CHAPTER 3
OPERATION

3.1 DESCRIPTION OF CONTROLS

The following sections describe the location and function of all of the controls on the Model-83 Punch Press.

3.1.1 CONTROL PANEL CONTROLS

The control panel is located on the front of the punch press. There are four different types of control panels. Each represents the VM, NP, PC, or SAS type of punch press. See Figure 3.1 A.

The control panels feature the following types of controls:

"OFF" Button -- Turns off all power to press electronics. See Figure 3.1 B for location of "OFF" button.

"ON" Button -- Turns on power to press. This button is lit up when the press is turned on. See Figure 3.1 B for location of "ON" button.

"MANUAL" Button -- This button can be used to override the automatic punching feature of the press. The press can be manually tripped by pressing and holding the "Manual" button and then pressing the foot switch. See Figure 3.1 B for location of "MANUAL" button.

"CONVERTER" Switch -- The "CONVERTER" switch is available only on the VM and NP presses. It has the two following positions:

a." On" Position: The "CONVERTER" switch must be turned to this position when punching highly reflective or transparent materials. The converter diffuses the target image.

b. "OFF" Position: The "CONVERTER" switch must be turned to this position when punching non-reflective or translucent materials.

See Figure 3.1 B for location of "CONVERTER" switch.

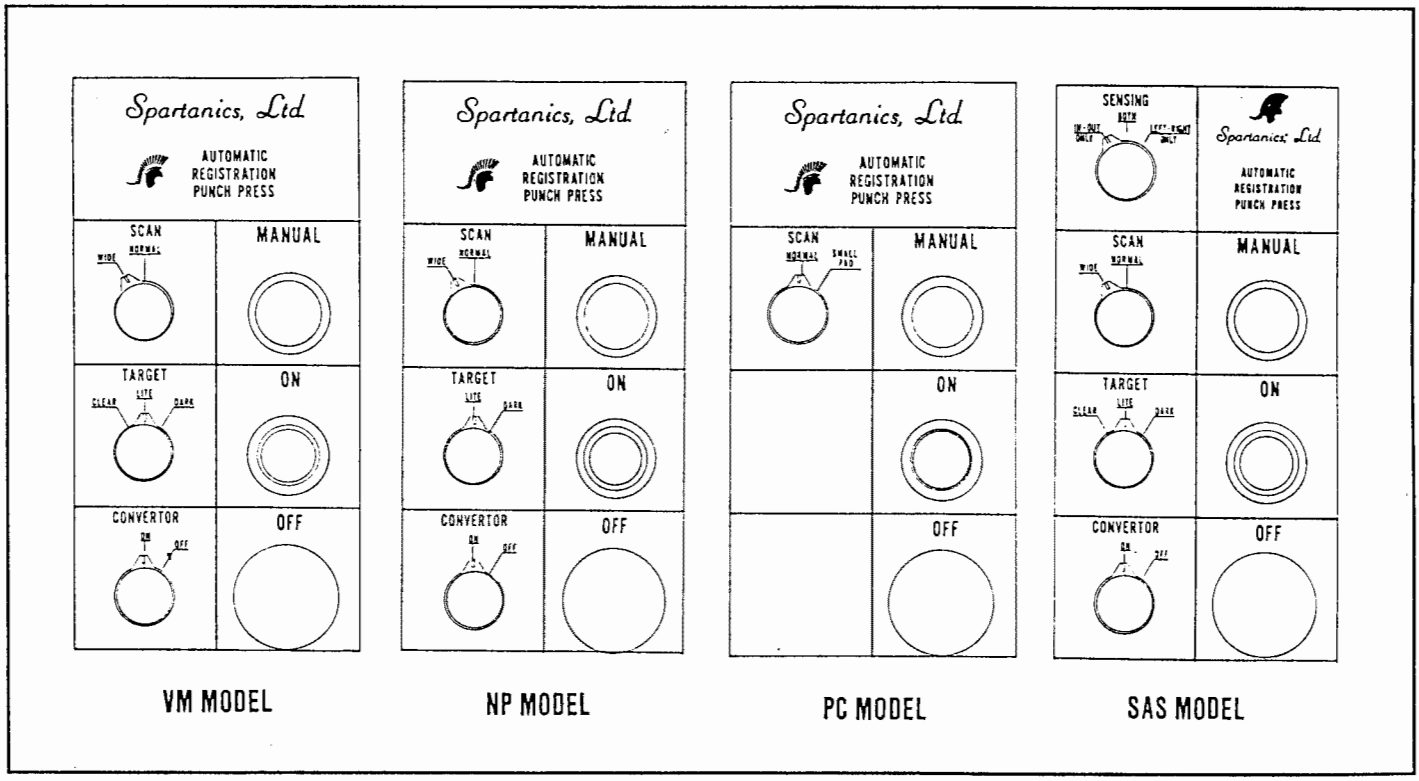


Figure 3.1 A

3.1.1 CONTROL PANEL CONTROLS

"SCAN" Switch -- The "SCAN" switch has the following two positions:

a. **"WIDE" Position:** This position is used when punching L or M type targets. Refer to Section 3.2.1 for definition of target types.

b. **"NORMAL" Position:** This position is used when punching all other types of targets.

The **"SCAN"** switch for the PC press is permanently locked in the "NORMAL" position.

See Figure 3.1 B for location of "SCAN" switch.

"TARGET" Switch -- The "TARGET" switch is used on the VM, NP, and SAS presses only. It has the three following positions:

a. **"LITE" Position:** This position is used when punching light- colored targets on a dark-colored background.

b. **"DARK" Position:** This position is used when punching dark-colored targets on a light-colored background.

c. **"CLEAR" Position:** This position is used when punching targets that are drilled holes or are on a clear background. When the switch is in this position, the target is illuminated from below. This position is only available on VM and SAS presses.

See Figure 3.1 B for location of "TARGET" switch.

"SENSING" Switch -- The "SENSING" switch is only used with presses equipped with a single-axis corrector table (SAS presses). It has the three following positions:

a. "IN-OUT" Position: When the switch is in this position, the press will only correct the position of the target in the in-out direction.

