

Rugby Site Conversion

Presented By

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UK Loran-C Trials

- **An important milestone in the process of validating and developing Loran as a complementary position and timing service in Europe**
- **The UK and France cooperate in a program to test the efficacy of Loran for timing, and for navigation over UK, and in the North Atlantic**
- **Trials are to take place over a 12 month period – beginning in Feb/Mar 05 timeframe**

Rugby Radio Station

- **BT has been broadcasting Radio Services from Rugby Radio Station in Central England for over 75 years**
- **Customers have been in the Defense, Government and Commercial Sectors**
- **The Frequency Bands broadcast have been from VLF to HF**
- **Current Services include The UK National Time Signal at 60KHz**
- **Recently VLF and LF contracts have ended releasing infrastructure**

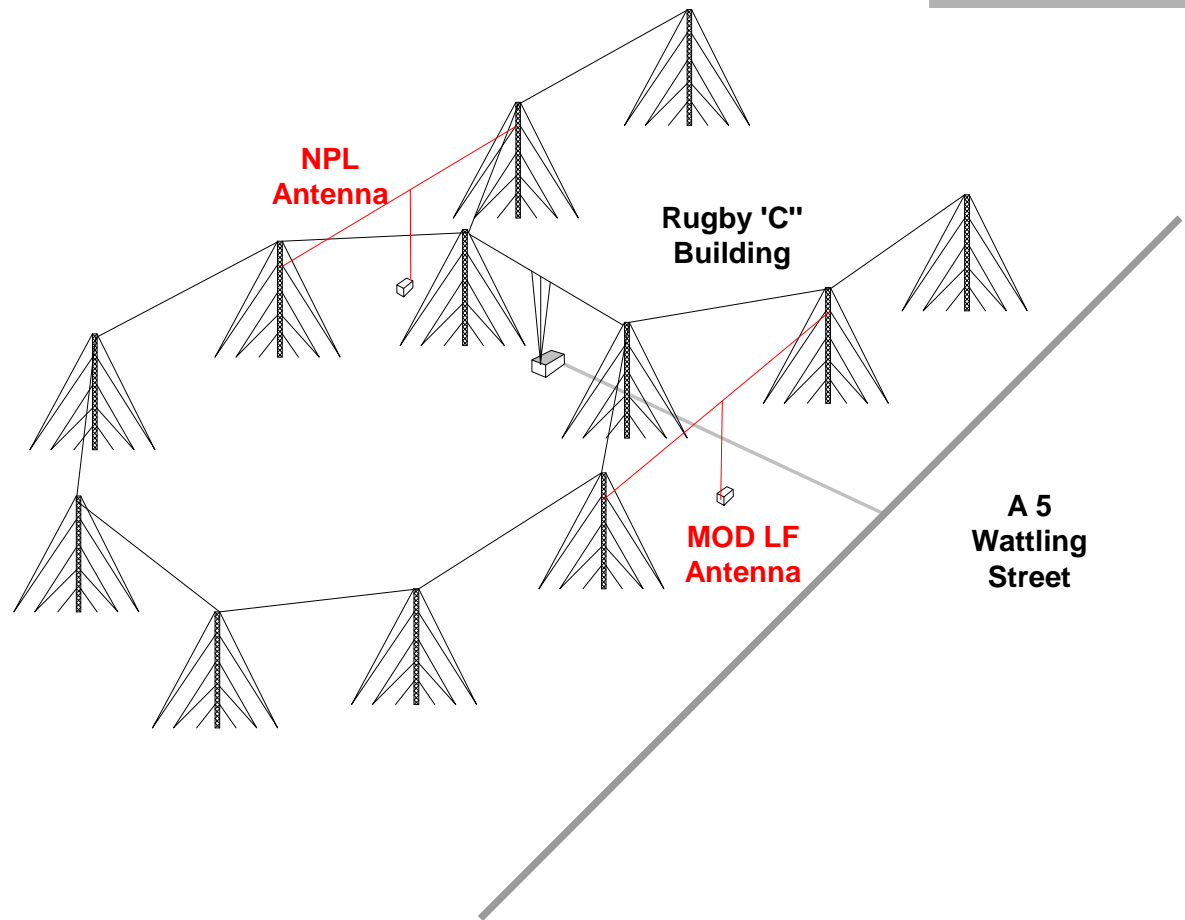
UK Initiative

- **UK General Lighthouse Agency (GLA) assigns British Telecom (BT) to plan and coordinate the Loran-C transmitter installation and support the Loran-C trials for the UK**
- **BT has the background, expertise and many years of experiences in the operation of a national network of radio broadcast stations**
- **BT operates and maintains radio broadcast stations throughout the world making it ideally suited to operate and maintain the Loran-C transmitter**

