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RANCH HAND: AIR FORCE HERBICIDE OPERATIONS IN SOUTHEAST ASIA

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A Dissertation

by

PAUL FREDERICK CECIL

Submitted to the Graduate College of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1984

Major Subject: - American History

ABSTRACT

RANCH HAND: Air Force Herbicide Operations
in Southeast Asia. (May 1984)

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Chairman of Advisory Committee: Dr. Roger A. Beaumont

In 1961, the United States began an experiment in unconventional warfare which ultimately raised a storm of protest throughout the world and helped to destroy the credibility of an American government. Even after the experiment was terminated ten years later, the controversy continued, expanding from the original charge that the United States was doing irreparable harm to the Asian environment to an eventual accusation that the weapon used had doomed American servicemen and their future offspring to lives of pain, lessened capabilities, and even death. The weapon used was chemical herbicides; the charges are as yet unproven.

Almost unnoticed amid the furor arising over Air Force use of herbicides in Southeast Asia was the actual performance of a small group of officers and men, flying a mission virtually without precedent, originating techniques even while in contact with enemy. Code-named "Operation RANCH HAND" and dubbed the "most shot-at Air Force unit in South Vietnam, the herbicide organization dispensed over eleven million gallons of herbicides on Southeast Asian jungles and croplands, while flying unarmed, obsolescent aircraft at minimum speed and tree-top level. The handful of spray planes were hit by enemy ground fire nearly five thousand times. Nine aircraft were lost and

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DEDICATION

In Memory of Comrades Who Wore the Purple Scarf

Staff Sergeant Milo B. Coghill

Captain Fergus C. Groves II

Captain Robert D. Larson

Captain Roy R. Kubley

Major Lloyd F. Walker

Captain Harvey Mulhouser

Captain Howard L. Barden

Airman First Class Ronald K. Miyazaki

Captain Thomas E. Davie

Lieutenant Colonel Everett E. Foster

Major Allan J. Sterns

Major Donald T. Stienbrunner

Staff Sergeant Irvin G. Weyandt

Sergeant Le Tan Bo, RVNAF

Captain Virgil K. Kelly, Jr.

Technical Sergeant Jacklin M. Boatwright

Technical Sergeant Harold C. Cook

Lieutenant Colonel Emmett Rucker, Jr.

Major James L. Shanks

Sergeant Herbert E. Schmidt

First Lieutenant Charles M. Deas

Master Sergeant Donald L. Dunn

Technical Sergeant Clyde W. Hanson

First Lieutenant Richard W. O'Keefe

Lieutenant Colonel Daniel H. Tate

Captain Joseph B. Chalk

And of a Special Friend

Lieutenant Colonel Merle D. Turner

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CHAPTER VII

FLIGHT TO SQUADRON: MORE PLANES, MORE HITS, MORE PROBLEMS¹

On 7 January 1966, RANCH HAND celebrated the beginning of its fifth year in Vietnam. Superficially, the seven aircraft of the expanded unit appeared little different from the three which arrived in 1962; they were even parked in the same area of the Saigon airport ramp. Operationally the differences were enormous--from a small experimental project in day-to-day danger of cancellation, RANCH HAND had become an integral part of the "greatest American gathering of airpower in one locality since the Korean War." By the first of the year, over five hundred planes and twenty-one thousand men of the United States Air Force were in Vietnam, in addition to other units operating over Southeast Asia from bases in Thailand and Guam. Army fixed-wing aircraft and helicopters swarmed over all parts of South Vietnam, while off-shore, aircraft carriers of the United States Navy contributed ~~the, on of, set, - way - some~~ more planes to the air armada. American troop strength, increased to nearly 150,000 men in 1965, and augmented by forces from Australia, New Zealand, the Philippines, Thailand, and Korea, would further expand during 1966 to reach 385,000 men.²

The crews of the spray planes, however, had little time to contemplate the meaning of the widening American role in Southeast Asia; they were too busy trying to keep up with the growing list of approved herbicide targets. The monthly record of 182 sorties, newly set in December, was quickly surpassed in January as 188 herbicide sorties dispensed 177,300 gallons of chemical. Besides continuing the Kien Hoa, Phuoc Tuy, and Laos projects, another forest fire experiment (Hot Tip I and Hot Tip II) was attempted in January and February. The target of 22,000 gallons of Orange defoliant was twenty-nine square miles of heavy forest on the slopes of the Chu Pong mountains, near the Ia Drang River valley, southwest of Pleiku. After giving the defoliant time to take effect, Guam-based Strategic Air Command B-52s bombed the area on 11 March with M-35 Incendiary Cluster Bombs; the heavy bombers were immediately followed by F-4 and F-100 fighter-

