

Boeing

E-3D

SENTRY AEW MK1:

The Future

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The first article on the E-3 covered the differing variants and capabilities of the Sentry along with its crew composition and tasking issues. The E-3D fleet now finds itself pivotal to any military operation, and in scenarios far more complex than those envisaged by procurement staff in the 1980s. The development of Composite Air Operations (COMAO) and the increased emphasis on out-of-area operations with UN and NATO forces have seen the E-3 move away from its traditional AD role. Connectivity with fixed ADGE units is no longer the norm, with E-3 tasking for deployed JFACCs, maritime units and a myriad of airborne C41 assets often taking priority. Similarly, E-3D controllers are now as likely to find themselves working with CAS aircraft and SF helicopters than with their more traditional DCA roles. This article explores what the future may hold for the RAF E-3D fleet in terms of upgrades, and, using a fictitious scenario, how it should fit into future operations with other assets.



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E-3D - THE WAY FORWARD

Since 1991, when the E-3D entered RAF service, it has become apparent that the aircraft has great potential for future development in both its capabilities and roles. The Sentry was initially procured as an AEW platform; however, the increasing emphasis on out-of-area operations dictate that the aircraft must be able to meet the changing requirements of tomorrow. Accordingly, an E-3D In Service Upgrade Working Group has been established to examine a variety of options aimed at increasing the E-3D's interoperability and cost effectiveness in the joint operations of the future.

AVIONICS UPGRADES

Although not directly impacting the ability of the E-3D's mission system, a number of upgrades to the airframe and avionics will considerably enhance the ability of the aircraft to deploy safely and at reduced cost. Currently, the E-3D has a traditional 4 man flight deck system (GINS), but improvements are funded, such as the installation of a GPS integrated navigation, which, together with CNS/ATM improvements, may allow for reduction in the size of flight crew, in the longer term. However, in the wider field, implementation of systems compliant with Reduced Vertical Separation

Minima (RVSM) and Traffic alerting and a Collision Avoidance System (TCAS) requirements mean that the E-3 is already being forced to use lower, uneconomical non-RVSM routes. Thus, an E-3D cockpit upgrade is increasingly being examined as a method of incorporating more modern avionics such as Electronic Flight Instrumentation Systems (EFIS), incorporating TCAS. Moreover, EFIS could allow for a limited tactical display to be available for the flight deck.

MISSION SYSTEM

Radar System Improvement Programme (RSIP). This upgrade will improve the capability of the E-3 AN/APY-2 surveillance radar to detect low radar cross section targets, whilst also improving its overall performance and clutter rejection. Already funded for installation on USAF, NATO and RAF E-3s, RSIP modified ac are presently undergoing evaluation. The first RAF E-3D will be RSIP modified by early 1999 and the whole fleet will be complete by early 2001. Aside from the overall increase in radar performance, the RSIP will also see a new Radar Technician (RT) console installed, allowing for improved in-fit radar monitoring and fault diagnosis.

IFF Upgrades. Concurrent with RSIP will be a modification to the E-3 IFF system to improve its overall tracking accuracy, particularly during COMAO ops.

ESM Upgrades and Defensive Aids Sub-System (DASS). The E-3D fleets ESM advantage is already being eroded as its Yellow Gate system approaches obsolescence and other E-3 fleets are equipped with the superior Boeing AN/AYR-1 system. Moreover, an upgrade will likely be required early next century as the Nimrod MRA4 fleet enters service with the ELTA ESM system. Options for any E-3D ESM upgrade would probably include both the AN/AYR-1 or ELTA integrated with a DASS.

Additional Consoles and Radios. To enable the E-3D to function as a true AWACS (as opposed to AEW) platform, additional mission crew consoles are essential. All USAF E-3B/Cs have been upgraded with an additional 5 consoles giving 14 compared to other E-3 operators 9 mission consoles. NATO E-3As are already planned to receive these additional consoles by 2004 and studies are in hand to justify a similar enhancement for RAF E-3Ds. These additional consoles and radios would greatly increase the flexibility for the E-3D to accept additional taskings associated with out-of-area and COMA ops without compromising other tasks. In addition, a limited PC-based display at seat 18 would allow for easier integration of an Airborne Command Elements (ACE) team during certain operations.

Mission System Upgrades. Numerous mission system upgrades are being studied for the E-3D, the most important being the development of Windows based 'Open System Architecture'(OSA) displays for the mission crew. OSA allows for greatly improved mission displays with increased on-board data processing including access to the internet and new generation C41 systems. Moreover a Commercial Off The Shelf (COTS) OSA should allow for upgrades to be installed at greatly reduced cost and in shorter time scales.

REAL WORLD EMPLOYMENT

Assuming the E-3D upgrades are fulfilled, the RAF will find itself with a greatly enhanced force multiplier that is highly mobile and offers enormous flexibility. It would prove to be an excellent defence budget investment. A brief fictitious scenario some 10 years from now demonstrates why.

