

RTL-4000



WEDDING BAND MACHINING CENTER

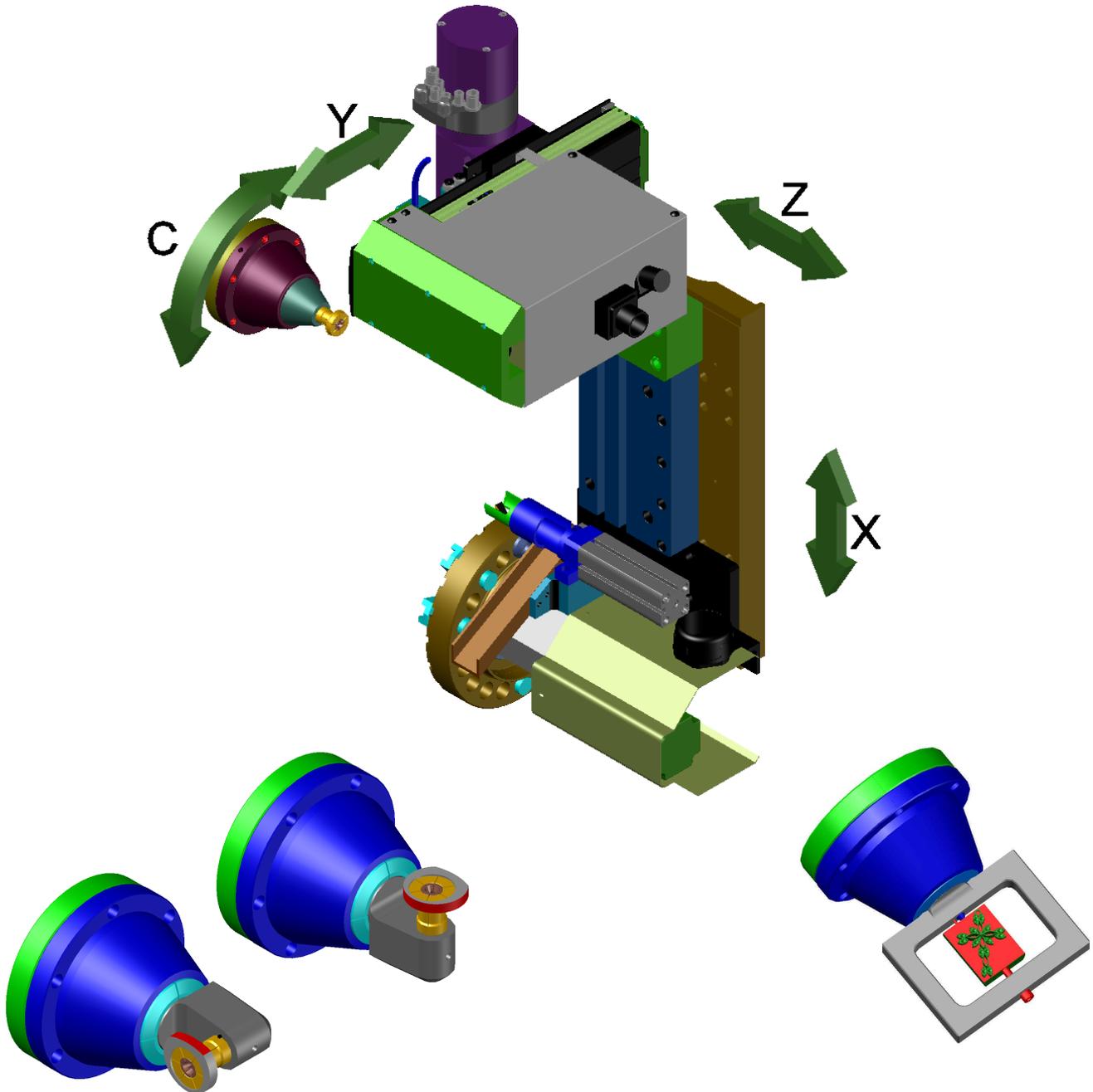
RTL-4000 TURN-MILL CENTER

Unique, in compact size, available tools and with 4 axes of motion. The RTL-4000 is a competitive solution to complex jewelry & band manufacturing.

