



**Infinity**™



THE INFINITY REFERENCE STANDARD VIDEO PROJECTOR

DEALER INFORMATION

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## GETTING THE MOST FROM YOUR INFINITY TELEVISION PROJECTOR

The infinity Reference Standard Television Projector is a state-of-the-art device. It can be floor or ceiling mounted. Its picture size is adjustable from 5 to 15 feet (measured diagonally). And it will work properly on both flat and curved screen surfaces. (Flat screen floor mounted units take special modification to the screen for proper alignment.)

In order to duplicate the Projector's high performance capabilities in your home, your Infinity dealer (or his authorized agent) must deliver, install and adjust the system.

Projectors are available from the factory in two configurations:

- A. Floor mount adjusted for 6 foot curved screens.
- B. Ceiling mount adjusted for 100" (8 foot, 4 inch) flat screens.

If you require a different screen size or type, your dealer can readjust one of these two models. It's not a difficult or expensive job. Custom installations, like ceiling mounting, will certainly incur extra charges.

Although it is theoretically possible for a consumer to install the standard floor model and get good pictures, years of personal experience with two-piece projection televisions has shown us otherwise.

Big television pictures are very revealing. a ghost on your 26" monitor can turn into a monster on a large screen. Graininess (video noise) can turn into a snowstorm. A reflection on the screen may turn into a washout. And small, "normal" misalignments found on normal size TVs are unacceptable on big screens.

You must approach large screen television as a system. The four key ingredients - source material (videotapes, videodiscs and reception), screen choice, room lighting control and proper installation - are all predictable. Their interactions can assure your enjoyment of projection television.

Scary? Not really, but setting up a large screen TV system does require attention to detail. Your Infinity dealer will counsel you regarding these choices. And don't worry, once it's installed the Infinity Projector works like a normal TV. But do be forewarned: theater-like television is addictive. It will probably become your personal reference standard.

## SOURCE MATERIAL

Nothing is more critical to the demonstration of a projection television system than good source material. The INFINITY Projector's picture is about twenty times larger than the average home TV and the quality of its electronics is good enough to expose any flaws in the input signal.

The set has a superb stereo TV tuner. For demo purposes, this presents several very distinct disadvantages! First is the quality of the reception. A little ghost, a little snow, or other "little" problems can grow to mammoth proportions on a large screen. Even when reception is good, it's easy to become critical of off-air video signals. There's a great deal of difference between the studio cameras used for the network news and film transfer chains used to broadcast midnight movies.

The biggest disadvantage with off-air reception is your inability to control program material and to predict how the quality and content of the material will impress a customer. Invest in a good antenna, satellite dish or cable feed. Subscribe to TV Guide, check it weekly, and be prepared to tape good demo material. Off-air signals can be excellent - you just can't count on them.

## THE PREDICTABLE DEMONSTRATION

THE FIRST IMPRESSION IS THE MOST IMPORTANT! Nothing builds credibility faster than your ability to make a really impressive, predictable demonstration. This requires a small library of video discs containing movies, music, sports and other special interest programming.

Video discs are far better than most video cassettes, with almost twice the number of lines or resolution. They also have the advantage of being easily cued or programmed and they look the same, year after year. When you can use a good disc! The latest generation of machines (like the Yamaha or the Pioneer 838 and 939) offer substantially better performance than their predecessors.

## SCENE CONTENT

A tremendous number of details are lost on a regular television. Big screen television magnifies normal TV programming (showing much more detail) and recreates movies in their original, large screen format. Look for newer material, particularly things which may have been mastered in video, rather than transferred from film. Avoid dark, poorly lit scenes—they show a lot of grain and offer little detail or color with which to evaluate the picture. Avoid

white outdoor scenes such as snow scenes - they have no detail or contrast.

Know your source material. Prepare the customer to see a particular scene and point out some unusual details in advance. Now play the disc and establish that the customer was able to see the details you mentioned. Standard play (CAV) video discs make this process easy since they can be stopped or cued to any frame of the picture. Some reliable scenes from good video discs include:

