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TRAINING FOR THREE WARS AGO: ANTIQUATED C-130H PILOT TRAINING

by

Jon M. Bergman, Maj, USAFR

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Advisor: Dr. Dennis Duffin

Maxwell Air Force Base, Alabama

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## TABLE OF CONTENTS

	<i>Page</i>
DISCLAIMER.....	ii
TABLE OF CONTENTS.....	iii
LIST OF FIGURES.....	iv
PREFACE.....	v
ABSTRACT.....	vi
INTRODUCTION .....	1
BACKGROUND .....	3
C-130 "Slick" Mission .....	3
C-130 Historical Operational Missions .....	4
C-130 PILOT CONTINUATION TRAINING PROGRAM.....	7
Intent.....	7
Process.....	8
TRAINING PROBLEMS AND KEY ISSUES.....	9
Existing Training Versus Recent Utilization.....	10
National Security and Army Needs.....	12
Age and Downsizing of C-130H Fleet.....	14
Constrained Fiscal Realities.....	15
Training Focus and Construct.....	16
CRITERIA BEING MEASURED.....	17
Effectiveness of Training.....	17
Mission Readiness.....	18
Cost Savings.....	20
ALTERNATIVES.....	21
Shift Focus Away From Mass Formation Operations/Training.....	21
Adoption of C-17 Operational Construct .....	22

Proficiency Versus Counters.....23  
Tailored Training for Individuals and the Real World.....24  
Increased Use of Simulators.....25

CONCLUSION.....27

RECOMMENDATION.....27

SUMMARY.....29

NOTES.....32

BIBLIOGRAPHY.....35



## PREFACE

My entire adult life can be directly or indirectly related to the C-130 Hercules. For the past 22-plus years, I have wrenched-on, sweated over and inside of, bled on, and flown this amazing aircraft all over the world. This research topic materialized in two distinct stages. First with our decision to leave North Carolina and start over at a newly formed AFRC unit with the awesome responsibility of training new C-130 aircrew members. Teaching the basic *top-to-bottom* C-130 mission to young and experienced aviators instilled a determined motivation to educate and train the best combat airlifters possible.

Fast forward several years, a few mission changes later (our unit went from a schoolhouse FTU to combat-coded mission) and a deployment to CENTCOM during the height of the ISIL crisis in Iraq and Syria in late 2014, and the impetus of this research project was born. As a community, the C-130s are stuck in time. We have conducted near non-stop deployments since 2001, the geo-political world we operate in has changed significantly, and technology has advanced by light-years, with minuscule change to the manner of our training. To remain safe, competent, and viable combat airlifters, we must adjust fire.

I would like to acknowledge Dr. Dennis Duffin and *all* the advisors that have pushed and advised me during this wonderful odyssey known as ACSC OLMP. The biggest thanks and apologies, have to go to my family. Thank you for understanding (in a majority of cases) all the time I devoted away from family outings or from just being together watching movies or TV. Without you, all this work is for naught.

## ABSTRACT

Being one of the longest continually produced combat aircraft in the Air Force inventory, the C-130H has over time acquired a diverse and demanding set of mission related continuation training tasks. However, the training paradigm presently in use is nearly as dated as the airplane itself. The current pilot continuation training program fails to adequately prepare C-130H pilots for demanding worldwide operations. These archaic tactics, techniques, and procedures (TTP) pose a significant financial and combat readiness burden on all C-130H units, necessitating action by Air Mobility Command (AMC) to improve the pilot continuation training program.

This research project employs a problem/solution framework to evaluate several viable modifications to the C-130H pilot continuation training process. Particular emphasis, as discovered by data analysis, should be focused on the restructuring of the Air Force Instruction (AFI) directing how continuation training is conducted. Many of the events flown everyday by “Herk” pilots have little or no chance at being utilized in contingencies or combat campaigns creating wasted training and proficiency opportunities. Additionally, the same AFI fails to mandate proficiency in tasks by allowing a gross amount of time to elapse between the completion of an event or events, while failing to provide commanders effective mechanisms to efficiently train their aviators. Finally, continuation training would benefit from the acquisition and fielding of small non-motion simulators to assist in overcoming flight training obstacles. The C-130H pilot continuation training program can be improved, quickly and inexpensively, to produce more combat effective and proficient pilots.

## INTRODUCTION

*The C-130 is the mating of Jeep/Truck/Airplane...destined to be rugged, versatile, get-the-job done aerial truck with many tough and demanding tasks to perform and varied missions to fulfill.*

–Joseph Earl Dabney, Lockheed-Martin employee

On August 23, 1954, the first C-130 took flight from Burbank California.<sup>1</sup> Sixty-one years later, Lockheed Martin's multi-faceted airframe still being operates all over the globe by governments and corporations alike and still remains in production. The largest and most prolific user of this venerable aircraft is the United States Air Force (USAF). The design, testing, and fielding of this aircraft was conducted only one decade after the events of the Second World War, its intended function as a reliable combat airlift/airdrop platform has been proven on countless occasions. However, the training paradigm covering C-130 utilization should not be stuck in that era given the problems, limitations, and technology advancements of today.

Today the C-130H, aircraft built from 1974 until 1992, and its crews face numerous challenges in the operational environment, which have a direct correlation to the conduct of mission training. Specifically, the training ensuring C-130H pilot's currency and proficiency in the mission-sets they perform is called continuation training. These mission-sets are derived from national security contingency plans, and are the national war planner's predictions to strategically procure and align resources and capabilities. Changing or eliminating these mission-sets, as defined by our elected political leaders through the National Security Strategy (NSS), falls outside the purview of this report. The internal inefficiencies evolving within these methodologies, then altering the conduct of training mandates the motivation for this research.

In addition to the combat capabilities tied to national security concerns, the current fiscal environment could arguably be the next decisive factor on operational and training decisions for

the C-130 community. Saving money and resources must be accomplished while concurrently providing military members from infantry troops to pilots with realistic and effective training without degrading combat or mission readiness standards. In keeping with combat capability, analysis of past C-130 combat and operation utilization illustrates how user needs have necessitated and mandated the use of newer, larger, and faster aircraft on certain missions. With the identification of impractical or unrealistic mission sets, the current training construct was examined and scrutinized for more efficient and economical ways of operating. Additionally, the lack of funds has mandated the accelerated retirement of some of the H-model fleet, further hampering operational and training opportunities.

In addressing these concerns, this research project delves into the ensuing question: What actions should Air Mobility Command (AMC) implement to improve pilot continuation flight training to sufficiently keep pace with current fiscal and operational realities? The purpose of this research report determined if certain aspects of C-130 training need re-calibration in scope and priority, then ascertain specific ways to cost-effectively strengthen the training continuation process without eliminating operational capability.

Recommendations for enhancement of the continuation training program emanated from the problem/solution research methodology. Criteria was ascertained by comparing the training effectiveness and mission readiness of the present construct versus proposed changes combined with inputs from numerous subject matter experts (SME) ranging from squadron leadership, training chiefs, and pilots experienced in multiple airframes. Next, a detailed analysis of C-130 capabilities versus Army Brigade Combat Team (BCT) requirements highlights why utilization of the C-130 is less feasible than other alternatives. Lastly, a flight hour cost analysis demonstrates the difference in expenditures between the original training programs versus possible alternatives. To preserve the abilities and capabilities needed in an ever-evolving and



dynamic world stage, it is essential that C-130H pilot continuation training be updated to better account for changes in mission tasking, lack of resources, and technological advancement while ensuring they will be world-wide capable and fully combat ready.

Using the mission description, with historical examples, and how continuation training is conducted, methodology will then be discussed, and criteria established to determine alternatives to solve the problem. Next, recommendations will be made and details given on how these suggestions could potentially improve the situation. Lastly, the conclusion will summarize how the research was conducted, what the findings were, and if implemented, how C-130H pilot continuation training will benefit.

