

SYNTHESYS DEFENCE

# BROCHURE



# 2024 - 25

INDEPENDENCE | INNOVATION | INTEGRITY



**SyntheSys**  
DEFENCE

# WELCOME

## EMPOWERING PROGRESS THROUGH INTEGRATED SYSTEMS

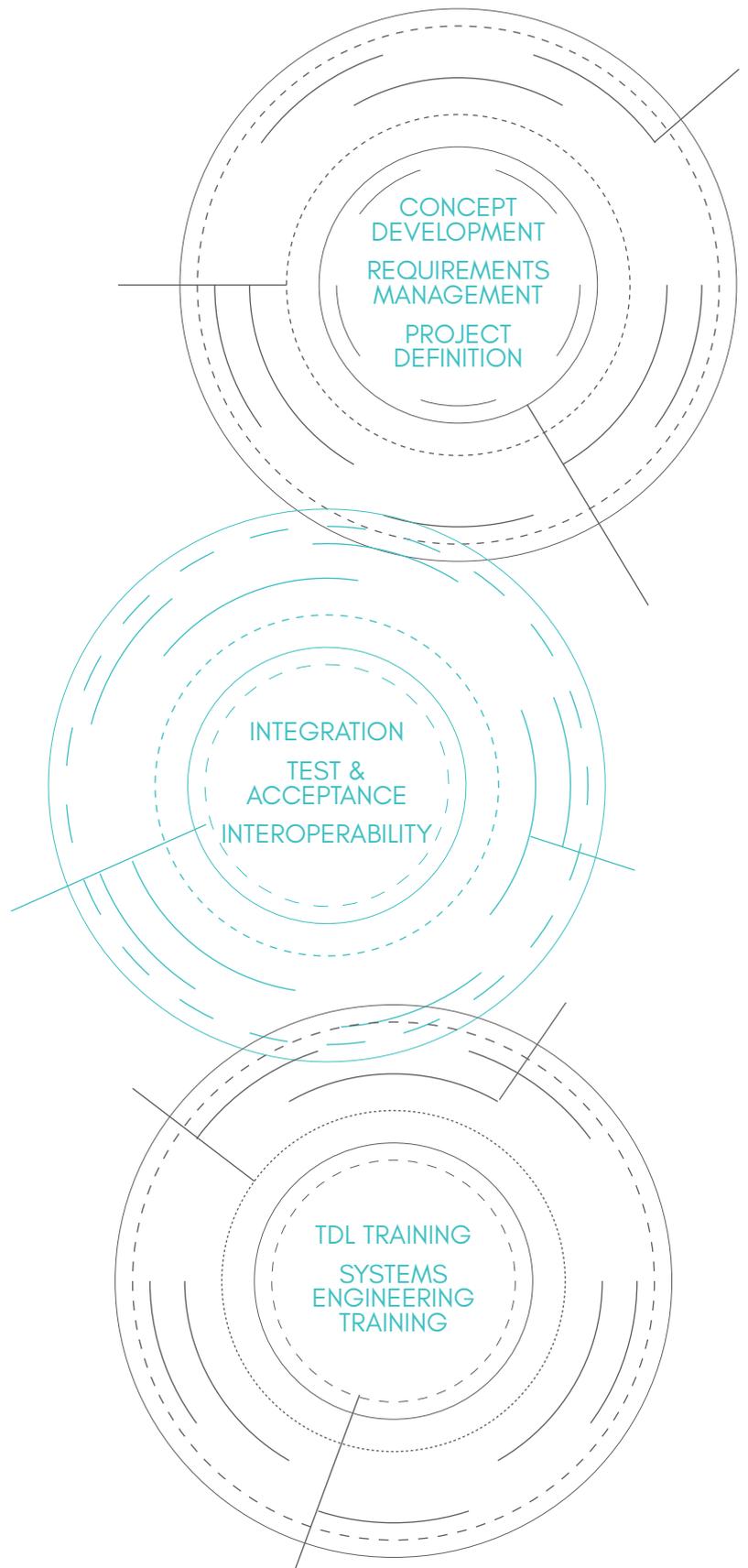
We are a leading systems engineering company dedicated to transforming complex challenges into innovative solutions. Our mission is to seamlessly integrate cutting-edge technology, interdisciplinary expertise, and holistic thinking to design, develop, and optimise systems that enhance efficiency, reliability, and sustainability.

With a commitment to excellence, collaboration, and forward-thinking, we strive to advance industries and drive positive impact at scale.

## ABOUT SYNTHESYS DEFENCE

Offering specialist services for Tactical Data Link (TDL) development, implementation and sustainment.

The SyntheSys Defence team provides world class TDL training, test and evaluation and interoperability management.



“LET’S GET IT RIGHT FIRST TIME, EFFECTIVELY AND EFFICIENTLY”

# THE CURRENT LANDSCAPE

## UNDERSTANDING TACTICAL DATA LINK (TDL) USAGE IN MODERN OPERATIONS

As with all modern technologies, TDLs are constantly evolving and, while we always need to keep abreast of the latest developments, we also need to recognise the need to integrate new systems with legacy systems. It is essential that there is a complete and coherent understanding of information exchanged across TDLs.

SyntheSys Defence has developed a series of processes that are relevant to TDL equipment throughout its entire life cycle from concept through to disposal. Interoperability is a major consideration throughout, ensuring proven compatibility between new and legacy systems and also maintaining the ability to communicate effectively with our allies during coalition operations.

To support interoperability, TDLs are governed by a myriad of standards that detail the technical operating characteristics, as well as providing information to the operators on how to use the systems in the most efficient manner. These standards, while detailing the required TDL characteristics, are open to some interpretation. This creates opportunities for different systems to be built in different ways, thereby creating interoperability challenges.

