# Keeping Peace with a Different Drum

## *A Note on Military Music*

by Joseph D. Hart, Jr.

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# Contents

*Dedication*

*This work is dedicated to the loving memory of my mother, Andrea Shannon Menke, my dad, Joel Kinion Menke, and brother Alias Simon Menke, who all passed away before I was able to complete this goal in life. To my father, Joseph Daniel Hart, Sr., for his never-ending search to find me. To my brother Bill, for enduring all my ups and downs. Thank you for being there; I look forward to reciprocating the love. To my daughter Chloi and son Orion, my greatest gifts in life, thank you for pushing me to succeed. It is because of you both that I have never quit.*

*Most of all, to my love, Scotti. "We can drown alone, or swim together." Thank you for not only teaching me how to swim, but for braving the waves alongside me.*

*Acknowledgments*

*To Dr. Scotti Veale, who sat through countless hours of revisions and discussion, your patience has been a true testament to the process. Thank you for your wisdom and insight; it was absolutely critical for my success.*

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*And to my professor, Dr. Jeffery James. Without your leniency on this subject, I would not have been able to accomplish anything. Thank you for allowing me the opportunity to research something I am passionate about.*

# Preface

Music has been a part of every civilization since the beginning of recorded history—and presumably before it. The instinctive reactions to sound, melody and harmony, to symphony and cacophony, are universal traits of human existence. Music has the power not just to inspire and energize, but also to color a person's entire frame of mind and even their ability to perform both simple and complex tasks. Given the plethora of scientific studies that examine how music can affect us from before we are even born and throughout the entire rest of our lives, there exists a need to reflect specifically on the role that music has played in times of conflict; trumpets, fifes, drums and bugles have a long military history around the world, and there are even instances of sound being used as a weapon. What exactly—neurologically, psychologically and physically—does music do to us? And why does this matter most especially for our Soldiers? With these questions in mind, Army leadership can give serious thought to how it allocates its resources, and with what purpose, as the Army seeks to efficiently and effectively shape its Soldiers.

*This paper is published in conjunction with ongoing research and partnership with the Army Music Analytics Team and the West Point Music Research Center. What is published here is a condensed version of a longer work, originally written for the completion of a National Security Master's Thesis at American Military University in 2019.*

# Keeping Peace with a Different Drum: A Note on Military Music

## Introduction

*"It is not the strongest nor the most intelligent of species that survives, but the one that is most adaptable to change." – Charles Darwin (1809–1882)*

Using research methodologies to examine and synthesize expansive ideas, this paper will present a comprehensive understanding of music in relation to the military world. The overall purpose is to look at military bands to see if there is a justification for the use of military music in defense of the nation.

Noise, sound and music are all distinct, but they play essential roles to one another. From the perspective both of the creator and of the recipient, noise, sound and music can vary drastically. Primarily, noise is usually considered unwanted or unintended sound capable of negatively affecting both communication and thought, e.g., the multitude of conversations in an auditorium, traffic or a passing train. In contrast, intentional sound is defined as something that has bright, distinguishable, vibratory patterns with a somewhat set duration. The "ding" on a microwave, the "chirp" of a bird and a crying baby are all sounds that catch attention. In the modern era, sounds function as shortened forms of communication. Music, finally, is defined as a combination of sounds with distinct characteristics—dynamics, pitch, rhythm, texture and timbre. While music may be desirable, unwanted music can be perceived as noise by the recipient.

For this research, these three terms will be used somewhat interchangeably. Appropriate annotations will identify distinct points when necessary. Although a set component might intrinsically identify a sound as belonging to one category or another, the reaction to it is up to individuals—their subjective experience might consider music to be noise and vice versa; "one man's rubbish is another man's treasure."[1]

In an era of dramatic fiscal deficits, where military spending does not always seem proportionate to successful results, this paper poses the following question: how can military bands,

such as the West Point Band, provide a return on the national investment, and can they remain a viable tool in contemporary warfare? This paper will look at the various ways that an Army band can contribute to the overall efficacy of the military in an age of advanced technology and communication.

## An Early History of Sound, Music and Conflict

Prehistoric man survived by adapting to changes. Weather, seasons, climate shift, the availability of shelter, the migratory patterns of food sources, the obtainability of freshwater and a need to procreate were all inescapable realities. Without an ability to adapt, human existence would have ceased. However, this goes beyond mere essential requirements. Human beings are consciously and subconsciously attuned to the sounds, patterns and rhythms in nature that allow them to relate to their environment. Noises activate the visual and auditory cortices[2] because they tap directly into the brain stem, allowing humans to react in "immediate and automatic ways."[3] In short, human pattern recognition of sound and rhythm allows for perceptual learning and adaptation.[4]

Sound is the most common form of communication across the entire animal kingdom, for both vertebrates and invertebrates.[5] Most species that communicate by way of auditory means have a multitude of sounds to relate specific information, such as mating calls or distress signals. Very few species, however, can mimic the communications of others.[6] This ability that humans have allows us to become better predators, attracting or distracting targets, and to blend in with the environment. Evolutionarily speaking, humans realized the importance not only of sound and communication, but also of the role that they could play in survival.

In more complete terms than above, music is "the science or art of ordering tones or sounds in succession, in combination, and in temporal relationships to produce a composition having unity and continuity," comprising "vocal, instrumental, or mechanical sounds having rhythm, melody, or harmony."[7] The first possible musical instrument would have been the human body itself, closely followed by the use of reeds, sticks, rocks, bones or shells. These sounds would have been rhythmic and patterned, but not necessary for survival. Instead, this was the beginning of an exploration into self- and group-expression, perhaps even as a form of group interaction or early worship.[8] Humans expressed a collective understanding, complex communication and creation of music—a rational and abstract activity that does not exist anywhere else in nature.[9]

Where did conflict fit in with the sound and music of prehistoric times? Prehistoric conflict was more than just man against nature. Changes in population density, advances in technological innovations, the environment and subsistence practices led to tribes being pitted against one another.[10] As early civilizations were established, they quickly became targets both for nomads and neighbors. Although little information is available on the organization and training of tribal warriors or the concept of defensive and offensive formations, there is no doubt of this occurrence over time—the concept of war is older than records can show. As the social interactions of trade, possession of land, control of resources, a convergence of evolutionary views and socialism grew, so did the need for advanced fortifications and their protection. With improvements in military strategy, in the size of a given civilization and an expansion of culture, the magnitude of war grew nearly exponentially.[11]

As the battlefield grew, and the complexities of warfare increased, so did the level of confusion. According to the military, there are four specific physical barriers to effective communication: distance, terrain, weather and other ambient noise. It was there, in the midst of conflict,

that music found a home; music and sound could provide organization and clear guidance when the human voice was too faint to be heard. And it provided additional benefits: comfort, remembrance, triumph and mourning.

