and 15,000-pound bombs under Project COMBAT TRAP. During MASSACHUSETTS STRIKER, three HLZs were blasted open with 10,000 lb. M-121 bombs and two were expended into FSBs Whip and Fury, shown in Figure 2. To drop the M-121--called COMMANDO VAULT--small bombs were first dropped to align the radar coordinates, after which, both a FAC and radar guided the drop of the parachute-retarded M-121 from a C-130. The bomb cleared space for at least one helicopter without a significant crater, allowing engineers to land to expand the site. Testing of the 15,000-bomb in 1969 in Vietnam suggested it would clear space for two to three helicopters.

On the day of a large troop assault, airstrikes were part of the "LZ prep" of bombs and artillery clearing the LZ of enemy mines and booby traps. On D-Day in APACHE SNOW, each of the four LZs was attacked for 50 minutes by tactical aircraft with Daisy Cutters, then for 18 minutes by artillery, and finally for one minute by ARA just before the troops went in. The LZs had been built randomly over a week's time to confuse the NVA and this apparently worked; there was almost no initial resistance.

LZ Prep could not always suppress the enemy's antiaircraft guns and small-arms fire that might await the actual landing of helicopters. In the case of Phase III of DEWEY CANYON, the Marines chose to go overland rather than risk the AAA threat, which consequently never came into full play. (The overland strike also allowed a thorough sweep of the area from the Da Krong River south to the Laotian Border.) In the case of APACHE SNOW, the five US/ARVN battalions hit the Laotian Border (and Tiger Mountain) at the same time under a sheltering air cover. The stratagem was to have sufficient fighters scheduled...
Close Air Support

Unlike the fleeting, small unit engagements, heavy fighting at bunker complexes, heliborne troop assaults, landing zones, and fire support bases made extensive use of close air support. In these situations, the static drawn out nature of the fighting made the large scale employment of airstrikes feasible.

LZ Assaults. Air cover could be pre-planned for the insertion and extraction of troops at landing zones. Often the heli-assault began with the construction of a helicopter LZ, a hard job in the double and triple canopy of western Thua Thien. During DELAWARE in 1968, building HLZs with heavy bombs had proved time consuming and inadequate. In at least one instance, the attempt failed and the HLZ was changed to a grassy lowland more exposed to potential enemy fire. This happened in APACHE SNOW where several sites on karst and razor-back ridges had to be rejected in favor of lower terrain covered with brush and elephant grass easily cleared with Daisy Cutters—1,000-pound bombs with fuze extenders to cause detonation above ground. The difficulty of hitting the mountain top and the thickness of the jungle canopy thus combined to deny the ground commander the HLZ he wanted. The APACHE SNOW After Action Report drew the following conclusion:

"The experiences of this operation seem to indicate that in the future, the process of LZ selection where tac air construction is required, should be more of a compromise between the highest ground, which is naturally desirable, and the more level ground, which is more practical to construct."

Air Force research was working on this problem and had developed 10,000
"I personally observed the operation on D-Day, which involved a heliborne assault by five US/ARVN battalions into the objective area. I was particularly impressed by the timing of each of the airstrikes, which were closely integrated into the assault plan. The control of the large number of tactical aircraft and helicopters in constricted airspace was superb. The performance of the fighter pilots, ALOs, FACs and other controlling agencies was totally professional. There is no doubt in my mind that the precise application of airpower was instrumental in throwing a determined enemy off balance and assuring the success of the combat assault."

An air cap could also be used in the extraction of troops. This was done at Tam Boi on 18 March to end DEWEY CANYON. The previous day, the extractions from FSB Erskine and Cunningham had employed a smoke screen laid down by artillery and this was very effective in disrupting enemy fire. Smoke was also used at Tam Boi where the enemy was known to be in dangerous numbers with definite plans to make the extraction costly. However, the Marine and Army helicopter pilots under intense fire extracted every man without any aircraft being shot down. The acting brigade commander described the employment of tactical air which helped make the extraction successful:

"The next day [after the extraction at Erskine and Cunningham] we laid on a tremendous amount of fire and suppressed fires we were sure the choppers were going to take. The first birds got the hell whacked out of them. We started running the fixed-wing; this was after a bit prep, too. We had fixed-wing, as I recall, every 2,000 feet up to and including 20,000 feet, starting at 5,000 to 6,000 feet. We just kept peeling it off and aiding to the top of the cake. We kept the fixed-wing in the whole time the choppers were in, working a circle around the area trying to keep the fire down. We also had a smoke screen to the south. It was the best display of supporting rounds it has been my pleasure to see. There was never more than 30 seconds when the NVA weren't getting something on top of them--mortars, artillery, or air--and it was mostly air."
Night Defensive Positions. Another important role of close air support was to help defend threatened Allied night perimeters. Tactical air and Spooky gunships had won fame for their defense of Special Forces camps. No such camps existed in the A Shau Valley area, but tactical air performed the same function at fire support bases and night defensive positions.

When the 2d Brigade, 101st Airborne, first entered the A Shau Valley area in MASSACHUSETTS STRIKER, it encountered the enemy tactics that differed from the fighting in the eastern lowlands and piedmont. On the plains, the fleeing enemy attacked and ran, rarely ever probing night defensive positions. But in the western mountains, the terrain was the enemy's home ground and often the NVA stubbornly defended well-fortified bunkers and mounted sapper attacks on night positions.

Sappers by their nature struck fast and suddenly. At 0330 hours on 13 May, about 110 members of the 806th NVA Battalion attacked and partially overran FSB Airborne in the Warehouse 54 area. Wearing loin cloths or shorts and equipped with AD-47s with folding stocks, the advance party slipped through the barbed wire, neutralized the trip flares, and dashed inside throwing explosives. Heavy RPG and mortar fire supported the attack. Allied artillery from nearby fire bases responded within five minutes, silencing the mortar positions. An AC-47 Spooky gunship arrived within one hour of request. By 0530 hours, the battle was over with 22 U.S. and 40 known enemy killed.
Sometimes, a fixed-wing gunship was requested before the situation became critical. Thus, during the battle for Dong Ap Bia, Charlie Company, on 15 May about midnight, reported enemy activity around the perimeter and requested a Spooky be on station all night. A gunship was not sent until small-arms fire was received about 0130 hours. A half-hour later, an AC-119 Shadow arrived to use its searchlight and guns. By now, the enemy was tossing sachet charges. Forty minutes after Shadow arrived, a Cobra gunship came on station and began firing in coordination with the oriented AC-119, which pointed out the targets with its searchlight. The Cobra and Shadow were gone by 0400 hours, replaced by a Spooky that continued until daylight since as late as 0510 hours, the Allies heard enemy movement. The APACHE SNOW After Action Report had the following comment:

"Evidently, if the enemy had planned an attempt at the perimeter, he decided against it when confronted by the alert response of the troops to his movement and the continuous mix of air and indirect fire support."

Fourteen enemy dead were found at dawn.

A third example of air defense of night perimeters involved something uncommon: tactical airstrikes. When the FACs discovered Warehouse 54, the 101st Airborne sent progressively large forces to counter stiff NVA resistance. On 26 April 1969, part of a battalion went into the Upper LZ built with 1,000-pound Daisy Cutters. Four helicopters were shot down and 14 men killed within the first ten hours. The rest of the battalion was at the lower LZ down the slope when night came, leaving the battalion precariously split and under attacks. By 2000 hours, a FAC and Spooky were on station to prevent either
LZ from being overrun. Fighters were requested and arrived 30 minutes later—two A-4s from Chu Lai and two F-100s from Phu Cat, the latter Air National Guard.

The target was on the valley floor near the lower LZ. The outcome was described by a FAC. The man referred to as "Honeycutt" was the Battalion Commander and later the Ground Commander at the battle for Hill 937:

"So we put a log flare on the ground. It's a beautiful mark at night; the fighters had no trouble picking up this large flare. We briefed the fighters and they started their passes. We asked for napalm just to give us a good reference and these fellows did an outstanding job—the visibility was bad; there was no moonlight; it was an extremely dark night, and they were quartering into this immediate 3,000 foot ridge with peaks to 6,000 feet. I was impressed beyond belief by the job these people did for us. The ordnance was exactly on target. Colonel Honeycutt said he couldn't have done any better if he had gone out and dropped it by hand. We put both flights of fighters in and at this time, he informed me that all movement had ceased and they had no movement to the south and he thought they'd get through the night okay."

Bunkers. Large unit sweeps—called reconnaissance in force—and the accompanying attacks on bunker complexes brought high friendly casualties.

