[redacted]

Cambodia into the RVN. It was also part of the DUFFLE BAG program of unattended ground sensors employed within Vietnam. The DART read out facility consisted of transportable components including a directional S-Band antenna atop a 60-foot relay tower. DART was designed to read out sensors, interpret the data, and relay near-real time (less than one minute old) information on enemy personnel and vehicular movements to strike agencies in much the same manner as the ISC at NKP.[237/]

The primary sensor used in DART I was the Hand Emplaced Seismic Intrusion Detector (HANDSID I). Magnetic Intrusion Detector (MAGID) or Passive Infrared Intrusion Detector (PIRID) devices could be hand-wired to HANDSID to increase its sensitivity.[238/] Because of the flat terrain in the MR III area of the RVN, sensor data was relayed to the Bien Hoa facility by means of a permanent ground relay atop a 3,235 foot mountain (Nui Ba Den). EC-121R BATCATs flying on Amber Orbit were available to automatically relay this data to Bien Hoa during periods when the ground relay was nonoperational. Both the Bien Hoa and Nui Ba Den facilities were operated by the Air Force, while the Army was responsible for emplacing sensors. Artillery fire responses to sensor activations came from the 25th Infantry, 1st Infantry and 1st Air Cavalry Divisions.[239/]

By early 1970, the Army's Battlefield Area Surveillance System (BASS) was being introduced into the DART I area. Once BASS was in

[redacted]

operation, II Field Force Vietnam (IIFFV) felt that a transfer of DART I to another operating area would be agreeable to the three divisions which it served.[240/] BASS employed the same sensors as DART I, and also used ground relay stations to pass the information to a read out facility.

DART I terminated operations at Bien Hoa on 18 March 1970 and began preparations for moving the sensor read out equipment and the 73 Air Force officers and enlisted men to the new operating location at Quang Tri in RVN MR I. The relay equipment situated on Nui Ba Den was also removed, with only the monitor antenna left behind to support the BASS system.[241/] Upon arrival at Quang Tri DART I began monitoring sensor strings located in or near the Demilitarized Zone (DMZ) and in the northwestern portion of the XXIV Corps area, including the A Shau Valley.[242/]

Due to the mountainous and rugged terrain in MR I and the presence of enemy controlled high threat areas which restricted the implant of sensors by hand or helicopter, certain features of the relocated DART I operation differed from those followed in MR III. In addition to HANDSID sensors and the previous emplacement techniques increasing use was made of F-4 delivered ADSID, ACOUSID, and COMMIKE sensors identical to those employed by IGLOO WHITE. While some sections of the DART I field were read out by BASS and hand-carried Portatale units, the primary monitoring was done by an EC-121R BATCAT flying Blue Orbit for 18-24 hours a day. XXIV Corps at Da Nang

determined desired sensor locations based on inputs from field units and then forwarded the requests to TFA. TFA managed the sensor field (plotted implant locations, prepared sensor addresses, and resolved terrain-masking problems) and arranged for F-4 implant sorties. Target data was relayed from Blue Orbit to the DART I facility at Quang Tri where it was read out on four 120-pin X-T Plotters (See Figure 27) and sent directly to an Army Tactical Operations Center (TOC) which determined the type of response.[243/] Primary Army users were the TOCs of the 1st Brigade of the 5th Infantry Division at Quang Tri and the 101st Airborne Division at Camp Eagle.[244/]

The DART I report for 1-31 October 1970 reflected typical activities of the system after its move to Quang Tri. During this period, the DART I sensor field established an enemy pattern of movement into and out of the RVN along Route 9. Based on this analysis an infantry force was able to establish contact to engage the enemy, killing five North Vietnamese soldiers and capturing three AK-47 rifles. Other infantry engagement and Cobra helicopter gunship strikes based on sensor activations resulted in an additional 29 enemy KIA and 36 bunkers destroyed. The 1st Brigade, 5th Infantry Division and the 101st Airborne Division recorded 1,048 sensor activations during the month and responded with 238 artillery fire missions which expended 1,296 rounds.[245/]

The DART I sensor field originally consisted of Phase I and II sensors like its IGLOO WHITE counterpart in Laos. During the 1970-71 campaign (COMMANDO HUNT V) the DART field as well as that in Laos

was converted to Phase III sensors. The DART I field was scheduled to convert fully to Phase III by 15 December, the date that the QU-22B aircraft would begin to monitor half of Blue Orbit.[246/] Since the QU-22B was equipped to monitor and relay data only from Phase III devices, no more Phase I/II sensors were implanted after 1 October. Those remaining were not monitored after 15 December and gradually died out.[247/]

The use of OV-10 aircraft to implant sensors was first mentioned in a November 1970 memorandum from a 7th AF staff officer. He reported that the Marines were using this method and recommended that it be seriously investigated by the Air Force on a selective basis.[248/] A 7th AF feasibility study of the suggestion in early December revealed that Military Assistance Command Vietnam (MACV) also had requested an investigation of this delivery method to support Army sensor implants in MR I and possibly replace F-4 implants. The 7th AF study determined that the AAA threat level in the DMZ, Western Reconnaissance Zone (WRZ) and A Shau Valley still required F-4s and that the Portable Multiple Bomb Rack (PMBR) utilized by Marine OV-10s for sensor implants was not available in Air Force supply channels and would take a year to procure, flight test, and install operationally.[249/] During the Dewey Canyon II phase of Lam Son 719 in early 1971, Marine OV-10s continued sensor implants and emplaced 41 ADSID strings in support of Route 9/Khe Sanh security.[250/]

The area monitored by DART was temporarily expanded during Lam Son 719 to include 19 selected strings in STEEL TIGER.[251/] Information

obtained on movers was passed through XXIV Corps Forward Headquarters to ARVN commanders and provided valuable information on enemy truck and personnel movements.[252] TFA was called upon to monitor the DART field during Lam Son 719 from 7-13 and 14-24 March when the DART facility at Quang Tri was down for maintenance. Since the DART field was monitored by the Blue Orbit BATCAT, the activations were transmitted to TFA and read out on the newly installed X-T Plotter. Although TFA possessed the capability of backing up DART for short periods of time without additional manning, four DART personnel were sent TDY to the ISC to provide assistance during the March difficulties. Activations were called directly to Army units from TFA by landline.[253]

On 5 July 1971, 7th AF proposals of the previous month to close down the DART I facility and transfer it to TFA were put into effect. Seventh Air Force justified the move for three reasons:[254]

a. The transfer of DART I would be consistent with programs for the future utilization of TFA and would provide a fifth antenna for IGLOO WHITE and COMPASS FLAG.

b. A combination of the DART and STEEL TIGER sensor read outs during future campaigns would provide real time target correlation and strike capability against enemy infiltration through the DMZ and along the Laos/RVN border.

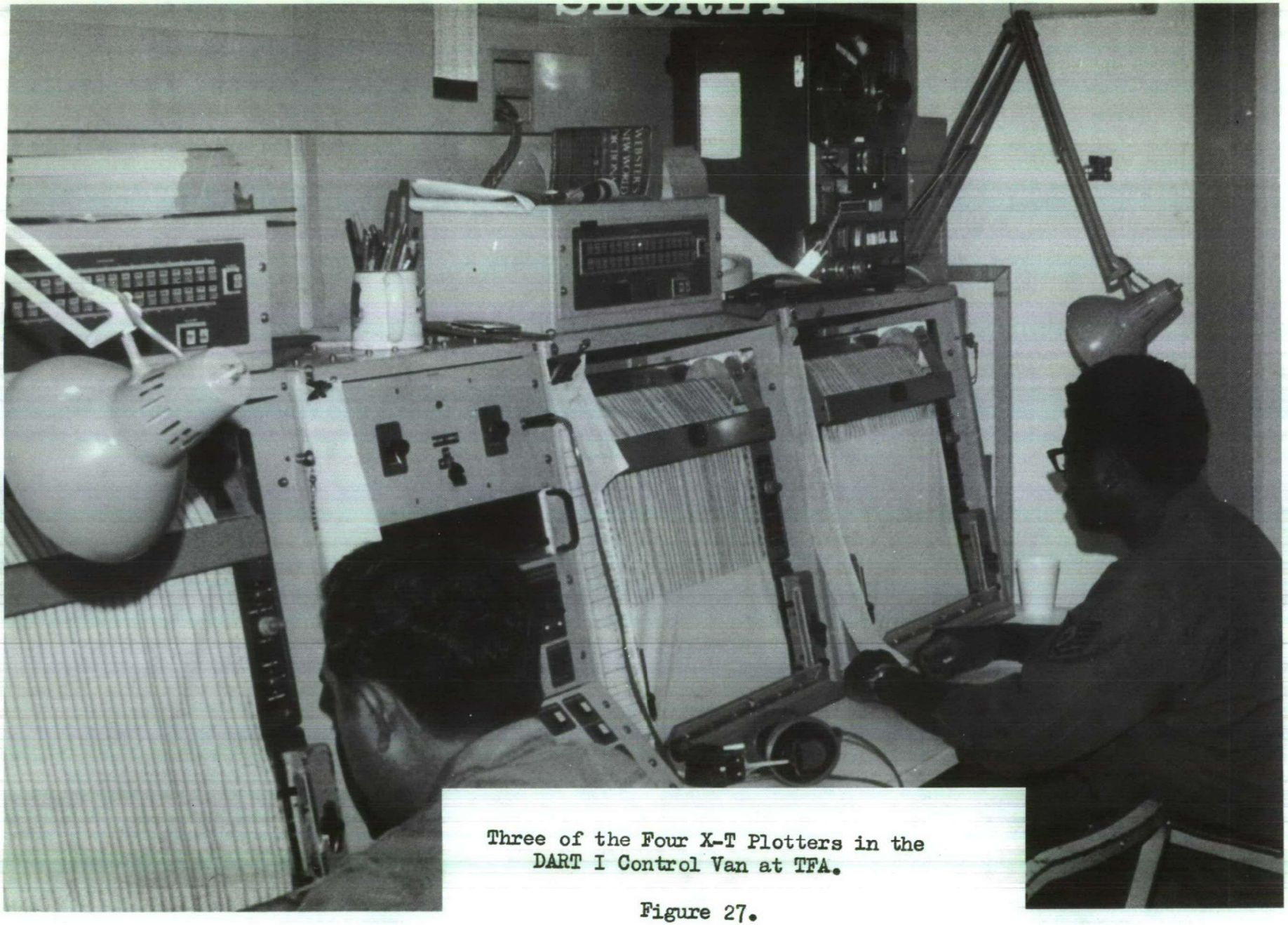
c. The anticipated withdrawal of U.S. Army forces from the Quang Tri area in the near future raised concern for the security of the DART facility and personnel.

In preparation for the move TFA began to monitor the DART field on 11 May be means of the ISC computer during normal computer duty hours and by the X-T Plotter at all other times, for a total of 19 hours daily. Upon completion of equipment installations on 1 August, the DART Plotter took over from the TFA Plotter, although the computer still monitored both the DART and IGLOO WHITE sensor fields from 1700-0600 hours daily.[255/]

DART activation sequences (relayed to TFA by Blue Orbit) were called by TFA in near-real time to the 1/5th and the 101st TOCs. From the TOC, mover information was passed to air strike forces (particularly AC-119G Stinger gunships) through the Tactical Air Control Party (TACP) at the TOC or the I Direct Air Support Center (I DASC).[256/] TFA also issued the DART daily intelligence summaries which had formerly originated from Quang Tri.[257/] A total of 18 DART personnel were transferred to TFA to operate the equipment, and the remaining 34 DART manning positions were deleted.[258/]

DART II

DART II was built originally as a backup for DART I or the ISC, or for use as a training facility in the CONUS. With the success of DART I in 1969, DART II was deployed to SEA in September 1969 to assist in antiinfiltration surveillance along the Cambodian border,[259/] with primary areas of interest being the tri-border area and the Plei Trap Valley.[260/] The system became operational at Pleiku on 28 September 1969 in support of I Field Force Vietnam (IFFV). Sensor read outs



Three of the Four X-T Plotters in the DART I Control Van at TFA.

Figure 27.

