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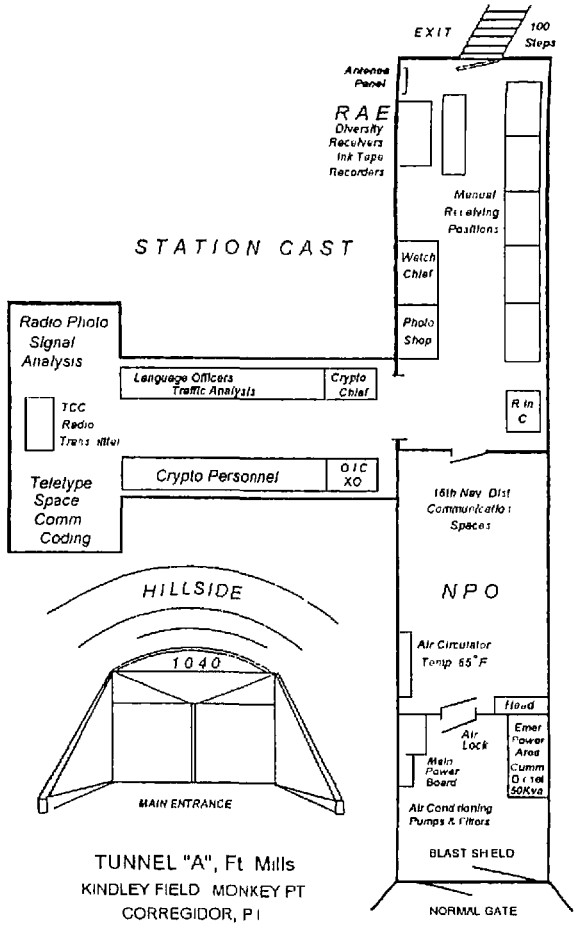
# U.S. NAVAL CRYPTOGRAPHIC ACTIVITIES IN THE PHILIPPINES PRIOR TO WORLD WAR II

## *SRH 180 — U.S. NAVAL PRE-WORLD WAR II RADIO INTELLIGENCE ACTIVITIES IN THE PHILIPPINE ISLANDS*

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Edited by Sheila Carlisle

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# U.S. Naval Cryptographic Activities in the Philippines Prior to World War II

Edited
by
Sheila Carlisle

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CERTIFIED TO BE UNCLASSIFIED
by
Director, NSA/Chief, CSS
13 July 1982.

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# I

# 1924 — 1934

IN A 13 May 1929 Chief of Naval Operations (OP-20-G) letter to the Commander in Chief, Asiatic Fleet (CINCAF) it was noted that, "*The peculiar situation of the Asiatic Fleet renders it most important in the development of a radio intelligence service.... The Chief of Naval Operations feels that the results obtained are sufficient to justify an expansion of this service with a view to increasing its effectiveness.*" The letter went on to state "*...and the Commander in Chief, Asiatic Fleet, should make such disposition of material and personnel as he may see fit. This includes all temporary and permanent intercept units in the Asiatic area, such as that now operating at Pekin, China. Material and personnel requirements for such stations should be arranged for entirely by the Commander in Chief, and not by any individual station.*" The letter then went on to outline plans, in general, for radio intelligence activities in the Pacific. A complete copy of the letter is contained in Appendix A.

Since 1924, the Commander in Chief, Asiatic Fleet, had been actively involved in the collection of radio intelligence against various Japanese targets through shore-based radio intercept stations at Shanghai and Peiping as well as shipboard platforms. These activities were now to expand using the Philippine Islands as a base with a station first established in Olongapo which was subsequently relocated to Mariveles, Cavite and finally to Corregidor where it remained until the final elements were evacuated south to Australia where the station was reestablished to play an important role in the ultimate victory in the Pacific. A 6 March 1930 letter from CINCAF to CNO stated that, "*...Olongapo forms a site which is apparently nearly ideal (for intercept work). It is sufficiently removed from our regular communication facilities to eliminate one form of interference.... It is understood to be one of the best receiving sites in the Philippines. Atmospheric interference throughout the year is at a minimum. The station is isolated... no other personnel or communication activity is involved.... It is planned to place operators at Olongapo and thoroughly investigate the use of this station as an intercept station.*"

On 5 May 1930, a message was received by the Bureau of Navigation from the Commandant, 16th Naval District (COMSIXTEEN) stating that, "*Radiomen detailed Olongapo PI for special Orange (Japanese) radio intercept work were established by CINC Asiatic. Duration indefinite.*" On 12 November, CINCAF forwarded an endorsement on a 3 October COMSIXTEEN request for a maintenance allotment for the Olongapo station which stated that a complement of about nine operators would be maintained at the station. In the second endorsement, dated 27 February 1931 from CNO (OP-20-G) to the Bureau of Engineering (BUENG), it was stated that nine operators had been assigned to "*a special undertaking at Olongapo*" and it was intended to maintain the complement at approximately this number. The nine operators reportedly represented an increase of five over the number employed at the beginning of the fiscal year (presumably FY31) and it was requested that BUENG approve an $800 increase in the maintenance allotment as well as an additional $750 to prepare living quarters for five additional men. BUENG approved the increases the same day.

A 10 June 1931 CNO (OP-20-G) letter to CINCAF on "Radio Intelligence Activities on Asiatic Station" stated that it was considered that the Asiatic Station should each have a third high frequency (HF) receiver and that BUENG had been requested to provide Olongapo with a Model RF HF receiver during FY31 and OP-20-G would issue an additional Underwood Code Machine sometime during the coming year bringing Olongapo's total to three. The Underwood Code Machine was another way of referring to the RIP 5 typewriter. It was also stated that "*Olongapo appears to have great promise as an intercept station and is believed to be most important. The advantages of location, mail facilities, and nearness to the Commander in Chief, Asiatic Fleet, are believed to outweigh inferior receiving conditions. It is expected that as more experience is gained, this station will compare more favorably with Guam in copying Orange Naval traffic. An added advantage of this station is its location with regard to Hong Kong, Singapore, and the East Indies. If Olongapo can be sufficiently developed, it should replace Guam as the main Asiatic Intercept Station.*" The letter also mentioned that the Bureau of Engineering was developing "strategic" direction finders with a frequency range of 100–4500 kHz. It was believed that such a station at Olongapo, manned by intercept operators, would be of considerable value in radio intelligence research work and CINCAF's recommendation was requested. According to one source, the Olongapo radio intercept station was relocated from the traffic station into a separate building in 1931 in an effort to improve operations but reception was still unsatisfactory due to a high noise level from power lines.

In a 23 December 1931 letter from CNO (OP-20-G) to CINCAF, it was mentioned that the quantity and quality of the intercept mission performed at Olongapo had not been up to expectation and not on a par with that of other intercept stations. The reason for this was unknown but it was believed that it could be attributed to any of a number of reasons such as diversion of intercept personnel from their primary duty, poor reception, lack of adequate officer supervision, poor material installation, demoralizing surroundings, etc. OP-20-G had been informed that intercept personnel were regularly performing regular communications duties which was contrary to the intent of assigning additional intercept personnel to the CINCAF staff. Half of the personnel assigned to Olongapo had previously been assigned to the intercept station at Guam where they had produced excellent results while reception conditions at Olongapo were indicated to be equal to other locations in the Philippines. It was requested that CINCAF investigate the problems being experienced by the Olongapo station and take necessary corrective actions; even to the extent of relocating the station for which a request would have to be submitted to BUENG via OP-20-G.

On 5 March 1932, CNO (OP-20-G) informed CINCAF that it was desired that the Asiatic Intercept Station, Olongapo, be developed as rapidly as possible on an efficient working basis. An allowance of 18 men was authorized through FY33 and assigned to the flag allowance of CINCAF with the provision that they were not intended for other than intercept duty or radio intelligence research work. BUENG had been requested to provide three receivers; a Model XR LF, a Model RAA LF/MF, and a Model RAB MF/HF, to Olongapo. At the time, the Model XR receiver was installed at the Naval Radio Station, Los Banos, and would be transferred to Olongapo when replaced by a new Model RAC receiver. The model RAA and RAB receivers were expected at Olongapo in the spring or summer of 1933. The letter went on to outline the desired intercept mission to be performed at Olongapo which was basically the collection of Japanese Naval traffic. Intercept logs were to be forwarded to the Navy Department as occasion permitted and a monthly report was to be forwarded to the Navy Department outlining the work accomplished at the station during the month. Copies of these monthly reports were also to be forwarded to CINCAF, while CINCAF was to submit such other reports as necessary to keep OP-20-G informed of the progress of radio intelligence work at Asiatic Fleet stations.

On 17 January 1933, CINCAF forwarded a letter to CNO discussing the intercept station at Olongapo. Measures had been taken to improve the performance of the station and, after a year, no appreciable improvement had been noted. It was believed that poor receiving conditions and the lack of

direct officer supervision were the station's major problems. Poor reception was the result of electrical interference produced by electrical equipment and power lines located close to the intercept station at the Olongapo Naval Station. Attempts to filter out the interference had proven only partially successful. However, the lack of constant and immediate supervision of the station by a qualified officer was considered to be the primary reason for the station's poor performance. Consideration of these factors had led CINCAF to the conclusion that radical action was required and that the only solution was to relocate the station from Olongapo to a more favorable location. In conjunction with this, it was the understanding of CINCAF that it was the Navy Department's final aim to locate the intercept station within the "ultimate defense area". Since no agreement had yet been reached with the War Department for such a move, the only possible course of action at the time was to locate the station as close as possible to that area. Los Banos was one area under consideration but this move would require the construction of a new building to house the intercept station or the relocation of the existing building from Olongapo to Los Banos; either step estimated to cost about $2,500. CINCAF considered the expense justified to remove the station from the interference experienced at Olongapo and to place the station under the immediate supervision of the Asiatic Communication Officer. It was therefore requested that authorization for the move be obtained from BUENG and funding be provided to cover the cost of providing the necessary housing for personnel and equipment.

The "ultimate defense area" was established by War Plan Orange which had been formulated after deliberations by the Joint Board of the Army and Navy. The basic feature of the plan was that in the event of an invasion of the Philippines by Japanese forces, the Army's forces in Luzon would abandon Manila and withdraw to the Bataan Peninsula where, with the rear protected by Corregidor, they would hold out while the Navy fought its way westward seizing Japanese-held islands along the way. It was estimated that at some point along the way, a decisive naval battle would be fought and the Japanese defeated, thereby opening the way for the relief of the Philippines. Although the plan was altered somewhat over the years, it was not until World War II broke out in Europe and it was realized that the United States would have to maintain substantial naval forces in the Atlantic as well as the Pacific, that a major change was made to Plan Orange. This change was that the Navy would not send units west of the 180th meridian in the event of war in the Pacific, thereby effectively writing off the Philippines and Corregidor.

On 17 April, CNO (OP-20-G) responded to CINCAF regarding the proposals set forth in his 17 January letter on relocating Olongapo. OP-20-G

concurred in the recommendation but regretted that the move could not be made due to a lack of funds. Funding from current fiscal year funds was not available while operation and maintenance funds for FY34 were to be some 30% less than those allocated for FY33. "*To keep within the reduced appropriations will necessitate the closing of about 40 radio stations, drastic reduction in the operating and maintenance costs of those remaining open, and no alterations or improvements of any sort.*"

Apparently security was also a problem or at least perceived to be a problem at Olongapo. On 13 December 1933, CINCAF forwarded a memorandum to COMSIXTEEN recommending actions to preclude the possibility of "leaks" regarding the intercept station. It was proposed that all general service radiomen be removed from the Radio Station at Olongapo, that radio traffic handled by the Olongapo station be reduced to a minimum, that two limited daily schedules be established for handling traffic between Olongapo and Los Banos and these schedules be handled by intercept personnel, and that a separate mess, receiving room, and quarters be established for the intercept personnel to reduce association of these personnel with other Naval personnel. Reference to the establishment of a separate receiving room indicates that intercept operations were conducted in the same space as regular communications operations.

In a letter dated 21 December, CINCAF directed that the above recommendations be implemented by COMSIXTEEN. The last paragraph of the letter reemphasized the need for security by stating, "*The Commander in Chief cannot too strongly insist that this intercept activity is of the greatest value only when enjoying the greatest secrecy; that even the knowledge of its existence must be limited to the fewest possible persons if we are to hope to preserve to it the desired degree of secrecy. Accordingly, you will direct that knowledge of this point be communicated to their reliefs by the following officers only and by none other: the Commandant, Asiatic Communication Officer, Radio Material Officer, Captain of the Yard, Olongapo, Communication Officer, Olongapo. Meantime every officer or man now in possession of this knowledge will be apprised of this view of the Commander in Chief and will be held to strict observance thereof.*"

The concern of CINCAF for the security of the Olongapo station was only part of his overall concern about the secrecy of the Navy's radio intercept activities throughout the Far East. In a 31 July 1933 letter to CNO, CINCAF had outlined his concern about the continuing spread of knowledge regarding the Navy's radio intelligence activities in the Far East, how widespread it was thought the knowledge was, and steps proposed or taken to prevent

further disclosures. In an 8 January 1934 response, it was CNO (OP-20-GX)'s belief that the expansion of the Navy's radio intelligence organization had reached the point that it had become impossible and impractical to conceal the existence of such an intelligence organization from each and all of the Navy's own personnel. While it was desirable to keep knowledge of any secret activity restricted to the smallest possible number of personnel, as the organization became larger and more widespread it became more necessary that certain administrative officers such as District Commandants, flag officers afloat, communication officers, intelligence officers, and radio material officers be advised of the organization's activities in order to provide the support necessary to the organization's functions. It was therefore considered more important to conceal the actual work and results of the organization rather than its existence from the Naval personnel who would have to come into cooperative contact with the organization in the performance of their regular duties. In the past, the work of the radio intelligence organization had been hampered because responsible officers outside the organization had not been, "*...wisely and fully informed as to the mission, aims, and objectives of the Department, in the employment of the officers, men, and material assigned to the radio intelligence organization.*"

The 8 January 1934 CNO letter went on to discuss several recommendations made by CINCAF in his 31 July 1933 letter:

a. CINCAF recommended the temporary disestablishment of the Olongapo station and the establishment of an afloat station on the USS GOLD STAR. In CNO's response, it was recognized that the Olongapo station was not located at a suitable site but it was preferable that the station be located within the Manila Bay region so that it would be accessible to frequent inspection and supervision by COMSIXTEEN. Other reasons for retaining the station in the Philippines were that it was generally considered that in the event of Orange hostilities, it would be likely that Peiping, Guam and the USS GOLD STAR would be lost, leaving only the Philippine station available to support CINCAF; the Philippine intercept station had obtained considerable intercept not available from any other station; studies of the Philippines and Hawaii had determined that they had complementary periods of "no signals" meaning what one couldn't hear, the other station could; and, in the event of Orange hostilities, it was considered probable that Guam would be lost and to increase the numbers of intercept personnel assigned there

would also increase the risk of the capture of up to 40% of the Navy's total complement of intercept-trained personnel. However, CNO recognized the fact that CINCAF was in the best position to determine the best course of action regarding the Olongapo intercept unit and therefore recommended that CINCAF consult with COMSIXTEEN to determine if there was a more suitable location within the SIXTEENTH Naval District for the intercept station. If it was determined that there was not a more suitable location and that installation of the intercept unit on the USS GOLD STAR was the most satisfactory solution, CINCAF was authorized to do so.

b. CINCAF had also proposed that regular operators and intercept operators not serve together and that sufficient numbers of intercept operators be provided to carry out routine communications duties. CNO concurred that the two groups of operators should not serve together when practicable but considered it undesirable that intercept operators perform regular communications duties.

c. CINCAF's recommendation that an officer be assigned to the intercept unit was concurred in by CNO but it was stated that there was no possibility of implementing such a policy in the immediate future.

