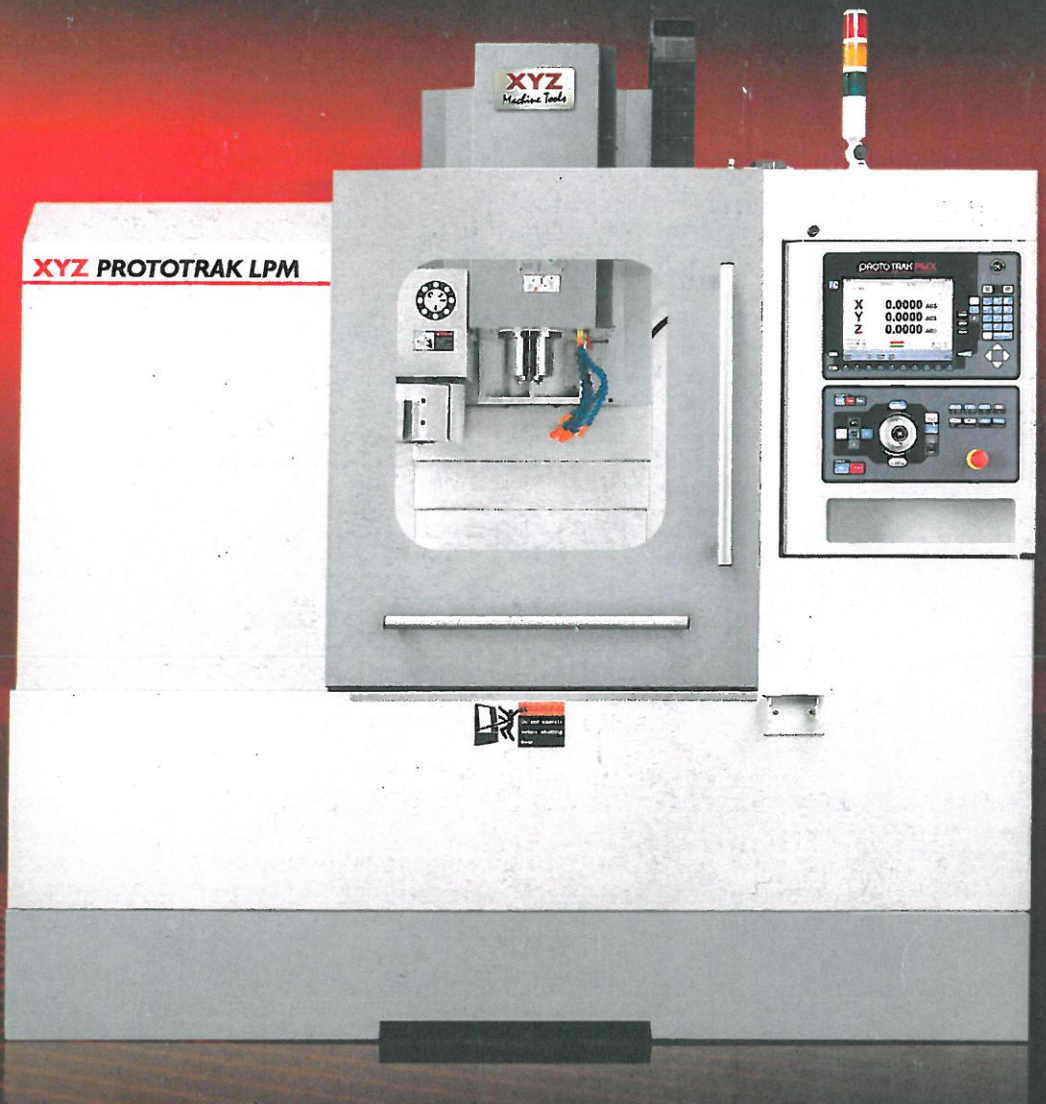
XYZ PROTOTRAK LPM

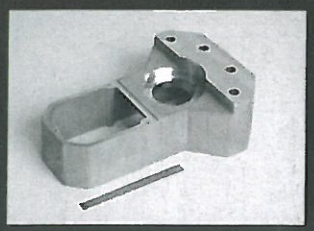
A New Concept in Small Batch Production



The XYZ *PROTOTRAK LPM* is more than a machine:
It is a machining *SYSTEM* for making parts in lower-volume production quantities.

The **XYZ *PROTOTRAK LPM*** combines Machining Centre technology with the simplicity and flexibility of the ProtoTRAK PMX CNC. It integrates programming, workholding, tooling and job management to make ProtoTRAK users extremely competitive in small volume production machining.

Compared to current production systems and toolroom systems, the **XYZ *PROTOTRAK LPM*** lowers the cost and complex set-ups of those production jobs that take from a few hours to a few days.



P/N 15621
Typical Batch 100 pcs
Cycle Time = 7 minutes
Operations = 2 combined set up
Part change time = 90 seconds
Total run time (typical) = 14.2 hrs
Set up time = 10 minutes

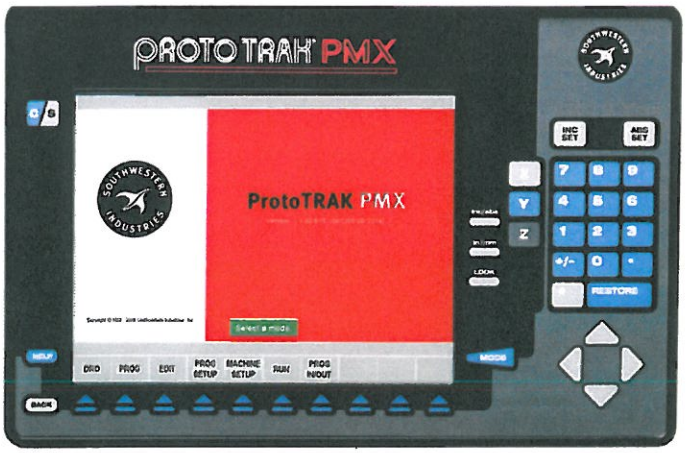
The XYZ PROTRAK LPM is the best system ever made for jobs like this.

XYZ PROTOTRAK LPM

The superior system for small batch production

Machine technology that is up to the job.
The **XYZ *PROTOTRAK LPM*** is a solid cast machine with linear guides and a 16-station carousel tool changer.

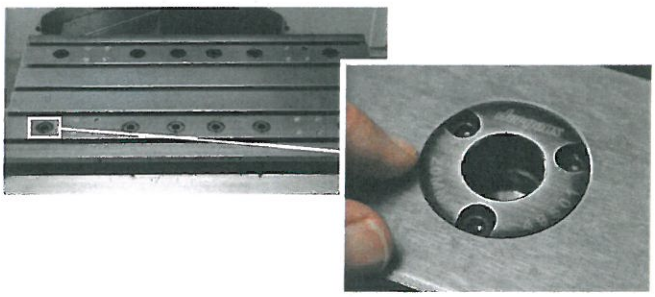
More than just a machine tool.
The **XYZ *PROTOTRAK LPM*** is much more than a machine. It is a system with unique, innovative features that bring an extraordinary level of productivity to machining in smaller quantities.



1

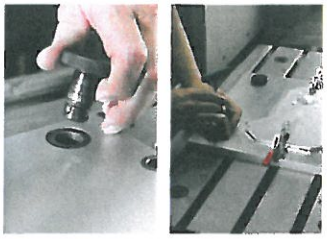
What makes the XYZ PROTOTRAK LPM so unique?