1. Dogfights, "TOP GUN"
2. Bicycle racing in the Rocky Mountains, "AMERICAN FLYERS"
3. A quick escape from the Federales, "ROMANCING THE STONE"
4. Who's who in music, "WE ARE THE WORLD"
5. Fight at the plane and truck chase into town, "RAIDERS"
6. Colorful cartoon animation, "RUPERT AND THE FROG SONG"
7. New York taxi vs bicycle, "QUICKSILVER"
8. Music video at its best, "TINA TURNER-PRIVATE DANCER"
9. Chase through the forest, "RETURN OF THE JEDI"
10. Chariot races in "BEN HUR"
11. Movie version of the opera "CARMEN"
12. Auto racing, "24 HOURS OF LE MANS '84"
13. Pioneer Demo Disc LVAP-101
14. Beaches, women, flowers..., "CALEDONIAN DREAMS"
15. Live concert & crowd scenes, "KENNY LOGGINS ALIVE"
16. Sony demo disco, "HOW TO PLAN YOUR ASIAN VACATION"
17. Travelog, "LAST PARADISE"
18. "METROPOLITAN OPERA 100 YEARS CENTENNIAL"

#### DOLBY SURROUND SOUND

This built-in feature adds a movie theater atmosphere to your demonstration. The rear speakers should be placed at, or above, ear level, and to the sides or rear of the viewing position. Facing the speakers towards the ceiling often heightens the special effects. Surround sound information is found on most DOLBY encoded discs and tapes. Some suggested discs are:

1. Rocket sleds in forest, "RETURN OF THE JEDDI"
2. Mine chase scene, "INDIANA JONES"
3. Credits and opening scene, "BACK TO THE FUTURE"
4. Dogfights, "TOP GUN"
5. Generally good surround, "OUT OF AFRICA"
6. Jungle noises, "EMERALD FOREST"

#### SCREEN SELECTION

Though the INFINITY Video Projector does not come with a screen, selection of the proper screen material is critical to the performance of the projection system.

Many installations use a conventional matte white screen which is mounted to the wall or ceiling. Electrically operated screens can be completely hidden in the ceiling and can be made to lower automatically when the projector is turned on. Extra top masking can be ordered to permit installation in high ceilings.

A matte white wall or screen has a gain of one. It reflects all light in a uniform manner. All parts of the screen appear equally bright and the picture can be viewed from any location in the room without a shift in colors or a loss of brightness.

Two-gain flat screens are available and work very well, though they are somewhat more fragile and more costly than standard matte surfaces. This doubling of brightness helps contrast and adds discernible bright highlights to the picture. It is critical that these two-gain screens be stretched FLAT - slight ripples or bulges are exaggerated.

We do not recommend the use of beaded glass screens. They are somewhat difficult to maintain and are retro-reflective (light from the projector is reflected back towards the projector). In floor installations the angle of the light reflection is too low, and for ceiling mounted installation it is altogether too high.

Higher gain flat screens are available, but they were not designed for use with projection televisions and cannot be recommended for two specific reasons. First, they have a tendency to "hot-spot," or appear substantially brighter in the center than at the edges of the picture. The highly reflective surface also causes severe color-shifting of the picture. One side reflects slightly more light from the red tube and appears pink, the other side does the same for the blue tube and looks blue or washed out.

The INFINITY Projector can also be used with curved high gain screens in areas where a substantially brighter picture is desired or where ambient room light makes the use of a flat screen difficult. The curvature of the screen minimizes the hot-spotting and the color-shifting can be minimized to permit viewing in a reasonably large area-about 45 degrees to each side of the edges of the screen.

The principle advantage to such screens is their ability to reject off axis ambient room light. Their surfaces reflect light exactly the same way a mirror does, the angle of incidence equals the angle of reflection. The screen can be tilted vertically to reflect light into the prime viewing height, and bright, off-axis light sources are reflected off-axis.

This is NOT the case with flat screens which reflect light uniformly and cannot distinguish between the light from the projector and any other light source in the same viewing area. For this reason, all flat screen systems require the darkest possible room in order to preserve contrast.

### ROOM LIGHTING CONTROL

Though much emphasis is placed on the brightness of a projection system, what the eye perceives most is contrast. No amount of additional brightness can compensate for the loss of the dark areas within the picture. Since no projection system can project black, the darkest part of the picture can be gauged by holding up a white piece of paper where the flat screen is to be mounted. Ambient room light that falls onto the paper will give you an idea how good the contrast ratio will be and the screen or light sources may be repositioned in order to improve contrast.

Track lighting or other well directed incandescent light sources permit a surprising amount of light in the viewing area-though a true theatrical heightens contrast and eliminates distractions. Particular care should be taken to eliminate sources of light from the projector.

Dealers should get the exact screen measurements before drawing blueprints or quoting exact specifications. Border sizes vary and actual screen dimensions are rarely exact.