On 2 February 1934, a letter from CINCAF to CNO stated that the continued usefulness of the Olongapo station was seriously threatened unless it was moved. The letter stated that the sooner the station was moved, the better, and when it was moved it should be relocated to an acceptable place for it to be located in the event of hostilities. This probably meant the "ultimate defense area" which was under the control of the Army which had orders precluding the construction of such a Naval facility in the area.

On 21 February 1934, the Commander in Chief, Asiatic Fleet (CINCAF) forwarded a letter to the Commanding General, Philippine Department, U.S. Army, Manila, stating that it was important the CINCAF be kept aware of the movements of foreign vessels in Asiatic waters in order to effectively direct the movement of Asiatic Fleet units as well as keep the Commander in Chief, U.S. Fleet, informed. To assist in this mission, it was requested that the Commanding General authorize the installation and operation by Naval personnel of direction finders in the Philippines; the "ultimate defense area" being mentioned as the logical site for the direction finder(s).

In a subsequent CINCAF letter to CNO dated 27 February, the need to relocate the Olongapo station to Corregidor was again mentioned but that such a move was blocked by the War Department. Apparently, Army personnel in the Philippines were in agreement but could do nothing without the approval of the War Department. This was supported by a letter from MGEN Frank Parker, USA, Commanding, Department of the Philippines, to the Chief of Staff, U.S. Army, in late February or early March 1934, which recommended approval of CINCAF's proposal to relocate the Olongapo station to Caballo Island which would be within the final defensive area of the Harbor Defenses and would involve a maximum of twelve men and about 600 square feet of office space.

In a Station "C" report dated 25 September 1934, it was reported that the station occupied one room (19'6" x 17') with the following equipment installed:

3 – Model RE LF receivers (battery powered)
2 – Model RAA-1 LF receivers
1 – Model RAB-1 HF receiver
1 – Model XR receiver with "barrage tuning equipment"
1 – Model DO direction finder (100–1500 kHz)
1 – Model RF receiver
1 – Model RS HF receiver (battery powered)
1 – Automatic Recording Equipment
1 – L. C. Smith typewriter
5 – RIP 5 typewriters
1 – Heterodyne Frequency Meter (battery powered)
1 – Model RT HF receiver (battery powered)

It was noted that all auxiliary equipment for the material listed above was available with the exception of satisfactory power supplies for the Model RAA-1 and the Model RAB-1 receivers. The Model RAB-1 and one of the Model RAA-1 receivers had been installed on 10 September for test purposes such as determining noise levels.

In a 20 December 1934 memorandum to CINCAF, LTJG E. S. L. Goodwin reported on his activities since his arrival on the Asiatic Station on 5 June. LTJG Goodwin stated that when he reported for duty, he had no information about the details of radio intelligence work or the operation of [an] intercept station, only a vague idea of the general principles involved, and had had no contact with or knowledge of Orange communications. He was able to acquire some knowledge from his predecessor, LT J. N. Wenger,

and had decided it was imperative for him to work at the Olongapo station in order to acquire the detailed knowledge he required. He proceeded to teach himself to copy the Japanese Kana code and to become as familiar as possible with all aspects of Orange (Japanese) communications. By the end of August, he decided to begin a cryptanalytic attack on Orange cryptosystems. Prior to this, work on Orange communications had concentrated on traffic analysis but in July 1934, LTJG Goodwin had been shown a letter written to COM-SIXTEEN by the Chief of Staff, Asiatic Fleet, in which he (LTJG Goodwin) perceived that it was the purpose of CINCAF to, "*...institute a cryptanalytic bureau on shore, and that my assignment to the SIXTEENTH Naval District was the first step in that direction.*" From his work, he was soon able to isolate several different Orange cryptosystems and solve some. He recommended that CINCAF continue [the] project of establishing a cryptanalytic bureau and proposed that the bureau consist of an Officer in Charge and nine other personnel.

LTJG Goodwin also reported that the existing location of Station "C" in Olongapo was unsatisfactory due to electrical interference from the industrial department and dwellings at the Navy Yard, and the visibility of the intercept station since it was located on the principal thoroughfare of the Naval Station where it was viewed with curiosity by all passersby. He considered that three principal requirements of an intercept station were good receiving conditions, privacy, and protection. However, to obtain good receiving conditions required isolation but with isolation often came visibility created by the natural curiosity of people toward an isolated facility about which the personnel stationed there were reluctant to talk. It was LTJG Goodwin's impression that many people in the Olongapo area, both American and Filipino, had some conception of the true purpose of Station "C". Mr. E. R. Trapp of the Radio Laboratory, Cavite, which came under the District Radio Material Officer, had some general idea of Station "C" and came forward with the recommendation that the station be relocated to the old Ammunition Depot, near the coaling plant across an arm of the bay from Olongapo about 20 minutes away by boat and foot. At the site were several concrete buildings suitable for offices and radio material although some repairs and alterations would be required. The entire depot was surrounded by forest and not visible from either Olongapo or the bay. Drinking water would have to be ferried in from Olongapo but non-potable water was available. The station would have to have its own power supply and existing telephone lines between the site and Olongapo would require repairs.

Subsequent reports by LTJG Goodwin contained additional information on progress in the cryptanalysis of Orange systems and forwarded key

recoveries. In a memorandum drafted by LTJG W. A. Wright on 5 February 1935, he reported to OP-20-G that, "*A check of the results obtained by the minor decrypting unit reveals that LT Goodwin had done a remarkable piece of work, from a cryptanalytical point of view. It clearly demonstrates that with adequate and capable personnel this unit is capable of furnishing considerable information both to CINC Asiatic and to the Navy Department.*"

In a letter dated 29 December 1934 from CINCAF to the Code and Signal Section, it was stated that RMC Goodwin had relieved RMC McGregor at Olongapo who, in turn, was transferred to the USS *Augusta*, the CINCAF flagship, relieving RMC Byrd who was to be transferred back to the United States.

# II

# 1935 — 1936

IN A 28 January 1935 message from CINCAF to OPNAV, immediate authorization was requested to relocate new equipment from Olongapo to the Mariveles area and to establish the new intercept station there. A technical investigation had shown the Mariveles area to be the better area while it was both closer to Cavite and was afforded the protection of Corregidor. The message estimated that the new station could be in commission in March and that $5,000, in addition to funds already allocated for the station, would be required to effect the relocation.

On 23 February 1935, CINCAF forwarded a report to CNO on the planned relocation of the Olongapo radio intercept station to Caracol Point in Mariveles Harbor. With the arrival of the USS *Augusta* in Manila on 22 December 1934, the Fleet Communication Officer and the Radio Intelligence Officer had begun an inspection of all possible sites for the establishment of a radio intercept station in the SIXTEENTH Naval District. A site had been selected earlier on Caballo Island but the Army had refused the Navy's request for use of the island. In conducting the survey, it was also CINCAF's desire to locate a radio station in the "ultimate defense area" which could be relied upon to provide emergency communications. The vulnerability of the existing Los Banos radio station and its distance from SIXTEENTH Naval District Headquarters were factors mitigating against the assumption that uninterrupted communications could be maintained in the event of Orange hostilities. On 21 January 1935, the survey of the Navy Camp in the southern part of the U.S. Naval Reservation on the southeastern end of Mariveles Harbor was begun. It was quickly determined that the site's radio reception was superior to Olongapo and it was both within a protected zone and readily accessible to Corregidor. Therefore, on 28 January, CINCAF requested OPNAV approval for the move which was disapproved on 30 January. The request was resubmitted on 9 February and approval for the temporary transfer of the intercept station from Olongapo to Mariveles was granted by OPNAV on 12 February.

The Navy Camp was actually one building which had been used by the Public Works Department of the SIXTEENTH Naval District in 1928–31 as an office and quarters while a survey was made of the proposed U.S. Naval Ammunition and Mine Depot at Mariveles. The building was considered to be in fair condition and, measuring 24' x 36' with a large screened porch on three sides, it was considered large enough to berth ten operators and house the modern radio equipment originally intended for Olongapo. The overall plan for relocating the Olongapo station called for the transfer of all intercept operators to the Caracol Point Station while establishing a decrypting center in the offices of the SIXTEENTH Naval District at Cavite. Traffic would be forwarded from the Caracol Point Station three times a week using the twice-a-week Caracol Point–Cavite steamer and the weekly Olongapo ferry which routinely stopped at Mariveles Harbor. The Army ran twice-daily ferries between Corregidor and Manila but these ferries could not be used since no Army personnel had been informed of the station's existence. The Caracol Point Station would be provided with a transmitter for a daily schedule with Cavite. It was also considered necessary to avoid publicity on the station by establishing a cover story of its being a temporary or emergency fleet radio station. Since the station's power plant was designed for emergency radio communications and not continuous operation, battery-powered receivers would be provided for emergency use and to prolong the life of the generator.

While there were advantages to the establishment of a temporary intercept station in the Mariveles area, there were disadvantages to a permanent station. Physical contact between Mariveles and Cavite was dependent upon water transportation which was frequently suspended during the typhoon season. The isolation of the Navy Camp was beneficial from a security standpoint but it did cut the personnel off from recreation facilities. While the Navy Camp was considered to be in an ideal location from the standpoint of health, some of the surrounding area was infested with malaria. The proximity of a rock quarry operated by the Atlantic, Gulf and Pacific Company of Manila had actually proven to be an asset because the company's labor, dock, water supply, and power had been utilized at various times during the establishment of the station. Other disadvantages were the unreliability of the camp's generator for continuous long-term operation, the need to improve the Navy Landing which was basically an emergency job constructed without substantial pilings, and the question as to whether a diversity antenna could be constructed at the Navy Camp due to the contour of the land. CINCAF then went on to discuss measures required to place the radio intercept station and related activities on a war footing at the earliest practicable date with the intention that the station would serve as a possible

emergency radio receiving and control station for COMSIXTEEN in the event of Orange hostilities. To accomplish this, the following were recommended:

a. Construct a suitable building in the vicinity of the Navy Camp or elsewhere in the U.S. Naval Reservation capable of housing all of the equipment assigned to the radio intercept station as well as a small receiving and control station to operate by remote control either existing transmitters at Canacao Point, transmitters on Corregidor, or emergency transmitters in the Mariveles area.

b. Install a generator of sufficient capacity to dependably operate the above.

c. Rebuild an old pier formerly used to unload cattle from ocean-going vessels in Mariveles Harbor.

d. Construct roads and improve existing trails to permit automobile travel from Manila to the Naval Reservation provided this would be agreeable with Army defense plans for the Bataan peninsula.

e. Construct a barracks with a small dispensary, a single unit quarters, and a duplex quarters in the vicinity of the proposed radio station which would permit sufficient space to accommodate the radio intercept personnel in peacetime and the wartime radio traffic personnel and a small Marine guard. It was also contemplated that the Decrypting Center would move to Mariveles in wartime and the Officer in Charge of the Center would be in charge at Mariveles and would be free to carry out his work at either Mariveles or COMSIXTEEN Headquarters.

f. Install and lay cable connections from the radio intercept station to the transmitter station at Canacao and possibly Corregidor.

CINCAF estimated to accomplish the above measures would cost about $85,000 exclusive of the costs of the cable connections. It was requested that the above plans be approved and the money allocated. If disapproved, it was requested that a suitable generator be provided for the temporary station and that $5,000 be allocated to rebuild the old cattle pier. The temporary radio

intercept station was then being installed in the Navy Camp at Caracol Point and it was estimated that it would be operational by 4 March. (See Appendix B for a rough sketch of the station site at Caracol Point.)

In a 28 March report from LTJG E. S. L. Goodwin, USN, to CINCAF, it was reported that intercept watches had been discontinued at Olongapo at 0800, 27 February and reestablished at the Navy Camp, Mariveles, at 1700, 1 March. The station had two Model RAB-1 HF receivers, two Model RAA-1 LF receivers, one Model RE LF receiver, one Model RFMF receiver, one Model RT HF receiver and one 5 KW DC generat[or] installed. LTJG Goodwin also reported that on 25 March, he had established an office, which was subsequently designated a Minor Decrypting Unit, in Building "G", U.S. Navy Prison, Cavite Navy Yard, and that he would be doing most of his work in this office while spending an occasional few days at Station "C". At the time, he reported that he was keeping track of Orange Naval vessels, compiling a Japanese-to-English vocabulary of commonly used message terminology, working on the reestablishment of Station "C" and performing cryptanalysis on Orange systems.

On 30 March, CINCAF requested the Bureau of Engineering provide $3,000 for ordinary maintenance of Station "C" which was to cover the costs of gasoline for the generation of electricity – $1,000; coal and kerosene – $100; material upkeep – $1,500; and repairs to operating equipment – $400. It was also noted that the station had been designated as the "Los Banitos Security Station" for use in administrative correspondence.

On 24 April, the Commandant, SIXTEENTH Naval District visited Station "C" and found that the personnel were performing their duties with "*energy and commendable loyalty*" but "*seemed frankly unhappy, and exhibited evidence of working under a strain.*" To improve morale, COMSIXTEEN requested CINCAF allocate money for a pool table with necessary equipment ($300) and a Hammerlund "Pro" All-Wave radio receiver ($175). The reliability of the Kohler 5 KW gasoline generator was also suspect since it was not designed to be run continuously as it was being required to do at Station "C". It was requested that CINCAF reallocate a similar generator then scheduled for the USS TULSA to Station "C" as a standby generator since there was no other alternate AC power source.

On 16 May 1935, COMSIXTEEN forwarded a letter to CINCAF covering a wide range of subjects basically relating to Station "C". On the subject of secrecy, it was stated that any correspondence relating to radio intelligence activity was handled personally between the Commandant and the Officer

Cryptanalyst. Periodic summaries of Orange Naval movements were presented to the Commandant for review after which he would initial the report. Files relating to radio intelligence were maintained in the safe in the Decrypting Office, Building "G", U.S. Naval Prison. The Commandant emphasized the need for a cryptographic system for use by the Radio Intercept and Intelligence Organization which permitted the rapid flow of communications. On the subject of Station "C" specifically, it was reported that radio communications between the station and Cavite depended upon a low-power amateur radio transmitter constructed and operated by RMC Goodwin. Small arms had been provided to Station "C" personnel but not yet had an opportunity to conduct familiarization training except on the .45 caliber pistol.

