As indicated in Chapter Two, U.S. and allied forces must be capable of responding to a broad range of contingencies that could threaten vital Western energy supplies. This chapter assesses European power projection capabilities, focusing particularly on the deployment of air power for major combat operations.\(^1\) The first section discusses current allied air forces' capabilities. The second section describes allied plans to improve their air forces' power projection prowess. The third section assesses the adequacy of current and planned capabilities against the demands of the major combat operations described in Chapter Two. The final section examines possible allied contributions in contingencies short of an MTW.

**CURRENT CAPABILITIES**

The first question often posed about allied power projection is how many aircraft the allies can muster. The recent history of collective

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\(^1\)The discussion here first presumes that the allies commit to the formation of an Air Expeditionary Force (AEF) and then considers their prospects for success given current and planned air force capabilities. It cannot be emphasized too strongly, however, that embracing the AEF concept would be a major undertaking for any of the allies and would have huge implications for their planning, training, logistics, weapons procurement, and command arrangements. In addition, the closely coordinated and tightly interdependent activities of a multinational AEF would require the participating air forces to develop much closer habits of cooperation. Thus, while a move toward the AEF notion would be a welcome one, the difficulties inherent in such a move should not be underestimated. That said, the chapter couches its examination of current and future European air power potential in the framework of an AEF.
allied air operations suggests that a reasonable assessment of the size and quality of allied contributions for any given contingency will be influenced by a number of factors. Some countries have deployed more aircraft or responded more quickly than their answers to the NATO Defense Planning Questionnaire (DPQ) indicated. In contrast, the last time a serious challenge to energy supplies arose in the Middle East—an event that could reasonably have been expected to generate a large allied response, since it affected allied interests directly—few NATO allies committed air forces to direct combat. Only France, Italy, and the United Kingdom did so, deploying 107 fighters and fighter-bombers along with 13 support aircraft. At the same time, in operations such as Deliberate Forge, the air component of the Stability Force in Bosnia, the Europeans contributed up to 96 of the 124 aircraft involved. In short, many Europeans have adopted a “coalition of the willing” approach, contributing forces to some operations out of a sense of being good European citizens, contributing to others for more compelling security considerations, and in still other instances demurring. Thus, the most useful way to gauge current European capabilities is to examine the recent record of deployments with the assumption that if the political will coalesces for air expeditionary operations, the contributions of the European allies will probably fall within a range reflected in their recent operational histories.

**Operation Desert Shield/Desert Storm**

When Iraq invaded Kuwait on August 2, 1990, America’s European allies responded slowly and unevenly. The United Kingdom was among the first to reply, announcing Operation Granby on August 9. With this announcement, Britain began deploying its air forces: a squadron of Tornado F-3 fighters and a squadron of Jaguar ground attack aircraft. These squadrons were operational in the Kuwaiti

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2For a complete description of the allied role in Operation Desert Storm, see Peters and Deshong, *Out of Area or Out of Reach?*


theater 48 hours later. Then, on August 23, London deployed a squadron of Tornado GRR-1 aircraft.

The French and Italian military responses were somewhat more deliberate. Paris began initial deployments in late August, principally of naval, helicopter, and ground force elements. France committed combat air forces only after Iraq seized the French ambassador’s residence in Kuwait on September 14. Italy deployed its air force component in September. Table 4.1 summarizes allied air force contributions to this effort.

By contrast, the U.S. force contribution dwarfed that of the Europeans. In addition to deploying roughly 1300 combat aircraft, the U.S. contributed 308 tankers, 149 transport aircraft, and 29 specialized planes ranging from reconnaissance to battle management. The U.S. contribution was also significantly larger than that of the Europeans in another critical respect: stockpiles of air force munitions in the theater of operations. Prior to Operation Desert Storm, the U.S. Air Force had 48,325 short tons of munitions pre-positioned in the region.5

**Operation Allied Force**

The most recent example of allied air operations—Operation Allied Force, conducted against Serbia—began on March 24, 1999, and

<table>
<thead>
<tr>
<th>Country</th>
<th>Fighter/Bomber</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>18</td>
<td>—</td>
</tr>
<tr>
<td>France</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Italy</td>
<td>8</td>
<td>—</td>
</tr>
<tr>
<td>U.K.</td>
<td>49</td>
<td>7</td>
</tr>
<tr>
<td>U.S.</td>
<td>1317</td>
<td>486</td>
</tr>
<tr>
<td>Totals</td>
<td>1424</td>
<td>499</td>
</tr>
</tbody>
</table>

**Table 4.1**

*NATO Contributions of Air Forces in Desert Storm*


---

ended on June 20, 1999. The military objective of this effort was “...to degrade and damage the military and security structure that President Milosevic [Yugoslav president] has used to depopulate and destroy the Albanian majority in Kosovo.”

All 19 NATO members contributed to that objective, and 13 of them flew missions in the air campaign. The United States and the allies deployed some 770 and 275 aircraft, respectively. The allied contribution included 192 fighter-bombers, 63 support aircraft, 19 reconnaissance aircraft, and three helicopters. In addition, France and Britain both operated an aircraft carrier in the area. Table 4.2 lists the numbers and types of aircraft contributed by key allies.

The deployment decision process developed over a period of several months, so Allied Force was not a test of prompt deployment. The

<p>| Aircraft Contributions from Key Allies |</p>
<table>
<thead>
<tr>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Netherlands</th>
<th>U.K.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Jaguar</td>
<td>14 Tornado</td>
<td>12 Tornado ECR/IDS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14 F-16AM</td>
<td>3 E-3D</td>
</tr>
<tr>
<td>4 Mirage F1CR</td>
<td>1 C-160</td>
<td>6 AMX</td>
<td>6 F-16</td>
<td>16 Harrier GR-7</td>
</tr>
<tr>
<td>11 Mirage 2000C</td>
<td>6 F-104 ASA</td>
<td>1 Canberra PR-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Mirage 2000D</td>
<td>6 Tornado IDS</td>
<td>4 L-1011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 C-160</td>
<td>4 Tornado ECR/IDS</td>
<td>12 Tornado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 KC-135</td>
<td>4 F-104 ASA</td>
<td>5 VC-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Mirage IV-P</td>
<td>1 Boeing 707T</td>
<td>7 Sea Harrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 E-3F SDCA</td>
<td>14 Super Etendard</td>
<td>7 Sea Harrier FFA-2&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Etendard IV&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4 Super Frelon</td>
<td>10 Sea King</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>15</td>
<td>39</td>
<td>20</td>
<td>58</td>
</tr>
</tbody>
</table>


<sup>a</sup>ECR = electronic combat and reconnaissance; IDS = interdiction and strike.

<sup>b</sup>Indicates carrier-based aircraft.

7Ibid.
NAC issued the activation order on October 13, 1998. On January 20, 1999, NATO decided to increase the readiness of the assigned forces so that they would be able to execute an operation on 48 hours’ notice. Further instructions increasing readiness were issued nine days later. On March 22, in response to Belgrade’s continued intransigence, the NAC authorized the UNSC to decide on a broad range of air operations should they become necessary. Air operations began two days later.

