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BULLETIN

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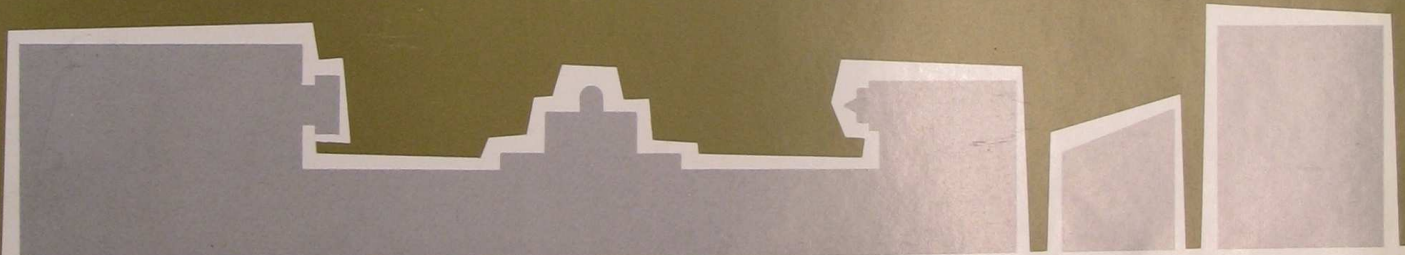
AMERICAN

TAPE

CONTROLLED

LATHE

with **MINUTEMAN** Coordinate Set-Up



The American Tool Works Company
Pearl Street at Eggleston Avenue • Cincinnati 2, Ohio

AMERICAN answers Industry's demand for a USABLE tape controlled lathe!

NUMERICAL CONTROL

Teamed With

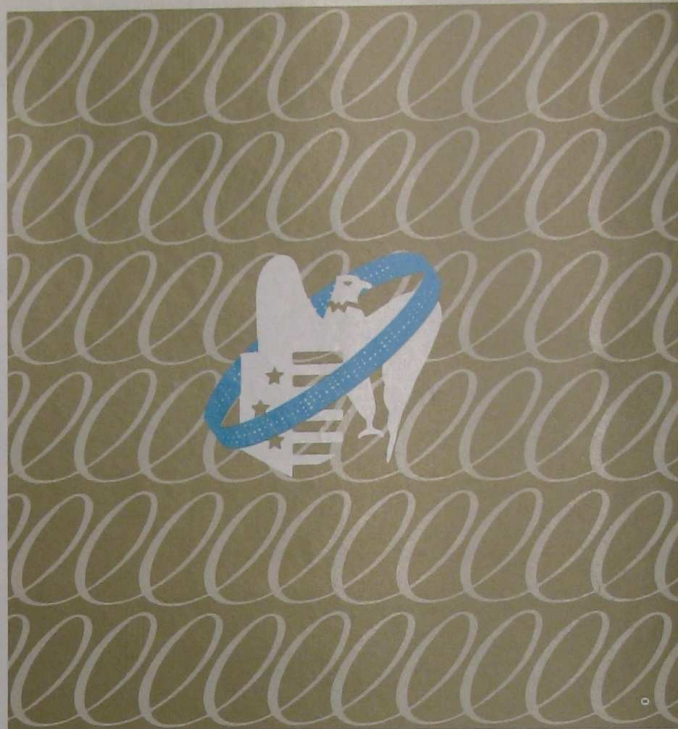
MACHINE TOOL KNOW-HOW

Gives You

THE MOST

PRACTICAL LATHE

IN THE WORLD



Here's a production queen with beauty and brains . . . especially designed and built to meet Industry's demand for simplicity, accuracy, rigidity and USABILITY!

Six sizes, from the smaller 2010 through the giant 4732, fill the need for *any* job. Each is teamed with a General Electric Mark Century continuous path control system, using standard 1", 8-channel punched tape.

