

Observations on the Air War in Syria

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His face was blackened, his clothes in tatters. He couldn't talk. He just pointed to the flames, still about four miles away, then whispered: "Aviones . . . bombas" (planes . . . bombs).

—Guernica survivor

Giulio Douhet, Hugh Trenchard, Billy Mitchell, and Henry “Hap” Arnold were some of the greatest airpower theorists in history. Their thoughts have unequivocally formed the basis of modern airpower.¹ However, their ideas concerning the most effective use of airpower were by no means uniform and congruent in their determination of what constituted a vital center with strategic effects. In fact the debate continues to this day, and one may draw on recent conflicts in the Middle East to make observations on the topic. Specifically, this article examines the actions of one of the world's largest air forces in a struggle against its own people—namely, the rebels of the Free Syrian Army (FSA).

As of early 2013, the current Syrian civil war has resulted in more than 60,000 deaths, 2.5 million internally displaced persons, and in excess of 600,000 refugees in Turkey, Jordan, Iraq, and Lebanon.² President Bashar al-Assad has maintained his position in part because of his ability to control the skies and strike opposition targets—including civilians.³ The tactics of the Al Quwwat al-Jawwiyah al Arabiya as-Souriya (Syrian air force) appear reminiscent of those in the Spanish Civil War, when bombers of the German Condor Legion struck the Basque market town of Guernica, Spain, on 26 April 1937. This purposeful bombing of a civilian populace shocked the world; Pablo Picasso later captured the incident in his famous mural *Guernica*.

Today the Syrian case invokes memories of Italian airpower theorist Giulio Douhet, who believed that aerial bombing could shatter civilian morale, unravel the social basis of resistance, and terrorize large portions of civilian populations.⁴ Although most modern Western militaries go to extraordinary lengths to perfect precision munitions and tactics designed to limit civilian casualties, early analysis reveals a much different approach in Syria. Indeed, the actions of the al-Assad regime will most likely be recorded as a bleak reminder of the abuses made possible and enacted by totalitarian regimes, reminiscent of principles predicted over a century ago by Douhet and others. Although a macabre narrative, the use of airpower in Syria demands examination, even while the fighting continues. This article, therefore, offers some observations on the past two years of civil war.

Evidently, the Syrian regime embraced Douhet's major premises and utilized airpower to target civilians first by means of helicopters and later fixed-wing aircraft, initially enabling al-Assad's forces to impede the FSA's advances and delay the regime's collapse. However the rebels have adapted to the threat, employing better tactics and more effective anti-aircraft weapons, and have since enjoyed a greater degree of tactical success. This analysis begins with a brief history of the rise of the al-Assad regime and then addresses the creation and buildup of the Syrian air force as well as events that led to the current conflict. It highlights several observations pointing to the conclusion that the regime embraced basic Douhetian theory as it executed an air campaign against rebel forces.

Background

Syrians celebrated Independence Day on 17 April 1946, "the date the last French soldier left Syrian soil."⁵ The Syrian air force formed in 1948, not long after the United States had created its own air force. The embryonic 1950s-era service powerfully shaped future president Hafiz al-Assad—father of the current president—who consolidated power in Syria on 16 November 1970 and ruled until his death in 2000.

His personality and dictatorship were closely intertwined with the Syrian air force, and, in turn, he built it into one of the largest air arms in the Middle East.

As a former fighter pilot, squadron commander, air force commander, and defense minister, al-Assad embraced airpower, along with armor, artillery, and missile capabilities. In 1951 he was one of only 15 cadets chosen for flight training in Aleppo. He became an accomplished pilot, surviving multiple near-fatal incidents and even attempting to engage a British Canberra reconnaissance plane during the Suez crisis of 1956.⁶ Al-Assad was one of the few Syrian officers chosen to undergo MiG-15 and MiG-17 jet fighter training in the Soviet Union in 1958 and later led a fighter deployment to Egypt.⁷ The Syrian air force offered him an opportunity for social and intellectual advancement—especially important since he hailed from the oft-persecuted Alawite minority, comprising around 14 percent of the Syrian population and considered by some Muslims a heretical offshoot of Islam.⁸

As president, al-Assad installed members of his religious sect in key air force positions, a technique later replicated by his son. In the current conflict, Bashar al-Assad has adeptly convinced his fellow Alawites that their future is tied to his survival. As evidenced during the current civil war, a scenario involving a minority that perceives an existential struggle while it commands a large, modern air force can have disastrous consequences for civilians.

The Seeds of Dissent

We encountered a stoop-shouldered old man . . . who was shuffling along this field of death.

“Where are all the houses that once stood here?” we stopped and asked.

“You are driving on them,” he said.

“But where are the people who used to live here?” I said.

"You are probably driving on some of them, too," he mumbled, and then continued to shuffle away.

—Thomas Friedman, *New York Times* correspondent
Hama, Syria, 1982

In 1982 a Sunni revolt led in part by the Syrian Muslim Brotherhood significantly challenged Hafiz al-Assad's rule. The regime's subsequent iron-fisted military response foreshadowed its devastating use of air-power today. The rebellion involved three of Syria's largest towns: Aleppo, Homs, and Hama, Sunni-majority communities that would later witness conflict opposing al-Assad during the civil war. Thomas Friedman's book *From Beirut to Jerusalem*, his seminal work on the Levant, assessed al-Assad's brutal crackdown on the Sunni uprising that may have killed almost as many Syrians, primarily in Hama, as the current civil war.⁹ Both then and now, one finds the tactics of destroying entire neighborhoods and historic landmarks and of killing non-combatants, not just to quell the uprising but to enact generational revenge. As a product of tribal politics, the Alawites' actions reflected a belief that cruelty was linked to their survival against the more populous Sunnis, justifying their devastatingly draconian counterrevolutionary techniques. Indeed, Hafiz al-Assad's authoritarian use of military might against civilians highlights the consequences of having a select group rule a military or an air force.¹⁰

