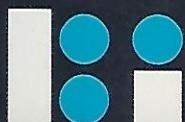


ACROLOC®



MANUFACTURED BY:



**BAYER
INDUSTRIES INC.**

**ACROLOC® 100
SERIES**

951 West Watkins
Phoenix, Arizona 85007
(602) 257-1056

P.O. Box 20907
Phoenix, Arizona
85036

CONTROL SPECIFICATIONS — GENERAL NUMERIC 6MB

SERIES 100

3 axis simultaneous positioning G00, and linear interpolation G01; circular interpolation G02, G03, including multi-quadrant arc

Switchable plane, mirror image, buffer storage

Least input/output increment: 0.0001"
0.001 mm

Automatic circular interpolation by arc designation; look-ahead cutter radius compensation C; inch/metric and metric/inch switchable

Label skip function, control out/in (mid-tape label skip function)

Decimal point programming and/or leading zero suppression

Dwell, G04; in-position programming by G09 or G61/G64

Automatic zero return: machine zero, high speed zero return G28, and start point return G29. Automatic return from zero thru intermediate point G29

Tool length offset: G43, G44 and G49

Tool position offset: G45, G46, G47 and G48

Tool offset in memory: 32 sets, loaded via tape or MDI

Absolute/incremental programming, G90, G91 both permissible in same block; absolute zero point, G92 (position preset)

Direct feedback designation in inches per minute or F code G94: IPM

Canned Cycles A: G81, spot drilling cycle; G82, counter boring cycle; G84, tapping cycle; G85, boring cycle with feedout; G86, boring cycle with spindle stop at bottom; G89, boring cycle with dwell at bottom; G98, initial level return; G99, reference level return

Canned Cycles B: includes canned Cycles A plus the following: G73, G83, peck drilling cycle; G74, counter tapping cycle; G76, fine boring cycle; G87, back boring cycle; G88, boring cycle with dwell and spindle stop at bottom

MDI/CRT Display: 9" (diagonal) CRT provides 15 line display (480 characters total). Display includes: current position (X3 magnification), relative position (relative to both work and machine coordinates), remaining distance to go, program and sequence numbers. MDI allows input of any program data.

Multiple part program storage and edit, non-volatile storage for 132 feet of program, repetitive subprogram, multiprogram stored up to 96 programs. Part program storage, bubble memory, 132 feet total

Edit panel: word scanning, word search, address search, insert, alter, delete, multiple block delete, block scanning, block search, program search, program compacting

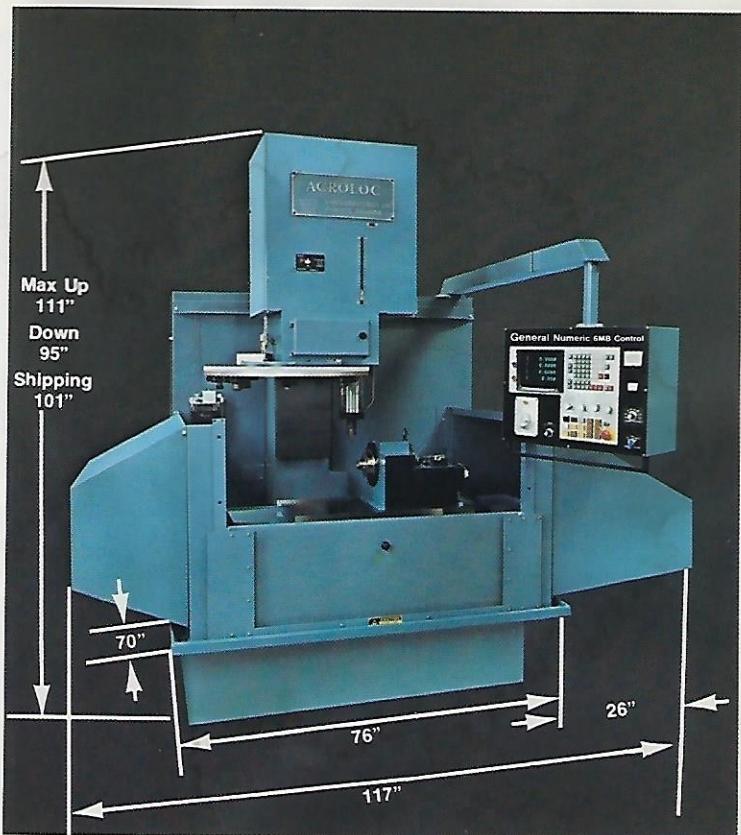
Single block, block delete, optional stop, dry run mode, machine lock, Z axis lock, stored program protect key