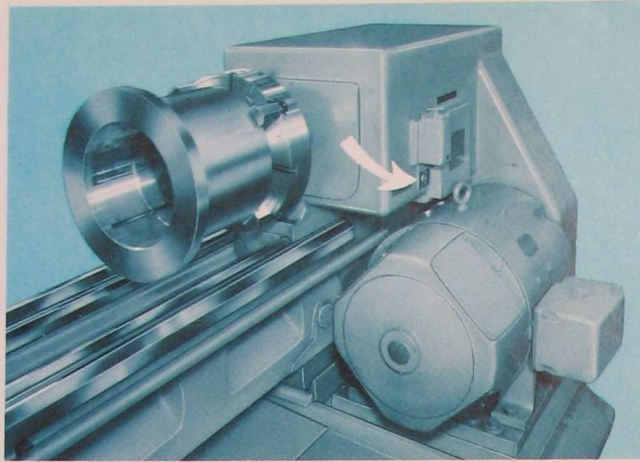
This flexible lathe is a real parts maker . . . performs *all* turning, facing, boring and form tooling . . . and it's designed to handle roughing as well as finishing with equal ease. Built-in computers generate continuous path tapers and radii up to 10 inches . . . form fillets of any shape. Tape-to-tool accuracies of $\pm 0.0005"$ and repeatability of $\pm 0.00025"$ will, in many cases, eliminate the need for grinding. It's so reliable that all chance of operator error is completely removed . . . so simple that no operator re-education is ever necessary . . . so fast that floor-to-floor time is drastically reduced.

FULLY AUTOMATIC

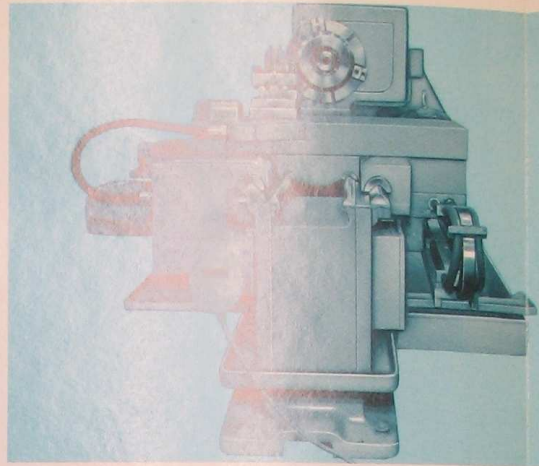
Everything about this American beauty is automatic! Spindle speed changes . . . tape selected. Longitudinal and cross feeds . . . tape controlled. Pre-set, interchangeable square tool turret positions . . . tape selected. Even the coolant flow is tape controlled! That's why you're protected against wasted time with this American continuous path tape controlled lathe.

THE BASIC MACHINE TOOL . . . BRAND NEW

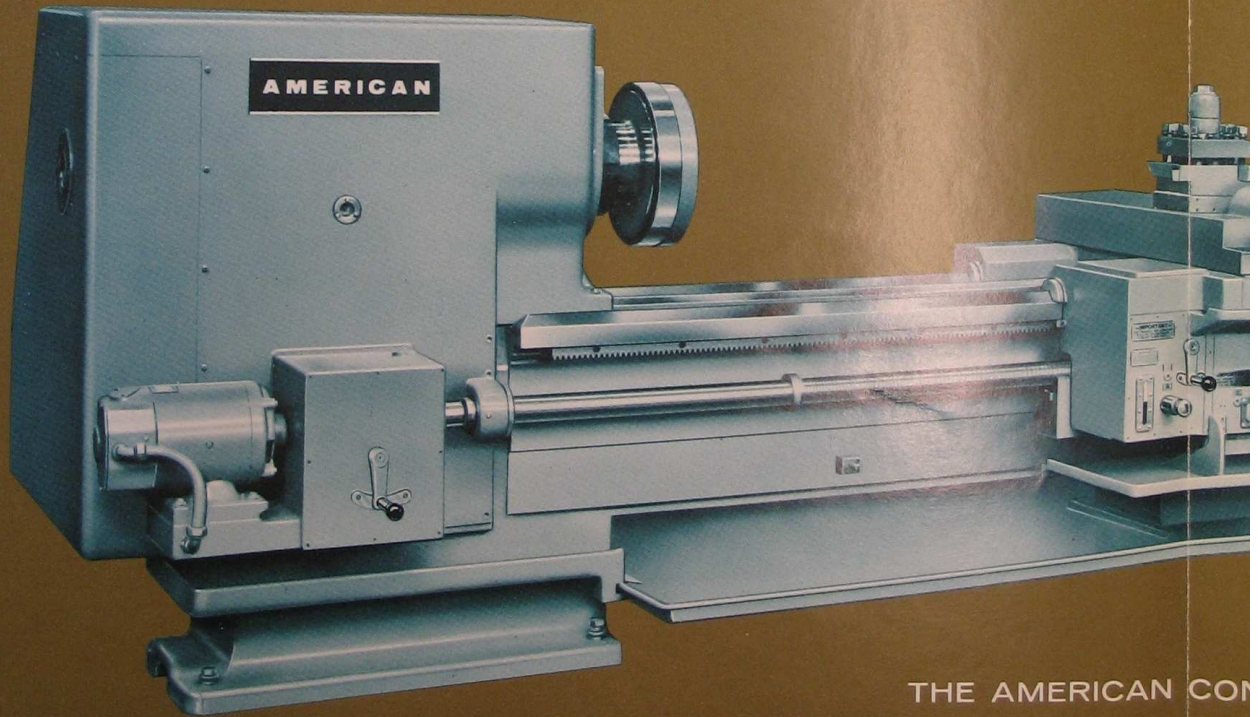
You wouldn't put a jet engine in a Jenny . . . and we wouldn't install numerical controls on yesterday's lathe. No mere adaptation, this servo-lathe was designed from its rugged bed to its Minuteman coordinate set-up system for today's space-age controls. Let's take a close look at this newly designed lathe, component by component:



Oversize spindle and bearings give better accuracy and low micro finish, even with extra heavy chucks and fixtures. Note simple bearing adjustment from outside the headstock . . . convenient to operator . . . encourages proper adjustment whenever necessary.



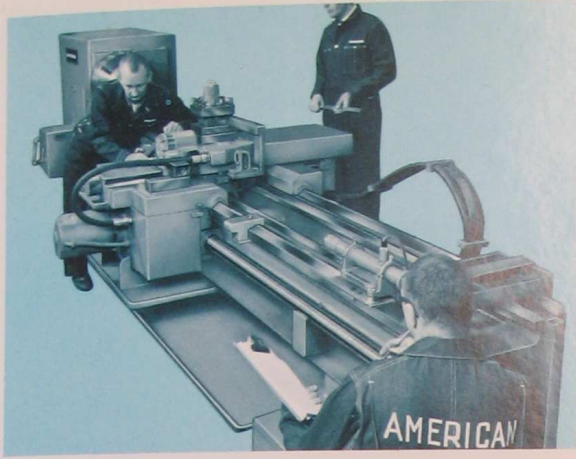
Four vee-bearings, non-metallic lined, fitted to bed overcome carriage tendency to twist and wear loose and out-of-square. Bed is extra wide and deep for maximum support. All four vee-ways are hardened and ground replaceable tool steel.



