

Chapter 8 – ~~(S//SI)~~ In Our Own Image: NSA, Vietnamization, and the Expansion of South Vietnamese SIGINT, 1969-1973

(U) In 1969, President Richard Nixon proposed, as part of the American disengagement from the Indochina War, a program called Vietnamization. This was not a new idea; Nixon's plan carried in it the echoes of President Johnson's 1964 comments about "Asian boys dying for Asia." In 1968, Johnson's new secretary of defense, Clark Clifford, had agreed to General Abrams' plan to modernize the South Vietnamese military and gradually turn the war over to Saigon.

(U) The idea of turning the war over to the Vietnamese had not even originated with the Americans. In 1951, the French had established the Vietnamese National Army (VNA), hoping to develop a force that could stand on its own. They called this program, *jaunissement*, literally, a "yellowing" of the war – a term more revealing of the crude French cultural and colonial attitudes that subverted all of their policies in Indochina. Central to the establishment of this Vietnamese army was the assumption that it would take over an increasingly greater role in the war. Eventually, the French command in Saigon thought, the VNA would grow to a point that the French Union Forces could withdraw and return to France and the North African colonies. But even by 1954 this plan was proving difficult to fulfill, even after three years of recruiting, training, and equipping a Vietnamese military.¹

(U) The desire to create this effective and self-sufficient Vietnamese military became a major theme running throughout both the final part of the French

combat phase and for the entire period of the American intervention. In 1954, as the French forces were being ground down inside the "fortress" of Dien Bien Phu, the then American vice-president, Richard Nixon, spoke of the Vietnamese inability to govern or protect themselves. After the war, in 1955, the visiting U.S. secretary of the army, William Brucker, declared that the mission of the American advisors there was to build a completely autonomous army. This theme was picked up eight years later by the Kennedy administration when more advisors were sent to South Vietnam to build up the ARVN. Yet, in 1965, after declarations of success, one of the major rationales for the American intervention was to provide breathing space for ARVN to build itself up. By 1967, Westmoreland announced that by 1969 the Vietnamese would be ready to take over missions then performed by American troops.²



(U) Vice President Richard Nixon inspecting a Vietnamese National Army position, 1954

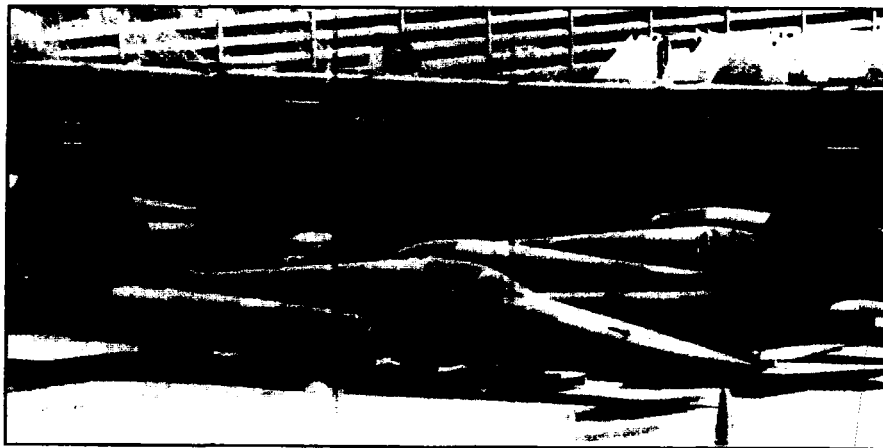
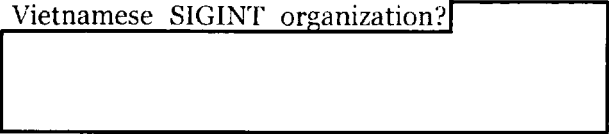
(U) By 1969, though, the issue of Vietnamization was no longer a policy luxury for the United States; nor could it continue to be projected into some rosy future when a military equilibrium between Hanoi and Saigon had been achieved. President Nixon's pre-election "secret" peace plan had come to naught. The only strategy left which could justify the withdrawal of American troops was Vietnamization.

(U) Vietnamization called for increasing both the size and capabilities of the ARVN to prosecute the war on their own with minimal American participation. The United States transferred everything from M-16 rifles to F-5 jets to the South Vietnamese; up to 2.5 billion dollars worth of equipment was passed to the ARVN. At the same time, South Vietnam's regular armed forces, security, and paramilitary units underwent a dramatic increase in size and capability.

~~(S//SI)~~ All of this was carried out under a plan known in the Pentagon as JCSM 42-70. The JCS memorandum contained a codicil which called for a similar expansion of the ARVN cryptologic organization known then as the Special Security and Technical Branch, or SSTB. At NSA, the plan for the expansion of the SSTB was referred to as the Vietnamization Improvement and Modernization Plan, or VIMP for short. It called for a threefold mission: improve and modernize

the South Vietnamese SIGINT capability to the point where it could support its armed forces; provide selected COMINT support to South Vietnam between the time it assumed its total combat responsibility and its ability to supply its own cryptologic support; and provide adequate SIGINT to the U.S. command and meet national intelligence requirements during and after the drawdown of American forces, including the previously mentioned support to the South Vietnamese cryptologic effort.³

~~(TS//SI)~~ The NSA VIMP was an ambitious program: it called for nearly tripling the manpower of the SSTB, adding a number of major new field sites, and installing an effective and secure communications system that could connect the smallest intercept team with headquarters in Saigon. In chapter 4, we had briefly discussed the effort in 1961 to improve and modernize the South Vietnamese SIGINT organization. It might be asked: What had happened in the intervening eight years? Or, more accurately, what had not happened during that time that warranted such a large-scale effort to build up the South Vietnamese SIGINT organization?



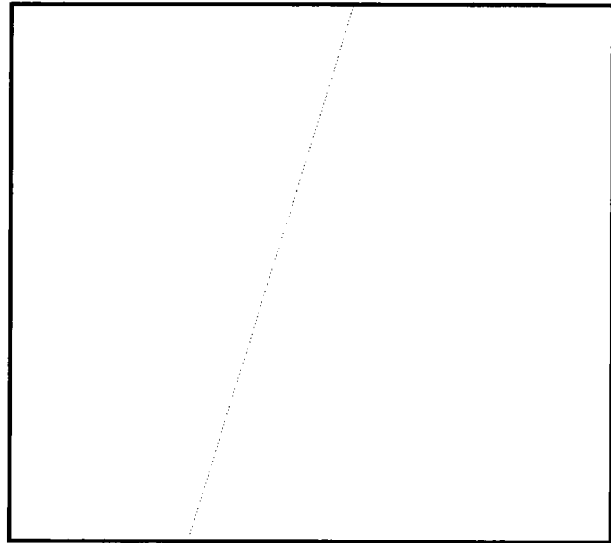
(U) F-5 jets intended for South Vietnam

(U) Being part of the French Empire, Vietnamese nationals could not participate in any aspect of cryptology (or cryptography) until their French colonial masters decided to allow them. Through World War II, there is no evidence that any native Vietnamese was

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allowed to work in any fashion in either field. French needs in both activities were sufficiently staffed by personnel drawn from the various French cryptologic and cryptographic bureaus headquartered in Metropolitan France. French colonial codes and ciphers were handled by Frenchmen; a small intercept mission in Indochina was staffed by French military personnel and supported the colonial administrations under the Third Republic and the collaborationist regime in Vichy between 1940 and 1945.⁴

(U) Even as manpower shortages developed in the French colonial cryptographic (and cryptologic) ranks due to Indochina's isolation from France, plans by Vichy and the colonial regime in Hanoi to develop a fully staffed and centralized colonial cryptographic service carried no provision for the participation in the program by any indigenous peoples, including Vietnamese.⁵



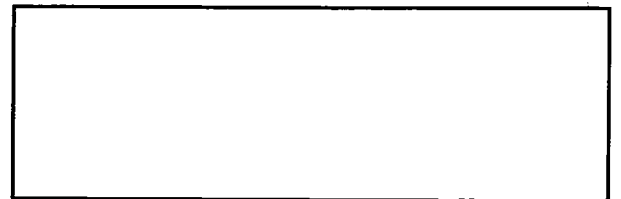
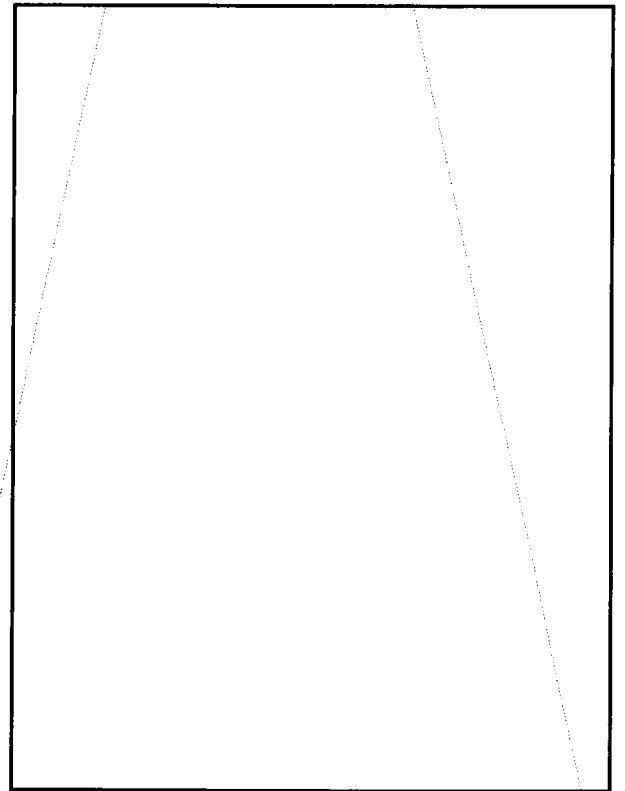
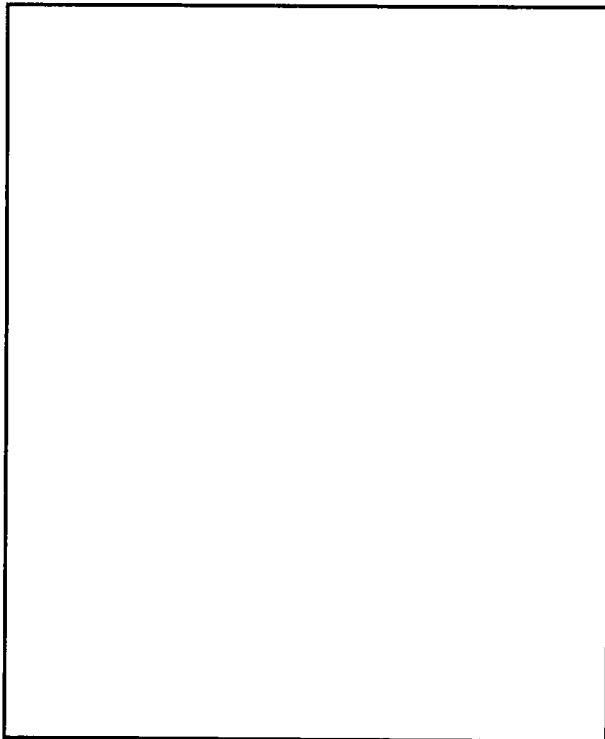
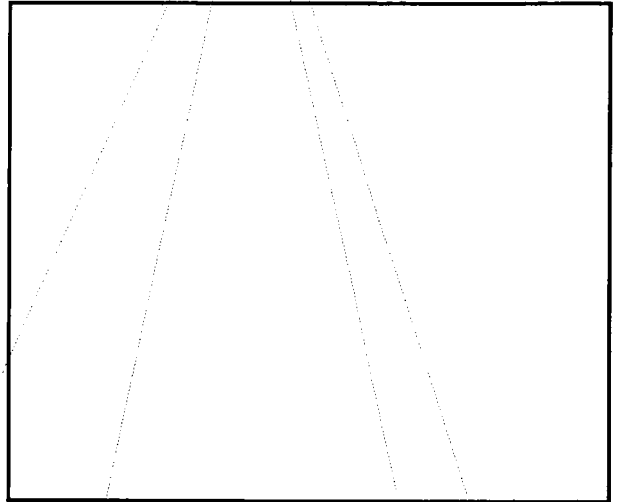
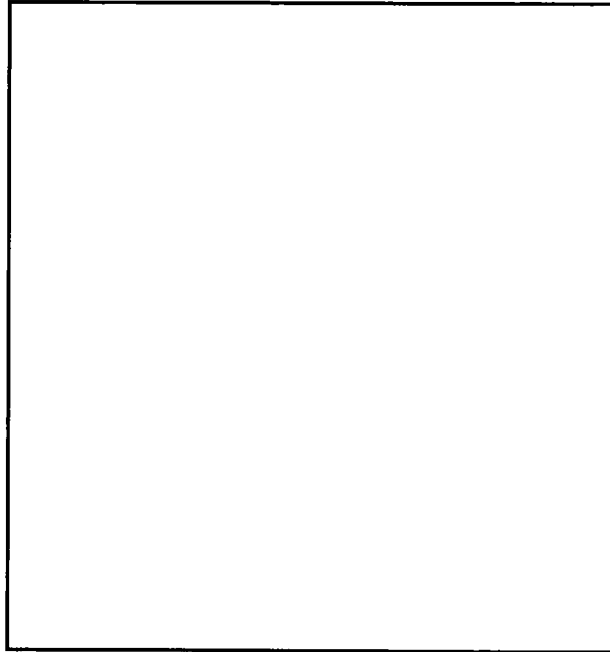
(U) In contrast to this lack of any real national Vietnamese COMINT effort, even something nested within the French cryptologic organizations, there stands the Viet Minh experience. In 1941, after defeats in Cochin China and Tonkin, the Viet Minh were forced to retreat into China where they became politically allied with the Nationalist Chinese and the Americans who were battling the Japanese. During 1944 and 1945, possibly as part of the Allied training program of Chinese COMINT personnel, selected Viet Minh were trained by the personnel from the U.S. Navy's cryptologic organization, OP-20-G, to be intercept operators and analysts.¹⁰

(U) Within a few years of the war against the French, in 1948 the Viet Minh had created a small cryptologic bureau, utilizing captured American equipment to monitor French communications.¹¹ A year later, it was reported to French intelligence that the Viet Minh had an intercept center at La Bang in Thai Nguyen province with ten positions along with a cryptanalytic capability.¹²

(U) Most of this effort probably had occurred with minimal help from the neighboring Chinese Communists. By 1950, the influx of aid from Moscow and Beijing could only increase the Viet Minh's capability. In fact, by late 1951, the French credited the Viet Minh with a sophisticated radio

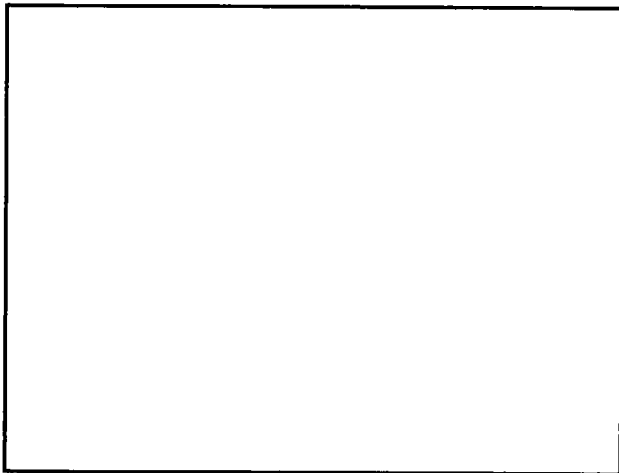
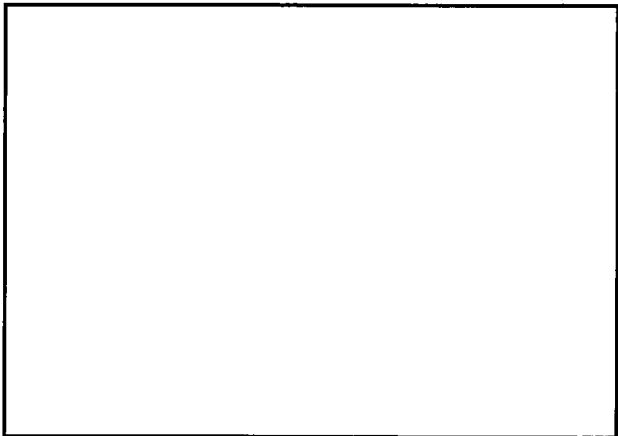
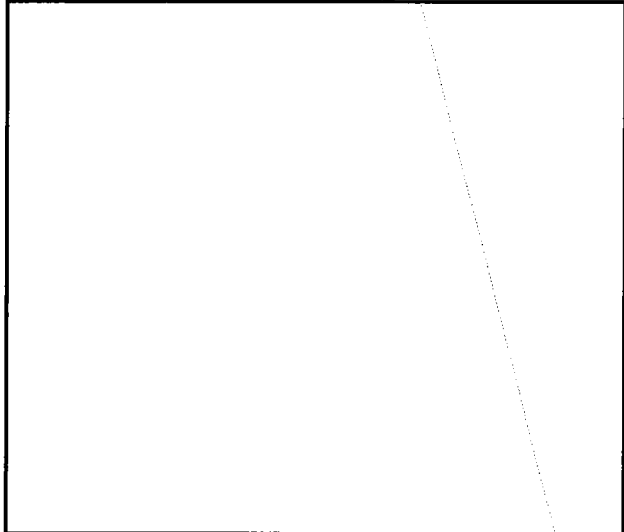
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intelligence capability that could provide General Giap with timely information.¹³ So pervasive were the Viet Minh radio monitors that French military radio operators practiced deception as a matter of standard procedure against them.¹⁴

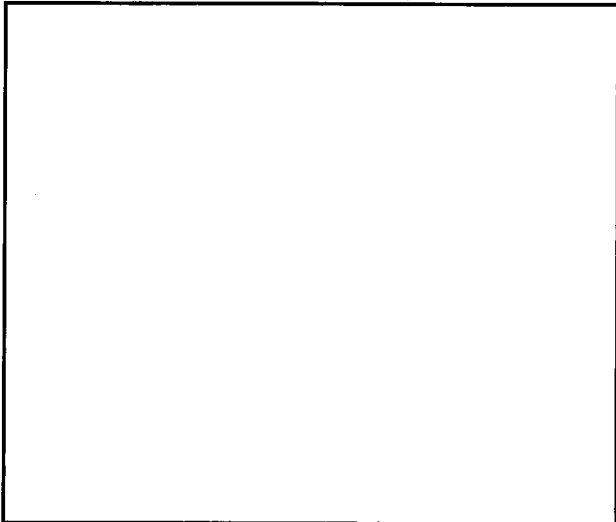
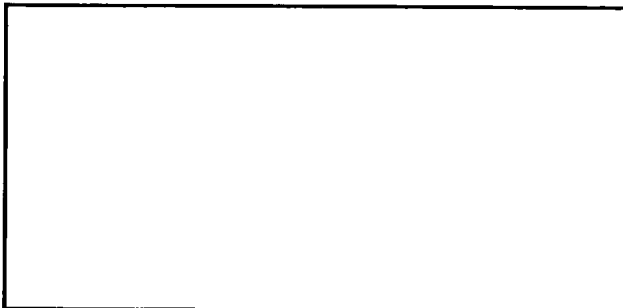


