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SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 11-261**

**15 OCTOBER 2012**

***Flying Operations***

**TACTICAL DATA LINK PLANNING AND  
OPERATIONS**



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This Air Force Instruction (AFI) implements the guidance contained in AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*. It provides guidance on the responsibilities of the Air Combat Command Director of Operations (ACC/A3) Tactical Data Link Operations and Management Organization (TDLOMO), tactical data link (TDL) managers, and wing/unit managers to support global interoperability of TDL operations with primary focus on Link 16. This instruction applies to all personnel and units involved with Link 16 and other TDL operations in the Combat Air Forces, Special Operations Forces, Space Forces, and Mobility Air Forces. It applies to the following MAJCOMs: Air Combat Command (ACC), Air Education and Training Command (AETC), Air Force Special Operations Command (AFSOC), Air Force Space Command (AFSPC), Air Mobility Command (AMC), Air Force Global Strike Command (AFGSC), Air National Guard (ANG), Air Force Reserve Command (AFRC), Air Force Material Command (AFMC), Pacific Air Forces (PACAF), and United States Air Forces in Europe (USAFE). This publication may be supplemented at any level. Supplements must be forwarded to ACC/A3CJ for coordination prior to certification and approval. No waivers may be granted for any part of this publication.

This instruction provides guidance to units to plan, implement, and manage Link 16 and other TDLs as they operate independently or integrate into multi-TDL networks both within the United States and its Possessions (US&P) and in theaters of operations outside the US&P. US&P is referenced in accordance with guidance provided in CJCSI 6232.01, and will be used throughout this document.

It covers specific responsibilities for units tasked with planning and operating Link 16 and other TDLs. It carries out the tenets for operational Link 16 deconfliction directed in the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6232.01, *Link-16 Spectrum Deconfliction* and

tactical data link standardization directed in CJCSI 6610.01D, *Tactical Data Link Standardization Implementation Plan*. It covers similar responsibilities for other emerging TDLs.

Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, Recommendation for Change of Publication; route AF Form 847s from the field through the appropriate functional’s chain of command to include ACC/A3CJ, [acca3cj.jtids@langley.af.mil](mailto:acca3cj.jtids@langley.af.mil). Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) maintained in the Air Force Records Information Management System (AFRIMS) located at <https://www.my.af.mil> /afrims/afrims/afrims/rims.cfm.

**SUMMARY OF CHANGES**

This document is substantially revised and must be completely reviewed. General changes include: Reflects new charter for ACC/A3CJ expanding its responsibilities from Link 16-only and a role of Air Force Link 16 Network Design Facility to its responsibilities for operations management of all non-legacy tactical data links (TDL) and its new role of (TDLOMO), with its primary focus remaining on Link 16. Identifies ACC/A3 as the Air Force command lead addressing cross-platform issues resulting from platform implementation, operational network employment, and TDL management. Adds F-35 Air Force operational Crypto Controlling Authority to TDLOMO responsibilities. Adds the new position of TDL Manager and its responsibilities as well as new responsibilities by Wing/Unit Managers for capabilities such as Situation Awareness Data Link (SADL) and the responsibilities associated with such capabilities. Introduces continuing education concept for TDL Managers and Wing/Unit Managers. Updates capabilities of using a website as a primary communications tool between the TDLOMO, TDL Managers, and Wing/ Unit Managers. Updates responsibilities of AF Link 16 Network Management Working Group. Expands guidance and procedures for requesting a new Link 16 network. Clarifies procedures for deconflicting Link 16 operations.

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## Chapter 1

### INTRODUCTION

**1.1. Tactical Data Links (TDL).** Command, control, and communications systems should be reliable, survivable, flexible, interoperable, timely, and secure. This concept of joint combat operations is supported by the exchange of tactical information between participants on a real-time or near-real-time basis with TDLs. The exchange of real-time tactical information between command and control (C2) systems, weapon systems, and intelligence systems provides mutual support, allows coordinated action, and prevents interference between interfaced forces for the efficient and effective application of military force.

**1.1.1. Link 16 Background.** Link 16 is the predominant TDL used in USAF, joint and coalition operations. It is a high capacity, secure, jam resistant communications system that supports a wide variety of information exchanges. These exchanges include air/surface/subsurface/land/space surveillance tracks, command and control directives, participant position reports, platform status, electronic warfare, imagery, network enabled weapons, engagement coordination, integrated fire control, and fighter target reports.

**1.1.1.1. Description.** Link 16 operates in the 960 – 1215 megahertz (MHz) frequency band, and is a line-of-sight system. However, message relays may extend the range beyond line of sight (BLOS). In addition, messages may be transmitted BLOS over digital media and networks not originally designed for tactical data exchange by embedding formatted tactical digital messages as data fields within available commercial and government protocols, such as those used over satellites and terrestrial links. Both the Link 16 waveform and data messages are standardized to provide interoperability between the different Services, allies, and platform types. Two levels of encryption provide secure information (message security) and non-vulnerable jam resistance (transmission security).

**1.1.1.2. Terminals.** The Air Force uses multiple types of Link 16 terminals that require operational parameter configuration to ensure mission capabilities are provided. Systems with integrated TDLs such as the F-22 and emerging systems such as the F-35 which support Link 16 using specific platform unique cryptographic modules, and future systems that will contain software programmable data link capability radios, will likewise require network design and management support.

**1.1.1.3. Link 16 Message Standard:** The Chairman Joint Chiefs of Staff (CJCS)-mandated J-series message set is used in tactical data links in accordance with Military Standard (MIL-STD) 6016, *Tactical Data Link (TDL) 16 Message Standard* and CJCSI 6610.01D, *Tactical Data Link Standardization Implementation Plan*.

**1.1.2. SADL Background:** SADL is a high capacity, secure, jam resistant communications system that is an AF derivative of the Army's Enhanced Position Location Reporting System (EPLRS) networking technology. It supports a wide variety of information exchanges along with the ability to exchange friendly ground force positions and Close Air Support (CAS) mission data with the ground EPLRS network. A configured Gateway is required for integration with Link-16 networks.

1.1.2.1. SADL Messages: TDL information exchanges, in the form of J-series messages, are used primarily for tactical operations among Link 16 and SADL-capable platforms and other platforms using J-series messages.

1.1.3. Other TDLs: Additional TDLs that may be used in a multi-TDL network (MTN) include those listed in Table 1-1 of the Joint Tactical Data Enterprise Services (TDES) Migration Plan (JTMP) under the Joint Family of TDLs and Expanded DLs list.

**1.2. Headquarters Air Force Responsibilities.** Headquarters Air Force (HAF), AF/A3O-AC provides policy, guidance and advocacy for tactical data links employed by AF platforms. This division provides HAF advocacy for TDL functional areas to include training, operations and maintenance funding, and special experience identifier (SEI) development.