Although carbon dating is not exact, hieroglyphs found on a doorway of a tomb 5,600 years old—from around 3580 BCE—clearly show the use of trumpets.[12] The earliest known horns (discovered in the tomb of Pharaoh Tutankhamun) were within the Valley of the Kings of the same region. Two trumpets, one made of wood and the other of silver, are dated to around 1325 BCE. Other tombs and temples within the area depicted horns in battle scenes, soldier processions and similar military activities.[13] It is in the Old Testament that the first written mention of music during a war occurs:[14]

> So the people shouted when the priests blew with the trumpets: and it came to pass, when the people heard the sound of the trumpet, and the people shouted with a great shout, that the wall fell flat, so that the people went up into the city, every man straight before him, and they took the city. And they utterly destroyed all that was in the city, both man and woman, young and old, and ox, and sheep, and ass, with the edge of the sword.[15]

This example represents three distinct uses of sound. Primarily, the horns provided a clear, concise signal for all soldiers surrounding the city to attack in unison strategically—a feat that, without the horns, would have been nearly impossible in that age before any type of clock. Second, the horns provided a tactical cover for the attack. Although not mentioned in the passages provided above, the trumpets played for six days before the incident. Sounding the horns for such a long period may have misled the city's defenses. Arguably, the horns would provide another use, that of psychological warfare; while they served as a war cry for the soldiers outside the walls, they likely frightened people within the city.

This record offers a plausible understanding of the power of music and sound in war. However, it presents the ideology without any archeological indication to support the event, as there is no physical evidence of these instruments from the Battle of Jericho. Many scholars estimate this conflict to have occurred around 1400 BCE; as there is evidence of trumpets in Egypt from this time period, there is some plausibility to the biblical story, and so provides the earliest look at the potential of musicians in combat.

## Literature Review

There are very few resources available on the topic of music and national defense or on military bands and their support to the nation. Music studies generally focus on a contribution to the arts, national identity, expression and creativity, while scholars looking into national defense see shifting paradigms of offensive and defensive strategies and work to articulate the subjects of linear and nonlinear conflict in the context of military power indices. Consequently, it would appear that the topics of national defense and music are too divergent to discuss in concert. However, that is not the case.

Generally, music is an accidental use of tones or intonation; it is deliberately written and performed to convey a particular thought or experience. Formal music, through the disciplined control and synthesis of a variety of elements, provides an auditory representation of mathematics and physics.[16] National defense employs similar practices; first, it is not an accident, but a deliberate posture of protection using scientific research (weaponry), strategic considerations

and political methodologies, and, at the most rudimentary level, it is a performance to psychologically outmaneuver an opponent.[17] Music and conflict, then, both effect a psychological and physiological impact, emotional influence, cultural identity and historical implications.

In *The Psychology of Music*, James Mursell relates the rhythm of the music to both kinesthesis and attention. His work discusses Stetson's unified "motor theory of rhythm," i.e., the use of music in primitive work-related activities. This posits that something important happens when trained musicians hear musical tempo and melody. However, this research did not consider the examples of people without formal training who still have an "ear" for tempo, such as soldiers, who conduct physical conditioning with patterns and tempo.[18] In conflict, there is an equally stimulating effect of pace, a speed at which events flow. For a seasoned commander, there exists a tempo when dealing with a successful attack or counterattack; to the trained logistician, knowing when to transfer supplies could mean the difference between a functional unit and one that cannot carry out its mission; and for medical personnel, there is a rhythm when dealing with a casualty and the homeostasis of human anatomy.[19]

Mursell specifically discusses how musical intervals and patterns, because of the effects they can induce in listeners, can be used to manipulate an audience. Even so, music is an art form whose subjective worth to each listener comes in part from their own perspective of hearing it. A recent study provided additional evidence that listening to music directly stimulates dopamine production in the brain, meaning that music works along similar neurological reward pathways (and registers in a comparable fashion) to food or sex.[20] When subjected to pleasant or agreeable sounds, anything can become more tolerable; when exposed to noise that is unpleasant, the opposite can occur. Additionally, there are direct correlations between the dopamine D3 receptor, post-traumatic stress, schizophrenia, autism and even substance abuse disorders, which is the reason why, for example, so many autistic people react positively to music therapy.[21]

Regarding a connection between musical form and military discipline, one author attests to the influence of cadence in military training, citing that it provides a "trance-like" focus, which helps to eliminate or subdue feelings of "fear, rage, and helplessness."[22] Specifically, he states that cadence exists in a place between war and music, which allows a soldier to cross the threshold through both collective exertion and fatigue.[23] This journey provides an intimate understanding and a new way of thinking when dealing with physical or psychological stress.

Charles Dennis propositioned the idea that "constructive leadership without 'soul' is impossible" and that the best way to provide that leadership was through music that enables communication.[24] He also suggested that music opens people to sensitivities, "away from materialism and harshness." Music—as previously suggested—has a direct correlation on autonomic biological functions. It even assists in the reorganization and rewiring of neural connectors.[25] This step is crucial for leadership in that it provides an adaptive way to improve and increase those traits commonly associated with advanced levels of abstract thinking.[26] Abstract thinking, then, is closely linked to dialectical comprehension, further reinforcing the concepts related to what executive leadership is.[27] However, abstract thinking is not the only attribute necessary to be an intellectual, much less a leader. Leaders must understand the importance not only of seeing outside the box, but also must be capable of sympathy and empathy.

This concept is also echoed by Lieutenant Colonel Gerald F. Sewell, who stated: "Leaders [must be] aware of their own emotions and how they affect those around them."[28] Within the

business world, a similar mentality exists; research clearly shows that "emotional intelligence is the *sine qua non* [absolute necessity] of leadership."[29] Without it, a person can receive the best training in the world and possess an incredible and creative intellect, but will never truly become a good leader.[30] There exists a direct correlation then, from music to the human brain and its emotional capacity that spans from leadership and experience to emotional intelligence.

