Having an avid SIGINT consumer in the White House had its drawbacks. David McManis, who replaced Edward Fitzgerald as the NSA representative to the Sit Room, remembers having to explain the nuances of SIGINT reporting to White House staffers all up and down the line. During the height of the war in Vietnam, the National Security Council staff wanted an accurate count of North Vietnamese infiltration into the South, and they buried McManis under a snowstorm of questions about infiltration groups appearing in SIGINT (the only high-validity source on infiltration). To some, he had to explain that there was no turnstile for infiltration groups heading south, but this just got into SIGINT intricacies that the questioners were not prepared to handle. McManis summoned battalions of NSA briefers to the White House to explain trail group accountability in SIGINT.[51]

David McManis



The White House insistence on raw, unevaluated SIGINT created other problems. Johnson wanted to be kept in touch with every crisis, and he once told [redacted] that he wanted to be called on every Critic, not realizing how many there were. SIGINT Critics on Soviet long-range bombers over the Arctic were fairly commonplace, and [redacted] wisely decided not to call the president on them, lacking other indicators.

Most of the SIGINT reports flooding into the Situation Room were relatively low-level reports and translations, with very little analysis and even fewer assessments. Assessing things was still not NSA's job. This situation kept the volume of reports up, but there was little analytic glue to fit the disparate pieces together. It was critical that someone be available to interpret and assess the SIGINT. Thus McManis found himself spending long hours in the White House. Moreover, NSA began contributing other Situation Room staff members on a permanent basis, the better to minimize the misuse of SIGINT. (The arrangement continues to this day.)

Very few people outside NSA liked the new, elevated status that SIGINT was getting. But it was a logical progression of events. Presidents wanted to know, and to know

quickly. They tended to be impatient with bureaucracy, and when they found a spigot of critical warning information, they turned it on, no matter whose feelings got bruised. When Nixon entered the White House, his Situation Room chief was an NSA official, and a major portion of the inputs to the White House was coming from the SIGINT system. Whatever anyone else in government might think of SIGINT, the White House was known to view it as the fastest and the most unimpeachable source. Through this reputation, the position of NSA grew, until it was virtually coequal with CIA and had far exceeded the other intelligence assets of the Defense Department.

### Carter Takes Command

Gordon Blake retired in 1965. He was replaced by Marshall Sylvester Carter, the deputy director of CIA, on 1 June 1965. Carter, a crusty Army general in the mold of Ralph Canine, presided over the stormiest period of NSA's history.

"Pat" Carter (the name he went by was bequeathed him by a Japanese maid when the Carter family lived in Hawaii) was from a military family, his father rising to the rank of brigadier general. As a result, his growing up was itinerant, and he set his sights on a military career very early. He took a traditional path up the chain, graduating from West Point in 1931 and going into the artillery branch (specializing in defensive artillery). During World War II Carter caught General Marshall's eye, and from then on he was a George Marshall protégé, serving Marshall in various executive capacities when he was chairman of the JCS, representing Truman in China, and secretary of state. After Marshall retired, Carter held a variety of positions in combat units and also served a tour as chief of staff of NORAD.

Marshall S. "Pat" Carter

In his NORAD job he had a fairly detailed involvement with various intelligence sources, including SIGINT, but had never had a job directly in intelligence until 1962, when President Kennedy nominated him to become deputy DCI. Carter came upon the position in the wake of the Bay of Pigs fiasco. There had been quite a shakeup at CIA, and one of those to lose his job was Air Force general C. P. Cabell, the deputy director. Carter survived his trial by fire, the Cuban Missile Crisis, in good shape, and was generally regarded to have had a successful tour at CIA.

He provided a human face to the Directorate, which was headed by the austere and remote John McCone. He became known as an inveterate prankster and became popular with the work force while handling day-to-day business for McCone, whose ties were to the Kennedy family rather than to the bureaucracy. One "Pat Carter story" that CIA employees loved to tell was about the door between McCone's office and Carter's. McCone was not close to anyone at CIA, and, as if to make the point, one day he had the door between his office and Carter's walled over. Carter placed a false hand at the edge of the new wall, as if a door had shut on it, and enjoyed a good laugh at McCone's expense.[52] John McCone was apparently not even aware of the hand.

Marshall Carter became DIRNSA almost by accident. When McCone left CIA in 1965, President Johnson appointed Admiral Raborn to replace him. By law, CIA could not be headed by two military officers, so Carter was out of a job. He put his problem to General Johnson, the Army chief of staff. A few days later he got a call from the deputy secretary of defense, Cyrus Vance. Gordon Blake had decided to retire, and Vance wanted to know if Carter wanted the job. It took him only a few seconds to make the decision. He had been a deputy or chief of staff virtually his entire career – as DIRNSA, he would finally run his own show.[53]

Carter knew a lot about NSA and had a high regard for the Agency. But he felt that NSA needed to be more forceful about its conclusions, more aggressive about carving out a place for itself at the intelligence table. He made it his business to make NSA more aggressive. The days of reticence and retirement under Samford, Frost, and Blake were over. Carter fell on a startled national defense community like a bobcat on the back of a moose.

He began with a symbolic assertion of NSA's independence. He directed that the NSA seal, which had its Defense Department affiliation prominently displayed, be changed to a new seal which referred only to the United States of America. Carter seriously considered the possibility of requesting that NSA be removed from the Defense Department and set up as an independent executive agency along the lines of CIA. He often referred to the fact that NSA was for him, as it had been for all previous directors, a final stop in a long military career. He was not up for promotion, and he did not care whose toes he stepped on.[54]

Even when he was deputy DCI, Carter did not get along with Eugene Fubini. He made his acceptance of the NSA job conditional on an assertion from Vance (which he got) that he would report directly to Vance, rather than through Fubini at DDR&E. He did not hide his disdain for the brilliant and opinionated Fubini, once calling him "a radar technician beyond his competence." But since DDR&E continued to exercise a major influence over NSA's programs, it did not matter much whether Fubini was in Carter's direct line of supervision or not. The two battled almost daily until Carter's retirement in 1969, to the ultimate detriment of NSA's programs.

Carter's abysmal relationship with Fubini and the OSD staff was more than matched by his almost disastrous relations with the armed services. The assertive Carter was ever on the lookout for service encroachments on NSA's prerogatives, and he found them daily. The military were, he felt, constantly building up their intelligence staffs, adding more analytic capability than they needed, especially in the SIGINT field, and doing more interpretation of NSA's information than they were qualified to do (especially at DIA). He felt that they were engaged in a continuing effort to redefine SIGINT as "electronic warfare," the better to take it out of codeword channels and build up their own tactical SIGINT capabilities outside of DIRNSA control.

The services, for their part, complained about perceived lack of NSA response to their needs in Vietnam. SIGINT was too compartmented, NSA refused to clear field commanders for the information they so badly needed, NSA was overprotective of its resources and too quick to fence off new capabilities under codewords and compartments. A battle royal erupted during Carter's regime over the handling of SIGINT and the provision of SIGINT support in Southeast Asia. It poisoned the atmosphere and led to a confrontational relationship between NSA and the military it was sworn to support. When Carter retired in 1969, NSA's relationship with the JCS was at an all-time low. Successive directors were so instructed by the experience that they never allowed relations to return to that level.[55]

To the SIGINT community, however, Carter was a champion. Like Canine, he elevated the status and pay scale of the work force, obtaining more supergrade billets and a generally higher average grade. Displaying his vaunted independence of action, he went directly to Senator Sam Ervin to get the billets and to make sure that the new billet allocation was designated specifically for NSA so that OSD could not co-opt some of them (as he suspected Deputy Secretary of Defense Cyrus Vance of planning). After years of struggle at the OSD level, NSA under Carter got the authorization to begin a career cryptologic service, separate and apart from the systems of any other agency.

At the same time, Carter began the civilian intern program, starting with a small number of recent college graduates entering the NSA work force. In 1969 he extended it to the on-board population. He fended off proposals that NSA's cryptologic work force join a DIA-sponsored intelligence community career development program, carrying with it the

clear implication that there should be transferability between the general intelligence field and cryptology.[56]

Internally, Carter wanted a strong central staff, and he created an executive secretariat to manage his staff and its activities. This reflected his Army background and his experience as staff chief for General Marshall. He strengthened the training school by upgrading its staff to assistant directorship and calling it the National Cryptologic School. Frank Rowlett was its first chief, thus bestowing a status and prestige which it had never had before. Carter was an Anglophile, and he worked hard to maintain the strong ties with GCHQ that had developed over the years.[57]

Under Carter the centralization of SIGINT moved quickly ahead. A Group implemented Plan B and closed the theater processing centers. In the Pacific, the decision to close JSPC, opened only in 1961, was made in 1965. JSPC was a victim of improved communications programs, especially the move to automatic forwarding of intercept traffic under the AG-22/STRAWHAT program (see p. 366). At first, arrangements were made for the AG-22 traffic to be routed through Sobe, where data of interest were stripped off for computer processing. But like [redacted] JSPC could do nothing that could not be done at Fort Meade, and the center at Sobe was doomed. As in Europe, the theater military commanders fought the closure of Sobe energetically, but to no avail.[58]

E.O. 13526, section 1.4(c)(d)

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It was also during Carter's tenure that AFSCC was finally closed. Though closure plans originated as early as the AFSA period, AFSCC was even stronger and more important when Carter arrived than when Canine became the director. But Carter signed a new closure plan in 1967 and made it stick. NSA had begun quietly transferring functions from AFSCC to Fort Meade in 1966, and after the closure plan this accelerated. First to go was the [redacted] followed by larger efforts like the [redacted] AFSCC officially went out of the COMINT processing business on 30 June 1969. [redacted] were transferred to NSA, [redacted] were eliminated, and [redacted] remained in San Antonio, where they merged into a new organization called Air Force Electronics Warfare Center, which analyzed the effectiveness of military-wide electronics warfare efforts, based primarily on SIGINT inputs.[59]

NSA would have closed AFSCC earlier if space could have been found, but the Agency was always chronically short of space. The dedication of the new nine-story headquarters building in 1963 just barely caught up with an expanding population, and there was still no room for the Center. The key event was the lease of the Friendship (FANX) complex (see p. 294). NSA moved into the first building, FANX I, in the fall of 1967, and as new buildings were completed, it occupied those also until by the fall of 1970 the Agency was the tenant in FANX I, II, and III. (NSA was the first and only resident of all the FANX and Airport Square buildings that it leased except for FANX I, whose lease has been given up.) It was not cheap – Carter once stated for the record that for four years worth of rent,

NSA could have built its own buildings. But military construction money was carefully controlled by Congress.[60]

## MECHANIZATION OF THE SIGINT PROCESS

> You people are doing a tremendous job producing history. You are not producing intelligence.
>
> Juanita Moody to the B1 work force, 1961

SIGINT had a reputation for being laborious and expensive. Intercept operations tended to be labor-intensive, while processing was equipment-intensive. Of all Department of Defense organizations, the SCAs were the most far-flung, draining the federal government of foreign currency in the attempt to maintain small sites in remote areas difficult and expensive to supply. Robert McNamara had a war to fight, and he exerted intense pressure on the SIGINT system to economize. This manifested itself in pressure to reduce the number of people involved in the system front end, both through field site mechanization, and through the transfer of operations back to the Continental United States.

Along with the economic pressures came demands to speed up the system. Eisenhower's concerns over war warning information, far from disappearing after his administration ended, intensified under Kennedy. The Bay of Pigs and Cuban Missile Crisis instilled a sense of hurry-up.

The twin demands of economy and speed pushed the cryptologic community into a thorough remodeling of SIGINT. The result was the fashioning of a new system, drastically different from the one which had emerged from World War II and had stood relatively intact through the 1950s.

It had been the dream of cryptologists for years to modernize and automate manual Morse intercept, the largest part of the front end. A first try at it was during World War II, when OP-20-G attempted to produce a punched paper tape from a manual typewriter, thus readying the intercept for introduction into a follow-on processor without further manipulation. The results of the experiment are lost. It was the last attempt at that sort of thing for at least ten years.[61]

In 1957 NSA began toying with the idea of copying Morse on a special typewriter that would do more than just copy alphanumeric characters. The Agency modified a Remington-Rand Synchro-tape typewriter by adding special keys at the top of the keyboard that designated tags, indicating such things as callsigns and frequencies. The project was called SPIT (Special Intercept Typewriter).[62]

While technicians modernized the intercept operation, NSA began looking at processing techniques. Since the dawn of America's SIGINT system, intercept sites had forwarded raw traffic to Washington for processing. While raw traffic went by courier and took weeks to arrive, traffic extracts, often called TECSUMS (technical summaries) were prepared at the field site from the raw traffic and were forwarded electrically so that Washington had at least a summary of significant intercepted material. Prior to the late 1950s the TECSUMS went by formal message, but with the advent of Opscomms, more and more TECSUMS were put on Opscomm circuits.

At the time, NSA technicians and analysts were engaged in a philosophical debate about mechanization. Should traffic be brought back in bulk to NSA, where machines could prepare it for computer processing, or should the mechanization occur in the field, closer to the front end of the process? In the end the front-enders won, and NSA began designing equipments that would mechanize the intercept operation.