**1.3. ACC Responsibilities.** ACC, Directorate of Operations, Command and Control, Intelligence, Surveillance and Reconnaissance (C2ISR) Operations Division (ACC/A3C), Langley AFB, VA, is designated as the Air Force's command lead for TDLs with emphasis on the Link 16 operational network design and management process.

1.3.1. **The TDLOMO** is located within ACC/A3C and provides an infrastructure to support TDLs included in the TDES JTMP, and employed on AF weapon systems. It is the Air Force's provider and OPR for Link 16 network design operations providing warfighter support to ensure effective planning and management of Link 16 and other TDL operations. The TDLOMO is manned by personnel assigned to ACC/A3CJ who have the experience in AF operations and the technical expertise in Link 16 capabilities needed to accurately incorporate operational information exchange requirements into the development and management of TDL networks. The TDLOMO also provides support services to SADL to ensure interoperability with Link 16 operations. Although Link 16 centric, the TDLOMO will migrate to network design and management support for other operational TDL systems employed by AF platforms as manning and requirements are identified.

## Chapter 2

### AIR COMBAT COMMAND DIRECTOR OF OPERATIONS TACTICAL DATA LINK OPERATIONS AND MANAGEMENT ORGANIZATION (ACC/A3 TDLOMO)

**2.1. Background.** The TDLOMO will support the interoperability needs of the data links fielded on AF weapons systems. The focus of this organization is Link 16, but its charter also includes other TDLs such as those listed in JTMP DL Categories under Joint Family of TDLs and Expanded DLs that are in use by AF platforms and whose data may be integrated into multi-TDL networks. This office will address other data links comprising the Joint Family of Tactical Data Link Systems and emerging data links in the future as these capabilities are fielded on AF weapon systems and as they are integrated into the multi-TDL networks.

**2.2. Mission.** The TDLOMO provides the Air Force with one organization as command lead addressing cross-platform issues resulting from platform implementation, operational network employment and TDL management with the goal of fostering interoperability and cross-domain integration and enhancing the digital kill chain. The TDLOMO supports existing and future Air Force requirements for validation, publication, management and maintenance of Link 16 network designs and integrates data from other TDL's operating in conjunction with Link 16.

#### **2.3. Duties and Responsibilities.**

**2.3.1. Functions.** The primary focus of the TDLOMO is the AF Link 16 Network Design Facility (AF NDF), which is the sole provider of Link 16 design products and services within the Air Force. The NDF:

2.3.1.1. Supports theater commander's Link 16 requirements for Joint, Combined or Coalition operations as part of the Joint Network Design Team (JNDT), which includes representatives from the United States Army (USA), the United States Navy (USN), the United States Air Force (USAF), and the United States Marine Corps (USMC) NDFs and is defined by Chairman of the Joint Chiefs of Staff Manual (CJCSM) 6120.01, *Joint Multi Tactical Data Link (TDL) Operating Procedures*, and CJCSM 3115.01, *Joint Data Network Operations*.

2.3.1.2. Supports operational and theater commanders and Air Force participants by ensuring that Link 16 designs are developed, validated, published, managed, and maintained in accordance with USAF, Joint, and Coalition/Combined requirements and by providing on-site support, as required, in support of operational plans, operational employment, exercises, testing and unit training.

2.3.1.3. Ensures that Link 16 operational networks that include USAF platforms meet USAF, Joint, Combined, and/or Coalition requirements. Provide Link 16 designs in accordance with user requirements, issue Air Force platform initialization data loads (IDLs) directly to users, and provide technical expertise for solving problems encountered during Link 16 operations.

2.3.1.4. Coordinates directly with the requesting unit/platform POC to help define Link 16 requirement for Air Force-only Link 16 network requirements. If a current design does not exist that meets the requirements, the AF NDF will coordinate with Joint and

National and Multinational Design Facilities, as needed, to develop a new Link 16 design and distribute platform loads to satisfy customer requirements.

2.3.1.5. Maintains a master library of all operational Link 16 network designs that include Air Force platforms. The library will provide a centralized source of predefined Link 16 files for selection and implementation by Link 16-equipped units, forces and theaters.

2.3.1.6. Coordinates with unit platform representatives to validate new designs prior to operational use.

2.3.1.7. Uses, evaluates, and recommends improvements, as needed, to Link 16 design aids and tactical data link monitoring tools. Ensure new platform Link 16 implementations interface properly and are correctly included in the Joint Network Design Aid (JNDA).

**2.3.2. The TDLOMO will:**

2.3.2.1. Manage AF Link 16 training slots at the Joint Multi-TDL School (JMTS) and assist in the development and planning of Link 16 continuing education opportunities.

2.3.2.2. Function as controlling authority for Air Force Link 16 cryptographic keys (crypto keys), F-22A and F-35 Air Force operational crypto keys and SADL Tactical Users Group (TUG) crypto keys. This responsibility includes serving as the POC and controlling authority for units to establish initial distribution, revalidate and/or change requirements. Crypto key material will be administered in accordance with AFI 33-215, *Controlling Authorities for COMSEC Keying Material (keymat)*. Crypto keying material can be ordered using the processes identified in AFI 33-201, Vol. 2 (FOUO), *Communications Security (COMSEC) User Requirements*.

2.3.2.3. Update and maintain a community web page that provides on-line support for unit Link 16 operations. The community web page will support up/down channel communications feedback, and information-sharing between operational commands and units. The community web page will provide the ability to disseminate platform loads to customers. The TDL community web page will be accessible through any military domain.

2.3.2.4. Represent the Air Force as command lead for TDL operational and technical issues in Service/Joint/Combined/North Atlantic Treaty Organization (NATO)/bilateral forums that address TDL design, management and related issues. Disseminate information and solicit input from MAJCOMs and other key TDL support agencies on any significant TDL issues.

2.3.2.5. Support ESC efforts to develop and evaluate Link 16 enhancements and new concepts of link employment and to integrate them into future platforms and network architectures. Also support efforts to evaluate Link 16 interfaces with evolving airborne networking waveforms and protocols, as time permits.

2.3.2.6. Chair the Air Force Link 16 Network Management Working Group (AFLNMWG).

**2.4. AFLNMWG.** ACC/A3 has delegated operational Link 16 network design and management oversight authority to ACC/A3C, with support from the TDLOMO. The AFLNMWG consists

of Link 16 wing/unit managers as well as other agencies that support the network management process. As AFLNMWG chair, TDLOMO will convene the group annually; however, any participating agency may request that it be convened more often.

**2.4.1. Working Group Responsibilities.** The AFLNMWG will:

2.4.1.1. Define and provide user requirements for the design and management of Link 16 designs throughout the four phases (design, validation, publication, and maintenance) of the Link 16 network management process.