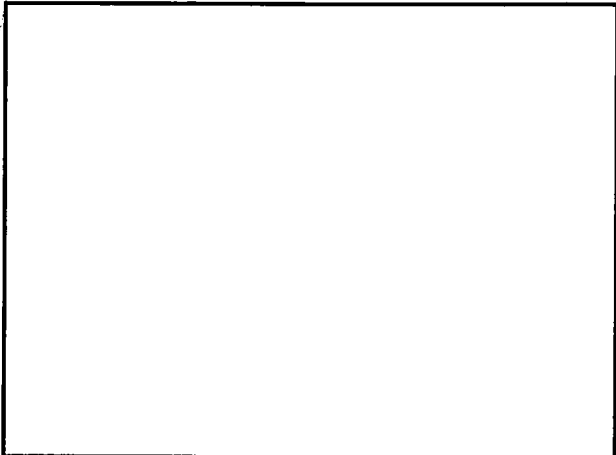
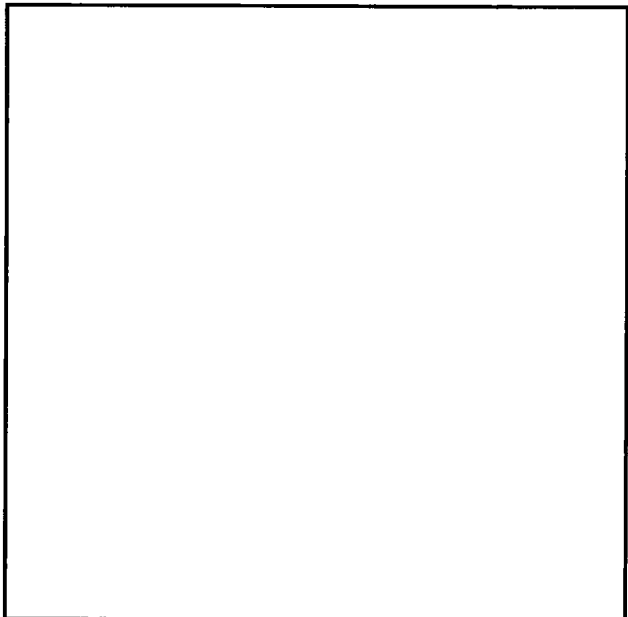
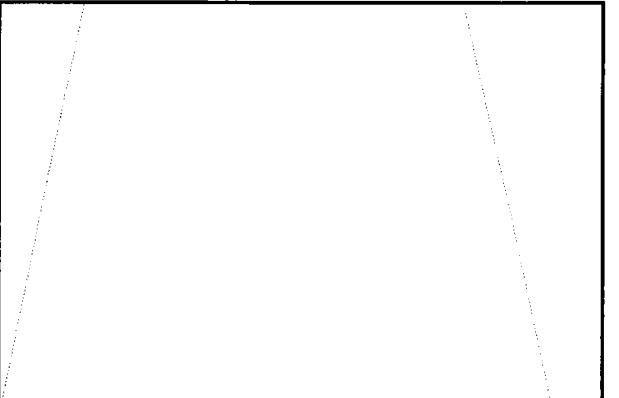
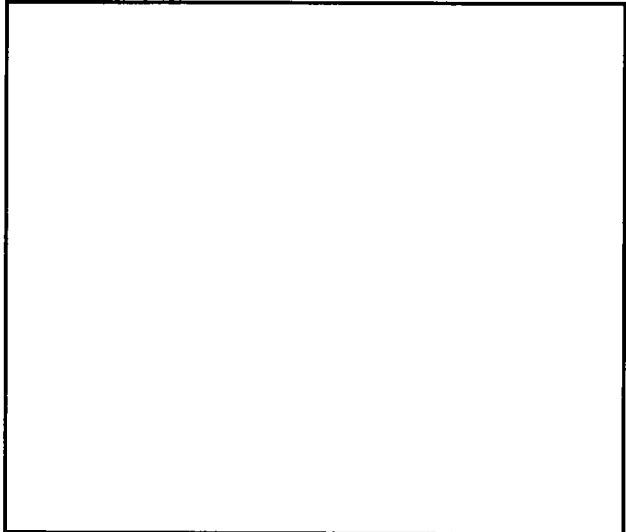
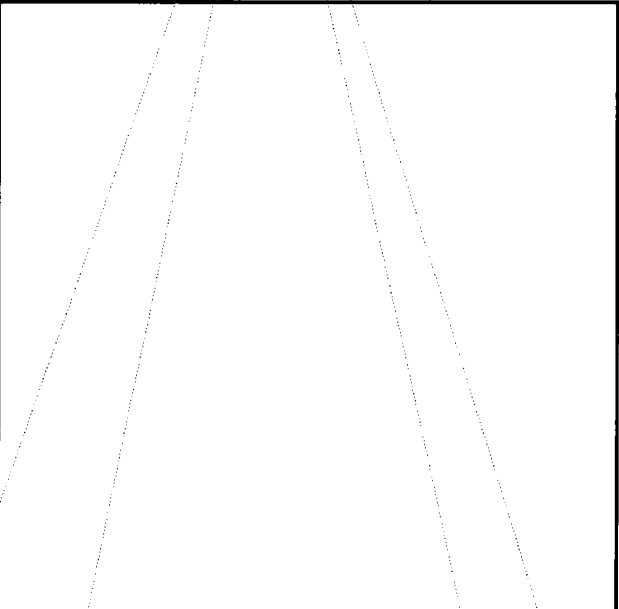
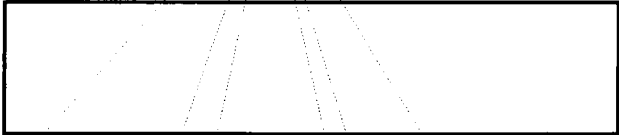
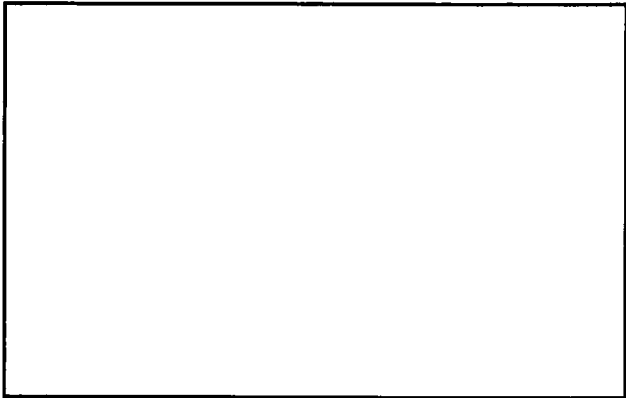


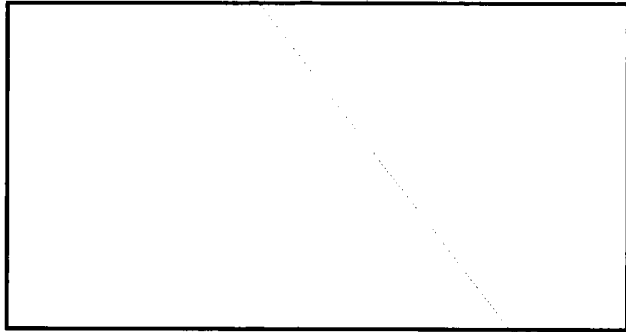
(U) President Eisenhower and U.S. secretary of state John Foster Dulles greet President Ngo Dinh Diem in Washington, D.C., May 1957.



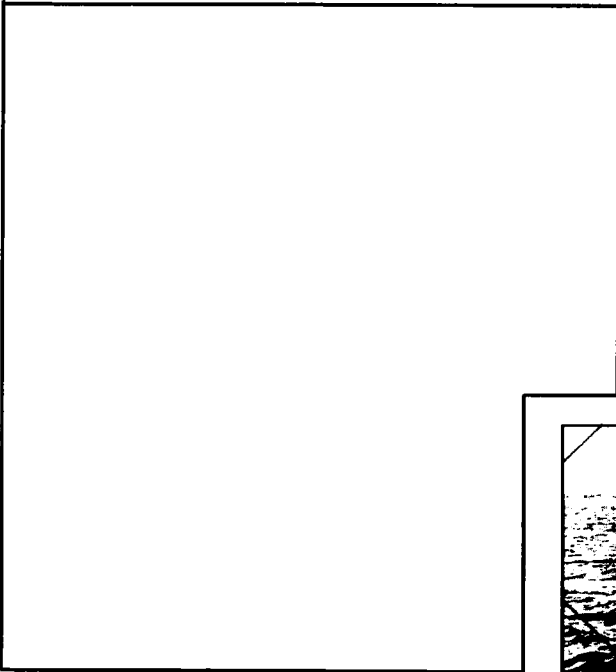
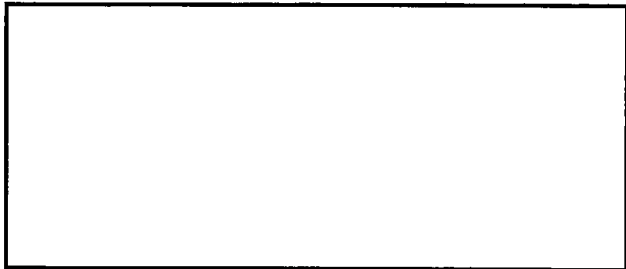
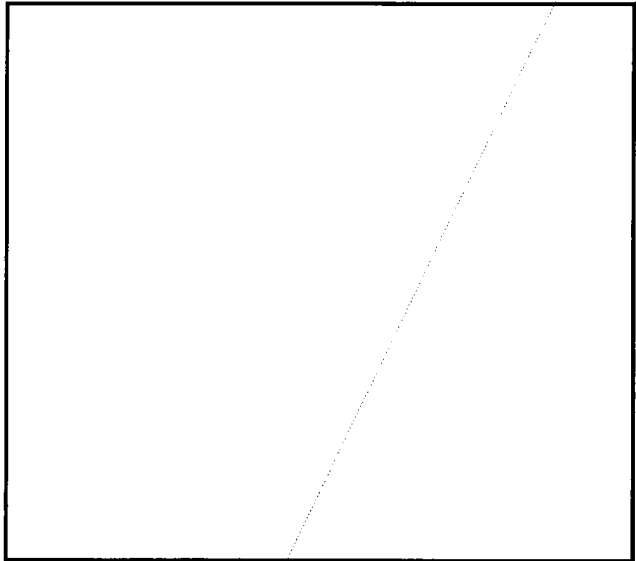
~~(S//SI)~~ NSA Looks for a New SIGINT Partner in Southeast Asia, [redacted] 1961



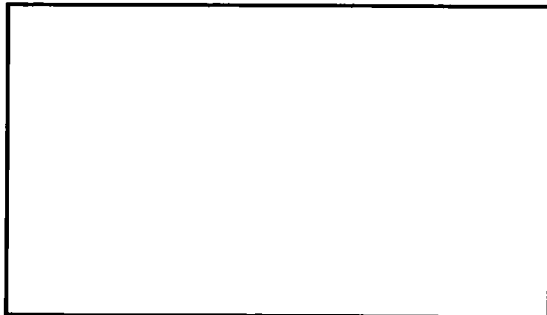




intercept for cash and equipment, as well as advice and training for the latter provided by the Americans.



(TS//SI) However, events were overshadowing these modest first efforts at a relationship; increasing communist pressure in Laos and throughout South Vietnam was pushing U.S. policymakers from a policy of aid only against a small insurgency towards one of holding the line against further communist gains in the region. An effective military response to the communist threat required much better COMINT support,



(U) PRD-1 D/F set aboard a South Vietnamese naval craft

especially more refined D/F support than the Vietnamese themselves could provide. To achieve this, the Americans would have to get involved.

(S//SI) America Moves in: The Sabertooth Training Program and the Vietnamese Expansion, 1961-1963

(TS//SI) In January 1961 the United States Intelligence Board sponsored a review of the SIGINT posture for Southeast Asia. The findings revealed several problems, but the most glaring was the near totally ineffective D/F effort against all communist communications transmitters in the region.³⁰ The current U.S. and foreign COMINT missions could not deliver the necessary and timely direction finding that could support military operations:

[redacted] no D/F capability [redacted] while the Vietnamese were handicapped by a shortage of useful equipment and training.

(TS//SI) [redacted]

The Vietnamese themselves would need to provide only physical security for the sites. The South Vietnamese leaders quickly agreed to the plan. Eventually, [redacted] set up five sites throughout the country, as well as a processing center in Saigon. Later, during the war, their network of sites would be integrated into the Allied effort. In late August 1967, one of the sites, located just a few miles from the big ASA site at Phu Bai, was completely overrun by a communist unit. The site was completely destroyed and took

some time to be rebuilt. The [redacted] mission finally departed South Vietnam only in the extreme days of April 1975.

(TS//SI) On the U.S. side, the Intelligence Board's report recommended that the assistance to the Vietnamese be increased substantially since it was seen as the most appropriate service meeting the current D/F needs in South Asia. This help would consist of traffic analytic and direction finding techniques with limited access to D/F steering data. These latter data included the frequencies [redacted] for Viet Cong radio stations in the southern parts of the RVN that used "fixed" (that is, never or seldom changed) callsigns. Additionally, a sanitized version of an NSA classic traffic analysis instructional text, *Introduction to Traffic Analysis*, published in 1953, was released to the Vietnamese to help teach them to develop a traffic analytic capability that would support a D/F mission.³²

(TS//SI) The USIB also made three recommendations which set the stage for the next major U.S. escalation: provide the Vietnamese with the appropriate traffic analytic and direction finding training at a Category II X level, make selected technical information available [redacted]

and request State Department to ascertain the political feasibility of U.S. mobile D/F teams operating within South Vietnam.³³

(TS//SI) The importance of effective D/F cannot be understated; it was the most tangible aspect of COMINT support to the Vietnamese military effort against the communists. No less an interested party was the then current chief USMAAG, Lieutenant General L.C. McGarr, who had discussed this specific issue with the U.S. ambassador to South Vietnam, Frederick Nolting, and the SSO staff, Saigon, in February 1961. General McGarr regarded the rapid growth of the communist radio nets as a measure of their current military and political success. In fact, other intelligence suggested that the Viet Cong were

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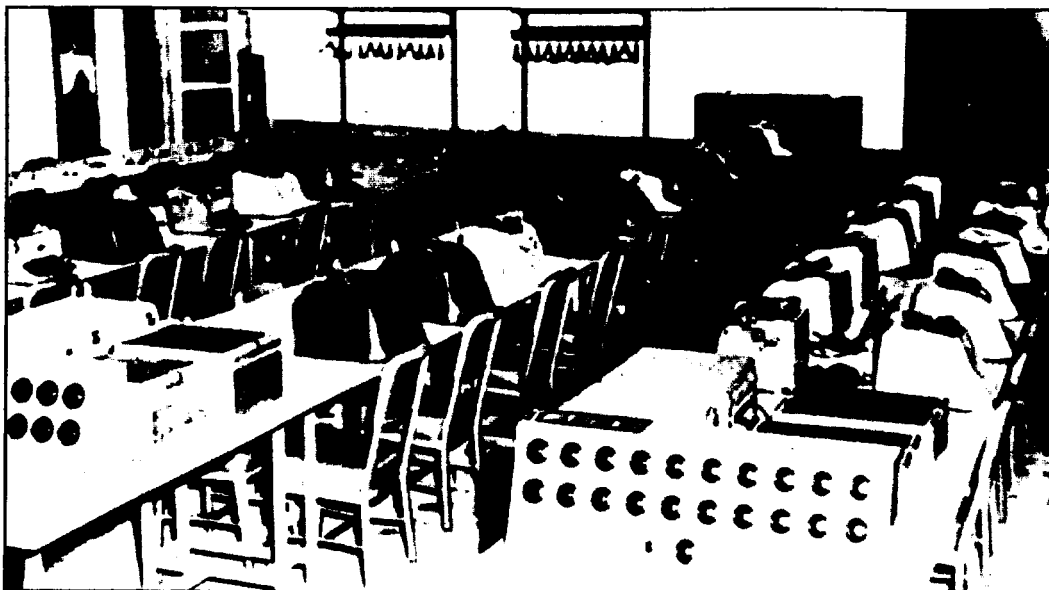
going to make a major effort during the upcoming April national elections to overthrow President Diem.³⁴ To McGarr, COMINT could pinpoint the enemy's transmitters; the tendency for U.S. intelligence, especially the cryptologic organizations, to preserve the communist radio stations for the purpose of retaining an intelligence source, seemed to him counterproductive from a strictly military perspective. His own understanding of the problem was that the Vietnamese army was not getting the support necessary to destroy these stations.³⁵ To him, there had to be channels to get the intelligence on these stations to the Vietnamese.

~~(TS//SI)~~ McGarr had also made one other recommendation: to get the U.S. Army Security Agency to train the Vietnamese to produce better COMINT on their own. It was an idea that had already been taken up in Washington. On 13 April, the Intelligence Board agreed that it was time to commit U.S. communications intelligence resources to the struggle. The USASA was tasked to develop the operating plans. On 8 May, DIRNSA informed NSA elements in the Pacific region of the approved plans which included the insertion of a seventy-eight-man ASA unit into South Vietnam, the provision of intelligence informa-

tion to the Vietnamese, and the arrival of a fifteen-man team to train the Vietnamese in intercept and D/F techniques. The training plan was called Sabertooth, and it was hoped that its results would change the face of Vietnamese COMINT.

~~(S//SI)~~ Earlier, we had talked about the first ASA contingent to Vietnam, the 3rd RRU, which had arrived in May 1961. We saw how they had to throw out everything they previously had learned about COMINT and D/F and begin from scratch. Their companion unit slated for the training of the South Vietnamese was in much the same straits. The Sabertooth team first assembled at Fort Devens, Massachusetts, to receive special indoctrination on South Vietnam. The original Sabertooth plan called for an overly optimistic target of training almost 400 South Vietnamese officers and enlisted personnel in voice and manual morse intercept, direction finding, traffic analysis, textual processing, and command and control of COMINT units. Funding was approved and training equipment arrived that summer. By September 1961, Sabertooth began with a ceremony attended by the nominal chief of the ARVN COMINT organization, [redacted] and General McGarr.

(U) Sabertooth
manual morse
intercept
training
classroom



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(U) Sabertooth training. U.S. and ARVN operators working with an AN/TRD-4A set

There were forty-five students in that first set of classes, thirty for the intercept-D/F course and fifteen for the traffic analysis section. By November 1961, thirty-one students had graduated from these courses.

(S//SI) However, from its very beginning, Sabertooth was bedeviled by problems which undercut its effectiveness. The biggest difficulty lay in obtaining adequate numbers of qualified personnel and getting them over the administrative hurdles. For example, in June 1962, 120 students were slated for training, but were placed on hold because they lacked security clearances. At other times, classes were cancelled or never scheduled; not one class was held for the entire year of 1966! Most other times, only one or two full classes could be scheduled. In early 1962, the program was turned over to the Vietnamese to administer while the 3rd RRU remained in an advisory capacity.

(S//SI) Another problem was the poor technical background of many students, which should have been anticipated considering the nature of Vietnamese schooling and culture. This led to sometimes steep washout rates approaching 60 percent for some classes. This technical gap also limited the number of students who could take courses in critical and highly technical subjects like crypto-equipment maintenance. By 1969, the Sabertooth program was closed down. Overall, Sabertooth never seemed to achieve the success hoped for it when it began in 1961.³⁶

(S//SI) There were other fundamental problems with Vietnamese COMINT that would keep it from being the effective program the Americans had wanted. One major drawback was the organization of Vietnamese cryptology. Subordinate units were a mixed bag of COMINT and COMSEC technicians with conflicting pay and promotion policies. Also, the COMINT organization was in competition with other Vietnamese military branches for the limited number of technically inclined recruits. Finally, the current organization of the communications intelligence units, which was geared towards fixed site operations, did not lend itself to field support for mobile military operations. To rectify this latter problem, the 3rd RRU proposed [redacted] COMINT units be reorganized along ASA lines.³⁷

(S//SI) In late 1962, the Technical Center was renamed the Technical Exploitation Organization (TEO) which functioned as an analytic and joint operations command. Subordinate to it was Unit 15, the Communications Technical Research Company (CTRC), which was the COMINT organization. The COMSEC function was renamed Unit 16 and temporarily shifted to the ARVN Telecommunications Command. There it performed cryptographic support functions and COMSEC monitoring operations. Eventually, the COMSEC unit would be returned to the cryptologic fold in 1964.

