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: The Movie

Planes vs. Planes

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>HP</th>
<th>Max Speed</th>
<th>Climb</th>
<th>Range</th>
<th>Ceiling</th>
<th>Bomb Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane IIC</td>
<td>1300</td>
<td>327 mph @ 18K ft</td>
<td>2750 ft/min</td>
<td>460mi @ 175 mph</td>
<td>36K ft</td>
<td>34K</td>
</tr>
<tr>
<td>Spitfire IA</td>
<td>1175</td>
<td>355</td>
<td>0-20K/9 min</td>
<td>575</td>
<td>34K</td>
<td>34K</td>
</tr>
<tr>
<td>ME BF 109E</td>
<td>1175</td>
<td>348 @ 14.5 ft/min</td>
<td>3510</td>
<td>410</td>
<td>36.5K</td>
<td>34K</td>
</tr>
<tr>
<td>ME BF 110G</td>
<td>1000x2</td>
<td>349 @ 250 cruising</td>
<td>0-19.6K/9.2 min</td>
<td>540</td>
<td>32.5K</td>
<td>34K</td>
</tr>
<tr>
<td>JU 87 D Stuka</td>
<td>1740</td>
<td>399 max</td>
<td>118 cruising</td>
<td>199</td>
<td>24K</td>
<td>1963 lbs</td>
</tr>
<tr>
<td>JU 88</td>
<td>1200x2</td>
<td>265 @ 16K ft/min</td>
<td>1553</td>
<td>32.5K</td>
<td>3510</td>
<td></td>
</tr>
<tr>
<td>DO 17z</td>
<td>1000x2</td>
<td>265 @ 16K ft/min</td>
<td>1553</td>
<td>32.5K</td>
<td>3510</td>
<td></td>
</tr>
<tr>
<td>HE 111</td>
<td>1350x2</td>
<td>270 @ 19.6 ft/min</td>
<td>1912</td>
<td>760 (loaded)</td>
<td>27.9K</td>
<td>Up to 5500</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

Shorter wavelengths, higher frequencies, greater precision in ranging
Rotating antenna for better directional accuracy Suitable for night interception

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

Fig. 1. Principle of CH (Chain Home) R.D.F. system
Ground Control Intercept

Fig. 72: 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 'flip' 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.

What Really Happened
- Part I
- Part II
- Part III
- Part IV
Next Week: 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 intentions?
    • Getting the fighters to arrive at where you expect to the bombers to be