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**TITLE: FRANK McCUTCHEON: CRUSADER FOR U. S. MARINE CORPS
CLOSE AIR SUPPORT, INNOVATOR OF COMMAND AND CONTROL**

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EXECUTIVE SUMMARY

Title: Frank McCutcheon – Crusader for U. S. Marine Corps Close Air Support

Sub-Title: Innovator of Command and Control

Author: LCDR J. M. La Point, United States Navy

Thesis: Under the direction of LtCol Keith B. McCutcheon, Marine aviation provided close air support (CAS) for the Army in the Philippines in 1945. McCutcheon's perseverance and innovative ideas in the area of command and control laid the foundation for all close air support efforts in the Pacific and became an integral part of the Marine air-ground team concept that makes the Marine Corps unique today.

Discussion: CAS was slow to start in World War II. There were no standard procedures to follow and a lack of coordination between air and ground units made it difficult to proceed. Additionally, Army ground commanders considered CAS non-responsive, inaccurate and dangerous. LtCol McCutcheon was assigned as the Operations Officer of Marine Air Group (MAG) 24 when he was tasked with devising a way for Marine aviation to protect the left flank of the Army's First Cavalry Division on their drive to Manila. While the Marine aviators had provided close support for Marine ground troops in the past, the methods had been ad hoc and met with varying degrees of success. McCutcheon strongly believed that CAS was an additional weapon available to the ground commander. Effective CAS required reliable, adequate, and deliberate communications with a command and control architecture that could support this demanding mission. His unique ideas shaped an intricate and effective architecture that provided the impetus for these historic missions.

Conclusion: McCutcheon understood what was required to organize CAS and prepare his teams for this mission. He developed and continued to improve upon the command and control structure necessary for CAS. Additionally, he provided the necessary doctrine and operating procedures, fine-tuned his teams' technical and tactical skills, and personally instilled in them a can-do work ethic that led to the successes at Luzon and beyond. He was known as the expert in Marine CAS and would go on to draft doctrine that would guide air operations during the Vietnam War. His legacy lives on as one of the founding fathers of CAS and the overarching Marine Air Ground Task Force (MAGTF) concept today.

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One

Close Air Support - A Beginning

Close Air Support is a Marine Corps innovation.¹

Many Marines contributed to the development of close air support (CAS). One man, LtCol Keith B. McCutcheon, USMC, fully understood the importance of teamwork, organization and command and control procedures that were required for CAS to succeed. Under his direction the Marines were given the mission to provide CAS for the Army in the campaign to take the Philippines back from the Japanese during World War II. His innovative ideas in the area of command and control laid the foundation for all subsequent close support efforts in the Pacific. With a combination of persuasion and foresight, his efforts shaped the solution to the crux of CAS for today's U. S. Marine Corps.

Beginning as early as 1919, United States Marine Corps (USMC) aviators conducted dive-bombing missions in Santa Domingo, China, and Nicaragua that served as a precursor to USMC close air support of combat troops. Defined as:

Attack by aircraft of hostile ground targets which are at such close range to friendly front lines as to require detailed integration of each air mission with the fire and movement of the ground forces in order to insure safety, prevent

¹ United States Marine Corps, Marine Corps Warfighting Pub (MCWP) 3-23.1, *Close Air Support* (Washington, DC: Headquarters, U. S. Marine Corps 1998), forward.

interference with other elements of the combined arms and permit prompt exploitation of the shock, casualty, and neutralization effect of the air attack²

CAS is considered Marine aviation's unique contribution to combat power. "Close" is not a concept that specifies an exact distance from ground troops; it is a situational term.³ "Close" depends on the disposition of troops, any additional fire support, and the terrain. As a guideline, one can consider anything less than a few hundred yards from the troops as close air support. To be complete, CAS requires frequent and robust communication between the ground and the air in order to coordinate the locations of the targets and minimum acceptable distances from troops, to de-conflict other fires, and to process the terrain.

During the years between the two World Wars, air power was greatly under appreciated. Doctrine was slow to develop. Any attempt at CAS was piecemeal and varied between the different military services. Overall, CAS was considered a far-fetched idea and a waste of air power when artillery or Naval gunfire was available.

Hence, CAS had a slow start during the early years of World War II. Due to a lack of support, no standard procedures, and a lack of coordination, it would be late in 1944 before CAS would get its first real test. Several factors contributed to this delay. Army ground commanders believed that CAS was considered ineffective, too dangerous and too expensive.⁴ Army troops feared the inaccuracy of CAS because of previous friendly fire accidents. As a result, when Army Air Force (AAF) aviators used close air support, they were not allowed to attack at close range. Disgruntled troops were forced

² Major John. N. Rentz, USMCR, "Marine Corps Aviation – An Infantryman's Opinion," *United States Naval Institute Proceedings* 75, no.11 (Nov 1949): 1278.

³ MCWP 3-23.1, *Close Air Support*, 1-1.

⁴Robert Sherrod, *History of Marine Corps Aviation in World War II* (Washington, DC: Combat Forces Press, 1952), 291.

to lose ground because they had to fall back to enable the execution of air support. When this happened, the enemy would often occupy the allied positions and impede the allied advance. This led to excruciatingly slow forward progress for the ground troops that often could only be measured in yards.

In short, close air support was neither responsive nor reactive. Missions were often planned one whole day prior. As a result, troops would advance before the planes even arrived. There were no Standard Operating Procedures (SOPs) to follow and no coordination with artillery and Naval gunfire.

In the Pacific theater, where many of the campaigns were fought on the islands thick with jungle, CAS was very difficult to perform. It was nearly impossible for ground controllers to mark targets for pilots to positively identify. Moreover, existing radio technology made it difficult for controllers to communicate with the aircraft. Maps of the terrain were inaccurate and landmarks were scarce; without close coordination, the pilots were unable to find the targets. The combination of these factors fueled the widespread frustration for the inadequacy of existing close air support methods.

In 1943 Marine air power was underutilized in the Pacific. Aircraft were “chopped” or assigned to the ground commander to “use as he saw fit”.⁵ What little support Marine aviation offered was limited to flying air cover sorties for allied landings. MGen Ralph J. Mitchell, USMC, Commander of Air Solomons (COMAIRSOLS) and 1st Marine Air Wing (1st MAW) was looking for more. He wanted his flyers to have a real combat mission. CAS fit the bill.

⁵ Sherrod, 294.

The Army Air Force in the Pacific had chosen not to use air assets to support their ground troops. Basic AAF doctrine considered direct support for troops a low priority. Instead air sorties were focused on escort duty, search and rescue, air cover for convoys, and attack of Japanese troops, supplies, and shipping.⁶ Conversely, the Marines considered support of ground troops a primary mission. Initially this support was in the form of Direct Air Support (DAS) with no ground or in-flight control. Eventually, the Marines would adapt and use their inherent teamwork skills to successfully execute this new kind of CAS and prove the value of this type of mission. At Luzon in the Philippines (see Figure 1 below), Marine aviation would get the chance to demonstrate the first ever CAS mission for Army ground troops and McCutcheon would be the man tasked to coordinate the effort.

⁶ Major Charles W. Boggs, Jr., USMC, *Marine Aviation in the Philippines* (Washington, DC: GPO, 1951), 32.



Figure 1: Luzon⁷

⁷ George W. Garand and Truman R. Strobridge. *Western Pacific Operations. History of the U. S. Marine Corps Operations in World War II. Volume IV.* (Washington: Historical Division, Headquarters, U. S. Marine Corps, 1971), 341.

