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14. ABSTRACT

The Air National Guard will need to recruit and retain the talent for a 5th-generation weapons platform to meet effective manning strength, which it currently is not meeting, rather than end strength numbers for the more technically sophisticated 5th-generation fighter. The active-duty United States Air Force and the Air National Guard are receiving the new F-35 5th-Generation fighter jet. The brand new technologies and systems in the F-35 make the jet the most sophisticated and capable fighter jet in the world. The F-35 is far more technically advance than the 4th-Generation F-16's and F-15's which it is replacing. The Air National Guard will initially field three F-35 units and these bases will need to change their recruiting and retention strategies to meet the effective manning requirements and fill vacant technical jobs it currently faces. Each F-35 base will need to work with the state and communities to come up with new strategies to recruit new members or prior service members to the Air National Guard while retaining the members that have the experience and currently serve. The challenges of recruiting new members scoring high on the mechanical and electrical portions of the ASVAB and finding new members who have the propensity to serve is a problem that the Air National Guard needs to solve. The Air National Guard will need to partner within their communities and states to bring awareness and educate the general public of the benefits of the Air National Guard in their communities and the opportunities the Air National Guard offers to increase the recruiting and retention efforts to meet effective manning strength.

15. SUBJECT TERMS
Recruiting, Air National Guard, F-35, Effective Manning, Overall Manning

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MASTER OF MILITARY STUDIES

TITLE:

**EFFECTIVELY RECRUITING AND RETAINING FIFTH-GENERATION AIRMEN
FOR THE F-35 FIFTH-GENERATION WEAPON SYSTEMS WITHIN THE AIR
NATIONAL GUARD**

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
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Executive Summary

Title: Effectively Recruiting and Retaining 5th-Generation Airmen for the F-35 5th-Generation Weapon Systems within the Air National Guard

Author: Major Shawn Daley, United States Air Force

Thesis: Recruiting in all branches of service across the Department of Defense are facing significant challenges to fill vacant positions in today's recruiting environment. Recruiting in the ANG is competing with the other services for eligible recruits. The Air National Guard will need to recruit and retain the talent for a 5th-generation weapons platform to meet effective manning strength, which it currently is not meeting, rather than end strength numbers for the more technically sophisticated 5th-generation fighter.

Discussion: The active-duty United States Air Force and the Air National Guard are receiving the new F-35 5th-Generation fighter jet. The brand new technologies and systems in the F-35 make the jet the most sophisticated and capable fighter jet in the world. The F-35 is far more technically advance than the 4th-Generation F-16's and F-15's which it is replacing. The Air National Guard will initially field three F-35 units and these bases will need to change their recruiting and retention strategies to meet the effective manning requirements and fill vacant technical jobs it currently faces. Effective manning is putting an individual in each vacant job position a base has without double-slotting many positions to meet end strength numbers. Each F-35 base will need to work with the state and communities to come up with new strategies to recruit new members or prior service members to the Air National Guard while retaining the members that have the experience and currently serve. The challenges of recruiting new members scoring high on the mechanical and electrical portions of the ASVAB and finding new members who have the propensity to serve is a problem that the Air National Guard needs to solve. Air National Guard leadership recognizes the issues and problems that the recruiters and base leadership are facing and the manning is effecting readiness numbers to deploy. There are solutions that can be used which requires Air National Guard members being more involved in the schools and communities in which they live.

Conclusion: The Air National Guard will need to partner within their communities and states to bring awareness and educate the general public of the benefits of the Air National Guard in their communities and the opportunities the Air National Guard offers to increase the recruiting and retention efforts to meet effective manning strength.

Preface

The Air National Guard (ANG) is beginning to receive the new F-35 Joint Strike Fighter. The new fighter jet is a 5th-Generation Weapons System Platform that is more technically advanced than their 4th-Generation predecessor, the F-16 and F-15. The ANG currently meets their end strength recruiting goals but are failing to meet their effective manning goals. I chose to do my research and focus on the three bases that will receive the F-35 first. The reason I chose this topic is that the three bases are failing to meet end strength manning goals, effective manning goals, or both.

I would like to thank SMSgt Sheila Clingman and MSgt Patrick Fitzgerald from the Alabama Air National Guard for assisting me in providing me the data for effective and end strength manning reports, as well as the 187th Fighter Wing authorized versus actual manning documents. I would also like to thank Dr. Bradford Wineman for his direction and guidance in helping me to narrow down the research and focus on the specific issues that the future F-35 bases are facing in recruiting and retention.

Table of Contents

	Page
DISCLAIMER	ii
EXECUTIVE SUMMARY.....	iii
PREFACE.....	iv
TABLES OF CONTENTS.....	v
LIST OF TABLES	vi
REPORT DOCUMENTATION PAGE.....	vii
MAIN PAPER.....	1
Introduction.....	1
Effective Manning vs. End Strength Manning.....	2
Advanced 5th-Generation F-35 Technology	9
Recruiting and Retention Manning Requirements for the F-35.....	12
Recruiting and Retention Strategies for the F-35 bases.....	15
Conclusion	21
ENDNOTES	23
TABLES	26
BIBLIOGRAPHY.....	31

Tables

Page

Table 1. FY 19 ANGRC Kneeboard 26

Table 2. FY 18 ANGRC Kneeboard 29

ANGRC (Air National Guard Readiness Center)

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The F-35 Joint Strike Fighter (JSF) developed by defense contractor Lockheed Martin is a 5th-generation fighter jet that is currently fielded to both the active-duty United States Air Force (USAF) and the Air National Guard (ANG) fighter wings. The F-35 is a 5th-generation weapon system with more advanced technologies than their 4th-generation predecessor, the F-15, F-16, F-18, and A-10.¹ The advanced stealth, engine, avionics, and weapon system technologies make up a 5th-generation fighter. The active-duty USAF, US Navy, and the US Marine Corps all currently have operational units with different variants of the F-35. The USAF will initially have six combat units receiving the F-35, three for the active-duty, and three for the ANG by 2025. The active-duty USAF has combat units at Hill Air Force Base (AFB), Utah, and will soon have two additional units at Eielson AFB, Alaska and Lakenheath AFB, England. The ANG will also receive the F-35 fighter aircraft at three different locations, the 158th Fighter Wing (FW) in Burlington, Vermont (VT), the 115th FW in Madison, Wisconsin (WI), and the 187th FW in Montgomery, Alabama (AL).² Burlington, VT, received its first delivery of F-35 JSF aircraft in September 2019. The F-35 will replace the F-16 at all three bases, with each base receiving 20 aircraft.³

With this new emerging 5th-generation technology, the USAF will need 5th-generation airmen. Fifth-generation airmen will need to have the ability to fly, fight, and win in an ever-changing technological environment. Pilots, maintainers, logisticians, intelligence, and information technology specialists will need the technical expertise to be able to fly, fix, and process the information that the new technology will generate.⁴ Recruiting in all branches of service across the Department of Defense are facing significant challenges to fill vacant positions in today's recruiting environment. Recruiting in the ANG is competing with the other services for eligible recruits. The ANG units with the new 5th-generation weapons system

technology will need to recruit and retain the talent of 5th- generation airmen as a part-time force. Most importantly, this paper will look at how the ANG will need to recruit and retain the talent for the F-35 5th-generation weapons platform to meet effective manning strength, which it currently is not meeting, rather than end strength numbers for the more technically sophisticated 5th-generation fighter. The reason for effective manning versus end strength manning is because effective manning puts an individual in each position vacancy at a unit. End strength is the total number of individuals a wing needs to perform the mission. For example, if a wing has a 1000 (1K) positions on the manning document and they have a 1K people assigned to the wing, then they are 100% manned.

In 2018, the Director of the Air National Guard (DANG), Lieutenant General (Lt Gen) Scott Rice, published guidance stating his priorities and lines of effort for Fiscal Year 2019. Lt Gen Rice pointed out that end-strength and effective manning will underpin ANG readiness. To meet today's and future challenges, the ANG has to meet its end-strength goals. Effectively manning units is crucial, and it enables units to be ready with properly trained, and equipped personnel to deploy and meet the needs of America's national defense. The ANG will need to meet the goals for effective manning to be able to accomplish this.⁵

The ANG end strength manning goals as a total service have exceeded their overall recruiting and retention goals for the past few years. In Fiscal Year (FY) 2020, the ANG increased its total authorized end strength manning numbers to 107,700 members from 107,100 the year before.⁶ ANG recruiting services were able to exceed their end strength recruiting and retention goals for FY 2019 by having a total force of 107,197. During the same year, the total force end strength for the US Air Force to include the ANG, and the Air Force Reserve, surpassed the goal by five hundred personnel to have a total force of 506,200 members.⁷ The end

strength numbers from FY 2018 also showed a positive increase with the ANG exceeding their numbers in recruiting with a goal of 106,600.⁸ End strength is vital because it gives direction for what the overall budget will be for staffing and personnel for each year. Congress then authorizes a yearly budget for the FY based on the manning requirements that each service is allowed. The ANG is mandated to meet its end strength goals each year, or the service could risk losing its authorized manning numbers for the next FY.⁹ The ANG has met its end-strength goals for the majority of the last fifteen years.¹⁰ Even though the ANG is meeting its end strength goals, they are failing to meet their effective manning goals, which leaves hard to fill technical STEM type jobs vacant. The ANG will need to focus on effective manning goals and fill all their vacant positions to include the hard to fill STEM jobs.

