

U.S. Air Force

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The mission of the U.S. Air Force has expanded significantly since 1947 when the USAF became a separate service. Initially, operations were divided among four major components—Strategic Air Command, Tactical Air Command, Air Defense Command, and Military Air Transport Service—that collectively reflected the Air Force’s “fly, fight, and win” nature. Space’s rise to prominence in the early 1950s brought a host of capabilities that would expand the service’s portfolio and increase its capabilities in the mission areas of intelligence, surveillance, and reconnaissance (ISR) and command and control (C2). With the birth of the Space Force in December 2019,¹ the Air Force began to move its space and space-related personnel assets to the new service. The impact of that change, coupled with the lingering effects of the global COVID-19 pandemic that were highlighted in the *2022 Index of Military Strength*, continue to hamper the trajectory of the Air Force.

The creation of the Space Force affected three Air Force mission areas: air and space superiority, ISR, and C2. Each of these mission areas was born from air-breathing assets, and while the loss of the space portfolio has reduced the service’s inherent capabilities, they remain within the Department of the Air Force (DAF) and should allow the Air Force to focus the weight of its efforts on core missions in the air and cyber domains.

Today’s Air Force has five principal missions:

- Air superiority (space superiority is now the responsibility of the Space Force);
- Intelligence, surveillance, and reconnaissance;
- Mobility and lift;

- Global strike; and
- Command and control.

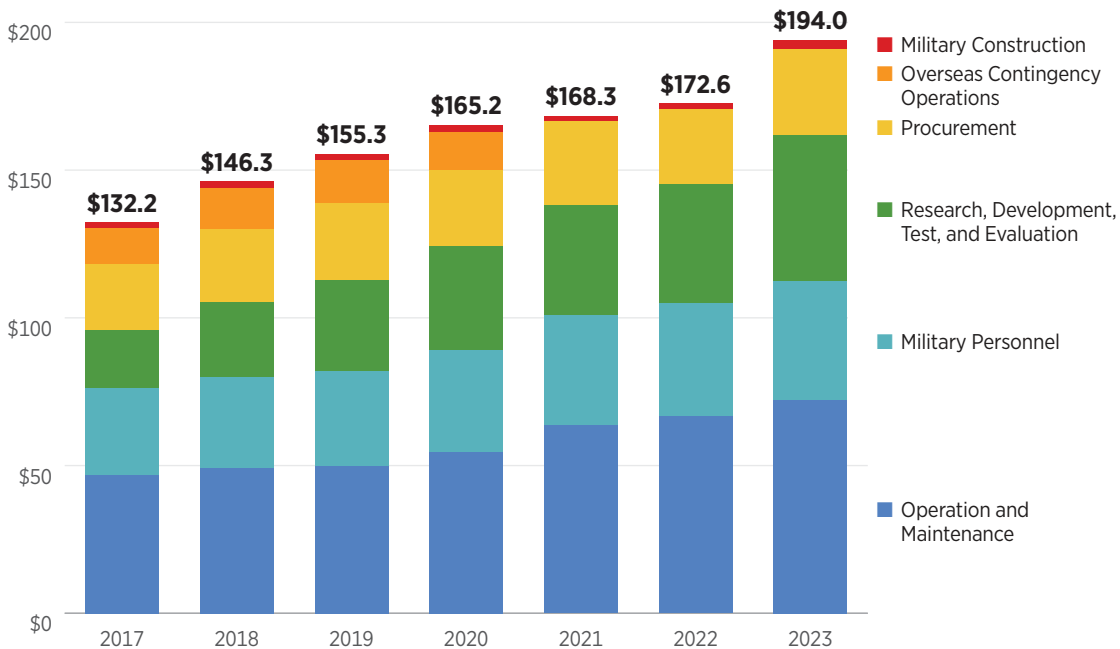
The summer of 2022 should have found the Air Force all but fully recovered from the effects of COVID-19. Readiness levels as measured by operational sortie rates and flying hours should have been well above the historic lows reached during the pandemic; instead, they have grown only marginally. The service’s ability (or willingness) to fund and then generate sorties and flying hours for training has now spiraled well below the hollow-force days of the Carter Administration with equally dismal readiness levels. Training pipeline capacity for basic military training, officer accessions, and pilot training are back up to pre-pandemic levels, but a vibrant job market and steadily increasing civilian wages have stymied recruiting, and while the Air Force met its recruiting goals in 2021, it will struggle to meet accession requirements for fiscal year (FY) 2022.² Moreover, in spite of more than 30 years of reductions in force size that left the Air Force 25 percent below the capacity level required for a fight with a peer competitor,³ the service has conveyed its intentions to reduce the fighter force by almost 20 percent over the next five years.⁴

On its face, that might not seem to be particularly worrisome, but the force structure required for a fight with China would significantly exceed the demands of a single major regional contingency (MRC). It would also require capability and readiness levels that significantly exceed what the Air Force possesses as it enters FY 2023. The Air Force did not have the funding required to increase capacity or develop any one of those critical areas, and it continues to defer their development under the overused mantra

CHART 9

Air Force Budgets, 2017–2023

IN BILLIONS OF U.S. DOLLARS



NOTE: FY 2023 figures are proposed.

SOURCES: Extracted from U.S. Air Force budget summaries for FY 2017 through FY 2023. For example: Table 1, “Air Force Budget Highlights Summary,” in U.S. Department of the Air Force, *United States Air Force Fiscal Year 2017 Budget Overview*, February 2016, p. 15, <https://www.safm.hq.af.mil/Portals/84/documents/FY17/AFD-160209-036.pdf?ver=2016-08-24-102126-717> (accessed September 8, 2022), and Table 1, “Department of the Air Force Budget Summary,” in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 2, https://www.safm.hq.af.mil/Portals/84/documents/FY23/SUPPORT_/BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d (accessed September 8, 2022).

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of “taking more risk.” Understanding the depth of the hole this service is in begins with a bit of history.

Unlike some of the other services, the Air Force did not grow larger during the post-9/11 buildup. Instead, it grew smaller as acquisitions of new aircraft failed to offset programmed retirements of older aircraft. Following the sequestration debacle in 2012, the Air Force began to trade size for quality.⁵ Presidential defense budgets from 2012 through 2017 during the Obama Administration proved merely aspirational, and as the service sustained the war on terrorism, it struggled also to sustain the type of readiness required to prevail in a major regional contingency (MRC) against a near-peer threat.

The Air Force was forced to make strategic trades in capacity, capability, and readiness to meet the operational demands of the war on terrorism and develop the force it needed for the future. The collective effects left the Air Force of 2016 with just 55 total force fighter squadrons, and the readiness levels within those organizations were very low. Just four of the Air Force’s 32 active-duty fighter squadrons were ready for conflict with a near-peer competitor, and just 14 others were considered ready even for low-threat combat operations.⁶

Recognizing the threat from a rising China and resurgent Russia, the 2018 National Defense Strategy (NDS) directed the services to prepare for a

large-scale, high-intensity conventional conflict with a peer adversary.⁷ Later that same year, the Air Force released “The Air Force We Need” (TAFWN), a study of the capacity it would need to fight and help the U.S. win such a war. Based on thousands of war-game simulations, the study found that the service needed to grow by 25 percent, from 312 to 386 squadrons, to execute that strategy. That growth included one additional airlift squadron and seven additional fighter, five additional bomber, and 14 additional tanker squadrons,⁸ which equates to an additional 182 fighter, 50 bomber, 210 air refueling, and 15 airlift platforms.⁹ During the same period, the service’s most senior leaders emphasized the need for more time in the air for aircrews. Secretary of the Air Force Heather Wilson, for example, “noted that even when air crews go abroad and fly combat missions, such as those against violent extremists such as the Islamic State, they’re not practicing skills that would be required for a high-end fight against an advanced adversary such as Russia.”¹⁰ Taken together, all of these demands required a bigger budget.

In a series of speeches in 2018, Secretary Wilson and Air Force Chief of Staff General David Goldfein highlighted the shortfall and the need for more funding to increase the service’s capacity with next-generation platforms: in other words, to buy all-new-design aircraft rather than continuing to purchase aircraft that have been in production since the 1980s and 1990s.¹¹ To meet that requirement, the Trump Administration increased DAF funding by 31 percent from 2017 to 2021.¹²

Considering the shortfall in aircraft, one might assume that the Air Force increased its procurement budget and accelerated acquisition of fifth-generation offensive platforms (F-35A) and next-generation tanker aircraft (KC-46A) during that period by a substantial margin. However, funding for aircraft procurement remained relatively flat, growing from \$22.4 billion in FY 2017 to just \$25.6 billion in FY 2022—a rate of growth that did not keep up with inflation. The budget for procurement fell from \$28.4 billion in FY 2021 to \$25.6 billion in FY 2022. While the President’s budget for FY 2023 increased procurement to \$29.3 billion,¹³ it had not been approved as this edition of the *Index* was being prepared. If it is not approved, the service will be forced to operate on continuing resolutions. Moreover, even if the budget is fully funded, the impact of inflation has meant that procurement has been flat from FY 2017 to FY

2023, even as the service’s budget has grown by 21 percent over the same period.

The budget for research, development, test and evaluation (RDT&E), on the other hand, has more than doubled since FY 2017, growing from \$20.5 billion in FY 2017 to \$49.2 billion in FY 2023. It now exceeds procurement by almost 70 percent.¹⁴ In spite of TAFWN’s finding that the Air Force was 25 percent too small for its mission sets, the Air Force announced last year that it would retire 421 F-22, F-15C, F-16C, and A-10 fighters by the end of FY 2026 while acquiring just 304.¹⁵ However, earlier this year, it was revealed that the Air Force plans to cut 1,468 aircraft from its fleet over the Future Years Defense Program (FYDP) and that this will include the accelerated retirement of 646 fighters and procurement of just 246 over that period.¹⁶ If enacted, this would equate to a net reduction of 19 percent of the total fighter fleet.

Capacity

At the height of the Cold War buildup in 1987, the active-duty Air Force had an inventory of 3,082 fighter, 331 bomber, 576 air refueling, and 331 strategic airlift platforms. When the strategic reserve assets within the Air National Guard and Air Force Reserve are added, the 1987 totals were 4,468 fighter, 331 bomber, 704 air refueling, and 362 strategic airlift platforms. After the fall of the Iron Curtain, the United States shifted from a force-sizing construct centered on great-power competition to one capable of winning two simultaneous or nearly simultaneous MRCs. Those numbers for capacity have been reduced significantly over the years.

