

Atari sets off fireworks!

Using Zoomracks to organize the light show.

by Matthew Stern

The Atari 800XL at Astro Pyrotechnics produces the most spectacular graphics you've ever seen. Its screen is the entire night sky. Sprites burst into ribbons of color. It can punctuate images with thunderous bangs and cannon bursts. The Astro Pyrotechnics Atari doesn't paint with pixels. It paints with fire.

Astro Pyrotechnics is using Atari computers to run its fireworks business. Their computers not only produce information; they can produce an entire fireworks show.

Instrumental in adapting Ataris to the fireworks industry is Robert Veline, who works in research and development.

He brought his fascination with computers and electrical engineering to his profession. With Atari computers, Robert says, "We are using technology to produce better art."

Preparing for blast-off.

Producing spectacular fireworks shows requires careful planning and organization. Large shows, like the ones Astro Pyrotechnics puts on for the Hollywood Bowl, Magic Mountain in Valencia, California and Knott's Berry Farm in Buena Park, California, can use 700 to 1,000 rounds of fireworks. To produce a successful show, all the fireworks have to be in the right place at the right time.

For this important task, Robert uses an Atari 520ST and **Zoomracks** from Quick-view Systems.

Robert enters into **Zoomracks** a schedule, called a *queue sheet*, which lists all the events in the show (called *queues*) and the fireworks needed for them. With this information, **Zoomracks** provides a number of reports: a pull sheet listing the fireworks needed for the show, an inventory list indicating which items are available in stock, and packing lists designating which fireworks go to which location.

Before using **Zoomracks**, Astro Pyrotechnics had to put together inventory and packing lists by hand. Workers had to carefully check and recheck their queue sheets to make sure they had all the fire-

works they needed. Even then, it was easy to make mistakes.

Robert said putting queue sheets on computer has greatly reduced the chance of error. "We can double and triple check to see if we have all the items there. It's not as likely you're going to miss one queue. It eliminates those times when the truck is in the driveway and someone shouts, 'Hey, we forgot the yellows!'"

Zoomracks also makes it easy to locate fireworks for certain special effects. For example, if a queue calls for red, white and blue aerial bursts, **Zoomracks** can search for fireworks that can perform the effect, and tell how many of them are in inventory.

The ST also simplifies the complicated job of calculating expenses. Figuring the manufacturing cost of each firework requires a sophisticated formula based on labor costs and the amount of chemicals used. Astro Pyrotechnics uses about 120 different formulas.

Plant Manager Stewart Carlton admitted that, be-



Fireworks *continued*

fore using computers, they seldom calculated these costs because it was too time consuming. Since Robert put this information in a **VIP Professional** spreadsheet, Astro Pyrotechnics can generate cost information in seconds. When material prices change, the totals can be updated instantly.

Stewart is a fireworks industry veteran who still likes to do things traditionally. But he likes using the Atari ST, because "it is simple enough for someone who is not a computer nut to use."

Robert remarked that the computer still requires time to key in the information. However, computers "present information in more comfortable formats to work with. We can get information in packages we didn't have before."

Getting a bang out of an Atari.

Robert and his step-brother Rick Rolle designed and built a computerized firing box with an Atari 800XL. A firing box is a device that sends an electrical charge to the fireworks, to set them off.

The Atari firing box is in a metal briefcase. Inside, there's a normal 800XL and cover. A small black-and-white TV serves as a monitor. The software has been transferred to a cartridge, so it's loaded upon starting up. The box contains a built-in rechargeable battery that can run for an hour and a half. (Most fireworks shows last just fifteen minutes.)

Robert explained, "It is still a full-functioning Atari. You can run BASIC programs on it just as on any other Atari."

But this firing box *isn't* like any other Atari. It contains additional features for testing and launching the fireworks. Instead of a normal on/off button, there's a locking switch. This prevents just anyone from turning on the machine and launching the fireworks. Transistorized circuits send electrical charges to the fireworks when signaled by the computer.

Four serial ports link the computer to up to four terminal boxes. Each box has five rows of screws: one screw for each queue. From the screws, workers attach long wires to electric matches (called *squibs*) which launch the fireworks. The firing box can launch up to 400 queues, each having 10 to 20 rounds of fireworks. Most shows only use 100 to 150 queues.

The Atari firing box can check all the circuits before firing, and display the ones that aren't working. This eliminates the chance of missing a queue because the circuits weren't ready.

Fireworks can be launched manually or automatically. The firing box has a jack for



Robert Veline with the ST, which Astro uses to produce the shows.



Computerized firing box uses the Atari 800XL.

plugging in a manual firing button. In live shows, like musical concerts at the Hollywood Bowl, fireworks are launched manually. Robert told me that, at a performance of the *1812 Overture*, a firing button was given to the drummer so he could fire the cannon at the precise beat.

For shows with prerecorded soundtracks, fireworks can be launched automatically. The soundtrack sends a tone to the computer when a display is to be launched. The Atari firing box launches the next queue of fireworks. Robert keeps the manual firing button handy, in case the computer doesn't receive the tone or launch the fireworks.

After the show, the firing box indicates any fireworks that weren't launched. The crews can thus find out which fireworks may still be dangerous, to make cleaning up much safer.

Before putting the Atari firing box together, Astro Pyrotechnics used a TTL terminal. It could launch fireworks by push-button or tone, but it had limited testing capabilities.

High-flying plans for the future.

Astro Pyrotechnics plans to use their Atari to further automate their shows.

Robert said he's just started scratching the surface of what the Atari firing box can do. "It offers maximum flexibility," he explained, "because it's a computer."

One feature Robert is working on is the

ability to disable fireworks prohibited under adverse weather conditions. "If it's too windy," he explained, "the Fire Marshall won't allow us to launch certain fireworks. I'll be able to flag those queues and skip them under those conditions." The Atari firing box can also change to alternate queues with acceptable fireworks.

Eventually, Robert wants to take a queue sheet generated on the ST, transfer it to the cartridge, and have the firing box launch the fireworks automatically.

Robert also hopes to design fireworks displays right on his computer screen. One step toward that goal is a program he wrote on the ST in GFA BASIC. It flashes multicolored aerial fireworks against a black screen. The colored lights fall to earth according to their fireworks type and gravity. "Some day," Robert mused, "I'd like to see a fireworks CAD program."

The field of fireworks is still one for craftsmen. Most fireworks are still made by hand. Displays are set up and wired by skilled workers. With Atari computers, Astro Pyrotechnics is bringing high technology to an ancient art. //

Matthew Stern has written about a number of computer systems, and currently works as a technical writer at AST Research. You can reach him at the ATARI16 Forum on CompuServe, ID number 73547, 2420.