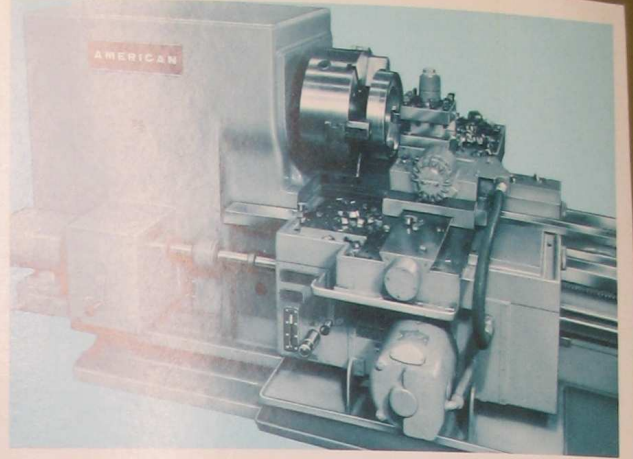
THE AMERICAN CO



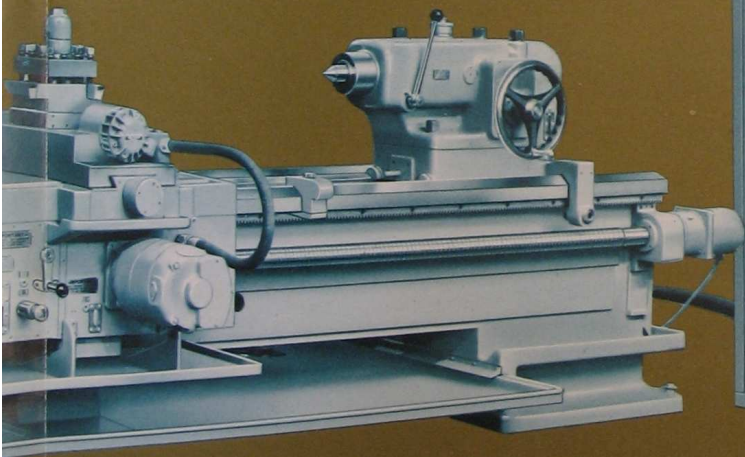
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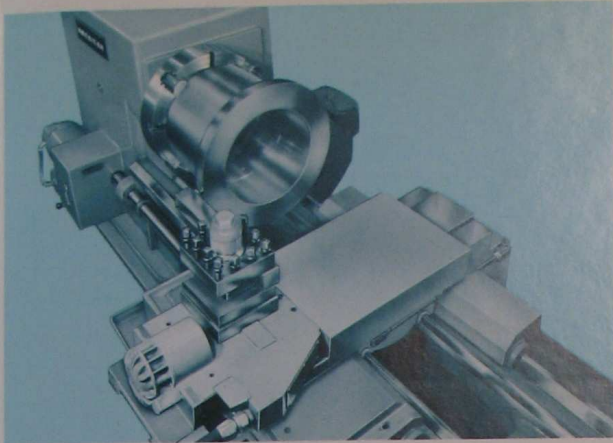
Careful construction means super accuracy. Here, engineers check bed ways to 5 seconds of arc with auto-collimator. Cross ways are hand scraped to 0.0002" square with bed ways in 10" of cross slide travel.



For low speed form tool and exotic metal cutting, American provides an extra tape controlled feed range of 0.01" to 2" per minute. This is secured by a manual 10-to-1 reduction shift for an overall range of 0.01" to 20" per minute.



N CONTINUOUS PATH TAPE CONTROLLED LATHE



Extra long carriage cross way makes it possible for the same tool that turns in front of center



. . . to bore in back of center.

THE HEADSTOCK—Watching this marvel at work gives you a feeling of confidence . . . it almost radiates power, stamina and ability. Smooth transmission of power from its variable speed reversing motor through hardened, precision ground gears give it the ability to take the heaviest cuts without chatter . . . make the finest finishing cuts to a low, low micro.

The superior spindle mounting of this American beauty is one result of its ribbed head casting. A heavy, cast-in rib supports the center of the spindle on a Timken Zero precision bearing. Deflection is impossible. This massive spindle is supported at the front by a Zero precision Timken, too, and one motion from outside the headstock simultaneously adjusts both. The rear is supported by a pre-loaded double opposed precision Timken bearing. This combination is ideally designed to give extra accuracy and better finishes, regardless of how tough the metal or how heavy the workpiece . . . and tape makes it automatic.

COOL RUNNING—It's impossible to run this lathe too fast or too long. Fewer moving parts . . . only four gears in all . . . produce less friction. American's new concept in lubrication . . . CASCADE OILING . . . floods the entire head, dissipates heat quickly . . . makes old fashioned splash oiling obsolete.

This simplified 100% anti-friction headstock has only two speeds, each selected by tape and activated by a double electric clutch. In combination with the 32-to-1 main drive motor, each gear gives 25 spindle speeds, all tape controlled, with 8-to-1 tapered horsepower at the bottom speeds and 4-to-1 constant horsepower at the top speeds. The constant horsepower range of the high speed gear blends with the low speed gear range to maintain a 15% geometric progression throughout the entire spindle speed range. In order to obtain from constant cutting speed the best possible finish on facing cuts, the speed range is designed so that any 8-to-1 section desired can be programmed into and actuated by tape without shifting headstock gears. Wider variations of speeds may or may not require one taped shift, depending on the starting speed.



The American
Pearl Street at Eggleston

THE FEEDING UNITS—CROSS AND LONGITUDINAL

A double electric clutch, tape controlled, in each feeding unit operating in conjunction with a tape controlled variable speed D.C. motor and a manual 10-to-1 reduction shift, provide 2000 cross and longitudinal feeds, from 0.010" per minute to 20" per minute, by 0.01" per minute increments. This makes low speeds usable on hard, exotic metals and on form tool work. For example, at 5 rpm a feed of 0.010" per minute equals 0.002" per revolution of the spindle, and with 0.01" per minute increment feeding, the next feed at 5 rpm is 0.004" per revolution of the spindle. Compare this with tape lathes with a low feed of 0.1" per minute and 0.1" increment feeding which offer at 5 rpm a feed of 0.020" per revolution of spindle and an immediate next feed jump of 0.040" per revolution of spindle. American is supplying a really practical range with which to make finished parts.

