

The operational setting of Yugoslavia contrasted sharply with the one presented to coalition planners by Iraq in 1991. Defined by a series of interwoven valleys partly surrounded by mountains and protected by low cloud cover and fog, Serbia and Kosovo made up an arena smaller than the state of Kentucky (39,000 square miles), with Kosovo itself no larger than the Los Angeles metropolitan area. Its topography and weather—compounded by an enemy IADS that was guaranteed to make offensive operations both difficult and dangerous—promised to provide a unique challenge for NATO air power.

Yugoslavia's air defenses were dominated by surface-to-air missile (SAM) batteries equipped with thousands of Soviet-made SAMs, including three SA-2 battalions; 16 SA-3 battalions, each with numerous launchers directed by LOW BLOW fire-control radars; and five SA-6 regiments fielding five batteries each, for a total of 25 SA-6 batteries directed by STRAIGHT FLUSH radars. These radar-guided SAMs were supplemented by around 100 vehicle-mounted SA-9 and several SA-13 infrared SAMs, along with a profusion of man-portable infrared SAMs, some 1,850 antiaircraft artillery (AAA) pieces, and numerous stockpiled reserve weapons and buried communications lines. Backing up these defenses, the Yugoslav air force consisted of 238 combat aircraft, including 15 MiG-29 and 64 MiG-21 fighter-interceptors.¹ Although the Yugoslav IADS employed equipment and technologies that dated as far back as the 1960s, albeit presum-

¹"AWOS [Air War Over Serbia] Fact Sheet," Hq USAFE/SA, December 17, 1999. See also *The Military Balance, 1998/99*, London, International Institute for Strategic Studies, 1998, p. 100.

ably with selected upgrades, its operators knew U.S. tactics well and had practiced air defense drills and honed their operational techniques for more than four decades. They also had the benefit of more equipment and better training than did the Bosnian Serbs in 1995. Finally, they enjoyed the advantage of being protected both by mountainous terrain and by the cover of inclement weather when the air war began.

In addition, Serbia's SA-2s, SA-3s, and SA-6s were served by more than 100 acquisition and tracking radars, all of which were interconnected by underground land lines and fiber optic cables. They were further backstopped by a robust civilian and military visual observer network that included covert Serb observers who monitored NATO aircraft as they took off from their bases in Europe.² In anticipation of a possible air offensive, Yugoslav defense specialists had met the month before in Baghdad with their Iraqi counterparts. Indeed, such Yugoslav-Iraqi collaboration had long preceded the Kosovo crisis. Baghdad had purchased some Yugoslav IADS equipment late during the cold war before the onset of Desert Storm. Iraq also very likely shared intelligence with Belgrade on U.S. suppression of enemy air defenses (SEAD) tactics, as well as its own experience and recommendations, in subsequent years.³ According to General Salko Begic, the air commander for the Muslim-Croat federation in Bosnia and a former service academy classmate of the Serb generals who were running Yugoslavia's air defenses when the air attacks began, the intended tactic to be used against attacking NATO aircraft was to create a killing zone below 10,000 ft by means of AAA, SA-7 infrared SAMs, and Swedish Bofors man-portable air defenses.⁴

²Discussions with former East European strategic and tactical SAM operators on IADS visual observer employment doctrine, as reported to the author by Hq USAFE/IN, May 18, 2001.

³John Diamond, "Yugoslavia, Iraq Talked Air Defense Strategy," *Philadelphia Inquirer*, March 30, 1999.

⁴Michael R. Gordon, "NATO to Hit Serbs from 2 More Sides," *New York Times*, May 11, 1999. This last system featured the Bofors 40mm gun tied to the Giraffe radar-based low-altitude air defense system (LAADS). It was the only radar-cued (as opposed to radar-directed) AAA weapon fielded in the war zone and possibly the most potent low-altitude AAA threat because of its local Giraffe-based LAADS command and control system. Peter Rackham, ed., *Jane's CAI Systems, 1994-95*, London, Jane's Information Group, 1994, p. 107.

In commenting on this layered and redundant air defense net, USAF chief of staff General Michael Ryan, who earlier had commanded Operation Deliberate Force over Bosnia in 1995, frankly conceded in congressional testimony before the start of the operation that “these guys are very good” and that friendly aircraft and aircrew losses were “a distinct possibility.”⁵ Ryan added that Yugoslavia’s IADS made for a “very substantive air defense capability” and that the Serbs maintained a “very professional army and air defense corps.” Because of the assessed robustness of the Yugoslav IADS, Pentagon planners were said to have estimated before opening night that NATO could lose as many as 10 aircraft in the initial wave of strikes.⁶

INITIAL ATTACKS AND THEIR EFFECTS

Operation Allied Force began against Yugoslavia on the night of March 24, within minutes of President Clinton’s announcement that air attacks were under way. The initial concept of operations envisaged night raids against so-called enabling targets, such as enemy air defense assets, in order to create a more permissive operating environment for subsequent attacks against other classes of targets. In announcing the commencement of attacks, the president declared that the operation had three goals: “To demonstrate the seriousness of NATO’s opposition to aggression,” to deter Milosevic from “continuing and escalating his attacks on helpless civilians,” and, if need be, “to damage Serbia’s capacity to wage war against Kosovo by seriously diminishing its military capabilities.” At the same time, he pointedly stressed: “I don’t intend to put our troops in Kosovo to fight a war.”⁷ To those opening words, the chairman of the Joint Chiefs of Staff, U.S. Army General Henry H. Shelton, added that NATO would engage “the full range of his military capabilities” if

⁵Paul Richter, “U.S. Pilots Face Perilous Task, Pentagon Says,” *Los Angeles Times*, March 20, 1999. In testimony to the Senate Armed Services Committee on the eve of the war, Ryan added: “I ran the air campaign in Bosnia, and this defensive array is much more substantive . . . two or three times more so. It is deep and redundant. Those guys [in Bosnia] were good, but these guys are better. There is a very real possibility we will lose aircraft trying to take it on.” David Atkinson, “Stealth Could Play Key Role in Kosovo, Despite Bad Weather,” *Defense Daily*, March 23, 1999, p. 1.

⁶Bruce W. Nelan, “Into the Fire,” *Time*, April 5, 1999, p. 31.

⁷Francis X. Clines, “NATO Opens Broad Barrage Against Serbs as Clinton Denounces ‘Brutal Repression,’” *New York Times*, March 25, 1999.

Milosevic did not desist from his offensive in Kosovo.⁸ As noted earlier, it was accepted as a given by the Clinton administration that Milosevic would settle quickly. As Secretary of State Albright clearly attested to this expectation in a television interview on the evening that the air attacks began: "I don't see this as a long-term operation."⁹

The air war commenced with 250 committed U.S. aircraft, including 120 land-based fighters, 7 B-52s, 6 B-2s, 10 reconnaissance aircraft, 10 combat search and rescue (CSAR) aircraft, 3 airborne command and control center (ABCCC) aircraft, and around 40 tankers.¹⁰ As for NATO's additional 18 members, 13 contributed aircraft for use in the operation, with 11 allies (Britain, France, Germany, Italy, Belgium, Canada, Denmark, the Netherlands, Norway, Spain, and Turkey) eventually participating in offensive and defensive air combat operations of all types. The first wave of attacks on the night of March 24 consisted of cruise missile launches only, featuring TLAMs fired by four U.S. surface ships (including USS *Gonzales* and USS *Philippine Sea*), two U.S. fast-attack submarines (USS *Albuquerque* and USS *Miami*), and a British attack submarine (HMS *Splendid*) operating in the Adriatic Sea. This initial wave further included AGM-86C CALCMs launched against hardened enemy structures by six B-52s flying outside Yugoslav airspace. The latter were the first shots fired in the operation.¹¹ The initial target hits occurred shortly

⁸Paul Richter, "Time Is Not on the Side of U.S., Allies," *Los Angeles Times*, March 25, 1999.

⁹John T. Correll, "Assumptions Fall in Kosovo," *Air Force Magazine*, June 1999, p. 4.

¹⁰This study has taken special care to characterize Operation Allied Force as an "air war" or an "air effort," rather than as a full-fledged "air campaign." Although that effort continues to be widely portrayed as the latter, formal Air Force doctrine defines an air campaign as "a connected series of operations conducted by air forces to achieve joint force objectives within a given time and area." *Air Force Basic Doctrine*, Maxwell AFB, Alabama, Hq Air Force Doctrine Center, AFDD-1, September 1997, p. 78. By that standard, NATO's air war for Kosovo did not attain to the level of a campaign, as did the earlier Operations Desert Storm and Deliberate Force. Rather, it was a continuously evolving coercive operation featuring piecemeal attacks against unsystematically approved targets, not an integrated effort aimed from the outset at achieving predetermined and identifiable operational effects.

¹¹The effectiveness of these initial standoff attacks was not impressive. During the first two weeks, no B-52 succeeded in launching all eight of its CALCMs. In one instance, six out of eight were said to have failed. Also, the two times that B-52s later fired the AGM-142 Have Nap cruise missile, both launches were reportedly opera-

after 8 p.m. local time in the vicinity of Kosovo's capital city of Pristina, shutting down the electrical power grid and plunging the city into darkness. The main commercial and military airfield at nearby Batajnica was also hit. In all, 55 U.S. cruise missiles were expended the first night.

These cruise-missile attacks were followed by fixed-wing air strikes that continued throughout the night, primarily against air defense targets such as SAM batteries and radar and military communications sites.¹² Allied aircraft operated out of Italy, Spain, France, Germany, the United Kingdom, and the Adriatic Sea.¹³ Their targets included a radar site at Podgorica, the capital city of Montenegro. In addition, NATO aircrews hit airfields in Serbia, Kosovo, and Montenegro, as well as electrical power generating facilities, weapons-producing factories, military and police barracks, and command and control nodes, including some aim points located north of Belgrade. Among specific targets attacked were the VJ's Kosovoski Junaci barracks near Pristina in Kosovo, the Golobovci airport in Montenegro, munitions stores at Danilovgrad, and other military targets at Radovac, Sipcanik, and Ulcini.¹⁴ Allied pilots were instructed to take no chances with enemy infrared SAMs and AAA and to honor an alti-

tional failures. See John D. Morrocco, David Fulghum, and Robert Wall, "Weather, Weapons Dearth Slow NATO Strikes," *Aviation Week and Space Technology*, April 5, 1999, p. 26, and William M. Arkin, "Kosovo Report Short on Weapons Performance Details," *Defense Daily*, February 10, 2000, p. 2.

¹²An important qualification is warranted here. Although the opening-night approved aim points largely entailed fixed IADS targets, the limited attacks conducted against them were not part of a phased campaign plan in which rolling back the enemy IADS was a priority. There was no strategic emphasis on IADS takedown in these attacks. Comments on an earlier draft by Hq USAFE/IN, May 18, 2001.

¹³Italian bases used included Aviano, Gioio del Colle, Villafranca, Amendola, Cervia, Gazzanise, Ghedi, Piacenza, Istrana, Falconara, Practica di Mare, Brindisi, and Sigonella. German bases used were Royal Air Force (RAF) Bruggen, Rhein Main Air Base (AB), Spangdahlem AB, and Ramstein AB. Bases made available by the United Kingdom were RAF Fairford, RAF Lakenheath, and RAF Mildenhall. Spain provided Moron AB, and France provided Istres. For a complete list of all participating allied air assets, their units, and their bases, as well as a tabulation of the Yugoslav IADS and air order of battle as of April 20, see Benoit Colin and Rene J. Francillon, "L'OTAN en Guerre!" *Air Fan*, May 1999, pp. 12–19. See also John E. Peters, Stuart Johnson, Nora Bensahel, Timothy Liston, and Traci Williams, *European Contributions to Operation Allied Force: Implications for Transatlantic Cooperation*, Santa Monica, California, RAND, MR-1391-AF, 2001.

¹⁴Robert Hewson, "Operation Allied Force: The First 30 Days," *World Air Power Journal*, Fall 1999, p. 16.

tude floor (or “hard deck”) of 15,000 ft to remain above their killing envelopes.

Targets attacked the first night were reviewed with special care at the White House by President Clinton, Secretary of Defense William Cohen, and General Shelton. Some proposed targets were removed from the list by dissenting NATO leaders out of concern for causing collateral damage because of their close proximity to civilian buildings. In other borderline cases in which targets were reluctantly approved, the recommended bomb size was reduced to minimize or preclude collateral damage. One of every five laser-guided bombs dropped by an F-117 the first night was a 500-lb GBU-12 instead of a 2,000-lb GBU-27. That meant less likelihood of the bomb's causing inadvertent collateral damage, but also a lower probability of destroying the intended target. The rules of engagement were uncompromisingly restrictive, with pilots instructed to return home with their weapons unless their assigned target could be positively identified.¹⁵

In all, some 400 sorties were flown the first night, including 120 strike missions against 40 targets consisting of five airfields, five army garrisons, communications centers, and storage depots, in addition to IADS facilities. Only a few SA-3 and SA-6 SAMs were launched against attacking NATO aircraft the first night. All the same, Pentagon officials anticipated the day after that at least a dozen NATO aircraft losses could be incurred should the operation continue beyond just a few days.¹⁶ Contrary to early Western press reports, Serb IADS operators never intentionally husbanded their SAMs. Instead, after experiencing allied SEAD operations for the first time, they adapted their tactics to balance lethality with survivability, with the result that they were always present and aggressive—even as they showed greater firing discipline than the Iraqis did during Desert Storm.¹⁷

¹⁵Nelan, “Into the Fire,” p. 32.

¹⁶Steven Lee Myers, “Early Attacks Focus on Web of Air Defense,” *New York Times*, March 25, 1999.

