Naval Gunnery and Early (Mechanical) Computers

Randy H. Katz
CS Division, EECS Dept.
University of California, Berkeley
randy@cs.Berkeley.edu
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The Gunnery Problem

- Cancel ship’s motion
- Range to target
- Range keeping
- Actual shooting

The Gunnery Problem

- Continuous aiming only made possible by gyroscopes

Longer Ranges and Larger Guns

- Torpedo Threat (Russo-Japanese War): engage at > torpedo range
  - 800-1500 yds, to 3500 yds at reduced speed
  - Improved to 10000 yds between 1900-1914
- Plunging fire: armor below/above the waterline or topside
  - Heavier guns, flatter trajectories, longer danger space
  - 2x shell weight, 4x destructiveness

“Danger Space”

Range Finding

<table>
<thead>
<tr>
<th>Distance</th>
<th>Vertical Range Finding</th>
<th>Horizontal Range Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 yds</td>
<td>200 ft</td>
<td>64 yds</td>
</tr>
<tr>
<td>4000 yds</td>
<td>344 ft</td>
<td>128 yds</td>
</tr>
<tr>
<td>8000 yds</td>
<td>568 ft</td>
<td>256 yds</td>
</tr>
<tr>
<td>12,000 yds</td>
<td>892 ft</td>
<td>384 yds</td>
</tr>
</tbody>
</table>

What happens at night?
Range Keeping

The range projector was the US Navy's equivalent to the Dazzle. Unlike Dazzle, it was uniformly applied over the entire surface of the projected area, creating a wide circle of light. Although this technique was not as effective as the Dazzle projector for conventional targets, the projector was used on battleships and cruisers. This was the theory for the range projector, as shown in the attached illustrations. This illustration is from the Dazzle projector manual.

Dryer Plotting Table

The Dryer Plotting Table demonstrates the use of the Dryer Plotting Table for plotting projects. It shows the range-to-target angle and bearing of the target to be plotted in the dry range table. The table also provides instructions on how to use the table for plotting. The table explains that the range-to-target angle and bearing must be determined before plotting. The table also explains that the range-to-target angle and bearing must be determined before plotting.
For More Information

• http://en.wikipedia.org/wiki/Frederic_Charles_Dreyer
• http://www.dreadnoughtproject.org/