (although the controls are duplicated on the control console).

A. First familiarize yourself with the location of the following controls:

1. TEST button
2. RED H, RED V
3. BLUE H, BLUE V

B. Press the TEST button. Cross lines will appear on the center of the screen. To get a feeling for the adjustment process, press the RED H button on its — side. Note how the red cross line moves to the left and the surrounding picture has red outlines.

C. Simply use the RED H, RED V, BLUE H and BLUE V controls to produce a single white cross line. The blue cross line is the hardest to see clearly. If you have trouble, further reduce room light level or reduce the COLOR picture control to its minimum to produce a black and white picture.

D. Press the "SET PRESET" button on the rear panel of the VPM500, behind the door near the power switch.

E. Then press TEST again to make the cross line disappear.

Why isn't there a green control? The green projector cross line is the standard to which you adjust the other two colors. So it can be stationary.

First move the red cross lines to cover the stationary green lines. This will produce a dark shade of yellow. Now move the blue lines over the yellow, resulting in white.

What if you can't get a pure white cross hair? The first suspect is the placement of screen and projector. Make sure the VPM500 is properly centered and that the screen is correctly placed.

The next possibility is the quality of the video input source. If you are using broadcast television for a test source, try a high quality videocassette to see if the problem still persists. If it doesn't, your tuner may be the culprit.

In the rare event that neither of these factors is at fault, internal adjustments may need to be made in the VPM500. Consult your Harman Kardon dealer or qualified installer.

Remote mania. It is possible to have separate remote controls for the VPM500, your VCR/tuner and stereo system all clustered around your viewing area. If this gets unwieldy, we suggest you investigate a new product development, the "universal" remote. Produced by several companies, it lets you program the functions of multiple remotes into a single compact unit.

We hope you have many years of rewarding viewing experiences from your Harman Kardon VPM500. The same innovation and quality is found in a whole range of other Harman Kardon video and audio products and JBL loudspeakers. Think of us when you want to further upgrade your Home Theater.

And in the meantime... ENJOY!

Monitor Care

Make sure that the VPM500's ventilation holes are not blocked and avoid covering the unit with decorative scarves, doilies or newspapers.

We do not recommend using ultrasonic humidifiers in the same room with the VPM500 since the microscopic water droplets it produces can evaporate on the optical surfaces of the projector and cause deposits.

Clean the outer surfaces of the VPM500's case only with a damp soft cloth. Avoid detergents and spray cleaners which can attack the housing material.

If dust, popcorn or cigarette ashes make their way onto the recessed control panel, remove them with a vacuum cleaner, using the brush attachment.

Extra special care should be taken when cleaning the front optical surface of the three VPM500 projection lenses. Treat them as you would any precision lens: First carefully dust the surface to remove abrasive particles. Then use a slightly damp facial tissue or camera lens cleaning paper (not a paper towel!) in a gentle rotary motion to remove any remaining deposit.

Screen Care

Avoid touching the screen. If fingerprints, dust or smoke deposits collect on it, use a solution of isopropyl alcohol or a clear window cleaner such as "Windex" with a soft, lint-free rag.

Consult the instructions which came with the screen for further maintenance tips.

Remote Care

The VPM500's remote control unit is powered by four AAA batteries. If your VPM500 stops responding to remote commands, or you are required to closely aim the remote unit to get any response, it's probably time to replace the batteries.

To open the battery compartment, slide the cover in the direction shown by the arrow on its top portion. Remove the old batteries and replace them with good quality alkaline cells, taking care to insert them correctly according to the + and - symbols on the bottom of the battery compartment.

Troubleshooting**No picture.**

- Is the VPM500 on, both at the control panel and on the remote by pressing VIDEO A?
- Is your video source connected to VIDEO A?
- Is the video source turned on and producing a signal?
- Are all connecting cables secured?

No sound.

- Is the video sound source connected to AUDIO INPUT A?
- Is the VPM500 volume turned up?
- Is the MUTE button pressed by accident?
- Is the video sound source properly hooked up?

- Are the speakers connected and free of shorts?
- If you are using your stereo amplifier, is it turned on? Is its input selector on the correct source?

Poor picture.

- Is the VPM500 and its screen properly aligned?
- Have you reconverged the picture lately. If not, do so.
- Have the COLOR/TINT/BRIGHTNESS controls been adjusted?
- Is your video source in good working order? The VPM500's superb resolution powers can magnify deficiencies you may not have previously noticed.

APPENDIX 2—

RGB INPUTS AND THE VPM500

The RGB input on the VPM500 can be used to produce dazzling computer displays, especially on games and graphics programs. With the correctly wired cable, the VPM500 is compatible with the Apple IIe, Commodore Amiga, IBM PC/XT/AT

and any other computers which have a standard RGB output. Certain other computers, such as the Macintosh cannot be used without special accessories because their output is not in a standard video format. Consult your computer dealer for specifics.

Note that external audio input may also be used. This should be routed through AUDIO INPUT B *only*. The VPM500 automatically switches to INPUT B when you activate the RGB source switch on either the remote or control panel.

The RGB Connector

The RGB input socket on the VPM500 accepts an 8-pin DIN plug with the following pin assignments:

- 1 insert +
- 2 green input
- 3 external sync (5 volts, 150 ohms)
- 4 insert —
- 5 external sync (1 volt, 75 ohms)
- 6 blue input
- 7 red input
- 8 ground

Setting the SYNC Switch

Locate the switch to the left of the RGB input on the VPM500. In the G (green) position, synchronization is obtained from the green input. The + and — settings set the VPM500 for positive and negative sync signals.

