

Japan Tropo System

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Introduction

I was stationed in Japan from 1956 to 1960. My first assignment was as Commander of Company C, Japan Long Lines Signal Battalion with Headquarters in Sendai, Japan. Our unit operated and maintained the US military communications from just north of Tokyo to the northern island of Hokkaido. We operated military AN/TRC-24 radio relay equipment with a channel capacity of 12 channels. We ran three systems in parallel. In the Tokyo and throughout the southern area of Japan other units operated GE pulse position microwave with a channel capacity of 23 channels. There were two or three systems in parallel in the southern route.

Three contributing events

There are three major events that happened at about the same time that all contributed to the idea of a Japan Tropo System.

First event

During the 1958-1959 time frame there was a reduction of military forces in Japan and a Washington decision to terminate all of the US Army operated and maintained communications systems and use leased communications facilities. This action was completed and I was transferred to the US Army Headquarters in Camp Zama, Japan as the Radio Officer. As time progressed the US military communications did not decrease as had expected but actually increased. Additionally, the Nippon Telephone and Telegraph Public Corporation (NTTPC) could not provide the communications required by the US military. NTTPC was a government controlled organization that did not have a budget for new facilities. In order to get new facilities there must first be a documented requirement, the funds for new requirements had to be requested in the budget which resulted a two year delay before new requirements could be fulfilled.

Second event

During this same time frame, The Department of the Army made plans to extend the Pacific Inospheric Scatter System (PACSCAT) from Okinawa into Japan. This system originated in Hawaii and extended through Pacific islands to Okinawa. In 1958, The US Army Signal Engineering Agency sent an engineer to Japan to conduct a site survey for two inospheric scatter sites, one in southern Japan and one along the coast southeast of Tokyo. Don Brown, a civilian communications engineer from our office, and I accompanied this engineer on the survey to southern Japan. A tentative site was selected on the southern tip of Kyushu, the southern most of the major islands.

Third event

The US Air Force was assisting the Japanese Air Self Defense Force in improving their Air Defense System. Nippon Electric Company (NEC) had just completed the development of tropo scatter equipment. The Air Force was negotiating with NEC to provide a tropo system to interconnect the AC&W sites in Japan.

Concept

I found out about the NEC development and began to make visits to NEC without the knowledge of any of my superiors. I met with Dr. Morita, Chief, Microwave Branch and obtained technical information, installation cost information and operating and maintenance cost information. With an understanding of the tropo scatter system cost factors, the knowledge of the cost of leased service and the knowledge that it took two years to get leased service, the thought of a tropo system began to evolve. I conceived of a system that would provide all of the US military communications from Tokyo south to Okinawa and Korea at a cost savings over leased service that would also eliminate the need for an extension of the Pacific Inospheric Scatter System from Okinawa to Japan.

Page contract for Japanese Air Self Defense Forces Tropo System

One day I was walking down the hall at NEC with Dr. Morita. I saw a very tall man walking up in front of us. It was obvious that he was not Japanese. I ask Dr. Morita who he was. Dr. Morita said, "Haven't you met Mr. Hames of Page?" This is how I met Stan Hames. Stan and Tom Nichols were both assigned to NEC to inspect the production of tropo equipment for the AC&W Tropo system procured by the US Air Force for the Japanese Air Self Defense Forces. I did not meet Tom until several years later.

How did Page get the job of supervising NEC? This is another story. When the Air Force began their procurement effort they had to use the only procurement activity in Japan which was run by the US Army. The Air Force told the Army that since the Army would do the contracting that they had to provide all of the technical supervision of production and installation. The US Army Japan position was that was not their responsibility. This problem got elevated to the US Army Pacific where our Signal Officer decided that it was not the Army's responsibility but the Army would accept the responsibility. The reason for this decision was that if the Army did not accept this responsibility that the Air Force would use that against the Army in the continuing fight on the assignment for communications responsibility in various areas through the world. The Army contract to Page for the Pacific Scatter System was modified to have Page provide this support.

My boss thought I was crazy

After several days of conducting map studies in my home, I was able to determine the feasibility of a tropo system from the Tokyo area, south and extending to Okinawa. Once I was sure of my facts, I talked to my boss, Major Ralph Keefer. Ralph and I were close friends and he had some respect for my technical ability. When I told him we could install a 60 to 120 channel tropo system that would pay for itself in less than a year he thought I was crazy. He told me to leave his office and not come back without his permission. For about the next 10 days I came no where his office for I knew he meant what he had said. Off duty it was a different story. We socialized together, partied together and played golf together but the subject of tropo was never mentioned.