¹⁷Comments on an earlier draft by Hq USAFE/IN, May 18, 2001.

Numerous enemy fighters, including at least a dozen MiG-29s, sought to engage attacking NATO aircraft the first night.¹⁸ One MiG-29 was reported to have fired an R-73 (NATO code-named AA-10 Alamo) radar-guided missile toward an ingressing NATO fighter in an ineffectual attempt to get off a counteroffensive shot. Two MiG-29s were downed by USAF F-15s and one by a Dutch F-16. In addition, a MiG-21 was believed to have crashed during an attempt to land. Only rarely did Serb fighters rise to challenge NATO aircraft after that. The following day, General Clark declared that the bombardment would “systematically and progressively attack, disrupt, degrade, devastate,” and “ultimately . . . destroy” Milosevic’s army if he failed to accept the American-drafted peace plan. Clark further declared that the air effort would be “just as long and difficult as President Milosevic requires it to be.”¹⁹

Attacks carried out by NATO aircrews the second night were described as “significantly heavier” than those the first night. Targets included the VJ barracks at Urosevac and Prizren in Kosovo; the military airfields at Nis in southern Serbia and Golubovci near Podgorica, Montenegro; and other Serb military facilities near Trstenik and Danilovgrad.²⁰ That night, fewer than 10 SAMs were fired, none of which succeeded in scoring a hit. The third afternoon, a USAF F-15C downed two more MiG-29s, which evidently had lost contact with their ground controller and inadvertently strayed into Bosnian airspace. Although their intended NATO targets were never positively determined, it was the subsequent conclusion of the allied air commander, Lieutenant General Short, that the Serb pilots had simply lost any semblance of air situation awareness and, as a result, set themselves up as easy prey for the F-15.²¹

¹⁸This suggested that the Serb IADS may have been unable to deconflict its SAMs and fighters operating in the same airspace because of identification and discrimination problems.

¹⁹Barton Gellman, “Key Sites Pounded for 2nd Day,” *Washington Post*, March 26, 1999. See also John D. Morrocco and Robert Wall, “NATO Vows Air Strikes Will Go the Distance,” *Aviation Week and Space Technology*, March 29, 1999, p. 34.

²⁰Hewson, “Operation Allied Force,” p. 17.

²¹Telephone conversation with Lieutenant General Michael Short, USAF (Ret.), August 16, 2001.

Third-night attacks included targets in Mali Mokri Lug, Ayala, Vozdovac, and, for the first time, nearer to the immediate outskirts of Belgrade. That night, 40 percent of the targets attacked were in Kosovo, as opposed to only 20 percent the first two nights.²² These attacks, however, just like the ones that took place the preceding two nights, caused no serious inconvenience for the Serbs. On the contrary, the gradually mounting intensity of the air war merely allowed the Serbs to adjust to a new level of pain, while pressing ahead with what they had planned all along: to redouble their effort to run as many ethnic Albanian civilians as possible out of Kosovo and thus be able to take an unobstructed shot at the KLA once and for all.

This escalated ethnic cleansing should not have come as a complete surprise to NATO. Weeks earlier, the director of the Central Intelligence Agency (CIA), George Tenet, had predicted that VJ and MUP forces *might* respond to a NATO bombing campaign with precisely such a strategy. Similarly, U.S. military leaders had argued behind closed doors that air power alone would not suffice to force Milosevic to back away from such a move.²³ The CIA had reportedly learned as early as fall 1998 that Belgrade was planning a move with tanks and artillery, called Operation Horseshoe, to drive ethnic Albanians over the southern and western borders of Kosovo as soon as the snow melted in the spring. The KLA would thus be stripped of a surrounding civilian population and exposed to direct attack.²⁴ The Serb incentive for such a move was not difficult to fathom, considering that the heavily radicalized KLA, which represented the aspirations of most Kosovar Albanians, was (and remains) committed to the establishment of an independent Kosovo—and a Greater Albania over the longer term.²⁵

In any event, Milosevic's unleashing of large-scale atrocities in Kosovo and his truculent defiance of NATO denied the alliance the quick settlement it had counted on and left both NATO and the

²²Hewson, "Operation Allied Force," p. 18.

²³John F. Harris, "Clinton Saw No Alternative to Airstrikes," *Washington Post*, April 1, 1999.

²⁴Johanna McGeary, "The Road to Hell," *Time*, April 12, 1999, p. 42.

²⁵For an informed treatment of the KLA and its origins, goals, and prospects by *The New York Times'* Balkans bureau chief from 1995 to 1998, see Chris Hedges, "Kosovo's Next Masters?" *Foreign Affairs*, May/June 1999, pp. 24–42.

Clinton administration with no alternative but to continue pressing the air attacks until NATO unambiguously prevailed. Because NATO's leaders on both sides of the Atlantic had banked on a quick win, no preparations had been undertaken to anticipate what the consequences might be should Milosevic raise the stakes by accelerating his ethnic cleansing plans. Lest there be any doubt on that score, General Naumann admitted a month into the bombing that from the air war's very start, "there was the hope in the political camp that this could be over very quickly" and that as a result, no one at any level had prepared for Milosevic's ethnic cleansing push.²⁶ As a result, what had begun as a coercive NATO ploy aimed at producing Milosevic's quick compliance quickly devolved into an open-ended test of wills between the world's most powerful military alliance and the wily and resilient Yugoslav dictator.

THE AIR WAR BOGS DOWN

Once it became clear by the fourth day that the air offensive was not having its hoped-for effect on Milosevic, Clark received authorization from the NAC to proceed to Phase II, which entailed ramped-up attacks against a broader spectrum of fixed targets in Serbia and against dispersed and hidden VJ forces in Kosovo. Attacks during the preceding three nights had focused mainly on IADS targets. Phase II strikes shifted the emphasis from SEAD to interdiction, with predominant stress on cutting off VJ and MUP lines of communication and attacking their choke points, storage and marshaling areas, and any tank concentrations that could be found. Immediately before Phase II began, NATO ambassadors had argued for more than eight hours, well past midnight, over whether to expand the target list. General Naumann insisted at that session that it was time to start "attacking both ends of the snake by hitting the head and cutting off the tail."²⁷ His use of that bellicose-sounding metaphor reportedly infuriated

²⁶Carla Anne Robbins, Thomas E. Ricks, and Neil King, Jr., "Milosevic's Resolve Spawned Unity, Wider Bombing List in NATO Alliance," *Wall Street Journal*, April 27, 1999. Unlike nearly all other NATO principals, General Naumann cautioned even before the air war began that although the intent was to be quick, Operation Allied Force could well turn out to be "long and protracted." Paul Richter and John-Thor Dahlburg, "NATO Broadens Its Battle Strategy," *Los Angeles Times*, March 24, 1999.

²⁷William Drozdiak, "NATO Leaders Struggle to Find a Winning Strategy," *Washington Post*, April 1, 1999.

the Greek and Italian representatives, who had been calling for an Easter bombing pause in the hope that it might lead to negotiations.²⁸

NATO went into this second phase earlier than anticipated because of escalating Serb atrocities on the ground. Up to that point, the air attacks had had no sought-after effect on Serb behavior whatsoever. On the contrary, Serbia's offensive against the Kosovar Albanians intensified, with Serb troops burning villages, arresting dissidents, and executing supposed KLA supporters. The Serbs continued unopposed in their countercampaign of ethnic cleansing, ultimately forcing most of the 1.8 million ethnic Albanians in Kosovo from their homes.²⁹

By the start of the second week, Clinton administration officials acknowledged that Operation Allied Force had failed to meet its declared goal of halting Serbian violence against the ethnic Albanians.³⁰ Echoing that judgment, Clark added that NATO was confronting "an intelligent and capable adversary who is attempting to offset all our strategies."³¹ It was becoming increasingly clear that at least one element of Milosevic's strategy entailed playing for time. Yet although the humanitarian crime of ethnic cleansing gave the Serbs an immediate tactical advantage, it also came at the long-term cost of virtually forcing NATO to stay the course. The bombing effort thus evolved into a race between those Serb forces trying to drive the ethnic Albanians out of Kosovo and NATO forces trying to hinder that effort—or, failing that, to punish Milosevic badly enough to make him quit.

²⁸The latter rumblings prompted concern in U.S. and NATO military circles that once any such pause might be agreed to, it would be that much more difficult to resume the bombing after the pause had expired. In the end, no pause in the bombing occurred at any time during Allied Force, other than those occasioned by bad weather.

²⁹After careful examination, the provision of airlift relief missions for the Kosovar refugees was ruled out by U.S. and NATO planners because they were deemed excessively dangerous in the face of threats from enemy ground fire and because of concern that any delivered supplies would end up in the wrong hands.

³⁰Bradley Graham and William Drozdiak, "Allied Action Fails to Stop Serb Brutality," *Washington Post*, March 31, 1999.

³¹Craig R. Whitney, "On 7th Day, Serb Resilience Gives NATO Leaders Pause," *New York Times*, March 31, 1999.

Five B-1Bs were added to the U.S. Air Force's bomber contingent at the start of the second week. In preparing them for combat, what normally would have taken months of effort to program the aircraft's mission computers was compressed into fewer than 100 hours during a single week as Air Force officers and contractors updated the computers with the latest intelligence on enemy radar and SAM threats. One aircraft with the latest updated software installed, the Block D upgrade of the Defensive System Upgrade Program, passed a critical flight test at the 53rd Wing at Eglin AFB, Florida, and two B-1s were committed to action over Yugoslavia two days later. These aircraft, which, alongside the B-52s, operated out of RAF Fairford in England, employed the Raytheon ALE-50 towed decoy to good effect for the first time in combat.³² They were still test-configured aircraft flown by test crews. The B-1s, all test-configured with Block D upgrades, typically flew two-ship missions against military area targets, such as barracks and marshaling yards.

While the Serb pillaging of Kosovo was unfolding on the ground, NATO air attacks continued to be hampered by bad weather, enemy dispersal tactics, and air defenses that were proving to be far more robust than expected. In the absence of a credible NATO ground threat, which the United States and NATO had ruled out from the start, VJ forces were able to survive the air attacks simply by spreading out and concealing their tanks and other vehicles. More than half of the nightly strike sorties returned without any weapons expended owing to adverse weather in the target area. Only four days out of the first nine featured weather offering visibility conditions suitable for employing laser-guided bombs (LGBs). By the end of Day 9, only 15 percent of the 2,700 sorties flown had actually been bombing missions. In all, it took NATO 12 days to complete the same number of

³²Of 10 known Serb SAMs that reportedly guided on B-1s during the course of the air war, all were believed to have been successfully diverted to the decoys. See David Hughes, "A Pilot's Best Friend," *Aviation Week and Space Technology*, May 31, 1999, p. 25. The commander of USAFE, General John Jumper, later explained the Serb IADS tactic employed: Radars in Montenegro would acquire and track the B-1s as they flew in from over the Adriatic Sea, arced around Macedonia, and proceeded north into Kosovo. Those acquisition radars would then hand off their targets to SA-6s, whose radars came up in full target-track mode and fired the missiles, which headed straight for the ALE-50 and took it out, just as the system was designed to work. "Jumper on Air Power," *Air Force Magazine*, July 2000, p. 43.

strike sorties that had been conducted during the first 12 hours of Desert Storm.

To all intents and purposes, the difference between Phase II and Phase I was indistinguishable as far as the intensity of NATO's air attacks was concerned. The commencement of Phase II was characterized as more of an evolution than a sharp change of direction. On that point, NATO's spokesman at the time, RAF Air Commodore David Wilby, said that the operation was "just beginning to transition" from IADS targets to fielded VJ and MUP forces.³³ By the start of the second week, merely 1,700 sorties had been flown, only 425 of which consisted of strike sorties against a scant 100 approved targets.³⁴ Up to that point, air operations had averaged only 50 strike sorties a night, in sharp contrast to Desert Storm, in which the daily attack sortie rate was closer to 1000. The operational goal of Allied Force was still officially described as merely seeking to "degrade" Serbia's military capability. In one of the first hints of growing concern that the air effort was not going well, a senior U.S. general spoke of at least "several weeks" of needed attacks to beat down VJ and MUP forces to the breaking point.³⁵ Similarly, by the start of the second week, an administration official declared that the goal of the bombing was to "break the will" of the Belgrade leadership, implying an open-ended air employment strategy.³⁶ Earlier, administration spokesmen had indicated that they believed that just a few days of bombing would do the trick.

NATO soon discovered that it was dealing with a cunning opponent who was quite accomplished at hiding. As a result, it conceded that it was being forced to "starve rather than shoot them out."³⁷ Even with clear skies at the beginning of the third week, NATO pilots were having little success at interdicting those VJ and MUP troops and

³³Bradley Graham, "Bombing Spreads," *Washington Post*, March 29, 1999.

³⁴The USAF flew 84 percent of those sorties, the NATO allies 10 percent, and the U.S. Navy 6 percent.

³⁵Graham, "Bombing Spreads."

³⁶Craig R. Whitney, "NATO Had Signs Its Strategy Would Fail Kosovars," *New York Times*, April 1, 1999.

³⁷William Drozdiak and Bradley Graham, "NATO Frustration Grows as Mission Falls Short," *Washington Post*, April 8, 1999.

paramilitary thugs in Kosovo who were carrying out the executions, village burnings, and forced emigration of Kosovar Albanians, to say nothing of finding and attacking their tanks and artillery. Since attacking dispersed VJ troops directly was proving to be too difficult, attacks against fielded forces concentrated instead on second-order effects by going after bases, supplies, and petroleum, oil, and lubricants (POL).