Moreover, al-Assad interpreted some Syrians' desire for stability no matter the cost as tacit approval of his methods. Although one of the oldest continually populated areas in the world, Syria is a politically young country, and the regime exploited its nascent Baathist nationalism to accuse the Sunni rebels of dividing the country. Like his father, Bashar al-Assad now attempts to portray all of the armed opposition as outsiders, terrorists, and an existential threat to Syria.¹¹ Even some non-Alawites would prefer a stable government to an Islamic theocracy or a system marred by never-ending sectarian conflict, as experienced at times in neighboring Lebanon.¹² The many parallels with the

Hama massacre from decades earlier may help explain the Hobbesian tactics employed by the Syrian air force today.¹³

The Civil War

The current popular uprising, known as “the Day of Rage,” began on 15 March 2011 when protesters took to the streets around the country, responding in part to the detention earlier in the week of young men under the age of 15 who wrote that “the people want to overthrow the regime” on a wall in Deraa.¹⁴ By April the regime had adopted an aggressive approach, using tanks, infantry carriers, and artillery but no aircraft. The protests spread across Syria, but the two largest cities—Damascus and Aleppo (fig. 1)—remained unaffected initially. (Damascus, the seat of power, and Aleppo, the population center, are two of the longest continually inhabited places in the world.)¹⁵ But al-Assad’s forces soon sealed and stormed towns such as Deraa, in the south, and Latakia, in the west.¹⁶ In early June 2011, the northwest town of Jisr al-Shughour—a strategic crossroad between Aleppo and the Mediterranean coast on the historic Orontes River—witnessed the ambush of 120 Syrian troops, either by rebels and townspeople or by defecting Syrian troops.¹⁷

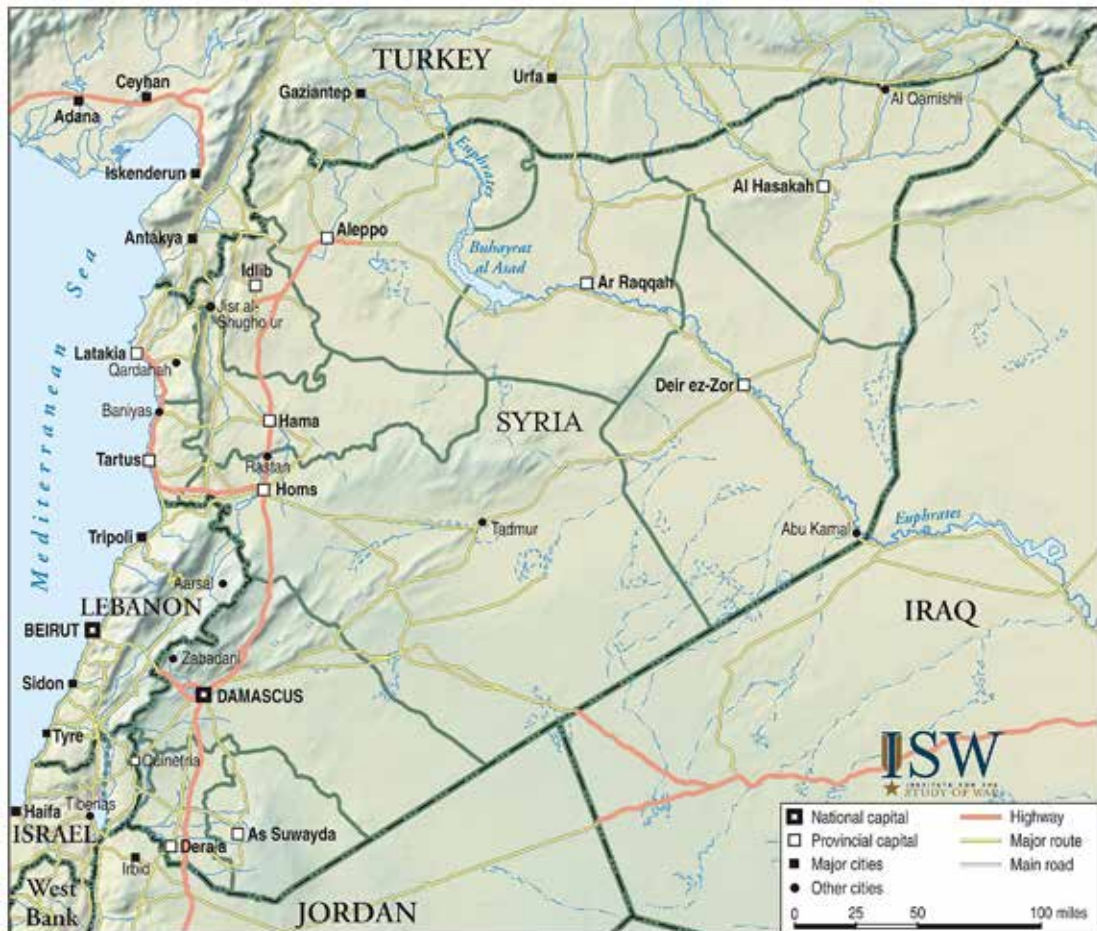


Figure 1. Major towns and lines of communications in civil-war Syria. (Reproduced by permission from the Institute for the Study of War, accessed 1 February 2013, <http://www.understandingwar.org/sites/default/files/ISWSyriaBaseMap%20copy.png>.)

According to Dr. Radwan Ziadeh, spokesman for the Syrian opposition, July 2011 marked the establishment of formal military resistance to the al-Assad regime.¹⁸ As the proficiency of Syria’s armed opposition increased, the Syrian military had to employ heavier weapons against the rebels. By January 2012, the regime had initiated large-scale artillery operations across Syria. In April of that year, al-Assad reacted to

unexpected FSA gains in Idlib and Aleppo by dispatching helicopters to engage “liberated” villages.¹⁹ Towards the end of May 2012, as the opposition mounted offensives, the regime began consistent use of helicopter gunships to compensate for its reduced mobility caused by the rebels’ effective interdiction of roads with bombs and ambushes. This elevated employment of helicopters culminated on 12 July during a massacre in the village of Tremseh. True to the major precepts of Douhet’s theories, helicopters bombed and *Shabiha* (Arabic for “ghosts”) irregulars stormed the town of 7,000.

