

## Entity State PDU (ESPDU)

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length		
	Timestamp								
BODY	Entity ID						Sequence Number		
	Entity Type								
	Padding								
	Entity Appearance				Entity Capabilities				
	Entity Location								
	Entity Orientation					Force ID	DRA	Num Variable Records (N)	
	Record Type = 2001 (Attached Parts Variable record)				Record Length		Padding	Num Parts	
Var Rec 1	Array of Attached Part record								Array
Variable Record 2	Record Type = 2010 (Dead Reckoning Variable record)				Record Length		Padding		
	Entity Linear Velocity								
	Entity Linear Acceleration								
	Entity Angular Velocity								
						Padding			
	Variable Record 3								
	...								
	Variable Record N								

Array

## Collision PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Issuing Entity ID						Colliding Entity ID (Site)
	Colliding Entity ID (App, Entity)				Event ID (Site, App)		
	Colliding Entity ID (Site)	Colision Type	Padding				
	Velocity						
	Mass						
	Location with respect to entity						
	Padding						Num Variable Records (N)
	Record Type = XXXX (Collision Elastic Variable record)					Record Length	Padding
Var Rec 1	Collision Intermediate Result - XX				Collision Intermediate Result - XY		
	Collision Intermediate Result - XZ				Collision Intermediate Result - YY		
	Collision Intermediate Result - YZ				Collision Intermediate Result - ZZ		
	Unit Surface Normal					Coefficient of Restitution	
	Variable Record 2						
	...						
	Variable Record N						

## Fire PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Firing Entity ID						Target Entity ID (Site)	
	Target Entity ID (App, Entity)				Munition/Expendable Entity ID (Site, App)			
	Munition/Exp Ent ID (Entity)		Event ID					
	Location							
	Velocity					Fire Mission Index		
	Munition/Expendable Type							
	Munition Descriptor							
	Padding							
	Range				Fire Type	Padding	Num Variable Records (N)	
	Variable Record 1							
	...							
	Variable Record N							

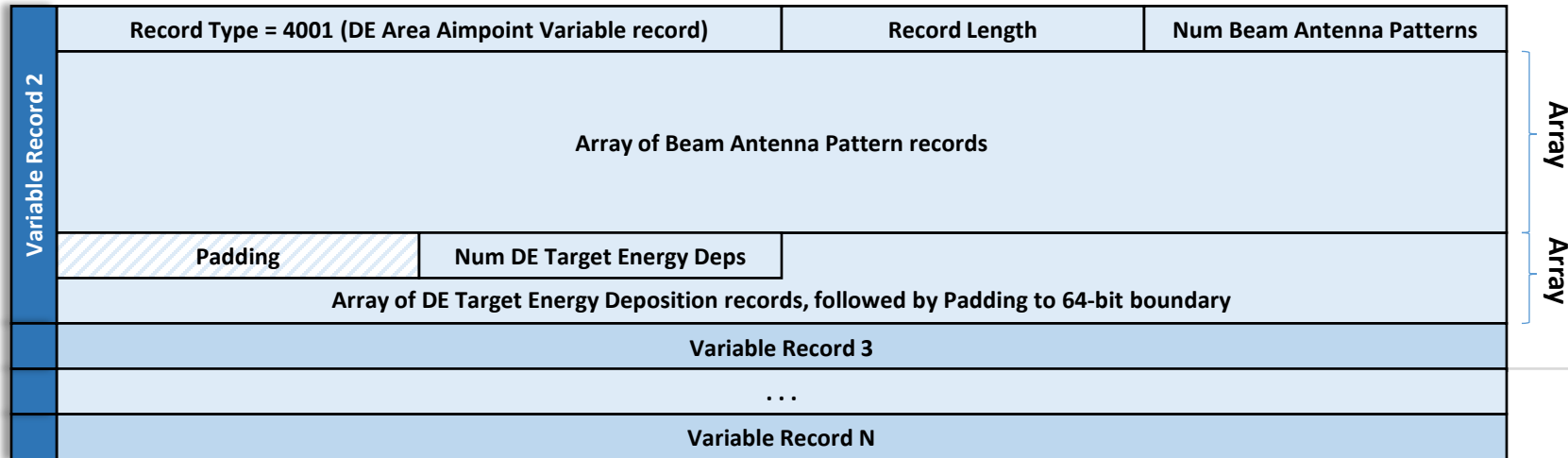
## Detonation PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Source Entity ID						Target Entity ID (Site)	
	Target Entity ID (App, Entity)				Exploding Entity ID (Site, App)			
	Exploding Entity ID (Entity)		Event ID					
	Location							
	Velocity							
	Location in Entity Coordinates							
	DTI	Det Results	Padding			Padding		
	Munition/Expendable/Explosion Type							
	Munition Descriptor							
	Explosion Descriptor						Num Variable Records (N)	
	Variable Record 1							
	...							
	Variable Record N							

