



ROLE OF LIVE, VIRTUAL, CONSTRUCTIVE IN EW TRAINING

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- ▶ Traditional EW Training
- ▶ Live Virtual Constructive (LVC) contribution to EW Training
- ▶ Problems to solve in delivery of LVC

TRADITIONAL EW TRAINING

- ▶ Traditional EW Training comes from 3 main areas:
 - ◆ Classroom Training
 - ◆ Synthetic Training
 - ◆ Live Training

- ▶ Classroom Training
 - ◆ Military lead
 - ◆ Basic, Intermediate, Advanced
 - ◆ Theory
 - ◆ Very little practical application
 - ◆ Not changed much in last 10 years

TRADITIONAL EW TRAINING

▶ Synthetic Training

- ◆ Varies by platform
- ◆ Not all platforms have mission synthetic devices
 - Pilot simulators only for conversion to type and license checks
- ◆ Can provide a range of threats using Computer Generated Forces (CGF)
- ◆ Some systems can be networked together
- ◆ A number of technical issues with current systems
 - No standardised format for EW data
 - Emitters and EW systems



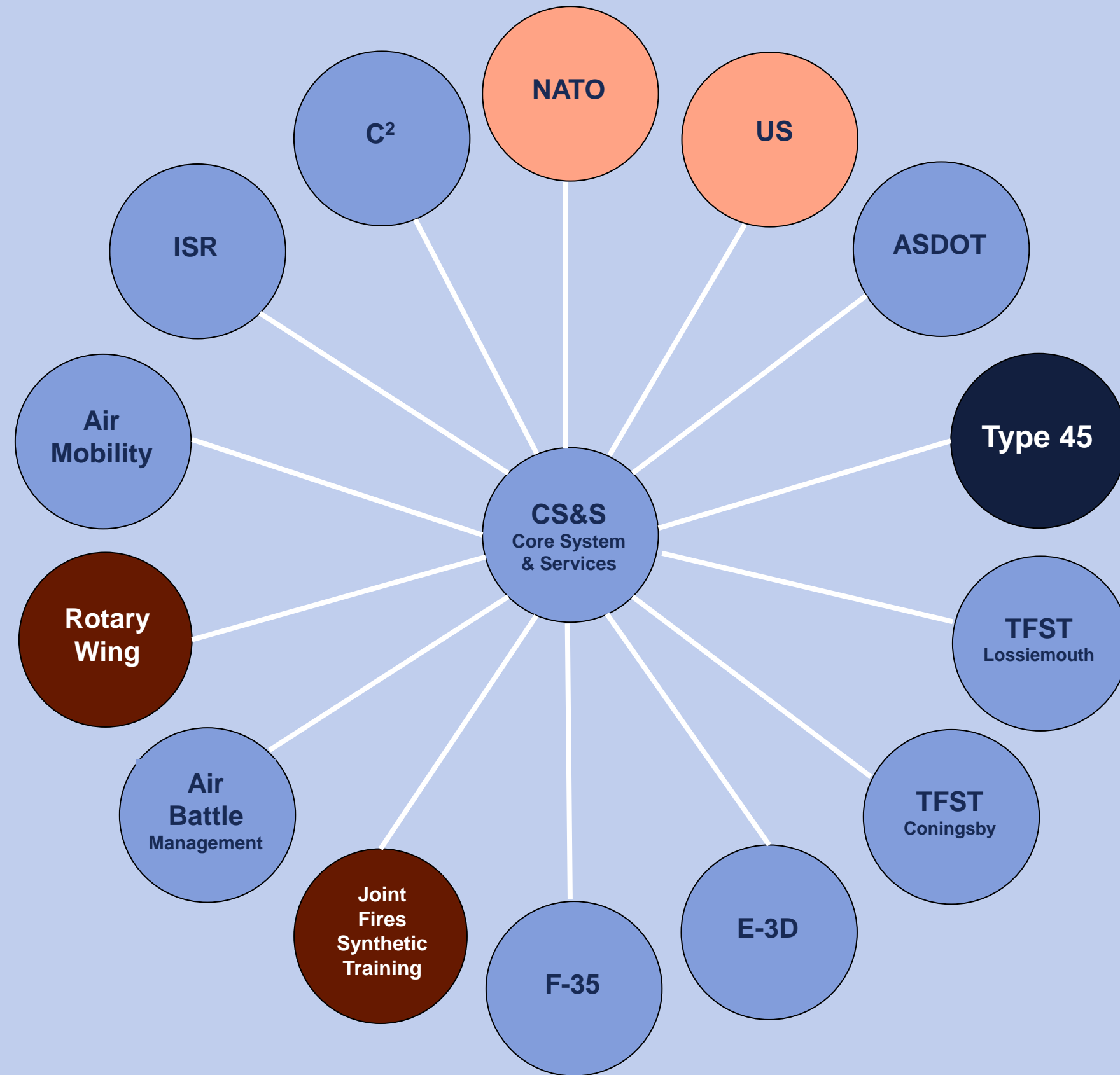
TRADITIONAL EW TRAINING

► Issues with Current Synthetic Training Devices

- ◆ System integration is complicated, both technically and commercially
- ◆ Most currently deployed Simulation Systems unable to adequately represent the complex operating environment
- ◆ Defence requires flexibility and agility to keep pace with changing operational requirements and Defence priorities:
 - Many systems require data in different formats
 - Currently requires significant duplication of effort across multiple training systems
 - Unaffordable leading to some systems becoming obsolete

► Defence Operational Training Capability is designed to address these issues

DEFENCE OPERATIONAL TRAINING CAPABILITY (AIR) - DOTC(A)



DOTC Core Systems & Services (DCS&S)

- Commonality
- Re-use
- Connectivity

Common Elements

- Image Generator
- CGF
- Will be used across the DOTC Programmes
- DTEC Compliant standards

- Centralised not localised

TRADITIONAL EW TRAINING

- ▶ DOTC(A) is divided into Tranches and so will deliver for different platform groups at different times
- ▶ The common infrastructure, models and services requires
 - ◆ Common architecture
 - ◆ Common data protocols
- ▶ This will offer a much improved platform on which to conduct synthetic EW training where the threat models for each platform will be the same