According to the II FFV survey on jungle fighting, no topic was more controversial than the tactics for assaulting a defended bunker complex. The subject became even more controversial during the battle for Hill 937 when certain Congressmen criticized the capture of a "worthless" hill with so many U.S. lives. These critics denounced U.S. offensive operations in the unpopulated mountains and questioned why airstrikes were not used in place of troops to destroy the hilltop positions. For their part, the U.S. ground commanders were reluctant to publicly debate tactics, but they did say the NVA were dug in deeply enough
to withstand B-52 strikes and therefore infantry had to root them out.

The 101st Airborne learned during MASSACHUSETTS STRIKER that the enemy in the mountains defended his fortified camps much more tenaciously than he did in the eastern lowlands. Experience taught that U.S. troops approaching defended bunker complexes should call in 155-mm artillery and 1,000/2,000-pound bombs, both with delayed fuzing. Sometimes even these could not destroy bunkers exceptionally well built or sited on narrow, hard to hit ridgelines. The 90-mm recoilless rifle proved the best weapon in this situation. Indeed, the MASSACHUSETTS STRIKER After Action Report suggested that the 90-mm be flown in when any significant bunker complexes were found.

The largest battle of the 1969 A Shau Valley campaign was the seizure of Hill 937, also called Dong Ap Bia or "Hamburger Hill". The battle (10-20 May) illustrates the role of airstrikes against a well-fortified, entrenched enemy.

On 10 May 1969, the 3d Battalion, 187th Infantry, assaulted into LZ 2 between a river marking the Laotian Border and the summit of Hill 937, about a kilometer from each. The enemy was caught by surprise; the LZ was cold, and a command post was established up a ridge to the southeast to effectively block the main trail system between Laos and Hill 937. The next day, Bravo Company moved to take the Hill 937 summit, encountering stiff resistance.

Ground and air observers reported numerous signs of NVA, which subsequent events revealed to be the 29th NVA Regiment Headquarters and its 7th and 8th Battalions. The estimated pre-battle strength of these units was 650, 400, and 380 men, respectively. While the paratroopers held blocking positions west of 937, it is not clear whether this accounted for the NVA's decision to stand and
fight. Because many of the enemy dead had fresh haircuts, clean uniforms, and new weapons, Allied intelligence concluded that the NVA were reinforcing nightly from Laos throughout most of the battle. Apparently the regiment had orders not to retreat. Evidence for this included lettering sewn on some shirts saying, "Stay and Fight and Not Run" and "Kill Americans, Kill Vietnamese," and signs on trees saying, "Stay and Fight. This Is A Good Place to Fight from."

For an NVA force willing to face U.S. firepower, Hill 937 was a better place than most to defend. The NVA regiment held high ground ringed on all sides by concentric bunkers with mutual supporting fires. Listening posts down the hill gave early warning, while interconnecting trenches upslope allowed screened reinforcement to the bunker complexes set ever more densely as the summit was neared. Notable were the varying sized A-frame log bunkers with one to two feet of overhead cover of sod and logs. These combination sleeping and fighting positions were considered hardened against B-52 strikes.

Within two hours of the initial LZ landing, U.S. troops encountered enemy resistance too determined to be mere trail watchers. The next day, captured documents revealed the opposing NVA were members of the 29th Regiment. Also, on this day, an ARA Short Round occurred when a helicopter fired on the battalion command post, causing one dead and 15 medevacs. On 12 and 13 May 1969, heavy airstrikes and artillery attempted to dislodge the enemy from fortified positions, but the defenders held fast against the airborne battalion. The next two days, the battalion made slow advances up the ridgelines under cover of very heavy artillery, airstrikes, and gunship support. On 15 May, the second Short Round occurred. The top of Hill 937 had nearly been attained when an ARA fired on.
Bravo Company's command section, killing two and wounding 14, including the company commander. The ARA attack broke the momentum of the assault, causing the troops within 75 meters of the top to withdraw and "let the Air Force continue to bomb the hill." The enemy followed the Allies down slope, attacking night defensive positions. Action was light the following day as a second U.S. battalion arrived. Positions were consolidated for the final assault, which came relentlessly from 17 to 20 May 1969. Ultimately, four battalions, including ARVN troops ringed the hill. Heavy bombing turned Hill 937 into the bald ruin shown in Figure 13. By noon on 20 May, the hilltop had been taken, driving the fleeting NVA west down a draw in broad daylight under attack from tactical aircraft. The APACHE SNOW After Action Report states: "Airstrikes into this area must truly have taken their toll because for days after this, numerous mass grave sites were found in the vicinity of the large western draw." These graves were discovered during the mop-up operations in the days following the capture of Dong Ap Bia.