The new ProtoTRAK PMX CNC.
The all-new ProtoTRAK PMX CNC has the look and feel so familiar to ProtoTRAK machinists. Despite being redesigned for small volume production, there are few new buttons and screens to learn. Even users who are new to ProtoTRAKs can learn easily.
The ProtoTRAK PMX is the most intuitive and easy to use production CNC ever made.



2

Preparation of the LPM table.
The table of the **XYZ *PROTOTRAK LPM*** is carefully prepared with locating bushings at precise locations.
The ProtoTRAK PMX knows the location of these holes so that your fixture and part references can be set off the machine and remembered forever.



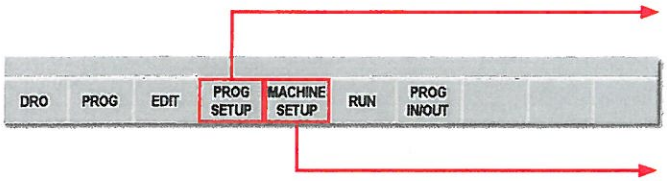
3

Ball Lock System Built In.
The locating holes in the table contain receivers for the Jergens® ball lock system. Fixtures are located precisely and held securely in seconds.

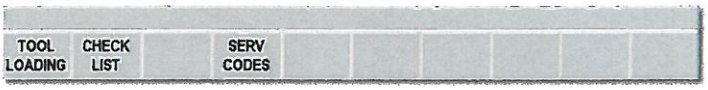
Staged Set Up.

4

You can prepare the ProtoTRAK PMX for a future job while it is already running a different job. This goes beyond merely the ability to work on two jobs found on other CNCs...the ProtoTRAK is deliberately and thoughtfully organized to enable you to reduce set-ups to minutes.



In Program Set Up you do those tasks for the next part that are possible while the machine is running.

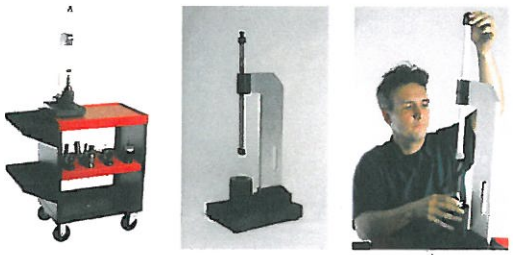


In Machine Set Up you do those few things that require the machine to be idle.

Tool Setting System.

5

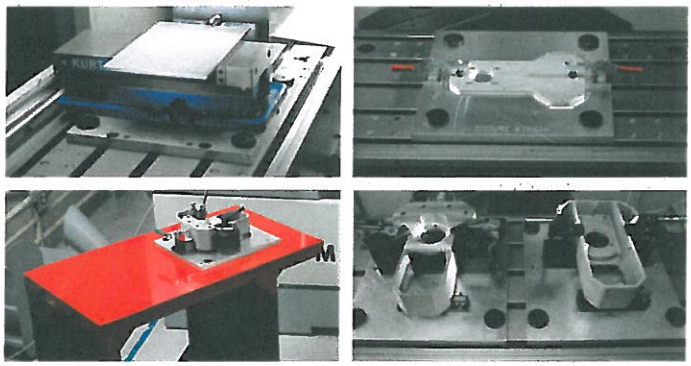
The mobile tool setting system is standard with every **XYZ *PROTOTRAK LPM***. A high quality tooling trolley which is equipped with a tool height presetting device and tool storage system that allows tool organization to fit perfectly with the guided tool setting procedure of the ProtoTRAK PMX CNC.



Workholding System.

6

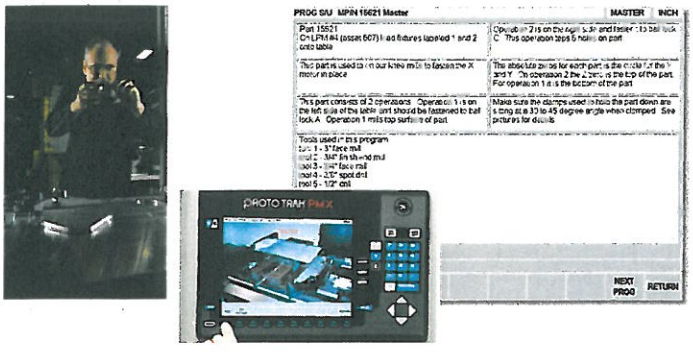
The Workholding system is based on fixture plates that can be prepared off the machine. The plates are positioned at one of the preset locations and locked down in seconds. You do not have to measure fixture offsets with the machine idle. The flexible ball lock locating guide allows you to use your existing tooling in the LPM system.



Job Management System.

7

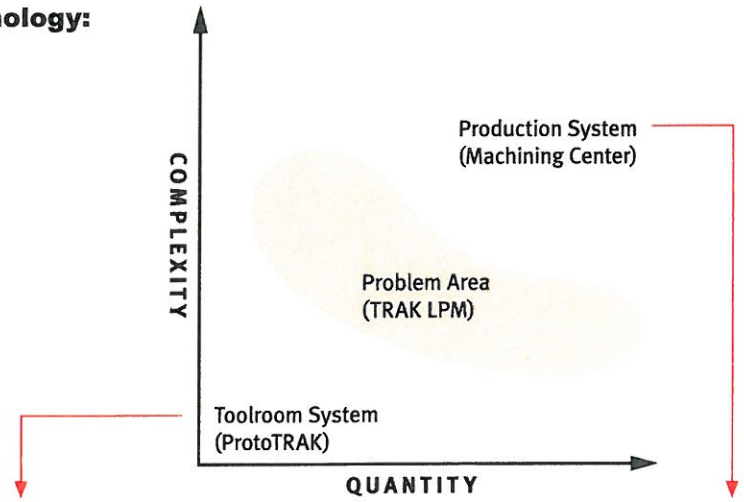
Information about your set up can be captured in photos and notes that you save with the program. You don't have to think through each set up each time. As you discover better techniques the photos and notes are easily updated to capture the benefit of your new ideas.



The Problem

Small batch production machining...why it is so painful.

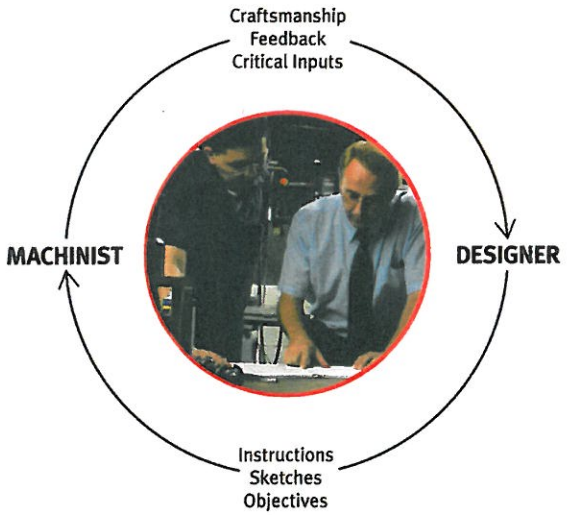
Selecting the Right Technology:



An optimal system for toolroom jobs includes short channels of communication, people who are skilled at machining and technology that fits craftsmen's methods.

An optimal system for production includes formalized channels of communication between specialists and high tech equipment that is capable, but expensive and complicated.

