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JOINT SACEUR-SACLANT Air Defence Operations in North European Waters

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Introduction

NATO planning for the defence of continental Europe by SACEUR and for maritime operations by SACLANT and CINCHAN was kept separate for many years. 'Little attention was given to … the integration of maritime and continental strategies, and the NATO command structure developed into two completely separate operational commands, SACLANT … and SACEUR. These Commands developed their own staff organisation, alert states, rules of engagement and operational doctrine'.[1] The differences are relatively unimportant to forces which are allocated to either SACEUR or SACLANT on a functional or a geographical basis, but they are extremely important to forces which have a multi-role capability or are responsible to both commanders simultaneously.

The main area in which continental and maritime responsibility overlaps lies between Norway, Iceland, Brittany and the European coastline. The area covers the strategic Iceland-Faeroes-UK gap and the air and sea approaches to the UK and major European ports. Militarily, it includes SACEUR's air defence Early Warning Area 12, a major part of SACLANT's command and the whole of CINCHAN's command. This division of responsibility, combined with the increasing participation of land-based aircraft in maritime operations, has caused problems in tactical air defence.

SACEUR and SACLANT both operate fighter, tanker and airborne early warning (AEW) aircraft in Area 12. Although SACLANT's main air power is based on board the aircraft carriers of the Strike Fleet Atlantic (STRKFLTLANT), air support for other naval groups is now provided by land-based aircraft. Procedures have been developed for the request, provision and transit of land-based aircraft to a fleet and for a limited exchange of radar information between shore stations and ships, and although 'the progress towards achieving inter-service operational capability and efficiency has been remarkable',[2] much yet remains to be done. It is only natural that air and naval commanders still tend to fight their own battles and this can often lead to duplication of effort, disruption of each other's plans and interception of each other's aircraft.

In a NATO maritime exercise in 1974 'nearly half the 60 or so aircraft "shot down" were destroyed by their own side'.[3] The lack of co-ordination is due mainly to inadequate communications between commanders, but the situation is exacerbated by the inadequacies of the common data base, by different procedures and operational doctrines and by over-lapping responsibilities. Air defence operations in North European waters should be improved; better co-ordination is needed between land-based and naval air defence forces.

Communications

Air and naval air defence (AD) commanders need to exchange three types of information to co-ordinate their operations:

Recognised Air Picture. Recognised air picture (RAP) data include the position and identification of all aircraft detected in an area. RAP data are required in real time and are exchanged continuously.

Air Transfer. Aircraft transfer information includes details of airborne times, armament, and joining and leaving instructions for land-based aircraft supporting a fleet. These messages occur frequently and require rapid transmission.

Battle Management. Battle management information is primarily concerned with deployment of aircraft and reaction to specific threats. Communications are required intermittently but immediately.

These types of information are exchanged on a variety of radio communication circuits. However, radio communication is not without its problems in northern latitudes. These include:

HF Circuit Quality. HF is notoriously unreliable in northern latitudes, and its quality varies with the time of day, the season, the weather and the location of the transmitting and receiving units. Unless special transmission techniques are used HF will normally be of poor quality and will sometimes be unusable in latitudes above about 60 degrees North. If this happens individual messages may have to be transmitted several times and the exchange of information on HF is slow and laborious.

Congestion. Ships' communications equipment is usually limited, and sometimes insufficient to meet all their tasks. The quantity of information carried, combined with the poor quality of some circuits, could result in serious congestion. Aircraft transfer information would normally be given priority, followed by RAP data. Conditions would rarely permit useful battle management discussion.

Security. HF transmissions can reveal the location of a fleet at long range, and the contents of the messages can also give away tactical information. A naval force can stop transmitting on HF to conceal its location, but this reduces any exchange of information to one-way traffic. Aircraft can be used to relay information passed on UHF, but this system has a limited range and is only effective when a relay aircraft is airborne. Messages can be coded to maintain security but unless sophisticated on-line cryptography is used this cannot be done quickly enough to cope with large quantities of information or extremely urgent messages.