Lt Gen Rice's challenge is to meet end-strength goals for the 107,700 ANG members in more than 90 air wings and 175 geographically separated units (GSU) in FY 20. A GSU is an air facility that is not physically located on an airbase. The DANG's responsibilities cover locations in 50 states, the District of Columbia, Puerto Rico, Guam, and the US Virgin Islands. Lt Gen Rice aligns his priorities with the challenges of recruiting and retaining the talent needed to produce a 21st Century ANG. His priorities are accomplishing the missions, taking care of the airmen, and building a force for the future. Taking care of the airmen is ensuring each member is ready, trained, and properly equipped to deploy or perform their mission. The ANG needs to be a part of the total force, which means working alongside the active-duty to be an equal contributing force. One of Lt Gen Rice's most significant challenges in the ANG is talent management. The ANG performs duty one weekend a month and two weeks a year for a total of 39 days in a year. Seventy percent of the total ANG force is part-time, while the other 30% is a full-time force. The full-time force is tasked with the part-time force being ready by having

adequate training, being equipped, and always prepared to deploy.

At the same time, the propensity to serve from qualified military candidates across the US has been shrinking in recent years from high school and college-age youth. The data shows that a large portion of the youth are unable to serve because of law violations, medical issues, or the inability to pass the ASVAB, according to Lt Gen Rice.¹¹ Nationally, overall the figures show that the propensity to serve in the military has declined. In 2016, the ANG leadership published numbers showing that out of the approximate 21 million 17-21 year-olds that live in the US, only 4.4 million were qualified to serve in the US military. Out of the 4.4 million eligible, only 11% or 465,000 had the propensity to want to serve. Statistics also show that in 1995, 40% of the 17-24 year-olds had a parent who served. In 2015, the percentage dropped to 17%. The propensity to serve in today's youth is most closely associated with being familiar with someone who has served.¹² One of the assumptions that the reader may come to is, the USAF has been in a constant state of war since January 1991, and this may directly contribute to youth wanting to serve. The high school graduates that will graduate and join the service in 2020 were more than likely born in 2002. The new graduates and the millennials born in the 1990s have only known the USAF to be in a state of war since birth. These issues are all part of the factors that challenge ANG leadership and recruiting staff to man the force effectively in the vacant jobs. Effectively manning the technical STEM-related F-35 jobs in the ANG will be challenging and needs to be solved

One of the systemic problems the ANG bases face is manipulating overall manning numbers. An ANG base "manipulates the manning numbers" by double slotting easy to fill positions such as Security Forces, Logisticians, Services, and Administrative personnel to show the base is meeting their end strength manning requirements. These jobs require a lower Armed

Services Vocational Aptitude Battery (ASVAB) score than more technically related career fields such as maintenance, information technology, cybersecurity, and intelligence. The ASVAB breaks the test into four categories scoring from a 0 as the low to 100 as the best. The four categories are Administrative, General, Mechanical, and Electronic.¹³ High school graduates need to score a minimum of a 36 on the ASVAB to qualify to get into the US Air Force on the total Air Force Qualification Test (AFQT) score and at least the minimum score on the Administrative, General, Mechanical, and Electronic portion for a specific job.¹⁴ For example, to qualify for a Security Forces position, a recruit would need at least a 36 on the AFQT portion and a 33 in the General Field of the ASVAB. Other requirements, such as passing a drug screening, passing a medical physical, and not having significant offenses on an individual's criminal record are all qualifying factors to enter the ANG.¹⁵ When bases recruit to meet end-strength goals rather than recruiting to fill vacant positions to meet effective manning goals, than it has a ripple effect for limiting the number of Basic Military Training slots, promotion opportunities for airmen, and it potentially effects sending the same individuals on deployments. ANG bases need to fill vacant positions, rather than recruiting just to meet the numbers and double slotting easy to fill positions. The ANG is trying to emphasize the effective manning numbers and is conducting monthly meetings with Wing leadership across the ANG to address this issue.

The ANG will try to remedy their effective manning numbers through targeted recruiting and superior training.¹⁶ Targeted recruiting is one possible solution that is being attempted to fix the issue of filling hard to fill vacant positions. Effective manning numbers over the years typically have been around 85% for the ANG. Lt Gen Rice states, "That the goal for the ANG is to sustain an effective manning rate of at least 90%. It will be met by having strong leadership

and retention efforts and by having the right people in the right job with the right training. Effective manning translates into a more ready, lethal force.”¹⁷ The ANG’s effective manning for FY 2019 was 89.1%¹⁸ as compared to 83.63% in FY 2018.¹⁹ There is a difference in the two calculations; in FY 2018, the numbers did not include student flight members. A student flight member is a recruit who has sworn in and is assigned to a vacant position but has not finished the required basic training, technical school, and on the job training to fill a deployment position. In FY 2019, the effective manning calculation included 60% of the student flight members in the vacant positions. In FY 2020, all student flight members will be included in the calculation of the jobs they have been recruited.²⁰ These changes will give a more accurate reflection of the effective manning numbers in the ANG as a whole. The recruits historically have not been calculated in the effective manning numbers even though they are filling the position.

Another change that the ANG has made is increasing the recruiting budget. The ANG has added 3.8 million dollars to the recruiting and retention budget for FY 2020. This increase puts the total spending on recruiting during the budget year to be over 40 million dollars. A good portion of the budget will fund advertising campaigns across a wide array of media sources. Some of the funding will be used to encourage talent to join or remain in the ANG to work on future systems and capabilities such as 5th-generation weapon platforms, cyber, and multi-domain operations.²¹ Advertising dollars is only one of the potential solutions to be used in fixing the manning issues in the ANG, but advertising dollars alone will not fill the hard to fill STEM-related jobs.

Recruiting is the primary focus on filling the vacant positions in the ANG, but retaining the experienced force in the ANG is another factor to increase effective manning numbers. Overall retention numbers have declined in the past year in the ANG. The ANG Readiness

Center (ANGRC) at Andrews AFB sets a retention goal for the ANG at 90% for the FY. In FY 2019, the retention rate was 89.38%, which is a little below the overall goal.²² The retention rates are down from the FY 2018 rate of 93.34%.²³ Even though the ANG barely missed its goal by less than a percent, the retention rate dropped 4% from the previous year. The ANG will have to continue to improve the retention rate figures to the levels of FY 2018, above the ANG goal of 90%, and keep an experienced force for 5th-generation weapon systems like the F-35. The ANG will need to retain and fill the hard to fill positions to meet its effective manning goals and meet mission requirements.

The overall effective manning numbers within the maintenance groups can reflect the unit's ability to meet their deployment requirements. The USAF and the ANG uses the Air Expeditionary Force (AEF) construct, Unit Type Codes (UTC), and the AEF UTC Reporting Tool (ART). The AEF construct is the Air Force's tool to show the ability to generate and manage the forces and the battle rhythm for the expeditionary force requirements needed by each of the Global Combatant Commanders while maintaining the highest level of readiness. The bases managing their assigned UTC's and reporting their status in the ART system accomplish readiness levels. The UTC is a particular position on each base that will have an individual name and training readiness level attached to it. The UTC's will have numerous positions needed to be able to deploy the mission set that is required and set by higher headquarters. At an F-16 base, these UTC's require a certain number of fighter jets, equipment, and personnel that are needed to sustain a combat deployment. When the properly trained and ready to deploy individual is identified by leadership, then their name is attached to the UTC position. Several variables can affect an individual's ability to deploy, such as proper training, medical, and fitness status. A wing is required to fill each position on the UTC, or the wing will be flagged as not prepared to

deploy as a unit in the ART system, and a possible shortfall will be identified. The wing will input their UTC availability with specific information into the ART system, which then generates a report for Air Force leadership to determine which bases are ready to deploy when needed.²⁴

The positions all require a certain amount of skill level positions to perform the job identified by leadership during a time of crisis. When a wing has an issue with recruiting and retaining the positions to deploy, then the unit runs the risk of short falling the positions or not being able to deploy as a wing. F-16 bases in the ANG have a five to one deployment to dwell ratio. This ratio means for every month spent deployed, five months are spent back at the unit and not deployable unless it is an emergency. F-16 units usually deploy once every three years for three to four months.²⁵ In most cases, the deployments will require the same individuals to deploy repeatedly, especially in the maintenance group. The repeated deployments have affected retention rates of maintenance group personnel in the ANG. The fighter wings converting from F-16 to F-35 will more than likely have to deploy at a more frequent pace because of the unique increased capabilities the F-35 performs. The deployment tempos will require the units to come up with a solution to be able to recruit and retain more effectively and try to develop their own “out of the box” solutions to increase recruiting within their units.