In August 2012, the regime began to employ jet aircraft in an interdiction role as battle lines in Aleppo hardened and the regime’s helicopter usage peaked. Al-Assad may have ordered the use of fixed-wing platforms because of maintenance issues associated with operating approximately 50 helicopters and a lack of the highly capable Mi-25 Hind attack helicopters. The Mi-25 (the export version of the Russian Mi-24) was apparently reserved for important opposition areas—namely, Jabal al-Zawiya, a contested stretch of highway in Idlib, and the Rastan and Talbiseh areas of Homs. The Syrian air force’s employment of combat jets in bombing and strafing runs quickly overcame daily helicopter use in terms of sorties.

The rebels’ growing air-defense capability, which forced the regime to operate at higher altitudes, also accounts for the transition from rotary- to fixed-wing aircraft. The opposition responded to the regime’s air power by shooting down a limited number of aircraft and attacking air bases. By late summer 2012, the rebels’ equipment probably included 15–25 ZU-23s, two to five 57 mm towed air defense artillery guns (or others), and 15–30 SA-7 man-portable air defense systems (MANPADS).²⁰ Reports also indicated the presence of SA-16 and -24 surface-to-air missiles (SAM). The rebels primarily relied on heavy antiaircraft machine guns like the ZU-23 and, on at least one occasion, a MANPADS.²¹ As of October 2012, the FSA had shot down an estimated five rotary-wing and six fixed-wing aircraft, at least seven videos confirming the rebels’ success. Uncorroborated FSA footage shows shoot-downs of planes and heli-

copters and even captured fighter pilots and aircraft wreckage. Other reports place the number of aircraft kills higher, at 19; however, FSA videos and claims remain difficult to verify.²²

Additionally, the FSA initially sought to overrun regime air bases, including those at Abu ad Duhur (south of Aleppo), Minakh (north of Aleppo and home to more than 40 Mi-8 helicopters), Taftanaz (another helicopter base near Aleppo), and al-Qusayr (near Homs). Presumably, the rebels overran these air bases to take advantage of aircraft vulnerability on the ground or during takeoff and landing. Four of the successful aircraft engagements occurred near these military bases.²³

Throughout the conflict, the Syrian regime relied on heavy weapons (field artillery, mortars, and rockets) as the primary means of quelling the rebellion. Later it increasingly employed airpower to slow the FSA advance, as evidenced in late October during the proposed cease-fire for the Muslim holiday Eid al-Adha. Rather than diminishing, the regime's air attacks actually spiked significantly, from an average of 20–25 air strikes per day to over 60 on 29 October alone. In that month, the fighting between the FSA and al-Assad's forces reached a crescendo with a tally of 764 reported clashes—the most since the war began.²⁴ Regardless of the reason for the change, the accelerated use of airpower indicated a waning ground offensive by regime forces.

Targeting Civilians?

By September 2012, many international observers believed that the Syrian air force was targeting civilians, primarily employing its aircraft in a punitive and retaliatory manner rather than a tactical one.²⁵ Empirical evidence and observations in one of the world's most videoed civil wars indicate that a majority of the regime's air strikes have targeted towns and neighborhoods where the rebels had gained control, rather than specific rebel military sites.²⁶ The 13-plus aerial bombings that occurred as Syrian civilians stood in line at bakeries and communal olive presses during harvest time illustrate their vulnerability to

airborne attacks.²⁷ By October 2012, it had become apparent that the Syrian air force made no pretense of avoiding civilian deaths when it attacked towns containing rebel forces (fig. 2).²⁸

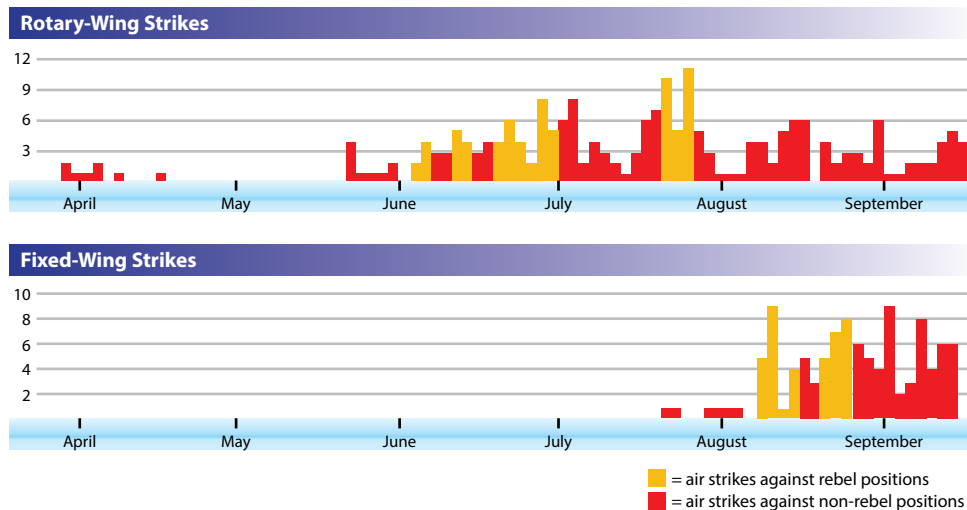


Figure 2. Air strikes against the FSA, 1 April–1 October 2012. (Reproduced by permission from Joseph Holliday and Christopher Harmer, *Syrian Air Force and Defense Overview* [Washington, DC: Institute for the Study of War, 25 October 2012], 4, <http://www.understandingwar.org/press-media/graphsandstat/syrian-air-force-air-defense-overview>.)