## **BACKGROUND**

### **C-130 “SLICK” MISSION**

As of January 31, 2012, Lockheed Martin delivered 2400 differing C-130 models to over 60 operators throughout the world, which is lauded as one of the longest continuously produced aircraft in the world.<sup>2</sup> Of these aircraft built, over ten percent (257), were the C-130H “Slick” delivered to the USAF.<sup>3</sup> The term “Slick” is used by operators to denote the basic combat airland/airdrop variant of this aircraft (since there are no additional pods, antennas, etc. protruding from the aircraft). Numerous special mission models operate not only with the USAF, but also with the Marine Corps, Navy, Coast Guard, and numerous foreign countries. Officially, the mission of the C-130H is to, “primarily perform the tactical portion of the airlift mission. The aircraft is capable of operating from rough, dirt strips and is the prime transport for airdropping troops and equipment into hostile areas.”<sup>4</sup>

### **C-130 Historical Combat/Operational Missions**

The C-130 first demonstrated its combat effectiveness and versatility in the Vietnam War in the early part of 1965. Being a huge step in technology and capability at the time over the C-47 and C-123 aircraft, “the C-130 Hercules proved remarkably adaptable for in-country tasks, vastly increasing the overall Southeast Asia Airlift System capacity.”<sup>5</sup> With the increased cargo capacity producing huge gains in personnel and cargo delivery, search-and-destroy missions in 1967 delivered the fight directly to the enemy. Operation Junction City saw the wars first and only American battalion-sized parachute assault operations in February 1967, with corresponding use of large amounts of resupply via airdrop.<sup>6</sup> The 173d Airborne Brigade jumped from 13 C-130s near the Cambodian-Vietnam border at a drop zone near a village called Katum, while an additional 10 C-130s dropped the Brigade’s 170 tons of equipment.<sup>7</sup>

Sixteen years passed until the next significant military campaign utilizing the C-130 materialized. In October 1983, the United States led a combined regional force into the Caribbean island nation of Grenada titled Operation Urgent Fury. A military coup resulted in a government friendly with communist Cuba and endangered national interests and citizens living there.<sup>8</sup> An airborne assault type operation was planned and executed, with the focus on Point Salines Airport as the gateway to the island. “Slick” C-130E/Hs were minimally involved in the formation airdrop of Army Rangers as this was primarily carried out by Air Force Special Operations Command (AFSOC) MC-130s.<sup>9</sup> However, the unique characteristics of the isolated target environment combined with the amount of equipment needing moved saw a mixed use of C-130 Hercules and C-141 Starlifter aircraft. The much larger and faster C-141’s proved better suited for the rapid movement of troops and material over extended distances.

Operation Just Cause was a military campaign to restore democracy by deposing its dictator Manuel Noriega, and bringing him to justice for drug trafficking, racketeering, and money laundering. Again, military planners opted for an airborne assault operation. “At 0100

on Dec. 20, 731 Rangers in seven C-141 and four C-130 aircraft parachuted onto Tocumen Military Airfield and the northern sector of Omar Torrijos International Airport.”<sup>10</sup> Similarly with Operation Urgent Fury, C-130 involvement was limited due to great distances, speed, and operational capability compared to the larger C-141. This operation marked the largest combat campaign since the Vietnam War, the largest personnel airdrop since the Korean conflict, and largest parachute assault ever conducted at night.<sup>11</sup>

Airborne assault operations facilitated by C-130s and other airlift assets proved their worth as a tool of deterrence in Operation Uphold Democracy. This intervention was designed to remove the military regime installed by the 1991 Haitian coup d'état which overthrew the democratically elected President Jean-Bertrand Aristide. An initial wave of 16 C-130s departed Pope AFB, North Carolina filled with paratroopers from the 82d Airborne Division. Last minute successful negotiations between President Carter and Raoul Cédras halted the combat invasion of Haiti, and the aircraft heading to Haiti were recalled.<sup>12</sup>

### **Middle East Conflicts**

The Iraqi invasion of Kuwait, launched on August 2, 1990, started a period of fluctuation of combat campaigns and long-term deployment presence in the Middle East. When Saddam Hussein invaded Iraq's much smaller and weaker neighbor to the south, most of the world rallied to its aid. Five days later, President George Bush ordered 100,000 troops to the region to prevent a possible invasion further south into Saudi Arabia, thus beginning Desert Shield, which would eventually materialize into Desert Storm. The statistics of C-130 usage in Desert Storm indicated that airland cargo delivery, not airdrop, would begin to dominate the mission-sets of “Slick” C-130 aircrews. Over 145 C-130 deployed to support Operation Desert Storm and during the timeframe from 10 August to 2 April, C-130s flew 46,500 sorties, logged 75,000

hours flying, moved 209,000 people, and moved over 300,000 tons of cargo with minimal airdrop, usually being conducted by AFSOC aircraft.<sup>13</sup>

The twofold combat operations conducted in Iraq and Afghanistan after the 9/11 terrorist attacks revealed much of same pattern overall. C-130H air mobility assets would be called upon to move massive amounts of cargo and people while rarely conducting airdrops for which they extensively trained. When mass formation airdrop was called for in dropping the 173d Airborne Brigade onto Brashur Airfield in northern Iraq in 2003, C-17s were utilized. As both conflicts evolved and improvised explosive devices (IEDs) became more prevalent, C-130s began airdropping cargo into austere and remote forward operating bases (FOB) via single-ship or two-ship formations using a new airdrop techniques such as low cost low altitude (LCLA) airdrop or via GPS controlled joint precision aerial delivery system (JPADS) depending on the threat composition for the area. Further evidence of the shift C-130s are making from large formation (typically more than four aircraft) tactics was personally witnessed by the author on a recent deployment to Kuwait while serving as the assistant director of operations (ADO) of the 737th Expeditionary Airlift Squadron (EAS). Humanitarian relief and combat resupply airdrops in support of anti-Islamic State of Iraq and the Levant (ISIL) operations were being conducted from September to October of 2014 utilizing single-ship high altitude improved container delivery system (ICDS) methods. A lone aircraft dropped CDS bundles from 17,000 to 20,000 feet altitude to mitigate and defeat the surface-to-air missile (SAM) threat. These historical examples demonstrate the C-130 is ideally suited for past and present airdrop operations. However, they also impart substantiation that as threats and missions change with time and technology, so has the utilization.

## C-130H CONTINUATION TRAINING

*“Si Vis Pacem, Para Bellum (If you want peace, prepare for war)”  
–Flavus Vegettius Renatus*

### **Intent**

Continuation training is one part of the three part training process that formalizes the C-130 aircrew training program. The other two parts consist of initial training, which is typically conducted at a formal training unit (FTU) for newly assigned aircrew members and upgrade training which can be conducted in the FTU environment or at home station. This type of training is used as a mechanism for advancement to positions like aircraft commander (AC) or instructor pilot (IP). As AFI 11-2C-130V1, *C-130 Aircrew Training* (August 2012), states,

The overall objective of the aircrew training program is to develop and maintain a high state of mission readiness for the immediate and effective employment in exercises, peacekeeping operations, contingencies, and war in any environment. Mission readiness and effective employment are achieved through the development and mastery of core competencies for C-130H crewmembers. These core competencies include tactical ingress, tactical egress, airdrop, formation, assault landings, NVG operations during all phases of flight, instrument procedures, mission planning, landing zone (LZ) ground operations, crew management, and C4/AOC [Command, Control, Communications, and Computers/Air Operations Center] integration.<sup>14</sup>

The purpose of continuation training is to ensure pilots are current, qualified, and *proficient* in the overall operations they will be called on to perform in combat or operational sorties. Expertise must also be demonstrated on everyday aeronautical skill sets like airmanship, situational awareness (SA), crew resource management (CRM) and safety consciousness. Within flying squadrons, there is an old adage that states, “There is a fine line between being current and being proficient.” One might ask, “If you are qualified and current, would you not be proficient?” The answer more times than not, is an ambiguous maybe. The reason for this

uncertainty and vagueness concerning the ability to execute the mission comes from the way C-130H continuation training is conducted.