Final casualty totals for Hill 937 from 10 - 24 May were 630 enemy known killed (51 by the ARVN) and 61 Americans killed and two missing. In addition, 152 individual and 25 crew-served weapons were captured. Included in the total enemy dead on Dong Ap Bia were 47 killed by air (KBA). (By comparison, ARA was credited with 16 KBA during the whole of APACHE SNOW and artillery received no mention in the tabulation.)

There was a question as to how accurately this reflected the actual KBA. Several excerpts of information taken from two Army reports indicated that the reported KBA was low. The total KBA for the entire APACHE SNOW operation was

49
102, all flown in support of the 3/187th Airborne, which directed the fight around Hill 937. The KBA credited directly to the fighting on Hill 937 was assigned to these days:

<table>
<thead>
<tr>
<th>Date</th>
<th>KBA</th>
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<tbody>
<tr>
<td>14 May</td>
<td>29</td>
</tr>
<tr>
<td>17 May</td>
<td>2</td>
</tr>
<tr>
<td>19 May</td>
<td>1</td>
</tr>
<tr>
<td>20 May</td>
<td>12</td>
</tr>
<tr>
<td>22 May</td>
<td>3</td>
</tr>
</tbody>
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Since a daily shredout of the 102 total was not given in the XXIV Corps After Action Report, only approximations are listed. Tactical air was credited with only 12 KBA on 20 May 1969 when airstrikes "must truly have taken their toll," so the 47 total apparently did not include the KBA in the western draw. But those killed in the draw could have been included in the 102 total. However, on 15 and 16 May, ARVN discovered the graves of 40 soldiers "recently killed by airstrikes" and the 47 total for 14 May allowed no place for these. (The 29 shown for 14 May were discovered by the 3/187th in a bunker complex that the battalion and airstrikes had been attacking that same day.) Thus the 40 ARVN-found KBA had to be in the 102 total, if they were recorded as KBA. But clearly, 102 minus 47 left only 55 KBA available to account for the ARVN-found 40 of 15-16 May, and the "numerous mass grave sites" found in the western draw after 20 May. The conclusion must be that the KBA totals from actual body counts did not adequately credit tactical air. Of course, getting an accurate KBA was a perennial problem in Vietnam because the battlefield allowed no place for autopsies. The question of credit would be minor if KBAs were not used as an indicator of air effectiveness.
Aside from objections to aggressive U.S. operations in the western mountains, the controversy over Hill 937 concerned the safest way for Allied troops to capture strongly fortified enemy bunkers. The obvious tactic would be to demolish bunkers with heavy artillery and airstrikes of at least 155-mm rockets or 1,000-pound size bombs. This was done on Hill 937, as witnessed in the following remarks from the APACHE SNOW After Action Report:

"17 May. At 0910 hours, Bilk 35, the AF FAC, reported on station with fighters carrying 1,000-pound fuse delay bombs. With him in the aircraft was a 3/187th officer who had been up the hill. It was hoped he could point out to the FAC the precise locations on the hill that the enemy was concentrating his defenses.

"18 May. Speedy II, a FAC, had fighters with 1,000-pound bombs, at 1751 hours, and continued pounding Hill 937.

"19 May. At 1050 hours, D Company reported seeing one NVA body fly through the air due to an airstrike on Hill 937. Another body could be seen hanging from a tree. By this time, the formerly triple-canopied top of Dong Ap Bia was bald and with each airstrike and each arty prep, the canopy peeled back more, exposing the shells of bunkers destroyed by the pounding."

