

Touch at Display Week 2007

With more than 40 companies involved in touch technology on the show floor at Display Week 2007, this is a segment of the display business that demands attention as never before. This overview of the trends and major announcements at Display Week is a good place to start.

by Geoff Walker

THE annual Display Week Symposium is certainly the largest exhibition venue for touch technology in North America, and quite possibly in the world. Fifteen touch-screen manufacturers exhibited at Display Week 2007, along with more than two-dozen related companies showing touch controllers, materials, enhancements, integration, haptics, and monitors.

Despite such a large presence on the exhibition floor, several of the touch exhibitors at Display Week expressed some surprise at the lack of representation of touch technology during the SID Symposium (just one oral presentation and one poster presentation). They were not sure if this was symptomatic of the touch industry or if there is a prejudice against touch because it is not technically a display technology. Nonetheless, what follows is a look at the noteworthy developments in touch technology demonstrated at Display Week 2007.

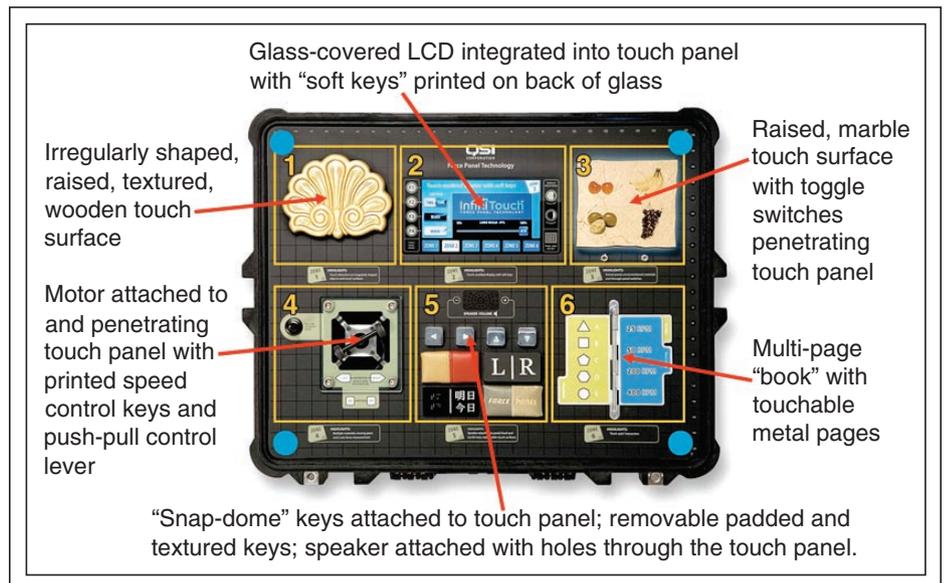
Touch Themes

Outdoor readability was a hot topic on the show floor. At least half of the touch-screen manufacturers were showing or talking about enhancements for outdoor readability. **A D Metro**, best known for its armored resistive touch screens, referred to an “explosion” of

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customer interest in outdoor readability for touch-screen displays, driven by the automotive and marine markets. **PanJit Touch Screens**, who demonstrated a wonderfully enhanced touch-screen-equipped tablet PC, said that 85% of its booth visitors were focused on outdoor readability. **Advanced Link Photonics**, a provider of both standard and touch-screen-enabled display solutions, demonstrated displays that had been enhanced with a transflector film; it was surprising how well the displays could be read with the backlight turned off and a spotlight aimed at the screen.

Multi-touch technology was also quite visible on the show floor, with several touch-screen manufacturers using it in their demos. For example, **IRTouch Systems Co.** created its own multi-touch gesture vocabulary in which one finger did the usual inking and dragging; two fingers zoomed, shrunk, and rotated the current image; three fingers moved all the images on the screen; five fingers minimized the current window; and 10 fingers zoomed the entire screen. In **eGalax eMPIA Technology’s** demo, horizontal movement of two fingers rotated an image, while vertical



QSI Corp.
Fig. 1: QSI’s “Force Panel Technology” demo box illustrated numerous objects and textures attached to and penetrating a single touch panel.



Hewlett-Packard Co.

Fig. 2: Hewlett-Packard's TouchSmart all-in-one "family" computer incorporating NextWindow's 1900 optical touch screen.

movement of two fingers tilted an image. Although a substantial portion of the current interest in multi-touch seems to have been created by the hype surrounding the Apple iPhone, Microsoft demonstrated at the Windows Hardware Engineering Conference in May how they are considering integrating multi-touch technology into Windows Vista, so it looks like it is here to stay.