## **Process**

The continuation training process is outlined and directed in AFI 11-2C-130, Volume 1. Upon completion of initial mission or requalification training, each pilot is designated with a flying training level (FTL) based on experience and aircraft proficiency. FTLs are divided into four categories, A, B, C, and E. The most inexperienced pilots are awarded a FTL of C, resulting in the highest numbers of training requirements. FTL B are considered experienced pilots, and have a moderate amount of training requirements. FTL A is reserved for those with a great deal of experience typically found in the squadron's instructor and evaluator pilot corps. FTL E is given those pilots who are senior leaders (wing or group commanders) and will never be called upon to perform combat missions, therefore, their requirements are few in nature and are always under the direct supervision of an instructor pilot (IP) while flying.

Once the FTL is given, the pilot accomplishes the corresponding number of flying training events dictated by the FTL within two separate six month windows. These requirements are known as semi-annual requirements since they are to be performed and completed twice a year in their entirety, January through June and again July through December. The intent is for pilots to spread out over the six months of that semi-annual period, the amount of events performed. However, it is completely acceptable to conduct all training items in January (meeting the first semi-annual requirements), then wait till December to accomplish the remaining amount of training events (meeting the second semi-annual requirements) to maintain mission ready (MR) status. By the AFI, pilots accomplishing training in this manner are 100 percent mission ready, yet their individual proficiency becomes questionable given the long amount of time between training event execution.

A preponderance of pilot continuation training is conducted via semi-annual requirements; however, some events are required to be accomplished with greater frequency. This increase in frequency leads into another mechanism within the continuation training program based on currencies. Depending on the training event, currency is based upon calendar months or three month sets (quarters) to accomplish training events. An example of this would be take-off, instrument approaches, and landings. To remain current, a C-130H pilot must accomplish one of these events each calendar month. However, if a pilot has twelve instrument approaches to accomplish according to their FTL C designation, and only remains current by doing one a month, at the end of the semi-annual period only six of these events will have been done. In this example, the pilot becomes Non-Mission Ready (NMR) due to not meeting the minimum number of events completed for a designated semi-annual period.

Lastly, this process is finalized by the logging and tracking of these events which is carried out by dedicated specialists in the Aviation Resource Management System (ARMS) work center. At the completion of every flight, a pilot annotates every event completed on a training accomplishment report (TAR). The expedient data entry of these TARs by the ARMS specialists is critical because of the process of how flight training, or real-world mission execution will be conducted the very next day if that pilot is scheduled to fly. The ARMS database is used to verify pilots are current and qualified to perform the tasked mission (training or real-world), or if they are not, that an IP is also scheduled for that mission to supervise them.

## **TRAINING PROBLEMS AND KEY ISSUES**

*“To be prepared for war is one of the most effective means of preserving peace”  
–George Washington*

### **Existing Training versus Recent Utilization**

A detailed examination of the training requirements detailed in AFI 11-2C-130 Volume 1 indicates an emphasis on mass formation airdrop mission-sets as opposed to the single ship airdrop and airland (delivery of troops or cargo once the aircraft is on the ground) operations which have been prevalent since the last C-130 formation airdrop conducted in Panama. Currently, a typical C-130H training mission lasts approximately two to four hours. Individual training needs, weather limitations, and aircraft availability determine the events that will be conducted that day and is known as a profile. A standard profile will consist of two routes, one flown at higher altitudes to simulate formation flying in the clouds, known as instrument meteorological conditions (IMC), and another route flown at 300 feet above ground level (AGL) utilizing visual flight rules (VFR). Both of these routes culminate with an actual airdrop of heavy equipment, container delivery system (CDS) bundles, personnel, or small sandbags simulating the aforementioned types of drops. These routes are carefully planned, pre-briefed, and executed to drop within one minute of the predetermined time-on-target (TOT). Upon completion of the tactical portion of the training profile, any excess time is used to perform other training needs such as assault landings, instrument and tactical approaches, and high altitude penetration descents.

Following the terrorist attacks on 9/11, operations in Iraq and Afghanistan established a new precedent for AMC airlift employment for combat operations. The utilization of airdrops have occasionally been conducted in both theaters of operation, a standard deployment of four to six months might witness one or two airdrop taskings emerge. Otherwise, the mission C-130H crews are performing in the deployed or operational environment is one of hauling people and cargo from Point A to Point B. These missions are not trivialized or deemed less dangerous, as numerous reports of surface-to-air fire (SAFIRE) occurred since operations in the CENTCOM AOR began.



To mitigate these threats, new techniques and procedures for conducting airdrop operations have become more prolific during deployments, yet are flown minimally during at-home training missions. AFI guidance mandates all FTL pilots, regardless of experience level, to perform one of these non-standard and complex airdrops per semi-annual.<sup>15</sup> Recent deployment experiences from Lt Col Christopher Sedlacek underscore this trend on using new procedures. He was the director of operations (DO) and then squadron commander (SQ/CC) of the 737th EAS late last year when ISIL forces were aggressively on the move necessitating humanitarian airdrops to fleeing civilians, as well as re-supply airdrops to coalition partners. “ISIL forces had shot down an Iraqi helicopter earlier in the month [October 2014] forcing us to abandon our standard way of airdropping supplies. The threat forced us to operate from high-altitudes out of the WEZ (weapons engagement zone) via single-ship JPADS or ICDS procedures.”<sup>16</sup>

When analyzed from a training and combat capability perspective, proficiency in these types of missions would seem critical. However, according to Maj William Rodriguez, Chief of Aircrew Training for the 327th AS this is not the case. When asked if these missions were practiced often he replied, “Unfortunately no. AFI guidance does not require it, and the logistics involved to perform these type of airdrops is cumbersome. The GPS steering apparatuses are difficult to acquire here in the states, and multiple limitations are in place where we can legally drop these type loads. Crews leave for deployed locations qualified, but have minimal experience with the various technology integration issues between the mission laptops, radios and aircraft”<sup>17</sup> When asked if current training reflects operational taskings he replied, “Not really. We focus on mass concentration of troops and equipment via large formations during training, yet when called upon to perform airdrop mission in theater, they are conducted almost exclusively single-ship.”<sup>18</sup> Pilots and aircrews are unable to *train the way we fight*, because the

continuation training program places its emphasis on meeting outdated or incompatible mission requirements.

### **National Security and Army Needs**

Training, regardless of military occupational specialty, is designed to equip and prepare service members to perform their respective roles as part of an overall joint or coalition force to achieve strategic national objectives. To realize these objectives, the National Military Strategy (NMS) mandates the following, “The U.S. military’s purpose is to protect our Nation and win our wars. We do this through military operations to defend the homeland, build security globally, and project power and win decisively.”<sup>19</sup> The connection between NMS and C-130H training can be found in the previous quote with the following words: *project power*.

The C-130H contributes to the projection of this power by being a force enabler primarily by the intratheater [within a theater] movement of personnel and cargo. This mission, in its simplest form “allows commanders to quickly position, concentrate, or reposition forces wherever and whenever needed. Air mobility forces are critical enablers to creating effects of deterrence, dissuasion, and destruction.”<sup>20</sup> National security needs an overwhelmingly majority of the time are met by moving troops and equipment from one location to another. These missions operate across the globe in a variety of operational environments, permissive and non-permissive alike.