Needless to say, leadership is a core proponent of the military experience.[31] To that end, the United States Military Academy at West Point believes in developing leaders of character who will "earn and maintain the trust of the American people . . . as they serve as stewards of the American Profession."[32] Character is built on ethics, not just on principles, and it provides some form of reliable, measurable performance.[33] It is a stance that resonates not only with authoritative leadership but is subject to considerable thought and deliberate action. The idea that music—in both practice and performance—is also thoughtful, deliberate, meticulous, consciously aware of planning and preparation—seems to run parallel with the similar demands of at least this one major leadership institution.[34]

"Both the characteristics of the individual and the military structure itself contribute to the military culture"—while an individual is essential, the overall roles, responsibilities and core missions are the cornerstones that bring military identity to fruition.[35] The individuality of a leader must continuously undergo growth and development while still maintaining a unique presence, honoring their distinct branch of service and upholding the values of the nation. It is impossible to overstate the historical importance of cultural identity. Its psychological impact, especially in music, "is central to national consciousness," even if it is not understood as such.[36] To further this understanding, it is helpful to remember that human grouping is a natural occurrence. Groups of like-minded people, or those with similar backgrounds, bond together through maintaining social integrity, effective communication and safety. Bonding in particular is an essential concept because it provides a basis for the creation of music before, during and after war; music can be performed as a preparation for combat, as a signaling source during a battle and in cathartic remembrance afterward.

In his article on the subject, John O'Connell focuses on the dynamics of music and conflict. Music, he says, through discord and practice, can quickly identify pending struggles. Fundamental practices of "policy and ideologies that informed musical production" point toward inherent flaws that might not be easily identifiable. He also stated that, in specific ways, music could be employed for the resolution of conflict—not as the ambassadors of peace, but by "articulating distinctive cultural perspectives" that could lead to harmonious solutions.[37] These two topics of consideration certainly merit attention, but they fail to establish a correlation between military bands and the music of war. He instead focuses on music as though it were a disconnected entity, citing numerous sources for his stance and providing an erroneous feeling that music alone can uncover flaws and resolve them. Instead, while music can be revelatory to both the performers and the audience, especially when the audience can sense performers' psychological or emotional attachment to the work as they are engaged in it, it still cannot fix everything by itself.

Martial music provides not only a marching rhythm or cadence, but also a distinct sound for any group of warriors. Baron Friedrich von Steuben was the Prussian military expert hired by George Washington to transform the Continental Army during the Revolutionary War. His manual, *Regulations for the Order and Discipline of the Troops of the United States*, included

musical calls to order Soldiers' daily lives. Use of military music, he says, not only maintains cultural identity but is necessary. Examples of this can be found in the Scottish bagpipes and drums, the New Zealand war cry (known as the Haka), African Zulu drums and Native American chants, all of which demonstrate that music is not only a portrayal of national character, but is also a means of communicating violence, ethnic differences and political values.[38]

### The Communicative Power of Music

After World War II until the 1970s, the U.S. State Department (DoS) hired Jazz musicians to travel the world. Musicians such as Louis Armstrong and Benny Goodman helped to raise the public image of the United States, impacting U.S. diplomacy abroad.[39] Similar effects are ongoing today, as DoS supports cultural ambassadors with bluegrass, gospel, hip-hop and zydeco music—in performances, classes and other civically centered music initiatives. The longevity of these programs indicates that the U.S. government knows that music is not only an art form, but is also a basis for education, partnerships and unification.

Programs (the ordinal arrangement of musical selections for a show or venue) intentionally convey a feeling or a story, leading the listener in an intended direction. Although manipulation may connote negativity, a concert is technically the intentional manipulation of listeners. Consequently, concerts performed by military bands—or any band—can sway audience members through calculated planning and presentation.

When seated in front of sheet music, people of different nationalities can, to a certain extent, instantly communicate with each other, despite potential linguistic and cultural barriers. And, in an even more remarkable instance of music passing through barriers, a study on the effect of music that babies hear before they are even born shows the long-term neural effects and influence on their developmental; music affects primal brain function.[40]

On numerous occasions, the weaponization of sound goes above and beyond propaganda material. The most recent was in November 2016, when American diplomats in Cuba faced persistent audible noises that induced a "range of symptoms, including headaches, nausea, and hearing loss."[41] While scientists believe that this was the result of Caribbean crickets, the recordings offered to investigators may not have captured all frequencies used, leaving room for debate. Similarly, music was used in the global war on terror. In Iraq, Afghanistan and even in Guantánamo, the use of loud music was a standard interrogation technique that provoked fear, disorientation, insomnia and other psychological impairments.[42] In these and other instances, the power of music, sound and noise played essential roles in conflict; outside the battlefield, however, the same weapon can instead be used to unite people.

Because human hearing is limited to between 12Hz and 28Hz, there is only a small range for vocal human communication.[43] However, since humans can *feel* sound vibrations outside of the standard range, they can still communicate without hearing; today, bone conduction microphones and speakers are leading technologies in military special operations units.

### The Mathematics of Music

Even a cursory glance at the principles of music theory reveals how much mathematics goes into musical composition. The first movement of Beethoven's *Moonlight Sonata* is a good demonstration of this. The chromatic scale consists of twelve tones that are equidistant from their immediate neighbors and have the same ratio—known as equal temperament. Beethoven

wrote the piece using triads (three corresponding note tones) and triplets (divisions of time into three equal lengths).

The triads employ frequency cycles whose mathematic harmony is known as musical consonance; it is considered sweet, pleasant and enjoyable.[44] The spaces between the sounded notes are also registered by human ears, with the resultant nerve impulses signaling objectively pleasing musical intervals. Contrastingly, in other pieces Beethoven similarly utilized dissonance—objectively displeasing sound—by using notes that do not provide satisfaction, thereby producing what Hector Berlioz famously called "[a poem] that human language does not know how to qualify." It is also worth noting that Beethoven, because of his deafness, wrote much of his later music either by holding a pencil in his mouth and touching it to his piano or by cutting the legs off of his pianos so that he could feel the vibrations of notes and intervals through the floor. The use of the pencil and the floor demonstrate an intimate understanding of sound and vibration. Indeed, his influence not just on the development of modern music but even on the piano as an instrument was so profound that the piano as we know it today owes its form to him; intent on providing an instrument that was capable of producing the sound he demanded, the craftsmen of his day developed one structural improvement after another in a quest for the piano that could satisfy his innovative genius. His music, and the story behind it, provide just one example of how interconnected science and sound are.

