

Powerful CNCThat fits on your PC!

The screenshot displays the Artisan-CNC software interface. At the top, it reads "CAUTION: MACHINE NOW RUNNING" and "Milling System". The interface is divided into several sections:

- Coordinate Readouts:**
 - X: 150.000 Millimeters (Rel)
 - Y: 75.000 Millimeters (Rel)
 - Z: 1.000 Millimeters (Rel)
 - W: 0.000 Degrees (Rel)
- Machine Status & Settings:**
 - Tool #: 2, Part Program: TEST.AGC
 - Offst #: 2, Program Type: G-Code
 - Size: 12., Len Off: -20., Exec Counter: .0
 - Feedrate: 100.076, Contouring: Disabled
 - Override% 100, Single Step: Disabled
 - Spindle RPM: 0, Coord Display: Relative
- Command Processing:**
 - Command Type Currently Processing: Rapid Traverse
 - Command String: G00 X0 Y0
 - Current Project: PROJDEF

At the bottom, the text reads: "CAFAA41 (c) 1992-2001 Ah-ha! Design Group Inc 651-641-1797"

Need CNC ?

But on a budget? Then this is the CNC catalogue for you! Hello from Eagland Machine Tools and Ah-ha! Design, and thanks for your interest in our products. We make CNC control software & hardware for machine retrofits & low cost automation applications.

Our systems are very, very, powerful for their low price. For six years we've been continuously updating and improving our products, by listening to your suggestions.

Call the Specialists at EMT!

Have you had trouble finding a vendor of low-cost controls who actually knows anything about machine tools? Would you rather talk to engineers who really use their own products? Then you want to order from Eagland Machine Tools.

And get some Straight Answers

Your questions are welcome. We specialise in answering your questions honestly and quickly. Contact us before ordering and we'll prepare a quote for you on the configuration you need.

Call EMT for

**Sales, Support, & Administration:-
Eagland Machine Tools Ltd**

The Studio

Hill Road

Lyme Regis

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DT7 3PG

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Normally Weekdays 9am - 1pm 2pm - 5pm

Overview of Ah-ha! Systems

Our Artisan-CNC software turns your Pentium PC into a complete Fanuc-compatible CNC control. The PC then connects to the EMT machine interface PCB which contains all the electronics to control the existing machine stepper drives & auxiliary devices. For servo drives there is a further card required for every 2 axes that connects between the EMT interface card and the existing drives and encoders. Use our full system approach to avoid the trouble of cobbling together a pile of incompatible parts from a bunch of different vendors. We can take you all the way "from the software to the machine", and fully support it all.

The Famous Artisan-CNC Software

Artisan software reads industry-standard G-code or HPGL tool path files that you can generate with your CAD/CAM programme. Or you can write part programmes yourself with the built-in G-code editor & command builder.

Artisan-CNC is the most powerful & easiest to use package in its class. It works with the existing machine stepper drives & motors or virtually any proprietary make of stepper motors. Very attractive for OEM's.

The EMT Machine Interface Card

The EMT IF card includes all the motor-driver & system interface electronics you need for a complete machining system. The motor drive cards, axis sensors, auxiliary devices, and the PC, all connect to this compact Printed Circuit Board.

How You Can Use Our Controls

Mill and Lathe Retrofits

Ah-ha! systems are perfect for upgrading an older NC paper-tape machine's failing control, like a Bridgeport 'Boss' for example. They're also great for converting manual machines to CNC by fitting suitable stepper drives and motors.

We carry in stock a number of used stepper motors and ball screws.

On machines fitted with 'Boss', 'Posidata' and 'North Eastern' controls, we can drive the existing motors and drive cards that are already fitted, at very low cost. Order an Ah-ha! system to get the ease of operation and reliability you've always wanted.

CNC Anything!

In other areas, we can help you automate anything you can connect motor shafts to, be it lead screws, timing belts, chain drive, etc., etc..

Mills, lathes, routers, grinders, EDM's, lasers, torches, spray guns, fluid dispensers, circuit board drills, and many other tools are all easily driven with Ah-ha! CNC.

Build Your Own Custom Machine

Many customers build their own machines for a specific purpose. For example, one built a 20' x 4' travel 7-hp router for cutting stair-stringers out of 2x12" lumber. He spent £6,000 total, instead of £35,000 for a commercial machine.