Furthermore, the regime has used its Mi-8/17 helicopters to toss old storage tanks or sheet metal cylinders packed with explosives and metal scrap—“barrel bombs”—out of helicopters. No one knows whether the air force used this tactic to maximize its helicopters’ multifunctionality or to save factory-grade munitions for the attack jets. Regardless, high-altitude employment of these “bombs” clearly terrorized the civilian populace to great effect. One Syrian refugee described the bombs as so big that “they sucked in the air and everything crashes down, even four-story buildings.”²⁹

The Syrian Air Force

By late summer 2012, the regime likely had no more than 200 combat-capable aircraft—approximately 150 jets and 50 helicopters—of the 600 in its total pre-civil-war inventory, and even those had varying degrees of combat capability. Additionally, in light of historical maintenance shortcomings, combined with the pace of operations, the al-Assad regime probably can employ no more than 30 to 50 percent of its aircraft.³⁰ The air force may have reserved its higher-end MiG-25s, -29s, and Su-24s in preparation for external intervention—but it may also have been unable to use these air-to-air designs in air-to-ground roles. For instance, the MiG-25—known as a “flying ironing board” because of its use in high-altitude intercepts rather than low-level maneuvering—is certainly not suited for an air-to-ground role. The Syrian leadership may also be concerned about further desertions. A Syrian MiG-21 pilot made a much-publicized defection to Jordan in June 2012; moreover, reports from inside the air force reveal that non-Alawite pilots must stay in the barracks and that only “vetted” Alawite pilots may fly, indicating that more fighter pilots could defect if given the chance.³¹

Like many modern air forces, Syria’s was not prepared to fight an insurgency, having focused primarily on a potential Israeli threat, which explains the re-role of L-39 (Albatross) aircraft not as trainers (their primary purpose) but as close air support platforms. The surprising use of L-39s may have resulted from the fact that they have fewer maintenance problems than the more finicky MiG jets, their comparatively better performance at lower altitudes and airspeed, or simply the presence of more pilots proficient and comfortable with a trainer aircraft.

In January 2012, the Syrian air force attempted to buy 40 Yak-130 trainers from Russia, but in July 2012, under pressure from Washington and the United Nations, Russia did not deliver the promised planes.³² This interest in these advanced fighter-trainers corresponded with the heightened use of the L-39 trainers, likely reflecting the regime’s wish to employ more ground-attack aircraft. At the end of No-

vember 2012, Su-17 and Su-22 Fitters made their first appearance in the war. Experts believe that a surge maintenance effort and large inventory allowed the regime to make a few of these aircraft flyable and thus introduce them into the conflict.³³

Syrian Air Defenses

Syria's air defense network at the start of the civil war ranked among the most capable and dense in the world, perhaps second only to North Korea's and Russia's. These multilayered defenses and the threat of Scud-launched chemical weapons were two major concerns during the interagency debate over a US-led no-fly zone. Located primarily along the Damascus-Homs-Aleppo corridor (see fig. 1) and the Mediterranean coast, the overlapping coverage of missiles and radars consisted of approximately 650 static air defense sites, the most worrisome of which housed the SA-5 "Gammon," having a range of 165 nautical miles and an altitude capability of 100,000 feet. Syrian platforms also included more than 300 mobile air-defense systems, the most capable of which included the newer SA-11s and SA-17s as well as the antistealth and anti-cruise-missile SA-22s. The downing of a Turkish F-4E fighter near Latakia on 22 June—although the cause of the crash remains unknown—enhanced the perceived lethality of al-Assad's air defense system.

On the other hand, Syria's Russian-made air defense legacy systems had limitations. A Syria-bound Russian jet diverted by Turkey reportedly carried much-needed spare parts. Also, the North Atlantic Treaty Organization and the Israeli air force have repeatedly and effectively penetrated and suppressed Russian-made systems. Indeed, the internal conflict has significantly degraded the effectiveness of Syria's air defenses. As with the ground forces, absenteeism and defections have plagued the readiness of Syrian missile and radar systems. In the past year, the FSA has captured SA-2 and SA-8 launchers and overrun SA-2, SA-3, and SA-5 sites and facilities.³⁴ Towards the end of October 2012, as the rebels consolidated gains in the north in Idlib province, Syrian

forces had to destroy some of their SAMs to prevent them from falling into FSA hands.³⁵ By December 2012, FSA battalions stationed in the governorate of Damascus had “gained control of most of the air defense bases in the governorate.”³⁶

Advantage Rebels

We control 70 percent of the sky, because if you compare the situation now to two months ago there are a lot less airplanes.

—Khelif Abu Allah, a Dushka gunner
November 2012

In late November and early December 2012, the Syrian opposition gained momentum. The war had been nearing a stalemate when rebel forces suddenly overran multiple air bases, including Marj al-Sultan outside Damascus, several major ground installations, and the Tishreen hydroelectric dam near the Turkish border. Rebel gains in the far-flung eastern province of Deir al-Zour led to government withdrawal from its last bases in Deir al-Zour City (Syria’s sixth-largest city), leaving rebels in control of the Syrian oil fields. Rebel forces exerted increasing pressure on Damascus itself, including the country’s international airport.

These successful engagements illustrate the rebel fighters’ new, effective strategy. First, as a way of impeding airpower, they focused on seizing the bases responsible for launching the bombardments and air raids. The rebels shifted away from trying to capture and hold territory inside villages and towns because Syrian aircraft would simply return and bomb the newly gained area and its civilian populace. Unlike before, the rebels quickly dispersed to avoid becoming massed targets for counterattacking aircraft. The change in tactics also constituted an attempt to regain waning public support: rebels and civilians alike realized that captured territory—especially urban settings with little or no military value—invited a devastating regime air assault.³⁷ Holding on to such ar-

eas proved too costly, alienating civilians who bore the brunt of the airborne counterassault—exactly the intent of the Syrian regime (i.e., show the population that supporting the rebels left civilians exposed).