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circled at 500 to 700 feet, spotting trail segments and marking them with smoke grenades. After dropping three grenades, the planes dove down and sprayed that section, flying from one marker to another before the smoke dissipated. By repeating this tactic, long stretches of the trail were gradually marked and exposed. Also frequently used was the standard mountain technique of having one aircraft at 500 feet "talk" the other aircraft along the trail as it sprayed. Again, this tactic was not used in "hot fire" areas due to the extreme exposure of the overhead aircraft.⁷

Where the trail was not at least intermittently visible from overhead, or where heavy ground fire was expected, the second new tactic consisted of short defoliation burns at 90 degrees to the suspected trail position, made every half mile or so. This allowed photo reconnaissance to map the trail and RANCH HAND then returned to defoliate the trail using time-and-distance dead-reckoning. These spray runs often revealed ingenious enemy attempts to conceal its road network. For example, in several areas lattice-work trellises overgrown with natural vegetation made living tunnels several miles in length. By February, the RANCH HAND navigator at Da Nang, Captain D. B. (Pete) Spivey, was able to present Seventh Air Force with the first accurately plotted 1:125,000 mile scale map of the Ho Chi Minh Trail south of Tchpone, Laos. *One*

In February the Laos defoliation project spread north of the 17th parallel, to expose segments of the infiltration route along the North Vietnamese/Laotian border. Some sorties on these northern sections of the trail were flown out of American bases at Nakom Phenom and Taklai, Thailand, with the concurrence of the Thai and Laotian governments. On at least one mission the spray planes penetrated North Vietnam to defoliate the Ban Karai Pass. Escort was provided by B-57 "Canberra" bombers to cover helicopter rescue in case a spray plane was shot down. In an unexpected role reversal, one of the bombers was downed, and the UC-123s remained overhead to relay radio instructions and help direct rescue helicopters to the site.

Throughout the next two months defoliation in Laos continued, primarily along Laotian designated routes 92, 922, 96, and 965 below

February 1966
Sorties flown
from Taklai
and NKP, Thailand

request had to be refused; there were no replacements and the headrest had to be repaired and reinstalled.¹²

While not working on the planes, the ground crews, in the words of a flightline controller of the period,

scrounged (stole[,], begged and borrowed) any and every thing we could find on base, that was not heavily guarded, by that I mean a guard with a loaded M-16 pointed at you, that we could use or swap to someone for something we could use. . . . You always would keep both eyes peeled for anything that we could use and that we could acquire one way or another.¹³

Supporting the controller's words ^{Hence} was the stripped frame of a Case tractor (parked in the RANCH area) ^{which} the tractor had mysteriously disappeared from the ramp at Clark Air Base in the Philippines at the same time a RANCH HAND aircraft transited the base.¹⁴

The overall RANCH HAND effort continued to expand throughout the spring. In March, 163 defoliation sorties sprayed 148,450 gallons of herbicide, and the following month the sortie rate increased another 20 percent, even though maintenance crews were frequently unable to repair one day's battle damage in time for the aircraft to fly the next day. By May, herbicide consumption exceeded 200,000 gallons for the first time, in spite of the temporary withdrawal from Da Nang. In recognition of the growing workload borne by only seven spray aircraft, in April COMUSMACV requested eleven more aircraft be assigned to the RANCH HAND mission.¹⁵ These additional spray planes would also make possible a new program of area defoliation in regions of heavy enemy concentration, such as War Zones C and D and the Iron Triangle. The request coincided with the loss in June of the first RANCH HAND aircraft since 1962.

On 20 June 1966, two defoliation aircraft were spraying a multiple-pass target in Quang Tin Province in I Corps, in an area known as the Pineapple Forest. Both aircraft had received some ground fire during each of the first four passes. On the fifth pass, one plane had an engine shot out and crashed in a hedgerow at the end of a rice paddy. The pilot, Lieutenant Paul L. Clanton, was badly injured and trapped in the burning wreckage. Fortunately, the left side of the aircraft had been peeled wide open, and the other crew members, Lieutenant Steve Aigner and Staff Sergeant Elijah R. Winstead, freed

Ranch Hand
Flights to Clark
AFB, Philippines

[Handwritten signature]
Fake
(you ask
AFB
elsewhere)

literally? how about actually?