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[redacted] E.O. 13526, section 1.4(c)

The experiment with the SPIT typewriter spawned a new project, called [redacted] or the AFSAV 311D. The [redacted] equipment consisted of a modified Remington-Rand typewriter similar to the SPIT model, with special keys referring to such traffic components as callsigns and to traffic externals like start-of-message, end-of-message, and case notation. These features would speed the intercept process by relieving the operator from having to type them in manually. But [redacted] added a new feature similar to the World War II experiment – the output was both page copy and a seven-level paper tape. The beauty of this modification was that the tape could be transmitted just like an outgoing message, and it could be input to a computer at the other end, providing that it was compatible with both.[63]

[redacted] quickly became the focus of the Joint Mechanization Group (JMG). This ad hoc committee was the brainchild of Frank Raven and Juanita Moody. Raven, one of the leading cryptanalysts to emerge from the Navy in 1945, was at the time chief of GENS, while Moody was a division chief within ADVA. They were intrigued by the possibility of automating the front end of the system and pushed [redacted] as a possible answer. Moody named her deputy, Cecil Phillips, to head the JMG.[64] A field test performed at ASA's Rothwesten site in 1960 proved the intercept portion of the concept.

The next logical step would be to input intercepted traffic produced on an [redacted] position into a computer and do some processing on it. Frank Pinkston, a USAFSS staff officer, heard about the [redacted] machines, which at the time (1961) were lying idle, and asked if Security Service could run its own test. The Air Force liked the idea because it would facilitate the rapid transmission and processing of highly perishable air-related traffic. Pinkston designed a test in which [redacted] positions would be located at the AFSS site [redacted] would produce communications-formatted tapes, and would forward the

E.O. 13526, section 1.4(c)

Frank Raven

Juanita Moody receiving the Distinguished Civilian Service Award from then-DCI George Bush in 1976. NSA director General Allen looks on.

tapes via Opscomm to [redacted] where they would be fed into the IBM 1401, which would produce an automated TECSUM. The JMG got a Bogart programmer to design the software, and in September 1961 AFSS ran a successful test. (Bogart was one of NSA's RAM systems.)[65]

The project then languished, primarily because every field site would need a 1401. The 1401 was at the time part of AFSS's 466L system, which was under intense fire from NSA because of its complexity and expense. But interest never vanished. ASA had embarked on its own project, called [redacted] which was soon subsumed under the auspices of the JMG. Meanwhile, [redacted] proclaimed the concept revolutionary and proposed that it be broken down into component portions and implemented gradually. Rather than locate computers at each field site, [redacted] proposed that traffic be forwarded to central locations. This concept would reduce the number of computers required (computers were still regarded as exotic and outlandishly expensive), but it would also overload the communications system. Thereby hung the dilemma.[66]

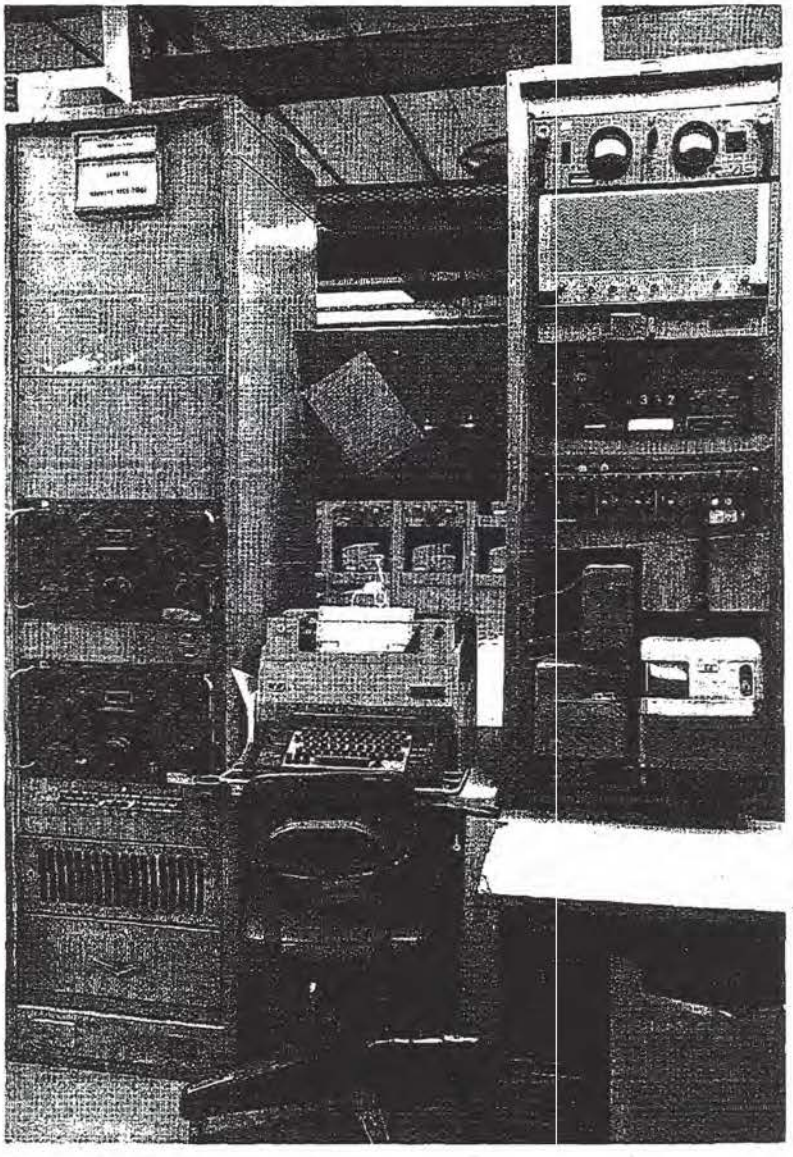
### AG-22

While the policy people thrashed out the dilemma, the technical people continued working on improvements to the device. The Remington-Rand equipment was judged not sturdy enough and was replaced by a Teletype Model 35, extensively modified by the addition of the special tagging keys. The Agency named the device the AG-22 and changed the output to an eight-level tape. NSA also standardized the tagging and traffic formatting requirements into a new TECHINS (T-5004), so that Morse traffic intercepted anywhere would look just like any other Morse traffic. Computer formatting requirements were beginning to drive the SIGINT system.[67]

### Changing the Communications System

The communications system that AG-22 tapes were preparing to assault had become creaky and outmoded, and it was incapable of handling the new requirements. The Cuban Missile Crisis jammed the communications system as it had not been since the twin Suez and Hungarian crises of 1956.

After the creation of Criticomm, NSA continued to try to develop a high-speed switch that would improve reliability and reduce handling time. At first, technical hurdles delayed adoption of a new switch. But in 1962 a new, bureaucratic obstacle appeared with the creation of the Defense Communications Agency (DCA). Such an agency was a logical outgrowth of McNamara's centralization strategy, but it confused the Criticomm situation. DCA took over the job of searching for a new switch, regardless of the feeling at NSA that this would slow the development process. There is little doubt that the project was further delayed by hard feelings between the two agencies.[68]



**AG-22 – Configured Morse Position at [redacted]**
**(R-390 receivers are in the left-hand rack; MOD-35 in the center; and tape unit on the right)**

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

In the mid-1960s, DCA decided on a new satellite communications system called Defense Special Security Communications System (DSSCS), and it decreed that the new Criticomm switch would have to be compatible with the rest of the system. The fact that operators in general service (Genser) communications centers were not SI-cleared created more policy problems, and the search for a switch slipped further.

Then in 1964 the picture was further clouded when DIA got approval to manage the SSO system. Part of the package was the creation of a separate communications system for the distribution of COMINT, called Spintcomm. This introduced new bureaucratic conflicts over who would be the ultimate manager of the composite Criticomm/Spintcomm system, and the edict that established Spintcomm further confused the picture by assigning significant responsibilities to all three participating agencies (NSA, DIA, and DCA). Gordon Blake strongly protested DIA management of the system, but he was overruled at the OSD level. This set off new turf battles and further complicated the technical design of a switch that would have to handle all communications requirements.[69]

Meantime, more and more traffic flooded the system, largely because of the Vietnam War, and message throughput actually declined from year to year, while errors increased. To stave off disaster, NSA took various halfway measures. Much traffic was diverted to the expanding Opscomm systems, and Criticomm was reserved mainly for formal messages. The Agency also designed terminal equipment which would speed and improve handling of traffic within the Criticomm centers.

One such solution was the BIX (Binary Information Exchange), a high-speed local message switch which could operate at various speeds to handle traffic from many different inputs. NSA awarded the contract to ITT, which delivered the first BIX in 1961. The principal improvement was in data storage (the BIX used magnetic tape to store large amounts of data) and in improved throughput (BIX could handle 100,000 words per minute). As an automatic switch, however, it failed, and messages still had to be processed manually.[70]

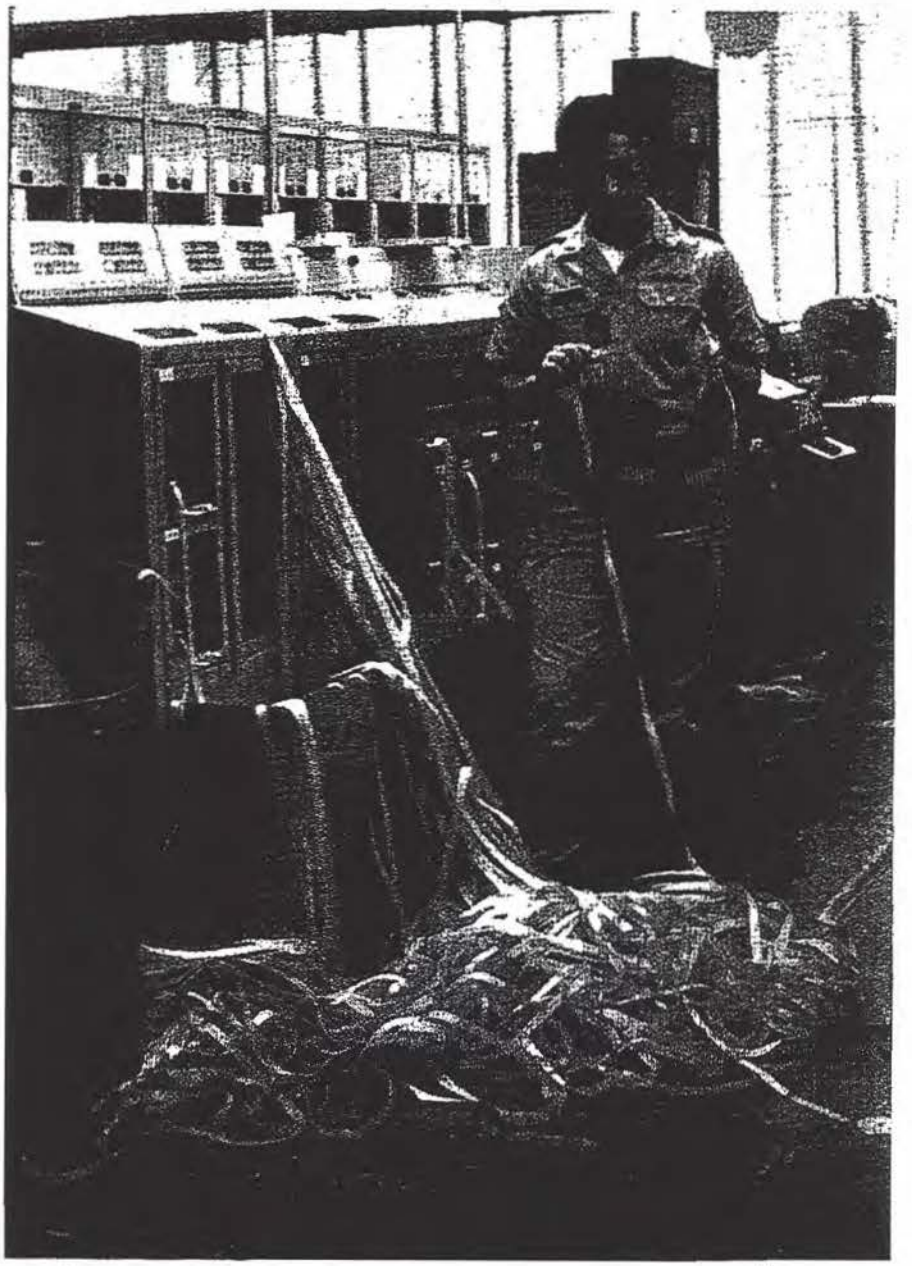
At the same time, the COMSEC organization was working on crypto that would handle the new circuit speeds. The KG-13, which could encrypt circuits up to 2400 bauds per second (the speed of the DLT-5 from Frankfurt) went on line in 1965.[71]

**STRAWHAT**

NSA planned to install AG-22s in virtually every HF field site in the world, but the Opscomm system would not be able to handle the volume. Originally designed for analyst-to-analyst conversations, Opscomms were, by the mid-1960s, becoming overloaded with new TECSUM and [redacted] forwarding requirements. They were slow of foot, either 60 or 100 words per minute, and barely able to handle current requirements. If AG-22

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36



**Comm Center, 1960s. Lacking a digital switch, Criticomm centers continued to be overwhelmed by five-level tape and manual processing.**

data were diverted to Opscomm, it would expand the circuit requirements geometrically. Lacking a revamped Criticomm system, the solution lay in a separate, high-speed data system specifically for AG-22 formatted tapes. In 1967 NSA came up with the answer – the Agency called it STRAWHAT.