The Toolroom System:



The Production System:

FLOW OF PART INFORMATION	SPECIALISTS IN A PRODUCTION SYSTEM
Design	Manufacturing Engineer
Documentation	Buyer/Planner
CAD	Materials Manager
CAM	Toolcrib Manager
CNC Program	CAD Designer
CNC Set up	CAM Programmer
Inspection	CNC Setup
	CNC Machinist
	Shop Scheduler/Expeditor
	Inspector
	Maintenance Technician

So a shop that needs to run small production quantities has these bad alternatives:

FORCE SKILLED MACHINISTS TO RUN A PRODUCTION SYSTEM

Here waste will occur because:

- machines that require constant attention use too much labor
- skilled machinists are inefficient when using unfamiliar technology
- machinists who value control and certainty over speed lack production instincts
- machinists lack production instincts because they value control and certainty over speed

FORCE THE PRODUCTION SYSTEMS TO ADAPT TO SMALLER BATCH

Here waste will occur because:

- spindles not running during set up is poor utilization of expensive machines
- Profits are eroded because of lengthy set-up times and specialists' inputs over part runs
- temptation to overproduce to economize on set ups loads up inventories

Waste occurs when the system doesn't fit the work. Creating an efficient system is a daunting task for a single shop to do on its own. Equipment manufacturers don't help because they don't make systems – they make machines and leave it to their customers to create the systems.

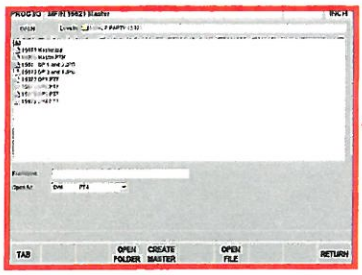
The Solution

How the XYZ PROTOTRAK LPM replaces pain with efficiency.

Shop Floor Usability

Workholding System

ProtoTRAK PMX & Machine Integration



Job Management System

Programming Simplicity & Flexibility

Tool Setting System

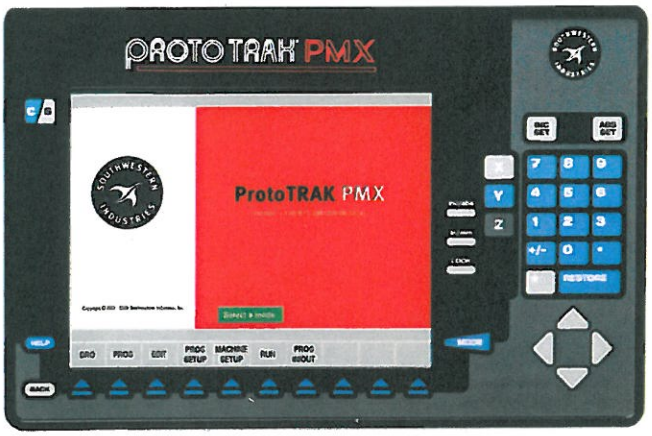
The production system that revolves around the machinist

The **XYZ *PROTOTRAK LPM*** relieves the pain of lower quantity production by providing a new system of machining – a system designed for the skilled machinist who can already run a ProtoTRAK.

The ProtoTRAK CNC revolutionised CNC programming, and in so doing created the optimal system for toolroom and small batch work. The **XYZ *PROTOTRAK LPM*** brings these same revolutionary concepts to the reduction of production set ups. For short run production, set up is wasted time because you cannot spread the cost over the few parts. The **XYZ *PROTOTRAK LPM*** will use the skills of ProtoTRAK machinists to reduce this set up to minutes.

The **XYZ *PROTOTRAK LPM*** provides the means for you to leapfrog the time and expense it would take for you to assemble your own production system. You will soon be competitive in producing smaller batches by using a level of technology and sophistication appropriate for the work.

You can do this - it is a ProtoTRAK after all

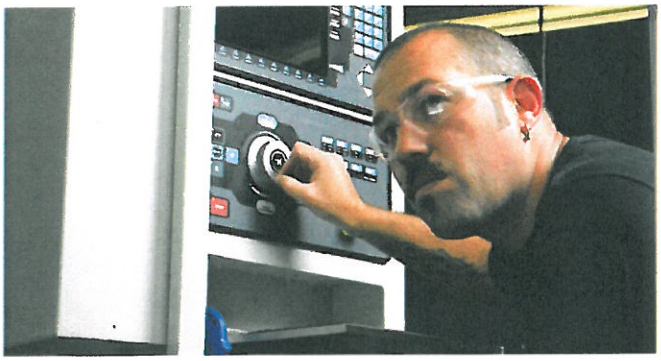


Program Panel

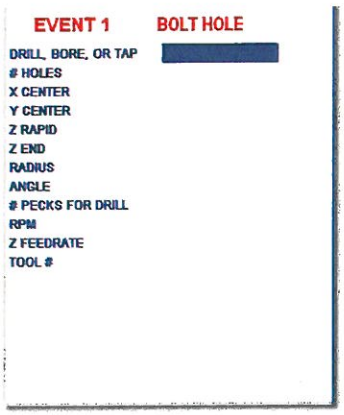
Run Panel

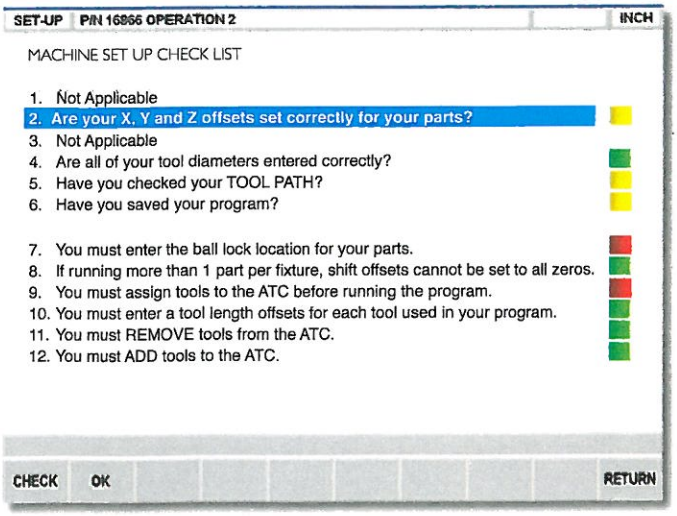
Familiar ProtoTRAK User Interface

Few new buttons and screens to learn
You stay in control:
TRAKing
Feedrate overrides
Spindle overrides



Modes
Geometry-based Programming





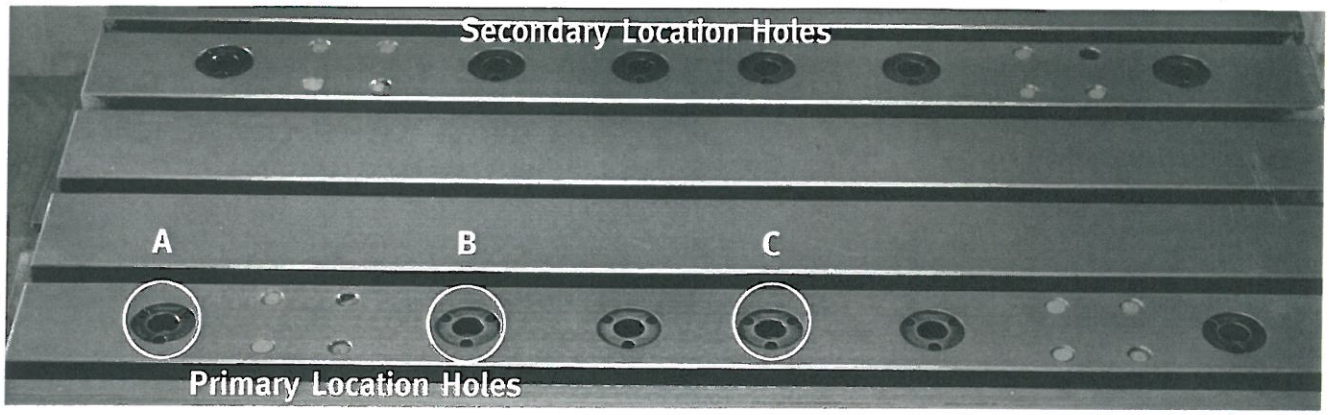
Check list in Set Up makes sure you don't forget to do something before you run