Use of heavy bombs presented problems for ground commanders. Nothing but direct hits would destroy the better constructed bunkers, such as those on Hill 937, which survived ten days of concentrated air and artillery strikes. Also, when troops pulled back from enemy positions to make room for airstrikes, the enemy sometimes followed them down hill. This was costly for withdrawing forces. Recognizing the fluidity of these considerations, the 101st Airborne's policy was to "follow the book," to maneuver to reveal the enemy's strength and either pull back for fire strikes or move forward with supporting fires put at the enemy's back.
Use of B-52 strikes had to consider the long processing time to get a strike, the extensive pullback of friendly forces that would be necessary, the use of only 500- and 750-pound bombs, and the area rather than pinpoint nature of the ARC LIGHT bombing pattern. Strikes were put on Warehouse 54 and Tam Boi but these were before ground troops went in. On Dong Ap Bia, the potential targets were revealed only when troops made contact and by then the ground commanders refused to disengage to the degree necessary for an ARC LIGHT strike. B-52 strikes in APACHE SNOW were along the western border to disrupt enemy movement and destroy facilities in Laos.

In short, tactics against enemy bunker complexes called for neither an automatic pullback nor a mandatory pressing forward. The ground commanders made on-the-spot decisions of how they would employ the various firepower available from M-16s to 2,000-pound bombs. In fact, the most common bomb load was "snake and nape"--napalm and the 500-pound fin retarded Snakeye bomb. This combination was good at clearing away the jungle canopy and exposing the enemy.

In fighting such as that on Dong Ap Bia, the Army requested tactical air spaced throughout the daylight hours so it could be available for integration into ground operations. From 10-20 May 1969, an average of more than 15 strikes (normally a pair of fighters) directly supported APACHE SNOW. Fighters were overhead "nearly fifty percent of the time," according to the APACHE SNOW After Action Report and "hardly a report of enemy combat occurred during this operation that there was not some type of air support overhead." This included helicopter gunships. The following illustration was given:
"...during this morning of contact [13 May] for B and C Companies, there were at least four assault gunship teams, each at different times, in the area supporting them. Each team averaged about an hour on station. Also, by noon, five airstrikes had been delivered in their support. During rare moments that air support was not overhead, artillery and organic mortar fires were falling into these enemy locations. Final casualty figures would show the enemy paid ten-fold for each casualty he inflicted on the 3/187."

This mixed application of air support helped make the kill ratio 9.5 NVA dead for each U.S. killed on Hill 937.

One particular technique for ferreting the enemy out of bunkers deserves mention—the use of chemicals. During MASSACHUSETTS STRIKER, the 1st Brigade dropped 160 drums of diesel fuel to burn the enemy out of small bunkers that were difficult for tactical air and artillery to hit. Accuracy was erratic but sometimes these drops "routed the enemy." Gas (called CS) in hand grenades, howitzer shells, and bulk helicopter drops were used on Dong Ap Bia with little effect. Prior to a major assault of 18 May 1969, a large airstrike and artillery prep included artillery rounds of CS, but accuracy was off and the gas drifted over to U.S. troops. Fortunately, the gas attack was too weak to do much damage to anyone and "would probably have had little effect on the enemy even if it had been on target."

In one instance on 17 May, some CS drove eight NVA from a bunker. The use of gas was not worth the trouble and the ground commanders stopped using it. Besides, the NVA had gas masks. (They also had a few CS grenades of their own—ChiCom types.) The use of gas added little to the mixed fire support that helped the Army capture the hilltop bunkers on Dong Ap Bia.
FOOTNOTES

CHAPTER I

1. (C) CED, CDEC, "Construction on Road by Elements of Group 559 in Tri-Thien-Hue Military Region," 8 May 69. (Microfilm Reel S-248)

2. (C) Memo, Col Eugene R. Freeman (CICV), MACV to ACS, MACV, "559th Transportation Group Study," 20 Jun 68. (Microfilm Reel TS-39)

3. (C) Info Rprt, DOD Intelligence, CDEC, "Activity Plan of Binh Tran 42, Group 559," 30 Apr 69, pg 3. (Microfilm Reel S-248)

4. (C) CED, CDEC, "personal Notebook of NVA Commanding General, Tri-Thien-Hue Military Region. NVA Strategic Objective," 9 Oct 69. (Microfilm Reel S-248)

5. (U) Special Study, CICV, "Thua Thien Province," undated. (Microfilm Reel S-248)
   (C) Rprt, Horn DASC, "Resume of the A Shau Valley Air Interdiction Campaign, 9 Dec 1968 to 28 Feb 1969," undated. (Microfilm Reel S-248) (Hereafter cited: Horn DASC Resume.)