M, S and T function lock input

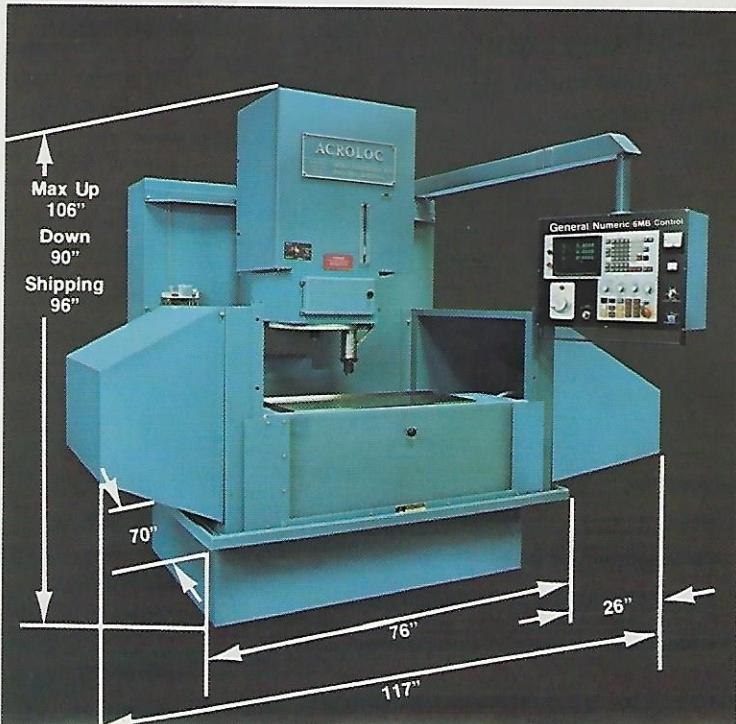
Manual pulse generator with lamp

Tape punch interface posts provided: Facit 4070, parallel ASR 33, serial RS 232C input/output

NOTE: OTHER CONTROLS AVAILABLE ON REQUEST.



SERIES 10



SPECIFICATIONS SERIES 100

STRUCTURE

BASE AND COLUMN - rigid Meehanite construction
TABLE - hardened and ground steel
TABLE WAYS - hardened steel on Turcite
BALL SCREWS (all axis) - hardened precision ground and preloaded, protected with overrun clutches
HEAD - rigid Meehanite construction
HEIGHT FROM FLOOR TO TABLE - 35"
COOLANT TANK CAPACITY - 25 gallons

TRAVELS

LONGITUDINAL (X) AXIS - 31.5"
CROSS (Y) AXIS - 15.5"
VERTICAL (Z) AXIS - 10" total, 8" usable
HEAD RANGE - 22" less cutter extension from toolholder
RAPID TRAVERSE SPEED - Up to 400 IPM X,Y,Z

SPINDLE DATA

SPINDLE DIAMETER - 4 5/8"
R.P.M. - 0-4500 direct programming
HORSEPOWER AVAILABLE - 10 H.P. (STD)
ORIENTATION - standard equipment

AUTOMATIC TOOLCHANGER

NUMBER OF TOOLS - 15
TOOL SELECTION - random by address code with uni-directional rotation of magazine

TOOL CHANGE TIME - chip to chip

3 seconds

TOOL EXCHANGE TIME - 1 second

ORIENTATION - automatic with retraction

MAXIMUM TOOL DIA. - 6.4"

STANDARD ACCESSORIES

1. AUTOMATIC LUBRICATION SYSTEM
2. SPINDLE ORIENTATION
3. LOW LEVEL LUBE ALARM
4. SPINDLE TACH AND AMP METER
5. CHIP ENCLOSURE (FULL)
6. FLOOD COOLANT SYSTEM
7. PROGRAM MANUAL

ACCURACY

CONTROL RESOLUTION .0001 in/pulse

POSITIONING ACCURACY $\pm .0008$ " in 12

REPEATABILITY $\pm .0004$ "

T.I.R. AT SPINDLE NOSE .0003"

CLOSED LOOP SYSTEM AND DRIVES WITH RESOLVER FEEDBACK DIRECTLY COUPLED TO BALL SCREWS

CAPABILITY

MILLING (3" Shell Mill) - STEEL 14 cu/in.; ALUMINUM 50 cu/in.

* DRILLING - STEEL 1 1/4" dia.; ALUMINUM 1 3/4" dia.