Imagine a tool that makes parts while you're on the phone taking the next order! Recoup your investment in months, or with one large order that you won because you made the jump to CNC. If you're still waiting, you're losing money!

Low Cost Automation

Our products are uniquely suited to low-cost automation. Enterprising engineers can automate their web feeds, strip cutters, labelling machines, & many other motion applications at a far lower price than traditional solutions.

Ah-ha! systems offer high resolution & accuracy with moderate speed capability. They're especially well suited to tasks that require programmable I/O functions and complex interpolated motion. Ah-ha! software provides both, with its PLC Power-Macro facility.

Just call EMT to discuss your OEM project.

Trying to choose a supplier?

Ask an Ah-ha! Customer...

We have supplied over 100 systems in the UK and to our knowledge we do not have such a thing as a dissatisfied customer. Many users are willing to show prospective customers their installation. If you want to see Ah-ha in action and cannot make it to Lyme (A great place for a weekend break) give us a call and we will try and find a user in your area that you can visit or talk to.

Steppers or Servos ?

It's commonly assumed that servos are "more accurate" than steppers. This is not true. Steppers are highly accurate, having no errors greater than a single step. Steppers are simple, reliable, easy to troubleshoot, and cheap.

Servos do provide two benefits over steppers: First, because servos require encoder feedback to work at all, they inherently provide a 'fault' indication if the machine is not at the commanded position. Second, servos are capable of greater top speed.

Servos Aren't Magic

Servos are not a perfect error-free solution. They can have: hunting, drift, overshoot, & 'following errors', that can seriously degrade part accuracy.

If you have a machine with Servos

Recognising that the most cost effective solution is to use existing drives and motors can drive servo machines using an interface card from Rutex that converts step and direction signals to analogue reading existing digital encoders.

New drives and motors

We are now stocking a modern AC servo drive system with 750 Watt motors. This provides the accuracy and simplicity of the stepper with the high speed and closed loop feature of the servo. Taking the command direct from the EMT IF card without needing a servo interface card the cost complete with all cables and connectors is £1250.00 per axis

Does It Matter?

The functionality of your machine is determined by the CNC software, not by which kind of motor you use. Both systems cut the same parts.

Artisan-CNC Software £850.00

Ah-ha! CNC software is the heart of your system. It is a complete industrial CNC control with a user interface, not just a "device driver" or "indexer". Ah-ha! CNC software includes all the commands, controls, & functions that a machinist needs for a real machining system.

You can program tool paths using industry standard G-Codes or HPGL, and our software will output fully synchronised step & direction signals for up to 4 axes. It works well with G-code files from CAD/CAM too!

Easy to use and very powerful for the price, it includes:- large on-screen position readouts, deluxe G-code editor with file load/edit/save, over 450,000 bytes of pop-up Help, metric support, a comprehensive manual, & many other features.

A very flexible setup adapts to your machine's speeds, accelerations, steps/inch, etc.. More than 100 items. Artisan-CNC also include many functions for control of auxiliary devices like coolant, clamps, chucks, turrets...

EMT IF PCB £750.00

EMT's IF card is the interface & power centre for all the various signals in your machine system. It includes complete buffering of all the 5 volt signals from the PC and a complete 'E' stop, Guard and Spindle enable circuit along with full LED indication of all functions. It also provides the step commands in the correct form for connecting directly to the machine's existing stepper drives. In the case of the Posidata range of controls the existing drive cable plugs straight into the PCB. The board requires 24 volts DC to operate but in most cases this is available from the existing machine electrics. All I/O connectors are industrial D-type connectors for the PC cable and Klippon standard plug in terminals for auxiliary functions.

EMT Bridgeport PCB £100.00

This board provides for the direct connection of the Bridgeport Series 1 drive cable (K8) that simply needs to be transferred from the Bridgeport logic board to the EMT adapter board which in turn connects directly to the EMT IF PCB with a 26 way ribbon cable that is supplied with the board.

Bridgeport Series 1 Hardware Kit**£100.00**

This includes new X Y limit switches, dogs and mounting plates. 4 new push buttons. Mounting plates for PCBs. New push button panel to replace tape reader. Multicore cable for limits and push buttons. All necessary hardware and detailed fitting instructions for Bridgeport series 1.