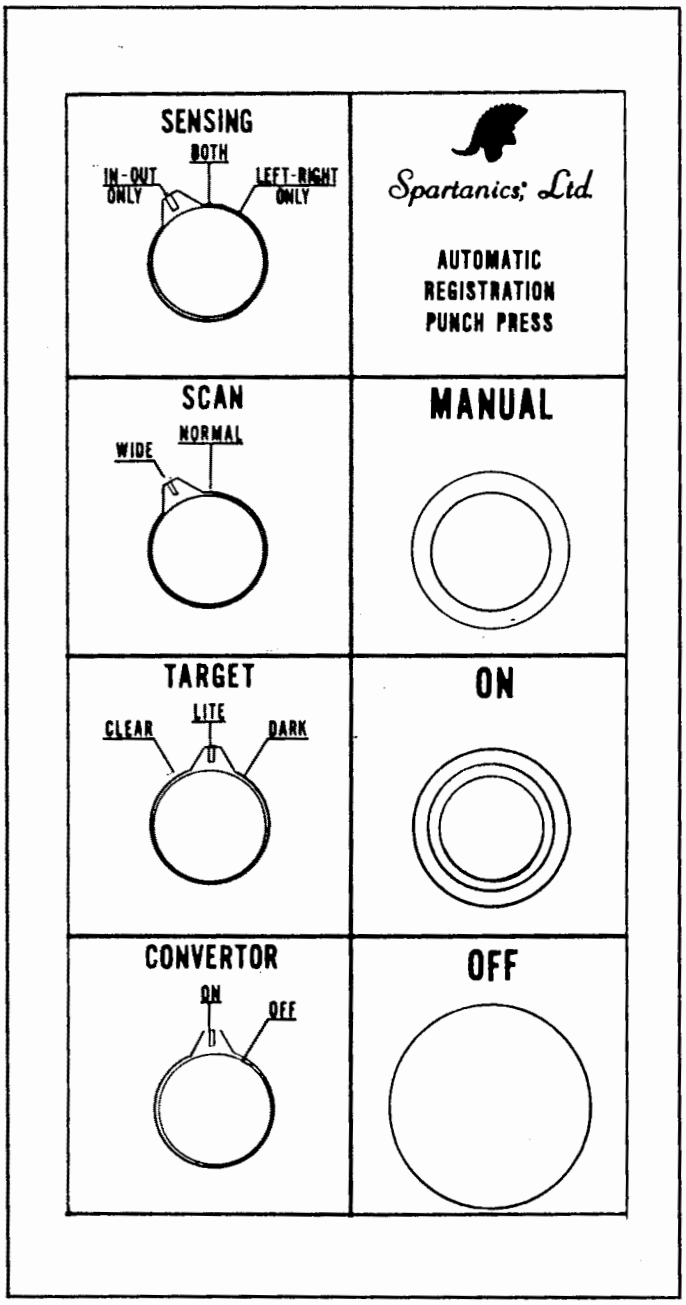


Figure 3.1 B

b. "LEFT-RIGHT" Position: When the switch is in this position, the press will only correct the position of the target in the left-right direction.

c. "BOTH" Position: When the switch is in this position, the press will correct the position of the target in both directions.

See Figure 3.1 B for location of "SENSING" switch.

3.1.2 SET UP SWITCH

The set up switch is a key-operated switch that is located on the right side of the press. See Figure 3.1 C.

The set up switch has the three following positions:

a. **"OFF"**: All power to the press's electronics and motor is shut off when the switch is in this position. The press cannot be turned on by pressing the "ON" button on the control panel when the switch is set to this position.

b. **"RUN"**: This is the normal operational position of the set up switch. The press can be turned on by pressing the "ON" button on the control panel when the set up switch is in this position.

c. **"SET UP"**: The press's motor is turned off but most of the press's electronic functions remain on when the switch is in this position. This allows maintenance people to install and align tooling and to do other maintenance procedures on the press.

3.1.3 VACUUM SWITCH

The vacuum switch is located on the rear of the press (see Figure 3.1 D).

The vacuum switch has the following two positions:

a. "PULSED": When the vacuum switch is in this position, the vacuum will turn on and suck the slug out of the die area only when the foot switch is pressed.

b. "CONTINUOUS" When the vacuum switch is in this position, the vacuum always remains on. The switch should be turned to this position when large or sticky slugs are being punched or when the slug will not clear the die area when the switch is in the "PULSED" position.

3.1.4 FOOT SWITCH

The foot switch is pressed to activate a punch cycle.

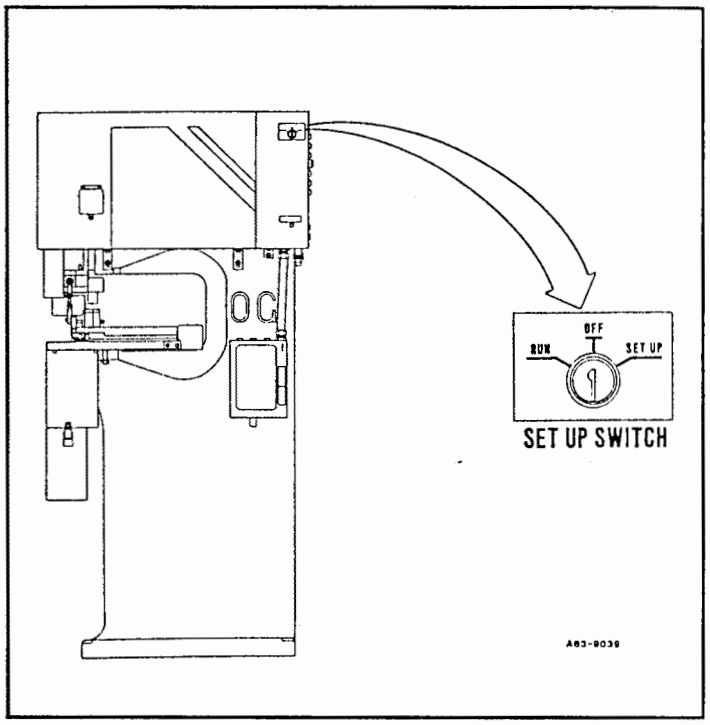


Figure 3.1 C

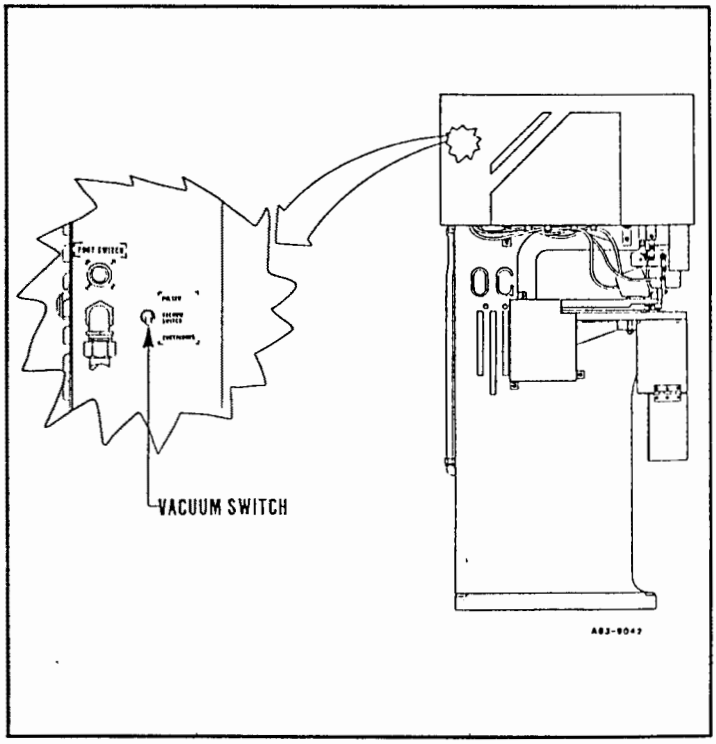


Figure 3.1 D

3.1.5 DISCONNECT SWITCH

The disconnect switch disconnects all power from the press. When the disconnect switch is in the "ON" position, the its door cannot be opened.

