

**FLUKE®**

**Biomedical**

# **Nuclear Associates 57-441**

## **CLEAR-Pb® X-Ray Compensation Foot Filter**

**Users Manual**

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# Section 1

## Introduction

### 1.1 General Information

CLEAR-Pb Compensation X-Ray Filters are made of lead-plastic material that is 30% lead by weight. Since lead is an efficient absorber of x-rays, the filters will attenuate the x-ray beam. By varying the shape and thickness of the filters, many combinations of filtering action can be achieved...from almost complete attenuation to full penetration.

CLEAR-Pb Foot Filters are transparent and lightweight. By means of our "Quick-Stik" system of magnetic strips, the filters can be held firmly in place or repositioned instantly. You can see and/or adjust the area of filter coverage as necessary by observing the light shadow projected on the region being radiographed. Last minute positioning checks of the patient, x-ray collimator and filters are possible. Selected beam shaping has never been so simple and effective.

CLEAR-Pb Filters may be used with all film/screen combinations and non-screen direct exposure film packs.

Rare-earth intensifying screens are recommended in order to further reduce patient exposure, and to provide the best image quality. Consult your film manufacturer for the proper film/screen combination.

### 1.2 Applications and Specifications

	Foot Filter	Filter Holder
<b>Model #</b>	57-441	57-426
<b>Applications</b>	PA Foot	-
	PA Foot Weight-Bearing	-
	LAT Foot	-
	LAT Foot Weight-Bearing	
<b>Length x Width</b>	6-1/2" L x 2" W	5-1/2" L x 6-1/2" W
<b>Thickness</b>	5/32"	1/4"
<b>Configuration</b>		

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## Section 2

# Filter Holder Mounting Instructions

### 2.1 Filter Holder Mounting Instructions

If the collimator housing has an accessory tray, the two 9" x 3" x 1/16" acrylic mounting plates (held together by four screws) should be cut to fit the rails of the tray (Figure 2-1). If the tray channel is less than 1/8" wide, only one of the mounting plates is required. The other should be removed and retained as a spare.

If the collimator does not have an accessory tray, the filter holder can be mounted with self-stick Velcro® tape. The Velcro attachment kit (57-426-1100) is available.

To separate the filter holder from the mounting plate(s), remove the four small screws holding them together (Figure 2-2). Carefully measure the collimator's accessory tray and mark one or both of the mounting plates for cutting. A cardboard template is recommended as a cutting guide. Make a trial fitting with the template before cutting the plastic to ensure that the filter holder will be in the proper position on the mounting plate. If the final shape of the mounting plate is not square, be sure to check for proper longitudinal orientation of the filter holder (Figure 2-1).

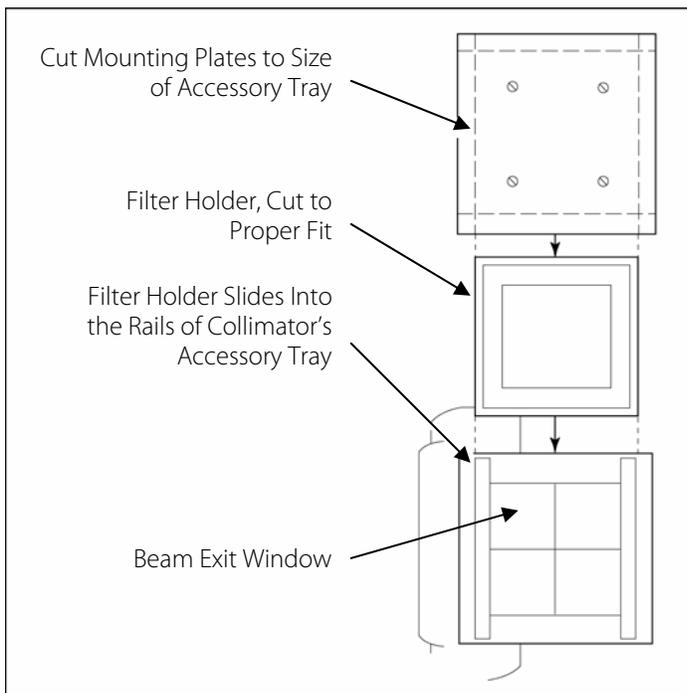
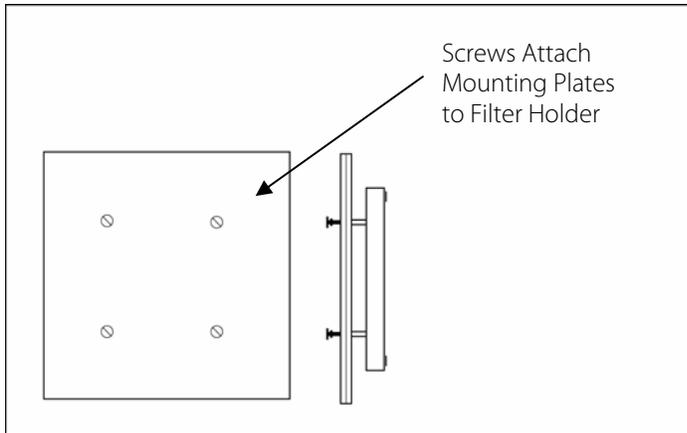