The EF2000 FA1 is established in service as are the Bombardier Global Express based Airborne Stand-Off (ASTOR) system, Nimrod MRA4 and the Tornado GR4. Yellowland with extensive mineral deposits and a strategic port, has decayed into anarchy following the collapse of its currency and an attempted military coup. There is widespread anti-western feeling and the large Anglo-French community employed by the mineral and marine commercial sectors is completely isolated. Moreover, Yellowland has strongly criticised the neighbouring democracy of Whiteland for their pro-western stance and trade links, and a number of Yellow overflights have occurred of White territory. Yellow military assets are as follows:

- 22 x SU-35 Flanker E armed with AA-12, 11, 10 and 8.
- 15 x MiG-21 Fishbeds upgraded with Israeli avionics and armed with the Python 4 AAM.
- 30 x SU-22M Fitter H.
- 8 x SU-24 Fencer D. AAR capable.
- 15 x Mirage F1 armed with Exocet. AAR capable.
- Various SAM assets including SA-12, 6, 2 and Crotale.
- Limited naval capability of OSA 2 Fast Patrol Boats.
- Large but poorly trained ground forces, although Scud SSMS are still in service and unlocated.

The WEU has decided to evacuate all French and British nationals from Yellowland pending a UN decision on the crisis, and has accepted an offer from Whiteland for basing rights within their borders providing White territorial integrity can be re-established and maintained. With this authority, the WEU has agreed to the following deployment of assets from the newly formed European Air Group (EAG) and a number of associated naval and land based assets:

French Forces

- 1 CVN 'Charles de Gaulle' with 18 Rafale M, 2 E-2C and helo support. Various surface escorts.
- 2 E-3F, 15 Rafale D, 3 C-135F, 1 SIGINT C-160, 5 C-130 land based in Whiteland.

UK Forces

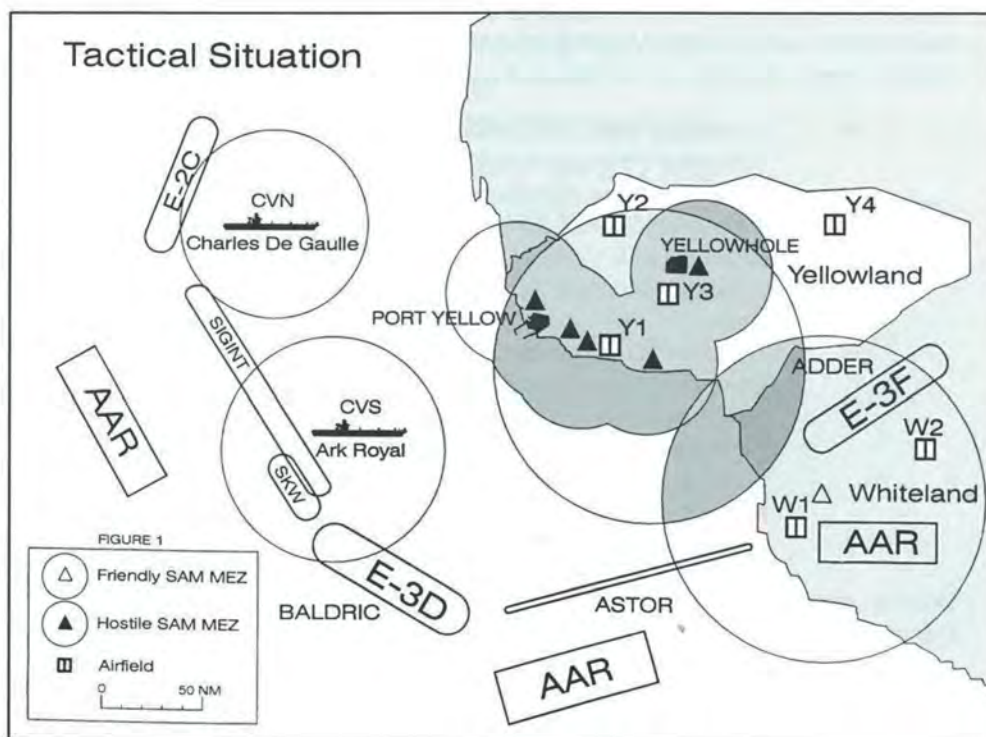
- 1 CVS HMS Ark Royal with 15 Sea Harrier FA2, 7 Harrier GR7, Sea King AEW (SKW), Merlin. Various surface escorts.
- HMS Ocean with amphibious assets and Chinook, Merlin and WAH-64D Apache helicopters embarked.
- 20 Eurofighters FA1, 25 Tornado GR4, 2 Nimrod MRA4, 1 Nimrod R1, 2 ASTOR, 2 E-3D, 5 VC-10, 5 C-130 and 2 C-17 landbased in Whiteland.

...extensive surveillance of Yellowland has been conducted by E-3, ASTOR and SIGINT assets

Other Deployment Forces. Numerous other forces are deployed in Whiteland, including a Dutch Patriot battery, RAF Regiment Rapier units, French and British airborne and Special Forces (SF) and 1 Air Control Centre1 (1 ACC).