2.4.1.2. Support the Link 16 network management process for Air Force and Joint environments as appropriate, to include Link 16 network designs.

2.4.1.3. Assist in planning, scheduling, and implementing formal training programs, both short-term and long-term, for all phases of the Link 16 network management process.

2.4.1.4. Ensure Link 16 network designs and management processes are implemented by existing Joint Battlespace Interoperability (JBI) interfaces and personnel.

2.4.1.5. Discuss, research, and assist in the resolution of issues related to Link 16 network management.

## Chapter 3

### DATA LINK MANAGEMENT

**3.1. General.** TDLs provide participating platforms the capability of operating together as an integrated force by allowing operators to share tactical information. Different levels of planning, coordination, and technical management skills are required depending upon the complexity of the TDL environment.

3.1.1. The most complex TDL environments are real world operations under the responsibility of a Joint Force Commander and conducted IAW an Operational Plan/Operations Order (OPLAN/OPORD). Complex TDL networks can also occur in large-scale joint exercises. These complex multi-TDL network (MTN) operations will fall under the management of a Joint Interface Control Officer managing a Joint Interface Control Cell. The network operations may further be subdivided into subordinate areas of responsibility and managed by Regional Interface Control Officers/Sector Interface Control Officers. Such individuals and the individuals manning interface control cells are normally located at Battle Management Command and Control (BMC2) facilities and are trained and qualified as Interface Control Officers/Interface Control Technicians under their unit training programs. Although TDL management and training in BMC2 facilities are not governed by this instruction, it provides data link management core functions that should form the basis for that training.

3.1.2. Most other TDL network pre-execution planning, coordination, infrastructure management, and network execution, NOT in support of an OPLAN/OPORD (Joint Task Force) or for major exercises, are conducted at the wing level for the purpose of training. The Air Force needs defined points of contact (POCs) at wing and unit level to act as Tactical Data Link (TDL) experts and interfaces between own wing/unit TDL participants and other elements of the TDL operational infrastructure. To provide an appropriate data link management infrastructure, the wing commander, or designated representative, of a wing possessing TDL capability will appoint:

3.1.2.1. A wing manager to act as the wing's designated POC and interface for network planning and coordination between the wing and other elements of the TDL operational infrastructure, including the TDLOMO. The appointed wing manager will be identified to the TDLOMO.

3.1.2.2. A unit manager for units with TDL capability, as required (see Para 3.3). For wings with limited TDL use, the wing/unit manager can be the same person. Unit commanders for units below wing level and not reporting to a wing will appoint a unit manager to perform the wing manager's duties referenced in this document. Note: Units with platforms that do not possess an RF Link 16 capability but still represent a distinct presence (direct or indirect PPLI, TDL connectivity) within the TDL interface are still required to establish a wing/unit manager position for direction of platform configuration, and coordination with the TDL network manager to ensure information exchange requirements (IERS) are met. Training requirements may differ for these individuals, but at a minimum should include an understanding of the capabilities and interoperability

requirements of their specific system or platform and how it impacts the overall TDL architecture.

3.1.2.3. For wings with complex TDL environments, the commander or designated representative may also appoint a separate TDL Manager (TDLM) to support the wing/unit managers at various locations. Whereas wing/unit managers at squadron levels are more focused in the pre-execution planning for TDL operations, the individual tactical data link managers at locations such as training ranges fulfill additional technical and TDL execution responsibilities.

**3.2. Wing Manager.** The wing manager will act as TDL expert and interface between wing TDL participants and other elements of the TDL operational infrastructure.

3.2.1. Appointed wing managers are assumed to possess the basic training for pre-execution planning and employment requirements for their wing's TDL system, to include mission planning and IERs for their specific weapons system. The wing manager will act as interface between own unit platforms and the exercise/host manager when wing assets are either participating in an exercise being managed by a TDLM outside the unit or deploying to participate in TDL operations being managed by another unit.

3.2.2. For coordinating unit TDL equipment requirements and the networks to meet local-unit requirements, the wing manager will act as the interface between the wing and higher-level agencies such as the TDLOMO. For daily training, the wing manager will act as the network manager for locally operated networks. He/she will determine the requirements for those networks and identify them to the AF agency tasked with providing network support. The wing manager will obtain network descriptions and initialization data loads for all networks in which own-unit platforms are potential participants, including joint and allied networks, and maintain them in a local TDL network library for use by local unit platform operations personnel. The wing manager will provide the appropriate information required to operate in the network (as extracted from the appropriate Operational Tasking Data Links (OPTASK LINK) message) directly to own-unit platforms and to other participants. If own platforms are deploying to work in a TDL network being managed by another unit, the wing manager will act as the interface between his/her platforms and that unit's TDL manager to ensure own-unit requirements are being met.

3.2.3. **Responsibilities.** The wing manager will plan and coordinate operations for the TDL(s) for which he/she is responsible and which include own-unit participants.

3.2.3.1. The wing manager will identify duties and responsibilities (see section 3.2) that are delegated to the unit managers.

3.2.3.2. The wing manager will determine (see section 3.2.4) training requirements that are applicable to unit managers. Unit managers should be afforded as much training in section 3.2.4 as is practical.

3.2.3.3. The wing manager will identify if unit managers will develop independent continuity books or if specific unit information will be incorporated in the single wing continuity book.

3.2.3.4. The wing manager will identify how unit managers will obtain TDL reference documentation (i.e. have independent reference library, use central wing reference library or some combination of both).

3.2.3.5. **TDL Network Selection.** For local operations/training events involving own-unit platforms, the wing manager will determine which TDL design will be used (either existing, modified or new); ensure the design meets own unit operations requirements; confirm it has required connectivity for own-unit platforms; confirm its functions correlate with the mission that will be conducted; ensure data to be exchanged is protected IAW its level of classification, and confirm that anticipated TDL frequency spectrum transmissions conform to frequency authorization constraints. If the planned network(s) do not meet requirements, coordinate with the TDLOMO for an updated/new design that best meets message exchange requirements and matches the maximum number of participants. Read the description document for the specific configuration of each candidate design. If necessary, request a new design. For joint and allied training, contact the TDLOMO to identify the correct design.

3.2.3.6. When wing assets are either participating in an exercise being managed by a TDL/wing manager outside the unit or deploying to participate in TDL operations being managed by another unit, the wing manager will act as interface between own unit's platforms and the exercise/host manager and will coordinate to ensure own-unit requirements are being met.

3.2.3.7. **The wing manager will** maintain a local TDL design library containing description documents and IDL files for TDL designs in which own wing platforms are potential participants (including joint and allied); and periodically review for needed updates. Design information for contingency operations and exercises may be classified or contain sensitive information. When documentation of this type is published, it will be available for download on the TDLOMO SIPRNET website at: <https://www.my.af.smil.mil/gccs-af/USAF/ep/globaltab.do?channelpageId=-476653> . Classified design information will be handled, stored, and protected in accordance with its level of classification. Note: Air Support Operations Groups will perform the wing manager function for Air Support Operations Squadrons.

