

party was unable to visit Dalat due to weather. Overall results of the visit were impressive, due to evidence of tidiness and professionalism in job accomplishment.

In summary, our fifth Sky Spot site opened at Dalat, Vietnam, on 26 September, and the first system capable of directing aircraft up to 200 nautical miles was installed at Nakhon Phanom, Thailand, in early July. The Bien Hoa site was closed for the 200 nautical mile modification on 28 September, and modification of the Pleiku and Dong Ha sites was scheduled. Comparisons between visual and electronic CEAs at one site revealed only 17 feet variance, overall. This is considered excellent overall accuracy for electronic bomb scoring. One site experienced problems in its first attempt to direct B-52s, primarily due to equipment malfunctions. An indication of a possible sixth Sky Spot site occurred when Seventh Air Force queried the Air Attaché in Laos as to the possibility of establishing a site in that country.

.....stated that test of the B-52/MSQ-77 would be conducted during November and December. As the AN/MSQ-77 at Nellis was the only ground directed bombing equipment in the Continental United States with a 200 nautical mile capability, they requested permission to temporarily locate the equipment at Matagorda. It could not be used to full range at Nellis due to terrain masking which was so bad that an aircraft would have to be above 40,000 feet at a 99-mile range to overcome it.

By the end of the quarter, three groups of Sky Spot replacement personnel had completed training. The major problem encountered was TAC's inability to provide SST-181 Transponder equipped aircraft for the training.

MARINE AIRCRAFT AIR FORCE EQUIPMENT COMPATIBILITY --- Our previous issue of the history discussed a test of compatibility between the Air Force AN/MSQ-77 Bomb Directing Central Radar and the transponder employed aboard Marine Corp aircraft. The test was conducted in an effort to determine if compatibility could be promoted between the equipment. The basic difference in the equipment is that the Marine Corp employs vertical antenna polarization in the airborne transponder and their TPQ-10 ground radar, while the Air Force equipment employs horizontal polarization.

On 7 July, the 1st CEG advised Air Force that we did not recommend adoption of the vertically polarized antenna for Sky Spot beacons. We felt that the only possible benefit would be that Marine ground equipment would have a beacon track capability if aircraft were equipped with vertically polarized transponders. This benefit was nebulous due to range limitations and accuracy of the Marine equipment. We pointed out shortcomings of vertical polarization, which included only half as much radiated frequency gain, and the beacon does not operate as well with other radars. Additionally, all aircraft present a better horizontal than vertical return when skin tracking is employed. This means that if an aircraft is being beacon tracked with a horizontally polarized beacon and the beacon track is lost, there is a good possibility of maintaining skin tracking to a distance of 100 nautical miles with Air Force equipment. Skin tracking with vertical polarization had been impossible at a distance of 25 miles in a previous test.

Seventh Air Force advised, on 1 August, that compatibility between Marine ground equipment and Air Force aircraft was not required, due to the SST-181 Transponders being considered the primary limiting factor in attaining full Air Force capability in Southeast Asia. They noted that changeover to vertical polarization would introduce added delay in aircraft beacon modification programs and cause costly down time of aircraft already modified. Seventh Air Force strongly recommended transponders be procured with horizontally polarized antennas and modification of Southeast Asia strike aircraft be expedited.

SAC concurred that compatibility of Marine equipment with SAC aircraft was not a valid requirement as the planned deployment of 1st CEG equipment would cover all but the Southwestern tip of South Vietnam. SAC recommended that the present SST-181 Transponder configuration be maintained. On 6 August, Pacific Air Force advised Air Force that USAF equipped aircraft should be equipped with horizontally polarized beacons. They further stated that our equipment covered the same areas covered by Marine equipment, and the advantages of horizontal polarization outweighed those of vertical polarization.

On 18 August, SAC relayed the information from USAF that there were many reasons to prefer horizontal polarization and that SST-181 beacons should be horizontally polarized. Also, that the Marine Corp was reportedly initiating a modification program for their ground equipment to permit either horizontal or vertical polarization.

after each beacon installation. This two for three-beacon installation also resulted in a restriction of flight cells as last minute changes in cell leaders could not always be accomplished. In view of this, SAC changed their requirement for transponders to include one for each B-52D deployed to Southeast Asia, plus 20% spares. SAC also noted that antenna masking may contribute to track difficulties and that Boeing Aircraft had indicated that two beacons and antennas were needed to solve the masking problem. We had already stated that masking was the primary problem and that Boeing Aircraft Company was working on a solution. SAC requested Oklahoma City Air Material Area conduct an engineering flight test to determine if the existing configuration was adequate, as well as determining if electro-magnetic interference from other B-52 equipment affected the SST-181. SAC also suggested that the beacon could be over-interrogated and that this could be corrected by modifying the equipment to provide a two-pulse interrogation capability. Subsequently, on 21 September, SAC identified beacon over-interrogation as a major factor in degrading tracking reliability. They stated that the Sky Spot equipment must be modified for double pulse interrogation. A Reeves Instrument Company proposal for accomplishing the modification would require six months from the date ordered, and would involve the installation of an additional modulator.