It is projected that at the end of FY 2022, the Air Force will have a total aircraft inventory (TAI) of 2,099 fighters, 140 bombers, 483 tankers, and 274 strategic airlift platforms. With the rollout of the President’s budget for FY 2023, the service announced its plan to reduce 167 total fighters from its inventory, reducing its TAI to 1,932 fighters, 140 bombers, 483 tankers, and 274 strategic airlift aircraft by the end of FY 2023.¹⁷ At that point, the Air Force will have a total force that equates to 43 percent of the fighter, 42 percent of the bomber, and 69 percent of the tanker and airlift assets that it possessed the last time the United States was prepared to fight a peer competitor.

The idea that aircraft production lines will somehow surge to come to the rescue in a peer-level crisis

may seem plausible to some,¹⁸ but even if Congress were to throw an unlimited amount of funding at production lines, it would take from two to three years for those additional assets to arrive.¹⁹

The *Index of U.S. Military Strength* uses “combat-coded” fighter aircraft within the Active Component of the U.S. Air Force to assess capacity. Combat-coded aircraft and related squadrons are aircraft and units with an assigned wartime mission, which means that those numbers exclude units and aircraft assigned to training, operational test and evaluation (OT&E), and other missions.

The software and munitions carriage and delivery capability of aircraft in non-combat-coded units renders them incompatible with and/or less survivable than combat-coded versions of the same aircraft. For example, all F-35As may appear to be ready for combat, but training wings and test and evaluation jets have hardware and software limitations that would severely curtail their utility and effectiveness in combat. Even if those jets were slated for upgrades, hardware updates sideline jets for several months, and training wings and certain test organizations are generally the last to receive those upgrades.

Of the 5,564 manned and unmanned aircraft projected to be in the USAF’s inventory at the end of FY 2022, 1,487 are active-duty fighters, and 940 of those are combat-coded aircraft.²⁰ It is important to separate the active-duty fighters and units from the strategic reserve because it would take several months to get elements of the latter up to manning and readiness levels that allowed their first elements to deploy. Unfortunately, other factors also affect the number of fighters the service could actually employ in combat.

Most squadrons will have to pack up and deploy several thousand miles to be able to fight. Because of the additional wartime manning requirements and the fact that most squadrons have several jets that are in disrepair at any given time, it takes the resources of approximately three active-duty squadrons to deploy two combat-capable fighter units forward.²¹ That effectively reduces the total number of active-duty, combat-coded fighters to 626 jets.

The strategic reserve has 661 fighters, 519 of which are combat coded. Because of the additional manning requirements and the fact that Guard and Reserve units generally have just one squadron at each location, it takes two squadrons to deploy one

combat-capable unit forward.²² In terms of capacity, this means that 626 active-duty and 259 strategic reserve fighters, for a total of 885 combat-coded fighters, could be deployed into combat, leaving virtually nothing in reserve. However, recent squadron deployments in response to a request from the Commander of U.S. European Command following Russia’s invasion of Ukraine were fulfilled with 12 jets—packages that were referred to as “squadrons.” This may have reflected the “lead force package” (LFP) concept within the 2020 Air Force posture statement: “More than 90% of our pacing squadrons are ready to ‘fight tonight’ with their lead force packages—the first Airmen to deploy at the beginning of a conflict.”²³ However, it is more likely a combination of LFPs and severe readiness challenges within the fighter force.

Capacity also relies on the stockpile of available munitions and the production capacity of the munitions industry. The actual number of munitions within the U.S. stockpile is classified, but there are indicators that make it possible to assess the overall health of this vital area. The inventory for precision-guided munitions (PGM) was severely stressed by nearly 18 years of sustained combat operations and budget actions that limited the service’s ability to procure replacements and increase stockpiles. From 2017 through 2021, funding for munitions was significant, and the service, believing the inventory is now sufficiently restocked, has reduced the number of PGMs it will acquire to a total of 6,473 munitions in FY 2023.

However, even though the munitions stockpile may have returned to a level that is capable of supporting a surge in expenditures associated with a conflict similar to the global war on terrorism—loosely encompassing operations in Afghanistan and Iraq—it probably would not support a peer-level fight that lasted more than a few weeks. Typically, there is a delay of 24–36 months between funding and delivery of additional munitions, and while the potential exists for a rapid expansion of production, it is hard to envision how such an expansion could be rapid enough to exceed demand before the stockpile is depleted. (See Table 7.)

Advances in the jamming of global navigation satellite systems (GNSS) like GPS have been significant over the past 20 years, and the number, types, and effectiveness of jammers are growing.²⁴ In the days leading up to its invasion of Ukraine and throughout

TABLE 7

Precision-Guided Munitions Expenditures and Programmed Acquisitions

TOTAL MUNITIONS EXPENDED						
	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022*
JDAM	30,664	5,462	7,354	4,004	4,242	4,032
HELLFIRE	1,536	2,110	2,449	1,019	1,023	180
SDB-I/II	4,507	749	1,289	397	98	84
APKWS	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
JASSM-ER	360	19	16	10	8	0
LGB	276	373	106	6,078	5,625	4,356
ARRW**	0	0	0	0	0	2
LRASM	0	0	0	0	0	0
Total	38,092	9,462	11,963	11,508	10,996	8,654

TOTAL MUNITIONS ACQUIRED						
	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023*
JDAM	35,106	36,000	25,000	16,800	1,919	1,241
HELLFIRE	3,629	3,734	3,859	4,517	1,176	5,151
SDB-I/II	7,312	6,254	8,253	3,205	1,983	5,837
APKWS	10,621	6879	15,642	1,323	12,801	11,199
JASSM-ER	360	360	390	400	525	390
LGB	0	0	0	0	0	0
ARRW**	0	0	0	0	12	0
LRASM	0	0	0	0	0	28
Total	57,777	53,976	53,893	26,994	18,416	23,818

* Estimate based on data from President's Budget.

** Air-launched Rapid Response Weapon (ARRW) is a hypersonic, long-range, conventional air-to-surface missile with precision-guided, prompt-strike capability from stand-off ranges.

SOURCES: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 11, 2022; Table 2, "U.S. Air Force Budget Summary," in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 4, https://www.saffm.hq.af.mil/Portals/84/documents/FY23/SUPPORT_/BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d (accessed September 8, 2022); U.S. Department of the Air Force, *Department of Defense Fiscal Year (FY) 2022 Budget Estimates, Air Force Justification Book Volume 1 of 1, Procurement of Ammunition, Air Force*, May 2021, p. Volume 1-7, https://www.saffm.hq.af.mil/Portals/84/documents/FY22/PROCUREMENT_/FY22%20DAF%20J-Book%20-%203011%20-%20Ammunition%20Proc.pdf?ver=PaFt7rWf7aiKYJhl-cpv9w%3d%3d (accessed September 8, 2022); and Dario Leone, "Second Successful Test of AGM-183A ARRW Hypersonic Weapon, Booster Tests Complete," The Aviation Geek Club, July 14, 2022, <https://theaviationgeekclub.com/second-successful-test-of-agm-183a-arrw-hypersonic-weapon-booster-tests-complete/> (accessed September 8, 2022).

its combat operations, Russia has used its systems to jam signals in the region to hamper the employment of Ukrainian and Allied GNSS guided weapons systems against its troops and equipment, and the areas covered by the effects of those systems can be considerable.²⁵ The employment of such systems in a war with a peer adversary could significantly diminish the accuracy of weapons like JDAMs and SDBs that rely on reliable GPS guidance to hit their targets.

Although there has been significant research toward making munitions less susceptible to the effects of GPS jammers, there is little evidence that such munitions would retain their accuracy during a full-up conflict with a peer adversary. Attacking targets in that environment using GPS guidance alone might require many more munitions and sorties than would otherwise be necessary, and this probably would deplete the inventory of GPS guided munitions much faster and with markedly less effect than is likely accounted for in current war plans.

The only weapons in the U.S. inventory that can fully counter GPS/electronic jammers and reliably hit their targets are those that can track physical targets with laser, optical, or infrared seeker heads. The Air Force has not acquired PaveWay or Maverick missiles for several years, and most GPS guided munitions do not have seeker heads or a secondary capability to track and guide on a target in a degraded GPS environment.

To cover this gap, the Air Force has added a laser guidance capability to its already effective GBU-53 smaller diameter bomb (SDB I). Known as the SDB II, the weapon “uses Link 16 and ultra-high frequency datalinks, along with infrared guidance, to provide course corrections” and hit “both fixed and moving targets.”²⁶ Funding in the FY 2023 budget will also support the acquisition of 4,200 JDAM guidance kits with laser sensors that will give this munition a seeker to acquire/track targets.²⁷ Unfortunately, the service has not yet acquired the SDB II or the advanced JDAM guidance kits in numbers required for conflict with a peer competitor.

Capability

The risk assumed in capacity has placed an ever-growing burden on the capability of Air Force assets. The ensuing capability-over-capacity strategy centers on the idea of developing and maintaining a *more-capable* force that can win against the advanced fighters and surface-to-air missile systems

now being developed by top-tier potential adversaries like China and Russia, which are also increasing their capacity.

Any assessment of capability includes both the incorporation of advanced technologies and the overall health of the inventory. Most aircraft have programmed life spans of 20 to 30 years based on a programmed level of annual flying hours. The bending and flexing of airframes over time in the air generates predictable levels of stress and fatigue on everything from metal airframe structures to electrical wiring harnesses.

