APPENDIX C

NETWORK ACCESS CONTROL ALGORITHM

C.1 General.

C.1.1 Scope.
This appendix describes the network access control (NAC) algorithm to be used in the DMTD and interfacing C^4I systems.

C.1.2 Application.
This appendix is a mandatory part of MIL-STD-188-220. The information contained herein is intended for compliance.

C.2 Applicable documents.
A list of data link parameters and their values as well as parameter ~~Parameter~~ values for the Network Timing Model, described in Appendix C, are provided in a separate document entitled "MIL-STD-188-220 ~~Media Access Configuration (MAC) Parameters and~~ Parameter Table ~~Values~~". Thise table ~~MAC parameters and parameter values are~~ is available via the CNR Implementation Working Group World Wide Web page: http://www-cnrwg.itsi.disa.mil.

~~A list of data link parameters and their recommended values is provided in a separate document entitled "MIL-STD-188-220 Protocol Parameters and Values". The Protocol parameters and parameter values are available via the CNR Implementation Working Group World Wide Web page: http://www-cnrwg.itsi.disa.mil.~~

C.3 Network timing model.
The network access control protocol shall be used to detect the presence of active transmissions on a multiple-subscriber-access communications network and shall provide a means to preclude data transmissions from conflicting on the network. The network access control protocol is based on a generic network-timing model. All stations on a network shall use the same network access control protocol and timing parameter values in order to maintain network discipline.

C.3.1 Network timing model definitions.
A network station consists of a DCE and a DTE. The DTE is the data device that performs the MIL-STD-188-220 protocol. The DCE includes all equipment external to the DTE (e.g., a radio with or without external COMSEC) that is used to provide a communications channel for the DTE. The interface between the DTE and DCE can operate in synchronous, asynchronous, or packet mode. The interface is synchronous if the DCE provides all required clocks to the DTE. The packet mode interface is a synchronous interface that conforms to CCITT X.21. For synchronous mode, the bit rate (n) is the rate of the transmit clock supplied by the DCE. If the DCE does not provide clocks to the DTE, the interface is asynchronous. For asynchronous mode,

the bit rate (n) is the rate at which the DTE transmits. The data link bit rate is defined as the effective bit rate at which the physical layer transmits the data bits. The data link bit rate is usually the same as the bit rate (n) at the physical layer, except for the PSK/DPSK modems (refer to MIL-STD-188-110). The robust protocol case is separately described in Appendix J.

C.3.2 Network timing model parameters.
The parameters of the network timing model are general enough to model interactions with a wide variety of DCEs. All parameters are specified at the DTE to DCE interface and are in units of milliseconds with a resolution of one millisecond. Parameters may have a value of zero if they are not applicable to the DCE being used. Network timing model parameters are shown in Figure 32. Actual network timing model parameter values are provided in a separate document entitled "MIL-STD-188-220 ~~Media Access Configuration (MAC) Parameters and~~ Parameter Table ~~Values~~". The use of identical values is crucial to interoperability, even more important than the values themselves. All stations participating in a network should utilize the values stated in this Table ~~separate document~~.

APPENDIX C

C.4.1.3 Network busy detect time.
The time allowed to detect data network busy shall be the same for all stations on the network. This Net_Busy_Detect_Time is a key factor in achieving both throughput and speed of service. The Net_Busy_Detect_Time values, as specified in the ~~MAC~~ parameter table, should be used per indicated Radio/System. All stations participating in a network should utilize the values stated in the "MIL-STD-188-220 ~~Media Access Configuration (MAC) Parameters and~~ Parameter Table ~~Values~~". The equation below shall be used as a default in cases where the ~~MAC~~ parameter table has not been updated to reflect actual measurements for specific device. Where a communications device provides a signal to detect network busy earlier than the calculated parameter B value, the DTE shall interface to that signal. The ~~MAC~~ parameter table~~s~~ lists the device specific signals that should be supported in order to use the timing values specified. Where a communication media provides capabilities to detect data network busy more quickly, the use of these capabilities has been reflected in the ~~MAC~~ parameter table Net_Busy_Detect_Time values. In these cases, Net_Busy_Detect_Time can be set to reflect the capabilities of the media. Where the communication media does not provide special capabilities or these capabilities cannot be used by all stations on the network, the station shall examine received data to detect data network busy. In these cases, the time allowed to detect data network busy shall be given by the formula:

$$Net\_Busy\_Detect\_Time = EPRE + ELAG + B + TOL$$

NOTE: Parameters EPRE and ELAG are initialized locally or learned using the XNP messages described in Appendix E. Net_Busy_Detect_Time can also be learned using the XNP messages described in Appendix E or from the ~~MAC~~ parameter table~~s~~.