~~(S//SI)~~ On 1 February 1963, the TEO was deactivated and the J7/Joint General Staff (J7/JGS) organization was formed. Essentially, this gave the South Vietnamese military COMINT effort more independence in operating and recruiting qualified staff officers and technical personnel. This new freedom encouraged the J7 to develop Low Level Voice Intercept (LLVI) teams which added a tactical supplement to a slowly growing field station capability. In fact, one of these teams would provide intercept and linguistic support to the U.S. Marine SIGINT support team stationed inside the base at Khe Sanh for the duration of that siege in early 1968.³⁸

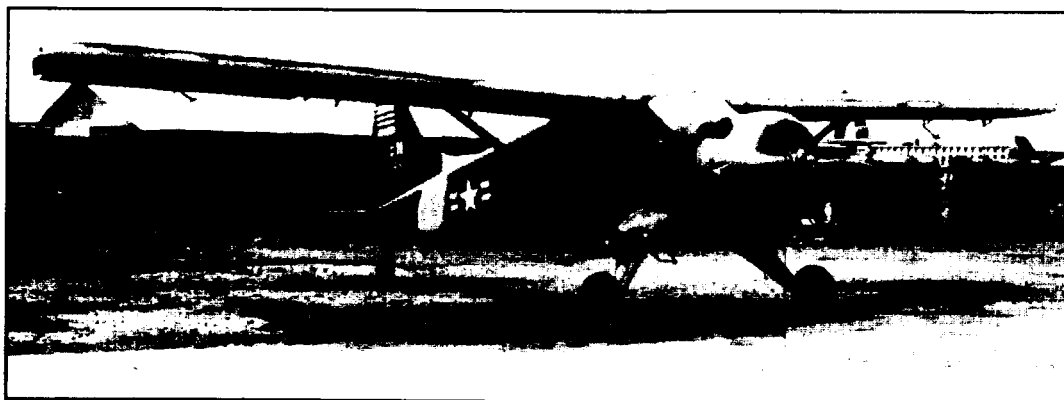
~~(S//SI)~~ As part of proposed joint U.S.-ARVN COMINT operations, South Vietnamese Medium Range Direction Finding (MRDF) sites were integrated into the ASA's Whitebirch D/F system. The first site, located near Ban Me Thout, under the supervision of an American noncommissioned officer, began operating in November 1961. Eventually, as many as four Vietnamese stations would join the Whitebirch network which targeted communications in the southern region of the country as far west as the Cambodian and Laotian borders.

~~(S//SI)~~ The effectiveness of Whitebirch's operations was always questionable.³⁹ In fact, its very considerable shortcomings compelled the United States to pursue ARDF as a substitute. Many of Whitebirch's problems were due to poor equipment, poor baseline location of its stations,

and the awful atmospherics of the region. Another one of its fundamental problems was the poor work by the personnel assigned to the Vietnamese stations which were part of the net. Technically overwhelmed, the Vietnamese personnel simply couldn't produce quality D/F returns.⁴⁰ By 1966, Whitebirch was reorganized as a High Frequency Direction Finding (HFDF) system. One of the provisions for the change was to exclude the ARVN D/F stations from the new Whitebirch. The Vietnamese went off and formed their own MRDF net.

~~(S//SI)~~ Realizing the shortcomings of their separate MRDF network, the Vietnamese also initiated a small ARDF program. The J7 leaders met with their American counterparts and in July 1963 signed an ARDF agreement that would get their effort literally off the ground. The Vietnamese part of the bargain required that they supply the planes, crews, and organize an effective security program. The Americans promised to provide the intercept and D/F equipment, training, a "flash" facility for coordinating direction finding missions, and the necessary technical steerage information, such as frequencies and call signs. Besides that, the Americans also retained an operational control of the aircraft.⁴¹

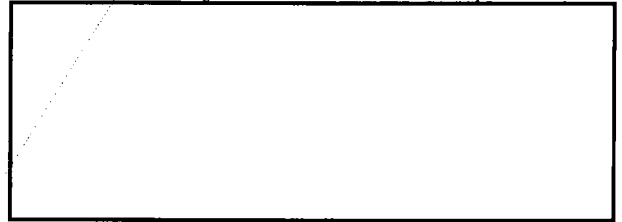
~~(S//SI)~~ In early 1964, the Vietnamese conducted a series of successful tests with four U-6A (Beaver) aircraft – the same plane that ASA tried in 1962 – using modified H-Adcock antenna arrays. By summer of that year, the J7/JGS had



(U) ARVN
U-6A ARDF
aircraft

an infant ARDF capability. But, like a lot of other J7 activities, it was limited by a lack of training and faulty equipment, as well as too few platforms to make any sort of impact on the expanding communist communications network.⁴²

to the nearby Vietnamese J-7 personnel.



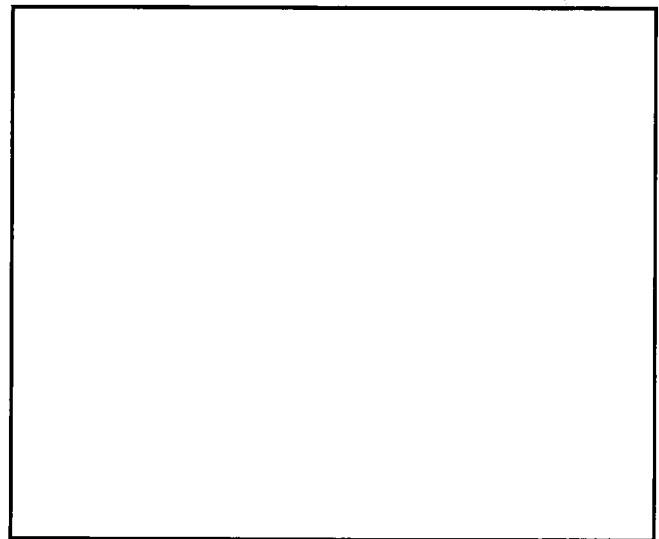
~~(TS//SI)~~ Ironically, the South Vietnamese COMINT program's development was retarded in large part by the security limitations imposed by its relationship with the Americans. A good illustration of this was the technical COMINT exchange policy between the two organizations. Of course, it was standard for NSA to limit exchanges with any COMINT Third Party organization, and the policy with the Vietnamese was basically no different from any other similar arrangement as outlined in DCI Directive 6/3.⁴³

~~(TS//SI)~~ However, tendencies were developing in the exchange which suggest that a higher level of classified material was being passed between the two countries. It seemed at times that the Vietnamese COMINT personnel would not react just to the D/F information being passed to them. At the same time, in Saigon the Americans would have to supply the Vietnamese commanders with communications intelligence above the Category II X level in order to convince them that the initial D/F information was valid.⁴⁵ Additionally, it seems that even Top Secret signals intelligence had to be used to convince the Vietnamese military, as well as President Diem, of the validity of the intelligence the MAAG was filtering to them.⁴⁶

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~~(TS//SI)~~ Essentially, the exchange with the Vietnamese included only limited D/F steerage information on links using semi-fixed callsigns, frequencies, [redacted] and callsigns on illicit and guerrilla targets in South Vietnam and North Vietnamese intelligence communications. It also stipulated that planned joint activities were to be limited to Category II X (Secret Non-Codeword) functions, such as plaintext intercept and processing. The exchange did allow Category II (Secret Codeword) and III (Top Secret Codeword) information to be passed to the Vietnamese military, but only through the USMAAG. However, this intelligence had to be in support of situations where attacks had to be launched quickly in order to be effective and surprise the communists.⁴⁴

~~(S//SI)~~ **A Matter of Distant Trust:
The Persistent Problem of Security in
the Vietnamese SIGINT Organization**



~~(TS//SI)~~ The exchange program, as it would evolve into a practical matter, was never as stringent as outlined in the agreement. Organizational and personal relationships, and technical transfer routines tended to settle at the simplest working level. At Tan Son Nhut, the Joint U.S.-ARVN COMINT facility conducted D/F at the lowest classification level possible. The U.S. Army's analytic center at Tan Son Nhut, which worked with Category II and III material, remained off limits

~~(TS//SI)~~ We have already discussed the alleged compromise in chapter 4. Although it was

demonstrated at the time that the release of technical information on VC communications to Saigon could not have been connected with the communications change, the attitude persisted in the minds of U.S. SIGINT leaders and advisors to the Vietnamese that there was a serious and systemic problem with Saigon's security. This was an opinion grounded in the knowledge that American intelligence and counterintelligence elements had accumulated over the years about lax Vietnamese security practices.

[Redacted]

[Redacted]

[Redacted]

[Redacted]

~~(TS//SI)~~ However, security problems continued to plague the ARVN COMSEC system. In July 1961, [Redacted] message to the VC HQ in the western Nam Bo region, revealed instructions to an agent on how to contact a cipher clerk working for the ARVN 21st Division stationed at Can Tho.⁵⁰

~~(TS//SI)~~ One of the most bizarre cases occurred in late 1962. The head of the Vietnamese Telecommunications Command, [Redacted] was dismissed after it was discovered that a junior officer he was sponsoring was, in fact, a member of a VC cell. In a byzantine twist, this same junior officer purportedly also was a double agent for [Redacted]

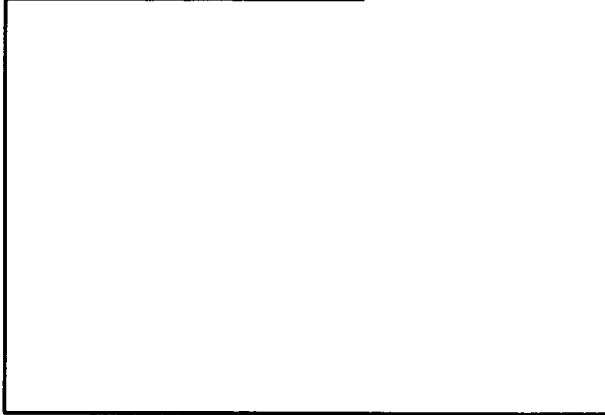
[Redacted]

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~~(TS//SI)~~ As for the COMINT organization, it was no secret that its security system was lax; whether the continuous compromise of COMINT was due to poor security or an attempt to gain a

political advantage in the morass of Saigon politics was not always certain.



starting its changes on 10 April.⁵⁵ Furthermore, in a report done six weeks later, it was shown that in October 1961 certain Viet Cong nets in the Nam Bo region had switched [redacted] systems, and that the interregional communications net had changed its cryptography by January 1962.⁵⁶

~~(TS//SI)~~ Aside from the cryptologic challenge imposed by the change – and it was considerable, as the VC communications now broadly resembled that of Hanoi's regular military, [redacted]

[redacted] there now was the difficulty, at least in American eyes, of how to proceed with the relationship with the J7 organization. Suspicion's worm, in the form of the compromise, had entered the minds of the Americans; from then on, they would view the J7 organization with an unease that would affect all future considerations.

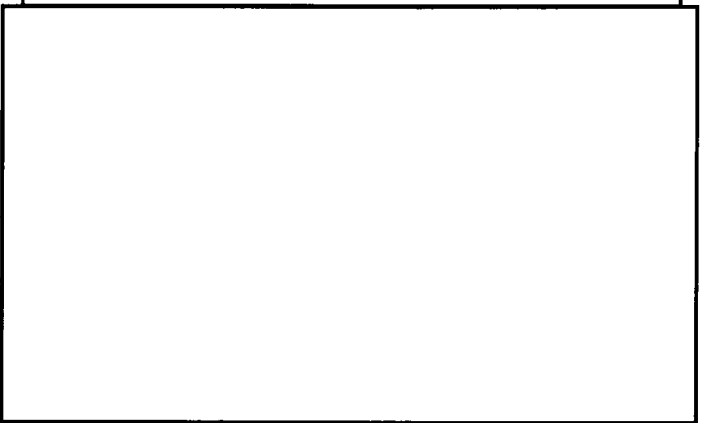
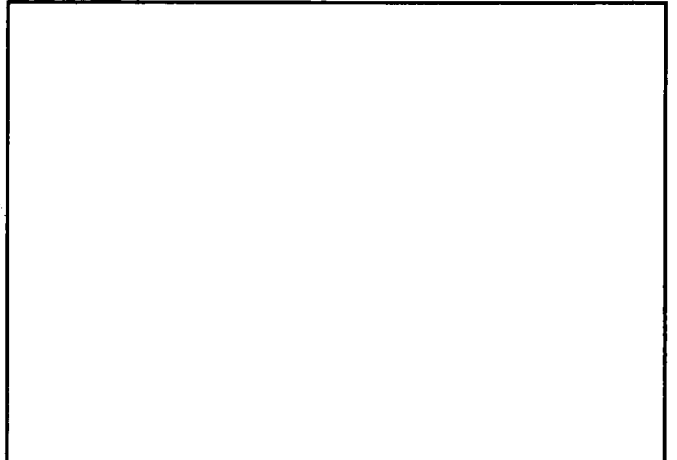
~~(TS//SI)~~ A more critical incident appeared in late March 1962. The U.S. intercepted a message sent by the headquarters of the Vietnamese military intelligence organization in Saigon to an outpost in Hue which listed the locations of various Viet Cong transmitters throughout South Vietnam.



It was suspected that, based on knowledge of earlier communist cryptologic successes, the information in this message was probably compromised.



~~(TS//SI)~~ This incident, along with the suspicion that the South Vietnamese had compromised the USMACV SIGINT Plan on 13 April, convinced many in American SIGINT leadership that the South Vietnamese leaks were responsible for the subsequent major communist communications change. However, the USIB was unable to prove this. At the time there was compelling SIGINT evidence that the communist changes had been under way well before the two compromises occurred. For example, two reports from the ASA site at Tan Son Nhut indicated that the communications change occurred in stages, with western Nam Bo (the area northwest of Saigon) initiating its changes on 6 April, and Military Region 5



~~TOP SECRET//COMINT//X1~~

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[REDACTED]

and technical material necessary for later planned plaintext voice intercept operations.⁶¹

(TS//SI) Although this exchange crisis had been defused, the American concerns about the security in the ARVN J7 organization remained. Earlier in May, Admiral Frost had advised the deputy director, NSA, Dr. Louis Tordella, who was preparing to brief the secretary of defense, Robert McNamara, about the implications of the communist communications change. He said that, "I do not accept the idea of joint U.S.-ARVN SIGINT operations and further promotion of this concept must be discouraged. Please advise CIA. Our job is training and assistance in technical field[s] and need not exceed CAT II (X) material."⁶²

[REDACTED]

(TS//SI) Oddly, all this concern over the security of the Vietnamese cryptologic organization followed an NSA evaluation of its performance as a COMINT producer, which rated it as poor. In June 1962, an evaluation from DIRNSA's staff to the CIA office handling foreign intelligence relationships stated that the expanded American effort reduced the need for the Vietnamese intercept. The latter's overall product was considered "not essential." Though, it was pointed out, that if intercept of communist voice communications ever materialized, then there would be use for the Vietnamese COMINT personnel for intercept and transcription.⁵⁹

(TS//SI) In September of 1962, this theme was repeated in a message from the NSA representative in Vietnam to the director, NSA, Admiral Frost. He reported that, except for monitoring the communist Liberation News Agency broadcasts, the ARVN COMINT effort was virtually a duplication of all other intercept sources, primarily American [REDACTED]. The bottom line assessment was put in a clipped style: "Good for back-up, and occasionally unique traffic, and excellent for LNA cover." Continue with the liberation radio broadcast copy, the NSA representative in Saigon suggested, but the other material "could be dispensed with."⁶⁰

(TS//SI) In July 1962, Admiral Frost, probably reacting to pleas from the American missions in Saigon, relented on his draconian measures against sharing with the Vietnamese. He pointed out that the prohibition was not intended to deny all steerage information. In a message to Saigon, he limited the steerage data to D/F information not higher than the secret classification which would not compromise sophisticated techniques

(TS//SI) Ultimately, it is difficult to make a clear judgment whether the security problems within the J7 organization and its successors were ever fixed to NSA's final satisfaction. Throughout the war, there were tidbits of evidence sprinkled through reports and messages from NSA representatives that indicated that the South Vietnamese had not eradicated completely the problem of infiltrators and lax security. For example, in 1964, it was discovered in SIGINT that the Viet Cong had an agent within an ARVN "radio monitoring center," though it was unclear what he was providing to the communists.⁶⁴ In a September 1968 incident, J7 communicators were discovered by American COMSEC monitors to be passing COMINT information to its customers over insecure communications channels.⁶⁵

(S//SI) The South Vietnamese themselves could barely keep their mouths shut when it came to cryptologic secrets. The 5 May 1964 edition of

~~TOP SECRET//COMINT//X1~~

the *Saigon Post* carried an interview with the South Vietnamese II Corps commander, Major General Do Cao Tri, in which he revealed the existence of a radio link between a Viet Cong base and Hanoi, that the VC transmitter had been successfully located thanks to "our modern equipment" and ultimately destroyed during Operation Do Xa.⁶⁶ Since the "equipment" Tri referred to was actually aerial direction finding gear, and he was not supposed to receive such information, these revelations brought on consternation all the way up the chain of command from the 3rd RRU to MACV, ASA Pacific and NSA. Although there were no indications of immediate damage to U.S. SIGINT capabilities in South Vietnam, MACV took the rather severe step of withholding all COMINT from the ARVN until an investigation was completed; no matter what the investigation showed, ARDF results were going to be withheld anyway.⁶⁷ Tri would be reprimanded by the Vietnamese minister for defense General Khiem, as well as the ARVN chief of staff, Major General Nguyen Van Thieu (who later was elected as president).⁶⁸

~~(S//SI)~~ ARVN personnel security procedures continued to color the American attitude, as well. A review of ARVN security "vetting" procedures in mid-1967 revealed problems with Saigon's clearance system. It was found to be untimely and prone to shortcuts. Often, Vietnamese security officers ignored the obvious necessity to investigate applicants who had grown up in the north.⁶⁹ Then there was the case of the Vietnamese transcribers who disappeared from Phu Bai the night before Tet and remained AWOL as long as six days later.⁷⁰ That was a hard one for the Americans to ignore.