All units are automatically oiled, with selective oiling to the longitudinal feeding mechanism and to the cross feeding mechanism, supplying oil only to that system which is in motion.

A resolver feedback is mounted on the end of each screw. The resolution is 0.0001".

Power rapid traverse to the carriage and cross slide is 100" per minute.

THE CARRIAGE—American is taking advantage of its long experience with ultra-precision lathes and putting this know-how into its tape lathe slides. To retain this extra accuracy of slides, the carriage is made to absorb the normal tendency to twist, not on one vee, or even two vees, but on four vee bearings, meticulously fitted to all four bed vees. With this design the carriage bearing does not wear loose and allow the cross way to shift out of square and produce false coordinate readings.

The cross way and cross slide are much wider than normal, giving maximum stability to the curvic coupling mounting for the interchangeable turret tool holders and indexing mechanism. Eight indexes are tape available and accurate to 0.0002" repeatability.

The anti-friction, anti-backlash re-circulating ball nut and precision hardened and ground screw feed both cross and longitudinally with extreme accuracies. Please turn to the specification page for listings.

THE BED—A four-vee design makes possible a four vee-bearing carriage and a two vee-bearing

tailstock. Quadruple and double vee guideways keep bearing-fit many times longer, therefore retaining stability and accuracy. All four vees are hardened and ground replaceable tool steel, 60–62 Rockwell C, cold treated to 150° Fahrenheit below zero for stability to give permanent alignment. The bed is exceptionally deep for maximum strength. Angular ribbing from the front wall to the back helps retain the true alignment of the bed, as well as serving as chip and coolant chutes to the rear.

THE NUMERICAL CONTROL SYSTEM — This continuous path control system is actuated by 1"-8 channel tape punched either on a Flexowriter or on a computer, all in accordance with E.I.A. standards. Controlled functions are: Tool path contour; feed rate, direction and movement; selection of cutting tool by turret tool holder indexing; headstock and spindle speed, including forward and reverse with no auxiliary manual shifting of the headstock gears; complete cycling of the cutting tool; coolant on-off; feed dwell from 0 to 100 seconds.

By manual command mounted on a portable operator's console are: Spindle jog forward and reverse; data read in push button; cycle start and stop; "go to zero-zero" push button; zero offset for full machine; limited zero offsets for turret tool holder faces, up to ± 0.0499 " (four offsets are standard equipment); feed override, adjustable down to "stop" or up to 150%; spindle speed override, 25% less only; manual control for turret tool holder face selection; automatic/semi-automatic/manual selector switch; jog-traverse push button selector switch for both axes.

Manual data input dials are mounted in the main control cabinet.

Other standard equipment are the panic button, a spindle load meter and 3-digit block read-out lights on the portable operator's console; Friden Tape Reader, reading a maximum of 20 characters per second; a tumble box with 5" diameter take-up reels; complete air conditioning in the main control cabinet.

Unless specified to 99.9999" radius, this system includes linear and circular interpolation up to 9.9999" radius.

DON'T OVERLOOK ITS BEAUTY — The clean line "square look" styling of this production queen compliments its all-new engineering design and space-age control. American overlooked no single detail in building the lathe that acts . . . and looks . . . like today, and tomorrow.

American Tool Works Company

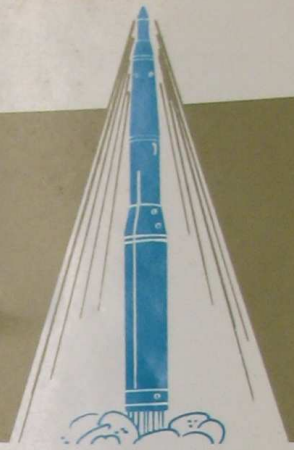
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Cincinnati 2, Ohio