The WEU force will be commanded from a Whiteland deployed Joint Force Headquarters (JFHQ) and CAOC under the command of a French 2 star. A map showing the disposition and political boundaries of Yellow and Whiteland, with associated forces can be found at **Figure 1**.

Figure 1.



CURRENT SITUATION

WEU forces based in Whiteland have conducted extensive overt training sorties in an attempt to re-establish Whiteland sovereignty and to place pressure on Yellow leaders. Meanwhile, extensive surveillance of Yellowland has been conducted by E-3, ASTOR and SIGINT assets. Both the French CVN and the RN CVS and amphibious Task Groups have arrived in the area with the latter SH and AH assets partly forward deployed to bases near the Yellow border. Following efforts by their respective embassies, nearly all French and British nationals have managed to gather at 2 locations; the British embassy in Port Yellow and a French ex-pat compound in Yellowhole. Both of these locations have areas suitable for helicopter landings, although hostile crowds have now surrounded these facilities and are barely under the control of local militia and police. With this deteriorating

situation, UK and French SF were covertly infiltrated into these encampments some 7 days ago, prior to them becoming surrounded. Current SF analysis is that evacuation of the ex-pats is essential in the next 48 hours. Authority to complete this operation – including the destruction of some Yellow assets to ensure the safety of friendly units – was given to the JFACC today at 1400Z. It is now 1830Z and units are preparing for a busy 12 hours

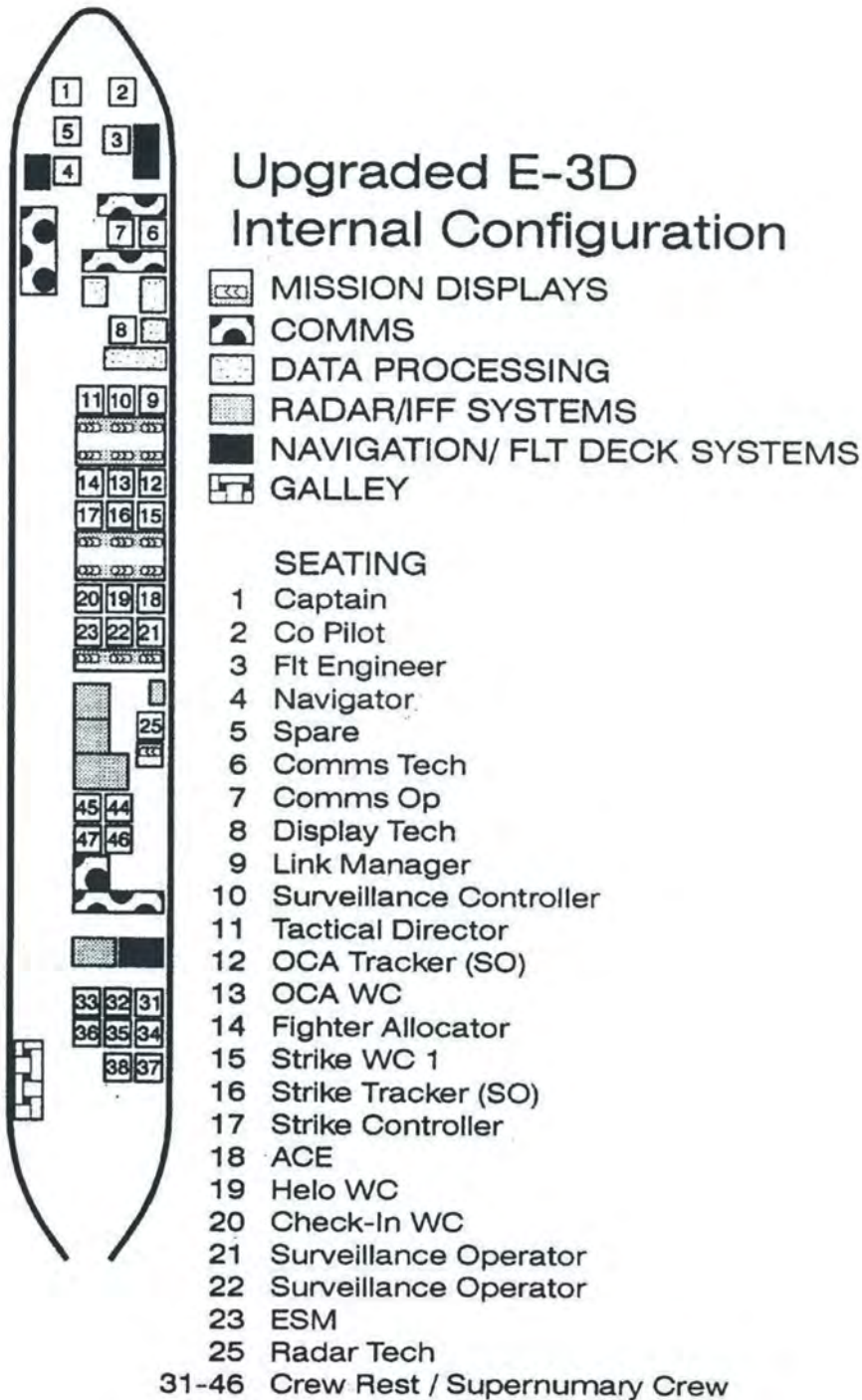
The E-3D crew arrive to be briefed on the situation. Following a crew brief at 1900Z, the aircraft launches from W1 at 2030Z to tank from a French C-135F before replacing a French E-3F on the 'Baldric' orbit. As has been happening for the previous 10 days, the handover is achieved automatically via JTIDS FTMs and the assumption of 'on-station' data-link parameters by the E-3D occurs 20 minutes earlier than fraggged at 2140Z. Unlike the French E-3F, RAF E-3D upgrades allow the aircraft to perform a true AWACS role with additional mission consoles. Therefore, the E-3D mission crew today is shown at **Figure 2** and consists of the following

