Future Communications Study Overview

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FCS Background

EUROCONTROL

- **Aeronautical air-to-ground voice and data communications capacity for Air Traffic Management (ATM) is reaching saturation**
  - **Most severe in Europe and parts of the United States**
    - **8.33 kHz channel spacing in Europe**
    - **25 kHz channel spacing in the US**
- **Various proposals to address this problem have been offered and approved independently; none has achieved global endorsement**
- **ICAO is seeking a common, global solution through the Aeronautical Communications Panel (ACP)**
- **The FAA and Eurocontrol have started a bi-lateral study of the problem with the support of NASA; study to provide major input to ICAO ACP**

FAA/Eurocontrol Joint Study

EUROCONTROL

CCOM
FAA/EUROCONTROL Coordination Committee

MITRE

EUROCONTROL

QinetiQ

NASA

ITT Industries
Engineered for life

- **FAA/Eurocontrol 3 year joint study**
- **Objectives:**
  - **Identification of requirements and operating concepts**
  - **Investigation into new mobile communication technologies**
    - **Technology Pre-Screening**
    - **Technology Alternatives Assessment**

- **Development of a Future Communications Roadmap**
- **Improvements to maximise utilisation of current spectrum**
- **Creation of industry buy-in**

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Study Schedule

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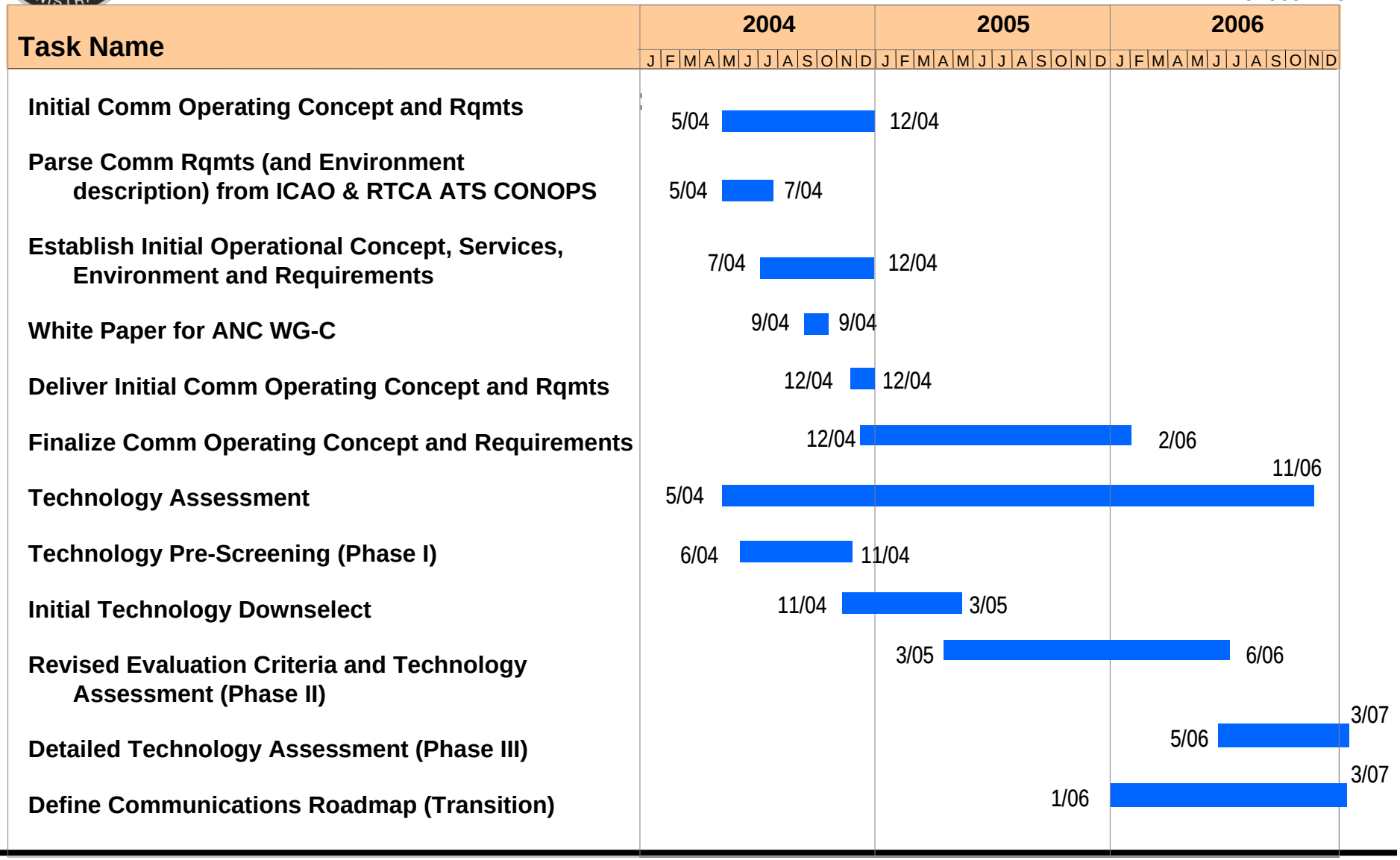

