Background Data:
The Air War Game—Battle of Britain
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Background History
• May 1940: German Blitzkrieg in the West
  - German mechanized warfare shocks the Allies
  - Holland, Belgium fall in days, France defeated in 6 weeks
  - British Expeditionary Force (BEF) miraculously escapes at Dunkirk, leaving most of its equipment behind
• Operation Sea Lion: Germany poised to invade England
  - Triumphant Luftwaffe operates from airbase in Northern France through Norway

Air War Game
Early War Version
• Britain on defense
  - Defend on the sea and in the air
• Germany on offense
  - Neutralize the Royal Navy and soften the defenses in preparation for an amphibious assault against Southeastern England

Decisions Made in the 1930s
• Have the sides invested in the right technologies to achieve their goals?
  - Planes and pilots
  - Strategic vs. tactical capabilities
  - Offensive vs. defensive focus
  - Detection measures and countermeasures
  - Interception methods
"Battle of Britain"

Planes vs. Planes

<table>
<thead>
<tr>
<th>Plane</th>
<th>HP</th>
<th>Max Speed</th>
<th>Climb</th>
<th>Range</th>
<th>Ceiling</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane IIC</td>
<td>300</td>
<td>327 mph @ 18K ft</td>
<td>2750 ft/min</td>
<td>4600 @ 175 mph</td>
<td>35K ft</td>
<td>2200 lb</td>
</tr>
<tr>
<td>Spitfire IA</td>
<td>179</td>
<td>355</td>
<td>0-20K/9 min</td>
<td>575</td>
<td>34K ft</td>
<td>1100 lb</td>
</tr>
<tr>
<td>ME BF 109E</td>
<td>175</td>
<td>348 @ 14.5</td>
<td>3500 ft/min</td>
<td>410</td>
<td>36.5K ft</td>
<td>265 @ 19.6</td>
</tr>
<tr>
<td>ME BF 109G</td>
<td>1000x2</td>
<td>249</td>
<td>0-35.6K @ 9.2 min</td>
<td>940</td>
<td>33K ft</td>
<td>236 @ 14.5</td>
</tr>
<tr>
<td>JU 87 D Stuka</td>
<td>600</td>
<td>220 @ 18K ft/min</td>
<td>139</td>
<td>24K ft</td>
<td>396 lb</td>
<td></td>
</tr>
<tr>
<td>JU 88</td>
<td>2000x2</td>
<td>216 @ 14.6</td>
<td>239 cruising</td>
<td>1923</td>
<td>36.5K ft</td>
<td>265 @ 14.5</td>
</tr>
<tr>
<td>DO 17z</td>
<td>1000x2</td>
<td>265 @ 14.6</td>
<td>236 @ 14.5</td>
<td>740</td>
<td>26K ft</td>
<td>2000 lb</td>
</tr>
<tr>
<td>HE III</td>
<td>350x2</td>
<td>270 @ 19.6</td>
<td>121 @ 7900 lb</td>
<td>348</td>
<td>28K ft</td>
<td>327 mph @ 14.5</td>
</tr>
</tbody>
</table>

RAdio Detection And Ranging

- Over the horizon detection
- Based on the principle of radio reflection

Chain Home vs. Chain Home Low

Short wave length, higher frequencies, greater precision in ranging, building networks for better fix of enemy position. Suitable for night interception.

Chain Home Chain Home provided the world's first automatic air defense radar network, essential along the east and south coasts of Britain, then extended to the west of England. The system included a series of tall metal towers, each containing a large radar machine. The towers were linked by radio to a central computer, which could detect and track enemy aircraft. The information was then passed to fighter bases where pilots could take action.
Ground Control Intercept

**Fig. 7.2** Forms of Radar Display  On the left above, the 'A' scope, with a baseline corresponding to a fixed time interval. The transmitted pulse registers at the left, the returned echo showing as a 'blip' at some distance to the right – the distance being proportional to the range to the target. On the right, the 'PPI' (plan position indicator), in which the radar is at the centre of the display, which shows not only distance but the direction of the target. In this illustration, North is assumed to be at the top.
Week After Next: Strategic Bombing Offensive vs. Germany

- Fighters vs. Bombers
  - What are good targets?
  - Strategic vs. tactical plans
- Precision bombing
  - Daylight vs. nighttime raids, formation flying escorts
  - Minimizing plane and crew losses while maximizing enemy destruction
- How do you intercept attackers?
  - Where is the enemy? Radar to observe planes at a distance, searchlights to track planes nearby
  - How to confuse the defender as to attacker's plans and intent loss?
  - Getting the fighters to arrive at where you expect to the bombers to be