- For simple or complex bands up to 32mm diameter x 20mm wide
- 4 axes of simultaneous motion. (X,Y,Z & C)
- 20 position servo driven turret
- 30,000rpm live spindle with 10mm capacity & 2.3Kw of power
- 18 position HSK25E tool changer for live tooling
- Gang slide for additional tools or accessories
- Probing capabilities for part inspection
- Control connectivity through Ethernet, USB and RS232
- High speed servo system for fast rapid motion and accurate high speed contouring of complex surfaces
- Up to 4Gb of program memory
- World class components for easy maintenance
- World Class support for anywhere you do business



RTL-4000 AXIS MOTION



FIXTURING TO MACHINE FACE PROFILES
AND DRILL AND MILL SURFACES

FIXTURING TO MACHINE FLAT SURFACES
AND FLIP 180°

With 4 axes of motion,(X-Y-Z-C) mold work, watch components, class rings, anything that requires a milling machine format can be accomplished.

The C axis can be clamped in position and the spindle can accommodate different fixtures to allow 3 axis milling capabilities.

Combined with turning or indexing, your horizons expand to meet your machining needs.

RTL 4000 DESIGN

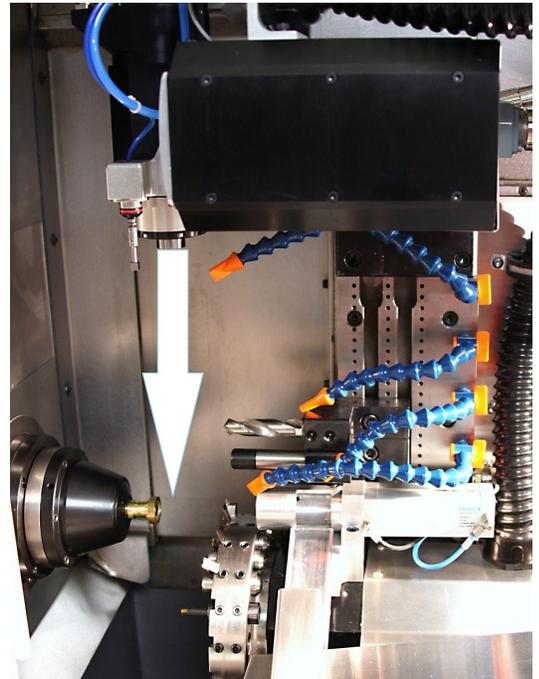
The RTL -4000 is an extremely precise, high speed, vertical format lathe & machining center. Designed for the rigors of high volume production in the aerospace, job shop and medical industries. This design is ideal for production jewelry manufacturing.

VERTICAL DESIGN

The vertical design allows metal chips to flow down into the chip collection area.

Easy cleanout of chips eases change over of materials so that mixed metal is minimized.

Ergonomic location of the machine table allows easy access to tooling and ease of use for the operator when changing tools or loading & unloading tubing or ring blanks.



EXTREME ACCURACY

High accuracy is a result of the combination of machine components and servo systems working together to position the machine.

We use aged meehanite castings for machine construction, oversized headstock castings for spindle location, and NSK linear rails and ball screws for motion delivery.

Coupled with the Fagor DDS Sercos (fiber optically linked) servo system, this provides speed and tolerance control when critical parts are being machined.

High accuracy provides accurate ring to ring weight when high volumes are the goal.

When you are milling designs or drilling stone locations or both, this accuracy provides the quality look only machined bands can provide.

0.001 Micron Precision



RTL-4000 DESIGN

HIGH SPEED

512 block look ahead and huge program storage capacity allows fast efficient machining of complex parts with the RTL-4000.

High speeds reduce cycle times and lower costs per ring.

Speed is critical in the production of wedding bands.

Our methods lower the production time of finished bands making them instantly ready for setting and polishing.