Our previous issue of the history discussed the development, testing, and deployment of the 200 nautical mile capable ground directed bombing system. It was planned that the existing equipment in Southeast Asia would be modified to have a 200 nautical mile capability, if the modified system proved successful in Thailand. On 27 July, Seventh Air Force stated that operations at Nakhon Phanom, Thailand had indicated satisfactory accuracy for the modified system. They requested the Bien Hoa, Pleiku, and Dong Ha, Vietnam, sites be modified as soon as possible and in that order. Seventh Air Force did not desire that the Dalat, Vietnam unit be modified as the Pleiku and Bien Hoa sites would provide adequate coverage overlap. Instead, they suggested the extra modification kit be retained at Bien Hoa as a spare. The Pacific Air Force concurred with Seventh Air Force's modification precedence preferences. USAF concurred with the priority listing and advised that the three necessary modification kits would arrive in Southeast Asia not later than 15 August.

On 10 August, the 1st CEG recommended delaying the modification program until completion of a dynamic calibration of the equipment installed at Nellis AFB, Nevada. We pointed out that the one system in Southeast Asia was factory modified and that the only thing proven at Nellis, by 10 August, was that the equipment could be physically modified in the field. The dynamic fly in proved the Nellis equipment successful, on 12 August, but corrections necessary to the equipment had emphasized the extreme caution necessary to modify equipment in Southeast Asia, although we recommended the modification program be implemented. Time required to install the kit was five days with the team working two shifts, and providing spare components were modified prior to close down. Seventh Air Force requested the modification program begin on or about 12 September, and Pacific Air Force concurred. The modification kits were shipped on 29 August, and contract maintenance personnel departed for Vietnam on 8 September. The Bien Hoa site was closed for modification on 28 September.

Seventh Air Force recommended various improvements to the Sky Spot program during the quarter. They stated that all fighter aircraft in Southeast Asia were being equipped with the SST-181 X Band Transponder to permit ground directed bombing at extended ranges. Limitations and deficiencies included the AN/MSQ-77 antenna being mounted on the control van with no capability for remote operation and the fact that the control and power vans had to be in close proximity to eliminate cable power loss. Since the antenna had to be on open elevated terrain, the accompanying radar complex and personnel became extremely vulnerable to enemy attack. Seventh Air Force requested the antenna be remoted up to 300 feet, a beacon CEP of less than 680 feet at 200 nautical miles, and a skin track CEP of less than 320 feet at 65 nautical miles be developed. They desired the equipment to be capable of tracking through moderate rain to 200 nautical miles and the antenna electronics protected by armor where possible. A stabilized elevation tower for the antenna group and a directional ultra high frequency antenna mounted on the tracking antenna was suggested. The latter improvement was to give a stronger signal and provide some communications security. They wanted the plotting board modified to 200 nautical mile range and development of a single plug-in module to permit selection, computation, and automatic plotting of Tactical Air Command's munitions ballistics. This proposal and other minor improvements was based on requirements in Southeast Asia and suggested by a Reeves Instrument Company study for the USAF. Later the communications console was identified as requiring corrective action as it reportedly lacked the reliability and flexibility required for Southeast Asia operations.

During the period 25 August through 9 September the 1st CEG Commander and Deputy Commander for Radar Bomb Scoring visited all of the 1st CEG Southeast Asia operating locations, except Dalat, Vietnam. The

By 14 July, the survey was complete, and the site was located at 11:5619.135 North latitude by 108:2935.198 East longitudes. Two aircraft had arrived by this time, and the remaining operational equipment was due in from the Sky Spot Three location on 15 July. Site preparation began on 20 July, and leveling was approximately half complete by 29 July. By 4 August, leveling of the site and grading of the road to the site was approximately 75% complete, but efforts had been drastically slowed by three days of rain. Rock was being crushed manually and spread at the location. By 6 August, gravel and rock laying were approximately half complete and the road was in a satisfactory condition to move the equipment to the site if the rain stopped, or continued light. Revetment materials were scheduled to be moved on 9 August. Near completion of the revetment was necessary prior to moving the equipment to the operating location. Safety of the equipment was not otherwise possible, due to known enemy activity in the Police Academy grounds where the site was located.

