FLAT PANELS:
AN ABUNDANCE OF RICHES
Picking the Best of an Ever-Evolving Crop

By David Keene

As long as we've been covering the digital signage industry, digital signage display and flat panels have gone hand in hand. Although video projection still dominates in the classroom, boardroom, and auditorium (for now), flat panels — especially LCD and plasma panels — seem to be the technology that keeps the digital signage market growing year after year. That's not to say there is not other display technology in the digital signage world. There is plenty. But it often seems LCD panels alone, with their inexorable economies of scale, are taking over the flat panel world.

On the surface, they often seem to be, but there are both old and newer flat panel technologies out there now, and more coming in the future. But this special supplement on flat panels is not meant to be a roadmap for the future. The industry still needs to address today's top issues: deciding between LCD and plasma, and deciding between commercial vs. consumer grade flat panels. And I could not think of two professionals more able to tackle these issues than Alan and Jonathan Brawn. They have both been involved in this industry since before we called it "digital signage." Of course, now with their DSEG (Digital Signage Experts Group) education, training, and certification initiatives, both Alan and Jonathan Brawn are again at the forefront of the industry.

Displays for digital signage take many forms, as the applications are many, and multiplying each year: point of decision, point of purchase, general awareness, wayfinding, commuting news and weather, advertising, inward facing corporate campus signage, emergency evacuation signage…the list goes on. And AV integrators, end users, and display providers continue to grapple with perennial issues regarding flat panel selection:

- Many customers want cheaper up front costs, so they ask for cheaper solutions, often confusing consumer and commercial grade products. (Most flat panel TVs have a PC connector, like a VGA connector or even a DVI connector, making their selection seductive to many.)
- Some flat panel manufacturers respond to the above, by offering their own consumer televisions through commercial channels, adding even more confusion.
- Just when it looks like LCD is pushing out plasma, plasma continues to win customers with its deep black levels, film like images, and ability to be very cost efficient at larger screen sizes especially.
- Speaking of black, it seems "Green is the new black." As Alan Brawn points out, energy consumption and Green initiatives are all important now, and the newest models of LCD and plasma displays are engineered to provide up to a 30 percent savings in power consumption compared to older models. Also, tests have shown up to a 20 percent savings in energy on properly calibrated displays versus those that are not calibrated.

In the advertising DOOH arena, as the huge Out of Home media placement companies such as JC Decaux, CBS Outdoor, and ClearChannel continue to migrate some customers to a digital signage platform, many challenges remain. The marketing challenges to this migration are daunting enough, and are the subject of much of our coverage in *Digital Signage Magazine*. While we address those challenges, it seems it's never too soon to revisit again the constantly evolving world of the digital flat panel — that mainstay of digital signage — that still offers the best platform for the rapid expansion of the market through the picking of low hanging fruit.

THE RIGHT TOOL FOR THE JOB

Commercial vs. Consumer Panels

Once again, I feel compelled to visit what is rapidly becoming a personal crusade: the battle of commercial AV and digital signage integrators to justify the use of commercial-grade equipment. It seems to be an issue that is cut and dried, but with every new generation of consumer flat panel each manufacturer introduces, the features get slicker, the displays get thinner and more and more appealing to everyone.

By Jonathan Brawn, CTS, ISF, ISF-C, DSCE

There used to be an extreme gulf between consumer grade and commercial grade panels. Consumer grade were sleeker looking, with more attention to the appearance of the bezel and stand, the depth of the product, the "look" of the remote, what the on screen menus looked like, and how easy they were to use. Commercial product, by comparison, was very simplistic, maybe even crude in comparison. But commercial displays have caught up; new LED powered commercial panels from companies like Samsung now bring that sexy thin profile to the commercial realm. And they are frequently decked out in really deluxe looking anodized aluminum, making them no slouch in the looks department. Seems like that is leveling out. So we need to turn elsewhere for differences.

In the realm of features and picture quality, the differences used to be great there, as well. Serial inputs, wide acceptance of PC input resolutions, large arrays of input options, calibration capability, and other similar advanced features have been the norm on commercial grade panels, but were largely absent on anything but the highest priced "enthusiast" type consumer product. Here, too, parity is now a way of life. While one may make an argument that there is still an appearance difference between commercial and consumer, but they are definitely close. Features, though, are now pretty much standard across the board, frequently even using the same interfaces. This one comes out as a wash.