Figure 2-1. Mounting the Filter Holder



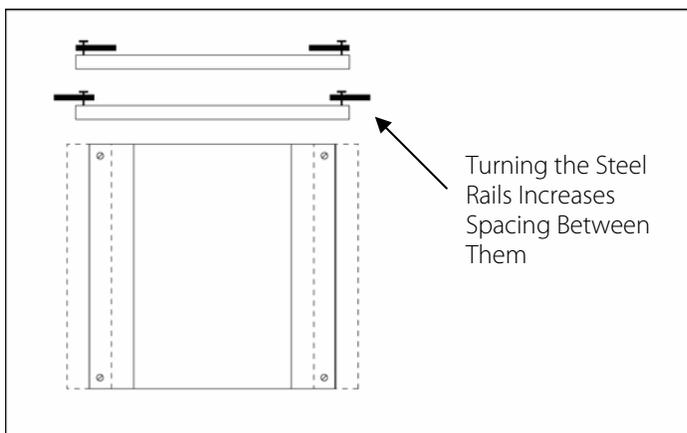
*Figure 2-2. Filter Holder to Mounting Plate*

To cut the plastic mounting plate(s), use a plastic scoring knife. Cut each plate separately. Score the plastic at the desired locations, making sure each score runs the full length (width) of the plate. Make the scores deep by going over each scratch several times.

Next, place the scored plate over the edge of a table, with the score mark on top and exactly above the edge. Hold the plastic sheet flat to the table top with one hand. With the other hand, bend the overhanging part of the plastic sheet down. If the score mark lines up exactly at the table edge, the overhanging piece will break cleanly at the mark.

Check that the mounting plate slides easily into the accessory tray. To make any fine adjustments needed for a proper fit, use a file or fine sandpaper.

Reattach the filter holder to the mounting plate(s), and insert the assembly into the collimator's accessory tray (Figure 2-1).



*Figure 2-3. Reversing the Guide Rails*

If the steel rails on the filter holder intrude into the x-ray field of view, unscrew the rails and turn them around (Figure 2-3). Since the screw holes in these rails are off center, turning the rails will set them  $\frac{3}{4}$ " further apart.

If desired, the magnetic tape on some or all of the filters can be cut to match the new position of the holder rails. Using a sharp knife, cut through the magnetic tape (on each side of the filter) in a line parallel to, and  $\frac{3}{8}$ " from the inner edge. Remove this  $\frac{3}{8}$ " strip, leaving a  $\frac{5}{8}$ " tape strip along the outer edge of the filter, which matches the new position of the filter holder rails.

The use of the filters and holder is not changed by the above procedure.

## Section 3 Filter Positioning

### 3.1 AP Foot 40" F.F.D.

NOTE

This section contains a detailed description of filter positioning. Please read it thoroughly before continuing.

When performing a single-exposure AP radiograph of the foot, the thin filtration portion of the filter should begin at the proximal end of the metatarsal bones. The thick edge of the filter should extend beyond the terminal phalanges. (See Figure 3-1)

Technique should be increased in order to image the tarsal bones; the attenuation of the filter will compensate for the exposure in order to prevent the terminal phalanges from becoming overexposed. The entire foot can be imaged with one exposure.

### 3.2 Oblique

The position of the filter is the same for an oblique projection.

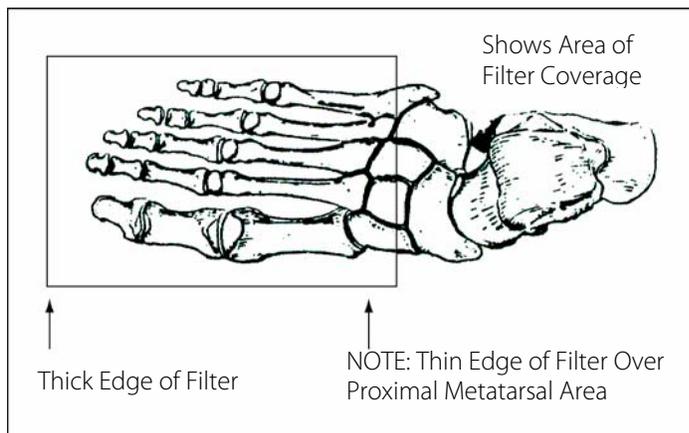
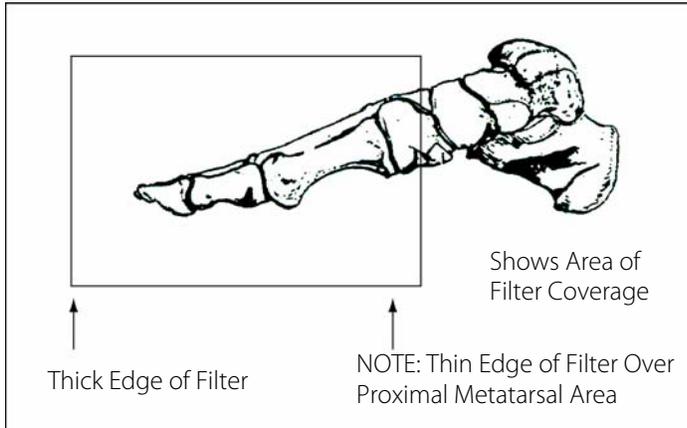


Figure 3-1. AP Filter Orientation

### 3.3 Lateral

When performing a single-exposure lateral radiograph of the foot, the thin filtration portion of the filter should begin at the proximal end of the metatarsal bones. The thick edge of the filter should extend beyond the terminal phalanges. (See Figure 3-2)

Technique should be increased in order to image the tarsal bones; the attenuation of the filter will compensate for the less-dense terminal phalanges.



*Figure 3-2. Lateral Filter Orientation*

For AP and lateral weight-bearing views, the positioning is the same as for conventional views.

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