COSTA RICA PUBLIC SAFETY

COMMUNICATIONS EVALUATION REPORT

WENDELL W. MOTTER, CHIEF

TELECOMMUNICATIONS BRANCH

MAY 1970

OFFICE OF PUBLIC SAFETY

TECHNICAL SERVICES DIVISION

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D. C.

EVALUATION OF THE POLICE AND CIVIL SECURITY TELECOMMUNICATIONS SYSTEMS OF COSTA RICA

This evaluation was performed at the request of the Costa Rica Mission to determine the status, progress and suitability of the concept of operation as well as the objectives and goals of the telecommunication planning and facilities of the police and civil security agencies of Costa Rica. The evaluation was performed during the period of 18 through 24 May 1970 by Mr. Wendell W. Motter, Chief of the Telecommunication Branch of the Office of Public Safety, Washington, D.C.

Attachment one is a working paper given to Mr. Motter by the Chief of Public Safety, Costa Rica, which, in general, reflects the progress to date and the overall long range planning, including specific recommendations made by the Mission. It has been observed by the writer that the indicated station locations in this plan are not necessarily correct nor is there any assurance that the stations are operational. The writer also wishes to go on record at this time that he is not in agreement with portions of the attached plan and feels that several important changes should be made as soon as time and funds permit. It is not the intent of this report to elaborate on the detailed operation or mission of the various police divisions as this subject is well covered in other documents including the above mentioned attachment.

At the present time, there are 13 police telecommunications networks either operational or in various stages of planning and/or implementation.

The major networks are:

1. ADMINISTRATIVE NET - VHF-FM LOW BAND - 47.3 MHz

This net consists of approximately 39 stations at various locations throughout the country. It is a sort of catch-all net with stations installed at sites ranging from the automobile of the President's wife to patrol launches and aircraft.

2. COMMAND NET - VHF-FM HIGH BAND - 154.78 MHz

This net has a total of 10 stations which are located at the provincial capitals and other strategic locations. The real purpose of this net was not made clear because, in most cases, the radios were co-located with sets in the so-called Administrative Network. It is simply a matter of which microphone the operator picks up that determines what net he is in.

3. SINGLE SIDEBAND NET - HF-SSB - 5560 KHz

The radios in this net are four or six channel sets, however, they only operate on a single fixed channel of 5560 KHz. The other channels have crystals and are operable. However, it was reported that there is considerable interference and it is difficult to communicate on any frequency except the above mentioned 5560 KHz. This net is generally restricted to daytime use due to a lack of usable nighttime frequencies. It was interesting to note that with the exception of Sabalito, locations which had a SSB radio also had a VHF-FM set which was in the Command or Administrative Net or both. This is not in accord with the generally accepted use of HF-SSB radios which is to establish communications with locations which cannot be reached with VHF-FM. There are a total of 6 stations in this network.

4. TOWN AND VILLAGE POLICE NET - VHF-FM - 164.74 MHz

The purpose of this network is to extend the lines of communication below the provinces and major cities to rural police stations, checkpoints and similar low level facilities. At the present time, there are very few radios installed in this system. However, it is high on the priority list for expansion. Presently, there are 62 FM-1/5 radios in country which will be installed in the near future.

5. RADIO PATROL NET - VHF-FM - 47.1 and 47.00 MHz

This net consists of approximately 55 vehicles operating in the vicinity of San Jose. It should rightfully be called the Metropolitan Police Mobile Radio Patrol Net.

6. DETECTIVE AND TRANSIT NET - VHF-FM - 167.92 T and 163.96 R

This net, which operates through a repeater located half-way up a volcano near San Jose, is shared by the Traffic Police and the Detective Bureau. There are approximately 6 traffic police vehicles and 6 detective vehicles in this system, each equipped with two-way radios. 23 FM-1/5 radios are presently in country to expand this network. The mission of the Traffic Police is to control and direct traffic in San Jose and other major cities.

7. HIGHWAY PATROL NET - VHF-FM - 47.3 and 47.1 MHz

This net, which will operate on two channels (the Administrative Net and the Detective/Transit Net frequencies), is not operational at this time. Eight US A.I.D. provided 100-watt mobile radios and four vehicles have been in country for approximately one year. However, they have not yet been turned over to the police. Apparently the police agreed to provide four vehicles from their own budget and have not done so to date. Consequently the implementation of the highway patrol is being held up.

8. CUSTOMS POLICE - HF-SSB - 4600 KHz

The Customs Police are not a normal responsibility of the US A.I.D. Public Safety Division. However, they do have a private radio communications system provided by the US A.I.D. Customs Project. Their network consists primarily of six Single Sideband radios, (SBT 20 type). At the present time, three of these six radios are deadlined at the central police repair shop and there are no spare parts available to repair them.

9. MARINE POLICE

The Marine Police have three 40-foot boats. Only two of them were in port available for inspection. One of these vessels, #401, had an old General Electric VHF-FM base station radio on a frequency of 47.3 MHz which is the Administrative Net frequency. There was also one HF-AM radio (Collins TCS-12 U.S. Military type) which supposedly could be used to communicate with other craft. Neither of the radios worked and no one on board remembered their ever working or know how to turn them on. The other boat inspected, #403, only had a TCS-12 radio. The Captain said he had been assigned to the craft for 8 years and, during that period of time, he had never known of the radio being used to contact other vessels. It appeared that, until a few years ago, the receiver portion of the set did work and the crew used it to listen to music from the local commercial broadcast stations. There was an FM-5 ground plane antenna installed on this vessel, however, the Captain stated that the radio had been removed sometime ago for reasons unknown to him. No one seemed overly concerned because of the lack of ability to communicate with the shore or other vessels.