Figure 4.1 summarizes the allied sorties flown in Operation Allied Force and Operation Deliberate Force. Owing to Kosovo’s demanding topographical conditions, strict rules of engagement, and poor weather conditions, a premium was placed on PGMs and on aircraft that could support the strike sorties flown by NATO. Of the 38,000 sorties flown, 27 percent were strike and 73 percent support sorties.8 (Strike sorties are those actually designated to drop munitions on targets; support sorties are all others involved in the air campaign.) The allies flew a considerable number of strike sorties, comprising 47 percent of the total—but that overstates their contribution. Of the sorties that required precision strike or that took place in adverse weather conditions, a disproportionate number were flown by the United States.9 Of the 23,614 air munitions released by NATO aircraft, more than 30 percent were PGMs.10 This represents a sharp increase over the amount dropped in the Persian Gulf War, where the proportion of PGMs was only 10 percent of the total dropped. There is every reason to believe that this proportion will increase further in future conflicts. The number of PGMs dropped by the European allies was only 7 percent of the overall total, reflecting a shortfall in these types of weapons among the Europeans.

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Another important component of Operation Allied Force was the support element. Tankers, electronic warfare, surveillance and reconnaissance, and forward air control–capable aircraft were depended on heavily in each stage of the air operations. However, the European allies’ lack of capabilities in jamming, refueling, and intelligence, surveillance, and reconnaissance (ISR) meant that the bulk of support missions were carried out by the United States; indeed, of the approximately 27,000 support sorties flown during Operation Allied Force, slightly more than 70 percent were flown by the United States.\footnote{Cohen, statement to the Senate Armed Services Committee.} There were, however, exceptions to this rule. For example, the allies did contribute a good number of capable unmanned aerial vehicles (UAVs) and, as mentioned above, fighter aircraft to the operation. But the lack of advanced munitions and of specialized support aircraft marginalized the allies’ contribution to the air war over Yugoslavia.
NATO has also been conducting other peace operations in the Balkans and elsewhere. Table 4.3 summarizes the size of the aircraft contributions to some of these operations for key allies. As this figure shows, the collective aircraft contribution from these allies ranged from 49 aircraft for Deliberate Forge to 163 aircraft for Deliberate Force. France’s average contribution was about 27 aircraft; Germany’s was 14, Italy’s 17, and the Netherlands’ 13. The average contribution from Spain, Turkey, and the United Kingdom was 9, 11, and 19, respectively. The expeditionary air force elements sought from European air forces to assist in a Middle East halt phase are within the scope of the forces generated by these allied forces during Operation Allied Force.

**Precision Munitions**

European air forces must be able to arm their aircraft with effective munitions, and in recent years this has come to mean having PGMs.

**Table 4.3**

Aircraft Contributions of Selected Allies

<table>
<thead>
<tr>
<th>Country</th>
<th>Deny Flight</th>
<th>Deliberate Force</th>
<th>Decisive Endeavor</th>
<th>Deliberate Guard</th>
<th>Deliberate Forge</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>33</td>
<td>50</td>
<td>20</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Germany</td>
<td>14</td>
<td>14</td>
<td>18</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Italy</td>
<td>20</td>
<td>24</td>
<td>16</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Netherlands</td>
<td>15</td>
<td>18</td>
<td>11</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Spain</td>
<td>11</td>
<td>11</td>
<td>7</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Turkey</td>
<td>8</td>
<td>18</td>
<td>8</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>U.K.</td>
<td>28</td>
<td>28</td>
<td>12</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>163</td>
<td>92</td>
<td>114</td>
<td>49</td>
</tr>
</tbody>
</table>

SOURCE: Compiled from NATO and AFOUTH fact sheets and *The Military Balance 1998/99*, London: International Institute for Strategic Studies, 1998. Deny Flight is an ongoing enforcement operation, maintaining a no fly zone over Bosnia-Herzegovina. Deliberate Force constituted the largest air assault in the history of NATO up to that time. The Alliance conducted air operations in response to the 1995 shelling of the Sarajevo central marketplace by the Bosnian Serb Army. Decisive Endeavor was the air component of the Implementation Force (IFOR) in Bosnia. Deliberate Guard was the air element of the Stability Force, the successor to IFOR. Deliberate Forge was the predecessor operation to Allied Force over Kosovo and Serbia.
Three main factors have shaped European decisions regarding the acquisition of precision munitions. First, NATO force goals encouraged the allies to buy ordnance suitable for the defense of the Central Region against a Warsaw Pact attack. Rolling terrain punctuated by forests, villages, cities, and mountains often provided good cover and concealment, making it difficult to engage point targets. Area munitions, including scatterable mines and cluster bombs, were appropriate in that they could exploit the terrain to create choke points in valleys, at bridges, and in front of towns that would disrupt the enemy’s advance.

Second, anticipating that any conventional war would quickly escalate to tactical nuclear weapons or worse, many European governments bought only the minimum essential conventional munitions. If the war was going to escalate after only a few weeks of conventional fighting, the European allies questioned the value of maintaining large stocks of conventional munitions. As a result, at the height of the Cold War some allied countries maintained stocks adequate for only 15 days.

Third, the effectiveness of precision munitions developed gradually from the Vietnam era to the present, making spectacular strides in the early 1990s. These munitions were slow to gain prominence in Europe, however, especially since the NATO force goals did not require large stocks of them. Although some countries acquired small stocks of laser-guided weapons (e.g., the AGM-65 Maverick, the Paveway, and the French AS-30L), most arsenals continued to feature cluster munitions and unguided iron bombs.

As a result of these factors, only eight of the 13 air forces that flew in Operation Allied Force carried precision munitions, and then in only limited quantities.\(^\text{12}\) Table 4.4 offers a snapshot of the limited employment of such weapons in Deliberate Force, the operation that preceded Allied Force.

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Table 4.4

Precision Munitions in Operation Deliberate Force

<table>
<thead>
<tr>
<th>Country</th>
<th>Precision</th>
<th>Nonprecision</th>
<th>HARM a</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>14</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.K.</td>
<td>48</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>U.S.</td>
<td>622</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>708</td>
<td>318</td>
<td>56</td>
</tr>
</tbody>
</table>


aHARM = High-Speed Antiradiation Missile.

Key allies’ exact holdings in precision munitions are currently uncertain because of recent operations against Serbian forces and because several countries have given vague answers about their inventories to the DPQ. Nonetheless, publicly available budgets and acquisition documents suggest that several countries’ inventories number only in the hundreds. In contrast, the U.S. plans to procure 90,000 Joint Direct Attack Munitions (JDAMs)—one of only several PGMs in the inventory.13

Long-Range Deployment

The primary question about long-range deployment is whether the allies have the means to move their AEFs to the theater of operations. Aircraft that can refuel in flight can self-deploy out to the limits of the pilot’s endurance; others are dependent on intermediate air bases. A key consideration is the adequacy of plans and capabilities to ensure that critical support personnel and equipment are in place.