Conspiracy

Finally he sent for me. He ask me to repeat what I had previously told him. He listened very intently. We then entered in what would we considered a "conspiracy". When two

decide to do something without the knowledge of their superiors that is a conspiracy. He and I arranged to make secret trips to NEC

After a few more secret trips to NEC, I was able to make the first of several written proposals for what we called the Japan Tropo System.

The initial proposal was for a system from the Tokyo area south to Okinawa. We then presented this concept to our commander, Col. Thomas Riley. Col. Riley approved our plan but said he wished we had briefed him earlier.

Briefings in Japan and Korea

During the next few weeks I briefed the Air Force and Navy in Japan on the concept and the system concept was expanded to continue on to Korea and extended northward to Chitose AFB on Hokkaido, just south of the Sapporo.

After we successfully "sold" the concept to all of the military forces in Japan, Maj. Ralph Keefer went to Korea, our superior headquarters, and got the support of all of the US Forces in Korea. A copy of the original system diagram follows this article.

After a considerable amount of telex traffic, formal and informal telephone calls to the US Army Pacific, in Hawaii, we were invited to make presentations in Hawaii.

Briefings in Hawaii

Ralph and I traveled to Hawaii. We met with the Signal Officer, Us Army Pacific, but he gave no indication as to whether he approved our plan or not. He said he would get in touch with us later. It became later and later and later with no word from the General. All of his staff, including our close friends, were also much closed mouth. After more than a week of waiting and doing nothing, Ralph and I started to enjoy some refreshments in our room. This activity extended on into the night and it was so late that the Officers Club dining room was closed. The staff at the club suggested that we go off base to a bowling alley where we could get a meal. We did and decided to bowl. I had an 88 and Ralph had a 94. You can see that we had really enjoyed our refreshments earlier in the evening.

The next morning we were summoned to the General's office and told that we would brief representatives from all three services and the joint command the next morning. We were shocked but we found out why we had been kept in the dark. The General and his staff had supported the plan from the beginning but did not want for us to get our hopes up until they had worked with all of the military headquarters paving the way for our briefing. A formal message had been prepared to the Department of the Army recommending approval of the plan. Ralph made the presentation and everything went well. We returned to Japan the next day, mission completed.

Approval from Washington

There was one more step. We had to get approval from the Department of the Army and get the necessary funding. We had an ally in the Pentagon. Maj. Fred Stivers was a good friend of mine and Ralph's. We contacted Fred informally to help pave the way for Ralph to go to Washington. Ralph went to Washington and made presentations. Shortly thereafter the program was approved and funded.

Engineering

During all of the time that these briefings were being conducted, our engineer, Don Brown was very busy. We had obtained some information from the Bureau of Standards on the design of tropo systems. This was long before the computer and Don did the entire complex, lengthily tropo computations using pencil, paper and a slide rule. Don was a superior engineer who was very precise in his work. A few years earlier he had been the principal engineer in the design of the Kanto Plains Microwave System.

NEC built the system

From the beginning our concept was a sole source contract to NEC with NEC performing all of the operations and maintenance. As I understand it, several years after system completion the O&M responsibility was transferred from the Army to the Air Force. The Air Force decided that the O&M had to be competed. An American firm won the contract but fell flat on their face in short order and NEC was again given the O&M contract.

Completion

I left Japan in June 1960 and lost contact with the project for three years. When I was transferred to Washington in 1963 I was happy to learn that the system was installed by NEC as originally conceived with essentially no changes. The US Forces in Japan had a greatly improved communications system with 60 voice channels going north and 120 voice channels going south with 60 going to Korea and 60 going to Okinawa.

Site visit

During the summer of 1963, during an extended trip throughout the Far East, I was able to visit Japan and visit one of the Japan Tropo stations. I visited Fuchu Air Station which was the major hub for the Tokyo area. It was a very impressive site. The path north to Sendai used octuple diversity, four frequencies and two 45 foot antennas and two kilowatt power amplifiers. NEC did not have two KW power amplifiers so they used two one KW power amplifiers in parallel. Since there were four frequencies there were eight, one KW amplifiers all in a row for the path to Sendai

Operational after 30 years

While visiting the Defense Communications Agency Engineering Office about 10 years ago, I determined that the Japan Tropo System was still operational some 30 years after the initial

activation.

