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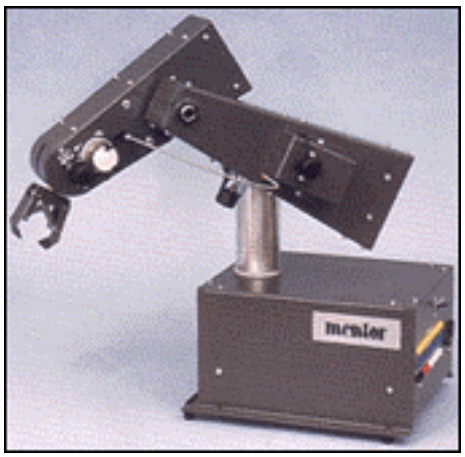
MENTOR
DESK TOP ROBOT

- **LOW COST INTRODUCTION TO ROBOTICS**
  The practical and economic way to learn how to use robots.
- **5 AXES + GRIPPER**
  Human-arm configuration as used widely in industry. All axes under closed-loop servo control system.
- **SELF CONTAINED**
  In-built control system. Just one easy to handle desk-top training aid ready to plug into the mains and into a computer.
- **SAFE AND STURDY**
  The youngest students can be left alone to experiment and learn.



Low priced, versatile, robust and reliable, the Mentor is the ideal entrypoint into the world of robotics and Computer Integrated Manufacturing.
The Mentor has an articulated arm with joints similar to that of the human arm and this configuration is widely used industrially.
Each of the axes is driven by a DC servo motor with its' position monitored by a potentiometer.
An in-built controller provides closed-loop control of the system and constantly provides monitoring data for the computer.
Programming may be from the computer by setting the data for each axis or by incrementing the axes by selecting them and using the + and - keys or the scroll bar.

Alternatively the motors may be switched off and the Mentor then moved by hand (lead by the nose).
Another means of programming, is simulator control where the robot copies the movements of the hand held model of the robot (Simulator).
Easy to use Windows software, helpful manual and on-screen assistance enable the robot to be unpacked and running programs within minutes.
The manual includes program examples and suggested robot experiments on accuracy, repeatability etc.
Also provided is full information on the control system and the computer interface.
Examples of computer code are also in the manual for assistance with student and research projects.

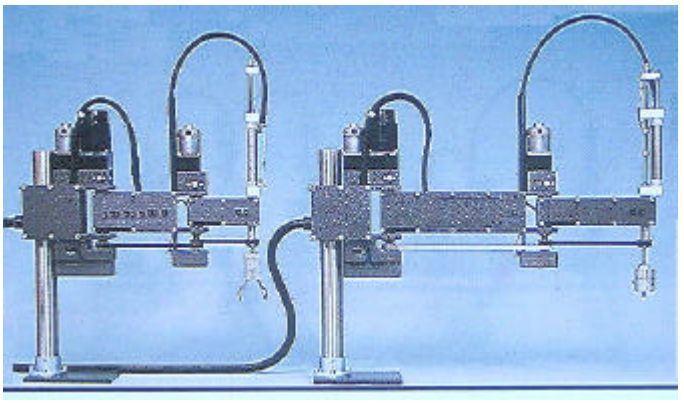
MENTOR SIMULATOR
A useful addition to the Mentor is the simulator. This is a small-scale model of the robot which is operated by hand.
Every movement is copied by the robot. These moves can then become part of the robots' program.

SERPENT EC SCARA ROBOTS

- **4 AXES + GRIPPER**
  With each of the major axes driven by servo motor under closed loop control.
- **SHAFT ENCODER FEEDBACK**
  12,000 counts/revolution on major axes.
- **ARM LENGTH CHOICE**
  Serpent I 400mm arm for highest accuracy
  Serpent II 650mm arm for furthest reach.

SCARA is an acronym for Selectively Compliant Articulated Robot Arm which means there is a small amount of springiness in the plane of operation. Providing there is a small lead-in, on the component, the compliance allows placement of a part even where there is some misalignment.
The two joints of the Serpent EC arms and the wrist are driven by DC servo motors with encoder feedback to achieve accurate closedloop control.
As is usual for SCARAs, the wrist motor is situated back at the column and connected by belts to the end of the arm.
This arrangement maintains a constant wrist angle relative to the bench when the arm moves.
The vertical movement is by pneumatic cylinder, operating at adjustable speed between moveable end stops.

SCARA robots are one of the most popular in industry and the Serpent ECs are typical of this class of machine.
The movement of a SCARA is simple but entirely adequate for a vast number of assembly and pick-and-place applications.