United Kingdom. In the U.K., 27 VC-10 tankers support transport and refueling operations. Some 50 C-130 aircraft provide long-range

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13Bacon and Wilson, DoD news briefing, April 30, 1999.
transport, although some Tristars and Bae 111s are also available.\textsuperscript{14} In addition, Britain has signed an agreement with France for a Franco-British Euro Air Group (FBEAG), a planning and coordination cell with no aircraft assigned that could designate, on a case-by-case basis, the best aircraft units of the two countries—combat or transport—to participate in operations and exercises. The cell provides a framework for combined operations that could be conducted bilaterally or under charter from the WEU.\textsuperscript{15}

The Readiness of Royal Air Force (RAF) aircraft is at present a controversial issue. A recent Ministry of Defence report indicated that only about half the Tornados, Harriers, and Jaguars can be battle ready in less than a week. Only eight of 21 Nimrod aircraft considered in the report were found to be ready for operations. Although the RAF has disputed these claims,\textsuperscript{16} low readiness rates for RAF units are consistent with the lower readiness of British naval and ground forces and with the explicit policies of the Ministry of Defence.\textsuperscript{17}

\textbf{France}. Like the United States, France has organized the majority of its air forces into an air combat command and an air mobility command.\textsuperscript{18} The air mobility command operates 13 transport squadrons, an electronic warfare squadron, and six helicopter squadrons. The transport squadrons include one heavy squadron flying DC-8F and Airbus A310-300 aircraft, five tactical squadrons based principally on C-160 aircraft but supplemented with some C-130s, and seven light transport squadrons operating an assortment of C-160s, DHC-6s, CN-235s, and other aircraft.\textsuperscript{19} The air force has withdrawn from the future large aircraft program, and no new

\textsuperscript{14}The Military Balance 1998/99.  
\textsuperscript{17}Comments by Mr. Jon Day, Director of Defence Policy in the Ministry of Defence, RAND, August 5, 1998.  
\textsuperscript{18}The Military Balance 1998/99.  
\textsuperscript{19}Ibid.
strategic airlift acquisitions are likely to occur in the next four to five years.\footnote{\textit{Ibid.}}

**Germany.** In addition to its 87 C-160 transports, the German Air Force (Luftwaffe) relies on “market aircraft”—i.e., those that can be contracted off the economy—to help it deploy major elements. Several options are now under consideration for expanding airlift range and capacity, among which are leasing IL-76 and Antonov 24 aircraft from Russia and the Ukraine. Perhaps the most innovative option would involve leasing 100 hours of flight time annually for Airbus A300-600ST “Beluga” giant transports. The Luftwaffe has master agreements with charter carriers “under agreement” but thus far has none in place.\footnote{\textit{Ibid.}} The German Air Force has no tankers for in-flight refueling, although current plans call for the conversion of some transports to transport-tanker configurations.\footnote{\textit{Ibid.}}

**Italy.** The Italian Air Force’s long-range transportation capabilities currently reside in its Transport and Rescue Command. The command operates 36 G-222 and 12 C-130H U.S.-built transports and is taking delivery of at least 18 C-130J aircraft. The command also operates four Boeing 707-328 tankers and two 707-328Bs in logistics configuration.\footnote{\textit{USNI Periscope Database}, Nation’s Armed Forces Database, February 1, 1999, http://www.periscope.ucg.com/}

**Netherlands.** The Royal Netherlands Air Force operates two tankers and 19 assorted C-130-size transports and maritime patrol aircraft. Otherwise, the service operates 13 CH-47D large transport helicopters and 43 utility helicopters.

**Spain.** Spain’s transport and logistics forces have been undergoing modernization since 1994. The air force’s long-range transportation assets include 56 C-212 medium transports, seven C-130s, six tankers of various models, and two each Boeing 707-320C and CN-235 transports.\footnote{\textit{USNI Periscope Database}, January 1, 1999.}
Table 4.5 summarizes the major aircraft contributing to each country’s long-range reach. In some instances, aircraft are dual-use, serving as both transports and tankers. Recalling that Operation Allied Force required only 63 support aircraft to sustain the allied contribution to the air campaign against Serbia, the pool of available transport and tanker aircraft, provided they had adequate access to forward basing, is adequate to support up to two allied AEFs. The transport and tanker inventory is sufficient, especially in instances such as Operation Allied Force, in which there is no requirement to deploy ground forces. Under such circumstances, all of the transport and tanker assets could be devoted to supporting the deploying air forces. That said, it should be noted that Operation Desert Storm required 222 USAF tankers for in-theater support and another 86 outside the area of responsibility (AOR). If future operations required disproportionately larger tanker contributions from the allies, most would have great difficulties satisfying them.

**Forward Basing and Force Protection**

Once the air forces deploy to the crisis region, questions of basing and force protection move to the fore. Basing issues have to do with how much base support infrastructure the allies can bring along to sustain their forces. Force protection issues center on the allies’ ability to protect their forward-deployed units from a range of threats, including NBC, conventional military, and terrorist attacks.

**Basing Requirements.** Unlike the USAF, which can import the base operating systems and infrastructure its deployed units require, the

<table>
<thead>
<tr>
<th>Country</th>
<th>Transports</th>
<th>Tankers</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>98</td>
<td>28</td>
</tr>
<tr>
<td>Germany</td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>Italy</td>
<td>68</td>
<td>4</td>
</tr>
<tr>
<td>Netherlands</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Spain</td>
<td>67</td>
<td>6</td>
</tr>
<tr>
<td>U.K.</td>
<td>50</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>389</td>
<td>67</td>
</tr>
</tbody>
</table>
European allies are more dependent on fully developed airfields to support their operations. Their operational effectiveness depends to a large degree on the availability of modern airfields with a full suite of facilities for crews, aircraft, and support personnel. Although some of the allies—i.e., Britain, France, and Italy—have limited airfield development capabilities, none has the ability to develop austere airfields fully on short notice. 25 Typical capabilities include airborne engineers trained to parachute in to a remote site and carve out a landing strip. However, this level of capacity pales in comparison to U.S. Air Force Red Horse construction capabilities, which can quickly extend runways, create new ramp space, build fuel and ammunition storage, and perform other related tasks.

**Force Protection.** Any country deploying military forces to the Persian Gulf must reckon with a variety of threats. Even air forces, which are based well beyond the reach of enemy armor and artillery, must be prepared for attacks by missiles, aircraft, truck bombers, and NBC weapons.

Each of the principal allies has some capabilities that contribute to force protection, but even their collective capabilities produce a vulnerable shield. Based on the Operation Allied Force experience, the allies could mass some 190 fighter-bombers for an offensive counterair operation to destroy enemy air forces. In addition, all of the allies can deploy low- and medium-altitude air defense systems to protect against air attack by enemy fighters, and the Dutch have Patriot batteries for high-altitude defense. Moreover, all of the allies could deploy ground forces to improve security against truck bombs and terrorist attacks, and some, especially the British, have excellent human intelligence (HUMINT) that could improve security by creating a warning network to alert their forces to a coming attack. Finally, all of the allies can provide their forces with basic NBC training and individual protective equipment.

