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A New Generation of Business Projectors

Is your clunky, noisy projector on its last leg? Have you been wondering if any of the newer projectors are worth an upgrade? There's good news: Today's projectors are small, lightweight, affordable, and provide high quality imagery. In this newsletter, we'll discuss the world of projectors.

To start out, there are two types of projectors on the market right now: business projectors and home theater (consumer) projectors. Since the applications are different, spreadsheets and PowerPoint presentations versus HD video, the technology needs to be different to accommodate the varied output. When researching, don't get caught up in the HD craze right now. Look at projectors that are specifically marketed for business applications.

Projector Technology



There are 3 types currently: **LCD** (Liquid Crystal Display), **DLP** (Digital Light Processing) and **LCoS** (Liquid Crystal on Silicone). LCoS is very expensive and has low contrast ratios so we'll focus on LCD and DLP for this newsletter.

The major difference between LCD and DLP is that LCD projectors use glass panels to reflect colored light while DLP projectors use mirrors. Since both of these technologies reproduce images in different ways, the output will change in different physical environments and with different source material. →

Tip of the Month

Summer's coming Are you protected?

As we head into the summer season of storms and increased energy needs for cooling, we'd like to remind everyone of the associated dangers.

Lightning strikes, although rare, happen unexpectedly and unpredictably. No house or building is immune from being hit by lightning. Likewise, **increased energy needs** for summertime cooling taxes the power companies leading to brownouts, blackouts, surges and spikes throughout the electric grid. Fortunately, there are things you can do that will mitigate any damage that these events may incur.

To prevent downtime, install UPS's (Uninterruptible Power Supplies) on all servers, phone systems and key workstations. All other devices should be connected to properly sized surge suppressors. Battery backup should be at least 15 minutes to allow adequate time for the device to shutdown properly. **[Note:** Laser printers consume too much power to attach a battery backup surge suppressor. Instead, attach laser printers to a regular surge protector that adequately supports the power requirements for the unit. If you can put the laser printer on its own circuit, this will help in balancing the power load.]

And above all, **BACKUP** your data. New hardware can be purchased, software can be re-downloaded but data is an asset that isn't easily replaced. Think of the time it would take to re-enter ALL of your data, then get on a regular cycle of creating backups, preferably stored off-site.

Then, rest easy and enjoy the summer!



The general consensus amongst reviewers is that DLP is geared more for home theater applications while LCD projectors work well in business applications. There are advantages and disadvantages to both technologies however, so depending on your needs, you may find that one technology is the clear choice. The best way to determine which technology suits your needs is to view the projector in similar conditions to where you will be presenting.

Advantages and Disadvantages to LCD and DLP

LCD Advantages

- Produces **better color saturation** and **sharpness**
- Doesn't suffer from the "rainbow effect" (see below under DLP disadvantages)
- More energy efficient; uses less power, less heat output

LCD Disadvantages

- Suffers from the **pixilation effect** otherwise known as the "screen door effect" – LCD technology is comprised of a light source, mirrors and LCD glass panels which are comprised of individual pixels. Even though there are hundreds of thousands of pixels on the LCD panels within the projector, there is still black space between the pixels that may be noticeable
- Difficult to produce true black color
- May show a decrease in color output and loss of contrast over time
- "Dead pixels" may appear marring the image. Since LCD projectors are costly to repair, it's better to replace the unit when dead pixels become problematic
- Larger and heavier than comparable DLP projectors

DLP Advantages

- Generally **brighter overall**
- Weigh less than LCD projectors so they tend to be more portable (some are 2 or 3 lbs.)
- Will not show a decrease in light output over time
- Don't suffer from the pixilation effect of LCDs
- True blacks indicate high contrast ratios for more realistic images

DLP Disadvantages

- Cannot compete on color saturation with LCD technology. DLP does not perform as well as LCD in rooms with ambient (background) lighting.
- **Rainbow effect** – rainbow striping that trails images on the screen. Some people are more sensitive to this rainbow effect while others do not see it at all or are not bothered by it. Improvements in technology have made this effect less noticeable

Resolution

At a basic level, resolution refers to the number of pixels in a display device. The more pixels there are, the sharper the images will appear. **Best advice** is to choose a projector with a resolution that matches the resolution of the computer (laptop) you will be using it with. Example: If you have a widescreen laptop with a native SXGA resolution, get a projector with this same resolution. If the projector has a higher native resolution than the laptop, the images won't be as crisp as they could be.

SVGA – 800x600; lowest resolution, inexpensive - not recommended unless you are constrained by price

XGA, XVGA –1024x768; 15" LCD monitors have a native resolution of 1024x768 pixels. To prepare for the future, purchase a projector with at least this resolution.