The transition to F-35 will require major changes in learning the new technology and components of the F-35, which will require all new and experienced maintainers to go through almost a year of school and training. New facilities, new support equipment, and technical expertise will be required by each base to make the transition. The transition, which starts about three years before receiving the F-35, will require the bases to send 465 maintenance personnel, 82 pilots, intelligence, and operations personnel, 36 information technology airmen, 72 logistics troops, and six security personnel to be retrained for their specific system and capability of the F-

35. The training is staggered over three years for base personnel. There are specialties that the new fighter requires that the bases do not have.²⁶ One of the new positions for the ANG and the F-35 is the targeteer. Targeteer school is one of the longest schools in the ANG. The training for a targeteer will take almost a year and a half to become fully mission capable. The accession will need to be a combination of new troops and trying to get troops from the active-duty force to transition to the ANG. The targeteer is responsible for helping the pilots identify and destroy their targets effectively using the Electro-Optical Targeting System (EOTS) technology. They will be required to go to four different bases to learn this specialized training. Going to four different bases and taking a year and a half to be fully trained up to be capable of performing the job sometimes is not very attractive to a young ANG recruit because they will be away from home and school. Before looking at other potential solutions to increase effective manning across the ANG overall, it is important to understand the capabilities of the F-35 and what makes it unique from 4th-generation fighters. The F-35 is more technical than the F-16 and requires more technically skilled airmen to work on the systems.

The F-35 JSF is an advanced 5th-generation fighter jet with a wide array of modern capabilities. The F-35 will replace the F-15, F-16, and A-10 aircraft eventually over about 20 years with the bases all receiving F-35. The F-35 will require a well-trained, highly technical, and skilled workforce to maintain and sustain the weapon system. The F-35 is highly automated and is the most advanced fighter jet in the world. The F-35 will combine advanced stealth capabilities while maintaining fighter aircraft speed and agility, an integrated avionics package, fused sensor information with intelligence, surveillance, and reconnaissance systems, an electronic warfare suite, and advanced logistics support, which makes it the most powerful fighter aircraft in the history of aviation.²⁷

The stealth capabilities of the F-35 makes the jet a low observable platform. To be low observable requires the jet to have a small radar cross-section signature visible by radar and allows the aircraft to have greater access and survivability in an anti-access/area-denial environment. The F-35 can evade radar, infrared, and emission detection. Aircraft maintainers will have to be able to work with the special composite materials that make up the skin of the aircraft that make it low observable. The airmen will also work with the electronic warfare suites, which make up a portion of the stealth capabilities that are more advanced than the 4th-generation fighters of today. The electronic warfare capabilities make the F-35 a unique weapon system. The complexity of the F-35 will require more STEM type personnel to maintain the system than the F-16.

The electronic warfare system of the F-35 enables the pilot the capability to fly deep into well-defended enemy territory, undetected, and to attack and suppress enemy air defenses such as surface to air missile systems, aircraft, and enemy early warning radar. The jet has a 360-degree situational awareness suite, which can produce false targets, jam radio frequencies, disrupt enemy attacks, conduct network attacks, and provide self-protection. The current 4th-generation weapon systems that the US military uses would take multiple platforms to do the same job.²⁸ The 5th-generation airmen that it will take to maintain the avionics and jamming systems will have to be highly technical and score a 70 in the electronics portion of the ASVAB. A 70 is a very high score on the ASVAB test, precisely measuring an applicant's ability in Arithmetic Reasoning, Mathematics Knowledge, Electronics Information, and General Science.²⁹ The ASVAB scores are more obtainable in states like VT and WI than in the state of AL. The quality of the education system is better in the northern states, but the propensity to serve in the military is greater in AL than VT. During academic testing in 2018, the National

Assessment of Education Progress, which is the “nations report card,” VT students scored 8th nationally, WI scored 19th, and AL scored 47th.³⁰ The high school students want to serve in AL but have a more difficult time passing the ASVAB test with a 36, let alone score a 70 to qualify for most technical positions required for the F-35, such as the personnel needed for the communication and interoperability systems.

The interoperability and communication suite of the F-35 gives the pilot the ability to share a common operating picture and battlespace with other aircraft, forces at sea, and troops on the ground, even if the forces do not possess 5th-generation technology. The F-35 is the first fighter to be able to receive satellite communication and share instantaneous data it collects to commanders on the ground, at sea, or in the air of the battlefield. Intelligence, maintainers, pilots, and information technology airmen will process, exploit, and disseminate the information that the fighter jet sensors gather and then passes the information on to the necessary forces that need it. These positions all require more highly skilled and capable 5th-generation airmen to do the job than that of the F-16.

The EOTS is a system on the F-35 that is a one of a kind and unique capability. The current 4th-generation aircraft do not have this type of capability or technology. The EOTS provides F-35 pilots’ a precision air-to-air and air to surface targeting capability. Combined with an Active Electronically Scanned Array (AESA) radar package, operators can now engage a target at a longer range. The AESA radar is not typically seen on 4th-generation fighter jets, and this capability gives the pilot a high energy, non-mechanical radar system that interacts with the other aircraft sensors to target enemy forces and systems effectively.³¹ These highly technical, one of a kind, systems require 5th-generation airmen with high ASVAB scores. The intelligence and targeting enlisted airmen that are needed to support these systems will have to have a

minimum score of 64 on the administrative section and a 66 on the general part of the ASVAB. The bombs and missiles that the aircraft use will require the maintenance troops to have a 60 on the mechanical and a 60 on the general portion of the ASVAB and not be colorblind. The F-35 will require 15 more intelligence personnel and will require more individuals to work the electrical and electronic warfare components than the F-16. The scores are not different for the F-35 over the F-16 in these particular examples, but changes to recruiting and retention need to be addressed to recruit to these positions because of the increase in total personnel.

One of the greatest challenges for the first three ANG units receiving the F-35, Burlington, VT, Madison, WI, and Montgomery, AL, is the recruiting and retention of 5th-generation airmen to maintain and operate this state of the art weapon system. VT and AL are struggling to meet both the overall and effective manning goals. WI is meeting their overall manning but are just short of meeting their effective manning goal of 90% set by ANG. All three of these bases have operated the F-16 fighter jet for over twenty years. They have successfully deployed in combat in Iraq, Syria, and Afghanistan and the defense of the US skies supporting Operation Noble Eagle. These units have also helped with Theater Security Packages in both the Pacific and European Theaters and supported foreign allied partners in the State Partnership Program. The three units will convert from the less modern F-16 fighter to the F-35. For the reader to have a better understanding of the recruiting and retention issues in the three ANG units receiving the F-35, the reader needs to understand the strength and effective manning numbers at each base.

The current ANG base trying to fill its vacancies in supporting F-35 operations is Burlington, VT. At the end of FY 2019, the 158th FW in Burlington had 1137 total positions on the base.³² The number of jobs is an increase of 13 total positions for FY 2017 when Burlington

was assigned the F-16 fighter jet. The end strength manning numbers in FY 2017 was 87.6%, and the effective manning was 78.7%. One hundred and one positions were double-slotted at the base leaving 240 positions vacant overall.³³ In comparison, in FY 2019, the end strength manning numbers were 85.6, and the effective manning was 76.5%, with a total of 308 position vacancies. The negative trend for receiving such a state of the art fighter jet is alarming in VT and recruiting, and retention issues will need to be addressed.³⁴ The VT population has more ASVAB qualifiers, but the population has less propensity to want to serve in the armed services than Alabama citizens. Vermont has increased its collegiate incentives, which is discussed later in the paper to try to help fix recruiting and retention issues.