The average age of Air Force aircraft is 29.4 years, and in some fleets, such as the B-52 bomber, the average is more than 60 years. In addition, KC-135s comprise 75 percent of the Air Force’s 483 tankers and are more than 61 years old on average. By the end of FY 2023, 95 brand-new KC-46s will make up 20 percent of the tanker inventory, but they will not be capable of refueling aircraft during combat operations—the jet’s primary mission—until FY 2024.²⁸ By that time, the Air Force will have taken possession of some 103 KC-46s. The Air Force estimates that the fix for problems in the KC-46’s refueling boom and remote vision system (RVS) should be ready by the spring of 2024. Assuming the boom and RVS redesign goes as planned, retrofitting jets that the service has already accepted will take several years, and the operational impact of that process will be significant: 103 strategic air refueling assets will be unusable in real-world operations in 2024. That number will grow to 110 jets in 2025, equating to 23 percent of the fleet that will be unable to fulfill operational taskings reliably.²⁹

The average age of the F-15C fleet is 37.8 years,³⁰ significantly exceeding the programmed service life of a fleet that comprises more than half of USAF air superiority platforms.³¹ The planes in the F-16C and F-16D fleets are 31 and 31.9 years old, respectively, on average.³² In 2018, the Air Force announced its intent to extend the service lives of 300 F-16s through a major service life extension program (SLEP) that will allow those jets to fly through 2050.³³ SLEPs lengthen the useful life of airframes, and these F-16 modifications also include funding for the modernization of avionics within those airframes. These modifications are costly, and the added expense reduces the amount of funding the service has to invest in modernization, which is critical to ensuring future capability. Even with a SLEP, there is a direct

TABLE 8

Air Force Total Aircraft Inventory (Page 1 of 3)

Type	FY 2022				MISSION-CAPABLE (MC)				FY 2023			
	Active Duty	Air National Guard	Air Force Reserve	Total	Average Age in Years	MC Rate FY 2020	MC Rate FY 2021	Change	Average Daily MC Aircraft, FY 2023	Programmed Retirements	Programmed Acquisitions	Total
A010C	141	85	55	281	41	72%	73%	1%	189	-21	0	260
AC130J	30	0	0	30	4	82%	84%	2%	25	0	0	30
B-1B	45	0	0	45	35	53%	41%	-12%	18	0	0	45
B-2A	20	0	0	20	27	62%	59%	-3%	12	0	0	20
B-52H	58	0	18	76	61	61%	59%	-2%	45	0	0	76
C-130H	0	86	42	128	30	70%	69%	-1%	82	-10	0	118
C-130J	114	27	10	151	13	79%	76%	-3%	116	0	2	153
C-5M	36	0	16	52	35	61%	57%	-3%	30	0	0	52
C-17A	146	50	26	222	20	82%	80%	-2%	178	0	0	222
CV022B	52	0	0	52	9	54%	51%	-3%	26	0	0	52
E003B	2	0	0	2	43	66%	56%	-10%	0	-2	0	0
E003C	2	0	0	2	38	77%	0%	-77%	0	-2	0	0
E003G	27	0	0	27	42	71%	61%	-10%	10	-11	0	16
E008C	0	12	0	12	22	67%	62%	-5%	2	-8	0	4
E11	4	0	0	4	11	n/a	n/a	n/a	n/a	0	2	6
EC130H	7	0	0	7	48	67%	67%	0%	3	-3	0	4
EC130J	0	7	0	7	22	53%	64%	12%	4	-1	0	6
F015C	46	122	0	168	38	72%	69%	-2%	74	-61	0	107
F015D	4	14	0	18	38	71%	69%	-2%	8	-6	0	12
F015E	218	0	0	218	30	69%	66%	-3%	144	0	0	218

TABLE 8

Air Force Total Aircraft Inventory (Page 2 of 3)

Type	FY 2022				MISSION-CAPABLE (MC)				FY 2023			
	Active Duty	Air National Guard	Air Force Reserve	Total	Average Age in Years	MC Rate FY 2020	MC Rate FY 2021	Change	Average Daily MC Aircraft, FY 2023	Programmed Retirements	Programmed Acquisitions	Total
F015EX	2	0	0	2	1.5	n/a	0%	n/a	0	0	6	8
F016C	421	277	52	750	32	74%	72%	-2%	521	-22	0	728
F016D	98	39	2	139	33	72%	69%	-3%	94	-4	0	135
F022A	166	20	0	186	16	52%	51%	-1%	95	0	0	186
F035A	356	20	0	376	5	76%	69%	-7%	297	0	56	432
HC130J	21	12	6	39	6	80%	76%	-4%	30	0	0	39
HH060G	38	18	16	72	29	69%	71%	2%	43	-12	0	60
HH060W	25	0	0	25	0.5	0%	0%	0%	0	0	14	39
KC010A	36	0	0	36	38	81%	79%	-1%	21	-10	0	26
KC046A	52	12	7	71	2	67%	71%	5%	68	0	24	95
KC135R	119	140	62	321	60	73%	71%	-2%	219	-13	0	308
KC135T	30	24	0	54	63	73%	70%	-3%	38	0	0	54
LC130H	0	10	0	10	36	44%	43%	-1%	4	0	0	10
MC130H	11	0	0	11	33	74%	75%	1%	0	-11	0	0
MC130J	55	0	0	55	7	76%	79%	3%	47	0	4	59
MQ009A	340	24	0	364	7	91%	90%	-1%	248	-100	12	276
RC135S	3	0	0	3	60	88%	86%	-2%	3	0	0	3
RC135U	2	0	0	2	58	87%	82%	-5%	2	0	0	2
RC135V	8	0	0	8	58	78%	73%	-5%	6	0	0	8
RC135W	12	0	0	12	60	81%	66%	-15%	8	0	0	12

TABLE 8

Air Force Total Aircraft Inventory (Page 3 of 3)

Type	FY 2022			MISSION-CAPABLE (MC)			FY 2023				
	Active Duty	Air National Guard	Air Force Reserve	Average Age in Years	MC Rate FY 2020	MC Rate FY 2021	Change	Average Daily MC Aircraft, FY 2023	Programmed Retirements	Programmed Acquisitions	Total
RQ-4	10	0	0	12	74%	74%	0%	7	-1	0	9
T001A	177	0	0	28	68%	74%	6%	94	-50	0	127
T006A	442	0	0	17	74%	71%	-3%	314	0	0	442
T007A	0	0	0	1	0%	71%	0%	4	0	0	5
T038A	53	0	0	56	71%	72%	1%	38	0	0	53
T038C	439	0	0	56	65%	63%	-2%	276	0	0	439
U2	31	0	0	40	73%	76%	2%	23	0	0	31

SOURCES: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 11, 2022; Table 2, "Department of the Air Force Budget Summary," in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 4, https://www.saffm.hq.af.mil/Portals/64/documents/FY23/SUPPORT_/BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUsvZ09CeHA%3d%3d (accessed August 29, 2022); and International Institute for Strategic Studies, *The Military Balance 2022: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2022), pp. 56-59 (accessed August 14, 2022).

correlation between aircraft age and the maintainability of those platforms. (See Table 8.)

The Air Force's ISR and lift capabilities face similar problems in specific areas that affect both capability and capacity. The majority of the Air Force's ISR aircraft are now unmanned aerial vehicles (UAVs). The Air Force will divest 100 MQ-9 Block-1 aircraft and accept delivery of 12 MQ-9 Block-5s in FY 2023 for a total of 276 Reapers.³⁴ The service divested the last of its fleet of EQ-4s and Block 30 RQ-4s in FY 2021 and FY 2022, respectively. The RQ-4 Block 40 fleet remains in service, and the RQ-4 Block 30 mission will be carried on by the 40-year-old U-2,³⁵ which is scheduled to be divested by the end of the current FYDP.³⁶

The E-8 Joint Surveillance Target Attack Radar System (J-STARS) and RC-135 Rivet Joint are critical ISR platforms. Each was built on the Boeing 707 platform, and the last one came off the production line 43 years ago. The Air Force will divest eight of its remaining E-8s in FY 2023, leaving it with just three operational platforms.³⁷

The Air Force is working on an incremental approach for a J-STARS replacement that focuses on advanced and disaggregated sensors (a system of systems) that would require enhanced and hardened communications links. Known as the Advanced Battle Management System (ABMS), it is envisioned as an all-encompassing approach to both airborne and ground Battle Management Command and Control (BMC2) that would allow the Air Force both to fight and to support joint and coalition partners in high-end engagements.³⁸

With respect to air combat, the Air Force will retire 67 more F-15C/Ds in FY 2023, leaving just 119 in its inventory.³⁹ Concerns about what platform will fill this role when the F-15C is retired are fully justified. Just 186 of 750 planned F-22A stealth air superiority fighters were acquired to replace the F-15C,⁴⁰ and the service has announced its intent to retire 33 Block 20 F-22s in FY 2023. If those jets are retired,⁴¹ the fleet will be reduced to just 153 jets.⁴²

The service's already low ability to fulfill operational requirements for air superiority fighters will be further strained by a 10-year program, intended to refurbish the low-observable coatings on the F-22's engine inlets and inspect and overhaul the aircraft's flight control system, that will run through 2031.⁴³ That program, coupled with the F-22's low mission capability rate, will significantly

hobble the availability of this system in a fight with a peer competitor.