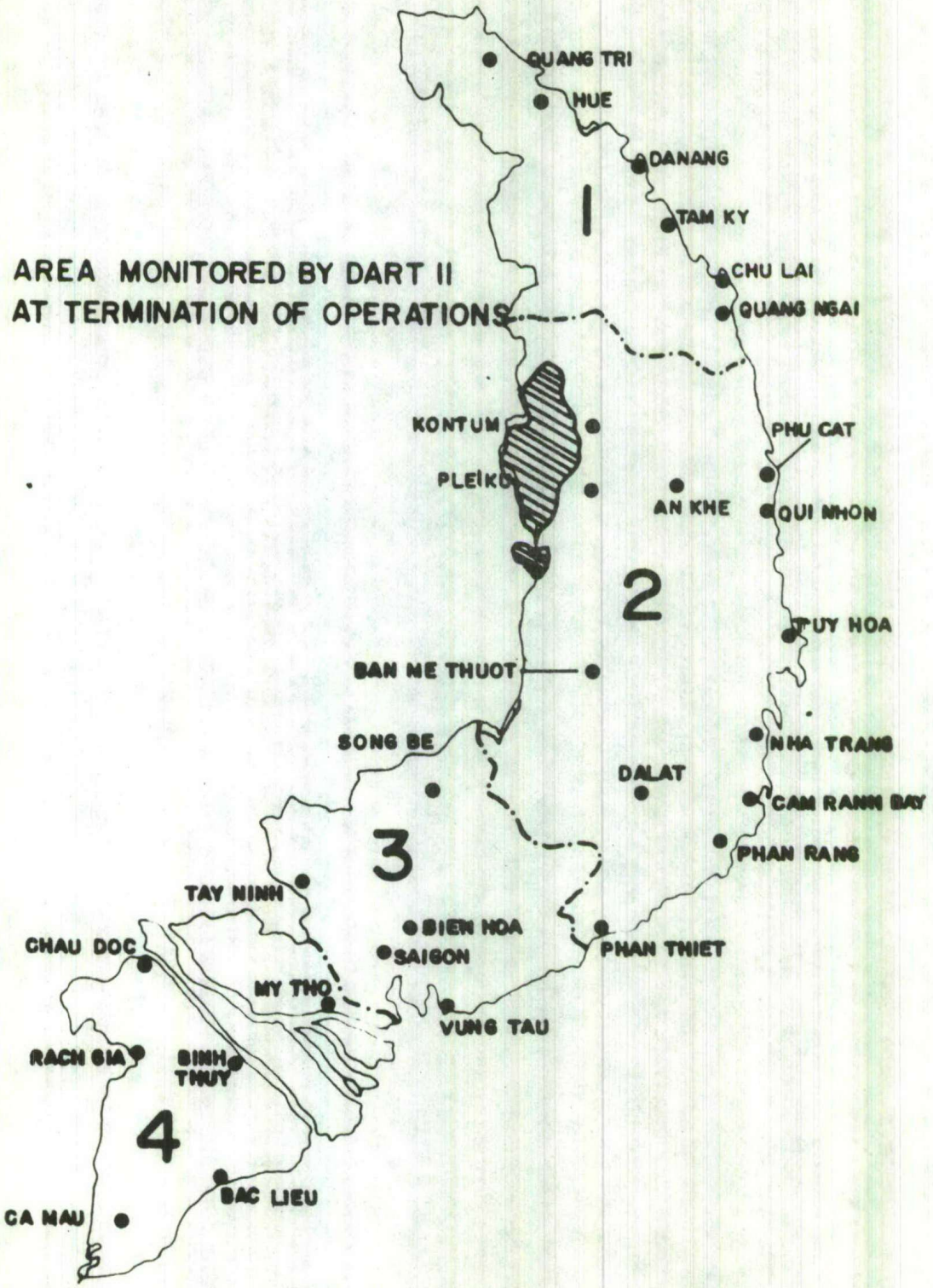

AREA MONITORED BY DART II
AT TERMINATION OF OPERATIONS
QUANG TRI
HUE
DANANG
TAM KY
CHU LAI
QUANG NGAI
KONTUM
PLEIKU
AN KHE
PHU CAT
QUI NHON
TUY HOA
BAN ME THUOT
SONG BE
NHA TRANG
DALAT
CAM RANH BAY
PHAN RANG
TAY NINH
BIEN HOA
SAIGON
PHAN THIET
CHAU DOC
MY THO
VUNG TAU
RACH GIA
BINH THUY
BAC LIEU
CA MAU
1
2
3
4

FIGURE 28

were relayed from DART II to the 52d Artillery Group where the type and extent of response were determined.[261]

DART II differed from DART I in three ways. While DART I did not employ an airborne sensor read out until it moved to Quang Tri, from the beginning DART II utilized EC-121R BATCATs flying Orange Orbit to transmit sensor data to Pleiku. Second, DART II always employed IGLOO WHITE ADSIDs and Phase I/II HELOSIDs and ACOUBUOYs implanted by Army helicopters. Terrain and enemy activity precluded the use of hand-emplaced sensors. Third, 22 Vietnamese Air Force (VNAF) personnel were integrated into the operation in late 1969.[262]

By early 1970, both 7th AF and IFFV began to express dissatisfaction with DART II and question its effectiveness as a real time targeting system. A 28 March message from the Vice Commander, 7th AF to MACV/J3 (responsible for the DART program) recalled that during January and February there had been an average of six fire support missions a day in support DART II. A 27 February order from the Commanding General, IFFV, however, had directed that artillery fire in support of DART II would be limited only to selected targets, such as those indicating movement. For the previous 30 days, 7th AF complained, there had been only three artillery fire missions against DART II targets. The Army had also recently relocated the 175mm guns covering the DART field in the southern Plei Trap Valley out of range of the sensors. A further shortcoming was that only six air strikes, resulting in one

confirmed enemy killed in action (KIA), had been directed against DART II derived targets since the system began operations in September 1969. Seventh Air Force felt that these results and the apparently diminishing Army interest hardly justified the continued commitment to the program of 380 Air Force personnel and six EC-121Rs.[263/]

A second "hard look" was taken at DART II in August. At that time, 7th AF pointed out to MACV/J3 the low number of Army and Air Force strike responses to DART II and the almost total absence of confirmed BDA, as well as the lack of significant intelligence. Other factors cited included:[264/]

a. The difficulties of maintaining the DART II field in light of the continuing U.S. withdrawal from western MR II.

b. Eighty-five percent of DART II Air Force personnel were scheduled to rotate at mid-September.

c. The tri-border sensor field would expire around mid-September and require re-seeding.

d. The impending introduction of the QU-22B relay aircraft on Orange Orbit would require converting all DART II sensors and facilities to Phase III equipment.

The Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV) and 7th AF also determined that cessation of DART II operations would not significantly affect tactical operations and that DART II did not meet the desired criteria for Vietnamization.[265/] Based on these considerations, DART II was terminated and Orange Orbit cancelled on 29 September 1970, exactly one year after the program originally became

operational.[266/]

The DART II end of tour report, dated 12 October 1970, listed a number of factors which had limited the effectiveness of the program:[267/]

a. Real time target acquisition and effective BDA were limited by the small size of enemy personnel concentrations, his ability to rapidly redeploy and practice concealment, and the large number of trails available for his use.

b. Repeated reactions by Tac Air and artillery compromised sensor locations, resulting in use of alternate trails by the enemy.

c. Terrain and the presence of triple canopy jungle limited the availability of collateral intelligence to assist in planning sensor emplacements. Enemy control of the sensor area prevented friendly reconnaissance teams or an agent network from assessing lucrative target areas. Canopy also hindered the accurate placement of sensors in close proximity to specific trails.

d. The DART II field was limited to an average of 200 sensors because of the need to share channels and addresses with TFA and DUFFLE BAG.

e. Phase I sensors could not be shut down and continued to broadcast until the end of their 180-day life span. Once strike reactions compromised their locations, enemy forces moved to an alternate area, but the sensor continued to broadcast and prevented the use of that address in a more lucrative area.

f. The average reaction time of artillery was 20 minutes. Tac Air responded only 11 times and usually involved long delays before a FAC arrived and then more time for strike aircraft to appear. These delays rendered reactions ineffective against an elusive, mobile enemy.

g. Triple canopy jungle, terrain, and the absence of friendly forces prevented accurate assessment of reaction results.

Table 8 sums up the results of DART II's year of operation.

TABLE 8

DART II RESULTS[268]

28 September 1969 - 29 September 1970

Total Operationally Valid Targets Detected:	4178
Total Artillery Fire Missions:	938
Total Rounds of Artillery Expended:	7469
Total TAC Air Strikes:	11
Total Number of Sensor Strings:	155
Total Number of Sensors Implanted:	607

Damage Inflicted on Communist Forces
by Actions Based on DART II Reports

Killed in Action:	6
Bunkers Destroyed:	2
Secondary Explosions:	2
Sustained Fires:	2
Captured Equipment:	One AK-47 Rifle Two Grenades One Rucksack with Documents

The final paragraph of the DART II Weekly Activity Report for 23-29 September 1970 appropriately marked the close of the program:[269]

In keeping with MACV. . .and 7AF. . .DART II ceased operations. So, as the sun slowly sank in the western sky, DART II bid a fond AMF

(Adios, my friends) as it sadly swung shut its doors to the ghastly background cry of a dying SPIKESID pleading, "Tac Air, Artillery, Car 54- Where are you-u-u-u-u-u-u-u-u?"

U.S. Air Force Support of DUFFLE BAG

The transfer of DART I to TFA and the cancellation of DART II did not terminate the Air Force's role in the RVN sensor program (designated DUFFLE BAG). MACV priorities for supporting DUFFLE BAG emphasized coverage of the DMZ and areas in the RVN adjacent to the Laos/Cambodian borders. In practice, this placed the majority of the DUFFLE BAG effort in northern RVN within the area controlled by XXIV Corps.[270/]

Seventh Air Force responsibilities in DUFFLE BAG included providing the capability to monitor a maximum of 400 sensors in the DMZ, WRZ, and A Shau Valley for 19 hours a day (this was the DART I program). Activation sequences would be called within one minute of validation to Army TOCs for possible fire response. Seventh Air Force provided F-4 implant sorties adequate to maintain a maximum of 40 sensor strings, with XXIV Corps retaining the option to implant or re-seed any of the 40 strings. Three IGLOO WHITE channels were made available to DUFFLE BAG for relay purposes on aircraft covering Blue or any follow-on orbit,[271/] in addition to the five channels permanently assigned to the program. All eight were read out by TFA.[272/]

Twenty-fourth Corps in turn was responsible for managing sensor addresses on its eight channels and for providing the Air Force with

a continuously updated listing of the 40 strings eligible for F-4 implant. Twenty-fourth Corps also provided a liaison officer to TFA on a TDY basis to coordinate sensor management, implant and monitoring requirements.[273]

DUEL BLADE

DUEL BLADE was another term associated with the DUFFLE BAG program. DUEL BLADE originally referred to a Strong-Point Obstacle Subsystem (SPOS) along the northeastern RVN border and had previously carried the name DYE MARKER.[274] By late 1968, the SPOS had evolved into a program in which friendly maneuver forces used mobile tactics with air, artillery, and naval gunfire support to respond to targets detected by ground sensor devices (this was known as DUEL BLADE II). The DUEL BLADE II area included all territory in the RVN south of the Provisional Military Demarcation Line (PMDL) and north of Route 9. By early 1971, the term DUEL BLADE II had been terminated and absorbed into DUFFLE BAG. In its last year, DUEL BLADE II referred more to a geographical area than a program or concept.[275]

BASS

Occasional references have been made in this report to the Army's Battlefield Area Surveillance System (BASS). BASS was different from the DARTs in that it did not consist of a specific, relatively fixed set of components or hardware. Rather, BASS was a concept which covered a variety of different sensors and read out facilities, as well as applications and uses.[276] BASS systems were often local

in nature and involved the monitoring of approaches to defended villages and fixed military installations. The system was capable, however, of covering a larger area, as occurred when DART I was replaced by BASS in MR III. Airborne read out of BASS fields or air emplacement of sensors by other than Army organic aviation generally was not practiced, although instances occurred in northern RVN, where Air Force F-4s and Marine OV-10s occasionally delivered sensors in support of Army requirements and read outs were available from Blue Orbit. No major USAF role was anticipated in the development and future use of BASS.