Our Ringtech Software is the key to fast and efficient programming.

20 M/Min Rapids

0-6000rpm in 0.5 sec



SPACE EFFICIENT

The RTL-4000 lathe is unique to any industry. The compact format provides an easy to operate, ergonomic platform able to fit into most any shop floor space.

This feature-rich machining center concentrates tremendous manufacturing capacity in a very small 61"x48" footprint (1.5m x 1.2m)



STATE OF THE ART CNC CONTROL

Fagor CNC controls allow customization beyond belief. This is **THE** difference in how RingTech can integrate the machine control and user interface into a complete easy to use package.

THE MAN MACHINE INTERFACE



The Fagor 8055i control has an integrated easy to use interface. All machine operations can be accessed from an easy to read, well laid out panel. Programmable buttons allow easy selection of machine operations and functions.

CONNECTABILITY

With Ethernet, RS232 & USB, programs can be downloaded to a computer, or CAD CAM generated programs can be uploaded into the control. Fagor WinDNC software allows easy connectivity to a PC.

SPEED

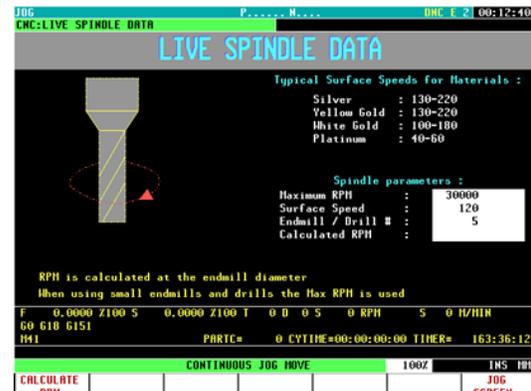
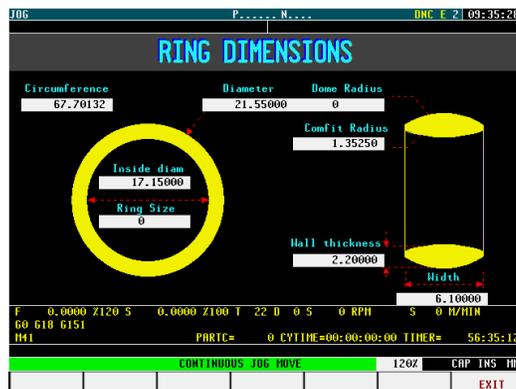
A 512 block look-ahead capability and high-speed block processing capabilities allow even the most complex programs to run at an optimum speed. Up to 4Gbytes of memory allow huge programs to be executed.



CUSTOMIZABLE USER INTERFACE

We can develop custom software for specific applications. Probing sequences to test part integrity, automatic offset and tool life management integrated into the program is at your fingertips, all controlled with an easy to use interface.

We created a complete system of programs and interfaces for our extensive jewelry customer base.



RINGTURN V6 SOFTWARE

Every Design is based on a few simple questions:

- Ring Size
- Ring Width
- Ring Thickness
- Specific Information for each design
- Type of inside profile



Sample of domed cross sections

TURNED PROFILES

There are 18 basic profiles, these profiles can be modified into thousands of different shapes. These shapes can have grooving, milling, drilling or all operations. We are constantly surprised by our customers ingenuity in developing new variations.

MILLED DESIGNS

The RTL-4000's milling features add a level of band customization limited only by the imagination. The built in designs are based on popular designs in the industry. With the addition of stone milling, the discerning jewelry manufacturer has an array of truly astounding design possibilities at their fingertips.



A cross sample of band designs, by no means complete. These graphics are based on 6mm wide profiles. All milling patterns can be scaled for ring size and width.