 - ◆ Training can be repeatable and consistent
 - ◆ Complex
 - ◆ Scalable

TRADITIONAL EW TRAINING

▶ Live Training

▶ Air to Air

- ◆ Some EW Training benefit can be derived from Air to Air if assets are available
 - Typhoon
 - Cobham Contract 020

▶ Surface to Air

- ◆ EW Tactics Ranges
 - 3 in Europe
 - Spadeadam main site for UK EW Training

TRADITIONAL EW TRAINING

▶ Spadeadam Tactics Range

- ◆ Operates within its own airspace
- ◆ Suffers from location
- ◆ Simulated, emulated and real threats available
- ◆ Limitations in moving threat systems around
- ◆ Restriction on use of expendables
- ◆ Operates within EM Spectrum constraints



▶ A number of constraints impact 'live training'

TRADITIONAL EW TRAINING

► Live Training Constraints

- ◆ Lack of Advanced Surface-to-Air threats
- ◆ Lack of Air-to-Air threats
- ◆ Scale and Combat mass
- ◆ Restricted Airspace
- ◆ EMCON
- ◆ Security
- ◆ Use of EA and expendables
- ◆ EM Spectrum Management
- ◆ GPS and Data Link Denied Environment

LIVE VIRTUAL CONSTRUCTIVE



LIVE VIRTUAL CONSTRUCTIVE

► Live Virtual Constructive

- ◆ Allows some 'Live' flying constraints to be overcome whilst using the same CGF threats employed in the Virtual Constructive environment
- ◆ Makes best use of Synthetic training whilst using real systems in the 'fog' of being airborne
- ◆ Place synthetic threats in a location that mitigates airspace restrictions
- ◆ Allows advanced and complex synthetic threats
- ◆ Overcomes some of the security restrictions
- ◆ Tactics can be protected
- ◆ War Modes can be used synthetically
- ◆ Facilitates complex scenarios
- ◆ Scalable from 4-ship to LFE

LIVE VIRTUAL CONSTRUCTIVE

► Challenges

- ◆ Networks to enable synthetic connectivity
- ◆ Standardised EW data format for LVC is required
- ◆ Coherent policy required on standardised EW systems in simulators leading to 'fair fight'
- ◆ Security
- ◆ Currently only Typhoon and Tornado are equipped with ACMI for AAR debriefs
- ◆ In complex scenarios all players need to participate in AAR debrief
- ◆ RAIDS, P5 and Encrypted P5 ACMI systems in UK
- ◆ Data links to carry CGF entities currently not interoperable
- ◆ Embedded training systems required
 - No single owner
 - Platform Project Team to fund

► Challenges can be overcome but Industry and Mod must work together