Guided, Intuitive Process
Clear Instructions in Plain English

Prompts make everything easy

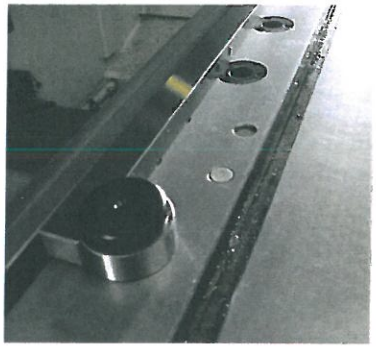
The Workholding System

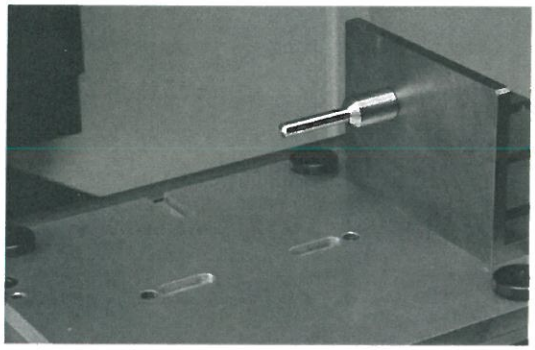
Location Holes in Table



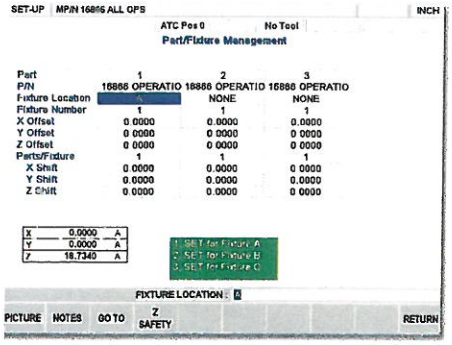
+/-0.0002mm (+/-0.0001") position accuracy

Fixture Plates





ProtoTRAK PMX Fixture Management

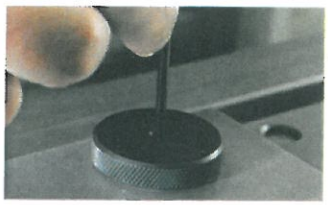


Workholding System Objectives

- enable part set up on fixture plates off the machine
- position fixture and part accurately
- eliminate the need to do fixture offsets
- enable secure fixturing in seconds
- enable continuous improvement of fixturing process for each part
- reduce planning for repeat jobs
- reduce planning within product families

Overall workholding system objective: reduce set up time between parts.

Ball Locks



- clamping force of 1,000 kg
- fixture repeatability +/- 0.012 mm (using 2 primary liners)
- insert and secure with an allen wrench in seconds

One fixture off and the next one on in a few simple motions.

The Tool Setting System

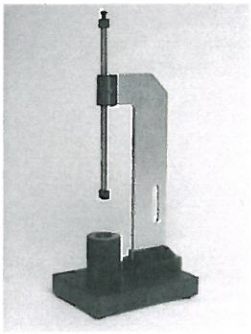
Mobile Tool Setting System

- Trolley
- Granite plate and holder
- Base tool
- Tool measurement device
- 16 tool storage locations

Base Reference System

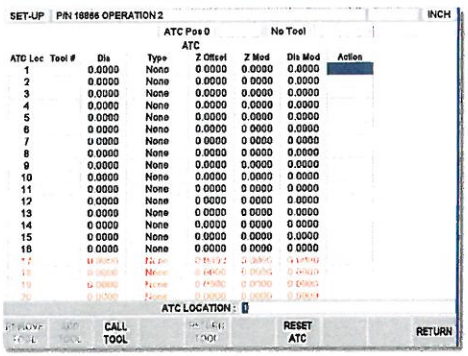
- Fail-safe tool reference for setting offsets
- Customized to each machine for accuracy

Offset Measurement Tool



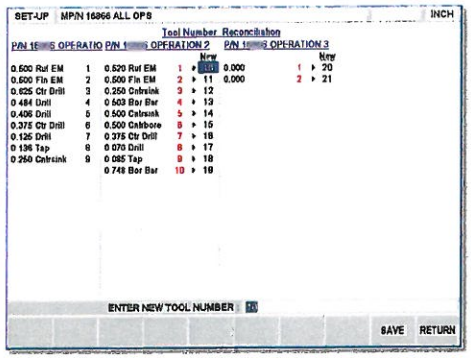
- Simple, accurate device for measuring offsets

Tool Loading



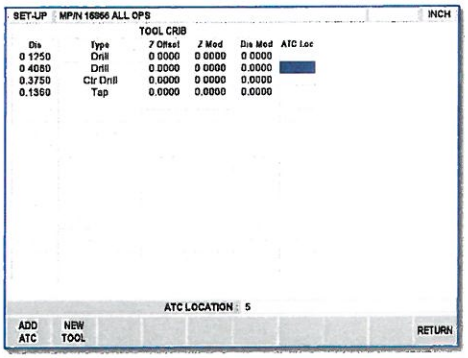
- Clear, easy instructions makes simple work of CNC tooling

Tool Reconciliation



- makes it easy to coordinate tools between programs

Tool Crib



- Storage of tool data for future use

Tooling System Objectives:

- enable dependable management of tools
- enable most tool data to be obtained and entered outside of the machine
- enable quick tool changeover while the machine is idle
- eliminate tool-related errors

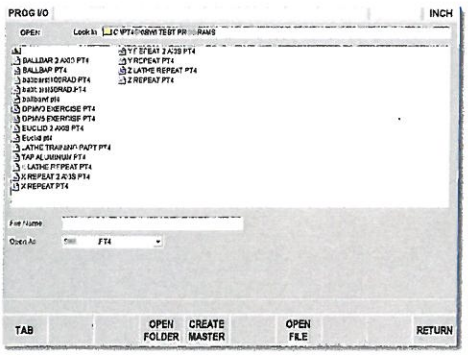
Overall tool setting system objective: reduce set up time between parts

Job Management

PMX Views

Work on a future set up while the machine is running a job with Current/Stage views

Program Loading

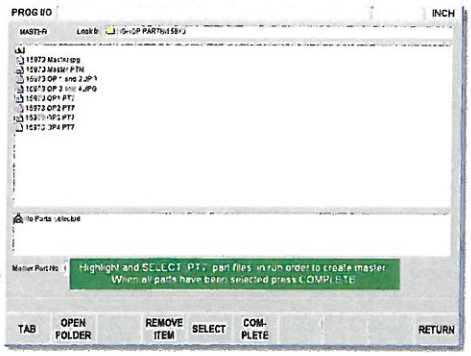


- Previous generation ProtoTRAK programs
- CAM
- DXF
- Networking - USB
- G Code

Shop Floor Usability

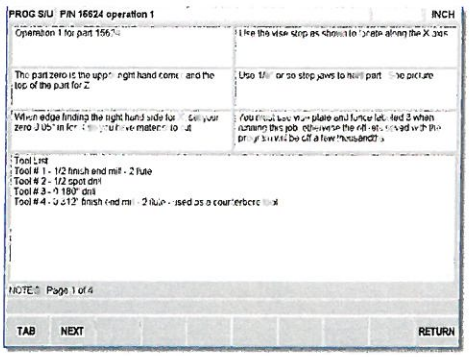
The LPM, like all ProtoTRAK machines, is made to use on the shop floor