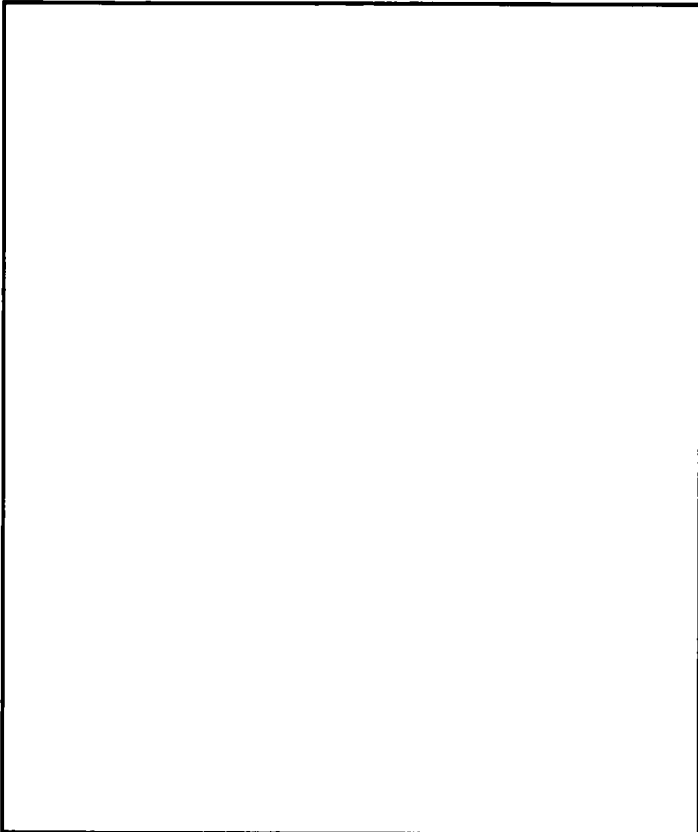
~~(S//SI)~~ South Vietnamese SIGINT during the American Expansion, 1965-1969

~~(TS//SI)~~ The effect of this limitation on technical exchanges was obvious. As we have seen, unilateral ARVN SIGINT initiatives and activities

such as the MRDF net and the tiny ARDF program, could not progress far from their larval stage. These endeavors remained small and therefore ineffective, especially when one considers the size of the communist communications network in the south. Meanwhile, the U.S. SIGINT presence in South Vietnam had begun its extraordinary growth. Eventually, almost 10,000 personnel, including civilians and representatives from all branches of the military, served in the Indochina region supporting the American intervention. A number of mobile platforms, including fixed-wing and rotary airborne intercept and ARDF aircraft and technical research ships, filled the skies and roamed the seas over and around the Indochinese peninsula. Land-based facilities, ranging from enormous sites such as Phu Bai, down to small detachments, littered the landscape with their (sometimes movable) forests of antennas, mountains of equipment, and tent cities. Yet, for the J7 organization, there was virtually no sharing of this cornucopia of SIGINT assets. Restricted to their bare toehold at Tan Son Nhut and the Whitebirch D/F net, the J7 organization was viewed as just another SIGINT Activity Designator (SIGAD) by the Americans. By early 1968, there were barely 600 Vietnamese personnel in J7, a fivefold growth since 1963, to be sure, but this did not even equal the manpower of one of the large American field stations such as Phu Bai – and this was the SIGINT organization of the host country!

~~(TS//SI)~~ In fact, the marginalization of the J7 efforts was not unanticipated by the Americans. It was pointed out earlier by Washington, even in mid-1962, that, as the American cryptologic capability in Vietnam grew, there would be a subsequent reduction in the utility and contributions by the Vietnamese. As more and more U.S. intercept positions came on line, the J7 collection, which, for the most part was duplicative, would be less useful. The positive ledger contained only a few items: assistance from the Whitebirch D/F net, cooperative processing of captured communist cryptographic materials, and the potential for

language assistance if and when the VC and North Vietnamese voice intercept missions could be developed.⁷¹



evaluation of "fairly effective."⁷³ Such statements reveal only how uncertain the Americans were about their Vietnamese SIGINT counterparts and stand in stark contradistinction to the detailed inventory of problems and shortcomings found in official and many personal reports, accounts, and messages. One example of this was the recollection by an NSA advisor of his 1973 experiences at the South Vietnamese Danang Processing Center. During an inspection trip of the outlying LLVI team, he found:

~~(S//SI)~~ LLVI team operation could have been far more productive if the lieutenants and senior NCOs had been more professional. Most of these teams were located in forward areas and I was unable to visit many of them. Those I did visit invariably needed basic improvement. Antennas were often oriented in wrong directions or were found to be grounded; radios and generators were rarely properly grounded; bunkers were not secured with perimeter wire and the men had not been counseled in document and equipment destruction in case of overwhelming enemy attack.⁷⁴

~~(TS//SI)~~ Another outcome of this separation was that the ARVN SIGINT organization, its people, and capabilities, remained largely a mystery to the Americans. To be sure, there were liaison people, and the later head of Vietnamese SIGINT, [redacted] was a constant visitor to American facilities in Vietnam and to NSA headquarters; but, when assessments were performed, especially in preparation for the VIMP in 1970, there was much confusion and ignorance about the Vietnamese, their technical abilities and shortcomings, at least to the detail needed to implement the upgrades later outlined in the VIMP.

~~(TS//SI)~~ For the Vietnamese SIGINT organization, these eight years were marked by grudging American allowances for intercept and processing efforts within extremely tight security restrictions. Even a project with as much promise as the Dancer program, originally started in early 1965 to handle the exponential growth of the intercept of North Vietnamese voice communications that was overwhelming the U.S. SIGINT system, would be inhibited from achieving its full potential. Eventually three DANCER sites – the ASA site at Phu Bai, the AFSS mission at Danang, and the ASA 509th Group in Saigon – were established to transcribe the avalanche of communist voice intercept.

1.4.(d)

~~(TS//SI)~~ When asked about how good the Vietnamese were, vague or conditional adjectives often were used, such as DIRNSA's 1970 overall

~~(TS//SI)~~ Yet Dancer was a program plagued with problems for almost three years before its projected impact at last was realized. Initially Dancer personnel were stationed at the three



(U) Vietnamese Dancer program personnel

U.S. sites, but they were segregated from the Americans with separate facilities and support functions. They were not indoctrinated into the mission; rather, they were maintained as mere transcribers. The finer point of record keeping of essential elements of information was not taught to them. At the same time, their basic language skills were uncertain; many could barely read or write Vietnamese, let alone rudimentary English.

~~(TS//SI)~~ With a great deal of extra training, the Dancers' problems would be overcome, though their final solution would drag on into 1967. Eventually, the Dancer personnel would contribute to the war. By late 1968, the South Vietnamese were transcribing valuable airborne intercept of the PAVN supply grid in Vietnam, Laos, and Cambodia known as the General Directorate for Rear Services (GDRS). Yet, even the distribution of the transcripts would be a point of contention between the U.S. SIGINT authorities and J7. Initially, as it was understood by the Vietnamese, all of the transcripts generat-

ed by the Dancers would be sent to their headquarters in Saigon. This was not the case. The tapes were transcribed at the three sites, and then the American station at Tan Son Nhut passed them both to J7. However, in early 1968 the number of tapes (and accompanying) transcripts passed were far less than J7 believed were being processed.

[REDACTED] Special approval was given by the [REDACTED] in mid-1968 to release these tapes to J7 for purposes of transcription and translation.⁷⁵

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~~(TS//SI)~~ However, even in the same period of 1968, NSA was quibbling with J7 over the exact meaning of the transcript release agreement. NSA maintained that the so-called quid pro quo of tapes for Dancer services was not its interpretation of the original agreement. However, NSA told the Vietnamese that if they requested tapes then they would receive them, but only if they specifically asked for them. This stipulation was reiterated in an NSA message to Saigon on 10 March 1968. The same message revealed NSA's recurring fear of "stimulat[ing] ARVN requests for additional U.S. assistance. Additionally, NSA would not encourage Saigon's exploitation of COMINT materials which do not appear to support the ARVN struggle. . . ." ⁷⁶

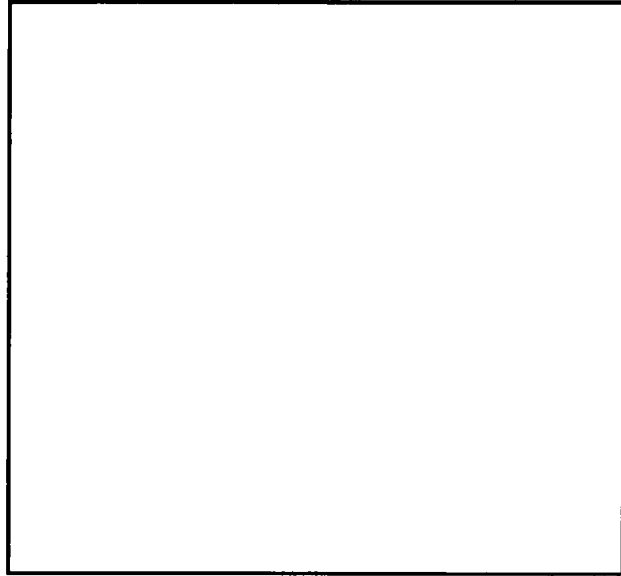
~~(TS//SI)~~ This point was repeated in another message ten days later. The J7 had proposed to the NSA representative in Saigon a plan to form Vietnamese direct support units (DSU) for each major command and division. This would require stepped-up training, equipment, and technical support. NSA's response was to remind NSAPAC of the 1962 prohibitions which were still in effect. NSA suggested that the DSU concept might be useful in steering the J7 effort towards a stronger

voice intercept capability which, in turn, would aid the American SIGINT effort.⁷

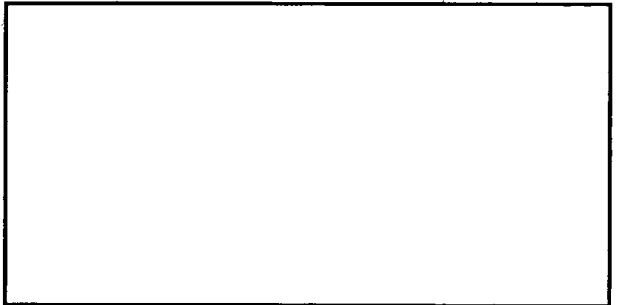
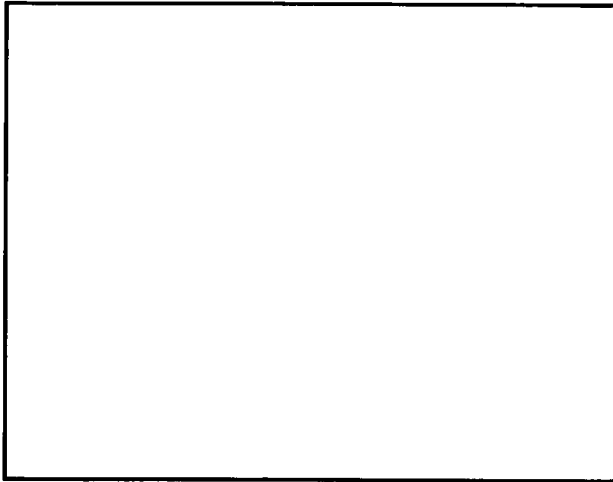
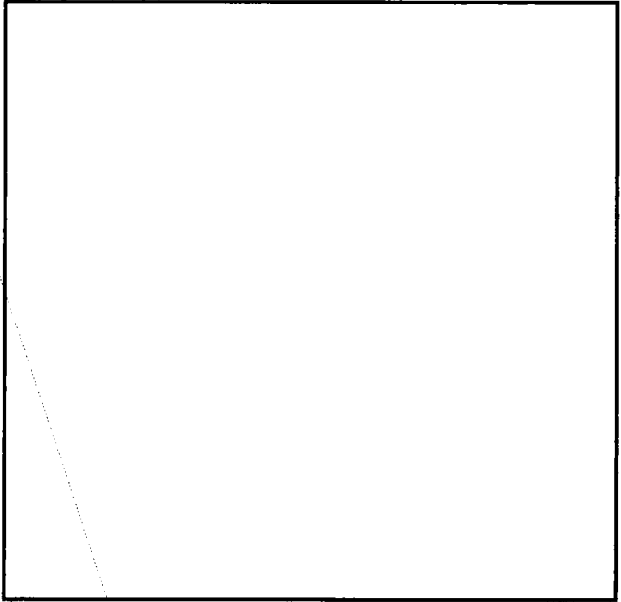
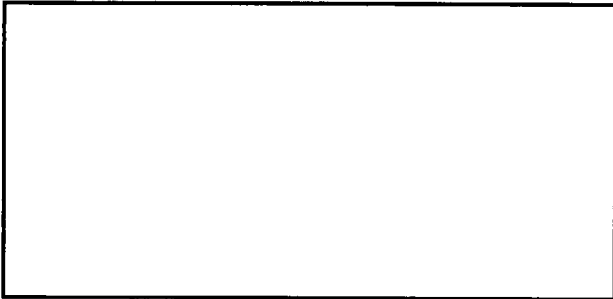


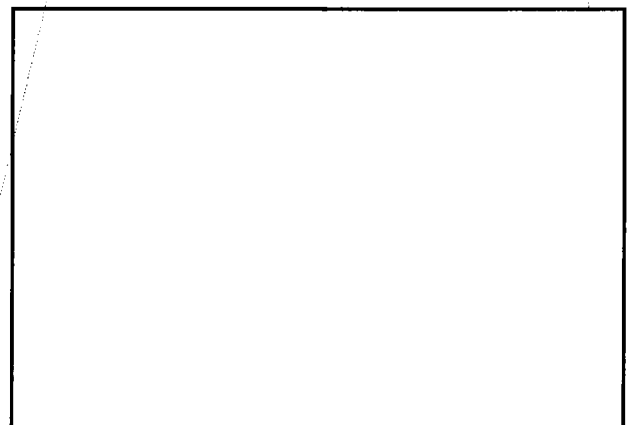
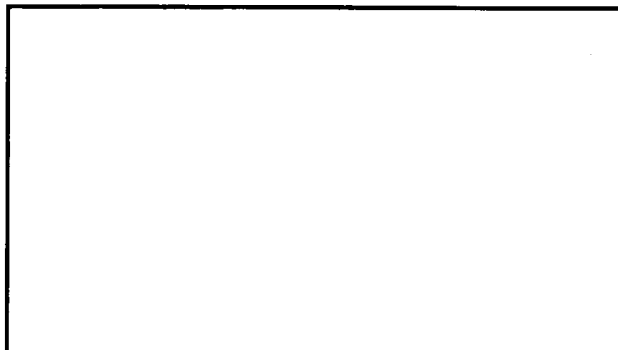
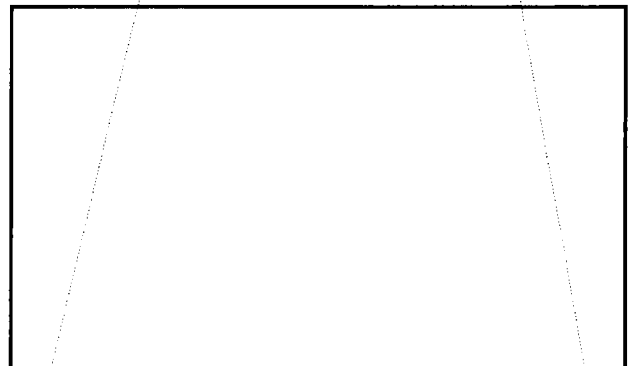
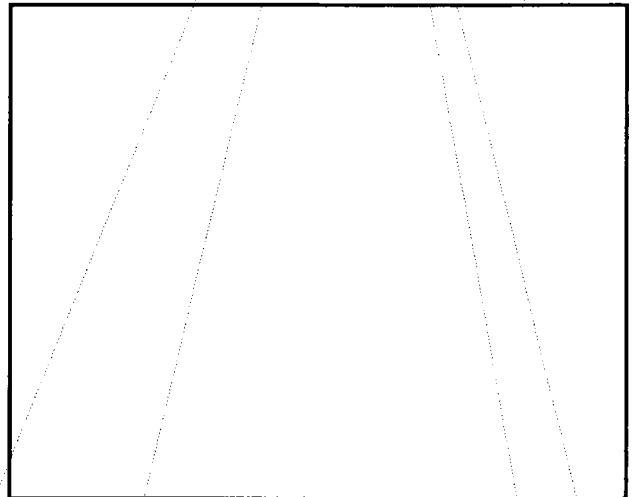
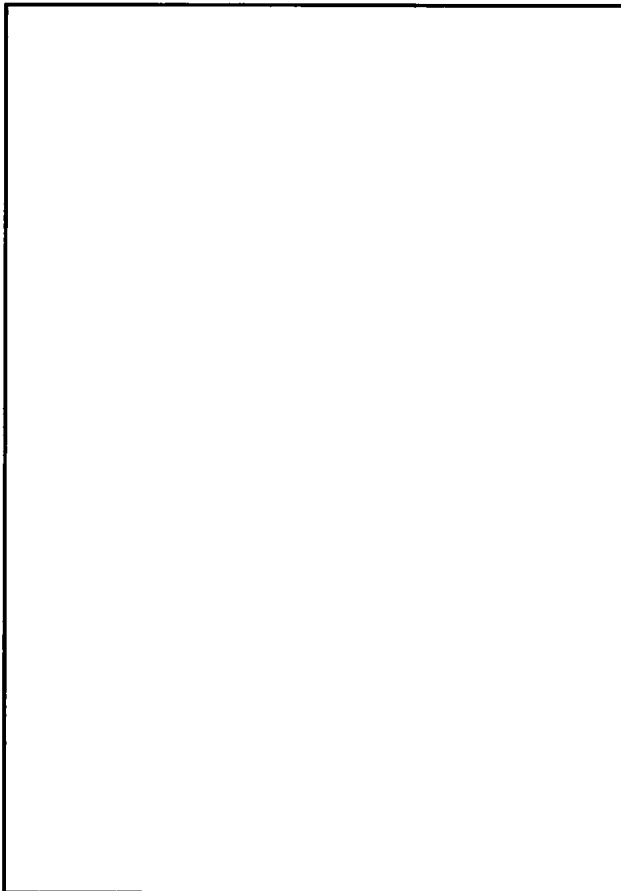
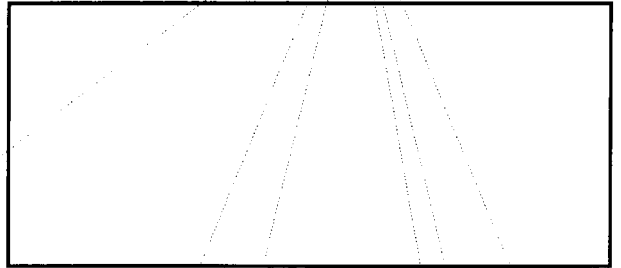
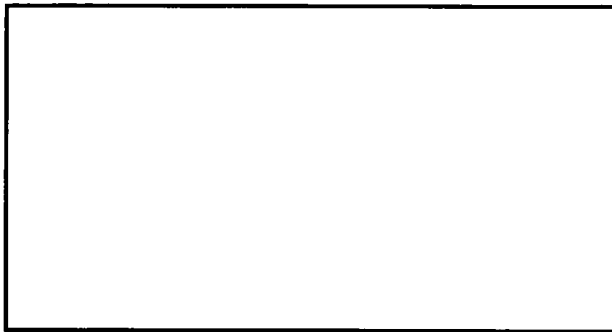
~~(TS//SI)~~ **Counterpoint: Vietnamese Communist COMINT, [redacted] 1970**

~~(C//SI)~~ While the J7 organization expanded slowly and remained on a short leash of limited exchange and cooperation with the American cryptologic organizations, to the north a radically different approach to the practice and organization of communications intelligence was developed by Hanoi.



(U) Earlier, we described how the Viet Minh had developed their own COMINT organization to support the military effort against the French and that it was successful in supplying intelligence on French tactical operations and, to a lesser but not insignificant degree, the French High Command's strategy.





[Redacted]

(TS//SI)
[Redacted]

activities came from two sources. The first was from the intercept of Viet Cong military, NLF, or PAVN communications. This effort collected only fragmentary information which was usually just scattered references to ARVN or U.S. military communications being monitored. Generally, it was difficult to isolate communist SIGINT-related communications. This was so for two reasons. First, their messages were included in the general intelligence traffic passed by communist military intelligence sections attached to combat unit headquarters staffs. Second, the communist tactical COMINT units, known as Technical Research Units (TRU), as a standard procedure, were located physically close to their host unit headquarters so that the intelligence they provided was often hand carried or transmitted by landline.⁹³

What little the U.S. knew came from two sources. The first was from intercept of DRV military communications, which contained targeting, tracking, and warning information that American cryptologists inferred was obtained most likely by monitoring U.S. communications.⁹² The second source was interrogations of captured PAVN and Viet Cong COMINT personnel.