* TAPPING - STEEL 1"-8 (straight); ALUMINUM 1 1/4"-7 (straight)

* Note: Capacity can be increased with optional high torque drive

MAXIMUM WEIGHT ON TABLE - 700 pounds centrally located

MACHINE OPTIONS

BAYER 4TH AXIS VERTICAL ROTARY TABLE AND LOGIC

15.7" HORIZONTAL ROTARY TABLE (4th Axis)

PROGRAMMABLE HEAD ELEVATION

SPECIAL TOOLHOLDERS:

MULTI SPINDLE - easily made fixed centered plates adapted to tool holder permits multi spindle drilling

ALL ANGLE - capable of drilling at compound angles

RIGHT ANGLE - double ended dual purpose

SPEED MULTIPLIER - max. R.P.M. 14,000 (with programmable lubricator)

ENGRAVING ADAPTER - used with speed multiplier to control engraving depth independent of surface irregularity

SPRAY MIST - programmable coolant on/off with M function

HIGH TORQUE DRIVE - for those applications requiring high torque at low speeds

GENERAL NUMERIC ROBOT - for loading and unloading parts

LINEAR SCALES - for greater accuracy

OVER 1000 MACHINES SHIPPED WORLDWIDE

SPECIFICATIONS SERIES 10

STRUCTURE

BASE AND COLUMN - rigid Meehanite construction
TABLE - hardened and ground steel
TABLE WAYS - hardened steel on Turcite
BALL SCREWS (all axis) - hardened, precision ground and preloaded, protected with overrun clutches
HEAD - rigid Meehanite construction
HEIGHT FROM FLOOR TO TABLE - 35"
COOLANT TANK CAPACITY - 25 gallons

TRAVELS

LONGITUDINAL (X) AXIS - 31.5"
CROSS (Y) AXIS - 15.5" for parts less than 6" above table; 14.5" for higher parts
VERTICAL (Z) AXIS - 8" total, 6" usable
HEAD RANGE - 25" less cutter extension from toolholder
RAPID TRAVERSE SPEED - Up to 400 IPM X,Y,Z

SPINDLE DATA

SPINDLE DIAMETER - 3"
R.P.M. - 0-3500 direct programming

HORSEPOWER AVAILABLE - 5 H.P. (STD)

AUTOMATIC TOOLCHANGER

NUMBER OF TOOLS - 12

TOOL SELECTION - random by address code with uni-directional rotation of magazine

TOOL CHANGE TIME - chip to chip 2.4 seconds

TOOL EXCHANGE TIME - 1 second

MAXIMUM TOOL DIA. - 3-1/2"

STANDARD ACCESSORIES

1. AUTOMATIC LUBRICATION SYSTEM
2. LOW LEVEL LUBE ALARM
3. SPINDLE TACH AND AMP METER
4. CHIP ENCLOSURE (FULL)
5. FLOOD COOLANT SYSTEM
6. PROGRAM MANUAL

ACCURACY

CONTROL RESOLUTION .0001 in/pulse

POSITIONING ACCURACY $\pm .0008$ " in 12

REPEATABILITY $\pm .0004$ "

T.I.R. AT SPINDLE NOSE .0003"

CLOSED LOOP SYSTEM AND DRIVES WITH RESOLVER FEEDBACK DIRECTLY COUPLED TO BALL SCREWS

CAPABILITY

MILLING (3/4" End Mill) - STEEL 2.0 cu/in.; ALUMINUM 10 cu/in.

DRILLING - STEEL 3/4" dia.; ALUMINUM 1.0" dia.

TAPPING - STEEL 3/4"-10; ALUMINUM 1.0"-8

MAXIMUM WEIGHT ON TABLE - 700 pounds centrally located

MACHINE OPTIONS

BAYER 4TH AXIS VERTICAL ROTARY TABLE AND LOGIC

15.7" HORIZONTAL ROTARY TABLE (4th Axis)

SPECIAL TOOLHOLDER:

SPEED MULTIPLIER - max. R.P.M. 17,000 (with programmable lubricator)

ENGRAVING ADAPTER - used with speed multiplier to control engraving depth independent of surface irregularity

GENERAL NUMERIC ROBOT - for loading and unloading parts

LINEAR SCALES - for greater accuracy

INEXPENSIVE COMPUTER PROGRAMMING PACKAGE AVAILABLE

SIMPLE DESIGN WITH FEWER PARTS TO PROVIDE THE MAXIMUM IN PRODUCTIVITY AND RELIABILITY

FASTEST TOOL CHANGE IN THE WORLD

Fast, simple and reliable tool change increases production and reduces down time. The tool is placed under the Spindle by programmed rotation of the Tool Disc. Downward motion of the Spindle engages and locks the Toolholder in place. Upward motion returns the Toolholder to the Tool Disc. Up to 15 Tools (12 Tools on Series 10) may be used. Tool chip to chip change time approximately 2.4 seconds. The ACROLOC® Toolholder is designed specifically for an automatic toolchanger. It offers simplicity, rigidity, accuracy, reliability and high speed change. Each Toolholder is a self-contained mechanical locking mechanism. It is not subject to Hydraulic, Pneumatic, timing or adjustment problems.

