

## DATA SHEET

## Threat Evaluation and Weapon Assignment

Cambridge Pixel's Threat Evaluation and Weapon Assignment (TEWA) system comprises a set of modules that support maintenance of asset and weapon databases, real-time threat evaluation and display, and operator-controlled flexible weapon assignment as a response to new threats.



TEWA may be used as part of a highly capable and cost-effective integrated air defence system, and when used in conjunction with Cambridge Pixel's world-leading target tracking capability, can support a wide range of legacy radars with analogue interfaces as well as more recent radars which provide a network-based source of video, plots or tracks.

SPx Threat Processor accepts track reports from the SPx Fusion server, with the input to the fusion server being primary tracks from SPx Server, Asterix CAT48 reports or tracks from other sources (converted using Cambridge Pixel's SPx Track Manager). These track reports may optionally be passed through SPx Track Manager as a first-stage filter to remove targets that are not of interest for subsequent threat evaluation.

The threat processor applies a number of algorithms to each target report in real-time to calculate an overall base threat score. This takes into account the user-assigned threat level (if any), any automatic classification from the tracker, the track speed, the track's origin and the target's manoeuvrability based on recent observations.

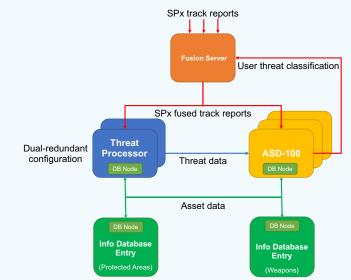
## Features:

- Target motion reports as ASTERIX Cat 48
- Primary and ADS-B targets fused before evaluation
- · Database of assets and associated priority
- Database of weapon types and availability
- Flexible and configurable threat scoring
- Threat classification by user
- Threat score based on target range, speed, automatic/user classification, origin, course deviation, manoeuvrability and asset priority
- Fully integrated with ASD-100 for simultaneous display of multiple threats and per-threat engagement for first-stage weapon assignment
- Weapon assignment based on threat dynamics and weapon capability and location
- Fully distributed architecture supports multiple operator displays and target engagement

For each defined asset, per-track calculations based on range-to-track (RTT) and time-before-hit (TBH) are performed. The sum of these scores is combined with the priority to form a total asset score. ASD-100 receives the threat data and presents it as vectors from target to

asset symbology with threat level indicated graphically and TBH as a label on vectors.

The operator can then select a specific threat and view intercept calculations based on target position and dynamics, asset location and weapon capability and availability. A selection of potential interception strategies including frontal, stern, beam and cut-off is presented in the ASD-100 display, and for each strategy, the time to intercept is indicated. Based on this information, the operator can decide on the most appropriate intercept strategy to deploy.