## Research Considerations and Limitations

### *Considerations*

According to the International Trade Administration, the music industry profited a net total of $22 billion in 2019, and it is expected to grow to $60 billion within the next five years. Broadway, as just one part of that industry, brought in a gross revenue of $1.7 billion in Fiscal Year (FY) 2018. In comparison, the NY Giants brought in $519 million, the NY Yankees $668 million, the NY Knicks $443 million and the NY Rangers $253 million, for a combined total of $1.8 billion.[45] These figures suggest that this one small piece of the much larger music industry has a monetary value equal to that of four independent, professional sports teams.[46]

If the military wants to be successful in recruiting, it should consider this statistic as it looks for cost-effective ways of advertising. Data can demonstrate the marketing value of military music across various platforms, including social media. Specifically, it is helpful to look at the additional value that the West Point Band provides to the nation. What measurable impact exists between intentional and unintentional exposure to military music?

It is important to note that there is a significant difference between the two types of Army bands, Regular and Special, i.e., 42 Romeo and 42 Sierra (42R and 42S). The 42R bands contain roughly 40 members who often PCS (permanent change of station) every two to four years. Scheduled turnover provides new vision and goals, among other benefits. Conversely, 42S band personnel—except for commanders and assistant band directors, are permanent; these world-class musicians must undergo stringent auditions to secure a position.

### *Limitations*

All correlations drawn in this study require careful consideration, as there are numerous limitations and biases to this field of study:

1. As stated earlier, there is almost no literature on the effectiveness of military bands in conflict—authoritative sources on this question are in short supply.

2. This research is limited to information available from within the continental United States and Hawaii that is written in English.
3. The scope of this research is the use of military bands within the Army—it does not extend to the other services.
4. The full impact of military bands is, to a certain extent, unknowable; the number of people who observe them, sometimes by chance, is not calculable—and neither is the reaction of those people.
5. The Army Band Operational Reports gathered are inconsistent; many missions were either incorrectly recorded or are missing. Consequently, though still meaningful, the collected dataset is incomplete.
6. Readily available social media statistics do not often include such details as a person's demographics of following, which have a significant impact on the overall reach of a statement made.
7. Although followers of a military band through social media may produce "likes" or other reactions, at this time, text analyzers cannot read the sentiment associated. Artificial intelligence algorithms are not able to distinguish if a "thumbs up" represents agreement with a statement, affiliation with another person or general acknowledgment.
8. Technological advances also limit data ranges. Data scraping and sentiment analysis are only a few years into development, which means that additional information may unintentionally be left out of this research or unavailable.
9. There is no way to tell if a person is actively paying attention to what they are watching at the time of a broadcast, or if their attention is diverted elsewhere.
10. Within the scope of data scraping and broadcast viewership, it is impossible to determine the number of personnel with inattentional blindness (also known as perceptual blindness)—although, in studies, this can occur in as much as 50 percent of the population.[47] More attentive viewers may pick up on critical details, while others might not.
11. Utilizing the second method of sentiment analysis (with keywords) may produce a result that favors the information, i.e., if a search emphasizes positive or negative words, it will produce positive or negative results accordingly, even if the stance behind those words is not the same as how the words appear on the surface level.
12. Herd mentality is a problem. On social media platforms, people might post based on what others have stated instead of posting what they feel or think to be appropriate. This research has no way of discerning the difference with any amount of confidence.

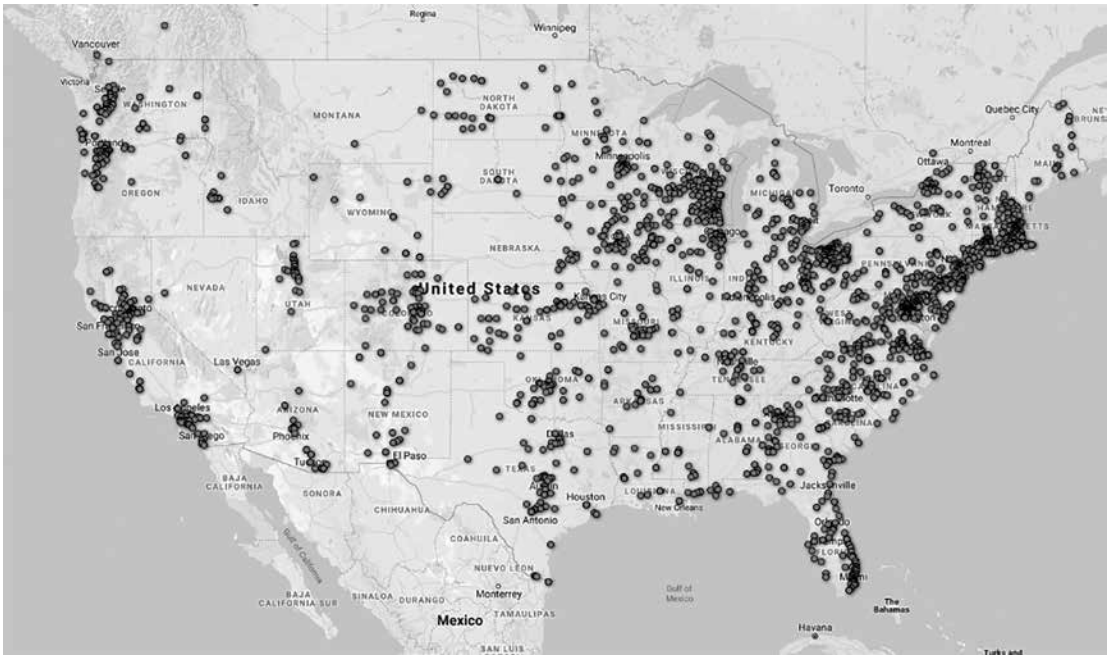
### Findings and Analysis

In FY18, there were 16,455 performances by all U.S.-based Army bands. Because both the Reserve and National Guard units only activate once per month, and for two weeks out of the year, they cannot produce the same output as active units. Separating 42R from 42S bands is also vital since 42S bands are larger.

Social media reach on Facebook equates to 67,897,723 people across all Army bands, with an average engagement rate of 8.104 percent, and the cost per mille (cost per thousand, i.e., the

*Figure 1*

**FY18 Performances by U.S. Army Bands**




amount that Facebook charges to bring content to 1,000 users) equates to $678,977. However, not all Army bands actively engage on social media platforms, meaning there is a potential disparity in the possible reach across the field. It should be noted, these figures do not reflect actual money spent—they show what it *would* cost to buy this kind of exposure, if the Army chose to purchase it (figure 2).

The scoring model represented in figure 2 on the following page was developed by this researcher in collaboration with Chief Warrant Officer 2 Jonathan Crane, Sergeant Major Denver Dill and Master Sergeant Eric Garcia of the Army Music Analytics Team at West Point. The weighted categories for the scoring model were established by the Army Music Steering Group (composed of representatives from Army bands), and the mathematical model was checked for accuracy through the Department of Mathematics at West Point.

