general-purpose parallel ports; a battery-backed clock-calendar chip; a Small Computer Systems Interface for integrating disk drives; two programmable timers; and an interrupt structure that can operate as either a round-robin or parallel priority arbiter.

SCSI SUPPORT. The board supports a full SCSI implementation, including host-to-host communications. It handles data-transfer rates of more than 8 Mb/s. Because the IV-3273 uses 32-bit direct-memory-access transfers over the VMEbus, disk data transfers use less than 25% of the VMEbus's bandwidth. This minimizes the degradation of coexistent real-time processes due to disk-drive transfers, Ironics says. The card supports a wide range of mass-storage peripherals, including floppy- and hard-disk drives, removable-cartridge tape drives, and nine-track tape drives.

Ironics offers a variety of operating systems and programming languages. The Unix V.2 operating system, which is compatible with AT&T Bell Laboratories software, comes from Unisoft with enhancements by Unisoft and the University of California at Berkeley. A C-language compiler and 68000 assembler are provided with the Unix operating system. Ironics also provides Ada, Cobol, Fortran, and Pascal compilers.

In addition, flexible and easy-to-use facilities are provided so that systems integrators can install third-party device drivers for serial I/O functions, Storage Module Drive interface boards, and Ethernet interfaces.

The Performer 32/D systems, which support two users in their basic configurations, are priced starting at under $18,000 and will be available in the second quarter. *–Steve Zollo*

Ironics Inc., 798 Cascadilla St., Ithaca, N. Y. 14850.
Phone (607) 277-4060 [Circle 354]

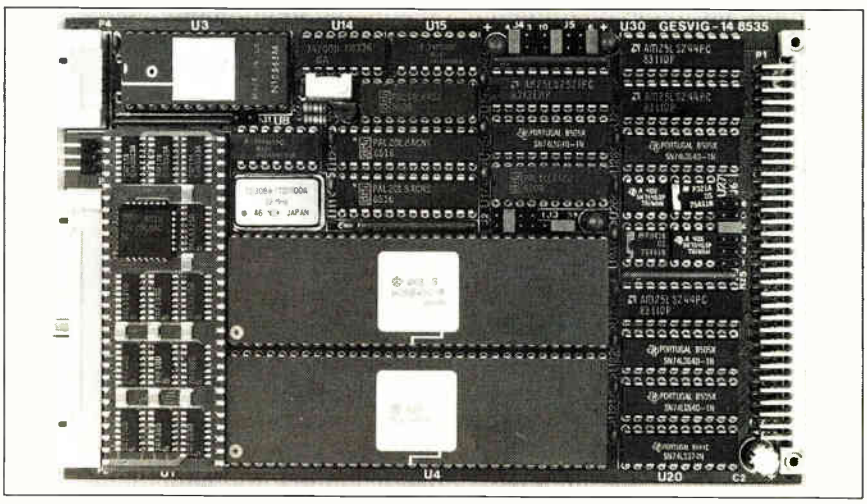
GESPAC BUS ADDS GRAPHICS, MEMORY CARDS

Gespac is making its proprietary bus more attractive to systems integrators by adding a graphics controller and memory board to its stable of offerings. The boards target designers of computer-aided-design work stations, industrial data terminals, and displays for navigation computers.

The Gesvig-14 controller supports noninterlaced displays of up to 800-by-600-pixel resolution in up to 16 simultaneous colors. The board uses Hitachi Ltd.'s advanced CRT controller, the HD63484, to draw more than 2 million pixels/s. It also contains a direct-memory-access controller that allows the user to exchange large blocks of display memory with system memory over the bus. With this feature, the user can create screen updates at speeds greater than 4 megabytes/s.

However, more cost-sensitive or less performance-sensitive applications do not require DMA operations. The interface to the controller can be handled completely under software control. The Gesvig-14 performs an interleaved access for display and drawing operations. Because there is no contention between display and drawing accesses, a flicker-free display is obtained while maintaining full drawing speed.

Most other controllers require additional hardware for windowing, but the



SQUEEZE. Surface-mount technology lets Gespac squeeze many features on the Eurocard.

HD63484 supports on-board windowing on the Gesvig-14. The chip divides the physical frame memory space into four logical screens; for each logical screen, the host specifies a starting address in the physical memory, the number of memory words per raster, and the number of bits per pixel.

The Gesvie-14 memory board is useful for CAD and other applications that demand fast pan and scroll throughout the display memory. Its 2 megabytes of dynamic RAM store four times the maximum display data of the Gesvig-14 controller board. This excess memory can be used to store the different windows supported by the controller or several different pictures, which can be recalled instantaneously to generate animation displays.

To pack such extensive features into the single-height Eurocards that serve as Gespac's form factor, the company went to surface-mount technology. Gespac's G-64 and double-wide G-96 buses are easy-to-use midrange 8- and 16-bit vehicles for industrial applications.

Gespac supports this subsystem with software drivers developed for the 68000-based OS-9 multitasking, real-time operating system. The boards are available now at $3,950 each. *–Ann Jacobs*

Gespac Inc., 100 W. Hoover Ave., Suite 11, Mesa, Ariz. 85202.
Phone (602) 962-5559 [Circle 351]

LAB APPLICATIONS RUN ON MACINTOSH

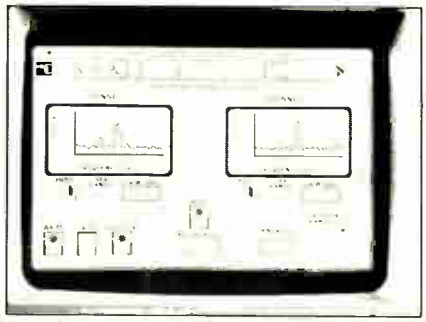
Programmers of test and measurement systems will get a new view of computer controls with LabView, a graphical programming product that runs on an Apple Computer Inc. Macintosh. National Instruments Corp.'s package applies the popular desktop system's icon interface to the development of such laboratory applications as instrument control, data acquisition and analysis, and report generation.

LabView's graphical programming language depicts an instrumentation configuration with images of front panels and functional block diagrams displayed on the Macintosh's screen. National Instruments also sells interface systems that attach the Macintosh to instruments over standard interfaces such as the IEEE-488 bus.

VIRTUAL. The heart of the new programming system is what National Instruments calls a virtual instrument, which the user sees as an image of a front panel. The panel is actually an icon that has "hot spots" representing a system's inputs and outputs. The company plans to build a library of icons representing commonly used lab instruments.

At Electro, National Instruments will demonstrate LabView with the icon of a voltmeter from John Fluke Mfg. Co. and a Wavetek Corp. arbitrary-waveform generator. The panels provide a window for interactive operation. Beneath the icon, a series of modular block diagrams is used to program functionality.

LabView is self-documenting because the front-panel icon and block diagrams construct a complete drawing of the op-



GRAPHICAL. National gives users a graphical view of hooking up their instruments.