The Air Force's number-one acquisition priority remains the F-35A, the next-generation fighter that is scheduled to replace all legacy multirole and close air support aircraft. The jet's full operating capability (FOC) was delivered in early 2018.⁴⁴ The F-35A's multirole design favors the air-to-ground mission, but its fifth-generation faculties will also be dominant in an air-to-air role, allowing it to augment the F-22A in many scenarios.⁴⁵ In spite of the jet's dominant performance in the air, relatively high mission-capable rates, and acquisition and sustainment costs that are at or below those for the F-15EX,⁴⁶ the Air Force has reduced the number of F-35As that it will acquire to just 33 jets in FY 2023 and 29 in FY 2024.⁴⁷

In terms of funding, the second major USAF acquisition priority is the B-21 Raider, formerly called the Long-Range Strike Bomber (LRSB). The USAF awarded Northrop Grumman the B-21 contract to build the Engineering and Manufacturing Development (EMD) phase, which includes associated training and support systems and initial production lots. The program has completed an Integrated Baseline Review for the overall B-21 development effort as well as the jet's Preliminary Design Review. The Air Force is committed to a minimum of 100 B-21s at an average cost of \$639 million per plane in FY 2019 dollars.⁴⁸

With the budget agreement that was reached for FY 2018 and FY 2019, the Secretary of the Air Force announced the service's intent to retire all B-1s and B-2s and sustain a fleet comprised of 100 B-21s and 71 B-52s.⁴⁹ The B-21 Raider and B-52s "will form a two-bomber fleet that will incrementally replace the aging fleet of B-1 Lancer and the B-2 Spirit bombers," and the B-21 is "slated to hit full operations in the mid-2020s."⁵⁰ The Air Force retired 17 B-1s in 2021 and continues to execute a SLEP on the remaining fleet of 44 to restore the bomber's engines to their original specifications. The Air Force had planned to modernize the B-2's Defense Management System but cancelled the plan in 2021 because of a software coding mismatch with its legacy computer system.⁵¹ Stores Management Operational Flight Program and Common Very-Low-Frequency/Low Frequency Receiver Program elements will be fielded to ensure that this penetrating bomber remains viable in highly contested environments, keeping it fully mission capable until it is replaced by the B-21.⁵²

Modernization efforts for the B-52 are also underway. The jet was designed in the 1950s, and the current fleet entered service in the 1960s. The FY 2018 budget funded the re-engineering of this fleet with upgrades that will include a new Long-Range Standoff (LRSO) cruise missile, improved radar, new computers, new communication links, and a new suite of electronic warfare countermeasures. The aircraft will remain in the inventory through 2050.⁵³

Acquisition of the KC-46A air refueling tanker is another critical enabler for the service. As previously noted, the KC-46 has experienced a series of problems and delays, the most recent of which involves the air refueling system that currently cannot refuel fighters in an operational environment. The Air Force will have 95 KC-46s by the end of FY 2023⁵⁴ and will acquire another 84 tankers for a total of 179 by the end of FY 2029. The KC-46 will replace less than half of the current tanker fleet and will leave the Air Force with more than 200 aging KC-135s (already averaging 61 years old) that still need to be recapitalized.⁵⁵

When the Secretary of the Air Force (SECAF) and the Chief of Staff of the Air Force (CSAF) rolled out “The Air Force We Need” in 2018 to expand the number of squadrons from 312 to 386, one of their goals was to fill the ranks of those new squadrons with only the newest generation of aircraft—F-35s, B-21s, and KC-46s—because of the capabilities that those platforms bring to bear.⁵⁶ Curiously, the Air Force is now acquiring the fourth-generation F-15EX, based primarily on the ill-conceived notion that it will be cheaper to acquire and operate than the F-35A.⁵⁷ The FY 2023 budget funds 24 F-15EXs and signals an intent to cap the purchase at just 80 jets. With the latest cuts in the fighter force, the service has reversed course on its stated intent to use them to replace Air National Guard F-15Cs; instead, approximately half of the F-15EX fleet will be fielded in active-duty units. Although the service will offset some of its fighter fleet retirements with this new hardware, the F-15EX is a step backwards and will not be survivable in anything more than low-threat environments by the time this weapons system reaches initial operating capability (IOC).

Readiness

The 2018 National Defense Strategy’s focus on peer-level war was designed to facilitate a clear and rapid paradigm shift away from the tiered levels of readiness the Air Force had adopted because of years

of relentless deployments and funding shortfalls. In a move that would refine the service’s focus on great-power competition as spelled out by the new NDS, Secretary of Defense James Mattis directed the Air Force to increase the mission-capable rates of the F-16, F-22, and F-35 aircraft to 80 percent by the end of September 2019.⁵⁸ The move was designed to make more of an all-too-small fleet of combat aircraft available to deploy in the numbers required to deter or defeat a peer adversary.

Early in 2019, General Goldfein stated that the service would likely not meet the 80 percent mission-capable (MC) threshold directive until 2020, and in the spring of 2020, he made it clear that the threshold was no longer a focus for the Air Force. MC rates are a measure of how much of a certain fleet is “ready to go” at a given time, and the general stated in clear terms that he regarded the statistic as an inaccurate portrayal of the service’s overall health.

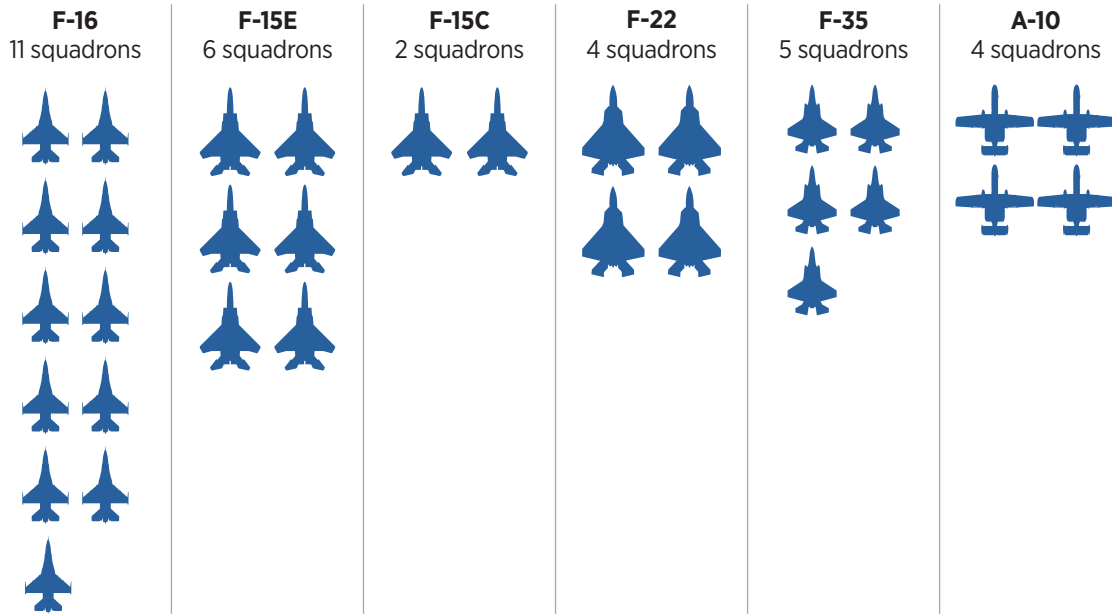
Instead of using that historic marker for readiness, the service moved to highlight how deployable a portion of any fleet was within a short period of time⁵⁹ and shifted its focus to the number of “force elements”—fighters, bombers, and tankers—that it has across the Air Force and how quickly those forces need to be ready. One of the examples that Goldfein used was the rapid deployment of a “task force” of four B-52s to the Middle East in May 2019.⁶⁰ The bombers, from Barksdale Air Force Base, Louisiana, had two days from notification to deployment, and while the ability to deploy four of 58 operational bombers rapidly is a capability, it is more in line with responding to a regional contingency than it is with taking on a peer adversary.

In the USAF’s FY 2020 posture statement, Secretary Wilson and Chief of Staff Goldfein said that more than 90 percent of the “lead force packages” within the service’s 204 “pacing squadrons” are “ready to ‘fight tonight.’” They went on to say that “pacing squadrons are on track to reach 80% readiness before the end of Fiscal Year 2020.”⁶¹ A short time later, however, the service abandoned even the illusion that it was working to achieve that goal.

The FY 2022 Air Force posture statement offered no more clarity or assurances of readiness; instead, it moved to change the paradigm of readiness into a three-phase force-generation model designed to “articulate readiness impacts and capacity limits.”⁶² In FY 2023, it morphed again into what is now known as the Air Force Generation (AFFORGEN), dividing

FIGURE 3

Air Force Active-Duty Combat-Coded Fighter Squadrons (32 Total)



SOURCES: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 11, 2022, and International Institute for Strategic Studies, *The Military Balance 2022: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2022), pp. 56–59 (accessed August 15, 2022).

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the deployable combat Air Force into four six-month phases of readiness known as “Ready, Available to Commit, Reset, and Prepare.” In theory, the model “builds high-end and sustainable readiness toward future missions by balancing elements of current availability, modernization and risk,”⁶³ but from the outset, it represents little more than an attempt to change the dialog surrounding what are perhaps the lowest levels of readiness in Air Force history.

In 2017, the Secretary of the Air Force and the Chief of Staff informed Congress that “[w]e are at our lowest state of full spectrum readiness in our history.”⁶⁴ In the four years since their testimony, DOD has stifled open conversation or testimony about readiness, limiting the Air Force’s ability to be forthcoming with open-source readiness indicators. While this makes any assessment of readiness difficult, there are three areas that can support an assessment:

- MC rates,
- Aircrew training, and
- Deployability.

MC rates are defined as the percentage of a unit’s aircraft that are capable of executing its mission set. Multiplying MC rates by the actual number of aircraft within a particular fleet yields the physical operational capacity of a weapons system. Several factors drive MC rates. The two most common to mature systems are operations and maintenance (O&M) funding and qualified manning to generate, fix, and fly those jets. Collectively, they dictate the number of sorties and flight hours that units have available for aircrew training.

The last time the United States was prepared to fight a peer competitor, the Air Force had more

TABLE 9

Air Force Flying Hours and Weapons System Sustainment (WSS) Funding

Dollar figures are in millions.

Fiscal Year	Flying Hours	Flying Hours Budget (Nominal Dollars)	WSS Budget (Nominal Dollars)	Flying Hours Budget (2023 Dollars)	WSS Budget (2023 Dollars)
2012	1,189,723	\$6,900	\$11,900	\$8,901	\$15,351
2013*	1,165,592	\$7,100	\$11,600	\$9,017	\$14,732
2014	1,203,877	\$7,800	\$10,500	\$9,762	\$13,141
2015	1,202,971	\$7,600	\$10,700	\$9,500	\$13,375
2016	1,219,557	\$7,800	\$11,500	\$9,625	\$14,191
2017	1,165,203	\$6,700	\$12,000	\$8,100	\$14,508
2018	1,423,000	\$6,200	\$11,900	\$7,316	\$14,042
2019	1,454,283	\$5,813	\$13,161	\$6,737	\$15,254
2020	1,325,156	\$6,063	\$14,847	\$6,942	\$17,000
2021	1,238,206	\$6,575	\$13,552	\$7,186	\$14,812
2022	1,150,715	\$5,647	\$12,299	\$5,647	\$12,299
2023	1,126,000	\$5,872	\$13,288	\$5,872	\$13,288

* Budget Control Act, also known as sequestration, implemented.