In Madison, WI, which will not begin to convert to the F-35 until FY 2022, their numbers in FY 2017 were 99.7% on meeting end strength. The effective manning numbers were 85.5%, with 203 vacant positions.³⁵ At the end of FY 2019, the end strength was over 101%, and effective manning was at 89.5%. There is more of a propensity to serve in WI than VT, and WI recruits have an easier time qualifying for the ASVAB than their AL counterparts. The numbers indicate a more positive trend in Wisconsin, but still, there is a need to reform recruiting and retention to fully man their vacant positions.³⁶

Montgomery, AL's FY 2017 numbers for end strength were at 90.1%, and the effective manning was at 79.7%, with 298 vacant positions.³⁷ In FY 2019, the end strength numbers and effective manning numbers increased to 94.6% and 85%.³⁸ The difference in effective and overall manning numbers at the 187th FW in AL had an increase from FY 2017 to FY 2019. The overall manning numbers in AL increased by 4.5%, and effective manning increased by 5.3% in two years. The increase in the numbers for AL is significant and is directly related to the recruiting and retention reforms initiated by the AL ANG. The reforms are helping to turn the

manning numbers in AL in a positive direction, but more still needs to be done. There is still a problem in filling the STEM-related positions in AL, especially in the maintenance career fields.

In looking at specific maintenance organizations within Alabama's 187th FW, the effective manning numbers are significantly lower than other career fields. There are four parts of a maintenance group; they are maintenance squadron, aircraft maintenance squadron, maintenance operations flight, and maintenance group staff. An F-16 maintenance squadron consists of sheet metal and structures technology, hydraulics, fuel systems, electrical and environmental shop, non-destructive inspections, engine shop, aerospace ground equipment, avionics back shop, egress, and munitions flight. Overall, 256 enlisted and officer personnel are assigned to the maintenance squadron but only had 171 personnel filling the vacant positions in FY 2017, giving 66.8% effective manning. The aircraft maintenance squadron consists of crew chiefs, flight line avionics, and weapons shop, and overall, 228 enlisted and officer personnel are assigned to the aircraft maintenance squadron. 158 personnel filled the vacant positions in the aircraft maintenance squadron in FY 2017, giving a 69% effective manning rate. The maintenance operations flight is primarily plans, scheduling, and documentation personnel. They provide technical orders and maintenance records on the jets and have 22 assigned positions with 19 filling the jobs. The flight has an effective manning rate of 86%. Finally, the maintenance group staff has 26 positions, and 21 personnel assigned for a rate of 80.8%. The overall numbers for the 187th Maintenance Group is 532 assigned positions but only have 369 positions filled. The total effective manning rate for the group is 69.4% as of June 2017.³⁹ The effective manning numbers from the 187th Maintenance Group in FY 2017 was a very long way off from the 90% that Lt. Gen Rice described as the goal during his interview in December of 2018. One of the primary reasons for not meeting effective manning is that the people of Alabama have the

propensity to serve but have a difficult time passing the ASVAB, let alone qualifying for F-35 related positions.

This section of the paper will discuss some initiatives that are currently being tried out by the ANG leadership of AL, as well as some new ideas that all three ANG units can initiate to try to improve recruiting and retention within their state. The recruiting and retention initiatives should be improved upon to recruit and retain airmen in the ANG. These initiatives are Science, Technology, Engineering, and Math (STEM) opportunities at the bases, schools, and administrators, new marketing campaigns aimed at the high school and college-aged students, and incentives to recruit and retain hard to fill technical-related positions.

In AL, the 187th FW leadership has tried to invent a brand, conducted fly-bys at nationally televised events, started a Red Tail Ambassador Program for recruiting, worked with state government officials to increase state tuition assistance to Guardsman, and hosted a STEM Day at the fighter wing for students to visit. These efforts were initiated within the past three years, and the AL ANG's numbers are trending in a positive direction in recruiting. However, the wing is still short of its recruiting goals. The ANG F-35 units will need to find ways to attract and recruit these individuals into their units to meet the effective manning goals and have individuals trained and ready to deploy and meet the nation's call.

Recruiting strategies that all three units will need to focus on is the ability to recruit both non-prior service and prior service candidates, especially in the hard to fill positions. Recruiting prior service from the active-duty will take a much more targeted approach. One of the best ways to target the prior service is to attend the Transition Assistance Program (TAP) briefs that all active-duty members are required to attend around six months before leaving active service. Recruiting at TAP briefs is currently an untapped resource, at least at the AL ANG. Most active-

duty members do not know the full benefit to be able to continue to serve in the ANG and to have the opportunity to continue their career on a part-time basis. Attending the briefs would give the ANG units the chance to meet and build a relationship with members who have the experience and expertise in their field. It could be giving them an opportunity in a new career field, which they already have an interest in. The ANG has better flexibility for members to choose a vacant position they desire, and it is easier to cross-train than the active service in most cases. The F-35 units could specifically target their unit vacancies at these events, which are held at least monthly on most bases.

One of the focuses that the ANG can help their air wings is in the field of STEM. Most high schools have a career technical program, and some schools are getting into STEM specific programs. In the state of AL, STEM and technical programs are offered in both the most affluent and lower-income school districts. The ANG can be more involved in these programs and school districts by building a relationship with the directors and staff of the programs. Having ANG leadership involved with the school superintendent and principal conferences and meetings, host STEM days at the bases, and perform classroom presentations are a few ideas that can help build a better relationship and partnership between the communities and the military. The AL ANG leadership in the summer of 2018 decided to get more involved in relationship building with the school systems. A team of recruiters and leadership from the state attended a superintendent conference where the majority of school superintendents from AL attended. The recruiters hosted a booth and spoke with the superintendents at meals, icebreakers, and during breaks. Information and flyers were provided to them, describing all the benefits and opportunities that the ANG had to offer. A brochure to help promote an AL ANG STEM day was also provided to each attendee of the conference. STEM days were attempted before, but

this one was thoughtfully planned out months in advance. Typically, a few hundred students would attend a STEM Day that was hosted in the past. The recruiters and leadership across the state worked to promote the STEM Day both before school let out for summer recess and followed up upon the schools returning in early August.

The AL ANG booked and planned food vendors, an air show, vintage, and current fighter aircraft displays to include the F-22 and F-35, jump teams, and interactive STEM displays. The planning for the STEM day took several months, and on the second Friday in September, the STEM day took place. The results for the AL ANG exceeded their expectations. Over 4700 students from over 60 different schools from across the state visited the 187th FW in Montgomery in one day.⁴⁰ The ability to promote the STEM Day at the superintendent conference had an impact on the results. Other military units can use the experience from the AL ANG to bring students, provide opportunities and information, and brand their units by using this model. The recruiters did receive several leads and brought new interest from freshman to seniors in what benefits the AL ANG had to offer.

High schools typically host school career days or bring speakers in to talk to their classes during the school year. The ANG can help build relationships through the schools and volunteer to bring uniformed members to speak to students and classes. Getting access to schools is easier in AL than in states like VT because of the civilian and military relationships in AL communities. Air National Guardsman lives in just about every community in the state. These members can build relationships in the schools and volunteer to talk to a class through a presentation or to set up a booth in a lunchroom, cafeteria, or social meeting place where the students congregate. The presentations or conversations should focus on the member's individual military experiences and the benefits that the ANG has to offer. A member that has

been out of that school for a few years would have a direct impact because the students and faculty more than likely would be familiar with the member. This effort directly plays into the next program, which is known as the recruiting ambassador program.

Every military unit, air wing, and organization should have a recruiting ambassador program. This program engages with the communities around the state to foster building relationships with local government, school districts, and manufacturing to show the benefits of what the ANG has to offer. Every enlisted and officer leader within the wing needs to support and be involved in the program for it to be successful. ANG volunteers are provided messaging training to speak to schools and businesses in their communities. Posters and handouts can be displayed in local businesses and schools on the ANG benefits. Leaders within the wings should speak at the chamber of commerce, government meetings, and other organizational clubs to bring awareness of the ANG in their state. Members should invite schools, groups, and businesses to come out for tours of the base. Usually, a base tour is coordinated and takes about half of a day to show the attendees the primary focus areas of the base, such as maintenance, support, and operations. These efforts do not take a lot of resources or time if the ANG units try to get all members involved in their communities. The program can bring a better awareness of what the unit provides for the nation and state, and the benefits it offers to the members that chose to serve in the ANG.