By 14 August, rock and gravel spreading at the site, a tedious process to accomplish by hand, was approximately 75% complete and was scheduled to be rolled the following day. On 16 August, the site reported the teletype facilities had been out of commission for a week due to generator outage, but that replacement generators had been supplied by Clark Air Base in the Philippines. Revetment materials and sand were on the site and personnel were filling sand bags. Sections of the revetment were being assembled by a civil engineering team and awaiting a forklift and welding equipment, on 18 August. The forklift arrived on the 20th, and the revetment was being erected, although foundation materials had not arrived by the 21st of August.

On August 20th we were advised that the Seventh Air Force Commander was concerned about the amount of time required to place the Dalat location on the air. Also, equipment was being cannibalized to keep the other four sites on the air. This, of course, could have led to an embarrassing situation if the equipment was non-operational after our other problems had been eliminated. We ordered that the unit not be further cannibalized without the theater Commander's approval.

By 23 August, the revetment was over half complete, but then work was slowed by rain. Road conditions were so poor that four-wheel drive vehicles were required, by the 1st of September. By this time, one wall of the revetment was complete and two other walls were half finished.

Vans were finally moved to the site on 9 September, and the following day the revetment was closed to a 10 foot entry way, antenna installation was completed, and power was applied. Communications equipment problems were immediately apparent, but were cleared up by 11 September. There was still no material for a security fence or lighting, although enemy activity was noted in the area and, as personnel at the site stated: "We are unable to become complacent."

Calibration flights were attempted on 15 and 16 September and completed on 19 September. On 21 September all equipment became operational, and the site was declared operational on 26 September.

At last, on 27 September at 1835 hours (GMT), the first attack was directed by the site and involved two F-100 fighter-bombers striking a Viet Cong area.

Sky Spot Six, an unprogrammed requirement, is a possibility. On 19 September, Seventh Air Force requested the Air Attaché in Laos to comment on the possibility of operating a Sky Spot site in North-eastern Laos. The site, if it is ordered, is to be located within 150 nautical miles of Hanoi, Vietnam.

Our previous history reported difficulties Sky Spot sites were experiencing with the SST-181X Band Beacon Transponder, and a special test of various beacon polarization possibilities which could be employed with Sky Spot ground equipment. The beacon is important to Sky Spot operations, as the transponded signal is the primary means by which the ground radar tracks an aircraft. Beacon problems, limitations, and recommendations are discussed in the following paragraphs.

On 1 July, our Bien Hoa, Vietnam, site advanced the theory that B-52 beacon transponder problems could be caused by the cold soak enroute to Vietnam from Guam. They recommended that beacons be turned on 45 minutes prior to the primary initial point to provide adequate warm up time. The existing warm up time allowed was five minutes, but was changed to 45 minutes to test Bien Hoa's theory. This did not rectify the difficulties with the B-52s, and, on 31 July, Bien Hoa indicated the problem was probably due to beacon installation in the B-52. They noted that no problems were experienced with other types of aircraft, including hand held beacons in F-4C fighter-bombers.

On 4 August, SAC established procedures whereby the ground controller could advise aircrews of the condition of their beacon. Also, between 5 and 17 August, a combined Air Force and industry team visited Guam and Bien Hoa to review the Sky Spot program. The team found that the current ratio of two transponders for each three Guam based B-52Ds was inadequate, resulting in 136 beacon movements among Guam aircraft during July. The maintenance workload for these movements was excessive, as a two hour check was required

Sky Spot Three (OL-23/Nakhon Phanom, Thailand) enjoyed routine activity throughout the quarter. The only unusual development involving this site was the installation of new radar, having a 200 nautical mile range, in early July.

Sky Spot Four (OL-24/Dong Ha, Vietnam), which became operational on 30 June, experienced problems during the quarter. On 3 July, the first operational mission was flown and the excellent CEA and CEP average was 107 feet for the period 3 through 5 July. The greatest miss distance during this period was 200 feet. The site performed well until 17 July, when the first B-52 heavy bombers were scheduled. Three waves of two aircraft each of the Guam based giants flew under Dong Ha's direction. The site reported the second wave over flew the target due to intermittent communications, while the CEA for 99% of the ordinance was 1237 feet, and the greatest miss distance was 1975 feet.