None of the allies, however, can provide either a reliable theater missile defense over their forward-deployed units or the "survive-to-operate" (STO) systems necessary to protect their forces from NBC weapons.

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25Italy, for example, maintains a parachute engineer company for this task. The British RAF maintains some capability in the ground squadrons of the air force regiment. Others draw on army resources.
attack (e.g., protective shelters and decontamination equipment for aircraft and their support systems). Allied air defense systems, for example, are intended to engage enemy aircraft, not incoming missiles. In short, none of the allies currently have STO systems to support AEFs in a foreign theater for sustained military operations.

Effective Military Operations

Effective military operations depend on many factors. For AEFs, the critical questions include:

- Once in the theater of operations, can the air forces generate enough sorties to contribute to the campaign’s objectives?
- Do the air forces have the right ordnance to attack critical targets?
- Can all the air forces make use of the same command and control system, share air tasking orders (ATOs), and coordinate effectively among national contingents?

Generating Sorties

Two key allies, France and the United Kingdom, have released some details of their armed forces’ respective roles in Operation Allied Force that can assist in drawing conclusions about military effectiveness. France contributed 88 aircraft to the operation. The French Air Force flew 45 fighter-bombers, six tankers, two airborne early warning (AEW) and command-and-control aircraft, three combat search and rescue (CSAR) helicopters, nine reconnaissance aircraft, and one C-160 Transall transport. The naval carrier air group embarked for the operation included 16 Super Etendard fighter-bombers, four reconnaissance aircraft, and two CSAR helicopters. According to the French Ministry of Defense, the allies flew roughly 10,450 offensive sorties, of which France flew 1261, or 12 percent. Of the 1564 reconnaissance missions flown over Serbia and Kosovo, French forces flew 330, or 21 percent.26

Britain has also detailed the size of the air forces it deployed for Allied Force. According to data released by the British Ministry of Defence, by the end of the operation Britain had flown 1,008 or almost 10 percent of the approximately 10,450 bombing sorties that the Alliance had carried out. The British also helped support the offensive sorties. Over the course of Allied Force, British planes flew 102 Combat Air Patrol, 184 AEW, and 324 air-to-air refueling (AAR) sorties.27

These sortie rates would be a major contribution toward the 1300 to 1600 sorties that some modeling results suggest would be necessary to halt a six-division armored force attacking into Saudi Arabia. The allies might in fact fare better in a desert campaign, where there would be few innocent civilians to worry about and where cluster munitions could still contribute significantly to stopping the armored onslaught. If there were fewer constraints on munitions and opportunities to use other types of ordnance, the principal allies might generate even more combat sorties.

Appropriate Ordnance

Table 4.6 shows selected acquisitions of precision munitions. Most of the allies have programs under way to develop new munitions, but many such programs are not mature enough to provide a reliable indication of how many will ultimately be produced. Another area of uncertainty that clouds judgment about whether the allies will have appropriate ordnance in sufficient numbers for halt-phase operations has to do with the prospects for converting “dumb bombs.” In many instances, unguided ordnance can be adapted by adding a guidance kit to the nose and a “tail kit” to provide steerage. For countries like Britain and Germany, which share some common ordnance with the United States (e.g., MK-82 bombs), the prospects for upgrading older bombs are good; they need only buy the modification kits. For other countries, however—including France, whose 2000-kg bomb is not compatible with U.S. modification kits—alternative options must be pursued. Stocks of other ordnance are important as well, especially those located in the theater of operations.

Table 4.6

Selected Acquisitions of Precision Munitions

<table>
<thead>
<tr>
<th>Weapon Name</th>
<th>Purchasing Country</th>
<th>Number Acquired</th>
<th>Date of Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGM-65</td>
<td>Germany</td>
<td>1400</td>
<td>1988</td>
</tr>
<tr>
<td>Maverick</td>
<td>Italy</td>
<td>42</td>
<td>1994</td>
</tr>
<tr>
<td>AGM-88</td>
<td>Germany</td>
<td>944</td>
<td>1991</td>
</tr>
<tr>
<td>HARM</td>
<td>Spain</td>
<td>80</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td>Italy</td>
<td>564</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td>50</td>
<td>1993</td>
</tr>
<tr>
<td></td>
<td>Netherlands</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ALARM(^a)</td>
<td>U.K.</td>
<td>750</td>
<td>1983</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
<td>1992</td>
</tr>
<tr>
<td>Scalp</td>
<td>France</td>
<td>300</td>
<td>1998</td>
</tr>
<tr>
<td>AS.30L</td>
<td>France</td>
<td>1172</td>
<td>1998</td>
</tr>
<tr>
<td>TADS/Taurus(^b)</td>
<td>Germany</td>
<td>600</td>
<td>2007</td>
</tr>
<tr>
<td></td>
<td>Italy</td>
<td>200</td>
<td>2007</td>
</tr>
<tr>
<td>AGM-114</td>
<td>U.K.</td>
<td>700</td>
<td>2006</td>
</tr>
<tr>
<td>Brimstone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AASM</td>
<td>&quot;smart bomb&quot;</td>
<td>250</td>
<td>2007</td>
</tr>
<tr>
<td>BGL(^c)</td>
<td>&quot;smart bomb&quot;</td>
<td>425</td>
<td>1997</td>
</tr>
</tbody>
</table>


\(^a\)ALARM = air-launched antiradiation missile.

\(^b\)TADS = target-adaptive dispenser system.

\(^c\)BGL = laser-guided bomb.

Before Operation Desert Storm, the USAF maintained almost 50,000 short tons of munitions in pre-positioned stocks. With a few minor exceptions—e.g., the RAF in Oman and the French in Djibouti—there are only a few small stockpiles in theater for allied forces.

**Command and Control**

For allied AEFs, command and control has at least two critical components: first, battle coordination, or the ability to synchronize the efforts of all the national contingents, and second, battlespace management, or the ability to see into the battlespace, locate targets.
within it, and promptly engage those targets before they can escape. The United States has played major roles in both of these key areas. The USAF automated planning systems that generate the air tasking order (ATO) and support rapid mission planning, for example, have been crucial to battle coordination. Likewise, U.S. imagery, the Joint Surveillance Target Attack Radar System (JSTARS), Rivet Joint, Airborne Warning and Control System (AWACS), and other reconnaissance platforms have been central to battlespace management. The key question, therefore, is whether the European allies have the capacity to interface with U.S. command-and-control systems. The answer is central to appreciating the overall effectiveness of allied air operations.

Currently, battle coordination presents major challenges to the Europeans. Although some allies—especially the French, Italians, and British—have had extended exposure to U.S. planning and ATOs, NATO has yet to adopt a uniform and complete set of battle coordination planning practices and tools. Interim tools, such as Power Scene, have emerged only recently as a result of operational demands in the Balkans. Future AEFs formed from “coalitions of the willing” may include some national contingents that still rely heavily on manual planning techniques. Whatever nations ultimately provide AEFs, battle coordination with current capabilities will require that the United States and its allies accommodate manual and automated planning to provide an ATO for all the contingents in a form they can use as well as to devise work-arounds for circumstances in which U.S. forces are not part of the deployment package.