Done

The change in operating locations was welcomed by RANCH HAND for several reasons. Besides leaving the 'impossibly' over-crowded ramp-space and air traffic pattern of the Vietnamese capital's airport, the herbicide unit was particularly interested in taking advantage of the move to establish a permanent hydrant system to supply chemicals to the aircraft. Using condemned 5,000 gallon F-6 refueling trailers joined in tandem, and a system of high pressure pumps, a "herbicide pit" was built adjacent to the south end of the new parking ramp, allowing the rapid servicing of up to four aircraft at a time with any of the three herbicides in use. This Bien Hoa bulk storage facility could hold up to 90,000 gallons of herbicide, in addition to the 55-gallon drum storage area. The new system also made it easier for the Vietnamese handlers to transfer chemical from the shipping drums to the bulk mixing tanks. A similar, but smaller, facility was constructed at Da Nang, using nine old refueling trailers. When Bien Hoa officers inquired about possible problems from the servicing area, Major Dresser warned them that fumes from mixing and servicing herbicides probably would denude the vegetation on a small hill with a pagoda immediately south of the storage area. Similar damage was done to trees at the Saigon airport terminal, which was located a short distance "downwind" from the RANCH HAND parking area on "Charlie" row at the airport.²⁷

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While RANCH HAND planned the move to Bien Hoa, the accelerated attack against targets throughout Vietnam and Laos continued. The persistent problem of herbicide shortages led to an attempt to stretch the available supply by increasing per-gallon coverage. In October, a test project was begun to spray the mangrove forests along the main shipping channel to Saigon (in the Rung Sat Special Zone) with Orange herbicide at one and one-half gallons per acre, half the normal flow rate. This allowed each sortie to defoliate six hundred acres. A similar rate was applied during two missions into Project 4-20-1-66 in the delta region. Although mangroves were highly susceptible to Orange herbicide, by November it was evident that the reduced rate was ineffective, confirming data from the previous test in Thailand.²⁸

See tests in Thailand

RANCH HAND was also hampered by increasingly poor weather.

The "bug birds" received an unusual assignment in May 1970. TACC directed insecticide missions be flown over two areas south of Da Nang--Landing Zone "Baldy" and Fire Support Base "Ross." Since both were "high threat" areas, two insecticide planes were to be used in formation and fighter escort would be provided by the 1st Marine Air Wing. After a survey flight over the first target on 21 May, the insecticide crews briefed their fighter support at Da Nang. The following day, despite the fighters and psywar support, the two spray planes came under heavy fire shortly after beginning their first run; the mission was aborted and the flight returned to Da Nang. The number two aircraft had been hit seven times, but damage was minor. Seven days later, an attempt was made to spray "Ross" with the same result--the number two aircraft was hit four times before the run was abandoned. Further attempts to "debug" active enemy contact areas were cancelled.³³

When the 12th ACS was deactivated in July, the insecticide unit continued its mission as part of "A" Flight, 310th Tactical Airlift Squadron (TAS), with home base at Phan Rang. The remainder of 1970 was uneventful--the unit history noted only two exceptions. On 14 November a "bug bird" took a hit while innocently returning to base from a mission--hits at cruise altitude over South Vietnam were rare. The other exception occurred in December. Because insecticide corroded the bare aluminum skin of the aircraft, insecticide planes required periodic corrosion control treatments at Kadena Air Base, Okinawa. When one of the insecticide planes came due for treatment in December, it was replaced with a camouflaged herbicide aircraft. In the hope of convincing local inhabitants of its peaceful purpose, Seventh Air Force required the painted temporary replacement to be escorted by extra psywar loudspeaker planes. The tactic was successful. During 1970 insecticide planes took only 12 hits while flying 486 sorties, dispensing 102,440 gallons of malathion.³⁴

Appropriately, RANCH HAND, which had originated from the insecticide mission at Langley, finished with the same mission. After cancellation of the herbicide program in 1971 and conversion of the herbicide aircraft to airlift duties, the insecticide flight continued

*Identifies
Kadena AB,
Okinawa
and
Malathion
spraying*

Dme

CHAPTER X

NEW AND OLD: K MODELS AND AIRLIFT DUTY

At the end of 1967, nearly 490,000 American servicemen were in South Vietnam. General Westmoreland had reported to the President, and to the National Press Club in Washington in November, that the war was being won--the tide had turned. An estimated 38,000 Viet Cong had deserted and surrendered during 1967. On the other hand, the cost of the war was approximately two billion dollars per month, and growing, and American losses since 1961 were almost 16,000, with 9,353 in 1967 alone. In the United States, the antiwar movement had grown dramatically, and ~~President Johnson~~ could not travel to any major American city without facing a crowd of chanting demonstrators. Congress, too, began to question the unilateral decisions of the executive branch on Southeast Asia. The new year held little prospect of abatement in the clamor of domestic discontent.¹