Vietnamization of Sensor Programs (TIGHT JAW)

On 19 March 1969, the U.S. Joint Chiefs of Staff directed that the in-country sensor program be expanded to include Republic of Vietnam Armed Forces (RVNAF) personnel. These efforts to provide the Vietnamese with their own sensor capabilities were known as Project TIGHT JAW. On 15 June 1969, COMUSMACV Operations Plan 103-69 provided for a combined US/RVNAF border surveillance and anti-infiltration program covering selected western border areas of the RVN from the DMZ to the Gulf of Thailand and an expansion of existing sensor missions throughout the RVN. Eventual Vietnamese unilateral operation of this program was envisioned.[277/]

A July 1970 examination of northern MR I revealed the requirement for Vietnamese-operated sensor fields in this area. At this time, MACV proposed eventual Vietnamese Air Force (VNAF) operation of

DART I (Quang Tri) and DART II (Pleiku), each with a 476 sensor capacity. The VNAF would have the ability to implant sensors and monitor them with an airborne platform dedicated solely to sensor read out. Although a particular aircraft was not specified, PAVE EAGLE II was indicated elsewhere.[278/]

PACAF, 7th AF and the USAF Advisory Group agreed that the VNAF should have a capability to implant sensors, but opposed Vietnamizing the DARTs and giving VNAF an additional aircraft to operate. Instead, a simple air relay-monitoring system compatible with BASS was proposed, since personnel resources, and budgetary limitations precluded any VNAF effort approaching even a modest IGLOO WHITE concept. It was also believed likely that any VNAF role in future Vietnamese sensor programs would be that of a support role responsive to ARVN through direction of the RVNAF Joint General Staff (JGS).[279/]

By October 1970, COMUSMACV agreed that Vietnamization of PAVE EAGLE II and the remaining DART was impractical. Instead of a specialized aircraft dedicated solely to airborne sensor read out, emphasis was placed on the development of an unsophisticated Palletized Airborne Relay (PAR) system which would interface with BASS equipment already programmed for the RVNAF.[280/] By September 1971, the USAF was in the process of procuring PAR packages which would initially be fitted in VNAF C-47s and be available for installation in C-7s when these aircraft entered the VNAF inventory in 1973. If necessary PARs could also be

in C-119s and C-123s.[281] Upon introduction of PARs, the VNAF was expected to be fully capable of relaying sensor data to ground stations from C-47s. However, RVNAF JGS would first have to authorize VNAF to utilize aircraft for this purpose in competition with other requirements (such as airlift). The USAF was expected to have no major role in the introduction of the PAR when the time came, and advisors were expected to be drawn from ARVN personnel familiar with sensors.[282]

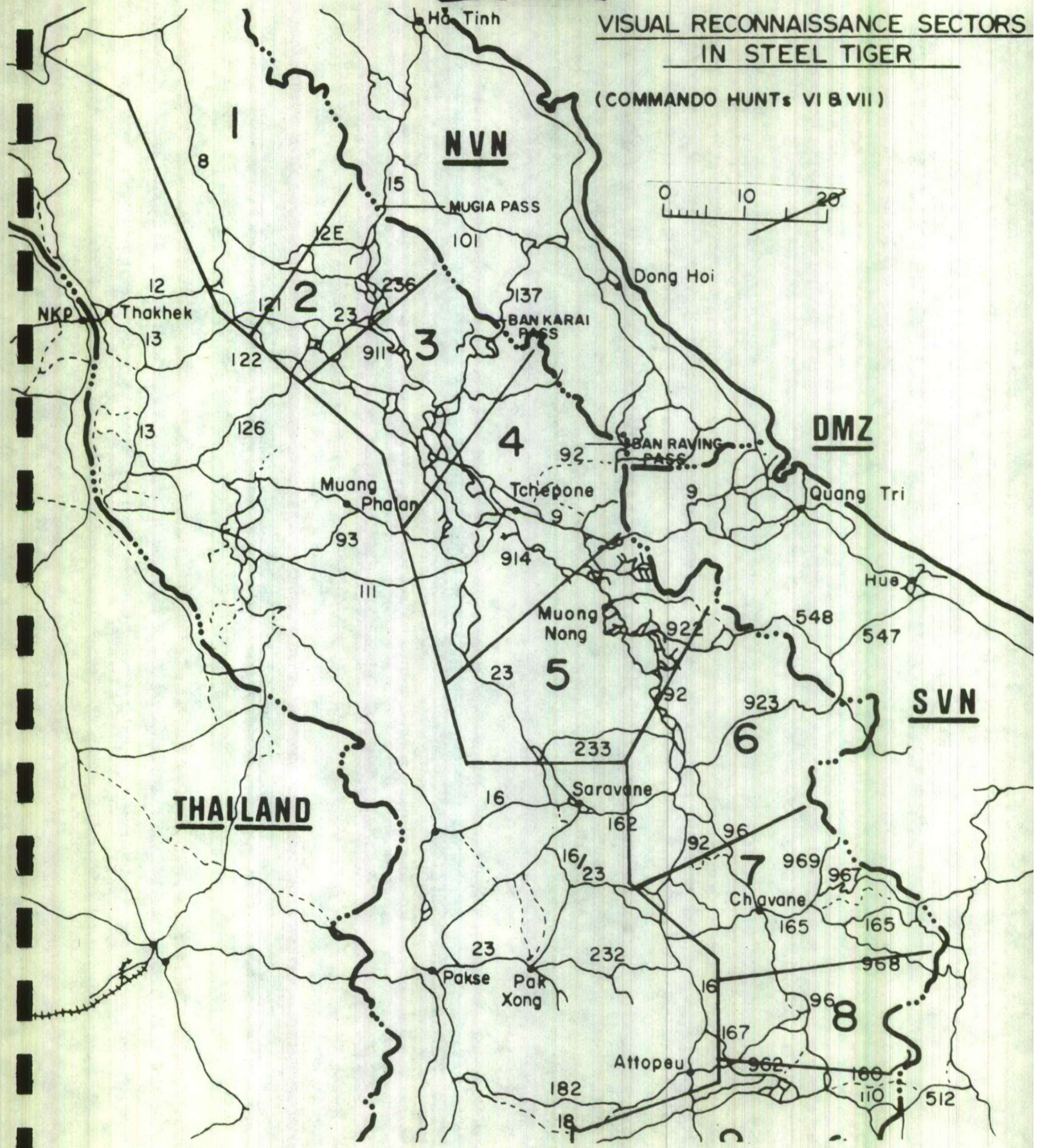

VISUAL RECONNAISSANCE SECTORS
IN STEEL TIGER
(COMMANDO HUNTs VI & VII)
NVN
DMZ
SVN
THAILAND
Hà Tinh
Dong Hoi
Quang Tri
Hue
Thakhek
NKP
Muang Phalan
Tchepone
Muong Nong
Saravane
Chavane
Pakse
Pak Xong
Attopeu
MUGIA PASS
BAN KARAI PASS
BAN RAVING PASS
0 10 20
1
2
3
4
5
6
7
8
8
15
12E
101
12
121
236
137
23
13
122
911
13
126
92
9
93
914
111
548
547
922
923
233
16
162
96
969
967
16/23
165
165
232
968
167
962
182
110
512
18

FIGURE 29

CHAPTER VI

THE FUTURE OF IGLOO WHITE: COMMANDO HUNT VII AND BEYOND

Planning for COMMANDO HUNT VII

The COMMANDO HUNT VII campaign was just beginning as this report was going to press. The most significant change planned for IGLOO WHITE for this campaign was TFA's resumption of operational control of strike aircraft operating as part of the STEEL TIGER interdiction program. The actual details of the new procedures were still being developed at the cut off date of this report, but certain features promised to be different from the SYCAMORE Control operation of COMMANDO HUNT I.

Early planning for TFA's new function envisioned the ISC operating as an extension of the 7th AF Combat Operations Center (COC, call sign BLUE CHIP) and utilizing near-real time sensor information to direct strike aircraft (including gunships) to lucrative truck-killing areas. Ideally, the process would be a complete cycle through to damage assessment, with a restrike capability if any lucrative targets remained.[283/]

One proposed form of the new procedures under consideration involved the division of the nine VR sectors into three groups (possibly sectors 1-3, 4-5, and 6-9). Aircraft operating over each set of VR sectors would be under the control of a sector operator "station" each of which would include strike control, radio communications and intelligence personnel. Like the COMMANDO BOLT system, strike nominators would closely monitor sensor strings in their assigned area by use of

IBM 2250 and 2260 display consoles. Specific coordinates of developing targets would then be passed by radio to FAC and strike aircraft in the area. In the majority of cases, moving vehicle targets would be acquired by the aircraft either visually or by radar before strike, rather than struck on the basis of predetermined LORAN coordinates. Under this proposal, a Chief Controller would supervise the "stations" and have the authority to divert strike resources from one set of VR sectors to another in which the number of strikeable targets exceeded the aircraft available to send against them.[284/] EC-121R BATCATs most likely would continue on-board sensor read out and FERRET III operations on Purple Orbit (covering sensor strings in the VR sector 6-9 area), since the distance precluded data relay to TFA without expanded communications facilities.

The intelligence section of the "station" would be composed of personnel knowledgeable of the local route structure, enemy activity patterns and the results of recent FAC and photographic reconnaissance of their assigned geographic area, as well as its target/BDA history. Based on developing sensor patterns and utilizing techniques similar to those of the Night Fixed Targeting Program, perishable semifixed targets would be located with varying degrees of precision and passed to the strike nominator for immediate FAC reconnaissance or strike. Working with the "stations" would be weather and communications-maintenance personnel, as well as another intelligence targets team responsible for combining previous target intelligence with inputs

from the "stations" to develop fixed-area targets throughout STEEL TIGER.[285/] The use of Special Intelligence (SI) would be an essential part of all target development functions, with much of this material being made available to IGLOO WHITE through the COMPASS FLAG program.

Questions unsettled at the end of this reporting period included the number of "stations" to be established, the final breakdown of VR sector responsibilities, whether all or only some strike aircraft would be assigned to TFA, and the number of hours a day the system would operate. This last question was of considerable importance, since a round-the-clock interdiction operation at TFA based on IGLOO WHITE infomation would require 24-hour a day coverage of the sensor-monitoring orbits with the resultant increased demands on manpower, aircraft, and material in all phases of the program.

Other changes anticipated for COMMANDO HUNT VII included the expansion of the KEYWORD File from its current approximately 24,000 entries to almost 100,000. This was to be accomplished by adding the 7th AF computerized intelligence data base to KEYWORD, and would expand the STEEL TIGER data base as well as introduce information from northern Laos (BARREL ROLL), Cambodia, and the RVN. In addition, the 7th AF AAA file and its BDA listing were also to be added to KEYWORD. Also available for target development purposes (although not a part of KEYWORD) was an SI collection of 10,000 cross-indexed file cards along with specialized supporting material.

Upon successful conclusion of the KEYWORD expansion, TFA would combine a variety of intelligence resources at one location: sensor information; KEYWORD File; access to FACs and their reports; Airborne Radio-Direction Finding (ARDF) capabilities; opportunities to coordinate with Controlled American Source offices; and SI programs (including COMPASS FLAG). In addition, TFA possessed the only Air Force map-making facility in SEA. By assuming operational control of strike aircraft during COMMANDO HUNT VII, TFA hoped to make direct real time use of its concentration of intelligence/targeting resources.[286/]

TFA also anticipated that the COMMANDO HUNT VII IGLOO WHITE sensor field would be larger than any of its predecessors, because of extension to the WRZ of the RVN and certain LOCs in STEEL TIGER west.[287/] Another proposal under consideration was to reduce the maximum number of sensors for certain strings from eight to four or five,[288/] which would allow an increase in the number of sensor strings from the approximately 185 possible with eight sensors per string. The 185 string figure had been made possible by the addition of eight more IGLOO WHITE sensor frequencies during COMMANDO HUNT VI.

Remote Ground Sensor Planning and Programming Objectives (REGSENSPO)

In December 1970, Headquarters USAF issued a document entitled REGSENSPO which sought to provide ". . . guidance for coordinated midrange and long-range U.S. Air Force planning and programming of remote ground sensors and associated resources."[289/] REGSENSPO envisioned

the "integration of ground-based surveillance capabilities and the resultant intelligence data into tactical networks for use by air base defense components and the Tactical Air Control System for the attack of ground targets in day, night and all-weather conditions." Tactical Air Command (TAC) was then in the process of coordinating with Air Force Systems Command (AFSC) and the Air Staff to incorporate sensor technology into contingency forces.

United States Air Forces Europe (USAFE) were asked in this document to consider remote ground sensors as a means of providing surveillance of forces hostile to NATO, especially their probable airfield, missile, AAA, and truck park/storage sites. Other factors to be considered by USAFE were the emplacing and airborne monitoring of sensors in hostile air environments and their use in a stay-behind role by retreating friendly forces.

PACAF's tasking letter which accompanied the basic REGSENSPO document to its subordinate numbered Air Forces (5th AF, 7th AF, 13th AF, and 7/13th AF) requested comments concerning organizational relationships of future sensor operations. For example, at what level of assignment could sensor resources be most effectively utilized; should they be aligned with the intelligence or the command/control function; and should all components (emplacement vehicles, read out equipment, required facilities) be centrally controlled?[290/]

The 7th AF reply to PACAF (dated 16 January 1970) concerned the SEA area during the 1974-78 timeframe when it was assumed that all U.S. forces supporting IGLOO WHITE would have been withdrawn. The most useful sensor types were seen as ADSIDs, ACOUSIDs, and possibly EDETs (this was before the EDET test of March-June 1971). To establish a minimal 40-string field for six months (with a 60-day average life per sensor), approximately 1600 sensors would have to be on hand or procurable on a short-term basis. A steady supply of new sensors would be necessary if either the 40 string or the six-month figure were exceeded. Sensor implant missions would almost certainly have to be performed by LORAN-equipped F-4D aircraft, although OV-10s possibly could be used for visual delivery in AAA low-threat areas.[291/]

The use of an airborne read out of sensors was seen as providing maximum felxibility for sensor field location and configuration, although 7th AF felt that there were no systems available at that time (March 1971) which could adequately perform this task. Even FERRET III operations with the X-T Plotter were viewed as ". . . only marginally adequate for even the less demanding applications."[292/] For relaying sensor activations to a ground read out terminal, 7th AF discussed both the QU-22B and a Palletized Airborne Relay (PAR) which was being developed for installation aboard various VNAF cargo aircraft. PAR was seen as offering maximum flexibility at the least cost for a contingency sensor system, and was recommended as the best choice for monitoring any future fields.