Cables

IF37 Cable: 1.5metre, for connecting IF16 PC card to EMT IF PCB £35.00

Using Ah-ha! CNC Software

You'll need a reliable, Pentium 100% IBM-compatible, desktop PC. It sits next to your machine & runs only the CNC software. Must be:- Intel/AMD CPU chip, colour VGA, Dos 6.22, an open 16-bit ISA slot, minimum 32mb RAM, 64K cache, 3.5" floppy, & a hard disk. A minimum speed of 200 MHZ is recommended. Avoid motherboards with built in graphics and sound. We cannot support any other setup. We do not support use of our products on laptops.

IF16 Card

Every copy of Ah-ha! CNC software includes an industrial, noise-filtered Timing/Interface card that we call an "IF card".

The IF cards plug in to your PC, & cables directly to the EMT IF PCB. The card includes 7 aux. outs & 7 aux. ins to control external devices.

16 OP

The IF16-OP Option Package adds: 8 more aux. outs, 5 more aux. ins, a 10 volt analogue output for spindle speed control etc., & an input for a lathe spindle encoder for threading. The IF16-OP option package is £125.00 additional.

Our basic stepper system is open-loop, just like a Bridgeport Boss control, which keeps the price low. Our systems have very high resolution and are quite accurate & repeatable. Absolute accuracy is determined solely by the quality of your machine tool & your mechanical installation.

Artisan includes an IF16 card, plus all these powerful features:-

Fanuc 6M Compatible

We emulate the famous Fanuc 6M control, including their macros! In general, we run industry-standard G-codes from almost any CAD/CAM system.

4-axis Control

Full set of Step, Direction, & Limit signals for every axis.

Full Interpolation

Simultaneous 3 axis linear, 2-axis (X-Y) circular.

Powerful 4th axis

Use it for indexing parts, cutting cams & threads horizontally on a mill, and many other profitable possibilities.

Graphic Tool path Display

Draws tool path on the VGA screen, & allows you to simulate a run without actually running the machine.

Full Cutter Compensation: G40, 41, etc.

Full cutter radius compensation for professional results & ease of programming. Tool length offsets & lathe offsets too!

Backlash Compensation

Get more accurate positioning with normal lead screws, in drilling-type (no side-force) applications.

Easy G-codes

We include an easy to use Command Builder Menu to help you programme lines, arcs, circles, rectangles, bolt patterns, & more.

Just fill in the blanks, & CNC does the trig & writes the G-codes for you. Pre cut & post-cut tool-axis moves, coolant controls, etc. are also automated here.

We help you concentrate on the creative aspects, not the drudgery of repetitive programming.

Restart Facility & Feed Hold

If a tool breaks, you can interrupt the programme, back up using the graphics display, and restart.

HPGL Input

Great for machines that don't need full Z-axis control (HPGL language doesn't support a true Z-axis). Our HPGL support is extensive. It includes a pen#-to-depth lookup-table so you can use pen colour in your CAD program to designate depth.

Full G-code Support

- G00 Rapid Traverse
- G01 Linear Interpolation
- G02 Clockwise Circular Interpolation
- G03 Counter Clockwise Circular Interpolation
- G04 Dwell or Delay Time
- G14 CW Thread Cutting Helical, Artisan & Pro only
- G15 CCW Thread Cutting Helical, Artisan & Pro only
- G17 Selects X-Y plane. Artisan only
- G18 Selects X-Z plane. Artisan only
- G19 Selects Y-Z plane. Artisan only
- G20 Select Inch Units
- G21 Select Millimetre Units
- G28 Return to Reference Point
- G39 Offset Tool For Auto-Pocketing Operations
- G40 Cancel Cutter Diameter Compensation
- G41 Cutter Diameter Compensation to Left of Work piece
- G42 Cutter Diameter Compensation to Right
- G43 Tool Length Comp Away From Part, Artisan & Pro
- G44 Tool Length Comp Toward Part, Artisan & Pro
- G49 Cancel Tool Length Compensation, Artisan & Pro
- G54 Work Coordinate System 1 Select (Cancel G92)
- G65 Macro/Sub-routine Call, Artisan & Pro Only
- G74 Cancel Multi quadrant Circular Interpolation
- G75 Set Multi-quadrant Circular Interpolation Mode
- G90 Absolute Mode, data are specified from fixed origin
- G91 Incremental Mode, data are relative to each other
- G92 Assign Absolute Reference Point

Feed rate Override

Fine tune the feed rate while cutting to improve finish. The +/- keys change feed rate in 5% increments from 20-150%

Continuous Contouring

Look ahead buffering eliminates pauses between most segments. Helps to minimise tool marks and burning.