UK Initiative (continued)

- **The site of choice to host the Loran-C signal broadcast transmitter is Rugby**
- **Rugby was originally developed to provide communication and timing services, now adds new radio positioning timing and communication capabilities**
- **BT continues to broadcast timing signals from Rugby radio station (call sign MSF)**

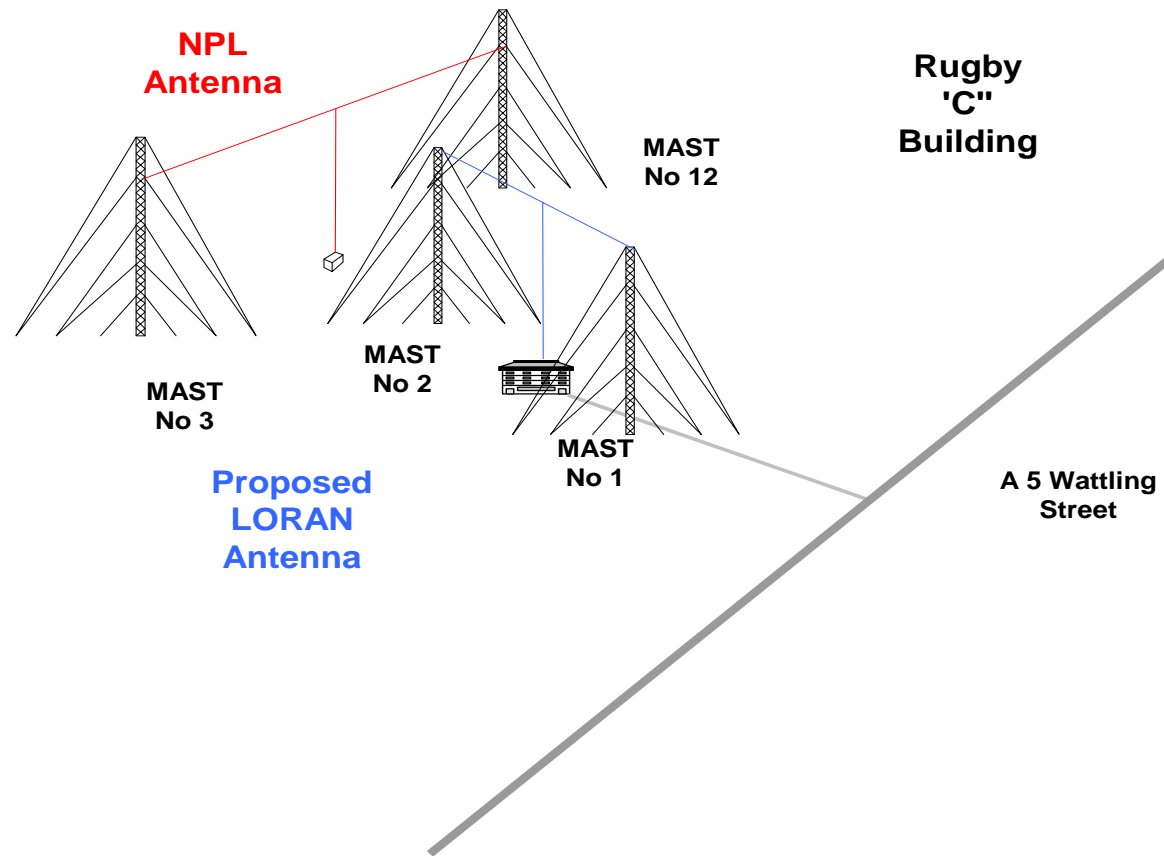
Former Rugby VLF Antenna Configuration



Proposal for Trial Loran Service

- **Withhold and utilize infrastructure that has been released**
- **Make use of services that provide the UK time signal service**
- **Propose T antenna to make best use of existing masts**
- **Release Megapulse transmitter held in store in USA and install in Rugby Transmitter Hall**
- **Set up and integrate service for General Lighthouse Authorities in UK and Ireland in the Lessay Chain**