Missions were broken down to the following categories:

- **Community Engagement**: relates to those events that were open to the community, intended to generate interest in the armed forces, promote patriotism, celebrate national holidays and engage with the general public (2,790 missions);
- **Fallen Honors**: events on or off an installation that honored the service of members of the armed forces, including funerals, memorials or other honors (6,180 missions);
- **Morale and Welfare**: events that fostered the morale and welfare of the Army and families, strengthening unit morale and promoting esprit de corps, such as military balls, dining in/out, receptions, or unit runs (4,691 missions);
- **Educational Outreach**: included missions that performed for audiences that were below the recruiting age, specifically that of elementary and junior high schools (488 missions);

*Figure 2*

## Scoring Model

| | | Verification Count: 16,455 | Total Missions: | 16,455 | 6,180 |
|---|---|---|---|---|---|
| **Optimal** | **Measures** | | **Raw Data** | **Value Function** | **Fallen Honors** |
| **Awareness** | Facebook (Impression) | | 67,897,723 | 1.000 | |
| | Facebook (Reach) | | 44,826,451 | 1.000 | |
| | Live Audience Count | | 20,889,739 | 1.000 | |
| | Influencer Count (Local Defined) | | 18.0 | 1.000 | |
| | Digital Print Impressions (Unique Visitors/Month) | | – | | |
| | Average Radio Listener Share | | – | | |
| | Broadcast Audience Count | | 222,987,133 | 1.000 | |
| **Engagement** | Facebook (Engagement Rate) | | 8.104% | 1.000 | |
| | Digital Print Shares | | – | | |
| | USAREC Leads | | – | | |
| | Survey Response Count | | – | | |
| **Sentiment** | Text Sentiment Score | | – | | |
| **Return on Investment** | Broadcast Ad Value (Total Time) | | $100,481,678.00 | 1.000 | |
| | Social Media CPM(10) Value | | $678,977.23 | 1.000 | |
| | USAREC Return on Investment/per Lead | | – | | |
| **Sum of Weights** | | **Total Missions:** | | | |
| **Mission Factor** | | **Total Funerals:** | | | **0.376** |

| | | **Strategic Goals** | | |
|---|---|---|---|---|
| | | Enhance confidence and patriotism among the American people | Perpetuate service identity, traditions and morale | Support the Commander's top priorities: Readiness, Strengthen Alliances and Partnerships |
| **Performance Conditions** | Fallen Honors | 0.188 | 0.188 | |
| | Reviews | | 0.017 | 0.034 |
| | Morale & Welfare | | 0.100 | |
| | Cultural/Historical Traditions | | 0.012 | |
| | Community Engagement | 0.184 | | 0.133 |
| | Media | 0.002 | 0.002 | 0.002 |
| | Official Entertaining | | | 0.001 |
| | Educational Outreach | 0.019 | | 0.006 |
| | Recruiting | 0.005 | 0.002 | |
| | **Effectiveness Score** | **39.760** | **32.060** | **15.614** |

- **Reviews**: events conducted to honor unit achievements, present awards or decorations or to mark military transitions, including graduations, retirements, deployments and changes of command or responsibility (1,242 missions);
- **Recruiting Support**: engaging with potential recruits at high schools and colleges in events such as workshops, conferences and contests (315 missions);

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1.242 | 4,691 | 677 | 2,790 | 47 | 25 | 488 | 315 |
| | Review | Morale & Welfare | Cultural/ Historical | Community | Media | Official Entertaining | Educational | Recruiting Request |
| | 0.050 | 0.100 | 0.050 | 0.150 | 0.300 | 0.050 | 0.150 | 0.150 |
| | 0.050 | 0.100 | 0.050 | 0.150 | 0.300 | 0.050 | 0.150 | 0.150 |
| | 0.100 | 0.200 | 0.200 | 0.300 | | 0.050 | 0.050 | 0.100 |
| | 0.150 | 0.150 | 0.080 | 0.200 | 0.120 | 0.300 | | |
| | | | | | | | | |
| | | | | | | | | |
| | 0.100 | | 0.050 | 0.300 | 0.350 | | 0.100 | 0.100 |
| | 0.080 | 0.050 | 0.050 | 0.200 | 0.200 | 0.150 | 0.170 | 0.100 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | 0.100 | | 0.050 | 0.300 | 0.350 | | 0.100 | 0.100 |
| | 0.050 | 0.100 | 0.050 | 0.150 | 0.300 | 0.050 | 0.150 | 0.150 |
| | | | | | | | | |
| | **0.680** | **0.700** | **0.580** | **1.750** | **1.920** | **0.650** | **0.870** | **0.850** |
| | **0.051** | **0.200** | **0.024** | **0.297** | **0.005** | **0.001** | **0.026** | **0.016** |

- **Cultural/Historical Traditions**: events that supported command recognition of cultural or historical importance, including observances, lighting ceremonies, remembrances and caroling (677 missions);
- **Media Engagements**: events without a live audience count but that were centered around pre-recorded shows broadcast later (47 missions); and
- **Official Entertainment**: events that supported senior leaders at various levels, such as presidential or United Nations events (25 missions).

The scoring model determines the efficacy of a given mission by looking at the maximum value for each metric along the left. Those values are represented through the summation of all data available for FY18. The number established the total amount available (each given the value function of 1.000, or 100 percent. The values of the metrics were then divided up by the mission they were affected by (e.g., the live audience count is more impactful for *community engagement* events and has no value for *media* events that are specifically designed for broadcasting). The final values for each mission category were then added together and divided between the three strategic goals (establishing confidence, perpetuating service and supporting the commander's top priorities). The information established by this methodology suggests that 32.15 percent of all missions were directed at enhancing confidence and patriotism among the American people, 54.26 percent of all missions were directed toward the perpetuation of service identity (traditions and morale) and that 13.58 percent were solely to support a commander's top priorities.

The following information is centered around specific events and their associated time frames, although some data was not available. From 1–2 November 2017 (i.e., the first quarter of FY18), 19 Army bands appeared in local media reaching 18 states. TVEyes identified a local viewer population of 11,645,319 and a national audience of 14,707,690 with an ad value of $1,046,771 and $2,414,470, respectively. Facebook reflected eight posts over five days with a total organic impression of 5,278 people (i.e., the total number of times people saw the activity on a band account), a reach of 4,881 people (defined as the number of people who visited a band's webpage) and 558 engaged users, with an engagement rate of 11 percent. Comparatively, nationally known musicians often have an average engagement rate of less than 2 percent.