Plane Selection

Allows you to circular interpolate on the X-Z and Y-Z planes. Nice for mould work, EDM electrodes, etc..

Helical Interpolation

2-axis (X-Y) circular with simultaneous Z linear, for vertical thread cutting, etc.

Single-Point Threading on a Lathe

Lets you use a spindle encoder to synchronise the carriage to the spindle for single-point threading.

Single-Step Mode, for Easy Debugging

You can test run your part programmes one line at a time.

Fast, Fast, Fast !

Up to 50,000 steps/second linear & 30,000 steps/sec circular on a Pentium 166 if your machine will stand it!

PLC Power macros

This powerhouse feature lets you write machine-specific PLC routines to use in all your G-code files. Fully automate turrets, tool changers, and special-machines. Use the auxiliary inputs/outputs and the macro bit-test/set capabilities. Includes: repeating loops, mathematics within G-code programmes, time delays, corner radiusing, pocketing, & many more capabilities. Perfect for OEM's or retro fitters, to fully automate all machine functions.

There's been some confusion..

Artisan: "One who crafts fine objects with their hands"

Artesian: "Water from an underground pressure source"

CAD/CAM Software

Going From Idea to Finished Part

It's a 3-stage process: CAD for drawing, CAM to generate a G-code or HPGL "tool path" file from the drawing, and third; the actual control of the machine, which Artisan-CNC software performs.

Camwrite DOS £995

Low cost CAD/CAM & Post-Processing Software. Includes basic drawing, the ability to import DXF files, and most importantly, the post processor to generate G-codes from your drawing

The list price is £1500.00 but we have negotiated a special price only when purchased with Artisan software

Canwrite Windows £2750

State of the art CAD/CAM & Post-Processing Software. Includes full drawing facility, the ability to import DXF files, and most importantly, the post-processing software to generate G-codes from your drawing

What You'll Need to Succeed

Pentium Computer 160 or greater
You'll need a dedicated high-quality desktop PC.
100% IBM compatible **with an ISA Slot and standard VGA Video card.**

When you install our software, this PC will become a CNC control. No other software should be run on this PC.

Artisan Software and PC interface card.

EMT interface card unless you arrange your own electronics.

Cables from PC to machine.

Limit switches if the existing switches are not suitable.

Stepper or servo motor drive cards unless using drives already fitted to machine. Most machines that are already fitted with motors have drive cards that can be used.

Stepper or servo motors. Again any existing motors are usually suitable.

Sundry hardware for mounting limit switches etc.

Several push buttons if nothing suitable exists.

Servo interface card(s) and encoders if you are using servo drives

Total Price Bridgeport Series 1 £1800

Includes Artisan software, PC IF Card, EMT IF Card, Mounting plate, 4 limit switches and mounts, 4 push buttons, Bridgeport adapter PCB with ribbon cable to EMT IF and 2 IF37 Cables plus sundry hardware and cable. Used when retaining existing drives. Includes detailed and comprehensive instructions on fitting and standard parameter files.

Total Price Matchmaker £1600

Includes Artisan software, PC IF Card, EMT IF Card, and 2 IF37 Cables. For use when retaining existing Posidata drives. Includes detailed and comprehensive instructions on fitting.

Total Price Posidata Controls £1600

Includes Artisan software, PC IF Card, EMT IF Card, and 2 IF37 Cables. For use when retaining existing Posidata drives. Includes detailed and comprehensive instructions on fitting.

Spindle Speed, extra IO and Threading basic £125 extra

Provides analogue, extra IO and encoder socket on PC card for end user to connect into machine

Spindle Speed, extra IO and Threading full kit £320 extra

Provides analogue, extra IO and encoder socket on PC card, 2 cables and interface card to fit to machine with buffered input and outputs.

Delivery on all items 2-3 days

Knowledge is Power !

If you've already talked to us, then you know you don't have to twist our arm to get us to answer a few questions. We also offer great books to satisfy your thirst for knowledge.

The demos listed here are a great way for you to see if our control will suit your application.