3.2.3.8. **TDL Spectrum and Deconfliction.** The wing manager will coordinate with the Installation Spectrum Manager/MAJCOM Spectrum Management Office to ensure that wing platforms operating TDL terminals are operating in accordance with the constraints/restrictions expressed in a valid frequency assignment. Radiate only if operations in the affected area have been deconflicted with all operators in the same area and meet the conditions in the frequency assignment. Ensure unit participants know and comply with the restrictions in the frequency assignment.

3.2.3.8.1. The wing manager will follow the appropriate AF guidance/procedures to obtain or update temporary frequency assignments for anticipated wing operating areas.

3.2.3.8.2. For deployed operations, the wing manager will coordinate with the TDL wing manager at the deployed location to confirm that a TDL frequency assignment exists. If an assignment exists, review the assignment to ensure planned operations

will not exceed the assigned parameters. If an assignment does not exist, refer to [Chapter 5](#).

3.2.3.8.3. If required, schedule unit TDL operations with the appropriate TDL deconfliction agency.

3.2.3.9. **Crypto Key Functions.** The wing manager will support crypto key functions, to include acquisition, maintenance and TDL terminal fill. Managers should consult the appropriate cryptokey utilization plans and order the crypto key(s) indicated for TDLs being operated by wing platforms. **NOTE:** Crypto keys are ordered via the base cryptographic custodian and normal cryptographic channels. The wing managers should ensure their units have a minimum of current plus 90 days of crypto keying material readily available to be drawn from wing accounts and held at unit level for daily use.

3.2.3.9.1. The wing manager will decide which crypto keys to use for local TDL operations and training or, for exercises/multi-wing operations, refer to the appropriate OPTASK LINK message for the appropriate TDL crypto key(s).

3.2.3.9.2. Proper link operation requires the correct loading of crypto short titles to match the crypto design of the network. **NOTE: Loading crypto keys contrary to the instructions in the OPTASK LINK and the Network Description Document will result in a lack of interoperability and may compromise classified information being exchanged on the network. This could also result in a potential COMSEC incident that should be reported to the COMSEC manager.**

3.2.3.10. **Operational Tasking Data Links (OPTASK LINK) Message.** For TDL events whereby the wing is participating in operations/training under the direction of an external Joint Interface Control Officer or TDL/wing manager, the wing manager will be able to extract data from an OPTASK LINK message, as defined in MIL-STD 6040, *U.S Message Text Formatting Program*, and to provide own unit's platforms with data essential to operating TDLs with which own unit is equipped.

3.2.3.10.1. As appropriate, the wing manager will associate actual units with generic design participants, the appropriate IDLs and track numbers, and other appropriate network-specific identifiers as indicated in the appropriate TDL section of the OPTASK LINK.

3.2.3.10.2. For TDL track producers, the wing manager will align track number blocks with producers as indicated in the appropriate TDL section of the OPTASK LINK.

3.2.3.10.3. The wing manager will determine which unit participants are designated to play special roles, as indicated in the appropriate TDL section of the OPTASK LINK, and will confirm roles are appropriate to their capability.

3.2.3.10.4. The wing manager will extract instructions for activating the network and provide them to expected link participants. Ensure the time frame of reference is clearly specified (e.g., local, Zulu, etc.)

3.2.3.11. **Operating TDLs.** The wing manager will ensure unit operators are knowledgeable of and follow procedures mandated in CJCSM 6120.01, *Joint Multi-Tactical Data Link Operating Procedures (JMTOP)* when operating TDLs.

3.2.3.12. **AFLNMWG Participant.** As a stakeholder in TDL operations, each wing manager will participate to the extent practical in activities leading to achievement of AFLNMWG responsibilities as outlined in **Para 2.4.1.**

3.2.4. **Training.** Wing managers will complete the academic and proficiency training appropriate to the TDL and position for which they have been designated. Wing managers at Link 16-equipped units will complete the Link 16 Unit Manager (LUM) Course (JT-220) offered at the Joint Multi-TDL School to obtain a basic level of knowledge and understanding of responsibilities as soon as practical but not later than six months after being appointed. The LUM course provides training in Link 16 planning and employment. The LUM course is not mandatory if the wing manager has previously attended the Multi-TDL Operations Planning Course, JT-201. ACC/A3CJ will confirm training requirements on a case by case basis after notification of assignment.

3.2.4.1. If an appointed individual is unable to complete the LUM course within the prescribed time, the unit operations training officer will notify ACC/A3CJ, in writing, and provide the unit's plan for completing the training.

3.2.4.2. ACC/A3CJ will provide funding, to the extent funds are available, for travel (excluding rental vehicles in the local area of the training) and per diem for active duty, government civilians supporting the AF, and ANG Title 10 individuals attending this training.. Other individuals will require unit funding.

3.2.5. **Continuing Education.** Training of personnel to effectively perform TDL pre-execution planning and coordination is an ongoing process primarily made up of local training programs and those provided by ACC/A3CJ, with the goal of expanding their TDL knowledge base and staying up-to-date on new developments in network planning and operations. Units must consider various means of reaching an objective level of knowledge through the use of continuing education. Some tools for consideration include local development of refresher training modules, use of computer-based training programs, development of local training guides for specific subject areas, and use of a self-inspection or compliance checklist. Operating procedures for TDLMs will be developed and added as an annex and/or chapter to unit local operating procedures and included in an annual review process. The TDLOMO Portal Page contains tools to be used as a basis for continuing education programs for both the wing/unit and TDL Managers. The TDLOMO will assist in development of non-platform-specific Defense Connect Online (DCO) training sessions as requested by the field.

3.2.5.1. JT-101, the Link 16 Joint Interoperability Course, is offered as a computer based training program and can be taken over a 90 calendar day period. Instructions for registration are located on the TDLOMO A3CJ Portal Page.

3.2.6. **TDL References.** Effective TDL planning requires that wing and TDL managers have access to a standard set of references to support TDL operations. Resources include a library of reference documents, a continuity book, and access to the internet. As a minimum requirement, the wing manager will develop a local continuity book and review annually. The TDLOMO A3CJ Portal Page contains applicable references and an outline for minimum topics to be established in the continuity book.

**3.3. Unit Manager.** Some wings may only require a wing manager who coordinates and manages all TDL operations for the wing and acts as the primary interface with external TDL operational infrastructure. Others may have a variety of TDL participants which requires managers at the unit levels below the wing level. This allows the wing manager to delegate responsibility to unit level managers to perform some of the duties described in wing manager (section 3.2) as they apply to their unit. The unit manager will be the unit's interface with the wing manager.