(TS//SI) Like information about Hanoi's COMINT effort, the overwhelming majority of intelligence about southern communist COMINT came from POW interrogation, captured documents, and the rare capture of an intact enemy COMINT unit, as was the case with Project Touchdown in 1969. What Touchdown revealed was a shock to American COMSEC specialists, both in terms of what American communicators were saying and what the capabilities were of the average communist TRU.⁹⁴

(TS//SI) In the south, most of what could be learned about communist signals intelligence

(TS//SI) American thirst for knowledge of communist signals intelligence was driven largely by the needs of the U.S. COMSEC program in Vietnam. Almost from the beginning of the ASA arrival, there had been an informal COMSEC monitoring and support mission. By October 1961, a dedicated ASA COMSEC unit had arrived at Tan Son Nhut and assumed responsibility for both the chief, USMAAG and the Republic of Vietnam Armed Forces (RVNAF).⁹⁵ Soon, all three military cryptologic services had COMSEC elements in country, monitoring their own and selected Allied communications. Their programs revealed that



(U) North Vietnamese intercept operator at work
(Captured Photograph)

TIME OF INTERCEPT	U.S. COMMUNICATORS (callsign & suffix)		MESSAGE	DATE	VOICE NET
D66	Fire 90		At 559368 found bunker and tunnel will check in the area tomorrow morning+	D2/28 2	
				22-11-1969	3/1
0935	Train 11	Stroy 11	Request urgent dustoff for 3 U.S. wounded (2 U.S. 1 litter) by bit booby trap at coord. 778344 contact on the ground D81 + We have 6 RP out at this time + Lead cv is at cpt 78, tail cv is at cpt x +		
1040	Paicher 11 Action 11 Stroy 11	" " Stroy 66	Reference from Flame at coord. 6937 he spotted base camp and movement, he wants Night Hawk took up 1 Lima size from Train element search area +		
				13-12-1969	D2/28 2
0905	Sluch 14	Fire 90	Come up on your post, give me location for put A/S at 1030 hour+		
	Fire 82	Sluch 14	+Roger wait+		
0910	Sluch 14	Fire 90	Location put A/S at 573408+		
	Fire D66S	"	You have friendly near at that location A/S+		
			+We have F at 2 to 5 clicks to the W area+ My 54 element AP 1 broken for coordination Stroy A element sweep+		
0930	Fire 90	Stroy A80	Road sweep team sp return your location yet?+		
			+Affirmative, road sweep to EC return D54 location+		
0935	Race 6	Fire 90	Request dustoff for 1 VN female at my location+		
0950	Fire D66	90	At coord 557367 we found 1 tunnel 130M bunker+		
1005	90	C66S	My A element sp my location at this time+		
	90	C66S	Your 54 element will working into SB, also your CP, 46 and 62 element return my location+		
			+Roger, Wilco+		

↔ Typscript of handwritten VC intercept of U.S. plaintext communications

insecurities of all types were rampant in American (and ARVN) communications. Surely, they must have asked themselves, could the communists benefit from those compromises? The answer was yes; and, in many cases, the communists were able successfully to exploit what they had through an active imitative communications deception program.⁹⁶

(TS//SI) However, despite all of the monitoring, education and training, and advisory efforts, the COMSEC situation for both the U.S. military and particularly the forces of South Vietnam, remained frustrating to security personnel in

Vietnam. Even as late as mid-1964, NSA reported to the JCS that, after three years of effort, the RVNAF still committed security breaches, like broadcasting tactical plans in such an insecure fashion that the Viet Cong must have been exploiting them. At that time, American knowledge of the communist ability to exploit Allied communications remained spotty; as a corollary, the case for communist exploitation remained unconvincing to military commanders. The best DIRNSA could say was that "it is assumed that the Viet Cong were privy to this information and in time to take counter measures."⁹⁷ At this point, the only evidence that NSA could point to consisted of SIGINT product [redacted] 1963, and a translated 1961 Viet Cong radio log referring to the intercept of ARVN communications.⁹⁸

(S//SI) American knowledge of VC and PAVN COMINT grew substantially with the buildup of American and North Vietnamese combat forces in South Vietnam after 1965. Proximity in the battlefield led to a much deeper awareness of the

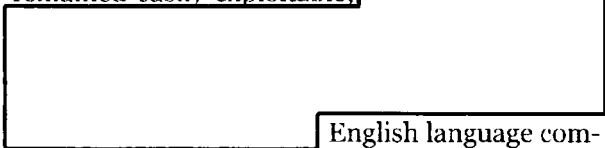
Vietnamese capabilities. As the Allied SIGINT coverage expanded, more and more intelligence was accumulated about the communist communications intelligence effort and organization. At the same time, the ASA HUMINT exploitation and reporting of captured communist COMINT personnel, documents, and equipment revealed a mountain of information. By the late 1960s, it was possible to piece together the structure and operations of the communist COMINT endeavor in the south.

(TS//SI) In the early 1960s, the Viet Cong had organized small strategic intelligence cells which

intercepted South Vietnamese military communications. In 1963, COSVN began to assert control over these units. First, the cells were organized into the 47th Technical Reconnaissance Battalion which worked under the auspices of the Military Intelligence Section of COSVN's military staff.⁹⁹



At this point, ARVN communications remained easily exploitable,

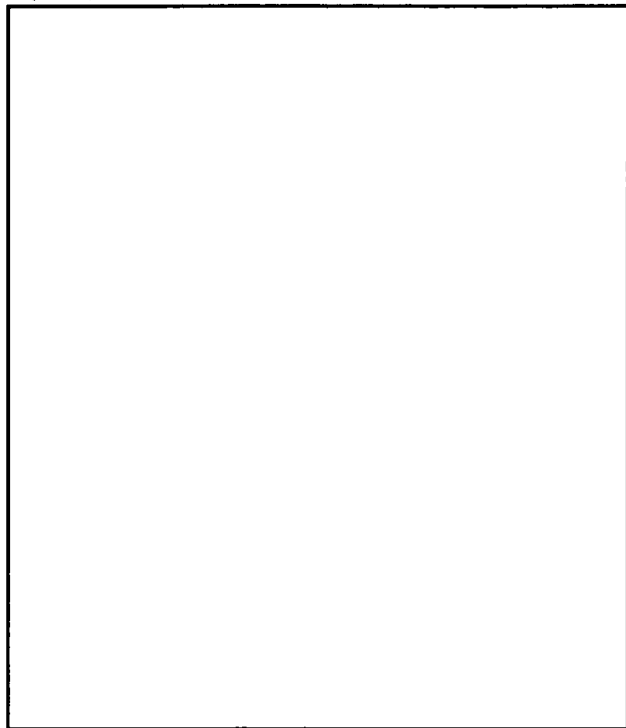


English language communications seem to have remained mostly untouched by the VC since they lacked intercept operators with a sufficient grasp of the language.¹⁰¹ This shortage would disappear by 1965, driven by the increasing American involvement in Indochina, especially after the start of the Rolling Thunder air campaign in the spring.

~~(S//SI)~~ By 1965, the southern communist command, realizing the importance of its communications intelligence effort, and anxious to retain its lucrative intelligence sources, convened a special conference of its COMINT and other intelligence personnel. At this meeting, it was decided to reform the technical reconnaissance effort into a joint strategic and tactical organization which would reach down into the provincial and regimental levels in both the political and military structures. Tactical combat units would continue to be supported by special units, while the COSVN and military region headquarters would retain their own units for higher-level analysis and training.¹⁰² In 1966, the communists had completed the reorganization of their COMINT effort in the south. The Central Research Directorate (CRD), Hanoi's headquarters for military intelligence, took operational and administrative control of all COMINT activity in the DRV, as well as the northern province of South Vietnam (MR 5), and the Central

Highlands (B3 Front). COSVN, located just across the border in Cambodia, took command of all the other elements in the remaining regions to the south.

~~(S)~~ Both the CRD and COSVN seem to have exercised nearly complete control of their separate commands, which included operations, staffing, recruiting, training, and technical capabilities. Both maintained central facilities where-in resided what could be termed as "high-level" cryptanalytic, traffic analytic, and language capabilities, as well as intercept operations. Training in all of the cryptologic skills were done in schools located at both sites. Intercept operator training lasted anywhere from six months for morse code to a year for English language personnel who had an extra six-month period of on-the-job-training (OJT).



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(S) The TRU's main objective was twofold: give their host unit intelligence that provided a tactical advantage during combat operations and the means of avoiding combat in disadvantageous situations.¹⁰⁴ TRUs concentrated on communications targets which offered both the path of least



(U) TRU personnel preparing to pass along information

resistance to analytic exploitation and the quickest payoff for immediately useful tactical intelligence. This meant that the communist monitors principally targeted all ARVN radio traffic and insecure American voice communications such as those of U.S. Army tactical combat units and USAF forward air controllers. (Also, the Vietnamese developed the ability to intercept Korean, Thai, and French language voice communications.) Yet, even limited to these types of communications, the TRU technical capability was impressive. Consider this CINCPAC appreciation of the communist capability from 1969:

Their [the TRU] competence in covering assigned targets is reflected by the heavy monthly figures on messages that platoons and companies report as intercepted and exploited. The first and largest company of the former TR Battalion had a strength of 130 and reported processing 7,745 messages during the month of September 1966. The third platoon (strength 69) of an unknown but entirely different company operating in Tay Ninh province reported an average of 500 messages *per day* (my italics), and a high of 920 messages in a single day

in the latter part of 1968. A captured target list of another unit operating near Danang in December 1968 showed it to be working against 31 voice nets of the U.S. 1st Marine Division.¹⁰⁵

(S) The TRUs had a further operational option that American SIGINT lacked: a command clearance to conduct active countermeasures against Allied communications. This included the use of imitative communications deception to enter into Allied radio nets and issue false orders or disrupt their communications through jamming or other forms of interference. Not that they always used these tactics; the communists also recognized that an exploitable link could be worth more as a

source of intelligence than its denial to the enemy through jamming.¹⁰⁶ Yet, they had the clearance from higher command to deceive and interfere with Allied radio communications, and they did it. From 1964 to 1967, the 509th ASA Group COMSEC specialists listed over seventy attempts by VC and PAVN personnel to use deception against U.S. Army units. At least 30 percent were partially successful, and eight of these further resulted in "friendly fire incidents" in which the communists were able, by communicating on Allied radio nets, to call in Allied artillery or air strikes on American units.¹⁰⁷

(C) The size of the communist effort continued to grow at a remarkable rate throughout the years of the American involvement. In 1964, after the 47th TR Battalion was formed, there were an estimated 179 personnel doing COMINT in South Vietnam. In 1965, it was estimated that COSVN controlled TRUs with a total of 838 people.¹⁰⁸ In 1967, there were as many as 1,500 personnel working COMINT for the communists.¹⁰⁹ By 1969, the total strength of the communications intelligence personnel under COSVN's control, as well as those in the direct support TRUs, totalled

almost 4,000 troops, while some estimates reached 5,000 personnel!¹¹⁰

~~(C)~~ Can this number be believed? It is about four times greater than the strength of the South Vietnamese SSTB from the same time. In truth, this Allied assessment of personnel was, at best, an estimate, arrived at by presuming the existence of TRUs at all levels of the VC structure, and then assigning them strengths extrapolated from those of known TRUs.¹¹¹ Yet, even if the estimates are exaggerated by a factor of two, the remaining strength is still an impressive number, and it was twice the number of personnel in the South Vietnamese SSTB at the time.

~~(S//SI)~~ A firm conclusion as to whether the VC and PAVN COMINT effort in South Vietnam was effective in its mission, and in what ways, is beyond the scope of this history. However, there is some anecdotal and statistical information which suggests tentatively that, at least in two aspects of their operations, the communist communications intelligence effort in the south did meet the objective of protecting its forces from Allied military units.

~~(TS//SI)~~ The first is in regards to the communist warning system for B-52 strikes, known as Arc Light. We have already looked at the problems with the Arc Light missions earlier when discussing the difficulties in targeting the COSVN complex during the 1970 incursion into Cambodia. A historical study of the Allied OPSEC program in Vietnam, known as Purple Dragon, concluded an evaluation of the communist system for warning its troops of the B-52 strikes with this statement:

It is likely that the VC/NVA [North Vietnamese Army] were able to obtain at least tactical warning of most, if not all, B-52 strikes in South Vietnam, and were thus able to avoid the worst effect of the bombing. It is indeed likely that the most massive bombing campaign in history to that time seldom if ever achieved

the element of surprise, and did little significant damage to the enemy's war-making capability.¹¹²

(U) This largely negative evaluation of Arc Light bombing mission effectiveness is mirrored in the studies done by the Defense Intelligence Agency, the Pentagon, and the Air Force from 1966 through 1968.¹¹³

~~(S//SI)~~ The second aspect to consider is the suggestion that communist tactical units were seldom surprised by Allied tactical ground operations. Again, there is much anecdotal information in the form of captured documents, prisoner interrogations, and rallier debriefs, which leave the distinct impression that the communists usually knew where and what the Allied units were doing. At least one communist POW claimed that his unit had never been surprised by an Allied attack in ten years.¹¹⁴ One of the difficulties in assessing this type of testimony is the question whether this information is a truly representative of what actually occurred, or is it the exception? How many debriefs constitute an acceptable basis for the conclusion that communist units were seldom surprised by Allied units?

(U) The answer to this question may exist, and it comes from the U.S. Army's own studies of ground combat activity in Vietnam. In 1966, the Defense Department's Office of Systems Analysis did a statistical study which evaluated ground combat activity in Vietnam. It looked at various types of engagements and listed the percentages of each one in which the communists initiated combat and those in which U.S. troops had the tactical initiative. The results were amazing: in over *three-quarters* of the situations, combat was initiated by the communists as opposed to a mere 14.3 percent for American troops (another 7 percent was considered chance encounters for both sides).¹¹⁵ Another study, the National Security Memorandum 1, completed in 1968, indicated that this trend continued at the same rate, stating that *three-quarters* of all engagements were "at

the enemy's choice of time, place, type, and duration." ¹¹⁶ CIA noted that of nearly two million Allied small unit operations carried out from 1970 through 1971, less than one percent resulted in contact with the enemy. ¹¹⁷

(C) The explanation for this inability to close and surprise communist units seems to be this: that the communist intelligence organization in the south, which was heavily supported by a large COMINT effort, had given its troops the wherewithal to select the time and place of combat with the Allied forces; or, failing this, communist intelligence gave its units the ability to avoid combat under unfavorable conditions. This latter trend had not gone unnoticed by American intelligence specialists. In 1971, USASAPAC had reported that the focus of VC and PAVN COMINT had shifted from gaining tactical advantage (and thereby gaining victories) to tactical avoidance. ¹¹⁸

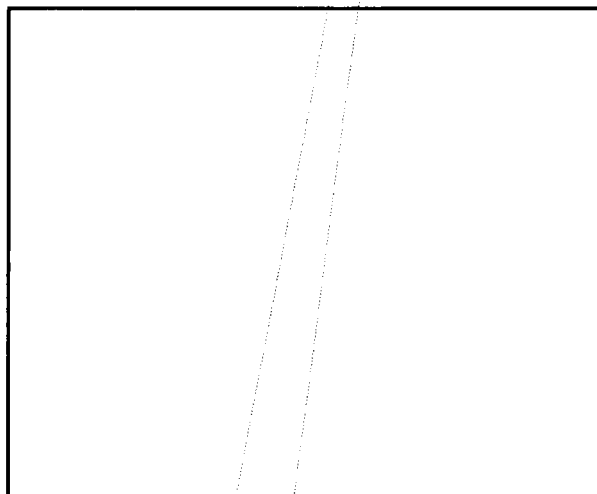
(U) During the war, American COMSEC specialists briefed commanders there that the communist COMINT effort was a nearly pervasive one, as well as one attuned to timely actions if the situation arose. If any one anecdote about this communist communications intelligence presence could be labeled as illustrative, then it is this one from 1968:

During the formation of MACV FWD (Forward), Gen. Abrams [who was the deputy to Gen. Westmoreland the commander of U.S. forces in Vietnam] made a helicopter flight from Saigon to Hue-Phu Bai. The details of the flight, including time, altitude, route, and passengers, were transmitted in the clear on an RTP [radio-telephone] link. Our COMSEC monitors picked it up and reported it immediately. As a result, the flight plan was changed. However, an accompanying craft was not notified of the change, and it was shot at the whole way from Saigon to Phu Bai – an unusual effort by the VC, who did not usually shoot at helicopters on such flights. ¹¹⁹

(S//SI) Our Man in Saigon:
[redacted] and South Vietnamese
SIGINT, 1963-1969

(S//SI)

(U) At this point in the narrative, it would be useful to discuss the career of South Vietnamese [redacted] the commander of J7, who, for better or worse, was the major influence on the operations, administration, and direction of ARVN SIGINT from 1963 until the end of the war.



(S//SI) [redacted] was viewed by his American opposites as a good organizer who was knowledgeable and experienced in intelligence and COMINT operations, as well as dedicated to getting a good performance from the personnel in J7. Perhaps his greatest virtue, especially to the Americans who daily saw the extraordinary level of corruption in Vietnamese institutions, was his absolute personal incorruptibility, though his own virtue seldom was imitated by others in J7. As the Vietnamese COMINT organization grew, it was subject to the same widespread petty corruptions that infested the workings of the South Vietnamese military. ¹²⁰

(S//SI) [redacted] was involved deeply in managing the affairs of J7, constantly striving to improve its posture, especially through more training. He also centralized much of the deci-



(U) [redacted] receiving the Legion of Merit from U.S. General Frederick Weyand, last commander of U.S. troops in Vietnam, 1971

sion-making of the J7 in his hands. This gave him a better grasp on J7's far flung operations, but it also had the defect of causing subordinates to defer to him decisions that they normally would make. [redacted] was also known to be a shrewd negotiator and flexible in his approach, which enhanced his ability to get what he wanted from Washington or Saigon. He also adopted many American mannerisms, giving the impression he was something of a dynamic business executive.

—(TS//SI) One policy that [redacted] championed which especially endeared him to the Americans was his insistence on rigorous security. Since the mid-1960's, the CIA had been involved directly in the J7/SSTB security program. It administered polygraphs to supplement the Vietnamese National Police background checks.¹²¹ By the late 1960s, [redacted] was running a secure program as far NSA was concerned.¹²²

(S//SI) From the beginning of his tenure in 1963, [redacted] main effort was to fix the haphazard organization of J7. The 1st Communications Technical Research Company was reorganized under the covername of "Unit 15," with an enlarged table of organization and equipment

(TO&E). Operational control of the unit exclusively belonged to J7; equipment supply and maintenance were still the responsibility of the General Staff's Telecommunications Command. The COMSEC unit, the 1st Communications Control Company, was returned to J7 and renamed "Unit 16." Unit 16 provided COMSEC support to both the Vietnamese Armed Forces and other governmental security organs like the National Police. It did this through a program that included the monitoring of governmental communications and the administering of a COMSEC awareness program. Unit 16 also managed the growing inventory of cryptomaterial provided by the Americans. With the development of the low-level VHF intercept teams, and the addition of a small squadron of U-6A ARDF aircraft, there was, by 1967 at least, a sense of controlled expansion, even if, as we have seen, technical ability and competence were uneven.