7. (C) Order of Battle, CICV, MACV, "559th Transportation Group," 5 May 69, pg 11. (Microfilm Reel S-248)
   (C) Memo, Eugene R. Freeman, CICV, to ACS, MACV, "559th Transportation Group Study," 20 Jun 68. (Microfilm Reel TS-39)

8. (C) Order of Battle, CICV, "559th Transportation Group," 5 May 69, pg 11. (Microfilm Reel S-248)

9. (U) Briefing, Capt Russell Cazier, OBOH, III MAF, 4 Aug 69. (Microfilm Reel S-248)


11. (C) CED, CDEC, "Construction on Road by Elements of Group 559 in Tri-Thien, Hue Military Region (C)," 8 May 69;
    (S) WAIS, 7AF, "The Role of Air Interdiction in Cache Discoveries," 24 May 69. (Microfilm Reel S-248)

13. (C) VIS, 7AF, "I Corps," 23-29 Mar 68, pg 8.
23. (S) DEWEY CANYON After Action Report, pg 10.
24. (U) Rprt, 22d Hl Hist Det, XXIV Corps, "APACHE SNOW," undated, pg 23. (Microfilm Reel S-248)
25. (C) APACHE SNOW After Action Report, pg 83;
   (S) DEWEY CANYON After Action Report, pg 13;
   (U) MASSACHUSETTS STRIKER After Action Report, pg 15.
26. (C) VIS, 7AF, "Infiltration from NVN to Thua Thien Province," 29 Mar - 3 Apr 69.
27. (C) Memo, Col Eugene R. Freeman, CICV, MACV, to ACS, MACV, "559th Transportation Group Study," 20 Jun 68 and 20 Jul 68. (Microfilm Reel S-248)
29. (S/NF) CHECO Rprt, Hq PACAF, DOTEC, "The Fall of A Shau," 18 Apr 66; CHECO Rprt, Hq PACAF, DOTEC, "Operation DELAWARE, 19 Apr - 17 Apr 68," 2 Sep 68.
30. (TS/NF) Hist Rprt, MACV 1968, pp 24-25. (Extract is classified SECRET.)
32. (S/NF) CHECO Rprt, Hq PACAF, DOTEC, "Operation DELAWARE, 19 Apr - 17 May 68," 2 Sep 68.
33. (C) Rprt, Maj Emmett Kelley, 22d Mil Hist Det, "Case Study: Operation 'SOMERSET PLAIN,' 4-20 Aug 68, 191st Abn Div," undated. (Microfilm Reel S-248)
34. (C) Horn DASC Resume.
35. Ibid; Interview, Capt Albert W. Estes, USAF, FAC, 3d Bde, 101st Abn Div, by Lt Col Bert Aton, Hq 7AF, DOAC, 8 Aug 69. (Microfilm Reel S-248) (Hereafter cited: Captain Estes Interview.)
36. (S) DEWEY CANYON After Action Report.
37. (S/NF) Interview, Lt Col George C. Fox, USMC, Commanding Officer, 2d Stn, 9th Mar Reg (for DEWEY CANYON and APACHE SNOW), by Lt Col Bert Aton, Hq 7AF, DOAC, 3 Aug 69. (Microfilm Reel S-248) (Hereafter cited: Fox Interview.)
38. (S) DEWEY CANYON After Action Report, pp 45-46.
39. Ibid; Fox Interview.
40. (S) DEWEY CANYON After Action Report, pg 5.
41. Ibid; DOD Intern Information Rprt, CDEC, "Information on 37th Engr Co of Military Station 42/Doan 559 in Thua Thien Province," 12 Sep 69. (Microfilm Reel S-248)
42. (S/NF) Fox Interview.
43. (U) MASSACHUSETTS STRIKER After Action Report.
44. Ibid, pg 37.
45. Ibid, pg 14.
46. (C) APACHE SNOW After Action Report.
47. (S/NF) Captain Estes Interview.
48. (C) APACHE SNOW After Action Report, pp 145-162.
49. Ibid, pp 16-17.
50. Ibid, pp 6 and 15.

CHAPTER II

1. (C) (U)
   APACHE SNOW After Action Report, pg 83;
   MASSACHUSETTS STRIKER After Action Report, pg 9.