- A weapons team comprising FA supported by a Check-in, OCA and 2 strike controllers. In addition, a fifth WC will be employed to control helicopters shuttling civilians between Port Green and the UK amphibious group off shore.
- A surveillance team comprising SC, LM and ESM operator as usual, with additional SOs to assist the OCA and strike controllers. Finally, another 2 SOs will produce the normal Surface and Recognised Air Picture (SRAP) for associated units.
- The crew TD will conduct his normal duties, but there is also a 3-man Airborne Command Element (ACE) team on board from the CAOC. This ACE team is commanded by an RAF SH Wg Cdr with another SH Sqn Ldr and an AAC Major WAH-64 Apache pilot who will be the ACE for the extraction of non-combatants from the UK embassy. Although not having direct access to mission consoles, the ACE will employ E-3 comms and act as an on-board, specialist CAOC to reduce the reaction time in this crucial op.

Once on station, the E-3D employs its data links to exchange a complete SRAP with both the French and RN TGs, the CAOC via 1 ACC, and numerous airborne assets. DCA control is conducted by the French E-3F on the 'Adder' orbit, The E-2C and SKW and 1 ACC. From 2140 – 0100Z little activity is apparent. No Yellow tactical flying is noted as they see no change to the WEU flying activity. However, as the COMAO and Helicopter crews receive final briefs in Whiteland and on board ships, last minute target surveillance is conducted by ASTOR using its Synthetic Aperture Radar (SAR) from its high level orbit. This confirms that numerous Yellow aircraft are in open dispersal at all 3 primary airbases. Y1, 2 and 4. Moreover, although strict EMCON is being observed by Yellow SAM batteries, SAR imagery locates an additional 3 SA-6 launchers that had been unlocated for the previous 3 days. This imagery is relayed via link to both the COAC and the TGs for dissemination on the intelligence network for the aircrews and the positions passed to the E-3D via JTIDS FTM.

At this stage all DCA is on cockpit ground alert consisting of 2 Eurofighter FA1s at W1, 2 Sea Harrier FA2s on Ark Royal and 2 Rafale M on the Charles De Gaulle. However, all are receiving the air picture via JTIDS and have full SA of both Yellow and White activity. Simultaneously, a Nimrod MRA4 is moving closer to land at low level to identify surface contacts detected by the E-3D maritime radar and transmitted via JTIDS, while a French SIGINT platform confirms that the

Figure 2.



Yellow SA-12 remains inactive. The way is thus clear for the helicopter carrier HMS Ocean with a type 42 destroyer as escort to move forward in EMCON silence. Ocean will position 30 miles off the Yellow coast to receive evacuated civilians from the Port area. The Nimrod quickly identifies the surface contacts as Yellow missile boats – a potential threat to HMS Ocean – and passes this information to the CAOC via SATCOM and to the ships and E-3D via JTIDS FTM. After a brief discussion at the JFHQ, the Nimrod is tasked to destroy these vessels simultaneously to the COMAO actions which will enable the extraction of the civilians. This tasking is relayed automatically by JTIDS through the E-3D to the Nimrod, still flying at low level.

At 0130Z French and RAF tankers launch, quickly followed by the assets tasked for the COMAO. The RAF E-3D will control a large COMAO to destroy Yellow SAM and GC1 sites and co-ordinate the helicopter extraction of personnel from the UK embassy in Port Yellow to HMS Ocean. DCA of Whiteland and a second extraction of civilians from Yellowhole will be co-ordinated by French E-3F. This will take the form of the seizing of the disused Y3 airfield by French and British troops flown in by C-130 and an RAF C-17. It is hoped then to employ WAH-64s to push back Yellow militia around the French Yellowhole compound allowing extraction of the civilians by SH to Y3 for onward evacuation by the C-17. This operation requires the E-3F to take an extra WC at the expense of a surveillance crewmember due to the limited number of consoles on the French jet. The E-3F will therefore be limited in its ability to perform normal surveillance duties for Whiteland, so these tasks will also be taken by the RAF E-3D. Meanwhile, maritime DCA will be controlled from the E-2C, SKW and ship controllers.

