APPENDIX E

LONGBOW (LBA) DCI/SMODIM Interface Specifications

Table of Contents:

SMODIM to DCI LBA event message BB……..1
LBA_EVENT_CODE …….2
LBA_EVENT_SUBCODE ……..2
LBA_TIME ……..2
LBA_VELOCITY ……2
LBA_ROUNDS ……3
LBA_DELTA_AZIMUTH …….……..3
LBA_DELTA_RANGE ……3
LBA_PROB_HIT ……..3
LBA_LASER_CODE ……...3
LBA_LAUNCH_MODE ……..3
LBA_TOF ……4
DCI to SMODIM Remote Event Message (36H) …… 4
SMODIM to DCI Missed Event Message (29H) ……..4

SMODIM to DCI LBA event message BB:

Byte	Data Element	Description
1	SAWE_SYNC	(BBH) Identifies communication between SMODIM and DCI
2	SAWE_DATA_MESSAGE_ID	(34H) Identifies Longbow Weapon Event Report
3	SAWE_MESSAGE_SIZE	(25H) Total message length in bytes
4-5	SAWE_EVENT_NUMBER	Index indicating number of event report
6	*LBA_EVENT_CODE	Identifies Longbow weapon fire event
7	*LBA_EVENT_SUBCODE	Identifies the Longbow weapon type
8-9	SAWE_NORTHING	Aircraft position at event time
10-11	SAWE_EASTING	Aircraft position at event time
12-15	*LBA_TIME	passes event time in BCD
16-17	SAWE_NORTHING	Aimpoint COM northing
18-19	SAWE_EASTING	Aimpoint COM easting
20-23	*LBA_TIME	Passes acquisition time in BCD
24-25	LBA_VELOCITY	Target velocity northing
26-27	LBA_VELOCITY	Target velocity easting
28	*LBA_ROUNDS	Rounds remaining on helicopter after shot (missile) or rounds fired (gun/rocket)
29	*LBA_DELTA_AZIMUTH	Footprint delta azimuth
30	*LBA_DELTA_RANGE	Footprint delta range
31	*LBA_TOF	Passes time of flight for SAL, and Rocket events
32	*LBA_PROB_HIT	Probability of hit hard target
33-34	*LBA_LASER_CODE	Alpha code plus Tri-service octal (missile laser code)
35	*LBA_LAUNCH_MODE	Missile launch mode or Rocket type
36-37	SAWE_CHECKSUM	

LBA_EVENT_CODE:
Identifies the Longbow weapon fire event

Range/Values	00 => lba_pri_loc
	01 => lba_pri_loc_to_be_followed_by_sec
	02 => lba_sec_loc
	03 => lba_firing_remote_laser_code
	04 => laser_on
	05 => laser_off
	06 => laser_code_change
Units:	N/A
Precision:	N/A
Format:	1-byte enumeration type

LBA_EVENT_SUBCODE:
Identifies the Longbow weapon type

Range/Values:	00 => Laser
	01 => Gun
	02 => SAL Hellfire
	03 => RF Hellfire
	04 => Rocket
Units:	N/A
Precision	N/A
Format:	1-byte enumeration type

LBA_TIME:
Event time in BCD (GMT(ZULU) time – GPS reference)

Range/Values:	See Below		
Units:	See Below		
Precision:	See Below		
Format:	4-byte BCD		
	byte 1(LSN)	SAWE_TENTHS_OF_SECONDS	tenths of second (BCD)
	byte 1(MSN)	SAWE_DAY_OF_WEEK	day of week (enumerated)
	byte 2	SAWE_BCD_HOUR	hour of day (BCD)
	byte 3	SAWE_BCD_MINUTE	minutes past the hour (BCD)
	byte 4	SAWE_BCD_SECONDS	seconds past the min (BCD)

LBA_VELOCITY:
Passes velocity of target

Range/Values:	-32768 to 32767
Units:	m/s
Precision:	2^{-4} m/s per LSB
Format:	2-byte signed integer LSB first

LBA_ROUNDS:
Passes number of missiles remaining on helicopter for missile firing event or number of rounds fired for rocket or gun firing event
Range/Values: 0 to255
Units: Missiles/rounds
Precision: 1 missile or 1 round
Format: 1-byte unsigned integer

LBA_DELTA_AZIMUTH:
Passes the azimuth delta to be used for footprint calculations
Range/Values: 0 to 255
Units: MRad
Precision: **1** mrad/LSB Represents ½ total footprint Format:1-byte unsigned integer

LBA_DELTA_RANGE:
Passes the range delta to be used for footprint calculations
Range/Values: 0 to 255
Units: Meters (for SAL missiles 255 = 2000M)
Precision: 2-meters/LSB Represents ½ total footprint
Format: 1-byte unsigned integer

LBA_PROB_HIT:
Passes the probability of hit used for Monte Carlo assessments
Range/Value: 0 to 255
Units Percent
Precision: 0.392 Percent/LSB
Format: 1-byte unsigned integer

LBA_LASER_CODE:
Passes tri-service octal laser code for either SAL event (missile launch or designation)
Range/Value: 0 to FFFF
Units: N/A
Precision: N/A
Format: 2-byte unsigned integer upper nibble = alpha missile code MSB First

LBA_LAUNCH_MODE:
Launch mode for missile event or Rocket type for Rocket event
Range/Value: if missile event 0 => LOAL
1 => LOBL
2 => LOBL**O**
if rocket event 0 => **6PD**
1 => 6MP
2 => Others
Units: N/A
Precision: N/A
Format: 1-byte enumeration type

LBA_TOF:
Time of flight for SAL, and Rocket engagements

Range/Value:	0 to 255
Units	Seconds
Precision:	0.2 seconds/LSB
Format:	1 byte unsigned integer

DCI to SMODIM Remote Event Message (36H):

Byte	Data Element	Description
1	SAWE_SYNC	(BBH) Identifies communication between SMODIM and DCI
2	SAWE_DATA_MESSAGE_ID	(36H) Laser designator event
3	SAWE_MESSAGE_SIZE	(17H) Total message length in bytes
4	LBA_EVENT_CODE	LBA event code
5-6	SAWE_NORTHING	designator position local grid northing
7-8	SAWE_EASTING	designator position local grid easting
9-12	LBA_TIME	time designation started
13-14	SAWE_NORTHING	aimpoint local grid northing
15-16	SAWE_EASTING	aimpoint local grid easting
17	LBA_DELTA_AZIMUTH	Delta Azimuth
18	LBA_DELTA_RANGE	Delta Range
19	LBA_TOF	Time of flight
20-21	LBA_LASER_CODE	Tri-service octal (missile laser code)
22-23	SAWE_CHECKSUM	Addition of bytes 1-21

SMODIM to DCI Missed Event Message (29H):

Byte	Data Element	Data
1	SAWE_SYNC	BB
2	SAWE_DATA_MESSAGE_ID	29H Missed SMODIM events
3	SAWE_MESSAGE_SIZE	Size of message in bytes
4	SAWE_DATA_MESSAGE_ID	Type of Message
5-36	Message Data	

Bytes 4-36 will be repeated as necessary for however many messages there are up to a maximum of 7. Format will be exactly the same as for either NTC RDMS event messages or LBA messages, with the first byte (byte 4 in this case) being the type of message (either 33H for RDMS event report or 34H for Longbow event report). If it is a Longbow event, it will take up bytes 5-36. If it is an NTC RDMS event, it will take up bytes 5-20 with bytes 21-36 being blank.
37 + N * 33 to 37 + N * 33 + 1 SAWE_CHECKSUM Checksum for message