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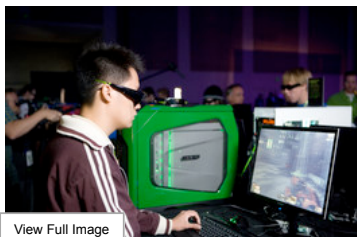
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By DON CLARK, BEN CHARNY, AND JERRY DICOLO

Animation giants have vowed this year to turn three-dimensional technology from a curiosity to a fixture in theaters. Now comes the attack on homes.

The quest to deliver 3-D versions of television shows, movies and videogames to the living room will be a hot topic at this week's Consumer Electronics Show, which kicks off Wednesday night in Las Vegas. The offerings face some big challenges -- including a grim economy and the difficulty of persuading users to wear special glasses associated with most 3-D technologies.



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Nvidia Corp.

Special glasses from Nvidia allow many videogames to be played in 3-D.

Yet some industry executives see the technology as an inevitable step to generate user excitement now that high-definition TV sets are reaching a mainstream audience. "The next big wave is 3-D," says Bob Perry, a senior vice president at Panasonic Corp.

Some of the key building blocks have already arrived, and more are expected at CES. (Please see related article.) Companies including Samsung Electronics Co., Mitsubishi Electric Corp. and Hyundai IT Corp. have begun selling what they call "3-D

ready" TV sets. Such new sets and computer monitors refresh images at high speed to help reduce the headache-inducing tendencies of early 3-D offerings.

There isn't much programming yet to exploit the new TV sets. But companies such as Dolby Laboratories Inc. and TDVision Systems Inc. plan to use CES to discuss new formats to encode and distribute 3-D signals, removing a roadblock to creating content.

Many videogames were created using 3-D modeling techniques, making it easy to render them in three dimensions. Chip maker Nvidia Corp., for example, at CES is introducing for \$199 special glasses and associated software that it says can play more than 350 existing videogames in 3-D for users with advanced displays. In a demonstration, zombie enemies in one shooting game appear to grab in front of the screen, while players dodge and fire around 3-D bushes and trees.

"When you've seen it, you kind of don't want to go back," says Dan Vivoli, Nvidia's senior vice president of marketing.

Simulating three dimensions requires two images, one each for the user's left and right eyes. One approach used since the 1950s distinguishes the images using colored filters in paper glasses. That technology, known as anaglyph, has recently been used with DVD versions of 3-D movies released in theaters.

But consumer-electronics companies want to create a much richer experience in the home, akin

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Companies within this Article

Panasonic Corp.(6752.TO)	1,141.00	28.00	1/4
Texas Instruments Inc.(TXN)	16.04	0.52	1/2
NVIDIA Corp.(NVDA)	8.71	0.64	1/2
Koninklijke Philips Electronics N.V. ADS(PHG)	20.73	0.86	1/2
DDD Group PLC(DDD.LN)	3.50	0.12	1/2
Prudential Financial Inc.(PRU)	30.77	0.51	1/2
Realdolmen N.V.(REA.BT)	0.16	0.00	1/2

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to the eye-popping effects being shown in theaters by companies such as [DreamWorks Animation SKG Inc.](#) and [Walt Disney Co.](#)

Their animated movies exploit a projection technology using polarized light and inexpensive plastic glasses, which creates effects that most viewers prefer over anaglyph technology.

For the home, Nvidia and other companies at CES favor what the industry calls active glasses, with shutters that are synchronized to open and close rapidly with the aid of an infrared emitter. Those approaches require fast-refreshing TV sets or displays and are considerably more costly than the anaglyph or polarized glasses.

The first of the 3-D ready TV sets use a rear-projection technology from [Texas Instruments Inc.](#) known as DLP. But some companies also have begun selling flat-panel models that can play 3-D content. Samsung, for example, in February began selling a 3-D-ready plasma TV set in a 42-inch version for \$1,850 and in a 50-inch model for \$2,656.

More high-end 3-D ready models are due this year, according to Samsung executives who spoke at a recent technology forum in San Francisco, saying the technology could help counter a generally weak market for TV sets. "3-D TV is real, and it is here," says Yun-Tae Lee, Samsung senior vice president.

Panasonic at CES plans to demonstrate a special Blu-ray DVD player that will be able to play back movies with 3-D images, with high-definition quality images for the right and left eyes. Filming in 3-D typically requires at least two cameras placed next to each other. If cameras need to be moved or aren't properly synchronized, users can experience nauseating effects, says Sandy Ciiman, chief executive of 3ality Digital LLC. His company sells technology that helps manage cameras for 3-D shooting and helps produce high-profile 3-D events.

The company last month helped shoot a National Football League game in 3-D for the first time and is taking part Thursday in a 3-D broadcast of the college football championship game to theaters equipped with technology from [RealD Corp.](#)

Getting such signals to homes will take time. Some broadcasters aren't eager to explore 3-D yet because they have just invested to upgrade their networks for high-definition TV and are still waiting for a return on that investment, according to Michael Lewis, chairman of RealD.

There are exceptions. On Thursday, the [British Sky Broadcasting Group PLC](#) -- known as the Sky Network in the U.K. -- says it has begun filming some sporting events in 3-D. On Dec. 18, the network demonstrated a 3-D TV in operation at its West London headquarters.

But there's no agreement on a standard format for broadcasting 3-D events, nor for storing movies on discs to be played in the home. Movies can be adapted for today's 3-D ready TVs, but studios aren't expected to do so until they can be sure they are compatible with most user equipment -- hoping to head-off the kind of standards battle that raged until Blu-ray emerged as a high-definition standard, Mr. Lewis says.

Dolby, known for setting audio standards, is proposing a format that it says is compatible with existing DVD and Blu-ray players and 3-D ready TV sets. Companies could encode 3-D images alongside two-dimensional versions on one disc, avoiding the problem of maintaining two sets of inventory, says Bill Jasper, Dolby's chief executive.

Others, including RealD, TDVision and [DDD Group PLC](#), also are hoping their technology will play a role in any 3-D format. Proposals are being evaluated by groups that include the Society of Motion Picture and Television Engineers, which may take 18 months to settle on a standard, estimates Wendy Aylsworth, an engineering vice president with the group. Picking a technology that doesn't require glasses -- an approach favored by companies such as [Philips Electronics NV](#) -- may take several years, she says.

Meanwhile, exactly how consumers will react to home 3-D isn't clear. The Entertainment Technology Center, a consortium at the University of Southern California funded by major studios, has set up a lab so that 3-D systems can be evaluated side-by-side and shown to students and other users.

In a soon-to-be released survey conducted by the center and the Consumer Electronics Association, which sponsors CES, 16% of U.S. adults said they are interested in watching 3-D movies or television programs in their home. That's pretty good considering that few people know anything about home 3-D, says David Wertheimer, the center's chief executive. Nearly 19% of the respondents said they would prefer seeing a film at a theater in 3-D. Only 5% said they've seen a 3-D demonstration on one of the new TV sets, according to the survey.

—Christopher Lawton contributed to this article.

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