On Day 6, Clark sought NATO approval to increase the pressure on Milosevic by attacking the defense and interior ministry headquarters in Belgrade. That request was disapproved by NATO's political leaders, on the declared ground that such strikes were still "premature."³⁸ The list of approved targets increased by about 20 percent at the end of the first week. Yet Clark still did not receive the full authority from NATO that he had sought. NATO Secretary General Javier Solana, in particular, expressed misgivings about a larger target set, saying that he was not persuaded that the time had come yet to intensify the operation so dramatically. As a result, Clark was forced to improvise changes to an original plan that had called for slow-motion escalation, punctuated by pauses, disturbingly comparable to the flawed strategy employed during Operation Rolling Thunder over North Vietnam a generation earlier.

Phase III, which entailed escalated attacks against military leadership, command and control centers, weapons depots, fuel supplies, and other targets in and around Belgrade, commenced de facto on Day 9 with strikes against infrastructure targets in Serbia. These included the Petrovaradin bridge on the Danube at Novi Sad; a bridge on the Magura-Belacevac railway; the main water supply to Novi Sad; and targets near Pec, Zatric, Decane, Dragodan, Vranjevac, Bajin Basta, and the Pristina airport.³⁹ No targets in or near Belgrade, however, were attacked. At this point, Allied Force was still generating no more than 50 ground-attack sorties a day.⁴⁰ There was mounting unease over the fact that attacks against empty barracks

³⁸Thomas W. Lippman and Dana Priest, "NATO Builds Firepower for 24-Hour Attacks," *Washington Post*, March 30, 1999.

³⁹The NAC did not formally approve strikes on Phase III targets per se, although it did assent to target classes within Phase III.

⁴⁰Hewson, "Operation Allied Force," p. 22.

and other military facilities were having no effect on Serb behavior now that VJ and MUP forces were well dispersed. It soon became evident that Milosevic had hunkered down in a calculated state of siege. Evidently sensing that he had accomplished many of his goals on the ground and believing that he could now succeed in dividing NATO, he declared a unilateral cease-fire on April 6. The United States and NATO, however, rejected that transparent ploy and pressed ahead with their attacks.

U.S. naval aviation, unavailable for the initial phase of Operation Allied Force, joined the fray when the aircraft carrier USS *Theodore Roosevelt* arrived on station in the Ionian Sea south of Italy two weeks afterward, on April 6. The air wing assigned to the *Theodore Roosevelt* flew complete and self-sustaining strike packages, including F-14Ds and F/A-18s for surface-attack operations, EA-6Bs for the suppression of enemy air defenses, F-14s in the role of airborne forward air controllers, and E-2Cs performing as ABCCC platforms. These packages typically flew missions only against dispersed and hidden enemy forces in Kosovo, although on one occasion, on April 15, they struck a hardened aircraft bunker at the Serbian air base at Podgorica in Montenegro in the first of several allied efforts to neutralize a suspected air threat against the U.S. Army's Task Force Hawk deployed in Albania (see below).⁴¹ The E-2C, normally operated as an airborne early warning (AEW) platform to screen the carrier battle group from enemy air threats, was used in Allied Force to provide an interface between the CAOC and naval air assets

⁴¹Conversation with Vice Admiral Daniel J. Murphy, USN, commander, 6th Fleet, aboard USS *LaSalle*, Gaeta, Italy, June 8, 2000. See also Vice Admiral Daniel J. Murphy, USN, "The Navy in the Balkans," *Air Force Magazine*, December 1999, p. 49. According to a later account by General Jumper, the strike against the Podgorica airfield was the most concentrated effort placed on any target throughout the entire course of Allied Force. To satisfy SACEUR's objective, General Short needed to neutralize the airfield's sortie generation capacity completely. At the time the target was selected, only 50 percent of the aim points required to meet that objective had been identified. It took 48 hours to accomplish the additional target analysis and to free up additional required NATO assets to carry out this strike. Since the *Theodore Roosevelt* had just arrived in the theater, it had not been tasked in the April 15 Air Tasking Order and accordingly had assets that were immediately available. As a result, F-14 and F/A-18 aircraft struck the hardened aircraft bunker (the highest-value critical element) and used CAOC (Combined Air Operations Center) assets to assist in targeting and weaponeering. Other NATO assets struck the remaining critical elements 48 hours later and met SACEUR's objectives. Conversation with General John P. Jumper, USAF, Hq Air Combat Command, Langley AFB, Virginia, May 15, 2001.

operating in the theater, including both strikers and intelligence collectors.⁴²

It was hard during the first few weeks for outside observers to assess and validate the Pentagon's and NATO's claims of making progress because U.S. and NATO officials had so deliberately refrained from disclosing any significant details about the operation. Instead, administration and NATO sources limited themselves to vague generalizations about the air war's effects, using such hedged terms as "degrading," "disrupting," and "debilitating" rather than the more unambiguous "destroying." On this studiously close-mouthed policy, the Defense Department's spokesman, Kenneth Bacon, declared that a precedent was being intentionally set, since both Secretary Cohen and General Shelton had seen a need to "change the culture of the Pentagon and make people more alert to the dangers that can flow from being too generous—or you could say profligate or lax—with operational details."⁴³

In one of the first tentative strikes against enemy infrastructure, the main telecommunications building in Pristina, the capital city of Kosovo, was taken out by two GBU-20 LGBs dropped by an F-15E on April 6. Yet the air effort as a whole remained but a faint shadow of Operation Desert Storm, with only 28 targets throughout all of Yugoslavia attacked out of 439 sorties in a 24-hour period during the operation's third week.⁴⁴ As for the hoped-for "strategic" portion of the air war against the Serb heartland, Clark was still being refused permission by NATO's political leaders to attack the state-controlled television network throughout Yugoslavia. On April 12, attacks were

⁴²See Commander Wayne D. Sharer, USN, "The Navy's War over Kosovo," *Proceedings*, U.S. Naval Institute, October 1999, pp. 26–29; and Robert Wall, "E-2Cs Become Battle Managers with Reduced AEW Role," *Aviation Week and Space Technology*, May 10, 1999, p. 38.

⁴³Jason DeParle, "Allies' Progress Remains Unclear as Few Details Are Made Public," *New York Times*, April 5, 1999.

⁴⁴In fairness to that effort, however, and given the many constraints that affected it—in contrast to the far fewer constraints that affected Desert Storm—weather, mainly an irritant during the Gulf War, was a significant factor during Operation Allied Force. Bad weather, combined with the higher population density of Serbia, the concern for collateral damage, and the increased surface-to-air threat, could easily have contributed to a lower relative intensity of strike operations. I thank Major Richard Leatherman, Hq Air Force Doctrine Center, for having called this possibility to my attention.

conducted against an oil refinery at Pancevo and other infrastructure targets, with the Pentagon announcing that all of Yugoslavia's oil refineries had been destroyed but that some stored fuel remained available. Also on April 12, the 20th day of the air attacks, NATO missions into the newly designated Kosovo Engagement Zone (KEZ) commenced with attempted attacks against VJ and MUP tanks, artillery, wheeled vehicles, and other assets fielded in Kosovo, in response to Belgrade's escalated ethnic cleansing of the embattled province.

By the third week, NATO's strategic goals had shifted from seeking to erode Milosevic's ability to force an exodus of Kosovar Albanian civilians to enforcing a withdrawal of Serb forces from Kosovo and a return of the refugees home. That shift in strategy was forced by Milosevic's early seizure of the initiative and his achievement of a near-fait accompli on the ethnic cleansing front. Up to that point, President Clinton had merely insisted that the operation's goal was to ensure that Milosevic's military capability would be "seriously diminished."⁴⁵

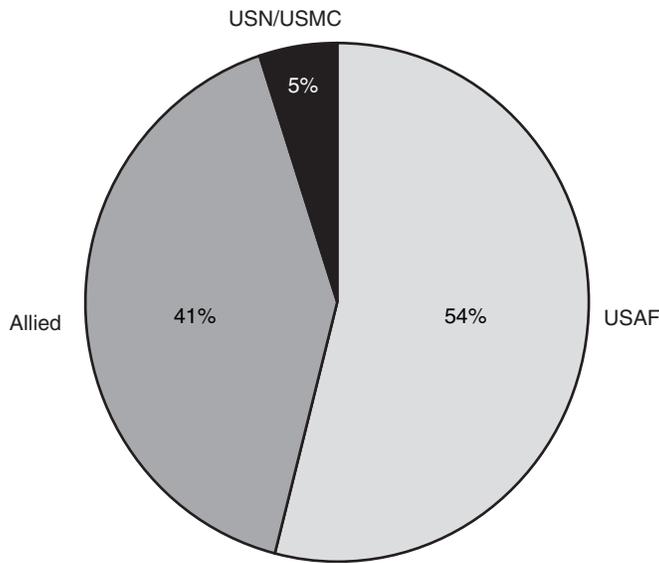
As Operation Allied Force continued to bog down entering its third week, the influential London *Economist* pointedly observed that it was not "just NATO whose credibility is at risk. At home, the Defense Department's post-Gulf-war prestige is also in the balance, along with the doctrines of high-tech dominance that the Gulf war encouraged people to believe. America's faith in air power, formed by the precision bombing of Iraqi targets, has already been tested by Mr. Hussein's durability. If the current bombing fails to unseat Mr. Milosevic, the air power doctrine could collapse."⁴⁶ Numerous factors accounted for why the operation's early performance had proven so disappointing. They included adverse weather, difficult terrain, a wily and determined opponent, poor strategy choices by the Clinton administration and NATO's political leaders, and, perhaps most of all, the burdens of having to coordinate an air operation with 18 often highly independent-minded allies.

⁴⁵John M. Broder, "Clinton Says Milosevic Hurts Claim to Kosovo," *New York Times*, March 31, 1999.

⁴⁶"Hope for the Best, and a Spot of Golf," *The Economist*, April 3, 1999, p. 9.

By the end of the third week, in large measure out of frustration over the operation's continued inability to get at the dug-in and elusive VJ positions in Kosovo, Clark requested a deployment of 300 more aircraft to support the effort. That request, which would increase the total number of committed U.S. and allied aircraft to nearly 1,000, entailed more than twice the number of allied aircraft (430) on hand when the operation began on March 24—and almost half of what the allied coalition had had available for Desert Storm. For the United States, it represented a 60 percent increase over the 500 U.S. aircraft already deployed (see Figure 3.1 for the ultimate proportions of U.S. and allied aircraft provided to support Allied Force). Among other things, it prompted understandable concern about where to base

RAND MR1365-3.1



SOURCE: AWOS Fact Sheet.

Figure 3.1—U.S. and Allied Aircraft Contributions

them, with NATO looking to France, Germany, Hungary, Turkey, and the Czech Republic for possible options.⁴⁷

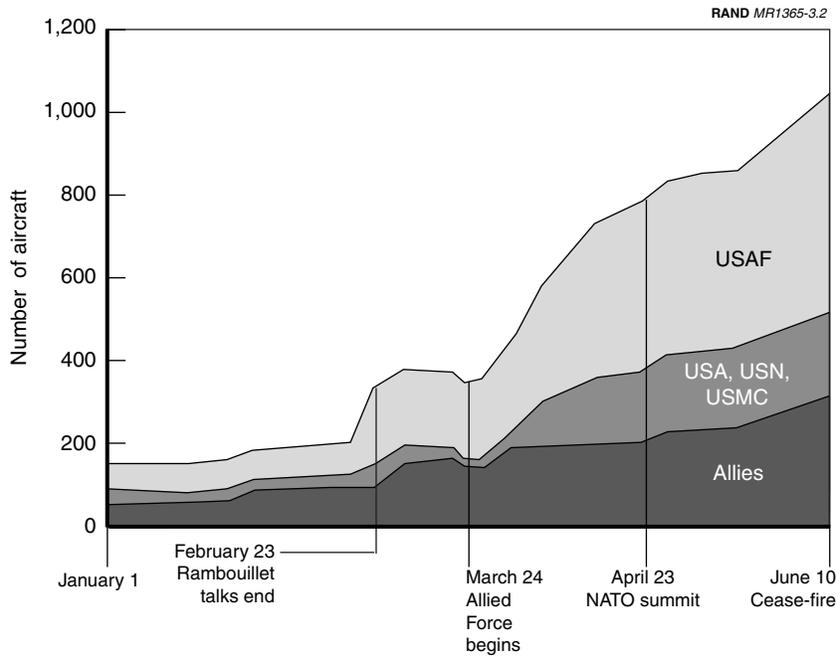
The call for 300 additional aircraft followed on the heels of an earlier request by Clark for 82 more aircraft, which had been promptly approved by the Pentagon. This time, Pentagon officials expressed surprise at the size of Clark's request and openly questioned whether it would be approved in its entirety.⁴⁸ The principal concern was that it would draw precious assets, notably such low-density/high-demand aircraft as the E-3 airborne warning and control system (AWACS) and EA-6B Prowler, away from Iraq and Korea. The service chiefs reportedly complained that Clark's requested quantities represented a clear case of overkill and that USEUCOM was not making the most of the forces already at its disposal.

In addition, Clark asked for the USS *Enterprise* and its 70-aircraft air wing, which would necessitate extending the carrier's cruise length and thereby breaking a firm Navy rule of not keeping aircrews and sailors at sea for any longer than six months at a single stretch. The request was opposed by the chief of naval operations, Admiral Jay Johnson, and Secretary of the Navy Richard Danzig. In the end, the *Enterprise* was made available by the Navy for diversion to the Adriatic as requested, but its air wing was never tasked by the CAOC, and it never participated in Allied Force. Once the additional aircraft were approved, NATO asked Hungary to make bases available and Turkey to help absorb those aircraft. Figure 3.2 shows how the in-theater buildup of aircraft ultimately played itself out.