New Rugby Antenna Configuration

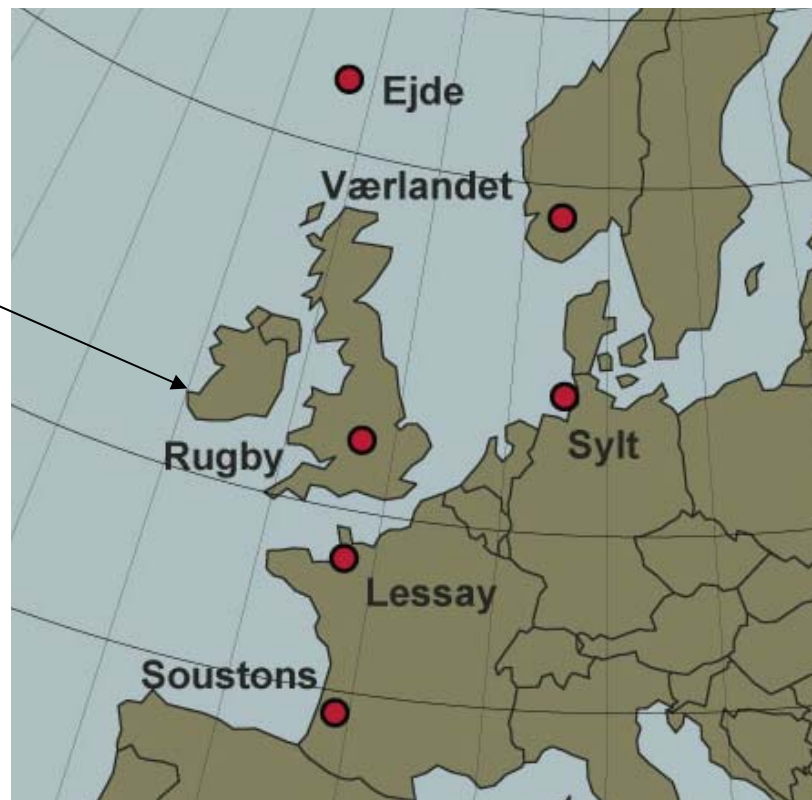


Loran-C Coverage

- **Loran-C coverage is provided by joining the (new) UK Loran-C site with established sites at Lessay, Soustons (France), Sylt (Germany), Værlandet (Norway), and Ejde (Denmark)**

Loran-C Coverage (continued)

Former planned
Irish Station



Rugby the Site of Choice (continued)

- Co-locating the Loran transmitter on an established site has a number of advantages
 - Infrastructure is in place
 - Compatible technology and 'use' optimization
 - Operational experience
 - Experienced staff
 - Absent environmental concerns
 - Schedule/cost risk mitigated
 - Encouraged to develop new procedures and practices

Rugby the Site of Choice (continued)



- Rugby – site of choice – 4 remaining masts – of 12 (2 - Timing , 2 - Loran)

Rugby



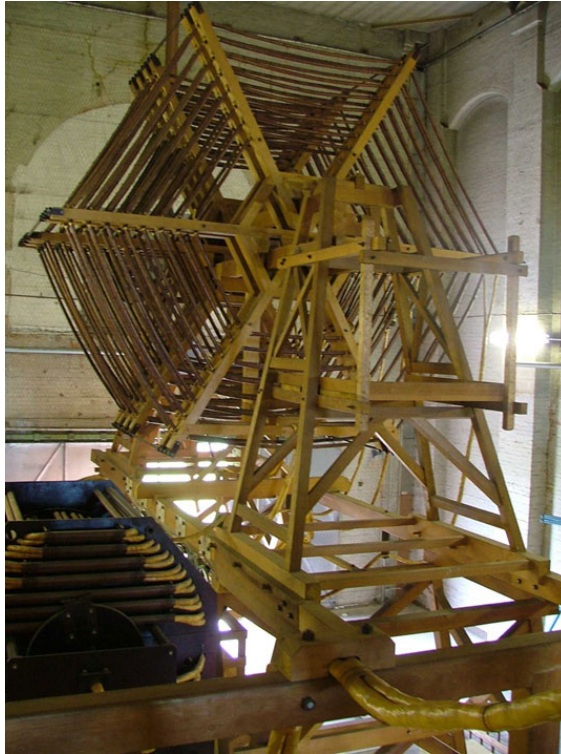
- Rugby – ‘T’ Antenna Masts (absent the top element)