Significant New Touch-Product Announcements

3M introduced its Flex Capacitive product, a

projected-capacitive touch screen aimed at the mobile-handset market. The initial sensor is a single layer of PET film with an OEM-specified conductive pattern; two-layered sensors, formed on two separate PET layers, may be developed in the future depending on OEM requirements. 3M said that the conductive lines on the sensor were 250 μm wide, but that it was doing miraculous things with index-matching (AR) to minimize their visibility. The author closely examined two different 2-in. samples of the sensor and was completely unable to see any sign of visible conductors – it was hard to believe with 0.25-mm-wide lines!

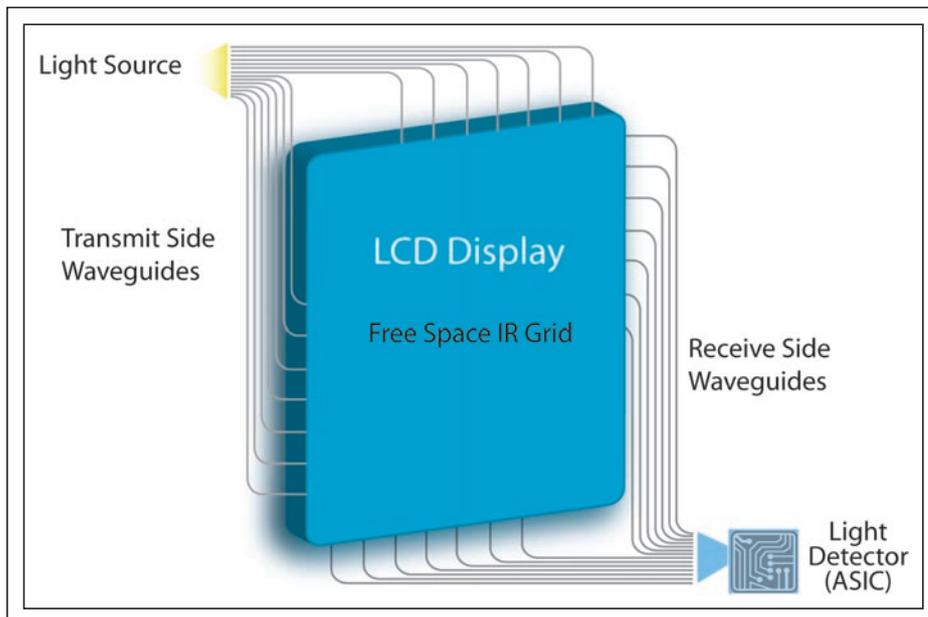
QSI Corp. launched its "Force Panel Technology," a new/old touch technology based on sensing the actual force exerted by a touch through the use of strain gauges. QSI created a very clever demo box (Fig. 1) in which the entire top of the box is a single touch panel containing a wide variety of materials and textures as well as an embedded display with soft keys, a motor with speed controls, a loud-speaker, and through-panel switches. The fascinating aspect of this touch technology is that any semi-rigid material can be used as a touch surface, even a pile of rocks! This opens up new "architectural" applications for touch far beyond simple display touch screens.

NextWindow Ltd. introduced its 1900 OEM-integrateable optical touch screen which uses two line-scanning CMOS cameras (one in each upper corner of the screen) to detect the shadows of a touching finger. The finger is backlit by light from a pair of IR-emitting LEDs that is reflected off strips situated around three sides of the screen. Apart from the intriguing technical aspects of NextWindow's optical technology [e.g., stylus-independence superior drag performance, multi-touch, simulated hover, object-size recognition, and human-interface-device (HID) compatibility], the most interesting aspect of the introduction was the announcement that the 1900 is currently shipping in the Hewlett-Packard TouchSmart all-in-one "family" computer (Fig. 2). This is the first time that optical-touch technology has been used in a mainstream consumer device, and it represents the emergence of optical touch into direct competition with the other more-traditional touch technologies.

RPO announced its "Digital Waveguide Touch" optical technology, targeted at touch-screen manufacturers. RPO's optical waveguide product provides an alternative method of distributing infrared light in an IR touch screen. In use, light from a single IR LED source is distributed in the x and y directions by a pair of waveguides and then channeled by a second pair of waveguides to an ASIC containing one photosensitive element for each track in the waveguide (Fig. 3). The waveguides, which can have a resolution as high as 10 μm , are made several hundred at a time on a large flexible substrate using photolithography techniques and then cut apart.

Conclusion

The overall impression of touch at Display Week 2007 was one of a vibrant, rapidly changing industry. Many indicators pointed in this direction, including the announcement of new technologies such as QSI's force-sensing touch; improvements in existing technologies such as RPO's IR waveguides; the announcement of new products such as 3M's Flex Capacitive and Zytronic's rear-projection touch sensor; the emergence of NextWindow's optical touch as a mainstream technology; the proliferation of multi-touch; the presence of first-time exhibitors such as LeadingTouch and Liyitec; and Bergquist's expansion into glass—glass resistive touch screens. ■



RPO

Fig. 3: Schematic diagram of a touch screen using RPO's "Digital Waveguide Touch" optical waveguides.