NOTES: Weapons System Sustainment supports aircraft sustainment through an enterprise-level concept for managing Depot Maintenance, Contractor Logistic Support (spare parts), Sustaining Engineering, and Technical Orders.

SOURCES: Extracted from U.S. Air Force budget summaries for FY 2013 through FY 2023. For example: U.S. Department of the Air Force, *United States Air Force FY 2013 Budget Overview*, February 2012, p. 12, <https://www.saffm.hq.af.mil/Portals/84/documents/FY13/AFD-120209-052.pdf?ver=2016-08-24-090344-023> (accessed September 8, 2022), and “U.S. Air Force Budget Highlights,” in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 3, https://www.saffm.hq.af.mil/Portals/84/documents/FY23/SUPPORT/_/BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d (accessed September 8, 2022).

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than 700 F-15C air superiority fighters with an MC rate of more than 80 percent for that fleet. If just 500 of them were combat coded, more than 400 mission-capable jets were ready to fight the Soviet Union. Conversely, there are 186 F-22As in the total aircraft inventory, but 28 are dedicated trainers, and 16 are primary development aircraft inventory used for testing new equipment, which leaves just 142 operational jets. In 2021, the F-22A had an MC rate of 51 percent, which means that just 72 F-22As could be committed to combat at any given time.⁶⁵ Although the F-22A is an incredibly capable fighter and 72 F-22s would be a formidable capability

against a regional threat, that number would be grossly insufficient for a peer fight.

Similarly, there are 33 operational B-1s in the Lancer fleet.⁶⁶ With an MC rate of 41 percent in FY 2021 (down from 52 percent in FY 2020), 13 are available for combat at any given time during the year. The B-2 fleet’s small size and 59 percent MC rate mean that, on average, just 12 are combat capable. If the B-52’s 58-plane operational fleet and 59 percent mission-capable rate are added, a total of 63 Air Force bombers were capable of executing combat missions on any given day in 2021.⁶⁷ For a summary of the mission-capable rates for combat-coded

TABLE 10

Mission-Capable Combat-Coded Fighters in the Active-Duty Air Force

	Combat-Coded Fighters	Average Age in Years	Mission-Capable Rate	Mission-Capable Combat-Coded Fighters
A-10C	115	41	73%	83
F-15C	55	38	69%	38
F-15E	164	30	66%	109
F-16C	336	32	72%	240
F-22A	133	16	51%	68
F-35A	139	5	69%	96
Total	942			634

NOTE: Thirteen months were added to the age of aircraft because of differences between aircraft data capture dates from the 2022 USAF Almanac and the publication date of this edition of the *Index*.

SOURCES: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information on Air Force mission-capable rates, May 11, 2022; Table, "Equipment: Aircraft Total Active Inventory (TAI) (As of Sept. 30, 2021)," in "Air Force & Space Force Almanac 2022," *Air Force Magazine*, Vol. 105, No. 6 and 7 (June/July 2022), p. 70, https://www.airforcemag.com/app/uploads/2022/07/Almanac2022_Fullissue-1.pdf (accessed September 8, 2022); and endnote 20.

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(operational) aircraft of the five fighter weapons systems, see Table 10.

Maintenance manning remains healthy across the board. (See Table 11.) If funding for flying hours and spare parts were robust, MC rates would rise, giving pilots more sorties and the capability to sharpen their combat mission-capable skills. Unfortunately, funding for flying hours has increased marginally in the years immediately following sequestration, and the number of available sorties falls well short of the minimum number required for pilots to be considered combat mission capable.

Unlike maintenance manning, the pilot shortage continues to plague the service. In March 2017, Lieutenant General Gina M. Grosso, Air Force Deputy Chief of Staff for Manpower, Personnel, and Services, testified that at the end of FY 2016, the Air Force had a shortfall of 1,555 pilots. Of that total, the Air Force was short 1,211 fighter pilots: 873 Active and 338 from the Active Reserve Component (ARC).⁶⁸ Even with the temporary surge in retention caused by COVID-19, the Total Force shortfall is 1,650: 650 Active and 1,000 ARC.⁶⁹

The Air Force graduated 1,200 pilots in FY 2018, added 1,279 in FY 2019, and projected that 1,480 would graduate in 2020, but the impact of COVID-19 was such that only 1,263 received their wings. Another 1,381 graduated in FY 2021, and the Air Force estimated that the number would be similar for FY 2022.

Those projected numbers rely on a very high annual graduation rate of approximately 94 percent of the candidates that enter flight school during any given year. According to the Air Force, the graduation rates for the past four years were 98 percent in 2018, 94 percent in 2019, 85 percent in 2020 (COVID-19), and 95.5 percent in 2021. The vast majority of those who washed out from flight school in 2021 were eliminated for health, discipline, or other reasons not specifically related to performance; only 0.27 percent were eliminated based on performance.⁷⁰

Throughout the pilot shortage, the Air Force has done an excellent job of emphasizing operational manning instead of placing experienced fighter pilots at staffs and schools, but the currency and qualifications of the pilots in operational units are at least as important as manning levels. Although the quality

TABLE 11

Air Force Maintenance Manning

Skill Level	Authorized	Assigned	Manning Percentage
3-level (Apprentice)	15,078	15,994	106%
5-level (Journeyman)	36,704	36,151	98%
7-level (Craftsman)	18,443	18,390	100%

NOTE: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations refused to provide manning data for calendar year 2021. Data shown are for calendar year 2020 and are assumed to be correct for 2021.

SOURCE: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information on Air Force mission-capable rates, May 17, 2021.

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of sorties is admittedly subjective, a healthy rate of three sorties a week and flying hours averaging more than 200 hours a year have been established as “sufficient” over more than six decades of fighter pilot training.⁷¹ In the words of General Bill Creech, “Higher sortie rates mean increased proficiency for our combat aircrews,”⁷² and given the right number of sorties and quality flight time, it takes seven years beyond mission qualification in a fighter for an individual to maximize his potential as a fighter pilot.⁷³

COVID-19’s impact on flying hours hit the Air Force as it was beginning to recover from an 18-year drought in training for combat with a near-peer competitor. Flying hours and sortie rates across all fighter platforms fell to historic lows as the average line combat mission-ready fighter pilot received less than 1.4 sorties a week and 131 hours of flying time per year.⁷⁴ Those numbers increased only marginally in 2021 to 1.5 sorties a week and 133.3 hours of flight time per year, not much above the all-time lows experienced the preceding year. That equates to roughly two-thirds the number of sorties required to meet the minimum sortie threshold to qualify pilots as combat mission capable throughout the Combat Air Force (CAF).

Those numbers are so low in a high-performance fighter that pilot competence levels drop to the point where even excellent pilots begin to question their execution of very basic tasks and where the execution of complex mission tasks can become overwhelming.⁷⁵ In a speech delivered on September 21,

2022, General Mark Kelly stated that the average fighter pilot received just 6.8 hours of flying time per month for a total of 81.6 hours of flying time in 2021.⁷⁶ No matter which data point is selected, the numbers reflect an Air Force that would struggle in a fight with a regional competitor and founder in a war with a peer adversary.

The last time that fighter pilots received an average of 150 hours of flying time and more than 2 sorties a week for an entire year was when the service was beginning to recover from sequestration in 2015. In spite of a budget that has increased by more than 75 percent in the years since, the number of flying hours the Air Force funds has remained abysmal. The number of funded flying hours dropped from 1.33 million in FY 2020 to 1.24 million in FY 2021 to 1.15 million in FY 2022,⁷⁷ and they will fall again in FY 2023 to 1.13 million hours⁷⁸—a level below which the Air Force was flying the year sequestration took effect.⁷⁹ Every reduction in funding for hours has been accompanied by a note stating that the hours were budgeted to “the maximum executable level,” but that is, at best, misleading as the only constraint beyond funding is maintenance manning, which has been healthy since 2019. (See Table 9.)

The current generation of fighter pilots, those who have been actively flying for the last seven years, has never experienced a healthy rate of operational flying. It will take several years of flying three or more sorties a week to regain the level of competence required to dominate a peer competitor,

TABLE 12

Average Hours All Fighter Pilots Received per Month

	2017	2018	2019	2020	2021	Percentage Change, 2020 to 2021
F-22	10.8	10.8	10.5	6.9	7.6	11%
F-35A	10.4	10.4	14.4	10.2	8.8	-13%
F-15C	10.5	10.5	11.8	4.8	9.0	88%
F-16C	12.2	12.2	12.1	6.7	10.4	54%
F-15E	18.3	18.3	20.3	13.0	12.8	-2%
A-10	15.1	15.1	16.5	12.2	10.7	-13%
All Jets	13.0	12.9	14.1	8.7	10.0	16%
Average Hours per Year	155.4	154.6	168.7	104.3	120.6	16%

SOURCE: Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information on Air Force fighter pilot flight hours, August 24, 2022.

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but the Air Force is not moving to make that happen. Readiness, as measured by any acceptable means, is incredibly low and it is no surprise that Air Force Chief of Staff, General C. Q. Brown is trying to shift the focus away from readiness or even redefine it using criteria that has yet to be released, or perhaps even formulated.⁸⁰ Either way, the effort will undoubtedly further erode the combat capability of the Air Force, pilot competency, and flying safety.

Deployability. Because long-term inspections and depot-level work affect the availability of support equipment and aircraft, it takes three active-duty squadrons to deploy two squadrons forward. For that reason, up until the end of the Cold War, the Air Force organizational structure was based on a three-squadron wing. On any given day, units have several aircraft that are not flyable because of long-term inspections, deep maintenance, or the need for spare parts. By using aircraft from one of the three squadrons to “plus up” the others, the wing could immediately deploy two full-strength units into combat. The handful of fully flyable jets and pilots left at the home station could then be used to train new and inbound pilots up to mission-ready status so that, among other things, they could replace pilots that were lost during combat.⁸¹

Normal, active duty fighter squadron manning levels are based on a ratio of 1.25 aircrew members

for every aircraft,⁸² which means that a unit with 24 assigned aircraft should have 30 line pilots and five supervisor pilots who are combat mission ready.⁸³ Flight times, sortie rates, mission planning teams, and flight supervision requirements are significantly higher in combat, and to cover those requirements, the manning ratio normally increases to 1.50 pilots per aircraft, or 36 line pilots per squadron. In other words, every squadron deployed to fight requires six more pilots than it has on its roster.⁸⁴ Pilots from “donor” squadrons can fill those slots for the deploying units.