The disconnect switch is located on the right side of the press (see Figure 3.1 E)

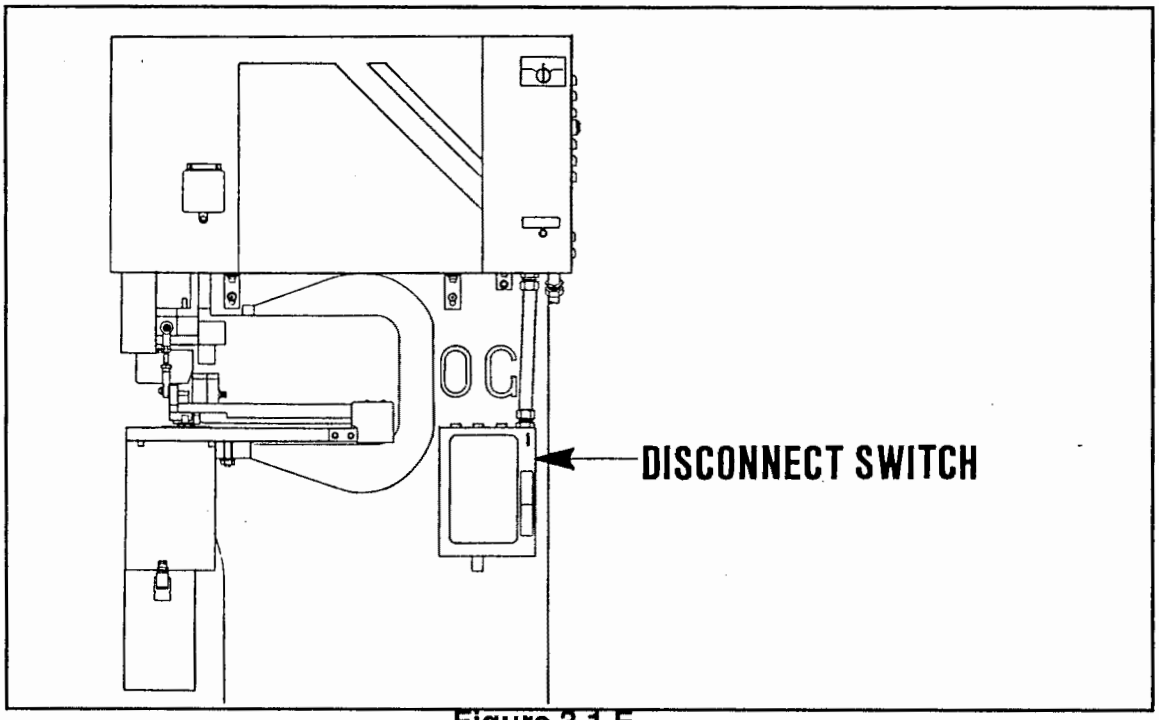


Figure 3.1 E

3.1.6 ROTATION CONTROL TABLE SWITCH

The rotation table switch is located under the rotation table. It turns the rotation table light on.

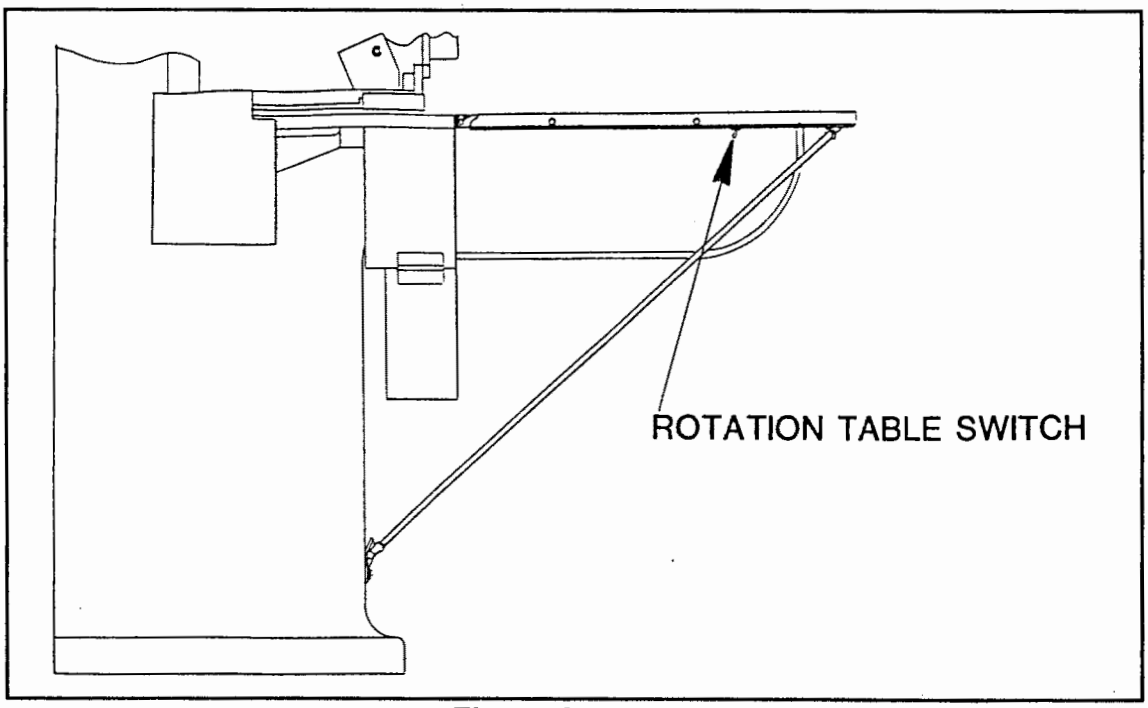


Figure 3.1 F

3.2 OPERATING THE PRESS

There are three things that you'll have to learn in order to operate the Model-83 Punch Press. First, you have to identify what type of target that you will be punching. This subject is covered in Section 3.2.1. Second, you'll have to learn how to set the controls of the press to punch your particular type of target. This subject is covered in Section 3.2.2. And, third, you'll have to learn how to actually punch the target. This subject is covered in Section 3.2.3.

3.2.1 IDENTIFYING THE TARGET TO BE PUNCHED

There are 14 basic types of targets that can be punched by the Model-83 Punch Press. All 14 types of targets used are shown below. Each type of target has been assigned a letter in the alphabet. Identify the type of target that you will be punching and remember the letter assigned to it.

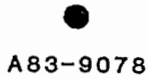
You will be using the assigned letter later to learn how to set the controls of the press. If you cannot find your type of target, contact Spartanics or your service representative for help.