SPINDLE SPEED CONTROL

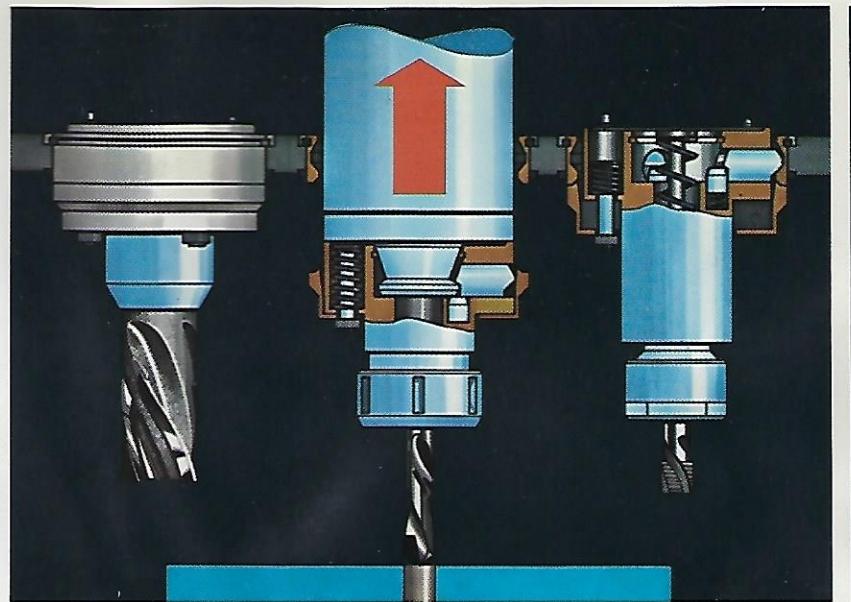
The Spindle is powered by a 10 horsepower DC motor (Series 10 is 5 horsepower). The speed of each tool may be infinitely adjusted from 0 to 4500 (0 to 3500 on Series 10). The spindle speeds may be programmed on tape in direct RPM. The speeds may be changed without changing the tape by speed overrides.

SPINDLE DRIVE AND BRAKE

A Two Speed Pulley increases torque at low speed. Dynamic breaking stops and orients (Series 100) Spindle before Tool change.

3RD AXIS SPINDLE CONTROL

The 3rd Axis Spindle Control provides the ultimate in flexibility. It permits limitless multi-step cutting. It enables the user to achieve the full benefit from Numerical Control by transferring the setup for succeeding runs. Tapping is achieved by using a tension type Toolholder and programming the most appropriate sequence.

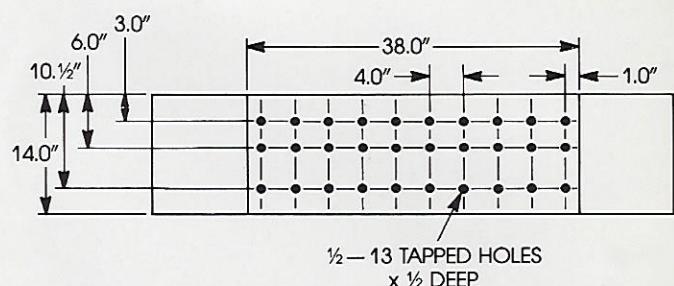


SPINDLE

Hard Chrome Plated Spindle Column is continuously supported over nine inches engagement. Opposing high precision Ball Bearings provide rigidity for milling. A lip type seal retains oil on Spindle Column.

TABLE AND SADDLE

The Table is fabricated from steel. The wear surfaces and entire top Table surface are hardened and precision ground. The saddle consists of an iron casting with turcite ways, ground and scraped to a precision fit. The base consists of hardened and ground alloy steel square ways. Dip rollers provide continuous lubrication for the Table.