## THE CHALLENGE

It is imperative that everyone involved with TDLs, from procurement agencies and maintainers to operators and decision makers, have the knowledge to understand what their TDLs can, and also cannot, provide. Systems users need confidence in the process to know that the interoperability aims are being delivered effectively. Testing regimes identify where interoperability disparities occur and highlight the provision of assured solutions.

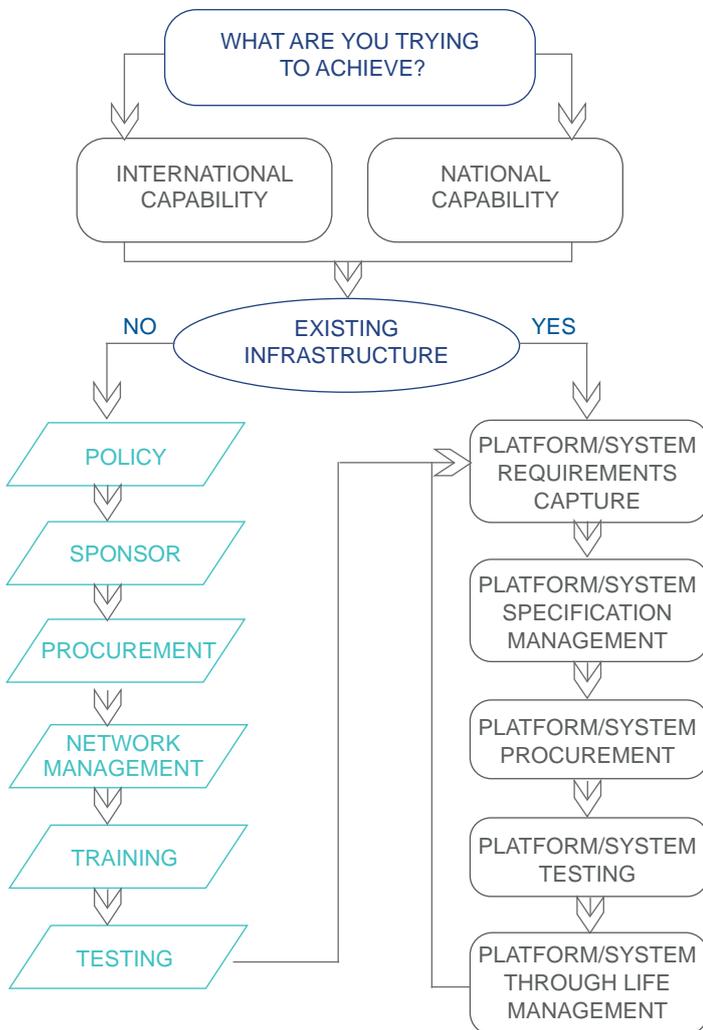


OUR PROVEN  
CAPABILITIES ACROSS  
THE FULL TDL LIFE  
CYCLE WILL HELP  
SOLVE YOUR TDL  
ISSUES AND CREATE  
GREATER EFFICIENCIES  
WITHIN YOUR  
ORGANISATION

# A GUIDE TO CHOOSING A TDL CAPABILITY

This simple guide to implementing a TDL amplifies the flow chart, with **bold text** referring to boxes in the flow chart.

## HOW TO IMPLEMENT A TDL



### STEP 1: Answer this question: "What are you trying to achieve?"

Generally, the answer falls into one of two areas: you want to be able to interoperate with other nations (**International Capability**), or you have a national data link requirement (**National Capability**). The key difference is that for an **International Capability** you **must** conform to the rules laid down by the international TDL community; for a **National Capability** you can make up your own rules.

### STEP 2: Answer this question: "Do you have an existing national TDL infrastructure capable of supporting your answer at Step 1?"

The main elements of a TDL infrastructure are: an organisation responsible for producing **Policies** (to answer the question at Step 1 and to help in **Procurement** and **Requirements Capture**); a **Sponsor** (an organisation responsible for equipment, personnel and training); an organisation responsible for **Procurement** (whether international procurement through processes such as Foreign Military Sales (FMS) or national procurement); an organisation responsible for **Network Management** (network design, planning and management of in-use networks); an organisation capable of providing TDL

**Training** (to users, maintainers, policy makers, procurement personnel, network managers); a **Testing** capability (to prove your implementation works both in principle and in use, both to the specification and with other systems {interoperability}). Without **Policy** there is a danger of **Procurement** purchasing the wrong equipment / capability. Without a **Sponsor** there may be no equipment or personnel to use the capability.

**Procurement**, even in a **National Capability** scenario, provides the required technical, financial and contractual skills to enable the purchasing of equipment and services. The **Network Management**, **Training** and **Testing** elements can be out-sourced from other nations with TDL capabilities similar to those you are aspiring to implement.

### Step 3: Deciding what capability you want and how to specify it

There are two main steps to navigate now - **Platform/System Requirements Capture** and **Platform/System Specification Management**.

**Platform/System Requirements Capture** deals with determining exactly what capability you want and why.

To get this far you know:

- What you are trying to achieve - **International** or **National Capability**;
- What your national **Policy** says (for instance, you might only require a Digitally Aided Close Air Support capability or you may want an Air Surveillance and Weapons Management capability).

You are now faced with a number of questions:

- (1) Which information exchange and why - Information Exchange Requirements (IERs) or Services?
- (2) Which TDL and why?
- (3) Which bearer system and why?
- (4) Which interoperability partner systems (with whom do you want to exchange data and why)?

Question (1) answers come from **Policy**, **Sponsor** or, most frequently by user Working Group supported by systems documents such as User Requirements, Systems Requirements and **Policy** documents such as Concept of Operations, Concept of Use and Concept of Employment.

Question (2) should be put on hold until the end, (see below for the reasons why) unless **Policy** states otherwise.