Further, 7th AF suggested that the ground terminal facility for interpreting sensor activations probably would be similar to DART I or the more sophisticated Sensor Reporting Post (SRP, this was an air-transportable, mobile ISC which featured a small digital computer and could monitor a field of 400 sensors. It was under development at Eglin AFB, Florida).[293/] This terminal would necessarily be readily deployable to SEA and reasonably mobile once it had arrived in theater. Given the geography of SEA and the PACAF area of operations, 7th AF suggested that the potential of a shipboard SRP-type facility should be investigated as a means of providing maximum deployment flexibility.[294/]

Finally, 7th AF answered PACAF's questions on who should control a sensor system, and to what degree it should be centralized. Management and control of the system should be within the operations rather than the intelligence function, 7th AF stated, although a close operations-intelligence relationship was necessary to its successful operation. In addition, central management of all system components was seen as necessary to insure proper coordination of sensor logistics, field location and configuration, sensor implant, airborne relay schedules, and ground terminal operations. The 7th AF reply concluded with a comment on the resource competition between a sensor system and strike forces:[295/]

The competitive priority of a contingency sensor system should be low compared to the priority of strike forces in a reduced budget environment. However, a minimal system could be maintained with little impact on strike force capability, considering the relative costs of a minimal sensor system versus the costs of strike aircraft, associated equipment and facilities.

PACAF's 15 March 1971 response to the original Headquarters USAF REGSENSPO document repeated many of 7th AF's ideas. The primary use of ground sensor technology to the Air Force in the future was seen by PACAF to be target development on a real time basis, with intelligence collecting being secondary. This technology could be best exploited in PACAF's opinion, by integrating the capabilities of the SRP or similar facility in a manual mode with the Combat Reporting Center (CRC) and then including both functions in the Tactical Air Control System (TACS).[296/]

Like 7th AF, PACAF recommended the use of ADSID/ACOUSID sensors against vehicles, but stressed the need for an antipersonnel capability as well. F-4 sensor implants also were seen as necessary, and airborne data relay requirements could be best satisfied by use of the PAR. Deployment mobility was regarded as vital for the ground read out facility, which would utilize either a DART type facility or the SRP. The PACAF letter also mentioned the use of sensors to augment existing Air Control and Warning (AC&W) systems by providing a capability for detecting low-flying aircraft. This capability would be most useful in Korea, but should also be deployable throughout the Pacific area. PACAF also drew attention to the vulnerability of sensors to hostile ECM, and stressed

that efforts should continue to develop protection against this threat in future applications.[297/]

In an article appearing in the June 1971 issue of The Air Force Magazine, Major General William J. Evans, former Deputy to the Director of the DCPG/DSPG, discussed areas in which sensor research and development were continuing. Development of longer-life batteries was a prime item of interest, as were sensors which would properly implant and operate in terrain in cold-climate parts of the world. Sensor cases were desired which would blend with different types of topography and vegetation. The General also mentioned the need for new types of detectors with better target discrimination (a possible reference to EDET III), and sensor frequency bands suitable for worldwide use. Also required were sensor transmitters less vulnerable to jamming, as well as an airborne monitor/relay platform able to operate in hostile air environments. Finally, Major General Evans expressed hopes that the accuracy of sensor implants could be improved by different sensor configurations and the development of more precise navigation systems for delivery aircraft. Sensors placed closer to the roads which they monitored would require less detection range and lower battery power, thus resulting in smaller, lighter, and cheaper sensors.[298/]

MYSTIC MISSION

On 4 March 1971, the DSPG assigned the name MYSTIC MISSION to a project to develop a Phase III sensor system for use in Europe. On

9 August, DSPG activated Detachment 1 of Joint Task Force 728 to test and evaluate the new sensor program. To control the CONUS phase of the evaluation, Detachment 1 became operational on 13 September 1971 at Field 2, Eglin Air Force Base, Florida. This was a joint services project, with a U.S. Army commander, an Air Force vice commander, and a Marine Corps chief of staff.[299/]

Conclusion

In October 1971, IGLOO WHITE stood at a crossroads. For the past four years, various sensor applications and uses had been proposed and tested operationally in SEA under combat conditions. For the COMMANDO HUNT VII campaign, the most successful of these programs apparently were to be combined with the authority to control directly a substantial portion of the Air Force's interdiction resources in STEEL TIGER. Although a number of separate and distinct agencies and operations were necessary to the success of the new system, the real time target detection capability of IGLOO WHITE was to be the center of the 1971-72 interdiction effort. Since both 7th AF and PACAF saw the ability of IGLOO WHITE to detect lucrative targets, direct strike aircraft against them on a real time basis, and restrike if necessary , to be the principal justification for such systems in the Air Force inventory, the results of COMMANDO HUNT VII promised to have a decisive impact on the future role of remote ground sensor technology in the U.S. Air Force.

APPENDIX I

Instructions for use of CONFIRM sheet readouts on pages 109 and 110.

SECTION 1 - Sensor String Number. The first two digits (01-09) identified in which the Visual Reconnaissance (VR) sectors of STEEL TIGER the string was located. There were nine VR sectors for the 1971-72 campaign. The notation at the extreme left identified the Ground Surveillance Monitor (GSM) responsible for monitoring the particular set of strings.

SECTION 2 - Distance Between Sensors. This figure was read from top to bottom in tenths of a kilometer. Thus, 0.26 would equal 260 meters. In certain cases the distance was given between the adjoining strings along the same LOC. For example, the last sensor in string 08-220 and the first in string 08-221 were 140 meters apart along the same road. The figures at the far left represented the year and the Julian (Zulu) date.

SECTION 3 - Individual Sensors in String. Sensor strings normally had a maximum of eight sensors, with additional strings being implanted if more sensors were desired. Since only currently active sensors were listed on the CONFIRM sheets, gaps frequently appeared in the enumeration. The sensors were always numbered from north to south, with the highest number being the southernmost sensor in the string. Strings with only one active sensor were not normally monitored.

SECTION 4 - Listing of Activations by Minute. The CONFIRM sheet displayed 40 minutes of Zulu time, with the most recent period being at the bottom of the sheet.

a. Since seismic sensors could activate for six 10-second periods each minute, the total number of those periods for which the sensor was activated was displayed in this section. This was updated at the end of each minute when all activations for that period had been received by the computer. Thus, the higher the number (up to six), the more activity was occurring within range of the sensor. Hyper-active sensors displayed continual activations and were regarded as unreliable.

b. The sample sheets illustrate patterns displayed by various activation sources. Vehicular traffic generally displayed a diagonal "step" pattern, starting with the first sensor in the string. Southbound vehicles would begin with low numbered sensors, while northbound trucks would first activate the higher numbered ones. Aircraft, ordnance and localized activity displayed distinctive patterns which a trained operator could easily distinguish from trucks.

c. Acoustic sensors were "polled" (commanded to transmit audio) when a nearby seismic or ignition sensor revealed activity. The resulting audio assessment by the Radio Operator helped determine the nature of the activation. In addition, COMMIKEs were polled at random throughout the night for any indication of enemy activity. In either case, the Radio Operator upon detecting positive signals entered his assessment of the sounds into the computer (and hence onto the GSM's IBM 2250 CONFIRM display) according to the following letter code:

AB	Tracked vehicles and motorcycles
AC	Motorcycles and aircraft
AF	Trucks and motorcycles
AK	Tracked vehicles and aircraft
AT	Trucks and aircraft
AV	Tracked vehicles and trucks
AZ	Trucks closest to sensor
B	Background noise
CA	Motorcycles
CM	Motorcycles and motion
CO	Motorcycles and ordnance
CS	Motorcycles and small arms
CV	Motorcycles and voices
G	Small arms
HA	Helicopter
JA	Jet Aircraft
KA	Tracked vehicles
KM	Tracked vehicles and motion
KO	Tracked vehicles and ordnance
KS	Tracked vehicles and small arms
KV	Tracked vehicles and voices
M	Motion
MO	Motion and ordnance
MP	Motion and aircraft
MS	Motion and small arms
O	Ordnance
OP	Ordnance and aircraft
OS	Ordnance and small arms
PA	Prop aircraft
SP	Small arms and aircraft
TA	Trucks
TM	Trucks and motion
TO	Trucks and ordnance
TS	Trucks and small arms
TV	Trucks and voices
U	Unassessable
V	Voices
VM	Voices and motion
VO	Voices and ordnance
VP	Voices and aircraft
VS	Voices and small arms
W	Weather

SECTION 5 - Mode. Indicates whether the sensor is being read out in a real time (R) basis with activations being passes as they occur, or non-real time (N), in which information is stored by the sensor for transmission at a later time upon command.

SECTION 6 - Type of Sensor. Sensors were identified by means of the following letter codes:

W - ADSID (Seismic only)
N - ACOUSID (Seismic and acoustic)
E - EDET (Ignition only)
Y - COMMIKE (Acoustic only)
Q - COMMIKE/EDET (Acoustic and ignition)

SECTION 7 - Sensitivity. Refers to sensor detection range and strength of activations. The sensitivity of sensors can be adjusted to eliminate extraneous stimuli which could cause false activations. This also allows adjustments to be made to individual sensors in a string in relation to their distance from the LOC which they are monitoring, so that a uniform pattern is presented on the CONFIRM display.

SECTION 8 - Bit Rate. Refers to the rate at which sensor-transmitted data is received by the computer. This is usually at 300 pieces of information (or "bits") per minute, although it can be reduced to 75. The lower rate is used to reduce the effect of various forms of radio. Frequency Interference (RFI).

SECTION 9 - Reliability. Sensors were rated according to the following code:

1. Unknown reliability. Given to all newly-implanted sensors.

2. A 2, 3 or 4-rated sensor which has had no activations for three days.

3. Audio sensors. COMMIKEs or ACOUSIDS which have lost their seismic capability but still retain audio.

4. Sensors that activate for weather, aircraft or random activations only. Does not participate in truck sequences.

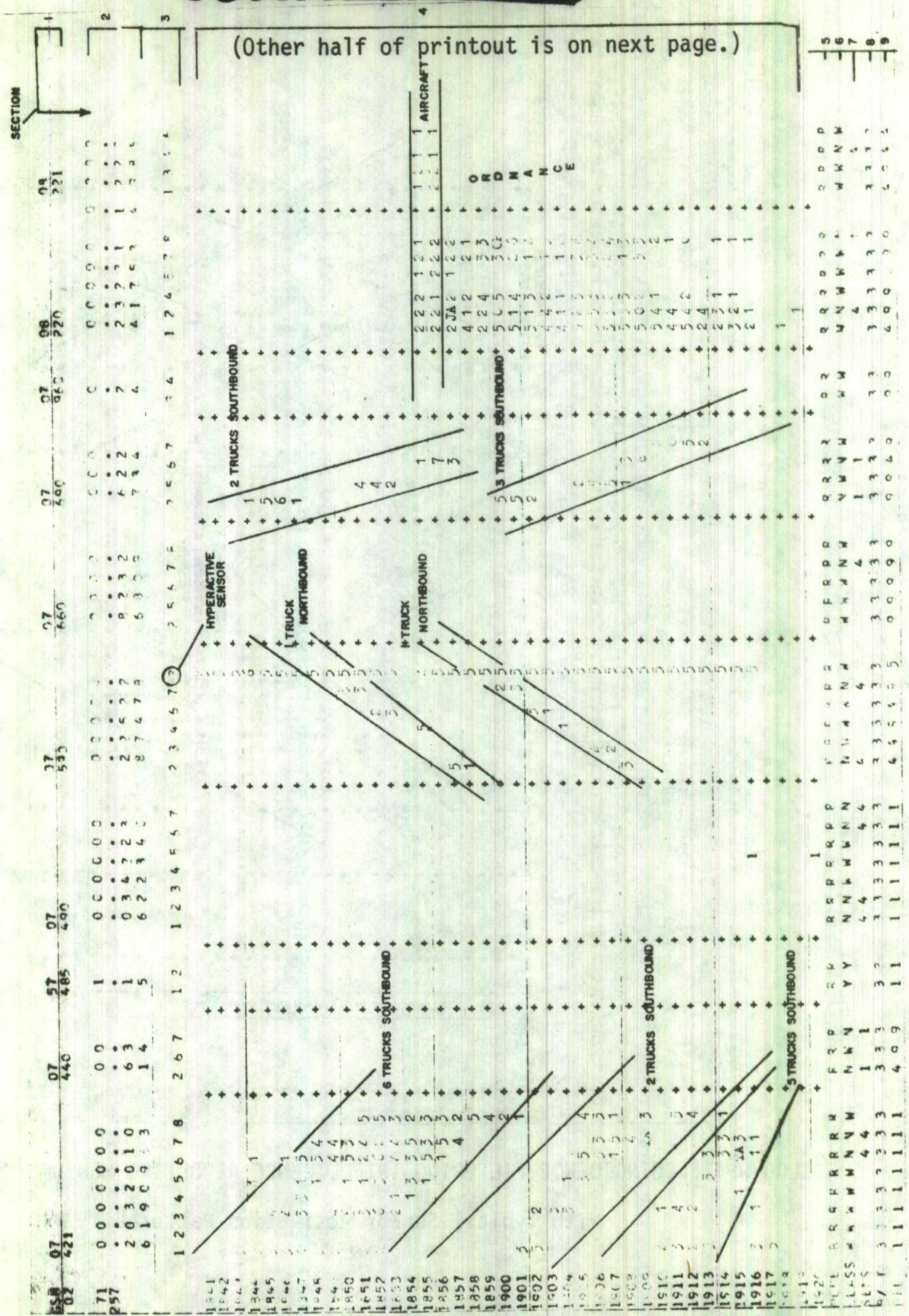
5. Hyperactive sensors. Activates for long periods of time for apparent reason.