Even though airland operations comprise the preponderance of missions conducted, due to the fact “it is the preferred method of aerial delivery when conditions permit, because it is the most efficient, safest, and least expensive way to deliver personnel and cargo,”<sup>21</sup> certain operational and tactical limitations, as seen in the past, will necessitate utilizing airdrop alternatives. The dropping of airborne troops and equipment is not specifically cited in President Obama’s National Security Strategy (NSS), yet this capability is critical in deterring, “aggression

through forward presence and engagement. If deterrence fails, U.S. forces will be ready to project power globally to defeat and deny aggression in multiple theaters.”<sup>22</sup> One of the primary methods to project that power, especially in remote or land-locked areas of operation (AOR), is through joint forcible entry operations (JFEO).

JFEO exists as any combination of the services working together. Amphibious or other near water operations cater to joint Navy-Marine Corps teams, while remote destinations require the speed, range, and payload capability of a joint Army-Air Force operation. “Joint forcible entry operations seize and hold lodgments against armed opposition. A lodgment is a designated area in a hostile or potentially hostile operational area that, when seized and held, makes the continuous landing of troops and materiel possible and provides maneuver space for subsequent operations (a lodgment may be an airhead, a beachhead, or a combination thereof).”<sup>23</sup> To be successful, a JFEO utilizes many of the basic tenets of warfare that can only be accomplished by rapid airlift capabilities. These include, mass, maneuver, and surprise.<sup>24</sup> With a relatively small combat load (compared to C-17s and C-5s), the C-130 is not traditionally identified a strategic airlift asset, yet depending on the tactical situation, it remains an integral part of the air mobility triad.

Modern airlift draws strength from their phenomenal capacities to move huge amounts of materials, long distances, in relatively short amounts of time. However, airlift is a finite resource. JFEO operations similar to those used in Operation Just Cause required extensive planning and coordination to ensure the flow of troops, typically being carried in dissimilar aircraft with significant speed disparities, arrive over the objective area at the correct time. Additionally, the operational restrictions of the AOR and overall complexity of the contingency, a particular airframe may not be properly suited to support the mission.

Exemplifying this operational requirement versus operational capability mismatch is realized in the rapid deployment of the Army's Brigade Combat Teams (BCT). The goal is to place a credible combat force on the ground anywhere in the world in 96 hours from liftoff.<sup>25</sup> Currently, the Army fields three distinct BCTs: the Heavy Brigade Combat Team (HBCT), the Infantry Brigade Combat Teams (IBCT), and the Stryker Brigade Combat Team (SBCT). Since the Stryker, an eight-wheeled armored fighting vehicle was specifically designed to fit inside the dimensions of the C-130 cargo bay, it was used for analysis.

The SBCT is a *medium-sized* fighting force attempting to, "balance combined arms capabilities with significant strategic and intra-theater mobility."<sup>26</sup> This modular building-block fighting force consists of approximately 300 vehicles and 3500 soldiers.<sup>27</sup> A C-130 can only carry one Stryker or two high mobility multipurpose wheeled vehicles (HMMWV) at a time with fuel load being a limiting factor depending on the distance to the target. Realistically, C-130s would never be used exclusively to move a force of this size since it would take a fleet of 50 aircraft weeks to completely transport this force. For comparison, a RAND study concluded that 60 C-17 aircraft, with three times the cargo capacity of the C-130, would require 14 days to transport the SBCT from Fort Polk, Louisiana to Bogota Columbia, a distance of 1907 nautical miles.<sup>28</sup>

Limitations in the C-130's physical size and performance capabilities are not conducive to large-scale, long distance Army transportation. When massive amounts of materials are needed to be moved intercontinentally, other aircraft will be called upon. Likewise, when the assets needed to comprise an adequate JFEO are analyzed, with the realistic distances needed to cover to get to the fight, the C-130 fails to meet the logistical requirement.

### **C-130H Fleet Age and Downsizing**

C-130H production started in 1974 and ended in 1997 with the introduction of the new C-130J Super Hercules, giving an overall average fleet age of 33 years old.<sup>29</sup> Near continuous deployments and operating in harsh environmental conditions (desert sand and dust) combined with evolving technologies and growing aviation regulations are threatening to make the C-130H fleet obsolete. As these limitations, both hardware and regulatory in nature mount, difficult decisions have to be made on whether to modernize (buy updated equipment for existing aircraft), or recapitalize (buy new production aircraft), or retire them from service.

Historically, AMC chose to modernize the existing fleet with varying improvements to their aircraft's avionics, defensive systems, and communication capabilities. These improvements resulted in a *non-standard* fleet of C-130H aircraft, a problem the C-130 avionics modernization program (AMP) has been attempting to remedy since 1993.<sup>30</sup> As these aircraft continue to age and the technology needed to operate in varying airspaces around the world increases, the USAF has elected to reduce the C-130 fleet to approximately 300, a reduction of 58 aircraft.<sup>31</sup>

A vast majority of these aircraft are assigned to Air National Guard (ANG) and Air Force Reserve Command (AFRC) units, with pilots having limited training opportunities since they do not work or fly at the squadron everyday like an active duty pilot. As these aircraft are increasingly decommissioned, the number sorties generated, further diminishes, compounding the training problem.

### **Constrained Fiscal Realities**

Conducting continuation training in the actual aircraft is very expensive. When the combined costs associated with generating a training sortie are tallied, one hour of flight training ranges between \$9,000 to \$12,000 depending on service component (air reserve component (ARC) being cheaper than their active duty counter-parts).<sup>32</sup> For fiscal years (FY) 2006 through

2010, the Air Force (all three components), provided on average, 65,000 hours of flight training per year for the C-130.<sup>33</sup> Averaging the cost per flight hour to \$10,500 and multiplying that by 65,000 nets a total of \$682,500,000 per year. Identifying unnecessary training events by either shortening the amount of training hours required annually, or keeping the hours to become more proficient in essential mission-sets will result in more proficient and capable crews.

Incorporated within the flight per hour calculations for ARC crewmembers and support personnel is pay. With the numerous Congressional *continuing resolutions* and threat of government shutdown, the last several years have seen the dramatic step of the ARC reducing or taking back funds made available to train crews. On how these reductions of flying hours impacted training, Maj William Rodriguez explained the following, “Our TRs [traditional reservists] rely on AFTPs [additional flight training periods] to maintain MR status. When those hours and training events were taken away, it hampered normal scheduling of pilots because a number of pilots became non-current or unqualified, needing instructors to regain lost status or currency”<sup>34</sup>

### **Training Focus and Construct**

As previously described, the training process has an end goal of producing and maintaining combat-qualified aircrews. This process endeavors to provide the amount of training sorties required to makes pilots comfortable performing the missions they may be called upon to someday perform in a conflict. This comfort with the mission, and all the nuances that accompany it, is more commonly known as proficiency.

The continuation training program in its current form relies on *counters*, or as the crews calls them, *beans*, to maintain currency. This system, with six month windows of training opportunities and limited event numbers needing to be accomplished makes proficiency in mission tasks events required for pilots to be comfortable. A flaw in this program is the potential

for significant amounts of time to elapse between events allowing pilots to be current, yet far from being proficient. This training model, while offering a great deal of flexibility, permits the proficiency of pilots to atrophy. This stagnation of skills could be mitigated by restructuring the way C-130 pilots train and the way training is tracked or logged.

The current C-130 community is structured so that 100 percent of its pilots and aircrews are airdrop qualified. Altering of this paradigm could prove to be a long-term viable option to increase combat readiness by focusing a greater deal of the training to tasks that C-130 crews perform in theater. This restructuring, would divide the C-130 fleet effectively into two entities. One group would be limited to the delivering of personnel and cargo via airland (landing and unloading), while the other could perform airland and the airdrop mission as well. The exact nature of this division would have to take multiple factors into account. Planned operational taskings, worst-case contingency planning, and for ANG and AFRC units, supporting potential state and domestic missions.