TARGET TYPE A Printed or ImagedDonut	 A83-9051	Comments: None
TARGET TYPE B Etched Copper or Metallic Donut	 A83-9051	Comments: None
TARGET TYPE C Square	 A83-9054	Comments: Sometimes a square will have a small hole in the center of it. This is especially true for targets on photographic film. If a square has a hole in its center, treat the target as if it were TARGET TYPE A.
TARGET TYPE D Light Printed or Imaged Crossline	 A83-9057	Comments: None

3.2.1 IDENTIFYING THE TARGET TO BE PUNCHED

TARGET TYPE E Dark Printed or Imaged Crossline	 A83-9060	Comments:None
TARGET TYPE F Copper Crossline	 A83-9060	Comments: None
TARGET TYPE G Etched Crossline	 A83-9060	Comments: Etched crosslines in metal that are filled with paint qualify as TARGET TYPE E. Rulers, scales, and name-plates often have etched lines that are filled with paint.
TARGET TYPE H Dark Dot	 A83-9069	Comments: For dark dots greater than .050" (1.27mm) in diameter, refer to TARGET TYPE L.
TARGET TYPE I I Light Dot	 A83-9072	Comments: For light dots greater than .050" (1.27mm) in diameter, refer to TARGET TYPE M.
TARGET TYPE J Copper Dot	 A83-9069	Comments: None

3.2.1 IDENTIFYING THE TARGET TO BE PUNCHED

TARGET TYPE K Etched Dot	 A83-9078	Comments: None
TARGET TYPE L Large Dark Dot	 A83-9081	Comments: * Outside diameter of dot is .060" (1.5mm)-.090" (2.2mm). * Sometimes large dots are really donut type targets because they have very small holes in their center (holes must be at least .010" (.25mm) in diameter). Very carefully check the center of large dots for a hole. If a hole is in the center of a large dot, treat the target like a donut-type target (TYPE A).
TARGET TYPE M Large Light Dot	 A83-9084	Comments: * Outside diameter of dot is .060" (1.5mm)-.090" (2.2mm). * Sometimes large dots are really donut type targets because they have very small holes in their center (holes must be at least .010" (.25mm) in diameter). Very carefully check the center of large dots for a hole. If a hole is in the center of a large dot, treat the target like a donut-type target (TYPE A).
TARGET TYPE N Drilled Hole	 A83-9087	Comments: None

If your target is not listed above, please contact Spartanics or your service representative for hel

3.2.2 SETTING THE CONTROLS OF THE PRESS

Use the following chart along with the type of target that you selected from Section 3.2.1 to set the controls of the press.

NOTE

If your press has a "SENSING" switch on its control panel and you are not using the single-axis corrector table, set the "SENSING" switch to the "BOTH" position.

		Control Panel Setting		
Target Type	**Background**	**SCAN**	**TARGET**	**CONVERTER**
A	Translucent (PC Boards)	NORMAL	CLEAR	OFF
A	Clear (Photographic Film)	NORMAL	CLEAR	ON
A	Opaque	NORMAL	*LITE	OFF
B	Translucent (PC Boards)	NORMAL	CLEAR	ON
B	Opaque	NORMAL	*LITE	ON
C	Translucent or Clear (PC Boards or Photographic Film)	NORMAL	CLEAR	OFF
D	Dark Opaque	NORMAL	LITE	OFF
E	Translucent, Clear, or Opaque (Non reflective)	NORMAL	DARK	OFF
E	Highly-Reflective Metallic	NORMAL	DARK	ON
F	All Backgrounds	NORMAL	*LITE	ON
G	Copper plated substrate. Cross-line is etched down to trans-lucent substrate.	NORMAL	CLEAR	ON
H	Translucent, Clear, or Opaque (Non reflective)	NORMAL	DARK	OFF
H	Highly-Reflective Metallic	NORMAL	DARK	ON
I	All Backgrounds	NORMAL	*LITE	OFF
J	All Backgrounds	NORMAL	*LITE	ON

ote: If the LITE position does not work, try the DARK position.

3.2.2 SETTING THE CONTROLS OF THE PRESS

		Control Panel Setting		
Target Type	Background	SCAN	TARGET	CONVERTER
K	Copper plated substrate. Dot is etched down to translucent substrate.	NORMAL	CLEAR	ON
L	All Backgrounds	WIDE	*LITE	OFF
M	Translucent, Clear, or Opaque (Nonreflective)	WIDE	DARK	OFF
M	Highly-Reflective Metallic	WIDE	DARK	ON

***Note: If the LITE position does not work, try the DARK position.**

3.2.3 PUNCHING TARGETS

Punch targets as follows:

1. Turn Set up switch to "RUN" position. See preceding Figure 3.1 C.
2. Turn vacuum switch to "PULSED" position for punching regular slugs or "CONTINUOUS" position for punching large or sticky slugs. See preceding Figure 3.1 D.
3. Press "ON" button on control panel.
4. Set control panel controls according to Section 3.2.2.
5. Insert sheet of material under punch as shown in Figure 3.2 A.

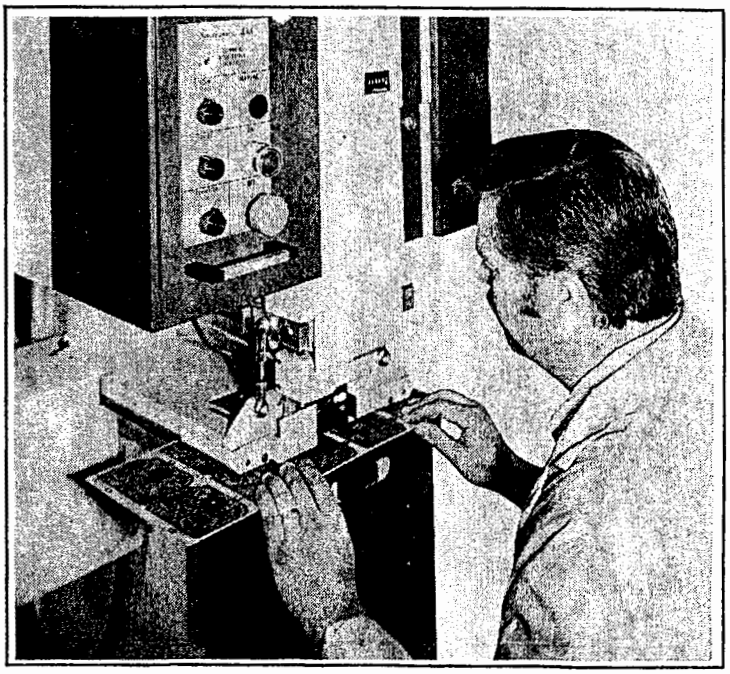


Figure 3.2 A

3.2.3 PUNCHING TARGETS

6. Line up target with target light beam as shown in Figure 3.2 B. Depending on how the control panel controls are set, the target beam will be a top or bottom type beam.

7. Press the foot switch. The press will automatically clamp the sheet of material, line the target up with the punch, and then punch the target out. The whole procedure takes about one second. If the target is not within the correction range or if the controls are not set correctly, the press will release the sheet without punching.

8. After the press punches the target out, move the sheet of material to the next target and press the foot switch again.

3.3 USING THE OPTIONS

The Model-83 Punch Press features six available options -- a converter, a set of film hold-downs, a single-axis corrector table, a rotation control table, a tracking backrail, and a special bolster plate. The following sections give a brief description of what each of the options do and instructions (if applicable) on how to use the options.

3.3.1 USING THE CONVERTER

The converter is used to punch highly reflective material. The arm on the converter diffuses the light reflected from the target or emitted through the target. The "CONVERTER" switch on the control panel must be turned to the "ON" position when punching highly reflective material.