As a part of his requested force increment, Clark also asked for a deployment of Army AH-64 Apache attack helicopters. Although the other aircraft were eventually approved by Secretary Cohen and the Joint Chiefs of Staff (JCS), this particular request was initially

⁴⁷Steven Lee Myers, "Pentagon Said to Be Adding 300 Planes to Fight Serbs," *New York Times*, April 13, 1999.

⁴⁸One former senior U.S. officer commented that Clark had presented "a wish list that would choke a horse." Elaine M. Grossman, "Clark's Firepower Request for Kosovo Prompts Anxiety Among Chiefs," *Inside the Pentagon*, April 15, 1999.



SOURCE: Hq USAFE/SA.

Figure 3.2—In-Theater Aircraft Buildup

disapproved, on the avowed premise that since attack helicopters are typically associated with land combat, the introduction of Apaches might be misperceived by some allies as a precursor to a ground operation. A more serious concern almost surely was that the Apaches might not survive were they to be committed to combat in the still-lethal Serb SAM and AAA environment.

In the end, despite Army and JCS reluctance, Clark prevailed in his request for the Apaches and announced that 24 would be deployed to Albania from their home base at Illesheim, Germany. Pentagon spokesmen went out of their way to stress that the Apaches were intended solely as an extension of the air effort and not as an implied

prelude to future ground operations.⁴⁹ To support the major aircraft buildup requested by Clark, the Pentagon asked President Clinton to authorize a call-up of 33,000 U.S. reservists and National Guard members—in the largest single reserve-force activation since Desert Shield in 1990–1991, when 265,000 Guard and reserve personnel had been mobilized for possible combat or combat-support duty in the Gulf. As the bombing entered its 27th day, Clinton asked Congress for \$5.458 billion in emergency funding to continue financing the air effort, with \$3.6 billion to cover air operations from March 24 to the end of FY99, \$698 million for additional cruise missiles and precision-guided munitions (PGMs), and \$335 million for refugee relief.

Meanwhile, Operation Allied Force remained as stalled as ever, with no sign of tangible progress. Clark had wanted to go after command bunkers and other vital targets in Serbia from the very start of the operation, but it took more than a month for NATO's political leaders to approve an attack on Milosevic's villa at Dobanovci. The Dutch government steadfastly refused to grant approval to bomb his presidential palace because the latter was known to contain a painting by Rembrandt.⁵⁰ NATO's ambassadors would not even approve strikes against occupied VJ barracks out of expressed concern over causing too many casualties among helpless enemy conscripts.⁵¹

By the end of the first month, as many as 80 percent of the strikes conducted had been revisits to fixed targets that had been attacked at least once previously. This was due in part to rapid enemy regeneration and reconstitution efforts, but mainly to the limited number of targets that had been approved by NATO's civilian leaders, the often maddeningly slow target generation and approval process, and

⁴⁹Bradley Graham and Dana Priest, "Allies to Begin Flying Refugees Abroad," *Washington Post*, April 5, 1999. In his subsequent memoirs, Clark frankly excoriated what he called "the reluctant Army mind-set in Washington" on this issue and dismissed other critics of his requested AH-64 commitment as "the voices of conventional air power" coming from "commanders who had no experience with the Apaches." General Wesley K. Clark, *Waging Modern War: Bosnia, Kosovo, and the Future of Combat*, New York, Public Affairs, 2001, pp. 230, 278.

⁵⁰To which General Naumann countered in resigned exasperation: "It isn't a good Rembrandt." Robbins, Ricks, and King, Jr., "Milosevic's Resolve Spawned More Unity in Alliance and a Wider Target List."

⁵¹Michael Ignatieff, "The Virtual Commander: How NATO Invented a New Kind of War," *The New Yorker*, August 2, 1999, p. 32.

SACEUR's desire to keep the bombs falling on Serbia notwithstanding those constraints. The Serbs repeatedly demonstrated an ability to perform workarounds and rebuild their damaged communications facilities, with some IADS installations being brought back on line less than 24 hours of having been attacked.⁵² Furthermore, among all the Air Tasking Order (ATO) releases of combat aircraft against preassigned targets, some failed to get airborne because of weather cancellations or maintenance-related aborts, and others either returned home without having expended their ordnance because of rules-of-engagement constraints or having failed to hit their assigned aim points when they did succeed in dropping munitions. These considerations also figured prominently in the low effectiveness of the overall effort.

As the air war entered its fifth week, Clark admitted that Milosevic was still pouring reinforcements into Kosovo continuously and that "if you actually added up what's there on a given day, you might find that he's strengthened his forces in there."⁵³ Much as during some periods of Desert Storm, adverse weather at the five-week point had forced a cancellation or failure of more than half of all scheduled bombing sorties on 20 of the first 35 days of air attacks. Seemingly resigned to a waiting game as the air war appeared stalled after more than a month of continual bombing, a senior NATO diplomat confessed that it now felt as though Operation Allied Force "had been put on autopilot. Now we are basically waiting for something to crack in Belgrade."⁵⁴ In light of the stalled offensive, some saw the air war now threatening to stretch into summer 1999, if not longer.

⁵²Bradley Graham and John Lancaster, "Most NATO Bombing Raids Target Previously Hit Sites," *Washington Post*, April 21, 1999. In fairness to NATO planners, some of those reattacks were valid, because a few especially large area targets entailed numerous individual aim points, some of which were missed in the initial attacks. The vast majority, however, merely entailed what many frustrated NATO crewmembers referred to as "bouncing rubble," having no practical effect and presenting considerable added risk to their own survivability. It was not uncommon for aircrews to complain vocally about having their "warm bodies sent out all over again to turn bricks into powder."

⁵³Craig R. Whitney, "NATO Chief Admits Bombs Fail to Stem Serb Operations," *New York Times*, April 28, 1999.

⁵⁴Neil King, Jr., "War Against Yugoslavia Lapses into Routine, but Clock Is Ticking," *Wall Street Journal*, May 6, 1999.

NATO FINALLY ESCALATES

In what proved in hindsight to be a watershed development for Operation Allied Force, the NATO summit that convened in Washington on April 23–25 to commemorate the alliance's 50th anniversary was pivotal in solidifying NATO's collective determination not to lose. As President Clinton's national security adviser, Samuel Berger, later attested, NATO's leaders unanimously agreed at the summit that "we will not lose. We will not lose. Whatever it takes, we will not lose."⁵⁵ Part of the mounting pressure on U.S. and NATO leaders to show greater resolution emanated from a public mood on both sides of the Atlantic that was growing increasingly sensitive to, and emboldened by, the horrific privations inflicted on helpless Kosovar Albanians by their Serb oppressors, shown daily on worldwide television—a public reaction, one might add, that calls into serious question the oft-heard assertion that Milosevic "won" the media campaign. The ugly spectacle of the ethnic cleansing push finally drove the allied leaders to turn the corner at the Washington summit, after which, as General Jumper later observed, "we really had the level of consensus we should have had to start this thing off. . . . After the Washington summit, there was no way that NATO was going to let itself fail."⁵⁶

That consensus, along with the refugee crisis, occasioned an increased NATO willingness to attack major infrastructure targets. Eventually, thanks to this heightened inclination to ramp up the pressure, NATO's Master Target File grew from only 169 targets on the eve of the air effort to more than 976 by its end in early June.⁵⁷ Once the call for a substantially expanded target list had prevailed, the new goal became punishing Belgrade's political and military elites, weakening Milosevic's domestic power base, and demonstrat-

⁵⁵Doyle McManus, "Clinton's Massive Ground Invasion That Almost Was," *Los Angeles Times*, June 9, 2000.

⁵⁶General John Jumper, USAF, "Oral Histories Accomplished in Conjunction with Operation Allied Force/Noble Anvil."

⁵⁷Dana Priest, "Target Selection Was Long Process," *Washington Post*, September 20, 1999. One must take care, however, not to confuse Master Target File growth with approved target growth. Although target *nominations* increased dramatically as the air war entered full swing, getting those targets individually approved remained a challenge throughout the air war to the very end.

ing by force of example that he and his fellow perpetrators of the abuses in Kosovo would find no sanctuary.

Even before the Washington summit, NATO's targeting efforts had already begun to focus gradually not just on dispersed and hidden enemy forces in Kosovo, but also on what NATO officials had come to characterize as the four pillars of Milosevic's power—the political machine, the media, the security forces, and the economic system. New targets added to the approved list included national oil refineries, petroleum depots, road and rail bridges over the Danube, railway lines, military communications sites, and factories capable of producing weapons and spare parts.⁵⁸ The first attacks against state radio and television stations in Belgrade took place on April 21, with three cruise missiles temporarily shutting down three channels run by Milosevic's wife, Mira Markovic, destroying the 12th through the 17th floors of the building, and killing several journalists and technicians, after NATO had issued a warning to employees to vacate the buildings. (Transmissions resumed 11 hours later, occasioning a reattack.) With that escalation, NATO finally brought the air war to Yugoslavia's political and media elite after weeks of hesitation, indicating that it was now emboldened enough to go directly after the business interests of Milosevic's family and friends. In the same attack, U.S. cruise missiles took out the offices of the political parties of Milosevic and his wife. Also on April 21, the Zezel bridge, the last remaining bridge over the Danube at Novi Sad, was dropped.

On April 28, a large, coordinated attack was launched against the Serb military airfield at Podgorica, with 30 munitions employed against such targets as hardened shelters, POL facilities, radar sites, and aircraft and helicopters parked in revetments. During that attack, a 4,700-lb GBU-28 "bunker-buster" was dropped for the first time in Allied Force by an F-15E on an underground aircraft and equipment storage hangar at the Pristina airfield. (By that point in the air war, F-15Es had begun flying seven-and-a-half-hour missions into Serbia directly from RAF Lakenheath in England.)⁵⁹ Having

⁵⁸Eric Schmitt and Steven Lee Myers, "NATO Said to Focus Raids on Serb Elite's Property," *New York Times*, April 19, 1999.

⁵⁹In the end, however, only some 10 percent of the 48th Fighter Wing's F-15E combat missions were flown out of Lakenheath. The remainder were flown out of the wing's

been repeatedly attacked before with less destructive munitions, that buried hangar and the remaining aircraft, munitions, and supplies kept in it were thought to have been taken out once and for all by this weapon, an assessment which later proved false.⁶⁰ Shortly thereafter, an attack was conducted against the national command center in Belgrade, a multistory facility buried more than 100 feet underground and known to have been one of Milosevic's occasional retreats.⁶¹ Equipped with communications, medical facilities, living spaces, and enough food to last more than a month, it was designed to accommodate the entire Yugoslav general staff, top defense officials, and other civilian authorities.⁶²

Despite these ramped-up attacks, however, the French leadership remained critical of many proposed strike options. In particular, President Jacques Chirac opposed any attacks against Belgrade's electrical power grid with high-explosive bombs that would physically render it inoperative for any length of time. In an effort to get around Chirac's resistance, U.S. planners worked behind the scenes with French officers in search of more palatable alternatives. As reported in a later U.S. press account, they finally came up with the idea of using the CBU-104(V)2/B cluster munition, formerly referred to by some U.S. Air Force officers as the CBU-94, which could shut down Belgrade's power source for at least a few hours by depositing carbon-graphite threads on the electrical grid, an option to which Chirac finally consented.⁶³

Thanks to that modest breakthrough, in possibly the most consequential attack of the air war up to that point, USAF F-117s reportedly dropped CBU-104s on five transformer yards of Yugoslavia's electrical power grid—at Obrenovac, Nis, Bajina Basta, Drmno, and

forward operating location at Aviano. Conversation with USAF F-15E aircrews, 492nd Fighter Squadron, RAF Lakenheath, England, April 28, 2001.

⁶⁰Robert Hewson, "Allied Force, Part II: Overwhelming Air Power," *World Air Power Journal*, Winter 1999/2000, p. 99.

⁶¹Paul Richter, "Bunker-Busters Aim at Heart of Leadership," *Los Angeles Times*, May 5, 1999.

⁶²*Ibid.* The Pentagon's formal report to Congress later indicated that "some" hardened underground command bunkers had been destroyed.

⁶³Dana Priest, "France Acted as Group Skeptic," *Washington Post*, September 20, 1999, and David A. Fulghum, "Russians Analyze U.S. Blackout Bomb," *Aviation Week and Space Technology*, February 14, 2000, p. 59.

Novi Sad—during the early morning hours of May 3, temporarily cutting off electricity to 70 percent of the country. These munitions were similar to weapons delivered by TLAMs against the Baghdad electrical power network during the opening hours of Operation Desert Storm. The effects were achieved by means of scattered reels of treated wire which unwound in the air after being released as BLU-114/B submunitions, draping enemy high-voltage power lines like tinsel and causing them to short out.⁶⁴ The announced intent of that escalated attack was to shut down the installations that provided electrical power to the VJ's 3rd Army in Kosovo to disrupt military communications and confuse Serb air defenses.⁶⁵ Very likely an unspoken intent was also to tighten the air operation's squeeze on the Serbian political leadership and rank and file.⁶⁶

Whatever the case, the attack moved NATO over a new threshold and brought the war, for the first time, directly to the Serbian people. By the end of the seventh week, there began to be reports of Yugoslav officials openly admitting that the country was on the verge of widespread hardship because of the air war's mounting damage to the nation's economy, which had already been weakened by almost four years of international sanctions imposed for Serbia's earlier role in the war in Bosnia.⁶⁷ The destruction of one factory in Krujevac that produced automobiles, trucks, and munitions resulted in 15,000 people being put out of work, plus 40,000 more who were employed by the factory's various subcontractors. Attacks against other factories had similar effects on the Yugoslav economy. By the time Allied Force had reached its halfway point, the bombing of infrastructure targets had halved Yugoslavia's economic output and deprived more

⁶⁴An inertial navigation system (INS)-guided version of the weapon, a variant of the wind-corrected munitions dispenser, is now said to be entering the U.S. munitions inventory. Fulghum, "Russians Analyze U.S. Blackout Bomb."

