VIDEOGAMES IN THE FAST LANE

With 16-bit microprocessors under the hood, the latest videogames deliver warp-speed action, 3D-like graphics, a rainbow of color and digital sound. Soon, you'll play by phone.

BY FRANK VIZARD, Contributing Editor

THE DIFFERENCE between playing videogames at home and at the amusement arcade is narrowing, thanks to the arrival of more powerful machines that plug directly into your television. Although they are more expensive than videogame systems that are already in many homes, the new game systems offer greater complexity, more realistic and colorful graphics, better sound and a lot more action.

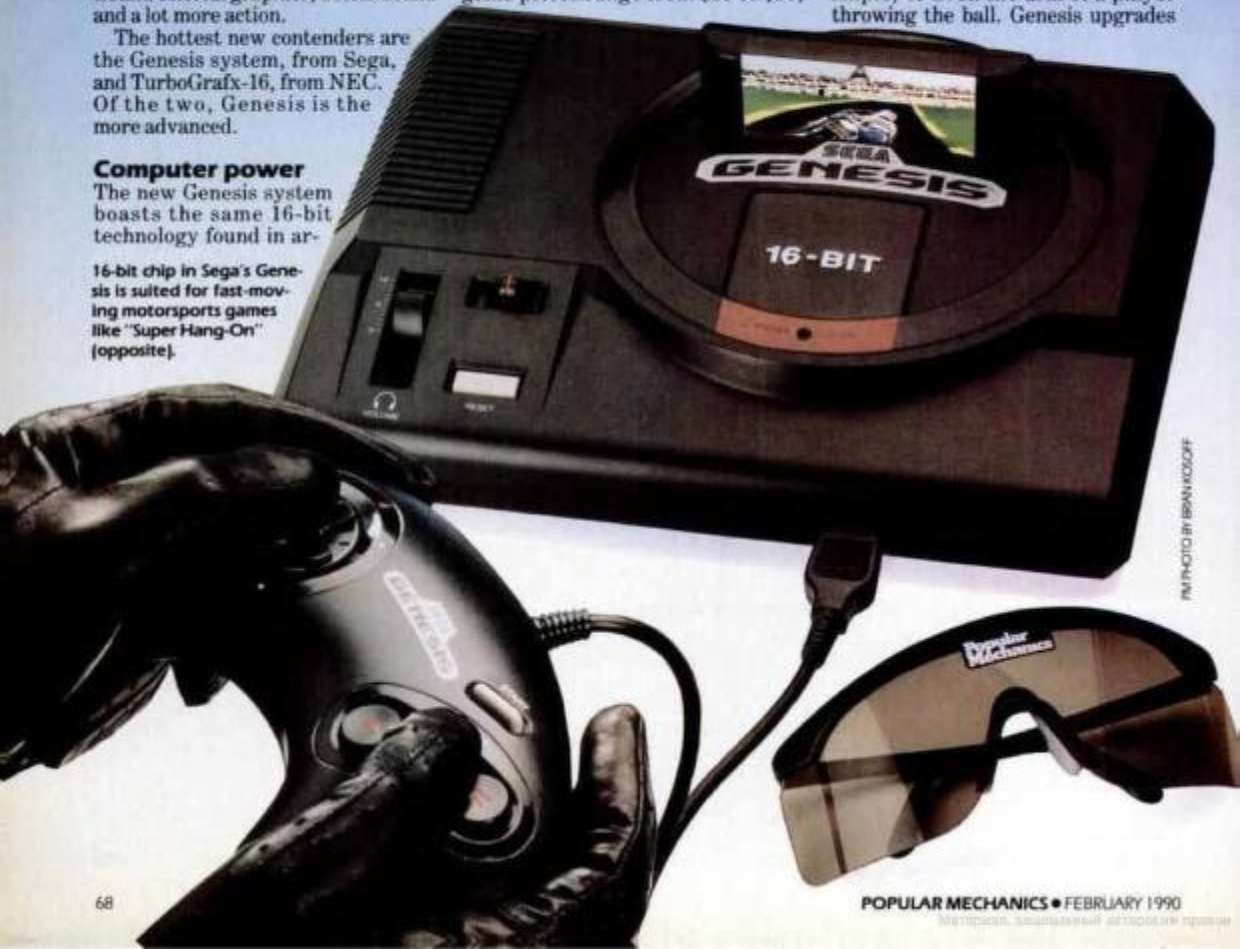
The hottest new contenders are the Genesis system, from Sega, and TurboGrafx-16, from NEC. Of the two, Genesis is the more advanced.