Second, the rebels used the air bases as vital supply depots for obtaining heavy weapons and anti-aircraft weapons, thus creating an ad hoc, low-altitude, layered defense through machine guns and MANPADS. The FSA acquired additional shoulder-fired missile systems, as many as 40, during the renewed fall offensives and shot down two helicopters and a fighter jet in Aleppo province the first week of December.³⁸ A video of one of the attacks posted online shows what appears to be a SAM slamming into a helicopter.³⁹ In another video, a Syrian Dushka machine gun mounted atop a small truck waits with a dismounted rebel MANPADS squad on a remote mountain, forming a machine gun, infrared-rocket air defense team. In the cities, footage shows Dushka-mounted trucks speeding towards aircraft sightings as an improvised quick-reaction air defense team. By the first week in December, at least one rebel truck was armed with not only machine guns but also a MANPADS—an improvised “all purpose” mobile air defense artillery vehicle. Further, video shows rebels using camouflage (cut tree limbs and brush) and firing from concealed positions in orchards and among buildings. In January 2013, an FSA convoy conducted an extensive “pass in review” near Aleppo with varying degrees of heavy weaponry mounted on or towed by civilian and captured military vehicles.⁴⁰

In particular the march towards the Damascus airport carries significant psychological and strategic importance, demonstrating that al-Assad's seat of power is in jeopardy.⁴¹ The rebels' pressure on airport operations caused both Emirates Airline and Egypt Air to temporarily cancel flights to the Syrian capital and disrupted replenishment of the regime's arms from Iran and Russia. The duress that they exerted on the Damascus airport, which hosts Syria's military transport and VIP aircraft, bolstered December reports of al-Assad losing hope of escaping his country.⁴² Indeed, the Obama administration considered

“deeper intervention to help push President Bashar al-Assad from power.”⁴³ Not more than a week later, Washington officially recognized the new National Coalition for Syrian Revolutionary and Opposition Forces as the legitimate political authority in Syria. In January 2013, due to increasing rebel checkpoints and fear of being engaged by SAMs on takeoff, over 80 Russian evacuees traveled by bus to the Beirut airport in Lebanon instead of departing from the international airport in Damascus.⁴⁴

As discussed earlier, Syrian air attacks continued to increase after the failed Eid al-Adha cease-fire. At the same time, the rebels claimed to have destroyed a grand total of 111 Syrian aircraft, half of them airborne kills and the others destroyed while sitting on the tarmac.⁴⁵ On 12 December, the regime launched its first Scud missile from Damascus against rebel positions in Aleppo, perhaps signaling that the Syrian civil war has reached another milestone—this time from airpower to surface-to-surface theater missiles as the FSA wears down the Syrian air force. To date, the Syrian regime has launched more than 25 Scuds and “Scud-like” missiles at targets in northern Syria and the Damascus suburbs.⁴⁶ Syria’s winter weather certainly has adversely affected the regime’s air force operations, but the use of missiles may suggest the strain on the Syrian air force along with the need to deliver ever-increasing munitions against the advancing rebels and the willingness to use every available weapon in the regime’s arsenal.

The FSA further demonstrated its ability to maintain an offensive in January 2013 when the rebels scored their most significant military victory to date—the capture of the strategic Taftanaz Air Base in northern Syria. Mentioned earlier, this base near Aleppo had been under siege for months. The FSA was “able to concentrate adequate forces, coordinate their actions, bring heavy weapons to bear, and sustain the siege for months under regime air attack.”⁴⁷ Besides the destruction of 20 of the Syrian air force’s helicopters and the capture of large amounts of weaponry and ammunition, this accomplishment demonstrated the rebels’ capacity to siege and capture heavily defended air bases.

Conclusion

The spread of protests across the Middle East has been labeled an *Arab Spring*, but perhaps the term *intifada* better describes the events in war-torn Syria.⁴⁸ Thus far, the civil war has embodied neither a new beginning nor a new growth; *intifada*, which means “throwing off a yoke,” seems more indicative of this antiregime struggle.

Although the Syrian *intifada* continues, some tentative conclusions present themselves. Throughout the war, the Syrian regime has attempted to thwart the rebels with its heavy ground weapons systems, and since the summer, airpower has played a crucial role. Syrian aircraft bombed populated areas and opposition forces, causing thousands of civilian deaths and thus enabling the al-Assad regime to maintain a degree of psychological dominance. In multiple discussions, visits with Syrian opposition leaders and rebels, and trips to the region, the emotionally charged topic of aircraft bombings dominates conversations.⁴⁹ Bashar al-Assad's regime will one day become associated with the use of airpower against a civilian populace. Although it used artillery in greater numbers than aircraft, Syrians consider helicopters and fighter aircraft the visceral means of death and destruction. Therefore, the Syrian struggle will be remembered as another dark chapter in the record of conflicts such as the Spanish Civil War and Saddam Hussein's bombing of Iraqis and Kurds.

No one knows whether the incremental use of airpower was a purposeful regime tactic or simply arose out of a need for flexible delivery of munitions. The regime may have resisted using aircraft because it feared Western intervention in the form of a no-fly zone. Presumably, early use of aircraft against civilians would have garnered too much international attention, a lesson most likely learned from the conflicts in Iraq, Bosnia, and Libya. Whereas a gradual approach to aerial bombardment made intervention by outside powers less likely, Syria's robust air defense systems, surface-to-surface missiles, and larger chemical weapons inventory influenced US policy makers and military

planners—a fact not unnoticed by other totalitarian regimes such as North Korea and Iran.

Al-Assad's airpower, however reduced, retains a capability to strike anywhere in Syria at a time of its choosing. Even a limited ability remains a powerful tool of the regime to influence Syrians psychologically as well as physically. Nevertheless, the FSA's newly adopted hit-and-run tactics have enabled it to make substantial gains in spite of a relentless, Douhetian-style air campaign. The rebels eventually implemented a two-pronged strategy by raiding the regime's air bases and cobbling together a low-altitude air defense network, thus preventing a quick victory as predicted by Douhet. Both the Syrian regime and the FSA have adapted over the past two years. The Syrian air force confronted an unexpected counterinsurgency, while the rebels slowly formed an ad hoc yet effective air defense system that, combined with ground advances, may eventually blunt the effectiveness of al-Assad's aircraft and surface missiles.

It remains to be seen whether the al-Assad regime will suddenly collapse or slowly contract into an "Alawite rump state" with the FSA gains. Undoubtedly, airpower has allowed the regime to stay in power, but battlefield losses and problems with aircraft maintainability have severely crippled one of the largest air forces and missile defense systems in the Middle East. The Syrian air force, crushed by Israel in 1967 and 1973, recovered after each defeat with more sophisticated weaponry, but it is hard to imagine a similar revival after this war has ended. Given the current toll of death and destruction, a drying up of oil reserves, and a burgeoning population (with high unemployment), one doubts whether that air force (historically an anti-US organization) would threaten either America or its regional partners. The fallout of the civil war in Syria will create a myriad of future security issues for the United States, but they will differ from the pre-2011 model of Soviet fighter squadrons and integrated air defenses led by a single autocratic leader.

