For more information, contact:

Advanced Displays and Product Integration

Panoram Technologies

Larry Paul
Director of Technologies

US HEADQUARTERS
Panoram Technologies, Inc.
10951 Pendleton St.
Sun Valley, CA 91352 USA
Tel: (818) 504-0714
Fax: (818) 504-0636
E-mail:
larry.paul@panoramtech.com

Henry van der Helm
Head of Operation, EMEA

EUROPEAN OPERATIONS CENTER
Panoram Technologies, Inc.
Siena Court, The Broadway
Maidenhead, Berkshire
SL6 1NJ, United Kingdom
Tel: +44 (0) 1628 509002
Fax: +44 (0) 2075 048577
E-mail:
henry.vanderhelm
        @panoramtech.com

www.panoramtech.com

Pneumatic Motion Base Servovalve and Control

COBRA
Technologies, Inc.

Ray Woodworth
President

Cobra Technologies, Inc.
2 Honeysuckle
Irvine, CA 92614
Tel: (949) 262-9118
E-mail: powerplan1@home.com

www.motionsimulator.com

Open Source Flight Simulation & Image Generation Software

FLIGHTGEAR

Curtis L. Olson
Project Coordinator

Alexander Perry
Programing Support

FlightGear Project
E-mail: curt@flightgear.org
          alex.perry@qm.com

www.flightgear.com

loki

Scott Draeker
President

Loki Software, Inc.
250 El Camino Real
Suite #100
Tustin, CA 92780
E-mail:
press@lokigames.com
sales@lokigames.com
All Other Inquiries:
info@lokigames.com

www.lokigames.com

Panoram Technologies

As seen at **ITEC 2001** in the Panoram booth #352

Panoram Technologies

Panoram
MICRO SIMULATOR DEMONSTRATION PROJECT

Micro Simulator
Demonstration Project

This demonstration project brings together a series of unique technologies that result in a new type of motion base simulator.

The technologies include:

a. Application of a new type of display technology from Panoram to provide a low mass, low maintenance, low cost and high resolution immersive display solution.

b. Application of a new type of pneumatic actuator to provide a low pressure, low maintenance, low cost yet highly responsive motion base technology.

c. Application of an open source operating system and flight software to provide a low cost yet highly effective Image Generation for the Micro Simulator.

Although these components are each independent technologies, we have brought them together to present "what is possible" if one rethinks the component requirements of traditional simulation systems.

We have eliminated costly visual systems, high pressure hydraulics, and expensive image generation.

The result of the demonstration project is surprisingly effective, very compelling and represents new standards for cost, maintenance, flexibility and transportability.

Display Technology
Panoram Techologies, Inc.

The display device installed on the Micro Simulator is a modified Panoram PV230 DSK. The PV230 DSK is a wide angle, high resolution TFT LCD display with generous working screen real-estate. This light weight display is highly flexible and is an economical choice for micro simulation applications.

The design of this display features a wide field of view (140°w x 28°h) that wraps neatly around the user. The three image panels offer a separation of only 7/16" (11 mm), providing simulation images across all three screens without any detrimental visual breaks.

The display's high 2.4 Mega pixel resolution (3072 X 768 pixels) provides for crisp terrain detail and dramatic interaction of simulation characters. The high resolution, light weight and wide field of view combine to make the PV230 DSK ideal for this type of simulation system.

The Panoram PV230 DSK provides source flexability with RGB and DVI computer sources as well as Composite and S-video inputs for the demonstrator, the RGB inputs were used.
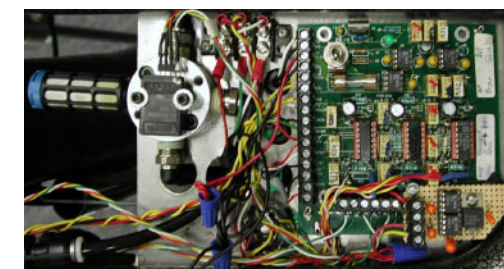

Panoram PV230 DSK

Display Input Panel

Motion Base
Cobra Technologies, Inc.

Cobra Technologies Servovalve

Pneumatic Control Electronics

The pneumatic three axis motion base system installed on the Micro Simulator utilizes Cobra Technologies Servovalve and Electronics. The Servovalve control system is an efficient, high performance pneumatic controller, which features high fluid flow rates and broad bandwidth capability (nearly 200 HZ).

Motion control is initiated by means of an operator-controlled flight yoke or joystick, used to control sixty (60) degrees (± 30) of motion in the pitch and roll axis. Rudder pedals provide (± 15) degrees of motion control for the yaw axis.

The Cobra Technologies Servovalve was developed with a grant from the National Science Foundation. In addition to the mechanical features found in the valve, a unique computer (algorithm) control system was developed which insures fast stable dynamic response.

The current valve design is calculated to flow 30 scfm, at 100 PSI, although the valve design is capable of operating at much higher pressures and flow rates.

Source Computers and Software
FlightGear Project / Loki Software, Inc.

This technical demontrator is currently being driven by three networked computers operating under Linux with 1Ghz Athlon processors and Nvidia GeForce2 GTS graphics cards.

A specially modified version the open source FlightGear software was created by Loki Software, Inc. in conjunction with "FlightGear Project" in order to display this content.

This system is capable of running in both "Closed Loop" or "Open Loop" modes.

In closed loop mode, the Micro Simulator's motion is being controlled by the FlightGear software rather than analog feedback from a joystick or foot pedal. This closed loop computer generated input to the Micro Simulator creates a realistic experience based on the simulation software and not simply on the position of the joystick (Open Loop). This is accomplished through the use of "hooks" implemented into the FlightGear software.

Triple 1Ghz Athlon
desktop computers

These "hooks" provide real-time pitch, roll, and yaw data for the simulated aircraft. The digital signal output is converted, through use of a 12-bit D/A converter, to drive the Servovalve/ Actuator assemblies in the Micro Simulator.

The use of these software controls ensure the accurate and synchronized motion in relation to the simulation software's visual output data. This relationship of FlightGear software and motion base hardware creates a highly realistic flight experince for the user.