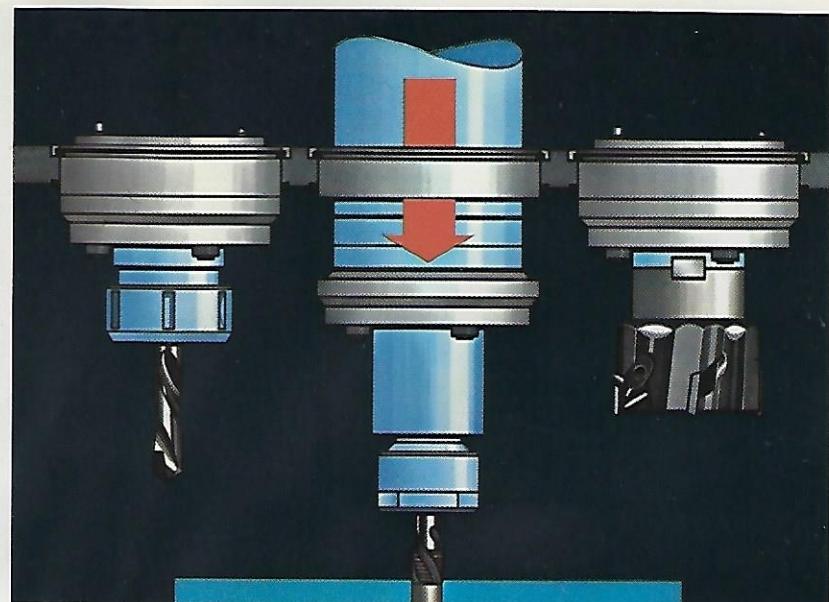
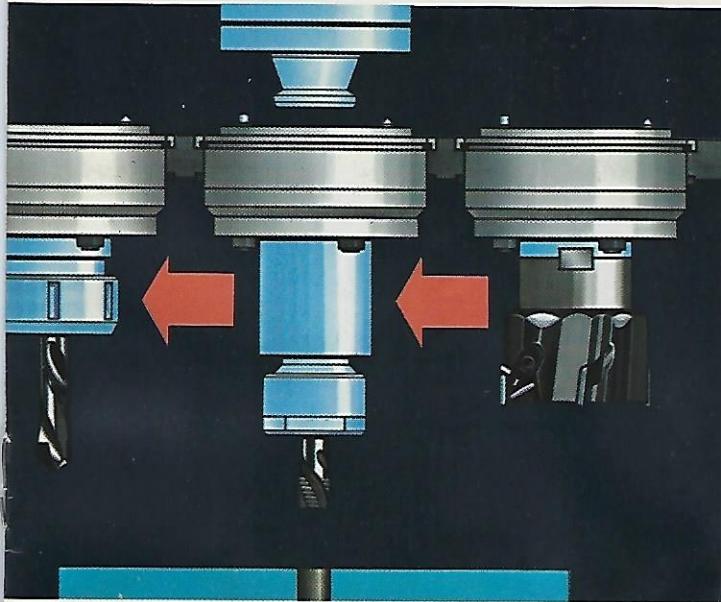


BALL SCREWS

Precision hardened and ground Ball Screws with anti back lash nuts position the Table and Spindle.

LUBRICATION

An electric pump automatically and intermittently injects oil to the Spindle, Ball Screws and Slides. A bell warns the operator when the reservoir oil level is low.



BAYER PATENTED TOOLHOLDER

INTERFACE CONTROLS

Plug in Circuit Board, relays and Components facilitate maintenance. Additional programmable relay sockets are included to permit future programmable options, such as pneumatic rotary indexers.

HEAD ELEVATOR

The Head is raised and lowered electrically. Clamps on each side lock the Head securely in place. (See 5 Axis Option for Acroloc® 100.)

CHIP CONTROL

The very large chip pan and enclosure stress operator safety and shop cleanliness. The enclosure permits high speed machining with abundance of coolant.

ACROLOC® 100 SERIES

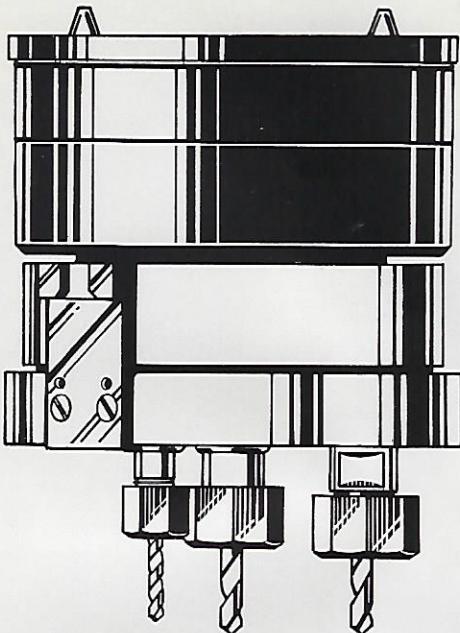
The 4 5/8" spindle gives it the milling capabilities you need for the larger jobs with a 10 horsepower constant spindle drive and 15 tools, at a cost very competitive with machines that can do less. You will have to see it perform to realize how much productivity you will get for your dollar.

