

## Galil and GlobalSim Help Crane Operators “Catch the Swing”

New, sophisticated software simulation is helping train the men and women who operate the big cranes used in construction and on the docks. With crane simulation, they learn to safely operate or “catch the swing” without harming themselves—or the multimillion-dollar cranes.

Crane simulation training is a relatively new and significant development in operator training. Modern cranes require extensive training to operate.

The GlobalSim simulators can provide this training before the operator gets his hands on a real crane, preventing fatal errors, injuries, and the destruction of both the surroundings and the crane itself. In the simulator a seat encased in a “cab” is attached to a motion base controlled by a Galil DMC-1240 motion controller. The controller directs large 20-amp, 300-volt motors along four axes: xyz and w.

The operator sees and feels whatever he might experience in a real crane. Sitting in the cab, he operates a set of joysticks as he looks out at a visual display. The simulator selects various loads such as shipping containers and crates, different terrains, traffic, people walking around, and all the other safety hazards and distractions a crane operator might experience.

With a command from Galil, the simulator cab moves

*The realistic visual display on the GlobalSim crane simulator trains operators to safely operate cranes in various conditions.*



backward and forward, from side to side, with pitch and yaw. The operator uses a control switch to select which part of the crane he is controlling, just as in the real crane.

When the trainee moves the crane, he sees the “boom,” which is the long swing arm. Attached to the boom is the steel cable that holds the load. As he moves the boom around, he must control the load and keep it from swinging wildly. This takes skill. He must learn to “catch the swing” to keep the cable and the load from swinging into everything in sight.

The controller’s jog mode in real time provides a feeling of acceleration in the cab. Based on the movement of the joysticks, the “virtual crane” moves and the acceleration is simulated. The host computer determines the G force and sends the appropriate velocity commands to the Galil controller. As the operator drives forward he is pushed back into the seat. The operator feels this acceleration.

GlobalSim also uses Galil I/O to incorporate safety features, such as safety gates around the simulator and a seatbelt check. The company chose Galil controllers because they are cost-effective and easy to use. Their engineers were able to use a simple C-program to talk to the Galil controller through the FIFO buffer for real-time commands.

A prospective operator learns to operate the crane efficiently and safely during a two- or three-week course using the simulator. The simulator can be programmed for different crane models, including those used on a ship or dock.

Based on configuration, GlobalSim sells their crane training simulators for \$180,000 to \$795,000. These simulators have been sold extensively to both union and non-union customers throughout the U.S. and are beginning to be sold worldwide. ■

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*With a command from Galil, the seat in the simulator cab moves backward and forward, from side to side, with pitch and yaw.*