With the downsizing that has taken place since the end of the Cold War and the reduction in the number of fighter squadrons, the Active Air Force has reduced the number of fighter squadrons to two or even one in many wings. All operational Guard and Reserve wings are comprised of a single squadron, which complicates the math behind the total number of deployable fighter squadrons.

Of the 55 operational fighter squadrons on the Air Force roster, 32 are Active and 23 are Guard or Reserve Units. (See Figure 3.) Using the notion that it takes three squadrons to get two active-duty squadrons forward, the airframe disposition of each active-duty wing would allow just 21 active-duty fighter squadron equivalents (24 fighter aircraft each) to deploy to a fight. That equates to 480 active-duty

fighters that could deploy to meet a crisis situation, which is well short of the 600 it takes to win a single MRC and means that a war with a peer competitor would draw heavily on our strategic reserve.

Guard and Reserve units face the same manning and deployment challenges that the active-duty service faces, except that the vast majority of those units have just one fighter squadron per wing, further straining their ability to muster the airframes and manning needed to meet an emergency deployment.⁸⁵ Planning for low-threat, low-intensity deployments to Operation Iraqi Freedom and Operation Enduring Freedom took this into consideration by mapping deployments out months (often years) in advance of the required movement, allowing pilots to deconflict their civilian work schedules not just for the deployment, but also to get the training and time in the air that they needed to employ successfully in those low-threat combat operations.⁸⁶ Nevertheless, it was common for Guard units to pull pilots from other units to fulfill manning requirements for “rainbow” fighter squadrons,⁸⁷ and in a conflict where there is little time from warning order to deployment, it would likely take two Guard and Reserve squadrons to enable one to deploy forward.⁸⁸

The average Guard and Reserve fighter squadron has one-third fewer jets than similar active-duty units have. By rainbowing units with similar aircraft, the Guard and Reserve could muster 12 squadrons as a strategic reserve of 288 fighters that could deploy sometime after the active-duty units deploy. In other words, the service could muster just 768 fighters (480 Active and 288 Guard and Reserve) for a peer-level fight. However, the gravity of that mix is

not fully understood. The Guard and Reserve numbers are based on airframes alone, but other factors such as manning levels would also limit the number of sorties and the amount of combat power that those fighters could generate continually in a high-end confrontation with a peer competitor.

The declaration in Air Force posture statements for FY 2020 and FY 2021 that lead force packages within the service’s 204 pacing squadrons are ready to fight also conveys the fact that only portions of its most capable squadrons have enough mission-capable aircraft and aircrews that are “closer” to the minimum Combat Mission Capable sortie requirements to respond somewhat readily to a crisis. Because of the pilot shortage, actual unit manning levels in fighter squadrons are below peacetime requirements (if only slightly), which obviously is not enough to meet the significantly increased demands and the tempo required for combat operations.

The service has already moved the majority of pilots who were in staff or other non-flying billets back to the cockpit in an effort to relieve the manning shortfall. Thus, the only way units can meet wartime manning requirements is by pulling pilots from other “donor” squadrons. The complications that this involves are significant and call into question the idea that the portions of the 55 fighter squadrons that are unable to deploy immediately in a crisis could be combined to create more combat power. The vast majority of aircraft and aircrew that are left would be used for homeland defense and to train replacement pilots or to replace aircraft that are lost through combat attrition.

Scoring the U.S. Air Force

Capacity Score: Marginal

One of the key elements of combat power in the U.S. Air Force is its fleet of fighter aircraft. In responding to major combat engagements since World War II, the Air Force has deployed an average of 28 fighter squadrons. Based on an average of 18 aircraft per squadron, that equates to a requirement of 500 Active Component fighter aircraft to execute one MRC. Adding a planning factor of 20 percent for spares and attrition reserves brings the number to 600 aircraft.

As part of its overall assessment of capacity, the *2023 Index* looks for 1,200 active-duty, combat-coded fighter aircraft to meet the baseline requirement for two MRCs.⁸⁹ That number of fighters lines up well with the fighter requirement from the 2018 TAFWN, which the Commander of Air Combat Command recently reaffirmed is the actual capacity requirement for today’s Air Force.⁹⁰ The bomber, tanker, and strategic air requirements from that study are also used in this assessment.

- **Two-MRC Fighter—Threshold:** 1,200 combat-coded active-duty fighters / 62 squadrons.
- **Two-MRC Fighter—Actual 2022 Level:** 940 active-duty combat-coded fighters (78 percent) / 55 total force squadrons (88 percent).
- **TAFWN Bomber Squadron—Threshold:** 14 combat-coded bomber squadrons / 140 bombers.
- **TAFWN Bomber Squadron—Actual 2022 Level:** nine combat-coded bomber squadrons (64 percent) / 111 combat-coded bombers (79 percent).
- **TAFWN Tanker Squadron—Threshold:** 54 tanker squadrons / 540 combat-coded tankers.
- **TAFWN Tanker Squadron—Actual 2022 Level:** 43 combat-coded tanker squadrons (80 percent) / 454 combat-coded tankers (84 percent).
- **TAFWN Airlift Squadron—Threshold:** 54 airlift squadrons / 540 combat-coded airlifters.
- **TAFWN Airlift Squadron—Actual 2022 Level:** 48 combat-coded airlift squadrons (89 percent) / 532 combat-coded airlifters (99 percent).

Based on a pure count of combat-coded squadrons and platforms that have achieved IOC, the USAF currently is at 86 percent of the capacity required to meet a two-MRC/TAFWN benchmark. However, the disposition of those assets limits the ability of the service to deploy them rapidly to a crisis region. While the active fighter and bomber assets that are available would likely prove adequate to fight and win a single regional conflict, when they are coupled with the low mission capability rates of those aircraft (see Table 10), the global sourcing needed to field the required combat fighter force assets would leave the rest of the world uncovered.

Nevertheless, the capacity level is well within the methodology’s range of “marginal.” However, with programmed retirements that will exceed acquisitions, capacity is now trending downward.

Capability Score: Marginal

The Air Force’s capability score is “marginal,” based on scores of “strong” for “Size of Modernization Program,” “marginal” for “Age of Equipment” and “Health of Modernization Programs,” but “weak” for “Capability of Equipment.” These assessments are the same as those in the *2022 Index*. New F-35 and KC-46 aircraft continue to roll off their respective production lines, but these additions are more than offset by aircraft retirements. As a consequence, this score will probably not improve over the next three to five years.

Readiness Score: Very Weak

The Air Force scores “very weak” for readiness in the *2023 Index*, a grade lower than it received in the *2022 Index and the lowest of the five-grade scale*. The USAF’s sustained pilot deficit certainly contributes to this assessment, but the incredibly low sortie rates and flying hours would prevent any Air Force combat-coded fighter squadron from being able to execute all or even most of its wartime mission. At best, half of the cadre of pilots within the most capable units will be able to execute some of the unit’s wartime missions. The Air Force’s mission-capable rates have increased only slightly from 2021, and the intent of the current CSAF to sustain or further reduce operational training sorties reflects a service that would struggle to respond to a regional contingency much less hold the readiness levels, competence, and confidence levels required to square off against a peer competitor.⁹¹ Readiness continues to trend downward.

The FY 2023 Air Force statement mentions the word “ready” just four times, and never in the context of current readiness levels.⁹² The Air Force should be prepared to respond quickly to an emergent crisis not with a “task force” of four bombers, but with the speed and capacity required to stop a peer competitor in its tracks. With the significant curtailment of deployments in support of the global war on terrorism, the Air Force should be much farther along in its full-spectrum readiness than we have witnessed to date.

Overall U.S. Air Force Score: Very Weak

This is a result of the lowest of the USAF’s three scores: a capacity score of “marginal,” capability score of “marginal,” and readiness score of “very weak.” Like a three legged stool, success or failure

is determined by the weakest leg. The shortage of pilots and flying time for those pilots degrades the ability of the Air Force to generate the quality of combat air power that would be needed to meet wartime requirements. Fighter pilots should receive an average of three or more sorties a week and 200 hours per year to develop the skill sets needed to survive in combat, and while some readiness issues can be written off to the effects of COVID-19, the service is making a calculated decision not to acquire more aircraft or fund the accounts required

for any significant increase in training and numbers of sorties.

Although there is a chance that it might win a single MRC in any theater, there is little doubt that the Air Force would struggle in war with a peer competitor. Both the time required to win such a conflict and the attendant rates of attrition would be much higher than they would be if the service had moved aggressively to increase high-end training and acquire the fifth-generation weapon systems required to dominate such a fight.