10. AIR SECTION

The Air Section consists of three Cessna type 185 aircraft. The fourth, a Cessna type 180 was recently wrecked. Two of the type 185 planes are equipped with VHF-FM radios tuned to 47.3 MHz which is the Police Administrative Net frequency. In addition to these special radios, they have the normal radio equipment carried by small aircraft. Located in the hangar were also two VHF-FM base stations - one on the above mentioned Administrative Net frequency and the other on 154.78 MHz which is the Police Command Net frequency. It was not made clear just why the Air Section was in both nets, especially when the aircraft were only equipped with the frequency utilized by the Administrative Net.

Other nets which are proposed and in various stages of implementation or planning are:

Special Riot Control Net

Search and Rescue Net

Special VIP Net

SAN JOSE CENTRAL REPAIR SHOP AND WAREHOUSE

All equipment for the various police networks is repaired at the Security Communications Maintenance Center located at San Jose. The personnel of this facility are also responsible for the installation of all police radios including the mobile sets for the radio patrol and traffic police.

The storage area for spare parts was clean and orderly. Stock control cards were being maintained and a spot check revealed that they were accurate and up-to-date. In the portion of the warehouse utilized to store major items of equipment, it was noted there was a considerable quantity of radio and other electronic equipment which ranged in condition

from new to used/good, used/bad and junk. There was also a large number of U.S. Military type radios. An itemized list of the most obvious items follows:

29 FM-5 VHF-FM radios - Hammarlund

84 FM-1 VHF-FM radios - Hammarlund

10 AC Power Supplies - Hammarlund

10 PA 20 Power Amplifiers for the FM-5 radios - Hallicrafters

2 100 watt VHF-FM low band mobile radios - General Electric

6 100 watt VHF-FM low band mobile radios - Motorola

2 100 watt VHF-FM low band base stations - General Electric

2 100 watt VHF-FM high band base stations - General Electric

1 250 watt VHF-FM low band base station - General Electric

1 100 watt SSB base station - Aerotron

1 KW M-2 SSB base station - Collins

2 100 watt SSB base stations - R.F. Industries

1 U.S. Military type SSB base station

1 Mixed lot of older type VHF-FM mobile and fixed station radios

12 AN-GRC/9 HF AM U.S. Military type radios

52 PRC-10 VHF-FM low band U.S. Military type radios

34 VRC-10 VHF-FM low band U.S. Military type radios

1 TCS-12 HF-AM U.S. Military type radio

1 mixed lot of various other type of U.S. Military equipment including field wire and telephones.

The 123 Hammarlund FM-1/5 radios were reported to be universally bad and no recent attempt had been made to place any of them in operation. It is realized that there are many technical problems connected with the Hammarlund radios. However, all Missions have been issued a series of

modification instructions which will correct the most serious deficiencies. The U.S. contract technician said that, in his own mind, he had written these radios off as useless and had never personally removed any of them from their cases to inspect them. The U.S. Military radios were reported, as a general rule, to be in operating condition. However, the chief of the repair facility said they had not used any of them for a long time because they were large, heavy, cumbersome and difficult to operate. He also said that most of them required special expensive batteries and there were no funds available for their purchase. He further indica i that, if it were possible, he would like very much to turn in all of the Military radios because they did not intend to use them and they occupied a considerable portion of his warehouse storage space.

The area of the building which was used to repair radios and other equipment had a confusion of spare parts, both new and used, as well as radio sets in various stages of repair or dismantlement scattered profusely on, around and under the repair benches. Adequate test equipment was on hand which the technicians apparently know how to use. There was a noticeable shortage of small hand tools such as pliers, screwdrivers, etc. Four fairly well-qualified technicians were on the job plus one apprentice technician. With the exception of the radios received from the Radio Patrol section for repair, there are no work orders or other detailed records maintained on equipment deadlined or repaired. In order to determine how many sets were deadlined in the shop, it was necessary to make a physical count. This count revealed there were 7 FM-5, 6 FM-1, 2 PA-20 and 10 SBT-20 radios deadlined. As a general rule, the printed circuit boards and/or other components of these radios had been removed from the cabinets and were scattered at

random around and under the benches, freely mixed with other components. Portions of the printed circuit boards from the 10 SBT-20 radios previously mentioned as being stored in the warehouse area were in the repair shop with burned out components. The necessary parts required to repair the deadlined equipment were not on hand or on order, with the exception of 45 transistors on PIO/C 5-00029. The Chief of the repair shop was asked for a list of parts required to repair the deadlined equipment and the following day submitted a list consisting of three typewritten pages.

The local budget for the purchase of repair parts was reported to be 2000 colones per month ($300.00). Due to recent changes of Government, no requisitions had been placed for replacement parts because it was felt it would be a waste of time due to the overall lack of funds. It was also reported that during normal times it was very difficult and time consuming to obtain funds for replacement parts even though they were supposed to have a budget for this purpose.

