## Speed-Mat Rectangle Cutter

1 Honeycomb baseboard.
2 Left hold down.
3 Bottom hold down.
4 Left / right rule.
5 Left / right rule pointer.
6 Top / bottom rule.
7 Top / bottom rule pointer.

8 Left / right adjustment stops.

9 Top / bottom adjustment stops.

10 Rectangle knife head.
11 Mat \& glass sizer head.
12 Sizer hold down.
13 Sizer rule.
14 Mounting brackets.


15 Hold down release.

## Baseboard Installation

1) Allow for clearances as shown.
2) Mount the shelf brackets on the wall spaced 32 " apart and 28 " from the floor. The height may be varied to suit the height of the operator.
3) Place the baseboard on the shelf brackets. Install 2 \# $8 \times 3 / 4$ " screws into the bottom of the baseboard.
4) Install the 2 " corner braces at the top of the baseboard in line with the same wall studs as the shelf brackets.

CAUTION: If you can not find studs in a plaster board wall you must use steel expansion anchors in place of the screws provided.

## Mounting Hardware

1) $26^{\prime \prime} x 8^{\prime \prime}$ shelf brackets.
2) 6 \#10 $x 1-1 / 2$ " screws.
3) 22 " corner braces.
4) 8 \#8 x $3 / 4$ " screws.


## Knife Carriage Installation

1) Remove top carriage stops.
2) Install left roller in left track.
3) Spring right roller into right track.
4) Replace top carriage stops.


## Rectangle Cutter Knife Head

## Functional Parts

1) Knife insertion knob
2) Knife release knob.
3) Index handle.
4) Index pin.
5) Index washer.
6) Knife depth screw.
7) Thumb nut.
8) Knife clamp.
9) Pressure foot.
10) Blade support screw.
11) Mat thickness gauge.


## Blade Installation

1) Remove the thumb nut, clamp plate, and old blade.
2) Install the new blade so that it seats against the back of the knife pocket.
3) Install the clamp plate and tighten the thumb nut firmly by hand. Do not use pliers.

## Blade Depth Adjustment

1) Press on knife insertion knob until blade locks in cut position.
2) Place the depth gauge on the flat surface of the pressure foot.
3) Adjust depth screw so blade point is exactly one mat thickness above the foot surface.
4) Press the knife release knob towards the center of the index handle to place the knife in the out position.


1


2


3


# Pneumatic Auto Index <br> Knife Head 

Operating Instructions

## CAUTION

## KEEP HANDS CLEAR OF KNIFE HOLDER WHEN OPERATING THE AIR SWITCH

1) Connect the knife head to a regulated air supply of $25-30$ psi ( 1.5 bar) using $1 / 4$ " or 6 mm tubing.
2) Place the air switch in the "IN" position. Install the knife blade and adjust the blade depth for the thickness of mat being cut. See page 3 of standard Speed Mat instructions for details on blade adjustments.
3) Cycle the air switch from "IN" to "OUT" positon until the knife head is in the "OUT" position between the left and top cuts. Install the knife head with the air switch handle pointing upward.
4) Start cutting at the upper left corner. Place the air switch at the "IN" position and make the top cut to the right.
5) At each corner flip the air switch to the "OUT" position and back to the "IN" position. This will remove the blade, rotate the head, and reinsert the blade.
6) At the end of the final cut place the air switch in the "OUT" and remove the mat.


## Knife Head Installation

## Rectangle Knife head

1) Place the knife head in the up position with the index pin between two slots of the index handle.
2) Remove the thumb nuts from the screws on the carriage plate.
3) Insert the knife head through the large hole and onto the carriage plate screws.
4) Replace the the thumb nuts. Tighten frirmly by hand. Do not use pliers.

## Sizer Knife Head

1) Engage white glides in opening in top of track.
2) Slide head down the track.
3) Lubricate the glides and track with silicone lubricant each morning before starting work.


Index pin towards floor.