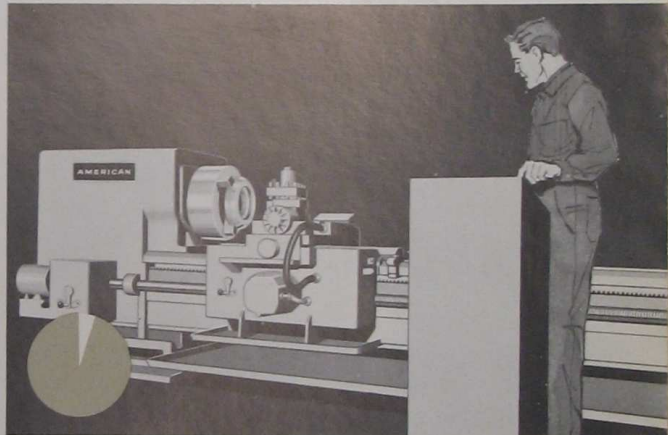
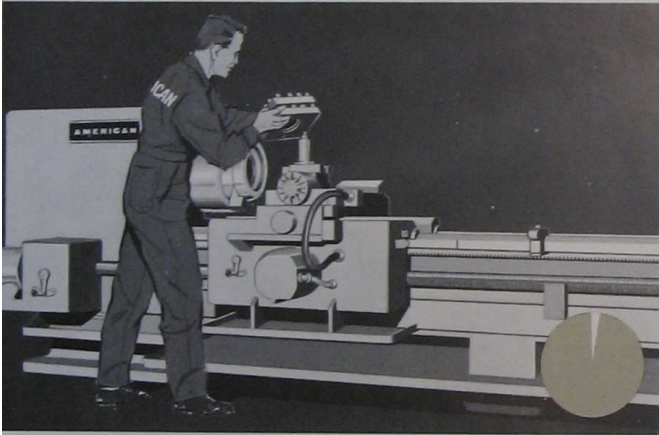
NEW!

AMERICAN Slashes Set-Up Time with **THE MINUTEMAN** Coordinate Set-Up



Only **3** minutes to get going with accurate, pre-set tools!

HERE'S HOW IT WORKS:

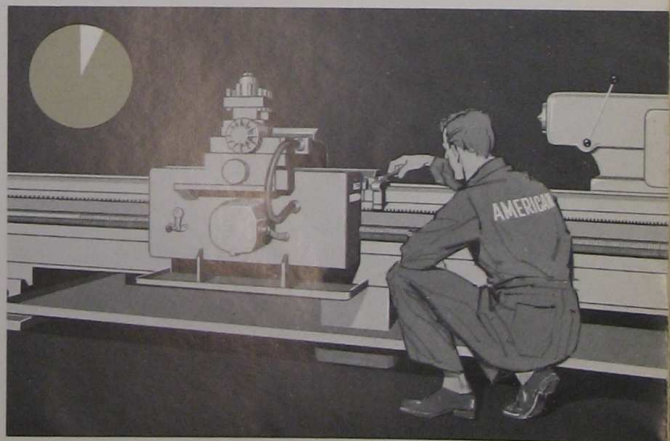


STEP 1—MOUNT PRE-SET INTERCHANGEABLE TURRET TOOL HOLDER. Place turret tool holder, with accurate pre-set tools, on curvic coupling. Tighten the single nut.

STEP 2—BY CONSOLE DIAL, MOVE CARRIAGE until the knife-edge pointer on the apron lines up within 1/32" with the precision scribed line on the bed.

STEP 3—After the tape takes the cross slide to fixed limit switch "Zero", a known X, then takes the carriage to a tape specified Z position, SET ADJUSTABLE STOP AGAINST LIMIT SWITCH on the side of the apron for a known Z "Zero" position.

STEP 4—SWITCH TO AUTOMATIC, PUSH THE BUTTON AND LET THE TAPE MAKE THE PART. That's all there is to it, and your lathe is "zeroed in" until you change it . . . AND . . . the Minuteman is standard on The American Tape Controlled Lathe!



OTHER STANDARD EQUIPMENT: ● Chip and coolant pan. ● Motor driven coolant pump.
● Tailstock with revolving anti-friction center built into the spindle.

AVAILABLE ACCESSORY EQUIPMENT:

- Additional interchangeable turret tool holders, either square or hexagon.
- Thread chasing attachment with right hand, left hand, multiple, constantly increasing or decreasing lead, scroll, with thread range limited only by the capabilities of the feed range and a maximum rpm of the headstock spindle of 200.
- Cutter compensation.
- Constant chip thickness, automatic.
- Photo-electric reader with Servo reels, with reading ability up to 350 characters per second.
- Extra low spindle speed range.
- Tool setting microscope, 40 power, with precision mounting on bed, for use when tool setting or checking is to be done at the machine.