OBSERVATIONS:

It becomes readily apparent that several of the above described networks are duplications, especially the Administrative Net, the Command Net and, in most locations, the Single Sideband Net. If these networks were servicing different police organizations with different missions and the radios were located at different sites, even if in the same city, their existence could possibly be justified. Actually, they all service the same elements of the police and, in the majority of cases, the radios are physically co-located in the same room or building. There appears to be a lack of long range planning designed to give maximum coverage utilizing the minimum number of radios and providing flexibility for expansion and cross communication compatibility.

It was also noted there is no in-country telecommunications training program and apparently no concrete plans for such a facility. This is normally the very first order of business for any Public Safety Telecommunications program. The U.S. contract technician stated that, about a year ago, he started a one-hour a day class on basic electricity but discontinued it after a few weeks because of lack of suitable classrooms and desks, etc. However, the writer personally observed several locations which appeared to be more than adequate to accommodate a class of six or seven students.

RECOMMENDATIONS:

An experienced well-qualified direct hire telecommunications advisor should be assigned to the mission. This advisor must be Spanish speaking and proficient technically and administratively. In the event Mission ceilings prevent the immediate assignment of a full-time direct hire advisor, contract technician services should be continued under the following conditions. The contract of the present technician (who is not technically qualified; specifics were supplied in writing to the Chief Public Safety Advisor) should be cancelled and a suitable replacement recruited. The contract technician selected should receive constant supervision by operational members of the PSD staff. In addition, regular monthly reports should be submitted by him covering, but not limited to, the following.

1. Number and type of radios deadlined in the repair shop. (Parts available for the required repairs).
2. Number and type of radios deadlined in the repair shop. (Parts not available for the necessary repairs).
3. Status of replacement parts - especially a list of components required to repair US A.I.D. provided equipment.

4. Total number and type of radios repaired during the reporting period.
5. Total number and type of radios in the repair shop that have been repaired and are waiting return to the using agency.
6. Total number and type of radios in the warehouse that are not designated for any specific location or purpose.
7. Total number and type of radios in the warehouse designated for a specific purpose or network but are waiting installation.
8. A list of the installations made during the reporting period.
9. The number, type and location of radios installed and operational in the various networks.
10. Station outages and the length of time any specific station was off the air during the reporting period. Also, what caused the outage and corrective action taken.
11. The number of messages sent and received over the various networks.
12. Status of telecommunication personnel.
13. A general overall statement regarding the status of the various installations from a technical, administrative and operational viewpoint, recommendations for improvement and any unusual circumstances or happenings which might influence the present or future status of the program.

The following recommendations for changes and/or consolidation of various networks are made on the premise that a qualified advisor will be available to implement the program. It is realized that there will, of necessity, be a considerable rearrangement of equipment and many frequency changes. However, it is believed that very little, if any, additional equipment other than that already planned for normal expansion will be required.

If the recommended changes are implemented, the end result will be the elimination of duplicate facilities and a compatible system with the capability of orderly expansion and cross communication. It is not the intent of the writer, at this time, to specify exactly which items of equipment should be moved into other nets or what the new frequency assignments should be. The following suggestions are general and their concept flexible, thus giving the assigned advisor freedom of action to make changes as circumstances and local conditions permit or dictate. It will be necessary to obtain a new block of VHF-FM frequencies in the 150 to 170 Mc range. The minimum requirements for this block of frequencies is a continuous 1 MHz segment, however, a 2 MHz segment would be preferred. Arrangements for the assignment of this block of frequencies should be made at once. If possible, a block which includes frequencies of the maximum number of radios already in country should be obtained, thus making it unnecessary to purchase new crystals for all equipment. One specific frequency near the center of the assigned block should be assigned as a common country-wide frequency and one channel of all radios should be tuned to it. Other net assignments can be made as required, above or below this common frequency, for the various police divisions. This way each unit can have its own private channel and, at the same time, have the capability for instant cross communication with other police elements in the event of joint operations or emergency situations. Specific recommendations for network changes follow:

ADMINISTRATIVE NET - COMMAND NET - SINGLE SIDEBAND NET:

These nets should be consolidated into a single integrated country-wide backbone system. This system should link the capital city of San Jose

to the six provincial capitals and 12 major cities and/or other strategic locations. It is recommended that VHF-FM high band equipment be the primary type of radios utilized in this system. With the existing VHF-FM High Band repeater properly located, it is believed that the majority of the desired locations can be contacted. Those locations which are out of range of VHF-FM transmissions through the repeater could be contacted by utilizing existing single sideband equipment or low band VHF-FM.

TOWN, VILLAGE AND RURAL POLICE NETWORK

The Town, Village and/or the Rural Police network which is an extension of the country-wide backbone system should be installed on a phased priority basis at selected locations as time and funds permit. The stations in this network should include the patrol boats, highway check-points and other isolated police and civil security facilities. The radios utilized in this network should all be of the two frequency type: one frequency on the specific provincial frequency and the other on the common country-wide channel. It is further recommended that the radios which are presently in country, destined for the Rural Police Network, be issued to the police for immediate installation.