That leaves the two truly great differences that even today I still base my arguments for commercial over consumer on: durability and warranty. There just is something lacking in most consumer grade panels when you compare them to their commercial cousins. A living room is a pretty benign environment in anyone's books. Controlled climate, clean, and not subject to extremes. Even power is much more "safe" in the home, while still tending to poor quality in most areas. Now let's take that consumer panel into a commercial environment. Issues like impact resistance (still the strong suit of plasma, by the way — sorry LCD!), cooling and dust management, and, most importantly, robust power supplies

Integrating flat panels into a "wet" environment like an anatomy or pathology lab presents a unique set of requirements, and when the University of Central Florida's (UCF) new Medical College needed an integrated monitor and touchscreen for its anatomy lab, they turned to Mitsubishi professional-grade LCD monitors (MDT521S, MDT651S, and LDT322V models), integrated with CyberTouch resistive touchscreens, for their anatomy lab.

that can take a spike that would leave most consumer grade home theater gear a puddle of rapidly cooling slag without wrecking the whole panel. This is still a serious concern! Admittedly, I have to give a point to the pro consumer grade crowd here, in a lot of well controlled retail and office environments, provided there is good power conditioning on the display, this one is less of an issue now. All right, I concede there, but warranty is still incredibly serious! And still the ultimate differentiator, between the two types of product.

That leaves the two truly great differences that even today I still base my arguments for commercial over consumer on: durability and warranty. There just is something lacking in most consumer grade panels when you compare them to their commercial cousins. A living room is a pretty benign environment in anyone's books. Controlled climate, clean, and not subject to extremes. Even power is much more "safe" in the home, while still tending to poor quality in most areas. Now let's take that consumer panel into a commercial environment. Issues like impact resistance (still the strong suit of plasma, by the way — sorry LCD!), cooling and dust management, and, most importantly, robust power supplies that can take a spike that would leave most consumer grade home theater gear a puddle of rapidly cooling slag without wrecking the whole panel. This is still a serious concern! Admittedly, I have to give a point to the pro consumer grade crowd here, in a lot of well controlled retail and office environments, provided there is good power conditioning on the display, this one is less of an issue now. All right, I concede there, but warranty is still incredibly serious! And still the ultimate differentiator, between the two types of product.

Let's leave you with a final consideration. When a commercial product is installed in a commercial location, any major manufacturer will give you a 2 to 3 year on site warranty. On a consumer product, the warranty is normally null and void when installed commercially. If you're truly lucky, it might get 90 days over the counter. This is a serious risk on the part of the customer. These displays, while affordable due to ever dropping prices, are not cheap. And replacing them frequently due to power supply problems, heat issues, or dust failures is an expensive proposition. A commercial display has a rated life in years, out in the field. Even with the incredible improvements in consumer equipment, the same just cannot be said. Perhaps one day a company will step up and unify the two product lines, but until this happens, the bottom line is always just that, at the bottom line. A commercial grade panel is a safe bet, and will not incur any unexpected costs throughout its life. Can a thin profile and shiny finish replace peace of mind? And is a small price savings worth potential replacement?

> "On a consumer flat panel product, the warranty is normally null and void when installed commercially."

Jonathan Brawn, CTS, ISF, ISF C, DSCE (jonathan@brawnconsulting.com) is a principal of Brawn Consulting, an audiovisual consulting, educational development, and marketing firm, based in Vista, CA. Jonathan is a co founder of ISF Commercial, and has extensive experience in AV systems design and integration, as well as expertise in the development of educational development programs.

FLAT PANEL DISPLAYS: THE EVOLUTION CONTINUES

Flat panels are the mainstay of digital signage, and there are some interesting new developments in both the LCD and plasma camps. Let's begin with the world of plasma. Not too many years back plasma dominated the flat panel industry. As we all know, LCD has take away a lot of their thunder but they still have reasons to hold their heads high. The first reason is their size versus price relationship. You can still buy large plasma for fewer dollars than a comparable sized LCD display. And plasma still leads LCD in overall video picture quality, mainly as reflected through image processing speed (faster response times). Another significant advantage of plasma is off-axis viewing with no color shift. Finally in the plus column, they are now delivering over 100,000 hours of panel life to half brightness.