3.3.1. If given clearance by the wing manager, the unit manager can act as interface between own unit platforms and the exercise/host manager when wing assets are either participating in an exercise being managed by a TDLM outside the unit or deploying to participate in TDL operations being managed by another unit. This individual may also be designated to coordinate with higher-level agencies such as the TDLOMO.

**3.4. Tactical Data Link Manager (TDLM).** To maximize benefits of any TDL system, pre-execution planning, and management of the infrastructure components are critical. For wings with complex TDL network pre-execution planning, coordination, infrastructure management, and network execution (e.g., at test and training ranges), the responsible wing commander may choose to designate, in writing, a TDLM to perform these core functions (see Para 3.4.1 below). The TDLM core functions provide the minimum essential tasks needed for all TDL operations management. These functions ensure initiation, operation, and termination of data link operations are efficient, effective, and conducted within established constraints. Operation of the TDL network will begin and end with the TDLM. The TDLM may be responsible for networks supporting operations such as daily training, test and evaluation, and experiments. The networks may consist of only Link 16 participants or may be part of a larger MTN. Wing or unit managers may double as TDLMs for Link 16 networks that only include participants from their unit/wing. Data Link managers in theaters located outside the US&P may have different coordination and deconfliction procedures than those listed here. However, procedures will be similar as these functions are necessary in all TDL operations.

**3.4.1. TDLM Minimum Core Functions.**

3.4.1.1. Assess platform multi-TDL capabilities and limitations, anticipated data loads, known interoperability problems, and environmental limitations.

3.4.1.2. Develop a multi-TDL network architecture that supports the operational information exchange requirements.

3.4.1.3. Publish OPTASK LINK message to assign appropriate network data and roles to participants.

3.4.1.4. Perform necessary coordination to accommodate restrictions on multi-TDL operations.

3.4.1.5. Initialize TDL networks and manage data coordination nets.

3.4.1.6. Identify and resolve multi-TDL data exchange anomalies or deficiencies that degrade accomplishment of network IERs.

**3.4.2. Responsibilities.** TDLMs will:

3.4.2.1. Specify planning parameters and IERs for TDL networks that will best satisfy operational requirements and will facilitate the TDLM's or external network manager's

selection of a network from the JTIDS Network Library or description of the characteristics of an alternate network, as required. The network that is selected may be an existing network, either as is or altered to meet requirements; or it may be a newly designed network. The TDL manager selecting the network will: ensure network configuration meets the operations requirement of the users; will confirm it has required connectivity for all users; will confirm its functions correlate with the mission that will be conducted; and will confirm the Time Slot Duty Factor (TSDF) meets frequency assignment restrictions. If a new network design or a modification to an existing design is required, the TDLM or an external network manager (if TDL operations are being managed by an external network manager) will contact ACC/A3CJ with requirements as indicated in Para 4.1. Users who are unsure whether an existing network design fulfills the users' requirements should contact ACC/A3CJ to request advice regarding a network design.

3.4.2.2. Prepare, or assist in preparing, the data link portions of the OPTASK LINK message.

3.4.2.3. Manage assignment of functional network roles such as network time reference or navigation controller.

3.4.2.4. Coordinate with the appropriate Link 16 Deconfliction Coordinators to satisfy all frequency assignment authorization restrictions. Each frequency assignment identifies the deconfliction requirement, as stated in CJCSI 6232.01, *Link-16 Spectrum Deconfliction*, for deconflicting US&P Link 16 operations. Each Service appoints deconfliction coordinators for their operations/areas, as needed. Chapter 6 lists coordinator responsibilities.

3.4.2.5. Confirm participants have the appropriate initialization data load files and the appropriate crypto.

3.4.2.6. Monitor the network operation for efficient operation and adjust, as needed.

3.4.2.6.1. Coordinate the data link initialization process.

3.4.2.6.2. Monitor and ensure that the Link 16 operations comply with civil and other restrictions on Link 16 transmissions in the operating areas.

3.4.2.6.3. Manage connectivity between JTIDS Units (JUs) including activation/deactivation of relays, and recommending change of JU transmit mode to normal or data silent.

3.4.2.6.4. Take corrective actions when disruptions occur.

3.4.2.6.5. Monitor and manage the network to ensure operations are efficient, effective, and conducted within established constraints.

### 3.4.3. Training

3.4.3.1. TDLMs will complete, as a minimum, the JT-102 (Multi-Tactical Data Link Advanced Joint Interoperability Course) and the JT-201 (Link 16 Planner Course) taught by the Joint Multi-TDL School. In addition, if possible TDLMs should complete the Advanced JICC Operators Course (JT-310).

3.4.3.2. If an appointed TDLM is unable to complete the JT-102 and/or the JT-201 course within six months of appointment, the unit operations training officer will notify ACC/A3CJ in writing and provide the unit's plan for correcting the deficiency as soon as possible.

#### 3.4.4. Continuing Education.

3.4.4.1. Training of personnel to effectively perform TDL pre-execution planning and coordination is an ongoing process primarily made up of local training programs and those provided by ACC/A3CJ, with the goal of expanding their TDL knowledge base and staying up-to-date on new developments in network planning and operations. Units must consider various means of reaching an objective level of knowledge through the use of continuing education. Some tools for consideration include local development of refresher training modules, use of computer-based training programs, development of local training guides for specific subject areas, and use of a self-inspection or compliance checklist. Operating procedures for TDLMs will be developed and added as an annex and/or chapter to unit local operating procedures and included in an annual review process. The TDLOMO Portal Page contains tools to be used as a basis for continuing education programs for both the wing/unit and TDL Managers. The TDLOMO will assist in development of non-platform-specific Defense Connect Online (DCO) training sessions as requested by the field.

3.4.4.2. Of particular importance is an established continuity book and review of the resource library materials posted on the TDLOMO A3CJ Portal Page. As a minimum, TDLMs will develop a local continuity book and review annually. An outline for continuity book minimum topics is located on the Portal Page under the Wing/Unit Manager tab.

3.4.4.3. JT-101, the Link 16 Joint Interoperability Course, offered as a computer-based training program, can be taken over a 90 calendar day period. This course is highly recommended as part of continuing education. Instructions for registration are located on the TDLOMO A3CJ Portal Page.

**3.5. SADL Equipped Units.** The guidance that follows is unique to wings equipped with SADL platforms and is in addition to that in **Para 3.2.**

3.5.1. **Responsibilities.** SADL equipped unit managers will plan and coordinate data link operations which may also include gateway-supported operations in conjunction with other TDL's.

3.5.1.1. **Gateways.** The SADL Manager will coordinate with appropriate Gateway System's Managers to verify mission area coverage and capability to support the applicable IERs.