STRAWHAT was a 9600-baud data link system from field sites to processing centers. A time division multiplex system capable of up to eight-level forwarding, its equipment could be patched directly from the circuit terminal to a computer, bypassing the person in the communications center. The first circuit became operational in December 1968, and NSA planned to wire up more stations with STRAWHAT circuits beginning in 1969. By mid-1970, the entire SIGINT system would have at least an interim STRAWHAT capability.[72]

**The Computer Industry at NSA**

By the mid-1960s mainframe computers had taken over much of the manual processing at NSA. Although the dual tracks of scientific versus general-purpose processors were continuing, increasingly the Agency was focusing on the latter. It had to do so in order to handle the TECSUM data flowing into Fort Meade via the burgeoning Opscomm network. At that time, the computer of choice for this operation was the IBM 7010, an advanced model of the IBM 1410. IBM machines almost totally dominated the general purpose processing job, and the collection of 7010s was simply called "the IBM complex."[73]

IBM was not the only company doing business with NSA. In 1963 the first mini-computer, the PDP-1, was delivered to the Agency. That, and its successor, the PDP-10, were used for a wide variety of special-purpose processing jobs. That same year, NSA purchased the Univac 490, which had a capability of handling thirty remote stations simultaneously. The stations were equipped with both paper tape and Teletype Model 35 input devices. The software, called RYE, was developed at NSA and was ideal for handling simultaneous inputs from the remote stations. It was made to order for processing from communications terminals, and thus it fitted NSA's emerging needs for handling Tecsumized inputs from field sites, as well as a variety of other small-job applications.[74]

By 1963 NSA's computer collection was by far the largest in the country and probably the world. The value of its computers topped $50 million, which was greater than the Census Bureau, the Baltimore headquarters of the Social Security Administration, and all the field offices of the Internal Revenue Service put together. By 1968 General Carter could boast that NSA had over 100 computers occupying almost 5 acres of floor space.[75]

NSA continued to do pioneering work in partnership with the commercial computer industry. One such innovation was the so-called Josephson Junction technology. This was a very-low-temperature phenomenon in which "switching an electron tunneling junction between two states is accomplished by means of a magnetic field."[76] Discovered in the mid-1960s, the potential for speeding up computer processing was so attractive that NSA

funded about one-third of the IBM research on the Josephson Junction technology. Unfortunately, it didn't work, and IBM ultimately gave up on the Josephson Junction. The project illustrated both the need for research in advanced technologies and the risks involved.

NSA also pioneered in techniques for mass storage. One such experiment was called TABLON, developed in concert with IBM and Ampex in the 1960s. Tablon used a photodigital process developed at IBM and a tape storage system developed by Ampex. The storage systems were internetted by means of two PDP-10s. The philosophy was to have a central data storage system that could be used by the entire agency. But TABLON had serious technical problems. Ampex was unable to develop a tape drive that met system specifications, and too much software was required to run the PDP-10-based star network. Ultimately TABLON was overtaken by new disk storage technology.[77]

NSA programmers were in the forefront of special computer language development. Agency programmers created special languages for HARVEST (called Beta), for the IBM 1401 (called PAL) and punched card emulation language (Transembler) for the IBM 705. Still, the Agency was losing its edge in pioneering work, as the commercial world forged ahead with new innovations that owed less and less to the inspirations that had stemmed from cryptologic applications. It was an inevitable process.[78]

## IATS

The new AG-22/STRAWHAT marriage, innovative though it was, had some problems that could only be called "logistical." A large field site, with row on row of manual Morse positions, could produce a considerable amount of eight-level tape in a day. The process of accounting for, and carting to the communications center, long coils of tape cascading off collection positions was time-consuming, and an analyst (who had now become a communications tape handler rather than a SIGINT analyst) could literally become buried in tape before the end of the shift.

In the mid-1960s K Group (the PROD organization responsible for interfacing NSA with the field sites) began working on a system for accepting manual Morse data directly onto a magnetic tape. After experimenting with several different computers, it settled on the Honeywell 316, which could accept data from 128 different sources simultaneously. (Thus, a field site would have to have more than 128 Morse positions before it required more than one 316.) Honeywell, which sold the 316 at a very competitive $12,500, agreed to loan one to NSA, and a test was run at Vint Hill in Virginia. The test system worked, and the Agency, which called the new system IATS (Improved AG-22 Terminal System), got $10 million in 1968 to install Honeywells at all AG-22 field sites. The AG-22 positions were wired to the on-site Honeywells, which packed the intercept files onto a magnetic tape. Periodically (usually every six hours) the tape was transmitted on a high-speed data link to NSA.[79]

At this point NSA embarked on a major software development effort to handle the expected influx of IATS data. Cecil Phillips gave the job to John W. Saadi, who was a team chief in Phillips's C Group. Saadi, writing in assembly language, created a series of processes (called [redacted] resident on a Univac 494, which accepted the data from the communications system. The 494 built batch files and passed them to the IBM 360 through a shared disk arrangement. This was a ground-breaking task because IBM machines were notoriously difficult to interface with the machines of any other company.



The IBM 360, the first third-generation machine, was introduced at NSA in the late 1960s to replace the 7010s. [redacted] Each production organization wrote applications programs for the 360 complex, so that its data, handed to the 360s from [redacted] would be processed and ready for the analyst. The complex did its heaviest work at night, so that the output would be ready for the analysts in the morning.[80]



Now that raw intercept files were available on computer, each production element developed databases. Some of the work in this area, especially that done by A Group to create a relational database for the Soviet problem, was on the leading edge of technology.[81]

**The Communications Solutions**

The impasse that had been created between NSA, DIA, and DCA lasted through the end of the Carter regime. By 1968 DCA had still failed to produce an adequate communications switch, and Carter felt that DCA failed to understand SIGINT (despite the fact that the director of DCA, Lieutenant General Richard Klocko, had been one of the founding fathers of the Air Force Security Service). But the next year brought a new director, Vice Admiral Noel Gayler, and a new approach to the logjam. Gayler moved quickly to iron out differences, and in August of 1969 he signed an agreement with Klocko covering management of the communications systems that supported SIGINT.

The agreement was a carefully crafted compromise. DCA would manage the entire system, based on technical specifications submitted by NSA. DCA could satisfy communications requirements using any type of circuitry, as long as NSA technical specifications were adhered to. The next month DCA cancelled the automatic switch contract with ITT. Shortly thereafter, OSD decided that the new DCA communications system, called Autodin, would be used for SIGINT traffic. This decision would result in NSA relinquishing a proprietary net that it had controlled since its birth. Some were not happy, but Gayler held to the compromise package, and an era of relative good feeling resulted between Gayler and Klocko.[82]

Lacking a DCA automatic switch, NSA developed its own in-house version and hatched plans to use it in its own communications center at Fort Meade. The Agency decided to scrap the Teletypewriter Distributions System in use since the new building had opened in 1957 and replace it with a new communications center based on the new switches. It was to be called IDDF (Internal Data Distribution Facility), and it opened its doors in early 1972 on the third floor of the Ops-1 building. The year before, NSA introduced optical character readers in the message processing facility, an innovation which led to the elimination of the time-consuming step of teletype operators hand-poking every outgoing message. Called AMPS (Automatic Message Processing System), its rigid formatting requirements and special IBM Selectric typewriter balls were at first hard for secretaries to get used to, but a godsend to the communications center.[83]

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**Automating the Collection Process**

E.O. 13526, section 1.4(c)(d)

New methods of forwarding data to NSA did not change the basic process of signal collection. Most of an operator's time was still spent searching for target signals. But with the new digital technology and smaller on-site computers, it should theoretically be possible to acquire certain signals automatically. In the early 1960s, R&D began working on the development process. The early development work was done in 1963/1964 under a project called

The production model of It was a more sophisticated system, which had an automated digital front end connected to several back-end manual Morse collection positions.

Digital computer-based collection systems eventually became the rule rather than the exception. Some, like the IRON HORSE system used in Vietnam (see p. 549), automated the collection of manual Morse signals. But Morse transmissions had a huge variety of formats, and the length of the mark or space varied depending on the sending operator. Computer-based collection was far more adaptable to baud-based signals. An early success in this area was Flexscop, a digital collection system

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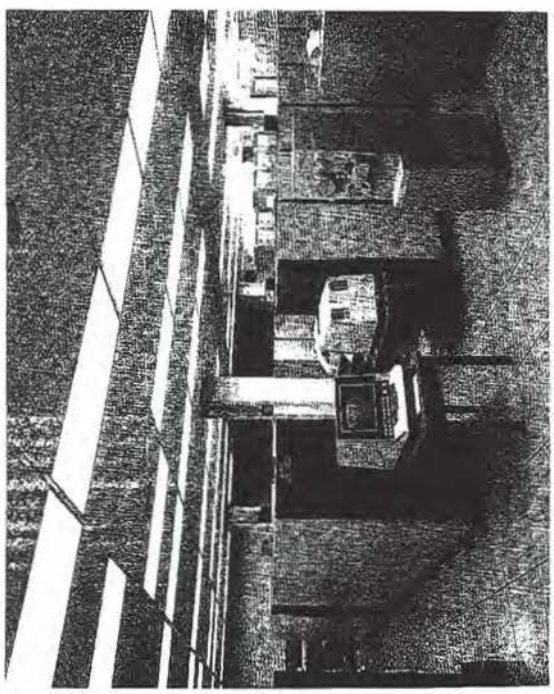


IDDF

[ ] The on-site computer (a CP 818) [ ] and demodulated the signal, then scanned the plaintext transmissions for key words. The system would alarm on recognition of high-interest text, and the operators would react with special processing and forwarding routines. It replaced the "ancient" CXOF equipment which had been the equipment of choice [ ] since the late 1940s.[86] [ ] with its stable frequencies, plain text, and bauded structure, was especially suitable to automation, and NSA collection and processing systems for that effort became among the most automated in the business.

In the 1960s NSA automated the collection of a very wide variety of signals. [ ] The Agency employed a bewildering variety of minicomputers for these specialized jobs, sometimes buying commercial computers from outfits such as Honeywell and DEC, sometimes building its own computers in-house.[87]

**Bauded Signals** [ ]

In the late 1950s NSA was struggling to cope with the increasing use of bauded systems for record traffic. The trend toward the bauded world resulted partly from increasing traffic flow, which required faster circuit speeds that radioprinter made possible; it also had a corollary benefit of making [ ] possible. The field sites were collecting ever higher volumes of printer messages, most of which languished in NSA's warehouses on magnetic tape, waiting to be converted and processed. (For instance, the volume of enciphered communications collection increased [ ] from 1958 to 1968.[88]) By the early 1960s the volume of unprocessed magnetic tape was becoming difficult to manage technically and was embarrassing politically.

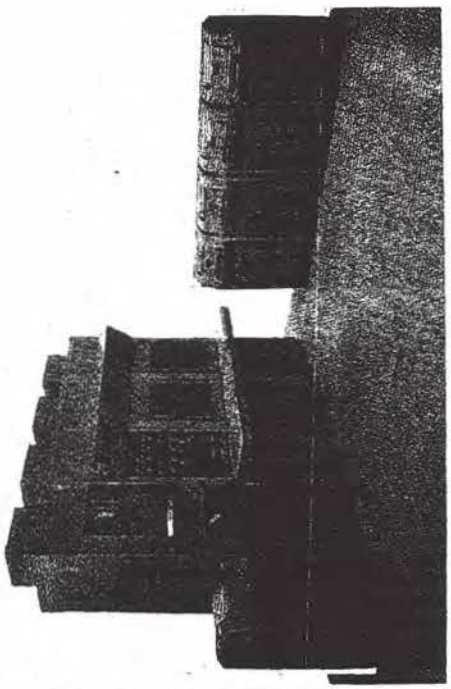
R&D's first approach was to build a general-purpose digitizer and diarizer for bauded signals. Project [ ] which originated between 1956 and 1958, at first targetted the on-line [ ] was only part of the problem, and R&D, working with A Group, began working toward the on-line digitization and diarization of the entire bauded signals problem. An ad hoc committee was established in 1959 to study the problem, and R&D began designing equipment to digitize printer signals onto magnetic tape at the collection position. [ ] consisted of a number of special-purpose components, [ ] which were designed to digitize, diarize, and format onto magnetic tape. It resulted in two parallel avenues, [ ]

While R&D experimented with general-purpose processors, DDO was becoming overwhelmed by magnetic tape. During July 1961 NSA received 17,000 reels of magnetic tape, all of which required signal conversion prior to processing. In fiscal year 1961 the Agency needed over [redacted] just to convert bauded signals for further processing.[90]

To stem the tide, Operations initiated a QRC (Quick Reaction Capability) project called [redacted] which quickly changed its name to [redacted] and the various spin-offs of the [redacted] project were in full swing (and in direct competition with each other) when, in 1962, DDO initiated a crash requirement [redacted] to collect the burgeoning [redacted] signals. The urgency of the requirement vaulted it ahead of everything else. The new project, called [redacted] would eventually result in the conversion of [redacted] to a standard position. The new positions would intercept, digitize, and record [redacted] Everything would be processed at NSA in a standard format, thus simplifying the job of the processing organization and the task of designing processors.[91]

## [redacted] The Attack Continues

[redacted]



[redacted] position, with its distinctive cantilevered scopes overlooking the four-channel digitizers

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[redacted]

**The Bissell Study**

At mid-decade, CIA commissioned a study of the status of NSA attack on high-grade ciphers, the first since the Baker study in 1958. Richard Bissell, a top CIA official unhorsed after the Bay of Pigs fiasco, was named to head the committee. Bissell was a good choice. He had stubbed his toe on covert operations, but he was highly knowledgeable on technical intelligence and had in fact headed the U-2 development project in the 1950s.[96]

Unlike Baker, who had ranged all over the SIGINT landscape, Bissell confined himself exclusively to the project at hand. It was Bissell who first noted [redacted]

[redacted]

E.O. 13526, section 1.4(c)

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~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

E.O. 13526, section 1.4(c)(d)

Richard Bissell

The draft of the Bissell report, which made the rounds of NSA seniors in December of 1964, generated a storm of controversy. The Agency believed that only cryptanalysts could make judgments about systems exploitability and that only NSA should make resource allocation decisions. Blake, at the urging of Deputy Director Louis Tordella, tried to get Bissell to change the report draft, but did not succeed. Once the report was released early the next year, the new director, General Carter, launched a blistering attack on the specifics. Regarding the recommendations to reallocate resources, he said, "I am confident that our present mix is about right and shall ensure that appropriate changes in emphasis and use of resources are made as warranted." Basically, Carter folded his arms and did nothing.[98]

So it had finally come to the stone wall. The Agency firmly believed that it would eventually read enough [redacted] traffic to make a difference, but practically no one outside the headquarters complex at Fort Meade believed it. Carter, who had no basis for an independent judgment himself, believed what his deputies told him. He held fast, and in this case his independence of action and absolute refusal to brook outside interference helped save the program.