Rugby (continued)



- Rugby – site of choice – operation building

Rugby (continued)



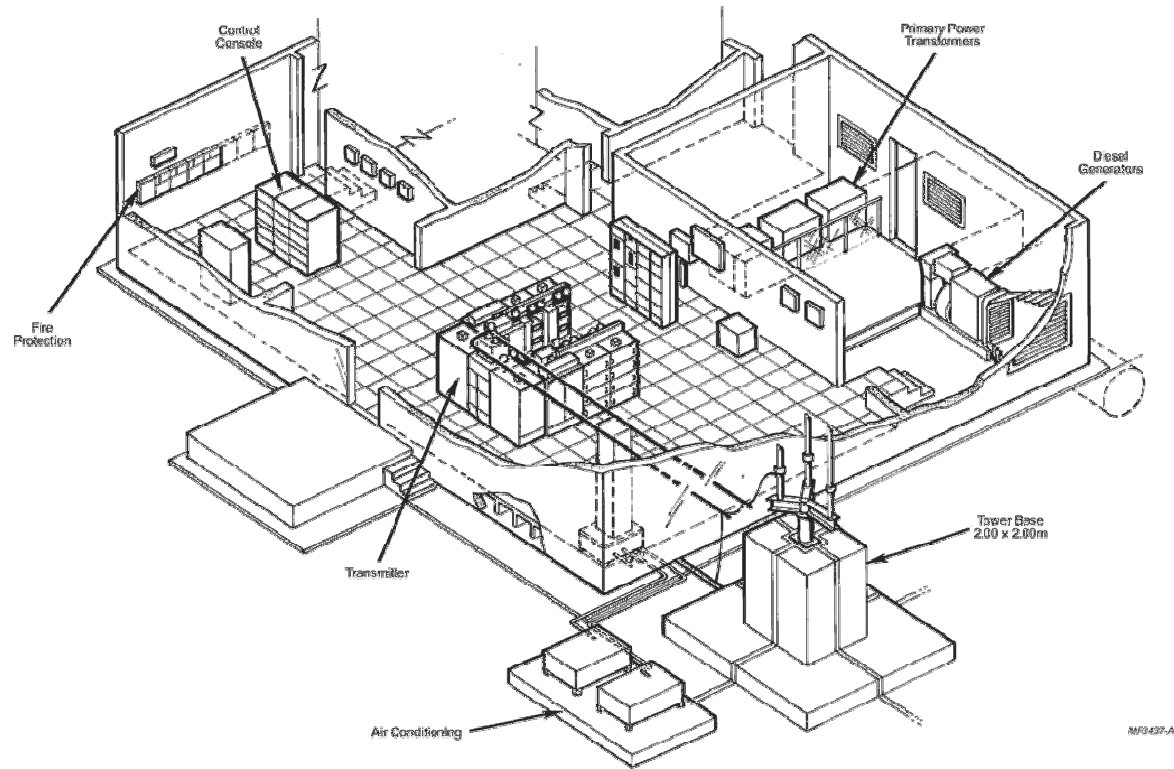
■ Helix Room

Rugby (continued)