Two

Keith B. McCutcheon

Keith McCutcheon was the first active duty Marine aviator promoted to General in the Marine Corps' history. During his thirty-four years of military service, General McCutcheon's most significant contribution to the Marine Corps was his understanding and vision of the Marine air-ground team.⁸

LtCol Keith B. McCutcheon, was assigned to Marine Air Group (MAG) 24 as the Operations Officer when his commanding officer, Col Clayton C. Jerome, USMC, approached him with the challenge to devise a way to protect the left flank of the Army's First Cavalry Division with close air support. This was in response to General Douglas MacArthur's orders, which on 12 October 1944 requested one Marine dive-bomber group with seven squadrons, to support Army ground forces. With inadequate doctrine and non-existent training, McCutcheon realized that his men were unprepared to fulfill a CAS mission. But he also knew that his Marines were traditionally Marines first and aviators second. Hence, they would understand the plight of the infantrymen and ultimately be better adapted to provide close support for the ground forces. Accepting the challenge, he was determined to train his Marine aviators to perform the close air support mission.

Keith McCutcheon (see Figure 2 below) was born in Ohio in 1915. After completing his Bachelor of Science degree in management engineering from Carnegie

⁸Major Kevin L. Smith, USMC. *General Keith B. McCutcheon, USMC: A Career Overview From the Dauntless to Da Nang*, MMS Paper (Quantico, VA: USMC Command and Staff College, 1999), 2.

Institute of Technology he accepted a commission in the Marine Corps in 1937. In 1940 he completed flight school and served with Marine Observation Squadron One. From 1941 to 1943 he completed undergraduate and graduate work in aeronautical engineering at the Naval Postgraduate School and then the Massachusetts Institute of Technology. While his schooling took place during the war, he was brevetted from Captain to Major and finally to Lieutenant Colonel in only 27 months. Prior to MAG-24, he served as Executive Officer of MAG-41 in California.⁹



Figure 2: General McCutcheon¹⁰

⁹ Information in this paragraph derived from: Karl Schoun. United States Marine Corps Biographical Dictionary; The Corps' Fighting Men, What They Did, Where They Served (New York: Watts, 1963), 137.

¹⁰ Photo taken of Portrait by Neary, located at Marine Corps Research Center, Quantico, VA, 14 March 2002.

While attached to MAG-24, McCutcheon flew multiple hours in the Douglas Dauntless dive-bomber (see Figure 3 below) in the Pacific at Leyte, Luzon, and Mindanao. Although he had received little operational experience, he had an uncanny ability to understand what it took to make a Marine air-ground team. His legacy would become one of developing air-ground doctrine for the entire USMC. He was determined to do the right thing, namely, integrate the joint forces in air-ground warfare, no matter how difficult the effort. McCutcheon was confident of his ability to succeed in challenging situations, as was evident in a letter he wrote to a potential employer prior to joining the Marine Corps:

I particularly pride myself in the fact that I can carefully and meticulously plan and organize my work in a most efficient manner; and not only plan the work, but to execute it with rapidity and accuracy. The ability to do these things lies in my will-power and conscience. Anything I have been responsible for, or anything I have undertaken, I have always endeavored to complete. It also seems that my capacity increased with the pressure; that is, the more work there is for me to do, the more efficiently I perform.¹¹

With this same mindset, and in order to succeed at this difficult mission, McCutcheon carefully picked his CAS team members and selected officers who exhibited similar attributes to his own.

¹¹ Graham A. Cosmas and LtCol Terrance P. Murray, USMC, *U. S. Marines in Vietnam: Vietnamization and Redeployment, 1970-1971* (Washington DC: History and Museums Division, Headquarters, U. S. Marine Corps, 1986), 20, as referenced in: Major Kevin L. Smith, USMC, *General Keith B. McCutcheon, USMC: A Career Overview From the Dauntless to Da Nang*, MMS Thesis (Quantico, VA: USMC Command and Staff College, 1999), 5.



Figure 3: Douglas Dauntless SBD.¹²

Col Jerome, commanding officer of MAG-24 and MAG-32, had also been McCutcheon's senior instructor at the Naval Postgraduate School, and was one of McCutcheon's respected mentors. This respect was mutual. Col Jerome was the first to agree with McCutcheon's description of himself and likewise invested a large amount of trust and confidence in McCutcheon's innovative ability to get the job done. This would not be the first time that Jerome would expect perfection from McCutcheon, for McCutcheon had also been one of Jerome's best students, graduating first in his class.¹³ Their close senior-subordinate relationship would blossom during World War II and

¹² "History of Marine Corps Aviation. The Philippines," URL: www.acepilits.com/usmc/hist11.html. Accessed 7 January 2002.

¹³ Smith, 7ⁿ.

would last through both gentlemen's lengthy careers because of their creative personalities, common goals, and love for the Marine Corps. It was with complete confidence that Jerome would task McCutcheon with the development of doctrine and training of forces for the Marines' first real close air support missions at Luzon.

Three

Luzon

Air power is not to be considered as a competitor or a substitute for either of the other two supporting arms [artillery and naval gunfire]; it may, however, be thought of as a supplement. In some respects aircraft are mobile platforms for transporting firepower closer to the enemy; in other words they are long range, mobile artillery.

LtCol Keith B. McCutcheon, USMC¹⁴

Air support would be like a bayonet.

Col Clayton C. Jerome, USMC¹⁵

MGen Ralph J. Mitchell, USMC, was in charge of 1st MAW in the Pacific from 1943 to 1944. His air forces were tasked with minor operations designed to whittle away at the enemy air force and provide air cover for allied landings. This chore became monotonous for the Marine flyers. Consequently, MGen Mitchell was fervently looking for another mission, and more importantly a combat assignment. In October 1944 his wishes came true with an assignment to support Army's XIV Corps operations at Luzon. Mitchell subsequently assigned the operational portion of this new mission to Jerome and MAG-24.¹⁶

¹⁴ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, "Employment of Close Air Support," (Quantico, VA: Marine Corps Schools, 8 August 1946), 1.

¹⁵ Capt John A. DeChant, USMCR. *Devilbirds: The Story of United States Marine Corps Aviation in World War II* (New York: Harpers & Brothers Publishers, 1947), 179.

¹⁶ Boggs, 57.

Although Luzon would mark the first use of USMC CAS for Army troops during the Pacific campaign, it would not be the first time Marine aviation provided close air support. As mentioned previously, close air support was not foreign to the Marines. As recently as 1939, USMC doctrine stated that the primary mission of Marine aviation was to support Fleet Marine Force amphibious landings and troop activities in the field.¹⁷ Still, early close air support missions had been ad hoc and employed on the basis of spur of the moment decisions, and with varying degrees of success.¹⁸ As early as 1942, the 1st Marine Division experimented with Air Liaison Parties (ALPs) using portable radio gear and colored panels to direct aircraft to enemy targets. The early techniques were rudimentary, but ignited the evolution of CAS.

Modern day Marines Corps close air support debuted in November 1943 on the island of Bougainville in the Northern Solomons. LtCol John T. L. D. Gabbert, USMC, the 3rd Marine Division Air Officer, organized a small school for ALP training. It was at Bougainville that colored smoke was first used to mark targets for better bombing accuracy. The effect of different settings for bomb fuses as well as appropriate safety margins for ground troops were considered. Unfortunately, it was also at Bougainville that a friendly fire accident occurred, killing two men and injuring six others. Accidents such as these would fuel the Army's disinterest in using close air support with its troops. In fact, the Army's field manual (FM 100-20), although never approved by Army ground forces, strongly argued *against* the merits of CAS.¹⁹

This non-acceptance of close air support by the Army and the lack of doctrine and standardized tactics for close air support presented a huge but necessary challenge for

¹⁷ Sherrod, 31.

¹⁸ Garand, 305.

McCutcheon and MAG-24. CAS was a prerequisite for success in defeating the enemy. Only by assault from the air could the allies route the Japanese out of their dug-in positions; the enemy's caves were impossible to attack from the ground.