⁶⁵David A. Fulghum, "Electronic Bombs Darken Belgrade," *Aviation Week and Space Technology*, May 10, 1999, p. 34.

⁶⁶The results were more symbolic than strategically significant. After the May 3 attack, some 500 workers managed to clear the filaments sufficiently to restart the equipment within 15 hours. After a similar attack on May 8, the threads were cleared within 4 hours. William Arkin, "Smart Bombs, Dumb Targeting?" *Bulletin of the Atomic Scientists*, May/June 2000, p. 52.

⁶⁷Robert Block, "In Belgrade, Hardship Grows Under Sustained Air Assault," *Wall Street Journal*, May 12, 1999.

than 100,000 civilians of jobs. Local economists reported that the effect was more damaging than that of the successive Nazi and allied bombing of Yugoslavia during World War II, when the country was far more rural in its economic makeup. A respected economist at Belgrade University who coordinated a group of economists from the International Monetary Fund (IMF) and World Bank, Mladjan Dinkic, called the results of the bombing an "economic catastrophe," adding that while the Serb population would not die of hunger, "our industrial base will be destroyed and the size of the economy cut in half."⁶⁸

Only during the last two weeks of Allied Force, however, did NATO finally strike with real determination against Serbia's electrical power generating capability, a target set that had been attacked in Baghdad from the very first days of Desert Storm. The earlier "soft" attacks at the beginning of May with graphite filament bombs against the transformer yards of Yugoslavia's main power grid had caused a temporary disruption of the power supply by shorting out transformers and disabling them rather than destroying them. But this time, in perhaps the single most attention-getting strike of the entire air war up to that point, the Yugoslav electrical grid was severely damaged over the course of three consecutive nights starting on May 24. Those attacks, directed against electrical power facilities and related targets in Belgrade, Novi Sad, and Nis, the three largest cities in Serbia, shut off the power to 80 percent of Serbia, leaving millions without electricity or water service. They affected the heart of Yugoslavia's IADS, as well as the computers that ran its banking system and other important national consumers of electricity.⁶⁹

As evidence that these infrastructure attacks were making their effects felt, the early street dancing and carefully orchestrated demonstrations of studied outrage against NATO in response to its earlier pinprick attacks became displaced by a manifest weariness on the part of most residents. Clark continued to stress that the top priority was to destroy the VJ's 3rd Army or run it out of Kosovo. He also ac-

⁶⁸Steven Erlanger, "Economists Find Bombing Cuts Yugoslavia's Production in Half," *New York Times*, April 30, 1999.

⁶⁹Philip Bennett and Steve Coll, "NATO Warplanes Jolt Yugoslav Power Grid," *Washington Post*, May 25, 1999.

knowledge, however, the goal of disrupting the everyday life of Serb citizens.⁷⁰ By late May, NATO military commanders had received authorization to attack Yugoslavia's civilian telephone and computer networks in an effort to sever communications between Belgrade and Kosovo.⁷¹ In all of this, a long-discredited premise of classic air power theory, namely, that the bombing of civilian infrastructure would eventually prompt a popular reaction, seemed to be showing some signs of validity. Until that key turning point, Clark later observed, Operation Allied Force had been "the only air campaign in history in which lovers strolled down riverbanks in the gathering twilight and ate at outdoor cafes and watched the fireworks."⁷²

FACING THE NEED FOR A GROUND OPTION

During the air war's initial weeks, administration officials continued to adhere to their initial hope that an air effort alone would eventually elicit the desired response from Milosevic. Even after Allied Force was well under way, Secretary General Solana announced that he was sure that the bombing would be over before the start of the long-planned Washington summit on April 23 to celebrate NATO's 50th birthday.⁷³ Deep doubts that the air attacks alone would suffice in forcing Milosevic to knuckle under, however, soon prompted a steady rise in military pressure—notably from some U.S. Air Force leaders directly involved with the air war—for developing at least a fallback option for a ground invasion.⁷⁴

Indeed, even before the operation was a week old, indications had begun to mount that senior administration officials were starting to have second thoughts about the advisability of having peremptorily

⁷⁰Ibid.

⁷¹William Drozdiak, "Allies Target Computer, Phone Links," *Washington Post*, May 27, 1999.

⁷²Ignatieff, "The Virtual Commander," p. 35.

⁷³James Gerstenzang and Elizabeth Shogren, "Serb TV Airs Footage of 3 Captured U.S. Soldiers," *Los Angeles Times*, April 1, 1999.

⁷⁴On that account, Clark later acknowledged that his air commanders were no happier than he was with the absence of a ground threat, noting that it was "sort of an unnatural act for airmen to fight a ground war without a ground component." Ignatieff, "The Virtual Commander," p. 33.

ruled out a ground option before launching into Allied Force. The chairman of the JCS, General Shelton, for example, remarked that there were no NATO plans “right now” to introduce ground troops short of a peace settlement in Kosovo.⁷⁵ In a similarly hedged remark, Secretary Cohen pointed out that the Clinton administration and NATO had no plans to introduce any ground troops “into a hostile environment,” leaving open the possibility that they might contemplate putting a ground presence into a Kosovo deemed “nonhostile” before the achievement of a settlement.⁷⁶ By the end of the second week, Secretary of State Albright went further yet toward hinting at the administration’s growing discomfiture over having ruled out a ground threat when she allowed that NATO might change its position and put in ground troops should the bombing succeed in creating a “permissive environment.”⁷⁷ Ultimately, the air war’s continued indecisiveness led President Clinton himself to concede that he would consider introducing ground troops if he became persuaded that the bombing would not produce the desired outcome. In a clear contradiction to his earlier position on the issue, he asserted that he had “always said that . . . we have not and will not take any option off the table.” That statement was later described by a U.S. official as testimony to an ongoing administration effort “to break out of a rhetorical box that we should never have gotten into.”⁷⁸

By the start of the third week, a consensus had begun to form in Washington that ground forces might well be needed, if only to salvage NATO’s increasingly shaky credibility that was being steadily

⁷⁵Paul Richter, “Use of Ground Troops Not Fully Ruled Out,” *Los Angeles Times*, March 29, 1999.

⁷⁶Rowan Scarborough, “Military Experts See a Need for Ground Troops,” *Washington Times*, March 30, 1999.

⁷⁷Rowan Scarborough, “Momentum for Troops Growing,” *Washington Times*, April 5, 1999.

⁷⁸John F. Harris, “Clinton Says He Might Send Ground Troops,” *Washington Post*, May 19, 1999. In an earlier attempt at revisionism, Secretary of State Albright upbraided an interviewer by flatly declaring that “we never expected this to be over quickly,” in complete contradiction to her categorical pronouncement the first night of the air war 11 days earlier that “I think that this is something, the deter and damage, is something that is achievable within a relatively short time.” John Harris, “Reassuring Rhetoric, Reality in Conflict,” *Washington Post*, April 8, 1999.

eroded by the air operation's lackluster performance.⁷⁹ That dawning realization led to two parallel escalation processes: one highly public—the substantial increase in the number of committed aircraft, the growing number of approved targets and heightened percentage of daily shooter sorties, and the hard attacks conducted against the Yugoslav power grid; and the other largely beneath public scrutiny—namely, more serious discussion within the U.S. government over the need to begin making concrete preparations for a ground intervention. Deputy Secretary of State Strobe Talbott conveyed a “very explicit” warning to Russian envoy Vladimir Chernomyrdin that President Clinton was seriously considering a ground option, a warning which we can assume Chernomyrdin duly passed on to Milosevic.

At the same time, a pronounced rift emerged between Clark and his Pentagon superiors over Clark's insistence on replacing talk with determined action in connection with preparations for a ground invasion. In his memoirs, Clark later gave candid vent to his frustration over this rift when he referred to the “divide between those in Washington who thought they understood war and those [of us] in Europe who understood Milosevic, the mainsprings of his power, and the way to fight on this continent.”⁸⁰ Earlier in April, he had challenged U.S. and British officers at NATO headquarters to consider “what if” options for a potential ground war. Out of frustration over the refusal of both Washington and his NATO masters to countenance any serious consideration of a ground component to Allied Force, he also asked the Army, shortly after the air war began, to send him a half-dozen officers from the School of Advanced Military Studies at Fort Leavenworth, Kansas, to draw up secret plans for a broad spectrum of ground options, ranging from sending in peacekeepers to police any settlement that might be achieved single-handedly by the air war to launching a full-fledged, opposed-entry land invasion if all else proved wanting. It soon became clear from

⁷⁹Dan Balz, “U.S. Consensus Grows to Send in Ground Troops,” *Washington Post*, April 6, 1999.

⁸⁰Clark, *Waging Modern War*, p. 303. As a testament to the depth of his conviction on the criticality of getting serious about laying the groundwork for a land invasion, Clark in mid-May wrote a letter to Secretary General Solana which, he said, “demonstrated at length how moving into ground-force preparations would *exponentially* increase [NATO's] leverage against Milosevic.” *Ibid.*, pp. 307–308, emphasis added.

that inquiry that only about a dozen roads led into Kosovo from Albania. Like Kosovo's bridges, they were heavily mined and strongly defended, with VJ troops well positioned on the high ground of the most strategically crucial terrain. Accordingly, the study concluded that the best invasion routes would be from Hungary and Croatia into the flatter terrain of northern Serbia.

Several administration officials later commented that an invasion threat from both east and west (namely, from Romania and Croatia and from Hungary) would have been preferable to one from Albania alone, where the transportation infrastructure was extremely primitive and where wheeled vehicles would quickly bog down in wet weather.⁸¹ They further characterized the nascent ground threat as pointed not just at Kosovo but at Serbia proper, since such an operation would aim directly at Milosevic's greatest vulnerability and, in so doing, threaten to take down his regime. Secretary General Solana later allowed that he had authorized NATO's military command to revise and update plans for a possible ground invasion, while at the same time indicating that the alliance was still far from any decision to use ground forces and voicing his conviction that the air effort would ultimately achieve its objectives.⁸²

Throughout this secret ground-options planning, Clark was strongly resisted by Secretary Cohen and White House security adviser Berger. But he had the unwavering support of Britain's prime minister, Tony Blair, who had unsuccessfully raised the issue of ground troops with Clinton at the NATO summit in late April. Not long thereafter, apparently reflecting growing British concern that air attacks alone would prove insufficient to compel Milosevic to quit, British Foreign Minister Robin Cook took the lead in mid-May in proposing that allied ground troops be sent into Kosovo, even in the

⁸¹Interview by RAND staff, Washington, D.C., June 11, 2000. The UK Ministry of Defense's director of operations in Allied Force, Air Marshal Sir John Day, however, later commented that there was never much military enthusiasm for a double envelopment through Hungary. Conversation with Air Marshal Day, RAF Innsworth, United Kingdom, July 26, 2000.

⁸²Thomas W. Lippman and Bradley Graham, "NATO Chief Asks Review of Invasion Planning," *Washington Post*, April 22, 1999.

absence of a peace agreement, once the bombing had reduced VJ forces to a point where they could mount only scattered resistance.⁸³

After a month of continued inconclusiveness in the air war, one began to hear talk not only at NATO headquarters but also in Washington regarding the need for a credible ground threat to evict the marauding Serb forces from Kosovo. As the end of the second month approached, NATO appeared more than ever headed toward conceding at least the possibility of a land invasion, even though the Clinton administration would still not brook even a hint of encouraging public debate over the subject. As one possible explanation for the administration's continued reluctance to embrace the growing need for a ground operation of some sort, polls taken during the air war's seventh week indicated that war fatigue was setting in, occasioning the first significant decline in U.S. public support. That support dropped from 65 percent in late April to 59 percent by mid-May, with opposition to the air war rising from 30 to 38 percent during the same period.⁸⁴

By late May, with winter weather promising to become a limiting factor as early as the beginning of October, Clark had begun to stress that time was now critical with respect to planning for a ground invasion. On one occasion, he expressly warned NATO's civilian leaders and Washington alike: "Don't let the decision make itself."⁸⁵ In the British view, September 15 was absolutely the latest date on which a ground push could start, based on a determination that it would take a minimum of one month to complete the operation.⁸⁶

By most accounts, the turning point in facing up to the need for a serious ground option came on May 27, when Cohen met secretly in Bonn with his four principal NATO counterparts, the British, French, German, and Italian defense ministers, in a six-and-a-half-hour ses-

⁸³Eric Schmitt and Michael R. Gordon, "British Pressing Partners to Deploy Ground Troops," *New York Times*, May 18, 1999.

⁸⁴Richard Morin, "Poll Shows Most Americans Want Negotiations on Kosovo," *Washington Post*, May 18, 1999.

⁸⁵Carla Anne Robbins and Thomas E. Ricks, "Time Is Running Out If Invasion Is to Remain Option Before Winter," *Wall Street Journal*, May 21, 1999.

