

Tactical Data Link 22

NATO Improved Link 11

NILE



Northrop Grumman Information Technology (IT) developed the Link 22 data link as a data communications link among air, surface, subsurface, and ground-based tactical units using radio frequency (RF) media. Seven participating NATO nations contracted through the U.S. Navy for the development of this economical but capable data link.

The development program produced the software system for the System Network Controller (SNC) of Link 22 communications systems, and the NILE Reference System, a test

system for Link 22 systems. The SNC software provides the communications transport function, including network protocols, and the multi-media system and network management function. This software enables each participating nation to procure tactical data systems that are interoperable and compatible with those of the other participating Link 22 nations. The Link 22 systems uses an integrated Link Level COMSEC (LLC) device.

The SNC software is transportable to any of three standard computer hardware architectures: HP, Sun, and Intel. Each participating nation develops its own tactical systems to implement the Link 22 message standards and operate with SNC software.

Northrop Grumman IT also developed the NILE Reference System (NRS), a test system used to assure compliance of SNCs with Link 22 system specifications. The NRS also tests Link 22 compatibility of new systems being developed for Link 22.

The NRS performs tests by generating scenarios and transmitting them to the system under test via an LLC segment and media simulator. Data extraction, reduction, and analysis tools enable the user to evaluate system performance. The NRS uses commercial-off-the-shelf (COTS) hardware. It is intended primarily for a laboratory environment, but can be used with operational platforms if required.

IT

Link 22 transmits data in fixed format messages using 72-bit words. Data can be forwarded between Link 16 and Link 22 networks, because Link 22 uses the same data element dictionary (DED) as Link 16, expanded to incorporate Link 22.

Like Link 16, Link 22 uses Time Division Multiple Access (TDMA) protocols, which allocate dedicated transmission capacity to each active unit in the network. This avoids dependence on a single net control mode. The dynamic TDMA protocols enable automatic allocation of more capacity to units with the most traffic to transmit.

Link 22 can use up to four RF media, including HF and UHF fixed frequency and frequency-agile waveforms. Selecting waveforms allow tailoring to adjust to prevailing RF channel conditions.

A single Link 22 participant can operate on up to four independent networks simultaneously. HF radio range is 300 nautical miles, gapless, and UHF is line of sight. Link 22 relay protocols can extend this range.



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