Next, it is helpful to look at 17–30 May 2018, a date range that includes both Armed Forces Day and Memorial Day. Within this scope, 33 bands were identified on TVEyes for a total of 733 unique mentions. National audience count was 12,731,455 and a local viewer count was 11,000,176, for a total ad value of $40,745,145 and $1,211,661, respectively. Within the scope of social media (specifically that of Facebook), there were 5,196,147 organic impressions, which is valued at $4,052. The organic reach was 3,649,337, with an engagement rate of 301,643 (15.3 percent), whereas the industry average is a little over 10 percent. The engagement rate stands as an important factor because it identified a percentage of people who are actively participating in military activities. Note that the numbers here are higher than that of the statistics from Veterans Day (above) and of the Fourth of July timeframe (below).

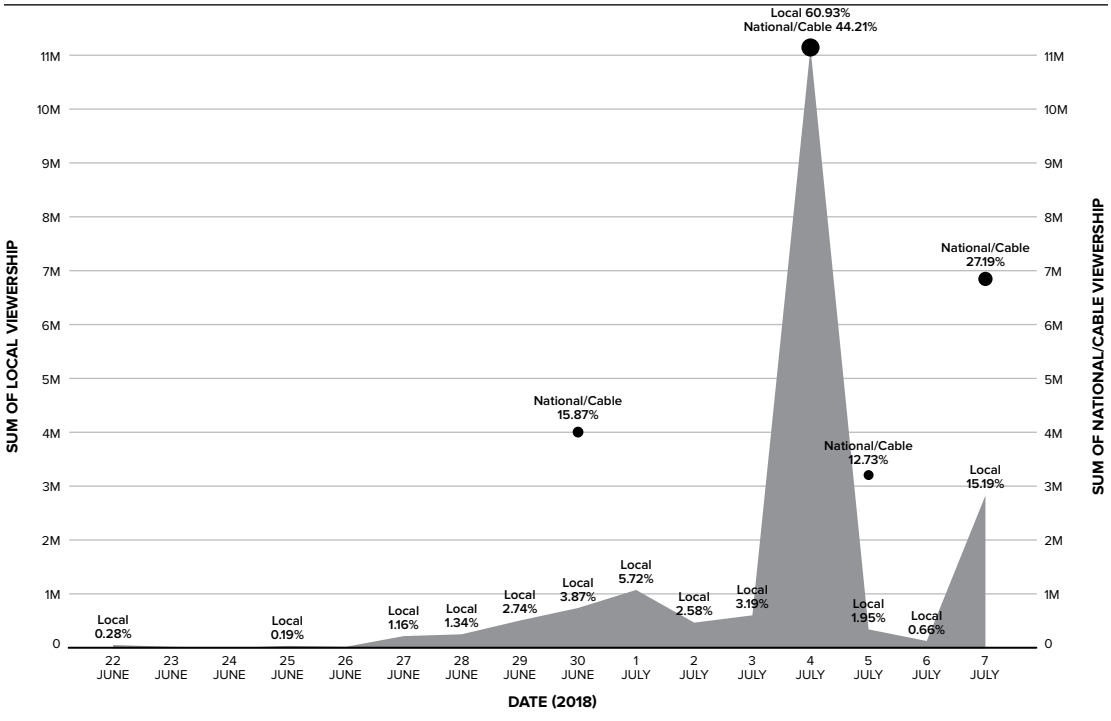
According to TVEyes, from 22 June through 8 July 2018, there were 27 different bands mentioned more than 980 times. The total national audience was 22,255,237 for a national media value of $90,009,887, where the local audience accounted for 18,546,497 people and a value of $78,241,105. Facebook—and the 50 bands examined—provided 2,553,558 organic impressions with a value of $28,600. The total organic reach made up 1,805,883 people. There were 161,712 engaged users for a total of 8.95 percent (below the industry standard of large organizations such as established symphonies or orchestras, but four times higher than the standard individual musicians. Twitter showed 1,080 tweets and retweets across 864 unique users, and, according to Muck Rack, there were 1,018 band mentions that reached 947,456 journalists with a total potential exposure of 1.27 billion people (or, roughly 16.4 percent of the world population). It is impossible to estimate the total ad value of this reach since the demographics of the population are unavailable to this researcher. The Fourth of July stood out as the single most impactful time during this span, accounting for 60.93 percent of all local viewership and 44.21 percent of the national viewership (figure 3). This is not to say that these numbers represent a percentage of everything watched during the Fourth of July holiday, but that they account for the peak times for the military views.

When combining all information available for FY18, the number of live audience members was 20,889,739, with a total of 222,987,133 broadcast viewers (or roughly 6.4 percent and 68.4 percent of the national population, respectively). The total value of all broadcast media viewed equated to $213,669,040. According to Loren Thompson (Chief Operating Officer at the Lexington Institute and an industry consultant) and Jessica Matthews (*New York Review of Books*), military bands have an estimated annual budget of between $500 and $550 million.[48] If this is a correct value, and that budget is split between the current 136 military bands, then the Army is recouping between 39 percent and 42 percent of that expenditure by way of ad value and media exposure alone. Again, this does not take into consideration those missions that were not included as a performance, nor does it account for any tasks that occurred overseas.

*Figure 3*

**Percentage of Viewership by Date**

*22 June – 7 July 2018*




Facebook data trends for Army bands showed a strong correlation between engaged users and written posts. For all of FY18 (1 October 2017 – 30 September 2018), there were 2,120 posts, including 1,489 photos, 136 links, 140 shared videos, 126 status updates, 223 videos and six entries that were unlabeled. The number of likes ranged from 0 to 2,058, with an average of 60.21 likes per listing, for a total of 121,564. The number of comments ranged from 0 to 194, an average of 8.17, for a total of 8,416. Finally, shares (i.e., forwarding the content to other people) ranged from 0 to 531, with an average of 7.93 each and a total of 9,634. Within the same data, there were only 71 times when people disliked an entry—54 of these were for a photo, seven for a video, five for a link and five for a status update. By comparison, this means that the negative reactions accounted for only 0.000584 percent of the total interaction of bands through social media and would suggest that bands are favored 99.999416 percent of the time.[49] Both videos and photos were more engaging than providing links, sharing (someone else's) videos, or merely providing a status update.