Unlike the Marines, the Army considered close air support only to be a corollary mission to strategic bombing and, overall, a waste of good firepower.²⁰ Army ground troops had neither the confidence that their own aircraft would not mistakenly bomb them nor did they believe air support should be used within range of ground artillery. When CAS was employed, it was AAF policy to control the aircraft at a higher command level, far away from the frontline troops, using a complex command and control architecture. This cumbersome process exacerbated the Army's earlier experiences with CAS, which failed because of a lack of the required teamwork. The air portion was not integrated into the ground operations and the limitations of the aircraft were not understood on the ground. There was inadequate planning and coordination. Finally, the Army failed to provide the necessary personnel and equipment to carry out the mission.²¹

So, when the assault mission at Luzon called for USMC air support for the Army's First Cavalry Division's advance to Manila (see Figure 4 below) there was understandably some concern on the part of the Army. As a result of the Army's jaded view of close air support, McCutcheon and his staff would need to change the accepted attitude toward air support. To succeed, the previously ad hoc Marine way of close air support had to be refined and perfected. Air-to-ground communications and the command and control structure had to be fixed. The ALPs would require the authority to

¹⁹ Sherrod, 191.

²⁰ Capt Robert B. Asprey, USMC, "Close Air Support," *Army* 12, no. 4 (Nov 1961): 36.

²¹ McCutcheon PC #464, Box 3, Headquarters, 8th Army, "Introduction to the SOPI", 8 June 1945.

direct the aircraft from the front lines. Finally, the Army had to accept this method of close air support as their own method. McCutcheon had some major work and convincing to do.

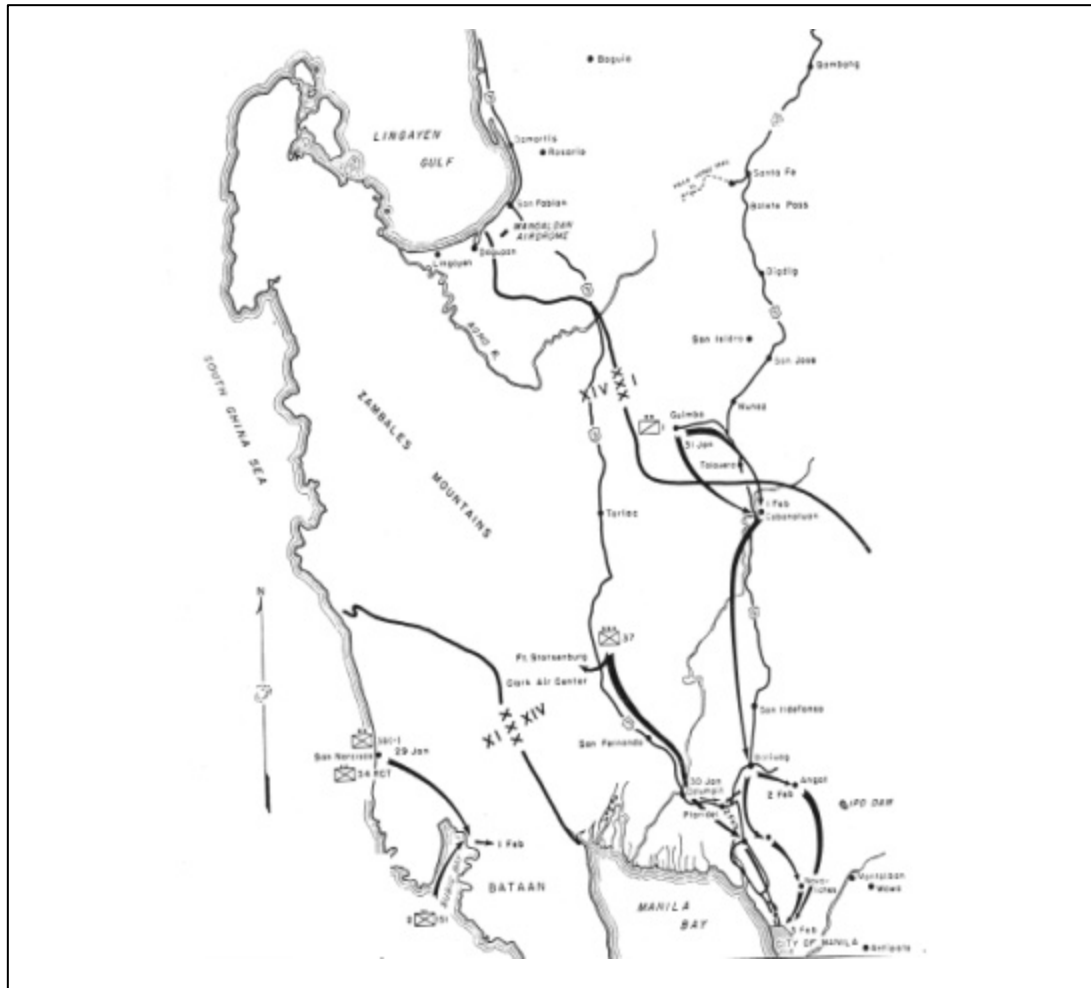


Figure 4: Route to Manila²²

McCutcheon firmly believed that CAS was an additional weapon for the ground commander, with the unique ability to reach the caves, reverse slopes, and camouflaged areas that artillery and Naval gunfire could not find. Reliable, adequate, and deliberate

²² Boggs, 77.

communication between the ALP and the aircraft was the key to successful CAS coordination.²³ This communication required a full team effort. Experienced aviators would lead the ALPs on the front lines. Intense training and simulated flights utilizing practice ammunition would precede actual missions. McCutcheon consolidated the available doctrine of the day and wrote the SOPs for this new kind of CAS.

With perseverance, he and his staff held several conferences with the Army's 5th Air Force and First Cavalry Division. Through expert salesmanship and old-school networking, backed by solid performance during USMC CAS demonstrations, McCutcheon and MAG-24 convinced First Cavalry Division to try CAS the "Marine way".

²³ LtCol Keith B. McCutcheon, USMC, "Close Air Support SOP," *Marines Corps Gazette* 29, no.8 (Aug 1945): 48.

Four

Training

A guide for the successful employment of close air support had now been established. Out of a hazy idea had grown a plan, which evolved into a concept. At maturity it became a doctrine that Marines could translate into action. In the short time available, all possible training that would assist Marine aviation personnel in the air and on the ground to put the theory into practice had been given. The stage was set for the ultimate test.²⁴

In order to succeed, MAG-24 needed quickly to institute an extensive educational program for CAS. On 13 October 1944, just one day after receiving word of General MacArthur's orders, MAG-24 began their training.²⁵ In developing his training program, McCutcheon gathered all the sources and doctrine he could possibly find from all military branches. No two sources were identical; even different nomenclature was used. New doctrine would have to be written. As a start, McCutcheon and his staff published five operating training manuals and eleven pilot training memoranda.²⁶

McCutcheon handpicked his Army and Marine instructors.²⁷ These instructors possessed advanced skills in aviation, ground combat, and communications. They had won the trust of McCutcheon because of their solid performance and creativity. These

²⁴ Garand, 308.

²⁵ Boggs, 61.

²⁶ McCutcheon PC #464, Box 3, MAG-24 Intelligence Section Memorandum, "Air-Ground Support Pilot Training Program, MAG-24, Summary of Ground School", 8 December 1944.

²⁷ Garand, 307.

instructors presented lectures multiple times on several of the Pacific islands to train as many operators as possible. An abbreviated course was offered for late arrivers, as well as an instructor course so the word could be spread back to the individual units.

