

3. DEFINITIONS

3.1 Abbreviations and acronyms. The abbreviations and acronyms used in this MIL-STD are defined as follows:

AC	automatic control
BCD	binary-coded decimal
BER	bit error ratio (bit error rate)
bps	bit(s) per second
BPSK	binary phase-shift keying
BSC	binary synchronous communications
CALL ACK	Call Acknowledgment
CCOW	channel control orderwire
COMSEC	communications security
CRC	cyclic redundancy check
CTIC	COMSEC/TRANSEC Integrated Circuit
DAMA	demand-assigned multiple access
dB	decibel
DC	distributed control
DEQPSK	differentially encoded quadrature phase-shift keying
DoD	Department of Defense
DoDISS	DoD Index of Specifications and Standards
ECM	embedded CTIC module
EICM	embedded INDICTOR COMSEC module
ELT	even link test
FEC	forward error correction

MIL-STD-188-183

FSCS	fleet satellite communications system
HEX	hexadecimal
Hz	hertz (cycles per second)
I	in phase
ID	identification
I/O	input/output
kbps	kilobit(s) per second
KG	key generator
kHz	kilohertz
ksp/s	kilosymbol(s) per second
LPN	Legendre polynomial
LSB	least significant bit
MIL-STD	military standard
ms	millisecond(s)
MSB	most significant bit
N/A	not applicable
nmi	nautical mile(s)
POR	power on reset
ppm	part(s) per million
PSK	phase-shift keying
PT	plain text
Q	quadrature phase
QPSK	quadrature phase-shift keying
RCCOW	return channel control orderwire
rf	radio frequency

MIL-STD-188-183

RFI	radio frequency interference
R/T	receiver/transmitter
s	second(s)
SATCOM	satellite communications
sps	symbol(s) per second
TBD	to be determined
TDMA	time-division multiple access
TRANSEC	transmission security
TS0	time slot zero
UHF	ultra high frequency
μ s	microsecond(s)

3.2 Definitions of terms. Definitions of terms not listed below are defined in FED-STD-1037.

Access: The ability, permission, or liberty to communicate with, or to make use of, any system resource.

Active ranging: The transmission and subsequent reception of a burst signal used for estimating the range to the satellite.

Address: The coded representation of the source or destination of a communication.

Automatic control: An operating mode that allows communications slots within the waveform to be dynamically assigned to terminals requiring access to the slots.

Binary-coded decimal (BCD) format: A numbering system in which each digit of a given decimal number is represented separately by a unique arrangement of binary digits (usually four).

Binary phase-shift keying (BPSK): A form of phase-shift keying (PSK). In PSK modulation, the phase angle of the carrier is discretely controlled by the information bits being transmitted. In BPSK, the instantaneous phase of the carrier can be either unchanged or shifted 180 degrees. The information content of an uncoded BPSK signal is 1 binary digit (bit) per symbol; therefore, the symbol rate and the information rate are

identical.

Bit synchronization (clock lock): The condition achieved when significant transitions of the recovered data rate clock are phase-stable to within 25 percent of the bit period.

Burst: A time-limited transmission composed of a synchronization preamble and a finite-length data stream.

Called party: The party to whom a call is addressed.

Carrier acquisition: The condition achieved when a receiver carrier reference is coherent, in frequency and phase, with the receive signal.

CCOW acquisition: A status the terminal achieves when it has successfully decoded a master frame CCOW.

CCOW acquisition loss: A terminal loses CCOW acquisition if six consecutive CCOWs are not received or decoded.

CCOW Channel (DC mode only): The channel through which a terminal receives CCOW and baseband transmissions from a frequency switching slot connect.

CCOW time slot: The slot through which a terminal receives CCOW transmissions.

Channel: A communications path characterized by such parameters as time, frequency, and bandwidth through which digital or other information may flow.

Channel control orderwire (CCOW): The transmissions from a controller that control the waveform and its usage, such as frame number, encryption synchronization counts, user slot assignments, and frame format in current use.

Channel resources: The available time, bandwidth, and power of a channel.

Circuit: The closed path between two terminals over which one-way or two-way communications may be provided.

Circuit number: A 5-digit decimal number that identifies a time slot when operating in the DC mode.

Communications: A method or means of conveying information of any kind from one person or place to another.

Controller: An entity which establishes frame format and system

timing. In the AC mode the controller also assigns waveform access to users.

Cyclic redundancy check (CRC): A type of error-detecting scheme that uses parity bits generated by polynomial encoding and decoding algorithms to detect transit-generated errors.

Data: (1) Any user information transmitted over a channel.
(2) Any information that is not voice.

Dedicated access: A channel assigned to provide circuit service for the exclusive use of two or more users.