E.O. 13526, section 1.4(c)(d)

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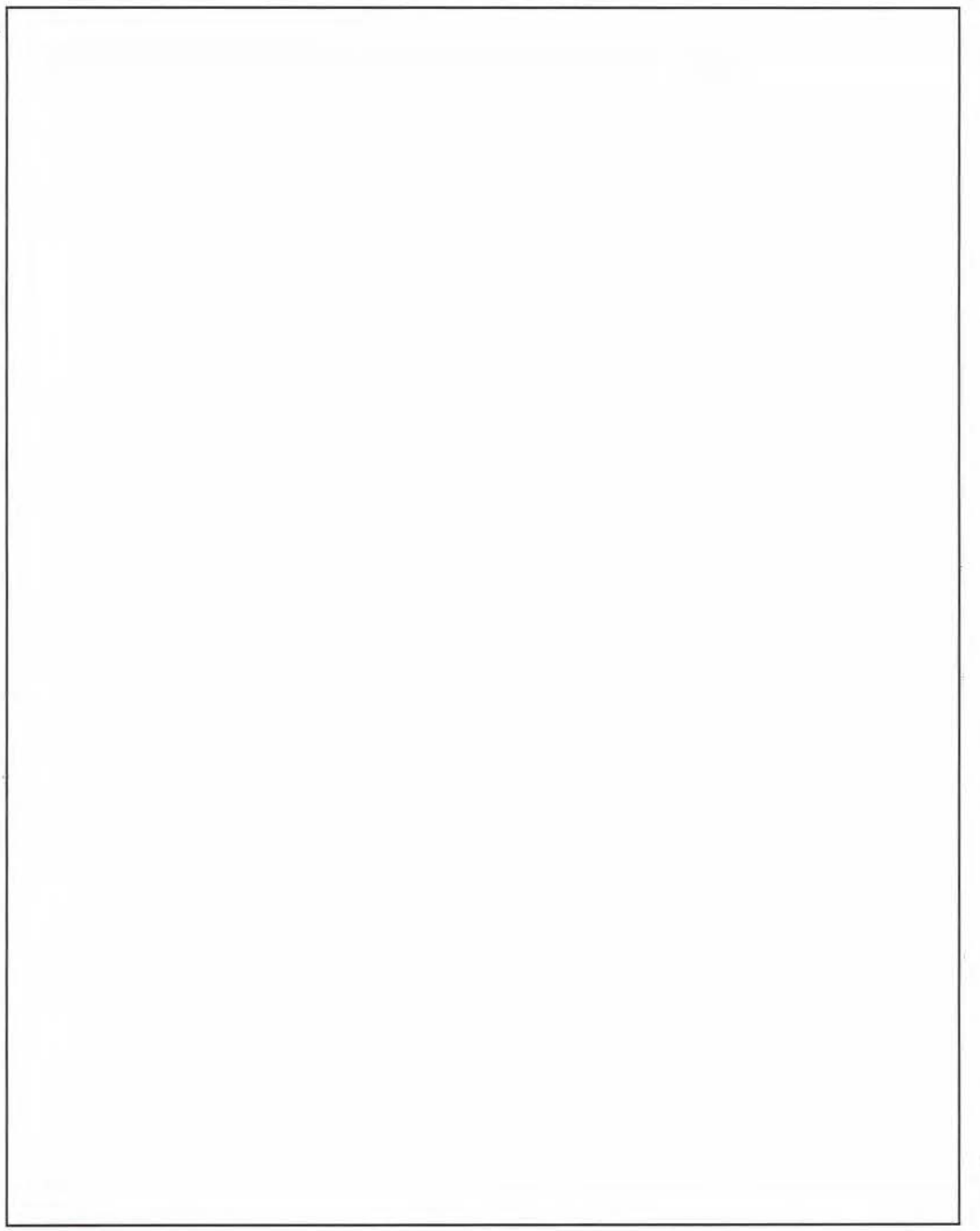

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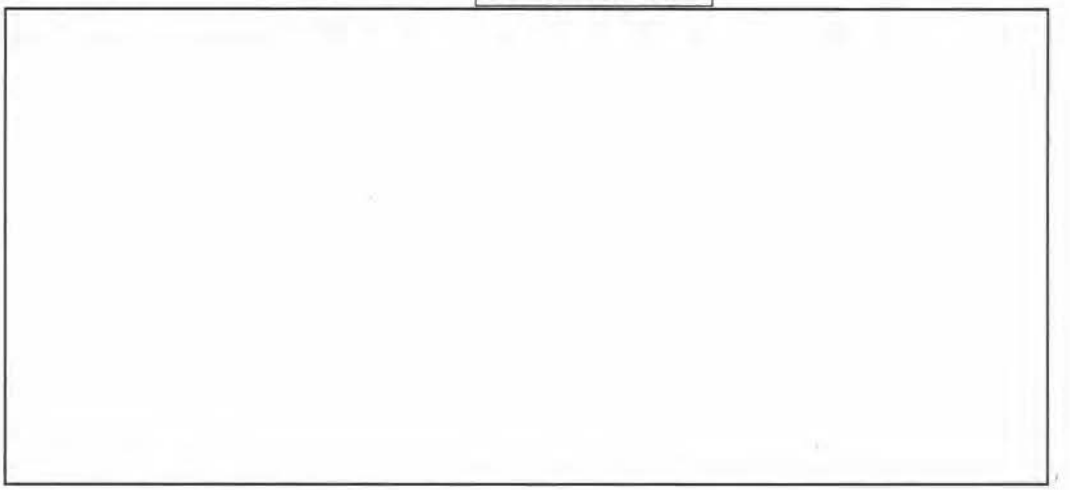


**COMSEC at Mid-decade**

In the 1960s the KW-26, the equipment of choice for securing long-haul point-to-point record traffic circuits, dominated American COMSEC. But American involvement in Vietnam led to a new set of tactical encryption requirements. Typical of the new COMSEC demands was the need to encrypt record traffic on low-level tactical nets in a combat environment. The KW-26 was ill-suited for this application, and to meet the demand, NSA developed the KW-7 to secure terminals which received traffic from multiple transmitters. This equipment added a unique indicator for each message, so that stations in a multiple-station net could correspond using a single crypto device.[103]

**The Development of American Secure Voice**

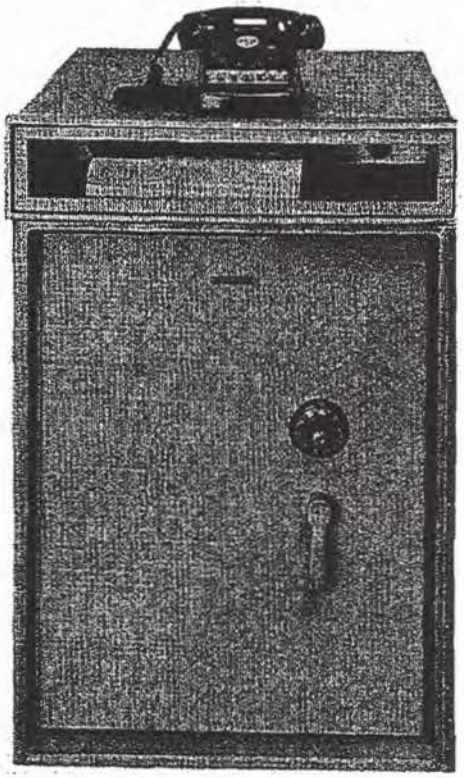
The big news in COMSEC in the 1960s, however, was secure voice. U.S. government users would use the telephone for classified talk, and the only solution was to provide them with a secure handset. Secure voice requirements spanned a broad swath from high-level point-to-point conversations to tactical military applications in the jungles of Southeast Asia. Well aware of the vulnerabilities of voice, NSA approached secure voice cautiously, and for many years secure voice capabilities lagged behind record traffic.

For strategic systems, NSA developed two devices in the 1960s. The KY-9 was a narrow-band digital system using a vocoder, and it was the first speech system to use transistors. The advantage of the KY-9 was that it could be used on a standard Bell System 3 kHz-per-channel telephone system without modification. The disadvantages were many, however. It was big and heavy, encased in a safe that had to be unlocked every morning before the system could be activated. It was also expensive (over $40,000 per

copy) and was a true "Donald Duck" system which required the users to speak slowly to be understood. Only about 260 sets were deployed, all to high-level users, mostly Air Force.[104]

Far more significant was the KY-3, developed about the same time. Built by Bell Labs under contract, it too was housed in a safe. It was big, klunky, and looked a lot like the KY-9, but without many of the drawbacks. The KY-3 was a broadband digital system, so voice quality was better, and it was not a push-to-talk system. But what brought it into wide use was its employment in the Autosevocom network.

Autosevocom was a secure voice network designed by NSA. Local networks consisted of KY-3s, whose individual voice conversations were first decrypted, then reduced to narrow-band signals and digitized in the HY-2 vocoder, and finally re-encrypted for transmission using a KG-13. The Autosevocom system achieved wide acceptance, and some 2,700 KY-3s were sold to users worldwide, including the White House, the Joint Chiefs of Staff, and the Strategic Air Command.[105]



KY-3

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As Vietnam heated up, NSA's attention turned increasingly to tactical voice encryption. An early entry into the tactical arena was a set of systems called PARKHILL. An analog system, it was acknowledged to be vulnerable to exploitation and was not authorized for conversations above the Confidential level. Knowledgeable COMSEC people called it [redacted] But it was better than nothing, and NSA assumed that the Soviets, if they were to exploit it at all, would have to devote inordinate resources.[106]

For digital encryption, the Agency first turned to the KY-8, whose development had begun in the late 1950s. The Air Force tested the KY-8 in its F-100 series jet fighters, but found it heavy and cumbersome to key. (As former COMSEC official David Boak once said, the Air Force would accept a device "only if it had no weight, occupied no space, was free, and added lift to the aircraft.") More to the point, if the KY-8 were to stay, the fire control

radar would have to go. The Air Force opted for the fire control radar, and American aircraft in Vietnam remained without voice encryption.

The Army and Marine Corps, however, found that they could use the KY-8 in jeeps, and some 6,900 devices were eventually deployed. Meanwhile, NSA embarked on a whirlwind project to provide a KY-8 type of device, absent the bulk and weight. The result was two new tactical voice encryption systems, the KY-28 and KY-38. The former was developed for aircraft, while the latter was employed in man-pack radio systems. Weight in both was reduced by the use of integrated circuits. The three devices (KY-8, 28, and 38) were referred to as the NESTOR family. By the end of the decade, there were 27,000 NESTOR equipments in the U.S. inventory.[107]

The next generation of voice encryption systems was called SAVILLE. Consisting of VINSON (KY-57/58) and BANCROFT (KY-67), they were smaller, lighter, and consumed less power than the earlier NESTOR sytems. They also employed updated keying systems and could actually be rekeyed from an aircraft, permitting the control station to remotely change the keys on a net in case a station were overrun by the enemy. BANCROFT was the first-ever combination radio and encryption device in a single unit. VINSON and BANCROFT were not introduced until the early 1970s.[108]

**TEMPEST**

TEMPEST standards had been set forth in the late 1950s in a document called NAG-1. Like other COMSEC policy documents, however, this one was advisory. What was needed was a directive policy and enforcement procedures. NSA spent the decade of the 1960s working on that aspect of TEMPEST.