U.S. Military Power: Air Force

	VERY WEAK	WEAK	MARGINAL	STRONG	VERY STRONG
Capacity			✓		
Capability			✓		
Readiness	✓				
OVERALL	✓				

AIR FORCE SCORES

1 2 3 4 5
Weakest ← Strongest

Procurement and Spending ■ Through FY 2022 ■ Pending

Strategic Bomber

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>B-52 Stratofortress Inventory: 76 Fleet age: 61 Date: 1961</p> <p>The B-52, the oldest of the bombers, provides global strike capabilities with conventional or nuclear payloads. Programmed upgrades for B-52 include a new communications, avionics, and Multi-Functional Color Displays. The Air Force plans to use this aircraft through the 2050s as a compliment to the B-21 Raider.</p>	1		<p>The B-21 is an advanced stealth bomber that is currently programmed to begin replacing all B-1s and B-2s within the Air Force bomber fleet in the late 2020s and expand to a fleet of at least 100 aircraft. Flight testing, originally scheduled for late 2022, has been pushed back to 2023 because of unspecified delays. However, the Raider is still projected to enter service in the mid-2020s.</p>		
<p>B-1B Lancer Inventory: 45 Fleet age: 35 Date: 1986</p> <p>Nicknamed “The Bone,” the B-1B Lancer is a long-range, multi-mission, supersonic conventional bomber that has served the United States Air Force since 1985. Originally designed for nuclear capabilities, the B-1 switched to an exclusively conventional combat role in the mid-1990s. In September 2020, the entire Air Force B-1B Lancer fleet completed the Integrated Battle Station upgrade to modernize the jet’s datalinks, cockpit displays, and test system. The B-1B is scheduled to be phased out in 2032.</p>	2	2			
<p>B-2 Spirit Inventory: 20 Fleet age: 27 Date: 1997</p> <p>The B-2 bomber provides the USAF with global strike capabilities for both nuclear and conventional payloads. The stealth bomber’s communication suite is currently being upgraded, and efforts are being made to increase its loadout and the ability of its payload to strike hardened and buried targets. The current plan is to begin phasing out the B-2 in 2032.</p>	3	4			

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Ground Attack/Multi-Role Aircraft

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>A-10 Thunderbolt II Inventory: 260 Fleet age: 41 Date: 1977</p> <p>The A-10 is the only USAF platform designed specifically for close air support mission using both self-designated precision-guided munitions and an internal 30mm cannon. While the retirement of the A-10 has been in discussion for years, Congress's denial of both the Air Force's request to retire the A-10 in 2021 and a subsequent request to cut 42 A-10s in FY 2022 indicates that the aircraft may fly for years to come.</p>	2	2	<p>F-35A Timeline: 2016–2035</p> <p>The F-35A is a multi-role stealth fighter that achieved IOC on August 2, 2016. The Block 4 version of the jet, meant to significantly increase combat capability, remains under development, leading to concerns about rising retrofit costs for existing F-35 aircraft, which in recent years have led to reduced procurement of the aircraft. The Block 4 modification will be retrofitted into all Block 3 F-35s.</p>	4	3
<p>F-16C Falcon Inventory: 863 Fleet age: 32 Date: 1980</p> <p>The F-16 is a multi-role aircraft capable of tactical nuclear delivery, all-weather strike, and Suppression of Enemy Air Defenses (SEAD). Improvements to the F-16's radar, mission computer, and cockpit displays and an ongoing Service Life Extension Program (SLEP) will keep this jet flying through the late 2040s.</p>			<p>PROCUREMENT SPENDING (\$ millions)</p> <table border="0"> <tr> <td style="width: 50%; text-align: center;"> </td> <td style="width: 50%; text-align: center;"> </td> </tr> </table>		
<p>F-35A Lightning Inventory: 432 Fleet age: 5 Date: 2016</p> <p>See Ground Attack Replacement Program entry. The F-35 is a multi-role stealth fighter that became operational in 2016. By the end of FY 2022, the Air Force will have received 326 of a planned purchase of 1,763 aircraft.</p>	5	5			
<p>F-15E Strike Eagle Inventory: 218 Fleet age: 30 Date: 1989</p> <p>The F-15E is a multi-role aircraft capable of all-weather, deep interdiction/attack, and tactical nuclear weapons delivery. Upgrades include an AESA radar, EPAWSS self-defense suite, a new central computer, and cockpit displays.</p>	2	2			

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Fighter Aircraft

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score		
<p>F-15C/D Eagle Inventory: 119 Fleet age: 38 Date: 1975</p> <p>The F-15C is an air superiority fighter that has been in service since the late 1970s. The jet is receiving upgrades that include a new AESA radar and self-defenses needed to survive and fight in contested airspace. The F-15C inventory is currently being reduced by the Air Force after determinations that a Service Life Extension Program (SLEP) would not be cost-effective with 48 aircraft being divested in FY 2022 ahead of fleetwide recapitalization by the F-15EX.</p>	1	2	<p>F-15 EX Timeline: TBD-2024</p> <p>The F-15EX, the most advanced Eagle variant, is based on the F-15QA as a replacement for the legacy F-15C/D. The USAF awarded Boeing a \$1.2 billion contract for the first eight of up to 144 new-build F-15EX jets on July 13, 2020. FY 2021 funds procure an additional 12 aircraft and 12 more in FY 2022. The Air Force accepted the first two F-15EXs in FY 2021 and expects the next six fighters in 2023.</p> <p>PROCUREMENT SPENDING (\$ millions)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"> </td> <td style="width: 50%; text-align: center;"> </td> </tr> </table>			1	1
<p>F-22A Raptor Inventory: 186 Fleet age: 16 Date: 2005</p> <p>The F-22 is the preeminent air superiority stealth fighter aircraft, modified to enable precision-guided weapons delivery. The jet is currently undergoing a modification called RAAMP that will improve reliability, maintainability, and performance. In FY 2022, the jet will also begin fielding the Link-16, which will allow it to transmit data with legacy aircraft via Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/JTRS). The Air Force could begin to replace the F-22 as early as the 2030s as it seeks to leverage new technologies developed from its NGAD program.</p>	4	5	None				

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

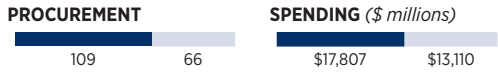
AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Tanker

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>KC-10 Extender Inventory: 26 Fleet age: 38 Date: 1981</p> <p>The KC-10 is multi-role tanker and airlift platform that can refuel both boom- and drogue-compatible fighters on the same mission. Recent modifications have enabled a service life extension through 2045. While Congress blocked efforts by the Air Force to begin retiring the aircraft in 2021, the Air Force retired eight KC-10s in FY 2022 and plans to retire 14 in FY 2023 to make way for the KC-10's replacement, the KC-46.</p>	2		<p>KC-46 Timeline: TBD-2027</p> <p>This aircraft is a multi-role tanker/airlift platform that can refuel both boom- and drogue-compatible fighters on the same mission. The Air Force accepted the first of 179 programmed aircraft in 2019. The program has significant problems with the remote vision system and boom that currently limit it to refueling fourth-generation jets in non-combat operations. The Air Force will receive another 24 jets in FY 2023 with this same limitation, bringing the total number of KC-46s in the inventory to 95.</p>	3	1
<p>KC-135 Stratotanker Inventory: 362 Fleet age: 62 Date: 1957</p> <p>The KC-135 is a multi-role tanker/airlift platform capable of simultaneous cargo and AE missions. The aircraft has undergone several modifications, mainly engine upgrades to improve performance and reliability. Air Force plans to further modify the aircraft with Block 45 upgrades: additional glass cockpit display for engine instrumentation, a radar altimeter, advanced autopilot, and modern flight director at a rate of 38 aircraft per year through 2026. Part of the fleet will be replaced with the KC-46 with the remainder scheduled to be in service through 2050.</p>		5			
<p>KC-46 Pegasus Inventory: 95 Fleet age: 2 Date: 2020</p> <p>This Pegasus is a multi-role tanker/airlift platform that can refuel both boom- and drogue-compatible fighters on the same mission. The Air Force accepted the first of 179 programmed aircraft in 2019. The program has significant problems with the remote vision system and boom that currently limit it to refueling fourth-generation jets in non-combat operations. The Air Force will receive another 24 jets in FY 2023 with this same limitation, bringing the total number of KC-46s in the inventory to 95.</p>					1



NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Heavy Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>C-5M Galaxy Inventory: 52 Fleet age: 35 Date: 1970</p> <p>The C-5 is the USAF's largest mobility aircraft. It can transport 270,000 pounds of cargo over intercontinental ranges and is air refuellable. The M models are heavily modified C-5A/Bs that have new engines, avionics, and structural/reliability fixes. Ongoing mods include a new weather radar and mission computer and improved Large Aircraft IR Countermeasures (LAIRCM).</p>	2	5	None		
<p>C-17 Globemaster III Inventory: 222 Fleet age: 20 Date: 1995</p> <p>The C-17 is a heavy-lift, strategic transport capable of direct tactical delivery of all classes of military cargo. It is the U.S. military's core airlift asset; it is air refuellable and is capable of operating on small airfields (3,500 ft. by 90 ft.). Ongoing mods include next-generation Large Aircraft Infrared Countermeasures (LAIRCM), structural, safety, and sustainment mods.</p>	4				

Medium Lift

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>C-130J Super Hercules Inventory: 153 Fleet age: 13 Date: 2006</p> <p>The C-130J is an upgraded tactical airlift platform with a medium-lift capability and multiple variants including the C-130J-30, AC-130J gunship, and HC-130 rescue/air refueling platform. The C-130J-30 can carry 92 airborne troops and lift over 40,000 pounds of cargo. The Air Force Active Component completed its transition to the C-130J in October 2017, but it will continue to procure C-130Js for the Guard and Reserve at least through FY 2023.</p>	5	5	<p>C-130J Timeline: 2006-2022</p> <p>The C-130J is an upgraded tactical airlift platform with a medium-lift capability and multiple variants including the C-130J-30, AC-130J gunship, and HC-130 rescue/air refueling platform. The C-130J-30 can carry 92 airborne troops and lift over 40,000 pounds of cargo. The Air Force Active Component completed its transition to the C-130J in October 2017, but it will continue to procure C-130Js for the Guard and Reserve at least through FY 2023.</p>	5	5
			<p>PROCUREMENT</p> <p>203</p>	<p>SPENDING (\$ millions)</p> <p>\$18,801 \$266</p>	

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Intelligence, Surveillance, and Reconnaissance (ISR)