(S//SI) [redacted] was an ambitious person and liked to think big, perhaps too big for what J7 realistically could perform. This tendency for overreaching plans was also a weakness, often diluting efforts at expansion. For example, in 1967 he developed a plan to establish a national-level SIGINT organization similar to NSA. He envisioned a national SIGINT capability that could provide the ARVN military with American DSU-like tactical support units, as well as a strategic signals intelligence effort against North Vietnam and other targets in Southeast Asia. This national organization would also be responsible for all COMSEC concerns, including the indigenous development, production, and fielding of cryptomaterial and crypto-equipment.

(S//SI) [redacted] first approached the Americans with this idea in the fall of 1967 while he was in the United States on a tour of both Vint Hill Farms Field Station (VHFS), Virginia, and Fort Devens, Massachusetts, the training center for the ASA. (Ironically, DIRNSA was reluctant to approve [redacted] visit to Vint Hill Farms, but relented after [redacted] Headquarters and the NSA

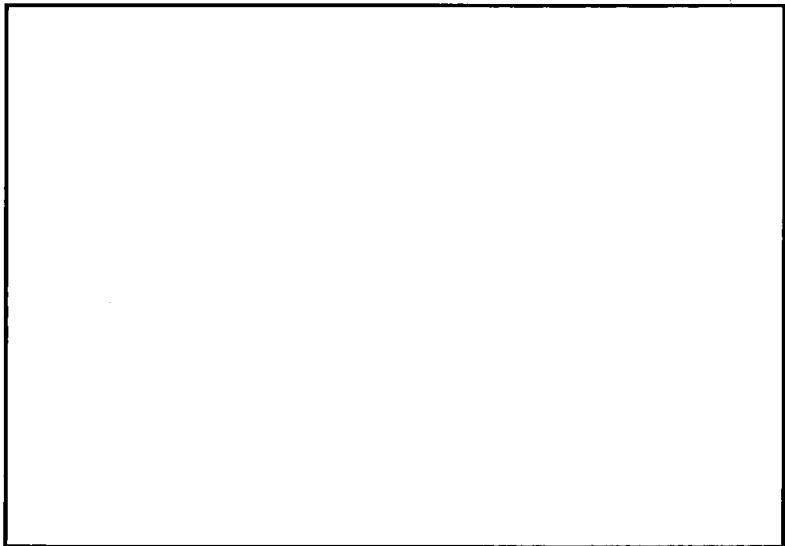
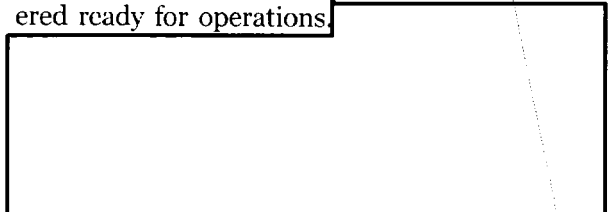
Representative in Saigon assured him that a "sanitized" tour could be accomplished, as long as [redacted] was not aware of the restrictions to what he could see.)¹²³ The Americans told [redacted] that for a variety of reasons - among others, J7's limited resources, capabilities, and budget problems - the plan was unrealistic. NSA suggested that if he was insistent on doing this that he should try to implement the plan in a series of phases beginning with the tactical units and ending with a transition to a national cryptologic organization.¹²⁴ Of course, what [redacted] was not informed of was that the United States, for some time, had considered the idea of such an organization as "inimical" to its cryptologic interests, that the development of a Vietnamese national cryptologic capability would seriously affect U.S. SIGINT and COMSEC positions in Vietnam.¹²⁵

~~(TS//SI)~~ [redacted] did go ahead with one part of his plan, which was to provide direct division-level COMINT support to the ARVN. These support units would be known as ARVN Special Technical Detachments, or ASTDs. Each ARVN division was to have one of these support companies. Actually, the formation of these units was not a new idea. Back in 1961, one part of the USASA OPLAN 8-61 called for the formation of a COMINT support company made up of five support platoons which were to have the capability of search, intercept, translation, D/F, and reporting of plaintext, tactical communist communications. These units were to be self-sufficient and able to accompany their ARVN host units anywhere.¹²⁶

~~(TS//SI)~~ The ASTDs were modeled after the highly successful ASA direct support units which were attached to each U.S. Army division and brigade in Vietnam, such as the 1st Infantry Division's 337th Radio Research Company. The

Vietnamese ASTDs had the dual mission of providing direct SIGINT support to its host division, as well as supporting J7's efforts in Saigon. In November 1968, [redacted] received approval from the Vietnamese General Staff to begin forming the ASTDs. His plan called for setting up ten of these detachments, each manned by four officers and fifty-six enlisted personnel. In turn, these ASTDs were further broken down into low-level intercept teams of four enlisted personnel and NCOs. Each ASTD would support their host division's COMINT needs through intercept, D/F, processing, and reporting of intelligence derived from communist communications.

~~(TS//SI)~~ Like everything else with Vietnamese communications intelligence, too few experienced and trained personnel, as well as a lack of equipment, hampered the ASTD start-up. The first detachment, assigned the ARVN's best combat division, the 1st, did not arrive until July of 1969. Even at that, the ASTD was not considered ready for operations. [redacted] OGA



(U) Some of the personnel of the 1st ARVN Special Technical Detachment intercept team

[Redacted]

[Redacted]

sions and one Marine regiment. The next year, another 100,000 troops were slated to head home. By early 1972, about 95,000 American servicemen remained in Vietnam, of whom around 6,000 were combat troops.

OGA

~~(TS//SI)~~ The American SIGINT presence underwent a similar dramatic drop-off. The earlier 1970 Vietnamization plan submitted by NSA had based its projections for a putative competent ARVN SIGINT capability largely on a controlled reduction of the American cryptologic presence from about 8,500 billets in 1970 to 6,654 in 1973 (or 6,000 depending upon what plan would be followed).¹³⁰ Defense Department critics of the plan pointed out how NSA was way behind what was actually happening in Vietnam.¹³¹ For example, the Army and Air Force cryptologic agencies had accelerated the pullout of their units. Yet, even revised figures for the drawdown were unrealistic in view of the political forces driving the overall American withdrawal. A draft 1971 NSA program still called for over 2,000 U.S. military and civilian cryptologists to remain in Vietnam for the fiscal years from 1974 to 1977!¹³² The truth was that the Americans were leaving Vietnam as fast as they could in order to meet the provisions of the approaching peace settlement. The rapid phaseout of American cryptologists made a shambles of the original VIMP's timetables, and subverted any chance to be effective.

~~(S//SI)~~ By 1969, the Americans were planning their withdrawal from Vietnam; Vietnamization, as mentioned earlier, was no longer a luxury, but a requirement. The Vietnamese communications intelligence organization, starved for personnel, training, equipment, and integration with the U.S. SIGINT System for the past eight years, would soon find itself awash in everything it had ever wanted. But was it in time? And was it enough? Or was it even what the Vietnamese needed? And could the Vietnamese get ready in time to go it alone? For by 1969, along with the combat troop withdrawal from Vietnam, the American cryptologic structure had begun its own drawdown.

~~(S//SI)~~ **The Great Cryptologic "Bugout," 1970-1973**

(U) President Nixon did not allow for the results of Vietnamization to determine the rate of the American withdrawal; whether Saigon's armed forces were ready or not to deal unilaterally with Hanoi's military formations mattered little to Washington. Driven by internal political considerations, which pressed for a reasonable, but also a quick as possible, disengagement, Nixon accelerated the American departure. In 1969 about 50,000 G.I.s had gone home. In early 1970, he announced a further decrease of 150,000 troops which included four army divi-

~~(S//SI)~~ There had been an ongoing reduction in the American SIGINT presence in South Vietnam for sometime before Nixon's announced withdrawals had started. Mostly, this involved the redeployment of some military cryptologic elements from Vietnam to bases elsewhere in the region. The Air Force, for example, had started to reduce its presence at Danang in 1967 and subsequently by late 1970 had moved most of its assets to bases in Udorn [Redacted] Thailand. These moves provided better support to the 7th Air Force which, by this time, staged most of its missions from several air bases located throughout that country. The navy's monitor-

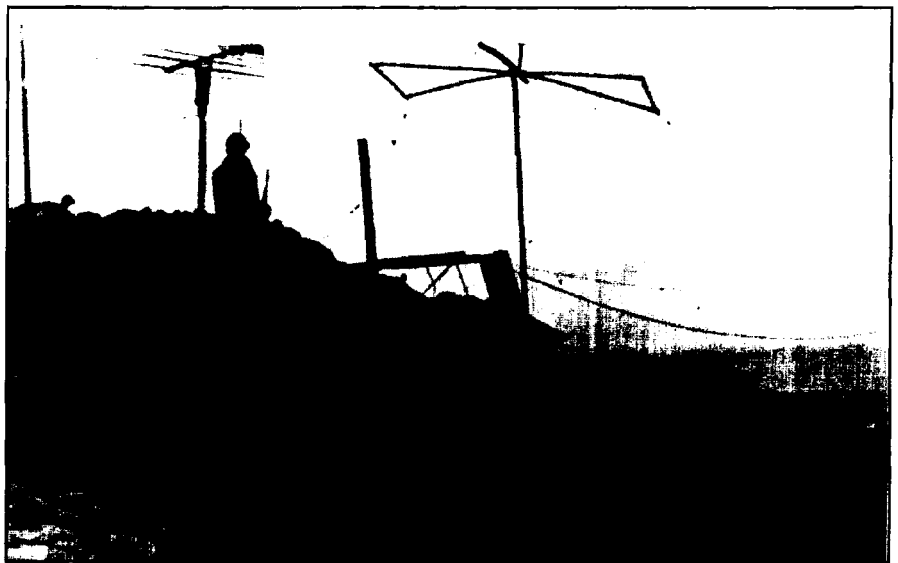
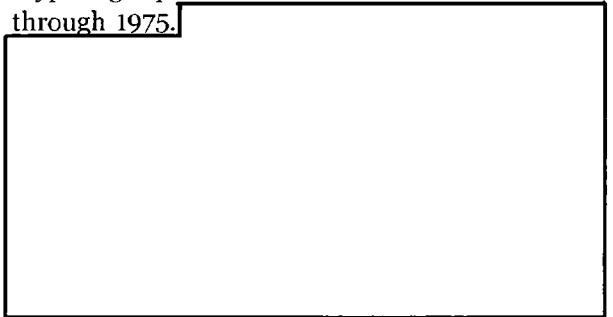
ing site at Danang had moved back to the intercept facility in the Philippines at San Miguel. The residual presence of the Air Force and Navy missions was composed of the Security Service's ACRP missions which staged out of Tan Son Nhut, Danang, and Bien Hoa. The Naval Security Group maintained Fleet Support Detachments at Danang and Cam Ranh Bay, while the Marines' First Radio Battalion remained at Danang.

(U) This meant that by 1970, the ASA made up an even larger percentage (about two-thirds) of the cryptologic presence within South Vietnam. Its strength was split between the two major intercept sites – Phu Bai and Bien Hoa – and a host of tactical units supporting the army's remaining divisions, totalling about 4,500 to 5,000 personnel.¹³³ As the combat units departed, the remaining field sites seemed isolated and vulnerable. In the savage fighting which occurred during the North Vietnamese Tet offensive in the spring of 1972, some of the remaining U.S. combat troops were pressed into the defense of the ASA field site at Phu Bai. With four PAVN divisions roaming the northern region of South Vietnam, it seemed that the historic fears concerning Phu Bai's precarious position were almost realized. Yet, the site was never actually threatened by the communists.

(U) However, the increased rate of American combat unit withdrawal created a situation in which the ASA support elements were pulled out when their host unit went home. NSA had no control over their redeployment stateside. At the same time, the field sites at Phu Bai and Bien Hoa had begun

their closeouts, especially after it became apparent that the Paris Peace Agreement dictated a near zero limit for American troops. In reality, even before the provisions of the accords kicked in by March 1973, the American cryptologic effort within South Vietnam, from an operational standpoint, was essentially finished. For example, personnel from the 8th RRFs at Phu Bai had relocated to Danang by November 1972.¹³⁴ Phu Bai's cryptologic mission had been farmed out to other sites: the intercept of the North Vietnamese internal military communications went to the field sites in Thailand and the Philippines, the communications of the NLF, VC, and PAVN units in South Vietnam were turned over to the SSTB.

~~(TS//SI)~~ The chart on the next page shows the cryptologic phaseout from Vietnam from 1969 through 1975.



(U) Sentry atop a bunker complex at the Phu Bai station in 1972

~~(S//SI)~~ Cryptologic Element Departure Chart, 1969-1975

<u>SIGAD/Location</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>
	X	X	X	-	-	-	-
	X	X	X	X	X	X	X
USA-32 Danang	X	X	-	-	-	-	-
USN-414 Danang	X	X	X	X	-	-	-
USA-522J Cam Ranh Bay	X	X	-	-	-	-	-
USA-561 Tan Son Nhut	X	X	X	X	-	-	-
USA-562 Phu Cat	X	X	X	X	-	-	-
USA-563 Danang	X	X	X	X	-	-	-
USM-604 Nha Trang	X	X	X	-	-	-	-
USM-605 Camp Eagle	X	X	X	-	-	-	-
USM-607 Can Tho	X	X	X	-	-	-	-
USM-613 Nha Tranh	X	X	-	-	-	-	-
USM-616 Xuan Loc	X	X	-	-	-	-	-
USM-624 Long Thanh	X	X	X	X	X	-	-
USM-626 Bien Hoa	X	X	X	-	-	-	-
USM-628 Bien Hoa	X	X	-	-	-	-	-
USM-631 Phouc Vinh	X	X	-	-	-	-	-
USM-633 Cu Chi	X	X	-	-	-	-	-
USM-634 Pleiku	X	X	-	-	-	-	-
USM-636 Di An	X	X	-	-	-	-	-
USM-638 Cam Ranh Bay	X	X	-	-	-	-	-
USM-645 Quang Tri	X	X	-	-	-	-	-
USM-649 Chu Lai	X	X	-	-	-	-	-
USM-653 Nha Trang	X	X	-	-	-	-	-
USM-704 Saigon	X	X	X	X	X	-	-
USM-794 Saigon	X	X	X	X	X	X	X
USM-808 Phu Bai	X	X	X	X	X	-	-
USN-842 Phu Bai	X	X	X	-	-	-	-
USN-843 Danang	X	X	X	X	-	-	-

~~(TS//SI)~~ The chart does not include the numerous miscellaneous and temporary detachments, or D/F stations belonging to major units or sites unless that detachment or site was the only one stationed in South Vietnam. Many of the "dets" were short-lived, often formed to support ongoing MACV operations or forward deployments of combat operational or maneuver units.

These detachments usually were designated by a letter suffix attached to the higher echelon SIGINT address, such as "USM-633J," which was a detachment of the 372d Radio Research Company, USM-633, supporting the United States Army's 25th Infantry Division. The departure dates reflect that of official cessation of activities, not their de facto curtailment. For example,

the ASA site at Phu Bai was effectively closed down in November of 1972, but officially departed in February of 1973.

~~(TS//SI)~~ As can be easily seen, after the Paris Peace Agreement was signed in January 1973, there was little in the way of an Allied cryptologic presence in South Vietnam. Except for the South Vietnamese organization, the only other SIGINT missions belonged to [redacted]

[redacted] the enlarged training and technical advisory staff under the NSA Pacific Representative, Vietnam, which was beefed up to around 160 personnel. Both organizations would remain in South Vietnam until the very end: [redacted]

[redacted] while the last American cryptologists, two civilian NSA communicators and the chief of the liaison mission, would be evacuated barely a day before Saigon was captured.



(U) 509th ASA Group receiving battle pennants at a ceremony in 1971

~~(S//SI)~~ Last Chance To Make Good: South Vietnamese SIGINT and the VIMP, 1970-1973

~~(TS//SI)~~ In the midst of the withdrawal, U.S. cryptologic priorities in the region concurrently and completely changed, especially in terms of the priority of the SIGINT target set [redacted]

[redacted]

This followed the new aims of U.S. strategic thinking that were driven by the Nixon-Kissinger plan for detente with the major communist powers of the Soviet Union and the People's Republic of China. Seen against the larger game of strategic relations, the conflict in Vietnam was construed as a continuing impediment to better relations between Washington and the two communist regimes in Beijing and Moscow. Washington now considered Vietnam as part of the Western Pacific region and was determined to avoid any more similar conflicts of attrition.¹³⁶

~~(TS//SI)~~ South Vietnam, along with the other countries of the region, was placed in Category II. Saigon's situation was submerged in the general concern for stability in all of Southeast Asia. The continuing insurgency problems in Laos and Cambodia [redacted]

[redacted] as well as the ongoing war in South Vietnam, still were considered a threat to U.S. interests. However, American cryptologists viewed the reporting of this problem less significant for U.S. policy after fiscal year 1974.¹³⁷

~~(TS//SI)~~ Due to the protocols of the peace accords, the cryptologic support that the United States could offer Saigon was to remain very limited. [redacted]

[redacted]

[redacted] The bulk of the U.S. effort in the representative's office was centered on supporting and evaluating the South Vietnamese SIGINT capability.¹³⁸

~~(TS//SI)~~ It was no secret that the American cryptologic community was not pleased with the plan since it had left only a technical and advisory staff in Saigon. In August 1971, a modification was proposed to have 400 to 500 U.S. SIGINT personnel in South Vietnam. These people would run [redacted] intercept operations in Saigon and Danang, operate jointly with the SSTB [redacted] and oversee Saigon's COMINT support communications system.¹³⁹

~~(TS//SI)~~ The main motive for this proposal was the fear that the loss of the American cryptologic effort within South Vietnam would mean that "virtually no SIGINT support would be provided to U.S. or RVNAF customers."¹⁴⁰ This motive, in reality, was an implicit criticism of the SSTB; that the Vietnamese organization, despite the bounty in equipment and personnel brought about by the VIMP, still lacked the capacity to fill the intelligence gap caused by a total American withdrawal; that the SSTB could provide only about 30 percent of the then current needs of the Saigon government, and, furthermore, that this meant an increased risk to American personnel remaining in-country.¹⁴¹

~~(TS//SI)~~ Against this limited strategic backdrop, the VIMP of 1970 has to be considered NSA's estimate of what assistance [redacted] would accept for his organization in order to make it a self-sustaining and reasonable substitute that could meet American intelligence needs. The plan established a three-year timetable to revamp the SSTB to the point where it could support the Vietnamese armed forces.¹⁴² Previous studies at NSA had indicat-

ed that, in order to meet this objective, the SSTB would require double the current manpower (1,600+); two new fixed field stations, one in the Central Highlands, at Pleiku, and the other in the Delta region, at Can Tho; enlargement of the two existing stations in Saigon and Danang; a central processing and management facility; an increased ARDF capability; and a secure, on-line communications network linking every unit and facility, including the ASTDs, with Saigon and NSA.