Stone shapes:

- Round
- Square (rotated at 45°)
- Baguette
- Trillion (In 4 directions)

CUSTOM DESIGNS

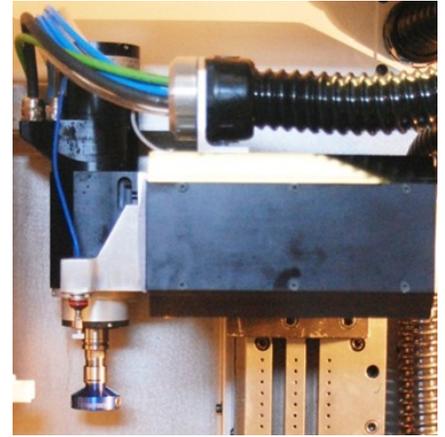
RingTech provides instruction to learn the required skills and become self sufficient. Our designers can also create the programming needed for your unique creations.

MACHINE OPTIONS

Y AXIS

The Y Axis expands the milling capability to 4 axes of motion. This extra motion now allows tools to machine the rings from the side. This allows faceting cuts to be made using fly cutters from the side of the ring. The Y axis allows high speed milling of flat or contoured surfaces on the top and sides of rings, This feature allows the “class ring” style of ring to be milled easily.

* The Y axis is only available with the tool changer spindle option.



20 POSITION TURRET

The 20 position turret expands the turning capability to allow more tools to be used. The standard gang tool style table can accommodate 6 tools for turning, with the turret option, up to 20 tools can be accessed. Setup time is reduced as standard tools can be setup and left in position.



BAND CATCHER & CONVEYOR

A programmable part catcher can be integrated into the turret system. The parts are caught by the part catcher and placed in a chute that moves the part to a conveyor for transport out of the machine. The part conveyor is automatic and only operates when the part is deposited on the conveyor.



CUSTOMIZATION

We can customize our equipment to meet your demanding needs, speak with us and find out how we can assist you.

MACHINE COMPONENTS

The Precision of the RTL -4000 is derived from using only the best components available. All of the systems we use are supported by companies that maintain a global service network

SERVO SYSTEMS

FAGOR Automation is a world renowned provider of control solutions. The RTL-4000 uses only FAGOR components in the CNC system, either full fiber optically connected digital servos for the main axis motors and drives, or digital motors and drives for the auxiliary servo driven systems.

PNEUMATIC SYSTEMS

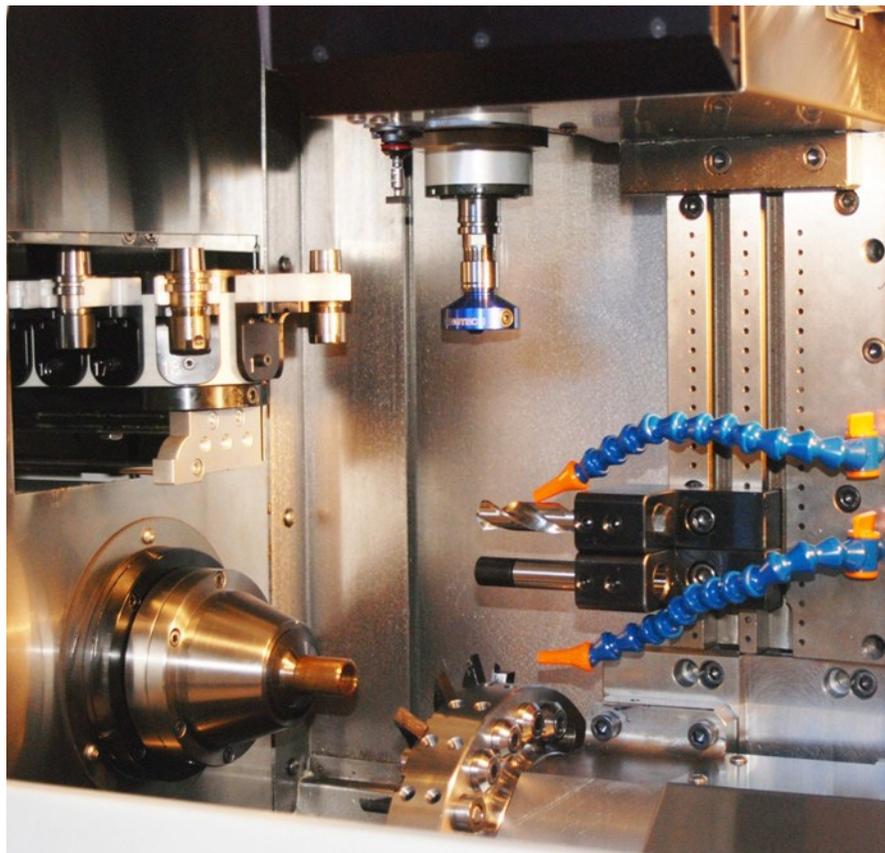
All of the pneumatic components are sourced from FESTO Corporation, the world leader in automation and integration systems. With Festo's global presence, Ringtech can provide fast parts and service support on all pneumatic systems.