If you're not sure which is correct, simply switch through each position until the proper display is achieved.

APPENDIX 3—

CEILING MOUNTING THE VPM500

If you're a homeowner, or in a relatively permanent apartment situation, you will find that ceiling mounting your VPM500 is desirable. It frees up floor space and is relatively unobtrusive.

NOTE: A qualified technician will need to invert and reconverge the VPM500's internal circuitry. This cannot be done by you. Consult your Harman Kardon dealer before undertaking ceiling mounting.

It's a good idea to start with a trial floor mount first to make sure that you are satisfied with the placement of the unit. Once you're happy with the viewing angles, light levels, etc., you're ready to invest the time and money to permanently mount your VPM500.

Ceiling height. In many ways, ceiling mounting follows the same placement dimensions as floor mounting — except upside down. The top of the screen should be 24 inches from the ceiling, the distance from projector to screen follows the same ratios as shown in the chart in Section II. If you want an extremely large screen but have a low ceiling to contend with, the VPM500 may be recessed up to 5 inches into the finished ceiling or up to 12 inches if you are not using the internal speakers.

Structural considerations. NOTE: It is the responsibility of the installer and owner to ensure a safe and secure installation in compliance with all local building and electrical codes.

The VPM500's ceiling mount bracket must be firmly attached to a structural beam and can under no circumstances simply be attached to sheetrock or plaster. Unless you are qualified, we suggest checking with a qualified installer, carpenter, building superintendent or architect before undertaking the mounting process. The VPM500 should not be mounted close to large metal masses, such as steel ceiling beams, large pipes or ducts, as this can cause deflection within the projector tubes.

Cables. If you are remodeling or designing the VPM500 into a new home, input and output cables may be run inside the ceiling and brought out near where your electronics will be placed. If not, the cables can be suspended by brackets or conduit across the ceiling and down a wall near your signal source.

We do not recommend hard wiring the VPM500's AC cord (and neither do most electrical codes). In new or remodel situations, have your architect or contractor specify a dedicated 3-prong socket close to the final mounting position.

Leave mounting and reconvergence to an installer. The actual ceiling mounting and reconvergence of the VPM500 should only be done by a qualified installer. In the extreme event that you cannot find the services of an installer in your area, your Harman Kardon dealer can obtain a VPM500 Service Manual for you. While it contains sequential instructions for assembly and mounting of the ceiling bracket and reconvergence procedure, we still highly recommend you seek the services of a qualified TV technician to carry out the process. Remember, Harman Kardon is not responsible for the installation of its products or any hazard or liability which might occur due to improper installation. Removal of the outer VPM500 top cover can immediately void the manufacturer's warranty.

Service

If you have followed the suggestions in the Troubleshooting section and are reasonably sure that your set does require service, call the Harman Kardon dealer from which you purchased your VPM500. It is important that service be carried out only by a designated Harman Kardon service agent to insure both proper service and to comply with the terms of the VPM500 Limited Warranty.

Remember to keep your sales slip or receipt in a safe place since you will be required to show it for service during the duration of the Limited Warranty.

VIDEO SECTION

| | |
|--|---|
| Input Sensitivity/Impedance Video A,B | 1.0V p-p/75 Ohms |
| RGB Input RGB | 0.7V p-p/75 Ohms |
| Sync | 0.3V p-p/75 Ohms 5.0V/150 Ohms (TTL) |
| Video Bandwidth Video A,B | 4.0 MHz |
| RGB | 6.5 MHz |
| Light Output | 300 Lumens |

AUDIO SECTION

| | |
|-------------------------|-------------------------------------|
| Audio Input Sensitivity | 0.5 Volts (RMS) |
| Power Output | 10 Watts/Channel into 4 Ohms Stereo |
| Loudspeakers (internal) | 6.0 cm x 16.0 cm (2) |

GENERAL

| | |
|--------------------------------------|---|
| Picture Size Range | 6' - 20' diagonal, continuous |
| Picture Size/Lens-to-Screen Distance | picture diagonal x 1.2 |
| Dimensions (W x H x D) | 26" x 10 $\frac{5}{8}$ " x 27 $\frac{5}{8}$ " 660 x 270 x 702 mm |
| Weight | 80 lbs. (36.3 kg) |

R E F E R E N C E C A R D

Detach this card and keep it near your remote for reference until you become familiar with the VPM500 controls.

| | |
|--------------------------|---|
| Off- | Switches the VPM500 to standby. To turn it back on, press VIDEO A, VIDEO B or RGB. |
| Video A | Switches from standby to normal and activates your primary video source. |
| Video B | Selects a second video source. |
| RGB | Switches to the input of a personal computer. |
| Volume | Controls loudness of sound. |
| Balance | Used to center sound in the middle of the screen. Activate it by pressing TEST and then operating the VOLUME control. Press TEST again to remove cross lines from screen. |
| Mute | Turns off sound. To restore sound, press it again. |
| Stereo | Press this button when using a stereo source. |
| Hy-Son | Enhances mono sound and widens the stereo image. |
| Color Convergence | Uses the same controls as COLOR/TINT/BRIGHT/CONTRAST. How to reconverge the VPM500's picture: <ol style="list-style-type: none">1. Press the TEST button.2. Observe the cross lines on the screen.3. Use the RED H, RED V, BLUE H and BLUE V buttons to produce a single white cross line on the screen.4. Press the TEST button again to remove the cross line. |

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