Artisan-CNC Demo

Working demo disk. Not a dumb slide show. You can actually enter and run your own G-code files. £9.00 including VAT & UK shipping.

Artisan-CNC Demo with Full Manual

Artisan-CNC demo disk as above, but including the full 130 page software technical manual. If you seriously want to evaluate our control, this is the package to order. £19.50 including VAT & UK shipping.

Terms and Conditions

Payment Terms

We accept orders that are prepaid with cheque. We can provide a pro-forma invoice for your prepayment process, so that you can take advantage of our budget-saving products and support. Please ask for what you need.

Disclaimer of Liability

Because of the nature of these devices, **PERSONAL INJURY OR DEATH MAY RESULT FROM IMPROPER CONSTRUCTION OR USE!**

Since neither EMT or Ah-ha! have control over installation and use, the buyer hereby agrees that he/she is solely responsible for the safe use of any product purchased. Ah-ha! products are not suitable for, nor intended for, any application where failure may cause injury or death.

Do NOT use our products for any life-support, medical, or lifting/hoisting device. Do NOT use our products without proper approved machine guards that comply with the latest regulations and "Emergency Stop" setups. Any CNC machine may move improperly, unpredictably, & without warning!

Approvals

Our products are sold only as industrial components, not as finished consumer goods. It's the *buyer's responsibility* for CE, or other approval of finished systems end products.

Warranty

All new products are warranted to meet specification for 1 year. Any products modified by machining, assembly, etc. are obviously non-returnable. This is not a full warranty statement. If you want all the disclaimers, etc., please request a full warranty.

Returns

All sales are final. Warranty service is by product return to our works. We make absolutely no warranties as to merchantability, usability, or fitness for a particular purpose.

Support

We enjoy talking with our customers and friends, and we're always happy to help with a specific question on our products. Call 01297-446000 for tech questions. Our software is easy to use, but ideally you should already know how to use a PC.

Performance

Every machine is different. Motors, friction/inertia coefficients, & resonance/stalling phenomena vary widely. Estimated rates are measured on our machines. We can't guarantee speeds or performance for your installation.

Shipping

Amtrak unless specified. Our freight charges include shipping, handling & packing costs.

About Ah-ha! Design Group

The Ah-ha! philosophy is to bring high-tech to the small shop on a budget. We provide 80% of the functionality of high-end systems for 20% of their price. Ah-ha! has experience in software & electronics design, machining & sheet metal fabrication, computer system integration, & managing a business with fairness and integrity. This is our 5th year making low cost CNC.

Our products are for the person with the skills & common sense to manage the project themselves. They're not designed for beginners, nor for absolute top speed or extreme environments. They're built for the shop or OEM that needs the *functions* of a sophisticated CNC, but can live with the lower rapid traverse rates of our low cost systems. EMT can supply OEM quantities of Ah-ha! products to boost *your* sales, & we invite your inquiries. Please feel free to suggest improvements or new products.

Thanks from EMT & Ah-ha!

About Eagland Machine Tools

Specialising in the supply of reliable used machine tools for over 30 years we have handled only CNC machines for the last 22 years. Building on our experience of retrofitting high level controls to machines of all types we have taken on the Ah-ha! Product to enable us to bring the benefit of modern CNC control to machinists who cannot justify the cost of new machines.

Eagland Machine Tools Ltd

Telephone 01297-446000

E-mail sales@eagland.co.uk

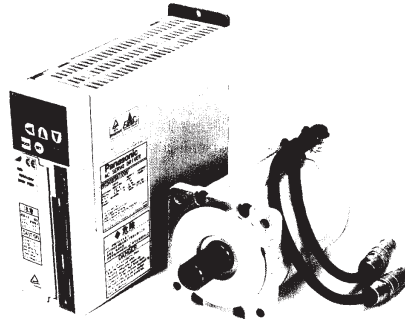
This Is the full specification of the new AC Servo drive we are now stocking. The cost complete with all cables is £1250.00 per axis