Master Programs



Combine separate programs into one to perform multiple operations in a single set up

Notes



Store information about the job with the program

Photos

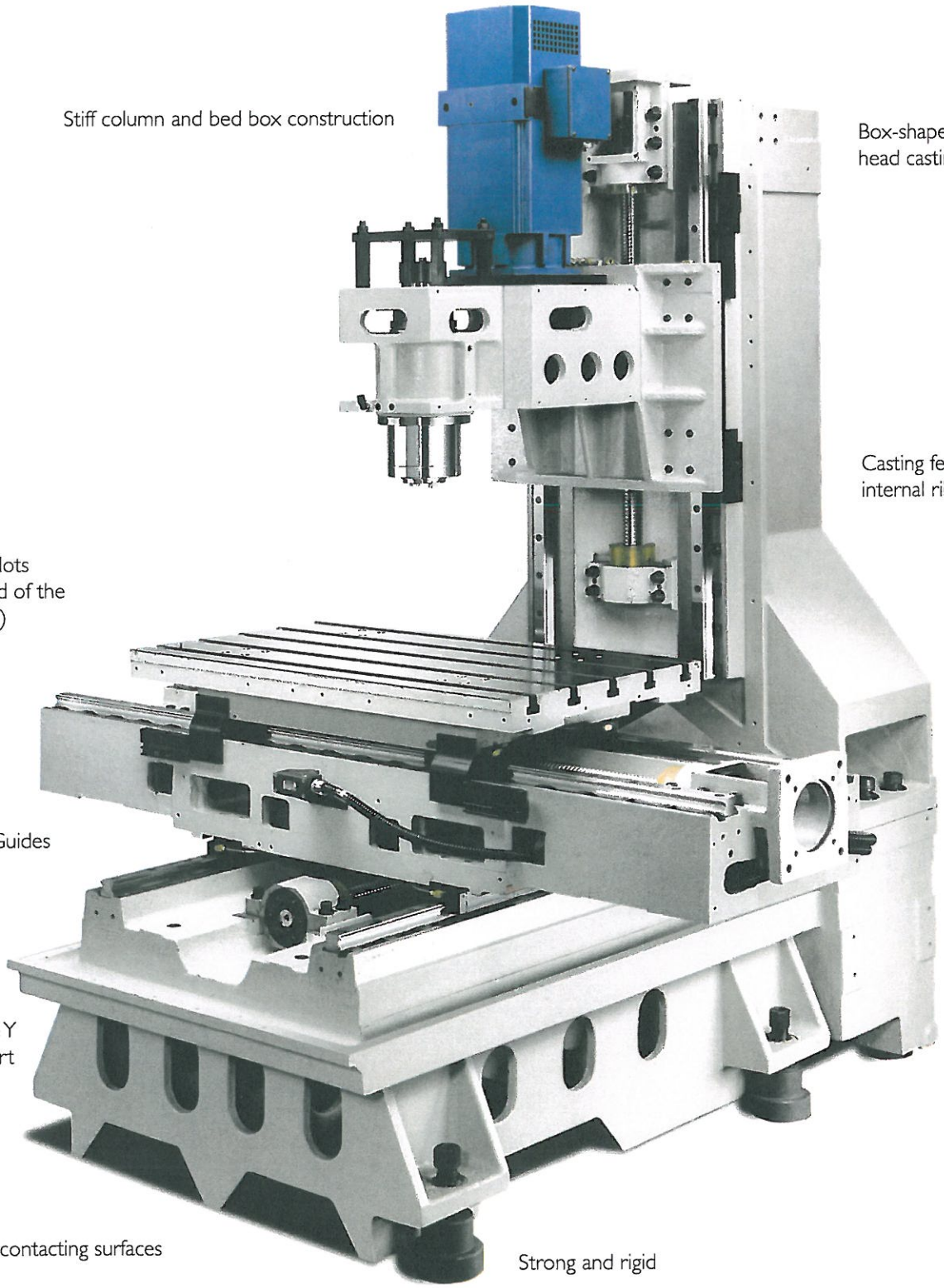
.jpg files can be saved with the program for annotated or plain photos

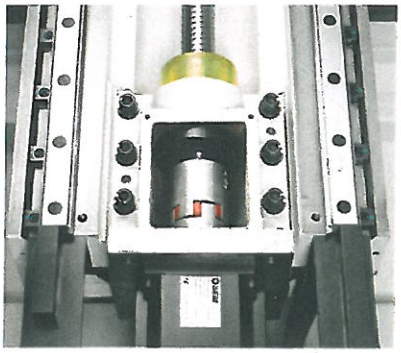
Job Management Objectives:

- allow flexibility in file types and file storage
- minimize labour by allowing operators to prepare future jobs while tending a current job
- enable a skilled machinist to control all aspects of a small-volume production job with minimal help from specialists
- reduce planning and thinking required for repeat jobs
- enable continuous improvement of techniques through updating of attached notes and photos

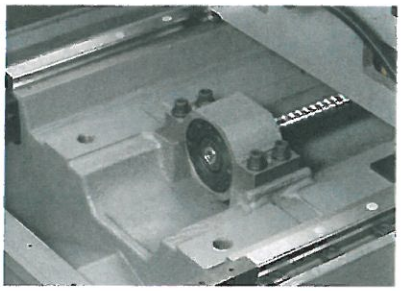
Overall job management objective: reduce set up time between parts

The XYZ PROTOTRAK LPM construction

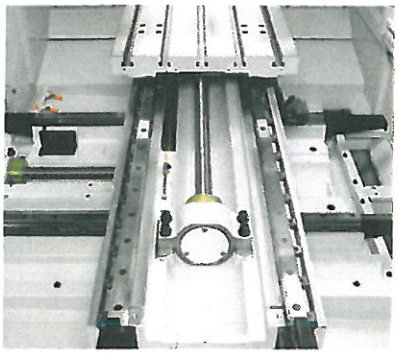




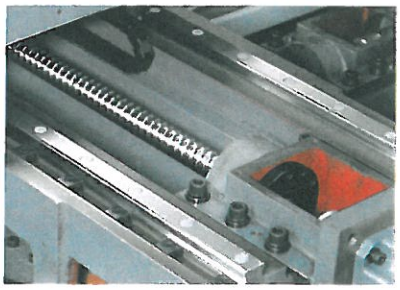
Direct coupled motors maximize efficiency and precision while minimizing elastic backlash



Dual angular contact bearings pretension the ballscrews



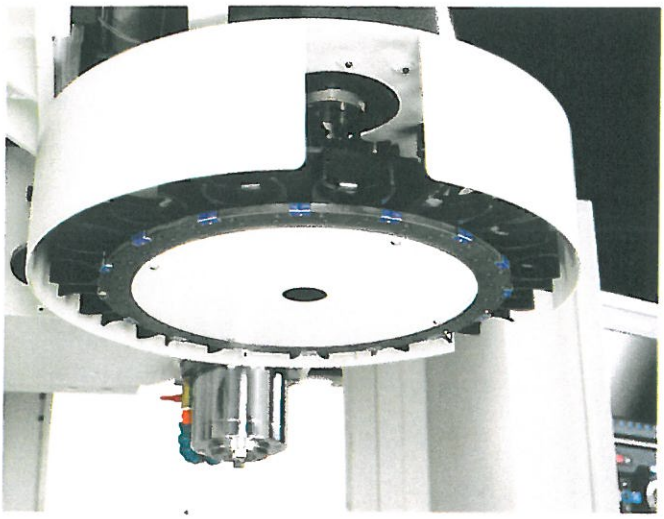
Linear guides provide smooth, accurate positioning