Computer power

The new Genesis system boasts the same 16-bit technology found in arcade games, and it also uses the same Motorola 68000 microprocessor as an Apple Macintosh computer. By comparison, conventional videogames like Nintendo's and even Sega's previous system use 8-bit digital processing. The extra computer brainpower gives Genesis a list price of $189, roughly $100 more than what 8-bit systems sell for in stores. Individual game prices range from $30 to $50, comparable to the cost of present videogames.

To fully appreciate the technical ability of Genesis, it's helpful to study it against the immensely popular Nintendo system.

The Nintendo system has 52 colors available, four per sprite. Sprite is videogame jargon for any on-screen movable object—a baseball, for example, or even the arm of a player throwing the ball. Genesis upgrades



16-bit chip in Sega's Genesis is suited for fast-moving motorsports games like "Super Hang-On" (opposite).

PHOTO BY BRIAN KOSOFF

the amount of color considerably. It offers 512 colors, with 16 available per sprite. Genesis also offers more sprites, 80 versus 64 for an 8-bit system. This means that more on-screen objects can be created, with more lifelike detail and greater mobility. A ballplayer's throwing motion, for example, can show greater articulation of the body joints—including movement of the eyes.

3D-like images

The added brainpower of the Genesis system is evident in other ways. Most games present an on-screen character moving against a stationary background. Genesis independently scrolls both the foreground and the background to achieve perspectives that are almost 3-dimensional in appearance. All of the action is seen in greater detail because of the Genesis system's finer resolution. Genesis offers a resolution of 320 × 224 lines, while Nintendo offers 256 × 240 lines.

The Genesis control pad includes a third ACTION button—one more than usual—to control on-screen action more precisely. Only one control pad is supplied with the game although there are ports for two. The second control pad must be purchased separately.

Although the visual upgrade is most immediately evident, the sound quality of the Genesis system also is an improvement over the tinny char-

Finer resolution is one attribute of 16-bit video graphics, giving depth and texture to scenes in Sega's "Last Battle."

Lifelike color and stereo sound effects are another bonus of 16 bits (notice the muzzle flash). Both excel in Sega's "Thunder Force."

A 16-bit system screens more objects, with more realistic motion. Sega fields a chopper task force in "Super Thunder Blade."

acter of older systems. Stereo sound is available through headphone inputs. Audio has been generally improved by the addition of true-to-life sound effects.

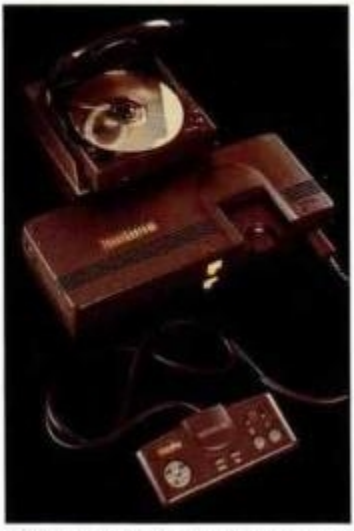
All the advantages of the Genesis system are apparent in a game such as "Tommy Lasorda's Baseball." It's as realistic as the Nintendo system's "RBI Baseball," and has better action and graphics.