## Sizer Glide Adjustment

1) Turn the upper glide screw clockwise until the sizer head will not slide. Turn the screw slowly counterclockwise until the head slides but does not drop when you let go.
2) Turn the lower glide screw clockwise until the
 sizer head will not slide. Turn the screw slowly counterclockwise until the head slides but does not drop when you let go.
3) It is important that they are evenly tensioned. It may be necessary to do the adjustment twice to achieve precise alignment of the glide with the track surface.


## Using The Mat \& Glass Sizer

## Cutter Head Features



## Setting Mat/Glass Dimensions

1) Slide the matboard or glass under the sizer bar from the right hand side.
2) Align the left edge of the mat or glass with the desired dimension on the rule.


Cutting Matboard

1) Press the hold down handle inward towards the base. Then lower the hold down bar until it clamps the mat in place.

2) Make the cut with a smooth downward motion. Then return the cutter head to the top of the track.
3) Lift the hold down up and outward to remove the mat.


Scoring and Breaking Glass

Do not use the hold down bar when scoring glass.

1) Slide the lock button upward and gently lower the glass cutter to contact the glass close to the top edge.
2) Score the glass with a smooth downward motion.
3) Move the glass to the right to align the score on the glass with the metal edge of the base. Grasp the outer edge of the excess piece of glass and make the break with a quick
 pressure towards the wall.

## Setting Rectangular Mat Dimensions



## Cutting The Rectangle Mat



Place the mat face down firmly against the guides in the lower left and close the hold down.

Start in the upper left corner with the carriage against the left and top stops.

Lower the knife head, insert the blade, and make the top cut guiding against the top stops.

Cut the right border while guiding against the right stops.

Cut the bottom border while guiding against the bottom stops.

Cut the left border while guiding against the left stops.

Release the knife, raise the head and rotate between cut positions.

Open the hold down and remove the mat.

## Mat Thickness Adjustment



The rule pointers may be changed quickly. Pull the rule pointer straight out from the white plastic bracket.

Use the rule pointers marked " 1 " for cutting 4 ply mats.

Use the rule pointers marked " 2 " for cutting 8 ply mats.

The pressure foot may be adjusted to obtain zero over cut in the corner of the mat. The foot is set on " 1 " for 4 ply mats and " 2 " for 8 ply mats.

Moving the foot towards the " 0 " decreases the over cut and increases the opening size.

Moving the foot towards the " 2 " increases the over cut and decreases the opening size.

Blade Support Screw


The blade support screw keeps the blade stable during the cutting process.

The blade support screw must be adjusted to just touch the surface of the knife blade with the blade in the in position.

This adjustment must be made after any change is made in the pressure foot position.

## Vertical Assembly Squareness Adjustment



1) Lock the vertical assembly in position with all four stops.
2) Only insert the knife partially and make a light vertical cut on a clean backing sheet.
3) Check the cut with a large framing square.
4) If the carriage needs adjustment unlock the bottom stops.
5) Swing the bottom of the carriage to align the right vertical track with the square.
6) Lock the bottom stops to hold this alignment position.
7) Loosen the "adjust" screw.
8) Reseat the roller on the track by pressing towards the upper left on the bottom of the roller plate.
9) Tighten the "adjust" screw.
10) Repeat steps one through three to check the adjustment.

## Mat \& Glass Sizer Adjustment



1) Test cutter by cutting narrow ( $1 / 2^{\prime \prime}$ ) strips from opposite sides of a full sheet of 32 " x $40^{\prime \prime}$ matboard. Turn the mat from left to right for the second cut. Mark the top before cutting.
2) Measure the dimension at the bottom of the mat.
3) Loosen the bottom holding screw $1 / 2$ turn with a Phillips screwdriver.
4) Turn the adjust screw clockwise to decrease the dimension or counterclockwise to increase the dimension. One turn $=1 / 32^{\prime \prime}$.
5) Tighten the bottom holding screw.
6) Measure the dimension at the top of the mat.
7) Loosen the top holding screw $1 / 2$ turn with a Phillips screwdriver.
8) If the mat is too wide at the top turn the adjust screw clockwise. One turn $=1 / 32^{\prime \prime}$.
9) If the mat is too narrow at the top turn the adjust screw counterclockwise. One turn = $1 / 32^{\prime \prime}$.
10) Tighten the top holding screw.