3.5.1.2. **Crypto Key Functions.** For local SADL operations, the SADL Manager will select the appropriate crypto key and notify anticipated participants of the planned key. For operations/training in conjunction with an external TDLM or network manager, the SADL Manager will ensure correct crypto keys are used, as specified in the OPTASK LINK message for SADL operations.

3.5.1.3. **Source Track Number (STN).** The SADL data link participants are universally identified by a STN as specified in the OPTASK LINK. For operations/training associated with an external TDLM or network manager where no OPTASK LINK exists, the TDL manager will assign the appropriate STN information.

## Chapter 4

### REQUESTING A LINK 16 DESIGN

**4.1. Design Requests.** Any unit planning to participate in local Link 16 operations/training where a Link 16 network design does not exist or has not been designated may submit a Link 16 design request to ensure operational needs are met. A request worksheet can be found in Attachment 2 of this publication. A request form is in JMTOP, pages A-D-A-5 through A-D-A-8. Air Force units will contact ACC/A3CJ to initiate this process.

**4.1.1. Existing Designs.** Prior to requesting a new design, review existing designs for applicability. The AF NDF will provide description documents for designs containing Air Force platforms. Users should review the description document and consider designs that support at least the maximum number and type of participants required, applicability of interface units to other links/TDLs, functional capabilities, connectivity/relay requirements, cryptographic isolation, and pulse density compliance. When an existing design meets the unit's need, download the terminal IDLs for platform participants and the network description document (NDD) from the TDLOMO Community Webpage at <https://www.us.army.mil/suite/grouppage/189842>.

**4.2. Designated Designs.** Units planning to participate in Link 16 operations/training under the direction of an external TDLM or network manager will identify the design to be used using the Link 16 section of the appropriate OPTASK LINK. Changes must be coordinated with the TDLM/network manager.

**4.3. Design Support.** If a new design or a modification to an existing design is required, contact ACC/A3CJ with unit platform requirements as indicated in Para 4.1 above. Users who are unsure whether an existing design fulfills the requirement should contact ACC/A3CJ to request advice regarding a network design.

## Chapter 5

### LINK 16 FREQUENCY ASSIGNMENT

**5.1. Background.** Link 16 planners and managers must be aware of the complex issues associated with Link 16 equipment operation within the 960 - 1215 MHz frequency band. This band is reserved worldwide for the safe operation of aeronautical radio navigation equipment. Therefore, responsibility for flight safety causes considerable scrutiny of operations within this band.

**5.2. Operations in the US&P.** The Federal Aviation Administration (FAA) is the designated administrator of the 960 - 1215 MHz band in the US&P and is responsible for ensuring all equipment operating in the band is electromagnetically compatible. Air Force units must obtain a Link 16 frequency assignment before Link 16 operations can be authorized. Link 16 users will strictly adhere to the restrictions or limitations placed on Link 16 operations.

**5.2.1. Using Existing Frequency Assignment.** Contact your installation spectrum manager to determine if a frequency assignment exists in your desired area of operations. If one exists, review it to ensure that your platforms, class of terminals and specific authorizations are included. Any operational capability that exceeds the existing assignment parameters will require a temporary frequency assignment in order to operate. If the installation spectrum manager cannot provide the necessary assistance, contact your MAJCOM Spectrum Management Office to determine whether an existing assignment will meet your requirements. If an assignment exists, the wing/unit deconfliction coordinator can schedule the operation through the Link 16 Pulse Deconfliction Server (LPDS).

**5.2.2. Requesting New Frequency Assignment.** If no frequency assignment exists for an intended area of operations, the user must submit requirements to the installation spectrum manager. If an existing assignment does not support the mission, the user must submit a temporary frequency assignment or process a new assignment through the installation spectrum manager. Procedures for requesting a new frequency assignment are found in the *JTIDS/MIDS Spectrum Users Guide*, Chapter 4 (Copy located in references on TDLOMO Portal Page @ <https://www.my.af.mil/gcss-af/USAF/site/ACC/A3/A3C/A3CJ>). The TDLOMO will coordinate with the appropriate MAJCOM Spectrum Management Office to assist field units in establishing and updating Link 16 frequency assignments for their operating/training areas.

**5.3. Operations Outside the US&P.** Use of Link 16 outside the US is subject to the frequency restrictions and procedures of the country where operations take place. These restrictions and procedures are country-dependent and vary from virtually no Link 16-specific controls to very strict restrictions with detailed procedures. Restrictions and procedures are subject to change. Some guidance for requesting frequency assignments in operating areas outside the US&P can be found in the *JTIDS/MIDS Spectrum Users Guide*, Chapter 7. Prior to use of Link 16 outside the US&P, users must identify, and comply with, host country procedures and restrictions. Current guidance for NATO countries is available in ADatP-33, Annex A to Volume 1 (National Annexes). Other sources of guidance include: Nationally published Frequency Clearance Agreements (FCA); Standard Operating Procedures (SOP); and Guest Force Operating Procedures. Some nations have established TDL management cells that deconflict and provide

authorization to operate on a day to day basis. Contact US Link 16-capable forces assigned to that country, or other appropriate host nation contacts to obtain the latest guidance needed to obtain permission to use Link 16 and follow that guidance. As there are often lead times for requesting permission to use Link 16, begin coordination well ahead of required operations date.

## Chapter 6

### LINK 16 DECONFLICTION PROCEDURES

**6.1. General.** CJCSI 6232.01 establishes the requirement to accomplish geographic area deconfliction for Link 16 operations to ensure Link 16 use in the US&P does not exceed pulse density restrictions/TSDF limitations specified by National Telecommunications and Information Administration (NTIA) and subsequent US Military Communications-Electronics Board guidance. Individual units must deconflict operations to ensure compliance with frequency assignment restrictions. If two or more units cannot deconflict themselves, the first common commander will perform this function. When no common commander exists or where such coordination is not achievable, the Joint Staff Link 16 Deconfliction Authority will perform the function and ensure compliance with frequency assignment restrictions. The ultimate authority for deconfliction of Link 16 operations is the Joint Staff (J-8). Link 16 operations outside US&P may be subject to similar deconfliction procedures specific to theater frequency constraints.

**6.2. Deconfliction Server.** The Deputy Director Joint Staff J7 for Joint and Coalition Warfighting's Joint Interoperability Division (JID) located at Ft Bragg, NC provides technical and operational support for pulse density deconfliction through the LPDS. It provides a LPDS web site (<https://jndl.forscom.army.mil>) to assist with coordination and deconfliction. To safeguard the scheduling information contained in the server database, a log-in and password are required to access the system. They may be obtained by contacting the LPDS administrator at e-mail [jndl@conus.army.mil](mailto:jndl@conus.army.mil). The LPDS is an automated approach to support the coordination process.