By 0215Z – controlled by 1ACC and the ships – AAR of all assets is complete and aircraft start to check-in with the E-3D. After establishment of Havequick (HQ) 11 circuits and last minute updates to the Eurofighters FA1, Rafale and Tornado GR4 by JTIDS ERV and FTM, the packages are handed over to their respective controllers. The E-3D division of crew responsibility is as follows:

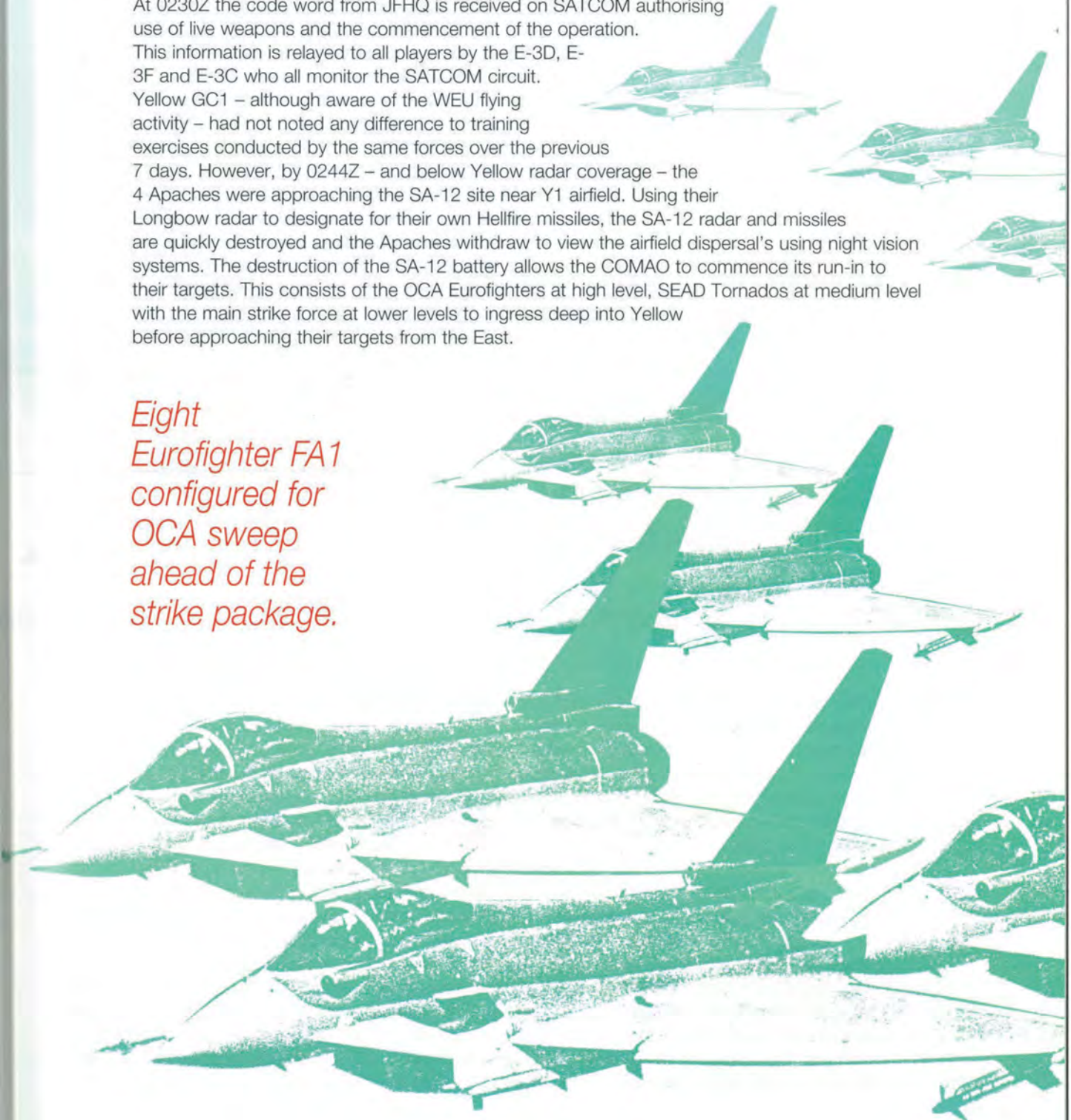
- **OCA.** This WC will control 8 Eurofighter FA1 configured for OCA sweep ahead of the strike package.
- **Strike 1.** Strike 1 controller will co-ordinate the main strike force of 10 Tornado GR4 variously configured for delivery for LGBs, Brimstone and CBU, with an additional 6 GR34 armed with ALARM in the SEAD role.
- **Strike 2.** The second strike WC will control 10 swing-role Rafale D and M armed with Mica AAMs and LGBs. Although flying with the Tornado GR4s and tasked against ground targets, they will be available for embedded OCA should the need arise.
- **Helo.** Working closely with the ACE, the fourth WC will control an RAF SH force of 6 Chinook HC3 and 4 Merlin HC2 shuttling personnel to HMC Ocean from the UK Embassy. In addition, the Helo WC will also control 8 British WAH-64s tasked to destroy the SA-12 site before covering the area around the embassy.
- **Check-in.** The fifth and final WC will be available to assist with the Helo controller should the WAH-64 and SH packages have to split and is available for overspill or CSAR once his initial check-in and marshalling role is complete.