DETECTIVE/TRANSIT NET - RADIO PATROL NET - RIOT CONTROL NET - HIGHWAY PATROL NET:

A consolidated coordinated metropolitan police network should be established in San Jose and other major cities as required. The Traffic Police, Radio Patrol Police and Detective Networks, which are now operating independently, should be merged and their communication system operated on common frequencies. It may be necessary to split their areas of responsibility and frequencies to avoid congestion, however, they should all have one channel of their radios tuned to a common city-wide frequency. Instead of establishing

a special Riot Control network, reserve radios should be maintained and issued as required to augment the existing system. At the present time, there is a considerable mix of VHF-FM high and low band equipment utilized by the various police agencies. The low band radios should be phased out as they become uneconomical to repair. However, at the present time, in order to make the maximum use of all in-country equipment, it will no doubt be necessary to utilize simultaneous dual transmission from high and low band base stations. This is a technical consideration and the assigned telecommunications advisor can work out the details as required when the decision to combine the above networks is reached. The Highway Patrol System should have radios with the common country-wide frequency on one channel and the other channel tuned to the provincial frequency in their area of responsibility.

The 16 VHF-FM low band radios ordered on PIO/C 5-00028, Item 7, should be suspended pending a final decision relative to the proposed system changes.

When a qualified telecommunication advisor is available, immediate steps should be taken to repair the 123 Hammarlund FM-1/5 radios which are presently in storage in the police warehouse.

COSTA RICA PUBLIC SECURITY COMMUNICATIONS PLAN

Costa Rica is a free and democratic country whose Constitution prohibits and army. Costa Rica therefore depends on civil police forces for internal security and protection of borders and coast lines. These internal security forces are now consolidated under the Ministries of Public Security, Government, Economy and Finance, and the Presidency. The Ministry of Public Security, through its Security Communications Operations Center (SCOC), controls the Command Net, Administrative Net, Single Side Band Net, stations within range on the Rural General Net, monitors and can control the Radio Patrol and the Transit/Detective Net to cover emergency situations and provides a back-up station for the repeater on Mt. Irazu. The Customs Police administration operates and controlshis own private net. The Security Communications Maintenance Center (SCMC) maintains all radio communications equipment and installations of the internal security forces.

1. The communications system of the Public Security Forces of Costa Rica, prior to 1966, consisted of two country-wide VHF-FM nets (Command and Administrative), and a VHF-FM patrol car net in the city of San Jose. In 1966, under USAID guidance, a Security Communications Operations Center was established to provide a control and coordinating center for these various independent police communication nets, and a country-wide HF-SSB net was established. Radio Patrol continued to control their own net, but the SCOC has the facility to monitor and take over control of this net during any emergency situation. Efforts to establish a Rural General Net failed due to poor quality of the Hammarlund FM-1's and FM-5's provided for this purpose. However,

the improved Hallicrafter's OPS FM-1's and FM-5's produced under contract by Hallicrafter proved that this type of net could be successfully employed because of the excellent communications that were established during the emergencies of the Volcano Arenal eruption, the Limon riots, and the disturbances along the southern border, using this type equipment.

In the years subsequent to 1966, the Command Net, Administrative Net, and the SSB Net were expanded to the sizes portrayed on the charts 1, 2, and 3 respectively (Attached).

The Radio Patrol expanded from a dozen vehicles to 50 vehicles, purchased by the GOCR and 10 Ramblers donated by USAID. The 50 Patrol vehicles were later traded in for 55 new ones in 1969. All of these expansions mean added work for the Security Communications Maintenance Center and the budget for the Communications Section has only called for four radio technicians for the years 1968, 1969, and 1970. During the years 1968 and 1969, the number of radio equipments in operation has doubled. Programmed installations for 1970 should double the number of installations once again. This system is still programmed to be maintained by 4 radio technicians.

2. Previous communications plans and reports state that the Costa Rican Government (GOCR) budget for communications is inadequate. This may be true, although the Communications Chief receives no reports and has no idea as to amount of funds obligated or still to be obligated. Some requisitions for spare parts are still delayed 3 to 6 months or longer due to the unavailability of funds. This causes cheap repair work or use of inadequate spare parts just to keep the sets operating, and the reliability of the communications system suffers.

3. Reliable communications for the internal security forces can be established with the assistance and guidance of USAID if the GOCR can provide sufficient funds to obtain and utilize local resources that are capable of operating and maintaining the communications system.

The following recommendations are based on USAID/GOCR Program Agreements now in effect. The communication system of the internal security forces was established and future expansions planned under these Program Agreements.

RECOMMENDATIONS:

1. The GOCR, on the advice of the Communications Chief of the Ministry of Public Security and the Communications Advisor provided by USAID, prior to further expansion or modernization of the existing communications system, should:

(a) Provide not only sufficient budgetary support to sustain the existing communications system, but also initiate a method whereby the Communications Chief will be able to tell exactly how much of his allotted funds have been used. The funds allocated should be sufficient for the purchase of spare parts for existing equipments and vehicles, administrative supplies, travel pay for maintenance personnel, replacement or repair of test equipment, and other needs for the good operation of the Communications Section. An estimate of the funds required for FY'70 $20,000; FY'71 $25,000; FY'72 $25,000.

(b) Assume responsibility for installation, operation and maintenance of all USAID and MAP donated communications equipments in country.

(c) Augment the Communications Section, from 37 to 41 members, by employing 4 additional radio technicians.

(d) Implement a training program for radio technicians, through OJT or local schools.

(e) Appoint a Communications Chief who is a radio technician. The salary should be raised to attract a competent technician who can dedicate full time to the job.