In order to have a man who could direct close air support at each infantry command post, each battalion and regiment sent representatives to the training. Air intelligence officers who had practiced early close air support in the Marshall and Marianas Islands were shipped in to train specifically for Luzon.²⁸

In an incredible feat, the intensive ALP training was completed in less than three months. From October to December 1944 over 500 pilots and gunners from the 37th Army Division and MAG-24 were cross-trained in the areas of infantry, aviation, tactics, armament performance, map reading, and communication procedures. In-depth lectures varied extensively and included the following topics:

- Psychology of Japanese Warfare
- Japanese Aircraft and Ships
- Recognition of Japanese and U. S. Armor
- Prisoner of War Survival
- Artillery Spotting and Observation
- Pilot as Observer-Reporter
- Lessons from the Leyte Campaign
- Marksmanship
- Interpretation of Aerial Photos
- Navigation and Geography
- Communication with Radios, Panels, and Pyrotechnics²⁹

This training bonded the different services and gave each student mutual appreciation of each other's roles and missions.³⁰

²⁸ Henry I. Shaw, Jr., and Major Douglas T. Kane, USMC. *Isolation of Rabaul. History of U. S. Marine Corps Operation in World War II. Volume II.* (Washington: Historical Branch, G-3 Division, Headquarters, U. S. Marine Corps, 1963), 292, 531.

²⁹ Victor J. Croizat, *Close Air Support Procedures in the War Against Japan* (Santa Monica, CA: Rand Corporation, 1967), 133-135.

³⁰ Boggs, 62.

Practical problems and practice runs were first completed in the classroom. Sand table training was then used to simulate unit movement and conduct transition drills.³¹ Finally, exhaustive exercises and mock strikes were conducted with simulated ammunition and real troops. Once command and control procedures were put into practice, the joint USMC and Army close air support team was ready for Luzon.

³¹ Smith, 9.

Five

Command and Control

You can lead a plane to a strike with anything from a radio jeep to a mirror, but MAG-24 found that closer air and ground liaison meant better hunting.

LtCol Keith B. McCutcheon, USMC³²

McCutcheon's innovative ideas related to command and control created the required unity of effort and led to the overall success of close air support at Luzon and beyond. He built upon the established relationships of the Marine air support organization, which included three key identities: the Air Liaison Party (ALP), the Air Support Control Unit (ASCU), and the Air Coordinator (AC). USMC CAS centered on the Air Liaison Party. The ALP consisted of one officer and six enlisted men. The officer, who was also a Marine aviator, was designated as the Air Liaison Officer (ALO). The enlisted men were radio repairmen and operators. ALPs were attached to each division, regiment, and battalion and trained together as a team for their respective units. Through his intense training program McCutcheon provided these teams with fine-tuned technical and tactical skill sets and instilled a can-do work ethic that led to the successes at Luzon.

Despite the fact that CAS was only a small part of the theater air picture, it nevertheless required coordination with all other air assets. The Air Support Control Unit

provided this coordination and controlled all aircraft sorties within the objective area. Attached to the ASCU was the Air Coordinator, an aviator experienced in close air support that maintained his station over the objective and helped control and direct air strikes. He was often thought of as “the eyes of the ASCU”.³³

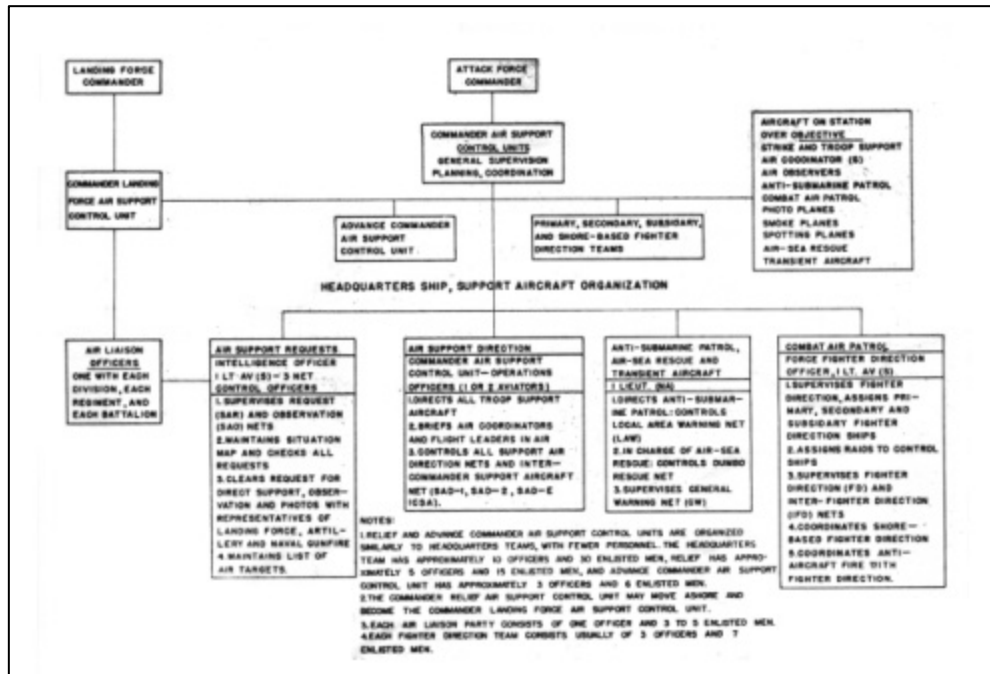


Figure 5: Support Aircraft Command Organization³⁴

The aircraft designated for close air support missions came from both carriers and advanced naval bases. They had to be suitable for attack by dive-bombing, glide bombing, ground strafing, and rockets. Additionally, they needed to be fitted for selective arming of its ammunition, and most importantly, be equipped for the essential

³² LtCol Keith B. McCutcheon, USMC. “Close Air Support on Luzon,” *Marines Corps Gazette* 29, no. 9 (Sep 1945): 38.

³³ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, “Employment of Close Air Support,” (Quantico, VA: Marine Corps Schools, 8 August 1946), 11.

³⁴ McCutcheon PC #464, Box 3, Amphibious Forces, U. S. Pacific Fleet Circular Letter, AL 11-Rev.1, “Support Aircraft –Organization, Training, and Operation”, 25 October 1944, 10-11.

air-ground communication.³⁵ These aircraft would be kept on ground alert (mission ready at their forward air base) or on air alert, orbiting several miles away at a rendezvous point called the Initial Point.

Figure 5, above, shows a typical support aircraft command organization flow chart used in the Pacific theater. To perform their mission the ALP landed ashore with a full set of mobile communication equipment. The ALO was co-located with the commander of the ground force unit in order to aid in target designation decisions and advise the commander on the best use of aircraft for close support. After working closely together for some time, the ALO became the ground commander's trusted agent for all air support. The ALO was the expert on the capabilities, limitations, and tactical employment of support aircraft with the authority to assume control of the aircraft and direct close air support strikes. He was expected to forge a close relationship and maintain frequent liaison with the ground force commander, executive officer, operations officer, and Air Combat Intelligence Officer (ACIO). Assigned to the ASCU, the ACIO was a valuable resource for the ALO. The ACIO monitored all the radio nets and kept a current situation map showing front line positions, targets, and enemy defenses.³⁶ He maintained artillery and naval gunfire schedules and was indispensable to the ALO who was responsible for closely coordinating with the Naval Gunfire Officer and the Artillery Liaison Officer at the unit headquarters or forward command posts.³⁷ This cross talk

³⁵ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, "Employment of Close Air Support," (Quantico, VA: Marine Corps Schools, 8 August 1946), 5-6.

³⁶ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, "Employment of Close Air Support," (Quantico, VA: Marine Corps Schools, 8 August 1946), 8.

³⁷ McCutcheon PC #464, Box 3, Amphibious Forces, U. S. Pacific Fleet Circular Letter, AL 11-Rev.1, "Support Aircraft – Organization, Training, and Operation", 25 October 1944, 10-11.

was essential to decide the best means of targeting, prevent redundant targeting, and to protect the close air support aviators from friendly fire accidents.