### HOW BIG?

The INFINITY Video Projector is available from the factory in two configurations: floor mount/6' curved screen and ceiling mount/100" flat screen. It can be readily readjusted to create any picture size from approximately five to fifteen feet.

Remember that while "picture sizes" are stated diagonally and picture area is what should really be compared. A 100" screen may sound only twice the size of a 50" counterpart, however the smaller screen measures only 8 sq. ft. while the 100" screen has a total of 33 sq. ft. - four times the viewing area of the smaller surface!

Since picture size is expressed as a diagonal measurement, there are times you must calculate both the height and width of the picture. Doing so is relatively simple, since television has a 3 by 4 aspect ratio (3x high by 4x wide). The picture size is equal to 5x. Simply divide the diagonal by 5 and multiply by 3 and 4 to obtain screen dimensions.

Also noteworthy: Sizes of manufactured screens are "nominal" and vary from manufacturer to manufacturer. In most cases, the screen size - including the black border is smaller than the stated dimension.

Following is a list of screen dimensions with heights, widths and total screen areas:

DIAGONAL	HEIGHT	WIDTH	SQ. FT.
36"*	21.5"	29"	4.32
40"*	24"	32"	5.33
45"*	27"	36"	6.75
50"*	30"	40"	8.33
5'	36"	48"	12.0
6'	43"	58"	17.3
6.5'	47"	62"	20.3
7'	50"	67"	23.5
8'	58"	77"	30.7
100"	60"	80"	33.3
10'	72"	96"	48.0
15'	108"	144"	108.0

\* For comparison only-sizes not available

#### ADJUSTING THE PICTURE SIZE

Readjusting the projector for screen sizes from 5 to 15 feet isn't very difficult, but it's a job for a trained service technician and should not be attempted by any one who is not properly trained on the RSVP in set ups and convergence. By removing the top cover, you have access to the center and edge focus wing nuts for the three lenses and the DC positioning rings on the yokes of the tubes. By adjusting these (with a full crosshatch pattern of the screen) the picture size can be adjusted. A touch-up to the convergence (or a complete re-convergence if you've changed from flat to curved or curved to flat) adjustments in about an hour. PLEASE REFER TO SERVICE MANUALS FOR A MORE DETAILED

#### SCREEN HEIGHT

Changing screen sizes also changes the height of the picture in relation to the floor or ceiling. To align the picture at the desired height, it is easiest to change the position of the screen. The height of the projector may also be adjusted. Dramatically changing the projection angle (raising or lowering the front of the projector may require a complete re-convergence of the picture.

The distance from the bezel above the green tube to the center of the bottom of the screen is absolutely fixed (and



different) for every screen size and type. The other distances vary based on the nature of the installation.

In the floor mount configuration, the distance from the bezel to the screen is 93". The bottom of the screen is 19" above the floor. This is the basic triangle and whenever possible it will be easiest to install this projector in exactly this configuration.

At times, however, it will be necessary to reposition the screen either higher or lower on the wall to please the customer or reposition the projector because of some structural considerations. This can be done so long as you maintain the fixed relationship between the projector and the screen.

For a floor mounted set, as the set is moved away from the screen, the bottom of the picture will move down the wall. As the projector is moved closer to the screen, the picture will move up the wall. Ceiling mounting reverses these movements. Either exercise requires leveling the projector to eliminate as much keystone as possible and a full dynamic convergence to realign the picture on the screen. The range of the convergence controls limits this flexibility, and there are subjective limits imposed by the amount of optical distortion and focus problems caused by repositioning the screen and projector.

#### SCREEN MEASUREMENTS INFO SHEET

SCREEN MEASUREMENTS ARE DONE FROM THE BLACK BASEL (BLACK BOARD THAT THE LENSES PASS THROUGH) TO THE BOTTOM OF THE SCREEN.

FORMULA FOR FLAT SCREEN SET UPS ARE 1.388 X THE WIDTH OF THE SCREEN.

FORMULA FOR CURVED SCREEN SET UPS ARE 1.61 X THE WIDTH OF THE SCREEN.

SCREEN SIZE	DISTANCE FLAT	DISTANCE CURVED
5'	66.5" (5'5")	77" (6'4")
6'	80.5" (6'7")	93" (7'7")
6.5'	86" (7'1")	99" (8'3")
7'	92" (7'6")	107" (8'9")
8'	106.5" (8'8")	123" (10'2")
100"	111" (9'2")	128" (10'6")
10'	133" (11')	154" (12'8")
15'	199" (16'6")	231" (19'2")

THESE MEASUREMENTS ARE NOT ABSOLUTE, AND ARE MEANT AS A STARTING POINT ONLY. FORWARD OR BACKWARD ADJUSTMENT MAY BE REQUIRED.