**6.2.1. Deconflicting Operations.** For routine operations, the wing/unit and data link managers will ensure unit planned activities are input into the server. The total number of Link 16 pulses for all operations in a geographic area must not exceed the TSDF limitation established in the applicable frequency assignment unless a temporary frequency assignment has been requested and approved. For complex exercises, tests, demonstrations, and special operations outside of routine operations, the planning OPRs for those operations will ensure that pulse deconfliction restrictions and procedures are followed. These OPRs will ensure that the planned event is properly coordinated with the Service-designated coordinator(s) and entered into the LPDS. Events will be input as part of the normal planning process of the exercise and should be accomplished at least as far in advance as coordination of airspace (or Operational Area) use.

**6.2.2. Conflicting Operations.** In the case of conflicting operations, deconfliction coordinators will deconflict their operations to ensure compliance with frequency assignments for the area.

6.2.2.1. There are many options available to deconfliction coordinators when the mission requirements exceed pulse density restrictions within a specific geographic area. The JID or the TDLOMO can provide technical advice to reduce the pulse density. Actions that may be taken/recommended include, but are not limited to, the following:

6.2.2.1.1. Provide different operating times to units within a single geographic area.

6.2.2.1.2. Establish operational procedures to limit the use of capacity to some or all units, so that the total pulse density in any given area complies with restrictions.

6.2.2.2. Change the geographical disposition of forces to reduce the pulse density in an area where Link 16 use is particularly heavy.

**6.3. Link 16 Deconfliction.** Each wing/unit or TDLM will ensure that the use of Link 16 by unit assets within that unit's geographic operating area is coordinated IAW CJCSI 6232.01. This includes ensuring that the total number of Link 16 pulses within that geographic area does not exceed the TSDF limitation established in the frequency assignment. The wing/unit or data link manager may either perform these duties or appoint an individual to assist with these duties. If requested, the TDLOMO will assist unit personnel with gaining access to the LPDS. The person responsible for deconfliction coordination will:

6.3.1. Ensure all participating Link 16 forces are included in the coordination process and are briefed on specific frequency assignment restrictions.

6.3.2. Ensure that entries for Link 16 operations within their area of responsibility are entered into the LPDS. This facilitates overlapping and adjacent area link operations coordination. The unit POC will be given access to the deconfliction server to record planned/scheduled operations. For operations involving more than one unit, one of the participating units' deconfliction coordinators can be identified as the individual responsible for recording the information in the server for all participants.

6.3.3. Ensure Link 16 operations within the frequency assignment authorizations have been coordinated, comply with NTIA restrictions, and do not exceed the geographic area TSDF limits.

6.3.4. Coordinate with the Link 16 wing managers to satisfy operational requirements for Link 16 use in their geographical area.

6.3.5. Coordinate with local frequency management agencies to obtain current Link 16 assignments and restrictions.

**6.4. Stop Buzzer.** Term is used as direction to immediately stop radiating RF energy in the tactical data link frequency spectrum. An agency within the Federal Aviation Agency has detected an indication of interference that could affect navigational aids and directs immediate correction.

6.4.1. Every Link 16 frequency assignment request must contain a stop buzzer POC. This is a 24-hour point of contact within the unit, or other command element in the area who can be contacted when Link 16 operations are in violation of restrictions.

6.4.2. The stop buzzer POC will immediately remedy the situation and take action to ensure adherence to the restrictions.

**Chapter 7**

**INFORMATION COLLECTIONS, RECORDS, AND FORMS OR INFORMATION  
MANAGEMENT TOOLS (IMT)**

**7.1. Information Collections.** No information collections are created by this publication.

**7.2. Records.** No records are created by this publication

BURTON M. FIELD, Lt Gen. USAF  
DCS, Operations, Plans and Requirements

## Attachment 1

## GLOSSARY OF REFERENCES, PRESCRIBED FORMS, AND SUPPORTING INFORMATION

*References*

Most documents are available at TDLOMO A3CJ Portal Page at: <https://www.my.af.mil/gcss-af/USAF/site/ACC/A3/A3C/A3CJ> or at the TDLOMO A3CJ Community of Interest (COI) website at: <https://www.us.army.mil/suite/grouppage/189842>

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*Abbreviations and Acronyms*

**ACC**—Air Combat Command

**AF**—Air Force

**AFGSC**—Air Force Global Strike Command

**AFI**—Air Force Instruction

**AFNDF**—Air Force Link 16 Network Design Facility

**AFNMWG**—Air Force Link 16 Network Management Working Group

**AFMAN**—Air Force Manual

**AFMC**—Air Force Material Command

**AFPD**—Air Force Policy Directive

**AFR**—Air Force Reserve

**AFRC**—Air Force Reserve Command

**AFSOC**—Air Force Special Operations Command

**AMC**—Air Mobility Command

**ANG**—Air National Guard

**AOC**—Air and Space Operations Center

**AOR**—area of responsibility

**ASOC**—Air Support Operations Center

**BLOS**—beyond line of sight

**C2**—command and control

**C2ISR**—Command and Control, Intelligence, Surveillance, and Reconnaissance

**CAF**—Combat Air Forces

**CAS**—close air support

**CJCS**—Chairman, Joint Chiefs of Staff

**CJCSI**—Chairman of the Joint Chiefs of Staff Instruction

**CJCSM**—Chairman of the Joint Chiefs of Staff Manual

**CoP**—community of practice

**CPD**—crypto period designator

**CRC**—Control and Reporting Center

**Crypto Keys**—cryptographic keys

**DME**—distance measuring equipment  
**DOD**—Department of Defense  
**EPLRS**—Enhanced Position Location Reporting System  
**ESC**—Electronic Systems Center  
**FAA**—Federal Aviation Administration  
**FTC**—force track coordinator  
**GAAC**—geographic area assignment coordinator (Navy)  
**IAW**—in accordance with  
**IDL**—initialization data load  
**IER**—information exchange requirements  
**IMT**—Information Management Tool  
**JBI**—Joint Battlespace Interoperability  
**JICC**—joint interface control cell  
**JID**—Joint Interoperability Division  
**JMTOP**—Joint Multi-TDL Operating Procedures (CJCSM 6120.01)  
**JMTS**—Joint Multi-TDL School  
**JNDT**—Joint Network Design Team  
**JTIDS**—Joint Tactical Information Distribution System  
**JTF**—Joint Task Force  
**JTMP**—Joint Tactical Data Enterprise Services (TDES) Migration Plan  
**JTRS**—Joint Tactical Radio System  
**JU**—JTIDS Unit  
**KEYMAT**—keying material  
**LOS**—line of sight  
**LPDS**—Link 16 pulse deconfliction server  
**LUM**—Link 16 Unit Manager  
**LVT**—low volume terminal  
**MAJCOM**—major command  
**MHz**—megahertz  
**MIDS**—multi-functional information distribution system  
**MIL STD**—military standard  
**NC**—navigation controller