Many shore sector operation centres (SOCs) and ships have automated or semi-automated RAP, and data are automatically exchanged between compatible systems. However, within NATO 'tactical communications equipment in many cases cannot directly communicate with corresponding equipment used by other nations'.[4] At sea '5 major navies use one and 3 navies use another'. As a result, 'there is no guarantee that ships can talk with each other or with a shore station'.[3] A manual system therefore has to be superimposed on the automatic system during joint operations with the consequent duplication of communications, manpower and training.

These problems of incompatible communications and data systems were foreseen.[5] It was planned to provide the NATO system with 'interface with surveillance radars of the US Sixth Fleet and possibly other NATO naval units under the Shore Buffer programme'.[6] The data were to have been transmitted on HF skywave, but this has been found to be too unreliable a medium in northern latitudes. Development of the buffer continues, and there remains an urgent need for such equipment. Alternative transmission systems either lack range or are more expensive than HF skywave, however. If a buffer system is introduced the congestion on voice circuits would be reduced and time made available for battle management discussions.

A switch from HF to satellite communications would, however, resolve most of the current problems. Satellite communications would have the range and capacity needed for automated RAP data to be exchanged, although a limited manual exchange would still be required for non-automated units. Most major ships, including STRKFLTLANT carriers and command ships, already use satellite communications for other purposes, and co-operational use of satellite communications already exists[7] between the US, UK and NATO.

A NATO airborne warning and control (AWACS) aircraft would introduce yet another communications and data handling system. However, as AWACS would also affect all the other matters discussed here, it is dealt with separately below.

Common Data Base

The RAP is the common data base used for battle management ashore and afloat. It gives the position, heading, speed, height, identification and reference number of all friendly and hostile aircraft known to be flying in an area. Data used for compiling an RAP and identifying aircraft are obtained from a variety of sources including surface and airborne radars, flight plans, in-flight position reports, IFF/SIF, and track behaviour. RAP data are exchanged by all interested units to supplement their own sources of information.

Friendly aircraft are normally distinguished from hostile by a variety of criteria. Ships and SOCs both have flight plans of land-based aircraft operating in direct support of the ships. Identification details of other aircraft are exchanged in the RAP crosstell, or the aircraft can be identified by their IFF/SIF transmissions. However, naval forces may adopt HF silence and monitor the shore RAP but not transmit. Without access to the identification criteria it would be extremely difficult for SOCs to identify aircraft under naval control. Similarly, individual

ships which are not in contact with an SOC would have difficulty in identifying all aircraft. Unidentified aircraft are very vulnerable to interception, particularly when jamming is being experienced and especially when the defence forces feel themselves actively threatened.

At present AD forces use several different geographical reference systems and various combinations of aircraft reference numbers and letters. Each type of reference is a fundamental part of the data language of an automated weapon system and cannot be changed without difficulty. A neutral grid and the reference number of the originating unit are used in joint operations, and each customer then translates the information as required. This is a slow, laborious and inaccurate process which degrades the performance of all the automated systems involved. A co-ordinated re-equipment programme would be required for standardisation, but an automatic interface, such as the ship-shore buffer, would allow the rapid exchange of automated data.

Procedural Differences

SACEUR and SACLANT 'at any time, may be holding their own alert states'.[8] This could cause two problems:

Command and Control. Control of some squadrons is transferred from SACEUR to SACLANT at a specific alert state. However, unless the procedures for generation of alert states and transfer of control are absolutely clear, some confusion could result among the forces involved in the transfer. This could also affect those airfields and SOCs which support these aircraft.

Rules of Engagement. With overlapping areas of responsibility, fighters from the same base responsible to different authorities could be using different rules of engagement (ROE) in the same area. One of SACEUR's fighters could be a considerable distance out to sea, restricted to shadowing a target. At the same time, a colleague, assigned to SACLANT and flying close to the mainland, could be cleared to engage a similar target. Enemy aircraft are unlikely to appreciate the subtle difference. If different ROE are necessary, it would be best to stipulate a clear geographical division between areas in which they each apply.

Plans exist for UK fighter, AEW and tanker aircraft to operate autonomously when their controlling SOCs are destroyed or severely hampered by jamming.[9] Communication difficulties are likely under these conditions, and co-ordination could be degraded. Heavy friendly aircraft losses could be expected unless plans for autonomous operations are standardised and well known to all participants.