Question (3) may also be answered by **Policy** or **Sponsor**; you may want a Beyond Line of Sight (BLOS) capability, or you need the bearer waveform to be implemented into a software definable radio.

Question (4) answers come from **Policy** or **Sponsor**.

The purist approach to **Requirements Capture** is to answer Questions (1) and (4) above. At this point you have not specified which TDL you want. There are existing toolsets which can take your answers and tell that you need **TDL A with messages A.1, A.2 and A.3** and **TDL B with messages B.1 and B.5**.

The more practical approach is to:

- (1) Recognise that TDLs are optimised for different environments, functions and systems;
- (2) Determine what services you want to receive and donate – choose from Position Reporting, Status Reporting, Surveillance, Weapons Control & Management, Electronic Warfare (EW), Network Management, Text/Voice, Imagery;
- (3) Determine what domains you want to operate in – choose from Air, Surface, Subsurface, Land and Space.

Using either the purist, or the practical approach, great care should be taken to avoid the temptation to start by specifying specific TDL messages unless **Policy** dictates otherwise.

**Platform/System Specification Management** is the process by which the Requirements Capture results are measured against the TDL Standard to derive the exact message and processing requirements to be implemented. For an **International Capability** you are constrained to implement the international agreed standards; these standards evolve on a regular update cycle and different platforms have implemented different versions of the standards. Hence the reason for determining, if possible, your interoperability partners. Toolsets exist to map the results of the **Requirements Capture** process to sections within the Standard; you just have to decide which version.

An internationally agreed process for maintaining system TDL specifications is iSMART and you shouldn't go wrong by following this process. In the iSMART process, the results of **Requirements Capture** are mapped to the Standard and a document called the Platform Requirements Specification (PRS) is generated as a subset of the Standard; in addition, a differences document – Platform Requirements Difference Document (PRDD) – captures the reasons why you have not implemented those parts of the Standard for which the **Requirements Capture** process has resulted in a “not required” result. iSMART also recognises that during the development of an implementation, things change – requirements may alter, cost issues may dictate a lesser capability, testing may result in a test failure which it is agreed not to fix – and therefore the PRS no longer reflects the implementation. An Actual Platform Implementation Specification (APIS) and its counterpart, the Platform Implementation Differences Document (PIDDD), tracks the actual implementation throughout the life of the capability. These platform documents – APIS and PIDDD – can be exchanged with other nations/systems as a means of informing others of your implementation – for interoperability, testing and operational reasons. Generally the toolsets used in the **Requirements Capture** and **Specification Management** processes support the generation, export and import and comparison of these platform documents.

For an **International Capability**, it is important to follow the spirit of the iSMART process and create exact subsets of the Standard and to avoid the temptation to alter, add to, or otherwise change, the requirements in the Standard. The chief reason is to ensure interoperability with other systems; if you implement Requirement A but you make changes to the wording of the Standard, then you have effectively implemented a different Requirement A than another platform. Testing is also impacted as test cases used by other platforms may have to be changed to reflect your different Requirement A; this will add to costs and timescales.

#### Step 4: Purchasing and testing your capability

**Platform/System Procurement** is the process by which your **Procurement** organisation takes the results of the **Requirements**

**Capture** and **Specification Management** process – the PRS and PRDD – and enables, through suitable contractual mechanisms (international or national), the delivery of the stated capability. It is in this process that changes to the contractual requirement – PRS – may be made in conjunction with the **Sponsor** and relevant user stakeholders and result in the origination and maintenance of the APIS/PIDDD. Both **Sponsor** and user involvement in this process is advisable, hence the need for suitable TDL **Training of Sponsor, Procurement** and users is highly desirable.

**Platform/System Testing** is the process by which the specified capability is tested for:

- (1) Contractual acceptance;
- (2) Standards compliance;
- (3) Interoperability.

Contractual acceptance testing is generally the remit of **Procurement** and is aimed at proving that the contract has been met. Standards compliance testing and interoperability testing is aimed at proving that the requirements of **Policy** and **Sponsor** have been met, in that the delivered capability meets the users requirements, meets international (or national) standards and is operationally interoperable. Both of these two types of testing can originate as desk-based testing, including checks by human experts and by system modelling, before moving to rig-based and “live” testing. Assuming the rigorous generation and maintenance of the PRS/APIS (in that both documents are sub-sets of the Standard), rig-based standards compliance testing can use test cases common to other platforms/systems, thus saving both on costs and time but also adding to a degree of interoperability assurance. Interoperability testing is aimed at demonstrating the operational effectiveness of the capability when operating with other nations/systems/platforms.

Interoperability testing can be conducted as Wide Area Network (WAN)-based rig testing (existing international TDL interoperability testing capabilities are in current use) as a live exercise or a mix of both; the cost of live testing and the difficulties in replicating fault conditions are a driving factor behind the need for standards compliance in both specification and manufacture.

**Platform/System Testing** at the rig and live stages can be supported by platform TDL data recording. It is desirable that **Policy** addresses the need for a platform TDL data recording capability.

#### Step 5: Maintaining your capability

**Platform/System Through Life Management (TLM)** is the process by which an implementation is supported from the initial stages of **Requirements Capture** through to its end of operational life.

**TLM** of a TDL implementation addresses the need to evolve the implementation to meet changes in the Standard, changes to requirements and changes to interoperability partner platform/system implementations. **TLM** is aided by the adoption of the iSMART, or similar process – such as SPIRIT (see Page 8) and especially by the maintenance of the APIS/PIDDD. **TLM** in an **International Capability** Implementation can also involve attendance and support to a number of international TDL forums and meetings, some of which will be TDL specific whilst some activities will be broader. Both **Policy** and **Training** have a role to play in a nation's/system's participation in the wider TDL community.

