Application areas for stacks, like those for computers in general, are only limited by the imagination. Some of the applications that seem well suited for stack machines include:

Image Processing: Object recognition, including optical character recognition, thumb print recognition and handwriting recognition as well as image enhancement require extremely powerful processors, but have wide application. Many commercially interesting applications require that the processor be small, inexpensive and portable.

Robotics controllers: Robot arms have 5 or 6 joints (degrees of freedom). A typical strategy is to have a microcontroller for each joint plus a more powerful processor for centralized control. With powerful microcontrollers, each joint can perform complex positional calculations in real time. In a mobile system, small size and low power consumption are vital.

Digital Filters: Filters require high speed multiplications to keep up with high data flow rates. Stack processors have the room on-chip for hardware multipliers and algorithm specific hardware to quickly perform digital filter calculations.

Process Control: More powerful processors can go beyond simple process control techniques to apply expert system technology to real time process monitoring and control. Stack machines are particularly well suited for rule-based systems.

Computer Graphics: While there are several special purpose graphics accelerator chips on the market, these tend to concentrate on the primitives of drawing lines and moving blocks of bits. The exciting opportunity here is in the area of interpreting high level graphics command languages for both laser printers and device independent screen display languages. One of the predominant languages, Postscript, is similar to Forth.

Other Computer Peripherals: The low system cost of a stack machine makes it well suited for controlling computer peripherals such as disk drives and communication links.

Telecommunications: High speed controllers can provide the capability for data compression and therefore lower transmission costs for telefax and modem applications. They can also monitor the performance of transmission equipment.

Automotive Control: The automotive market forces very severe restrictions on cost and environmental requirements. In this business a minute difference in cost per component can add up to large profits or losses. A high level of system integration is mandatory. Computers can improve car performance and safety even while reducing system cost in applications such as computerized ignition, braking, fuel distribution, anti-theft devices, collision alert systems, and dash display systems.

Consumer Electronics: Consumer electronics are, if anything, more sensitive to pricing and system integration level than are automotive products. Anyone who has taken apart an inexpensive calculator or digital watch knows the miracles that can be accomplished with a few pieces of plastic and a single chip. Opportunities for the use of high speed, portable, inexpensive stack processors abound in music synthesis (such as MIDI compatible devices), compact laser

disk sound and video playback devices, digital tape devices, slow scan television via telephone lines, interactive cable TV services, and video games.

Military and Spaceborne Control Applications: While spaceborne applications may be used for commercial purposes, they have the same reliability and environmental requirements as many military applications. Stack processors are well suited to high speed control applications involving missiles and aircraft. In addition, there are applications in acoustic and electronic signal processing, image enhancement, communications, fire control, and battlefield management.

Parallel processing: Preliminary research shows that stack machines can execute functional programming languages very efficiently. Programs written in these languages have a great deal of inherent parallelism, which may be exploited by a multiprocessor stack machine system.