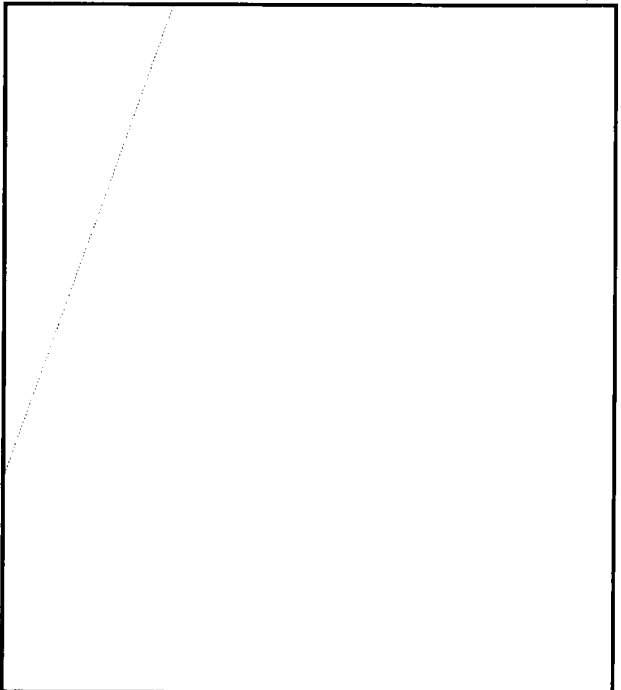
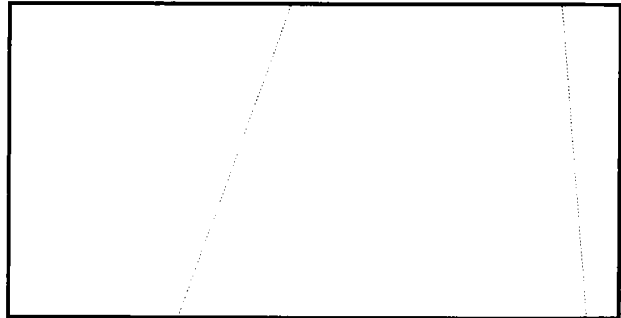
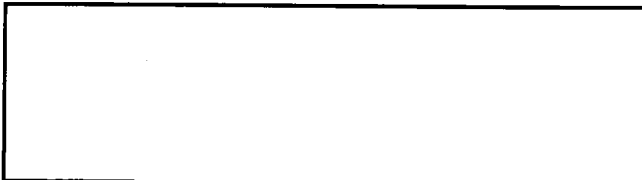
~~(S//SI)~~ Progress towards this goal proved to be a difficult item to measure, and evaluation^{EO 1.4.(d)} the Vietnamese tended to be equivocal. By 1972, after two years of Vietnamization, the scorecard on the ARVN cryptologic effort suggested that a long effort still remained. Persistent problems in almost every aspect of operations, personnel, equipment, support, and training continued to plague the SSTB.

~~(S//SI)~~ Foremost was personnel recruitment, processing, and training. It was a situation that earned the closest scrutiny from the highest quarters in the U.S. command. In August of 1972, the JCS in Washington had considered that "one of the most unsatisfactory elements in our Vietnamization program has been the personnel situation of the RVNAF SIGINT organizations."

The Joint Chiefs wanted [redacted] to be made aware of its concern and for him to bring the SSTB up to strength "with high quality personnel" while replacing "below standard personnel."¹⁴³

~~(S//SI)~~ The effect of these constant personnel shortages on SSTB operations was considerable. For example, by early 1972 the SSTB's four field sites were only at about 30 percent of their authorized strength.¹⁴⁴ The bottleneck was the quality of the recruits who lacked the technical aptitude for many of the cryptologic specialties. The practical outcome of this technical skills shortfall was the requirement for a much longer training lead time. So, even though the manpower levels for the SSTB were nearly met in early 1972 - short only by about 15 percent - the Vietnamese were not getting their personnel into productive positions.¹⁴⁵

~~(S//SI)~~ The Americans still questioned the quality of the Vietnamese SIGINT, even when it was up and running. Vietnamese cryptanalysts and traffic analysts seemed unable to merge their results into meaningful intelligence product.¹⁴⁶ Intercept steerage suffered due to an inability to perform collection management of intercept resources. How information was disseminated from the SSTB to Vietnam's armed forces remained unclear to American advisors. Local South Vietnamese military commanders received little information from their ASTDs. Usually, this was derived from low-level communist communications. Intelligence from the central SSTB centers did reach Vietnamese corps and division commanders. On the other hand, the Vietnamese Air Force and Navy did not appear to get any intelligence support from [redacted] organization. Nor, for that matter, did the SSTB even collect communist communications for the other services.¹⁴⁷



~~(S//SI)~~ What emerged after three years of Vietnamization? Certainly, there existed an organizational structure, replete with functional lines of relationships, subordination, communications, and control. The mish-mash of LLVI teams, ASTDs, field sites, COMSEC units, and the ARDF squadrons, was brought under a single control. By 1973, there were over 2,500 personnel in the SSTB. An air force of sorts had been organized with almost three dozen aircraft, including EC-47s and the ubiquitous U-6A, in its inventory. A complete and modern MRDF net was established. Secure communications, including HW-10 and HW-19 COMSEC interface equipment, the KL-7 teletype encryption device, and the KY-8 secure voice equipment (Nestor), now connected all units from LLVI teams up to Saigon headquar-

was too low to avoid modern AAA and SAMs, especially the new hand-held SA-7s (Grail). During initial training, American air crews flew the aircraft while Vietnamese "backseaters" manned the collection and ARDF positions. Rates for missions and ARDF fixes were steady and, in the latter case, actually increased in early 1972.¹⁴⁸ But as the Vietnamese air crews assumed complete responsibility for the aircraft, overall mission rates fell. Also, the necessary maintenance and spare parts support for the aircraft were almost nonexistent. Flights rates dropped off dramatically after early 1973.

~~(S//SI)~~ The communications networks among the field sites and Saigon, and the subsidiary links from the three Processing Centers to the ASTDs, were often down as crypto-equipment would fail and be out until the repairmen from Saigon arrived. The necessary relay of vital intercept never occurred on a regular basis. Often, cryptologic intercept and product would have to be physically couriered in order to reach an analytic center, which, after February 1973, meant only Saigon. This was especially true for the more remote ASTDs, which were quite literally at the ends of the earth in terms of communications hookup.¹⁴⁹

~~(S//SI)~~ In some quarters, especially American officials in Saigon, notably the NSA representative [redacted] the feeling was that, for the rest of fiscal year 1973, the SSTB should work to consolidate its position and "refine" already existing projects.¹⁵⁰ The Americans had determined that the SSTB had serious shortcomings in several areas, some of which were deemed critical. These included the inability of the Vietnamese to obtain qualified pilots for its growing fleet of EC-47 aircraft. The planned turnover of all twenty aircraft from the U.S. 7th Air Force would have to be slowed down if the pilots could not be ready. Also, the more mundane issues of adequate operations buildings

EO 1.4.(c)

and power requirements for the newly organized ASTDs were unresolved.¹⁵¹

~~(TS//SI)~~ Yet, when faced with the American concerns for fully digesting its newly acquired resources, [redacted] countered with his continuous desire for expansion. He was particularly concerned with the accelerated American drawdown and was anxious to erect a Vietnamese structure that could compensate for the disappearing U.S. mission. Accordingly, he asked for help in establishing a South Vietnamese collection capability against North Vietnamese internal communications of such entities as its air force, air defense forces, army, and navy from the site at Phu Bai. When told by the Americans that the personnel and equipment needs for this plan would exceed current authorizations, [redacted] explained that he knew this, but what Saigon needed was to mount the mission against the North. Similarly, he wanted to start a collection program against the North Vietnamese logistics network in the south, the GDRS, but, like the envisioned mission against DRV internal military communications, [redacted] really did not know what resources were needed.¹⁵²

~~(S//SI)~~ Nowhere to Go But Down: The Danang Processing Center, October 1972-February 1973

~~(C//SI)~~ These growing pains were widespread enough to affect every place that the SSTB was trying to get set up during this period. A good chronicle of them can be found in the startup of the Danang Processing Center (DPC), later known as the Danang Technical Center, from October 1972 through to the final American pull-out in February 1973.

~~(S//SI)~~ The Danang center, located in the military complex next to the harbor, began as a joint American-Vietnamese SIGINT operation in early October 1972. About 200 American personnel released from the recently closed 8th RRFS, Phu Bai, joined with 150 SSTB counterparts at the

~~TOP SECRET//COMINT//X1~~

center. In addition, ASA advisory personnel from the 1st CARR and DARR detachments were stationed at the site to work with the ASTDs and their subordinate low-level intercept teams. At the adjacent air base, the 138th ASA Aviation Co and Detachment "J" of the AFSS 6994th Security Squadron were to train the local Vietnamese Unit 17 crews in airborne intercept and direction finding operations.

~~(C//SI)~~ U.S.-only operations began on 11 October 1972. The Americans manned the manual morse intercept and reporting sections. Although some SSTB manual morse intercept operators were working in the collection bay, they seem to have been in training for the first few weeks before they assumed responsibility for their own positions. Plans for the expansion of the facility were drawn up by the Americans and then handed to the Center's Vietnamese commander, [redacted]. True joint operations in the various sections did not begin until 15 October.

~~(C//SI)~~ By the end of October, the DPC had established itself, at least to the degree that all sections were operating, although every phase of SIGINT activity still was dominated by the Americans. The communications center had links to the Saigon Processing Center, the 1st and 2nd ASTDs, the NSA liaison in Saigon, and NSA at Fort Meade. The manual morse intercept section was in the process of still training the Vietnamese, and the American advisors hoped to increase the number of SSTB personnel manning each mission position for all three shifts. The language and cryptanalytic shops had been issuing a number of translations and exploitable message reports (EMR). Two wideband intercept positions were up and running, though they would be closed later. The American traffic analysts worked up the next week's communist units call-signs and net diagrams and passed the information to the Vietnamese.

~~(C//SI)~~ From the beginning, the DPC was plagued with facilities problems. These ranged from the darkly humorous ones like overflowing latrines, to more operationally critical lack of proper voltage lines, air conditioning units for equipment bays, and so on. A review of the daily reports on the DPC building remodeling suggests to the reader that the Americans and Vietnamese were trying to build a new field site right on top of ongoing SIGINT operations.¹⁵³ In the midst of all this building, the clouds of dust, the bulldozers, and faulty plumbing, the Americans were racing to train the SSTB intercept operators, analysts, and communicators so they could operate on their own before the deadline for the American withdrawal.

~~(C//SI)~~ One of the biggest headaches for [redacted] was the overcentralized control exerted on the DPC by Saigon [redacted]. We had discussed earlier how [redacted] controlled virtually every aspect of SSTB operations. However, the downside to this singular approach to control was the concurrent inability (and unwillingness) of the subordinate SSTB commanders to exercise local initiative. The Danang Center relied on Saigon for everything from the supply of the critical one-time tapes for the online secure teleprinter links to the assignment of drivers for the buses that would bring the various shifts of Vietnamese personnel to work at the center. Whenever [redacted] needed supplies, he had to refer to Saigon for approval to receipt for equipment and even replenishment of "expendables," such as pencils and paper. Often, he refused to sign for them until he got the okay from [redacted] headquarters. Such a dependence left the DPC vulnerable to critical shortages, as happened on 26 January 1973, when the supply of one-time tapes was exhausted and the center had to cease communications with Saigon for an entire day. When Saigon was informed of the outage, their communications center advised Danang to reuse the expended tape. However, the American advisors intervened and informed Saigon that this would be a major security compromise. So Danang

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ceased secure communications for a day until new tape was flown up from headquarters.¹⁵⁴

~~(C//SI)~~ This centralization affected the decision process at Danang, adding delays to administrative and supply problems that should have been handled [redacted]. For example, on 30 November, a number of discone antennas arrived at the DPC which were placed on [redacted] property account. The discones were intended for the two ASTDs that Danang supported and the LLVI team stationed on Hill 327 just outside the complex. But [redacted] refused to release the antennas since he was not responsible for logistics support for the ASTDs; that came from their host unit. He consulted with Saigon. The answer to release the antennas arrived a week later.¹⁵⁵ This problem was followed by a dispute between [redacted] and the Americans over the scope of property inventories. The Americans wanted to do a full listing of all equipment in the complex, including items brought down from Phu Bai. [redacted] refused and said that the Americans could only inventory the Phu Bai material brought to Danang. This matter was kicked up to Saigon for mediation, which decided in [redacted] favor nearly three weeks later on 27 December.¹⁵⁶

~~(C//SI)~~ Throughout the last two months of 1972, the Danang Center slowly increased its productivity in morse intercept (it had no voice intercept capability, that came from the LLVI team on Hill 327), the number and types of reports issued (translations, exploitable message reports, spot reports, and TACREPs), while its ARDF support brought in fixes on communist transmitters in the area. One tactical combat success could be claimed by Danang. On 5 January 1972, it was learned from a POW that a 3rd ARVN Division preemptive artillery barrage of some 5,000 rounds on a suspected NVA regimental position had produced almost 200 casualties. The DPC had issued spot reports which had located the suspected unit in the area where the artillery strike had hit.¹⁵⁷

~~(C//SI)~~ Despite the American efforts at training, as their contingent shrunk, shortcomings in the operations of the DPC became apparent. In the manual morse intercept mission, there had been a large increase in Vietnamese copy, both in terms of total collection (as a percentage of maximum possible coverage) and percentage of assigned copy, beginning late December 1972. However, it was soon realized that the increase was due to the presence of American analysts in the intercept section who were working directly with the Vietnamese intercept operators, helping them identify transmitters, links, and nets. As these analysts withdrew, it was hoped that some Vietnamese could be trained to continue this support.¹⁵⁸

~~(C//SI)~~ On 22 January 1973, the ASA Left Jab ARDF flights performed by the 138th ASA Aviation Company ceased. Left to their own, the Vietnamese ARDF mission effectiveness declined, both in terms of absolute fixes and the number of fixes of known stations.¹⁵⁹

~~(C//SI)~~ On 31 January 1973, the last ASA Vietnamese linguist left the DPC and, as a consequence, the cryptanalytic/linguistic section at the DPC was closed. The center no longer could process low-level, communist tactical voice intercept, nor could it issue any reports based on the take. The intercept was transmitted directly to the Saigon Center. Also, the section's order-of-battle card index was shipped to Saigon for the latter's use.¹⁶⁰ Two weeks later, all intelligence reporting at the DPC ended, and that mission was transferred to the Saigon Processing Center. This included all reporting on communist communications from the northern part of the country, known as Military Region 1.¹⁶¹ This left the ARVN command in the region, I Corps, without any local SIGINT support except from their ASTDs. The Danang Center now was nothing more than a front-end collector and processor.

~~(S//SI)~~ After a year without the Americans, the situation at the Danang Processing Center

hardly improved. Support to the ASTDs was poor, while the LLVI teams suffered from a lack of technical support and reliable communications equipment. An effort to collect North Vietnamese air surveillance tracking from the DPC proved to be too difficult: Vietnamese analysts wound up plotting North Vietnamese tracking data that was two days old. Since the flight time from the DMZ to Danang was six minutes, this was "hardly acceptable" as noted by an American observer.¹⁶² The Vietnamese ARDF effort out of Danang never matured into a useful program. Maintenance and the lack of competent air crews were organic problems that reduced flights to a bare minimum; operationally, Saigon controlled the aircraft and it alone tasked them, while the ARVN command in the area could not.¹⁶³

* * * *

~~(S//SI)~~ Although the final chapter on the South Vietnamese SIGINT effort would not come until the collapse of Saigon, which will be discussed in the next chapter, there are some observations that can be made here. First of all, the question of the SSTB's effectiveness must be measured in terms of what [] desired and what the NSA had hoped to create through the VIMP. However, two preliminary points need to be made.

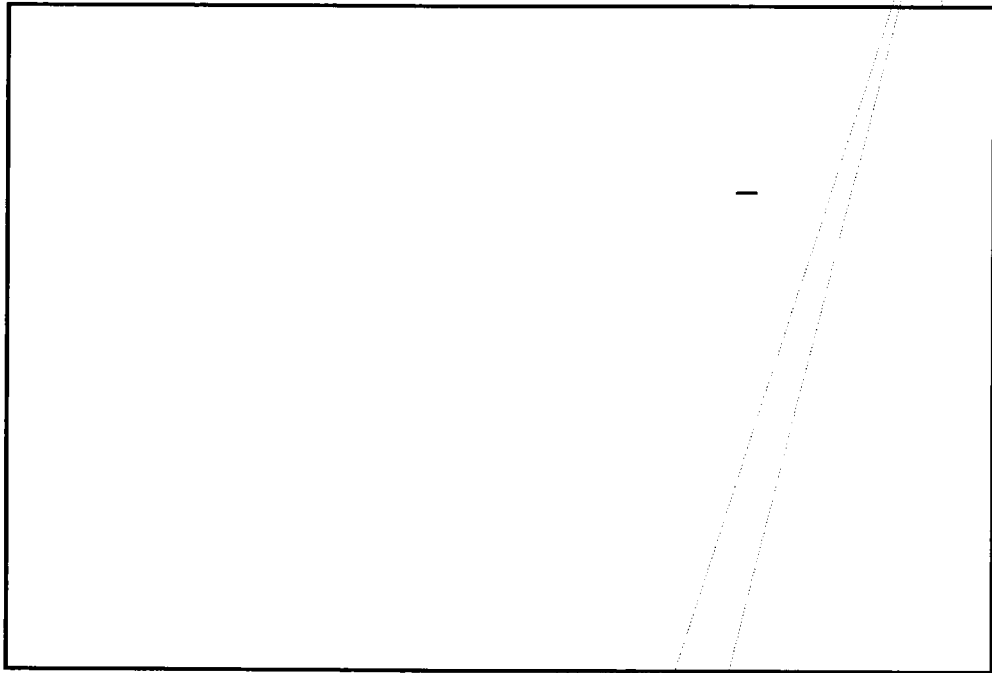
~~(S//SI)~~ First, the American policy of limiting exchange and training for the Vietnamese to, initially, Category II X, and later Category II SIGINT information and techniques, was standard policy []. The purpose behind these strictures was twofold: to direct support to the existing level of [] technical SIGINT proficiency, and to accommodate NSA's desire to protect its equities from both the standpoints of exploitation and security. In this context, the NSA policy towards Vietnamese SIGINT was the same [].

~~(S//SI)~~ Secondly, the SSTB and its predecessors were unlike any other [] crit-

ical aspect - they were involved in an ongoing military conflict.¹⁶⁴ While the SIGINT organizations in other countries had the luxury of peace - a tense peace; nonetheless, it was still peace - the South Vietnamese did not. From the origin of the insurgency, which began in earnest in 1959 with Hanoi's participation, until the end in 1975, South Vietnamese SIGINT had to apply itself to wartime support while trying to develop its own skills, organization, and obtain proper equipment. In this particular case, then, American SIGINT support, in all of these aspects, was critical.

~~(S//SI)~~ However, American SIGINT support has to be judged a failure. The failure did not occur during the period of Vietnamization after 1970; nor did it happen with the American effort to contain [] unrealistic ambitions. No, the American failure occurred during that crucial period from 1962, with their withdrawal from Sabertooth, up to the period of the VIMP in 1969-1970. It was this nearly eight-year gap in which Vietnamese communications intelligence was left essentially to develop on its own. It is no surprise that Saigon's home-grown efforts at ground-based D/F, ARDF, and the ASTD program all failed to get past the larval stage. Even Vietnamese-American efforts, such as the LLVI teams, the Dancer program, and the Whitebirch D/F network remained very limited in scope and objectives. As has been discussed earlier in this chapter, these limits were imposed by the Americans, who feared lax Vietnamese security and wanted to proscribe Vietnamese involvement in SIGINT operations outside of Saigon's immediate needs. In the end these joint efforts gained the Vietnamese little beyond the minimal exposure of the handful of participants.

~~(S//SI)~~ Not unlike the ARVN combat forces, which were reduced to an adjunct status during the main American combat phase from 1965 to 1969, Vietnamese SIGINT spent all of these years barely developing in both quantitative terms and technical capabilities. These years "in the wilderness" were a critical time for Saigon's cryptologic



equipment, and techniques that Saigon lacked.