By Alan Brawn CTS, ISF, ISF-C, DSCE, DSDE

Now on the minus side of things, plasmas still have the burn in issue to contend with and though they have vastly improved, the issue still needs to be worked around for use in digital signage where images will be on screen for significant lengths of time. Finally plasma displays are less energy efficient than comparable sized LCDs. The bottom line is that if the playback of video is the prime objective, do not overlook what companies like Panasonic, Samsung, and LG have to offer in plasma..

Now let's look at the ever popular LCDs that seem to be in every nook and cranny of the digital signage world. There have been many improvements in LCDs over the last few years, perhaps in response to and in anticipation of OLED panels that seem to be looming on the horizon. Well, OLED is not here yet and will not displace LCD in the near or perhaps even the mid-term, but we are seeing the benefits of their impending launch with numerous improvement in LCD panel design. One of the first issues to improve has been panel speed. A couple of years ago, 8 millisecond panels were common, but today we are seeing 4 millisecond and even 2 millisecond panels. The benefit is that we do not see the famous LCD "blur" in fast action scenes.

The second development in LCD is the migration from the environmental challenges of CCFL backlights to the incorporation of LEDs as the illumination source. We are seeing edge lit, bottom lit, and full LED backlit panels, and each of the big manufactures like Samsung, LG, and Sharp will roll out new LED lit models over the next few months. This gives us several benefits, including lower power consumption, a better environmental footprint, and extension of panel life to over 100,000 hours, but in this writer's opinion, the real benefit of LED illumination is improved contrast levels. As we know, contrast provides the quality of the picture and where LEDs are properly employed the contrast levels are stellar.

Another area of improvement in LCD displays is brightness. One of the issues with previous LCD panel designs was image retention or energy retention. If you looked closely at the warranties from the panel manufactures, they did not cover retained images or 24 7 365 operation. This phenomenon looks a lot like plasma burn in, but actually is not from a purely technical sense. Heat was the culprit in causing image retention and it comes from the warping of the layers in an LCD pixel that would not let the energy dissipate. The first company to the rescue was Samsung and their DID or Digital Information Display panel. It incorporates heat dissipation layers that funnel off the heat in extreme applications. The side benefit

Pei Wei Asian Diners needed to replace static signage with LCD displays for menu boards and promotional content. Pei Wei's implementation of digital signage using NEC's 46-inch MultiSync LCD4620-2-IT LCD monitors has significantly impacted the restaurant chain's need for quicker displaying of updates to its menu offerings, while eliminating the expense and paper waste of printing panels.

ONE MAJOR MANUFACTURER'S TAKE ON COMMERCIAL GRADE VS. CONSUMER-GRADE LCD PANELS

NEC, in a special webinar produced by *Digital Signage Magazine* earlier this year, outlined the major differences between NEC's panel offerings, below. (For Jonathan Brawn's assessment of the issue, see his article in this supplement.)

Commercial-Grade LCD Panels:

- Use of "A" grade commercial LCD module glass with tighter specifications
- Built for 24/7/365 operation and wider temperatures variations
- Incorporate a large palette of bi directional communication and controls
- Designed for rotation and tiling of monitors
- Incorporate diagnostics such as temperature monitoring and monitor status
- Wide variety of inputs/outputs
- 3 year standard warranty period; 5 year optional warranty

Consumer LCD TVs:

- Lower initial cost, but performance, quality, and reliability is sacrificed
- Fewer communication features and OSM options
- Not designed for extended hours of operation or wide temperature environments
- Susceptible to image retention
- Designed for accurate flesh tones (white point look pink) not colors
- Not designed for portrait mode
- 90 day commercial warranty (1 year consumer), or limited 3 year warranty

to this is the increase in brightness of the panel. The light output for a typical 40 inch LCD flat panel is approximately 400 to 450 cd/m^2 and it is tough to complete with the ambient light in the most digital signage environments. The newest LCD displays from companies like Samsung and NEC produce up to 700 cd/m^2 in their large format models.