Done
 in government
 spokesmen

For RANCH HAND, 1968 was a year of contrasts. During the first five months, no crop destruction missions were scheduled because of a large backlog of high priority defoliation missions and the unusually dry weather--Vietnamese agriculture was hit hard by the drought and there were few good crop targets available. Twice during the year spray aircraft were diverted to airlift duties, further hampering accomplishment of the herbicide mission, and in April the squadron started converting to the jet-assisted K model UC-123 aircraft. As a result, for the first time since the program was established, acreage sprayed and herbicide sorties flown did not double the previous year's total, but instead fell by over 13 percent. More welcome was the dramatic reduction in hits on spray planes, down by nearly 28 percent.²

Part of the reduction in hits was due to concentration on defoliation; crop targets normally were "hotter" targets, and exposure time usually longer than against single-pass defoliation targets, although there were exceptions to this rule of thumb. Another possible factor was, ironically, the greater number of targets

quickly abandoned.⁴¹

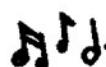
On 31 October 1968, RANCH HAND returned to the An Xuyan target area where Lieutenant Colonel Rucker's crew was lost. The squadron had attempted this target only once since the fatal mission in May; on 2 July a six-ship formation again came under extremely intense ground fire and was hit twenty-nine times, in spite of heavy suppression by escorting fighters. For the October return, even heavier suppression was planned, with ten F-100 fighters from the 90th Tactical Fighter Squadron at Bien Hoa striking pre-assigned targets just before the spray formation flew over the sites, and delivering heavy ordnance at minimum safe distance in front of the spray planes throughout the run. The tactic worked; no ground fire was reported and none of the planes were damaged.⁴²

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moderate

The continued arrival of K models and departure of B models left the 12th squadron with only four unmodified aircraft by the end of October. To the great joy of the RANCH HANDS, one October arrival was "Patches," still without the mottled camouflage of the other aircraft, but proudly sporting the jet engines of a K model. (Rumor had it that an ~~incredible~~ number of strings were pulled to insure that the beloved aircraft was not painted while undergoing modification.) "Patches" was temporarily returned to flying defoliation missions, and on 17 November, while leading a formation spraying a VC-controlled island off the delta (target 4-20-1-68), hit a fruit bat and sustained a broken nose. The distinctive silver plane, always the lead aircraft on herbicide missions, added several more hits to its substantial total before being returned to safer mosquito control duty.⁴³

*November 1968
visit to
Udon, Thailand*

November also found the squadron involved in a highly classified mission into Laos, at the covert invitation of the Laotian government. The mission began when Lieutenant Colonel Phillip Larsen, OIC of the Da Nang detachment, and his targeting officer, First Lieutenant Lloyd West, were ordered to Udorn Air Base, Thailand, for a special briefing, where they learned the ~~special~~ target was a large area of rice fields approximately forty miles north of Vientiane, Laos, in the Nam Sane and Nam Pa valleys. In civilian clothing, the officers boarded an Air America transport plane for a survey flight over the

hmm 

area. On 5 November, the spray crewmen flew another aerial survey of the target, this time using an unmarked RANCH HAND aircraft. Noting the sparseness of crop in the designated area, the targeting officer assumed the mission was more a political gesture than a military necessity.⁴⁴

On 11 November, Colonel Larson returned to Udorn with four UC-123Ks. For the next four days the spray planes attacked various targets in the Laotian complex. Some friction developed between the Forward Air Controllers and the RANCH HAND navigators, however, with the FACs refusing spray clearance on some excellent crop targets and directing attacks on other targets that were not within the briefed area. During the eight lifts, the spray planes were hit four times. After the final mission, the detachment returned to Da Nang, where they put on a demonstration on arrival by trailing purple smoke from their tail booms as they made an echelon fly-by and then tossing out drogue chutes on landing, in parody of fighter planes. Although the crews questioned the effectiveness of their mission to Laos, they enjoyed the almost state-side atmosphere of the base in Thailand; before leaving, they threw a party in the officer's club which left no doubt among the permanent party officers that RANCH HAND had been there.⁴⁵

By December the squadron had increased to twenty-five aircraft, almost all K models. On the thirteenth, the worth of the jet modification was proven once more on a target only fifteen miles north of Bien Hoa. Just as the formation finished spraying and began climb-out, the lead aircraft came under intense automatic weapons fire. Almost immediately the aircraft started a hard roll to the left, which could be corrected only by full deflection of the aileron control by both pilots and full power on the left jet engine, with the right jet in idle. A check by the flight mechanic found that the left aileron was deflected full up and the control cable was severed. Eighteen hits in the forward section also had knocked out the nose steering hydraulic mechanism and the left main tire. After the crew determined they could keep the wings level by using full aileron trim, full right aileron, a large amount of right rudder, and differential power, they

November 1968
Ranch Hand
missions
flown from
Udorn AB, Thai-
land.