The Europeans fare better in battlespace management. Although they lack Rivet Joint completely, some allies do have JSTARS–like aircraft that allow them to track some moving targets (e.g., the British Nimrod Star Window variant). The allies also have reasonable numbers of AEW aircraft as well as command-and-control aircraft such as the French E3F-SDCA, which, taken together, allow them to manage the battlespace. All of the key allies can also deploy good reconnaissance aircraft, and some supplement their fixed-wing aircraft with heliborne systems such as the French Horizon battlefield surveillance system. Several allies currently have first-generation UAVs as well. In addition, NATO infrastructure provides a limited number of AWACS platforms.
The Current Assessment

Under today’s circumstances, the Europeans can certainly field enough fighter-bombers and support aircraft for two viable AEFs. However, their stocks of PGMs and lack of pre-positioned stockpiles in the region leave the Europeans inadequately prepared for the full range of possible enemy forces. RAND modeling indicates that against a six-division enemy force, the AEF had to fly some 1500 sorties and expend 6500 smart munitions to halt the enemy advance.\textsuperscript{28} Of the munitions expended, just over 1700 of them would be European. Based on the evidence available, it is doubtful that the European allies possess enough guided bombs and missiles or in-theater stocks of other ordnance that might be used in lieu of the preferred weapons. If key allies—notably Britain, France, and Germany—were committed to the operation, allied inventories might be adequate against attacks of up to six divisions. Against nine to twelve division assaults, however—or under circumstances in which the better-armed allies do not play major roles—the European arsenal is likely to prove inadequate. (In 1990, Iraq attacked Kuwait with 11 divisions.)

Long-range deployment, contingent on the availability of suitable bases in the region, will not in all likelihood be constrained by a lack of transport and support aircraft to support the routine needs of the AEFs contemplated here. Leases and “market” arrangements seem more than adequate, since they were originally intended to deploy far more numerous ground forces and equipment. However, there is no amount of airlift that the Europeans are willing to procure that would compensate for Europe’s lack of pre-positioned munitions stocks. Moreover, forward basing and force protection will probably be difficult if fully modern bases are not available or if the European forces are based within range of WMD. Under these circumstances, the lack of STO systems would leave European units vulnerable. The prospects of militarily effective operations are likewise uncertain. The lack of large quantities of precision munitions certainly undermines the probability that the allied forces could halt enemy seizure of critical energy installations. The chances of success are further

\textsuperscript{28}The case in question is based on regular (as opposed to rapid) deployment of four U.S. and two European AEFs.
diminished by the questions that surround European battle coordination capabilities. In short, without the United States to cover their gaps, it is doubtful that European AEFs, with today’s munitions and command-and-control arrangements, could make a significant contribution during the halt phase of a Persian Gulf MTW. But what of the future? The next section examines key allies’ plans and the prospects for addressing present shortfalls.

FUTURE CAPABILITIES

The European allies have been taking steps to modernize their forces since the early 1990s, and most have undertaken comprehensive defense reviews or are now in the process of doing so. Recently, however, the long-term viability of these plans was called into question in a U.S. General Accounting Office report.29 This report indicated that allied defense budgets may shrink in coming years to finance domestic programs and deficit reductions. Indeed, nowhere are these pressures more acute than in Germany, where defense budgets are projected to shrink from deutsche mark (DM) 47.1 billion this year to DM 43.7 billion in 2003.30 France, too, has been forced to renege on earlier pledges to hold the line on its defense spending. Therefore, the possibility exists that the defense plans summarized below could be cut back.

United Kingdom

The future of the RAF was outlined in the British SDR.31 In it, the British government committed to acquiring 232 Eurofighters to replace aging Tornado F3 and Jaguars. However, the plan called for an

overall reduction in attack/strike aircraft from 177 to 154 and for the reduction of air defense fighters from 100 to 87. The RAF will continue procurement plans for Brimstone and Stormshadow air-to-surface missiles, upgrade some Tornado GR4 aircraft, and improve the NBC and STO capabilities of the RAF Regiment. The SDR also made a commitment to continue seeking a replacement for the Tornado ground attack fleet. The placeholder is known as the “Future Offensive Air System,” and its requirements may be satisfied through the purchase of the Joint Strike Fighter or through the pursuit of other aircraft options.32

The RAF will undertake other improvements as well. Current ground attack aircraft, for example, are being outfitted with thermal imaging and laser designating pods to allow them to deliver Paveway II and III laser-guided bombs. Some 142 of these aircraft are also getting Global Positioning System (GPS) navigation systems and digital mapping systems. The Star Window variant of the Nimrod has been upgraded as well, and a follow-on airborne standoff radar (ASTOR) aircraft is expected to enter service in 2002. Britain has also been vigorously exploring precision munition options, including U.S., French, and German systems. A new advanced air-launched antiarmor weapon, for example, will replace the BL-755 cluster bomb throughout the RAF inventory. The RAF expects the new weapon to enter its arsenal beginning in 2000.33

France

France’s armed forces are in the midst of a major strategic realignment and redirection that is scheduled to conclude in 2015. For the air force, the program has meant modernization for some current aircraft as well as acquisition of new aircraft and munitions. The fighter/attack aircraft inventory has grown with the delivery of 139 Rafale B fighters, and another 95 are on order. If all goes according to plan, the first wing of Rafale aircraft will be operational by 2002, with all the aircraft delivered by 2012. An electronic reconnaissance and observation version of Rafale is also on order. The air force is, more-

over, in the process of taking delivery on Mirage 2000D strike aircraft, and older Mirage 2000 models are scheduled to be upgraded. France is also improving its air-to-air refueling capabilities with the installation of underwing flight refueling pods on 11 of its KC-135FR tankers.34

Precision attack will benefit from the delivery of new cruise and air-to-surface missiles. The Scalp variant of the Apache EG is slated for delivery beginning in 2003, and 500 of these cruise missiles have been ordered. Other versions, including the shorter-range antirunway and area interdiction models, are being delivered now, with the order complete in 2002. Some 500 of these missiles should ultimately fill the French Air Force’s arsenal. The Vesta air-to-surface missile is currently under development as well and is expected to be ready for delivery beginning in 2005. Five thousand direct attack weapons are in production as replacements for AS-30 laser-guided weapons and the Arcole laser-guided bomb; delivery is scheduled to begin in 2002.35

Less progress is evident in air defense and STO capabilities. France withdrew from the Medium Extended Air Defense System (MEADS), which Paris had agreed to pursue in cooperation with the United States, Italy, and Germany. No major acquisitions of collective NBC protection or other STO technologies have been announced.