~~(S//SI)~~ It is also possible that the structure that the Vietnamese SIGINT took - an imitation of the American system - may have been unsuitable for them. A system of large, technically sophisticated field sites with centrally managed collection,

effort. Without any real growth in organization, skills, equipment, or even an understanding of the SIGINT process, the Vietnamese were unprepared for the explosive growth brought about by Vietnamization. Yet, as has been noted, Americans, both in Saigon and at Fort Meade, seemed unconvinced that the Vietnamese could develop a proficient program.

processing, and reporting, and connected with an advanced, secure, and high-speed communications network might have worked well with a technically proficient and command-responsive workforce. However, for the Vietnamese, as the Danang Processing Center chronicle illustrated, this system was, at best, difficult to implement and equally hard to maintain. It may be that the Vietnamese, because of their low level of technical competence and a hierarchical social structure, were unsuited to an American-style SIGINT organization. What might have worked would have been a system that emphasized mobility and direct support and that made use of their organic language skills.

~~(S//SI)~~ The Vietnamese, as well, were not blameless; they were often unrealistic in what they thought they could do. [redacted] was a creature of Saigon politics who desired to see the SSTB grow rather than improve. Even up to the final American withdrawal in 1973, he was developing schemes to acquire more capabilities than his personnel reasonably and effectively could absorb. Possibly he was influenced by the benefits of the VIMP. As the SSTB fell into a cornucopia of equipment, money, and personnel, [redacted] may have interpreted this new affluence as success. However, like the Vietnamese military, which under Vietnamization had grown enormously, and still was critically dependent on U.S. air power and logistics, the SSTB ultimately relied on NSA and ASA to supply the advice,

~~(S//SI)~~ Whatever opportunities had existed, they had been dissipated in the years before the VIMP was implemented. What NSA hoped to create through the VIMP was meant to fill in for the loss of American cryptologic sources in South Vietnam. [redacted]

[redacted] called only for a wideband intercept mission for Saigon; otherwise, the American presence would be exclusively advisory. The plan called for the Vietnamese to collect

communist communications in and adjacent to their country. If Thieu survived, the plan stated, then the prospects for a SIGINT relationship were good. But if the political situation changed, say a coalition government was formed, then the U.S. presence would have to be reduced [redacted]

[redacted] In fact, the plan said nothing beyond FY 1974, except for a reduced advisory role. In light of what finally happened, this silence would seem almost prescient.

(U) Notes

- 1. (U) Olson and Roberts, 45.
- 2. (U) Jeffrey J. Clarke, *The U.S. Army in Vietnam: Advice and Support: the Final Years* (Washington, D.C.: The Center for Military History, 1988), 280.
- 3. ~~(TS//SI)~~ National Security Agency Cryptologic Vietnamization Implementation Plan (NSAVIMP), 9 November 1970, 2-3.
- 4. (U) ASA Diplomatic Translation, SIS #58855, Hanoi to Vichy, 7 October 1942.
- 5. (U) ASA Diplomatic Translation, SIS #116843, Vichy to Hanoi, 3 February 1944.

[redacted]

7. (U) Ibid., 12.

[redacted]

9. ~~(TS//SI)~~ Ibid., 11.

10. (U) John Quesenberry, "SIGINT in World War II: Personal Reminiscences of an Intercept Operator in China," *American Intelligence Journal*, Spring/Summer 1964, 64.

11. (U) Douglas Porch, *The French Secret Services: From the Dreyfuss Affair to the Gulf War*, (New York: Farrar, Strauss, and Giroux, 1995), 309.

12. (U) Ibid., 309.

13. (U) Spector, 150.

14. (U) Davidson, 169.

[redacted]

16. (U) John D. Bergen, *The United States Army in Vietnam: Military Communications, A Test for Technology*, (Washington, D.C.: Center of Military History, United States Army, 1986), 20.

[redacted]

18. ~~(S)~~ Ibid.

[redacted]

[redacted]

[redacted]

[redacted]

23. ~~(S//SI)~~ USCIB 29.26/4 1957, CCH Series XXI.B, Box 10.

[redacted]

[redacted]

[redacted]

[redacted]

28. ~~(TS//SI)~~ Ibid.

[redacted]

30. ~~(TS//SI)~~ Memorandum for the Members of the USIB, [redacted]

[redacted]

31. ~~(TS//SI)~~ 3/O/VNR/T15-61, 2 March 1961.

32. ~~(TS//SI)~~ Memorandum for the Members of the USIB, 30 January 1961.

33. ~~(TS//SI)~~ Ibid.

34. ~~(TS//SI)~~ SSO JCS/OSD 286-61, 031620Z March 1961.

35. ~~(TS//SI)~~ SSO Saigon, SGN 66 INTEL, 270645Z March 1961.

36. ~~(TS//SI)~~ 509th, 19.

37. ~~(TS//SI)~~ Ibid., 11.

38. ~~(TS//SI)~~ Theodore Lukacs, *Focus on Khe Sanh*, Cryptologic History Series, 1969, 61-63.

39. ~~(TS//SI)~~ Johnson, 504.

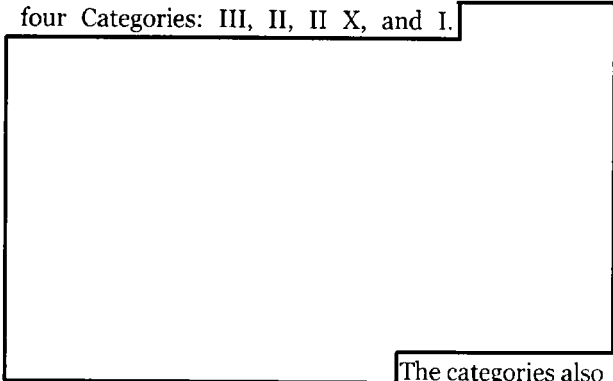
40. ~~(S//SI)~~ See Whitebirch message from September/October 1961.

41. ~~(S//SI)~~ U.S.-ARVN ARDF Agreement, 6 July 1963, NCA ACC# 39325.

42. ~~(S//SI)~~ 509th, 33.

43. ~~(TS//SI)~~ DIRNSA 271858Z April 1962, AGO No. 4109/27.

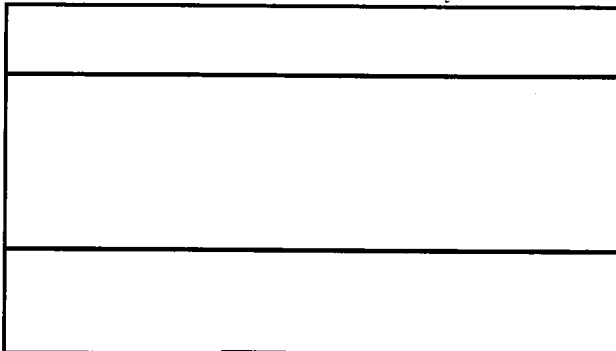
44. ~~(TS//SI)~~ Gerhard, 30. COMINT Categories refer to the determination of the degree of technical sophistication of the cryptographic systems. There are four Categories: III, II, II X, and I.



The categories also reflect an intrinsic threat to the capabilities of U.S. intelligence that might result from the compromise or disclosure of such information. Categories equate to classification levels, Top Secret (III), Secret (II, IIX), and Confidential (I).

45. ~~(TS//SI)~~ DIRNSA 271858Z April 1962.

46. ~~(TS//SI)~~ DIRNSA 010500Z May 1962.



50. ~~(TS//SI)~~ 3/ [redacted] T426, 5 August 1963.

51. [redacted]

52. ~~(TS//SI)~~ Gerhard, 44.

53. ~~(TS//SI)~~ 3RD RRU to CUSASAPAC, 240900Z May 1962; see also 3/ [redacted] VNR/T078-62, R 301310Z, March 1962.

54. ~~(TS//SI)~~ 3/ [redacted] VNR/T078-62.

55. ~~(TS//SI)~~ 3/G10/VNG/R32-62, 3/G10/VNG/R33-62.

56. ~~(TS//SI)~~ B26 Report, "Increased Communications Security On Viet Cong Communications Network, October 1961-April 1962," 30 May 1962.

57. ~~(TS//SI)~~ Gerhard, 46.

58. ~~(TS//SI)~~ NSAPAC to DIRNSA, 20 June 1962, AGI 29323.

59. ~~(TS//SI)~~ D33 to FI/D, WR-6046, 151730Z June 1962.

60. ~~(TS//SI)~~ [redacted] to DIRNSA, 050622Z September 1962, AGI 42968.

61. ~~(TS//SI)~~ DIRNSA to CUSASA, 102046 July 1962, AGO 07187/10.

62. ~~(TS//SI)~~ Frost to Tordella, 010730Z May 1962, F4/366.

63. ~~(TS)~~ USIB-S-29-23/1, "U.S. COMINT Relations with South Vietnam," 11 May 1962.

64. ~~(TS//SI)~~ 3/O [redacted] R18-67, 1 November 1967.

65. ~~(TS//SI)~~ DIRNSA Message, 092156Z September 1968.

66. ~~(S//SI)~~ Commanding Officer 3rd RRU, 8832, 050503Z May 1964.

67. ~~(S//SI)~~ DIRNSA Message, 251812Z May 1964.

68. ~~(S//SI)~~ D33 Memorandum, 13 May 1964.

69. ~~(S)~~ IRR 5 399 0216 67, 12 August 1967.

70. ~~(S//SI)~~ USM-808 10978, 040103Z February 1968.

71. ~~(TS//SI)~~ D33 to FI/D, WR-6046.

72. ~~(TS//SI)~~ NSAPAC REP Vietnam to DIRNSA, 200952Z October 1966, [redacted] 5972; DIRNSA to NSAPAC REP Vietnam, 252145Z October 1966, DIR 181, CCH Series VI.HH.6.49.

73. ~~(TS//SI)~~ Johnson, 568.

74. [redacted] "The Danang Processing Center," *Cryptolog*, October 1975, 27. Much of the recollections about the DGTS can be labeled "anecdotal," a term which, in recent scholarship, has taken on the

undeserved connotation of unreliability. Still, for an interesting set of recollections, it is suggested that the special Vietnam issue of *Cryptolog* be read for its trio of stories recounting the experiences of four NSA technical advisors during the last period of the DGTS existence.

75. ~~(TS//SI)~~ 143rd SIGINT Committee Meeting, March 1968, "Request by the Government of Vietnam for Assistance in Establishing a Central Cryptologic Organization." - USIB-SC-29.23/11, 13 February 1968.

76. ~~(S//SI)~~ DIRNSA to NSAPAC REP (VIETNAM), 182322Z March 1968, D33-451.

77. ~~(S//SI)~~ DIRNSA to NSAPAC REP (VIETNAM), 290017Z March 1968, D33-536.

[Redacted]

79. ~~(TS//SI)~~ Ibid., 3.

80. ~~(TS//SI)~~ Ibid.

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

85. ~~(TS//SI)~~ Ibid., 32-34.

86. ~~(TS//SI)~~ Ibid., 13.

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

91. (U) Gaddy, 94.

92. ~~(S//SI)~~ Donzel E. Betts, Hiram M. Wolfe, Raymond P. Schmidt, Thomas N. Thompson, *Deadly Transmissions: (COMSEC Monitoring and Analysis)*, Cryptologic History Series, Southeast Asia (Fort George G. Meade, Maryland: National Security Agency, December 1970), 4.

[Redacted]

94. ~~(S//SI)~~ Betts et al., 4-8; This is more than an impressionistic or anecdotal opinion. A review of official publications concerning U.S. Communications/Operations/Signal Security concerns shows that they cite almost exclusively collateral reports issued by

MACV J-2, USASA TAREX, and ARVN. For example, in the chapter on VC/PAVN signals intelligence in the history of the Purple Dragon program, *Purple Dragon* (CCH-E32-93-04, 1993), there are 41 citations, none of which are individual SIGINT reports, and only four of these are classified at or higher than SECRET Codeword, meaning SIGINT was used in the citation itself. (S//SI) For further information on Project Touchdown see Project Touchdown accessions 32802 and 37377, NCA. (S//SI) For further information on Project Touchdown see Project Touchdown accessions 32802 and 37377, NCA.

95. ~~(TS//SI)~~ Donzel E. Betts, [Redacted]

Working Against the Tide: COMSEC Monitoring and Analysis. Part One, Cryptologic History Series, Southeast Asia (Fort George G. Meade, Maryland: National Security Agency, June 1970), 22. This work was the original study produced by a joint effort of the various history offices of the cryptologic community. It reflects a higher classification and the use of extensive SIGINT and SIGINT-related information which were excluded from the later version, *Deadly Transmissions*.

96. Ibid., 8-10.

97. ~~(TS//SI)~~ DIRNSA Message 062025Z May 1964.

98. ~~(TS//SI)~~ Ibid. [Redacted]

3/O [Redacted] 04-62/VNG for specific examples.

99. (U) Bergen, 404.

[Redacted]

101. ~~(TS//SI)~~ Betts et al., *Working Against the Tide*, 3.

102. (U) Bergen, 404-405.

[Redacted]

104. ~~(S)~~ "VC/NVA COMINT Effort," USASAPAC TAREX Technical COMINT Special Report (TCSR) 04-71, 8 March 1971.

105. ~~(TS//SI)~~ [Redacted] *Purple Dragon: The Origin and Development of the United States OPSEC Program* (Fort George G. Meade, MD: Center for Cryptologic History, National Security Agency, 1993), 68.

106. ~~(S)~~ TCSR PAC-15-69, 18 November 1969, CCH XII.NN.I.F.

107. ~~(S)~~ Betts et al., *Deadly Transmissions*, 11.

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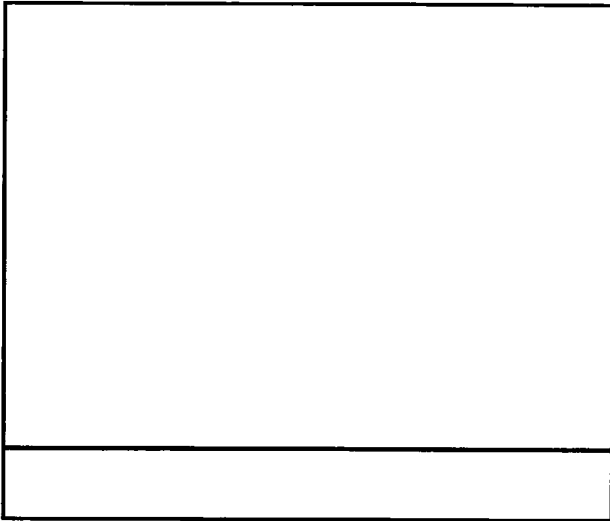
108. ~~(C)~~ Communications Security Newsletter, USNSG, 8-69, September 1969, CCH Series VI.HH.5.2.
109. (U) Bergen, 405.
110. ~~(C)~~ Ibid; also see CINCPAC OPSEC Study, 1 April 1969, SSO 00048-69, as quoted in *Deadly Transmissions*, 6.
111. ~~(S)~~ Betts et al., *Deadly Transmissions*, 6.
112. ~~(TS//SI)~~ Kelley, 53.
113. (U) Staaveren, 190-192, 250; Schlight, 52-55, 149, 153.
114. ~~(C)~~ IR 6028 0138 68, 14 January 1968.
115. (U) *Final Report, Department of Defense, United States-Vietnam Relations, 1945-1967*, Book 5 of 12, U.S. Ground Strategy and Force Deployment, 1965-1967, Vol. I, Section IV.C.6.(b), 112-123.
116. (U) Gibson, 109.
117. (U) Ibid.
118. ~~(C)~~ USASAPAC TAREX TCSR 04-71, 8 March 1971.
119. ~~(TS//SI)~~ Betts et al., *Working Against the Tide*, 19.
120. ~~(S//SI)~~ Cameron, 28.
121. ~~(S//SI)~~ [redacted] 153-154.
122. ~~(TS//SI)~~ Johnson, 568.
123. ~~(S//SI)~~ NSAPAC REP Vietnam to DIRNSA, 240940Z August 1967, F46C/6184.
124. ~~(S//SI)~~ NSAPAC REP Vietnam to DIRNSA, 150400Z December 1971, F46-4722-71.
125. ~~(TS//SI)~~ Ibid., 143rd SIGINT Committee Meeting, March 1968.
126. ~~(TS//SI)~~ USASA OPLAN 8-61, 20 April 1961, CCH Series XII. B. Box 10.
127. ~~(TS//SI)~~ SSO MACV to 509th Group, Vietnamization, 241420Z January 1970, 06637.
128. ~~(TS//SI)~~ Leo C. Stepp and Edward A. O'Connor, "1972-1973: A Vietnam Odyssey," *Cryptolog*, October 1975, 8; also 509th Radio Research Group, "When the Tiger Stalks No More...The Vietnamization of SIGINT, May 1961-June 1970," February 1971, 62-64.
129. ~~(S//SI)~~ DIRNSA to NSAPACRVN 200200Z January 1970, CCH Series VI.HH.15.8.
130. ~~(TS//SI)~~ "Report of the MACV Cryptologic Planning Conference," [redacted] 673-70, 4 December 1970, CCH Series VI.HH.6.51.
131. ~~(TS//SI)~~ Johnson, 570.
132. ~~(TS//SI)~~ B-246-71 Memorandum to NSA Representative Defense Department, not sent.
133. (U) Shelby Stanton, *Vietnam Order of Battle* (New York: U.S. News Books, 1981), 233-234. To arrive at a precise number of ASA personnel at a particular time probably is impossible. This is due to troop rotational policies, redeployments, and withdrawal schedules.
134. (U) Ibid., 233.
- [redacted]
136. ~~(TS//SI)~~ Ibid., 3.
137. ~~(TS//SI)~~ Ibid., 11.
138. ~~(TS//SI)~~ Ibid., 19.
139. ~~(TS//SI)~~ "Jackson Paper," August 1971; NCA# 30408, "South Vietnamese SIGINT Organization."
140. ~~(TS//SI)~~ Ibid.
141. ~~(TS//SI)~~ Ibid.
142. ~~(TS//SI)~~ NSA VIMP, 9 November 1970, 2.
143. ~~(S)~~ JCS Msg 112017Z August 1972.
144. ~~(S//SI)~~ B6-096-72 Memo, Cryptologic Vietnamization, 22 February 1972. EO 1.4.(d)
145. ~~(S//SI)~~ Ibid.
146. ~~(S//SI)~~ Ibid.
147. ~~(S//SI)~~ Ibid.
148. ~~(S//SI)~~ Ibid.
149. ~~(S//SI)~~ Alan Cameron, "The Danang Processing Center," *Cryptolog*, October 1975, 29.
150. ~~(S//SI)~~ NSAPAC REP Vietnam, F46-459-72, 061337Z March 1972.
151. ~~(S//SI)~~ NSAPAC 020317Z February 1972, F4-0377-72.
152. ~~(S//SI)~~ Ibid.
153. ~~(C//SI)~~ Danang Processing Center Daily Status Reports, [redacted] CCH Series XII.NN.VI.A.3; hereafter referred to as "DSR."
154. ~~(C//SI)~~ DSR 261150Z January 1973.
155. ~~(C//SI)~~ DSR 011110Z December 1972.
156. ~~(C//SI)~~ DSR 081415Z December 1972.
157. ~~(C//SI)~~ DSR 051230Z January 1973.
158. ~~(C//SI)~~ DSR 151125Z January 1973.
159. ~~(C//SI)~~ DSR 221145Z January 1973; ARDF fix statistics drawn from the DPC Summaries.
160. ~~(C//SI)~~ DSR 311225Z January 1973.

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161. ~~(C//SI)~~ DSR 130905Z February 1973.

162. ~~(S//SI)~~ Cameron, 28.

163. ~~(S//SI)~~ Ibid.



EO 1.4.(c)

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