6. A sensor previously rated 7, 8 or 9 but which has had no activations for a minimum of three days.

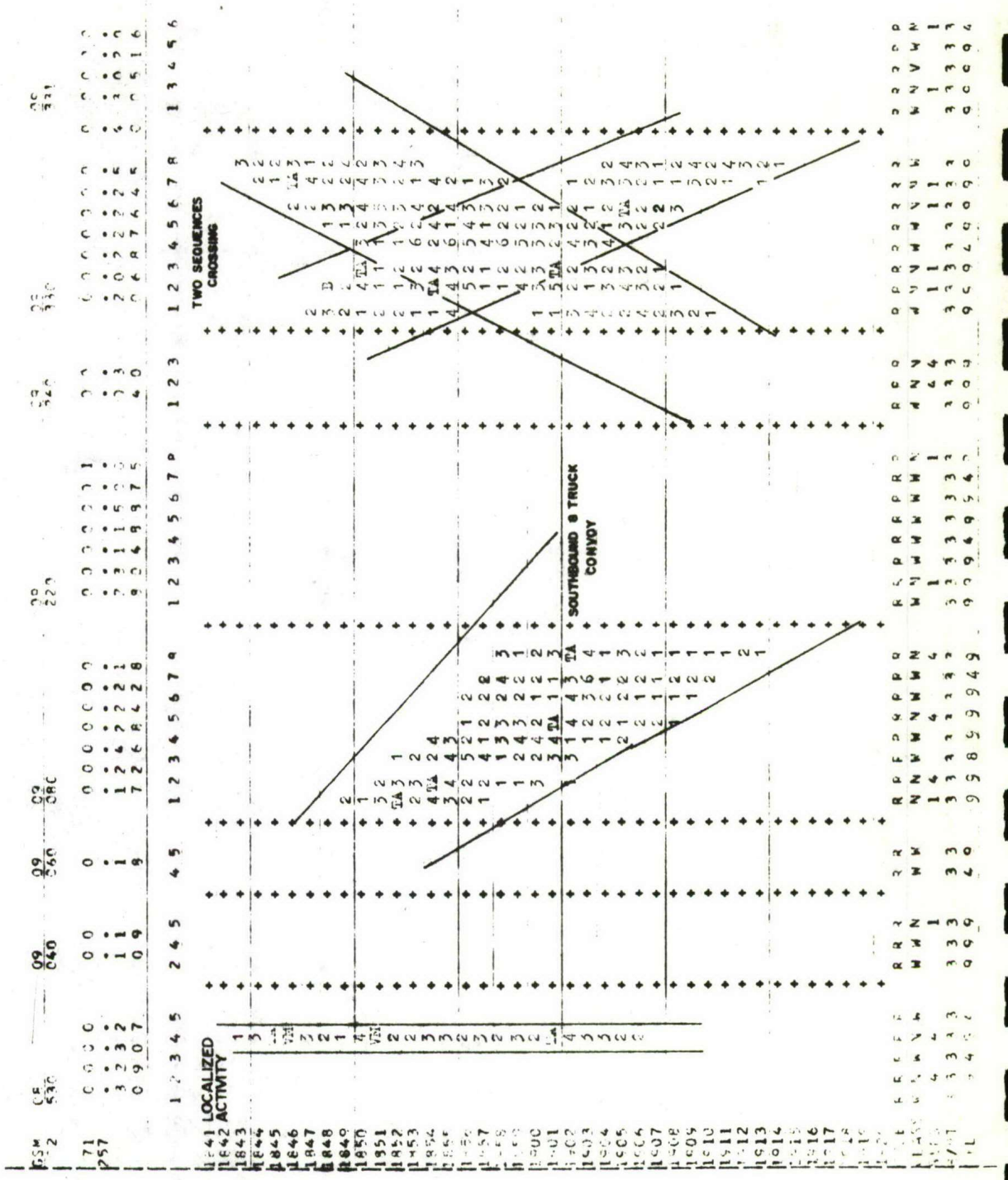
7. A useful but not reliable sensor. Activates for less than 40 percent of truck sequences, or gives unusual activations during sequences. Occasionally helps 8 or 9-rates sensors call sequences.

8. Activates for 40-95 percent of truck sequences.

9. Activates for more than 95 percent of truck sequences.



IGLOO WHITE COINCIDENCE FILTERING INTELLIGENCE REPORTING MEDIUM (CONFIRM) Sheet
With Typical Sensor Activation Patterns
(Numbers along right side are keyed to the explanatory text in Appendix I)



IGLOO WHITE COINCIDENCE FILTERING INTELLIGENCE REPORTING MEDIUM (CONFIRM) Sheet With Typical Sensor Activation Patterns

APPENDIX II

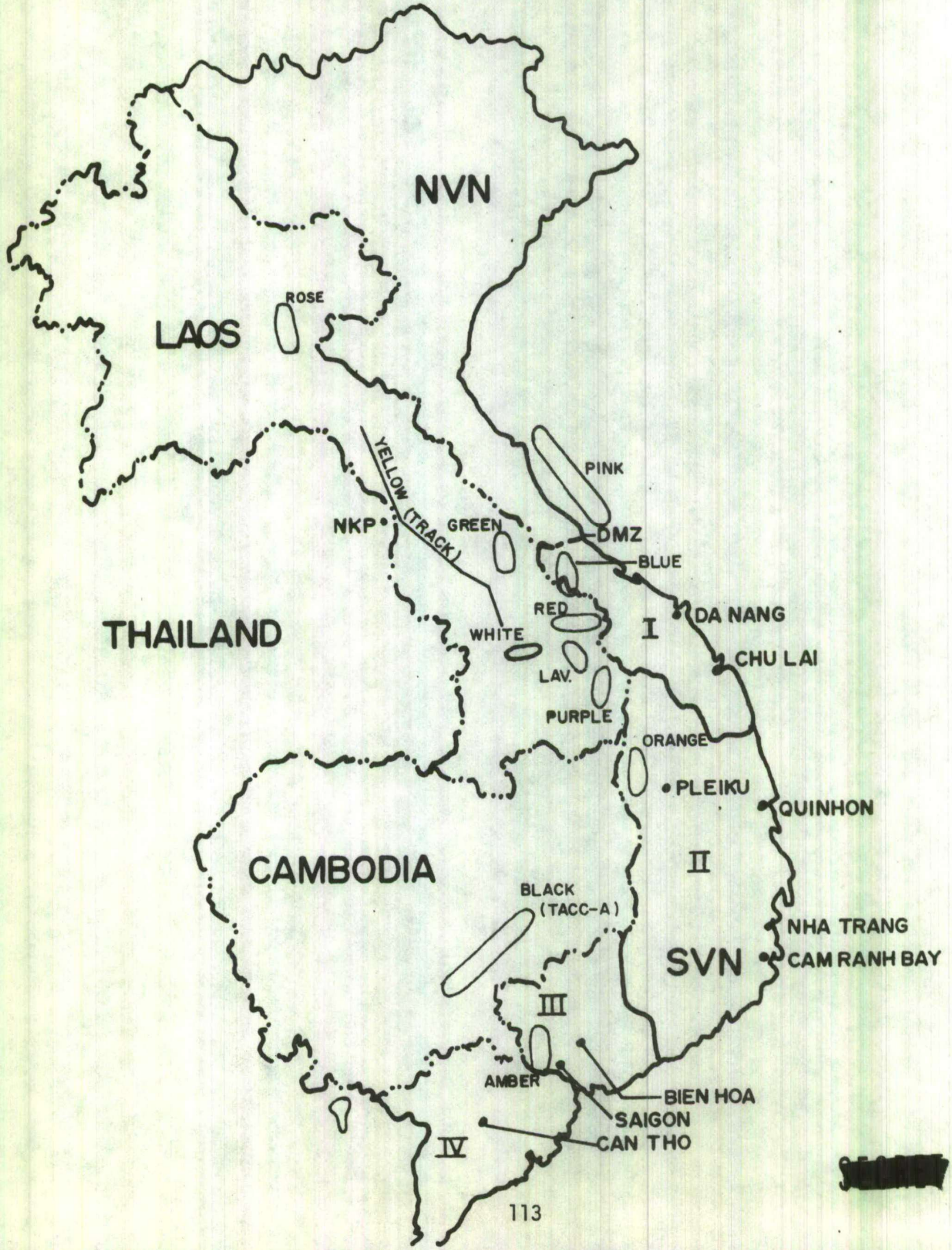
This list of aircraft orbits associated with IGLOO WHITE includes all those mentioned in this report.

ORBIT	AIRCRAFT	PROGRAM SUPPORTED	NO. OF HOURS DAILY	DATE FLOWN OR SEPTEMBER 1971 STATUS
Amber	EC-121R	DART I at Pleiku (Backup)	As required	May 1969 - March 1970
Black (TACC-A)	EC-121R	Cambodian strings (Use of Cambodian ABCCC to monitor sensors)	18	December 1970 - February 1971 (as sensor monitor)
Blue	EC-121R QU-22B C-130 (ABCCC)	DART I, IGLOO WHITE	18-24	Flown daily
Green	EC-121R QU-22B C-130 (ABCCC)	IGLOO WHITE	21	Flown daily
Lavender	EC-121R QU-22B	A test orbit flown to determine feasibility of White Orbit		Late 1970 - early 1971
Orange	EC-121R QU-22B	DART II	10 (Night)	September 1969 - September 1970
Pink	EC-121R	Sensors in NVN	Unknown	3-26 November 1968
Purple	EC-121R	IGLOO WHITE. Distance precluded relay of data to TFA	10 (Night)	Flown when C-130B not available for White Orbit

Red	C-130 (ABCCC)	Test orbit flown to assess quality of data read out from ABCCC C-130 compared with Blue Orbit		July 1971
Rose	EC-121R	Sensors along Route 7 in BARREL ROLL	10.0	August 1969 - January 1970
White	C-130B	Monitors Purple Orbit, but positioned so that higher altitude allows relay of data to TFA for read out	10.5	Flown daily
Yellow	QU-22B C-130	COMPASS FLAG (flies a track rather than an orbit)	10-12	Test stage

[redacted]

AIRCRAFT ORBITS ASSOCIATED WITH IGLOO WHITE



[redacted]

APPENDIX III

SEQUENCES PASSED, SEQUENCES NOT PASSED, AND BDA FOR HEADSHED NIGHT TRAFFIC ADVISORY SERVICE
24 October 1970 - 31 August 1971 (Based on OPREP-4 Data) 300/

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Sequences processed	15	3501	9103	15,721	17,732	18,841	17,988	13,034	3804	1137
Movers processed	22	6190	13,781	26,913	31,471	34,337	26,892	18,483	4966	1436
Sequences passed	4	1652	2836	5690	4793	5221	5843	4441	1506	508
Sequences not passed	11	1849	6267	10,031	12,939	13,620	12,154	8593	2298	629
No aircraft available	7	1154	3157	3530	4249	5607	3562	4745	1600	339
Unable to contact aircraft	0	162	758	1586	1632	1436	1588	1123	170	78
Aircraft working strike or busy	0	373	2025	3891	5412	5052	6441	2208	377	139
Communications difficulties made information untimely	0	7	45	63	203	54	48	41	4	7
Weather precluded use of advisory	0	68	229	946	191	971	249	384	139	62
Below filter level	1	45	5	15	0	0	0	0	0	0
Other	3	39	48	0	0	500	257	92	8	3

Trucks destroyed	0	0	17	350	426	873	1012	134	15	11
Trucks damaged	0	0	4	76	105	233	165	142	32	15
Secondary Explosions	0	0	26	375	275	795	479	160	168	93
Secondary Fires	0	0	23	267	277	494	348	108	74	79
Sequences passed to:										
COMMANDO BOLT	2	729	1014	2299	2658	1996	814	301	99	20
MOONBEAM	0	286	293	721	471	714	1148	823	417	131
FACs	2	313	709	1157	672	707	1400	1474	516	135
Gunships	0	135	502	948	733	1165	2037	1517	346	182
BLUE CHIP (7AF COC)	0	0	3	10	0	0	0	0	0	1
Armed Recce	0	189	315	555	259	639	444	326	128	40

FOOTNOTES

CHAPTER I

1. (S) CHECO Report IGLOO WHITE, July 1968 - December 1969, Hq PACAF, 10 January 1970, p. 1 (Hereafter cited as CHECO IGLOO WHITE II).