# TDL & DEFENCE CONSULTANCY

We provide advice and assistance on the implementation and operation of military TDLs, including Link 11, Link 16, Link 22 and Variable Message Format, as well as Joint Range Extension Application Protocol (JREAP).

We provide world-class support to TDL and other defence projects; our customers come to us because we listen, assess, respond and deliver.

Like any successful enterprise, SyntheSys' strength lies in the capabilities of its staff. All of our consultants and engineers have extensive expertise. These capabilities give SyntheSys the ability to assess problems from a broad range of perspectives and ensure that our customers receive the best possible service.



# OUR CAPABILITIES

## INTEROPERABILITY MANAGEMENT

Achievement of interoperability requires a structured approach, a clear expression of exchange requirements, an auditable compliance to requirements and standards, and through-life support. We have extensive experience with the life cycle specification and management of complex data, which is supported by our SPIRIT process - detailed on Page 8.

## TDL TESTING

SyntheSys has unrivalled knowledge in the development and definition of TDL testing programmes. The UK Multi-Link Test Facility (detailed on Page 9) in conjunction with our SPIRIT tool provides powerful TDL testing capability.

## NETWORK DESIGN & MANAGEMENT

All TDLs require a certain amount of pre-planning (design) and furthermore, during operations, an element of dynamic management. Our personnel have first-hand expertise in the design and management of operational TDL networks enabling us to provide bespoke specialist network management advice and training.

## FRONT LINE NETWORK OPERATIONS

Many of our personnel are experienced ex-military operators, providing specialist advice and knowledge across the full spectrum of network enabled capability, in coalition, joint and single service environments. Our operational experiences encompass air, surface and land platforms in C2 and nonC2 roles.

## LIFE CYCLE COSTINGS

SyntheSys develops models for the life cycle costing of TDLs, enabling users to predict expenditure and take appropriate actions to ensure minimum through-life costs.

## PREPARATION OF TECHNICAL SPECIFICATIONS

SyntheSys is a leading provider in the delivery of expertly-detailed technical specifications for key elements of TDL infrastructure.



Unless otherwise accredited, all military photographs in this brochure are © Crown Copyright 2020 [www.defenceimagery.mod.uk](http://www.defenceimagery.mod.uk)

We have a variety of advanced tools, services and training solutions, as detailed in the following pages.

# SYSTEM PROCESS FOR INTEROPERABILITY REQUIREMENTS AND IMPLEMENTATION TESTING (SPIRIT)

SPIRIT is a unique process for interoperability management and assurance. Built on IBM® Engineering Lifecycle Management (ELM) software, SPIRIT is a standards-based interoperability assurance approach.

Offering a cohesive, integrated approach to the specification, installation and testing of complex data interfaces, SPIRIT relates unique Mission Stories into relevant test cases, reducing costs and allowing early test case evaluation. In turn, this allows the development team to collect evidence and guide the design evolution from the conceptual development to the completion of tests within the life cycle.

The SPIRIT process focuses on the definition of an integrated and self-consistent set of standards, which define how the individual systems within a system-of-systems coordinate and report actions. We refer to this set of standards as the 'vision'. At the heart of the SPIRIT method is a model of the standards that represent the vision. Mission stories develop this concept further, enhancing real-life requirements capture and testing in a 'Test Like you Fight' approach. The model identifies where the standard / vision is incomplete and inconsistent, thus supporting the development of change proposals.

The SPIRIT approach is ideally carried out as part of an interoperability assurance programme and it can be applied very effectively to the development and testing of an individual system.



## 'WHAT IF' ANALYSIS



A change in vision can be costly if it causes significant knock on changes to implemented systems. SPIRIT evaluates change proposals using 'what if' analysis using a model of the extant standards.

## MEANS FOR CERTIFICATION



By using standard test cases you can make quantitative assessment of system compliance and show your value for certification.

## SYSTEMS DEVELOPMENT INTEGRATION



Integrated with systems development life cycle: ensures testing is integrated and allows testing to take place throughout development as opposed to on completion.

## DEVELOP TEST CASES AGAINST YOUR VISION



Determine the sub-set of standard test cases that apply to your system.

## DEFINE SYSTEM REQUIREMENTS



Use the vision to identify individual system requirements.

## ESTABLISH INTEROPERABILITY MANAGEMENT PROGRAMME



By testing against your vision, SPIRIT allows you to automatically establish an interoperability programme by identifying the difference between the system capability and the vision.

# TDL TESTING

## SYNTHESSYS TESTING SERVICES



Today's interoperability challenge for platform project managers, requirement managers, engineers and operators is demanding and complex, which is why many government and platform teams find systems testing increasingly difficult to manage as a primary function.

A lack of resources, time, subject matter expertise or funding leaves multiple project teams with a gap in system quality and capability.

Our clients come to us because we enable them to solve common testing challenges in a cost effective way. We apply quality systems engineering processes and our expansive experience to establish evidence that platforms operate effectively, which improves performance, functionality and interoperability.

We offer flexible testing services that can be provided either individually or as an end-to-end package; our independent services are tailored to your needs.