⁸⁶Conversation with Air Marshal Sir John Day, RAF, UK Ministry of Defense director of operations in Allied Force, RAF Innsworth, United Kingdom, July 26, 2000.

sion convened expressly to consider what it would take to mount a land invasion and to weigh the merits and risks of such a course of action. By one informed account, that meeting was pivotal in getting the allies to come to closure once and for all on the need to begin serious preparations for a land invasion.⁸⁷ The chief of Britain's defense forces, General Sir Charles Guthrie, was an especially strong backer of a ground option, as was the British defense minister, George Robertson. The RAF also had agreed from the start that a ground option was needed. As but one indicator that acceptance of the need for such an option had, by that time, become all but a fait accompli, British planning had progressed to the point of actual reserve call-up and the booking of ferries and civil air transports to deliver British troops to the combat zone. The Bonn ministerial meeting thus took the process begun at the NATO summit a step further toward solidifying the idea that NATO was going to win, come what may, by extending that notion to include acceptance of a ground invasion should matters come to that.

By the end of May, NATO was generally acknowledged by the media as "inching ever closer to some kind of ground operation in the Balkans."⁸⁸ Lending further credence to that impression, several administration officials later acknowledged that Britain was on board with the United States by that time for a ground invasion if need be. They further acknowledged that most of the allies' concerns about attacking infrastructure targets had been largely put to rest, even though France remained an obstacle, and that it would have been easier to obtain NAC approval to go after increasingly sensitive targets with air attacks once the likelihood of a NATO ground invasion loomed larger.⁸⁹

COUNTDOWN TO CAPITULATION

Following an inadvertent attack on a refugee convoy near Djakovica, Kosovo, on April 14—occasioned in part by a suspected visual misidentification by the participating USAF F-16 pilots (see Chapter

⁸⁷Ibid.

⁸⁸Richard J. Newman, "U.S. Troops Edge Closer to Kosovo," *U.S. News and World Report*, June 7, 1999.

⁸⁹Interview by RAND staff, Washington, D.C., July 11, 2000.

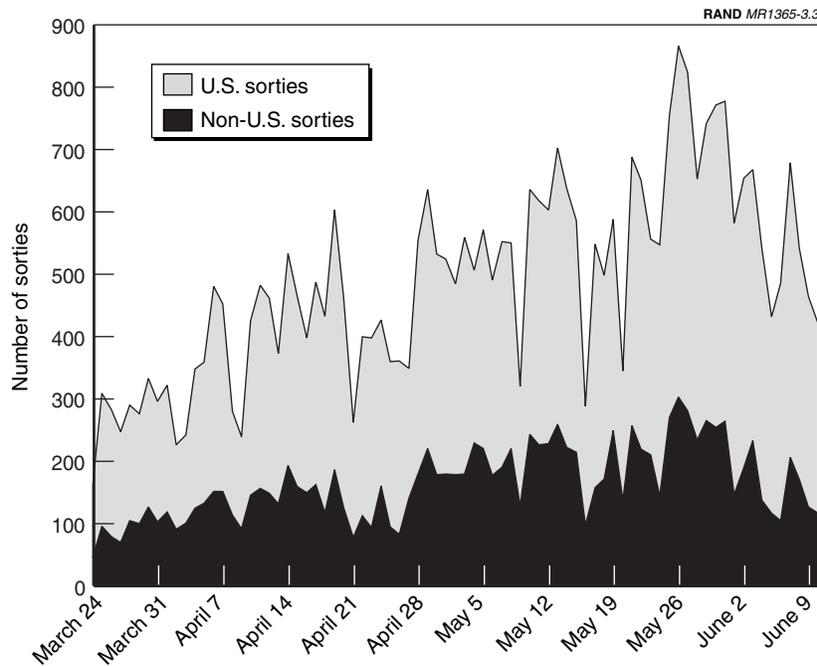
Six)—the altitude floor of 15,000 ft that had been imposed at the start of the air war was eased somewhat in the southern portion, and NATO forward air controllers (FACs) flying over Kosovo were cleared to descend to as low as 5,000 ft if necessary, to ensure positive identification of ground targets in the KEZ.⁹⁰ Direct attacks on suspected VJ positions in Kosovo by B-52s occurred for the first time on May 5 and again the following day. Clark declared afterward that 10 enemy armor concentrations had been hit and that the Serbs were no longer able to continue their ethnic cleansing. NATO spokesmen further reported that enemy troops in the field were running low on fuel and that VJ and MUP morale had declined.⁹¹ A day later, NATO claimed that it had destroyed 20 percent of the VJ's artillery and armor deployed in Kosovo. As for infrastructure attacks, only two of the 31 bridges across the Danube in Yugoslavia were said to be still functional by the end of the week. During the second week of May, however, enemy attack helicopters conducted an attack against the village of Kosari along the main supply route for the KLA. They also served as spotters for VJ artillery against KLA pockets of resistance.⁹² Those operations indicated that NATO had done an imperfect job of preventing any and all enemy combat aircraft from flying.

On May 12, roughly 600 Allied Force sorties were launched all told, including the highest daily number of shooter sorties to date. (See Figure 3.3 for the overall trend line in U.S. and allied sorties flown over the 78-day course of Allied Force. Most of the troughs in that trend line indicate sortie drawdowns or cancellations occasioned by nonpermissive weather over Serbia.) The multiple waves of successive large force packages commenced with a sunrise launch of 36 aircraft, including USAF F-16s and A-10s, RAF Harrier GR. Mk 7s, French Jaguars and Super Etendards, Italian AMXs, and Canadian CF-18s. A subsequent late-morning launch featured 32 aircraft, consisting of RAF Tornado GR. Mk 1s, French Jaguars, and USAF

⁹⁰The 15,000-ft restriction was never done away with over Serbia and Montenegro, however, and over Kosovo it was eased only for FACs and for some weapon deliveries in selected circumstances.

⁹¹Hewson, "Allied Force, Part II," p. 102.

⁹²R. Jeffrey Smith and Dana Priest, "Yugoslavia Near Goals in Kosovo," *Washington Post*, May 11, 1999.



SOURCE: Hq USAFE/SA.

Figure 3.3—U.S. and Allied Sorties Flown

F-16s, followed by 30 F-15Es and 16 more later in the surge. A mid-afternoon strike with 28 jets was then followed by 24 more, with the day finally ending with a midnight package of 38 strikers, including B-1Bs and B-52s.⁹³

Three days later, General Jumper declared that NATO had achieved de facto air superiority over Yugoslavia, enabling attacking aircraft to “go anywhere we want in the country, any time,” even though the skies were admittedly “still dangerous.”⁹⁴ Not long thereafter, an option became available to attack from the north with 24 F/A-18Ds of Marine Air Group 31 deployed to Taszar, Hungary. That option

⁹³Hewson, “Allied Force, Part II,” p. 109.

⁹⁴Ibid., p. 110.

promised to further isolate Yugoslavia, make it appear surrounded, and force its remaining air defenses to work harder by having to look in more than one direction rather than mainly toward a single attack axis from the west. It also promised to avoid adding to the already severe air traffic congestion over the Adriatic and in other western approaches to Yugoslavia.

As allied air operations against VJ troops in the KEZ became more aggressive, a clear preference for the USAF's A-10 over the Army's AH-64 Apaches in Albania became evident because weather conditions over Kosovo had improved by that time, rendering the Apache's under-the-weather capability no longer pertinent and because enough of the Serb IADS had been deemed weakened or intimidated to make it safer to operate the A-10s at lower altitudes. Moreover, the Apaches were deemed to be more susceptible to AAA and infrared SAM threats than were the faster and higher-flying A-10s. President Clinton himself later reinforced those reservations when he commented in mid-May that the risk to the Apache pilots remained too great and that because of recent weather improvements, "most of what the Apaches could do [could now] be done by the A-10s at less risk."⁹⁵

Later on in May, allied fighters and USAF heavy bombers committed against suspected enemy troop positions in the KEZ were joined for the first time by USAF AC-130 gunships, which offered an additional standoff capability against enemy vehicles and other ground targets with their accurate 40mm Bofors gun, 25mm Gatling gun, and 105mm howitzer. The AC-130, however, was only used over areas where there was no known or suspected presence of operational SAM batteries and always flew above the reach of IR SAMs and AAA. When targets of opportunity presented themselves on rare occasions, sensor platforms that detected ground vehicular movement would pass the coordinates and target characterization information to the

⁹⁵Robert Burns, "Use of Apache Copters Is Not Expected Soon," *Philadelphia Inquirer*, May 19, 1999. In what may have been intended as an attempt to lessen the sting of this leadership ruling, one Army source suggested that sending the Apaches in had been meant all along merely as a scare tactic to induce Milosevic to negotiate. The source added that if they had really been intended to be used, the more modern and capable Apache Longbows would have been deployed instead. "Obviously, it was just for show, not for go." Rowan Scarborough, "Apaches Were Sent to Scare Serbs," *Washington Times*, May 21, 1999.

EC-130 ABCCC, which, in turn, would vector NATO attack aircraft into the appropriate kill box, first to confirm that the targets were valid and then to engage them. The ABCCC also controlled the ingress and egress of attacking fighters and maintained battlespace deconfliction throughout ongoing operations.

Once Serbia's air defenses became a less imminent threat, the air war also saw a heightened use of B-52s, B-1s, and other aircraft carrying unguided bombs.⁹⁶ By the end of May, some 4,000 free-fall bombs, around 30 percent of the total number of munitions expended altogether, had been dropped on known or suspected VJ targets in the KEZ. There was a momentary resurgence of Serb SAM activity later that month, with more than 30 SAMs reportedly fired on May 27, the greatest number launched any night in nearly a month.⁹⁷ That heightened activity was assessed as reflecting a determined last-ditch Serb effort to down at least one more NATO aircraft. (An F-117 had been shot down during the air war's fourth night, and a USAF F-16 had later been downed on the night of May 2.)⁹⁸

⁹⁶The Block D version of the B-1 employed in Allied Force was configured to carry the GBU-31 joint direct attack munition (JDAM), but only the B-2 actually delivered that still-scarce munition.

⁹⁷It bears noting here that the highly effective GAU-8 30mm cannon carried by the A-10 saw use only 156 times in Allied Force because of the extreme slant range that was required by the 5,000-ft altitude restriction (comments on an earlier draft by Hq USAFE/SA, April 6, 2001). At that range, the principal problem for today's A-10 pilots is not hitting the target; it is *seeing* the target. At a 30-degree dive angle from 5,000 ft, the slant range to target is 10,000 ft.

⁹⁸Glenn Burkins, "Serbs Intensify Effort to Down Allied Warplanes," *Wall Street Journal*, May 28, 1999. In the second instance, the ABCCC drew on instantly accessible satellite photos and maps maintained in a National Imagery and Mapping Agency computerized database to identify potential obstacles, such as power lines, in order to plot a safe course for the rescue helicopter that recovered the downed pilot. Bill Gertz and Rowan Scarborough, "Inside the Ring," *Washington Times*, May 19, 2000. Although there was definitely a pronounced increase in enemy SAM activity during the night of May 27 in an apparent effort to down a NATO pilot at any cost, it bears stressing that there were *no* nights during Allied Force without at least a few SAM shots, approximately 35 nights with 10 or more shots, and at least 13 nights with 20 or more shots. The highest number of shots observed (significantly higher than the number observed on May 27) was on the night of the F-16 loss. Overall, enemy SAM activity levels tracked closely with allied air attack levels. Low-observable and cruise-missile-only strikes prompted little enemy IADS reaction, whereas trolling for SAMs with F-16CJs and CGs and large conventional attack packages always generated a proportionately large enemy reaction. This trend remained consistent throughout the air war from start to finish. Comments on an earlier draft by Hq USAFE/IN, May 18, 2001.

In what was initially thought to have been a pivotal turn of events in the air effort against enemy ground forces, the newly enlarged and hastily trained KLA, estimated to have been equipped with up to 30,000 automatic weapons, including heavy machine guns, sniper rifles, rocket-propelled grenades, and antitank weapons, launched a counteroffensive on May 26 against VJ troops in Kosovo. That thrust, called Operation Arrow, involved more than 4,000 guerrillas of the 137th and 138th Brigades and drew artillery support from the Albanian army, with the aim of driving into Kosovo from two points along the province's southwestern border, seizing control of the highway connecting Prizren and Pec, and securing a safe route for the KLA to resupply its beleaguered fighters inside Kosovo.

Operation Arrow represented the first major assault by KLA rebels in more than a year. It was evidently intended to demonstrate both to Milosevic and to NATO that the KLA remained a credible fighting presence in Kosovo. The assault was thwarted at first by VJ artillery and infantry counterattacks, which indicated that the VJ still had plenty of fight in it despite 70 days of intermittent NATO bombing. Three days after launching their assault, the rebels found themselves badly on the defensive, with some 250 KLA fighters pinned down by 700 VJ troops near Mount Pastrok, a 6,523-ft peak just inside the Kosovo-Albanian border.

For abundant good reasons, not least of which was a determination to avoid even a hint of appearing to legitimize the KLA's independent actions, NATO had no interest in serving as the KLA's de facto air force and repeatedly refused to provide it with the equipment it would have needed for its troops to have performed directly as ground forward air controllers (FACs). The KLA did, however, receive allied support in other ways. There had been earlier unconfirmed reports going as far back as the air war's second week that KLA guerrillas had been covertly assisting NATO in the latter's effort to find and target VJ forces in Kosovo.⁹⁹ The first known direct NATO air support to the KLA occurred on the day that Operation Arrow commenced. It was confirmed both by KLA fighters in Albania and by military officials in Washington.

⁹⁹Alessandra Stanley, "Albanian Fighters Say They Aid NATO in Spotting Serb Targets," *New York Times*, April 2, 1999.