In September 1960 NSA briefed the USCSB on existing American TEMPEST vulnerabilities. It shocked USCSB into action, and at a meeting in October the board agreed on a crash program and established its first and only subcommittee, SCOCE (Sub-Committee on Compromising Emanations). The first item on SCOCE's agenda was a request from USIB to evaluate the Flexowriter, which was being considered for almost universal adoption within the intelligence community as a computer input-output device.

The Flexowriter, SCOCE found, was the strongest radiator ever tested, hardly a recommendation for its adoption within the intelligence community. With the proper equipment, an enemy listening service could read plain text as far as 3,200 feet. The subcommittee posted a series of recommendations that became known as the "Flexowriter policy," including recommendations that it not be used overseas at all, that in the U.S. it not be used for classifications higher than Confidential (and then only if the using organization controlled a space 400 feet in circumference), and that the Navy be tasked with a long-range technical fix. At the same time, SCOCE published two lists: one

containing equipment that could not be used at all with classified information, and one listing equipments that could be used only on an interim basis.

USCSB took the issue to McNamara, who became an ally. In December 1964 he signed a directive imposing the policy DoD-wide. The reaction was consternation. Without waivers, some agencies would have to virtually close down. All would have to buy new equipment, that expense coming directly out of their O&M moneys. In many cases the cost of equipment would double – in some cases no fix at all could be designed, and the equipment would have to be scrapped or sold. The result was that many went straight for the waivers, and in the face of imminent operational shutdown, got them. Even most SIGINT sites had to operate under waivers for years as agencies scrambled to comply.[109]

## GEOGRAPHICAL RETREAT

> Certain reductions and consolidations in intelligence and communications-electronics activities in Turkey are feasible and desirable.
>
> Blanchard Study, 1963

The conventional collection system reached its point of maximum expansion in the early 1960s. Then, like a star imploding, it began to shrink. The shrinkage was basically a product of two problems, one internal and one external.

The internal cause was money. The Vietnam War, and President Johnson's domestic initiatives like the War on Poverty, began to squeeze the cryptologic budget (not to mention other DoD programs). By 1963 a serious international balance of payments problem had already developed, and the far-flung conventional SIGINT collection system became a prime target for reduction. Directed to study the problem, NSASAB concluded in 1963 that technology to remote collection sites back to the U.S. did not yet exist, except for the technique of recording signals on wideband tape and transporting the tapes back to the CONUS for transcription. Since this did not in most cases meet timeliness requirements, overseas reductions would mean real reductions in SIGINT collection capability.[110]

The second problem was developing Third World nationalism. Many of the countries which hosted SIGINT collection sites were moving toward more independent foreign policies, and foreign troops on their soil did not play well in domestic politics. As the Vietnam War wore on, there was, in addition, a sense of diminishing American power in the world, and a feeling that it was better to move into a neutral camp, rather than to lean on weakening American military protection. These trends often manifested themselves in a demand that the Americans somehow "pay" for their rental of foreign space.

**Turkey**

In no country did these trends play out more forcefully than in Turkey. The Anatolian Plateau had become the ideal SIGINT collection platform.

Turkey had been friendly to Americans since the end of World War II, and this friendship continued strong until the Cyprus crisis of 1963. Anti-Americanism first made an overt appearance at that time, intergovernmental relationships were strained, and a Turkish mob burned the USIA library in Izmir.[112]

Leftist, anti-American factions, emboldened during the Cyprus crisis, became increasingly vocal in the National Assembly. By mid-1965 these factions had succeeded in steering the pro-American government of Suleiman Demirel toward a reevaluation of the bilateral relationship with the United States.

BIG RIB was actually an airborne telemetry collection program using RB-57 aircraft newly available from the LITTLE CLOUD collection program in Pakistan (see p. 386). The program was in its very early days, flying out of Adana, when, on 14 December 1965, one of the planes crashed over the Black Sea. The cause of the crash was (and is to this day) unexplained.

Weather was not the best, but did not appear to be bad enough to cause the crash of a high-performance aircraft like an RB-57.

The unexplained crash resulted in a frantic American and Turkish search for wreckage, which the Soviets independently joined. Fragments of the plane were recovered, but nothing that would have provided clues to the cause of the crash. The incident hit the Turkish press and received wide play, amid leftist demands that the government throw the Americans out. Although the Soviets did not protest the crash itself, they called the search and rescue effort that followed it a "dangerous provocation." This merely oiled the fires of the Turkish nationalists, who contended that Turkey had become a pawn in the chess game between the Americans and the Soviets. Following the Cyprus crisis by two years, and Kennedy's withdrawal of Jupiter missiles without consulting Turkey in 1962, the BIG RIB incident buttressed nationalist contentions that Turkey should draw away from American sponsorship.[115]

E.O. 13526, section 1.4(c)(d)

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Buffeted by rising nationalist sentiments in Turkey, [redacted] was whipsawed by cost reduction efforts at home. A study by Lieutenant General W. H. Blanchard in 1963 had concluded that [redacted]

In July 1968 the DDR&E, [redacted] informed General Carter that to meet McNamara's gold flow reduction targets, it would be necessary to close Trabzon and either Samsun or Sinop by fiscal year 1970. Carter chose Samsun, and soon Sinop was the only Black Sea collection site remaining.[121]

**Pakistan**

To the east, Pakistan was an even more difficult case. The Pakistanis had drawn close to the Eisenhower administration in hopes of getting the wherewithal to defend themselves against Hindu India. Eisenhower had a very different goal – to align Pakistan in an anti-Soviet alliance and, coincidentally, to obtain permission to use Pakistani soil for certain sensitive intelligence operations. The Pakistanis did not much care about the USSR, but they cared very deeply about American military arms and agreed to all the conditions for purchase, [redacted]

Under Kennedy, relations between the United States and Pakistan plunged swiftly downhill. After the Sino-Indian War of 1962, Kennedy arranged to send India military aid to help them defend against the PRC, but of course Pakistan felt the arms could be turned against them. Street demonstrations in Peshawar against the American presence did nothing to assuage fears for the safety of the Air Force people on the base. In March 1963, General Ayub (the Pakistani military dictator) began improving relations with the PRC as a hedge against American indifference. Through the next two years it became increasingly obvious to the State Department that Pakistan was playing a double game and that it would accept aid from any quarter if it would improve its defensive position against India.[122]

[redacted]

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The new program, called LITTLE CLOUD, was a unique international SIGINT cooperative venture,

Faced with increasing Pakistani nervousness about Soviet attitudes and an upsurge of militant Islam, the U.S. tried to make the arrangement more palatable to Ayub. To minimize the visibility of the base, NSA held up planned installation of an FLR-9.

The India-Pakistani War erupted in September 1965, in the middle of precarious relations with Ayub. Indian air strikes hit near the city. Angry mobs roamed the streets of Peshawar, and American GIs, whose government was assumed by the Pakistanis to be in league with India, were restricted to the base.

Nineteen sixty-seven was another bad year for American interests in Pakistan. Ayub regarded Lyndon Johnson as even less of a friend than Kennedy, and when the Arab-Israeli war broke out in June he offered aid to the Arab states. Once again militant Muslim mobs invaded downtown Peshawar, and Americans were restricted to the base.





~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

By the end of 1967, Ayub had just about decided to dump the United States as a sponsor and go for either the USSR or Communist China, depending on what kind of an aid package each could offer. In April 1968, Pakistan's minister of foreign affairs handed Ambassador Oehlert a note that Pakistan had decided not to renew the ten-year lease in Peshawar; this gave the United States about a year and a half to get out.

Ayub would probably have reversed himself if the U.S. had provided Pakistan with a certain quantity of tanks and had downsized the Peshawar site to make it a less visible American presence. This situation touched off a debate in the U.S. government over the value of [redacted] vis-a-vis the tanks and overall U.S. policy toward the government of Pakistan.

The United States began a retreat from Peshawar that concluded when the base was officially closed in September of 1970. By that time, Ayub had been unhorsed by a new military dictator, General Agha Mohammed Yahya Khan, and Lyndon Johnson was no longer president. But neither Khan nor Richard Nixon was inclined to reopen [redacted]

It had occupied the time of two presidents and dominated the attentions of the American ambassador in Rawalpindi. The issue had once again put NSA and CIA at sword's point.

The loss of geography on the Asian subcontinent indicated which way the winds of nationalism were to blow, and it gave a huge boost to the overhead collection program. In the long run it also gave impetus to efforts to develop remoting technologies,

E.O. 13526, section 1.4(c)

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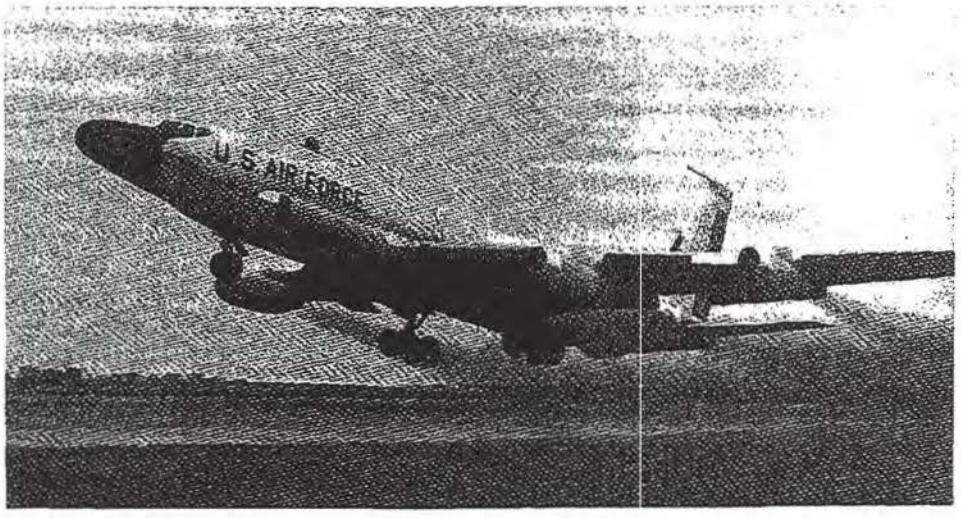


RC-135

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**Airborne Collection**

The success of the [redacted] program in Alaska (first USAFSS use of RC-135s to collect COMINT; see p. 312) prompted AFSS to ask for more RC-135s. After a lengthy struggle, six aircraft were added to the program, and all were initially ticketed for Kadena, Okinawa, to bolster a Far East collection program hard pressed to satisfy collection requirements in both Southeast Asia and the Soviet/PRC/North Korean coastlines. The addition of the far more capable RC-135s pushed the RC-130 program farther down the priority list, and all eventually became strictly theater assets before they were phased out of the inventory in the early 1970s. It also meant that the airborne collection program would inevitably take on a stronger global connotation, with home basing at Offutt AFB in Nebraska and much less of a theater presence.[133]

As collection requirements multiplied, so did AFSS airborne programs. Many responded to the need to collect against [redacted] and they were usually joint SAC-USAFSS operations. During the late 1960s, airborne programs were pulled in different directions by conflicting requirements in Southeast Asia, [redacted] and wars in the Middle East. For several years airborne SIGINT assets of the Air Force and Navy were frantically juggled to keep up with requirements.[134]

E.O. 13526, section 1.4(c)(d)

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Many of the RC-130s were ultimately replaced by "mini-manned" U-2s. Receiver front ends were placed on a pallet that was loaded on board, and the aircraft served as a high-altitude intercept station, downlinking intercepted RF to operators on the ground.

These programs were preceded, however, by an experiment using drones. Begun in Korea in 1971, the drone program (under a variety of names) never worked. The drones were vulnerable to antiaircraft fire, and it eventually became too expensive to keep replacing them.[135]

[redacted]

**The Wood Study** E.O. 13526, section 1.4(c) Withheld from public release Pub. L. 86-36

Budgetary pressures and the rise of nationalism in the Third World led to a series of high-level basing studies in the mid- to late 1960s. Aside from the NSA study that led to the closure of [redacted] (see p. 349), the most significant was the so-called Wood Study, named after General Robert J. Wood, called out of retirement in 1968 to chair a Senior Interdepartmental Group (SIG) looking at the worldwide intelligence posture. The objective was to save money; the target was SIGINT.

Wood felt that much of the expense of SIGINT was with the front end – the overseas bases. He put forth a litany of ways that SIGINT could be done more cheaply, which would be repeated by future study groups. NSA should pour money into advanced technologies (such as satellites and remoting) that would reduce force posture overseas. It should place more reliance on Third Parties. It should develop transportable SIGINT assets. It should rely more on technical research ships (despite the relatively recent destruction of the *Liberty* and the capture of the *Pueblo*). And it should be much more aggressive about consolidating overseas field sites.

There were very cogent reasons why SIGINT sites were spread so widely throughout the world; they related to propagation phenomena and a perceived need to diversify intercept in case of attack. But these objections were drowned by the need to economize. The Wood Study increased pressure to "do something" about the huge number of sites, and the first move was to further reduce assets in Germany. Thus the decision was made (it had been impending for several years) to close the three Army sites at Rothwesten, Herzogenaurach

and Bad Aibling,

One interesting spin-off of the Wood Study was an assessment of political vulnerability in countries housing U.S. SIGINT operations. The chart rates postulated tenure (as measured by the Wood Study) and actual withdrawal dates.