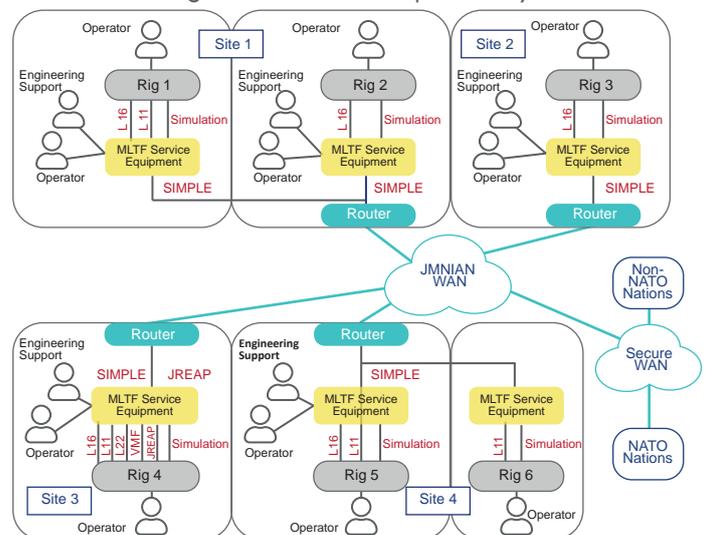
Synapse improves TDL capability performance from its foundation, by ensuring standards conformance throughout integration, interoperability and simulation test & training programmes.

## CUSTOMER DEPLOYMENT: MULTI-LINK TEST FACILITY

It's no secret that testing platform TDL systems using live trials is expensive. Synapse builds upon the long-standing and unique knowledge foundation, developed over many years in support of the United Kingdom (UK) Ministry of Defence (MOD) MLTF programme to facilitate TDL testing of geographically dispersed equipment, and to perform local standards conformance testing, in support of both integration and interoperability.

A highly cost-effective and bespoke supported solution, Synapse provides compliance and interoperability assurance testing. By conducting TDL interoperability tests of geographically dispersed TDL-equipped platforms, over a Wide Area Network (WAN), Synapse is able to test conformance to the latest military standards world-wide.

As part of the Synapse service, SyntheSys provides hardware, software, process and training, bridging the gap between desk-based evaluations and expensive live trials. Unlike live trials, tests are fully instrumented and repeatable. Synapse is proven as an extremely capable, efficient and cost-effective distributed training enabler to support collaborative military training.



\*Representative Capability  
JMNIAN = Joint Multi-National Interoperability Assurance Network

# OPERATIONAL SERVICES

As TDL systems evolve so must Doctrine, Policy and Strategy. Policy and Strategy are inter-dependant, strategy directs action to achieve policy. Doctrine brings together a coherent approach and describes how the military influence is applied across operational domains. Technological advancement and the rapid growth of information and data sharing enables new tools and tactics. Modern technology facilitates the delivery of true Network Enabled Capability (NEC) to ensure the alignment of military operations and support activities in the delivery of integrated action.

A vital element in providing NEC is to understand the operational context in which information and data flows. Merely providing a means of data flow runs the risk of loss of information. Information is the key, data is the vehicle carrying the information.

Our team of high calibre ex-military personnel and engineering staff bring a combination of specialist operational, technical, and scientific experience in support of our Capability Acquisition work.

A large percentage of our personnel are ex-military operations experts, enabling us to provide specialist knowledge across the full spectrum of operational needs in the joint and single service warfare environments. Our expertise and experience is spread over air, maritime and land C2 systems and their associated sensors and weapon systems.

Our operational expertise includes:

- Standards Management
- TDL Simulation
- Technical Assurance
- Requirements Capture & Documentation
- TDL Configuration Management
- Security
- Operational Test & Evaluation
- Customer Friend
- Data Analysis
- Interoperability Analysis, Tests & Reporting
- Platform Initialisation
- Human Machine Interface Development
- Frequency Clearance Agreements
- Doctrine