A useful recruiting tool for ANG units to utilize is marketing and branding. Marketing and branding go together because of the multiple platforms social media offer. Each unit needs to capitalize on the marketing strategy to reach and communicate recruits to the maximum extent. The 187th FW with in the past few years updated and added Facebook, Instagram, and YouTube accounts to be able to market and recruit. The branding of the 187th is the heritage of

being a “Red Tail” Tuskegee Airmen unit during World War II. Four F-16 fighter jets have tails painted red to signify the Red Tail heritage that the Tuskegee Airmen used during World War II. Being a Red Tail is an effective way to let the public identify with the Alabama ANG. The wing will perform several flyovers at ceremonies and nationally televised events using the Red Tail jets. Each press release always identifies the unit as the 187th FW “Red Tails.” During a flyover at the 2017 Iron Bowl, a college football game between Auburn University and the University of AL, the 187th FW did a two-minute promotion video about the flyover. The video was released the night following the game. After a week, the video had over 300K views and shared almost 5K times on YouTube and Facebook on the 187th FW Facebook page alone.⁴¹ The time and effort put forth in this marketing campaign brought positive results for the unit.

One of the essential tools that help both recruiting and retention of 5th-generation airmen are incentives. The ANG offers incentives such as the Montgomery GI Bill for Selected Reserve, GI Bill Kicker, and recruiting and retention bonuses. Individual states have their tuition assistance at state schools and universities. The Montgomery GI Bill for Selected Reserves offers up to \$384 a month for up to 36 months.⁴² The GI Bill Kicker pays new enlistees an additional \$350 a month for selected career fields. The recruiting and retention bonus pays selected career fields up to \$20K for a six-year commitment. These bonuses are paid in year three and year five at \$10K increments.⁴³ The Kicker bonus and the recruiting and retention bonus applies to hard to fill maintenance, information technology, and intelligence career fields. WI, AL, and VT are all now 100% tuition assistance states for members of the ANG. The members can go to any state school and have their tuition waived. WI was the first state to incorporate this incentive.⁴⁴ AL worked with state legislators and increased their tuition assistance from \$2K a year to full tuition at state schools in 2017, which is up to \$10,300 a

year.⁴⁵ VT has been at 100% tuition assistance since January 2019. VT students received \$3K to \$5K a year before that, based on state funding.⁴⁶ The recruiters and members of the units can use the numbers as a marketing tool based on the incentives the ANG has to offer. They could recruit eligible high school and college students offering free college tuition, as well as an additional \$1K a month for GI Bill, GI Bill kicker, and a drill check to pay living expenses for working 39 days a year. Also, a \$20K bonus for each recruit paid at year three and five. A recruit can receive all of this for going into selected career fields, which are hard to fill maintenance jobs needed for the F-35. The incentives are not new but are a compelling sales pitch for the ANG to use as a marketing tool, whether it is on social media, advertising mediums, or potential meeting recruits in person.

The ANG is competing with the civilian sector to retain both full and part-time airmen and not fully lose them to higher-paying civilian sector jobs so that they can keep an experienced force. When the individuals are trained and become proficient in their job, at the end of their first six-year service commitment, some of the airmen get recruited to work similar jobs in the civilian sector. Losing part-time and full-time airmen to the civilian sector is a current retention issue within the ANG. The part-time airmen find it difficult to fulfill their military commitment while continuing to serve. The Intelligence Community civilian jobs are more attractive and make more money than their AGR Staff Sergeant (E-5) counterparts working similar jobs in the military. An idea for retaining drill status members is offering quarterly drills. Quarterly drills can be offered to experienced individuals who travel from a long way around the country to continue to serve. The members would come in to drill once a quarter and perform six days in a row, which would count for three months of drills. Quarterly drill helps part-time airmen who have to travel several hundred miles by driving or flying in. Some members of the intelligence

light at the 187th FW travel in from Seattle, Fort Worth, Fort Bragg, and Tucson. The intelligence flight only has 14 members currently, and more than 25% travel to drill. Most drill status airmen work Monday through Friday, travel Friday evening, drill Saturday and Sunday, travel home Sunday evening, and then go back to work Monday through Friday. After a few years, this schedule is hard to maintain while keeping a healthy balance in their life. Offering quarterly drills is an excellent solution to help alleviate the pressure and stress, and support both the member and the unit to retain the experienced help needed to fill the critical positions.

The US military continues to upgrade its technology to stay competitive with the new threats and potential future fight that peer competitors continue to pose. The joint force has been participating to ensure the defense of the US. This effort will remain in the near future. The ANG continues to grow in size and seems to have a smaller pool of recruits to select that can qualify for the specific jobs the ANG needs. The states of AL, VT, and WI are the first three states to receive the F-35 fighter with other F-16 units to follow in the coming years. The three states will need to recruit and retain the talent of the 5th-generation airmen required to maintain and sustain the F-35 as a part-time force. The future F-35 units will have to meet their effective manning numbers to effectively deploy and maintain the operations tempo in critically manned career fields. The recruiting and retention managers of these units will need to use some new recruiting ideas and change their recruiting strategy to continue to fill and increase the numbers in the hard to fill critical career fields. These strategies can be implemented, and AL's 187th FW has proven some of these techniques can work. Recruiting in all branches of service across the Department of Defense are facing significant challenges to fill vacant positions in today's recruiting environment. Recruiting in the ANG is competing with other services for eligible recruits. The ANG should put a better focus on effective manning rather than end strength, and

provide the resources needed to the units for recruiting and retention efforts. With these strategies, the ANG's recruiting and retention efforts will be successful. The 5th-generation airmen needed for the 5th-generation weapons systems will be in place in the near future for the nation's defense.

END NOTES

¹ Lockheed Martin, “*F-35 capabilities, Multi-Mission Capability for Emerging Global Threats*,” accessed December 27, 2019, <https://www.f35.com/about/capabilities>.

² “*AF selects locations for next two Air National Guard F-35 bases*,” published December 21, 2017, <https://www.af.mil/News/Article-Display/Article/1402425/af-selects-locations-for-next-two-air-national-guard-f-35-bases/>.

³ Wilson Ring, “*First F-35 fighter jets assigned to Air National Guard arrive in Vermont*,” Associated Press, published September 19, 2019, <https://www.airforcetimes.com/news/your-air-force/2019/09/19/first-f-35-fighter-jets-assigned-to-air-national-guard-arrive-in-vermont/>.

⁴ Lockheed Martin, “*F-35 capabilities, Multi-Mission Capability for Emerging Global Threats*,” accessed December 27, 2019, <https://www.f35.com/about/capabilities>.

⁵ Air National Guard, “*Air National Guard Readiness Center 2019 Strategic Plan*,” October 2018, pg. 14,

https://www.ang.af.mil/Portals/77/documents/ANGRC%20Strat%20Plan/2018_Fall_Strategic%20Plan_Web%20Version.pdf?ver=2018-10-10-160858-667.

⁶ Erin Duffin, “*Number of National Guard members in the United States from 1995-2020*,” Statista, April 29, 2019, <https://www.statista.com/statistics/207392/national-guard-members-in-the-usa/>.

⁷ Stephen Losey, “*Air Force beats recruiting goals in 2019*,” Air Force Times, October 9, 2019, <https://www.airforcetimes.com/news/your-air-force/2019/10/09/air-force-breaks-recruiting-record-in-2019-again/>.

⁸ Stephen Losey, “*Air Force hits more modest recruiting goal in 2018*,” Air Force Times, Oct 11, 2018, <https://www.airforcetimes.com/news/your-air-force/2018/10/11/air-force-hits-more-modest-recruiting-goal-in-2018/>.

⁹ Rand Corporation, “*DOPMA/ROPMA Policy Reference Tool, Authorized Strength*,” accessed December 30, 2019, <http://dopma-ropma.rand.org/authorized-strength.html>.

¹⁰ Airman Magazine, “*21st Century Air National Guard: ANG, Director empowers the force to sharpen its lethality to a razor’s edge*,” December 17, 2018, <https://airman.dodlive.mil/2018/12/17/21st-century-air-national-guard/>.

¹¹ IBID

¹² IBID

¹³ Military.com, “*ASVAB Scores and Air Force Jobs*,” accessed December 31, 2019, <https://www.military.com/join-armed-forces/asvab/asvab-and-air-force-jobs.html>.

¹⁴ Rod Powers, “*Minimum Required ASVAB Scores for Military Branches: The Air Force, Army, Coast Guard, Marines, and Navy all vary*,” The Balance, updated May 20, 2019, <https://www.thebalancecareers.com/minimum-required-asvab-scores-and-education-level-3332646>.