Preliminary Findings of Technology Pre-screening Results

Eurocontrol/QinetiQ

- Evolution of existing aeronautical systems or concepts.
  - XDL-3, XDL-4, ETDMA
- Terrestrial Systems
  - B-VHF, WCDMA, P34.
- Satellite Systems
  - INMARSAT-4 (Swift Broadband)
  - New satellite System(s)
- Airport / Surface systems
  - 802 derivatives .11x, .16 and .20
  - Airport Data Link

NASA/ITT

- Technologies applicable for provision of comms over enroute, terminal and surface airspace domains
  - Primary: P34 in L-Band, VDL-3 in L-Band, B-VHF in L-Band
  - Secondary: WCDMA (L-Band)
- Technologies applicable for provision of communications over specific airspace domains
  - Oceanic: INMARSAT-4 (Swift Broadband); Iridium in AMS(R)S
  - Surface: IEEE 802.16 in (5091-5150 MHz)

ATMAC Recommendations

- **Sustain voice communications in VHF Band as long as possible**
  - **Make optimum use of current equipage**
- **8.33 KHz channel spacing is the preferred first alternative only when current 25 KHz spectrum no longer meets operational needs**
- **New technical solutions should be pursued only after all non-equipment solutions have been exhausted**
  - **Spectrum allocation**
  - **Policies and procedures**
- **Aeronautical Data Link System (ADLS) is important**
  - **Use existing VHF capabilities / equipment to provide ADLS until Future Communications Study decisions and milestones are set**
    - **VDL Mode 2, 1090 MHz, Universal Access Transceiver (978 MHz)**
- **Commit to a data link technology, schedule, funding by 2007. Implement - 2015**
- **AOC should remain separate from ATS communication**

Additional Guidance

- **Following a Meeting of the Senior Executive Management (SEM) Team, the FCS was directed to:**
  - **Make use of existing infrastructure (particularly in the aircraft) longer and more cleverly**
  - **Consider alternatives which make use of the VHF band including the possible use of the current VOR band**
  - **Look at separating the voice and data functions.**

FAA Position

- **The US intends to stay in the VHF Band for the foreseeable future [all current planning horizons]**
  - **Baseline system will be Analog Voice (DSB-AM) and VDL2**
    - **Analog Voice will remain at 25 kHz for as long as practicable**
      - **8.33 is not desired, but rather a measure of last resort**
      - **VDL2 is envisioned as the starting datalink**
- **The FAA will investigate a planned transition to an enhanced VHF digital link to support safety related services**
- **The FAA will participate in any jointly developed terrestrial L-band digital technology with Europe and evaluate its potential use in the U.S.**
- **The FAA will investigate satellites as an overlay, or auxiliary system. They will look at an ensemble of satellite systems, with multimode avionics, as potentially be able to meet our communications needs. Initially, this would be an augmentation to VHF systems. Eventually, roles could be reversed.**

European Position

- **Sustain voice communications in VHF Band as long as possible**
- **Sustain future operation of voice communications in the VHF band**
  - **by expanding 8.33 services**
- **Foresee a change in paradigm in the 2020 timeframe where additional capacity is provided by making data the primary mode of communications**
  - **Given this short timescale to develop and implement new technologies, a decision has to be made soon.**
- **Target a worldwide harmonised solution that focuses on the requirements of the high-density core areas**
- **Demonstrate a solid business case for the introduction of future systems**
  - **In the case of Satellite communications, consider options of having a dedicated ATM system vs. sharing the infrastructure with other services.**
- **Facilitate the transition to a new system by considering the introduction of a digital voice service. This is a desirable step but not critical.**