**Survivability of SIGINT Sites[137]**

| Country | Postulated Retention | Actual Retention |
|---|---|---|
| Ethiopia | indefinite | 6 years |
| Morocco | 10 years | 2 years |
| Taiwan | indefinite | 11 years |
| Korea | 10 years | indefinite |
| Philippines | 10 years | 13 years |
| Thailand | 10 years | 8 years |
| Vietnam | as long as war lasts | same |
| Pakistan | 1 year | 2 years |
| Turkey | 5 years | indefinite |
| Greece | 5 years | 24 years |
| Cyprus | 10 years | indefinite |
| Iran | 5 years (depends on survivability of Shah) | 10 years |

To a SIGINTer used to an expanding SIGINT system, 1968 must have seemed like a shrinking world. General Carter, protesting late-decade cutbacks, protested "a pattern of subtractions from U.S. cryptologic strength."[138] He fought reductions like a tiger. But the twin pressures of paying for Vietnam and reducing the balance of payments deficit combined to trim the SIGINT posture no matter what Carter said. Thus base consolidations in Germany, Japan, and (to a lesser extent) Turkey tightened up the SIGINT waistline. The pressure for this was budgetary, and it came from the top.

Viewed from the standpoint of international geopolitics, however, the picture was a little different. Of the ten countries (above) that the U.S. abandoned from an overt SIGINT collection standpoint, nationalist pressures were the clear culprit in seven cases and were at least partly responsible in two others. Thus, SIGINT reductions came from internal budgetary causes, while outright abandonment of a country resulted almost inevitably

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E.O. 13526, section 1.4(c)(d)



from nationalist sensitivity. SIGINT sites were generally acceptable as long as they were invisible to the local population. Thus the U.S. was forced to close its site in Thailand in 1976, [redacted] The lesson was clear, and it became a factor in the new remoting technology that was, even in 1968, picking up steam in NSA.

**The Harrogate Experiment**

Manning the front end of the SIGINT system with civilians had long been an NSA goal. In the 1950s NSA sent integrees to SCA sites, but the numbers were never large, and as the decade wore on, the SCAs tended to get tougher on the idea of NSA invading their turf. The CIA experiment in Cyprus (Project APPLESAUCE; see p. 92) was another attempt at civilian manning. But for an adequate rotation base, it would have succeeded. However, civilianization took on a life of its own, chiefly because of the advantages that could accrue.

The most significant advantage was expertise. The SCAs had trouble training collectors [redacted] Moreover, NSA could sometimes provide linguistic talent that was hard to come by in the military world.

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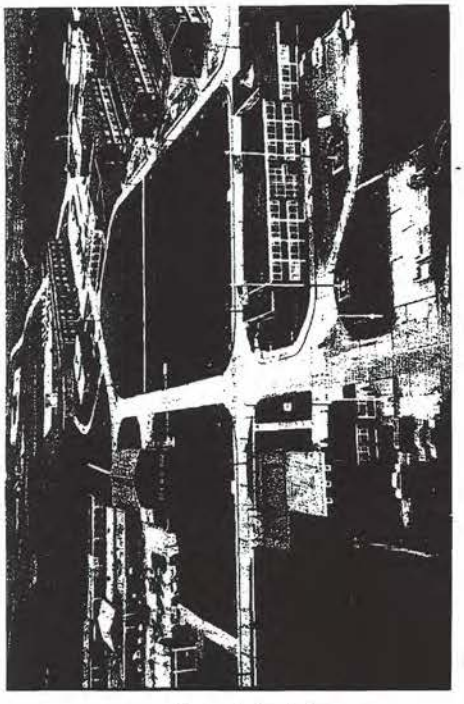
A second advantage was retainability. Military retention rates, low in the 1950s, dropped even lower during the Vietnam war. NSA wanted to [redacted] employ civilian collectors and analysts at the front end of their system for many years. The Americans could not match the expertise found at [redacted] E.O. 13526, section 1.4(c)(d).

The 1958 Robertson Committee initially considered a system of NSA-only collection sites, but withdrew the recommendation from the final report in the face of determined SCA hostility. Instead, the report recommended increasing NSA civilian presence in hard-to-find skills and establishing roving NSA teams of experts to help out with special field site problems. But even that proved difficult to implement, and civilianization appeared to be a dying concept.[139]

This turf fight between NSA and the SCAs stopped civilianization cold until 1965, when a new factor emerged. The factor was Vietnam.

By 1965 the drain on military manpower was becoming severe. In August, the Defense Department canvassed all its activities looking for jobs that civilians could do so that the military people in them could go to the war zone. The most severe pressure was in the Army, and Army stations were threatened with the most serious manpower cutbacks to support the war. Faced with rows of potentially unmanned positions, NSA proposed that it be authorized to coordinate a program of civilianization within the cryptologic community. After a heated internal debate at NSA regarding civilianization at Bad Aibling or Harrogate, NSA proposed the civilianization of Harrogate.[140]



**Harrogate in the early days**
**(Pictured – main gate and support facilities)**

Harrogate, [redacted] was an ideal candidate. [redacted] Located in the Yorkshire moors, Harrogate had originally been surveyed by ASA in the early 1950s. Construction had begun in 1956, and the site officially opened in 1960 as an ASA field station. A site in the United Kingdom was thought to be an attractive place for civilians to relocate. NSA moved rapidly forward, and the site converted to civilian status in August 1966, less than a year after it was originally proposed.[141]

**Naval SIGINT Ships**

The signal success of the *Oxford* against Cuban microwave communications during the Cuban Missile Crisis resulted in a boom in the Technical Research Ship (TRS) program. NSA's long-term TRS program included sixteen vessels, eleven Military Sea Transport Service (MSTS) charters and five of the larger *Oxford*-class *Liberty* ships. The Navy had an even more grandiose plan to build a TRS fleet from the keel up, at a cost of $35 million per vessel. They would have a cruising speed of at least twenty knots. But despite the giddy success of the *Oxford*, the numbers did not add up. For instance, it cost $13.5 million to convert a *Liberty* ship into an *Oxford*-class vessel, but only $3.3 million to redo a *Valdez*-class MSTS ship.[142] DoD was strapped for cash for the Vietnam buildup, and this kind of floating SIGINT platform, logical in theory, fell victim to the budget axe.

Failing in the big plan, the Navy opted for a far cheaper option. The idea was to convert some trawler-type vessels at very minor cost and outfit them for general intelligence collection, including (but not limited to) SIGINT. Their primary purpose would be naval direct support, with a secondary national tasking mission from NSA. They would call the vessels AGER (Auxiliary General Environmental Research).

NSA opposed the program from the beginning. Some Agency seniors believed that it was an end run around NSA's authority to control SIGINT. Nonetheless, the Navy converted the first AGER in 1965, calling it the USS *Banner* (AGER-1). The long-range program was to have twelve such vessels. When, in late 1965, the Navy went forward with a request to convert two more *Banner*-class trawlers, NSA opposed it, and Cyrus Vance, the deputy secretary of defense, sent the proposal back to the cryptologic community to resolve the conflict.

NSA and the Navy fashioned a compromise in which the vessels would sail sometimes on solely direct support missions, sometimes on hybrid national tasking and direct support orders. It would be a wholly Navy owned, manned, and protected program. The ships were smaller and less capable than the *Oxford*- or *Valdez*-class vessels, and as for speed, could not even make ten knots. They would be almost defenseless, but up to that time SIGINT ships had never been bothered by hostile forces. The *Pueblo*, which put out on its first operational voyage in December 1967, was an AGER-type trawler.[143]

TRS communications were, in the early years, bothered by crowding of the HF spectrum. To solve this problem, the *Oxford*, in February of 1964, demonstrated for the first time the feasibility of bouncing microwave signals off the moon from a ship at sea. This technique had been used first in 1959 between two stationary locations, Hawaii and Washington, but the technical problems involved in doing it from the deck of a pitching ship were daunting. Although the problem was considered essentially insoluble, Commander William Carlin White of NSG managed to get the Naval Research Laboratory interested, and White, NRL, and NSA, all working together, gathered the equipment for a test. When the *Oxford* successfully communicated with the NSG site at Cheltenham, Maryland, a new era of naval communications was under way. Soon CNO-approved installation of this new gear (called TRSSCOM, or TRS Special Communication System) was programmed for the *Belmont* and *Liberty*, and plans were made to convert all TRSs to the so-called Moon Shot system.[144] E.O. 13526, section 1.4(c)

TRSs became very popular substitutes for dry land SIGINT real estate. With nationalism on the rise and the United States experiencing declining popularity in the Third World, it was often the only platform available. A TRS was sent to [redacted] TRSs were thrown into the Vietnam conflict, essentially as augmentation for existing fixed sites. An *Oxford*-class vessel, the *Liberty*, was deployed to the Mediterranean during the 1967 Arab-Israeli War. [redacted]

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In the flush of enthusiasm, the latent problems in the program remained hidden. Program flexibility led to scattershot deployments to areas where the technical database was nonexistent. Vessels were put against targets with exotic language requirements that the Navy could not meet. SIGINT crew training and expertise levels appeared to many NSAers to be declining in the face of so many short-fuse deployments to strange places. Command and control became convoluted, especially in war zones like Vietnam or the [redacted] and at times it appeared that no one really knew who had control of TRSs in certain areas. Occasionally a TRS would wind up doing non-SIGINT work like hoisting refugees aboard – this happened during the Cuban Missile Crisis, and was ordered, but not done, during [redacted] Further, TRSs had to compete, in essence, with even more rapid AFSS airborne assets. Often the airborne fleet won out because it could get there faster, and AFSS had better trained operators and linguists.[146]

E.O. 13526, section 1.4(c)

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Finally, and fatally, floating SIGINT platforms proved to be not as secure as had been expected. The *Liberty* incident in 1967 (see p. 432) shocked a cryptologic community that had always assumed that American SIGINT platforms would be accorded the same courtesies that the U.S. gave to the Soviet SIGINT trawlers. The incident was repeated (with variants) the very next year when North Korea captured the *Pueblo*. NSA support for the program was already crumbling because of the dispute over the control of AGERs. With the *Pueblo*, it completely died.

The program was good in theory, and if the execution had been better, TRSs might still be around. It is still a good idea today, but the *Pueblo* incident probably killed it forever.

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**THE END OF HF?**

E.O. 13526, section 1.4(c)

The decade of the 1960s led NSA inexorably into above-HF signals, more and more difficult to intercept, more and more exotic to process once intercepted. Fixation on the [redacted] problem marked one very difficult and expensive avenue, which would require complex intercept and processing gear and unconventional collection locations or platforms. The trend toward above-HF communications, especially microwave, radio relay, and communications satellites, marked another knotty problem for the cryptologic community.

During World War II, the Soviet Union's communications were estimated to be approximately 50 percent HF and 50 percent landline. [redacted]

[redacted]

This pessimistic assessment of Soviet communications trends was not immediately borne out. [redacted]

[redacted]

Still, all long-range forecasts agreed with the above-mentioned 1968 Eachus Report. NSA had been worrying about this problem for some years, and the Agency was in the process, in the late 1960s, of designing and fielding systems that would accommodate the expected surge in above HF communications.

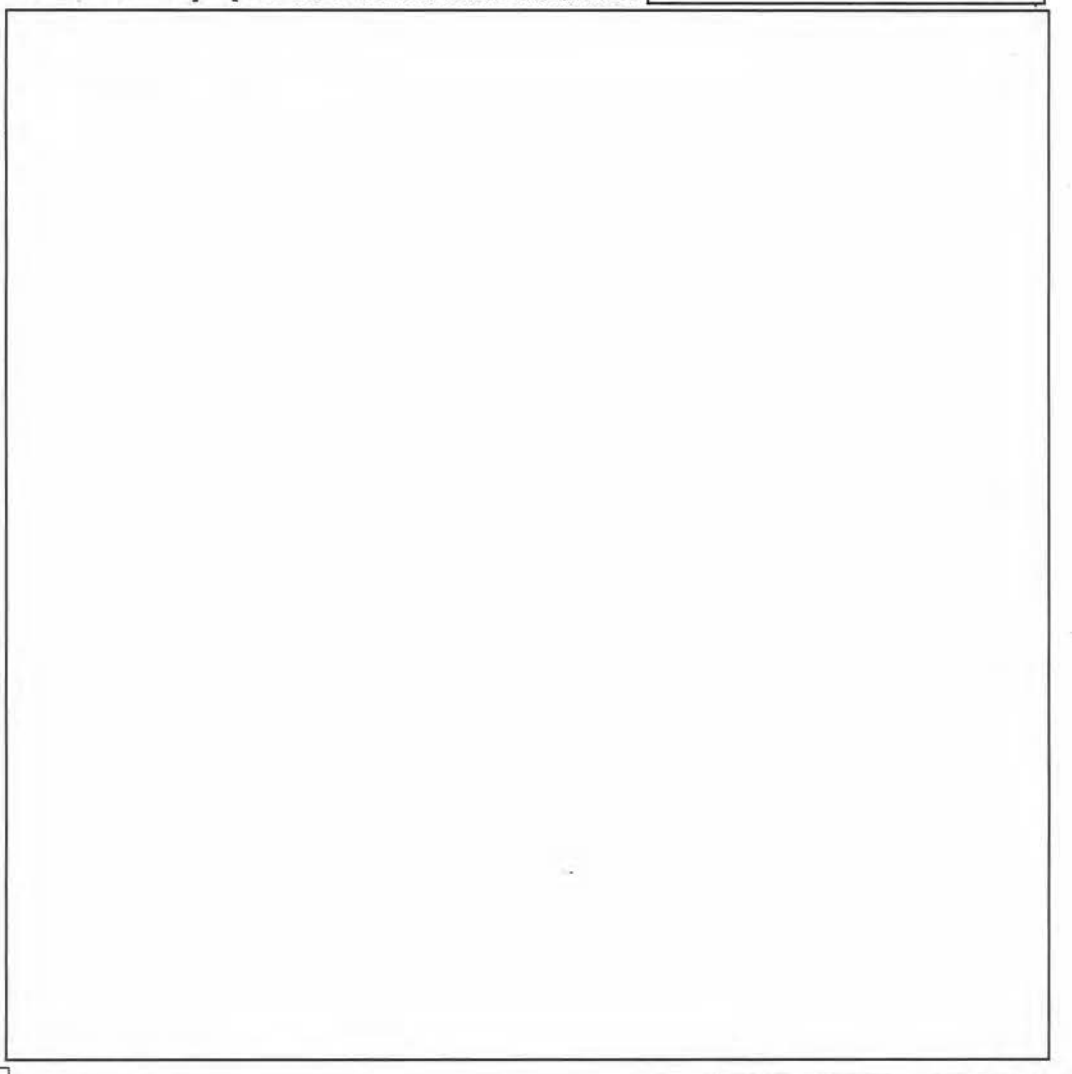
[redacted]

The 1957 launch of *Sputnik* created an immediate requirement to track Soviet ESVs (earth satellite vehicles). The thought that the USSR might have an ESV in orbit whose

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

existence and purpose were unknown was intolerable.