### **Criteria Being Measured**

#### **Effectiveness of Training**

The C-130H continuation training program is measured and evaluated almost daily within flying operations groups by the Standardization/Evaluation office (OGV). OGV verifies that that the training procedures and syllabi meet the standards outlined in AFI 11-2C-130V2, C-130 Aircrew Evaluation Criteria. This manual gives detailed benchmarks on specific areas that are being evaluated with grading criteria (Q1, Q2, and Q3) listed for each area. This is done by the administration of periodic flight and ground evaluations and well as no-notice and spot evaluations. Periodic evaluations occur on a 17-month cycle and include an emergency procedures verbal examination as well as multiple tests depending on qualifications. No-notice

and spot evaluations are less formal evaluations designed to evaluate a specific event, sometimes with no prior notice the evaluation was to occur.<sup>35</sup>

Analysis of evaluations given in 2014, utilizing current continuation training guidelines, to the pilots of the 913th Airlift Group [full disclosure, this is the author's current flying unit], which consists of one active duty squadron (50th Airlift Squadron) and a reserve squadron (327th Airlift Squadron) had the following results. Of the 68 periodic pilot evaluations given, 61 of them were graded Q1 (meets standards), two were graded Q2 (meets standard with some deficiencies), with the remaining five evaluations graded as a Q3 (below standard).<sup>36</sup> Of all the evaluations given that year, 93 percent of the pilots met the expectations of the evaluators with only seven percent resulting in evaluation failure. Of these eight failures, the area resulting in the awarding of the Q3 fell within the tactical or airdrop realm of the check ride.<sup>37</sup> Of the 118 evaluations conducted, only one failure was recorded in the basic airland section of the check ride.<sup>38</sup> If continuation training shifted focus from less demanding and unused/unneeded tactical areas (formation tactical airdrop events), and began focusing more on the airland segment of the mission (which was determined to comprise a majority of combat sorties) , the statistics presented above would improve as most of the downgrades rested in the tactical portion of the evaluation.

### **Mission Readiness**

The capacity to perform the basic mission outlined by each unit's mission capabilities (MISCAP) statement defines the unit's MR status. This ability to perform the mission is tracked and logged using semi-annual *counters*, or upon calendar based currency to gauge MR status. Each individual's training events are carefully screened to ensure they are able to legally fly the mission tasked, whether it is a home-station training sortie or an off-station operational mission. When pilots are found to be non-current for a particular event they are assigned an IP. Pilots can



lose currency for a multitude of causes, but tend to go non-current for the following reasons: medical issues, commonly called DNIF (duty not including flying), deployments (both flying and non-flying), and availability to fly (this would apply to ARC pilots only).

Analysis of overall unit mission readiness is tracked and recorded in the Status of Resources and Training System (SORTS). This is a classified reporting system, thus making it impossible to utilize. However, unit flying training reports have no classification and detail those pilots who have gone unqualified or non-current. Again using the 913th AG (consisting of the 327th AS and 50th AS), the 2014 NMR reports detailed the following MR statistics. Of the 82 pilots assigned to the 913th AG, only 13 pilots went NMR representing 16 percent of the pilot force.<sup>39</sup> Of those 13, eight went overdue training events due to deployments.<sup>40</sup> These deployments ranged from ground positions with no flying, while others flying deployment spanned an entire semi-annual period making the accomplishment of the predetermined number of specific training events, as directed by the FTLs in AFI 11-2-C130V1, impossible to obtain.

Analysis of this data has determined that the 913th AG has done a commendable job in maintaining MR status while maintaining the current standards established in the C-130 evaluation AFI. As a comparison, similar training reports were requested from the author's previous unit, the 440th Airlift Wing (AW), 95th AS located at Pope Army Airfield, NC. During the same period of time (2014), the 440th OGV conducted 88 pilot evaluations. Of these 88 pilots, 83 earned a Q1, three a Q2, and three a Q3.<sup>41</sup> The "Flying Badgers" of the 440th AW posted very similar results to those exhibited by the 913th AG, with 97 percent of their pilots meeting the expectations of the pilot evaluator corps.

Further investigation of the 440th pilot MR statuses exhibited numbers comparable to the 913th. Of the 98 pilots attached to the 440th in 2014, 26 went unqualified or non-current (NMR).<sup>42</sup> Seven of these were for deployments, three for extended DNIF, and the 16 remaining

pilots (all TRs) were unavailable to train due to work conflicts (training with airlines, cargo carriers, etc.).<sup>43</sup> This unavailability was as a result of the slated inactivation of the 95th AS and removal of all permanently stationed aircraft at Pope Army Airfield, resulting in the savings of \$116,000,000 and the elimination of eight excess C-130's.<sup>44</sup>

### **Cost Savings**

*“We are demanding greater effectiveness and efficiencies. In a resource-constrained environment, we are striving to be careful stewards of our resources. Programmatic discipline by the Services has never been more important, as it is vital to generating economic efficiencies.”*

-- The National Military Strategy of the United States of America 2015

If history, national security requirements, and aircraft limitations dictate a change in mission focus of the C-130H, could the *resource-constrained* environment mentioned above be the final factor in mandating a change? Continuation training, being derived from the potential mission-sets and contingencies of both state and domestic requirements, as well as the needs of combatant commanders, could be updated to better reflect those needs. These updates have the potential to significantly reduce training cost, or if hours flown remain the same; generate better proficiency in the remaining training tasks.

In the examination of a pilot TAR, the elimination of certain training events focusing on those missions not deemed essential could generate considerable savings. As explained earlier, typical training lines last roughly three hours with these sorties divided into roughly three segments. The removal of the training requirements no longer necessitated (those focusing on large formation procedures) can reduce sortie length by approximately one hour. According Maj Rodriguez, the 327th AS Chief of Training, a standard mission training profile consists of one route utilizing station-keeping procedures (SKE) which allows large formations to fly together regardless of the weather conditions, followed by low-level (LL) visual routes.<sup>45</sup> The

elimination of this one segment of training, which has not been used since the Panama invasion,<sup>46</sup> of the training profile has a tremendous potential to eliminate unneeded capabilities and save vast sums of time and resources.

If the decision was made to cut C-130H continuation training by one-third, with the elimination of unutilized tactical capabilities, flying hours could be reduced by over 21,667 hours annually. At the cost per flight hour stated above at \$10, 500 an hour on average, the savings would exceed \$227,500,000 per year or a marked increase in capability and proficiency if the flight hours remained. With the per unit cost in FY 2014 of approximately \$70,000,000 per copy,<sup>47</sup> three of the newest C-130J Super Hercules could be bought with the funds if not allocated to potentially obsolete tactical procedures.