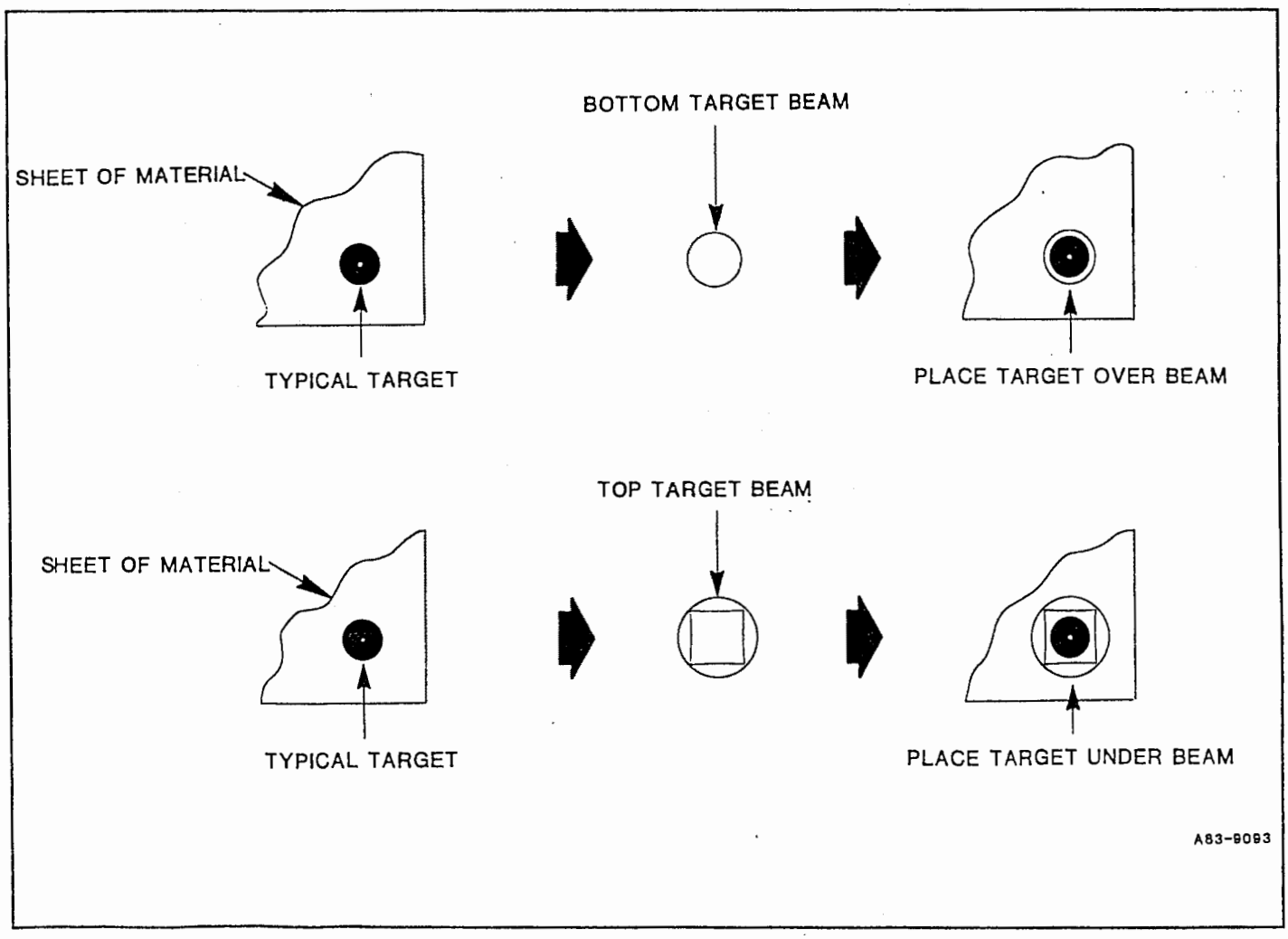


Figure 3.2 B

3.3.2 USING THE FILM HOLD-DOWNS

The film hold-downs are used when photographic film or other types of thin film are punched. The film hold-downs do not damage thin films like regular hold-downs do because they are spring loaded and more gentle on thin films. The hold-downs are factory installed and adjusted. Presses not equipped with special hold-downs can be retrofitted (see Section 8.7.4). THE OPERATOR DOES NOT HAVE TO KNOW ANY SPECIAL INSTRUCTIONS FOR OPERATING A PRESS EQUIPPED WITH SPECIAL HOLD-DOWNS.

3.3.3 USING THE SINGLE-AXIS CORRECTOR TABLE OR ROTATION CONTROL TABLE

There are many ways in which these tables can be integrated into a plant's production setup. The best way for you to find out how the single-axis corrector table fits into your production setup is to consult a sales or service engineer from Spartanics or your service representative.

3.3.4 USING THE SLIDING BACK-RAIL

The tracking backrail is used on material that has many in-line targets that are equal distance from the edge of the sheet. The tracking backrail helps the operator quickly position a target for punching.

Adjust the tracking backrail as follows:

1. Squeeze the spring-loaded backrail handle and push the backrail to its rearmost position. See Figure 3.3 A.

2. Place a sheet of material into position so that the hole target is in the target light beam.

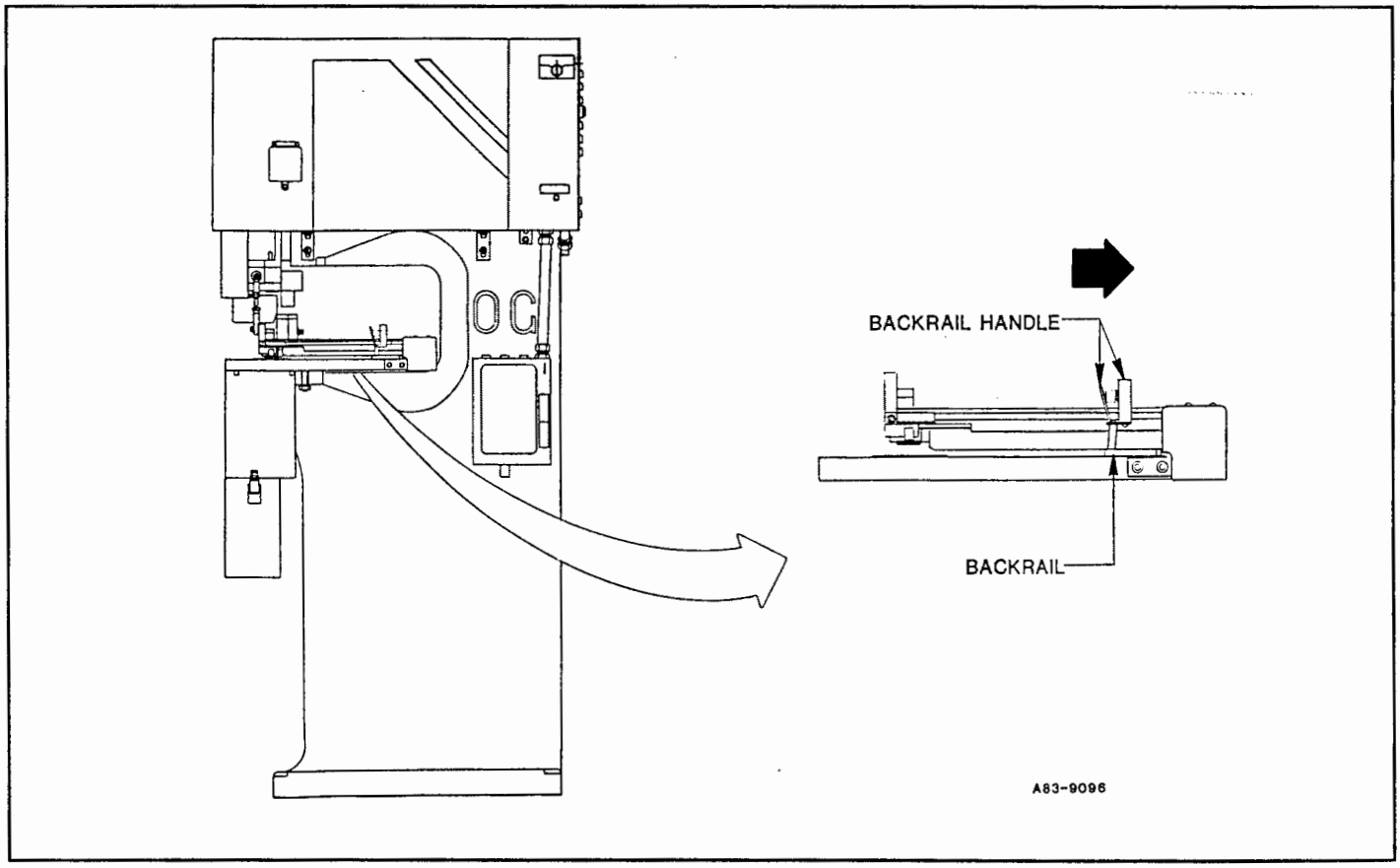


Figure 3.3 A

3.3.4 USING THE SLIDING BACK-RAIL

3. Squeeze the backrail handle and slide the backrail up to the rear of the material as shown in Figure 3.3 B.

4. Punch the sheet of material and then slide the sheet along the backrail until the next hole is in position. Do not worry about the backrail restricting any rearward correction. The backrail moves with the correcting action of the press.

3.3.5 USING THE SPECIAL BOLSTER PLATE

The special bolster plate is used for punching noncircular holes (ovals, squares, etc.). The special bolster plate is equipped with two adjusting screws that adjust the position of the die so that the die lines up with the punch. The bolster plate is factory installed and adjusted. THE OPERATOR DOES NOT HAVE TO KNOW ANY SPECIAL INSTRUCTIONS FOR OPERATING A PRESS EQUIPPED WITH A SPECIAL BOLSTER PLATE.