Operational Doctrine

The differences in operational doctrine between naval and air AD commanders are mainly caused by the range and scale of their operations. Naval operations are concentrated on the

point defence of the parent ships whereas shore operations provide defence for large land or sea areas. The differences reduce flexibility and may cause unnecessary waste of effort.

Naval forces establish AD zones of varying size around themselves. The zones range from approximately 20 miles radius around an isolated missile-equipped ship, through 150 miles around a land-supported force, to 200 miles around a carrier group. It is a common doctrine for aircraft operating in direct support of a fleet to remain in a zone under naval tactical control, although there are occasions when shore stations could provide more effective control of AD forces.

Area 12 covers nearly one million square miles, and AD aircraft are rapidly redeployed throughout the area to match specific threats. Interceptions frequently take place at ranges up to 700 miles from the coast[10] and it is not unusual for a fighter to be tactically controlled by a number of different agencies in a single sortie. Aircraft which pose a threat to a land or island target outside a fleet's AD zone could be intercepted on the far side of the fleet, and fighters frequently transit through the zone to get to their interception point. Under these circumstances the use of carrier AD aircraft might be preferable.

Overlapping Responsibility

Some of the difficulties in co-ordination are caused by three conflicting maxims: air power should be centrally controlled; air defence is indivisible; and all forces involved in a battle at sea should be controlled by the naval tactical commander. In applying these maxims, both air and naval commanders will prefer to operate independently; indeed they are conditioned to do so by experience and training. At present, they can operate independently throughout the whole of Area 12 because both SACEUR and SACLANT have responsibilities throughout the area. This causes particular problems in the south of the area.

The airspace south of 62° North is very heavily congested with civil and military air traffic in peacetime, and the further south, the worse the congestion. In wartime, the UK fighter force would probably be concentrated in this region, and aircraft supporting the Central Front from UK will transit through it. Current communications appear inadequate for the degree of co-ordination required for peacetime flight safety requirements and for effective joint battle management in the war. The only practical alternative to effective close co-operation is the physical separation of forces under different tactical control, so far as this can be done. Separation would avoid duplication of effort, reduce friendly losses, minimise long exchanges of information and provide a clear chain of command.

To achieve separation, Area 12 could be divided approximately along the lines of 62° North and 9° West with SACEUR and SACLANT assuming responsibility to the south/east and north/west respectively. Each commander could then be given complete control over all AD forces operating within area and use his own ROE and procedures. This would require the transfer of certain radar facilities to SACLANT's control and the transfer of all carrier-borne AD aircraft in

the south/east to SACEUR's control. These, however, are radical proposals, and it is doubtful if commanders could be persuaded willingly to abdicate their sovereignty in this way.

An alternative solution would be for Area 12 to be divided along the same lines, but with commanders assuming primary responsibility only for the overall direction of forces within their sub-areas. The commanders with secondary responsibility could then exercise tactical control in mutually agreed and clearly defined and limited sectors, as follows:

North/West. Air and naval forces could operate independently in this area with little conflict. They could use SACLANT's ROE and be aware of each other's procedures. Limited battle management discussion would be required, and present communications might be adequate.

South/East. AD forces in this area could operate under SACEUR's overall direction. Naval AD commanders could exercise tactical control in sectors which could be avoided by aircraft not under their control. However, these sectors would have to be considerably smaller than the 20-200 mile radius zones currently claimed by different types of ships so that land-based aircraft could get around them. Unless there were a high probability of correct blind identification, it would be preferable for all fighters operating near a carrier to identify a target visually before firing. All forces in this area could use SACEUR's ROE. Some extra co-ordination might be possible as ships would be in range of an airborne UHF relay. A relay aircraft would be required continuously, but relatively short-range aircraft could be used.