The 16-bit technology employed means that a variety of information screens provide contestants with data as the game progresses. Updates include speed of the last pitch, the count of balls and strikes, the number of outs, and statistics on both the pitcher and batter. There's also a small white outline in the lower right corner that shows all the players and their locations. Lineups and pitchers are chosen according to stats on file for each team member. Once the game begins, look for all the stealing, bunting and fielding you'd see in a real baseball game. At times you'll even see the stitching on the ball.

Play by phone

Soon, baseball fans will be able to play "Tommy Lasorda's Baseball" and popular arcade titles, such as "Altered Beast," against cross-town or cross-country rivals—by telephone. Players will use a specially designed TeleGenesis modem that connects to your home phone line. The modem is scheduled for delivery later this year. Based on an evaluation of the system during a recent trade show, the data exchange between two callers is virtually instantaneous. Besides the telephone modem option, Genesis is equipped with an expansion port that could be used for a keyboard or other extras to be developed later.

Genesis also is backward compatible in that all the older Sega games can be played on the new system. An optional "power base converter" allows the existing group of more than 80 games to be played, although the 8-bit games do not benefit from the more powerful 16-bit microprocessor.



NEC's TurboGrafx-16 system brings compact disc technology to videogames. The CD option enhances game complexity.

TurboGrafx-16

Also using 16-bit technology is NEC, a new name in the videogame business. The company's TurboGrafx-16 system ($199) uses 16-bit technology only in its handling of a game's graphics. Like the Genesis system, therefore, the TurboGrafx-16 has 512 colors available, 16 for each sprite. But it fields only 64 sprites, and resolution is limited to 256 × 212 lines. Other than its excellent graphics, the NEC TurboGrafx-16 system operates like any older 8-bit system in its gaming capabilities, though NEC does add stereo sound for much improved audio.

From an operating standpoint, the NEC TurboGrafx-16 system will look familiar to anyone who's ever seen a Nintendo system. There are some differences, however, not immediately apparent to the eye.

One difference is that the game console comes with only one port, for a single control pad. If more than one person wants to play a game simultaneously, the competitors must use an optional TurboTap controller ($20) and control pads. The TurboTap controller allows up to five players to compete at once. Each additional control pad costs $20.

Every TurboGrafx-16 control pad has a 3-position switch over each of its two ACTION buttons. These switches control the rapidity of fire in shooting games. The switches are also important in games such as "Victory Run," a simulation of the Paris-to-Dakar automobile rally. The switches and buttons determine your ability to shift gears and control your rate of speed.

The CD option

Also different is the appearance of the TurboGrafx-16 game cartridge. It is about the size of a credit card, and slips into a small slot on the game console. It is as if you were using an automatic bank teller machine. Game playing can be expanded with a novel compact disc player that attaches to the front of the game console. A compact disc can store up to 550 megabytes of information, roughly the equivalent of 300,000 typed pages. CD-based videogames promise levels of complexity not otherwise available. The digital audio capability also promises some good special sound effects. The $399 CD player is specially designed to interface with the TurboGrafx-16 system. It can also be used to play standard 3- and 5-in. music CDs, as well as CD+G (graphics) discs.

Other options for the TurboGrafx-16 system include a joystick with slow-motion capability ($45) and an adapter ($35) that provides direct video and stereo audio to a home entertainment system.

Despite the merits of NEC's TurboGrafx-16, the Genesis system from Sega clearly points the way toward the future of videogame playing. The 16-bit system is the closest homebound players can get to the arcade experience and soon, the telephone will let them compete across town or across time zones. **PM**

"Victory Run" for TurboGrafx-16 celebrates the Paris-to-Dakar auto rally. Advanced controls facilitate shifting and steering.

TurboGrafx-16's optional CD player can be used for musical entertainment, too. Your CD player controls are displayed on screen.

Another 16-bit benefit is more on-screen information. Notice the first and third base windows in NEC's "World Class Baseball."