Communication was a cumbersome necessity for close air support. Control of air support required an elaborate communication network. Over twenty radio nets could be employed during an operation. The four primary nets used for close air support included the following:

- (1) Support Air Request (SAR): a ground-to-ground, high frequency (HF) net that linked the ASCU and the ALP. The ground forces, via the ALP, transmitted requests for close support and the ASCU forwarded approval or disapproval of target requests on this net.
- (2) Support Air Direction (SAD): an air-to-ground, very high frequency (VHF) net that linked the ASCU, Air Coordinator, aircraft, and ALP. The ASCU used this net to talk to the pilots, assign missions, and report results of missions. The Air Coordinator also used this net exclusively to lead the aircraft during close air support missions. He would then signal the end of a CAS mission by dropping a flare.³⁸
- (3) Support Air Direction – Emergency (SAD-E): an air-to-ground, VHF net reserved for emergencies or designated by the ASCU to be used as the SAD net in case of failure of the primary circuit or for a second, concurrent CAS mission.
- (4) Support Air Observation (SAO): an air-to-ground, HF net that consisted of 1-2 circuits that linked the ASCU, air observers, and ground unit headquarters. The ALPs monitored these nets to receive real time battlefield information provided by the air observers.

Figure 6, below, shows the typical nets used for air support control for a landing operation. Aircraft were on station at their Initial Point awaiting orders from the Commander, Air Support Control Unit (CASCU). An additional net called the Air Support Command (ASC), a ground-to-ground, HF net, provided administrative information between the ASCU and the embarked units and shore bases that supplied the

³⁸ McCutcheon PC #464, Box 3, Capt James McHenry, USMCR memorandum “Air Liaison and Air Support Control as Related to Air Combat Intelligence”, 10 March 1945, 10.

aircraft. The radio nets were encrypted for security, standard to both Army and Naval units.³⁹

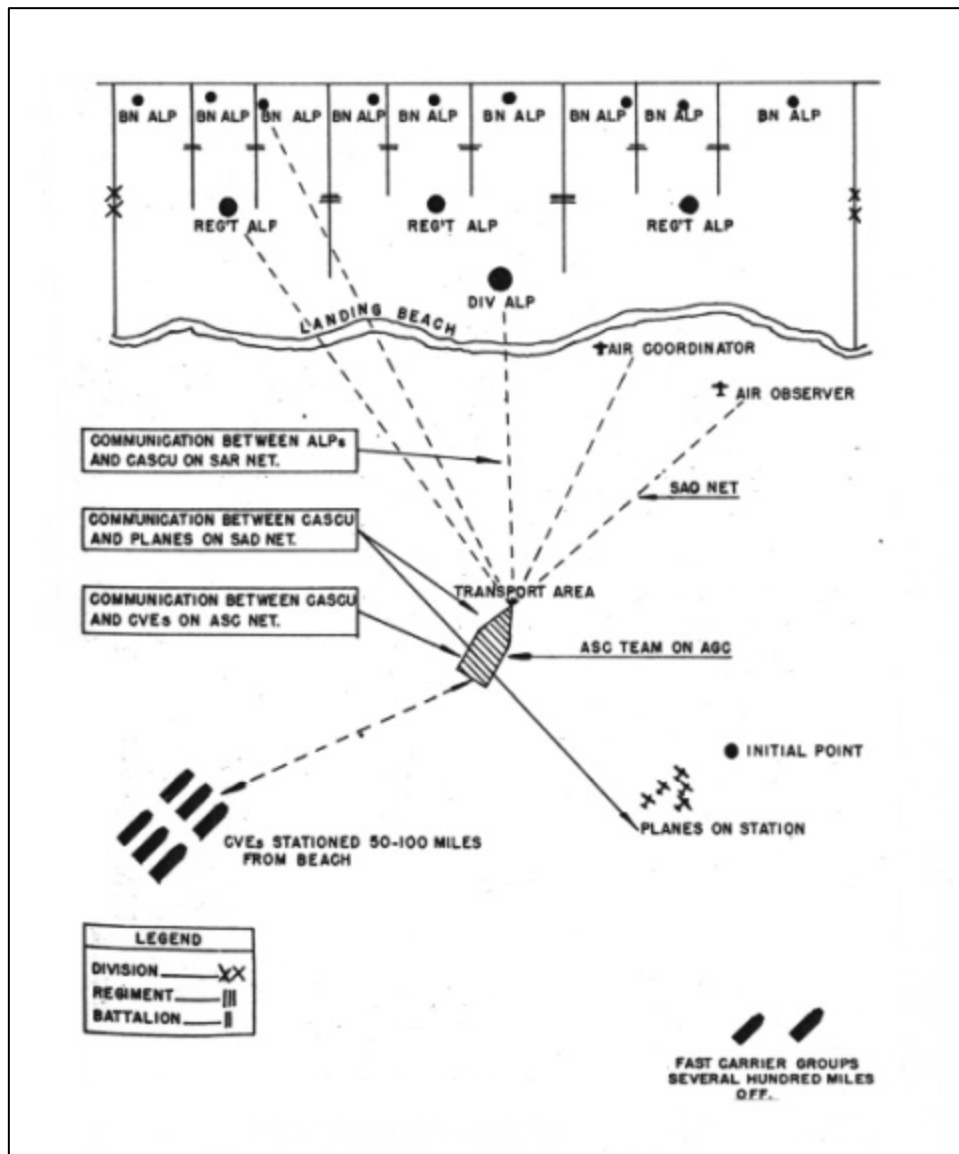


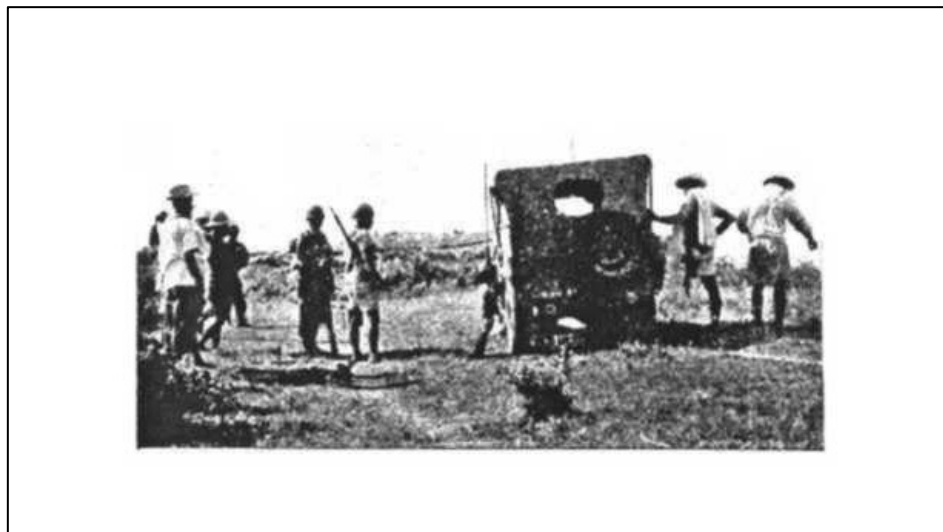
Figure 6: Schematic Air Support Control Diagram⁴⁰

³⁹ McCutcheon PC #464, Box 3, 22d Support Aircraft Party, 41st Infantry Division letter to Commanding General, 13th AAF, "SOP for Close Air Support", 28 February 1945, 3.

⁴⁰ McCutcheon PC #464, Box 3, Capt James McHenry, USMCR memorandum "Air Liaison and Air Support Control as Related to Air Combat Intelligence", 10 March 1945, 3.

Each ALP was outfitted with enough organic communication equipment to complete their mission. At a minimum, all ALPs carried two SCR 536⁴¹ radios and two standard field telephones. The SCR-536 man-portable, handie-talkie units were the smallest and most popular of the Signal Corps radio transmitter and receiver sets during World War II.⁴² Despite the popularity of this equipment, the ALO could only relay requests through the ASCU and not directly control aircraft.