OUR REAL-WORLD OPERATIONAL EXPERIENCE GIVES US THE EXPERTISE TO EMPOWER ORGANISATIONS

# DEFENCE TRAINING

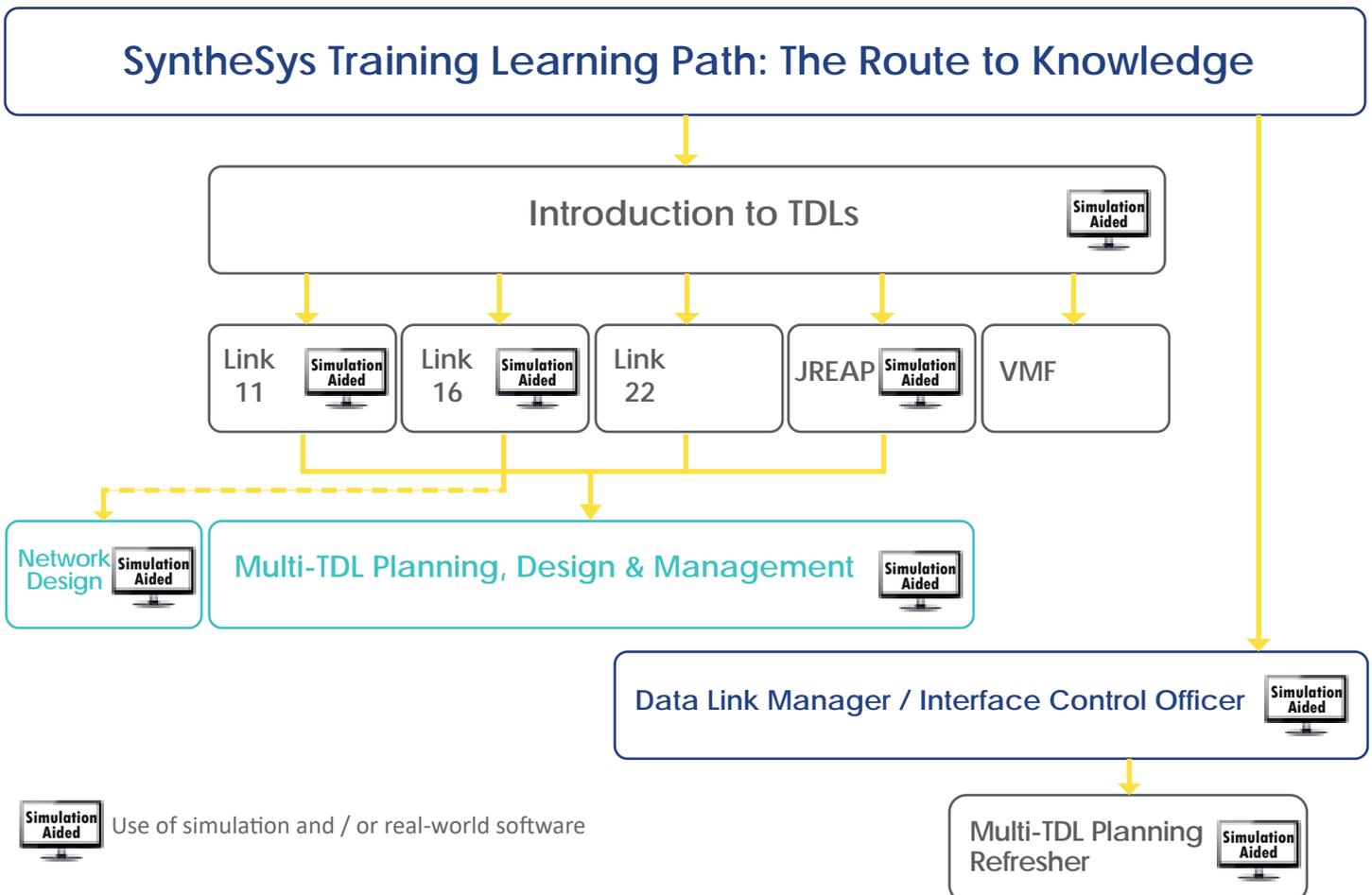
## FULLY FLEXIBLE TRAINING

At SyntheSys, we recognise the importance of delivering effective training that develops personnel to progress their understanding and confidence regardless of their previous experience.

The successful development and operation of TDL systems involves a broad range of disciplines: procurement officials, project managers, engineers and end-users. Our training courses are balanced to meet those requirements by providing stimulating and thought-provoking lessons that challenge each attendee to aspire to learn more. Our instructors have extensive operational and engineering backgrounds. Their aim is to deliver not only knowledge, but understanding, and to that end, the why. Why does it work that way? Why was it built like that? They are committed to providing the right training, from basic through to advanced level, to guarantee each attendee meets their own individual training goals.

We appreciate that to make training courses fully effective and interactive, we must encompass as many learning styles as possible. Practical scenarios, discussions and even role play can all facilitate a highly productive learning environment. Maybe you are unsure of your exact training requirements. We can help by offering a complimentary training needs assessment, where we will assist in identifying your needs to ensure that the training received by your personnel is truly valuable to your organisation.

Unique to SyntheSys is the ability to provide a simulation-aided learning process, which ensures our students receive the theory, reinforced by hands-on practical experience. We are also able to offer flexible online delivery for some of our training solutions. Please contact us to find out more.



# DEFENCE TRAINING

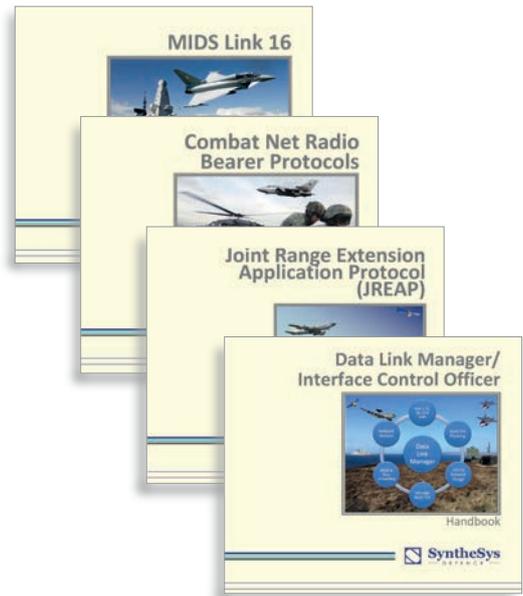
## TRAINING MANUALS

These renowned manuals are complimentary when attending a SyntheSys TDL Training Course, but may be supplied separately on request. They cover a wide range of TDL topics, (four of which are shown here) and all contain information as detailed for our courses.

To purchase our manuals, visit:  
<http://www.synthesys-defence.co.uk/docs.html>

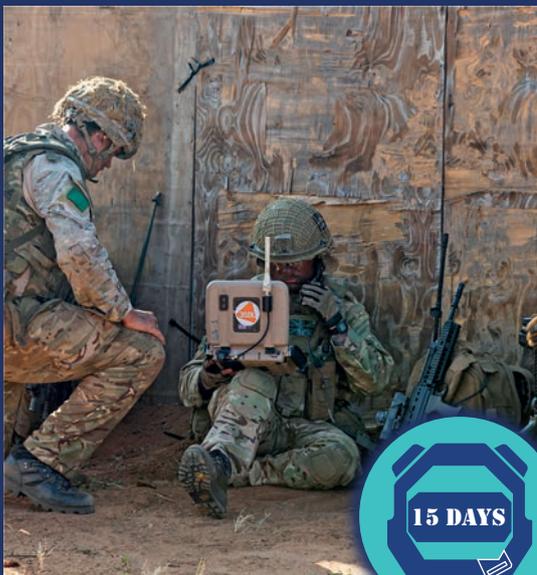
## PRICING INFORMATION

Our pricing structure aims to provide the customer with a highly cost effective solution to their training requirements. We recognise that, when budgets are tight, training often becomes a casualty. Our courses are extremely competitively priced to ensure best value for money and we offer discounts for military personnel.



## Data Link Manager / Interface Control Officer Training Course

Designed for Operators, Delivered by Operators



The Data Link Manager / Interface Control Officer (ICO) is responsible for the entire Tactical Data Link (TDL) interface from planning, right through to execution. So it is critical that today's DLM/ICO receives comprehensive training.