On 19 July, Third Air Division reported that the aforementioned B-52 mission revealed problem areas that had to be eliminated prior to further use of the site. Communications problems included cell mis-identification, garbled transmissions, difficulty in authenticating, and periods of no transmission or reception. Third Air Division indicated that one cell did not obtain the two-minute authentication until five seconds to go and two or three attempts were required by the site to arrive at the proper letter designators. Additionally, the site was under the impression that one cell was enroute when it had already passed the target. This cell did not release as no corrections or countdown calls were received. Further, photography revealed bombing accuracy left much to be desired, which is obvious in the electronic CEAs reported in the preceding paragraph. Third Air Division recommended practice runs on each site by B-52s prior to scheduling new sites for actual releases. They also requested alternate targets in South Vietnam when Sky Spot aborted a mission.

Due to 3rd Air Division's criticism of Dong Ha's performance, we instructed all site commanders to assure that operations and controller personnel were familiar with authentication procedures. SAC also requested information as to action taken to resolve discrepancies.

It was determined that the problem with the first B-52s was not entirely the site's fault. A shorting high frequency coupler had been operating intermittently and finally failed completely. Due to this, communications with the first wave of B-52s were not established until 15 seconds to go, resulting in the site's inability to get aircraft back on track in time for better releases. Also, lack of communications caused the site to miss the second wave completely. Landline communications (teletype and phone) were also marginal, contributing to the poor performance. The order for the B-52s was not received until one hour prior to the mission. This order was being decoded and computed when the first aircraft arrived. This problem was to be eliminated by Sky Spot One (Bien Hoa) screening the order each night and passing pertinent information to Dong Ha via single sideband radio, which was the only alternative to closing down. The authentication problems were due to inexperience, and the Site Commander instituted a study program to eliminate the problem. Basically, the marginal performance resulted from equipment shortages and malfunctions.

By 26 July, teletype landlines were still intermittent. New equipment was at the site, but the installation team was experiencing difficulty in attaining reliable operation. All remaining problems and equipment shortages had been eliminated.

The site's performance was not subsequently a problem, in fact it was outstanding. Maj. Gen. Alvan C. Gillem II, SAC Director of Operations, reported favorable comments about the site when he visited Southeast Asia. It was reported that the Sky Spot personnel were, of all the troops in the area, by far the most impressive group. The business attitude, appearance, housekeeping, and self-help projects at the site was most impressive. General Gillem sent his congratulations to Lt. Col. R. D. Davis and his professionals at Dong Ha.

Sky Spot Five (OL-25/Dalat, Vietnam) was more difficult to be established than any other site. In addition to the three aircraft already scheduled and reported, we requested a fourth C-133 transport from Barksdale to Lien Khuong, Vietnam, to arrive by 15 July. The purpose of this additional flight was to deliver three water purification units which were not available at the time the original schedule was finalized. This aircraft was scheduled to leave Barksdale AFB on 11 July.

As previously reported, the Sky Spot Five equipment had a 200 nautical mile capability and was to be compared for accuracy and exchanged with Sky Spot Three equipment at Nakhon Phanom, Thailand, if accurate. As scheduled, the second, third, and fourth C-133s departed Barksdale AFB on 7, 8, and 11 July, respectively, enroute to Lien Khuong, Vietnam. The third C-133 had the additional mission of flying from Lien Khuong to Nakhon Phanom, Thailand, to move the 100 nautical mile equipment previously installed at Nakhon Phanom to Lien Khuong.

CHAPTER III

OPERATIONS AND TRAINING

INTRODUCTION --- This chapter pertains to the operational aspects and training programs of the 1st CEG. Our mission, providing the best possible training and comprehensive evaluation of SAC's aircrews, will be reported. Also included will be analyses performed on various training programs and concepts. The chapter includes five basic topics, which are: Operations in Southeast Asia (Sky Spot), 1966 Bombing Competition, Radar Bomb Scoring (RBS), Standardization/Evaluation, and Analysis. The latter three topics are individual operations within the group, while the Southeast Asia and Combat Competition programs are special projects involving all functional areas of the organization.

SKY SPOT --- Air Force pilots can now bomb targets near our forces at night, or in rain, fog, or clouds, thanks to a radar system nicknamed Sky Spot. Operating a mobile radar set, a Sky Spot controller can direct strike aircraft with great accuracy through bad weather and darkness. The controller tracks an aircraft on radar, corrects its direction and speed to the target, and signals the pilot to drop when he is over the target.