Demand-assigned multiple access (DAMA): A channel access scheme in which access of a channel from geographically distributed communications terminals is allocated in accordance with demand. (NOTE: FED-STD-1037 lists this term as *demand assignment multiple access*.)

Destination terminal: The terminal addressee of a communication.

Differentially encoded quadrature phase-shift keying (DEQPSK): Quadrature phase-shift keying (QPSK) that has been differentially encoded. DEQPSK is used to resolve the phase ambiguity of digital data recovered from demodulation. It is not used for error detection or correction. See 5.5 and QPSK.

Distributed control (DC): An operating mode in which a terminal's access to a communications slot is preassigned (both time slot and frame format) and any configuration changes are directed by the CCOW.

Downlink acquisition: The status of a terminal achieved upon correct reception of a CCOW burst during initial acquisition of the waveform.

Even-link test slot: A link test slot occurring whenever the receive frame count is even. It is used for dedicated ranging.

Field: A specific portion of a message.

Flag: A bit, used to identify the occurrence of a condition or event.

Flush bits: Bits added to a data field to reset the shift registers to zero.

Format: An arrangement of a frame into slots for control and communications.

Frame: A unit of time on the channel. A frame is $1.386\bar{6}$ seconds long and is subdivided into waveform overhead slots and user time segments. (See *Frame subformat*.)

Frame count: The sequence in which a particular frame occurs. The frame count is defined by a 21-bit field transmitted by the controller in each master frame.

Frame format: The manner of dividing a frame into different time periods for CCOW, RCCOW, ranging, link test, and user segments.

Frame lock: A status the terminal achieves when it has received and detected the precise location of two consecutive CCOWs. A

terminal that achieves this status is considered to have properly established receive frame timing.

Frame lock loss: The condition of a terminal which has not received any CCOWs for five minutes.

Frame subformat: The division of user time segments into slots used for different baseband, coding, and burst rates, as well as different amounts of time allocated for the transmission.

Frame time delay: Time delays introduced due to conversion of a continuous data stream into burst-formatted data blocks.

Frequency code: An 8-bit code that defines the uplink/downlink frequency pair of a satellite transponder.

Frequency uncertainty: The difference between a received signal's expected frequency and its actual frequency. Frequency uncertainty results when (1) a difference in frequency between reference oscillators exists, (2) doppler effects cause frequency shifts, or (3) frequency-setting inaccuracies occur.

Full duplex: (1) Communications that occur in both directions (transmit and receive) within one frame. (2) A terminal characteristic that signifies the capability of simultaneous receipt and transmission of rf signals.

Guard list: A set of addresses for which a terminal may receive services.

Guard number: The address of a subscriber or net that uses a terminal.

Guard time: A time period that allows for time uncertainty of a transmission to prevent overlap of transmissions.

Half duplex: A terminal characteristic that allows receipt and transmission of signals, but not both at the same time.

Home channel (DC mode only): The channel through which a terminal performs all rf transmissions, receives all RCCOW transmissions, and receives all baseband transmissions from a normal slot connect.

Inclination angle: The angle between a satellite's orbital plane and the earth's equatorial plane.

Indicator: A symbol, flag, or signal that serves to identify a specific state or item.

Information: The meaning that a human being assigns to data, using certain conventions applied to those data.

Input/output (I/O) rate: The rate, in units of bps, at which bits are sent or received to or from an I/O device.

KG day: A 3-bit code that defines the daily or weekly mode of operation used to prepare the orderwire KG.

KG memory: A 3-bit code that defines the memory location of one of eight KG keys used for orderwire encryption and decryption.

KG net number: A 5-bit code used to prepare the KG, which encrypts the CCOW and RCCOW.

KG ID number: The identification number associated with an encryption/decryption device.

Legendre polynomial (LPN): A binary code which has correlation properties acceptable for this waveform. The end of the LPN(s) marks the start of the data for each slot.

Link: Communications connections between two nodes of a network.

Link test slot: A time slot in each frame during which any terminal may access the waveform to transmit and receive a test data stream for the evaluation of its link conditions.

Master frame: A frame, occurring once in every eight frames, that identifies the current waveform format and other configuration parameters.

Master frame epoch: A set of eight contiguous frames, beginning with a master frame.

Message: (1) Alphanumeric information. (2) Information contained in orderwire transmissions. (3) Any information prepared in a form suitable for transmission.

Modulation: The process used to impress baseband data onto a carrier.

Modulation rate: The rate at which symbols are transferred across a satellite channel, in units of symbols per second (sps).

Modulo: A mathematical function that yields the remainder of a division.

Network: A collection of stations capable of interstation communications.

Node: A terminal or channel controller in a network.