The lack of direct US involvement in the conflict justifies further exploration. As the death toll rises, as anti-US Islamic groups gain influence, and as one considers the prospect of a lack of control over chemical weapons in a post-Assad Syria, airpower experts will justifiably discuss what the United States could have done, either through no-fly zones, air strikes, or assistance with heavier weapons. A combination of the death of more than 60,000 civilians, the displacement of millions, and the “any moment” threat of chemical weapons raises the future “intervention bar” of the US Air Force to new heights. In light of the past two decades of airpower rescues in Iraq, Bosnia, and Libya, the role of Western air forces in protecting Muslim civilian populations from despotic rulers has evidently ended. Thus, the pre-Syria Libya operation may become a footnote in history—the last example of a no-fly zone enforced by the US Air Force.

Other viewpoints and lessons learned will most surely surface as more information becomes available and validated. The Syrian conflict is certainly too broad and complex to lend itself to coverage in a single article, but this one has sought to document and discuss airpower themes through a historical framework of the civil war. The words of Douhet and others who predicted widespread terror and fear from the air ring surprisingly true a century later. Picasso's *Guernica*—over 100 years old and inspired by a different war, location, and time—still represents the loss of human life and physical destruction in today's Syria. Homs, Hama, Aleppo, and other Syrian towns and villages are linked to Guernica through a shared narrative—airpower used for a dark and singular purpose. ✪

Notes

1. Jeffrey White, Defense Fellow at the Washington Institute for Near East Policy, and Katie Kiraly, research assistant for the Program on Arab Politics, contributed to this article.
2. Megan Price, Jeff Klingner, and Patrick Ball, *Preliminary Statistical Analysis of Documentation of Killings in the Syrian Arab Republic* (Palo Alto, CA: Benetech, 2 January 2013),

1–4, <http://www.ohchr.org/Documents/Countries/SY/PreliminaryStatAnalysisKillingsInSyria.pdf>.

3. “Measured Approach to the Syrian Crisis,” editorial, *New York Times*, 30 November 2012, <http://www.nytimes.com/2012/12/01/opinion/a-measured-approach-to-the-syrian-crisis.html>.

4. Robert S. Dudley, “Douhet,” *Air Force Magazine* 94, no. 4 (April 2011): 64–67, <http://www.airforce-magazine.com/MagazineArchive/Documents/2011/April%202011/0411douhet.pdf>.

5. Eyal Zisser, *Asad's Legacy: Syria in Transition* (New York: New York University Press, 2001), 1.

6. Patrick Seale with the assistance of Maureen McConville, *Asad of Syria: The Struggle for the Middle East* (London: I. B. Taurus, 1988), 52. Seale is Hafiz al-Assad’s biographer. A phone call from Iraq notified the Syrians that the British surveillance plane was inbound from Iraq as it departed for Cyprus; “Asad had the satisfaction of firing his cannon at it” (ibid.).

7. Ibid., 279.

8. Central Intelligence Agency, “Syria,” *The World FactBook*, 22 January 2013, <https://www.cia.gov/library/publications/the-world-factbook/geos/sy.html>.

9. Supposedly, during an interview, Rifaat al-Assad, Hafiz al-Assad’s brother and the regime’s on-scene commander in Hama, disputed the reported number of 7,000 killed: “What are you talking about, 7,000? No, no. We killed 38,000.” Thomas L. Friedman, *From Beirut to Jerusalem* (New York: Farrar, Straus, Giroux, 1989), 90. This must-read book about the Levant won the National Book Award in 1989.

10. Ibid., 91.

11. “We Can’t Win Media War with West but It’s Not Battle That Counts,” Autonomous Nonprofit Organization (“TV-Novosti”), 17 May 2012, <http://rt.com/news/syria-media-battle-assad-429/>. Al-Assad has repeatedly described the FSA “as a crowd of convicted criminals, comprised among other things of Al-Qaeda type religious fanatics, extremists and terrorists and to some extent of foreign mercenaries, predominantly from other Arab states” (ibid.) Some FSA members are in fact hard-line Islamists, but the vast majority have no affiliation with al-Qaeda.

12. Friedman, *From Beirut to Jerusalem*, 91. Friedman eerily brings up this point during the Muslim Brotherhood revolt decades earlier. This premise is further reinforced today through the lukewarm embrace of the FSA by some Sunni, Kurdish, and Christian factions. Throughout the “Arab Spring” and other times in Middle East history, when an autocratic regime is overthrown, the minority groups tend to find themselves at risk—take, for example, the recent plight of the Coptic Christians in Egypt.

13. Thomas Hobbes (1588–1679) was an English philosopher and political theorist best known for his book *Leviathan* (1651), in which he argues that one can secure civil society only through universal submission to the absolute authority of a sovereign.

14. *Wikipedia: The Free Encyclopedia*, s.v. “Timeline of the Syrian Civil War (January–April 2011)” [see “6 March”], [http://en.wikipedia.org/wiki/Timeline_of_the_Syrian_civil_war_\(January%20%80%93April_2011\)#15_March_.E2.80.93_.22Day_of_Rage.22](http://en.wikipedia.org/wiki/Timeline_of_the_Syrian_civil_war_(January%20%80%93April_2011)#15_March_.E2.80.93_.22Day_of_Rage.22). For a video of the Day of Rage, see “Syrian Revolution, Syria,” YouTube video, posted 15 March 2011, <https://www.youtube.com/watch?v=75Ng0J6DdH0>.

15. Anne Sinai and Allen Pollack, eds., *The Syrian Arab Republic: A Handbook* (New York: American Academic Association for Peace in the Middle East, 1976), 59.

16. During World War I, Deraa—a vital crossroad of the Jerusalem-Haifa-Damascus-Medina railroads—was the scene of the Ottoman Turks' torture of T. E. Lawrence, also known as Lawrence of Arabia. T. E. Lawrence, *The Seven Pillars of Wisdom* (New York: G. H. Doran, 1926).