### **Alternatives**

#### **Shift Focus Away From Mass Formation Operations/Training**

As recent history has demonstrated, C-130 combat operations have concentrated on the intra-theater delivery of cargo and personnel, with the occasional foray into the airdrop spectrum of operations. The C-130 has been utilized for humanitarian and combat airdrop operations on numerous occasions since its last use in a large mass airdrop formation in 1983, but always in a single ship or small flight (less than four) aircraft. Additionally, the Army has *outgrown* the C-130 since its demands have changed over time, including both timetable execution (96 hours in place) and in airlift requirements. The C-130 simply does not have the speed, range, and lift capacity to meet the immediate strategic intercontinental needs of the Army.<sup>48</sup>

These limitations have been recognized within the C-130 “Slick” community for quite some time. In 1998, HQ AMC convened a multi-command C-130 Tiger Team to analyze many problematic facets of the C-130 mission including the need to conduct mass formation airdrop operations and training. In regards to this question, the Tiger Team offered four distinct options

to address this question. Three of the options involved taking certain percentages of the C-130 fleet and designating them as airland only or airland/airdrop qualified.<sup>49</sup> The fourth option (designated Option Zero) called for doing nothing. This would allow all C-130 “Slick” units to maintain full combat capability in all force projection functions encompassing both airland and airdrop. This was the option recommended by the Tiger Team for the following justifications: the crews themselves view formation airdrop a core competency, the concern that multiple qualifications within the community would create a “A Team/B Team culture” amongst the total force (especially between the active duty and ARC units), difficulty with changing duty stations (PCS) and the effect of having IPs able to instruct in some but not all mission sets, and, most importantly, having all pilots and crews airland/airdrop qualified for maximum flexibility for combatant commander needs.<sup>50</sup>

Seventeen years have passed since this one (and only) formal investigation into altering the operational and training focus of the C-130 weapon system. Since that time, the C-130H fleet has shrunk considerably, and will continue to diminish in size as age, requirements and money become an increasingly limiting factor. The potential savings or reallocation of scarce flight training hours could be a reasonable course of action that was unfeasible nearly 20 years ago.

### **Adoption of C-17 Operational Construct**

The C-17 did not follow in the footsteps of its older and smaller brother in terms of organizational concepts and structure. From its initial declaration of being operational in the mid 1990’s, C-17 squadrons were segregated with designations of being airland only or airland/airdrop qualified. C-130 units maintain 100 percent airland/airdrop capability while the AF elected to designate only 19 out of 29 C-17 units as airdrop capable. Even within these

*specialized* C-17 squadrons, only a select few within these 19 squadrons are permitted to be airdrop qualified.

Whereas the previous alternative had formation airdrop capability (theoretically different by the percentage of those who would be airdrop qualified) in each unit, the C-17's took a more all or nothing approach. With the factors identified in this research project, the suggestion of C-130 squadrons embracing this style of construct could now have viability since operational demand, fleet reductions, and harsh fiscal climate are necessitating the streamlining of resources. However, altering the fleet-wide dynamic would not be an easy or popular undertaking. C-130H crews have a great deal of pride and can-do attitude concerning all facets of the operational mission with particular emphasis on airdrop operations.

### **Proficiency Versus Counters**

The C-130H pilot continuation training program was thoroughly detailed and explains how the training events are tracked, via calendar currencies or through semi-annual counters, to determine MR status and proficiency. At little to no cost to the AF, this system of tracking and logging of training events could be reorganized to focus less on numbers of events being accomplished within a period, to equally spreading the training burden over more time allowing lessons learned and muscle memory to develop from more consistent training.

The current database ARMS utilizes to track pilot training would require minimal alteration to facilitate this change. The training events would remain the same with the only benchmarks requiring an updated would be the timeframes between event completions. Currently a FTL C pilot could accomplish 12 assault landings in one sortie [this is possible yet not easily done] or two sorties in January, not perform an assault landing till the end of December and be current. Breaking up these 12 event counters over more definitive amounts of time would promote the proficiency the current training program lacks. Simple math would

require the same 12 assault landings to be completed at a rate of two per month within a semi-annual period. If more are performed within a given month, these could count towards the 12 needed for the 6 month semi-annual period, but in no case would a pilot be able to go one full month (30 calendar days) from completing that event again. If a pilot finished 12 assault landings on the 15<sup>th</sup> of the second month of the semi-annual period, he or she is good for 30 days until the 15<sup>th</sup> of the next month (and so forth) and lasting through the end of the semi-annual period. Examination of the 11-2C-130V1 training tables identifies certain events with minimal counters to complete (three or less). These counters could also be changed to reflect a *rolling* date of completion or maintain the current frequency since the numbers required cannot be subdivided. Combining the restructuring of mission set focus and the corresponding change to the continuation training tables would enable those events with low numbers to increase allowing pilots to develop the proficiency and tactical expertise needed in the events they are more likely to perform in a deployed environment.

### **Tailored Training for Individuals and the Real World**

In the search for streamlined and efficient processes, wasting flight training time on pilots who are exceptionally qualified and proficient is another area for examination. FTLs are assigned by the squadron commander (through the training office) based on experience and skill. These FTLs apply to both the non-tactical (instrument approach, normal take-off, landings, etc.) and the tactical (low-levels, assault take-offs, assault landings, etc.) with no mechanism to separate the two subareas. For example, a highly experienced pilot transferring into a C-130 unit from a non-tactical airframe (DV transport is a good example) would be exceptionally qualified at flying instrument approaches, yet way less proficient at tactical events. Consequently, this pilot could be given a FTL B (highly experienced) in instrument flying and assigned a FTL C (inexperienced) for mission specific events.

Another example of tailored training that could be utilized to save on flight training hours is known as *just-in-time* training. C-130 units have used this training technique for some of its less used, less popular, or more difficult to accomplish training events (difficulty typically in obtaining the proper parachutes, rigging materials, or authorized airspace). An example of an event utilizing the just-in-time concept would be low cost low altitude (LCLA) airdrops. These types of airdrops have been crucial in the emergency resupply of forward deployed Marine and Army units, especially in the underdeveloped and difficult terrain of Afghanistan. The basic premise of LCLA airdrops is to use non-serviceable personnel parachutes or even heavy-duty trash bags to deliver light weight cargo from altitudes ranging from 150 to 300 feet while traveling 130kts.<sup>51</sup>

This critical tactical event, used for quick forward-based resupply utilizing minimally sized drop zones (DZ) allows supply convoys to stay off the road with less susceptibility to IED (improvised explosive device) attacks.<sup>52</sup> However, this specific type of airdrop is rarely practiced and is given very little significance, even within the aircrew training AFI. It states, “LCLA is one-time training for all crew positions... Semi-annual continuation training for LCLA airdrop is not required, but units will refresh crews on LCLA operations prior to AOR deployment.”<sup>53</sup> If training for particular airdrop missions that were recently conducted in the combat environment with a great deal of success can be done using just-in-time training, as directed by AFIs, what other less functional or obsolete mission events can be undertaken in the same manner?

### **Increased Use of Simulators**

Our current *fiscal culture* is one of doing more with less. As this research has determined, not unexpectedly, that actual flight training is expensive. Being able to find training

alternatives to devote precious time to training events that can only be replicated in the aircraft is a sensible course of action.

Pilots and aircrews have been making use of simulators as safe and cost effective training platforms for decades. Consequently, C-130 pilots (like most other civilian and military pilots) must attend simulator refresher training combined with crew resource management (CRM) training annually.<sup>54</sup> For C-130H pilots, this training is accomplished in extremely large and technologically advanced hydraulically actuated full-motion simulators. These simulators have a base cost of \$26,000,000, with additional operating costs of approximately \$850 per hour.<sup>55</sup> These simulators require a significant number of highly trained technicians to keep them functional, not to mention a building large enough to house the simulator capsule itself and its entire supporting infrastructure making them impractical to purchase and construct at every installation.

A compromise, however, is the use of non-motion room sized simulators. Recently, the ANG has contracted for six of these simulators called the Multi-Mission Crew Trainer (MMCT), starting with the 179<sup>th</sup> Airlift Wing in Mansfield, Ohio. According to Col. Mark Auer, the 179<sup>th</sup> Operations Group commander, “The MMCT when fully operational will act as a low-cost squadron level trainer that allows for advanced mission rehearsal, threat awareness training, aircraft system refreshers, emergency procedure and crew resource management training.”<sup>56</sup> The subsequent contract cost for 30 additional *micro-sims* is approximately \$2,000,000.<sup>57</sup> This places the per unit cost at roughly \$66,667, or slightly over 6.3 hours of flight training based on the \$10,500 cost per training flight hour in the actual aircraft. For roughly the cost of a two-ship training sortie lasting three hours, this simulator can be purchased, delivered, and set-up. The dollars spent on this training device, which could run far in excess of actual aircraft flight hours, would have an incredible benefit-cost ratio.