Each system is carefully monitored by proximity switches that check every motion of the pneumatic system. Safety and correct operation of the machine is our utmost priority.

SLIDE SYSTEMS

The main slide systems use THK linear slides and ball screws. Each component is lubricated from a central lubrication unit, that times the lubrication to the use of the machine.

These slides together with the cnc control system contribute to the speed and accuracy of the RTL-4000



MACHINE ACCESSORIES

RingTech customizes each machining center to meet the specific needs of each application. Our technical staff can assist customers in choosing the options that best meet the needs of specific work to be done.

The RTL-4000 can be equipped with the following options:

WORK HOLDING

The RTL-4000 features a unique adaptable spindle that provides rapid change-over for different rings based on required machining operations - changeovers from inside, outside or tube within 2 minutes

Machining blanks or 2 tones requires machining the inside profile of the band and the outside profile in 2 separate operation. The Adaptable spindle allows each operation to be completed in minimal time.



MATERIAL LOADING

When machining precious metals, a reliable method of material loading is required.

We have developed a 30" feeder to suit the needs of precious metal manufacturers, combining the advantages of a small footprint and safe reliable operation.



PROBING SYSTEMS

RingTech's probing system can locate a blank or tube automatically, Set the ring or material diameter, set the reference position and allow error-free machining instantly.

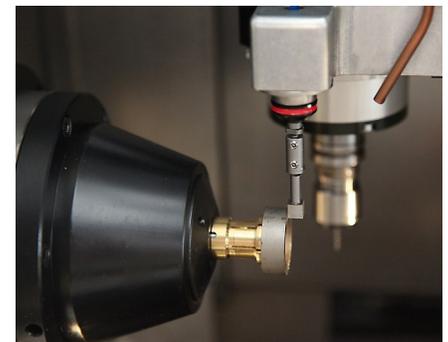
Using a single button, the operator can initiate the probing cycles.

Each type of operation has a unique probing profile.

For blank rings we can detect ring size, width and position.

Our software checks these values and eliminates the possibility of machine the wrong sized blank.

This option compliments the Adaptable Spindle Nose option.



PRECIOUS METAL MANAGEMENT

A problem critical to the jewelry manufacturer is the cost of raw materials. RingTech has created a simple but effective solution to access the chips and reclaim the precious metals for reprocessing.



LIVE TOOLING OPTIONS

With so many live spindle options available, we carefully reviewed the industry and came to one conclusion, flexibility is the most requested feature for milling capability.

RingTech offers two types of live spindles encompassing the widest range in flexibility – fixed, manual tool change spindles or automatic tool change capable spindles with preset capable cutting tools.

FIXED NSK SPINDLES

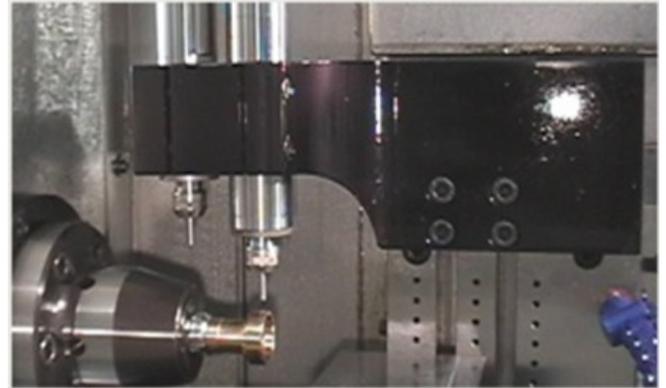
Many different parts can be made using two manual tool change NSK spindles.