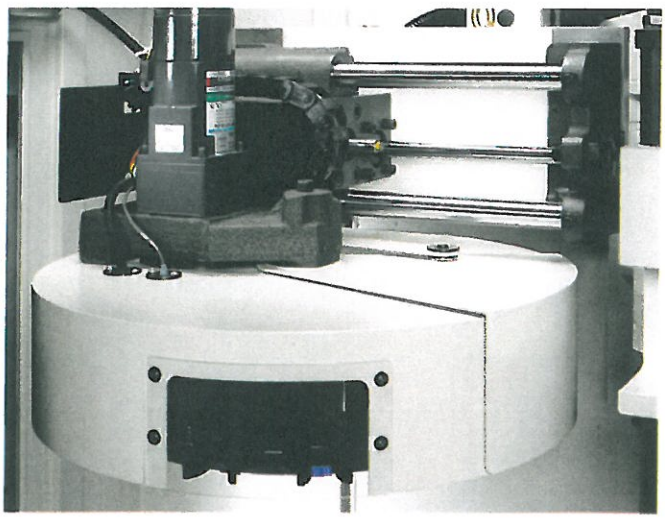


40mm dia precision ground ballscrews

High-precision
cartridge-type spindle.

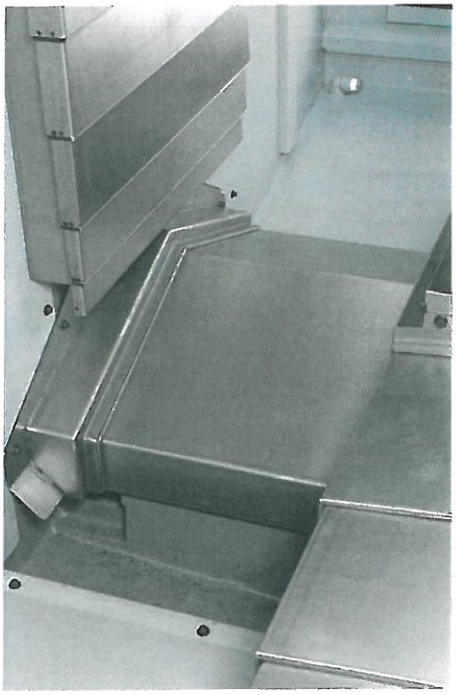
- Four precision angular contact bearings
- ABEC 9, P2 (radial run out)
- permanently lubricated – requires no maintenance





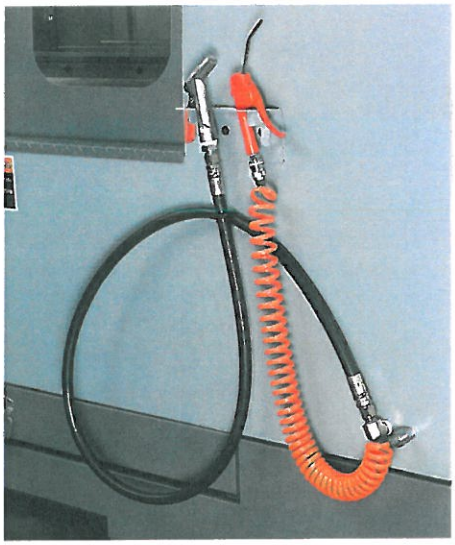
16-station carousel Tool Changer

The XYZ PROTOTRAK LPM construction

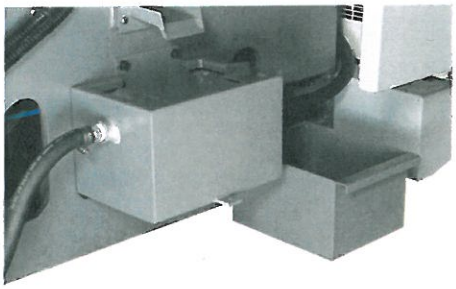


Telescoping covers protect all X,Y and Z linear guides, ballscrews and motors

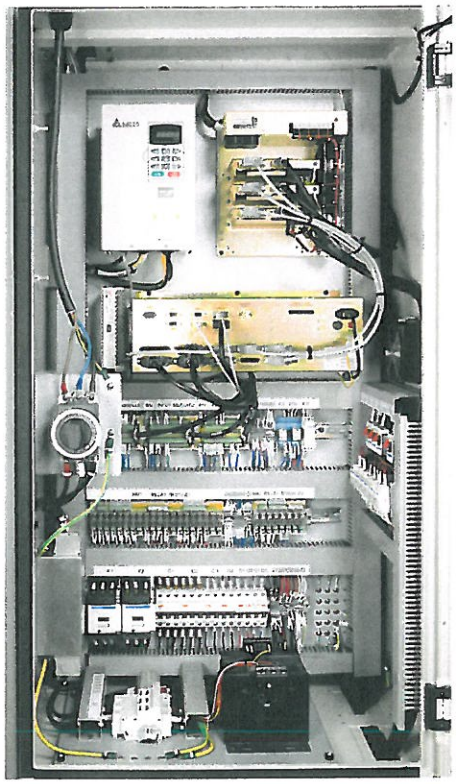
Dual 0.68 hp pumps provide coolant for machining and the built-in wash down nozzles



Convenient built-in air and spray guns



Separating system for oil and water (or coolant)



NEMA 12 (equivalent) enclosure houses the clean, well-organized control and machine electrical systems

	XYZ PROTOTRAK LPM
X Travel	785 mm
Y Travel	470 mm
Z Travel	530 mm
Table size	900 x 500 mm
Spindle centre to column	489 mm
Spindle to table	85 - 610 mm
Rapid feed XYZ axis	20M / Min
Max table load	460Kg
T slot size	18 mm
T slot number & pitch	5 x 100 mm
Max Spindle speed	8000 RPM
Spindle motor	15 HP
Spindle taper	BT40
Tool magazine capacity	16
Max tool diameter	80 mm
Max tool weight	7 kg
Coolant capacity	220 Litres
Ball screw size	40mm dia x 8mm pitch
Machine weight	3,410 kg
Footprint W x D x H	2870 x 2246 x 2743

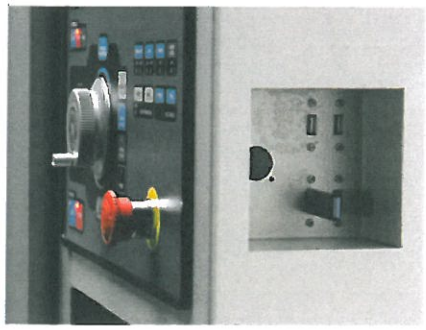
Standard Features

- Chip Auger.
- Internal wash down nozzles.
- Air gun.
- Wash down gun.
- Halogen work lights.
- Auto lube system.
- Mobile Tool setting system (incl. trolley).
- Belt drive spindle.
- Coolant pump.
- Wash down pump.
- Oil/coolant separation system.
- Status lights.
- Rigid tapping.
- Air blast to clear chips from spindle.
- 4 each Ball lock clamping device.
- Pull Studs – BT 40 – set of 16.