2. (TS) CHECO Report IGLOO WHITE, (Initial Phase), Hq PACAF, 31 July 1968, p. 1 (Hereafter cited as CHECO IGLOO WHITE I).

3. (S) Ibid, p. 3

4. (S) Ibid, p. 5

5. (S) Ibid, p. 6

6. (S) Ibid

7. (S) Ibid, pp. 30-31

8. (S) Ibid, p. 10

9. (S) Briefing, subject: "TFA Command Briefing," presented to Colonel D. L. Flowers, Director of Command and Control, Hq 7AF, 18 September 1971 at TFA, NKP RTAB, Thailand. (Hereafter cited as TFA Briefing.)

10. (C) Message, TFA to 7DCOP, subject: Phase III Sensor Frequencies, 200220Z June 1971.

(S) Interview, topic: IGLOO WHITE. With Lieutenant Colonel Gean G. Kowalski, Chief, Surveillance Systems Branch, Tactical Air Control/Surveillance Division, Directorate of Command and Control, DCS/Operations, Hq 7AF, by Captain Henry S. Shields, Project CHECO at Tan Son Nhut AB, RVN, 12 October 1971. (Hereafter cited as Kowalski Interview.)

11. (S) Kowalski Interview.

12. (S) TFA Briefing

13. (S) Ibid, and conversation with Colonel R. Rumney, former Director of Technical Operations, TFA, at Tan Son Nhut AB, RVN, 14 December 1971

14. (S) Report (Staff Summary Sheet), subject: EDET Sensor Test, 23 June 1971, by 7DOCPS.

CHAPTER II

15. (S) CHECO IGLOO WHITE II, pp. 5-6

16. (S) Report, subject: Commando Hunt, 20 May 1971, by 7AF, p. 215 (Hereafter cited as Commando Hunt I)

17. (S) Ibid, pp. 28-29

18. (S) Ibid, p. 29

19. (S) Ibid, p. 214

20. (S) Ibid, p. 239

21. (S) Ibid, p. 214

22. (S) Ibid, p. 43

23. (S) Ibid, p. 215

24. (S) Ibid, p. 214

25. (S) Ibid, p. 43

26. (S) Ibid, p. 234

27. (S) Ibid, pp. 43-44

28. (S) Ibid, p. 68

29. (S) Ibid, p. 161

30. (S) Ibid, p. 71

31. (S) Ibid, p. xix

32. (S) CHECO IGLOO WHITE II, pp. 12-13

33. (S) Report, subject: "History of TFA, 1 January - 30 June 1970," 10 July 1970, by TFA, p. 4. (Hereafter cited as TFA History, 1 Jan-30 June 70.)

34. (S) CHECO IGLOO WHITE II, p. 13

35. (S) Report, subject: "History of TFA, 1 January-31 March 1971," 10 April 1971, by TFA.

36. (S) Interview, topic: KEYWORD File. With Captain Susan L. LaFontaine, Targets Analysis Officer, TFA, by Captain Henry S. Shields, 17 September 1971.

37. (S) CHECO IGLOO WHITE II, p. 15

38. (S) TFA History, 1 January-30 June 1970, p. 4.

39. (S) Report, subject: COMMANDO HUNT III, May 1970, by 7AF, p. 167 (Hereafter cited as COMMANDO HUNT III.)

40. (S) CHECO IGLOO WHITE II, p. 11

41. (S) Ibid, p. 17

42. (S) COMMANDO HUNT III, pp. 168-169

43. (S) Ibid, p. 169

44. (S) Ibid, pp. 172-174

45. (S) Ibid, p. 173

46. (S) Ibid, p. 171; pp. 174-176

47. (S) Ibid, p. 174

48. (S) Ibid, p. 176

49. (S) Ibid, p. 175

50. (S) Ibid

51. (S) Ibid, p. 176

52. (S) Ibid, p. 171; pp. 174-176

53. (S) Ibid, p. 177

54. (S) Ibid.

55. (S) Ibid, p. 178

56. (S) Interviews, topic: COLOSSYS and the Role of Computers in IGLOO WHITE. With TFA personnel, including Captain Ray E. Ruprecht, Duty Director, Directorate of Engineering TFA, and Captain Clifford C. Chastain, Chief, Infiltration Surveillance Division, TFA, by Captain Henry S. Shields, at TFA, NKP RTAB, Thailand, 12-19 September 1971. Also personal observations by the author.

57. (S) Msg, 553RW Korat RTAB, Thailand to 7DOT, Tan Son Nhut AB, RVN, subject: FERRET III Operations, 120955Z Mar 70 (CHECO Microfilm S435, FR 214.)

58. (S) COMMANDO HUNT III, p. 158.

59. (C) Report (Staff Summary Sheet), subject: "X-T Plotter Sensor Read Out in EC-121R," 11 December 1970, by 7DOPTS (CHECO Microfilm S437, FR 188).

60. (S) COMMANDO HUNT III, p. 158

61. (S) Briefing Notes, subject: FERRET III Operations, 18 February 1970 (Hereafter cited as FERRET III Briefing). (CHECO Microfilm S435, FR 213)

62. (S/NF) Memo for Record, "Methods of Providing Target Information to FACs and Gunships," by TFA/TOA, 27 May 1970, Appendix I: Evaluation of Spotlight and FERRET III. (CHECO Microfilm S420, FRs 175-176)

63. (S/NF) Ibid

64. (S/NF) Ibid

65. (S) FERRET III Briefing

66. (S) Interview, topic: DART, X-T Plotter, FERRET III. With Captain Clifford C. Chastain, Chief, Infiltration Surveillance Division, TFA, by Captain Henry S. Shields, at TFA, NKP RTAFB, Thailand, 15 September 1971.

67. (S) Report, subject: "Ban Raving Operations," part of TFA COMMANDO HUNT III Input to 7AF DOAC, 6 April 1970 (CHECO Microfilm S341, FR 193); TFA History, 6 April - 30 June 1970, pp. 49050; Memo to General Buckner, "Commando Bolt, 15 April - 15 June 1970," from 7AF Tactics and Combat Systems Directorate, 16 August 1970 (CHECO Microfilms S346, FR 47)

68. (S) TFA History, 1 January-30 June 1970, p. 7

69. (S) Report, subject: COMMANDO HUNT V, May 1971, by Hq 7AF p. 210 (Hereafter cited as COMMANDO HUNT V)

70. (S) TFA History, 1 January-30 June 1970, p. 13

71. (S/NF) Msg, TFA to 7DO, subject: Expanded COMMANDO BOLT Operations, 141010Z August 1970 (CHECO Microfilms S436, FR 47)

72. (S) Interview, topic: COMMANDO BOLT Operations. With Major Eric J. Brister, Staff Operations Officer, TFA, by Captain Henry S. Shields, at TFA, NKP RTAFB, Thailand, 14 September 1971, and conversations, same subject, with Colonel Ben A. Barone, Director of Operations, TFA, 18 September 1971

73. (S) COMMANDO HUNT V, p. 206

74. (S) Ibid.

75. (S) Ibid, p. 212

76. (S) Ibid, p. 213

77. (S) Msg, 7DOC to TFA, subject: COMMANDO BOLT Operating Areas, 060200Z March 1971

78. (S) Brister Interview

79. (S) Ibid

80. (S/NF) Msg, TFA to CTF 77, subject: COMMANDO BOLT Liaison Sitrep 20, 120700Z December 1970 (CHECO Microfilm S436, FR 29)

81. (S) Msg, TFA to CSAF/XOOG, subject: Request for Sensor Information, 0210102Z August 1971

82. (S) COMMANDO HUNT III, p. 160

83. (S) Ltr, TFA/INAA to TFA/IN, subject: Band Concept, Commando Hunt V. 20 March 1971 (Hereafter cited as TFA 20 Mar 71 letter)

84. (S) COMMANDO HUNT V, p. 210-211

85. (S) Report, subject: "History of TFA, 1 October-31 December 1970," by TFA, p. 22

86. (S) COMMANDO HUNT V, p. 211

87. (S) Ibid, p. 205

88. (S) Ibid.

89. (S) TFA, 20 March 1971 letter, p. 1

90. (S) Ibid, Attachment 1

91. (S) Report, subject: "History of TFA, 1 January-31 March 1971," 10 April 1971, by TFA. (Hereafter cited as TFA History, 1 January-31 March 1971)

92. (S) Interview, topic: "Night Fixed Targeting Program." With Captain Susan L. LaFontaine, Targets Analysis Officer, TFA, and conversations with Major Barry W. Hubbard, Chief, Targets Branch, TFA, by Captain Henery S. Shields, at TFA, NKP RTAB, Thailand, 17-18 September 1971

93. (S) Data obtained from TFA/INT files by Captain LaFontaine

94. (S) CHECO IGLOO WHITE, p. 29

(C) Report (Staff Summary Sheet), subject: "X-T Plotter Sensor Read Out in EC-121R," 11 December 1970, by 7DOPTS.

95. (C) Report (Staff Summary Sheet), subject: "X-T Plotter Sensor Read Out in EC-121R," 11 December 1970, by 7DOPTS

96. (S) COMMANDO HUNT V, p. 210

97. (S) Report (Staff Summary Sheet), subject: "Sensor Support Lam Son 719 and 720," 29 April 1971, by 7DOCPS (Hereafter cited as 29 April 1971/DOCPS Report)

98. (S) Message, Commanding General XXIV Corps to COMUSMACV, subject: Lam Son 719 After Action Report, 260722Z April 1971 (Hereafter cited as 260722Z April 1971/XXIV Corps message).

99. (S) 29 April 1971/DOCPS Report

100. (S) 260722Z April 1971/XXIV Corps message

101. (S) Ibid.

102. (S) 29 April 1971/DOCPS Report

103. (S) 260722Z April 1971/XXIV Corps message

104. (S) TFA 20 March 1971 letter, p. 2

105. (S) TFA History, 1 January - 31 March 1971

106. (S) Ibid

107. (C) Message, TFA to 7DOCP, Daily Sensor Activity Report, 030940Z October 1971

108. (S/NF) Message, Commander, 7AF to CINCPACAF, subject: Transfer of DART, 140005Z June 1971

109. (S/NF) Ibid

110. (C) Message, TFA to 7DOCP, subject: Phase III Sensor Frequencies, 200220Z June 1971; Msg, Director MAT MGT, Kelly AFB, Texas to 7DOCP, subject: IGLOO WHITE Phase III Sensor Frequencies, 132100Z July 1971

111. (C) 200220Z June 1971 message

112. (S) Message, CINCPACAF to CSAF, subject: PACAF PAD 71-18, COMPASS FLAG, 262015Z April 1971

113. (S) Message, 7DOCP to 56SOW, NKP RTAB, Thailand, subject: COMPASS FLAG Orbit Tracks, 032130Z August 1971

114. (S) Message, CINCPACAF to AFLC, subject: IGLOO WHITE/COMPASS FLAG 091905Z September 1971

115. (S) Message, 6908SS, NKP RTAB, Thailand, to 13AF, Clark AB, PI, subject: IGLOO WHITE/COMPASS FLAG, 130730Z September 1971

116. (C) Letter, Commander TFA to all TFA personnel, subject: Shift to Night Shift Operations, 22 June 1971. Interview, topic: DART X-T Plotter, FERRET III. With Captain Clifford C. Chastain, Chief, Infiltration Surveillance Division, TFA, by Captain Henry S. Shields at TFA, NKP RTAB, Thailand, 15 September 1971.

117. (C) 22 June 1971 TFA Commanders letter.