SPECIFICATIONS

TOPQUIST MACHINERY CO.

3825 SANTA FE AVE. LOS ANGELES 589-5551

864 BURLWAY RD. BURLINGAME 342-3505

PHOENIX, ARIZ. 265-6575

	2010	2413	2514	3019	4025	4732
Swing Over Carriage Wings	21"	24"	25½"	31"	40"	47"
Swing Over Cross Slide	10"	13"	14"	19"	25"	32"
Domestic Shipping Weight, Base Center Distance, Approx.	11,000 lbs.	11,400 lbs.	18,000 lbs.	18,500 lbs.	40,000 lbs.	41,000 lbs.
Weight, Two Foot Section	700 lbs.	700 lbs.	900 lbs.	900 lbs.	1,525 lbs.	1,525 lbs.
Base Length Between Centers	54"	54"	48"	48"	84"	84"
Optional Center Distances	78" or 102"	78" or 102"	72", 96" or 120"	72", 96" or 120"	108" or 132"	108" or 132"
Main Drive, 32 to 1 Variable Speed Motor, H.P.	15, 20, 25 or 30	15, 20, 25 or 30	20, 25, 30, 40 or 50	20, 25, 30, 40 or 50	30, 40, 50 or 60	30, 40, 50 or 60
HEADSTOCK						
Taper of Center, Morse Taper No.	4	4	5	5	6	6
Number of Spindle Speeds, Non-overlapping	35	35	35	35	35	35
Range of Spindle Speeds, RPM	12-1800	12-1800	8-1200	8-1200	4-600	4-600
Spindle Diameter at Front Bearing	4¼"	4¼"	6"	6"	8½"	8½"
Front Bearing						
1. Diameter and Width	8¾" x 2½"	8¾" x 2½"	10¼" x 2¼"	10¼" x 2¼"	16" x 3¾"	16" x 3¾"
2. Radial Load at 50 RPM	40,300 lbs.	40,300 lbs.	60,500 lbs.	60,500 lbs.	99,500 lbs.	99,500 lbs.
3. Thrust Load at 50 RPM	25,700 lbs.		46,300 lbs.	46,300 lbs.	76,800 lbs.	76,800 lbs.
Hole Through Spindle	2"	2"	2¾"	2¾"	3"	3"
Spindle Nose	L-1-D-6"	L-1-D-6"	L-2-D-8"	L-2-D-8"	L-3	L-3
CARRIAGE						
Length of Carriage on Bed	26¾"	26¾"	35"	35"	42"	42"
Width of Carriage Bridge	10"	10"	12"	12"	15"	15"
Cross Feed Nut Travel on Screw	16"	16"	20"	20"	32"	32"
CROSS FEED MECHANISM						
Number of Feeds	2,000	2,000	2,000	2,000	2,000	2,000
Range of Feeds, Inches per Minute	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20
Minimum Increment of Feed, Inches per Minute	0.01	0.01	0.01	0.01	0.01	0.01
Rapid Traverse Rate, Inches per Minute	100	100	100	100	100	100
Diameter of Ball Screw	1¼"	1¼"	1½"	1½"	2"	2"
LONGITUDINAL FEED MECHANISM						
Number of Feeds	2,000	2,000	2,000	2,000	2,000	2,000
Range of Feeds, Inches per Minute	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20	0.010 to 20
Minimum Increment of Feed, Inches per Minute	0.01	0.01	0.01	0.01	0.01	0.01
Rapid Traverse Rate, Inches per Minute	100	100	100	100	100	100
Diameter of Ball Screw	2"	2"	2½"	2½"	3½"	3½"
CROSS SLIDE						
Square Tool Turret	7"	7"	8"	8"	10"	10"
Size of Tool—Width and Height	1" x 1¼"	1" x 1¼"	1" x 1½"	1" x 1½"	1½" x 1½"	1½" x 1½"
Hexagon Tool Turret	7"	7"	8"	8"	10"	10"
TAILSTOCK						
Diameter of Tailstock Spindle	4"	4"	5"	5"	7½"	7½"
Spindle Travel	10"	10"	12"	12"	18"	18"
Length on Bed	14¾"	14¾"	19¼"	19¼"	28¼"	28¼"
BED						
Width	16"	16"	20"	20"	32"	32"
Depth	15"	15"	18½"	18½"	21½"	21½"



The American Tool Works Company

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Cincinnati 2, Ohio

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