VALUE ENGINEERING MAKES THE ACROLOC® THE LOW MAINTENANCE MACHINING CENTER



ILLUSTRATIONS ON SERIES 10

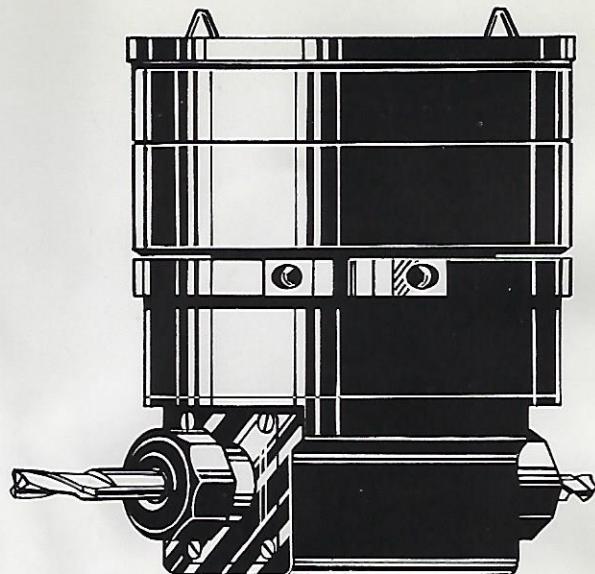
SPECIAL PURPOSE TOOLHOLDERS



ACROLOC® MULTI SPINDLE TOOLHOLDER

CAPACITY: 1/16" - 1/2" dia. DRILL

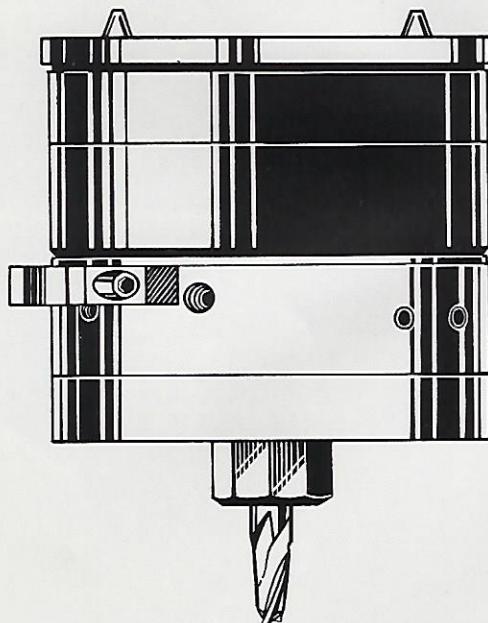
ADVANTAGE: Reduces part run time.
Available on Series 100



ACROLOC® RIGHT ANGLE TOOLHOLDER

CAPACITY: 1/16" - 3/8" dia. MILL
1/16" - 3/8" dia. DRILL
1/16" - 3/8" dia. TAP

ADVANTAGE: Reduces need for tooling, setup and parts handling.
Available on Series 100.



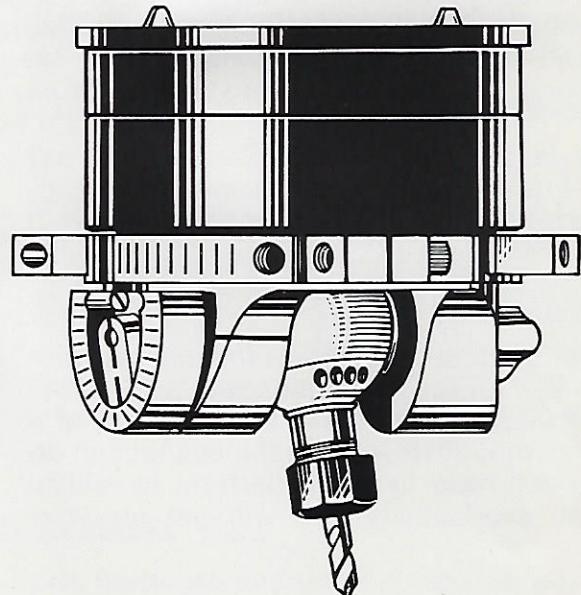
ACROLOC® SPEED MULTIPLIER TOOLHOLDER

CAPACITY: 1/16" - 3/8" dia. MILL
1/16" - 3/8" dia. DRILL

SPEED: Series 100 — 14,000 R.P.M.
Series 10 — 17,000 R.P.M.

ADVANTAGE: Reduces run time, especially for aluminum parts.

Available on Series 10 and Series 100.



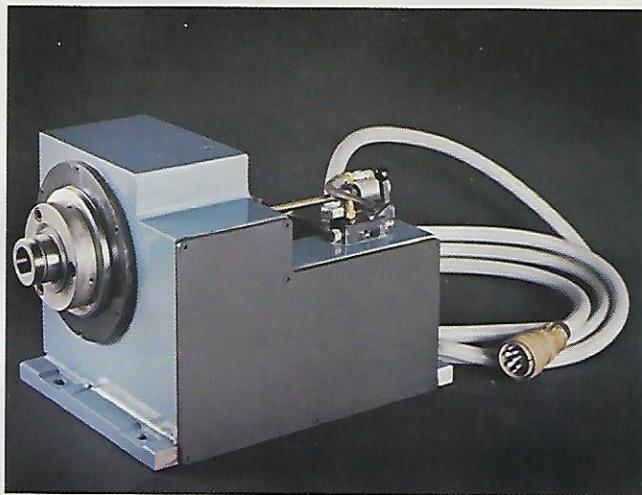
ACROLOC® ALL-ANGLE TOOLHOLDER

CAPACITY: 1/16" - 1/2" dia. DRILL AND TAP

ADVANTAGE: Reduces need for tooling, setup and parts handling.
Available on Series 100.