Although the Clinton administration denied helping the KLA directly, U.S. officials did admit that NATO had responded to “urgent” KLA requests for air support to turn back the VJ counterattack against its embattled troops near Mount Pastrok. In addition to the support they attempted to provide at Mount Pastrok, NATO aircraft attacked VJ targets near the Kosovar villages of Bucane and Ljumbarda, enabling the rebels to capture those villages. The KLA kept NATO informed of its positions in part so that its troops would not be inadvertently bombed, which had occurred two weeks earlier in an accidental NATO attack on a KLA barracks in Kosari.¹⁰⁰ KLA guerrillas used cell phones to convey target coordinates to their base commanders, who, in turn, relayed that information to NATO military authorities.

Throughout most of Allied Force, NATO and the KLA fought parallel but separate wars against VJ and MUP forces in Kosovo, and both the U.S. government and the KLA denied coordinating their operations in advance. NATO did acknowledge, however, that rebel attacks on the ground had helped flush out VJ troops and armor and to expose them to allied air strikes on at least a few occasions, and that Clark had authorized the communication of KLA target location information to attacking NATO aircrews indirectly through the ABCCC. The KLA further acknowledged that NATO air strikes had helped its ground operations.¹⁰¹ Despite NATO denials throughout the air war that it was aiding the KLA, it became evident that cooperation between the two was considerably greater than had been previously admitted. As reported by KLA soldiers, the KLA had begun as early as May 10 to supply NATO with target intelligence and other battlefield information at NATO's request, with the KLA's chief of staff, Agim Ceku, working with NATO officers in northern Albania. While refusing to elaborate on specifics, KLA spokesmen admitted that Ceku had been the KLA's principal point of contact with NATO. It was also Ceku who had participated in Croatia's 1995 Operation Storm offen-

¹⁰⁰Dana Priest and Peter Finn, “NATO Gives Air Support to Kosovo Guerrillas,” *Washington Post*, June 2, 1999.

¹⁰¹Marjorie Miller, “KLA Vows to Disarm If NATO Occupies Kosovo,” *Los Angeles Times*, June 7, 1999.

sive that drove out the Krajina Serbs and helped end the fighting in Bosnia.¹⁰²

Ultimately, VJ forces managed to repulse the KLA assault at Mount Patrik. To do so, however, they had to come out of hiding and move in organized groups, making themselves potential targets, especially for A-10s, on those infrequent occasions when they were detected and approved for attack by the ABCCC or the CAOC.¹⁰³ When KLA actions forced VJ troops to concentrate enough tanks and artillery to defend themselves, NATO aircraft were occasionally able to detect and engage them. Enemy ground movements during the final two weeks were often first noted by the E-8 joint surveillance target attack radar system (Joint STARS) or other sensors, even though the VJ studiously sought to maneuver in small enough numbers to avoid being detected. The sensor operators would then transmit the coordinates of suspected enemy troop concentrations to airborne forward air controllers who, in turn, directed both unmanned aerial vehicles (UAVs) and fighters in for closer looks, and ultimately for attacks.¹⁰⁴ KLA ground movements were also displayed aboard the ABCCC, which was coordinating and controlling NATO attacks against VJ armored vehicles in Kosovo, deconflicting the attacking aircraft, and ensuring that KLA forces in close contact with the VJ were not inadvertently hit. Those operations represented classic instances of close air support, with KLA and enemy forces in close contact on the ground. The ABCCC and attacking NATO aircrews received commands directly from the allied CAOC in Vicenza, Italy, which, in at least one case, aborted an attack out of concern for hitting KLA fighters.¹⁰⁵

Despite this heightened activity in the KEZ during the air war's final days, however, the attacks did better at keeping VJ and MUP troops

¹⁰²Matthew Kaminski and John Reed, "NATO Link to KLA Rebels May Have Helped Seal Victory," *Wall Street Journal*, July 6, 1999.

¹⁰³William Drozdiak and Anne Swardson, "Military, Diplomatic Offensives Bring About Accord," *Washington Post*, June 4, 1999.

¹⁰⁴Tony Capaccio, "JSTARS Led Most Lethal Attacks on Serbs," *Defense Week*, July 6, 1999, p. 13.

¹⁰⁵Michael R. Gordon, "A War out of the Night Sky: 10 Hours with a Battle Team," *New York Times*, June 3, 1999.

dispersed and hidden than they did at actually engaging and killing them in any significant numbers. Most attack sorties tasked to the KEZ did not release their weapons against valid military targets, but rather against so-called dump sites for jettisoning previously expended munitions, sites that were conveniently billed by NATO target planners as “assembly areas.” Even the B-52s and B-1s, for all the free-fall Mk 82 bombs they dropped during the final days, were tasked with delivering a high volume of munitions without causing any collateral damage. After the air war ended, it was never established that any of the bombs delivered by the B-52s and B-1s had achieved any militarily significant destructive effects, or that NATO's cooperation with the KLA had yielded any results of real operational value. The steadily escalating attacks against infrastructure targets in and around Belgrade that were taking place at the same time, however, were beginning to produce a very different effect on Serb behavior.

THE ENDGAME

On June 2, with Operation Allied Force working at peak intensity and with weather and visibility for NATO aircrews steadily improving, Russia's envoy to the Balkans, former Prime Minister Viktor Chernomyrdin, and Finland's President Martti Ahtisaari, the European Union representative, flew to Belgrade to offer Milosevic a plan to bring the conflict to a close. Ahtisaari's inclusion in the process was said by one informed observer to have grown out of a suggestion by Chernomyrdin that value might be gained from including a respected non-NATO player on his mission.¹⁰⁶ The same day, after the two emissaries had essentially served him with an ultimatum that had been worked out and agreed to previously by the United States, Russia, the European Union, and Ahtisaari, Milosevic accepted an international peace proposal. Under the terms of the proposed agreement, he would accede to NATO's demands for a withdrawal of all VJ, MUP, and Serb paramilitary forces from Kosovo; a NATO-led security force in Kosovo; an unmolested return of the refugees to

¹⁰⁶Comments on an earlier draft by Ivo Daalder of the Brookings Institution, Washington, D.C., March 15, 2001. Daalder previously served as director for European affairs on the National Security Council staff in 1995 and 1996, where he was responsible for coordinating U.S. policy for Bosnia.

their homes; and the creation of a self-rule regime for the ethnic Albanian majority that acknowledged Yugoslavia's continued sovereignty over Kosovo. NATO would continue bombing pending the implementation of a military-to-military understanding that had been worked out between NATO and Yugoslavia on the conditions of Yugoslavia's force withdrawal. The agreement, which came on the 72nd day of the air effort, was ratified the day after, on June 3, by the Serb parliament and was rationalized by Milosevic's Socialist Party of Serbia on the ground that it meant "peace and a halt to the evil bombing of our nation."¹⁰⁷

Milosevic later met with loyalist and opposition leaders to explain the reasons for his decision to accept the peace plan. That was as strong an indicator as any to date that the United States and NATO were at the brink of success in their effort to get Yugoslavia's 40,000 troops removed from Kosovo, the Kosovar refugees returned to their homes, and NATO-dominated peacekeepers on Kosovo's soil to ensure that the agreement was honored by Milosevic. The agreement stipulated that once all occupying VJ and MUP personnel had departed Kosovo, an agreed-upon contingent of Serbs—numbering only in the hundreds, not thousands—could return to Kosovo to provide liaison to the various peacekeeping entities commanded by British Army Lieutenant General Sir Michael Jackson, help clear the minefields that they had earlier laid, and protect Serb interests at religious sites and border crossings.

The two-page draft agreement further called for removing all Serb air defense equipment and weapons deployed within 15 miles of the Kosovo border by the first 48 hours so that NATO aircraft could verify the troop withdrawals unmolested by any threats. The plan envisaged a U.S. sector to be controlled, first, by 1,900 Marines with light vehicles and helicopters standing by aboard three ships in the Aegean and, later, by the full American force complement made up largely of Army tank and infantry units to be brought in from Germany. U.S. forces, including the Marines from the 26th Marine Expeditionary Unit at sea and three Army battalions from the 1st Infantry Division in Germany, would make up 15 percent of the overall

¹⁰⁷Daniel Williams and Bradley Graham, "Yugoslavs Yield to NATO Terms," *Washington Post*, June 4, 1999.

Kosovo Force (KFOR). The agreement similarly provided for British, French, Italian, and German sectors.

NATO refused to commit itself to an early halt to its air attacks, since its leaders knew that it would be extremely difficult to resume the bombing once the refugees began coming home. During the negotiations over the terms of Serb withdrawal, however, NATO pilots were under orders not to attack any enemy positions unless in direct response to hostile acts. After the Serb parliament agreed to the ceasefire, no bombs fell on Belgrade for three consecutive nights. B-52 strikes against dispersed VJ forces, however, continued.

No sooner had this accord been reached in principle than NATO and Serb military officials failed to reach an understanding on the conditions for VJ and MUP withdrawal. The talks quickly degenerated into haggling over when NATO would halt its air attacks and whether Serbia would have more than a week to get its troops out of Kosovo. The proximate cause of the breakdown in talks was a Serb demand that the UN Security Council approve an international peacekeeping force *before* NATO troops entered Kosovo. That heel-dragging suggested that the Serbs were seeking to soften some of the terms of the settlement or, perhaps, were looking for more time to continue their fight with the KLA. Secretary Cohen and General Shelton allowed that extending the Yugoslav withdrawal by several days would be acceptable but that they would not countenance any deliberate attempts at delay. More specifically, the implementation of the Serb withdrawal was hung up on differences over the sequencing of four events: the start of the enemy pullout, a pause in NATO bombing, the passage of a UN resolution, and the entry of international peacekeepers with a "substantial NATO content." In response to this willful foot-dragging, NATO's attacks, which initially had been scaled back after Milosevic accepted the proposed peace plan, resumed their previous level of intensity.

On June 7, at the same time as the talks were under way, VJ forces launched a renewed counterattack against the KLA in an area south of Mount Pastrok, where the two sides had been locked in an artillery duel since May 26. For a time, a major breakthrough in NATO's air effort was thought to have occurred when the defending KLA forces flushed out VJ troops who had been dispersed around Mount Pastrok, creating what NATO characterized as a casebook target-rich envi-

ronment. Thanks to improved weather, a noticeable degradation of Serb air defenses, and the effective role thought to have been played by the KLA in forcing VJ troops to come out of hiding, two B-52s and two B-1Bs dropped a total of 86 Mk 82s on an open field in a daytime raid near the Kosovo-Albanian border where VJ forces were believed to have been massed.¹⁰⁸ The initially estimated number of enemy troops caught in the open by the attack was 800 to 1,200, with early assessments suggesting that fewer than half had survived the attack.¹⁰⁹ It later appeared, however, that the number of enemy casualties was considerably less than originally believed—if, indeed, the attacking bombers had killed a significant number of VJ troops at all.

Whatever the case, the following day the United States, Russia, and six other member-states agreed on a draft UN Security Council resolution to end the conflict. The resolution called for a complete withdrawal of Serb troops, police, and paramilitary forces from Kosovo and for all countries to cooperate with the war crimes tribunal that had indicted Milosevic.¹¹⁰ The sequence finally agreed to was that the Serb force withdrawal would commence, NATO would concurrently halt its bombing, and only *after* those two actions occurred would the Security Council vote on the text of the agreement. The last provision was a token concession to Russia and China, whose representatives had insisted that the bombing be stopped before any Security Council vote was taken.

In the end, the VJ acceded to a six-page agreement that permitted a KFOR presence of 50,000 peacekeepers commanded by a NATO general and having sweeping occupation powers over Kosovo. By the terms of the agreement, Serb forces would withdraw along four designated routes over 11 days, under the constant threat of resumed bombing in case of any willful delays.¹¹¹ (Belgrade had asked for 17

¹⁰⁸R. Jeffrey Smith and Molly Moore, “Plan for Kosovo Pullout Signed,” *Washington Post*, June 10, 1999.

¹⁰⁹William Drozdiak, “Yugoslav Troops Devastated by Attack,” *Washington Post*, June 9, 1999.

¹¹⁰Smith and Moore, “Plan for Kosovo Pullout Signed.”

¹¹¹At one point in the negotiations, the VJ military delegation leader, Colonel General Svetozar Marjanovic, abruptly walked out of the talks, stating that he needed to

days.) Kosovo was to be ringed by a 5-km buffer zone, and NATO was to provide for the safe return of all refugees. After 78 days of continual bombing by NATO, the agreement was finally signed on June 9 in a portable hangar at a NATO airfield in Kumanovo, Macedonia, five miles south of the Yugoslav border. The 11 days granted to Yugoslavia for the troop withdrawal was another diplomatic concession, considering that NATO had initially insisted that the withdrawal be completed in 7 days.

NATO finally stopped the bombing upon verifying that the Serb withdrawal had begun, after which the UN Security Council approved, by a 14-0 vote with China abstaining, a resolution putting Kosovo under international civilian control and the peacekeeping force under UN authority. With that, President Clinton declared that NATO had “achieved a victory.”¹¹²

Once NATO peacekeeping forces moved in on the ground in Kosovo, they began discovering the full extent of Serb atrocities committed against the Kosovar Albanians. Among other things, they found an interrogation center in Pristina that had been used by Serb police, in which thousands of Kosovar suspects were said to have been “processed.” Inside the bowels of the building, they came across garrotes with wooden handles, brass knuckles, broken baseball bats, chainsaws, and leather manacles and straps. They also were told by surviving Kosovars that the Serb police had spent three days burning records before the British paratroopers finally arrived.¹¹³ Later, the British government estimated that some 10,000 ethnic Albanians had died at the hands of marauding Serbs during the course of Operation Allied Force.¹¹⁴

As the last of some 40,000 VJ and MUP personnel exited Kosovo on June 20 a few hours ahead of NATO's deadline, NATO declared a formal end to the air war. The bombing had earlier been suspended

“consult with authorities in Belgrade.” He made it only to a border post and returned to the negotiating table within an hour.