■ Antenna Interface

Requirement



■ Typical installation

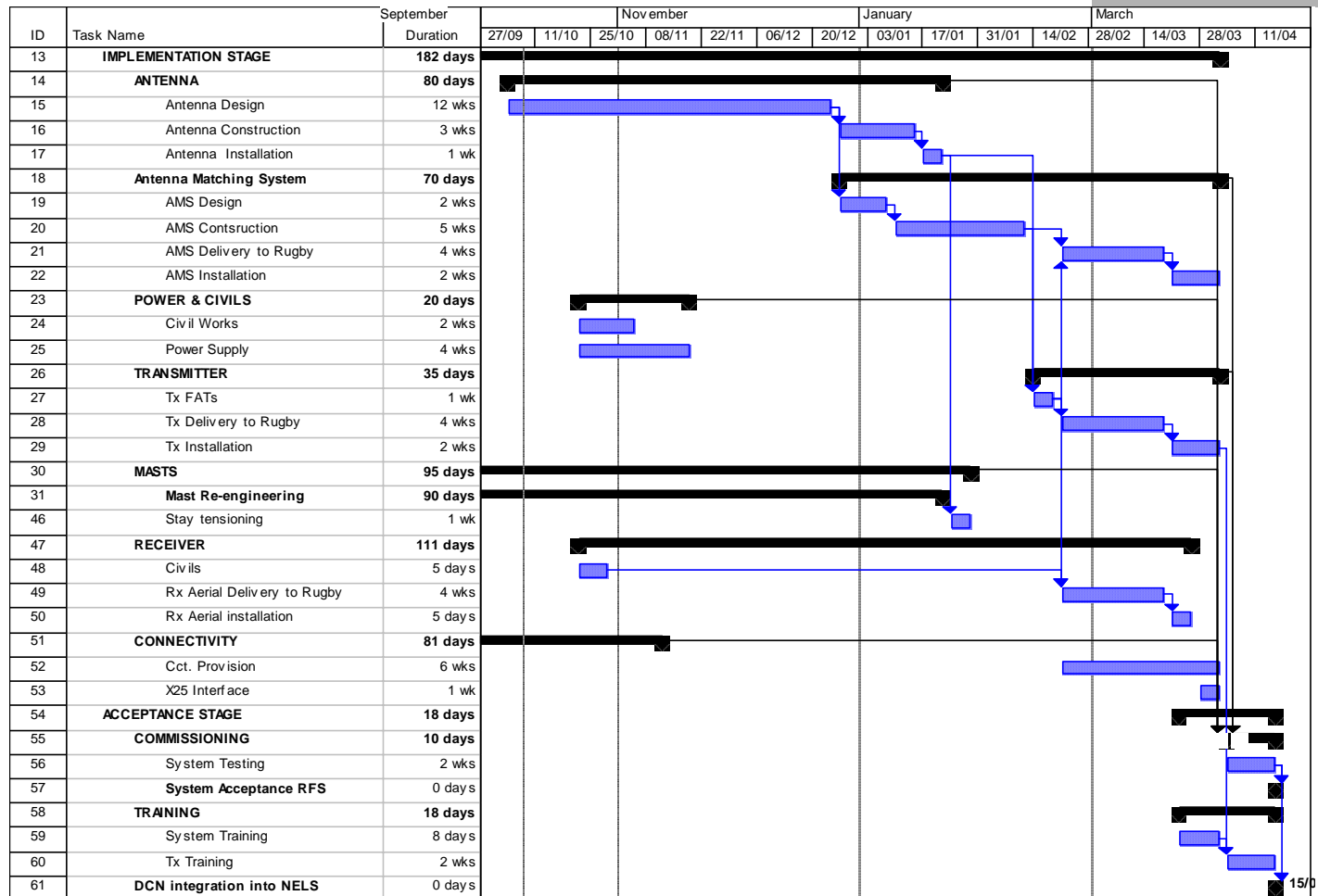
Process

- **A transmitter destined for Loophead Ireland is being relocated to Rugby**
- **The transmitter has been in storage at Megapulse since 1993**
- **The transmitter will be retested at Megapulse and configured to comply with site specific requirements, i.e. antenna matching to the Rugby 'T' antenna system**
- **Installation will be in the Helix room, space liberated from an earlier LF broadcast transmitter**

Process (continued)

- Antenna design and installation by Telefunken (Germany)
- Integration and system control by DCN (France)

Process- Schedule Plan



Summation

- **Real estate, just like the ‘slot in orbit’ for a satellite is a scarce resource and consequently expensive**
- **The elegant low cost solution for our ground based systems is recycling legacy sites. More particularly, in our case, site conversion, to add a new capabilities and expanded services.**

Summation (continued)

- **Rugby can serve as our model for expected Europe and Loran-C expansion programs**
- **Model characteristics**
 - **Scarce resource**
 - **Adapted for technology transformation**
 - **Ready to deliver intended services and business results, e.g. new user applications**
 - **Aligned with political goals, e.g. desirable services and more robust critical infrastructure**