Options

- Fixture trolley.
- Sets of ball lock liners, primary and secondary.
- Ball lock locating guide
- Fixture plates – small, medium and large.
- Fixture clamping devices – set of 4.
- Vice fixture kit – fixture, fence, stop.
- Vice Stop Assembly – incl 1", 2" and 3" extensions.
- Offline Programming.
- DXF File converter.

ProtoTRAK PMX Hardware Specifications

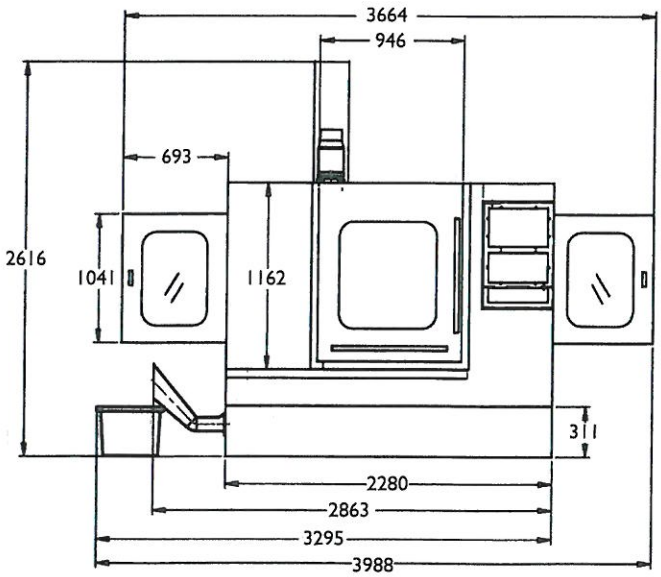


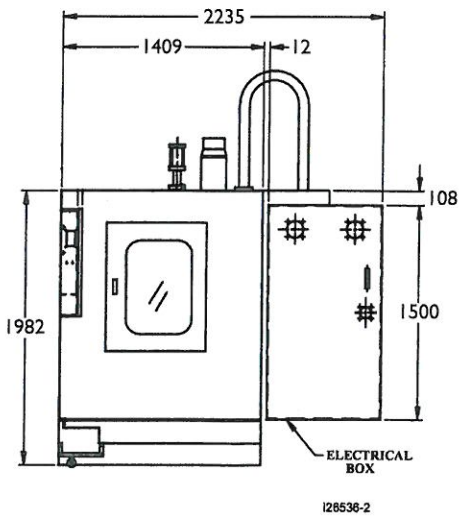
- Jog wheel for TRAKing and positioning.
- 12.1" color active-matrix screen.
- Industrial-grade Celeron® processor.
- 512 MB Ram.
- 4 User USB connectors.
- Override of program feedrate.
- LED status lights built into display.
- RJ45 Port with 10/100 Ethernet.
- Override of program spindle speed.
- 4th axis interface.

Software Features - General Operation

- Clear, uncluttered screen display.
- Prompted data inputs.
- English language – no codes.
- Soft keys - change within context.
- Windows® operating system.
- Color graphics with adjustable views.
- Inch/mm selectable.
- Convenient modes of operation.
- Absolute Home location.
- Spindle load indicator.
- Reference to ball lock locations on table.
- Dimension reference indicator.
- Selectable view between Current. and Staged programs.

Overall Dimensions *dimensions in mm*





Features and Specifications

DRO Mode Features

- Incremental and absolute dimensions
- Jog with selectable feed rates
- Powerfeed X,Y or Z
- Servo return to 0 absolute
- Go To Dimensions from convenient reference
- Spindle speed setting with manual override
- Selectable handwheel resolution
- Convenient choice of dimensional references:
- Machine Home, Part Zero, Abs Zero Ball lock locations

Program Mode Features

- Auto Geometry Engine.
- Geometry-based programming.
- Tool Path programming.
- Scaling of print data.
- Multiple fixture offsets.
- Programming of Auxiliary Functions.
- Event Comments.
- Three-axis Geometry conversational programming.
- Incremental and absolute dimensions.
- Automatic diameter cutter comp.
- Circular interpolation.
- Linear interpolation.
- Look –graphics with a single button push.
- List step – graphics with programmed events displayed.
- Alphanumeric program names.
- Program data editing.
- Program pause.
- Conrad – automatic corner radius.
- Programmable spindle speeds.
- Math helps with graphical interface.
- Auto load of math solutions.
- Tool step over adjustable for pocket routines.
- Pocket bottom finish pass.
- Selectable ramp or plunge cutter entry.
- Subroutine repeat of programmed events.
- Nesting.
- Rotate about Z axis for skewing data.
- Mirror of programmed events.
- Copy.
- Copy rotate.
- Copy mirror.
- Tool data entry in event programming.
- Selectable retract in Bore operations.

Auxiliary Functions

- Coolant on/off
- Air on/off
- Pulse indexer
- Part change table position

Canned Cycles

- Position.
- Drill.
- Bolt Hole.
- Mill.
- Arc.
- Circle pocket.
- Rectangular pocket.
- Irregular Pocket.
- Circular profile.
- Rectangular profile.
- Irregular Profile.
- Circle Island.
- Rectangular Island.
- Irregular Island.
- Helix.
- Thread milling.
- Engrave.
- Tapping.
- Face Mill.

Edit Mode Features

- Delete events.
- Erase program.
- Spreadsheet editing.
- Global data change.
- G-Code editor.
- Clipboard to copy events between programs.
- Move between subprograms in a master program.

Program Set Up Mode Features

- Program diagnostics.
- Advanced tool library.
- Tool names.
- Tool length offset with modifiers.
- Tool path graphics with adjustable views.
- Program run time estimation clock
- Convenient part/fixture management screen.
- Fixture offsets.
- Part offsets within fixture.
- Convenient manual tool handling when tools required exceed ATC capacity.
- Photo storage and display.
- Notes.
- Z Safety Dimension to prevent crashes.
- Tool Crib.
- Tool by Tool or Part by Part run strategy.
- Convenient Tool Reconciliation between programs and ATC.
- Convenient ATC capacity.

Machine Set Up Mode Features

- Advanced diagnostic routines.
- Software travel limits set in the factory.
- Prompted Tool loading and ATC Management.
- Checklist to assure nothing is forgotten.
- Single key press to get to step needing attention.

Run Mode Features

- TRAKing.
- 3D CAM file program run.
- 3D G code file run with tool comp.
- Real time run graphics with tool icon.
- Countdown clock for total part cycle time or manual tool change.
- Error alarms prevent Run when set up steps are skipped.
- Work on Staged programs while Current program runs.

Program In/Out Mode Features

- CAM program converter.
- Converter for prior-generation ProtoTRAK programs.
- DXF/DWG file converter (Optional).
- Selection of file storage locations.
- Automatic file back-up routine.
- Preview graphics for unopened files.
- Networking.
- Create Master routine for combining programs.
- Transfer of Staged program to Current.
- Tool reconciliation for Master Programs.

Control Options

The DXF File Converter Option.

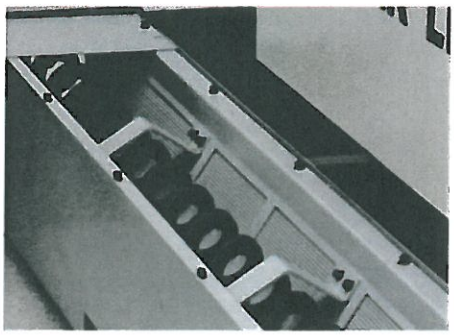
- Import and convert CAD data into ProtoTRAK programs.
- DXF or DWG files.
- Chaining.
- Automatic Gap Closing.
- Layer control.
- Easy, prompted process you can do right at the machine

CAM Out Converter Option.