¹¹²Tim Weiner, “From President, Victory Speech and a Warning,” *New York Times*, June 11, 1999.

¹¹³See Julian Barger, “Bloody Paper Chain May Link Torture to Milosevic,” *The Guardian*, June 18, 1999.

¹¹⁴Ian Black and John Hooper, “Serb Savagery Exposed,” *The Guardian*, June 18, 1999.

informally for 10 days when the first Serb troops began leaving Kosovo. The departure of the last Serb forces and the arrival of the KFOR peacekeepers effectively brought an end to Yugoslav control over a province that had been a special and even sacred preserve of Serbia for centuries.

Initial estimates just before the cease-fire went into effect claimed that the air war had taken out 9 percent of Serbia's soldiers (10,000 of 114,000), 42 percent of its aircraft (more than 100 of 240), 25 percent of its armored fighting vehicles (203 of 825), 22 percent of its artillery pieces (314 of 1,400), and 9 percent of its tanks (120 of 1,270).¹¹⁵ After the cease-fire, the Pentagon claimed that the operation had destroyed 450 enemy artillery pieces, 220 armored personnel carriers, 120 tanks, more than half of Yugoslavia's military industry, and 35 percent of its electrical power-generating capacity.¹¹⁶ General Shelton reported that 60 percent of the infrastructure of the Yugoslav 3rd Army, the main occupying force in Kosovo, had been destroyed, along with 35 percent of the 1st Army's infrastructure and 20 percent of the 2nd Army's.¹¹⁷ The U.S. Air Force's deputy chief of staff for air and space operations, Lieutenant General Marvin Esmond, announced that the allied bombing effort had destroyed a presumed 80 percent of Yugoslavia's fixed-wing air force, zeroed out its oil refining capability, and eliminated 40 percent of its army's fuel inventory and 40 percent of its ability to produce ammunition. Many of these initial assessments were later discovered to have been overdrawn by a considerable margin.

In the final tally, allied aircrews flew 38,004 out of a planned 45,935 sorties in all, of which 10,484 out of a planned 14,112 were strike sorties.¹¹⁸ A later report to Congress by Secretary Cohen and General Shelton claimed that more than 23,300 combat missions, including

¹¹⁵Michael R. Gordon and Eric Schmitt, "Shift in Targets Let NATO Jets Tip the Balance," *New York Times*, June 5, 1999.

¹¹⁶Weiner, "From President, Victory Speech and a Warning."

¹¹⁷Bradley Graham, "Air Power 'Effective, Successful,' Cohen Says," *Washington Post*, June 11, 1999.

¹¹⁸Operation Allied Force and Operation Joint Guardian briefing charts dated August 19, 1999, provided to the author by Air Marshal Sir John Day, RAF, UK Ministry of Defense director of operations in Allied Force, RAF Innsworth, United Kingdom, July 25, 2000.

defensive counterair patrols and defense suppression attacks, were flown altogether, entailing weapon releases against roughly 7,600 desired mean points of impact (DMPs) on fixed targets and slightly more than 3,400 presumed mobile targets of opportunity.¹¹⁹ As for the air war's intensity over time, what started out as little more than 200 combat and combat-support sorties a day eventually rose to over 1,000 sorties a day by the time of the cease-fire.¹²⁰ All told, 28 percent of the sorties flown were devoted to direct attack, with 12 percent going to SEAD, 13 percent to attacks against dispersed enemy forces in Kosovo, 16 percent to defensive counterair patrols, 20 percent to inflight refueling, and 11 percent to other combat support missions (including AWACS, Joint STARS, ABCCC, EC-130 jammers, airlift, and combat search and rescue).¹²¹ Figure 3.4 shows the breakout of U.S. sorties flown by aircraft type.

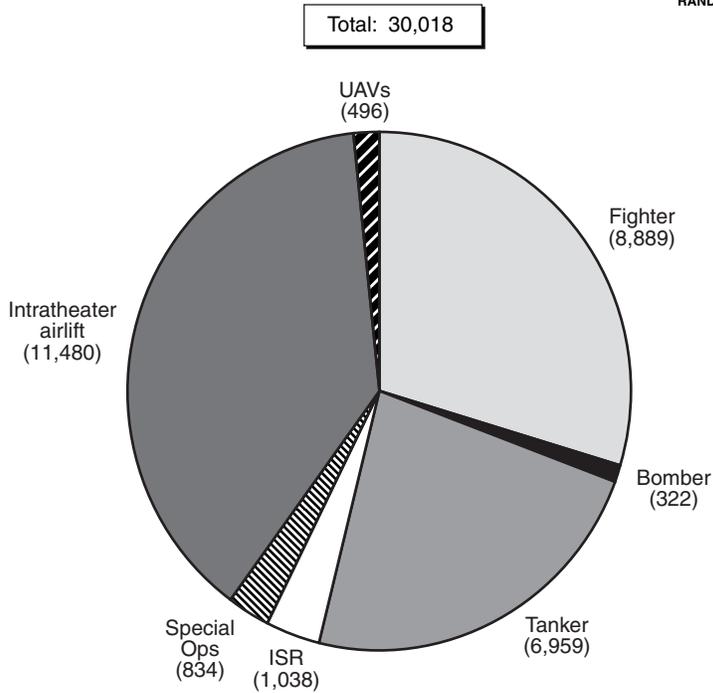
According to the final air operations database later compiled by Hq USAFE, 421 fixed targets in 11 categories were attacked over the 78-day course of Allied Force, of which 35 percent were believed to have been destroyed, with another 10 percent sustaining no damage and the remainder suffering varying degrees of damage from light to severe. The largest single fixed-target category entailed ground-force facilities (106 targets), followed by command and control facilities (88 targets) and lines of communication, mostly bridges (68 targets). Other target categories included POL-related facilities (30 targets), industry (17 targets), airfields (8 targets), border posts (18 targets), and electrical power facilities (19 targets). In addition, 7 so-called counterregime targets were assessed as having sustained overall light damage. Finally, 60 targets were associated with Serb air defenses in two categories (radars and launch equipment), out of which two of

¹¹⁹Secretary of Defense William S. Cohen and Chairman of the Joint Chiefs of Staff General Henry H. Shelton, *Kosovo/Operation Allied Force After-Action Report*, Washington, D.C., Department of Defense, Report to Congress, January 31, 2000, p. 87.

¹²⁰*Ibid.*, p. 68.

¹²¹Operation Allied Force and Operation Joint Guardian briefing charts dated August 19, 1999.

RAND MR1365-3.4



SOURCE: AWOS Fact Sheet.

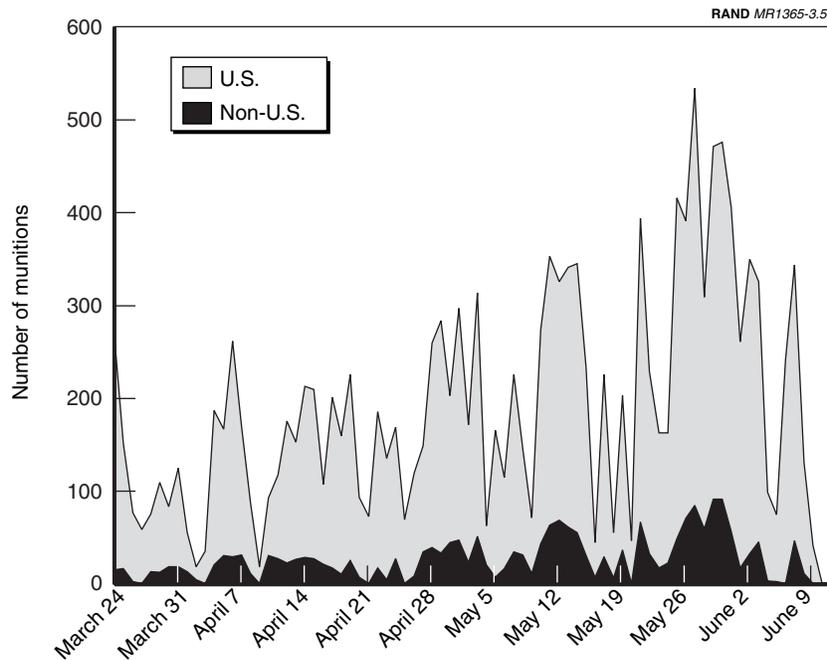
Figure 3.4—USAF Sortie Breakdown by Aircraft Type

three SA-2s, 11 of 16 SA-3s, and 3 of 25 STRAIGHT FLUSH radars associated with the SA-6 were assessed as having been destroyed.¹²²

¹²²“AWOS Fact Sheet,” Hq USAFE/SA, December 17, 1999. See also William M. Arkin, “Top Air Force Leaders to Get Briefed on Serbia Air War Report,” *Defense Daily*, June 13, 2000, p. 1. As attested by cockpit display videotapes released to the press throughout the air war, allied air attacks succeeded in taking out quite a few more SA-6 launchers than those accounted for here. However, since the STRAIGHT FLUSH radar formed the core of an SA-6 battery, the battery was considered operational until the STRAIGHT FLUSH was destroyed. Comments on an earlier draft by Hq USAFE/IN, May 18, 2001.

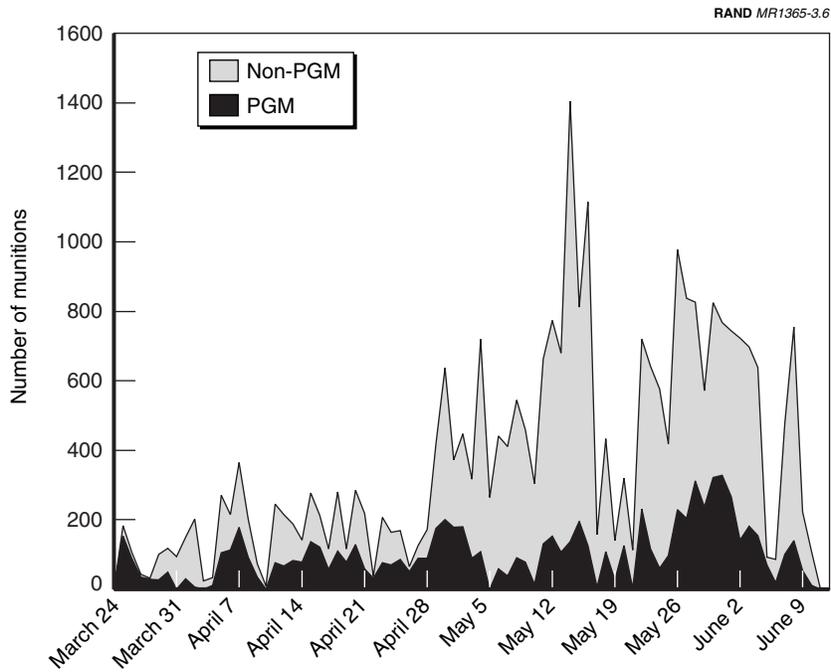
As for the 28,018 munitions (excluding TLAMs) that were expended altogether, a full one-third were general-purpose Mk 82 unguided bombs dropped by B-52s and B-1s during the war's final two weeks. Figure 3.5 presents the trend of U.S. and allied munitions expenditure over the 78-day course of Allied Force. Figure 3.6 shows the number of precision weapons and nonprecision weapons delivered daily over the same period. Of that number, the United States delivered 83 percent, or all but 4,703 (see Figure 3.7).

In a telling reflection of the sparse intelligence available on the location of enemy SAMs and of NATO's determination to avoid losing even a single aircrew member, some 35 percent of the overall



SOURCE: Hq USAFE/SA.

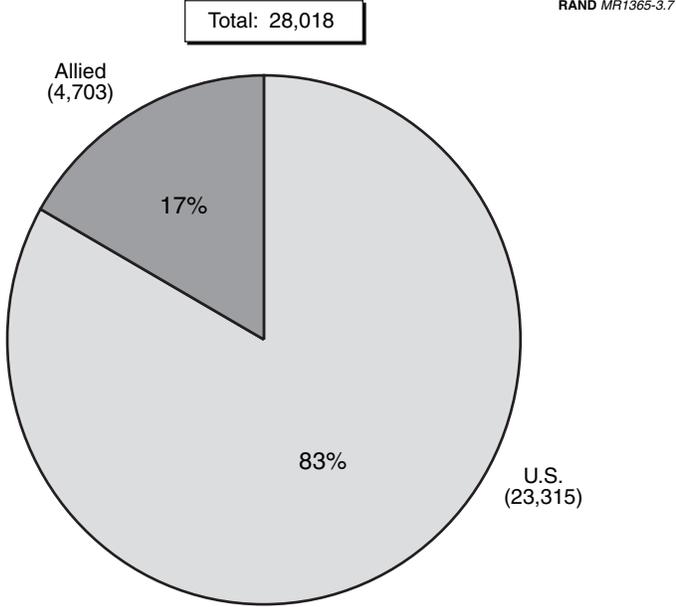
Figure 3.5—U.S. and Allied Ground-Attack Munitions Expended (excluding TLAM)



SOURCE: Hq USAFE/SA.

Figure 3.6—U.S. and Allied Munitions Expenditures by Type

effort (including both direct attack and mission support) was directed against enemy air defenses. Thanks in part to the weight of that effort, only two allied aircraft were downed and not a single friendly fatality was incurred, save for two AH-64 pilots who were killed in a training accident in Albania (see Chapter Five for more on these incidents). Even at that, however, enemy SAMs were effectively suppressed but not often destroyed.



SOURCE: AWOS Fact Sheet.

Figure 3.7—Total Numbers of Munitions Expended