Figure 7:
AN/VRC-
1 Jeep (K-
ration)⁴³



All battalion and regimental parties deployed with the preferred ALP communication configuration, which was mounted on an AN/VRC-1 jeep (see Figure 7 above). Installed equipment included the SCR-193 for HF communications and the SCR-542 for VHF communications; they provided the ALP with ranges of 25-100 miles. With this radio suite ALPs could monitor all the required circuits, forward air assault requests, and direct the close air support aircraft. Unfortunately, the jeeps were restricted in their

⁴¹ SCR is an abbreviation for Signal Corps Radio or Set Complete Radio.

⁴² George Raynor Thompson and Dixie R. Harris. *United States Army in World War II. The Signal Corps: The Outcome*. (Washington: Center of Military History, United States Army, 1985), 638.

⁴³ ALP jeep surrounded by Filipino guerillas in Northern Luzon. From: Boggs, 98.

movement during beach landings and through the mountainous and jungle terrain. They required proper waterproofing prior to debarking and more than once were carried by troops over obstacles to the front lines. When the jeeps could not traverse the terrain, the ALO would use one of the field telephones to relay information back to the jeep for transmission to the ASCU and aircraft. The jeeps were fondly known as K-rations. This code name was devised by one of McCutcheon's most industrious ALOs, Capt Francis "Frisco" Godolphin, who pointed out that the three components of the K-ration (pre-packaged meals) included supper, breakfast, and dinner or "SBD".⁴⁴ The Douglass Dauntless SBDs were the aircraft used for close air support and were directed from the K-ration jeeps.

As advisor to the ground force commander, the Air Liaison Officer discussed all the risks of attacking enemy targets prior to requesting close air support. Upon determining the desired targets, the ground force commander directed the ALO to send a request for CAS. It was important that requests for CAS were specific and included enough details to determine the following:

- (1) "What", or the nature of the target,
- (2) "Where" or the location of the target as well as the allied front lines,
- (3) "When", or the time on target (TOT) and time of quitting the target (TQT), and
- (4) "How", to include the direction of attack, recommendation for number of planes, bomb loads, fuse settings, and target marking methods.

Since it was not uncommon for the traffic on the air support nets to become excessive during concurrent missions, ALPs created their own code words and used

⁴⁴ DeChant, 186.

brevity words to minimize the transmission times for requesting close air support. Priorities were assigned to requests depending on if it was “routine” (an ordinary target) or “priority” (if enemy units were approaching or firing upon allied positions). The request was sent via the SAR net to the ASCU. The ACIO monitored this transmission and checked the target proximity with other allied forces, artillery and naval gunfire, and other ALP requests for close air support;⁴⁵ headquarters would not intervene if approved. But, if the requested mission created a potential hazard with other units, headquarters would cancel the request by transmitting the word “cancellation” on the SAR net.⁴⁶ Once the ASCU approved a close air support request, a flight was assigned the CAS mission and the ALP was given authority to conduct the strike. If the ALP did not have direct observation of the target or could not maintain good communications with the Air Coordinator, the ALP routed the direction information through the ASCU on the SAR net.

Additional precautionary procedures were adopted to prevent radio frequency overcrowding. Frequently other nets were used to relay requests from the ASCU to ground force headquarters. All net users were held to strict net discipline. Excessive messages were kept to a minimum. Units were instructed not to check into a net unless they had a pertinent message.

For proper target identification it was essential that the ground and aviation units used maps with the same grid system. To assist the aviators in accurately attacking the correct target, creative signaling techniques were employed to include smoke, panels,

⁴⁵ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, “Employment of Aviation in an Amphibious Operation, Landing and Assault and Exploitation Phases,” (Quantico, VA: Marine Corps Schools, 12 June 1946), 12.

sheets, and mirrors. The Air Operations Support Plan designated the colors of smoke and panels that would be used for target and troop markings.⁴⁷ Additional information or changes were updated in the ALP's transmitted request for support. Good visibility of the signals could be hampered depending on the terrain, weather, or wind. The Japanese also tried to dupe the attacks and confuse the aviators by deploying their own colored smoke as decoys. It took the creativity and flexibility of the ALO to make last minute changes, use multiple methods, and communicate the new signals to the aircraft in flight.

Another method employed to assure accuracy was the aircraft dummy run. The Air Coordinator would first fly the intended route with or without smoke rockets. The ALO could then correct the flight path and target location through communication and additional target markings. These dummy runs often confused the enemy and boosted the morale of friendly troops.⁴⁸ During the actual bombing run, if friendly fire fell too close to the ground forces, the ALO repeated the word "urgent" several times over the SAD net to immediately stop the strike.

With his command and control structure in place, McCutcheon and MAG-24, soon to be known as the "Diving Devil Dogs of Luzon,"⁴⁹ were ready to demonstrate the advantages of Marine close air support.

⁴⁶ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, "Employment of Close Air Support," (Quantico, VA: Marine Corps Schools, 8 August 1946), 13.

⁴⁷ McCutcheon PC #464, Box 3, Amphibious Forces, U. S. Pacific Fleet Circular Letter, AL 11-Rev.1, "Support Aircraft –Organization, Training, and Operation", 25 October 1944, 15.

⁴⁸ McCutcheon PC #464, Box 4, Lecture to 11th Command and Staff School Class, "Employment of Close Air Support," (Quantico, VA: Marine Corps Schools, 8 August 1946), 17.

⁴⁹ DeChant, 182.

Six

The Result

I can say without reservation that the Marine dive-bomber outfits are among the most flexible I have seen in this war. They will try anything, and from my experience with them, I have found that anything they try usually pans out. The dive-bombers of the 1st Marine Air Wing have kept the enemy on the run. They have kept him underground and enabled troops to move up with fewer casualties and with greater speed. I cannot say enough in praise of these dive-bomber pilots and their gunners for the job they have done in giving my men close ground support in this operation.

MGen Verne D. Mudge, USA⁵⁰

On 1 February 1945, McCutcheon and MAG-24 embarked on their historic mission of guarding the left flank of Major General Mudge's First Cavalry Division as it advanced on Manila from Lingayen. During the three-day advance, Marine ALOs were close at hand to the ground commander. Their efficient communication with the Marine aviators gave the ground commander confidence and immediate access to his close air support weapon.

McCutcheon had prepared his ALP's thoroughly, providing them with a full kit bag of doctrine and tools to perform their close air support mission. Through trial and error, the ALO's guided the Marine bombers onto the objectives with skill and tenacity. One such motivated ALO was the earlier mentioned Captain Godolphin, a 42-year-old

veteran of four major Pacific campaigns.⁵¹ As McCutcheon's trusted agent, he would lead some of the first and finest close air support missions at Luzon. Persuasive with the Army ground commanders, his demonstrations on the front lines would win the troops' praises and respect. Goldophin was not afraid to command from the front. Well-versed in CAS doctrine, he expertly used various methods to direct close air support. The K-ration was his vehicle of choice for communicating, but he did not let its limitations hinder his will to succeed in directing aircraft to their targets. He climbed to the tops of buildings and even a water tower to observe the target area and call in fire support. In preparing for his missions, he enlisted Filipino guerillas to draw accurate maps. He excelled in oral communication with the aviators and could direct them within hundreds of yards of the allied front lines. When some Army ground commanders insisted that close air support targets be approved through higher headquarters and should not be conducted within 1000 yards of friendly troops, it was Captain Godolphin who pleaded with MGen Mudge for ALP control of the airplanes. Mudge, a convert in Marine Corps close air support, immediately replied: "When planes report on station, you tell them what you want to hit. Never mind what they have been briefed for. I'll accept full responsibility."⁵²

As the successes grew, more aviators were assigned to the infantry front lines. CAS not only protected the troops, it devastated the vegetation, making it harder for the Japanese to hide. Close air support also provided much needed assessments of battle

⁵⁰ General Mudge, Commander, First Armored Cavalry Division at Luzon, as quoted in: Dechant, 173.