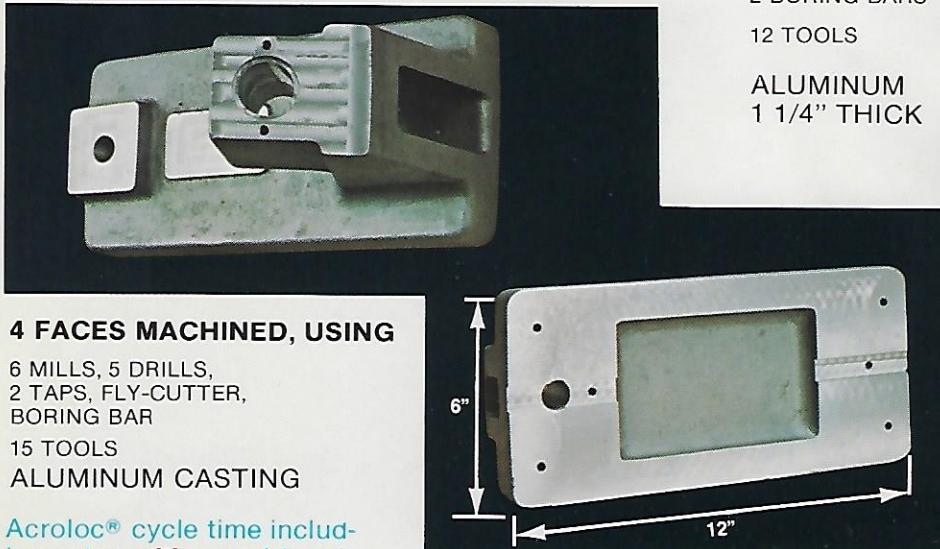
OTHER Toolholders available for milling, drilling, tapping, boring.

BAYER 4TH AXIS ROTARY SYSTEM



This optional rotary axis complements the Acroloc®'s already outstanding machining ability. Profile milling as the part rotates allows the Acroloc® to cut cams and radially eccentric diameters with ease. Splines and gears are also possible. With one 4th axis fixture, elimination of up to six fixtures allows a part to be finished machined on all sides in one cycle. Setups become minimum and higher production is inevitable.

Positioning Programmable to .001 of a degree
Bearings Two 6" taper roller bearings
Rotation Bi-directional in rapids and feeds
Through Diameter One inch
Tooling Available The Bayer air-actuated collet nose accommodates Hardinge 5C collets; interchangeable with face plates up to 15 inch diameter. A three jaw-chuck is also available.
Weight 275 lbs.



4 FACES MACHINED, USING

6 MILLS, 5 DRILLS,
2 TAPS, FLY-CUTTER,
BORING BAR

15 TOOLS
ALUMINUM CASTING

Acroloc® cycle time including setup **with** one 4th axis fixture

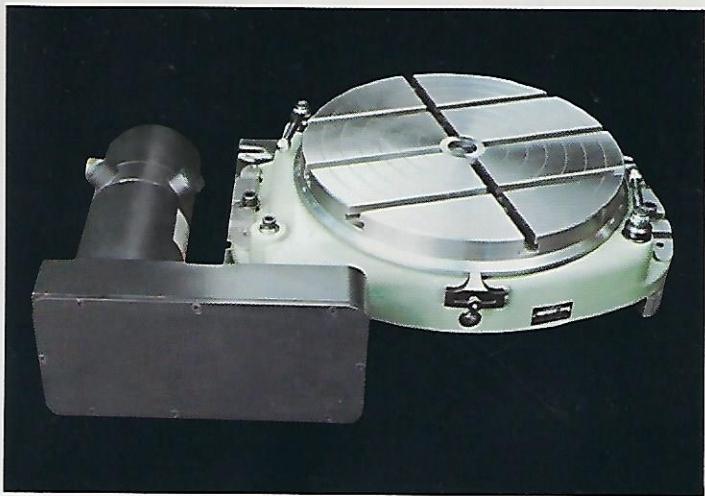
Fixture Cost \$180.00

C.N.C. cycle time including setup **without** 4th axis and using 4 fixtures

Fixture Cost \$680.00

The above times are based on a run of 40 parts. The need for accurate location from a previously machined face is eliminated; therefore, a more consistent accurate part is obvious.

4TH AXIS HORIZONTAL SYSTEM



This system greatly enhances the machining capabilities of the Acroloc®. Larger diameter parts far greater than the standard throat size of the machine can be machined. Driven by a closed-loop servo motor and resolver feedback system, high precision contouring and positioning is maintained.