Two hundred statements were used for text sentiment analysis; comments were pulled between 17 June 2016 and 26 August 2018. The events used included Veterans Day programs, parades, concerts and community events. The bands were a mixture of active 42R, 42S, reserve and National Guard units. Results, using only the VADER (valence aware dictionary and sEntiment reasoner) system, provided scores ranging from -0.888 to +0.996, rounded to the nearest hundred-thousandth—0.001. The average positivity of all comments was +0.328; neutrality scores averaged +0.631; negativity scores averaged +0.042; the overall compound score was +0.795. There were 155 comments, according to this system, that fell outside the 0.800

thresholds. Removal of these entries left only 45 statements with positivity of +0.270, neutrality of +0.570, negativity of +0.160 and a compound average of +0.377. Based on some of the statements recorded (e.g., "top gun performance," which provided a compound score of -0.153, and "no comments," which resulted in a -0.296), this researcher believes the VADER system to be fundamentally flawed, even though it has a reported 90 percent accuracy. One statement that seemed contrary provided a +0.964:

> Please accept my comments with my intent: to make it better next time. For the 2nd year in a row, the TRADOC Band's excellent performance was interrupted by a 15 min trio (from TRADOC) performing about four rock and roll songs that had nothing to do with the 4th of July. This is a 4th of July celebration of our country's birth, and the ENTIRE performance should reflect that purpose. I do, however, commend the one-song New Orleans jazz number. Even though this single song wasn't "patriotic" per se, it was very good and entertaining. And the jazz number was limited to one song. The multi-song, single-singer, rock and roll was mediocre at best, and an unwelcome distraction from the event. Simply put, it was out of place. Thanks for your time.

Additionally, when the VADER scores were reviewed, the negativity scores never fell below 0.000, thereby providing questionable results to the entirety of this analysis.

The same statements, when run through the updated algorithm, produced vastly different results. Out of 40 search terms, 23 returned a sentiment score. The top five results were (in descending order):

- *American*: 20 statements, 90.0 percent positive with 85.0 percent confidence;
- *profession*: 18 statements, 94.4 percent positive with 88.9 percent confidence;
- *excellence*: 15 statements, 100 percent positive with 100 percent confidence;
- *service*: 14 statements, 92.9 percent positive with 85.7 percent confidence; and
- *family*: 10 statements, 76.7 percent positive with 73.3 percent confidence.

In all, 132 (out of the 200) comments returned a sentiment matching the terms, with an average of 88.7 percent positivity and an 82.7 percent confidence. This would suggest that 70 percent of the population (132 statements out of the 200) talks about bands (or perhaps the military) with a generally standard vocabulary. Although this research never intended to look at the idiomatic properties, it certainly raises additional questions about communication between the military and the public, supporting a need for ongoing assessments. However, these numbers alone do not fully encompass West Point Band engagement. Instead, this researcher found numerous other topics of concern and consideration that seem critically important to discuss, if not to identify, as they have not yet been given any meaningful attention in research literature. The topics below provide a glimpse of initiatives that West Point is actively working on:

> **Research and Analytics**. Currently, the West Point Band is one of the few—if not the only—units that lead the way in both research and analytics for all other Army bands. A report provided to the 2017 Government Accountability Office inquiry set the standard for additional services to follow and demonstrates an understanding of music and public interaction that supersedes anything else currently in the military's cache of tools for community interaction. The unit looks at a wide variety of information to include music and health, music and public information, music measurement, persuasion and social media,

as well as music grants and fundraising—all to better understand not only their position within the military, but also to serve better the people with whom they are in contact.

**Marketing**. The West Point Band is currently changing the face—or, more specifically, the sound—of the United States Military Academy with sonic branding. As previously explained, sonic branding is an audio trademark, where sound functions as the unique identification of a product or service. For West Point—which serves as both a military institution and an NCAA (National Collegiate Athletic Association) franchise—sonic branding provides a recognizable aural identity along with an emotional link. This is costing upward of $20,000—which may not compare to the military's $1.3 trillion budget, but it still contributes to overall expenditure. By comparison, the West Point Band can work on this project—and others like it—with the resources already on hand, through the utilization of personnel within the unit. This means that the band is fiscally responsible for taxpayer dollars. It is also involved with creating sound effects for other areas of interest, including collaboration with the Department of History, the Army Cyber Institute, the Center for Junior Officers, the Center for the Army Profession and Ethic, the Department of Defense Warrior Games and a sonic brand for the Department of the Army, to name just a few.

**International Outreach**. Military units have a long-running history of working with counterparts from other countries. Training exercises increase joint-service awareness, provide additional institutional knowledge on topics such as leadership, cultural diversity and a greater depth of experience within the profession. The Marine Corps and the Japanese Defense Forces trained together in October 2019; the Air Force, along with NATO Allies, conducted exercises every month for FY19; and the Navy—in cooperation with 50 partnering nations—kicked off the International Maritime Exercise in October 2019. The Field Music portion of the West Point Band—known as the Hellcats—have, in recent years, been able to work alongside the Royal Regiment of Scotland as well as England's Royal Military School of Music and the Royal Military Academy. In all instances, the Hellcats carried on West Point history through close collaborations with ambassadors, military officials, civic leaders and other bands, reinforcing international partnerships and the reciprocation of historical honors. Master classes—classes taught by experts within a discipline—were provided by each unit, offering a mutual understanding of traditions and heritage while upholding military stewardship. In 2021, the Hellcats will travel to Spain to work with the Spanish Military Academy and to perform at the Embassy, establishing similar lines of effort.

**Subject Matter Experts**. Soldiers from the West Point Band are skilled in far-reaching fields, all of which work with their musical prowess in a mutually complementary manner. These Soldiers have also served as instructors of varying subjects at USMA, such as engineering, math, statistics, game theory and programming; while these classes are not music performance, the band members' musical training indubitably informs and enriches their ability to instruct in these other disciplines. The Band also supports other commitments that include running Thayer Hall Operations for R-Day—where the incoming class of plebes is processed for acceptance into West Point; teaching proper drill and ceremony to 4,000 upcoming officers; providing instruction on land navigation during Cadet Summer Training; and instructing on changes of command, changes of responsibility and other significant military-specific ceremonies. The responsibility for instructing drill and ceremony

to the corps of cadets instills discipline and sets the high standard anticipated by exceptional leaders.

**Longevity**. Although the West Point Band is not the oldest band in the United States (that title that belongs to the Marine Corps Band, established in 1798), it is in fact the oldest Army band, the oldest unit at USMA and the second oldest unit in the Army, behind the 1st Battalion, 5th Field Artillery Regiment. It began with a solo fifer and drummer on the orders of General George Washington in 1817. This lineage has maintained the standards and discipline required by all cadets to this day; for example, West Point is the only installation where a live bugler performs "Evening Colors"—better known as "Retreat"—every day of the year (except for Thanksgiving and Christmas). This established presence provides both continuity and commitment to service and stands as a reminder of the daily responsibilities of servicemembers.