Energy consumption and "green initiatives" are all the rage and flat panel improvements certainly add to the evolutionary mix. The newest models of LCD and plasma displays are engineered to provide up to a 30 percent savings in power consumption compared to older models. Also, tests have shown up to a 20 percent savings in energy on properly calibrated displays versus those that are not. While this might not be a big issue for single

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display installations, just imagine the impact of power consumption in projects using 10 to several hundred displays!

The concept of display calibration for flat panels has another value beyond power consumption. The ability to color match the flat panels in a video wall and to accurately reproduce the proper colors on screen is a must especially for digital signage.

Another area of flat panel evolution is in the area of environmentally robust displays capable of use in high brightness applications as well as high humidity, high temperatures, and sometimes even in the rain. Companies like Sanyo and Planar produce large format LCDs that are "water proof" and companies such as Samsung and Vartech produce panels that produce up to 2K nits of light output.

The world of flat panel displays is anything but stagnant. We are seeing giant leaps in flat panel evolution and the newest models are coming in at less than 1 inch of thickness. We are at the very beginning of new illuminations sources with LED illumination for LCD taking the early lead. Energy efficiency is now being taken seriously and, last but not least, 3D without glasses is on the horizon at least in a limited sense. As a final admonition, keep organic light emitting diode (OLED) displays in the back of your mind. Several of the major flat panel manufacturers are investing heavily in larger OLED flat panels. Each one is looking for product differentiation and we the consumers and resellers of these products are sure to benefit.

Alan Brawn, CTS (alan@BrawnConsulting.com) is a principal of Brawn Consulting LLC an audio/visual and IT consulting, educational development, and market intelligence firm with national exposure to major manufacturers, distributors, and integrators in the industry. Brawn is a member of the Imaging Science Foundation and managing director of ISF Commercial. Most recently he became Director of the Digital Signage Experts Group certifying professionals in the digital signage industry.

Visit www.digitalsignageexperts.org for information about the Digital Signage Certified Experts program — including information on flat panel display calibration.

For an update from Alan Brawn on 3D developments for flat panels, visit the online digital edition of this publication, available at digitalsignageweekly.com.

FLAT PANEL PRODUCT BRIEFS

Samsung Thin LCD

Samsung Electronics America has introduced its newest Large Format Display (LFD) series. The Samsung Syncmaster LED LFD 460EX, 460EXn, 550EX, and 550EXn are the first LFD displays to incorporate LED Backlight Unit (BLU) technology providing a significant savings on energy consumption in a lighter, thinner, and easier to install setup. This LED LFD series is Samsung's thinnest, lightest and most energy efficient professional LCD display in the 46 inch and 55 inch screen class to date. Measuring only 1.6 inches deep and with a 43 percent weight savings over similar models, it is easy and quick to install in almost any environment. To find out more about becoming a Samsung Power Partner, visit www.samsungpartner.com.

Sony E-Series LCD

Sony Electronics' new E Series of professional LCD display technology is designed to address marketers' needs and issues when it comes to fully utilizing digital signage. The Sony E series of LCD public displays incorporates a high quality, professional 42 inch LCD panel, which offers superb picture quality in full HD resolution. The series' first model, the FWD S42E1, offers excellent quality per cost for digital signage applications, and delivers features typically associated with higher end models. The FWD S42E1 is designed to be ecologically conscious, with a stylish slim bezel design that accentuates the viewing area while reducing the use of plastics. Whether used in portrait or landscape installations the monitor operates with low power consumption (typically less than 100 watts). For more information, visit http: pro.sony.com.

Almo Professional A/V Educational Rewards Program

To help its reseller partners turn buying power into brain power, Almo Professional A V, the audiovisual distributor, has launched Almo EDGE, the first distributor reward program that allows partners to earn points toward training courses worth InfoComm International CTS renewal units. Enrollment in the Almo EDGE program is free and open to all Almo Professional A V partners. "Our goal is to give our partners more than just a product we want to give them a competitive edge," explains Sam Taylor, executive vice president and COO for Almo Professional A V. "If they are going to invest in a partnership with Almo, then we're going to give back the opportunity for them to learn, develop their business and advance their careers. Education has and always will be our priority it's one of the primary ways Almo stands apart from the distributor pack." Taylor adds that training is a necessary part of career advancement but it's also a reward that can extend further to increase employee retention and even improve morale. To enroll in the Almo EDGE reseller rewards program, visit www.almoproav.com.