#### HOW SHARP?

The INFINITY Video Projector can produce one of the sharpest pictures ever made by a large screen television. In most cases, the set is limited by the quality of the source material. To understand how we measure the quality of the picture, it helps to understand why television pictures are created.

There are several different broadcast standards used throughout the world. The American standard is called the NTSC system, and produces a picture by scanning a total of 525 lines, left to right, top to bottom across the face of a television tube. Every 1/30th of a second, an electron beam scans every other "line," producing "half" of the picture (or field). In the next 1/30th of a second, the beam interlaces the other half of the picture onto the screen scanning the alternate field. Two interlaced fields are called a frame. Then the process begins all over again and the result is a series of still images changed frequently enough to create the illusion of motion.

All NTSC television pictures are made up of 525 lines of information regardless of screen size, though occasionally a set fails to interlace properly which produces a picture which looks like a page of typewritten, doublespaced copy.

The quality (fidelity) of the picture is limited by the bandwidth (range) of the source material. This is measured in lines of resolution which is different than the number of lines used to make up the picture. Sources with more high frequency information will have more fine details in the picture. To accomplish this, a television system must have wide bandwidth amplifiers and other special circuits to maximize picture quality.

The NTSC broadcast bandwidth is limited to 4.2mhz, with the color information modulated into the system at 3.58mhz. If the set is to distinguish between color and fine picture details, this signal must be filtered out of the picture without removing the high frequency video information. Until very recently it was common to simply roll down the top end of the signal limiting the resolution of the picture to little better than 250 lines of resolution.

The INFINITY Video Projector uses a special digital ccd comb filter to remove the unwanted carrier signals plus a special surface acoustical wave (saw) filter at the very top of the

video bandwidth to eliminate visible interference from the audio portion of the program which is broadcast at 4.5mhz. The result is a broadcast picture conservatively rated at more than 330 lines of resolution. It is very difficult to receive a broadcast signal with more high frequency information.

It is possible to bypass the tuner circuit and feed information to the direct video inputs of the set. These are capable of producing a picture conservatively rated at better than 400 lines of resolution. This exceeds the signal quality of most video discs or other direct video sources.

Finally, it is possible to feed computer generated signals through the RGB and TTL inputs into the video amplifiers which have a 12mhz bandwidth. This produces an excellent large screen 80-column monitor display rated at more than 600 lines of resolution in the center of the screen.

With any of these sources, the bandwidth of the electronics in the set may exceed the quality of the source material. It may be necessary to adjust the sharpness control to "improve" the picture much as you would turn down the treble to soften the sound of an audio system with poor source material.

Other nonadjustable auto sharpness and auto black level circuits maintain overall picture quality while a optional vertical crash lock circuit can be added at will to correct vertical sync problems (flagging) associated with some video tape sources.

The INFINITY Video Projector also has two separate power supplies, one for the high voltage and focus, and a second source for the sweep and low level signal processing. This improves picture quality, especially in bright scene sequences and insures long term reliability of the television.

Every component in this set was specially designed to make this television the finest projector available on the market today, and a rugged performer for years of service in the home or commercial marketplace.

#### CEILING MOUNTING?

The INFINITY Video Projector may be floor or ceiling mounted. The appropriate ceiling mounting hardware and mounting instructions are available from INFINITY. While a floor set can be ceiling mounted, doing so requires several internal modifications and a re-convergence of the picture.

This is required because of the 180 degree phase shift when the set is inverted in the earth's magnetic field and to compensate for changes in the angle of the projector to screen relationship. A trained technician should be able to modify a set in less than an hour.

However, since INFINITY manufacturers sets in both floor and ceiling mount configurations, it is possible to eliminate much of this initial set-up time by specifying a floor or ceiling projector for a particular installation.

To assure the finest possible picture, a technician must touch up the convergence of every installation once the set and screen have been mounted in their proper positions.

Difficult installations can be time consuming, even for the most experienced dealer. Some radical installations can produce focus and optical geometries which are displeasing to even the least critical customer. INFINITY cannot be held responsible for any modifications or alterations undertaken by the dealer or the customer, nor can we warrant the suitability of our projector in any installation which requires modification by the dealer or the customer.