Germany

The principal elements in future German Air Force programs are evident from an earlier study that established a framework for future German military planning. The air force will emphasize the integration of surveillance, command-and-control, and weapons systems. More specifically, it will pursue stealth and high-speed, high-capacity data processing to maintain and improve interoperability with U.S. forces.36

34 USNI Periscope Database, February 1, 1999.
35 Ibid.
However ambitious the long-term plan for the air force may be, the near-term prospects are much more modest, emphasizing upgrades to current aircraft and systems. The Tornado strike/attack air fleet is undergoing modernization, which includes the ability to deliver AGM-65 Maverick and AGM-88 High-Speed Antiradiation Missiles (HARMS). The Tornados are also being outfitted with a new laser-designating pod that will allow for the use of the BLU-109 laser-guided bomb. The transport fleet of C-160 Transalls has undergone extensive refitting to extend their lives out to 2010, but budget pressures have clouded their replacement plans in uncertainty. Plans to buy two additional A310 transports fell victim to budget pressures and have been canceled. Germany is buying the Eurofighter and ultimately plans on 180 of these aircraft. Forty will be ground attack fighters and should begin entry into service in 2004.37

Munitions plans include the purchase of 400 BLU-109 laser-guided bombs. Germany is also developing the Taurus KEPD 350 air-to-surface missile in point attack, antirunway, cluster, antiarmor, and hard-target configurations. Initial operational capability should be around 2001. The air force will also receive ARAMIS, a replacement for the AGM-88 HARM. The new missile is expected to have a range of 100 km.38

Germany continues its modest participation in MEADS, which is scheduled to become operational in 2005. The air force has also signed an agreement with Lockheed Martin Vought to develop a German Patriot PAC-3 system as an interim, stopgap measure until MEADS is operational. Otherwise, there are no official indications of major work on force protection or STO capabilities.39

The aforementioned budget pressures could take their toll on Germany’s military plans. For instance, Germany might terminate its role in MEADS and defer decisions about replacing the C-160 fleet. In addition, notwithstanding the central role the Eurofighter will play in the future German Air Force, Berlin may be forced to stretch the program to distribute the costs more evenly over a longer

37 *USNI Periscope Database*, February 1, 1999.
38 Ibid.
39 Ibid. See also "Country Briefing—Germany."
period. As an extreme option, the Ministry of Defense may have to face the prospect of purchasing fewer aircraft. Finally, all the munitions programs would probably face reductions in their size and delays in their introduction into the force. In sum, defense spending cuts of the magnitude being contemplated by Berlin would hamper efforts to improve the power projection capabilities of the German armed forces.

Italy

Italy’s New Defense Model plan has led to downsizing within the air force and intense pressures on overall defense spending. The current defense plan and cost overruns associated with acquisition of the Eurofighter have together created severe constraints on force modernization. Long-standing plans to purchase AEW aircraft have been shelved, although the Ministry of Defense has retained a requirement for four aircraft. Budget considerations have likewise foreclosed the opportunity to buy ECR Tornado aircraft and have forced the air force to lease 24 Tornado F3 air defense fighters from the U.K. Acquisition of precision munitions has slowed to a trickle.40

The Italian Air Force is, however, still in the process of buying Eurofighters. The service also remains involved in MEADS, which will improve its ability to defend its units deployed in a forward theater. The air force will eventually buy up to 44 Future Large Aircraft (FLA) and has recently purchased 18 U.S.-built C-130J transports. Current plans also call for the air force to launch a military communications satellite, Sicral, later this year. The satellite will handle UHF, VHF, and EHF traffic and will be protected against jamming. The air force expects it to support expeditionary operations.41

Netherlands

Most of the Netherlands’ modernization program has been accomplished. As part of this effort, the air force upgraded much of its air fleet. Midlife upgrades are currently ongoing for the F-16 fleet and

40USNI Periscope Database, February 1, 1999.
41Ibid.
focus on improved electronic countermeasures (ECMs), better radar, and a modular mission computer. Sixty aircraft have been fitted with night navigation systems. Some of these aircraft are also getting laser designation pods to support Dutch Paveway II laser-guided bombs. Longer-term plans include acquisition of the U.S. Joint Strike Fighter as a replacement for the F-16 after 2010. The air force also plans to buy AGM-65G Mavericks and the AGM-154 Joint Stand-Off Weapon (JSOW), probably after 2000.42

Spain

Spain modernized its air forces in the mid-1990s, during which time the EF-18, Mirage F-1, RF-4C, and C-130 aircraft all received upgrades. In addition, Spain eventually plans to buy 87 Eurofighters. Madrid’s munitions plans are modest and focus on purchasing new air-to-air missiles, leaving them with only marginal capability against ground forces.43

ASSESSING THE ADEQUACY OF CURRENT PLANS

Chapter Two postulated Iraqi armored assaults ranging in size from three to twelve divisions. This chapter began with the premise that in order to be effective in stopping an Iraqi invasion force, the allies would have to perform four key tasks: (1) get to the theater of operations, (2) establish bases from which to strike, (3) sustain and protect the forward-deployed units, and (4) carry out effective strikes. The key question, therefore, is: Given the allies’ plans for future force development, how would they fare against an Iraqi invasion of Kuwait? Each of the key tasks is considered below.

All allied air forces can self-deploy, and there are enough tankers in the NATO nations’ inventories to support the deployment of the aircraft associated with two European AEFs. The tankers will, however, need forward bases from which to fly. It is therefore important that Turkey and other allies make their air fields available to support the deployment of European AEFs. More important, the allies face seri-

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42 USNI Periscope Database, January 1, 1999.
43 Ibid.
ous shortfalls in their capability to move the support package for AEFs both promptly and efficiently.

Virtually all of the allies remain dependent on fully developed airfields, although France and the U.K. have created limited capabilities to operate under austere conditions. If the allies were required to operate from more austere facilities, the requirements for supporting aircraft would escalate. In some instances, local contractors could be hired to provide services; in other cases, living quarters, latrine facilities, field kitchens, and a host of other support elements would have to be flown in. More important, rudimentary airstrips typically lack the ramp space, maintenance areas, and other flight operations support essential to sustaining high sortie rates.

A critical sustainment issue is whether the precision munitions available will be adequate for the job. Five of the six key allies plan to make major purchases of precision munitions. Of the acquisition initiatives reported in Table 4.6, the average of all 15 transactions was 512 weapons. If all six key allies make future purchases of 500 weapons each, the combined inventory would be 3000 through 2007. The range of precision munitions expended by the Europeans against a six-division Iraqi force modeled in other RAND work ran from about 1700 to 3200 munitions, depending on the details of each excursion. This suggests that the six-division case is near the upper limit of what the Europeans could sustain under this program. Unless they decided to buy larger stockpiles of these munitions than their recent practices and current plans call for, the Europeans would thus be likely to run out of PGMs in the most demanding circumstances surrounding a six-division-or-larger attacking force. In any event, these countries would not agree to use a 15-year accumulation of PGMs in a single operation. The absence of pre-positioned stocks in the theater further undermines Europe’s potential contribution.