### *Analysis Conclusion*

Do military bands provide a return on the national investment? Yes. The exploration of public information using data, scraping techniques and advanced text sentiment analytics quantify this result. The effort provided by fixed units, such as the West Point Band, goes far above and beyond the essential job requirements established by DoD doctrine. Their expertise in the field of music is simply the gateway to a more impactful knowledge basis than previously explored and their ability to remain viable at locations such as USMA and Arlington National Cemetery is unmatched by units that PCS every two to four years.

The West Point Band supports not only the Academy and its tenant units but has also established an excellent working relationship with the surrounding communities. The band's ongoing efforts that extend beyond standard service to the nation are woefully understated even in this paper, and they strongly correlate to current national interests. The direct impact the band has on the West Point Cadets (to mold, shape, guide and mentor future leaders of character) is unequivocally tied to the Army's ability to do its job; these cadets are the leaders that will take charge of the units standing on the front lines, for generations to come. It is not only the musical support, but also those missions that are not musically related, that provide substantial evidence of honor, trust and reliability to the nation, underpinning the thesis of this research.

## Conclusion

Technological advances propelled humans from prehistoric times—without written history—into the modern era, where "knowledge" is always merely a touch away. In many parts of the globe, the struggle for survival has transitioned into life with abundance; and although this may not be accurate for third world countries, globalization provides some relief. The exponential growth of the human population creates new political views and increases tensions between neighbors and an overuse of natural resources; the world continuously resides in vacillating states of conflict and (all too brief) resolution. War and conflict are only tempered by peace and harmony—and that relationship is, ironically, the epitome of what music is: conflict and resolution.

Within the chaotic transitions of world dominance through trade and political governance, there exist military powers designated to support the people. It is within these organizations that military bands and military musicians are found, preserving historical traditions, providing guidance during training, serving as standard-bearers, offering emotional comfort and

upholding the world's cultural expression. Music is primarily a physical representation of both mathematics and physics; it is a language understood by nearly all people, either rhythmically, harmonically or melodically. It is a bridge of communication that transcends etymological barriers and has the power to build and unite a nation or tear down cultural identities. It is both an art and a science, capable of negating cultural differences and edifying anyone saturated by its presence. Therefore, musicians are not only artists; they are linguists capable of reading, writing and speaking a language universally comprehended first by people within their field of expertise and then by people of every age, gender, culture, ethnicity and nationality. Military musicians take this ability one step further by also supporting and defending the nation they serve. They honor the traditions and heritage passed down from generation to generation, and, in the case of the West Point Band, from one of the founding fathers. Serving as a military musician is an honorable path, and yet it is still a path that receives criticism and slander from offices wanting to save a dollar.

The results of a 2017 Government Accountability Office inquiry concluded that the information currently available to address the effectiveness of military bands was severely lacking and that those bands should "develop and implement measurable objectives and performance measures for their respective [service]."[50] The inquiry also concluded that those measures should target essential attributes tied to mission success, establish a baseline and provide measurable targets to "demonstrate program performance." Due to this deficiency, further questioning of the relationship between the Army's established purpose (to defend the nation) and the bands in its charge began to surface. To broaden the depth and body of knowledge (within the field of intelligence studies), pursuing an answer to the proposed questions and answering (at least in part) a field of study that seems to be non-existent was believed to be in the best interest.

Because, to a certain extent, music will always have an element of subjectivity, information from recipients' points of view is vital to support any hypothesis. However, biased or leading questions would not only interfere with data collection, but conducting a study or poll was also beyond the scope of this research, which is why social media data was used instead.

This project was intended to examine Army bands (specifically, the West Point Band) to determine if there existed an under-established role in supporting Soldiers' missions, in and out of conflict, and, of equal importance, if there were a return on the federal expenditure used to maintain them. The results support both the importance and significance of the West Point Band. Sentiment analysis of social media suggests that the West Point Band induces feelings of patriotism, support for national interests and general military patronage. Additionally, analysis of both media exposure and calculated ad values demonstrates a return on investment that is unparalleled by any other military unit identified by this researcher. Together with the other products produced by the West Point Band, there are numerous ways that this unit supports not only West Point's mission, vision and intent, but that of the United States Army and DoD, thereby meeting the needs of national service.

This research adds to the field of *Intelligence Studies*, demonstrating the diverse effects that military bands have on the general public and how bands can serve as catalysts for gathering HUMINT (Human Intelligence) as well as performing PSYOPS (Psychological Operations). Music injects positivity and cultural identity, creating shared experiences through a universal medium. Additionally, this study shows the influence and unobtrusive ability for the military to present itself in casual and friendly situations (inside the home or at a social meeting place), potentially increasing recruiting capabilities. It also provides insight into the actual workload

of a unit, above and beyond what is prescribed by doctrine, showing the true nature of how some military units offer support.

Additional explorations should be made not only to continue enhancing knowledge about music in the military, but also specifically on the role of music and musicians in the armed forces. Data strategies should incorporate human feedback by way of questionnaires or other direct data collection methodologies. Data scraping should look at various events that do not include military band involvement to provide a better baseline for comparative analysis. Data mining should also look at an entire year for each of the components of military service. Each branch of service considers a musical mission differently; all military service bands should report on strategic engagement with standards set by the DoD. Tools should be developed for the continuation of data collection that include built-in measurements—something that this researcher is currently resolving through the West Point Music Research Center—and will perhaps be used for a future dissertation.

# Notes

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[29] Sewell, "Emotional Intelligence."

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[46] Broadway is relatively unique in that there are few (if any) other locations that can produce similar results. Therefore, this statement relates only to the state of New York.

[47] Siri Carpenter, "Sights unseen," *American Psychological Association—Monitor on Psychology* 32, no. 4 (2001): 54.

[48] John T. Bennett, "Analyst: Military bands to cost Pentagon $50B over next 50 years," *The Hill*, 18 May 2011; Jessica T. Mathews, "America's Indefensible Defense Budget," *The New York Review of Books* 66, no. 12 (18 July 2019): 23–24.

[49] It is impossible for this researcher to determine if likes were associated with other band members or if the data set is from people not related to a given unit. It is also impossible to determine (without cost) the demographics of engaged users and if those people were/are of recruiting age.

[50] U.S. Government Accountability Office, "MILITARY BANDS: Military Services Should Enhance Efforts to Measure Performance," 10 August 2017, https://www.gao.gov/products/GAO-17-657.


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