2. (S)
   (Microfilm Reel S-248)

3. (S/NF)
   CHECO Rprt, Hq PACAF, DOTEC, "Operation DELAWARE, 19 Apr - 17 May
   68," 2 Sep 68, pp 5-8.

4. (U)
   (Microfilm Reel S-248)

5. Ibid.

6. (U)
   MASSACHUSETTS STRIKER After Action Report, pg 12.

7. (OU)
   Rprt, Maj Gen Hal D. McCown, Dep CG, II FFV, "Analysis of Jungle
   Ops," 12 Sep 69, pp 2-3. (Microfilm Reel S-248)


9. (U)
   SOP, 101st Abn Div, "Ops and Intel Policy Guide," 1 Jul 69. (Micro-
   film Reel S-248)

10. (OU)
    Rprt, Maj Gen Hal D. McCown, Dep CG, II FFV, "Analysis of Jungle
        Operations," 12 Sep 69, pg 3. (Microfilm Reel S-248)

11. (C)
    APACHE SNOW After Action Report, pg 66.

12. (U)
    Ibid, pg 169;
    MASSACHUSETTS STRIKER After Action Report, pg 12.

13. Ibid, pg 12.

15. (U) Rprt, 22d Mil Hist Det, XXIV Corps, "APACHE SNOW," undated, pg 17. (Microfilm Reel S-248)


20. (C) APACHE SNOW After Action Report, pg 15.


22. (C) APACHE SNOW After Action Report, pg 72.


24. (C) Horn DASC Resume.

25. Ibid, Nr 52.

26. (S) WAIS, 7AF, "Operation DEWEY CANYON," 29 Mar 69, pg 5. (Microfilm Reel S-248);
   (C) Study, CDEC, "Organization and Activities of 559th VC Transportation Group, 29 May 68, pg 66. (Microfilm Reel TS-39)

27. (S) WAIS, 7AF, "Operation DEWEY CANYON," 29 Mar 69. (Microfilm Reel TS-39)


29. (C) DOD Intel Info Rprt, CDEC, "Information on 37th Engr Co of Military Station 42/Doan 559 in Thua Thien Prov," 12 Sep 69, pg 4. (Microfilm Reel S-248);
   (C) Horn DASC Resume, Nr 23.

30. (S) DEWEY CANYON After Action Report, pg 43.

31. (C) Ibid;
   Memo, Col Eugene R. Freeman, CICV to ACS, MACV, "559th Transportation Group Study," 20 Jun 68 and 20 Jul 68. (Microfilm Reel S-248)
32. (S/NF) Fox Interview.

33. (S) DEWEY CANYON After Action Report, pg 5.

34. (C) Horn DASC Resume, Nr 12.

35. Ibid, Nrs 43-46.

36. Ibid.

37. Ibid, Nr 39.

38. (S) DEWEY CANYON After Action Report, p 5, 37, and 42.

39. (C) Horn DASC Resume, Nrs 9, 13, and 40.

40. (S/NF) Fox Interview.

41. (C) DOD Intel Info Rprt, CDEC, "Information on 37th Engr Co of Military Station 42/Doan 559 in Thu Thien Prov," 12 Sep 69. (Microfilm Reel S-248)

42. (C) Horn DASC Resume, Nr 55.

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44. (S/NF) Fox Interview.

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48. (S) WAIS, 7AF, "Interdiction Program in I Corps," 14 Dec 68, pg 2; (C) Rprt, XXIV Corps, "Intelligence Estimate 11-69 (Spring Offensive)," pg 3. (Microfilm Reel S-248)

49. (C) Rprt, Horn DASC, "Interdiction was Cache Discovery," 27 Apr 69, pg 3. (Microfilm Reel S-248); (U) MASSACHUSETTS STRIKER After Action Report.

50. (C) Horn DASC Resume, Nrs 32-33.


52. (C) APACHE SNOW After Action Report, pg 31.

53. (U) MASSACHUSETTS STRIKER After Action Report, pp 4 and 7-8.
UNCLASSIFIED


55. (C) APACHE SNOW After Action Report, pp 117, 158; (C) DOD Intel Info Rprt, JDEC, "Information on 37th Engr Co of Military Station 42/Coan 559 in Thua Thien Prov," 12 Sep 69; (C) Hist Rprt, 22d Mil Hist Det, XXIV Corps, "APACHE SNOW," undated, pg 2. (Microfilm Reel S-248)

56. (S) DEWEY CANYON After Action Report, pp 41-42.