Force protection is a growing concern for all the allies. Despite efforts on the part of the RAF to improve its NBC protection, and despite plans for advanced Patriot PAC-3 and MEADS air defense systems, the vulnerability of allied air forces both to missiles and to NBC weapons is growing.\textsuperscript{44} The modest steps being taken by the allies

\textsuperscript{44}Peters and Deshong, \textit{Out of Area or Out of Reach?}, Chapter 3.
may, moreover, be outstripped by the pace at which these weapons are proliferating. Among the allies, Spain is probably most vulnerable in this regard; Spanish forces have long lagged behind the other allies in NBC protection. No matter which ally is most or least prepared, however, none is fully prepared with a full suite of STO capabilities. A successful attack that produced mass casualties might lead some allies to withdraw from the operation.

Some of the allies’ plans will certainly make them more effective in halt-phase operations. Five of the six key allies, for example, will have better ECM pods for their attack aircraft, and all will have at least some aircraft with laser designating pods. Most will also have modern PGMs, including advanced antiradiation missiles. There is little doubt, therefore, that future allied AEFs will be better equipped both to fly against very demanding targets and to destroy those targets.

At the same time, the suitability of the allies’ battle command and battlespace management capabilities is more questionable. Plans for Star Window, Atlantique 2 Plus, and similar aircraft will help the allies see the battlespace in greater depth and detail. The cooperation and experience that comes from NATO operations like Allied Force is also important. However, current allied plans do not show evidence of shared or interoperable automated mission-planning and command-and-control systems that are capable of moving high volumes of data. The ability to generate effective strikes thus remains limited by the allies’ uneven capacity for processing and responding to an ATO. In sum, only by undertaking improvements in missile defense, command-and-control capability, and munitions stockpiles can the European allies develop an effective air-to-ground capability against armored forces. The preceding discussion and RAND modeling suggest that if the Europeans made those improvements, they could play a significant role in the halt phase in combination with U.S. air forces; indeed, if the U.S. military were heavily engaged elsewhere, the contribution of one to two European AEFs might well prove critical.

ALLIED CONTRIBUTIONS OF NICHE CAPABILITIES

America’s European allies confront two major challenges: adapting their forces to out-of-area operations and managing the technologi-
cal gap with the United States. At a minimum, declines in allied defense spending will need to be stopped and defense spending priorities altered. In some areas, moreover, these changes will not come cheaply or easily. European defense spending may need to increase at a time when allied governments face strong pressure to cut defense expenditures. According to one NATO official, “It would take the Europeans two decades to catch up with the Americans (technologically) even if they had the money and the will to spend it.” 45 Under these circumstances, European governments will have to shift investment priorities and make tradeoffs, and there will be a strong temptation to sacrifice the “niche” capabilities described below to fund other priorities—assets that could prove useful in a variety of Gulf military contingencies that threaten common Western security interests.

Access and Basing

Across the range of out-of-area contingencies, the most critical allied support will often be in the form of access and basing privileges. Notwithstanding the successful use of the B-2 bombers flying from the continental United States (CONUS) in Operation Allied Force, the USAF will continue to rely on in-theater bases for beddown of shorter-range combat assets.

European partners are also pivotal in supporting mobility operations as well as in providing overflight, transit, basing, fuel, and crew rest stops for strategic airlifters and operating bases for intratheater transports. Support aircraft such as tankers, AWACS, JSTARS, and U-2 aircraft also rely on beddown locations in allied countries.

As the USAF evolves into an “expeditionary aerospace force,” it will require new logistics concepts to facilitate its engagement and power projection activities. Whether called “regional contingency cen-

ters,” or “forward support locations,” one powerful concept is to establish a small number of large, well-stocked operating bases in secure locations around the world. Using these facilities as “hubs,” support could flexibly swing across regions, servicing bases from which operations are being executed. Given their long history of political and military cooperation, shared interests in energy security and other issues, and a wealth of well-developed infrastructure, NATO partners would clearly be good candidates to play host to this kind of installation.

Tactical Reconnaissance and Electronic Warfare

Since the retirement of the RF-4E, F-4G, and EF-111, the U.S. Air Force no longer operates dedicated tactical reconnaissance and electronic warfare aircraft. While some of those capabilities are provided by other platforms—e.g., by UAVs such as the Predator, Navy and Marine Corps EA-6B jamming aircraft, and F-16s equipped to perform a version of the “Wild Weasel” surface-to-air-missile (SAM) hunting mission—the experience in Operation Allied Force demonstrated that these assets are in short supply. As the threat evolves—with Iran or Iraq potentially possessing more sophisticated SAMs such as the SA-10 or SA-12 as well as more dangerous mobile SAMs such as the SA-11—aany existing shortfalls, particularly in electronic warfare, are likely to be exacerbated.

Several allied aircraft could help fill this gap. Both the German and Italian air forces fly the ECR version of the Tornado twin-engine fighter-bomber. The Tornado ECR is equipped with a precision locator system for detecting and locating hostile emitters and is armed with HARM missiles for antiradar attack. It also has a

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48 For example, the USAF reports losing four Predators in Operation Allied Force, and the loss of an F-117 aircraft early in the Kosovo campaign has been attributed in part to the absence of jamming support at a key point in the mission. See Peter Skibitski, “Pentagon to Create Additional EA-6B Prowler Unit to Meet Demands,” Inside the Navy, August 30, 1999, and David A. Fulghum, “Kosovo Report to Boost New JSF Jamming Role,” Aviation Week and Space Technology, August 30, 1999.
forward-looking infrared sensor and an infrared line scanner for passive reconnaissance. The British RAF operates reconnaissance variants of both the Tornado and the Jaguar. Both were employed extensively in Operation Allied Force.

Other NATO air forces operate tactical reconnaissance aircraft as well. Some Dutch, Danish, and Belgian F-16s have been modified to carry reconnaissance pods, while Poland flies the MiG-21R reconnaissance aircraft and the Czech Republic operates a small number of Su-22 FITTERs in the reconnaissance role. Finally, the French air force is equipped with 40 Mirage F-1CR reconnaissance aircraft.

**Airborne Early Warning**

Boeing E-3 AWACS aircraft are among the USAF’s most important, and most overtaxed, assets. A vital “force multiplier,” AWACS planes and crews have been called upon to perform almost nonstop deployments—monitoring no-fly zones, supporting strike operations, and the like—since the end of the Cold War. Thus, managing the wear and tear on the USAF’s fleet of 33 E-3 aircraft and the men and women who fly them constitutes one of the most serious operational challenges facing the Air Force today.

Fortunately, NATO is in a position to help. The Alliance itself operates 18 AWACS aircraft as the NATO Airborne Early Warning (NAEW) forces. France has taken delivery of four E-3F models, and the U.K. flies seven E-3Ds. Together, these aircraft roughly equal the USAF inventory and could contribute significantly to any NATO out-of-area operation in the greater Middle East or elsewhere.49

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49There are a number of technical differences between the various models; the British and French aircraft, for example, have engines that differ from those of the U.S. and NATO planes. All, however, are capable of performing the basic functions of AEW and intercept control. All USAF, U.K., and NATO aircraft are also undergoing a radar system improvement program (RSIP) to increase the ability of the AWACS to detect small and/or stealthy targets, to improve its electronic counter-countermeasure performance, and to enhance its maintainability.
Theater Airlift

No NATO country other than the United States currently operates a strategic airlift fleet of any consequence, although Great Britain’s recent SDR called for the acquisition of six C-17-equivalent aircraft.50 As Figure 4.2 shows, however, no fewer than 11 non-U.S. NATO members fly the C-130 Hercules medium transport. Germany, France, and Turkey fly the Franco-German C-160 Transall, a twin-engine transport of similar performance to the C-130. Thus, the Netherlands is the only militarily active NATO member of more than a year’s standing that operates no airlifter in the C-130 class.