The location of Station "C" was considered unsatisfactory due to the lack of recreational activities and isolation eventually affecting morale, the physical isolation of the station with accompanying problems in communications with the station possibly leading to danger in so much as the station had no local protection except that provided by its own personnel and weapons, and the difficulty in responding to medical emergencies at the station. In addition, traffic could be delivered to the Decrypting Office only once or twice a week which, in the event of a surprise action on the part of Orange forces, could result in a fatal delay. The station depended upon Cavite completely for material support and supplies. A cut-off of this support would result in the station soon becoming inoperative. The physical isolation of Station "C" and its dangers were emphasized by a Sakdalist uprising on Luzon during which the landline communications between the Commandant's office and the Radio Station at Los Banos were cut. Repair parties dispatched to repair the break were turned back by the Sakdalists. Although no violence was actually directed toward American personnel, the break in communications lasted 28 hours and served to cause the Commandant grave concern in the event a similar uprising might occur in the Mariveles area in which efforts were made to occupy the Radio Intercept Station. Finally, it had been determined that the expense of establishing and maintaining Station "C" even on a temporary basis at Mariveles would be excessive.

As an alternative, it was proposed that Station "C" be relocated to Cavite. This would make recreational facilities available to station personnel and married personnel could live with their families. The station would have protection available from the Marine forces assigned to the Navy Yard and medical facilities would be readily available, also. Intercepted traffic could be forwarded to the Decrypting Office with a minimum of delay while electrical power, material, and supplies would be easily obtainable. In addition, the station could be operated with considerably less expense. No new construction

would be required at Cavite with the possible exception of some renovation of an existing building or buildings to provide for soundproofing, ventilation, etc. It was estimated that the move could be accomplished for $3,000. Other factors to be considered regarding the move were if the station would have the privacy needed for an intercept station and if the receiving conditions at Cavite were suitable for an intercept station. It was common knowledge both at Cavite and throughout the Fleet that a radio station existed at Mariveles while it was estimated that with the station at Cavite, station personnel would draw little or no attention since they would simply be sailors in a Navy Yard once the initial attention created by the station's physical relocation died down. It was proposed that a study of reception conditions at Cavite be made to provide the answer to that question. Three locations were to be considered; the upper floor of the Radio Laboratory, the building then in use as a radio school, and Building "G" at the U.S. Naval Prison.

If the station was to remain at Mariveles, it could be placed on a permanent basis at the Navy Camp and equipped for operation for an indefinite period of time, or placed on a temporary basis and equipped to operate for three or four years. Equipping the station for permanent operations would require the construction of permanent, concrete buildings, two power units each capable of maintaining the station's electrical load independently, and the provision of quarters for at least four families. It was estimated that this would cost about $85,000. To maintain the station on a temporary basis (more than one year) would require $16,225 to provide two generators, a shelter for the generators, transformers, a transmitter, building improvements, antennas, increased refrigeration capacity, a temporary recreation building, and recreation equipment. An additional $11,000 would be required to construct, furnish and provide utilities for four small temporary cottages for families. In addition to all the preceding arguments, it was estimated that operation of the radio intercept station at Mariveles with no improvements would cost about $2,400 per year, or some $1,600 more per year than when located at Olongapo, and up to $6,500 per year if the various improvements recommended were implemented. While Cavite was not in a protected area, it was considered that the station would be much less vulnerable to minor raids by landing forces and attacks by air than at Mariveles even though some protection was provided at the latter location by nearby Corregidor.

On 20 May 1935, a conference was held in the Washington, D.C. offices of the Director of Naval Communications to arrive at a solution regarding the SIXTEENTH Naval District Radio Intelligence Intercept Station. The history of the station at Olongapo, its move to the Mariveles area, attempts to locate

the station on Caballo Island, funding shortages, and other considerations and alternatives were reviewed and discussed. It was decided that the question of relocating the station to either Corregidor or Caballo Island should be reopened with the Army.

In the interim, CNO informed BUENG on 27 May 1935, that an investigation of the feasibility of establishing a permanent radio intercept station at Mariveles had determined that it was not practicable to do so at the time. Reconstruction of the former cattle wharf was not approved but BUENG was requested to attempt to obtain a suitable generator so the station could continue to operate on a temporary basis. BUENG responded on 22 June that a 17 KW Diesel generator had been shipped from Boston to Cavite for installation at the Naval Radio Station, Los Banos, as an emergency unit and the generator could be installed at Mariveles if CNO approved the shift although it would leave Los Banos without an emergency generator. Installation of the generator at Mariveles would require the construction of a building (25' x 20') with suitable concrete flooring, auxiliary equipment, and fuel oil storage facilities at an estimated cost of $7,500. On 25 June, CNO (OP-20-GX) concurred in the diversion of the 17 CW generator from Los Banos.

On 25 June, CNO informed CINCAF it had been determined that it was impractical to establish a permanent radio intercept station at Mariveles due to plans to construct ammunition storage facilities and fuel oil tanks at Mariveles which would not allow sufficient space for the radio intercept station, the necessity to obtain Congressional approval for the construction of permanent facilities for the station at Mariveles, and the unresolved question of the future retention of naval bases in the Philippines.

On 20 August, CINCAF informed OPNAV that excessive power costs and the increased number of personnel which would be required to operate the generator originally programmed for Los Banos and subsequently reallocated for Mariveles, rendered that generator unsuitable for Mariveles and steps were being taken to obtain a suitable gasoline generator. The problem of a dependable supply of electrical power at Mariveles was apparently a major factor in tipping the scales in favor of relocating the station from Mariveles to Cavite. In a 27 August message from OPNAV to CINCAF and COMSIXTEEN, reference was made to COMSIXTEEN's 24 June report of favorable radio reception conditions at Cavite. OPNAV and BUENG therefore considered that the only feasible permanent solution was in the establishment of a radio intercept station at Cavite as soon as possible. On 29 August, COMSIXTEEN responded to CINCAF and OPNAV concurring in the

proposed shift from Los Banitos to Cavite. It was estimated that the move would cost some $8,000 of which $2,000 could be obtained from other projects leaving a balance of $6,000 to be funded. On 30 August, CINCAF also concurred in the proposed move.

In the Station "C" report dated 10 February 1936, it was reported that the station had been moved from the Navy Camp, Mariveles, to the second floor of the Radio Laboratory, Navy Yard, Cavite, on 4 January. The move had been accomplished completely with station personnel. Watches were discontinued at Mariveles at 1600, with a one-man watch instituted at Cavite at the same time. The old station was dismantled and loaded on a barge which arrived at Cavite at 1400, 4 January, whereupon it was immediately unloaded and installation of the equipment begun. Installation was completed on 5 January and watches initiated. The report stated that, "*The month of January has been devoted to the effecting of the best possible installation at the new station and at the same time maintaining a two-man, four-section watch and this policy has not permitted the usual amount of traffic study and research.*" It was reported that the station had three Model RAA-1 (10–1000 kHz) receivers, two Model RAB-1 (1000–30000 kHz) receivers, and one Model RAD (1000–30000 kHz) diversity receiver with automatic recording apparatus installed and operational. In February, it was planned to install a Type SE-2307 heterodyne frequency meter. It was also reported that the following equipment was not installed at the new station location due to a lack of space and because it was not required:

3 – Model RE LF receivers
1 – Model RT HF receiver
1 – Model RS-1 (GE) HF receiver
1 – Type SE-2907A crystal-controlled calibrator
1 – Model DO direction finder
1 – Model XR LF barrage receiver

It was reported that the station was experiencing a high noise level on the high and low frequencies during normal working hours in the Cavite Navy Yard; i.e., 0700–1600 Monday through Friday. Intermittent interference was experienced from the starting and stopping of electrical machinery in the Radio Laboratory workshop on the first floor and in the general vicinity of the laboratory while a constant source of interference on the low frequency band was apparently originating from the Navy Yard's generating plant. During periods when the Navy Yard was shut down, the station enjoyed practically the same level of reception on the high frequency band as at Mariveles with the advantage of a more stable and constant power supply.

Studies were being made to see what measures could be taken to improve reception at the new site through identification of sources of interference, installation of filters, installation of a transformer for the receivers' power supplies, and improvement of the antenna system. Assigned to the station at this time was one RMC (Radioman in Charge) and eight operators. Intercept assignments during the month of January 1936 were:

1. Orange Fleets (less THIRD Fleet)
2. Hozan and Bako
3. Orange aircraft and air stations
4. COMDESRON FIVE, THIRD Fleet
5. Detached units and vessels in the vicinity of the Philippine Islands
6. Tokyo and other principal stations sufficient to keep track of Orange units.

In the station report dated 2 March, it was reported that the station had one RMC and nine radiomen on board during the month of February maintaining a two-man, four-section watch with the extra man assigned to material duties in connection with work in eliminating electrical interference. The installation of a 5 KW transformer and rearrangement of the LF and HF antennas had produced some improvement in radio reception. There was no change in intercept assignments during the month. This report also contained some intercept statistics for both January and February but it was not specified if the "traffic record" statistics were pages of intercept or messages intercepted although it is thought to be the former. These and statistics for subsequent months are as follows:

| Assignment | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| 1 | 139 | 378 | 216 | 184 | 109 | 75 |
| 2 | 429 | 310 | 276 | 361 | 717 | 198 |
| 3 | 127 | 264 | 616 | 130 | 119 | 200 |
| 4 | 766 | 700 | 750 | 470 | 145 | 773 |
| 5 | 85 | 118 | 83 | 31 | 53 | 32 |
| 6 | 204 | 194 | 95 | 31 | 31 | 30 |
| 7 | 557 | 718 | 1499 | 1115 | 869 | 1267 |
| Totals | 2307 | 2683 | 3535 | 2322 | 2043 | 2575 |

During the month of March, the station still had one RMC and nine radiomen assigned although two were assigned TAD during the period 21–31 March in connection with calibrating and making the direction finder at

Canacao, or Sangley Point, operational. The watch schedule during the month was one operator 0000–0630, two operators 0630–1130 and 1130–1700, and three operators 1700–0000 (except Sunday) while intercept assignments remained unchanged. Work continued on reducing the level of electrical interference from the Navy Yard. All metal roofs of Navy Yard buildings were being grounded. Filters were being installed on the 178 electric fans in the Navy Yard; these having proved to be the greatest single source of interference. A new salt water ground had been installed to replace the former water pipe ground resulting in a great improvement.

As background on the installation of the direction finder at Sangley Point, a 19 July 1935 letter from the Bureau of Engineering (BUENG) to the Commandant, Mare Island Navy Yard, stated it had been proposed to relocate the Model CXK high frequency direction finder, which had been installed at Mare Island on an experimental basis, to Cavite for installation at an undetermined location in the SIXTEENTH Naval District. The Model CXK was no longer required at Mare Island since the personnel assigned to it had been transferred to work on other experimental equipment. On 30 October, BUENG informed COMSIXTEEN that a, "*...rotating Adcock-RAB high frequency direction finder...*" which had been developed at the Mare Island Navy Yard had been shipped from Mare Island on board the USS RAMAPO about 23 September for delivery in Cavite. Considering the site requirements for installation of the HDFD unit, BUENG suggested that, "*...a location on Sangley Point, between the Sangley Point landing and the west boundary line of the Fuel Depot Reservation, Y & D map of U.S. Naval Fuel Depot P-5838, may possibly be the most satisfactory compromise location available.*" On 5 November, COMSIXTEEN responded by message stating that based on the siting requirements forwarded by BUENG, the only two locations available were one, "*...three inches below figure nine top of Cavite drawing P-6256...*", and one 800 feet south of Building #200 on drawing (P)-6255. Of the two locations, the first was considered the best since at the second there would often be less than 500 feet separating the station from harbor shipping.

While this correspondence was flowing back and forth, COMSIXTEEN forwarded a letter on 4 October to the Chief of Naval Operations via CINCAF discussing the SIXTEENTH Naval District Plan O-7, Orange. According to the letter, the Asiatic Fleet Operating Plan O-2, Orange, under "Supporting Measures", called for the establishment, "*...as soon as the material can be obtained Radio Compass Stations at the Radio Control Station and at Cape Engano, Cape Bojeador, Encanto Point, Pandan, San Fernando Light, Cape Bolinao, Mariveles Point, and Masugbu, in order to ascertain the location of Orange vessels and assist navigation of friendly vessels.*" In an endorsement

dated 12 August 1935, CINCAF had directed COMSIXTEEN to initiate steps to obtain the required material for the project. However, COMSIXTEEN considered that the necessary material for the project should be obtained and held in reserve in the District prior to "M-Day". Material estimates for the project included nine direction finders with a frequency range of 100–18000 kHz, power supplies for those sites not having electrical power, and eight transmitters.

In a 29 November 1935 letter originated by OP-20-G and signed by a Mr. Claude A. Swanson to the Secretary of War, it was stated that the Navy had an urgent need to establish a radio direction finder project in the Philippines at a location which would provide the best possible radio receiving conditions. Extensive searches over the years had failed to identify a site meeting all of the requirements on property under Navy jurisdiction. The question of establishing the direction finder on either Corregidor or Caballo Island had been informally discussed with the War Plans Division of the Army with the conclusion that establishment of the unit on Corregidor was feasible. It was requested that approval be given to the installation of the direction finder on either island on a site agreeable to the Army and with the Army's cooperation and assistance.

The Model CXK HFDF unit had apparently been installed and was operating prior to 20 April 1936 as a letter from BUENG to the Director of the Naval Research Laboratory outlined improvements based on information received from COMSIXTEEN which should be incorporated into the Model CXK HFDF unit to meet the requirements of the Philippine area. These improvements included improved shielding and additional coupling coils for satisfactory operation below 8000 kHz; preferably to 4000 kHz, improved ventilation of the power packs, and improved sensitivity.

In Memorandum RSL #9 dated 27 March 1936 signed by LTJG R. S. Lamb, USN, from the Officer in Charge, Asiatic Security Unit to CINCAF, it was reported that receiving conditions at Station "C" had improved during the month and that a systematic program of identifying and correcting sources of electrical interference was underway. Plans for the proposed Corregidor Security Station were being drawn up and would be submitted to the Army Quartermaster Department for estimates. The project would be under the cognizance of the District Radio Material Officer and the Cavite Navy Yard Public Works Officer. The direction finder was being calibrated using transmissions from the USS *Paul Jones* (DD 230) as it circumnavigated Luzon Island. It was also planned to use transmissions from the seaplane tender USS *Heron* as it traveled to Shanghai and the USS *Chaumont* (AP 5)

then enroute from Manila to Guam, as other sources of calibration transmissions.

The first available Summary of Radio Intelligence from the Asiatic Security Unit is contained in a letter serial #13 dated 8 April 1936, and reported Orange Naval and Naval Air activities, in general. There was no reference to this being the first of such reports but it is not known when the reports started. Earlier available memoranda from the Asiatic Security Unit reported on the results of analytical efforts and technical details. It appears that the Summary of Radio Intelligence was published on a weekly basis during this period.

The station report for April 1936 showed little change over the March report except for a change in the watch posture to allow for the training of two new men and the loss of one man who was assigned to the HFDF station at Canacao. The watch schedule called for one operator 0000–0630, two operators 0630–1130, one operator 1130–1700, and two operators 1700–0000 with the new operators on watch with experienced operators for an expected period of two months.