(f) A radio operator with the rank of officer should be designated as chief of the SCOC, and be directly responsible for all operations there.

2. Given the GOCR actions described in paragraph 1 above, USAID and the GOCR should proceed to improve the internal security force communications as follows:

PHASE I (1970)

A) Improve the Transit/Detective Net by adding 15 mobile sets (FM-5B's) and 3 portable sets (FM-1B's).

B) Improve Radio Patrol control room operations by providing 3 lighted maps for incidents control. One of San Jose city, one of San Jose province, and one of Costa Rica. All three maps to be 1.5 x 2 meters in size.

C) Establish a Highway Patrol Net with eight four-wheel drive vehicles (pick-up trucks). Each vehicle to have a two-channel VHF-FM radio on the Administrative Net and Radio Patrol Net frequencies.

D) Improve the Rural General Net, from sixteen sets installed now, to seventy eight sets installed in isolated spots throughout Costa Rica.

E) Improve the HF-SSB Net by installing the eight new SBT-20B units, and expand

this net to a total of fifteen stations.

PHASE II (1971)

A) Improve the Rural General Net from seventy-eight to one hundred thirty-eight stations. A total of 200 radios are planned for this net.

B) Improve the Highway Patrol Net work to ten vehicles with two-channel VHF-FM radios.

C) Improve the HF-SSB Net from seven to fifteen stations. Estimated cost: FY'70 $40,000; FY'71 $40,000; FY'72 $40,000. See Annex for detailed costs FY'70, 71 and 72.

PART I

Police Organization in Costa Rica

The Police Forces in Costa Rica are under four different ministries. Chart 4 shows the composition of the various groups involved.

A. Ministry of Public Security

Civil Guard	1742
Traffic Police	137
Detective Agency	110
Immigration	38

B. Ministry of Government

Town & Village Police	1702

C. Ministry of Finance

Treasury Police	432
Customs Police	289

. Ministry of the Presidency

National Police School 21

Communications Networks Installed in Costa Rica

A. Ministry of Public Security

The main police organization under this ministry, the Civil Guard, operates a Command Net (VHF-FM on 154.78 MHz) with 100 watt stations in San José, Heredia, Alajuela, Cartago, Puntarenas, and Liberia and an 80-watt station in Limón. El Coco Airport and San Lucas Penitentiary are also on this net. (See Chart I).

The Civil Guard, through the SCOC, controls the Administrative Net and operates various stations on this net. (See Chart II).

The Civil Guard also controls the SSB Net, through the SCOC, and operates various stations. (See Chart III).

The Civil Guard, through Radio Patrol "Control", controls the Radio Patrol Net. This net, along with the Detective/Transit Net, is monitored by the SCOC and can be controlled from there if the situation warrants.

B. Ministry of Government

The Town and Village Police under this ministry maintains law and order in approximately 400 small communities throughout the country. Most of these isolated spots without any means of communication. Sixteen of these towns and villages now have FM-1's and FM-5's installed on the Rural General Net (VHF-FM). Sixty-two sets are also awaiting installation, and sixty more sets are on order.

C. Ministry of Finance

Both the Treasury Police and the Customs Police are under this ministry. The Treasury Police is responsible for controlling contraband activities and works in cooperation with the Town and Village Police to enforce law and order in the provinces. The Treasury Police operates various stations on the Administrative Net (See Chart II) and on the SSB Net (See Chart III), but has no net of its own. The function of the Customs Police is surveillance of docks and Custom warehouses, collection of duties at border points, but it has no law enforcement authority. The Customs Administration has a private communications net (HF-SSB) with stations in Golfito, Limón, Puntarenas, Paso Canoas, Peñas Blancas, and the net control station in the main Customs office building in San Jose.

D. Ministry of the Presidency

The only police organization under this ministry is the National Police School which operates one station on the Command Net (See Chart I).

PART II

Observations

1. The Command Net (VHF-FM on 154.78 MHz) (See Chart I).

   This net links the Comandancias in the six provincial capitals, with San Jose through the SCOC. The stations on this net are San Jose, Puntarenas, Heredia, Alajuela, Liberia, Cartago, Limón, plus stations at El Coco, San Lucas, and the National Police School.

2. The Administrative Net (VHF-FM on 47.3 MHz) (See Chart II)

   This net covers the four geographic areas of Costa Rica, and program agreements call for operation on a zone basis. Further expansion of this net is difficult without zoning. (See Chart V). The four zones

and their control stations should be :

Central Zone - San Jose

Guanacaste Zone - Liberia

Southern Zone - Golfito

Northern Zone - Ciudad Quesada and Limón

The following stations are planned for this net:

Central Zone: San Jose, Puntarenas, Alajuela, Heredia, San Ramón, Cartago, Quepos, Atenas, El Coco, DG2, DG3, and Las Delicias.

Guanacaste Zone: Liberia, La Cruz, Nicoya, Peñas Blancas.

Southern Zone: Golfito, San Isidro, Palmar Sur, Paso Canoas.

Northern Zone: Limón, Los Chiles, Boca San Carlos, Barra Colorado, Ciudad Quesada, Puerto Viejo Sarapiquí, Turrialba, Sixaola.

Other stations originally planned for this net, will appear on the Rural General Net.