At 0230Z the code word from JFHQ is received on SATCOM authorising use of live weapons and the commencement of the operation.

This information is relayed to all players by the E-3D, E-3F and E-3C who all monitor the SATCOM circuit.

Yellow GC1 – although aware of the WEU flying activity – had not noted any difference to training exercises conducted by the same forces over the previous 7 days. However, by 0244Z – and below Yellow radar coverage – the 4 Apaches were approaching the SA-12 site near Y1 airfield. Using their Longbow radar to designate for their own Hellfire missiles, the SA-12 radar and missiles are quickly destroyed and the Apaches withdraw to view the airfield dispersal's using night vision systems. The destruction of the SA-12 battery allows the COMAO to commence its run-in to their targets. This consists of the OCA Eurofighters at high level, SEAD Tornados at medium level with the main strike force at lower levels to ingress deep into Yellow before approaching their targets from the East.

Eight Eurofighter FA1 configured for OCA sweep ahead of the strike package.



...a volley of ALARM is launched to destroy any active SAM radars and to maintain a suppressed corridor for the ingressing strike aircraft.



Within 2 minutes of the destruction of the SA-12 by the Apaches, the French SIGINT C-160 starts to report active Yellow SAM radars turning on. This is confirmed by ESM from the E-3F, E-3D and Nimrod and parametric information quickly sent via JTIDS to the SEAD assets. This confirmation of the Yellow radars is not required however, and a volley of ALARM is launched to destroy any active SAM radars and to maintain a suppressed corridor for the ingressing strike aircraft. Simultaneously, the Nimrod has reported destruction of the Yellow missile boats to HMS Ocean and the ship continues its approach to the coast. Meanwhile, the WAH-64s have put 4 Fishbeds and 2 Flankers out of action at Y1 using guns as they transit to the port area but report a number of fast jets taxiing at the location. ASTOR confirms with its moving target indicator (MTI) radar that there is increasing activity on all Yellow airbases and that some vehicles are starting to leave Yellow military compounds. The information is relayed to the OCA and other relevant assets such as CAOC and SF at both the British embassy and the French compound at Yellowhole. By now, it is 0300Z and the COMAO is approaching the Yellow coast, the crews note that the JTIDS picture from the E-3Ds still does not indicate any Yellow fighters getting airborne. Moreover, SIGINT, ESM and the fighters own RHWRs start to show Yellow SAM radars falling silent – hopefully the result of the ALARMS. However, the SEAD aircraft follow up their initial attack with LGB and CBU to achieve hard kills as the strike packages go ‘feet dry’.



At 0318Z, the E-3D and E-2C simultaneously detect fast moving tracks getting airborne from both Y1 and Y2. As tracks are initiated by the E-3 surveillance team, ESM from both aircraft suggest them to be Flankers and the OCA controller allocates the tracks to 2 pairs of Eurofighters. Instantly, all OCA and strike assets note the initial signs of Yellow resistance and are aware from the JTIDS track category and associated calls on HQ11 that they are probably Flankers. The 2 Eurofighter cells split, remaining radar silent and accelerate towards the hostiles. Quickly, however, the Eurofighter pilots see passive Infra Red Search and Track (IRST) derived targeting symbology appear in their helmet mounted sights, confirming the E-3D JTIDS symbology. Now within AMRAAM range the Eurofighters each activate their radars and lock-up the already target-sorted Flankers. Immediately, JTIDS symbology appears on the E-3D mission crews screens showing the Eurofighters have locked up the hostiles and the OCA controller notes the launch of AMRAAMs against the Flankers. Too late, the Flanker pilots each see a brief indication on their RWRs as they accelerate away from their airbases and the AMRAAMs find their mark. As the Eurofighters return to radar silent mode and turn back towards the main part of the COMAO package, the crews of the Tornados, Rafales and DCA in the air and on cockpit alert note the disappearance of the hostile tracks from their JTIDS displays. Likewise, the CAOC and JFHQ staff are passed confirmation via SATCOM by the E-3D TD of the destruction of the Yellow fighters that they have just seen on their own displays.

With 7 minutes to go before the strike aircraft's assigned time on target, ASTOR informs the E-3D that 6 aircraft are leaving HAS protection on the northern dispersal of Y2. Mindful that the main target is the southern dispersal's of Y2, the ASTOR requests AWACS inform the strike package to allow rapid retargeting against these exposed aircraft. This information is relayed and the strike mission lead orders 4 of his aircraft to change offsets and attack the northern dispersals, whilst the swing role aircraft watch for any aircraft launching. As the strike aircraft pull up to medium level to allow TIALD designation of the southern HAS complex, fuel and bomb storage, the CBU's are released destroying the 6 Fishbeds as they prepare for take off. Between 0325 and 0330Z, strikes are carried out to hamper any Yellow operations from Y1, Y2 and Y4 airfields and additional efforts to destroy remaining SAM threats.

...in Port Yellow, RAF Chinooks and Merlins start to shuttle the trapped civilians to HMS Ocean lying 30 miles off-shore...