In the Summary of Radio Intelligence for the week ending 5 May 1935, some statistics were given indicating Station "C" 's ability to cover Japanese communications:

| Station | Msgs Originated | Msgs Intercepted |
|---|---|---|
| Tokyo | 265 | 63 |
| Sasebo | 295 | 35 |
| Yokosuka | 178 | 34 |
| Kure | 192 | 29 |
| Bako | 90 | 28 |

In the station report for May, it was noted that the station had one RMC as Radioman in Charge, one RM1 assigned to maintenance duties, and two RM1, four RM2 and two RM3 assigned as operators. On 28 May, the station was shut down during the day to enable the Public Works Department to remove a wall thus permitting the expansion of the station across the entire southwest end of the building which provided an additional 90 square feet of floor space and with two additional windows, much improved ventilation. It was also reported that the Model XF low frequency equipment had been thoroughly overhauled by the Radio Laboratory and would be installed by 1 June. It was thought that this equipment would have certain advantages over

the Model RAA equipment, particularly during periods of heavy static.

In June, the station had the same number of personnel as in May and was maintaining a two-man, four-section watch with the Radioman in Charge and the man assigned to maintenance duties standing watches if the level of intercept activity required. Based on a statement in this report, it is believed that RMC Max C. Gunn was RMIC at the time. In the report was also a summary of general remarks on the operation of the station during the six months since the move from Mariveles to Cavite. It was generally considered that the performance of the station had been good considering a number of negative factors. It was considered that the space allocated for the station resulted in cramped and crowded conditions. In addition, the location was apparently considered temporary which resulted in a policy of keeping expenditures for improvements at a minimum pending the selection of a permanent site. The location of the station in the industrial section of the Cavite Navy Yard also resulted in considerable electrical interference which, over the course of time and through considerable effort, had been greatly overcome.

In July, the numbering system for the intercept assignments changed and no key was given defining the targets. Monthly intercept totals for July and succeeding months are:

| Assignment | July | August | September | October | November |
|---|---|---|---|---|---|
| 0 | 1301 | 904 | | | |
| 1 | | | 1045 | 1038 | 510 |
| 2 | | | 1294 | 829 | 583 |
| 3 | 380 | 473 | 415 | 284 | 283 |
| 11 | 63 | 171 | 341 | 198 | 63 |
| 22 | 107 | 106 | 235 | 126 | 95 |
| 30 | 79 | 73 | 50 | 131 | 70 |
| 41 | | | 427 | 458 | |
| 43 | 443 | 369 | 400 | 496 | 436 |
| 45 | 69 | 132 | | | |
| 49 | 31 | 31 | | | 57 |
| 12 | | | | | 3 |
| 70 | | | | | 2 |
| 91 | | | 14 | | |
| 100 | 0 | 0 | | | |
| Totals | 2473 | 2259 | 4221 | 3560 | 2102 |

The July report also reflected an apparent increase in personnel or a change in how they were reported. At the traffic station, one RMC was assigned as Radioman in Charge while three RM1 and five RM(2) were assigned as watchstanders maintaining a two-man, four-section watch posture while one RMC as Radioman in Charge, one RM1 and one RM2 were assigned to the HFDF station at Sangley Point. Watches were maintained at the HFDF station from 0600–2200 daily except when the fleet was underway or some other activity required a 24-hour watch.

In August, the number of personnel assigned to the traffic station had increased to one RMC (RMIC), three RM1 and one RM2 as supervisors/operators, and three RM3 operators standing a three-man, four-section watch. The number of personnel and the operational status of the HFDF station remain unchanged.

September traffic totals reflected both an apparent change in assignments and a significant increase in traffic volume. It was noted in the report that this increase in traffic had been accomplished at the same time as an increase in electrical interference in the vicinity of the station due to the construction of a new radio station for Los Banos. This increase in traffic volume reflected the Japanese Fleet maneuvers conducted through September and concluding on 22 October.

The 17 September 1936 letter from CDR L. F. Safford to LT R. S. Lamb at SIXTEENTH Naval District Headquarters, CDR Safford stated that he was very interested in LT Lamb's report on the "Rotating Adcock DF" dated 28 August. CDR Safford stated, "*You and your operators did a splendid job and you have my heartiest congratulations. You have made history, as this is the first occasion when a U.S. DF station has tracked a foreign ship. The results are all the more gratifying since 70% of the bearings were taken on frequencies below the 'effective' limit of the apparatus. As a result of your good work, another Adcock will be sent to Cavite for 'reconditioning' and thence to Guam for use.*" CDR Safford wanted to see loop DF units given a fair and thorough test against the rotating Adcock and he suggested that both Guam and Cavite assign one man exclusively to the loop DF and another to the Adcock so they could become expert in operating the equipment in order to be conclusively certain which was the better equipment. CDR Safford stated, "*I regard the CXM only as an expedient — something to get started with. I believe the permanent DF stations will eventually have fixed Adcocks and the portable station a loop collector with cathode ray visual indicator. But both types of apparatus need further development. The Rotating Adcock is good only on the higher frequencies; likewise a new type of DF that Bellevue has been*

*developing. The only available apparatus that will work on the 4000–5000 kHz with a weak signal is the Coast Guard type. And if they can make it work we ought to. Our operators are as good as theirs, and they can make the CXM work if the problem is properly explained to them."*

During the month of October through the 22nd, it was reported that normal three-man, four-section watch was modified with a reduction to two men on the midwatch with the extra man assigned to the eve-watch the following morning. After 22 October, one man was transferred to the HFDF station and one man to the Officer in Charge, Asiatic Security Unit, for translation work. Therefore, the station was reduced to a two-man watch on eves and mids and three men on days. The HFDF station had one RM1 (RMIC) and one RM2 assigned and the station undertook special tracking problems.

In November 1936, Station "C" maintained a two-man watch posture on day and eve-watches with one man on during mid-watches. It was also reported that the Radioman in Charge had completed drawing up plans for the permanent installation of the station. Funds to accomplish the work had been requested from the Bureau of Engineering with plans to complete the work in December.

# III

# 1937 — 1938

ON 6 January 1937, the Officer in Charge, Asiatic Security Unit, forwarded a report of the tests of the Model CXM direction finder to the Chief of Naval Operations (Communication Security Group) via COMSIXTEEN and CINCAF. The Model CXM DF had been located on the roof of the Radio Laboratory, Cavite Navy Yard, during the tests and one thousand bearings were taken during the period 15–30 December 1936. The summary of the tests concluded that the equipment was not suitable for sky-wave direction finding. Only occasional bearings could be taken on frequencies over 8000 kHz and they were generally erratic. Radio reception up to 8000 kHz was comparable to a standard receiver but signal loss increased in direct proportion to increased frequency. As indicated by the tests, the average useful range of the equipment was:

| Frequency (kHz) | Range (miles) |
|---|---|
| 200–700 | 300 |
| 1900–3200 | 100 |
| 3000–5200 | 50 |
| 5000–8000 | 30 |
| 8000–12000 | 20 |
| 12000–18000 | 20 |

It was considered that the Model CXM could be of use for inshore tracking but was of no value for long distance, high frequency strategic tracking.

The next available station report is for the month of February 1937. The report contained a complete listing of personnel assigned to the station and confirmed that RMC Max C. Gunn was Radioman in Charge of Station "C". The personnel of the station were divided into four watch sections of three men with one of the operators also serving as the watch supervisor. In addition to standing their normal watches, one man was assigned to electronic maintenance duties, one man was tasked with typewriter mainte-

nance, and two worked with translations when they were not required for indexing traffic. The indexing of traffic was done by two men on each watch on their day off, one-half each day, alternating. It was reported that, "*Due to the great amount of traffic being copied by this station, this system keeps the men busy at this work.*" Two other men, RM1 M. J. Royer, (RMIC) and RM2 I. S. Bemis, were assigned to the HFDF station at Canacao. The HFDF station was reported to be under the direction of the Officer in Charge, presumably of the Asiatic Security Unit, for operations and under the Radioman in Charge, Station "C" for maintenance and material. In addition, one man, RM1 N. V. Lewis, was assigned to the office of the Officer in Charge for research work. It was also mentioned that the station had been employing automatic recording equipment on the Sasebo to Tokyo circuit which had enabled the station to improve intercept of the circuit, both in quality and quantity. It was the opinion of Station "C" that automatic recording equipment could be well utilized and additional HF receivers and recording equipment had been requested in originated by the Officer in Charge.

In March 1937, the composition of the Operations Section of the Station "C" monthly reports changed from general information on the station's operation to details on the operational mission and brief summaries of the information derived from Japanese communications as well as radio reception conditions.

On 22 June 1937, LT Holtwick reported that through the intercession and cooperation of the Commandant, RADM Meyers, the personnel situation at Station "C" had improved considerably. Unmarried personnel were being moved into new quarters recently vacated by the Marines and had begun receiving $.50 per day commuted rations. The four married enlisted personnel (Green, Conant, Gunn, and Pelletier) had to provide their own quarters and were only receiving the $.50 per day commuted rations but were no worse off then they had been before. A new room was also being obtained for CPO quarters. In comparison with earlier days at Olongapo, Mariveles and Cavite, personnel were relatively well off or at least not much worse off then other enlisted personnel on station.

In the August 1937 month report, it was stated that induction from man-made static and Cavite's high-power transmitters continued to be a problem for Station "C" in spite of efforts to reduce the interference. It was stated, "*Apparently, complete freedom from this trouble will not be realized until the activity (station) is removed to another location.*" A penciled note on the bottom of the page containing this statement indicates that a later report stated that conditions had shown improvement.

Based on information on coverage assignments contained in the November report, one intercept position had two Model RAB receivers, the second had one Model RAC and two Model RAB receivers while the third position had one Model RAB and two Model RAS receivers installed. The bulk of research, presumably search, was accomplished on Position #3. In addition to this equipment, one Model RT and two Model RAA receivers were available as needed. Automatic recording was done if a volunteer operator was available, by utilizing the Model RAB receiver in Position #3. Subsequent reports showed that the equipment was shifted around between the different positions as required by mission and availability of personnel.

In November 1937, CINCAF requested the Navy Department send four Model XAB-HRO HFDF units to Cavite for distribution to intercept stations to form an "*organization outlined in war plans, Asiatic Fleet and 16th District...*". The Model XAB-HRO was a rotating Adcock HFDF unit.

On 23 November, CNO (OP-20-GX) forwarded a letter to BUENG reporting on direction finder tests using a rotating Adcock (XAB-RAB) and a special HFDF unit (CXK) at Mare Island, rotating Adcock HFDF's (XAB-HRO) at Sand Point, Lualualei and Ford Island in Hawaii, and Imperial Beach, California, as well as several navigational loop DF stations on various targets including aircraft. The tests concluded that it was considered that the Model XAB-HRO direction finder was worthy of experimental development to determine its further possibilities. Therefore, it was recommended that the Bureau of Engineering reopen experimental design work on the XAB-HRO to determine the suitability of the equipment as a permanent installation including:

a. Cheap temporary housing or shelter for the equipment

b. A provision for the operator to sit down while on watch

c. Extension of the frequency range of the equipment at both ends of the scale, and

d. The addition of such mechanical devices as a visual bearing indicator and recorder provided such devices would not degrade the existing efficiency of the equipment.

In April 1938 the monthly report made reference to "*important Combined Fleet developments*" and outlined equipment and personnel plans to increase coverage. It was planned to rent two Model HRO receivers at $25

per month and defer personnel transfers to bring the station up to 16 men. However, authorization to rent the receivers was not received and the personnel were therefore not required. The station did acquire the temporary use of a Patterson PR-10 receiver for radio-telephone research and a Model CXM portable HFDF unit. The station's normal complement of equipment at this time was five Model RAB, one Model RS, one Model RT and three Model RAA receivers and one automatic recording equipment.

In May, the initiation of active Japanese naval operations against South China was mentioned. The volume of radio communications during the attack was very light, leading to the assumption that most of the operations were being carried out in accordance with a pre-arranged schedule. The first indication of the hostilities was the appearance of the aircraft carrier *Soryu* in communications controlled by the Commander in Chief, FIFTH Fleet. This reinforcement was followed by the attack on Amoy.

In the August 1938 report, it was mentioned that Station "C" was maintaining a two-man watch from 0100–0900, and a three man watch from 0900–1800 and 1800–0100. The intercept mission was totally against Japanese targets. The report also stated that the station's primary responsibility was to furnish the Commander in Chief, Asiatic Fleet, with all important Japanese Naval information. To accomplish this task to the fullest, it was projected that the station required a four-man watch utilizing eleven HF and two LF receivers. If additional coverage of communications was desired, it would require extra equipment and personnel. In addition, personnel were required for maintenance and to support the Officer in Charge. Therefore, it was concluded that, excluding HFDF personnel, the station required a complement of two RMC, 16 operators, one man for maintenance, and two for the OIC's office. Penciled changes to the report deleted the one man for maintenance and the two for the OIC's office and changed the equipment requirements from eleven HF and two LF receivers to eight HF and three LF receivers.

In a 26 September 1938 memorandum from the Director of Naval Communications (OP-20-GX) to the Chief of Naval Operations, it was stated that the Cavite was a strategic tracking station functioning as control of the Asiatic Group under the control of CINCAF with outstations at Guam and Shanghai. Stations of the Asiatic Group were not manned continuously and, therefore, required only two men per station. The billets for the direction finder stations were included in the intercept stations' existing allowances and, since the DF stations were collocated with intercept stations, sudden requirements for DF personnel could be met out of the intercept complement.

# IV

# 1939

THE Asiatic Group was still organized as of 11 July 1939 when it was mentioned in an OP-20-GX memorandum to OP-20-A.

In March 1939, it was reported that the station had thirteen radiomen on board. Seven RM2 were assigned as watchstanders; two RMC and one RM1 sat a circuit when not involved with routine duties such as maintenance, correspondence or research; one RM2 was assigned to the OIC's office, and one RMC and one RM2 were assigned to direction finder duties.

In April 1939, LT Dennis was at Cavite assisted by CAPT A. B. Lasswell, USMC, a recent Japanese language graduate. Digging was well underway on the Corregidor intercept tunnel, and as of 7 April, was reported to be about 30% complete with costs running above estimates. New estimates and final plans for the tunnel and quarters were promised by "*first available transportation*". Tests of the Model DT-1 HFDF unit at Cavite had been started in March with the equipment first set up in the same location as previously selected for the Model XAB-RAB unit — on the beach at Canacao about 300 yards from the nearest 600' steel tower of the high-power transmitting antenna. After about two weeks of testing, the Model DT-1 was dismantled and relocated to the end of Sangley Point about one mile from the high-power transmitting station and about one-eighth of a mile from the nearest metallic structure. After some two weeks of testing at this location, the equipment was relocated back to the Canacao beach location where further testing with a Naval aircraft as a target determined that the steel tower caused distortion on bearings taken through the tower.

On 30 April, LT Dennis reported that the primary mission of the Communication Intelligence Unit was to obtain for the Commander in Chief, Asiatic Fleet, all information by traffic analysis and cryptanalysis. However, since 1 November 1938 this had been subordinated to the effort to make a rapid entry into the next Japanese naval code which had been introduced on that date.

In a May 1939 report, the operations section made reference to a "Miscellaneous Section" of the report which included camera-oscillograph reports, maintenance/material, the Telediphone and super-high frequency reports.