The Serpents may be programmed from the computer either by setting the data for each axis or by steering the arm by hand using the lead-by the-nose buttons. Alternatively the Serpent EC will follow the hand-held control pendant or simulator.
Grippers are readily interchangeable.

SERPENT TEACH PENDANT
Supplied with the Serpent EC is the pendant. With this, each of the arms may be controlled even without a computer connected.
When connected to the computer, the moves may be recorded and played back either as a stand-alone robot or as part of a multi-device work-cell.

SERPENT SIMULATOR
The Serpent simulator is an optional small-scale model of the robot which is operated by hand.
Every movement is copied by the robot. These moves can then become part of the program of the robot.

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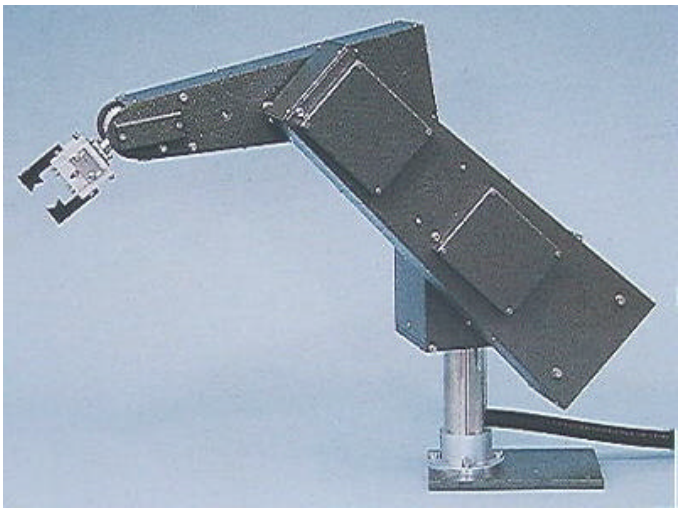
GRYPHON EC PRECISION ROBOT

- **5 AXES + GRIPPER**
  Human arm configuration as widely used in industry.
- **SHAFT ENCODER FEEDBACK**
  12,000 counts/revolution on major axes.

Precise, smooth, fast travel characterise the Gryphon EC.
The articulated arm is under the control of 4 micro-processors and will accurately place components in a CNC machine or work-cell.



Each axis is powered by a stepper motor with encoder feedback to provide closed-loop control. In the controller there is one microprocessor to monitor the positions of the axes, two more to control the motors and another one to supervise the first three and to communicate with the host computer.
Programming may be accomplished in a variety of ways. Data for each axis may be directly entered on-screen or the selected axis may be incremented either with the scroll bar or use of the + and - keys. Alternatively, the Gryphon EC may be moved by the teach pendant or by hand (lead-by-the-nose).

Either a two fingered or a vacuum gripper may be fitted and these may be readily interchanged.
Included in the manual is full information on the control system and the computer interface. Also there are program examples and suggested experiments and exercises on accuracy, repeatability etc.

GRYPHON TEACH PENDANT
Supplied with the Gryphon EC is the teach pendant. With this each of the arms may be controlled even without a computer connected.
When connected to the computer, the moves may be recorded and played back either as a stand-alone robot or as part of a multi-device work-cell.

GRYPHON SIMULATOR
A useful addition to the Gryphon EC is the simulator.
This is a small-scale model of the robot which is operated by hand.
Every movement is copied by the robot. These moves can then become part of the robots' program.

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SOFTWARE- WALLI for Windows

WALLI = Work-cell Amalgamated Logical Linguistic Instructions

WALLI for Windows is a fully integrated package enabling control of a system starting from a single robot and building up to a workcell with up to 8 active devices (robots, mills, lathes and expansion boxes).

In addition an almost unlimited number of peripheral devices such as conveyors, indexing tables, sensors and gauges may be controll Robots may be controlled in a variety of ways. On the screen is shown the data which is being sent to the robot.
When that data is selected by clicking on it (or using tab and cursor keys), it may be incremented with the scroll bar (or the + and - keys). Alternatively new data may be simply typed in.ed as part of the work-cell When a simulator, pendant or control panel is being used the data on the screen is updated to the new position.
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An advanced feature of WALLI for Windows is DDE (Dynamic Data Exchange) which enables it to share data with other Windows programs that support DDE. This enables other manufactures equipment such as vision systems to be operated in conjunction with the work-cell.