118. (S/NF) Message, 7DIT to TFA,subject: Sensor String Placement Planning for Northeastern Cambodia, 191131Z May 1970 (CHECO Microfilm, S436, FR 97)

119. (S/NF) Ibid

120. (S) Memorandum for General Hardin (Vice Commander, 7th AF) from Colonel James H. Raddin, Director, Tactics and Combat Systems 7AF, subject: MACV Sensor Surveillance Guidance, 5 June 1970, (CHECO Microfilm S435, FR 139)

121. (S) Ibid

122. (S/NF) Briefing notes, subject: Cambodian Sensor Plan, 24 June 1970, (CHECO Microfilm S436, FR 98)

123. (S) Secret Working Paper, subject: Cambodian Sensor Field Plan and Impact on Sensor Requirements, 30 July 1970 (CHECO Microfilm S436, FR 98)

124. (S/NF) Message, 7DO to TFA, subject: Cambodian Sensor Implants, 271005Z September 1970 (CHECO Microfilm S435, FR 141)

125. (S/NF) Ibid

(S/NF) Report (Staff Summary Sheet) subject: "Use of FERRET III in Cambodia," by 7DOPTS, 12 October 1970 (CHECO Microfilm S435, FR 184)

126. (S) Report (Command Correspondence Staff Summary Sheet), subject: "Analysis: Cambodian Sensor Field Evaluation," by 7DOPTS, 2 November 1970 (CHECO Microfilm S435, FR 140)

127. (S/NF) Report (Staff Summary Sheet), subject: "Use of FERRET III in Cambodia," by 7DOPTS, 12 October 1970. (CHECO Microfilm S435, FR 184)

128. (S/NF) Message, 6INT to TFA, subject: Cambodian Sensor Field Plan, 301039Z October 1970 (CHECO Microfilm S435, FR 141)

129. (S) Message, 7DOP to 388TFW, 553RW, Info: COMUSMACV, CINCPACAF, 7/13AF, Udorn RTAB, Thailand, TFA, subject: Sensor Monitor on EC-121R TACC-A Mission, 190350Z December 1970 (CHECO Microfilm S435, FR 140)

130. (S) Message, 7DOCPto 388TFW, subject: Sensor Monitoring on EC-121R TACC-A Mission, 070830Z February 1971

131. (S/NF) Report (Staff Summary Sheet), subject: "Cambodian Sensors Monitored by TACC-A," by 7DOCPS, 10 February 1971

132. (S) CHECO IGLOO WHITE II, pp. 14-15

133. (S) COMMANDO HUNT III, p. 159

134. (S) Report (Staff Summary Sheet), subject: "Special BARREL ROLL/ IGLOO WHITE Orbit," by 7DOCPS, 12 August 1971

135. (C) Message TFA to PACAF and 7DOCP, subject: Radiation Contract F64620-71-C-0003, 140745Z August 1971

136. (S/NF) Letter, 7IN to 7DO, subject: Sensor Placement in NVN, 7 December 1970 (CHECO Microfilm S435, FR 166)

137. (S/NF) Message, COMUSMACV to 7AF, info: TFA, subject: Sensor Placement in NVN, 130800Z December 1970 (CHECO Microfilm S435, FR 129)

138. (S)Q Message, TFA/INAA to 7DOP and 7IN, subect: Sensor Placement in NVN, 160830Z December 1970 (CHECO Microfilm S435, FR 166)

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139. (S) CHECO IGLOO WHITE II, p. 22

140. (S) Ibid, pp. 22-23

141. (S) COMMANDO HUNT III, p. 159

142. (S) COMMANDO HUNT V, p. 205

143. (S) CHECO IGLOO WHITE II, p. 24

144. (S) COMMANDO HUNT V, p. 205

145. (C) Message, CSAF to CINCPACAF, AFSC and TAC, subject: SEAsia Evaluation of EDET Sensor, 101657Z March 1971

146. (C) Report (Staff Summary Sheet), subject: "EDET Sensor Test," 23 June 1971, by 7DOCPS

(S) Hq PACAF DOOCS Review, subject: Project CHECO Report, subject: "IGLOO WHITE, Jan 70 - Sep 71," 10 Jan 72 (Hereafter cited as Hq PACAF DOOCS Review.)

147. (C) Ibid

148. (C) Message, TFA to 7DOCP, subject: Production Requirements for EDET Sensor, 131040Z May 1971

(S) Hq PACAF DOOCS Review

149. (C) Message, DSPG to DSPG LNO Saigon, subject: EDET Use for Motorized Sampan Detection, 272220Z August 1971

150. (C) Message, TFA to 7DOCP, subject: Production Requirements for EDET Sensor, 131040Z May 1971

(S) Hq PACAF DOOCS Review

151. (C) Message, CINCPACAF to TFA, subject: Procurement of EDET III Sensors, 141932Z August 1971

152. (C) Message, DSPG LNO Saigon to DSPG Washington, subject: EDET Use for Motorized Sampan Detection, 150835Z August 1971

153. (C) Message, DSPG to DSPB LNO Saigon, subject: EDET Use for Motorized Sampan Detection, 272220Z August 1971

154. (S) Interview, topic: EDET III Sensors as Used along Waterways. With Captain Richard Herman, Jr., Intelligence Analyst, TFA, by Captain Henery S. Shields, at TFA, NKP RTAB, Thailand, 13 September 1971

155. (C) Message, TFA to Hq ESD L G Hanscom Field, Mass, subject: EDET Development Concepts, 0910342Z June 1971

156. (C) Ibid

157. (S) Letter Commander TFA to 7DO, subject: Improved Sensor Requirement, undated-

158. (S) Ibid

159. (S) Message, CSAG to AFSC, Andrews AFB, Maryland, subject: EDP Changes, 292053Z July 1971

160. (C) Message Hq ESD, L G Hanscom Field, Mass, subject: CAEDET, 181512Z August 1971

161. (C) Message Hq ESD, L G Hanscom Field, Mass to Det 6, ASD, Tan Son Nhut AB, RVN, subject: EDET III and IV, 012141Z July 1971

162. (S) Report (Staff Summary Sheet), subject: "Status Report, Radar Beacon Transponder (RABET II)," 4 July 1970, by 7DOPTS (CHECO Microfilm S436, FR 196)

163. (S) Report, subject: "RAVET III History," 4 November 1970 (CHECO Microfilm S436, FR 193)

164. (S) Message, DCPG to CSAF, subject: Radar Beacon Transponder - RABET, 241902Z December 1970 (CHECO Microfilm S436, FR 193)

165. (S) Memorandum for Record, "Reasons for Limited Use of ACOUBUOY Sensors in STEEL TIGER in COMMANDO HUNT III, by Lieutenant Colonel James R. Lillethum, Chief of Analysis Division, TFA, 30 June 1970 (CHECO Microfilm S341, FR 204)

166. (S) COMMANDO HUNT I, p. xv

167. (S) Lillethum 30 June 1970 Memorandum

168. (S) Ibid

169. (S) TFA History, 15 January-31 March 1971, 10 April 1971

170. (C) Report (Staff Summary Sheet), subject: "New Concept - Acoustic Targeting Area," 18 July 1971 by 7DOCPS

171. (S) Interview, topic: Acoustic Targeting. With Captain Harry C. Harrison, OIC, Targets Operations Section, TFA, by Captain Henry S. Shields, at TFA, NKP RTAB, Thailand, 14 September 1971. (Hereafter cited as Harrison Interview)

172. (S) Report (Staff Summary Sheet), subject: "Present Status of Acoustic Targeting Areas (ATA) Program," 28 July 1971, by 7DOCPS.

173. (S) Harrison Interview

174. (S) Report (Staff Summary Sheet), subject: "Use of Sensors for BDA," 23 April 1971, by 7DOCPS.

175. (S) Interview, topic: "Use of Sensors for BDA." With Lieutenant Colonel Theodore E. Hurt, Chief, Air Operations Division, TFA, by Captain Henry S. Shields, at TFA, NKP RTAB, Thailand, 15 September 1971

176. (S/NF) Message, TFA to III MAF/G2 Da Nang, subject: OV-10 Modification, 050940Z January 1970 (CHECO Microfilm S437, FR 201)

177. (S) Talking Paper, subject: "OV-10 Portatale in COMMANDO BOLT," approximately January 1970 (CHECO Microfilm S437, FR 200)

178. (U) Message, DIR MAT MGT Kelly AFB, Texas to CINCPAC and 7AF/DMMA, subject: Class IB MODE Request - OV-10A Aircraft, 311853Z December 1969 (CHECO Microfilm S437, FR 201)

179. (S) Memo for Record, "Status of OV-10/Portatale Modifications," by Major Ronald C. Cadieux, 7DO, 23 January 1970 (CHECO Microfilm S437, FR 201)

180. (S) Report, subject: "Portatale Evaluation," Appendix F to TFA Input to COMMANDO HUNT III Report, 16 April 1970 (CHECO Microfilm S341, FR 195)

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182. (S) Ibid

183. (S) Ibid

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185. (S) Ibid

186. (S) Ibid

187. (S) Ibid

188. (S) Ibid

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191. (S) Report (Command Correspondence Staff Summary Sheet), subject: "IGLOO WHITE Phase III Vulnerability to ECM," 20 October 1970, by 7DOPTS (CHECO Microfilm S436, FR 94).

192. (S) Memo for Record, "Comments on ECM vs IGLOO WHITE," by Colonel Joseph H. Wack, Assistant for Electronic Warfare, 23 September 1970 (CHECO Microfilm S436, FR 94)

193. (S) Message, 553RW Korat RTAB, Thailand to 7DOPT, subject: Data Channel Interference, 190831Z October 1970 (CHECO Microfilm S436, FR 101)

194. (S) Memo for Record, "TFA Sensor Data Link Jamming," from 7DOPT to 7INTSM, 8 March 1971

195. (S) 8 March 1971 Memo; Message AGSC San Antonio, Texas to TFA and 7DOPRE, subject: Sensor Degradation, 102212Z March 1971

196. (S) Memo for Record, "Common Module Conference at Sandia Laboratories, Albuquerque, New Mexico, 28 April 1971," in 7DOCPS files.

197. (S) Message, DIR MAT MGT Kelly AFB, Texas, to CSAF/XOOO, subject: IGLOO WHITE Transmitter Channels, 041941Z May 1971; Message 7AF to COMUSMACV, subject: IGLOO WHITE Transmitter Channels, 060700Z May 1971; Message COMUSMACV to 7AF, subject: IGLOO WHITE Transmitter Channels, 090456Z May 1971, all in 7DOCPS files.

198. (S/NF) Message, TFA to 7DOCP, subject: Sensor Countermeasures, 060645Z September 1971, in 7DOCPS files.

199. (C) Interrogation Report #1516-0146-71, subject: "Sensors Briefing to an Infiltration Group," 11 March 1971, by 1021st USAF Fld Activity Squadron

200. (C) Interrogation Report #1516-0289-71, subject: "NVA Briefing on Sensors," 14 May 1971, by 1021st USAF Fld Activity Sq.

201. (C) Interrogation Report #1516-0138-71, subject: "NVA Briefing on Sensors in Laos," 9 March 1971, by 1021st USAF Fld Activity Sq.

202. (C) Interrogation Report #1516-0226-71, subject: "NVA Reaction to Sensoring Devices," 4 May 1971, by 1021st USAF Fld Activity Sq.

203. (C) Interrogation Report #1516-0289-71

204. (C) Interrogation Report #1516-0226-71

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205. (S) CHECO IGLOO WHITE II, p. 27

206. (S) Ibid, pp. 29-30

207. (S) Ibid, p. 30

208. (S) QU-22B Chronology, August 1971, in 7DOCPS file. (Hereafter cited as QU-22B Chronology)

209. (S) CHECO IGLOO WHITE II, p. 31

(S) Hq PACAF DOOCS Review

210. (S) COMMANDO HUNT I, p. 237

211. (S) CHECO IGLOO WHITE II, p. 31

212. (S) QU-22B Chronology

213. (S) CHECO IGLOO WHITE II, p. 31

214. (S) COMMANDO HUNT V, p. 208

(S) Hq PACAF DOCCS Review

215. (S/NF) Report (Command Correspondence Staff Summary Sheet), subject: "IGLOO WHITE Forces," 28 January 1970, by Lieutenant Colonel Arthur C. Lehrman, Chief, Systems and Resources Branch, 7AF (CHECO Microfilm S436, FR 233)

216. (S) Interview, topic: IGLOO WHITE Orbits and Use of Sensors. With Captain Ray E. Ruprecht, Duty Director, Directorate of Engineering, TFA, by Captain Henry S. Shields at TFA, NKP RTAB, Thailand, 13 September 1971.

217. (S) QU-22B Chronology

(S) Report (Command Correspondence Staff Summary Sheet), subject: "553 Recon Wing C-121G Aircraft," 1 May 1970, by Lieutenant Colonel Edwin J Hatzenbuehler, Jr., Surveillance Division, 7AF.

218. (S) QU-22B Chronology

(S) COMMANDO HUNT V, p. 208

219. (S) Message, CINCPACAF to AFSC, subject: Deletion of PAVE EAGLE II Drone Capability, 082316Z March 1971.

220. (S) QU-22B Chronology

(S) COMMANDO HUNT V, p. 210

221. (S) COMMANDO HUNT V, p. 210

222. (S) Message, 56SOW to 7DO, subject: QU-22B Operations, 220700Z April 1971

223. (S) Report (Staff Summary Sheet), subject: "IGLOO WHITE Orbits," 7 June 1971, by 7DOCPS.

224. (S) QU-22B Chronology

225. (S) Message 7DOC to 56SOW, subject: "IGLOO WHITE Orbits," 180850Z August 1971

226. (S) Message CINCPACAF to CSAF, subject: "QU-22B," 202135Z August 1971

227. (S) Ibid

228. (S) Message CINCPACAF to CINCPAC, subject: "IGLOO WHITE Orbit Requirements," 180135Z September 1971

229. (S) Kowalski Interview

230. (S) Message TFA to 7DOCP, subject: "Relay Aircraft," 250255Z February 1971

231. (S) Report, subject: "CROC-C-130/ABCCC/IGLOO WHITE," in 7DOCPS files

(S) Report (Staff Summary Sheet), subject: "ABCCC/ADR, 12 August 1971, by 7DOCPS

232. (S) Message Commander 7AF to CINCPACAF, subject: "QU-22B Get Well Program," 18 August 1971 (No DTG)

233. (S) Kowalski Interview

234. (S) Ibid

235. (S) Message 13AF to CINCPACAF, subject: "IGLOO WHITE/COMPASS FLAG," 090820Z September 1971

(S) Message CINCPACAF to AFLC, subject: "IGLOO WHITE/COMPASS FLAG," 091905Z September 1971

236. (S) Kowalski Interview

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237. (S) CHECO IGLOO WHITE II, p. 44

238. (S) Ibid, p. 46

239. (S) Ibid, p. 45

240. (S) Report (Command Correspondence Staff Summary Sheet), subject: "DART Status," 6 January 1970, by 7DPTS (CHECO Microfilm S437, FR 55)

241. (S) Report (Command Correspondence Staff Summary Sheet), subject: "Termination of DART I Operations in III CTZ," 12 March 1970, by 7DOTS (CHECO Microfilm S437, FR 42).