SXGA – 1280x1024; 17" and 19" LCD monitors; mid to high resolution; used mainly for CAD and engineering drawings that require very fine detail

WXGA – 1280x768; similar to SXGA

UXGA – 1600x1200; very high resolution used for specialty applications; very expensive

In addition to the above resolutions, you will also see 1080p and 720p resolutions listed in the specifications (1080p = 1920x1080 pixels). These refer to HD or high definition resolutions and are applicable for HD TV reception and DVD playback such as HD-DVD and Blu-Ray – geared for Home Theater viewing rather than business use (PowerPoint presentations / photos / spreadsheets).

Lumens (lux) – one of the most important criteria for projector performance

Indicator of brightness – 1000 lumens is the minimum standard currently. The room lighting conditions and number of audience members will affect how many lumens will be appropriate. The larger the room and the more ambient light present requires a projector with higher lumens to ensure a good picture for everyone. For **best results**, look at projectors that have a lumens rating **greater than 1000 ANSI**.

- DLP projectors will generally have higher lumens values than LCD projectors for the same output.
- If you will be projecting in a room with ambient light, opt for a projector with a higher lumens count, 2000 lumens or more. The higher lumens will provide enough illumination to filter out the background light.

Contrast Ratio

Secondary to lumens in choosing a business projector is the contrast ratio. Contrast ratio indicates the “depth” of the picture – how saturated the colors are and how much shadow there is in the images. In simple terms, contrast ratio is the ratio between black and white.

Contrast ratio is most noticeable in darkened rooms so if the projector room is dimly lit (ambient light), contrast ratio won't matter so much. If you plan on using the projector in a darkened room often and/or will view photos, go with a higher contrast ratio value such as **1000:1 or higher**.

Video Signals

There are many ways of connecting your equipment together. You'll find the following ports/interfaces on projectors as well as many other electronic devices. Make sure that when you purchase a new device, that the ports are compatible.

Composite – aka RCA, BNC, yellow port. Composite video is a single wire analog connection that consists of compressed component signals. Common uses: TV antenna, coaxial cable, VCR, DVD players.

S-Video – Two wire analog cable that prevents degradation of single wire composite video.

Component – Analog cable with a max distance of about 200 feet. Known as RGB and uses the familiar three jack cluster of red (PR), green (Y) and blue (PB) wires. Better option than composite or s-video for connecting devices since it can display all resolutions up to the current maximum HD (1080i).

HDMI – High Definition Multimedia Interface – An uncompressed, all digital audio/video interface used for connecting electronic devices.

DVI – Digital Visual Interface – Devices that have this video interface connect digitally eliminating conversion errors common between analog and digital interfaces. Max distance is about 25 feet.

- Note: HDMI and DVI support HDCP (High Bandwidth Digital Copyright Protection) which protects copyrighted material by encryption methods.

Optics

Most projectors have a **zoom lens** that is digital or optical. Just like in cameras, an optical zoom will deliver a better quality picture than a digital zoom. Digital zoom technology uses pixel interpolation which may introduce distortion. Another feature is **power zoom** (using a remote) versus manual zoom (must be near the projector to manually adjust the lens). Finally, many projectors offer **interchangeable lenses** for greater flexibility in projector placement.

Lamp Life (bulb replacement)

There is a wide range on how long the projector bulb will last as well as the cost of bulb replacement. Some projector bulbs will last for 2000 hours while others will only last for 500 hours. If you use the projector on a regular basis, buy a projector with a long bulb life and **factor the cost of bulb replacement into the purchase price.**

Size, Weight, Portability

Three categories: **ultralight** (featherweight) – can be carried around easily, weight between 2 – 9 lbs; **conference room** – portable but larger than the ultralights (may include additional features); weight usually between 10 – 25 lbs; **fixed installation** – expensive, can handle many lighting scenarios effortlessly, very heavy – usually requires professional installation.

Conclusion

- Consensus from research indicates that LCD projectors work very well for business applications while DLP is well suited for home theater applications.
- Resolution is more important than lumens when comparing specifications; i.e., buying an XGA projector with lower lumens is better than an SVGA projector with higher lumens.
- If you opt for a DLP projector, make sure you purchase one with above average lumens to compensate for ambient light levels. For example, if you're making a final choice between an LCD and a DLP projector, make sure that the DLP projector has a higher lumens rating (e.g., 2000 lumens) than the LCD (e.g., 1,500 lumens). If you compare a DLP and an LCD both with a 1500 rating, you'll find that the LCD performs better in rooms with ambient lighting.
- If you mainly present in rooms with ambient lighting (people need to see to take notes or people are coming and going frequently), purchase an LCD projector. DLP technology works best in darkened rooms.

There are many criteria for choosing a projector and nothing compares to **physically viewing the unit** you wish to purchase. Generally speaking though, if maximum brightness and color saturation are most important, go with an LCD projector. If the weight/size/cost ratio and true image representation are most important, go with a DLP projector.