- Save ProtoTRAK files as CAM files for running on different controls.

Standard Equipment

Ball Lock Clamping Device
Set of 4

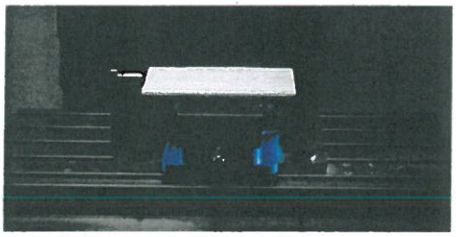


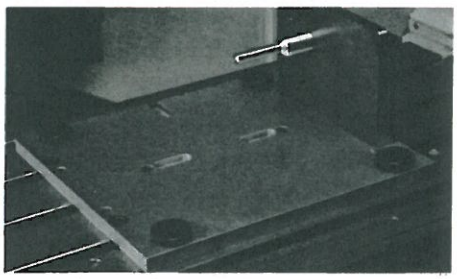
Chip Auger

Mobile Tool Setting Trolley
Includes digital measuring device, granite block and base measuring tool.

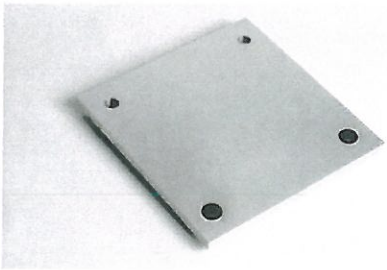
Optional Equipment

Vice
Model D675 6" Kurt vice and mounting hardware. Opens to 7.5".

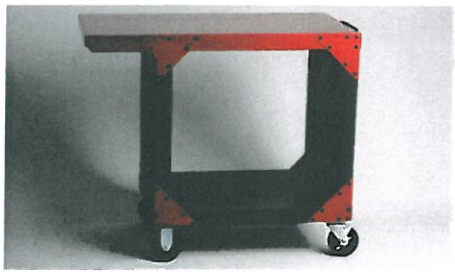




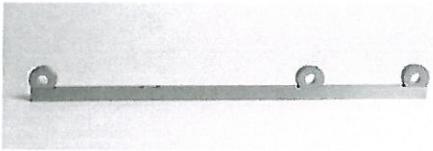
Fixture Plate Set Up For Kurt D675 Vice
Includes plate, fence, stop and hardware. Does not include vice.

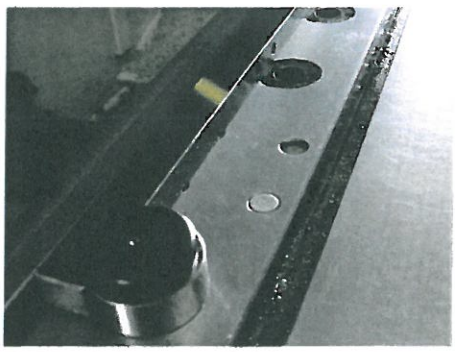


Fixture Plate
Precision plate with primary liners.
Come in three sizes:
Small (shown above) - 406 x 394mm
Medium – 406 x 609mm
Large – 406 x 813mm
Thickness 19mm



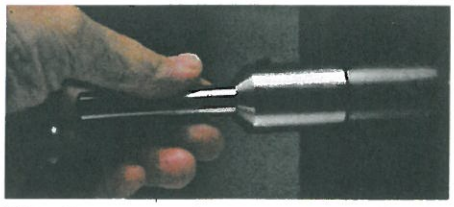
Fixture Trolley
High quality trolley by Huot Manufacturing. Lip height and length matches LPM table position during fixture change





Ball Lock Locating Guide Assembly
For locating your current fixtures on the LPM table using the ball lock system and locating holes on the table. Includes three stops.

Ball Lock Liners Primary-Set of 8
For fixture plates. High precision for use with Primary Locating Holes in the LPM table
Ball Lock Liners Secondary - Set of 8
For fixture plates. Lower precision for use with Secondary Locating Holes in the LPM table



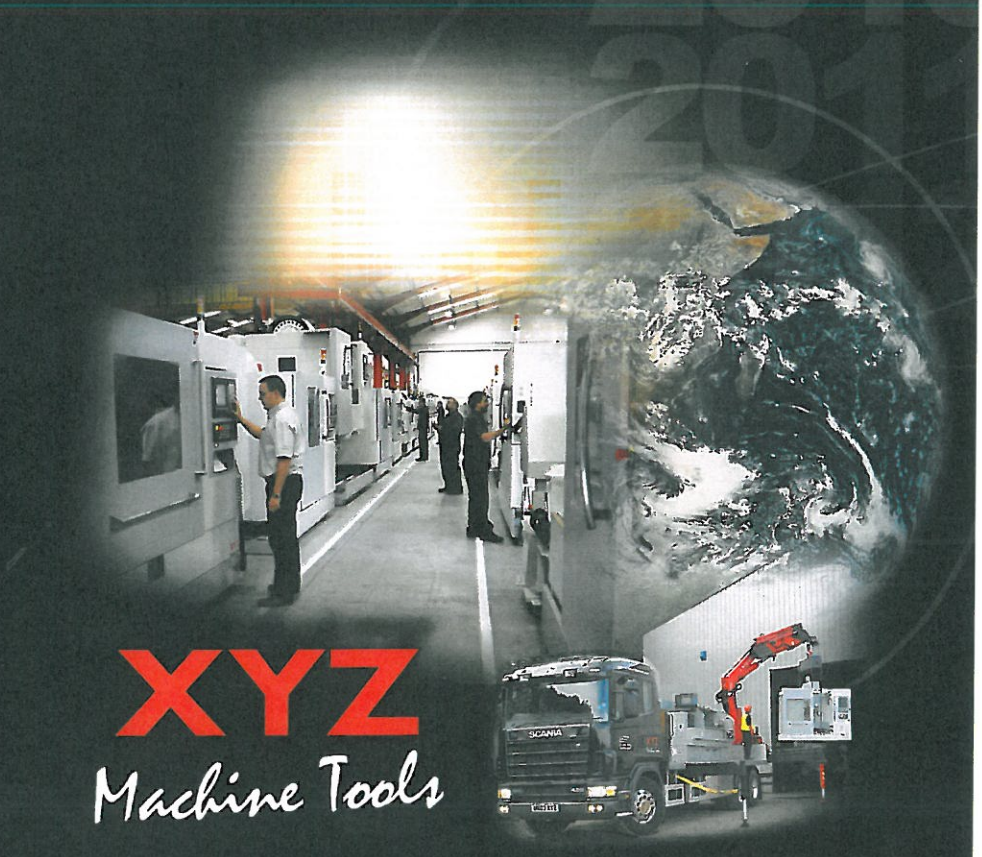
Vice Stop
Includes mag base and 25, 50 and 75mm extensions.

Pull Studs (BT 40)
Set of 16. Shown installed.

XYZ
Machine Tools

XYZ Machine Tools operates from the following five U.K. sites

- **Main Factory & Admin**
  Tiverton, Devon.
- **Midlands Showroom**
  Nuneaton, Warwickshire.
- **Northern Showroom**
  Blackburn, Lancashire.
- **London Showroom**
  Waltham Abbey, London.
- **Glasgow Showroom**
  Glasgow, Scotland.



THE XYZ 2010 RANGE, EACH ONE THE VERY BEST IN ITS CLASS.

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