



Application Note

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Environmental Considerations for LaserDisc Player Installations

Overview

A LaserDisc is a durable medium that allows dependable playback of high quality audio and video (A/V) material. Because a LaserDisc player uses relatively few moving parts and retrieves A/V information optically, it's particularly well suited for applications where repetitious playback is required.

To ensure reliable operation, however, it's important to consider the environment where a LaserDisc system will be installed. Like any electro/mechanical device, continued exposure to hostile conditions can cause premature wear and tear, improper performance, or both. Fortunately, a small amount of planning and preparation will result in relatively trouble-free operation of a system.

The two major environmental "enemies" of an optical disc player are excessive heat and dust. These factors, more than any others, cause the most problems in field installations. Following is a brief discussion of these and other environmental considerations.

Temperature and Humidity

If a player is installed in an enclosure that is not properly ventilated, heat can gradually build up during operation and exceed a player's operational threshold. Pioneer LaserDisc players are designed to operate reliably at temperatures up to 95° F. Exceeding this temperature for sustained time periods can cause operational problems (interrupted playback, inaccurate frame searches, etc.), as well as the possibility of eventual damage to internal components.

To prevent this scenario, temperature measurements of the air immediately surrounding the player should be taken after at least 30 minutes of normal operation in the proposed environment. "Normal operation" includes the simultaneous operation of any other heat producing devices that are installed in the same air space as the player; this is particularly important when using enclosures such as kiosks and equipment racks. It's also vital to consider the maximum ambient temperature of the area where the system will be installed. The possible impact of seasonal changes in climate should be prepared for as well.

It's also possible to operate a LaserDisc player in colder environments. Although Pioneer players are designed to operate in temperatures as low as 41° F, this limit is

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Temperature and Humidity (cont.)

rarely encountered because players are generally installed where people expect to be comfortable. If a player is operated in a cold environment, however, it's very important to ensure that it's not subjected to sudden increases in ambient temperature, as this can cause moisture condensation on the laser optics. Condensed moisture can interfere with the player's ability to focus on a disc's surface, resulting in possible playback problems.

The relative humidity range at all constant "in spec" temperatures is not critical as long as it doesn't exceed 85%. Some players will operate as high as 90% relative humidity. If these limits are exceeded, moisture condensation can form as described above.

Dust Contamination

Excessive dust is another enemy of optical disc devices. This is particularly true with respect to the objective lens surface and the disc surface. Since LaserDisc players use retro-reflective optics (fancy words for bouncing a light beam off of a reflective surface), the attenuating effect of dust is doubled. This is because the player's laser beam has to pass through a layer of dust on the way out to the disc surface, and then once again on the way back after bouncing off the disc's reflective information layer. This is further compounded if dust is on both the disc and the lens.

Fortunately, dust is not a problem in most office and school environments. Exceptions are areas where there is a great deal of cigarette smoking, construction work taking place or dust-laden materials being frequently jostled (clothing racks, for example). When a player is operated in dusty environments such as these, a regular lens and disc cleaning procedure should be implemented. The frequency of cleaning depends on the rate of dust accumulation, and should only be attempted by properly trained personnel. (Call 1-800-872-4159, to request the number for your nearest Pioneer Authorized Service Center.)

Dust can also be a problem in kiosks or other enclosures where a ventilating fan is causing a large volume of dusty air to be circulated around the player. This can be solved by installing a dust filter on the intake side of the cooling fan to prevent contaminants from entering the enclosure. Filters should be replaced regularly depending on the rate of accumulation.

Other Environmental Concerns

- Players should be mounted as flat (horizontally) as possible. Some models are only capable of performing accurate frame searches when they are mounted at a horizontal mounting angle, and have a maximum tolerance of $\pm 5^\circ$. Non-horizontal mounting of a player could also interfere with proper loading/unloading of discs.
- Players should be installed where they will remain stationary at all times while operating. Vibrations caused by movement of the player can cause playability problems. Severe movements can even cause damage to a disc or player.

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Other Environmental Concerns (cont.)

- Line voltage should be maintained within the limits of a particular model's specifications. Typically, players are designed to be operated at 120 volts, $\pm 10\%$. Although most players are actually quite tolerant of line voltage instability, severe conditions can result in performance problems.
- A player can be fastened to a mounting plate or surface, but it's important to take great care not to use screws that penetrate too far into the player's cabinet. Sometimes, mounting screws that are too long can cause short circuits or interfere with internal mechanical operations.
- **NOTE:** Excessive finger prints on a disc can also interfere with optical playback. It is recommended that discs be handled with care at all times. Hold discs by the outer edge and the center hole to avoid placing finger prints on the surface of the disc. Also, avoid scratching the disc. Never wipe smudges or dust off the disc with a circular motion, always use a radial motion, gently drawing a soft cloth from the center hole to the outer edge.