Future Developments

The introduction of the Nimrod AEW to UK service, and the Boeing E-3A AWACS aircraft into the US and, possibly, the NATO inventory will affect all issues raised above:

Communications. AWACS and, hopefully, Nimrod will use a time division multiple access (TDMA) system for transmitting automated data.[11] Information on the Nimrod fit is sparse, but it is assumed that it will be compatible with AWACS equipment and, therefore, the TDMA. AWACS will feed data to the TDMA for relay between similarly equipped surface units and aircraft.[12] The TDMA system is not compatible with other communications systems currently in use, but it will be made inter-operable by interfacing buffers located at surface units.[13]

Other Problems. AWACS and Nimrod will provide air and naval commanders with a greatly improved data base when airborne. However, they are likely to exacerbate other problems. These aircraft will introduce a third agency to the current air/naval mixture. AEW aircraft could be switched rapidly from one NATO flank to another or deployed to Europe from the US,[14] and alert states, ROE and procedures must be standardised if the crews are to cope. Although AWACS and Nimrod will improve communications

to a degree where co-ordinated battle management will be possible, air and naval commanders will probably still prefer to operate independently. Moreover, the range and performance of AWACS and Nimrod's facilities will give them increased ability to do so. Commanders are therefore likely to compete actively for their share of an AEW aircraft's facilities. Thus a clear division of responsibility between commanders will still be required.

Command and Control Systems. Great savings could be made if NATO adopted a single, standard command and control communications system. The US Department of Defence believes that NATO AWACS 'would force cohesion in the Alliance, particularly in the Command and Control Areas'.[15] All NATO nations wishing to use AWACS or Nimrod data will require access to a TDMA terminal, and interface units for their own systems. Increasingly sophisticated interfaces will be required in the long term as US forces intend eventually to change to TDMA systems. The AWACS communications unit 'is the forerunner of a family of compatible units projected for the US tri-service joint tactical information system (JTIDS).[16] The US 'is offering NATO participation in JTIDS's development and access to US technology'.[17]

Conclusion

Lack of standardisation affects joint SACEUR/SACLANT AD operations in all fields. Incompatible communications and data handling systems currently require a superimposed manual system during joint operations. The automated systems could be made inter-operable by a series of interface buffers provided a suitable transmission medium could be provided. Satellite communications would provide such a medium and give reliable voice communication. AWACS equipment is incompatible with current surface systems. Its introduction into the NATO inventory would require widespread use of interface buffers and may eventually force nations to standardise their equipment.

SACEUR and SACLANT forces can be using different alert states and ROE in the same area at the same time. They also use different operational procedures. Standardisation in these fields would be invaluable, particularly for AWACS or Nimrod AEW aircraft which are likely to be deployed rapidly between different operational zones. However, the major operational limitation to effective AD co-ordination lies in conflicting maxims which state that both air and naval operations are indivisible. Air and naval AD commanders prefer to operate independently, and AWACS and Nimrod will increase their ability to do so. At present there are few constraints on independent AD action as Area 12 is claimed equally by SACEUR and SACLANT. A clear geographical division of responsibility for AD operations is required. This would not preclude overlapping operations but in such cases would define the senior partner. Without such a division, duplication of effort, mutual disruption and heavy friendly losses can be expected.

Notes

[1] *International Defence Review* (IDR) 6/1974, page 733.
[2] IDR 6/1974, page 733.
[3] *The Guardian*, 11 Dec 1974. Statement to the NATO Military Committee.
[4] *Aviation Week and Space Technology* (AW&ST), 28 Jun 1976, page 22.
[5] L.W. Martin, *The Sea in Modern Strategy* (1967), page 129.
[6] IDR 3/1974, page 312.
[7] *AW & ST*, 28 Jun 1976, page 21.
[8] IDR 6/1974, page 734.
[9] *The Guardian*, 8 Feb 1974.
[10] *Jane's Weapons Systems*, 1976, page 246.
[11] *AW & ST*, 26 Apr 1976, page 48.
[12] *AW & ST*, 26 Apr 1976, page 49.
[13] *IDR* 5/1975, page 672.
[14] *Annual Defense Department Report*, FY 1976 and FY 1977, pages 111-117.
[15] *AW & ST*, 21 Jun 1976, page 15.
[16] *AW & ST*, 26 Apr 1976, page 48.
[17] *AW & ST*, 21 Jun 1976, page 14.