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>RQ-4 Global Hawk</p> <p>Inventory: 9 Fleet age: 12 Date: 2011</p> <p>The Global Hawk is a strategic, high-altitude, long-endurance (HALE), “deep look” ISR platform complementing satellite and manned ISR. Unlike the MQ-9, which is a medium-altitude, long-endurance UAV, the RQ-4 has a higher altitude and longer range.</p>	4	3	None		
<p>MQ-9 A/B Reaper</p> <p>Inventory: 276 Fleet age: 7 Date: 2007</p> <p>The MQ-9B is a medium-altitude to high-altitude, long-endurance hunter-killer RPA (remotely piloted aircraft) tasked primarily with eliminating time-critical and high-value targets in permissive environments. Additional roles include CAS, CSAR, precision strike, armed overwatch, target development/designation, and terminal weapon guidance. The MQ-9 fulfills a secondary tactical ISR role utilizing its Multispectral Targeting System-B (MTS-B), Lynx SAR, and/or Gorgon Stare wide-area surveillance. The USAF is attempting to end MQ-9 procurement and seeks to replace the Reaper with a more survivable, flexible, and advanced platform as early as 2031.</p>	5	1	<p>MQ-9</p> <p>Timeline: 2007–2022</p> <p>The MQ-9 is a hunter/killer unmanned Aerial Vehicle (UAV). The Air Force planned to end procurement for the Reaper in FY 2021, but in FY 2021, Congress decided to procure an additional 16 Reapers. With the decline of U.S. counterinsurgency efforts, the Air Force has announced plans to transition the MQ-9 away from counterinsurgency to operating in near contested airspace. The Air Force is planning to replace the Reaper with a more survivable, flexible, and advanced platform as early as 2031.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>PROCUREMENT</p> <p>371</p> </div> <div style="text-align: center;"> <p>SPENDING (\$ millions)</p> <p>\$430 \$17</p> </div> </div>	5	5
<p>RC-135 Rivet Joint</p> <p>Inventory: 25 Fleet age: 60 Date: 1972</p> <p>The RC-135V/W is tasked with real-time electronic and signals intelligence-gathering, analysis, and dissemination in support of theater and strategic-level commanders. The extensively modified C-135s detect, identify, and geolocate signals throughout the electromagnetic spectrum. Rivet Joint is used mostly to exploit electronic battlefield intelligence and deliver near-real-time ISR information to tactical forces, combatant commanders, and National Command Authorities. Ongoing upgrades include new direction-finding COMINT, precision ELINT/SIGINT system integration, wideband SATCOMS, enhanced near real-time data dissemination, and new steerable beam antenna. The Air Force’s most recent utility assessment projected that the RC-135 would fly through 2050.</p>	1	4	None		

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022 ■ Pending

Intelligence, Surveillance, and Reconnaissance (ISR) (Cont.)

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>U-2 Dragon Lady</p> <p>Inventory: 31 Fleet age: 40 Date: 1956</p> <p>The U-2S is the Air Force's only manned, strategic, high-altitude, long-endurance ISR platform and is capable of SIGINT, IMINT, and MASINT collection. The aircraft's modular payload systems allow it to carry a wide variety of advanced optical, multispectral, EO/IR, SAR, SIGINT, and other payloads simultaneously. Its open system architecture also permits rapid fielding of new sensors to counter emerging threats and requirements. The Air Force is currently upgrading the U-2 with ASARS-2B/C, which will improve the U-2's high-altitude, deep-look radar ground mapping, moving target, and maritime capabilities.</p>	1	4	None		

NOTE: See page 423 for details on fleet ages, dates, timelines, and procurement spending.

AIR FORCE SCORES



Procurement and Spending ■ Through FY 2022
■ Pending

Command and Control

PLATFORM	Age Score	Capability Score	REPLACEMENT PROGRAM	Size Score	Health Score
<p>E-3 Sentry Inventory: 16 Fleet age: 42 Date: 1977</p> <p>The E-3 Airborne Warning and Control System (AWACS) is tasked with all-weather, air and maritime surveillance, command and control, battle management, target, threat, and emitter detection, classification, and tracking. Ongoing upgrades include an urgent operational requirement to shorten kill chains on time-sensitive targets, modernizing airborne moving target indication, and adding high-speed jam-resistant Link 16. Due to difficulties sustaining the E-3, the Air Force has looked into potentially procuring Boeing's E-7A Wedgetail as a compliment to the E-3.</p>	1	1	None		
<p>E-8 JSTARS Inventory: 4 Fleet age: 22 Date: 2001</p> <p>E-8C is a ground moving target indication (GMTI), airborne battlefield management/command and control platform. Its primary mission is providing theater commanders with ground surveillance data to support tactical operations. Congress approved divestiture of the E-8 in 2022 with four aircraft being retired.</p>					

NOTES: See Methodology for descriptions of scores. The date is the year the platform achieved initial operational capability. The timeline is from the year the platform achieved initial operational capability to its final procurement. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E).

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F-15EX Strike Eagle

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KC-46 Pegasus

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MQ-9 Reaper

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AIR FORCE PLATFORM SUMMARIES

B-52 Stratofortress

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B-1B Lancer

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B-2 Spirit

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A-10 Thunderbolt II

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F-16 Fighting Falcon

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F-15C Eagle

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F-22 Raptor

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69. Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information on Air Force manning levels, May 11, 2022.
70. *Ibid.*
71. John Venable, "Independent Capability Assessment of U.S. Air Force Reveals Readiness Level Below Carter Administration Hollow Force," p. 4.
72. James C. Slife, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces, 1978–1984* (Maxwell Air Force Base: Air University Press, October 2004), p. 92, https://www.airuniversity.af.edu/Portals/10/AUPress/Books/B_0095_SLIFE_CREECH_BLUE.pdf (accessed July 4, 2022).
73. John Venable, "A Plan for Keeping the U.S. Air Force's Best Pilots in Service," Heritage Foundation *Commentary*, November 14, 2017, <https://www.heritage.org/defense/commentary/plan-keeping-the-us-air-forces-best-pilots-service>.
74. Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information on Air Force manning levels, May 14, 2021.

75. Venable, "A Plan for Keeping the U.S. Air Force's Best Pilots in Service."
76. General Mark Kelly, "Air Force Fighter Enterprise," Air & Space Forces Association Air, Space and Cyber Conference, National Harbor, Maryland, September 21, 2022.
77. Oriana Pawlyk, "Cuts to Flight Hours Necessary as Aircraft Sustainment Costs Surge, Air Force General Says," Military.com, June 23, 2021, <https://www.military.com/daily-news/2021/06/23/cuts-flight-hours-necessary-aircraft-sustainment-costs-surge-air-force-general-says.html> (accessed July 4, 2022).
78. Table 2, "U.S. Air Force Budget Summary," in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 4.
79. The flying hour budget for FY 2013 was \$7.1 billion in then-year dollars. The flying hour budget for FY 2023 is \$5.87 billion. Extracted from U.S. Air Force budget summaries for the years 2013 and 2023. U.S. Department of the Air Force, *United States Air Force Fiscal Year 2013 Budget Overview*, February 2012, p. 12, <https://www.saffm.hq.af.mil/Portals/84/documents/FY13/AFD-120209-052.pdf?ver=2016-08-24-090344-023>, and "U.S. Air Force Budget Highlights," in U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 3, https://www.saffm.hq.af.mil/Portals/84/documents/FY23/SUPPORT_/BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d (accessed August 29, 2022).
80. General Charles Q. Brown, Jr., and General David H. Berger, "Redefine Readiness or Lose," War on the Rocks, March 15, 2021, <https://warontherocks.com/2021/03/redefine-readiness-or-lose/> (accessed August 29, 2022).
81. Author's experience through 26 years of Air Force operations coupled with senior leader engagements from 2018–2019.
82. Albert A. Robbert, Anthony D. Rosello, Clarence R. Anderegg, John A. Ausink, James H. Bigelow, William W. Taylor, and James Pita, *Reducing Air Force Fighter Pilot Shortages* (Santa Monica, CA: RAND Corporation, 2015), p. 33, https://www.rand.org/content/dam/rand/pubs/research_reports/RR1100/RR1113/RAND_RR1113.pdf (accessed July 4, 2022).
83. Even though active-duty fighter squadrons have an average of 30 aircraft per squadron, that number includes maintenance spare and attrition reserve platforms. Manning is based on Primary Assigned Aircraft (PAA), which is 24 aircraft for active-duty fighter squadrons.
84. Based on a squadron with 24 Primary Assigned Aircraft. Units with 18 PAA require four additional pilots.
85. The very premise of these units is that they are manned with citizen soldiers whose main source of income is full-time civilian jobs and who are committed to travel and temporary duty locations that make them unavailable for days or weeks at a time. Those units would likely require several days to assemble the manpower needed to deploy, and once an assessment of their real mission currency was made, they would need some period of intense training before a responsible senior leader could employ them in a fight with a peer competitor.
86. "Deployments most suited to the ARC are those in which there is long lead time (six months or more), and in which the operation is of short duration (six days or less), requiring a small force package (12 aircraft or less), and in which the scheduling is flexible." John T. Correll, "Future Total Force," *Air Force Magazine*, Vol. 82, No. 7 (July 1999), p. 32, <https://www.airforcemag.com/PDF/MagazineArchive/Documents/1999/July%201999/0799total.pdf> (accessed July 4, 2022).
87. The author commanded the 349th Expeditionary Combat Group at Al Udeid, Qatar, from 2004–2005. During that time, he flew with seven different Air National Guard F-16 squadrons. Every one of those units had some level of rainbow manning, and each performed admirably.
88. Interview with senior Air National Guard leader, November 20, 2019.
89. The number of fighters needed for a two-MRC strategy is based on a Heritage Foundation study of airpower requirements and actual fighter deployments for all major combat operations and conflicts from 1950 through 2021.
90. Kelly, "Air Force Fighter Enterprise."
91. See Venable, "Independent Capability Assessment of U.S. Air Force Reveals Readiness Level Below Carter Administration Hollow Force."
92. The FY 2023 Air Force Posture Statement does not discuss current posture; it makes declarative allusions as to what it should or must be ready to do. For example: "[T]o provide effective integrated deterrence, the Department of the Air Force must be fully ready to expeditiously transition to a wartime posture. We must be ready to mobilize against a peer competitor who has spent decades researching and developing the means to attack the systems and infrastructure we depend on to go to war through cyber and non-cyber means." The Honorable Frank Kendall, Secretary of the Air Force; General John W. Raymond, Chief of Space Operations, United States Space Force; and General Charles Q. Brown, Jr., Chief of Staff, United States Air Force, "Department of the Air Force Posture Statement, Fiscal Year 2023," Department of the Air Force Presentation to the Committees and Subcommittees of the United States Senate and the House of Representatives, 117th Cong., 2nd Sess., p. 5, https://www.af.mil/Portals/1/documents/2022SAF/FY23_DAF_Posture_Statement.pdf (accessed July 4, 2022). "These investments ensure today's space capabilities are ready to support day-to-day campaigning in the near-term as the Space Force's modernization efforts pave the way to deliver new architectures that are resilient by design." *Ibid.*, p. 9. "To ensure this capability remains ready, the Air Force is modernizing with the Sentinel system, our Ground Based Strategic Deterrent (GBSD)." *Ibid.*, p. 12.