In July, it was reported that the station had intercepted 11,118 sheets of traffic during the period 1–26 July for an average of 427.6 sheets per day. The July report also made reference to a two-man watch from 0100–0900, a four-man watch from 0900–1800, and a three-man watch from 1800–0100. This watch posture was maintained through at least 31 October. Station "C" assignments reported in the July report were as follows:

| Assignment | Description |
|---|---|
| 1. a. | Tokyo to Shanghai |
| b. | Shanghai to Tokyo |
| 2. a. | Tokyo to CINC FIFTH Fleet |
| b. | CINC FIFTH Fleet to Tokyo |
| 3. a. | Tokyo to Takao |
| b. | Takao to Tokyo |
| 4. a. | FIFTH Fleet circuits; intrafleet; Fleet to Takao and Bako |
| 5. a. | Combined Fleet circuits (when and as directed) |
| 6. a. | CINC's China Fleet circuit (Central China) |
| 7. a. | Tokyo to CINC FOURTH Fleet and Ryojun |
| b. | CINC FOURTH Fleet to Tokyo |
| c. | Ryojun to Tokyo |
| 8. | LOW FREQUENCY (LOUDSPEAKER) |
| a. | Takao |
| b. | Sasebo |
| c. | Bako |
| 9. | GENERAL |
| a. | Tsingtao to Sasebo |

| | | |
|---|---|---|
| | b. | Sasebo to Tsingtao |
| | c. | HFDF Net |
| | d. | Itinerant ships to shore, etc. |
| 10. | | RESEARCH |
| | a. | SHF research (high priority when Orange Naval activity disclosed) |
| | b. | Telediphone (for Washington training school, circuit analysis, etc.) |
| | c. | Camera-oscillograph |
| 11. | a. | Search for procurement of data on "Frequencies Afloat and Airborne" |

On 19 September 1939, CNO (OP-20-GX) forwarded a letter to BUENG establishing the locations and installation priorities for nine Model DT HFDF units then under construction worldwide. The first unit was to be assigned to Cheltenham and the second to Cavite.

On 4 December, COMSIXTEEN forwarded a letter to CNO discussing the cancellation of projects called for the installation of eight direction finders in the Philippines. COMSIXTEEN presumed that the cancellation was directed because of an assumption that the stations were intended as strategic tracking stations which was incorrect. The stations were to form an intermediate frequency Coastal Tracking Organization under the command of the Commander, Local Defense Forces. It was recommended that construction of the stations be approved and the initial step be the construction of four "intermediate radio compass stations" to guard the western approaches to Luzon. The eight DF stations were to be constructed at Corregidor, Cape Engano, Cape Bojeador, Encanto Point, Pandan Point (Cantanduanes Island), San Fernando Light, Cape Bolinao, and Masugbu. In CNO's response of 1 April 1940, it was stated that CNO disapproved the construction of the eight DF stations due to the projected cost of $5,000 each and that seven of the eight stations would be outside the "ultimate defense area" therefore being of doubtful military value. CNO was still of the opinion that the expenditure of funds for the stations was unwarranted. It was stated that the "Emergency Naval Radio Station, Corregidor" was nearing completion and it would be equipped with both an HFDF and an IFDF unit thus permitting the station to cover as much of the radio frequency spectrum as, "*...the present state of the radio art permits.*" Until the intermediate frequency direction finder arrived, it would be necessary to utilize the Model CXM portable DF unit then on hand at Cavite to cover as much of the IF range as possible. It

was mentioned in subsequent correspondence that the Model CXM DF unit covered the frequency spectrum from 200 to 750 kHz and from 2000 to 18000 kHz. On 21 May 1940, OP-20-GX forwarded a memorandum to DNC via OP-20-G outlining the options for obtaining an IFDF unit for Corregidor. One could be obtained by BUENG's purchase of a Model DP (100–1500 kHz) which would be expensive and result in a long delay; one could be relocated from an existing DF station which would mean decommissioning one of the stations; or one of the 88 Model DP's then on order and slated for installation in a destroyer or noncombatant ship, then in a decommissioned status, could be diverted. This was advanced as the best solution.

# V

# 1940

ON 11 January 1940, Communication Intelligence Report #1-40 was issued giving the administrative organization list of the Japanese South China Forces. Communication Intelligence Report #4-40 was dated 29 October 1940, and only Part "A" is available in historical files. Part "A" contained a General Report of Activity and reported that during the period covered by the report, 16 June–30 September, the Asiatic Decryption Unit had recovered sufficient keys and "forms" to materially assist in providing CINCAF with timely information on Japanese activities based on crypt-analysis and traffic analysis.

In the Station "C" report for October 1940 it was reported that the station had moved from the Cavite Navy Yard and had begun operations at 1700, 17 October, in the Tunnel, Fort Mills, Corregidor.

The move of Station "C" to Corregidor represented the conclusion of several years of plans, negotiations, and construction. The original idea of moving the Radio Intelligence Station to Corregidor was reportedly first conceived by CINCAF, Admiral Upham, and the Asiatic Communication Intelligence Officer, LT J. N. Wenger, in 1933. In a 12 April 1934 memorandum from OP-20-G for the Director of Naval Communications reference was made to a letter dated 27 February from CINCAF Admiral Upham, to CNO in which Admiral Upham recommended the relocation of the Asiatic Intercept Station from Olongapo to Corregidor as soon as possible. Although the Commanding General of the Philippine Department was in agreement with Admiral Upham, War Department orders barred such a move. It was therefore recommended that CNO confer with the Army Chief of Staff, General MacArthur, to obtain the necessary approval and authority from the Army to establish a Navy intercept station on Corregidor subject to the following conditions:

a. The Navy would have complete and absolute administrative control over the intercept station.

b. A commissioned officer would be placed in command of the intercept station.

c. To maintain security and secrecy, all persons would be excluded from the limits of the station except those personnel who were attached to it or were directly connected with its operation.

d. Army authorities would agree to provide and furnish the station and its personnel with all available accommodations, facilities and assistance which they could possibly place at the Navy's disposal.

On or about 29 May 1934, a proposal was informally presented to the Army which requested authorization to establish a Naval radio direction finder station on Caballo Island for military-naval purposes. On 15 June, BGEN C. E. Kilbourne, USA, responded that after due consideration, it had been decided that there was no need for immediate action as it appeared that the existing Navy direction finder station was functioning well at its present location. On 21 June, CNO (OP-20-G) informed CINCAF of the Army's disapproval of the project due to the Army's plan to undertake direction finder operations on Caballo and the desire to prevent the intermingling of Army and Navy personnel, "*...as the Army contends that it is conducive to lowering the morale of Army troops owing to differences in pay.*" In view of the Army's disapproval, CINCAF was advised to find another suitable location.

On 13 November 1935, CNO (OP-20-GX) forwarded a letter to CINCAF referencing a number of letters from CINCAF and an OPNAV letter. The letter initially expressed the appreciation of CNO for the great interest and whole-hearted cooperation of CINCAF in the development of the radio intelligence activities on the Asiatic Station with noteworthy progress having been made in recent years. The letter then went on to discuss several topics. It was stated that when the intercept station had been relocated from Mariveles to Cavite, it had been intended that the move be a permanent one since it appeared that the subject of relocating the station to either Corregidor or Caballo Island was closed and that the cost of permanently establishing the station at Mariveles was prohibitive. However, new discussions with the Army on the subject of Corregidor or Caballo showed indications that a favorable decision could be reached. In regard to CINCAF's desire to expand

the operations of the Asiatic Decrypting Unit in order to obtain additional and more timely information on Orange activities, CNO responded by stating that it was considered that more information could be obtained through the analysis of Orange radio traffic vice cryptographic research since it was believed that the numbers of skilled cryptanalysts available to CINCAF would never be sufficient to conduct cryptographic research. In keeping with the suggested duties of the Asiatic Decryption Unit; i.e., to keep CINCAF informed of the disposition of the Orange Naval forces through the analysis, interpretation, and translation of Orange Naval radio traffic, and to conduct research on Orange communications (the primary peacetime function), CNO was of the opinion that these duties would best be accomplished through the Asiatic Decrypting Unit's concentration on traffic analysis as a major source of information, by translating such traffic as might be a possible minor source of information using publications provided by CNO, by observing all Orange cryptographic systems for the purpose of detecting any changes therein and reporting such changes to CNO, and, to permit officer-cryptanalysts to continue their training, by spending a limited amount of time in their analysis of the more simple cryptographic systems with any results immediately forwarded to Washington, D.C., to prevent unnecessary duplication of effort. The letter also mentioned that a special radio intelligence cipher machine for the coordination of cryptanalytic efforts had already been forwarded to CINCAF and the Asiatic Decrypting Unit. One officer-cryptanalyst and two enlisted cryptographic clerks were enroute to the Asiatic Station to join the one clerk already on board. On 29 November 1935, the Secretary of the Navy submitted a request to the Secretary of War for authority to establish a direction finder and an intercept station on Corregidor. On 22 November 1938, the Secretary of War informed the Secretary of the Navy that the Commanding General, Philippine Department, had been authorized to begin work on the construction of the tunnel for the radio intercept station. The intervening three years had been spent with deciding whether or not to construct the project, obtaining authorization from the War Department, and obtaining funds for the project.

The Island of Corregidor is one of five islands guarding the entrance to Manila Bay. Running from north to south are La Monja, Corregidor (Fort Mills), Caballo (Fort Hughes), El Fraile (Fort Drum) and Carabao (Fort Frank). Of the five, only La Monja, a tiny islet about an acre in area, was never fortified. Corregidor, the largest of the islands — some 1735 acres in area, lies two miles from the southern tip of Bataan Peninsula and seven miles from Cavite Province dividing the mouth of Manila Bay into what was called the North Channel and the South Channel.

Corregidor is shaped like a tadpole with the head facing the South China Sea and the tail curling back into Manila Bay. Topographically, the island is divided into five parts. The high, round head of the island rising to 628 feet in elevation forms an area about a mile in diameter which was nicknamed "Topside" and was the site of all of the heavy batteries, the post headquarters, a nine-hole golf course, a huge enlisted barracks, a parade ground, and most of the living quarters. Moving eastward toward the tail of the island, the round slopes downward about 100 feet to a plateau nicknamed "Middleside" where the hospital, post stockade, service buildings, warehouses, more barracks, and quarters were located. On the north, or Bataan, side of "Middleside" was a ravine called Power Plant Ravine which contained the island's electrical generation plant. From "Middleside", the ground slopes steeply downward another 300 feet or so to "Bottomside" which is the lowest part of the island occupying an area about 300 yards from beach to beach and about 200 yards wide. Located here were more warehouses and various post utilities as well as the small village of San Jose where most of the island's workers lived. Two docks, one on each side of the island, permitted small ships to unload supplies. Separating "Bottomside" from the eastern part of the island is Malinta Hill, some 390 feet high, through which the Malinta Tunnel was dug. Passage around Malinta Hill was possible via two narrow roads carved from the slopes of the hill which were called the North and the South Shore Roads. The remainder of Corregidor is the long, twisting tail of the island, about two and one-half miles long which was given no particular name.

On 26 May 1939, COMSIXTEEN discussed antenna systems for the radio intercept station on Corregidor in a letter to the Chief of Naval Operations (Communications Security Group). The first plan called for the construction of three four-bay Bruce-type antennas for receiving and one single pipe radiator for the emergency transmitter with an estimated cost of $16,000 while the second plan called for a standard single-bay Bruce-type diversity antenna directed on Japan, a three-doublet spaced diversity for general coverage, and eight single-doublets for receiving with a single pipe radiator for the emergency transmitter with an estimated cost of $14,000. On 21 August, CNO (OP-20-G) informed BUENG that the first antenna layout plan was endorsed and the use of four-wire transmitting lines was preferred over coaxial cable due to the difficulty in repairing, replacing and servicing coaxial cable, particularly during attacks. On 4 August 1939, COMSIXTEEN reported to OPNAV and CINCAF that the completion of the tunnel on Corregidor was projected for mid-October at an estimated cost of $36,000 but overall project cost estimates were unchanged since other items of Project AFIRM were reduced in cost. It was reported that the nature of the earth at the site had required reinforcing concrete which largely accounted for the increased

costs. Quarters were to be located on a ridge north of the Monkey Point Trail.

On 31 August, COMSIXTEEN forwarded a letter to the Chief of Naval Operations discussing Projects AFIRM, BAKER and CAST. Project AFIRM was the construction of the radio intelligence tunnel on Corregidor, Project BAKER was the construction of a direction finder, and Project CAST the construction of quarters for the personnel of Station "C" on the island. Under Project AFIRM, it was mentioned that on 4 May 1939, the Philippine Department Engineer (Army) had informed COMSIXTEEN that $20,000 allocated for construction of the tunnel would be expended by 1 July and that an additional $12,000 would be required for its completion. On 24 June, COMSIXTEEN submitted a revised total estimate for the tunnel project at $28,150 for engineering and $45,000 for public works. On 28 June, the Army Department Engineer revised the public works cost upward to $46,100 while the engineering costs remained unchanged. The cost of tunnel construction alone had been increased to $36,000, as mentioned earlier, but this increase was offset by decreases in other costs. The status of Project AFIRM was that the tunnel construction was 80% complete. Project BAKER had been deferred by CNO's letter of 24 July 1936, and it was estimated that the project would cost $1,000 when accomplished. Engineering costs for Project CAST were originally estimated at $14,050 and public works costs at $107,000 although these costs would be reduced by some $6,400 if four-wire transmitting lines were used instead of coaxial cable. However, on 28 June it had been reported that revised estimated costs for the public works' portion of Project CAST was $49,700, a considerable reduction unless the earlier figure was incorrect. (Perhaps the construction of antennas was originally part of Project CAST and was shifted to another project.) Work on Project CAST had been delayed until about 1 May 1940, at which time $49,700 would be required for the construction of the quarters (public works) and $14,050 for furnishings (engineering). Project CAST called for the construction of two sets of officer's quarters, seven duplex married enlisted quarters, a ten-man barracks, roads, sewage, fixtures, etc., as well as furniture for the quarters. It was estimated that Project AFIRM could be ready for emergency occupancy by 1 January 1940, provided a public works allotment of $14,100 could be made available immediately. The allotment would apparently fund the installation of the air conditioning, gas-filtering equipment, the water supply, and the fuel and water-cooling tanks for the Diesel generator without which the generator, which was already funded, would be inoperative.

On 20 September, funds in the amount of $1,750 were transferred to the Army to cover the expense of the installation of power equipment and construction in connection with a high frequency direction finder, Project BAKER.

On 29 September, COMSIXTEEN forwarded a letter to CNO discussing the transfer of transmitters for essential communications to the "ultimate defense area". Various plans called for the transfer of certain essential communications equipments from Cavite to Corregidor and space had reportedly been provided in the Asiatic Fleet Intercept Station (Project AFIRM) for the necessary traffic receiving station while the Army had provided an underground space at Battery Geary for the transmitters. While the plans were adequate in theory, it was considered that they would not permit an efficient shift of communications in actual practice. Funds were requested which would permit the Army to enlarge the magazine designed for the transmitters as well as for the installation of air conditioning, gasproofing and other items to permit the prompt installation of transmitters if and when the time should come. It was also suggested that consideration be given to actually providing some transmitters for installation at Corregidor rather than depend upon the relocation of existing transmitters after the emergency had begun. It was estimated that the total cost would be about $29,000.