¹⁵ Military.com, “*ASVAB Scores and Air Force Jobs*,” accessed December 31, 2019, <https://www.military.com/join-armed-forces/asvab/asvab-and-air-force-jobs.html>.

¹⁶ Air National Guard, “*Air National Guard Readiness Center 2019 Strategic Plan*,” October 2018, pg. 10,

https://www.ang.af.mil/Portals/77/documents/ANGRC%20Strat%20Plan/2018_Fall_Strategic%20Plan_Web%20Version.pdf?ver=2018-10-10-160858-667.

- ¹⁷ Airman Magazine, “21st Century Air National Guard: ANG, Director empowers the force to sharpen its lethality to a razor’s edge,” December 17, 2018, <https://airman.dodlive.mil/2018/12/17/21st-century-air-national-guard/>.
- ¹⁸ National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.
- ¹⁹ National Guard Bureau A1, *End Strength/Effective Manning FY 2018*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2018), PowerPoint presentation.
- ²⁰ National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.
- ²¹ National Guard Bureau Office of Legislative Liaison. *FY 2020 President’s Budget Request*. (Arlington, VA: National Guard Bureau, 2019), pg. 7, <https://www.nationalguard.mil/Portals/31/Documents/PersonalStaff/LegislativeLiaison/FY20/NGB-LL%20FY20%20President's%20Budget%20Summary.pdf>.
- ²² Air National Guard Readiness Center. *FY 2019 Air National Guard Retention Rates*. (Andrews Air Force Base, Maryland: A1 Staff, Oct 2019.)
- ²³ Air National Guard Readiness Center. *FY 2018 Air National Guard Retention Rates*. (Andrews Air Force Base, Maryland: A1 Staff, Oct 2018.)
- ²⁴ Secretary of the Air Force, Reporting Status of Air and Space Expeditionary Forces, Air Force Instruction 10-244, Air National Guard Supplement, November 19, 2013, pg. 4. https://static.e-publishing.af.mil/production/1/ang/publication/afi10-244_angsup_i/afi10-244_angsup_i.pdf.
- ²⁵ Brig Gen Michael Taheri, ANG Commander Fly In (ANGRC, Andrews AFB, VA, November 2, 2016), PowerPoint presentation
- ²⁶ Air National Guard Readiness Center. *F-35 OPS/MX Planning Guide*. (Andrews Air Force Base, Maryland: A1 Staff, Oct 2017.)
- ²⁷ Lockheed Martin, “F-35 capabilities, Multi-Mission Capability for Emerging Global Threats,” accessed December 27, 2019, <https://www.f35.com/about/capabilities>.
- ²⁸ IBID
- ²⁹ Military.com, “ASVAB Scores and Air Force Jobs,” accessed December 31, 2019, <https://www.military.com/join-armed-forces/asvab/asvab-and-air-force-jobs.html>.
- ³⁰ Stan Liebowitz and Matthew L. Kelly, “Fixing the Bias in Current State K-12 Education Rankings,” CATO Institute, November 13, 2018, https://www.cato.org/publications/policy-analysis/fixing-bias-current-state-k-12-education-rankings?gclid=CjwKCAiAzJLzBRAZEiwAmZb0airk4L6Bo7t_zWtZ9UxKRrPM5TCzvNg11TkQPpT486h1DaXP_BE41xoCEjUQAvD_BwE
- ³¹ Lockheed Martin, “F-35 capabilities, Multi-Mission Capability for Emerging Global Threats,” accessed December 27, 2019, <https://www.f35.com/about/capabilities>.
- ³² National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.
- ³³ National Guard Bureau A1, *End Strength/Effective Manning FY 2017*, (Air National Guard Readiness Center, Andrews AFB, MD, August 31, 2017), PowerPoint presentation.
- ³⁴ National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.
- ³⁵ National Guard Bureau A1, *End Strength/Effective Manning FY 2017*, (Air National Guard

Readiness Center, Andrews AFB, MD, August 31, 2017), PowerPoint presentation.

³⁶National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.

³⁷National Guard Bureau A1, *End Strength/Effective Manning FY 2017*, (Air National Guard Readiness Center, Andrews AFB, MD, August 31, 2017), PowerPoint presentation.

³⁸National Guard Bureau A1, *End Strength/Effective Manning FY 2017*, (Air National Guard Readiness Center, Andrews AFB, MD, August 31, 2017), PowerPoint presentation.

³⁹187th Fighter Wing Manning (June 21, 2017), unpublished report received as an email attachment from Master Sergeant Patrick Fitzgerald, Microsoft Excel file.

⁴⁰Col. Robert Bell, Director of Staff, Alabama Air National Guard to Brig. Gen Steven Nordhaus, Commander Air National Guard Readiness Center, Bullet Background Paper, September 25, 2018,

⁴¹187th Fighter Wing Facebook page, “Auburn Alum leads Iron Bowl flyover,” video, November 26, 2017,

<https://www.facebook.com/187thFighterWing/videos/vb.116599751869323/712859045576721/?type=2&theater>

⁴²Veterans Affairs, “Montgomery GI Bill Select,” accessed January 14, 2020,

<https://www.va.gov/education/about-gi-bill-benefits/montgomery-selected-reserve/>.

⁴³Department of the Army, “My Army Benefits,” accessed January 14, 2020,

<https://myarmybenefits.us.army.mil/Benefit-Library/State/Territory-Benefits/Alabama>.

⁴⁴Military Tuition Assistance Information, “Wisconsin National Guard Tuition Grant Program,” accessed January 14, 2020, <http://www.militaryta.com/benefits/wisconsin-national-guard-tuition-grant-program.shtml>.

⁴⁵Department of the Army, “My Army Benefits,” accessed January 14, 2020,

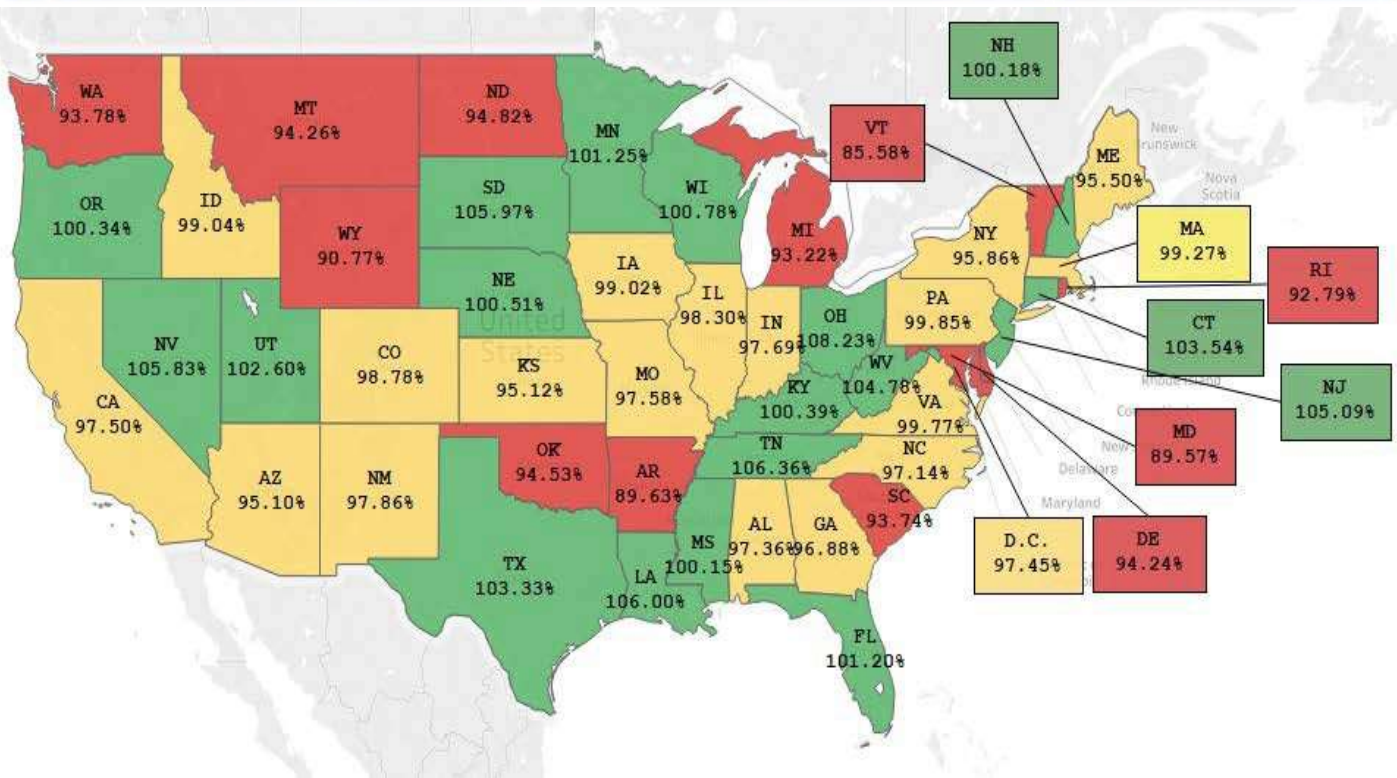
<https://myarmybenefits.us.army.mil/Benefit-Library/State/Territory-Benefits/Alabama>.