By 0320Z, Yellow GC1 and SAM radars have either been destroyed or turned off and the SH, C-130 and C-17 are all inbound to extract the French and UK nationals from Port Yellow and Yellowhole. The E-3D embarked ACE is happy with the current situation and directs the TD and Helo controller to pass the code word authorising seizure of Y3 and ingress to the helicopter landing sites. At 0300Z, the E-3F controlled C-130s and C-17 land at Y3, disgorging their troops and light tanks to secure the airfield that is already being patrolled by British WAH-64s. As the



first helicopters full of ex-pats leave the French compound at Yellowhole, the E-3F reports that Y3 is secured at 0335Z. Simultaneously, at the UK embassy in Port Yellow, RAF Chinooks and Merlins start to shuttle the trapped civilians to HMS Ocean lying 30 miles off-shore while more Apaches patrol the local area, their presence alone restricting opposition to small arms fire. Gradually, Yellow military assets become aware of the scale of the WEU operation and ASTOR notes convoys deploying from known Yellow Army compounds. Rapidly, the ASTOR mission crew pass target information on these convoys to 4 of the Apaches via the Improved Data Modem (IDM) UHF data link and the attack helicopters deploy to identify, and if necessary engage, the Yellow reinforcements.

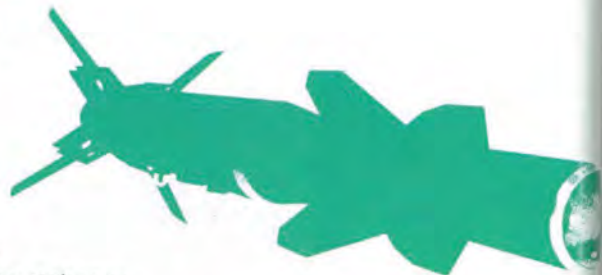
Meanwhile, the COMAO packages are egressing their targets as the SH Shuttle of civilians continues to both HMS Ocean offshore and the waiting C-17 at Y3. The 4 swing role Rafale M, free of their heavy air-ground weaponry, are now cleared to join the Eurofighter OCA as the remaining Strike assets egress at high speed over water before turning South East towards Whiteland. As the Tornados and Rafale D climb and are handed off to 1 ACC for entry into the Whiteland MEZ and recovery, the E-3D Strike 2 controller sets his Rafale MS up to cover west of the ongoing evacuations near Y3, whilst the OCA WC maintains his 8 Eurofighters covering east of Y3. Both the French SIGINT asset and ASTOR are alert for any sign of Yellow SA-2 or SA-6 site activity. However, TRDs carried by both the Eurofighter and Rafale M are effective against these older generation missiles, with optical launches or AAA considered the main threat. By 0345Z, the Apaches have located the deploying Yellow convoys from ASTOR IDM data and identified them as military. The ACE on board the E-3D instructs the WAH-64s to engage only the front and rear vehicles of each convoy to stop them with the minimum loss of life. Simultaneously, estimates from the E-3F and British SF at the embassy indicate that all British and French nationals will have been evacuated by 0340Z to either HMS Ocean or the C-17 at Y3. This will then allow the withdrawal of the C-130s and C-17 from Y3 and the British helicopter carrier from close in-shore. This sitrep is passed via JTIDS FTM to all assets.

Unfortunately, at 0352Z the E-3F and E-3D simultaneously note 4 fast contacts departing Y4 and initiate tracks. The E-3D OCA controller commits 4 of his Typhoons to the hostiles automatically via JTIDS, and the aircraft split to form an eastbound 40 miles wide wall to the approaching hostiles – with JTIDS data on your wingman, there is no need to stay visual. The Eurofighters and E-3D soon identify the bandits as Fencers via RHWR and ESM and 3 of the aircraft are splashed in snap-down AMRAAM and ASRAAM shots from the British aircraft. However, a missile failure allows one Fencer to escape and continue towards Y3. The E-3D FA instructs his OCA controller to haul off his assets from the leaker whilst Strike 2 assigns his Rafale M formation to the target. The Rafales had watched the engagement and escaping Fencer on their own JTIDS displays and were anticipating this order. Already, with full SA on the surviving Fencer and the Eurofighters turning back west, the lead Rafale launches a pair of Mica AAMs and destroys the remaining Yellow threat as he approaches from the east.

As the Apaches return from their engagement of the Yellow convoy, one of the AAC gunners notes on his night vision systems what appears to be a newly-erected Scud launcher. The E-3D passes this information to CAOC and ASTOR is directed to perform a high resolution spot SAR 'quickfire' at the area in question. This confirms the sighting and the WAH-64s are cleared to engage the SSM before returning to their patrol around the embassy. After quickly dispatching the Scud with Hellfire missiles, the 4 Apaches rejoin the main activity around the embassy. Meanwhile, the 0400Z, the Eurofighters and Rafales are getting low on fuel and are about to be replaced by fresh aircraft scrambled by CAOC. These replacement OCA Typhoons move into position having received a full update via JTIDS ERV and FTM.