Note: The sequence of this adjustment is important. The bottom adjustment should be repeated until accurate and not changed after the top adjustment is completed.

## Special Techniques



## Cutting Borders Less Than 1-1/2"

1) Add the difference between $1-1 / 2$ " and the desired border to the overall width and height of the mat.
2) Cut the mat with the left and bottom borders set at $1-1 / 2$ " and the right and top borders set to the desired dimension.
3) Trim off the excess on the left and bottom borders.

## Double Mat

1) Set the borders for the artwork opening with the desired stop spacers in place.
2) Remove the stop spacers and cut the face mat. Leave the mat in the machine. Do not open the hold down.
3) Cut the outside dimensions of the back mat $1 / 2 "$ smaller and tape it to the face mat.
4) Insert the stop spacers and cut the back mat.

## Inlayed Mat



## Reverse Bevel Inlayed Mat

1) Set the borders for the artwork opening with the desired stop spacers in place and cut the opening in the inlay mat.
2) Turn the inlay mat face out. Insert the v-groove stop spacers and cut the outside of the inlay mat. Remove the inlay mat.
3) Remove the v-groove stop spacers, insert the outer mat, and cut the opening to fit the inlay mat.

## Production Stop/Spacers



Install the stop/spacers in the opening at the end of the track. The knife carriage must be removed out of the top of the vertical tracks to install the bottom stops.


Turn the handle clockwise to lock the stop in position. The handle only requires a rotation of 90 degrees from locked to unlocked. Lift and rotate the adjustable handle to position it in the proper quadrant.


Lift slightly and rotate the spacer block to change the spacing. The block will snap down into the new position. The following spaces are available:
$\mathrm{V}=1 / 16^{\prime \prime}$
$1=3 / 16^{\prime \prime}$
$2=1 / 4 "$
$3=3 / 8$ "
$4=1 / 2$ "

## V-Groove Mats

1) Cut the artwork opening from the back of the mat in the normal clockwise direction.
2) Adjust the blade depth screw one full turn clockwise, so the blade does not cut through the mat.

3) Turn the mat face out.
4) Set the borders for the desired position of the v-groove.
5) Insert two v-groove stop spacers on the right side and make the right cut moving upward.
6) Move the spacers from the right hand side to the top and make the top cut moving to the left.
7) Move the spacers from the top to the left and cut the left side moving downward.
8) Move the spacers from the left to the bottom
 and make the bottom cut.
9) Remove the v-groove spacers from the bottom.
10) Cut the inner bevel of the v-groove in the clockwise direction.
11) Return to the normal knife depth setting by turning the knife depth screw one full turn clockwise.


## Multiple Opening mats

## Numbers Method

1) No layout is required. Use sketch at right to figure and record borders.
2) Figure the distance from the left edge of the mat to the left and right cut of each opening.
3) Figure the distance from the bottom edge of the mat to the top and bottom cut of each opening.
4) Use the rule pointer for setting the left and bottom borders.
5) Add one inch to the top and right border distance and align this result with " 1 " on the border scale.


## Layout Method

1) Alignment marks must be added to the pressure foot on the knife head before using this method. See page 16 for this procedure.
2) Layout the opening pattern on the back of the matboard.
3) Rotate and lower the knife head for the left hand border cut.
4) Align the mark on the foot with the pencil line on the mat for the left border and set the left hand stops.
5) Rotate the knife head and make the stop settings for the top, right, and bottom borders.


## Caution:

Remember you are cutting from the back.
Non-symmetrical patterns must be reversed.

## Visual Stop Settings

When cutting multi-angle mats you will be making individual cuts and opposite pairs of cuts. The stops are set by aligning guide marks on the pressure foot with a penciled layout of the desired mat opening. The guide marks must be added to the pressure foot using a fine point permanent marker.

## Marking the Pressure Foot

1) Cut the right, bottom, and left borders of a rectangle mat. Leave the stops as set for this mat. Lower the foot against the mat in position for the bottom cut. Add guide marks to the pressure foot as follows:

2) Move the head left to the end of the bottom cut. Make an ending mark on the front face of the foot.


## Diamond Mats

1) Draw the mat opening on the back of the mat in pencil.