Air Force control of aircraft of all commands is being carried out by 1st CEG personnel and equipment operating in Vietnam and Thailand under the nickname Sky Spot. To control and direct aircraft, we employ the AN/MSQ-77 Bomb Directing Central Radar. This ground directed bombing system is employed in Southeast Asia to provide all weather day and night air support. The system is used with tactical fighter, bomber, reconnaissance, and troop carrier (primarily rotary wing) aircraft. At present, the system is primarily employed for direction of level bombing, but is being expanded to include navigational assistance, computer updating, flare dropping, target location, and aerial resupply. The system employs the SST-181X Band B eacon Transponder to track aircraft to a maximum range of 200 nautical miles for the latest modified equipment, and 100 nautical miles for unmodified equipment. We have four sites in Vietnam and one in Thailand which, when modified to a 200 nautical miles range, will provide coverage over all of South Vietnam, the southern half of North Vietnam, and the majority of Laos. Our first operational site opened on 1 April 1966, at Bien Hoa, Vietnam, followed by site two at Pleiku, Vietnam, which opening on 26 April, site three at Nakhon Phanom, Thailand, opening on 3 June, and site four at Dong Ha, Vietnam, opening on 30 June. These sites and initial surveying and planning were reported in previous issues of the history. During this quarter, site five opened at Dalat, Vietnam, on 26 September, and actual operations began on 27 September. The following pages include a discussion, by site, of developments this quarter.

Sky Spot One (OL-21/Bien Hoa, Vietnam) enjoyed routine operations throughout the quarter. On 16 September, the unit provided a statistical report indicating that 626 attacks had been directed by the unit where visual CEAs could be compared with electronic CEAs. During the 626 attacks, 622 bomb impacts were scored, 270 (43.3%) of which were within 100 feet of the electronically scored impact point. The average electronic CEA for these 270 bombs was 187 feet, compared to 146 feet visual CEA. Inspection revealed that 35.2% of the bombs impacted further from the target than electronically scored. Of the 219 bombs in this category, the electronic CEA was 185 feet, compared to a visual CEA of 435 feet. There were 133 bombs (21.4%) impacting closer to the target than electronically scored. These bombs were awarded an electronic CEA of 670 feet, compared to a 216 feet visual CEA. Overall CEA for the 622 bombs, which represented the results of approximately 9% of total attacks by the one site, was 289 feet electronically and 272 feet visually. This gave an overall accuracy variance of 17 feet per bomb, average, which could be expressed as an accuracy of 94.1% for electronic scoring. The only other significant development at the Bien Hoa site was the beginning of installation of the long range (200 nautical mile) modification. The site was placed in non-operational status on 28 September, and site re-opening was scheduled for 2 October.

Sky Spot Two (OL-22/Pleiku, Vietnam) also enjoyed primarily routine activities during the quarter. The one exception was on 13 August when the site successfully directed a mercy mission. At 0615 hours (local) the 38th Aerospace Squadron (Air Rescue) at Pleiku requested Sky Spot assistance in directing two rescue helicopters. By 0630 hours (local) the controller had the helicopters over the requested coordinates. The weather included low ceilings and ground fog. The helicopter mission was to pick up seriously wounded personnel and deliver them to a field hospital. The helicopter pilots indicated they would have had extreme difficulty navigating without the aid of Sky Spot.

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SAC, recognizing the value of competition to increase command and individual abilities, decreed that a combat competition would be staged from Fairchild AFB, Spokane, Washington, between 1 and 9 October 1966.

on 5, 6, and 7 June. A problem at Dong Ha was the collocation of a Marine TPQ-10 radar bombing unit. At a meeting on 27 May, between the Air Force, Navy, Army, and Marines, the decision was made to go ahead with locating the Air Force equipment and determine the extent of interference during initial operations. The Marines also indicated the TPQ-10 could be relocated if the Air Force AN/MSQ-77 could support their forces.

By 6 June, the first two aircraft had arrived at Hue Phu Bai. The equipment arrived undamaged, but could not be moved to the site, as a Marine escort was not available for over the road movement. The Marines were engaged in priority operations in the area at the time. Additionally, the survey was incomplete, due to the survey team being casualties on 5 June, discussed in chapter two. As an interim measure, an attempt was to be made to establish the location by picking coordinates from a local map.

By 25 June all equipment was in place and operating. The location was still inaccurate, but was the best available due to enemy action at survey stations. On 27 June, the target was calibrated and proved accurate to within 150 feet at a distance of 43 miles. The site became operational on 30 June.