And as simulated and practical training environments become central to national defence strategies and priorities, it is vital that individuals receive training which mirrors real-world scenarios.

SyntheSys' DLM/ICO training course has been the training of choice for operators and technical personnel alike for many years and is the only end-to-end training of its type currently on the market. We provide robust training which is delivered by high calibre and experienced trainers in an open and practical learning environment.

For more detail including key lessons, value of attendance and what you can expect to learn, download the DLM/ICO training brochure:

<https://resources.synthesys.co.uk/defence/datasheet-dlm-ico-training-course.pdf>

# A SIMULATION-AIDED LEARNING EXPERIENCE

Our style of training is completely unique. We provide a blend of operational, theoretical and practical exercises to ensure that each of our training courses caters to different learning styles. Our training utilises an unrivalled suite of tools to aid learning, which combines simulation and real-world software to complement and enhance tuition. We also use a variety of different assessment methods, including a powerful interactive learning tool.

## UNRIVALLED TOOLS AND SIMULATORS

### C S Group's Multi-Link Simulation System (TACTX)

TACTX 2 suite is the worldwide standard multi-link simulation and test tool, to support the development and integration of air, sea and land tactical systems. The tool evaluates the compliance of an embedded TDL implementation with standards, to verify and qualify the combat platform interoperability with NATO Forces and/or Domestic Armed Forces.

### Tactical Network Design Station (TNDS)

TNDS is a fully integrated, Microsoft Windows based facility for the planning, generation, distribution and configuration management of TDL Network Designs, supporting both the initialisation of Joint Tactical Information Distribution System/Multifunctional Information Distribution System (JTIDS/MIDS) assets and the exchange of international Network Designs. TNDS converts operator specified Communications Requirements into an allocated Network Design. Network Designs may also be exchanged between nations and with NATO, regardless of whether TNDS or other design tools are being used, allowing platforms to participate in multi-national Network Designs.

### Joint Range Extension (JRE)

JRE is a combat-proven data link gateway that provides multipoint, interoperable, long-haul communications data exchange.



TACTX generated Multi-TDL Scenario operating within the Baltic Sea

## HOW SIMULATION MAKES THE DIFFERENCE

We can design a Link 16 network on TNDS.

Scenarios and complex message flow can be demonstrated using TACTX, while disparate simulated networks can be connected using JRE.

## DEFENCE TRAINING COURSES

COURSE TITLE	DURATION	COURSE OUTLINE
Identification Friend or Foe (IFF)	1 Day	To provide students with a wide-ranging understanding of IFF and associated systems. To demonstrate how IFF Modes 5 and S information is exchanged via TDL.
Introduction to TDLs 	1 Day Optional second day for simulation	The aim of this course is to provide students with an overview of, and a basic introduction to, TDLs. The course has the option to be delivered over two days, which provides students with the opportunity to undertake instructor guided practical exercises.
Link 11 	1 Day	This course is designed for those personnel who require a thorough understanding of Link 11. As such, the syllabus has been designed to cover both technical and operational employment of Link 11. The course covers both Link 11 and Link 11B.
MIDS Link 16 	3 Days	This course is primarily aimed at those personnel who require a balanced understanding of MIDS Link 16. As such, the syllabus has been designed to cover both technical and operational employment of MIDS Link 16.
Link 22	3 Days	This course has been created for those personnel who require a balanced understanding of Link 22. As such, the syllabus has been designed to cover both technical and operational employment of Link 22.
Variable Message Format (VMF)	2.5 Days	An extensive course to provide students with both technical and operational instruction in VMF over a Combat Net Radio (CNR) bearer.
Joint Range Extension Application Protocol (JREAP) 	1 Day	A comprehensive course to provide understanding of JREAP. As part of our commitment to a variety of learning styles, the course has a practical session to reinforce the theory content. Consequently, we utilise JRE software to support this practical module.

# DEFENCE TRAINING COURSES

COURSE TITLE	DURATION	COURSE OUTLINE
MIDS Link 16 Network Design & Management	4 Days	This course is designed for those personnel who have either attended the SyntheSys MIDS Link 16 training course, or who have a thorough understanding of MIDS Link 16. The course is designed to provide a wide-ranging perspective of both MIDS Link 16 Network Design and its impact upon operational network management.
Advanced MIDS Link 16 Network Design 	8/10 Days	The course is predominantly focused on practical exercises that develop the student's understanding of Advanced Network Design in a progressive manner. As such, each exercise builds on theory content and is subsequently more complex and demanding. Further details of the contents of each exercise can be provided upon request.
Data Link Manager/ Interface Control Officer (DLM/ICO) 	15 Days	The aim of this course is to provide students with an in depth understanding of TDL systems, operations and of the roles and responsibilities of a DLM/ICO. The course places particular emphasis on practical training with students utilising both simulation and operational software.
Introduction to TDL Interoperability Testing	1 Day	This one day course equips students to fully understand the benefits of participation in the TDL Capability Team Interoperability Test Syndicate (TDL CaT ITS). The course provides an in depth understanding of the process involved when a platform team participates in a NATO/Partner TDL Interoperability Test (TDLIOT). The course teaches project managers, as well as engineering and operational professionals, how to get the most out of being involved in the Test Syndicate.