2) Place the mat face down at 60 degrees to the right using 30/60 triangles as a support guide. Hold in place with the bottom hold down.
3) Set the stops for the bottom cut using the guide marks on the pressure foot. If an odd angle is desired a support guide may be made using matboard.
4) Make the bottom cut, then turn the mat end for end and make the opposite cut. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.

5) Reposition the triangles to support the mat at 30 degrees to the right. Hold in place with the bottom hold down.
6) Set the stops for the right cut using the guide marks on the pressure foot.
7) Make the right cut, then turn the mat end for end and make the opposite cut. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.


## 6-Sided Mats

1) Draw the mat opening in pencil on the back of the mat.

2) Place the mat in the corner against the guides and close the hold down.
3) Set the stops for the left and right cuts using the guide marks on the pressure foot.
4) Make the right and left cuts. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.

5) Place the mat at 30 degrees to the right using the 30/60 triangles. Hold in place with the bottom hold down.
6) Set the stops for the bottom cut using the guide marks on the pressure foot.
7) Make the cut, then turn the mat end for end and make the opposite cut. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.

8) Place the mat at 30 degrees to the left using the 30/60 triangles. Hold in place with the bottom hold down.
9) Set the stops for the bottom cut using the guide marks on the pressure foot.
10) Make the cut, then turn the mat end for end and make the opposite cut. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.


## 8-Sided Mats

1) Draw the mat opening in pencil on the back of the mat.

2) Place the mat in the corner against the guides and close the hold down.
3) Set the stops for the top and bottom cuts using the guide marks on the pressure foot.
4) Make the top and bottom cuts. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.
5) Set the stops for the left and right cuts using the guide marks on the pressure foot.
6) Make the left and right cuts. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.
7) Place the mat at 45 degrees to the left using the 45 triangles. Hold in place with the bottom hold down.
8) Set the stops for the bottom cut using the guide marks on the pressure foot.
9) Make the cut, then rotate the mat to make each of the four corner cuts. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.


## Photo Corner Mats

A photo corner mat is achie ved by cutting an additional smaller rectangle in an 8 sided mat.

1) Draw the mat opening in pencil on the back of the mat.

2. Place the mat face down in the machine and close the hold down.
3. Align the guide mark on the pressure foot with the pencil layout on each side of the photo corner opening and set the stops for each of the four sides.
4. Cut the mat opening. If cutting a double or inlayed mat, insert the stop spacers and make these cuts in the second color.

5) Before removing the mat, tape the drop out at the corners to hold it in place while making the remaining cuts for the 8 sided mat.
6) Continue with steps 2 through 12 of the 8 sided mat instructions.


## Speed Mat Oval Cutter

1) Hold down bar.
2) Carriage stops.
3) Horizontal rule.
4) Vertical rule.
5) Vertical tracks.
6) Vertical carriage.
7) Horizontal tracks.
8) Horizontal carriage
9) Cutter bar.
10) Cutter head.
11) Cutter locking screw.
12) Offset bar.
13) Offset locking screw.
14) Crank bar.


## Oval Cutter Installation

1) Remove the rectangular knife head.
2) Remove the left hand carriage stops.
3) Roll the rectangle carriage off the left end of the tracks.

4) Place the top right roller in the upper track and hold in place.
5) Press down on the lower right roller and guide it into the bottom track.
6) Repeat this process with the left hand rollers.
7) Replace the left hand carriage stops.

## Positioning Matboard for Oval Cut

1) Place the matboard against the left guide.
2) Slide the matboard up or down until the bottom edge aligns with $1 / 2$ the height of the matboard on the rule.
3) Close the hold down.

4) Move the oval cutter assembly left or right until the pointer aligns with $1 / 2$ the width of the matboard on the horizontal rule
5) Lock the oval cutter assembly in place with all four stops.

## Oval Cutter Knife Head



## Blade Adjustment

1) Set blade depth $1-1 / 2$ matboard thickness beyond the white pin.

2) Position blade $1 / 16^{\prime \prime}$ from the white pin for mats larger than 4 " $\times$ 6".

3) Position blade tip half way between the white pin and the shaft for mats smaller then 4"x 6 ".