By 0405Z, Yellow command is not finally mobilising its full ground capability from its military bases outside of Port Yellow, and ASTOR notes numerous vehicles deploying from these bases. This information is relayed to ground forces at both the British Embassy and French Compound and the E-3D ACE via JTIDS and secure voice. Mindful that his Apache gunships may require their remaining ordinance to



ACE orders a pair of Harrier GR7s to be scrambled from Ark Royal. These Harriers from the joint RAF-RN Maritime Air Group (MAG) employ LGBs to drop a bridge.

suppress ground activity nearer the embassy and compound, the ACE orders a pair of Harrier GR7s to be scrambled from Ark Royal. These Harriers from the Joint RAF-RN Maritime Air Group (MAG) will employ LGBs to drop a bridge and prevent the Yellow ground units reaching the Embassy area. The forming of the Joint Force 2000 MAG in 2002 meant that all Harrier GR7 were equipped with JTIDS to allow compatibility with the Sea Harrier FA2s, and the RAF crews on deck alert on board Ark Royal have been monitoring the situation on their JTIDS displays. Following rapid brief from both ASTOR and the E-3D strike 1 controller, the GR7s launch and proceed at medium level to overhead Port Yellow as the replacement OCA Eurofighters push inland to cover any response from Yellow airbases.

ASTOR passes last minute updates to the Harriers on possible AAA emplacements near the bridges, as the attack aircraft commence self designating the bridge of 0416Z. Within 2 minutes, the GR7s have destroyed the bridge with LGBs and prevented the deploying regular Yellow forces from reaching the area of the British Embassy. However, as the Harriers egress over Port Yellow, an SA-18 shoulder launched missile hits one of the GR7s. The E-3D informs CAOC and

requests HMS Ark Royal to ready CSAR assets and the aircraft's TD directs the FA and check-in controller to prepare to co-ordinate the rescue should the Harrier fail to make it back to the CVS. As this is being done, the pilot of the damaged Harrier is forced to eject only 5 miles offshore and an emergency special point designator is automatically initiated by the Harriers' JTIDS terminal showing other JTIDS units the position of the ejection.

The Nimrod MRA4 assumes On Scene Commander (OSC) for the CSAR and vectors a RN Merlin onto the JTIDS special point which is also displayed in the helicopter. By 0425Z the Chinooks have lifted the final British personnel from the Embassy compound and are withdrawing to HMS Ocean while all French nationals from Yellowhole have been flown to the waiting C-17 at Y3. Happy that no units remain, the E-3D ACE orders all assets involved in the evacuation to egress under top cover from Typhoons. As the RAF C-17 takes off from Y3 with all 130 French nationals from the French Compound at Yellowhole on board, French troops that have secured the airbase reduce their perimeter and evacuate onto the waiting C-130s. Finally, with the last C-130 airborne, the covering WAH-64s turn for White territory whilst the Typhoons remain on CAP 30 000 ft above watching the egressing friendlies on their JTIDS displays. The RN Merlin meanwhile has located the Harrier pilot under the direction of the Nimrod MRA4 OSC and is returning him to Ark Royal.

JFHQ staff in the CAOC operations room watch the JTIDS displays with satisfaction as the final EAG rescue assets cross back into White airspace, and the ACE on board the E-3D passes the mission successful code word to all players at 0500Z. This clears the remaining Eurofighter CAP to withdraw from Yellow territory as the E-3D confirms that no further hostile air activity is evident. The E-3D is due to be replaced by a French E-3F at 0600Z after over 8 hours on station and, as the EAG activity reduces to 2 DCA CAPs to cover the withdrawal of HMS Ocean, the AWACS mission crew set about updating the JTIDS FTNs to be passed to the French jet during station handover.

SUMMARY

No doubt many specialists will be able to find fault in the tactics, assumption and overall execution of the above scenario. However, it gives graphic indication of the role that an E-3D can play in modern Joint Operations. Moreover, the comparison between the capabilities of a 9 console E-3 – limited traditional AEW duties – and an E-3 with 14 mission consoles and the ability to discharge a true AWACS role illustrates the potential that the E-3D possesses. Add to this the information warfare capabilities of an 'ISTAR triad' consisting of E-3D, ASTOR and Nimrod R and one can see how real time situational awareness can be enhanced via modern data links such as JTIDS. The capabilities of such assets will provide British forces with a greatly enhanced force-multiplication capability in the coming years and will provide commanders on the ground with the necessary real-time information required of any operation. However, it is essential that such capabilities are jointly developed with our allies to ensure that UK services can quickly and effectively achieve data and C4I fusion. It is this aspect that provides the true challenge as the UK military moves into the 21st Century.

Clearly, this brief is necessarily unclassified. A more detailed E-3D Roadshow exist to increase understanding of E-3 operations and to emphasise the importance of improved training and integration with other units. The paper and roadshow presentation were prepared whilst Flt Lt O'Dell was a TD on 8 Sqn, and he has since been posted as an instructor on the E-3D OCU within 23 Sqn. If your unit could benefit from an E-3 presentation, Flt Lt O'Dell can be contacted on RAF Waddington Ext 6678 and he would be happy to tailor a presentation to your own needs.

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