## Directed Energy (DE) Fire PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Firing Entity ID						Sequence Number
	Event ID						Flags
	Munition Type						
	Shot Start Time						
	Cumulative Shot Time						
	Aperture/Emitter Location in Firing Entity Coordinates						
	Aperture Diameter				Wavelength		
	Padding				Pulse Repetition Frequency		
	Pulse Width				Pulse Shape	Padding	Num Variable Records (N)
	Record Type = 4000 (DE Precision Aimpoint Variable record)				Record Length		Padding
Variable Record 1	Target Spot World Location						
	Target Spot Entity Location						
	Target Spot Velocity						
	Target Spot Acceleration						
					Target Entity ID (Site, Application)		
	Target Entity ID (Entity)		Targ Comp ID	Spot Type	Beam Spot Cross-Section Semi-Major Axis		
	Beam Spot Cross-Section Semi-Minor Axis				Beam Spot Cross-Section Orientation Angle		
	Peak Irradiance				Padding		

## Directed Energy (DE) Fire PDU continued



## Entity Damage Status PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BDY	Damaged Entity ID						Sequence Number	
	Padding				Padding		Num Variable Records (N)	
Variable Rec 1	Record Type = 4500 (DE Damage Description Variable record)				Record Length		Padding	
	Damage Location							
					Damage Diameter			
	Temperature				Compnent ID	Damage Stat	Vis Damage	Vis Smk Color
	Fire Event ID						Padding	
	Variable Record 2							
	...							
	Variable Record N							

Service Request PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Requesting Entity ID						Servicing Entity ID (Site)	
	Servicing Entity ID (App, Entity)				Padding			
	Padding				Padding	Service Type	Num Variable Records (N)	
Var Rec 1	Record Type = XXXX (Supply Type Variable record)				Record Length		Padding	Num Types
	Array of Supply Type records							
					Padding to 64-bit boundary			
	Variable Record 2							
	...							
	Variable Record N							

Array

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## Resupply Cancel PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Cancelling Entity ID						Other Entity ID (Site)
	Other Entity ID (App, Entity)				Padding		
	Padding				Padding		Num Variable Records (N)
	Variable Record 1						
	...						
	Variable Record N						

## Resupply Offer PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Supplying Entity ID						Receiving Entity ID (Site)	
	Receiving Entity ID (App, Entity)				Padding			
	Padding				Padding		Num Variable Records (N)	
Var Rec 1	Record Type = XXXX (Supply Type Variable record)				Record Length		Padding	Num Types
	Array of Supply Type records							
					Padding to 64-bit boundary			
	Variable Record 2							
	...							
	Variable Record N							

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## Resupply Received PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Receiving Entity ID						Supplying Entity ID (Site)	
	Supplying Entity ID (App, Entity)				Padding			
	Padding				Padding		Num Variable Records (N)	
Var Rec 1	Record Type = XXXX (Supply Type Variable record)				Record Length		Padding	Num Types
	Supply Type				Padding to 64-bit boundary			
	Variable Record 2							
	...							
	Variable Record N							

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Repair Complete PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Repairing Entity ID						Receiving Entity ID (Site)
	Receiving Entity ID (App, Entity)				Padding		
	Padding				Repair		Num Variable Records (N)
	Variable Record 1						
	...						
	Variable Record N						

Repair Response PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Receiving Entity ID						Repairing Entity ID (Site)
	Repairing Entity ID (App, Entity)				Padding		
	Padding				Padding	Repair Result	Num Variable Records (N)
	Variable Record 1						
	...						
	Variable Record N						

## Electronic Emitter PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Emitting Entity ID						Sequence Number	
	Emitter System							
	Location with respect to entity							
	Padding						Num Variable Records (N)	
Variable Record 1	Record Type = 3503 (Radar Beam Variable record)				Record Length		Beam Num	Beam Status
	Beam Func	Padding	Beam Parameter Index		Frequency			
	Frequency Range				Effective Radiated Power			
	Pulse Repetition Frequency				Pulse Width			
	Beam Azimuth Center				Beam Azimuth Sweep			
	Beam Elevation Center				Beam Elevation Sweep			
	Beam Sweep Sync				Padding			
	Jamming technique				High Density	Padding	Number of Targets	
	Array of Track/Jam Data records							
		Variable Record 2						
	...							
	Variable Record N							

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## Designator PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Designating Entity ID						Sequence Number	
	Designator System			Num Bms				
	System Beam Origin Offset							
	Padding						Num Variable Records (N)	
Variable Record 1	Record Type = TBD (Laser Beam Variable record)				Record Length		Beam ID	Bm Status
	Beam Parameter Index		Beam Code		Beam Func	Bm Shape	Padding	
	Power				Wavelength			
	Pulse Repetition Frequency				Pulse Width			
	Beam Width				Aperture			
	Beam Spot Location							
	Illuminated Object ID						Spot Type	Mot Patrn
	Beam Spot Offset wrt Illuminated Object							
					Padding			
		Variable Record 2						
	...							
	Variable Record N							