3. HF-SSB Net

This net operates as a singleside band, voice net, on one of four channels: 3850, 4570, or 6810 KHz. San Jose (SCOC) controls this net. Some stations are operated by the Civil Guard and the rest by the Treasury Police. Stations are located at San Jose, Limón, Peñas Blancas, Paso Canoas, Golfito, Sabalito, and Barranca. (See Chart III).

4. CAP Net

Costa Rica is linked with Central America and Panama by this radio teletype net for transmission and receptio of police intelligence information. The radioteletype equipment (TMC GPT-750 transmitter, Collins receiver, and ASP-28 teletype machine) is located in the SCOC

and operated by the Ministry of Public Security.

5. Special Net (VHF-FM on 159.84 MHz)

This net has been planned for use within the city of San Jose by high ranking government officials. It is proposed to use seven FM-1's installed at the residences of the following authorities:

a. Minister of Public Security

b. Secretary to the Commander in Chief

c. Director General of the Civil Guard

d. Director General of Detectives

e. Inspector General of the Treasury Police

f. Director General of the Traffic Police

g. Chief of Public Safety (AID)

For proper usage of this net, ground plane antennas should be installed at the residence of each of the above officials, and whip antennas supplied to permit use of the radios as portables.

PART III

Recommendations

Implementation of the part of this plan to be initiated by USAID should not commence until the GOCR has given some measure of assurance that they will comply with their part of this plan. Subsequent planning, as outlined previously in this plan, should be committed in phases as follows:

PHASE I

A) Transit and Detective Net.

Improve this net by the addition of 15 mobile sets and 3 portable sets.

Supply 15 OPS/FM-5B units, 15 OPS/PA-20 amplifiers, 15 vehicular antennas, and 3 OPS/FM-1B units. (These radio sets are now in country).

B) Radio Patrol

Improve, control room operations by the installation of display maps in the control room. Supply 3 maps 1.5 by 2 meters . These maps should be divided in zones and each zone should have a series of lights to designate police activity within the zone. These maps should be one of the Metropolitan Area, one of the Province of San Jose, and one of Costa Rica.

C) Highway Patrol Net.

Establish a Highway Patrol Net which will include eight mobile stations. Supply four vehicles and the eight radios for this net. (These vehicles and radios are now in country).

D) Rural General Net

Expand the Rural General Net from sixteen to seventy-eight stations in outlying districts. Supply thirty-five FM-5B's, twenty-seven FM-1B's plus the necessary antennas, power supplies and accessories for the complete installation of sixty-two base stations. (These radio sets are now in country).

E) The SSB Net

Improve the SSB Net by expanding from 7 to 15 stations. Install SBT-20B's at Turrialba, Ciudad Quesada, Nicoya, San Isidro , Palmar Sur, Quepos, Barra Colorado, and Los Chiles. (These radio sets are now in country). Supply modules, or printed circuit boards to facilitate maintenance.

F) The Administrative Net

Improve the traffic handling capabilities and relieve some of the congestions

by dividing Costa Rica in four geographical zones separated by natural barriers.

This net will then operate on two frequencies, 47.1 and 47.3 MHz. The Guanacaste and Southern zones on the former and Northern and Central zones on the latter frequency.

Supply 20 crystals to change operating frequencies. Supply 10 Higain type antennas and 10 Log Periodic type antennas.

G) GOCR Responsibility

Provide sufficient personnel and budgetary assistance to install, operate, and maintain equipments mentioned in A through F.

PHASE II

A) The Rural General Net

Improve this net by expanding it from seventy-eight to one hundred thirty-eight stations. Provide fifty OPS/FM-5B's and ten 25 to 35 watt base stations (These radios are on order on PIO/C 00029).

B) The Highway Patrol Net

Improve this net by expanding from eight to ten mobile units. Supply four vehicles and two two-channel VHF-FM radio sets on the Administrative and Radio Patrol Net frequencies.

C) GOCR Responsibility

Install, operate, and maintain all equipments in A and B of Phase II.

(See Annex I for detailed costs and lists of equipments for FY'70, FY'71, and FY'72.)