LG Electronics SignNET

Making it simple to incorporate full digital signage solutions in commercial environments, LG Electronics has announced SignNET, a turnkey digital signage solution. Making it simpler to buy, sell and use digital signage, LG SignNET includes hardware, software, and starter templates as well as news feeds from CNN all available at an affordable monthly cost. Right out of the box, digital signage content can be created simply using almost a dozen starter templates that are customized for numerous vertical markets. LG SignNET also has the ability to connect third party content designers for creating engaging advertising and content. These certified developers will then provide paid, custom content and resources for a growing base of SignNET users that want to personalize their content beyond the templates available. For more information, visit www.LGSolutions.com.

NEC 42-inch 1080P LCD Display

NEC Display Solutions of America has announced the addition of the 42 inch V421 to its value driven V Series. These cost effective LCD displays provide an assortment of features to entry level digital signage users. The new V421 dazzles passersby with full high definition details using high contrast and brightness. Its full selec

tion of inputs, from HDMI to 5 BNC, allows customers the ability to connect a variety of secondary devices to the display, as well as the opportunity to remotely monitor and control the display by utilizing its Ethernet port. To dissipate potential damage and encourage interactivity, the V421 is protective glass and touch panel ready. Its real time scheduler enables the advanced scheduling of content and power on off, which saves both time and energy costs. For more information, visit www.necdisplay.com.

Mitsubishi MDT651 Commercial-Grade 65-Inch LCD

Mitsubishi Digital Electronics America's Presentation Products Division has introduced a new 65 inch LCD monitor, the first monitor in Mitsubishi's line that is IP addressable for easy control and management, using Mitsubishi's own networking software. Unlike many digital commercial displays on the market today, the MDT6518 65 inch LCD is one of the first monitors to offer both front and rear ambient light sensors that detect lighting conditions in two areas. These sensors adjust the monitor's brightness level based on its readings and automatically balance image brightness for optimum viewing, regardless of the brightness of the ambient light either in front of, or behind the monitor. For more information, visit www.mitsubishi presentations.com

Panasonic 47- and 42-inch Models Optimized for Bright Venues

Panasonic Solutions Company has announced two new LF20 Series Full HD LCD displays, the TH 47LF20U and TH 42LF20U, the company's first professional LCD models for general purpose signage. Distinguished by high brightness, slim design, light weight, and a wide range of professional features, the new displays will deliver powerful performance in such demanding signage venues as shopping malls, public transportation, and other commercial facilities. With a full 1920 x 1080 pixel In Plane Switching (IPS) panel, the new 47 inch and 42 inch LCD displays feature an expanded color gamut to ensure vivid, true to life color. The LF20 Series displays have a high level of brightness that accurately conveys information even in extremely bright, open spaces (brightness is measured at 700 cd/m^2, with wide 178 degree horizontal/vertical viewing angles). For more information, visit www.panasonic.com/proplasma.

Planar Energy-Saving LCD

Planar Systems, Inc. has unveiled a new energy saving LCD Video Wall: the Clarity Matrix LX. The Clarity Matrix LX model is engineered to consume 17 percent less power than the standard Clarity Matrix MX model when operating at full brightness and is designed for corporate and control room environments with relatively low ambient light conditions. While Clarity Matrix LX operates at a lower power level, the system incorporates the capabilities and characteristics that differentiate the Clarity Matrix video wall family, including the thinnest installation profile (only 4.5 inches including the mount), narrow image to image gap (only 7.3mm), front serviceability, superior image alignment, redundant power supplies, and the quietest video wall available in the industry — the video wall itself has no fans. The unprecedented ease of installation and serviceability with rack mounted electronics, built in video processing, and monitoring capability sets the Clarity Matrix family apart. For more information, visit www.planardigitalsignage.com.