⁵¹ DeChant, 190.

⁵² DeChant, 193.

damage that had been too difficult to collect during previous campaigns.⁵³ Other observers on the ground had the following to say about MAG-24's CAS efforts:

CAS provided outstanding examples of drama and daring, carried out not in the spirit of recklessness but with cool-headed precision of flyers who excelled in their specialty.⁵⁴

Japs in disorder, you have killed a mess of them with your bombs and strafing. Bodies, guns, papers blown all over the place. Kisses from Commanding Officer of adjacent ground units.⁵⁵

Accuracy excellent.⁵⁶

During the 45 days on Luzon, the Marine aviators averaged over 159 flights per day.⁵⁷ Numerous lessons were learned at Luzon and the following campaigns. The requirement for clear and reliable, two-way communications between the ALPs, the aircraft, and the Air Support Control Unit was essential for efficient close air support. Other requirements included: air superiority, good weather, and well-trained personnel. Without air superiority, sufficient aircraft could not be diverted to the mission of troop support. Since radar use was only in its infancy, good weather visibility and high ceilings were required for flight. Finally, personnel, both on the ground and in the air, were required to complete the same training and needed to understand the command and control structure and its components: units, radio nets and equipment, procedures, target markers, and terminology.

⁵³ John Pomeroy Condon. *Corsairs and Flattops, Marine Carrier Air Warfare, 1944-1945* (Annapolis: Naval Institute Press, 1998), 41.

⁵⁴ McCutcheon PC #464, Box 3, "Marine Dive-Bombers in the Philippines. Analysis and Summary of the Operations of VMSB Squadrons Base on Luzon for the Month of February 1945," 5 May 1945, 4.

⁵⁵ McCutcheon PC #464, Box 3, "Marine Dive-Bombers in the Philippine. Analysis and Summary of the Operations of VMSB Squadrons Base on Luzon for the Month of February 1945," 5 May 1945, 7.

⁵⁶ McCutcheon PC #464, Box 3, "Marine Dive-Bombers in the Philippine. Analysis and Summary of the Operations of VMSB Squadrons Base on Luzon for the Month of February 1945," 5 May 1945, 7.

⁵⁷ Boggs, 7.

Also at Luzon, the practice of using the same team to train and work one area became popular.⁵⁸ It was the human element that played an important role. The men who trained together and kept close liaison, understood their individual capabilities and were sympathetic to the limitations present in their situations on the ground or in the air. Pilots who were trained as ALOs greatly improved their own discipline when they returned back to their cockpits.⁵⁹

⁵⁸ McCutcheon PC #464, Box 36, "Close Support Aviation," undated, 3.

⁵⁹ Croizat, 132.

Seven

The Journey Continues

Starting on D-day and continuing throughout the battle, naval gunfire and air support by carrier-based planes contributed in heroic measure to the accomplishment of our mission.

LtGen Holland M. Smith, USMC⁶⁰

Working its way through the Solomon Islands, Marine Corps close air support in World War II gained momentum. From Luzon, and MAG-24's first use of ALP controlled aircraft from the Army's front lines, CAS grew and prospered. Col Jerome urged maximum use of CAS with the Army. His executive officer visited all the infantry divisions to encourage use of this Marine Corps weapon. To persuade the units, the operations and intelligence officers were allowed to ride in the back of the attacking aircraft to witness mission effectiveness.⁶¹

At Iwo Jima, in February 1945, the Marine concept of Landing Force Air Support Control Unit (LFASCU) was used, for the first time, to direct CAS for amphibious landings. Aircraft deployed off carriers to support the troops on the beach. The confidence the ground commanders now had in the Marine air-ground team resulted in the acceptance of decreased distances between troops and ordnance and closer bombardment of targets. CAS became extremely popular; there were more requests for

⁶⁰ LtGen Smith commenting on the Iwo Jima campaign, from: Capt John McJennet, USMC. "Air Power for Infantry," *Marines Corps Gazette* 29, no. 8 (Aug 1945): 15.

missions than there were planes and personnel equipped to provide support. Prioritizing targets became a standard procedure. SAR nets were overloaded and strict radio procedures could only alleviate some of the problems. Because the treacherous terrain made it difficult for the aviators to see and process the targets, the importance of marking targets with mortars or smoke was paramount.

On 15 March 1945, Jerome requested McCutcheon to set up a flight operations organization at Zamboanga for MAG-32 similar to MAG-24's organization for CAS.⁶² Here, close air support was conducted at night for the first time. Air-ground radio circuits were added to the Fighter Director's standard equipment to form Joint Support Air Parties. This allowed the P-61 Night Fighters to be vectored in and destroy Japanese artillery targets at night.⁶³

In the Malabang area, Marine close air support was used to support the Filipino guerilla forces. Walkie-talkies were used to relay information from the guerillas to the ALPs who could then call in support. The pilots would often describe the targets back to the controllers. This method, along with the ALP familiarity with the terrain and target areas, greatly increased the accuracy of the raids.⁶⁴

Beginning in April 1945, Okinawa was the largest campaign in the Pacific during World War II to demonstrate close air support for both Marine and Army troops,⁶⁵ with

⁶¹ Boggs, 81.

⁶² Boggs, 114.

⁶³ McCutcheon PC #464, Box 36, "Close Support Aviation", undated, 10.

⁶⁴ McCutcheon PC #464, Box 3, XIII Air Force Report, "Close Support Operations Support in the Malabang Area, 7-9 April 1945 and the Dipolog Area, 12 April 1945." Received at Headquarters, MAG-24 on 9 May 1945, 4-5.

⁶⁵ Dechant, 244.

over 7000 CAS sorties flown in three months.⁶⁶ Also at Okinawa, in-depth SOPs for CAS were developed.

Throughout the Pacific, close air support expedited the ground campaign and decreased the number of infantry casualties. Soldiers expected CAS and morale was high when they saw the Marine flyers heading their way. It did not take long for the Army troops to prefer USMC CAS to Army Air Force CAS with the smooth coordination and the multiple missions that the Marines could provide.

It is no wonder that McCutcheon earned the Legion of Merit with Combat “V” for his service as the Operations Officer of MAG-24 and for his innovative development of the first formal training program and execution of close air support from November 1944 to May 1945.⁶⁷ He was known as the expert in Marine close air support for years to come and frequently contributed articles to professional military journals on the subject. In 1960, he was assigned to Headquarters, Marine Corps as the Director of Aviation and the principal aviation advisor to the Commandant of the Marine Corps. In this role he continued with his vision of combined combat arms teams and joint air-ground cooperation.⁶⁸ He would go on to draft joint doctrine that would guide air operations during the Vietnam War.⁶⁹ While in Vietnam, as Commander, 1st MAW, he would introduce the concept of combining close air support and helicopter operations to support Marine ground forces.⁷⁰ Throughout his career his efforts shaped the doctrine that would mature into the present day Marine Air-Ground Task Force (MAGTF) concept. It is in

⁶⁶ Marine Corps Schools. Study and Evaluation of Air Operations Affecting the U. S. Marine Corps During the War With Japan. Quantico, VA. 31 December 1945, 6.

⁶⁷ Smith, 11.

⁶⁸ Smith, 20.

⁶⁹ Smith, 21.

⁷⁰ Smith, 28.

these modern concepts that General Keith B. McCutcheon's legacy, one of the founding fathers of close air support, continues today.