57. (S/NF) Estes Interview.

58. Ibid.


60. (S) APACHE SNOW After Action Report, pg 6.

61. (S/NF) Fox Interview.

62. (U) MASSACHUSETTS STRIKER After Action Report, pg 11.

63. (U) Rprt, 22d Mil Hist Det, "Narrative of Sapper Attack on Fire Base Airborne, 13 May 69," undated; (C) APACHE SNOW After Action Report, pg 165.

64. (C) APACHE SNOW After Action Report, pg 94.

65. Ibid.

66. (S/NF) Estes Interview.

67. Ibid.


69. (C) APACHE SNOW After Action Report, pg 57.

70. (U) MASSACHUSETTS STRIKER After Action Report, pp 11-12.

71. (C) APACHE SNOW After Action Report.

72. Ibid.
75. (C) APACHE SNOW After Action Report, pp 36-38; 80-113.
77. Ibid, pp 29 and 62.
78. Ibid, pg 51.
80. (C) APACHE SNOW After Action Report, pg 37.
81. Ibid, pp 96, 102, 105.
82. Ibid, pg 109.
83. Ibid, pg 93;
84. (S/NF) Estes Interview.
85. (C) APACHE SNOW After Action Report, pg 108.
87. Ibid, pg 88.
88. Ibid, pg 51.
89. (U) MASSACHUSETTS STRIKER After Action Report, pg 25.
90. (C) APACHE SNOW After Action Report, pg 98.
91. Ibid, pp 7 and 98;
   (U) Rprt, 22d Mil Hist Det, XXIV Corps, "APACHE SNOW," undated, pg 15. (Microfilm Reel S-248)
92. (C) APACHE SNOW After Action Report, pg 69.
**GLOSSARY**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AA</td>
<td>Anti-aircraft</td>
</tr>
<tr>
<td>AAA</td>
<td>Anti-aircraft Artillery</td>
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<tr>
<td>AO</td>
<td>Area of Operation</td>
</tr>
<tr>
<td>ARA</td>
<td>Airborne Rocket Artillery (Helicopters)</td>
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<tr>
<td>Artillery</td>
<td>Artillery</td>
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<tr>
<td>ARVN</td>
<td>Army of the Republic of Vietnam</td>
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<td>Atk</td>
<td>Attack</td>
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<tr>
<td>AW</td>
<td>Automatic Weapons</td>
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<tr>
<td>BDA</td>
<td>Bomb Damage Assessment</td>
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<td>Bde</td>
<td>Brigade</td>
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<td>Bn</td>
<td>Battalion</td>
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<td>Binh Tran</td>
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<tr>
<td>CAP</td>
<td>Combat Air Patrol</td>
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<td>Cav</td>
<td>Cavalry</td>
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<td>CDEC</td>
<td>Combined Document Exploitation Center</td>
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<tr>
<td>ChiCom</td>
<td>Chinese Communist</td>
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<td>CICV</td>
<td>Combined Intelligence Center, Vietnam</td>
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<td>Comm</td>
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<td>DASC</td>
<td>Direct Air Support Center</td>
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<td>DMZ</td>
<td>Demilitarized Zone</td>
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<td>FAC</td>
<td>Forward Air Controller</td>
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<td>Field Force Vietnam</td>
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<td>Fire Support Base</td>
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<td>Helicopter Landing Zone</td>
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<td>Killed by Air</td>
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<td>LOC</td>
<td>Line of Communications</td>
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<td>LOH</td>
<td>Light Observation Helicopter</td>
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<tr>
<td>MACV</td>
<td>Military Assistance Command, Vietnam</td>
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<td>Marine Amphibious Force</td>
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<td>mm</td>
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<td>NVA</td>
<td>North Vietnamese Army</td>
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<td>OIC</td>
<td>Officer-in-Charge</td>
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<tr>
<td>POL</td>
<td>Petroleum, Oils, and Lubricants</td>
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<td>Recon</td>
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<td>Rocket Propelled Grenade</td>
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<td>Side-Looking Airborne Radar</td>
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<td>Tac</td>
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<td>Tactical Area of Responsibility</td>
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<td>VR</td>
<td>Visual Reconnaissance</td>
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<td>White Phosphorus</td>
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