⁴⁶Vermont Biz, “Vermont National Guard Tuition Program Benefit,” accessed January 14, 2020,

<https://vermontbiz.com/news/2018/september/01/vermont-national-guard-tuition-benefit-program>.



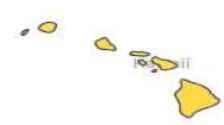
PERSONNEL – End Strength By State October Edition As of 30 September 2019



AK 87.72%

HI 96.76%

VI 76.71%



PR 70.55%

GU 112.90%



ANG ES 98.05%

> = 100.00% **99.99% - 95.00%** **< = 94.99%**



PERSONNEL – End Strength and Adjusted Vacancy Fill Rate (VFR) By State October Edition As of 30 September 2019

State	Wing	Authorized	Assigned	Strength %	MLPDS Vacancies	ADJ VFR	STU FLT	Excess
AK	176 WGH WG	1606	1425	88.73%	320	80.78%	19	124
AK	168 WGH WG	828	710	85.75%	171	79.86%	7	49
AL	187 FTR WG	1490	1409	94.56%	331	84.99%	179	74
AL	117 ARF WG	976	992	101.64%	159	89.55%	95	83
AR	189 ALF WG	1121	1006	89.74%	233	82.75%	66	55
AR	188 WGH WG	1001	896	89.51%	259	81.98%	131	26
AZ	161 ARF WG	835	836	100.12%	109	88.60%	23	90
AZ	162 WGH WG	1817	1686	92.79%	347	84.14%	98	121
CA	195 WGH WG	784	730	93.11%	225	78.95%	100	73
CA	144 FTR WG	1121	1129	100.71%	223	84.98%	91	144
CA	129 RSQ WG	1038	1020	98.27%	233	85.65%	140	78
CA	163 ATK WG	932	938	100.64%	181	87.27%	104	90
CA	146 ALF WG	1046	981	93.79%	225	84.57%	106	65
CO	140 WGH WG	1639	1619	98.78%	329	85.09%	141	194
CT	103 ALF WG	1131	1171	103.54%	152	91.87%	100	95
DC	113 WGH WG	1334	1300	97.45%	291	82.77%	102	165
DE	166 ALF WG	1146	1080	94.24%	219	85.45%	87	69
FL	125 FTR WG	1999	2023	101.20%	322	88.27%	146	203

Currently, 60% of student flight members are being credited to the number of vacancies for the VFR calculation. For FY20, actual number of student flight members projected into valid vacancies will be used.

Legend		
End Strength Formula: Assigned/Authorized = %		
> = 100%	99.99 - 95.00	< = 94.99%
VFR: (Authorized-Vacancies)/Authorized		
> = 90%	80.00 - 89.99	< = 79.99%



PERSONNEL – End Strength and Adjusted Vacancy Fill Report (VFR) By Unit

October Edition As of 30 September 2019

State	Wing	Authorized	Assigned	Strength %	MLPDS Vacancies	ADJ VFR	STU FLT	Excess
SD	114 FTR WG	1055	1118	105.97%	101	96.85%	113	55
TN	118 WGH WG	1096	1136	103.65%	185	88.05%	90	138
TN	164 ALF WG	941	984	104.57%	148	91.16%	108	86
TN	134 ARF WG	1185	1307	110.30%	141	93.82%	113	155
TX	149 FTR WG	1110	1172	105.59%	152	89.98%	68	149
TX	136 ALF WG	1093	1160	106.13%	128	93.06%	87	127
TX	147 ATK WG	1010	988	97.82%	198	86.28%	99	80
UT	151 ARF WG	1422	1459	102.60%	187	90.90%	96	136
VA	192 WGH WG	1286	1283	99.77%	232	87.56%	120	120
VI	285 CEG SQ	73	56	76.71%	25	70.68%	6	4
VT	158 FTR WG	1137	973	85.58%	308	76.50%	68	79
WA	141 ARF WG	1005	945	94.03%	206	83.74%	71	79
WA	194 WGH WG	1102	1031	93.56%	193	84.61%	39	85
WI	115 FTR WG	1440	1457	101.18%	227	89.53%	127	120
WI	128 ARF WG	853	854	100.12%	112	92.08%	74	44
WV	130 ALF WG	1111	1116	100.45%	157	89.97%	76	89
WV	167 ALF WG	917	1009	110.03%	105	93.59%	77	123
WY	153 ALF WG	1354	1229	90.77%	293	82.75%	99	72

Currently, 60% of student flight members are being credited to the number of vacancies for the VFR calculation. For FY20, actual number of student flight members projected into valid vacancies will be used.

Legend		
End Strength Formula: $\text{Assigned/Authorized} = \%$		
> = 100%	99.99 - 95.00	< = 94.99%
VFR: $(\text{Authorized-Vacancies})/\text{Authorized}$		
> = 90%	80.00 - 89.99	< = 79.99%



PERSONNEL – End Strength and Effective Manning By Unit

October Edition As of 30 September 2018

State	Wing	Authorized	Assigned	Strength %	Excess	Effective Manning %	State	Wing	Authorized	Assigned	Strength %	Excess	Effective Manning %
AK	168 WGH WG	826	712	86.20%	81	76.39%	GA	165 ALF WG	1474	1386	94.03%	196	80.73%
AK	176 WGH WG	1581	1434	90.70%	230	76.15%	GA	116 ACN WG	1441	1435	99.58%	199	85.77%
AL	187 FTR WG	1484	1393	93.87%	230	78.37%	GU	254 ABS GP	308	389	126.30%	99	94.16%
AL	117 ARF WG	944	990	104.87%	176	86.23%	HI	154 WGH WG	2397	2274	94.87%	318	81.60%
AR	188 WGH WG	1000	911	91.10%	155	75.60%	IA	185 ARF WG	947	945	99.79%	153	83.63%
AR	189 ALF WG	1120	1007	89.91%	116	79.55%	IA	132 WGH WG	986	899	91.18%	125	78.50%
AZ	161 ARF WG	831	821	98.80%	94	87.48%	ID	124 FTR WG	1343	1376	102.46%	155	90.92%
AZ	162 WGH WG	1824	1644	90.13%	193	79.55%	IL	182 ALF WG	1284	1236	96.26%	183	82.01%
CA	163 ATK WG	932	931	99.89%	175	81.12%	IL	183 WGH WG	895	916	102.35%	153	85.25%
CA	129 RSQ WG	1009	1010	100.10%	194	80.87%	IL	126 ARF WG	818	842	102.93%	143	85.45%
CA	146 ALF WG	1035	941	90.92%	96	81.64%	IN	122 FTR WG	973	1007	103.49%	170	86.02%
CA	144 FTR WG	1119	1122	100.27%	178	84.36%	IN	181 ITL WG	968	922	95.25%	119	82.95%
CA	195 WGH WG	777	703	90.48%	131	73.62%	KS	184 ITL WG	1319	1163	88.17%	123	78.85%
CO	140 WGH WG	1637	1560	95.30%	238	80.76%	KS	190 ARF WG	972	951	97.84%	141	83.33%
CT	103 ALF WG	1129	1199	106.20%	225	86.27%	KY	123 ALF WG	1262	1269	100.55%	187	85.74%
DC	113 WGH WG	1315	1275	96.96%	213	80.76%	LA	159 FTR WG	1445	1550	107.27%	293	86.99%
DE	166 ALF WG	1132	1107	97.79%	154	84.19%	MA	104 FTR WG	1033	1087	105.23%	202	85.67%
FL	125 FTR WG	1996	2089	104.66%	358	86.72%	MA	102 ITL WG	1161	1145	98.62%	180	83.12%

Legend		
End Strength Formula: Assigned/Authorized = %		
> = 100%	99.99% - 95.00%	< = 94.99%
Effective Manning Formula: (Assigned-Excess)/Authorized = %		
> = 90%	89.99% - 80.00%	< = 79.99%