## Conclusions

Even though the C-130H has proved, and continues to prove, its worth as a premier airlift asset, the continuation training programs for its pilots has languished in the past. Archaic paradigms on how the C-130 will be employed in the next “big shooting war” still reign absolute. Even though the active duty is divesting itself from H-model operations in the very near future, these aircraft will remain in ARC inventories as viable force multipliers for combatant commanders and for emergency domestic operations alike, necessitating innovative and cost conscious ways to produce combat capable pilots. To meet these requisites, the pilot continuation program must be updated.

The information compiled and analyzed for this research report indicates several areas in need of transformation by both AMC and AETC to balance and complement the C-130H mission. Historical evidence not only provided a backdrop from which to draw contextual and comparative data, it also revealed a blatant disconnect between the training being conducted and mission utilization. Another key disparity identified through this research is the needs (size, weight, and time) of the Army versus the capabilities of the C-130H. The modern Army requires too much equipment, far too quickly for the “Herk” to participate effectively. These various incongruities, if permitted to continue, seriously degrade combat readiness by squandering limited flying training hours and wastes vast sums of money and resources.

The best course of action in answering the question of, “What actions are needed to improve pilot continuation training?” would involve a thorough and honest rewrite of the C-130 Aircrew Training AFI, 11-2C-130V1. If the missions flown for the past 25 years are any indication of how training should be conducted, then how we train must change. Make proficiency in critical mission-sets the priority and shift the focus away from the “Normandy style” invasions envisioned by combat planners. These missions are no longer appropriate or

combat effective for the C-130. Additionally, the current training scheme allows for inordinate amounts of time to elapse between events fostering a negative learning and knowledge absorption construct. Pilots flying the minimum number of events at the maximum time intervals allowed will struggle to master their particular craft, making them more vulnerable to pilot induced errors or accidents. Finally, give commanders the flexibility to focus the training pilots need to be successful and proficient. The current training program with its “one size fits all” FTL construction forces units to waste flying training opportunities on unneeded events. This proposal will force commanders and the training section to be more extensively involved in a pilot’s particular strengths, abilities, and flight competencies; yet will allow more efficient allocation of training sorties to be distributed.

Once the allocation of training sorties is optimized with the rewrite and refocus of how training is accomplished, further shrewd initiatives that improve proficiency with minimal fiscal expenditure should be applied. Changing words in an AFI may be the most cost-effective way to save money and resources, followed closely by the use of simulators. These small, room-sized, non-motion devices would allow pilots increased training opportunities by not being limited in the same manner as actual flight training. Weather, crew availability, or aircraft maintenance often limit the amount of training that can be accomplished. These factors disappear with the use of simulators. Simulators will never replace all the nuances associated with actual flight, however, when used as procedural or emergency training devices, pilot proficiency will increase exponentially.

### **Recommendations**

The formulation of recommendations to this research question must be cognizant of the economic limitations our country faces. Our elected political leaders and senior military leaders make difficult decisions concerning the allocation of increasingly sparse money and resources.

This reality was evident in the infamous quote by Donald Rumsfeld, former secretary of defense, when asked about lack of proper defensive armor for the Army vehicles heading north to Iraq in 2004. His reply to this lack of resources, “You go to war with the Army you have, not the Army you might want or wish to have at a later time.”<sup>58</sup> This statement, seen as callous and insensitive to the plight of our soldiers, was an accurate description of the financial issues then, which are even more prevalent today.

First, given the historical precedence, imposing expectations of the Army and limitations of the C-130 H airframe, AMC should examine the continued use of the C-130H for mass formation operations and adjust continuation training (with AETC coordination) accordingly. Mission requirements that do not realistically match platform capabilities or limitations not only waste time and money in training, it negatively affects the readiness of these squadrons by having them focus on mission-sets that have little chance of being employed. Recent operations (consisting of one to three aircraft in formation) have proven and justified maintaining airdrop qualifications in the C-130H, yet have also given credence that the *mass over the DZ*, which the Army requires, is not operationally feasible. Mission-sets, and the training to support them, should be revised to better coalesce the abilities of the C-130H to the needs of the Army, respective states (for those aircraft within the ANG) and other national security requirements. Allow training to focus on the missions the C-130H will perform in combat. If mission requirements, geographic realities, and aircraft limitations necessitate the use of C-17s, change the C-130H focus to operations that embrace its strengths. These missions would include JPADS, ICDS, LCLA, and other small clandestine airdrop operations. Mandate the performance of these types of training events over other less advisable, outdated, or incompatible events.

Second, the way continuation training is conducted, tracked and logged can be quickly and cost-effectively changed to concentrate on missions best suited for the C-130. The AFI

governing the continuation training program makes the claim of promoting a “high state of mission readiness”, yet analysis of the program and interviews from experienced C-130H operators relates a different reality. This program is structured in such a way, that massive amounts of time can transpire between flying and performing an event, either in training or operationally, which could be detrimental not only for the mission, but also to the crews involved. In order to truly promote the *proficiency* mandated by operating complex machines in even more complex environments, a more fluid and consistent administration of training is required. Rewrite the continuation AFI to remove or reduce items not flown in recent combat or contingency operations. Give the pilots and aircrews the training needed to fly the *actual* mission for which the C-130 is now capable to accomplish, not a mission rooted in out-of-date techniques and capabilities.

Third, give commanders the ability to individualize training needs. When pilots or aircrew members do not fit neatly into the predesignated hierarchy of the FTL classification system, introduce a means that allows for command discretion on mission subareas. This extremely quick and easy change to the governing AFI would redistribute and refocus training flight hours. This change would better align the experience levels and training needs of pilots to the available flight training hours provided thereby eliminating unneeded duplication of events. Efficiencies gained by this recommendation will relinquish additional training opportunities to less experienced pilots, improving the overall squadron MR status.

Finally, the proliferation in the use of micro-sims has the potential to increase training effectiveness and proficiency, while also reducing flight hours and costs associated with generating that sortie. The real benefit of these simulators is the preparation or pre-flight mission planning they would enable. Complex scenarios or difficult instrument approaches could be *flown* in the simulator, building confidence and situational awareness in the pilots before flying it

for real. However, the use of these or any other type of simulator is not a full substitute for flying the actual aircraft. “Simulators, even the full-motion types, have a difficult time in accurately relaying the seat-of-the-pants feel and visual representation of the actual aircraft, and pilots would never advocate this as primary form of flight training.”<sup>59</sup> Even though simulators have limitations on providing *air sense* and *flying dexterity*, they are indispensable as emergency procedures trainers, systems refresher training, and situational awareness and confidence building apparatuses.

### Summary

If history is a good indicator of aircraft lifespan, then the C-130H will be employed, deployed and utilized for a great many years to come. Its predecessor, the C-130E built from 1961 to 1974<sup>60</sup>, officially retired from service at Little Rock AFB on May 1, 2012.<sup>61</sup> If the last of the H-model “Herks” emulate this pattern, the last H-model (built in 1996) could very well fly its final mission in 2053 (or later). If these aircraft remain operational until that time, AMC and AETC have an obligation, to the pilots flying them and the American taxpayers, to update and modernize the C-130H pilot continuation training program.

To build familiarity for the C-130H mission, this research project briefly described the basic AF mission-set for the “Slick”, then proceeded to provide historical combat cases and explanation of the current continuation training process to provide context for the training and operational issues confronting C-130H pilots today. These brief case studies and training processes framed the challenge of how the current continuation pilot training, as dictated by AFI 11-2C-130V1, has neglected to stay relevant to current needs.