750 W

Panasonic compact digital servo

Motor specification

Rated output power	(W)	750
Rated torque	(Nm)	2.4
Intermittent peak torque	(Nm)	7.15
Rated speed	(r/min)	3000
Maximum speed	(r/min)	5000
Rated r.m.s. current	(A)	4.3
Maximum peak current	(A)	18.3
Rotor inertia	(kgm ² x10 ⁻⁴)	1.33
Electrical time const.	(ms)	6.4
Mechanical time const.	(ms)	0.48
Torque const.	(Nm/A)	0.40
Resistance	(Ω)	0.39
Inductance	(mH)	2.5
Insulation class		B
Standard enclosure		IP40
Incremental encoder pulse rate		2500

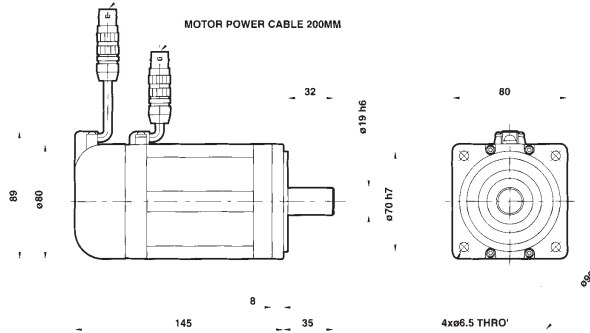


Model

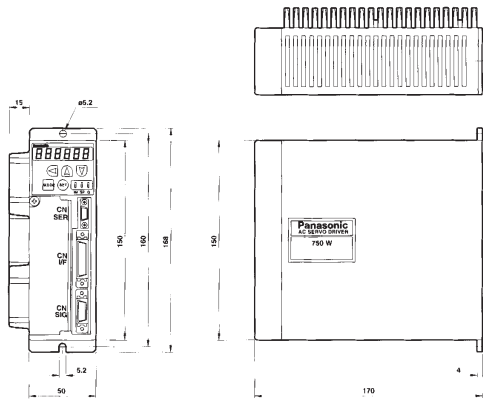
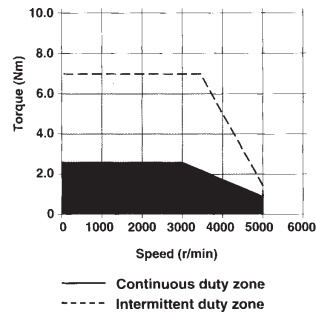
750W brushless servo motor **M1-643 364**
 750W digital servo drive **M2-636 850**
 RFI noise filter **K3-19 725**

ENCODER CABLE 230MM

MOTOR POWER CABLE 200MM



Motor characteristics



Price List Ah-ha! systems

A	Artisan C.N.C. Software With IF16 Card	£850.00
B	IF16OP Option on IF16 Card for threading on lathes, Spindle speed control and extra M functions.	£125.00
C	EMT 24 Volt Machine interface Card, converts all switched I/O to 24 Volts and converts step commands for Bridgeport, Posidata, PKS drives and Servo Interface Card. Complete with 2 off 37 way cables	£750.00
D	EMT interface card for use with IF16OP option converts all additional I/O to 24 Volts and provides terminals for Analogue speed output and threading encoder input. Complete with 2 off 25 way cables	£195.00
E	Bridgeport Stepper connection card, connects to EMT card (C) and accepts existing Bridgeport drive plug.	£100.00
F	Bridgeport hardware kit includes all mounts and switches	£100.00
G	37 Way Cables PC to interface card (2 normally required) Each	£35.00
H	25 Way Cables PC to Machine (Only needed with 16OP option) Each	£20.00
K	Panasonic 750W AC servo drive, motor and cables	£1375.00
L	Panasonic Ah-ha I/F card (plug connects up to 4 axes of drive)	£150.00
M	Gecko G212 7 amp micro stepping Stepper Drive	£155.00
N	Gecko G340 20 amp servo Drive The G212 produces 10 micro steps for 1 full step command and is suitable for all computers. A power supply for 3 Geckos costs approximately	£155.00 £130.00
Basic mill kit price using existing stepper drives or Gecko drives (A + C)		£1600.00
Programmable spindle speeds and extra I/O for Tool changers etc (B + D) costs an additional		£320.00
Lathe kit price using existing stepper drives or Gecko drives (A + B + C + D) includes programmable spindle speeds, threading input and extra I/O		£1920.00
Complete Kit price for Bridgeport using existing drives (A + C + E + F) Bridgeport card includes full documentation on wiring modifications		£1800.00

We also have a selection of Ball screws at competitive prices.

All Prices plus VAT & Carriage at cost