17. The Aleppo-to-Damascus route is no stranger to Muslim conflict and misery. The schism between Shiites and Sunnis was embodied during the battle of Karbala (680 CE) in present-day Iraq, where Muhammad's grandson Imam Hussein and 70 followers were killed by Yazid I, a Damascus-based ruler. The anniversary of the defeat is now known as "Ashura," a holy day of fasting and prayer, in which Shiites commemorate the perceived abandonment of Hussein and his followers. Yazid, a traditional Sunni, ordered that the captured Karbala survivors, along with Hussein's head, be paraded throughout the region. After a brief stop in Mosul, the procession traveled from Aleppo, south to Homs, and finally ended in Damascus. See Andrew Tabler, *In the Lion's Den: An Eyewitness Account of Washington's Battle with Syria* (Chicago: Lawrence Hill Books, 2011), 170.

18. Dr. Radwan Ziadeh, "The Battle for Syria" (lecture, School of Advanced International Studies, Johns Hopkins University, 30 November 2012), <http://mms.tveyes.com/Transcript.asp?StationID=200&DateTime=12%2F3%2F2012+12%3A21%3A12+PM&Term=washington+institute+for+near+east+policy&PlayClip=TRUE>.

19. Joseph Holliday and Christopher Harmer, *Syrian Air Force and Defense Overview* (Washington, DC: Institute for the Study of War, 25 October 2012), <http://www.understandingwar.org/press-media/graphsandstat/syrian-air-force-air-defense-overview>. Mr. Holliday, a former US Army intelligence captain with extensive experience in the Middle East, is an analyst at the Institute for the Study of War—a nonpartisan, nonprofit public-policy research organization. One of the first people to document and track the use of Syrian airpower against civilians, he founded and led a diverse interagency problem-solving group of diplomatic, military, intelligence, and Syrian experts.

20. Eddie Boxx and Jeff White, "Responding to Assad's Use of Airpower in Syria," Policywatch 1999, Washington Institute for Near East Policy, 20 November 2012, <http://www.washingtoninstitute.org/policy-analysis/view/responding-to-assads-use-of-airpower-in-syria>.

21. Ibid.

22. David Axe, "Danish Architect Maps Every Plane, Helicopter Shot Down by Syrian Rebels," *Wired*, 19 October 2012, <http://www.wired.com/dangerroom/2012/10/mapping-syrian-air-war>.

23. Information garnered through YouTube videos. Although unable to verify these facts independently, the author established a link between those aircraft engagements and sieges of air bases.

24. Jeffrey White, "Syria's Internal War Turns against the Regime," Policywatch 1996, Washington Institute for Near East Policy, 13 November 2013, <http://www.washingtoninstitute.org/policy-analysis/view/syrias-internal-war-turns-against-the-regime>.

25. Anne Barnard, "As Killings Go On, Syria Reacts Strongly to War-Crimes Petition," *New York Times*, 19 January 2013, <http://www.nytimes.com/2013/01/20/world/middleeast/syria-war-developments.html?ref=syria&r=0>.

26. In addition to conventional media coverage, YouTube videos uploaded by both regime and rebel forces as well as anti-Assad reporting by the British-based Syrian Observatory for Human Rights, local coordination committees, and nongovernmental organizations provided extensive documentation of events as they occurred.

27. Forum, Brookings Institution, subject: “Syria: The Path Ahead,” 8 November 2012. Mike Doran, the Roger Hertog Senior Fellow in the Saban Center for Middle East Policy at Brookings, and Salman Shaikh, director of the Brookings Doha Center, shared their views during the forum. Shaikh’s recent paper *Losing Syria (and How to Avoid It)* was a focus of the discussion, moderated by Daniel L. Byman, Senior Fellow and Research Director of the Saban Center for Middle East Policy.

28. These findings were presented and adopted on 12 October 2012 at the Syrian Project working group hosted by the Institute for the Study of War (ISW) and chaired by Joseph Holliday. The panel consisted of Human Rights Groups; nongovernmental organizations; personnel from the State Department, Department of Defense, and intelligence community; Syrian think-tank experts; and congressional staffers. The data came from two sources—YouTube videos of air strikes and the Syrian Observatory for Human Rights. The graphs show rotary versus fixed wing over time. The “bin size” is one day (i.e., each bar represents a day), and the data does not account for time of day—only the 24-hour period during which an air strike occurred. The instances that the ISW identified as aircraft against rebel positions proceeded from the following analysis: If ground combat occurred between rebels and regime forces in the same location and on the same date as air strikes, then the latter targeted rebels directly. If no FSA activity occurred and if air strikes were corroborated by other sources, then civilians were the intended targets. Certainly not every air strike that harmed civilians was intentional; the regime lacked precision-guided munitions and accurate targeting data. But by examining regime-posted videos and other evidence, one may reasonably conclude that it waged an air campaign against civilians. For this and more amplifying data on the air strikes, see Holliday and Harmer, *Syrian Air Force and Defense Overview*.

29. Oliver Homes and Shaimaa Fayed, “Syria Undecided on Ceasefire Proposal, Rebels Divided,” Reuters, 24 October 2012, <http://www.reuters.com/article/2012/10/24/us-syria-crisis-idUSBRE88J0X720121024>.

30. Holliday and Harmer, *Syrian Air Force and Defense Overview*; issues of *Scramble*, accessed 1 February 2013, <http://www.scramble.nl/sy.htm>; and the International Institute for Strategic Studies, *The Military Balance 2011* (Washington, DC: International Institute for Strategic Studies, 2011), 331.

31. “Syrian Colonel ‘Defects’ in Jet to Jordan,” *Guardian*, 21 June 2012, <http://www.guardian.co.uk/world/middle-east-live/2012/jun/21/egypt-election-result-delay-coup-live>.

32. “Russia Will Not Deliver Yak-130 Fighter Jets to Syria,” *Airforce-technology.com*, 9 July 2012, <http://www.airforce-technology.com/news/newsrussia-syria-fighter-jet-delivery>.

33. Jeff White, Washington Institute for Near East Policy, interview by the author, 29 November 2012 (expert opinion based on YouTube video of Fitter, posted 16 November 2012, http://www.youtube.com/watch?v=n5f5mjpVSEk&feature=player_embedded).