242. (C) Letter, 553RW (DCOOT) to 7DOT, subject: "Conference on 6-8 July to Discuss Standardized Reporting Procedures by the 553RW and DART I to Army Commanders in I Corps," 17 July 1970 (CHECO Microfilm S437, FR 72)

243. (S) Fact Sheet, "Sensors in SEA, Army, DUFFLE BAG (South Vietnam Only)," 27 October 1970 (CHECO Microfilm TS98, FR 019)

244. (C) Report (Command Correspondence Staff Summary Sheet), subject: "DART I (Deployable Automatic Relay Terminal)," 21 November 1970, by 7DOPTS (CHECO Microfilm S437, FR 55).

245. (S) Report, subject: "DART Statistical Report of Sensor Activations, 1-31 October 1970," by Det 2, 505 TAC Control Group (CHECO Microfilm S437, FR 60)

246. (C) Report (Command Correspondence Staff Summary Sheet), subject: "DART I (Deployable Automatic Relay Terminal)," 21 November 1970 by 7DOPTS (CHECO Microfilm S437, FR 55).

247. (C) Message 7DOP to CINCPAC, subject: "Disposition, Phase I/II Assessment Van, DART I," 241045Z December 1970 (CHECO Microfilm S437, FR 51).

248. (S) Memo for Record, "Trip Report for DART I Operations," by Major Alvin L. Pavik, 7DOPTS, 13 November 1970 (CHECO Microfilm S437, FR 56).

249. (S) Report (Command Correspondence Staff Summary Sheet), subject: "Sensor Implant by Air Force OV-10 Aircraft," 3 December 1970 by 7DOPTS (Major Pavik) (CHECO Microfilm S437, FR 164).

250. (S) Message Commanding General XXIV Corps to COMUSMACV, subject: "Lam Son 719 After Action Report," 260722Z April 1971.

251. (C) Report (Staff Summary Sheet), subject: "Status DART I," 22 March 1971 by 7DOCPC.

252. (S) Report (Staff Summary Sheet), subject: "Sensor Support for Lam Son 719 and 720," 29 April 1971 by 7DOCPS.

253. (C) 22 March 1971 Staff Summary Sheet

254. (S/NF) Message Commander 7AF to CINCPACAF, subject: "Transfer of DART," 140005Z June 1971.

255. (S) Message 7DO to TFA, subject: "DART Transfer," 060430Z July 1971

256. (S) Report (Staff Summary Sheet), subject: "DART Reporting," 7 July 1971 by 7DOCPS

257. (S) Message 7DO to TFA, subject: "DART Transfer," 060430Z July 1971

258. (S/NF) Message 7DO to COMUSMACV (J3), subject: "Transfer of DART I Function to TFA," 111000Z May 1971

259. (S) CHECO IGLOO WHITE II, p. 47

260. (S) DART II End of Tour Report, 12 October 1970 (CHECO Microfilm S437, FRs 84-86).

261. (S) CHECO IGLOO WHITE II, p. 47

262. (S) Ibid, p. 48

263. (S) Message Vice Commander 7AF to MACV (J3), no subject, 28 March 1970 (No DTG), (CHECO Microfilm S437, FR 29)

264. (S) Letter, 7DO to COMUSMACV (J3) (Major General Cowles), subject: DART II, 20 August 1970 (CHECO Microfilm S437, FR 81).

265. (C) Message CINCPACAF to 7AF, subject: "DART II Redeployment," 090350Z October 1970 (CHECO Microfilm S437, FR 79).

266. (C) Message 7DO to CINCPACAF, subject: "DART II," 011130Z October 1970 (CHECO Microfilm S437, FR 80).

267. (S) DART II End of Tour Report, 12 October 1970 (CHECO Microfilm S437, FR 84-86)

268. (S) Ibid

269. (C) Message, Det 1 505 TAC Control Group, Pleiku AB, RVN, to 7DO, subject: "DART II Weekly Activity Report 23-29 September 1970," 020130Z October 1970 (CHECO Microfilm S437, FR 82).

270. (C) Memo for Record, "Notes on IGLOO WHITE/DUFFLE BAG Sensor Program," by Lieutenant Colonel Gean G. Kowalski, 7DOCPS, 3 August 1971, in 7DOCPS files.

271. (C) Ibid.

272. (S) Kowalski Interview

273. (C) 3 August 1971 Memo

274. (S) CHECO Report SEA Glossary 1961-1970, Hq PACAF, 1 January 1970, p. 59

275. (S) Fact Sheets, subject: "Reporting of MACV Liaison Officer to Paris Peace Talks," by MACV J3-04, 2 February 1971.

276. (S) Interview, topic: DUFFLE BAG Program and USAF Participation. With Major Robert E. Davis, Communications Systems Officer, Special Operations Branch, Surface Operations Division, ACS/Operations, MACV, by Captain Henry S. Shields at Hq MACV Saigon, RVN, 6 September 1971 (Hereafter cited as Davis Interview).

277. (S) Report, subject: "Minutes, DUFFLE BAG/TIGHT JAW Conference, 16-17 April 1970," 5 June 1970 by MACV J3-04 (CHECO Microfilm S437, FR 212).

278. (S) Talking Paper, subject: "VNAF Role in RVNAF Sensor Program," 12 July 1970 by 7DOT (CHECO Microfilm S437, FR 106).

279. (S) Ibid

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281. (S) Report (Staff Summary Sheet), subject" "PAR Relay," 3 July 1971 by 7DOCPS in 7DOCPS files.

282. (S) Davis Interview

283. (S) Briefing/Conference, subject: "TFA Operations in COMMANDO HUNT VII," presented by Colonel Ben A. Barone, Director of Operations, TFA and Major Eric J. Brister, COMMANDO BOLT Operations Shop, TFA, to Colonel D. L. Flowers, Director of Command and Control, Hq 7AF, 18 September 1971

284. (S) Ibid

285. (S) Ibid

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287. (S) Report, subject: "Appendix IX to Annex EE (Anti-infiltration/ IGLOO WHITE)," to COMMANDO HUNT VII Plan, 5 July 1971 by TFA. In 7DOCPS file.

288. (S) Conversations with Colonel Ben A. Barone, Director of Operations, TFA by Captain Henry S. Shields, Project CHECO, 18 September 1971 at TFA, NKP RTAB, Thailand.

289. (S) Study, subject: "Remote Ground Sensor Planning and Programming Objectives (REGSENSPO)," no date, by Hq USAF (CHECO Microfilm S442, FRs 142-143).

290. (S) Letter Hq PACAF/XP to 7AF, 5AF, 13AF, 7/13AF, subject: "Ground Sensor Capabilities and Employment," 16 December 1970. Cover letter to Hq USAF REGSENSPO Document.

291. (S) Message 7XP to PACAF/XP, subject: "Ground Sensor Capabilities and Employment," 160702Z January 1971 (CHECO Microfilm S442, FRs 141-142). (Hereafter cited as 7AF Sensor Capabilities 160702Z January 1971 message).

292. (S) Ibid

293. (S) TFA History, 1 January-30 June 1970, p. 5

294. (S) 7AF Sensor Capabilities 160702Z January 1971 message.

295. (S) Ibid

296. (S) Letter, Hq PACAF/XPX to Hq USAF (XOXFT), subject: "Remote Ground Sensor Planning/Programming," 15 March 1971.

297. (S) Ibid

298. (U) John L. Frisbee, "IGLOO WHITE," Air Force Magazine, Vol 54, #6 (June 1971), pp. 48-53.

299. (C) Message, Det Eglin AFB, Florida to JCS/Sec Def Wash DC, subject: "CONUS Plan for Demonstration of a Ph IIIE System in Europe (MYSTIC MISSION)," 131230Z September 1971.

300. (S) Gathered from records on file in office of the Air Operations Division, Directorate of Operations, TFA, NKP RTAB, Thailand. Obtained 16 September 1971.

GLOSSARY

AAA	Antiaircraft Artillery
ABCCC	Airborne Battlefield Command and Control Center
ACOUSID	Acoustic Seismic Intrusion Detector
AC&W	Aircraft Control and Warning
ADSID	Air Delivered Seismic Intrusion Detector
AFSC	Air Force Systems Command
AMTI	Airborne Moving Target Indicator
ARDF	Airborne Radio Direction Finding
ARVN	Army of the Republic of Vietnam
ASR	Automatic Sequence Routing
ATA	Acoustic Targeting Area
BASS	Battlefield Area Surveillance System
BDA	Bomb Damage Assessment
CAEDET	Commandable Audio Engine Detector
CAP	Combat Air Patrol
CAS	Controlled American Source
COC	Combat Operations Center
COLOSSYS	Coordinated LORAN Sensor Strike System
COMMIKE	Commandable Microphone
COMUSMACV	Commander, United States Military Assistance Command, Vietnam
CONFIRM	Coincidence Filtering Intelligence Reporting Medium
CRC	Combat Reporting Center
DART	Deployable Automatic Relay Terminal
DASC	Direct Air Support Center
DCPG	Defense Communications Planning Group
DMPI	Desired Mean Point of Impact
DMZ	Demilitarized Zone
DO	Directorate of Operations (TFA)
DSPG	Defense Special Projects Group
ECM	Electronic Countermeasures
EDET	Engine Detector
ETA	Estimated Time of Arrival
FAC	Forward Air Controller
FADSID	Fighter Air-Delivered Seismic Intrusion Detector
FFV	Field Force Vietnam
GSM	Ground Surveillance Monitor

HANDSID	Hand-emplaced Seismic Intrusion Detector
HELOSID	Helicopters-emplaced Seismic Intrusion Detector
IN	Directorate of Intelligence (TFA)
ISC	Infiltration Surveillance Center
JGS	Joint General Staff
KIA	Killed in Action
LOC	Line of Communication
LORAN	Long Range Navigation
MACV	Military Assistance Command Vietnam
MAGID	Magnetic Intrusion Detector
MAW	Marine Air Wing
NOD	Night Observation Device
NULLO	No Live Operator Aboard
PAR	Palletized Airborne Relay
PIRID	Passive Intra-red Intrusion Detector
PMBR	Portable Multiple Bomb Rack
PMDL	Provisional Military Demarcation Line
PME	Prime Mission Equipment
RBA	Reconnaissance by Acoustic
REGSENSPO	Remote Ground Sensor Planning Objectives
RFI	Radio Frequency Interference
RTAFB	Royal Thai Air Force Base
RVN	Republic of Vietnam
RVNAF	Republic of Vietnam Armed Forces
RW	Reconnaissance Wing
SAM	Surface to Air Missile
SAR	Search and Rescue
SEA	Southeast Asia
SI	Special Intelligence
SOW	Special Operations Wing
SPIKEBUOY	Spike Acoubuoy
SPIKESID	Spike Seismic Intrusion Detector
SPOS	Strong Point Obstacle System
SRP	Sensor Reporting Post
SS	Security Squadron
SSS	Special Strike String
SSZ	Special Strike Zone
STOL	Short Take-off and Landing

TAC	Tactical Air Command
TACAIR	Tactical Air
TACP	Tactical Air Control Party
TAO	Traffic Assessment Officer
TFA	Task Force Alpha
TFS	Tactical Fighter Squadron
TIO	Targets Intelligence Officer
TO	Directorate of Engineering (TFA)
TOC	Tactical Operations Center
TOT	Time on Target
USAFE	United States Air Forces Europe
USAFSS	United States Air Force Security Service
VHF	Very High Frequency
VR	Visual Reconnaissance
WRZ	Western Reconnaissance Zone

RESEARCH NOTE

The period before 31 December 1970 covered in this report was largely based on the COMMANDO HUNT I, III, and V reports, the two previous CHECO IGLOO WHITE studies and material found in CHECO TOP SECRET Microfilm 98 and SECRET Microfilms 341, 346, 420, 435, 436, 437, and 442. Material for the period after 1 January 1971 was obtained from an examination of current files at TFA and the Surveillance Systems Branch, Tactical Air Control/Surveillance Division, Directorate of Command and Control, DCS/Operations (DOCPS) at Headquarters, Seventh Air Force, Tan Son Nhut Air Base, Republic of Vietnam. Interviews and conversations with TFA and DOCPS personnel were also used, as were the author's personal observations at TFA.