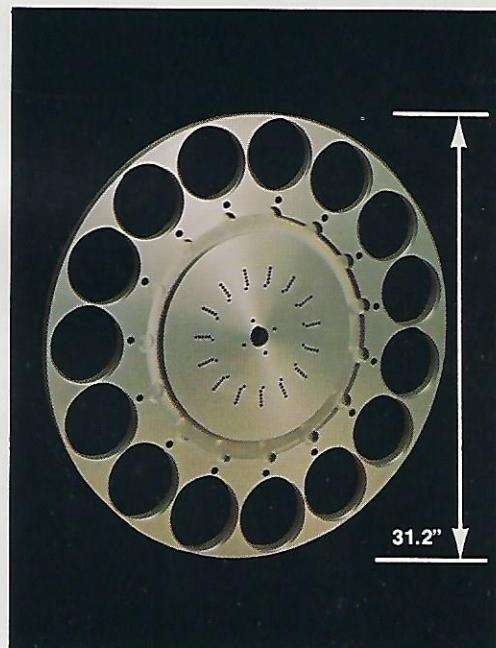
Positioning Programmable to .001 of a degree
Rotation Bi-directional in rapids and feeds
Table Diameter 15.7 inches with T-slots
Weight 280 lbs.

Cycle time 38 minutes

5 DRILLS, REAMER,
4 END MILLS,
2 BORING BARS

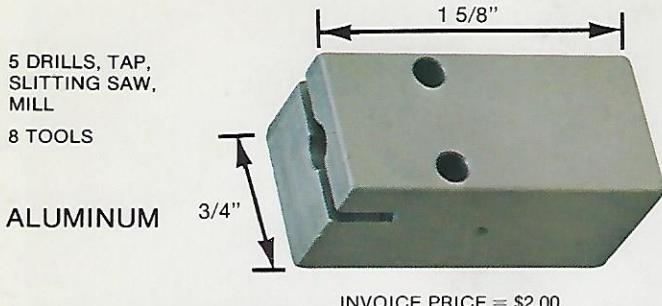
12 TOOLS

ALUMINUM
1 1/4" THICK



The above part was machined on an Acroloc® using the 4th axis horizontal rotary table system. The size of the part would normally require a much larger and more expensive machine. The Acroloc® machined the part with ease; profitability, naturally, was high.

APPLICATIONS



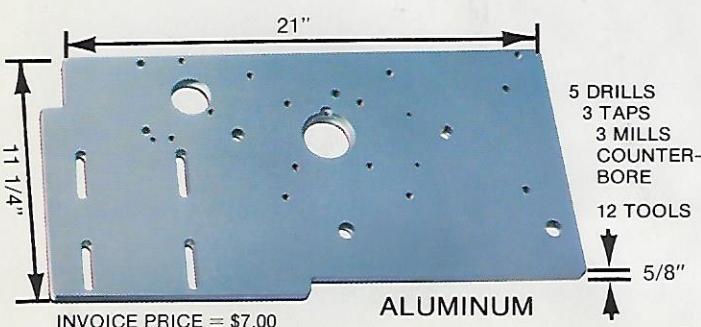
NEAREST COMPETITOR RUN TIME

3.05 MIN.

Total Tool Change Time	2 MIN.	Total Tool Change Time	19 SEC.
Manufacturing Cost	\$1.50	Manufacturing Cost	\$0.47
Productive Profit Per Hour	\$39.34	Productive Profit Per Hour	\$128.57

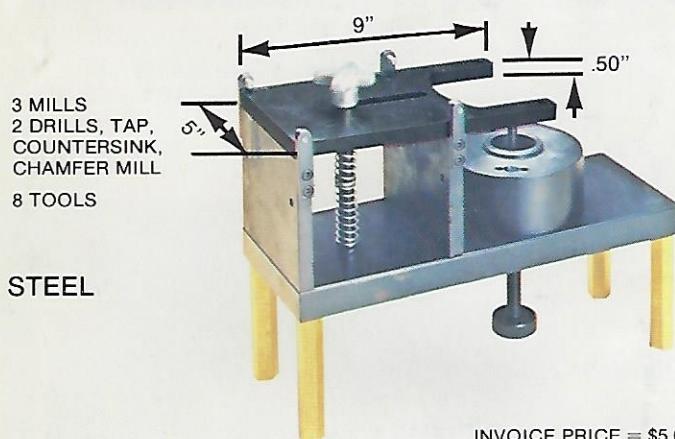
ACROLOC® RUN TIME

56 SEC.



16 MIN.

Total Tool Change Time	3 MIN.	Total Tool Change Time	29 SEC.
Manufacturing Cost	\$8.00	Manufacturing Cost	\$5.75
Productive Profit Per Hour	\$26.25	Productive Profit Per Hour	\$36.52



12 MIN.

Total Tool Change Time	2 MIN.	Total Tool Change Time	19 SEC.
Manufacturing Cost	\$6.00	Manufacturing Cost	\$4.00
Productive Profit Per Hour	\$25.00	Productive Profit Per Hour	\$37.50

The above studies were carried out assuming an N.C. shop rate of \$30.00 per hour. Our nearest competitors chip to chip tool change time was 15 seconds.

**THE WORLD'S FASTEST TOOL
CHANGE GIVES YOU THE
COMPETITIVE EDGE**



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