The fifth Sky Spot system was ordered on 15 April. SEVENTH Air Force indicated a requirement existed for a fifth system in the Dalat, Vietnam area. This system was required to provide complete coverage of the II and III Corps area, as well as furnishing a low altitude capability in support of friendly forces in the south central section of the country. The additional system was requested for 15 June. On 27 April, SAC advised that a fifth system could be made available for Sky Spot. We completed the initial survey of the Dalat area on 30 April, and pinpointed a tentative location 15 miles east southeast of Dalat. This location was adjacent to a permanent communications site atop a hill, was fenced, and had a Vietnamese Army security force. On 4 May, Air Force advised that a fifth system had been approved for deployment to Dalat, and deployment date would be established by SAC, although a target date of 25 June was subsequently established. The necessary airlift was requested for 25, 26, and 27 June, and was approved. The initial site survey was completed on 2 June and the site selected was within a national police force training compound.

SEVENTH Air Force decided to operate Sky Spot Five and Sky Spot Three side by side, as Sky Spot Five was an extended range system (200 nautical miles). This was to allow correlation of units, provided minimum system down time, and assist in determining the requirement for modifying additional units. SEVENTH Air Force did not desire to replace the Sky Spot Three system with the Sky Spot Five system until the accuracy of the new system was verified, although they preferred the extended range system in Thailand rather than Vietnam. Air Force had previously suggested that the extended range for the Nakhon Phanom unit should be accomplished through a modification to the existing equipment. Air Force stated that the anticipated shipment date of the modification equipment was 1 July, assuming tests in the Continental United States proved successful. They estimated the modification installation time would be only three to four days. The destination of Sky Spot Five was changed from Dalat to Lien Khuong, presumably due to the airfield capabilities. The first aircraft was requested to be rescheduled from Barksdale AFB, Louisiana, on 30 June to Nakhon Phanom to offload the Sky Spot Five equipment to conduct the comparison with Sky Spot Three. The remaining two aircraft were to depart Barksdale on 7 and 8 July, respectively, enroute to Lien Khuong. The third C-133 was to continue empty to Nakhon Phanom from Lien Khuong to pick up one of the two radar vans employed in the test. By the end of the quarter, 30 June, this schedule had been approved.

In summary, this quarter saw four Sky Spot units go operational in Vietnam and Thailand, and a fifth planned. The first system was deployed to Bien Hoa, Vietnam, during the period covered by the previous History (2 March) and became operational on 1 April. Equipment for location two, Pleiku, Vietnam, began arriving on 13 April, and the site became operational on 26 April. Site three, Nakhon, Phanom, began receiving equipment on 16 May, and became operational on 3 June. Sky Spot Four was deployed to Dong Ha, Vietnam. Initial equipment arrived on 5 June and the site became operational on 30 June. System five had not arrived by the end of the quarter, but was planned for Dalat, Vietnam.

1966 SAC COMBAT COMPETITION --- Planning for the 1966 SAC combat competition, which will pit SAC's best aircrews against each other in October, took a significant step forward. The operations order delineating responsibilities and procedures for conducting the competition was produced and distributed by SAC.

On 19 April, the first fly-in (calibration) of the Pleiku unit was attempted. The aircraft could not be tracked during a morning attempt, so the radar was adjusted and the flight was attempted again in the afternoon. By that time weather had become a factor and the aircraft could not be sited from the ground. The following day, 20 April, another calibration was attempted, and no activity was scheduled on 21 April due to ordnance shortages. Results of a similar mission on 23 April were described as “--- incomplete, inconclusive and rather discouraging.” This was due to the need to adjust the target several times, and large miss distances. On 26 April, a tactical (strike) mission was flown and it was finally apparent that no further calibration was needed. Aircraft were guided and bombs dropped through the clouds from 9000 on a Viet Cong troop concentration. The forward air controller reported a perfect hit with a CEA of less than 150 feet and all bombs in the target area.

The Pleiku Sky Spot also participated in a special test, on 13 and 14 June. This test was to determine the compatibility of the equipment used in Sky Spot (AN/MSQ-77 – Bomb Directing Central Radar) with Marine Corp Aircraft. Several attempts to trigger the beacon in Marine Corp aircraft for a return on the Sky Spot radar scope had been unsuccessful. The test showed that the easiest solution was to tune the Air Force equipment to the Marine aircraft frequencies. An alternate solution would be to recalibrate Marine Corp equipment (TPQ-10) to operate at Air Force frequencies. This solution was more complex, however.