ORGANIZACION DE LA POLICIA DE COSTA RICA

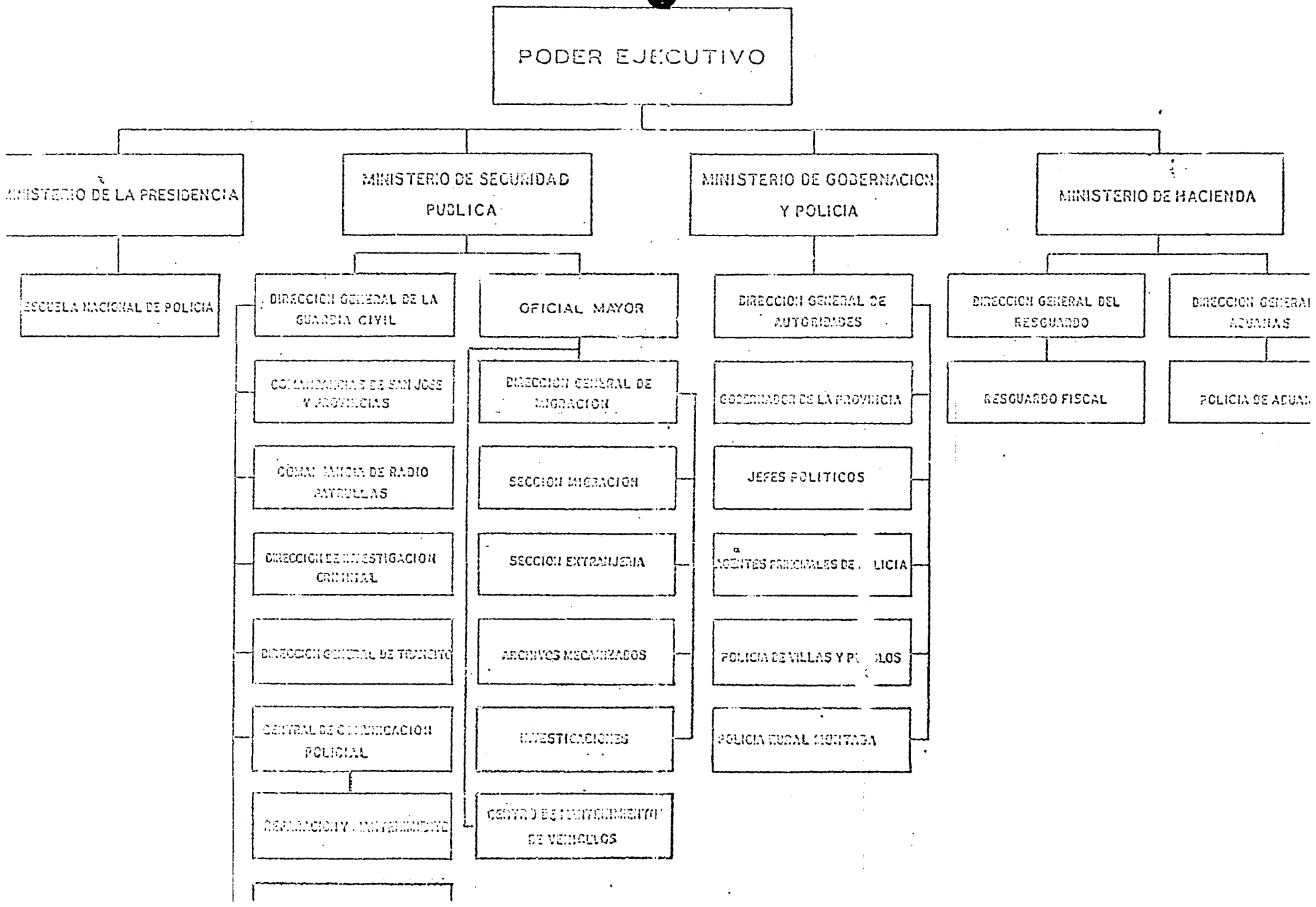
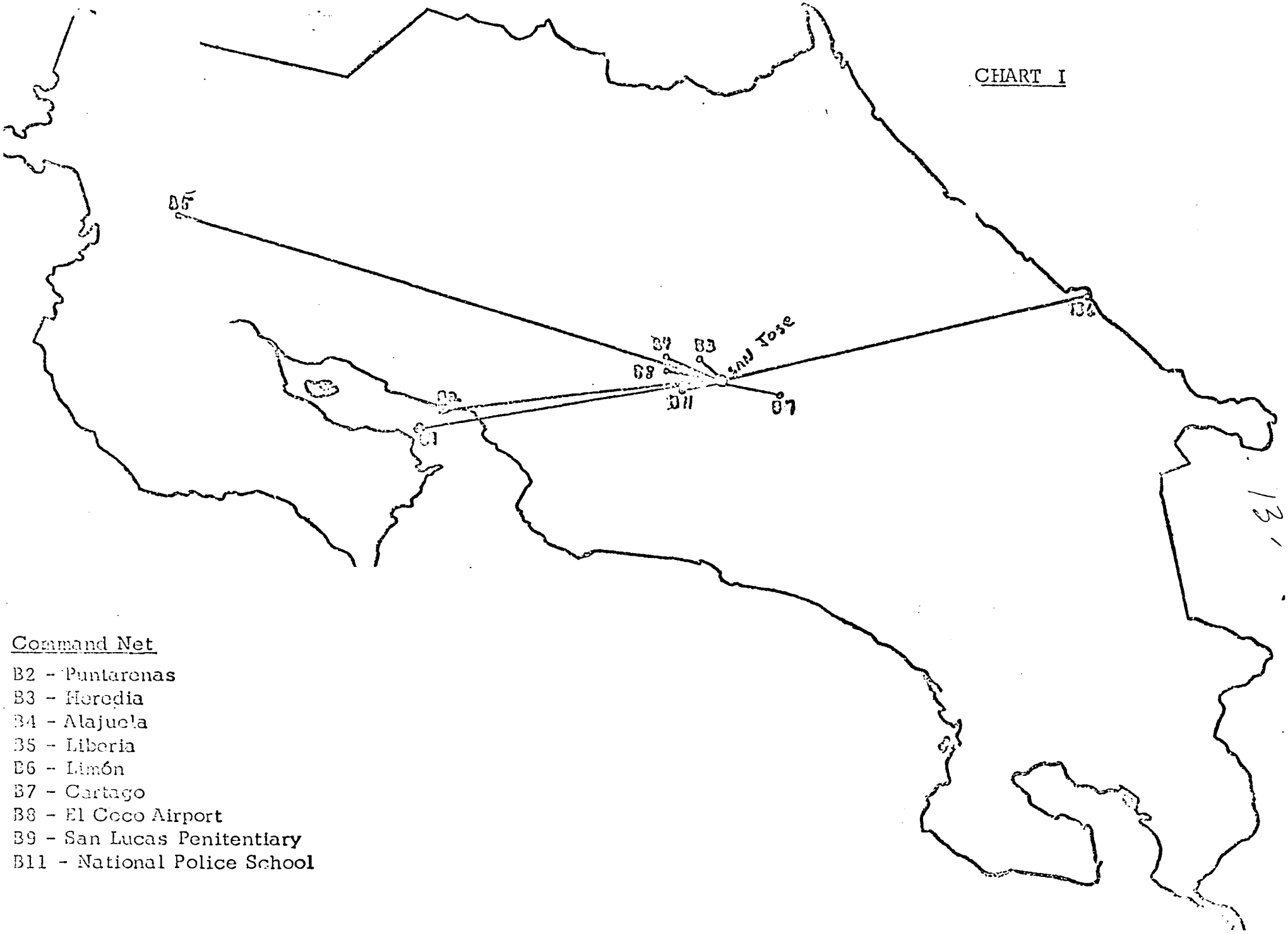