PERSONNEL – End Strength and Effective Manning By Unit

October Edition As of 30 September 2018

State	Wing	Authorized	Assigned	Strength %	Excess	Effective Manning %	State	Wing	Authorized	Assigned	Strength %	Excess	Effective Manning %
PR	156 ALF WG	1162	1106	95.18%	159	81.50%	VT	158 FTR WG	1129	955	84.59%	109	74.93%
RI	143 ALF WG	1122	1062	94.65%	160	80.39%	WA	194 WGH WG	1101	1057	96.00%	116	85.47%
SC	169 FTR WG	1331	1291	96.99%	123	87.75%	WA	141 ARF WG	1003	966	96.31%	126	83.75%
SD	114 FTR WG	1051	1119	106.47%	183	89.06%	WI	128 ARF WG	852	882	103.52%	130	88.26%
TN	134 ARF WG	1183	1300	109.89%	241	89.52%	WI	115 FTR WG	1431	1465	102.38%	223	86.79%
TN	164 ALF WG	939	966	102.88%	165	85.30%	WV	167 ALF WG	916	1025	111.90%	223	87.55%
TN	118 WGH WG	1093	1114	101.92%	165	86.83%	WV	130 ALF WG	1097	1125	102.55%	167	87.33%
TX	147 ATK WG	1005	981	97.61%	158	81.89%							
TX	136 ALF WG	1104	1110	100.54%	166	85.51%							
TX	149 FTR WG	1110	1164	104.86%	213	85.68%							
UT	151 ARF WG	1420	1451	102.18%	193	88.59%							
VA	192 WGH WG	1285	1248	97.12%	186	82.65%							
VI	285 CEG SQ	73	55	75.34%	6	67.12%							

Legend		
End Strength Formula: $\text{Assigned/Authorized} = \%$		
$\geq 100\%$	99.99% - 95.00%	$\leq 94.99\%$
Effective Manning Formula: $(\text{Assigned}-\text{Excess})/\text{Authorized} = \%$		
$\geq 90\%$	89.99% - 80.00%	$\leq 79.99\%$

BIBLIOGRAPHY

1. Lockheed Martin, “*F-35 capabilities, Multi-Mission Capability for Emerging Global Threats*,” accessed December 27, 2019, <https://www.f35.com/about/capabilities>.
2. “*AF selects locations for next two Air National Guard F-35 bases*,” published December 21, 2017, <https://www.af.mil/News/Article-Display/Article/1402425/af-selects-locations-for-next-two-air-national-guard-f-35-bases/>.
3. Wilson Ring, “*First F-35 fighter jets assigned to Air National Guard arrive in Vermont*,” Associated Press, published September 19, 2019, <https://www.airforcetimes.com/news/your-air-force/2019/09/19/first-f-35-fighter-jets-assigned-to-air-national-guard-arrive-in-vermont/>.
4. Military.com, “*ASVAB Scores and Air Force Jobs*,” accessed December 31, 2019, <https://www.military.com/join-armed-forces/asvab/asvab-and-air-force-jobs.html>.
5. Rod Powers, “*Minimum Required ASVAB Scores for Military Branches: The Air Force, Army, Coast Guard, Marines, and Navy all vary*,” The Balance, updated May 20, 2019, <https://www.thebalancecareers.com/minimum-required-asvab-scores-and-education-level-3332646>.
6. Air National Guard, “*Air National Guard Readiness Center 2019 Strategic Plan*,” October 2018 pgs 10-14, https://www.ang.af.mil/Portals/77/documents/ANGRC%20Strat%20Plan/2018_Fall_Strategic%20Plan_Web%20Version.pdf?ver=2018-10-10-160858-667.
7. Erin Duffin, “*Number of National Guard members in the United States from 1995-2020*,” Statista, April 29, 2019, <https://www.statista.com/statistics/207392/national-guard-members-in-the-usa/>.
8. Stephen Losey, “*Air Force beats recruiting goals in 2019*,” Air Force Times, October 9, 2019, <https://www.airforcetimes.com/news/your-air-force/2019/10/09/air-force-breaks-recruiting-record-in-2019-again/>.
9. Stephen Losey, “*Air Force hits more modest recruiting goal in 2018*,” Air Force Times, Oct 11, 2018, <https://www.airforcetimes.com/news/your-air-force/2018/10/11/air-force-hits-more-modest-recruiting-goal-in-2018/>.
10. Rand Corporation, “*Dopma/Ropma Policy Reference Tool, Authorized Strength*,” accessed December 30, 2019, <http://dopma-ropma.rand.org/authorized-strength.html>

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11. Airmen Magazine, “21st Century Air National Guard: ANG, Director empowers the force to sharpen its lethality to a razor’s edge,” December 17, 2018, <https://airmen.dodlive.mil/2018/12/17/21st-century-air-national-guard/>.
 12. National Guard Bureau A1, *End Strength/Effective Manning FY 2019*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2019), PowerPoint presentation.
 13. National Guard Bureau A1, *End Strength/Effective Manning FY 2018*, (Air National Guard Readiness Center, Andrews AFB, MD, September 30, 2018), PowerPoint presentation.
 14. National Guard Bureau Office of Legislative Liaison. *FY 2020 President’s Budget Request*. Arlington, VA: National Guard Bureau, 2019. <https://www.nationalguard.mil/Portals/31/Documents/PersonalStaff/LegislativeLiaison/FY20/NGB-LL%20FY20%20President's%20Budget%20Summary.pdf>.
 15. Air National Guard Readiness Center. *FY 2019 Air National Guard Retention Rates*. Andrews Air Force Base, Maryland: A1 Staff, Oct 2019.
 16. Air National Guard Readiness Center. *FY 2018 Air National Guard Retention Rates*. Andrews Air Force Base, Maryland: A1 Staff, Oct 2018.
 17. Air National Guard Readiness Center. *F-35 OPS/MX Planning Guide*. Andrews Air Force Base, Maryland: A1 Staff, Oct 2017.
 18. National Guard Bureau A1, *End Strength/Effective Manning FY 2017*, Air National Guard Readiness Center, Andrews AFB, MD, August 31, 2017, PowerPoint presentation.
 19. 187th Fighter Wing Manning. “Authorized vs Assigned Personnel FY 17.” Unpublished report received as an email attachment from Master Sergeant Patrick Fitzgerald. June 21, 2017. Microsoft Excel file.
 20. Secretary of the Air Force, Reporting Status of Air and Space Expeditionary Forces, Air Force Instruction 10-244, Air National Guard Supplement, November 19, 2013. https://static.e-publishing.af.mil/production/1/ang/publication/afi10-244_angsup_i/afi10-244_angsup_i.pdf.
 21. Brig Gen Michael Taheri, ANG Commander Fly In. PowerPoint presentation. ANGRC, Andrews AFB, VA, November 2, 2016.
 22. Bell, Col. Robert, Director of Staff, Alabama Air National Guard. Col. Robert Bell to Brig. Gen. Steven Nordhaus, Commander Air National Guard Readiness Center. Bullet Background Paper, September 25, 2018.

-
23. 187th Fighter Wing Facebook page, “Auburn Alum leads Iron Bowl flyover,” video, November 26, 2017, <https://www.facebook.com/187thFighterWing/videos/vb.116599751869323/712859045576721/?type=2&theater>
 24. Veterans Affairs, “Montgomery GI Bill Select,” accessed January 14, 2020, <https://www.va.gov/education/about-gi-bill-benefits/montgomery-selected-reserve/>.
 25. Department of the Army, “My Army Benefits,” accessed January 14, 2020, <https://myarmybenefits.us.army.mil/Benefit-Library/State/Territory-Benefits/Alabama>.
 26. Military Tuition Assistance Information, “Wisconsin National Guard Tuition Grant Program,” accessed January 14, 2020, <http://www.militaryta.com/benefits/wisconsin-national-guard-tuition-grant-program.shtml>.
 27. Vermont Biz, “Vermont National Guard Tuition Program Benefit,” accessed January 14, 2020, <https://vermontbiz.com/news/2018/september/01/vermont-national-guard-tuition-benefit-program>.
 28. Stan Liebowitz and Matthew L. Kelly, “*Fixing the Bias in Current State K-12 Education Rankings*,” CATO Institute, November 13, 2018, https://www.cato.org/publications/policy-analysis/fixing-bias-current-state-k-12-education-rankings?gclid=CjwKCAiAzJLzBRAZEiwAmZb0airk4L6Bo7t_zWtZ9UxKRrPM5TCzvNg11TkQPpT486h1DaXP_BE41xoCEjUQAvD_BwE.