## Underwater Acoustic PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length		
	Timestamp								
BODY	Emitting Entity ID						Sequence Number		
	Padding								
	Padding		Padding	Prplsn Config	Passive Parameter Index		Number Variable Records (N)		
	Entity Appearance				Entity Capabilities				
Var	Record Type = 6000 (UA Shafts Variable record)				Record Length		Padding	Num Shafts	
	Array of Shaft records								
Var	Record Type = 6001 (UA APA Variable record)				Record Length		Padding	Num APAs	
	Array of APA records				Padding to 64-bit boundary				
Variable Record 3	Record Type = 6002 (UA System Variable record)				Record Length		Padding		
	Acoustic Emitter System								
	Location with respect to entity								
	Padding				Padding		Padding	Num Beams	
	Array of UA Beam Parameter records								
	Variable Record 4								
	...								
	Variable Record N								

Array Array

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# Identify Friend Foe (IFF) PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Emitting Entity ID						Sequence Number	
	System ID						Sys Designatr	Sys Specific
	Sys Status	Data Field 1	Padding	Data Field 2	Parameter 1		Parameter 2	
	Parameter 3		Parameter 4		Parameter 5		Parameter 6	
	Padding						Num Variable Records (N)	
Var Rec 1	Record Type = 5015 (IFF Emissions Data Variable record)				Record Length		Specific Info	Padding
	Beam Data				Op Param 1	Op Param 2	Num IFF Param	
					Array of IFF Fundamental Parameter records			
Var Rec 2	Record Type = 5017 (IFF Mode 5 Transponder Variable record)				Record Length		Specific Info	Padding
	Reporting Simulation				Padding			
	Mode 5 Transponder Basic Data							
Var Rec 3	Record Type = 5019 (IFF Mode S Transponder Variable record)				Record Length		Specific Info	Padding
	Reporting Simulation				Padding			
	Mode S Transponder Basic Data							
	Variable Record 4							
	...							
	Variable Record N							

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## Transmitter PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length
	Timestamp						
BODY	Transmitting Entity ID						Sequence Number
	Radio Type						
	Frequency						
	Padding						
	Radio Number		Xmit State	Input Src	Padding		Num Variable Records (N)
	Record Type = 3001 (Transmitter State Variable record)				Record Length		Padding
Var Rec 1	Transmit Frequency Bandwidth				Power		
	Antenna Location						
Var Rec 2	Record Type = 3002 (Voice Signal Variable record)				Record Length		Encoding Scheme
	Sample Rate				Samples		Data Length
	Array of Sample Data						Padding to 64-bit boundary
	Variable Record 3						
	...						
	Variable Record N						

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## Transfer Ownership PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Originating ID						Receiving ID (Site)	
	Receiving ID (App, Reference)				Request ID			
	Padding							
	Transfer Entity ID					Reliability	Transfer Type	Num Variable Records (N)
Var Rec 1	Record Type = XXXX (Record Set Variable record)				Record Length		Padding	
	TO Record ID				TO Record Set Serial Number			
	Padding				TO Record Length		Number of TO Records	
	Array of TO Record Values						Padding to 64-bit boundary	
	Variable Record 2							
	...							
	Variable Record N							

Array

- SIMAN PDUs Record and Set Record also use Record Sets
- Can we share the Record Set Variable record with those PDUs?
  - Wouldn't be able to call them TO records
  - But they need a name to distinguish them from Variable records

Environmental Process PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	Environmental Process ID						Sequence Number	
	Environment Type							
	Padding							
	Padding				Model Type	Env Status	Num Variable Records (N)	
Var Rec 1	Record Type = XXXX (Bounding Sphere Variable record)				Record Length		Index	Padding
	Centroid Location							
	Radius				Padding			
Var Rec 2	Record Type = XXXX (Flare State Variable record)				Record Length		Geometry Index	
	Munition Source							
	Number Intensity				Number of Sources			
	Time Since Creation				Padding			
	Variable Record 3							
	...							
	Variable Record N							

## Information Operations (IO) Action PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length	
	Timestamp							
BODY	IO Attacker Entity ID						IO Primary Target Entity ID	
	IO Primary Target Entity ID				Request ID			
	IO Warfare Type		IO Simulation Source		IO Action Type		IO Action Phase	
	Padding							
	Receiving Sim ID						Num Variable Records (N)	
Var	Record Type = 5501 (IO Communications Node Variable record)				Record Length		Node Type	Padding
	Communication Node ID							
	Variable Record 2							
	...							
	Variable Record N							

## Information Operations (IO) Report PDU

HDR	Proto Ver	Compat Ver	Exercise ID	PDU Type	PDU Status	HDR Len	PDU Length		
	Timestamp								
BODY	IO Attacker Entity ID						IO Primary Target Entity ID		
	IO Primary Target Entity ID				IO Simulation Source		Report Type	Padding	
	Padding						Num Variable Records (N)		
Var	Record Type = 5500 (IO Effect Variable record)				Record Length		IO Status	IO Link Type	
	IO Effect	Duty Cycle	IO Effect Duration		IO Process		Padding		
	Variable Record 2								
	...								
	Variable Record N								