**NDD**—Network Description Document  
**AF NDF**—Air Force Link 16 network design facility  
**NTIA**—National Telecommunications and Information Administration  
**NTR**—Network Time Reference  
**OPLAN/OPORD**—operations plan/operations order  
**OPR**—Office of Primary Responsibility  
**OPTASK LINK**—operational tasking data links  
**PACAF**—Pacific Air Forces  
**POC**—point of contact  
**RDS**—Records Disposition Schedule  
**SADL**—Situation Awareness Data Link  
**SIPRNET**—Secret Internet Protocol Router Network  
**SOF**—Special Operations Forces  
**SPACEAF**—Space Air Forces  
**STN**—source track number  
**TDC**—Tactical Data Coordinator  
**TDES**—Tactical Data Enterprise Services  
**TDL**—tactical data link  
**TDLM**—Tactical Data Link Manager  
**TDLOMO**—Tactical Data Link Operations and Management Organization  
**TSDF**—time slot duty factor  
**URL**—uniform resource locator  
**USA**—United States Army  
**USAFE**—United States Air Forces in Europe  
**USMC**—United States Marine Corp  
**USN**—United States Navy  
**US&P**—United States and Its Possessions

### *Terms*

**Crypto Variable Logic Label (CVLL)**—A 7-bit number that can range in value from 0 to 127 that is used during Link 16 design to implement the segmenting or isolation of portions of the design into cryptographic nets.

**Deconfliction Coordinator**—A designated representative of an organization tasked with the scheduling of JTIDS/MIDS operations for their platforms.

**Frequency Assignment**—Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions.

**Geodetic Navigation**—A procedure used by a Link 16 terminal to determine its position and velocity in a latitude/longitude grid using passive observations of Position and Status messages transmitted by other platforms.

**Interference Protection Feature (IPF)**—A Link 16 hardware feature that monitors the terminal's transmissions for out-of-band transmissions, transmissions in the IFF notches, improper frequency hopping distribution, incorrect pulse widths, high powered amplifier operation, and TSDF above a preset level. If authorized levels are exceeded, the interference protection feature (IPF) function automatically inhibits further transmissions.

**Initialization Data Load (IDL)**—Platform initialization data files that, in the case of Link 16, contain time slot assignments and standard parameter values fixed for the platform type and, for other TDLs, contain the necessary timing, spectrum control, and addressing assignments used to assure efficient and effective tactical digital communications.

**JTIDS Unit (JU)**—A unit communicating directly on Link 16.

**Multi-Net**—The coordinated use of a specific block of time slots for different functions on different nets in a Link 16 design by different communities of users.

**Navigation Controller (NC)**—The navigation controller establishes the origin and North orientation of the relative grid for the LINK 16 Relative Navigation function. Other JUs align to the grid reported by the NC.

**Network Participation Group (NPG)**—A unique list of applicable messages used to support an agreed-upon technical function without regard to subscriber identities. This list is a means of transmitting a common set of messages to all interested users.

**Net Time Reference (NTR)**—A subscriber Link 16 terminal that is assigned as the reference for system time for each synchronized netted system. The NTR terminal's clock time is never updated by system information and is the reference to which all other terminals synchronize their own clocks. There can be only one NTR in each Line of Sight segment.

**Operational Tasking Data Links (OPTASK LINK)**—The OPTASK LINK message is a formatted message that disseminates the detailed instructions necessary for establishing and maintaining the operational tactical data links in a multi-TDL network/multi-TDL architecture.

**Relative Grid Navigation**—A procedure used by a Link 16 terminal to determine its position and velocity in a common referenced coordinate system (with an arbitrary grid origin established by the navigation controller) by passive observations of Position and Status messages transmitted by other terminals.

**Stacked Net**—The coordinated use of a specific block of time slots for the same function but on different nets in a Link 16 network design by different communities of users.

**Tactical Data Link (TDL)**—A Joint Staff-approved, standardized communication link suitable for transmission of digital information. Tactical data links interface two or more command and control or weapons systems via a single or multiple architecture and multiple communications media for exchange of tactical information.

**Time Slot Duty Factor (TSDF)**—A measure of the aggregate number of pulses transmitted by all Link 16 units within a geographic area. A pulse density of 396,288 pulses per frame is defined as a TSDF of 100%.

**Track Number (TN)**—The unique numeric or alphanumeric octal identifier associated with a specific set of track data representing a vehicular object, point, line of bearing, fix, or area of probability.

**United States and Its Possessions (US&P)**—The term "United States and Its Possessions" includes the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, and the territories and possessions

## Attachment 2

NETWORK REQUEST WORKSHEETGENERAL INFORMATION

1. Requesting Unit: \_\_\_\_\_

2. Address of Requester.

Name/Rank/Title:

DSN/Commercial Phone Number:

E-Mail:

Street Address:

Base/State/Zip:

3. Projected Use:

Operation, Exercise, Test, Training, Experiment

Reference Name (**Provide operation/exercise name only if unclassified**):

4. Requested Delivery Date:

GENERAL NETWORK INFORMATION.

1. Are different digital subnets required? Network designs will normally support stacked or pseudo-stacked nets for Air Control (NPG 9), Imagery (NPG 11), Voice (NPG 12/13), NEW (NPG 18), and Fighter-to-Fighter (NPG 19/20). If additional subnet requirements are needed to support functions such as Red/Blue/Purple training, network enabled weapons, image transfer, etc., specify the participants and functions you need to be separated to subnets. 2. Is Link 16 voice needed? (1 or 2 channels; 2.4 KBPS, 16KBPS or both). Because of the large number of time slots needed to support Link 16 voice, use other secure voice communications, if available.

Number of Channels

2.4 KBPS: \_\_\_\_\_

16 KBPS: \_\_\_\_\_

3. What is the jamming environment? None \_\_\_\_, Low \_\_\_\_, Medium \_\_\_\_, High \_\_\_\_.

4. What are the Interference Protection constraints (pulse density restrictions)? If you are not certain of the interference protection requirements in your area, contact your frequency management office.

Full Protect 100/50 \_\_\_; Contention Access Permitted \_\_\_ Combat \_\_\_ Other \_\_\_\_.

5. Are there any special crypto net requirements? Series and editions should be published in the OPTASK LINK which specifies this network. Default network design will support NPG 20 crypto isolation for all US fighter-to-fighter-B exchanges. Explain any special crypto net requirements:





**Notes:**

1. Choose a convenient scale for estimating distances and label the diagram.
2. Depict the most likely positions of the platforms contained in the Participant List.
3. Depict the threat axis, if known.
4. Depict any geographic obstructions to LOS connectivity.