34. Boxx and White, “Assad’s Use of Airpower.”

35. *Ibid.*

36. “FSA Targeting al-Assad Regime Air Bases—Sources,” *Asharq Alawsat*, 7 December 2012, <http://www.asharq-e.com/news.asp?section=1&id=32082>.

37. Boxx and White, “Assad’s Use of Airpower.”

38. Joby Warrick, “Missiles Boost Rebels’ Arsenal,” *Washington Post*, 29 November 2012, A1, <http://thewashingtonpostnie.newspaperdirect.com/epaper/viewer.aspx>.

39. Babak Dehghanpisheh, "Syrian Rebels Take Two Military Bases in Heavy Fighting," *Washington Post*, 28 November 2012, 13, http://articles.washingtonpost.com/2012-11-27/world/35509205_1_syrian-rebels-military-bases-aleppo.

40. YouTube video, posted 16 January 2013, http://www.youtube.com/watch?feature=player_embedded&v=y5jsI739NRw.

41. Capture of the Damascus airport, the busiest one in the country and an important hub in the region, would have great significance. Damascus is served by more than 40 passenger and cargo airlines from across the Middle East, Europe, Africa, and the Commonwealth of Independent States, averaging over 4.5 million passengers annually. Ever since World War II, American forces have seen the strategic value of quickly seizing airfields. For example, the 3rd Infantry Division's capture of the Baghdad International Airport in 2003 signaled to the world that the United States had won the tactical fight for the city.

42. Jeffrey White, "Last Act in Damascus," Washington Institute for Near East Policy, 11 December 2012, <http://www.washingtoninstitute.org/policy-analysis/view/last-act-in-damascus>.

43. David E. Sanger and Eric Schmitt, "U.S. Weighs Bolder Effort to Intervene in Syria's Conflict," *New York Times*, 28 November 2012, 1, http://www.nytimes.com/2012/11/29/world/us-is-weighing-stronger-action-in-syrian-conflict.html?_r=0.

44. "Russians Flee Syrian Conflict on Planes from Beirut," BBC, 22 January 2013, <http://www.bbc.co.uk/news/world-middle-east-21140041>.

45. Bassel Oudat, "Airport Battles in Syria," *Al-Ahram Weekly*, 6 December 2012, <http://weekly.ahram.org.eg/News/497/19/Airport-battles-in-Syria.aspx>. Throughout the conflict, even with documented video footage, verifying the number of rebel claims of aircraft kills has been difficult. Compiled videos, however, suggest that the century mark seems a realistic number of total Syrian aircraft damaged in combat.

46. As part of the Syrian Missile Database Project at the Washington Institute for Near East Policy, a team daily searches YouTube videos and other media posted by the FSA and Syrian air force for Scud or other surface-to-surface missile launches. Media reports sometimes use the term *Scud* interchangeably to describe all surface missiles, so the goal is to determine the exact type of missile employed. Information documented includes launcher type, number of launches, launch origin, target location, type of missile, and type of target. With the help of meteorologist Capt Brian Yates, USAF, the team examines missile launches in the context of Syrian weather to identify whether regime forces use missiles rather than aircraft during inclement weather or whether they use them in desperation. At this time, not enough complete data exists to make an assertive conclusion; thus, the research project remains ongoing. Using YouTube videos of missile attacks, the Washington Institute for Near East Policy has tentatively identified and registered missile attacks. It observes that Scuds are transported on wheeled launcher vehicles and launched vertically (usually white in color and large) with a significant prelaunch smoke (perhaps due to liquid propellant)—basically upgraded 1944 V-2 Nazi rockets. In contrast the Fateh-110s are darker in color (tan or olive drab) than the Scud missiles and are essentially rockets on wheeled launchers with an SA-2 rails system. Thus they need to be fired at a pronounced angle (note that the rail remains after missile launches), much like oversized "bottle rockets." The SS-21 is also a non-white missile transported on a six-wheeled vehicle launcher, but it does *not* leave behind a rail after launch and goes vertical soon thereafter.

47. Andrew J. Tabler, Jeffrey White, and Aaron Y. Zelin, “Fallout from the Fall of Tافتاناز,” Policywatch 2015, Washington Institute for Near East Policy, 14 January 2013, <http://www.washingtoninstitute.org/policy-analysis/view/fallout-from-the-fall-of-taftanaz>.

48. Dr. Robert Satloff, director of the Washington Institute for Near East Policy for the last 20 years, has explained on multiple occasions the misnomer of an *Arab Spring* and why the Arabic term *intifada* better represents the unrest in the Middle East. I am much indebted to his extensive knowledge of the region and his willingness to explain a very complicated yet important area of the world.

49. Through the efforts of the Washington Institute for Near East Policy and the support of Syrian expert Andrew Tabler (author of *In the Lion’s Den* [see note 17], another must-read book on Syria), the author has gained significant insight into the opposition by meeting with Syrian opposition leaders and an FSA member (opposition names withheld for security reasons).



Lt Col S. Edward Boxx, USAF

Lieutenant Colonel Boxx (BA, University of Texas–El Paso; MS, Embry-Riddle Aeronautical University; MA, Air University) is a Visiting Defense Fellow at the Washington Institute for Near East Policy. Previously he directed the air component coordination element for Joint Interagency Task Force South in Key West, Florida, where he was responsible for integrating Air Force assets to counter aerial and maritime smuggling operations. A veteran combat air battle manager, he has qualified in both the E-3 AWACS and E-8 JSTARS aircraft. Lieutenant Colonel Boxx has logged 1,500 combat and combat-support hours in the Middle East in support of air operations in Yemen, Turkey, Saudi Arabia, Iraq, and Afghanistan. While deployed in 2006 in support of Operation Iraqi Freedom, he participated in aerial operations against the smuggling and employment of improvised explosive devices. He also flew missions in support of the northern and southern no-fly zones in Iraq in the 1990s. A graduate of Squadron Officer School and Air Command and Staff College, Lieutenant Colonel Boxx has published numerous airpower articles.

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