This brings us to Sky Spot Three, the only unit to be located in Thailand. This unit was originally scheduled to Phu Mu Hill, which was approximately 12 miles south of Mukdahan, Thailand. SEVENTH Air Force eventually agreed to locate the system at Nakhon Phanom, however. This location offered several advantages, including an on base location, no logistics problems, and a fenced and guarded aircraft control and warning compound. By 19 April the survey had been completed and the site was located at 17:2235N 104:3938E. We experienced difficulties in getting the equipment delivered to Nakhon Phanom, as that airfield was not cleared for the C-133 transports employed to carry the equipment. In view of this, Military Airlift Command requested an alternate destination. SAC could not provide an alternate, so an operational waiver was requested to operate C-133's into Nakhon Phanom. This was approved, and the aircraft were scheduled at daily intervals. The first aircraft was due to arrive on 15 May, but was diverted to Bangkok due to engine failure. The aircraft then arrived at 1525 hours (local) on 16 May. Just over an hour after arrival the Bomb Directing Central Radar Van was dropped during unloading when a dolly broke. It took seven more hours to complete the unloading operation, and fortunately there were no damages. The second aircraft arrived on the 18th, and the final aircraft on 20 May. By 21 May, all personnel and equipment were in place.

On 23 May a calibration flight was attempted, but was unsuccessful due to equipment problems and the possibility of an inaccurate location. Equipment and weather problems plagued the site during the next week, and by 29 May an equipment error of 375 feet had come to light. The problem seemed to hinge on a range computer installed at this headquarters. The accuracy of this computer was not checked, other than against a calibration target. Spares were also in short supply as the equipment (System #17) came directly from the manufacturer (Reeves Instrument Corporation) and did not include normal spares. On 2 June the unit reported “success at last.” A target had been successfully flown in at 75 nautical miles. Operational status was then reported after it had been requested and approved on 3 June. Operational activity was scheduled to commence on 8 June.

The Sky Spot Three unit immediately began performing in an exceptional manner. On 11 June, a target 88 miles from the site was bombed from 20,000 feet through ground direction, which led to the following comments from General William C. Westmoreland, Commander, Military Assistance Command, Vietnam:

“Hearty congratulations to Captain Charles Sexton and all others involved in MSQ-77 drop on ford on Route 137 at 0810, 11 June. Photo results shown me are just what we want. Professional planning and execution have paid significant dividends.”

The survey for location number four was scheduled to begin on 7 May. The unit was to be located at Dong Ha, Vietnam, as planned. This location required the airlift to terminate at Hue Phu Bai and a subsequent road convoy to Dong Ha.

Equipment for Sky Spot Four was obtained from the Bayshore, Michigan, RBS Detachment. Three C-133's for the airlift were scheduled for 1 through 3 June from Barksdale AFB, Louisiana, which was the assembly point for all Sky Spot deployments. Aircraft were scheduled to arrive at Hue Phu Bai

CHAPTER IIIOPERATIONS AND TRAINING

INTRODUCTION – (U) This is the heart of the History. This chapter will delve into the manner in which we performed our mission; providing the best possible training for SAC aircrews. There are five major topics included in this chapter. First, and by far the most important, is Project Sky Spot, operations in Southeast Asia), followed by the 1966 SAC Combat Competition. These two topics involve virtually all elements of the 1st CEG, which accounts for their independent coverage. The remainder of the chapter is devoted to radar bomb scoring, standardization/evaluation, and analysis, in that order. These three elements encompass all of the operational activities of the organization. Sky Spot --- Sky Spot is the nickname assigned 1st CEG ground directed bombing from Vietnam and Thailand. Our mission in the area is to ground direct tactical (strike) aircraft during inclement weather and night operations.

Our previous installment of the History covered the initial surveying and deployments to Southeast Asia. Our mission of ground directed bombing is an extension of area saturation bombing for munitions delivery in areas devoid of suitable aiming points. In conjunction with normal bombing procedures, a ground director can provide additional assurance that friendly forces are safeguarded. As originally planned, upon verification of Sky Spot's abilities, four units were to be deployed, three to Vietnam and one to Thailand. Each unit was to consist of five vans and 37 personnel. Vans included one for control and plotting, tow for power, and one each for administration and supply, and communications and maintenance. Personnel included 4 officers, 31 airman, and 2 civilians per site. Personnel requirements were subsequently reevaluated and established as 24, including 3 officers, 1 civilian, and 20 airmen.

Each of the sites will be discussed in depth in the following pages, including site number five which was not originally planned.

On 1 April the initial Sky Spot unit (OL-21/Bien Hoa Air Base, Vietnam) became operational. This unit, capable of tracking aircraft to a distance of 98.6 nautical miles radius of the site, experienced no serious difficulties subsequently, with one exception. The exception was not due to the site, but to airborne equipment problems. A transponder (SST-181X) is employed aboard strike aircraft to afford the ground controller a better target and allow extended range tracking. By 9 April, no transponder had performed adequately. This problem continued to plague the site, and all sites, throughout the quarter. By the end of June, we had determined that tracking difficulties occurred when B-52 heavy bomber aircraft make large bank angles in performing heading corrections to the target. The tracking problem was due to the aircraft shadowing the transponder antenna, and is not a problem with fighter aircraft, which have a different antenna configuration. Boeing Aircraft Corporation was attempting to find a solution to the B-52 problem at the end of the quarter.

