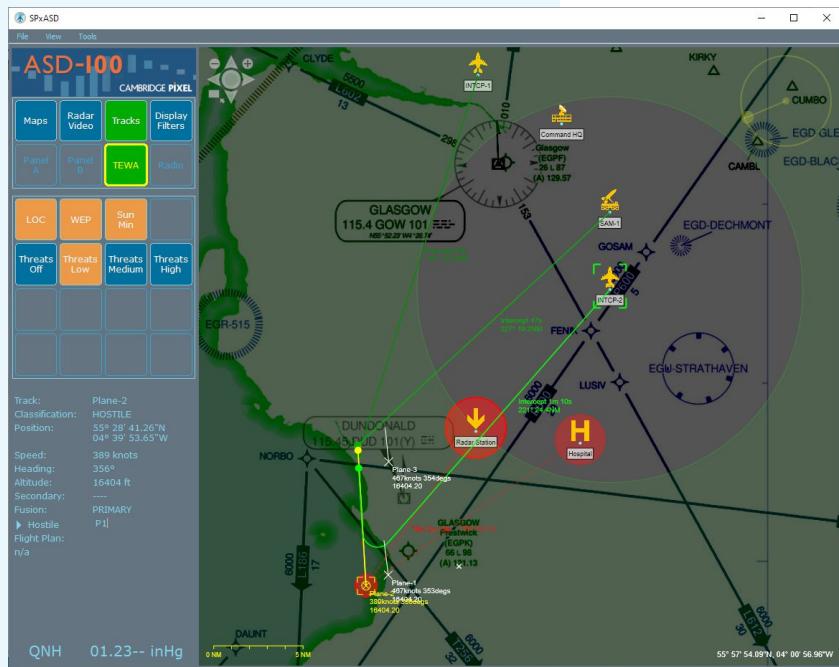


Threat Evaluation and Weapon Assignment (TEWA)



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

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.

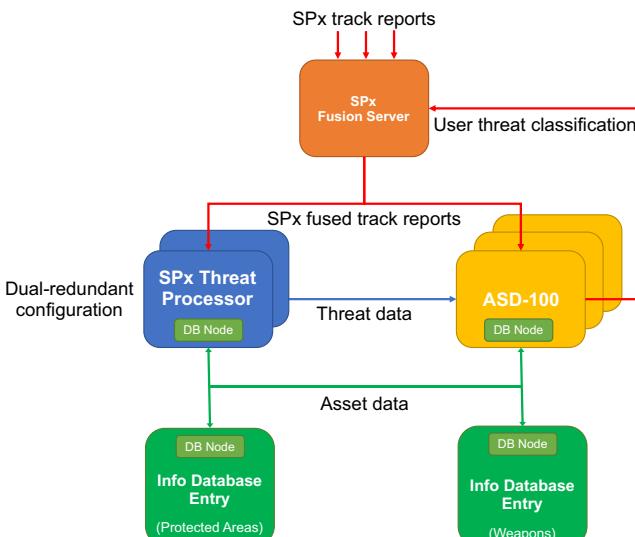
TEWA may be used as part of a highly capable and cost-effective integrated air defence system, and when used in conjunction with Cambridge Pixel's world-leading target tracking capability, can support a wide range of legacy radars with analogue interfaces as well as more recent radars which provide a 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 CAT-48 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.

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.



Threat Evaluation and Weapon Assignment (TEWA) Specifications

CP-16-444-01, Issue 1.2

DATASHEET

SPx Threat Processor Application

Tracks

Name	Total Score	Level Score	Class Score	IFF Score	Speed Score	Origin Score	Manoeuvre Score	PL Score
Plane-1	201.120	200.000	0.000	0.000	0.480	0.000	1.000	0.480
Plane-2	203.563	200.000	0.000	1.000	0.480	0.000	2.000	0.163
Plane-3	202.120	200.000	0.000	0.000	0.480	0.000	1.000	0.480
Plane-4	202.794	200.000	0.000	1.000	0.600	0.000	1.000	0.194