Nonregenerative transponder: A transponder (e.g., a satellite repeater) in which digital signals are not reconstituted.

Operator: The person involved in control and operations of a communications terminal or controller.

Orderwire: The portions of the TDMA frame used for transmission of management, control, and status information between the channel controllers and terminal users. See *Channel Control Orderwire (CCOW)* and *Return Channel Control Orderwire (RCCOW)*.

Originator: A person or terminal that initiates a communication.

Passive ranging: A process by which a terminal determines the signal propagation time to the satellite by means other than transmitting a ranging signal.

Preassigned service: A type of service whose time-slot allocation is scheduled and set up well in advance of being used.

Precedence: A designation that an originator assigns to a message, indicating the relative order of handling, and to the addressee the order in which the message is to be used.

Preempted service: A service that has been interrupted to allow for higher-precedence network activities.

Preset channel code: A 6-bit code that identifies an uplink/downlink frequency pair in a CCOW Slot Connect message.

Protocol: The set of rules for a communications system operation that must be followed if communications is to be effected.

Quadrature phase-shift keying (QPSK): A form of PSK in which the instantaneous phase of the carrier can be either unchanged, shifted ± 90 degrees, or shifted 180 degrees. QPSK may be represented as two independent binary bit streams modulated onto the I and Q components of the carrier. The information content of a QPSK signal is 2 binary digits (bits) per symbol; therefore, the symbol rate is one-half the information rate.

Queuing: The process of sequencing requests for communications resources.

Queued service: A service on the request queue waiting to be assigned communications resources.

Range: The round-trip distance between a satellite and a

terminal within the satellite's footprint. (Because signal propagation velocity is constant, terminals measure range in units of time.)

Range lock: A status the terminal achieves when it has determined its slant-range time delay. [Terminal transmissions are inhibited (except for active ranging transmissions) until the terminal achieves this status.]

Range time slot: A shared slot used to measure two-way range to the satellite.

Ranging: A process by which a terminal determines the propagation time to the satellite, to establish uplink timing. See *active ranging* and *passive ranging*.

Ranging epoch interval: The interval between scheduled dedicated ranging attempts by a terminal.

Requested party: The subscriber to whom a call is placed.

Requesting party: The subscriber initiating a call.

Return channel control orderwire (RCCOW): A TDMA slot used by the terminals to (1) request, from the channel controller, access to the waveform; (2) respond to channel controller requests with information such as status and configuration; and (3) transfer computer data to other terminals.

Satellite footprint: The area of the earth's surface from which terminals are able to access a particular satellite.

Segment: A portion of a frame allocated to users for communicating. The segment is further divided into time periods called *slots*.

Service: The assignment of communications resources to user terminals.

Slant range: The one-way distance between a satellite and a terminal within the satellite's footprint. (Because signal propagation velocity is constant, terminals measure range in units of time.)

Slot: A fraction of the TDMA frame during which a communications transmission by a single satellite terminal occurs. The TDMA-1 frame is subdivided into four control slots (CCOW, RCCOW, Range, Link Test) and three user segments (A, B, and C). The user segments are further subdivided into a number of communications time slots.

Slot connect: (1) A CCOW command that directs a terminal's I/O port(s) to be connected to a communications slot in the TDMA-1 frame. (2) A connection between a terminal's I/O port(s) and a communications slot in the TDMA-1 frame.

Slot number: A 5-bit code that identifies a time slot when operating in the AC mode.

Source terminal: The terminal from which information is considered to originate.

Station ID: A 16-bit code (RCCOW field) that defines the KG ID of the terminal that originates the RCCOW.

Symbols per second (sps): The unit of measure of the modulation rate. The modulation rate in sps is calculated by dividing the bit rate (after the FEC) by the number of bits per symbol.

Terminal: An equipment or function that originates or terminates communications traffic.

Terminal Base Address: The User Number of the lowest numbered port attached to a terminal.

Time chip: One cycle of a 19,200-Hz oscillator (approximately 52 microseconds).

Time-division multiple access (TDMA): A communications technique that allows multiple terminals to share a given frequency spectrum. Based on TDMA, each terminal has exclusive use of the frequency spectrum for a small time interval (fraction of a second), which is known as a TDMA time slot.

Time slot: See slot and time-division multiple access.

Transmission: The dispatching of a message or other form of information by means of radio signals.

User: A person, organization, or other entity that employs the services provided by a communications system for transfer of information to others.

User number: A 16-bit code (address) that uniquely identifies a terminal port.

User slot: A fraction of the waveform frame that carries user-to-user communications (such as encryption preambles, independent network protocols, and encrypted data).

Waveform: The combination of baseband signal structure, rf

signal structure, and communications protocols. The waveform provides a framework within which coordinated communications can be effected.