Setting Dimensions for Circle or Oval


## Example

Settings for an 8 " x 10 " oval.
Cutter setting $=4$ " or one half of $8^{\prime \prime}$.
Offset setting $=1$ " or one half of 10 " minus 8 ".

## Cutting the Circle or Oval

1) Start the cut at the lower right.
2) Rotate the handle downward to release the knife head.
3) Position the knife inside the cut to cut an opening.
4) Position the knife outside the cut to cut the outside of a mat to fit a frame.


Save center.
Discard center.


## Cutting Oval Glass

1) The cutter head uses tip of a standard glass cutter cut off at the back of the first notch.
2) Insert the glass cutter in the recess of the glass cutter head and tighten the clamp screw.

3) Compress the spring and rotate the glass head to lock in the upper position.
4) Slide the glass head on the cutter bar and lock at the correct setting for the width of the oval or circle.
5) Set the offset setting the same as for an oval or circle mat.
6) Start with the cutter bar horizontal to the right. Rotate the glass head and gently lower the cutter onto the glass.
7) Make one complete clockwise turn with the cutter. No more.
8) Raise the glass head and rotate to lock.
9) Remove the cutter head from the cutter bar.
10) Remove the glass for breaking.
11) Place the glass on soft carpet with the score side down.
12) Press just inside the score moving gradually around the oval until the score is broken through.
13) Make four scores from the oval to the outer edge. Press firmly on each of these scores to break away the outer portion.


## Solving Mat Dimension Problems

## Use the following sequence to solve mat dimension problems.

## Checks

1) Check outside dimensions of mat. This will affect the top and right borders.
2) Check the squareness of the outside of the mat.
3) Check the squareness of the opening with the outside of the mat. This will affect all borders.
4) Check the straightness of the cut. This will affect the opening and all border dimensions.
5) Check the opening dimensions.
6) Check the left and bottom borders looking at the mat from the back.
7) Check the over cut on the face of the mat. Should be $1 / 16$ " or less in both directions at each corner.

## Adjustments

See page 11 of the manual for sizer adjustments.

See page 11 of the manual for sizer adjustments.

See page 10 of the manual for for vertical assembly squareness adjustment.

- Not guiding against carriage stops.
- Carriage stops not set in perfect alignment.
- Carriage stops slipping.
- Knife blade not seated properly.
- Dull blade set too deep.

Move the pressure foot $1 / 2$ amount of error: Towards the " 0 " if the opening is too small. Towards the " 2 " if the opening is too large.

Cut a test mat. Mark the top of the mat and be careful in set up of dimensions. Do not change the stop settings after cutting the mat. Measure the left border on the back of the test mat. Place the carriage against the left stops and adjust the left rule pointer to agree with the left border measurement of the test mat. Make the adjustment for the bottom border in the same manner.

- Knife blade set too deep. Should be set for exactly one mat thickness beyond the pressure foot.
- Pressure foot is not set in correct position for the mat thickness being cut. See page 9 .


## Warranty

The seller warrants the items described herein against defects in material and workmanship under normal use for a period of one year from purchase date. The seller's obligation under this warranty is limited to furnishing or repairing of, at its option, any part or parts which it determines to be defective, with necessary packaging and transportation costs to be paid by the buyer.

The seller makes no warranty of fitness for purpose merchantability and no other warranty express or implied, except as specifically set forth herein. The seller's warranty shall not apply to the items described herein in persons other than the seller shall have, without the written consent of the seller, made any alterations in the items as supplied by the seller.

The seller shall under no circumstances be liable for any special, indirect, or consequential damages arising from the loss of production or other damage or losses owing to the failure of the seller's items described herein, or the supply by seller of defective items, or by any other breach of the contract by the seller.

## Service

Upon termination of the one year warranty the seller will continue to service any repairs, replace parts, and provide custom knife blades with nominal charges to be paid for by the Buyer based on the current cost of materials, labor, and transportation. If you experience difficulty or part failure with your Speed-Mat system contact your sales representative or H. F. Esterly Co. directly. Do not return any items without permission and shipping instructions from H. F. Esterly Co.

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