**STONEHOUSE**



The only site ever built specifically for space collection (as opposed to missile telemetry) was STONEHOUSE, collocated with the ASA HF intercept site at Asmara. Set on the high equatorial plateau of Ethiopia, it was originally manned primarily by ASA people, with a small complement of NSA civilians and contractors. It sported two huge dish antennas 150 feet in diameter. In 1972 ASA got out of the business, and the site was left permanently for NSA to operate.[151]

E.O. 13526, section 1.4(c)

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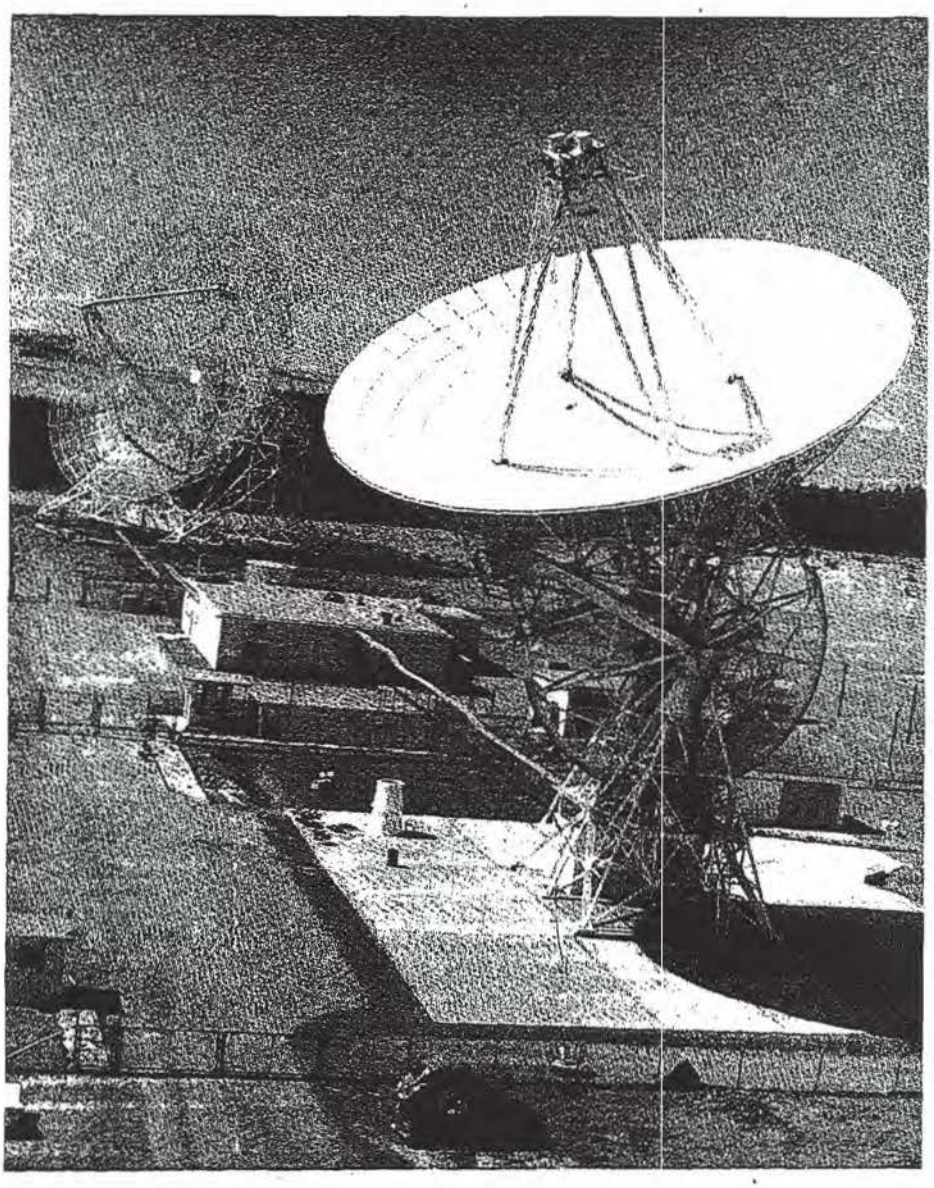

**STONEHOUSE**
**Asmara, Ethiopia**

~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY~~
~~NOT RELEASABLE TO FOREIGN NATIONALS~~

By the early 1960s the United States had established that ESVs were potentially very useful communications vehicles. On 31 August 1962, President Kennedy signed the Communications Satellite Act which sanctioned the Comsat Corporation to establish U.S. participation in a global network of communications satellites. Both Intelsat and Comsat were organized soon after to develop the systems to provide Comsat vehicles for international, as well as national, use. The feasibility of high-quality TV and voice transmission via satellite was proved during the Tokyo Olympics of 1964, and the first American Comsat, called Early Bird, was launched in April of 1965. It was so successful so fast that by 1966 the U.S. projected that Intelsat-assigned circuits would increase from 585 then to over 6,000 ten years later.[152]

The Soviets, too, understood the implications of Comsats. In 1966 they launched three satellites in elliptical orbit, which they called *Molniyas*, and began beaming multichannel and television signals to distant users. These early systems had sixty channels, but most were, in those early days, vacant.[58]

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E.O. 13526, section 1.4(c)(d)

But Army regulations required extensive support facilities for the troops, and the cost and visibility of the site quickly got out of hand. It died a sudden death at the hands of the budgeteers.[155]

E.O. 13526, section 1.4(c)(d)

Withheld from public release Pub. L. 86-36

**Overhead**

Since the science fiction writings of Arthur C. Clarke in the 1930s and 1940s, it had been an American dream to place a reconnaissance satellite in orbit around the earth. At the end of World War II, General Curtis LeMay, then deputy chief of staff for Research and Development for the Army Air Corps, commissioned the Rand Corporation to do a study on the feasibility of just such a project. The Rand study, dubbed Project FEEDBACK, proceeded in secret for eight years. It was finally turned over to the Air Force in 1954, coincident with the Eisenhower administration's thorough examination of the strategic warning dilemma under the Killian Board (see p. 229).[158]

The Technological Capabilities Panel (TCP) on the Killian Board recommended that Eisenhower proceed with the highly compartmented U-2 project being developed by Lockheed. In addition, the Intelligence Committee of the TCP, chaired by renowned optics scientist Edwin Land, recommended that the United States begin to develop reconnaissance satellites. This also got Eisenhower's approval, and it proceeded along a parallel track.[159]

The Air Force immediately began developing an intelligence satellite program. The prime objective was photoreconnaissance, but the initial operational requirement, published in 1955, also contained provisions for an ELINT package.[160]

From the beginning, the program was beset by competing jurisdictions and security concerns. The Air Force, the Navy, and CIA (the latter by virtue of its domination of the U-2 program) all designed entries into this new intelligence sweepstakes. The prize for the most successful system was money and people, both on a very large scale. Overhead reconnaissance loomed as the biggest potential spender in the intelligence system.

Once the Soviets launched *Sputnik* in 1957, American attention focused on a competitor. Although the main objective would be reconnaissance, it would have been imprudent to be up front with this. So in 1958 Eisenhower decided that the Americans would publicize their satellite program as a purely peaceful program, with scientific objectives. The first program, called Discoverer, was pushed ahead as an overt "white" program. Reconnaissance would be a "black," covert program, with classified payloads attached initially to the Discoverer vehicles.[161]

The way Eisenhower created it, the new overhead program had a divided jurisdiction. The Air Force was to build and launch satellites, while CIA was to process the photography. The first processing center was actually set up by CIA to process photos from the U-2. Called NPIC (National Photographic Interpretation Center), it was established in the old Steuart Motor Car Building at 5th and K St., N.W., in downtown Washington. The CIA's Richard Bissell was in charge of the program, and Arthur Lundahl headed NPIC.[162]

Meanwhile, the Air Force had set up operations on the West Coast. In October 1955, the Air Force moved its satellite development project from Wright-Patterson AFB in Ohio to Inglewood, California, locus of their ballistic missile development. This was done in order to insure that both programs remained in synch and that they would not compete for boosters. To control satellite operations, the Air Force chose to collocate with its prime contractor in California.[163]

### The Air Force ELINT Programs

The first SIGINT packages were a product of SAC's desire to support the SIOP, or Single Integrated Operational Plan, the plan for nuclear war with the Sino-Soviet Bloc. For SAC to design penetration routes for its bombers, it had to know where the Soviet radars were and what they were capable of. At the time (the mid-1950s), ELINT was blissfully fragmented, and NSA was a COMINT agency. SAC proceeded with its program unchallenged.[164]

While all this was going on, [redacted] working in CIA's Office of ELINT, became concerned that the ELINT payloads might not be ready for the first launch of a photoreconnaissance satellite. [redacted] concluded that a small, interim, piggyback payload could be designed and ready for the first launch. Its only mission would be to detect threat radars. The interim program was called [redacted] and it became an end unto itself.[165]

E.O. 13526, section 1.4(c)

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Discoverer experienced all sorts of disasters, as payload after payload plunged into the ocean, was fired into an unrecoverable orbit, or just exploded on launch. But when the first photoreconnaissance payload (Discoverer XIII) actually achieved its mission and was snagged on reentry by elated Navy frogmen in August of 1960, [redacted]

### Program Management

E.O. 13526, section 1.4(c)

[redacted] remained an Air Force program, and SAC did the early signals processing. But in 1961 McNamara appointed Eugene Fubini to look into the proper relationships in the SIGINT satellite program. The Fubini committee concluded that the SIGINT satellites had to be a partnership. The satellite payloads and their booster systems remained an Air Force and NRO concern, but processing and reporting became an NSA responsibility. This decision led to a series of fragmented agreements between NSA, on the one hand, and the various satellite operators on the other, regarding the precise terms of NSA's participation in each program.[167]

One beneficial result of the Fubini study was the signing, in September 1961, of a formal agreement between NSA and SAC regarding the processing of ELINT from the Air Force program. Essentially, they agreed that a certain amount of parallel processing would be done – NSA to benefit the intelligence community, SAC to support the SIOP.[168]

In 1961, just before leaving office, Eisenhower set up a special compartmentation for overhead reconnaissance. Called Talent-Keyhole, or TK for short, it covered both the on-going U-2 program and the nascent satellites. CIA, which exercised general supervision of

the programs, controlled the clearances. The plan listed a total of [redacted] TK billets, of which NSA would have exactly [redacted] (The Byeman compartment was set up two years later to handle technical aspects of the satellite programs.)[169]

The next year the two main players in the satellite reconnaissance game managed an accommodation. The CIA and Air Force agreed that a new multiagency program would be established, called the NRP (National Reconnaissance Program). The CIA component of the NRP would be headed by Richard Bissell, who had managed the U-2 program from its infancy. The Air Force component would be housed in a new organization directly responsible to the secretary, called SAFSS (Secretary of the Air Force Space Systems), with Joseph Charyk as its head. The same directive established a joint agency, the National Reconnaissance Office, or NRO.[170]

NSA was still a minor player. It had very few cleared people, and its only responsibility was to process and report ELINT data. Even though NSCID 6 gave it significant responsibilities in both ELINT and COMINT, NSA had no official role in the tasking of reconnaissance satellites.[171]

Satellite tasking was then handled by COMOR (Committee on Overhead Reconnaissance), a USIB subcommittee. COMOR was concerned at first only with PHOTINT, but as the ELINT packages broadened in function from purely a vulnerability assessment to wider intelligence applications, ELINT tasking came to be done by the SIGINT Working Group (SWG) of COMOR.[172]

SWG tasking tended to be very specific, and mission ground stations found it almost unworkable. NSA was used to having USIB set general collection priorities, which the NSA tasking messages would flesh out. One of the problems that bedeviled the overhead program for years was the lack of sufficiently flexible tasking documents.[173]