As Sky Spot One was operating, SEVENTH Air Force directed the unit to conduct a special test during the period 8 through 28 April. There was a requirement to direct aircraft to a known position during inclement weather and periods of low visibility. An evaluation was requested to determine the feasibility of guiding Army helicopters to predetermined locations during the monsoon season. Sky Spot One conducted the test during the week of 16-22 April. Seventeen runs were completed, 14 helicopters were transponder equipped and the remaining three were not. Ranges varied from 7.83 to 59.7 nautical miles. Of the 14 transponder-equipped helicopters, nine were on target and the remaining five were 20 to 50 feet off target. Of the three runs not employing beacons, one was on target and the remaining two were 50 feet off. Therefore, the test was highly successful. It was also determined that a helicopter at 2000 feet altitude could be tracked up to 41 miles without being beacon equipped.

Sky Spot Two (OL-22) was established at Pleiku, Vietnam (14:0103N 108:0001E). The site suffered from masking, but has enjoyed considerable success since it became operational on 26 April. Personnel to man the site arrived on 12 April and found the location was complete and ready for equipment installation. The equipment arrived aboard three C-133 transports between 12 and 16 April. By the latter date, all equipment was in place.

CHAPTER II

PERSONNEL

INTRODUCTION --- Presented herein will be the personnel actions, reactions, and programs of the 1st CEG. This chapter will show the overall manning and related statistics, report upon the assignment of a new Commander, and tell of the first ever battle casualties by this organization. Technical training is also included in this chapter as we are primarily affected in the personnel area by technical training.

COMMANDER --- Highlighting the area of personnel this quarter was the assignment of Colonel Jacob A. Hutchison as the 1st CEG Commander, and concurrent reassignment of Colonel Melvin R. Schultz, the outgoing Commander, to the 2nd Bombardment Wing. SAC directed the reassignments, with an effective date of 16 May 1966. An official photograph of Colonel Hutchison and biographical information are included in this History under the "List of Key Personnel," near the conclusion of the narrative section.

CASUALTIES --- On 5 June, six 1st CEG personnel encountered an ambush and were killed approximately five kilometers (3.7 miles) south southeast of Dong Ha Air Base, Vietnam. The deceased personnel included:

TSgt Antone P. Marks, AF11192320

TSgt Bruce E. Mansfield, AF11232855

SSgt Ephraim Vasquez, AF18555118

SSgt John P. Guerin, AF28244605

A1C Rufus L. James, AF18603627

A1C Jerry D. Olds, AF14517996

Personnel involved departed Dong Ha by jeep at approximately 0930 hours local, on 5 June. They were searching for a survey point for Project Sky Spot, discussed in chapter three. The survey party was required to establish radio contact every 15 minutes and the last contact was at 1045 hours. At approximately 1430 a Military Assistance Command Vietnam advisory team notified Dong Ha that the survey party apparently encountered an enemy ambush and was killed by small arms fire. Although armed, there was no evidence that the team returned fire during the ambush. Of the six personnel, four were from the headquarters, and remaining two were from Detachment 10, 10 RBS Squadron, at Hastings, Nebraska. Remains of the four headquarters personnel departed Vietnam for return to the Continental United States on 8 June. Remains of the two detachment personnel, burned in the incident, did not leave Vietnam until 13 June.

Interrogation of personnel having knowledge of the ambush revealed that the survey team traveled beyond safe perimeter limits. The party chief (TSgt Marks) was reportedly briefed by the Dong Ha Marine force Commander as to the possibility of Viet Cong in the area. The Marine Commander also recommended a Marine platoon accompany the survey team. The 1st CEG team chief declined the security force.

The loss of the survey team proved a hardship on the 1st CEG. Our remaining teams, needed in the United States was scheduled to depart Travis AFB, California, on 11 June. We initiated action resulting in SAC requesting immediate personnel assistance to replace our losses and allow the organization to regain a site survey capability in the Continental United States.

AIR MEDAL --- While on the subject of personnel activities relating to the Vietnam conflict, an officer of this organization was awarded the Air Medal for his activities in Vietnam. Major Errol L. Goldsbury earned this award for flying 37 missions over -----

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1ST COMBAT EVALUATION GROUP (SAC)

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