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SPx Threat Processor								-		🐼 Weapon	s Table			
plication														
Track Limits	Tracks									- Interception				
Min Speed: 100 🔹 m/s Max Range: 20000 🔹 m	Name	Total Score	Level Score	e Class Scor	e IFF Score	Speed Score	Origin Score	Manoeuvre Score	PL Score	Profile:			10	✓ Use Altitude
Max Speed: 500 m/s			200.000	0.000	0.000	0.480	0.000	1.000	0.450	St. 2000 00000000000000000000000000000000	and the second sec		and the second se	Num Interceptions: 3
head	Plane-2		200.000	0.000	1.000	0.400	0.000	2.000	0.163					-
rack Threat Level	Plane-3 Plane-4		200.000	0.000	0.000	0.480	0.000	1.000	0.640	- Tactic				Details
Unclassified Score: 200.000	Pione-4	202.734	200.000	0.000	1.000	0.000	0.000	1.000	0.134		None	🕘 Cut Off		Name: INTCP-2
riendly Score: 0.000 Civilian Score: 0.000											Frontal	Beam	Stern	Target: Plane-2
leutral Score: 100.000 🜩 Hostile Score: 200.000 🌩										TCA:	0	Auto	~	
Track Classification														Distance: 24.43 NM
Class Code: 1 V Score: 100.000	Selected Track									K:	10			Time: 1m 10s
	Protected Local	ions												
rack IFF	Name	Total Score	Priority	RTT Score	TBH Score					AD:	1.0			
Unknown IFF Score: 1.000	Bridge	0.000	0.700		0.000					AD.	1.0 -			
rack Speed	Command HQ				0.000									
Max Speed Weighting: 1.000	Hospital	0.122	1.400		0.087					Province of the second	Pier and a second second	L COMPANY		
	Orphanage Radar Station		0.500		0.000					Name				
Frack Origin	Read States	0.105	0.000	0.017						Carlos de la				
Sector Index: 1 V Score: 0.000										SAM-1	Normal	255	47s Cut Off	
Sector Start: 0.0 + • Sector End: 90.0 + •										INTCP-2	Normal	0s	1m 10s Ster	
Frack Manoeuvres	Track Informati									INTCP-1	Normal	10s	1m 19s Ster	n
Accel Thresh: 10.0 n/s <sup>2</sup> Score: 1.000	Protected local	ion:	2 Radar Sta	tion					^	INTCP-3		0s	1m 44s Cut	
ROT Thresh: 2.0 + o/s Max Count: 10 +	CPA:		12349.2 m	n / 76.4 s						SAM-2	Normal	0s	2m 48s Cut	044
	Range to tra Time before	ck (RTT): hit (TBH):	19650.2 m 138.2 s	n							Contraction of the local division of the loc		a contract of the second second	
ROC Thresh: 100.0 m/s	Protected local CPA:	ion:	Hospital 23104.3 m	. 167.0 -						SAM-3		0s	Out Of Rang	
Protected Locations	Range to tra	ck (RTT):	26710.7 m	n/07.05										
RTT Weighting: 1.0 TBH Weighting: 1.0	Time before Protected local	hit (TBH):	182.5 s Command	HO										
	CPA:		23138.5 m	n / 232.9 s										
Status	Range to tra Time before	ck (RTT):	52007.2 m 348.6 s	n										
Connected clients: 1	Protected local		348.6 s Bridge						~					

Assets and weapons are held in a custom distribute database implemented using Cambridge Pixel's Network Data Sharing capability. Any changes to objects in the database are immediately reflected to all other database entry instances and consumers the data including ASD-100 and the threat process This provides a highly resilient architecture that is i dependent on the continued operation of specific nodes.

ted	Specifications	
	Platform:	Windows 10
to	Configuration:	Configuration file read at start-up
s of sor.	Track input:	SPx format from Fusion
not	Number of Tracks:	Unlimited
	Number of Assets:	Unlimited
	Threat Factors:	Range
×		Speed
~		Manoeuvrability
		Sector of Origin
		User Classification
		Automatic Classification
		Range to Target
×		Time Before Hit
VitStatus	Weapon Assignment Factors:	Location
		Readiness
		Range
		Performance Profile
		Weapon Fit (for Flying Assets)
	Intercept Options:	Cut-off
		Frontal
		Beam

					7.071114, 3		466.5knots		201.120	
Plane-1	55" 29'	17.33 <b>"N</b> ,	04" 37'	41.52"W	4.00NM, 2	63.0"	466.5knots	0 353°	200.930	
Plane-2	55° 28'	41.26"N,	04° 39'	53.65"W	5.33NM, 2	158.2*	388.8knots	0 356°	201.563	
					45.24101,		583.2knots			

Create.	. Edi	it	Delete	⊳E								
Name [1]	Туре	ID	HomeLatitude	HomeLongitude	Status	TUR	TrackID	Latitude	Longitude	LLStatus	Altitude	AltStatus
INTCP-1	Interceptor	1	55.954314%N	04.480414°W	Normal	00:00:10	0	55.954314%N	04.480414ºW	2	0.0	2
INTCP-2	Interceptor	2	55.7543149N	04.261919°W	Normal	00:00:00	0	55.7543149N	04.261919°W	2	0.0	2
INTCP-3	Interceptor	2	56.252656°N	04.456456°W	Normal	00:00:00	0	56.252656°N	04.456456°W	2	0.0	2
SAM-1	SAM	1	55.826454%	04.261919°W	Normal	00:00:25	0	55.8264549N	04.261919°W	2	0.0	2
SAM-2	SAM	1	56.892968®N	05.126823°W	Normal	00:00:00	0	56.892968 N	05.126823°W	2	0.0m	2
SAM-3	SAM	1	56.350258 N	07.143823°W	Normal	00:00:00	0	56.350258 N	07.143823°W	2	0.0m	2

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