## 8 REASONS WHY OUR CUSTOMERS KEEP COMING BACK

TRAINING PRESENTED BY EXPERTS



TRAINING MANUAL FOR EACH STUDENT



FREE TRAINING NEEDS ASSESSMENT SERVICE



VALUE FOR MONEY



UNRIVALLED ACCESS TO TRAINING TOOLS



OUTSTANDING CUSTOMER SATISFACTION



COST AND TIME SAVING - WE COME TO YOU



ISO 9001 ACCREDITATION

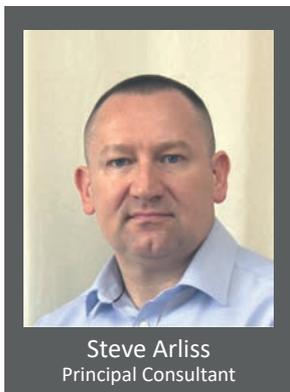


# MEET THE TEAM



John's career began with designing and developing software for high performance, real-time, industrial control systems. He then moved on to work in a research / analysis role where he specialised in issues related to operational use and management of advanced military communications systems. In 1988 Dr Hartas set up SyntheSys to provide information systems products and services to government and industry markets, and is now one of the UK's leading independent suppliers of systems engineering consultancy services.

Mark has an abundance of technical engineering experience, specialising in TDLs since 1993. Since 2008 his work focus has largely been on distributed test and trials engineering. Mark has unrivalled experience in this field, having been the technical lead on the United Kingdom Ministry of Defence MLTF contract initially, and subsequently as the project manager. He maintains a strong involvement in the provision of technical support in test and trial activities.



Steve has 30 years' TDL experience working with Link 11A/B, Link 16, and Link 22, having worked on all phases of the development project life cycle of numerous Operational, Test, Simulation & Training Systems. Since joining SyntheSys, this experience has been utilised to provide TDL expertise in support of UK and multi-national trials using the UK MLTF.

Kate has worked with international organisations, government departments and civil / military committees and is experienced in strategic policy development, joint research analysis, operational planning and key programme delivery. Kate is an Air Traffic Management (ATM) specialist and has worked across a broad number of areas during 32 years in the military and civil environment, including conceptual development as part of the Air Staff, information management and international engagement. In addition to her role at SyntheSys, Kate is a current reservist in the Royal Air Force Service Complaints Team.



## MEET THE TEAM

James served 21 years in the United States Air Force, serving in various assignments both in the US and within NATO. He excelled as a data link subject matter expert providing student instruction, leading teams through test & evaluation processes and course planning, with the goal of eliminating inefficiencies in a specific process for the benefit of everyone involved, from those participating in the system, to the eventual stakeholders. This unique blend of experience enables James to grow customer relationships while exceeding consumer demands.



Kurt has over 30 years' experience within military C2 systems, both in flight and ground operations, having started his career in the Royal Danish Air Force in 1984, with 28 of those years spent working in a software engineering capacity on real-time C2 systems. Kurt joined NATO in 2003 where he worked with the Airborne Warning and Control System (AWACS) team in Geilenkirchen, Germany. He spent 12 years as data link programmer and 8 years as test leader and test manager. Kurt specialises in the data link field and has extensive development and testing knowledge within real-time and simulated environments.

Roland (JRE JICO, JRE Principal Field Engineer), is a highly experienced TDL and former Dutch Hawk and Patriot Air Defence fire control operator. Roland served for 37 years in the Royal Netherlands Air Force. His experience includes Link 11/11B, ATDL-1, Link 16, JREAP and network design, and Senior Link 16 Manager at the National Data Link Management Cell. The last 5 years of active duty were spent at the Centre of Excellence from the Ground Based Air Defence Command as an SME for Tactical Data Links and was involved in the introduction of JREAP. His broad experience enables Roland to assist in training courses and exercises.



# RESOURCES

## TDL TECHNOLOGY MAGAZINE



- Issue 1: —○ Interoperability Assurance with Swedish FMV;  
Ask the Expert - Dynamic Networking.
- Issue 2: —○ Simulated TDL Environment with Daronmont;  
Ask the Expert - Maximising Rig-to-Rig Trial Involvement.
- Issue 3: —○ Engility Joint Range Extension & HF Radios;  
A Guide to Choosing a TDL.
- Issue 4: —○ Viasat - A New Era in Close Air Support;  
Dutch Patriot JRE Provision.
- Issue 5: —○ Bundeswehr & Exercise Timber Express;  
JREAP vs SIMPLE - Understand the Difference.
- Issue 6: —○ Viasat Multi-Channel Link 16 Terminal;  
The Single European Sky.
- Issue 7: —○ Demystifying TDLs - Why Do We Need Them?  
Shaping the Future of Drones in UK Cities.
- Issue 8: —○ E-3A Final Lifetime Extension Program;  
Demystifying TDLs - TDL Standards.
- Issue 9: —○ Viasat - The Link 16 Evolution;  
Demystifying TDLs - Development of TDLs.
- Issue 10: —○ TDL IO Testing;  
Airborne Early Warning - Evolving the Mission.
- Issue 11: —○ Managing TDL System Complexity;  
Demystifying TDLs - JREAP.
- Issue 12: —○ Model Based Testing in Defence;  
Hyper Connected Air Traffic Management from EUROCONTROL.
- Issue 13: —○ NATO's Eyes in the Sky;  
A Tribute to the E-3D Sentry
- Issue 14: —○ A Tribute to Her Majesty;  
Interoperability Musings of a Running Man
- Issue 15: —○ TDL Integration and Net Zero;  
Alternative Approach to TDL IO
- Issue 16: —○ The Growth of TDLs - Insights from ReportLinker;  
Technology vs TDLs - Friend or Foe?



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*This SyntheSys publication offers a collection of inspired articles about all aspects of Tactical Data Link (TDL) implementation, integration and management. The magazine aims to highlight current global development and unveils new technologies within the industry. TDL Technology is aimed at personnel who are interested in TDLs and related technology.*

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# RESOURCES

Free access to downloadable technical articles, white papers and other useful resources

Capabilities and Limitations (Caps & Lims) database

Unlimited subscription to TDL Technologies magazine

Access to pre-recorded TDL training courses and details of online training schedule



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