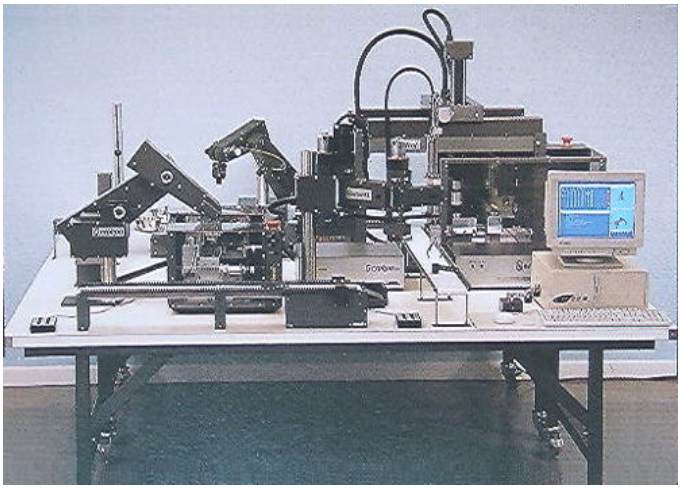
An example of DDE linking with an EXCEL spreadsheet is included in the package. From the spreadsheet, robots may be controlled and data brought in for analysis. Microsoft Visual Basic is another Windows program supporting DDE and with this the system may be expanded to include almost unlimited additional activities.
The system supports RS232 and parallel ports and these may be used for further data exchange between peripheral devices.

WALLI for Windows includes extensive online help and is supplied with a site licence so enabling it to be run on any number of computers either individually or on a network.
WALLI programs may be written off-line, with no devices connected to the computers enabling a whole group of students to work on programming the robotic and CNC systems even if there is only one set of hardware.

TURN-KEY FMS
DEMONSTRATION BENCHES

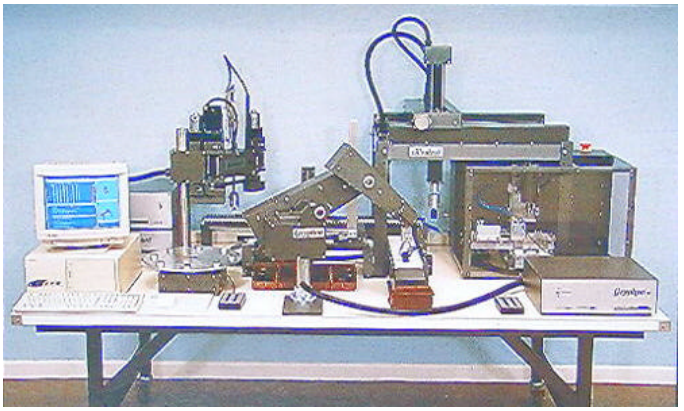
We can instantly produce, to your specification, a fully documented, wired, plumbed and programmed bench-mounted system which requires only a mains supply to immediately demonstrate a computer controlled fully automated series of manufacturing processes.

The items of your choice are secured to a very sturdy work-bench. The 2240x1220mm work-top is 40mm thick and covered with durable white melamine. The frame is constructed of welded, heavy gauge 50x50mm square section steel tube. Rubber wheeled castors are fitted to make this substantial unit easy to move.
The mains supply is via a single lead which plugs into a distribution conduit on which IEC sockets are fitted.
Each item in the system may be readily unplugged and removed from the table if required for alternative demonstration purposes. Use of each component individually and in other work-cells is fully documented.



In this system, a batch of parts is placed in the parts dispenser on conveyor 1. One part is dispensed onto the moving belt which stops when the the part interrupts infra-red beam IR1. The belt increments a fixed distance to take the part into the centre of the width gauge. After gauging, the belt starts moving again. When the part reaches infra-red beam IR2 the belt stops but then increments a further fixed distance to position the part in the centre of the height gauge for another measurement. The computer now has a record of the dimensions of the part and future processes will be dependent upon the data.

The belt is now incremented to take the part to the pick-up point of Mentor 1 ready for lifting and then placing in the motorised vice of the mill. The vice and parts centraliser now position and clamp the part ready for the mill to run a machining cycle selected upon the dimensions of the part.
After machining, the vice and centraliser open, allowing Mentor 1 to remove the part and place it on conveyor2. The belt starts moving and continues until the part interrupts IR3 beam. Mentor 2 picks up the part, the indexing table rotates to present the bin appropriate to the finished part and the Mentor then places it in there. The cycle now starts again with another part issued by the dispenser.



A supply of work-pieces and documented programs is included with the work

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