On 11 October 1939, in a message from COMSIXTEEN to CINCAF and OPNAV, it was reported that the Corregidor radio intelligence station would be given the official title of "Navy Emergency Radio Station" with the published purpose of "*providing standby (communications capability) for Cavite and conduct research (in) long distance reception with experimental equipment.*" This was officially promulgated by CNO (OP-20-G) on 21 October.

On 19 October, COMSIXTEEN informed CNO that since COMSIXTEEN's letter of 29 September the Army had determined that it was impractical to suitably modify the magazine site for use as an emergency transmitter station (Project DOG). Local Army authorities were strongly opposed to the installation of any equipment or an antenna system at Battery Geary prior to an actual emergency. However, it was considered very unlikely that a satisfactory transmitter station could be established at Battery Geary within a reasonable length of time in the event of an Orange emergency. Therefore, it was requested that authority and funds be granted for the construction of one lateral (14' x 10' x 150') in the Malinta Hill tunnel system at an estimated cost of $37,900.

On 22 December, COMSIXTEEN reported to the Commanding General Philippine Department that the construction of the Navy Radio Station on Corregidor was approximately 90% complete. It was planned to proceed with the equipment installation as soon as the equipment could be obtained so the station could be occupied and placed in operation in the event of an emergency. Funding for quarters for the operating personnel was being delayed

and it was expected that the quarters would not be ready until late summer of 1940. It was not expected that the station would be occupied except for caretakers and maintenance personnel until the quarters were ready. The letter then went on to explain that while the activities of the station were to be classified as SECRET, the large numbers of people, both military and civilian, who knew or would know of the existence of a Naval radio activity on Corregidor required a lower security classification for administrative purposes. Therefore, the official title of the station was the Navy Emergency Radio Station, Corregidor, and its official purpose was to provide a standby radio station in case of failure or damage to the Cavite radio station and, when not required as such, to conduct research on long distance radio reception with experimental receiving equipment. Administrative correspondence relating to the station would be classified RESTRICTED while correspondence relating to the military features of the station would be classified SECRET. An excerpt from a CINCAF letter regarding the station was also quoted, "*When installation of equipment begins and Naval personnel are transferred to Fort Mills, no attempt should be made to keep the presence of Naval personnel in that location unknown. It is realized that much curiosity will be evidenced at that time. However, it is believed that the best safeguard to security is a straightforward answer to queries on the basis of the function stated in paragraph 2.*" It is assumed that paragraph 2 outlined the cover story as stated previously.

On 6 May 1940, COMSIXTEEN forwarded a message to BUENG stating that an extension of the 30 June completion date to 1 December was required and an additional allotment of $3,200 was needed to complete miscellaneous additions to the project such as photographic film refrigerator (film) development equipment, equipment racks, desks and other fitting-out equipment required by an increase in activity since the original estimate was made. It was also possible that additional funds for the installation of aircraft warning lighting of the Navy antenna supports might be required. It is not known if this modified project completion date referred to Project AFIRM or the Malinta Tunnel lateral as it was referred to only as Project 5240.

On 12 June, COMSIXTEEN reported to CINCAF that there were three HFDF units available in the District. One Model DT-1 was installed and operational at Sangley Point, one Model DT-1 was in storage in the Cavite Navy Yard, and one Model DY was in storage on Corregidor. When the Navy Emergency Radio Station was placed in full commission, the Model DY would be permanently installed on Corregidor, the Model DT-1 in storage at Cavite would be moved to Corregidor, set up, calibrated, and then again placed in storage on the island in the event the Model DY was destroyed; and the Model

DT-1 at Sangley Point would be turned over to the District Communication Activities for use in conjunction with the Patrol Squadron. It was also stated that BUENG was to ship a Model DP IFDF unit for installation on Corregidor. Action was also underway to fully calibrate the Pan American Airways' direction finder stations at San Pedro, Makati (Fort William McKinley); San Fernando, La Union; and Laoang, Samar, so they could be used to assist the District Radio Security and Inshore Tracking Organizations in time of emergency.

On 18 June, COMSIXTEEN forwarded a status report to CINCAF on the Navy Emergency Radio Station. It was expected that the Army's phase of work on Project AFIRM would be completed about 15 July as would the installation of the antennas at which time the station would be ready for emergency occupancy.

Painting of the interior in a light buff color was underway and would also be completed about the same time so the installation of office equipment would begin. The installation of internal antenna and audio-monitor wiring would begin upon completion of the painting and would require about a month for completion. A Model TCC transmitter was planned for the station but, as it had not yet arrived, a Model TAF had been made available from NPO. A shell baffle was to be constructed outside the entrance to the tunnel about 1 July. Project BAKER could not be started until the antennas and other construction work was completed but the funds and the Model DY HFDF unit were available. Project CAST had begun with the duplex quarters which were to be followed by construction of the barracks and then the officer quarters with completion of all quarters projected for 1 February 1941. It was intended to occupy the Navy Emergency Radio Station as soon as all quarters had been completed.

A 28 June 1940 letter from CNO (OP-20-G) to various addressees on the subject of HFDF stations reported that an allowance of radio receiving equipment had been established for each of the direction finder and control stations. The allowance for Cavite (control) was two intermediate-high frequency receivers with four additional receivers designated as Asiatic spares to be retained at Cavite. The receiver to be assigned against the IF-HF requirement was the Model RAS-1.

On 12 July 1940, CDR L. F. Safford forwarded a memorandum from OP-20-G to OP-20-A stating that CINCAF desired to establish a Security Watch at Cavite similar to the "Department's Security Watch at Cheltenham" and requested additional billets (one RMC and four RM1/2) for the purpose.

The memorandum stated, *"In view of the present international political situation, it is considered highly desirable to approve this increase of allowance in order that the Security Watch may be established."*

On 12 October, the Cavite Navy Yard requested that an allocation of $12,000 be provided by the Bureau of Yards and Docks to purchase a Diesel generator for Project QUEEN (Navy radio lateral at Malinta Tunnel). The original Project QUEEN estimate had been made on the assumption that the Army could supply electrical power but the Army had since advised that it would be unable to furnish electrical power to any Navy projects due to overloading of the existing electrical system.

In Station "C" 's 141550Z OCT 40, it was reported that Station "C" was moving to its new location. Station "B", Guam, was to establish watches to insure maximum coverage of assigned circuits; apparently to take up the slack until Station "C" was reestablished. In the SIXTEENTH Naval District Communication Intelligence Report #5-40 for the period 1 October through 23 November, it was reported that the SIXTEENTH Naval District Communication Intelligence Unit officially moved to Corregidor on 17 October. The space was described as air conditioned and illuminated by fluorescent lights.

In the November Station "C" report, it was noted that, as indicated by tests conducted during December 1938, general receiving conditions were much better on Corregidor than at Cavite on all frequencies while the low noise level and negligible induction allowed for coverage of frequencies that could not be heard at Cavite.

On 10 December 1940, Station "C" assumed coverage of the mission of Station "A", Shanghai, which was disestablished, in addition to the normal Japanese Naval mission. The decision to close the Shanghai station may have been made on rather short notice. According to the December 1940 report, hearability tests were conducted by Corregidor in accordance with CINCAF instructions on frequencies normally used by the Japanese consular net to determine the percentage of coverage of Station "A" assignments which could be intercepted at Station "C". The results of this and an earlier similar test conducted 12 January – 12 February 1939, were forwarded to CINCAF. As stated, Corregidor assumed Shanghai's mission on 10 December and, on 16 December, the personnel and equipment from Shanghai were received by Corregidor. It was mentioned that the reception of the Japanese consular communications was almost as good at Corregidor as it had been at Shanghai with improvement noted on several stations. Corregidor had the advantage of a much lower noise level and a better antenna system than had Shanghai.

# VI

# 1941

ON 24 January 1941, a summary, to date, of the various Corregidor projects was presented:

a. Project AFIRM was a reinforced, concrete-lined tunnel completely equipped with drainage, air conditioning, gas-proofing, and electrical facilities. Construction had begun in February 1939, and the project was estimated at 99% complete with completion projected for May 1941. To date, over $70,750 had been spent on the project. AFIRM had been placed in commission in August 1940, but several items remained to be accomplished to place the tunnel in full operation and to meet all safety requirements. It was estimated that this would cost an additional $12,000 for a protective wall, a splinterproof door, improved lighting, emergency air vents, machinery spares, a cover for the Diesel generator engine, underground power cable, and obstruction lights for the antennas.

b. Project BAKER was the installation of a Navy direction finder facility on Corregidor. Although planned for some time, it had only recently been definitely established in scope and plan. The plan called for the installation of two direction finders, each equipped with power and communication facilities, located about 3500 feet east of AFIRM. Work had started in June 1940 with completion estimated for June 1941. The project was about 10% complete with $1,000 expended; largely for surveys, tests and temporary foundations. Yet required for the project were two direction finder huts, communication lines, and electrical power with a 5KW generator planned. It was estimated that an additional $2,950 would be required for completion of the project.

c. Project CAST called for the construction of two officers' quarters, seven two-story duplex enlisted men's quarters and one barracks. The buildings were to all be of native wood construction on concrete footings, equipped with oil stoves, electric lights, water and tropical furniture constructed for a total of $85,750. Begun in April 1940, the project was 80% complete with completion estimated for June 1941. Outstanding items consisted of a fresh water system for the quarters and a salt water system for fire protection at an estimated cost of $16,350.

d. Project DOG was a reinforced, concrete-lined tunnel to be equipped similarly to Tunnel AFIRM as well as a rhomboid antenna and a remote control connection to AFIRM. Work had begun in July 1940 with completion estimated for June 1941. Some $23,900 had been allocated and work was about 45% complete. This figure did not include some $17,000 received by the District Radio Material Officer from BUSHIPS for radio equipment. It was estimated that additional funds would be required as when the original estimate had been made, it was based on an underground space having no facilities except ventilation and air conditioning. Since then, it had been determined that full provisions for 75 personnel were required. In addition, limitations in electrical and water supplies from the Army, requirements for sanitary facilities, electrical interconnection with Project QUEEN, splinterproof doors, and a gas-proofing system had to be programmed for. Therefore, it was estimated that an additional $23,000 would be required to complete the project.

e. Project QUEEN was to be a main tunnel and five laterals of reinforced concrete, water-proofed with drainage electrical power, sanitary facilities, splinterproof doors and ventilation. Work had begun in July 1940 with completion estimated in August 1941. The project was about 32% complete and $68,900 had been allocated. An additional $12,000 had been requested for a Diesel generator and it was estimated that another $18,000 would be required to complete the project.

f. Project ROGER called for the construction of an underground fuel oil storage area consisting of three reinforced concrete-lined tunnels which would contain 49 steel tanks with a total

capacity of 20,000 barrels. The tanks would be connected by a pipeline to the end of South Pier. Work was begun in August 1940 for completion in June 1942, The project was 10% complete and $222,000 had been allocated. In the interim, it had been determined that smaller steel tanks of heavier construction would be required at an additional cost of $40,000 and that the entrance to each of the three tunnels should be protected which would cost another $6,000.

On 28 February, Station "C" assumed coverage of the Tokyo-Berlin circuits from Station "B", Guam. Initial coverage was maintained as well as practicable with equipment on hand while additional automatic equipment was expected from Guam via the USS *Trenton* about 10 March. On 27 March, COMSIXTEEN forwarded a letter to CNO on the inadequacy of Project AFIRM. The letter stated that it had been originally intended that Project AFIRM would be divided into two sections; one section for the Communication Intelligence Unit and the other section to be used as an Emergency Radio Receiving Station and an Operations Office for the Commandant. Under this plan the second section would have a Receiving Room, Communication Office, Code Room, Operations Office and the Commandant's Private Office. However, the Communication Intelligence Unit had been greatly augmented with both personnel and equipment with the result that almost the entire space at Project AFIRM was occupied by the unit and it was very probable that it would expand further in size. As a result, the second section was almost entirely occupied by the Communication Intelligence Unit which had priority on the use of the tunnel. A BUSHIPS letter of 21 August 1940 had directed the Commandant to select a suitable site for the construction of a small bombproof Emergency Radio Station in the Cavite area which had subsequently been estimated at about $45,000. However, it was the opinion of the Commandant that there was no readily available or suitable site in the Cavite area for such a station and it was recommended that another tunnel be constructed near Project AFIRM for use as an Emergency Receiving Station and Headquarters for COMSIXTEEN. The receivers in the proposed tunnel could utilize the same antennas as Project AFIRM and it as estimated that the total cost of construction and equipment would be about $100,000. It was informally known that the Army would look with favor on authorizing a site for the tunnel.

On 13 May, CINCAF forwarded COMSIXTEEN's letter on to CNO without recommendation. CINCAF stated that plans had been for only receivers to be located in Project AFIRM while SIXTEENTH Naval District officers, command post, etc. were to be located in one of the new tunnels which

had recently been constructed some distance from Project AFIRM and it was considered unnecessary to change these plans. On 4 June, OP-20-G forwarded a memorandum to OP-20-G discussing COMSIXTEEN's 27 March letter. It stated that COMSIXTEEN's statement that plans had been made for COMSIXTEEN to use half of AFIRM was incorrect as only the installation of "*six receiver positions for emergency use*" had been authorized in the intercept tunnel. CDR Safford stated that the need for a new tunnel should be judged upon its own merits but recommended the project be approved and that COMSIXTEEN establish his command post in existing facilities until the new tunnel was ready. It was recommended that the command post tunnel be referred to as Project EASY. In his memorandum, CDR Safford stated, "*The war plans have changed considerably since the Corregidor projects were first originated. We now expect to hold Manila Bay and use it as a base for offensive operations against Orange at the start of the war.*" On 6 June, the Director of Naval Communications favorably endorsed COMSIXTEEN's 27 March letter.

On 14 April 1941, a memorandum was forwarded from OP-20-G to OP-20 recommending an increase in the allowance for the Navy Detachment, Fort Mills, from 35 billets to 71 billets including support personnel. At the time, there were 42 personnel on board. CNO recommended approval of the billet increase on 19 April.

On 17 April, CDR Macgowan, District Communication Officer, forwarded a letter summarizing events since a previous (unavailable) letter. At the time, a 60 KVA Diesel generator was being installed at Project DOG, and both transmitters and receivers were being transferred to Corregidor. He stated that, "*Until such time as it becomes impossible to remain in exposed positions and the Commandant evacuates Cavite, the Radio Control Corregidor is expected to be in the Army Message Center on Topside of that place.*" The Army was loaning the Navy the use of five metallic twisted pair of wire from the message center to Project DOG until required by the Army. The Assistant DCO and about 80 men, including support personnel, were to be sent over to Corregidor and an old barracks on Topside, located about four miles from AFIRM, would be used for berthing. It was not to mix regular communications and intercept personnel unless required by emergency conditions. It was planned to have NPO (Corregidor) in operation by 15 May. CDR Macgowan stated that AFIRM (receivers and communications) was about three miles by road from DOG transmitters and the Commander, Local Defense Force was located at QUEEN which was alongside DOG. Reference was again made to the "special unit" in AFIRM having expanded beyond preliminary plans and the need to construct a second tunnel for "the general unit."