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No choice
- these are
only means for
these control
surfaces



CHAPTER XI

THE LAST YEARS

Militarily, 1968 had been a victory for the Allies in Vietnam as they defeated major VC/NVA offensives in February, May and June, although additional American forces had to be rushed to Vietnam to bolster General Westmoreland's forces. Heavy losses were inflicted on the attackers by Allied ground troops, aided by 840,117 USAF combat sorties during the year. By mid-year, North Vietnam had agreed to begin peace talks in Paris aimed at ending the war, and the United States had begun a "Vietnamization" program, to build up the South Vietnamese Armed Forces to ~~where they could~~ assume a greater role in the security of their country, allowing the United States to start withdrawing American combat troops. ^{withdrawing} Politically, however, the year was a disaster for the American administration. ^{Simply dependent in the P} Facing a rising tide

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main reason: set back in New Hampshire primary; Tet

of criticism of the war, and embarrassed by the Pueblo incident, President Johnson ordered a halt to American bombing of the North and announced that he would not run for a second full term as president. In November, Richard Nixon defeated the Democratic nominee, Hubert Humphrey, in the presidential election, having pledged in his campaign to bring American troops home and to win an honorable peace, although he warned that the United States might first have to make a greater effort. To American fighting men stationed in Vietnam, the 1969 New Years' Day seemed little different than the previous year.¹

Due

Neither the change in administrations nor increased Vietnamization seemed likely to affect RANCH HAND, particularly since the VNAF had no equivalent unit with which to assume herbicide responsibilities. The departure of the last B model aircraft in January 1969 left the squadron only the safer K model UC-123s, and the programmed arrival of more modified aircraft from the United States implied an increasing role for herbicides in Vietnam.²

Due

Due continuity

RANCH HAND's permanence seemed further confirmed by the occupation of improved facilities at Bien Hoa. In January 1969, after two years of "making-do" with marginal facilities on the west ramp,

Due

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squadron operations and command sections moved into a new, air-conditioned building, designed especially for RANCH HAND. An adjoining facility was under construction for the maintenance section, together with a parking ramp for the herbicide aircraft that included a special hydrant system for servicing herbicides. This new parking area was badly needed, ^{since} Bien Hoa had 515 aircraft assigned to various base units--over one-fourth of the total aircraft stationed at the ten primary air bases in South Vietnam. Unfortunately, construction delays precluded completion of the ramp for almost a year, leaving the operations section and the aircraft parking area over two miles apart. The aircrews remained in substandard quarters, midway between the two sites.³

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Parking space and housing were not the only problems the herbicide squadron faced. Virtually every RANCH HAND commander complained at one time or another that the UC-123, despite its splendid ability to absorb punishment and continue flying, was too slow and vulnerable to increasingly sophisticated enemy weaponry. If herbicide operations were to continue, a more efficient delivery system was needed. A hint of USAF research and development in this area occurred in January when F-4E "Phantom II" fighters, equipped with modified 370-gallon fuel drop-tanks, were used experimentally to spray several swaths in Laos. At 550 knots^T airspeed, the F-4Es covered a 100-foot-wide, 16 kilometers~~x~~-long area in only 70 seconds; it was assumed that with this brief exposure time they would not need other fighter escort. During the tests, however, one F-4E spray plane was shot down by enemy ground fire--evidence that speed was not the total answer.⁴

In the meantime, RANCH HAND had to rely on the obsolescent twin-engine transports. In addition to continuing attacks throughout South Vietnam, on 17 January seven spray planes flew to Ubon, Thailand, to attack a target in Laos the following day. The mission was uneventful, and the planes returned to Vietnam without being hit.⁵

By mid-February intelligence reports pointed to another major attack on Bien Hoa. To prevent damage to spray aircraft and disruption of the mission, on 22 February all in-commission aircraft

*January 1969
Ranch Hand
mission's
flown from
Ubon AB
Thailand*