Selected Track: Protected Locations

Name	Total Score	Priority	RTT Score	TBH Score
Bridge	0.000	0.700	0.000	0.000
Command HQ	0.000	1.000	0.000	0.000
Hospital	0.122	1.400	0.000	0.087
Orphanage	0.000	0.700	0.000	0.000
Radar Station	0.163	0.500	0.017	0.309

Track Information

Protected location	CPA:	Range to track (RTT):	Time before hit (TBH):
Radar Station	12349.2 m / 76.4 s	358.5 m	138.2 s
Bridge	20304.3 m / 67.0 s	367.3 m	182.5 s
Command HQ	21188.5 m / 232.9 s	52097.2 m	348.6 s

Weapons Table

Interception Profile: Short Medium Long

Tactic: None Cut Off Frontal Beam Stern

Details: Name: INTCP-2 Target: Plane-2 Status: Available Distance: 24.43 NM Time: 1m 10s CTP: 55° 31' 07.96" N 04° 37' 39.74" W

Selected Track: Interception of Plane-2

Name	Status	TUR	Interception of Plane-2
SAM-1	Normal	25s	47s Cut Off
INTCP-2	Normal	0s	1m 10s Stern
INTCP-1	Normal	10s	1m 19s Stern
INTCP-3	Normal	0s	1m 44s Cut Off
SAM-2	Normal	0s	2m 48s Cut Off
SAM-3	Normal	0s	Out Of Range

Assets and weapons are held in a custom distributed 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 of the data including ASD-100 and the threat processor. This provides a highly resilient architecture that is not dependent on the continued operation of specific nodes.

Track Table

Total Tracks: 4

Name	Coordinates	Position	Velocity	Threat
Plane-3	05° 38' 37.45"N, 04° 37' 40.38"W	7.07NM, 325.3°	446.8knots @ 354°	201.120
Plane-1	05° 29' 51.73"N, 04° 37' 41.62"W	4.00NM, 269.0°	446.8knots @ 353°	200.930
Plane-2	05° 29' 41.26"N, 04° 39' 53.65"W	5.03NM, 269.2°	389.8knots @ 356°	201.563
Plane-4	05° 13' 32.43"N, 04° 10' 30.20"W	45.24NM, 14.8°	583.3knots @ 220°	201.794

Weapon Status

Name	Type	ID	HomeLatitude	HomeLongitude	Status	TUR	TrackID	Latitude	Longitude	LLStatus	AltStatus	
INTCP-1	Interceptor	1	55.754314N	04.480414W	Normal	00:00:10	0	55.754314N	04.480414W	2	0.0	2
INTCP-2	Interceptor	2	55.754314N	04.261919W	Normal	00:00:10	0	55.754314N	04.261919W	2	0.0	2
INTCP-3	Interceptor	2	56.252655N	04.456456W	Normal	00:00:00	0	56.252655N	04.456456W	2	0.0	2
SAM-1	SAM	1	55.826454N	04.261919W	Normal	00:00:25	0	55.826454N	04.261919W	2	0.0	2
SAM-2	SAM	1	56.892969N	05.126823W	Normal	00:00:00	0	56.892969N	05.126823W	2	0.0m	2
SAM-3	SAM	1	56.350258N	07.143823W	Normal	00:00:00	0	56.350258N	07.143823W	2	0.0m	2

Specifications

Platform: SPx format from Fusion

Configuration: Configuration file read at start-up

Track input: Unlimited

Number of Tracks: Unlimited

Number of Assets: Unlimited

Threat Factors:

Windows 11

Range

Speed

Manoeuvrability

Sector of Origin

User Classification

Automatic Classification

Range to Target

Time Before Hit

Weapon Assignment Factors:

Location

Readiness

Range

Performance Profile

Weapon Fit (for Flying Assets)

Intercept Options:

Cut-off

Frontal

Beam

Stern

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