Eight

Epilogue

On 8 June 1972, General E. E. Anderson, Assistant Commandant of the Marine Corps and good friend of McCutcheon and his family, dedicated and renamed New River Airfield at Marine Corps Air Station (MCAS), New River, North Carolina, as McCutcheon Field...All were present to commemorate the outstanding contributions of this selfless Marine leader.⁷¹

The U. S. Marine Corps recognizes pioneers and heroes. General McCutcheon is no exception to this rule. His role in developing close air support during the 1940s is unprecedented. While CAS may seem to be only a small part of USMC aviation, it is an integral part of the air-ground team concept that makes the Marine Corps unique today.

At Luzon, McCutcheon accepted the challenge and convinced the Army to try close air support the Marine Corps way. Overcoming a lack of coordinated doctrine, he re-wrote the books and provided a thorough and streamlined training program for the Marines and Navy. Using the lessons learned from previous campaigns and the existing communication infrastructure, he took ad hoc, piecemeal procedures and developed a potent command and control structure. McCutcheon formed and trained his teams thoroughly for their mission. His trusted agent on the ground, the Air Liaison Officer, was given the authority and wherewithal to directly control the strike aircraft.

⁷¹ Smith, 57-58.

Once his procedures were in place, his teams demonstrated their proficiency time and time again. After their successes at Luzon protecting the flank of the Army's First Cavalry Division, McCutcheon and Jerome urged the Army commanders to request the maximum use of Marine CAS.⁷² Hence, CAS spread throughout the Philippines. McCutcheon became known as the CAS resident expert and traveled across the islands to set up new CAS operations. His combined efforts contributed materially to the allied victories across the islands of the Pacific.

The concept of USMC close air support today is not much different than it was during World War II. The same conditions required for effective CAS in the 1940's apply today. They include:

- (1) Air Superiority
- (2) Target Marking
- (3) Favorable Weather
- (4) Prompt Response
- (5) Aircrew and Terminal Controller (or ALO) Skill
- (6) Tailored Weaponeering
- (7) Dependable and Interoperable Communications Systems
- (8) Integrated and Flexible Command and Control.⁷³

Today the ALP has been replaced by the Tactical Air Control Party (TACP); the ALO is now called the Forward Air Controller (FAC). He is required to:

- (1) Advise the commander on proper use of air support.
- (2) Maintain liaison with ground unit intelligence for current target information.

⁷² Boggs, 81.

⁷³ MCWP 3-23.1, *Close Air Support*, 1-8 - 1-11.

- (3) Arrange for air support.
- (4) Direct and control aircraft assigned.
- (5) Observe and report the results of the strike.⁷⁴

The Airspace Control Authority (ACA) replaced the CASCUS. The coordination of fires for CAS, Naval gunfire, and artillery takes place in the Fire Support Coordination Center (FSCC) on land, or in the Supporting Arms Coordination Center (SACC) on board an amphibious command ship.

Various radio nets are reserved for CAS with numerous alternate nets for redundancy. These nets include the:

- Direct Air Support (DAS) Net
- Group Common Net
- Guard Net
- Helicopter Direction Net
- Squadron Common Net
- Tactical Air command Net
- Tactical Air Control Party (TACP) Net
- Tactical Air Direction (TAD) Net
- Tactical Air Request (TAR) Net
- Tactical Air Traffic Control (TATC) Net.⁷⁵

MCWP 3-16, Fire Support Coordination in the Ground Combat Element, integrates CAS as one of the many weapons used for combined fire support for the MAGTF. The USMC continues to invest a significant amount of time and money into command and control and interoperability to successfully execute CAS, all because one man took an unpopular idea and formed the tactics, techniques, and procedures (TTP) to make it all work.

⁷⁴ Major Alfred Drago, USMC. "The High Price of Air Control," *Marines Corps Gazette* 48, no. 3 (Mar 1964): 30.

⁷⁵ For complete descriptions and functions of each net see MCWP 3-23.1, *Close Air Support*, 2-12 – 2-14.

As late in his career as 1963, when BGEN McCutcheon was the Assistant Operations Officer for U. S. Pacific Command, he was still requested by senior officials to comment on the merits of CAS, its usefulness and successes.⁷⁶ He is recognized for forming one of the earliest joint teams, combining air assets and ground troops in the close-knit cooperation of CAS. For this accomplishment, McCutcheon's legacy lives on as one of the founding fathers of both CAS and the MAGTF.

⁷⁶ McCutcheon PC #464, Box 32, Letter to Admiral Felt, USPACOM, "Air Ground Coordination," 6 August 1963.

APPENDIX A: LIST OF ABBREVIATIONS

Abbreviation	Full Name
AAF	Army Air Force
AC	Air Coordinator
ACIO	Air Combat Intelligence Officer
ALO	Air Liaison Officer
ALP	Air Liaison Party
ASA	Airspace Control Authority
ASC	Air Support Command
ASCU	Air Support Control Unit
BGen	Brigadier General
CAS	Close Air Support
CASCU	Commander, Air Support Control Unit
Col	Colonel
COMAIRSOLS	Commander, Air Solomons
DAS	Direct Air Support
FAC	Forward Air Controller
FM	Field Manual
FMF	Fleet Marine Force
FSCC	Fire Support Coordination Center
HF	High Frequency
LFASCU	Landing Force Air Support Control Unit
LtCol	Lieutenant Colonel
MAG	Marine Air Group
MAGTF	Marine Air Ground Task Force
MAW	Marine Air Wing
MCAS	Marine Corps Air Station
MGen	Major General
SACC	Supporting Arms Coordination Center
SAD	Support Air Direction
SAD-E	Support Air Direction - Emergency
SAO	Support Air Observation
SAR	Support Air Request
SCR	Signal Corps Radio or Set Complete Radio
SOP	Standard Operating Procedure
TACP	Tactical Air Control Party
TAD	Tactical Air Direction
TATC	Tactical Air Traffic Control
TOT	Time on Target

Abbreviation**Full Name**

TTP

Tactics, Techniques, and Procedures

TQT

Time of Quitting Target

VHF

Very High Frequency

APPENDIX B: CHRONOLOGY

Date(s)	Event
1919	USMC conducts first dive-bombing missions
12 October 1944	First published orders for Luzon campaign ⁷⁷
13 October 1944	MAG-24 begins three months of CAS training
10 January 1945	McCutcheon first from MAG-24 to arrive ashore at Luzon ⁷⁸
1-4 February 1945	1 st Cavalry Division makes drive to Manila, MAG-24 protects left flank ⁷⁹
12 March 1945	McCutcheon arrives at Mindanao to set up CAS operations ⁸⁰
5 - 31 March 1945	Marines fly 186 CAS missions for Filipino guerillas ⁸¹
1 April 1945	L-day for Okinawa campaign ⁸²
9 April 1945	USMC CAS supports 41 st Army Infantry Division's shore-to-shore landing from Zamboanga, Mindanao to Jolo Island ⁸³
14 April 1945	MAG-24 dive-bombers fly last CAS mission on Luzon ⁸⁴
20-22 April 1945	MAG-24 dive-bombers move to Malabang, Mindanao and commence operations ⁸⁵
20 April 1945	Malabang Airfield renamed Titcomb Field for Captain John A. Titcomb, USMC, an ALO who was killed directing CAS at Luzon ⁸⁶

⁷⁷ Boggs, 57.

⁷⁸ Garand, 337.

⁷⁹ Boggs, 141.

⁸⁰ Garand, 368.

⁸¹ Garand, 348, 351.

⁸² DeChant, 222.

⁸³ DeChant, 197.

⁸⁴ Garand, 764.

⁸⁵ Boggs, 141.

⁸⁶ Garand, 383.

Date(s)	Event
30 April 1945	Napalm used as a CAS weapon for the first time, Mindanao ⁸⁷
12 July 1945	Last USMC CAS mission in the Philippines, for 24 th Infantry Division at Sarangani Bay ⁸⁸

⁸⁷ Garand, 385

⁸⁸ Garand, 387

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