In 1962, reacting to this situation, NRO set up a Satellite Operations Center (SOC) in the Pentagon. NSA predictably saw this as another intrusion into its authority to task SIGINT collectors, and it soon was sending representatives to the SOC to represent its interests.[174]

Tasking continued to be handled by COMOR until Huntington Sheldon of CIA became chairman of the SIGINT Committee in 1967. Sheldon lobbied USIB to split apart SIGINT and PHOTINT satellite tasking and succeeded in getting COMOR divided into two pieces. A new USIB committee, COMIREX (Committee on Imagery Requirements and Exploitation) tasked satellites, while another committee, SORS (SIGINT Overhead Reconnaissance Subcommittee) tasked the ELINT and COMINT payloads.[175]

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**The Advent of Overhead COMINT**

E.O. 13526, section 1.4(c)

Although satellites were originally the domain of PHOTINT and ELINT, NSA was studying possible COMINT applications. A 1959 study by NSA analyst [redacted] concluded that it would be feasible to collect COMINT signals from the ELINT packages aboard Air Force satellites.[176]

Beginning in the early 1960s, experimental COMINT-targetted payloads piggybacked on the [redacted] systems. [redacted]

**The [redacted] Payloads**

In the early [redacted] days engineers designed a specialized payload that would do ionospheric mapping [redacted] They realized during the development phase that the payload could be injected into an orbit different from the mother payload. Since the objective was independent of satellite electronic defense, there was no special reason for it to stay with the main payload. This led to the development of a separate program, [redacted]

[redacted]

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

Withheld from public release Pub. L. 86-36

**Program C**

E.O. 13526, section 1.4(c)

The Navy's share of the satellite pie was called Program C. (Program A was Air Force and Program B was CIA.) But, though it was last in the alphabet, it had the first successful launch of an ELINT payload on 22 June 1960. Moreover, the Navy designed a unique program that outlasted all the others.[180]

The program was actually conceived early in 1958 by Naval Research Laboratory engineers. They designed a program to receive [redacted] and transmit this intercept in real time to Navy ground sites [redacted] These ground sites were self-contained units called ESV huts, mounted on vans that could be moved around quickly. The huts would be located primarily at NSG field sites, but because of geography it might be necessary to use sites owned by other organizations.[181] Most sites acted as "dumb" terminals, receiving and recording the signals. Recordings were shipped to NSA for analysis.[182]

This early program, which was solely under the auspices of the Navy, was called DYNO, and was referred to in unclassified terms as GRAB. It was the first to document the extremely rich radar signals environment in the Soviet Union. But to some extent it was a targetting anomaly. The Navy was collecting signals of interest to all services and the CIA, but the program was not doing ocean surveillance. In 1962 the program was subsumed within the overall satellite collection system as Program C, and it was renamed POPPY.[183]

In 1966, overhead photos of Soviet ABM installations showed considerable progress toward site construction, [redacted] This became a matter of grave concern to the President's Scientific Advisory Committee, and a study group was appointed. If ABM systems were not the highest priority target up to that point, the committee made them such. A series of [redacted] payloads was developed and launched rapid-fire to respond to the concern.[184]

Program C was also affected. [redacted]

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E.O. 13526, section 1.4(c)

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E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

RUNWAY

As for the control issue, that was solved [redacted] by moving tasking control to NSA. [redacted] NSA set up a new facility called SSSC (SIGINT Satellite System Control) to provide technical support and tasking guidance to the program. Some non-NSA USIB members were less than pleased because SSSC amounted

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E.O. 13526, section 1.4(c)

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

to a de facto delegation of tasking control to NSA. The direction was irreversible, however, and by 1972, representatives from the SOC in the Pentagon had moved to SSSC.[188]

The program was not popular downtown, and it came under repeated attack. When this happened, Admiral Gayler himself indicated that he wanted to attend the NRP Executive Committee meetings to defend the program. At his very first meeting, Gayler went on the attack, not just defending the money that had been put into the system to date, but demanding more money to launch more satellites and to buy more processing equipment.

**RAINFALL**

The RUNWAY program was encountering such ferocious opposition in Washington partly because CIA already had a competitor. The CIA project had been initiated by Albert "Bud" Wheelon, who had come to CIA during the early years of the Kennedy administration. A brilliant and aggressive administrator, as well as a top-notch scientist, Wheelon had been newly installed as John McCone's director of science and technology when he read about the Syncom II geosynchronous satellite. from Soviet missile tests was the number one U.S. intelligence priority, Wheelon wondered if a geosynchronous satellite could be placed in an orbit that would continuously look down on Tyuratam and Sary Shagan. Wheelon pressed his idea with McCone, who approved for a pilot study.[190]

The project was fraught with tremendous risk. It would be hideously expensive, the most costly intelligence system ever mounted. An immense antenna would be required – a scientist calculated that it would have to be at least seventy-five feet in diameter, the largest such object ever unfurled in space. The Department of Defense, wanting CIA out of the satellite business anyway, opposed it from the beginning.[191]

Albert "Bud" Wheelon

Withheld from public release Pub. L. 86-36

E.O. 13526, section 1.4(c)

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E.O. 13526, section 1.4(c)

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CIA cleared no one at NSA. Thus, CIA knew about NSA's nascent plans for RUNWAY, but NSA did not know about CIA's plans for a similarly disposed geosynchronous satellite system, [redacted]. This situation changed in the late summer of 1965, because General Marshall Carter migrated from the position of deputy DCI to director of NSA. When he arrived, he arranged to clear a handful of NSA people and sent them to CIA to learn about the RAINFALL program.[192]

The road proved rocky in the extreme. CIA wanted no NSA partipation at all, and in the early months did a great deal to shut NSA out. But a breakthrough of sorts occurred in December of 1965, when [redacted] to clear the air. Through these high-level contacts, the two organizations began joint planning.[193]

NSA immediately suggested that COMINT become an ancillary mission. After a period of hesitation, CIA accepted the proposal and gave NSA the job of collecting what COMINT they could from a bird whose job was TELINT, not COMINT. Through the Director's Advisory Group for ELINT and Reconnaissance (DAGER), headed by Charles Tevis, NSA negotiated the details of their participation in the RAINFALL program. NSA got a COMINT processing subsystem and an ELINT subsystem [redacted] and when the money for those systems was cut from the budget, NSA allocated CCP funds. DAGER was also instrumental [redacted] Eventually NSA provided all the COMINT staff and about half of the TELINT crew.[195]

SIGINT satellites were the wave of the future, and they offered breathtaking new opportunities for access to the Soviet Union. [redacted] But it also offered a significant new battleground for the control of intelligence resources. CIA-Air Force conflicts over the control of imagery became well known to the American public through the publication of such books as William Burrows's *Deep Black*. Far more obscure, but just as fierce, was the competition between NSA and others (especially CIA) over the ownership and control of SIGINT payloads. It eventually settled down to a series of compromises based on the areas of respective technical competence. But the early years, when these compromises were still in the future, were not easy.

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E.O. 13526, section 1.4(c)

~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

## NSA'S FOREIGN RELATIONS

> They [Third Parties] should not be used for economy reasons to supplant vital U.S. capabilities. However, rapport with Third Parties should be developed as insurance against the loss of U.S. bases in the future.
>
> Eaton Committee, 1968

With the cryptologic budget being cut back in practically every area except Southeast Asia, NSA in the mid-1960s gave a serious relook at what the Third Parties could do for the U.S. Every budget exercise resulted in an increased determination to bring foreign countries more fully into the process. By the late 1960s the budgeteers demanded that

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

The Eaton panel in 1968 (see p. 479) backed NSA's contention and stated that Third Party collection should complement U.S. collection.[196]

General Carter, fresh from his stint at CIA, placed Third Party relationships on center stage, and he was reputedly the first NSA director to permit Third Party representatives into the NSA complex. But Carter's attention to foreign relationships brought NSA up against CIA's long-standing prerogatives in this area. Although NSA began to take a more active hand in several of the relationships, the disputes were not resolved during the decade, and resolution was put off until the late 1970s.[197]

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

**Germany**

The Reinhard Gehlen organization (the BND) was one of NSA's most lucrative Third Party sources during the 1960s. But there were serious problems within the organization itself which limited its utility and caused the Agency to keep it at arm's length. Most of the problems revolved around security.

Basically the BND, like almost all West German governmental organizations, was penetrated and publicized. The problems began in 1952, when a leftist journalist named Sefton Delmer published a highly critical article in the *London Daily Mail* entitled "Hitler's General Now Spies for Dollars." Delmer appeared to get much of his material from one Otto John, who had headed the West German equivalent of the FBI until his defection to East Germany. John was, in 1952, engaged in a bitter bureaucratic struggle with Gehlen over the control of intelligence.[200]

Things just went from bad to worse. In 1953 one Hans Joachim Geyer, a member of the Gehlen organization, fled to East Germany with the names of Gehlen agents. Within hours more than 300 Gehlen agents had been rounded up, and East Germany exposed the "spy ring" in a resonating press conference. Geyer had been passing classified documents to the KGB for several years, although it appears that he was not involved in SIGINT.[201]

But the coup de grâce was not administered until 1961, with the exposure of Heinz Felfe. A rising star in the BND, Felfe had worked for the KGB since the early 1950s and had passed thousands of documents. He worked in counterintelligence, not SIGINT, but his

access was very wide, and nothing in the BND was really safe. The exposure of Felfe in November 1961 led to a prolonged and highly public spy scandal, during which it was revealed that the BND had been thoroughly compromised by the East Bloc. At the same time Gehlen himself was involved in a public row with Franz Josef Strauss, the minister of defense. His inflexibility in dealing with outsiders, and his lack of appetite to rid the BND of East Bloc agents, ended his effectiveness. Gehlen continued to head BND until 1968, but withdrew more and more from active management.[202]

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

This did not stop NSA-CIA competition. However, it did lessen the points of friction and charted the way for a gradual CIA withdrawal from the day-to-day intricacies of Third Party SIGINT exchanges. As Third Party SIGINT became more important and more time-sensitive, this was a natural and evolutionary step.

E.O. 13526, section 1.4(c)

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E.O. 13526, section 1.4(c)

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E.O. 13526, section 1.4(c)

**NSA and CIA in the Third Party World**

By the end of the 1960s, the control of Third Party SIGINT relationships had become quite muddled.

**NSA and GCHQ**

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

As for the American-British relationship, the two SIGINT operations had become virtually inseparable by 1970.

## Notes

1. NSA Retired Records, 288Z, 199104.

2. CCH Series VI.C.1.27; Kennedy Library material in CCH Series XVI.

3. CCH Series VI.C.1.27.

4. CCH Series VI.EE.1.25; VI.C.1.27; Frost interview at Kennedy Library, Boston.

5. Anne S. Brown, "The Consolidated Cryptologic Program and its Predecessors, 1957–1975," unpublished NSA history available in CCH.

6. CCH Series VI.EE.1.12.

7. Brown, CCH Series VI.C.1.27.

8. S. D. Breckinridge, *The CIA and the U.S. Intelligence System* (Boulder, Co.: Westview Press, 1986), 58–9.

9. Kirby interview, Tordella interview, Ward interview, CCH Series VI.D.2.3.

10. Blake biography in CCH Series VI.D.2.5.

11. [redacted] III, 39, 43, 121–24.; NSA Retired Records, 42068, A66-77.

12. [redacted]

13. [redacted] III, 125.

14. "NSA's Telecommunications Problems . . . ," V. III, 13, "Chronology of Significant Events in the History of Electronic Security Command. . . ."

Withheld from public release Pub. L. 86-36



15. Oral interview with Major General (USAF, Ret) John E. Morrison, 10 Aug 1993, Charles Baker and Tom Johnson, NSA OH 24-93; CCH Series X.H.26.

16. Oral interview with Milton Zaslow, December 1993.

17. CCH Series VI.O.1.8.

18. CCH Series VI.O.1.10.

19. CCH Series VI.O.1.2.; NSA/CSS Archives, ACC 10460, CBRI 51.

20. CCH Series VI.D.2.6.; VI.EE.1.12.

21. Memo, subject; "Material for Special Study Group Staff," 27 September 1967, in CCH Series VI.C.1.27.; oral history with RADM (Ret) Donald M. Showers, 5 May 1992, by [redacted].

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Withheld from public release Pub. L. 86-36

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E.O. 13526, section 1.4(c)

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Withheld from public release Pub. L. 86-36

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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Withheld from public release Pub. L. 86-36

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E.O. 13526, section 1.4(c)

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~~TOP SECRET UMBRA~~

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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Withheld from public release Pub. L. 86-36

E.O. 13526, section 1.4(c)

~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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~~TOP SECRET UMBRA~~

E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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Withheld from public release Pub. L. 86-36

E.O. 13526, section 1.4(c)

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E.O. 13526, section 1.4(c)

Withheld from public release Pub. L. 86-36

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Withheld from public release Pub. L. 86-36

E.O. 13526, section 1.4(c)

~~HANDLE VIA TALENT KEYHOLE COMINT CONTROL SYSTEMS JOINTLY NOT RELEASABLE TO FOREIGN NATIONALS~~

E.O. 13526, section 1.4(c)

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Withheld from public release Pub. L. 86-36