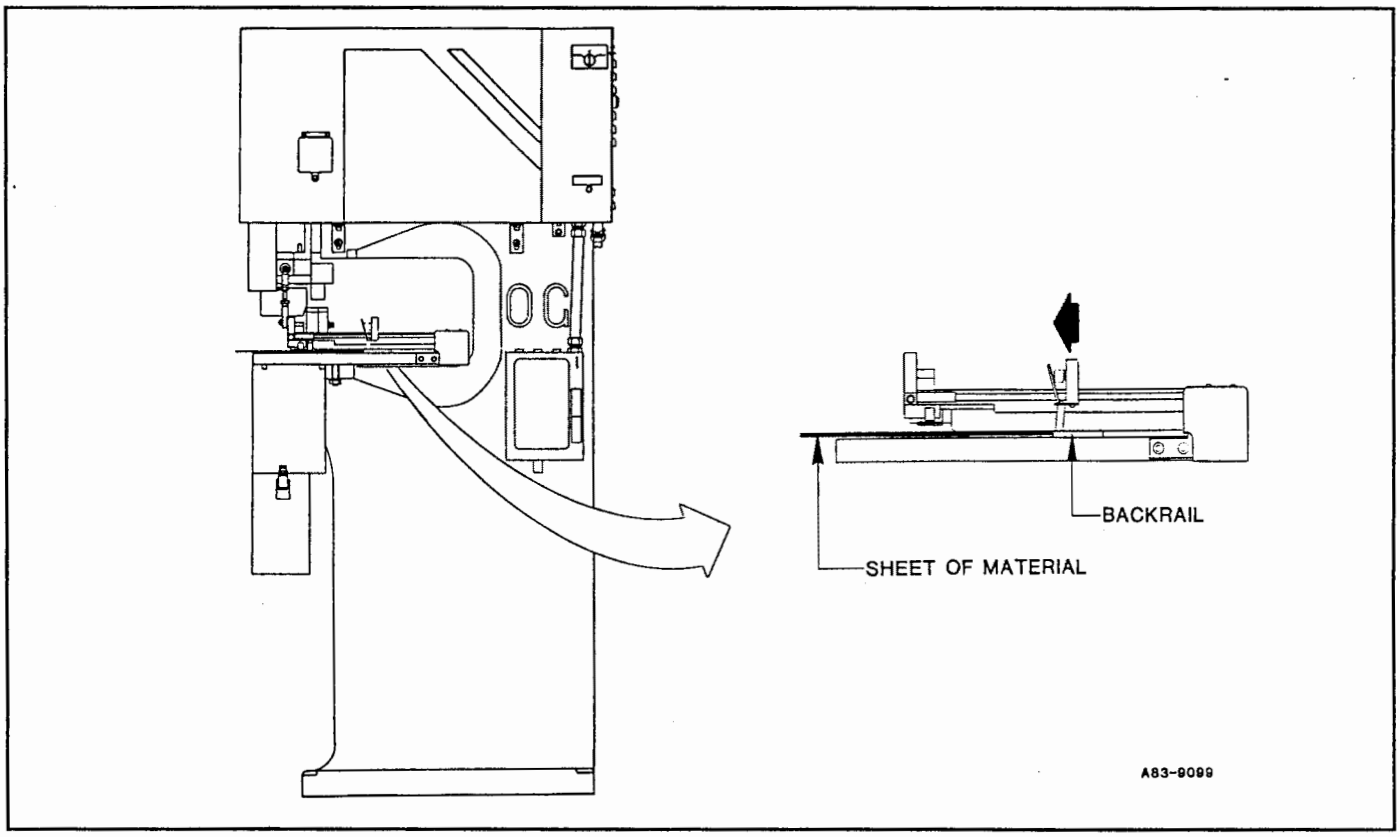


Figure 3.3 B

3.3.6 USING THE ROTATION CONTROL TABLE

This is used for punching slots in printed circuit boards. See Figure 3.3 C

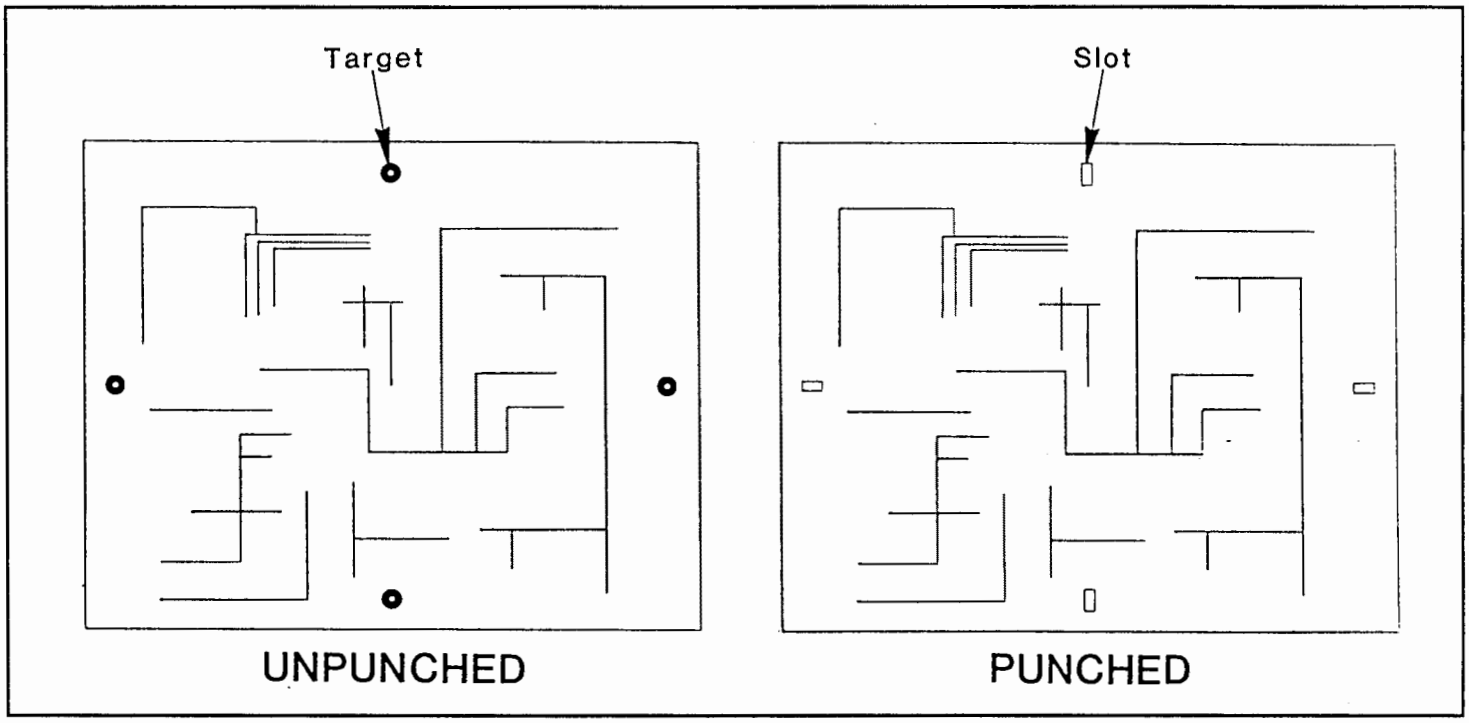


Figure 3.3 C

The table has a "Lighted Line" that is used to help align the board before it is punched. See Figure 3.3 D.

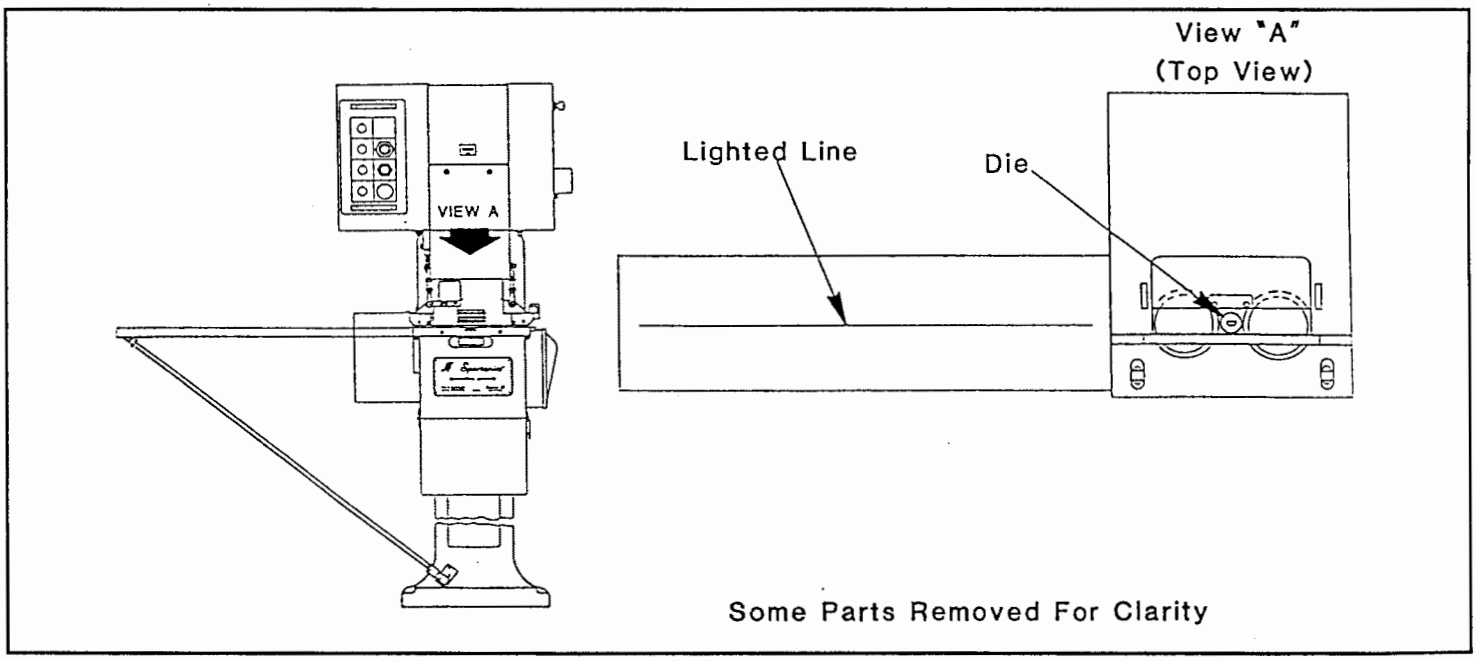


Figure 3.3 D

3.3.6 USING THE ROTATION CONTROL TABLE

The table can be used as follows:

1. Turn the press on.
2. Set the control panel for the type of target to be punched.
3. Turn the rotation table switch on. See Figure 3.3 E
4. Place the board in the press so that the right target is over the die and the left target is bisected by the lighted line. See Figure 3.3 F.
5. Press the foot switch *half-way* down and hold it there. The press's hold-down arms will come down and adjust the position of the right target so that it is exactly placed over the die. At this point, you can make fine adjustments to the position of the left target.
6. Press the foot switch all the way down. The press will punch the right target.
7. Turn the board 90° and repeat steps 4-6.
8. Turn the board 90° and repeat steps 4-6 again. But this time you will have to align the lighted line with a punched-out slot instead of a left target.
9. Turn the board 90° and repeat steps 4-6. The board will be completely punched