In a 19 June letter from CDR Macgowan to LT Robert L. Densford, reference was made to the Communication Intelligence Unit in AFIRM being cramped for space, partially due to the arrival of "*these business machines*" (presumably IBM machines) and that, "*...the extension of AFIRM will be a big improvement and will house general communications, operations office and staff control with Commandant.*"

In an OP-20-GS history apparently prepared near the end of World War II, it was stated that the IBM machine installation in the Philippines when the war started consisted of a Type 405 alphabetical tabulator, a Type 075 sorter, a Type 035 punch, and a Type 513 reproducing gang punch. The installation was run by YNC V. Knutson, YNC M. D. Jones and YN3 L. Bowers, while maintenance of the equipment was accomplished by a representative of the Watson Business Machine Company in Manila. Attempts had been made to obtain the services of ENS R. E. Cook, USNR, a former IBM engineer assigned to COMSIXTEEN as a communication watch officer at the Cavite Navy Yard, but these efforts were unsuccessful until after Cavite was destroyed by bombing on 10 December and the communications personnel had been evacuated to Corregidor to man the emergency radio station. At that time, an agreement was made between the Officer in Charge, Asiatic Fleet Radio Unit and the DCO, releasing ENS Cook to duty with the Fleet Radio Unit. As the evacuation of Manila appeared imminent, ENS Cook went to the city on 15 December to obtain whatever supplies and spare parts as were available. The IBM equipment was used only for essential work due to low card and paper stocks and, as the siege of Corregidor and Bataan continued, reportedly was eventually suspended. After the second group of Station "C" personnel were evacuated from Corregidor, it was decided to dismantle the IBM equipment for shipment to Australia since no similar equipment was available there. With the surrender of Bataan, the remaining Station "C" personnel were suddenly evacuated on 8 April 1942 on such short notice that they were unable to take equipment or personal effects, and the IBM equipment was left with orders for its destruction if it proved impossible to ship it out of Corregidor.

According to a memorandum dated 13 February 1948, then LCDR R. E. Cook reported a conversation with Mr. Kevin Mallin who had been the manager of the Manila IBM office before World War II and had served as a Major attached to USAFFE during the war. According to Mr. Mallin, the IBM equipment left on Corregidor was not destroyed as ordered and as had been reported, but was captured by the Japanese Army and subsequently taken by the Japanese Navy to Tokyo for examination. The Japanese Navy reportedly spent more than a year attempting to reassemble the equipment and

then pulled one of the former Tokyo IBM office men out of a concentration camp to get him to reassemble the equipment. He was able to work on it for over another year without accomplishing the task as he deliberately stalled whenever possible. As a result, the Japanese were believed to have been unable to learn anything about the equipment.

In a letter dated 3 July 1941 from CDR L. F. Safford (OP-20-G) to LT R. J. Fabian, Navy Detachment, Fort Mills, CDR Safford responded to some points raised in an earlier letter from LT Fabian. One item dealt with the Electronic Cipher Machine (ECM) in which LT Fabian was directed to begin using the ECM Mark II and utilize the ECM Mark I as a standby and for overloads until it was converted, at which time the Detachment would have two machines to use for cipher traffic. On the subject of forwarding intercept traffic, LT Fabian was informed that traffic could be forwarded either by lockbox via commercial airlines in paper form or as microfilm, or via U.S. registered mail delivered directly to the airplane without going through the Philippine Post Office.

A billet listing for Radio Stations, SIXTEENTH Naval District, dated 24 July 1941, shows a total of 175 billets allocated with 72 billets at Cavite, 26 at Canacao, 5 at Olongapo, 5 for the direction finder at Fort Mills, and 67 designated as Fort Mills "specials".

On 24 October 1941, LT L. W. Parke, USN, at OP-20-G, forwarded a letter to LT John M. Lietwiler on Corregidor. The letter discussed in general terms some items regarding cryptanalysis of Japanese traffic as well as delays which were being experienced in receiving hard copy traffic from Corregidor and Guam. According to the letter, no traffic had been received from Guam since 30 June and none from Corregidor for the period 10 July through 14 August. It was considered that the delays were far too great and plans were being studied to either forward the traffic on onion-skin paper via air freight at $2.50 a pound or on microfilm via air mail. The air freight idea was preferred by LT Parke since it would not require the installation of photographic equipment at each site as well as OP-20-G in Washington, D.C. LT Lietwiler responded on 16 November and endorsed the air freight shipment of traffic on onion-skin paper since he stated it would be practically impossible for Corregidor to handle the volume of traffic being forwarded if they were to use microfilm. LT Lietwiler also stated that all of Corregidor's resources were being devoted to trying to keep up with current cryptographic traffic, and no work was being performed on old material. According to the letter, enough current traffic was read to keep two translators very busy.

In the Direction Finder Section of the Station "C" report for October 1941, it was reported that the station was assigned a Model DT HFDF unit, serial #10.

# VII

# 1942

ON 1 January 1942, CAPT Safford forwarded a memorandum to OP-20 regarding communications on Corregidor. He reported that as of 15 May 1941, eight transmitters — a Model TAB (2 KW, 100–555 kHz), a Model TAD (100 W, 2000–3000 kHz), two Model TAF (1 KW, 4000–4525 kHz plus 2nd, 3rd and 4th harmonics), two Model TBA-1 (1 KW, 4000–26000 kHz), a Model TBB (5 KW, 4000–26000 kHz) and a Model TCC (1 KW, 2000–18000 kHz), the latter controlled from AFIRM, were installed in Project DOG on Corregidor. In case of emergency, it had been estimated that one IF and three HF transmitters could be transferred from Cavite via a Navy tug to Corregidor in seven hours but it was not known if this had actually been accomplished. In addition, the Army had two 10 KW HF transmitters on the island; one installed "Topside" and the second underground. One antenna was provided for each Navy transmitter and the antennas were interchangeable.

On 8 January 1942, COMSIXTEEN reported to OPNAV that all radio intelligence publications had been destroyed except the RIP 5 typewriters, RIP 40A and 40D, and all CI ciphers. The message also stated that the station was, "*...unable (to) put PURPLE in operation again. Destroyed...*". The station was not retaining any copies of traffic (presumably intercept traffic) except one category which was being destroyed as soon as it was read. It was not planned to start up files again until the situation warranted. Also mentioned was that an individual named Grisham had been killed in a motor accident.

YN3 Kenneth F. Grisham was crushed to death by an overturned tractor shortly after the first bombing attack and was the only casualty sustained by the unit on Corregidor. According to CWO Burnett, YN3 Grisham had volunteered to help move stores from North Dock to Malinta Tunnel. YN3 Grisham was buried in an emergency graveyard located between the battery charging shack and the Model DT HFDF building.

In a 23 January memorandum signed by John Redman from OP-20-K

to OP-20-A, it was stated that there were 76 radio intelligence personnel on Corregidor consisting of eight officers, 43 radiomen and 25 yeomen. The loss of this group would represent a severe setback to Communication Intelligence activities. It was strongly recommended that thought be given to the evacuation of at least some of the personnel, "*...should there be early prospect of losing Corregidor.*" It was also noted that the British Radio Intelligence Unit at Singapore was being moved to Colombo, Ceylon.

On 31 January, COMINCH transmitted the following message to CINCAF:

| | | |
|---|---|---|
| From: | COMINCH | Jan 31, 1942 |
| To: | CINCAF | 011500 CR 108 |
| INFO: | OPNAV | |
| | COMSIXTEEN | |

SINCE THE WITHDRAWAL OF SINGAPORE CI UNIT TO COLOMBO, COMMUNICATION INTELLIGENCE ORGANIZATION UNDER YOUR COMMAND IS OF SUCH IMPORTANCE TO SUCCESSFUL PROSECUTION OF WAR IN FAR EAST THAT SPECIAL EFFORT SHOULD BE MADE TO PRESERVE ITS CONTINUITY. SUGGEST CONSIDERATION PARTIAL EVACUATION FORT MILLS UNIT TO ESTABLISH NEW CI UNIT AT ... OR AUSTRALIAN BASE. SEE OPNAV 111750 CONFIDENTIAL. DEPT WILL INITIATE SHIPMENT RECEIVERS AND OTHER EQUIPMENT AS RECOMMENDED.

On 3 February, CINCAF informed COMINCH that a nucleus of CI and RI personnel totaling 28 men was to be withdrawn from Fort Mills. The station personnel had been subdivided into smaller units each capable of independently carrying out all RI and CI activities. It was planned to establish the initial group where they could operate in coordination with British forces. It was not known what equipment and other material would be evacuated from Corregidor with the group but it was expected that seven to nine receivers, test equipment, a Model DT HFDF unit, and photographic copies of all useful records would accompany the group. On 6 February, COMSIXTEEN informed OPNAV that the group had been evacuated the previous night and was enroute to Bandoeng on board the USS *Seadragon* (SS-194). Included in the group were four officers, three RMC, four RM1, two RM2, three YN1 and one YN2. Equipment evacuated included a Model DT HFDF unit, eight receivers, various publications and ciphers, photographic equipment, and spare parts and tubes.

The COMSIXTEEN message also reported that the feeders for six rhombic antennas were completely out due to bombing while three (probably feeders) were still operative. Intercept coverage could be maintained using a single-wire antenna, if necessary. The Model DT and DY HFDF units were still intact but only the Model DF IFDF unit was available as a spare since the other Model DT unit had been shipped out with the first evacuation party. It was estimated that there was a three-month supply of ECM and recorder tape and a four- to five-month supply of material for the IBM remaining on hand. An artillery bombardment from Batangas had begun that morning and considerable material damage was expected.

On 17 February COMSOUWESTPACFOR informed COMINCH that approximately 15 additional members of the Corregidor Special Intelligence Unit would be evacuated on or about 20 February. This would leave at Corregidor, "*...a reading unit, DF operators, RI section and (a) group for copying and forwarding DIP traffic.*" It was reported that the first group to be evacuated was installed at Bandoeng and beginning operations could be maintained on Java for a worthwhile period of time, the second group would be sent there. However, it was intended to, "*...secure a timely withdrawal of all special intelligence personnel to whatever location in Australia it appears will be profitable either in or outside of ABDA (American-British-Dutch-Australian) area...*".

On 24 February, COMSOUWESTPACFOR informed COMINCH that it had not been possible to evacuate the additional CI personnel as planned in the message of 17 February due to lack of passenger space. The group evacuated to Bandoeng was then enroute to a port on the west coast of Australia with plans to possibly reestablish the group at Fremantle.

On 5 March 1942, COMINCH directed COMSIXTEEN, "Evacuate personnel of Radio Intelligence Unit soon as possible. If space cannot be made available in submarines use any means of transportation to get them at least to southern Philippines or take all steps possible to prevent loss of personnel or Radio Intelligence Unit."

On 12 March, LT John M. Lietwiler, USN, Officer in Charge of the Fleet Radio Unit, forwarded a list of two officers and twelve enlisted personnel who were to comprise the evacuation party scheduled for departure on Saturday, 14 March. It was stated that the men's health records were at Monkey Point while their service and pay records were at QUEEN Tunnel. The personnel were to report to the Senior Naval Officer at the point of debarkation, "*...for further transfer to Melbourne, New South Wales, Australia, there to report to*

*the Senior U.S. Naval Officer Present and to the Officer in Charge of the Commander Southwestern Pacific Forces Special Radio Unit for duty.*" With the group's departure, LT Lietwiler took the opportunity to forward a letter summarizing the unit's activities over the past few months. LT Lietwiler stated that all files and records had been reduced to a minimum, "*...in anticipation of a last minute burn party — which I believe not too far in the future now.*" Coverage of diplomatic and consular communications would be discontinued with the departure of the second evacuation party. Reference was made to a "non-cooperation dispatch" relative to the Army. LT Lietwiler stated that the only way the unit could be of use to the Army was to assist them in air warning activities. The unit had a telephone line to the "ACP" (possibly Army Command Post) at Malinta Tunnel which the unit had been using as much as possible. Unit translators had also spent considerable time translating captured diaries and similar material of little value so it was thought that complaints of non-cooperation on these points were without justification. He did point out that the unit was not providing the Army with information on the general situation and fleet movements obtained by the unit, due to a lack of security awareness on the part of the Army. An example cited was a diplomatic translation sent to Manila in November, the contents of which were overheard being discussed on a golf course shortly afterward. Another example was information provided the Army regarding a Japanese convoy schedule in Olongapo at a specified time. Sometime afterward, the Japanese commander in Manila urgently changed the convoy's orders which resulted in its arriving safely in Lingayen because of information the Japanese had picked up from a U.S. Army radio transmission. LT Lietwiler's opinion was that further security breaches could very well cause the Japanese to change their code. LT Lietwiler also reported having problems with other Naval elements regarding security; primarily with non-CI personnel being allowed access to the AFIRM Tunnel. LT Lietwiler then discussed problems relating to the FRU's being removed from CINCAF's direct control and placed under COMSIXTEEN, evacuation, and some problems with non-CI personnel in areas other than security. His letter closed with the comment that the next letter he would send would either be from Australia or Japan. On 15 March, the second party was detached from the unit for evacuation.

In the Direction Finder Section of the Station "C" report dated 15 March 1942, it was reported that during October and November 1941, the HFDF installation on Corregidor had been completed. The buildings for the Model DT and the Model DY HFDF units were connected to the main radio station by underground telephones lines. In November, the installation of a gasoline-powered emergency generator made the HFDF installation self-supporting in the event of a disruption of its outside power supply with sufficient capacity

to supply all requirements for battery charging and lighting. The unit was located about midway between the two DF buildings with underground electrical cables connecting them with the generator. It was reported that the Model DT HFDF unit had been operated on a 24-hour watch since 1 October, and the HFD personnel had lived in the field with the equipment since December. At the time of the report, this 24-hour watch was being maintained by two men. When there had been more HFDF operators, a continuous search of all frequencies was maintained but with the reduction in personnel, it was possible to only maintain a watch on known frequencies and search only during periods of satisfactory reception. When receiving conditions were poor, the HFDF operator assumed an "on call" status responding to the telephone while the intercept operators maintained the search mission. The Model DY HFDF unit was being maintained in a fulltime standby condition ready for use if the Model DT HFDF unit failed.

On 19 March, LT Lietwiler forwarded a message to OPNAV reporting that two officers, six RMC, one YNC, five RM1, three YN1, one RM2, one YN2, one AG1 and one MMC remained at Station "C" and were operating the station on a 24-hour basis although coverage was greatly reduced. Every effort was being made to complete the evacuation but it was agreed that submarines were the only safe means of transportation due to increased Japanese destroyer patrol activity. If only a partial evacuation of the remaining personnel was possible, it was planned to evacuate the two officers and all Kana-trained personnel in the order of their Kana proficiency. Operations had shifted to the Model DY HFDF unit while the Model DT and the IBM equipment were being packed into an estimated 50 boxes weighing 7.5 tons. The Model DY HFDF unit would be destroyed upon departure unless the Army could use it. Authorization was requested to include ENS Cook in the evacuation so he could reassemble the IBM machines when they reached their final destination. Correspondence and message file[s] up to 1 March were being destroyed but a complete "AN" intercept file was being retained for possible shipment to Melbourne. On 28 March, OPNAV responded agreeing with the transfer of ENS Cook with the IBM machines in the event that they, the machines, were shipped. It was also mentioned that the IBM Company had stated that there was no IBM equipment available in Australia.