Together, non-U.S. NATO air forces operate more than 150 of various C-130 models along with 114 C-160s, and Italy flies 36 G-222 medium

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50 The FLA is supposed to be the first European strategic airlifter since the 1950s. Although the program is proceeding, escalating cost estimates and the possible defec- tion of several key partners, including Germany and Britain, have placed its future in doubt.
transports. America’s European partners together have about 300 theater airlifters in their inventories; this compares favorably to the 201 C-130s in the active USAF force structure and constitutes more than half of the 540 Hercules operated by the total air force.

**Special Relationships and Special Forces**

Many of America’s NATO allies have relationships with key countries in the greater Middle East that stretch back to colonial days. Great Britain, for example, put the Hashemites on the Jordanian throne. France and Belgium, meanwhile, retain fairly close contact with various nations in Central Africa as well as in Syria and Lebanon, while Paris, Madrid, and Rome have interests in and close ties to the governments of North Africa. Because of these historical ties and cultural affinities, some Middle Eastern regimes might find it more palatable to deal with non-U.S. NATO governments under some circumstances. This political leverage could prove valuable in negotiations for access or overflight rights or in attempts to navigate the treacherous terrain in the intranational conflicts depicted in some of the scenarios described in Chapter Two.

These bonds of history may also make some allied special forces particularly useful in the region. The British Special Air Service (SAS), for example, was essentially born in the desert. Created to operate behind German lines in North Africa during World War II, the SAS has evolved from a force dedicated to harassing Rommel’s rear area to one of the most respected special forces organizations in the world.

French special forces are about 1000 strong. In addition, the 8500-man Foreign Legion serves as an elite force for overseas use, with one regiment stationed in Djibouti. The Spanish Legion Extranjera has similar capabilities and is partially dedicated to the rapid reaction mission. A number of other NATO countries maintain small special forces establishments that could be valuable for missions such as intelligence collection, training of indigenous troops, direct action, and support of allied air operations.
102  Persian Gulf Security: Improving Allied Military Contributions

Countermine Warfare

Sea mining constitutes a considerable threat in the Strait of Hormuz and in the Persian Gulf. During the 1991 Gulf War, two U.S. warships—the Aegis cruiser USS *Princeton* and the amphibious assault ship USS *Tripoli*—struck Iraqi mines; according to some reports, the *Princeton* was nearly lost while the *Tripoli* suffered a 16- by 20-foot hole 10 feet beneath her waterline. The narrow Strait, meanwhile, seems an ideal place for offensive mine warfare, and many scenarios for Iranian aggression in the Gulf prominently feature maritime mine warfare. Countering these weapons could thus play an important role in any conflict in the Gulf.

Defeating naval mines is a complex, time-consuming, and resource-intensive process. Throughout the Cold War, the U.S. Navy focused on open-ocean, “blue water” operations, placing little emphasis on countermine warfare.\(^{51}\) Despite its commitment to littoral operations, the U.S. Navy still fields relatively modest mine warfare assets; only 15 mine warfare ships are in the active navy, with 13 more to be found in the Naval Reserve Fleet.\(^{52}\) Unlike major naval combatants, these vessels are not self-deploying over long distances; with fairly limited endurance and top speeds in the 10- to 14-knot range, they are typically transported to the area of interest on super-heavy-lift cargo ships. This is how, for example, the USS *Avenger* and three other U.S. mine countermeasure ships deployed to the Persian Gulf in 1990 during Operation Desert Shield.\(^{53}\)

Other NATO countries, particularly those with a North Sea or Baltic orientation, have paid more attention and devoted more resources to the problems of mine warfare. The Danish navy, for example, has 14 mine warfare vessels on its rolls, with 14 more modern mine countermeasure (MCM) ships on order. The French, Belgians, and Dutch

\(^{51}\)Indeed, 25 years elapsed between the completion of the last large ocean-going minesweeper for the U.S. Navy, the *Assurance* in 1958, and the laying down of the first Avenger class in 1983.

\(^{52}\)One of these ships, the USS *Inchon*, was converted from an amphibious assault ship into a mine operations command vessel. Although it can carry up to eight mine warfare helicopters, it has no intrinsic countermine capabilities.

\(^{53}\)Today the U.S. Navy maintains two mine countermeasure ships, the USS *Ardent* and the USS *Dextrous*, on station in the Gulf area and rotates crews for them.
cooperated in designing and building the “Tripartie” mine warfare ship in the 1980s and 1990s. All 35 vessels are undergoing extensive modernization, and several Dutch ships will also be fitted as command platforms for the “Troika” deep-water mine-sweeping drones (which are also fielded by Germany). In addition to its seven “Tripartie” vessels, Belgium is also procuring four new MCMs and has two mine warfare command-and-support ships.

Britain’s Royal Navy sails 21 modern mine warfare ships and is constructing five more new Sandown-class MCMs, four of which will also be built by Spain. Italy deploys a dozen new mine warfare vessels; in fact, its Lerici design was the basis for the U.S. Navy’s new Osprey-class mine hunters (MCH). Germany has 12 1990s-vintage Frankenthal-class MCHs among its fleet of 32 mine warfare vessels.

Canada built 12 Kingston-class mine hunters between 1995 and 1999; although the ships are being employed as multipurpose coastal-defense vessels, they retain all their design countermine capability. The Norwegian navy has 12 advanced double-hulled surface-effect mine hunters and minesweepers of the Oksoy and Alta classes.

**Chemical Warfare**

The capability of NATO allies to operate in an environment contaminated by chemical agents is limited. However, some new Alliance members have competencies in this area dating from their Warsaw Pact days that equal or exceed those of the U.S. armed forces. For example, when the U.S. Army urgently needed an NBC reconnaissance capability during the run-up to the Gulf War, it acquired a variant of the former East German TPZ-1 Fuchs (“Fox”) wheeled armored personnel carrier (APC); eventually about 120 were purchased (designated the M93 in U.S. service).

The former Warsaw Pact countries were also regarded as having taken the prospect of NBC warfare fairly seriously. As a result, their militaries possess credible NBC reconnaissance and decontamina-

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54 There are 15 Alkmaar class in the Netherlands service, 13 Eridan class in the French navy, and seven Aster class in Belgium. Greece also has three Tripartie-class ships acquired from the Netherlands.
tion capabilities. The Czech and Hungarian armies, for example, operate NBC reconnaissance variants of the OT-65 and BTR-80 APCs, respectively, while Poland employs a version of the BRDM-2 for the same purpose.