This milling spindle option offers reasonable cost on a 3-axis machine package.

Speeds up to 80,000rpm are available.

Spindles can be mounted in different angles.

* This option is not available on the 4-axis (Y) machine.



TOOL CHANGEABLE SPINDLES

The tool-change spindle system option can be used as a stand alone spindle or with an integrated automatic tool changer.

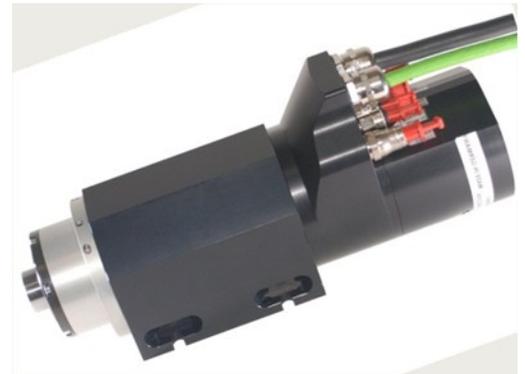
Add Y-axis and fixturing options, and you have a complete 4-axis mill/turn machining center.

This spindle uses HSK25 tool holders with a collet capacity of 10mm

Speeds from 3000 to 30,000rpm are fully programmable.

This 2.6KW (3.3Hp) spindle has the sufficient torque needed to machine aerospace style materials.

* 45K rpm spindles are available.



A water cooling system is used to provide thermal stability when in use.



18 POSITION TOOL CHANGER

RingTech has designed an integrated tool changer system with 18 tool capacity.

The toolchanger is servo driven for fast accurate positioning. 1.25 seconds between the furthest tool,

The RTL-4000 is fast at machining complex parts with a chip-to-chip tool change times of less than 8 seconds.



Specifications

Capacity

X Axis Travel	305mm	(12")
Y Axis Travel	150mm	(6") (Optional)
Z Axis Travel	175mm	(7")
C Axis Travel	360°	

Work holding

Bar Capacity	27mm (1.062")	42mm(1.562") Optional
Collet types	5C (Hardinge style) for tube or bar (16C optional on 42mm)	
Clamping System	Hydraulic	

Precision

Positional Repeatability	0.00127m	(0.000050")
Positional Accuracy	0.00127m	(0.000050")
Spindle TIR	0.00127m	(0.000050")
Axis Interpolation	Plane selectable for XC, ZC, XYZ, interpolation in X-Y-Z & C	
CNC Control	Fagor 8055i Plus with Ethernet, RS232 and USB connection	
Axis Control System	FAGOR Sercos Digital drives (Fiber optic link)	

Performance

Spindle Motor Power	5.4 Kilowatt	(7.3hp)
Spindle Rpm	60-6,000rpm	
Axis Speed X,Y,Z	20m/min	(787"/min)
Axis Maximum Feed Speed	10.15m/min	(400"/min)
Axis Power Rating	5.1nm	(42"/lb)

Tooling

Tool Center Height	42mm	(1.653")
Tool Holders	A wide range of tool holders are available	
Live Spindle	Programmable rpm IMT 30,000rpm 2.6kw, water cooled (Optional)	
Live Spindle Capacity	10mm	(0.375") (HSK-25 ER16)
Tool Changer	18 position HSK25 Bi-directional Fully Automatic, servo driven.	

Miscellaneous

Coolant Capacity	95 liter (25 Gallon)	
Compressed Air Requirement	1cu.m / min	(3.2cu.ft/min)
Total Power Required	440VAC 3 phase 8KVA (220v step up transformers are available)	
Dimensions (machine)	1550 x 1220 x 1830	(61"x48"x72") (L-W-H)
Weight	1704kg	(3750lb)

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