On 3 April, COMSIXTEEN reported to COMINCH that 36 personnel from the Radio Intelligence Unit had been evacuated from Corregidor to Australia on board the USS *Permit* (SS-178) on 15 March and that the remaining 21 personnel would be evacuated on the first available submarine. COMSIXTEEN also reported that there were 198 Naval officers remaining on duty in the Philippines.

On 6 April, a message from COMSOUWESTSEAFRON to Radio Cavite referenced a Cavite 151230 message and stated, perhaps for confirmation, that 21 personnel from the Radio Intelligence Unit plus four other personnel had been evacuated on board the USS *Snapper* (SS-185) and that this was understood to complete the evacuation of the Radio Intelligence Unit. The personnel had, in fact, been evacuated on board the USS *Seadragon* rather than the USS *Snapper* as originally planned.

In the meantime, the previously evacuated personnel were busy reestablishing themselves in Melbourne. On 8 April, it was stated that the Melbourne unit was established in an exclusive Australian-American RI-CI building, known as Monterey Flats, about three miles from the center of the city, and that completion of the Melbourne (Morabin) intercept station was soon expected. On 9 April, the Melbourne unit responded to an OPNAV message stating that receiving conditions in the area of the Morabin intercept station were unknown and would remain so until the station was operational. The message also advised against sending any personnel to China until the Melbourne unit was functioning properly. A 4 April OPNAV message had proposed reestablishing the Radio Intelligence Unit in China as a way of promoting a closer relationship with the Chinese and eliminate concern over the loss of Corregidor's coverage of intermediate frequency and other short-range transmissions in the China Sea–Japan area. When the Melbourne unit was fully operational, it was estimated that two radiomen could be spared for transfer to China but no officers could be sent.

On 12 April, COMSIXTEEN reported to OPNAV via message that, "*All papers and equipment left behind by LT Lietwiler have been totally destroyed...*". As noted, this was evidently incorrect in the case of the IBM equipment. Another COMSIXTEEN message of 12 April forwarded a listing of the final group of Radio Intelligence Unit personnel who had been evacuated on board the SS *Seadragon*.

At 060210Z MAY 42, COMSIXTEEN informed OPNAV that all publications and machines had been destroyed. On 6 May, Corregidor surrendered to the Japanese forces and the final message was transmitted from Radio Cavite to Radio Honolulu, "*Going off air. Good luck and goodby. Callahan and McCoy.*"

On 9 June 1942, LT Lietwiler forwarded a letter to CAPT L. F. Safford summarizing the last days on Corregidor and subsequent event[s]; the previous report having been sent out on 16 March with the second evacuation party. On 15 March, two officers and twelve enlisted personnel were sched-

uled to comprise the second evacuation party and they departed for the embarkation point at 2015 on the 15th. At about 0150 on the 16th, LT Lietwiler received a call from the Commandant, CAPT Hoeffel, who asked if another group could be organized immediately for evacuation; the second party to consist of 22 personnel. By 0245, this second party was on its way and all 36 personnel departed on the same submarine although LT Lietwiler assumed at the time that another submarine had arrived. In selecting personnel for evacuation, it had been decided to disregard the criteria of training and experience but rather organize the parties to be as self-contained as possible so any one party would provide a nucleus around which a new unit could be organized. LT Lietwiler stated that the selection of the additional 22 personnel for the second evacuation group was very difficult as he fully expected that he and the remaining personnel would be on the island when the end came. During the last days, the Station "C" personnel were working as long as they could until they had to sleep and would resume working as soon as they woke up. Eating was done outside the tunnel at mess tables under a camouflage screen by the galley stove which had been set up at the end of a flat extending about 50 yards east of the tunnel entrance. LT Lietwiler stated that everyone ate, "*...with one eye for food and one for planes, but both ears cocked for shells.*"

On 24 March, LT Lietwiler reported, the Japanese began their big push. Island power and water to the tunnel were knocked out immediately and it was necessary to depend on the tunnel's diesel generator for electricity and water brought in by a water wagon. The tunnel had a reserve of 5,000 gallons of fresh water in its own tanks but this was held in reserve in the event the water wagon couldn't get through which happened on two occasions when the road around Malinta Hill was partially blocked or carried away by shelling. Personnel were safe inside the tunnel, as LT Lietwiler reported that the tunnel merely shivered a little under direct hits by 1,000 kilogram bombs. However, necessary trips outside the tunnel were hazardous. At least one watch section had to sleep outside the tunnel until after the second evacuation party departed when it became possible to convert their working spaces into sleeping quarters. LT Lietwiler reported that the peak population of the tunnel was 156 personnel, not counting Army personnel who took shelter in the outer tunnel during daylight raids. In preparation for the evacuation of the last party, LT Lietwiler was informed by the Commandant that they would be departing on the USS *Snapper*. Preparations were made under the guise of stowing spare equipment and watches were not secured until the mid-watch on 7 April. The Commandant was going to send for the equipment after dark on 8 April in order to get it on board the USS *Pigeon*, a submarine rescue vessel, ahead of time and the personnel were on short notice for the

following 24 hours. However, the surrender of Bataan upset the time table. At 2000, 8 April, LT Lietwiler received a call from the Commandant which he expected to be about the truck coming to pick up the boxes of equipment. Instead, he was ordered to have all personnel ready for departure in 15 minutes with no gear at all. They were able to take a cipher machine and two small boxes of publications but most departed without even a toothbrush. They were put aboard a small motorboat which then searched along the Mariveles shore looking for the submarine. They did not know at the time that Bataan had surrendered. The Commandant had decided that it was not safe to wait until the next night for the arrival of the USS *Snapper* so the men were embarked on board the USS *Seadragon*. After remaining in the area for a few days, the USS *Seadragon* headed south and arrived in Freemantle on 26 April. The group departed Fremantle by destroyer on 1 May, arriving in Melbourne on 6 May, the day Corregidor surrendered, where they joined the rest of the Corregidor evacuees.

On 13 June, LT Fabian forwarded a letter to CAPT Safford giving his report of his party's evacuation from Corregidor and their subsequent travels before arriving in Australia. The first party to be evacuated departed Corregidor on the night of 5 February on the USS *Seadragon*, arriving in Sourabaya on 13 February and leaving there by train for Bandoeng on the 14th. Upon arrival in Bandoeng, a receiving station was set up. However, progress on the erection of antennas and other equipment was very slow and the Japanese began bombing the area before the station became operational. A conference with LCDR Redfield Mason in Lembang on the afternoon of 20 February resulted in a four-hour evacuation notice. The group was loaded into cars and buses for an all night drive to Tjilatjap where a submarine, the USS *Snapper* (SS-185), was waiting to depart on the 21st. Enroute to Perth, the submarine stopped at Exmouth Gulf where the group had orders to disembark and proceed by car or train. Apparently whoever drafted those orders knew nothing about Australia because it was found that the population of Exmouth Gulf was exactly one man and millions of desert flies. After two days at Exmouth Gulf, the group continued on board the submarine arriving in Fremantle on 3 March. The group was able to bring six receivers, nine RIP 5's, the Model DT HFDF unit and some publications through the entire evacuation trip to Australia. The equipment proved quite valuable as there was virtually no equipment available in Australia and the little that was available could only be obtained after much wrangling and red tape.

After the fall of Bataan, pressure was increased on the Japanese commander to complete the conquest of the Philippines. On 29 April, the Emperor's birthday, the Japanese began an unrelenting bombardment of Corregidor

which continued day and night. At 2045 on 5 May, the bombardment was intensified on the beach between Cavalry and Infantry Points, east of Malinta Hill, where the Japanese planned to land. However, their landing craft were swept eastward by the current to the vicinity of North Point near the end of the island. Although they suffered high casualties, there were two Japanese battalions ashore by midnight and American defenses had been penetrated. By 0130 on 6 May, the defenders on the eastern end of the island were isolated. American forces threw a defensive line across the island between Water Tank Hill and Malinta Hill while a triangular perimeter defense line was organized extending along the high ground for a quarter mile on either side of the Radio Intelligence Tunnel (AFIRM). This line held and its defenders were still actively fighting the Japanese when the island was surrendered. The main fight was, however, for Water Tank Hill and efforts to drive the Japanese out of their positions on the hill were severely hampered by the ability of the Japanese artillery on Bataan to sweep the area between Water Tank Hill and Malinta Hill. Counterattacks against the Japanese entrenched on Water Tank Hill were unsuccessful. By 0930, Japanese tanks had been landed on the island and were shortly in position to attack while Japanese artillery pounded the area in front of the Japanese lines. At 1030, the remaining American defenders fell back to the remains of a concrete trench in front of Malinta Tunnel. The American command expected more Japanese landings at any minute and it was not known how many tanks the Japanese had been able to land. There was great fear of the destruction a tank could accomplish if one were to penetrate the Malinta Tunnel. As General Wainwright wrote in his memoirs, "*...it was the terror that is vested in a tank that was the deciding factor.*" He concluded that while the American forces might last through the day, the end would probably come that night; therefore, it was better to conclude the surrender during the daylight hours and hopefully avoid a repeat of the events at Singapore when the British had attempted to surrender at night and the Japanese troops had gotten out of hand. At 1130, the defenders received word of General Wainwright's decision to surrender the island at noon. At midnight that night General Wainwright broadcast the order for all U.S. forces in the Philippines to surrender.

It was well known that the Station "C" personnel were evacuated. CWO Burnett reports that following the war he met again with RMC J. Walter Foy, with whom he had gone through boot camp in 1927. RMC Foy had been assigned to the NPO elements located within AFIRM Tunnel and was captured by the Japanese when Corregidor fell. RMC Foy told CWO Burnett that after the surrender, a detail led by a Japanese Lieutenant Commander rounded up the remaining personnel who had worked in the tunnel. They had a list of the names of the OP-20-G personnel, or at least several of them, who

had been assigned to Station "C" and were searching for them. Apparently the list was primarily of those personnel who had previously served on Guam. RMC Foy specifically remembered the Japanese asking for then-RMC Burnett.

# VIII

# General MacArthur's Forces Return to the Philippines

ON 20 October 1944, American forces returned to the Philippines with the landing of General MacArthur's forces on the island of Leyte. On 16 February 1945, the liberation of Corregidor was begun as elements of the Army's 503rd Parachute Combat team began landing against 5,000 Japanese defenders commanded by CAPT Akira Itagaki of the Imperial Japanese Navy. The plan of attack called for one-third of the attacking force to drop into two drop zones on "Topside" at 0830 on D-Day. At 1030, an infantry battalion was to effect an amphibious landing on the southern beach at "Bottomside" to occupy Malinta Hill and link up with the paratroopers from "Topside". A second drop on "Topside" was to take place on the afternoon of D-Day with a third drop scheduled for D plus 1. The Japanese defenders were completely surprised and CAPT Itagaki and his entire staff were killed in the opening minutes by a grenade thrown by a paratrooper. The second drop was carried out as planned but the drop scheduled for D plus 1 was cancelled and the paratroopers landed over the beach at "Bottomside". By 26 February, the paratroopers had moved toward the tail of the island and had reached the area of the Radio Intercept Tunnel. At 0800, paratroopers, aided by two Sherman Tanks, began their attack to close the tunnel and clear Monkey Point. By 1105, one company was on top of the little ridge at Monkey Point directly above the Japanese defenders in the Radio Intercept Tunnel below, while a second company was guarding the lower entrance. The paratroopers were resting and watching artillery and air preparations for an attack down Kindley Field while one of the Sherman tanks fired its 75mm gun into a small series of caves on the ridge. Suddenly, a tremendous underground explosion lifted the entire ridge above the tunnel into the air, throwing bodies and debris alike for thousands of yards with one sizeable chunk of debris landing on a destroyer over a mile away. The 35-ton Sherman Tank that had been on top of the ridge was thrown end-over-end for some 50 feet, killing all but one of the crew. The Japanese defenders had detonated several tons of explosives

stored in the tunnel, creating a huge, oblong crater some 130 feet long, 70 feet wide and 30 feet deep. In one brief moment, the Navy Radio Intercept Tunnel had ceased to exist. One can imagine the force of the explosion when it is remembered that this was the same tunnel which LT Lietwiler described as merely shivering a little under the direct hits by 1,000 kilogram bombs.

# Appendix G

# Composite Equipment Listing

| | 1938 | | 1939 | | 1940 | | 1941 | | 1942 |
|---|---|---|---|---|---|---|---|---|---|
| *Equipment* | *Jan* | *Jul* | *Jan* | *Jul* | *Jan* | *Jul* | *Jan* | *Jul* | *Mar* |
| RAA-1 LF Rcvrs (10-1000 Khz) | 3 | | | 3 | 3 | 3 | 3 | 3 | 1 |
| RAE Diversity Rcvng (1000–30000 kHz) | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 |
| RT HF Rcvr | 1 | | | 1 | 1 | 1 | | | |
| RIP 5 | 10 | | | 14 | 8 | 15 | 21 | 21 | 7 |
| RAB-1 HF Rcvr | 2 | | | | | | | | |
| RAC-1 LF Rcvr | 1 | | | | | | | | |
| CL AR-1496C HF Rcvr | 1 | | | | | | | | |
| RE LF Rcvrs (in storage) | 3 | | | | | | | | |
| CXM DF Unit | 1 | | | | | | | | |
| XAB-RAB DF Unit | 1 | | | | | | | | |
| RAO HF Rcvrs (540–30000 kHz) | | | | 6 | 6 | 6 | 11 | 11 | 6 |
| NC-110 SHF Rcvr (30–300 kHz) | | | | 1 | 1 | 1 | 2 | 1 | |
| DT-1 HFDF Unit (2–30 mHz) | | | | 2 | 2 | 2 | 2 | 2 | 1 |
| Boehme Recorder | | | | 1 | 1 | 1 | 2 | 3 | 3 |
| Boehme Tape Pullers | | | | 3 | 3 | 3 | 5 | 6 | 6 |
| Telediphone Recorder (twin) | | | | 1 | 1 | 1 | 1 | | |
| Transcribing Unit | | | | 1 | 1 | 1 | 1 | | |
| High-speed Camera | | | | | 1 | 1 | 1 | 1 | |
| Electron Oscillograph | | | | | 2 | 2 | 2 | 2 | |
| NC-100 HF Rcvr (540–30000 kHz) | | | | | 1 | 1 | 1 | 1 | |
| RAS HF Rcvr (190–30000 kHz) | | | | | | 6 | 6 | 6 | 4 |
| DY HFDF Unit (540–30000 kHz) | | | | | | 1 | 1 | 1 | 1 |
| HRO Rcvr | | | | | | | 1 | 1 | 1 |
| RAK-2/RAL-2 Rcvng Equipment | | | | | | | 1 | 1 | |
| Generator (62.5 KVA) | | | | | | | 1 | 1 | |
| RME Rcvr | | | | | | | | 4 | 4 |
| Hallicrafter SX-25 Rcvr | | | | | | | | 2 | 3 |
| Meissner "Traffic Master" Rcvr | | | | | | | | 2 | 1 |
| RME DB-20 Preselector | | | | | | | | 11 | |