The current needs or utilization of the aircraft was then explored. This research determined that C-130H pilots train diligently for missions they are likely to never fly. C-130H pilots train to meet national security and end-user (Army) needs for combat operations, yet that

training has been found to diverge significantly from historical and near-present utilization. Additionally, this research found that Army timelines and certain equipment dimensions/weight factors make the C-130 completely unsuitable for certain taskings.

Other mitigating factors, such as C-130H fleet downsizing and age, were detailed since these reductions in fleet health and size will perpetually put strain on the amount of flight hours being offered for continuation training. Flight training, as described earlier, is a very expensive endeavor. Detailed information on flight training hour totals and the cost of those hours were expounded upon to give scope to the immense sums of money spent fleet wide to train C-130H pilots.

To determine if the current continuation training system is meeting the goals outlined by AFIs, baseline criteria was examined for two different units covering 2013 and 2014 was examined by analyzing the effectiveness of current training through squadron training review reports. Additional criteria came from the examination of evaluation data, and where pilot deficiencies occurred during the check ride process. The final benchmark was the financial and potential resource allocation impact updating the pilot continuation training program would provide.

Five distinct changes or alternatives to the current program were propositioned. Shifting the C-130H mission focus from large formation operations to single-ship or small formation operations was explored. Similar in intent to changing operational focus was the assessment of modeling C-130 units after the current operation construct of C-17 units. Two administrative solutions were offered in the changing of how continuation training is structured, tracked, and logged with examples and justification provided. Finally, cost effective micro-sims were introduced and validated as sensible solutions to the fiscal realities of today.

The Air Force, like other large institutions, is resistant to change. Some of the options presented in this research would be simple to implement, while others exceptionally difficult. Dogmatic attitudes, like the steadfast loyalty some Air Corps officers had for high-altitude precision daylight bombing during the Second World War, have to be viewed with great suspicion. What made sense 25 years ago in most cases will not make sense or work today. The C-130H continuation pilot training program is a victim of this mentality.



## Notes

<sup>1</sup> Lindsay T. Peacock, *Mighty Hercules: The First Four Decades*. London: RAF Benevolent Fund, 1994, 9.

<sup>2</sup> Lockheed Martin, "Lockheed Martin Delivers 2400th C-130 Hercules," [http://www.lockheedmartin.com/us/news/press-releases/2012/january/120130ae\\_c-130--240th-delivery.html](http://www.lockheedmartin.com/us/news/press-releases/2012/january/120130ae_c-130--240th-delivery.html).

<sup>3</sup> Lindsay T. Peacock, *Mighty Hercules: The First Four Decades*. London: RAF Benevolent Fund, 1994, 144.

<sup>4</sup> U.S. Air Force, C-130 Hercules," <http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104517/c-130-hercules.aspx>.

<sup>5</sup> Ray L. Bowers, *Tactical Airlift* (Washington D.C.: Office of Air Force History, 1983), 169.

<sup>6</sup> Ray L. Bowers, *Tactical Airlift* (Washington D.C.: Office of Air Force History), 269.

<sup>7</sup> Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command 1941-1991* (Scott AFB, IL, 1991), 133.

<sup>8</sup> Mark Adkin, *Urgent Fury: The Battle for Grenada*. Lexington, MA: Lexington Books, 1989, 23.

<sup>9</sup> Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command 1941-1991* (Scott AFB, IL, 1991), 183.

<sup>10</sup> Thomas Donnelly, Margaret Roth, and Caleb Baker. *Operation Just Cause: The Storming of Panama*. New York: Lexington Books, 1991, 195.

<sup>11</sup> Military Airlift Command Office of History, *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command 1941-1991* (Scott AFB, IL, 1991), 198.

<sup>12</sup> Walter E. Kretchick, Robert F. Baumann, and John T. Fishel. *Invasion, Intervention, "Intervasion" a Concise History of the U.S. Army in Operation Uphold Democracy*. Fort Leavenworth, KS: U.S. Army Command and General Staff College Press, 1998, 76.

<sup>13</sup> Airlift/Tanker Association, *Airlift Tanker: History of U.S. Airlift and Tanker Forces* (Paducah, KY: Turner Publishing Company, 1995), 40.

<sup>14</sup> Air Force Instruction (AFI) 11-2C-130V1, *C-130 Aircrew Training*, 21 August 2012, 8.

<sup>15</sup> Air Force Instruction (AFI) 11-2C-130V1, *C-130 Aircrew Training*, 21 August 2012, 42.

<sup>16</sup> Lt Col C. P. Sedlacek (96th Airlift Squadron Director of Operations, Minneapolis, MN), interview by the author, 12 September 2015.

<sup>17</sup> Maj W.W. Rodriguez (327th Airlift Squadron Chief of Training, Little Rock AFB, AR), interview by the author, 24 August 2015.

<sup>18</sup> Maj W.W. Rodriguez (327th Airlift Squadron Chief of Training, Little Rock AFB, AR), interview by the author, 24 August 2015.

<sup>19</sup> *The National Military Strategy of the United States* (Washington, DC: Office of the Secretary of Defense, 2006), 5.

<sup>20</sup> Air Force Doctrine Document (AFDD) 3-17, *Mobility Operations*, 28 July 2011, 7.

<sup>21</sup> Air Force Doctrine Document (AFDD) 3-17, *Mobility Operations*, 28 July 2011, 37.

<sup>22</sup> Barack H. Obama, National Security Strategy (Washington, DC: The White House, February 2015), 5.

<sup>23</sup> Joint Publication (JP) 3-18. *Joint Forcible Entry Operations*, 27 November 2012, vii.

<sup>24</sup> Air Force Doctrine Document (AFDD) 3-17, *Mobility Operations*, 28 July 2011, 4.



## Notes

<sup>25</sup> Headquarters, Department of the Army, Operational Requirements Document for a Family of Interim Armored Vehicles (IAV), Prepared for Milestone I Decision, Washington, D.C., April 6, 2000, 2.

<sup>26</sup> Army Field Manual (FM) 3-90.6, *Brigade Combat Team*, September 2010, 1-12.

<sup>27</sup> GlobalSecurity.org, “Overview of the Stryker Brigade Combat Team,” <http://www.globalsecurity.org/military/library/army/fm/3-21-31/c01.htm>

<sup>28</sup> Alan Vick, et al, *The Stryker Brigade Combat Team Rethinking Strategic Responsiveness and Assessing Deployment Options*, (Santa Monica, CA: RAND Corporation, 2002), 23.

<sup>29</sup> Aviation Week, “The C-130 Hercules,” [http://www.aviationweek.com/site-files/aviationweek.com/files/uploads/2014/07/asd\\_07\\_10\\_2014\\_crs6.pdf](http://www.aviationweek.com/site-files/aviationweek.com/files/uploads/2014/07/asd_07_10_2014_crs6.pdf).

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<sup>32</sup> Albert A. Robbert, *Costs of Flying Units in Air Force Active and Reserve Components*, (Santa Monica, Calif.: RAND Corporation, 2013), 14.

<sup>33</sup> Albert A. Robbert, *Costs of Flying Units in Air Force Active and Reserve Components*, (Santa Monica, Calif.: RAND Corporation, 2013), 17.

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<sup>35</sup> Air Force Instruction (AFI) 11-202V2, *Aircrew Standardization/Evaluation Program*, 18 October 2012, 35.

<sup>36</sup> Minutes of monthly Review & Certification (R&C) Board, 913th Airlift Group, 1 January 2014 – 30 December 2014.

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## Notes

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<sup>54</sup> Air Force Instruction 11-2C-130V1. *C-130 Aircrew Training*, 108.

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<sup>61</sup> Jeff Rhodes, “Last Active Duty C-130E Retired,” *Code One*, 15 June 2012, [http://www.codeonemagazine.com/article.html?item\\_id=102](http://www.codeonemagazine.com/article.html?item_id=102).

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