**GRIDS**

**Laboratory Experiment #7**

**Procedure:**

Select those grid ratios which are available to you and cross out those listed below that are not available.

Place a 14 x 17 inch 400-speed screen cassette on the *tabletop*, and place various wafer grids on it as listed below with techniques. Place an abdomen/pelvis phantom on top of the grid. Use 50-inch SID and center carefully to the grid. Be sure to label each film with lead markers.

Determine what ratio your Bucky grid is and fill in the technique change factor by deriving it from the other listed factors. Choose a homogeneous medium-gray area on Exposure #1, circle it on each film and measure it a “Area A” to record.

Fixed = 80 kVp

Film # Grid Ratio Technique Change Factor Density Measured

1 No grid

(standard) 10 mAs 1X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

2 6:1 grid 30 mAs 3X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

3 8:1 grid 33 mAs 3.3X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

4 10:1 grid 37 mAs 3.7X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

5 12:1 grid 40 mAs 4X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

6 Bucky grid = \_\_\_\_\_\_\_\_\_ \_\_X Area A: \_\_\_\_\_\_\_\_

7 15:1 grid 50 mAs 5X Area A: \_\_\_\_\_\_\_\_

Alternate Technique = \_\_\_\_\_\_\_\_\_

**Analysis:**

1. Review the Area A densities. As grid ratio is increased, what would happen to film density (increase, decrease, or remain equal) if technique were not adjusted? How does this occur?
2. If the rounded technique change factors above worked, the Area A densities from one film to the next should be within roughly 25 percent of each other. Is this so? List those which are not.
3. For those you listed in #2, estimate what technique change factor you believe would have worked better. List the technique change factors you would use for each grid ratio. Extrapolate for the grid ratios you did not have available for the experiment.
4. On Films #1 and #6 (or the one with the highest ratio grid), select a lighter homogeneous density Area B on the phantom image. Take densitometer measurements at these points and record. Copy the area A measurements from the previous sections for these films. Calculate the contrast ratios by dividing the smaller number into the larger number, and record.
5. Note the contrast ratios in Question #4. What is the purpose of adding a grid?
6. How does a grid accomplish this?
7. As grid ratios increase, does contrast increase, decrease, or remain equal?
8. Observe the bone edges on the non-grid and the *Bucky* grid exposures. Did use of a grid affect sharpness of detail?
9. Observe a given bone on the non-grid and Bucky grid radiographs. Do grids affect magnification? Do they affect shape distortion?
10. What artifact do you notice on the wafer grid exposures which the Bucky film does not show? Explain how this artifact is eliminated by the Bucky mechanism.