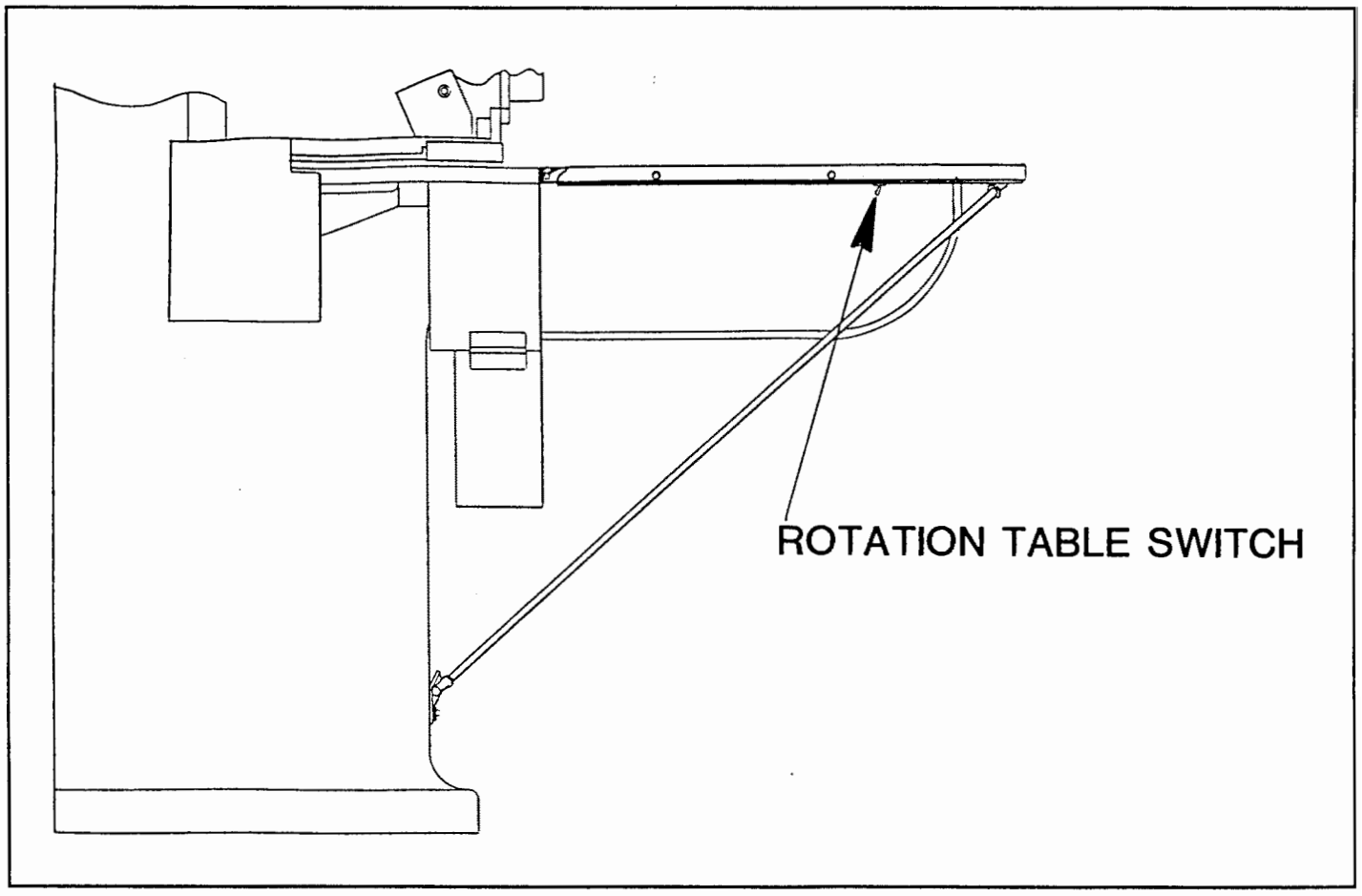


Figure 3.3 E

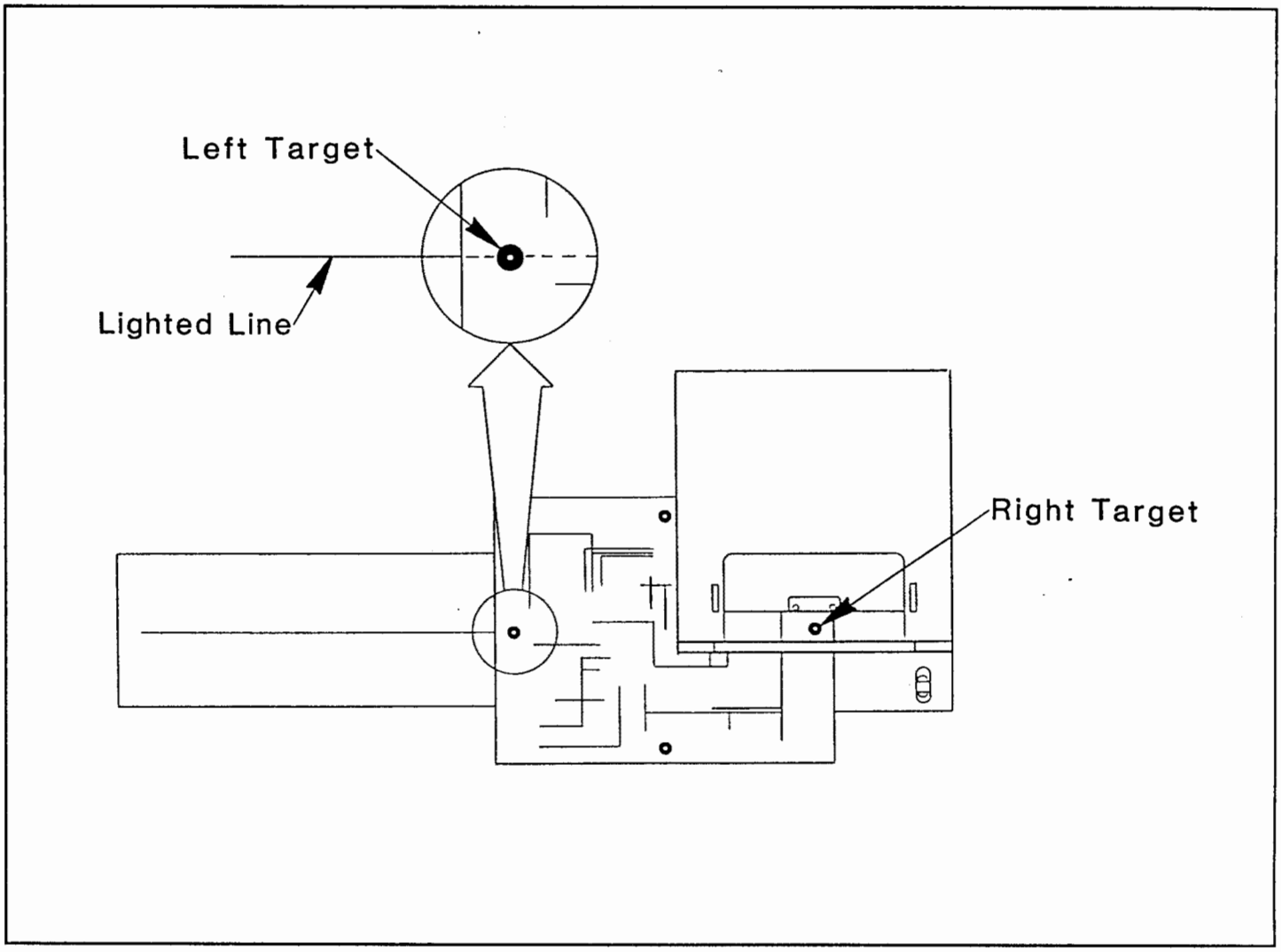


Figure 3.3 F