CHART I

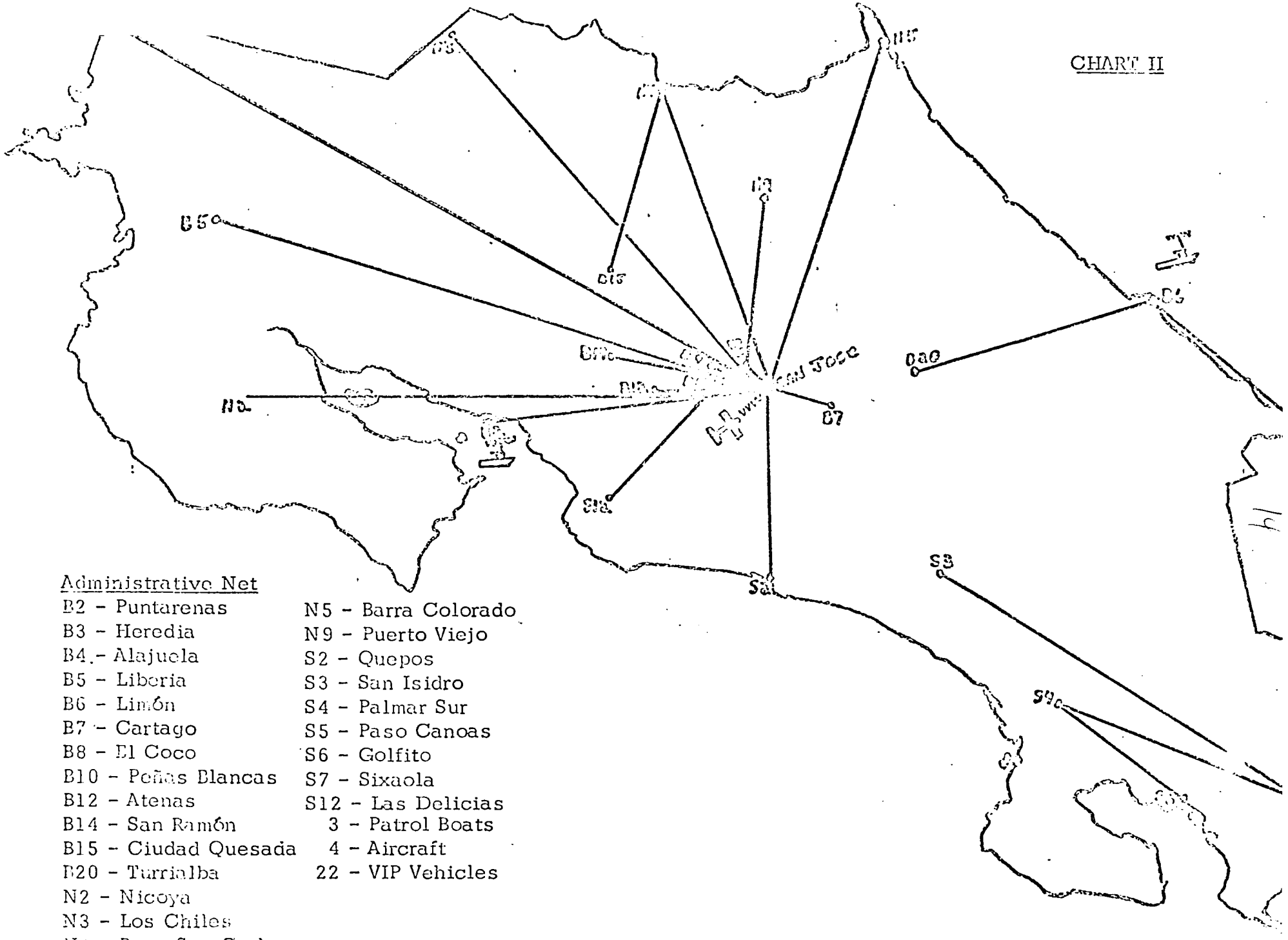


Command Net

B2 - Puntarenas
B3 - Heredia
B4 - Alajuela
B5 - Liberia
B6 - Limón
B7 - Cartago
B8 - El Coco Airport
B9 - San Lucas Penitentiary
B11 - National Police School

13

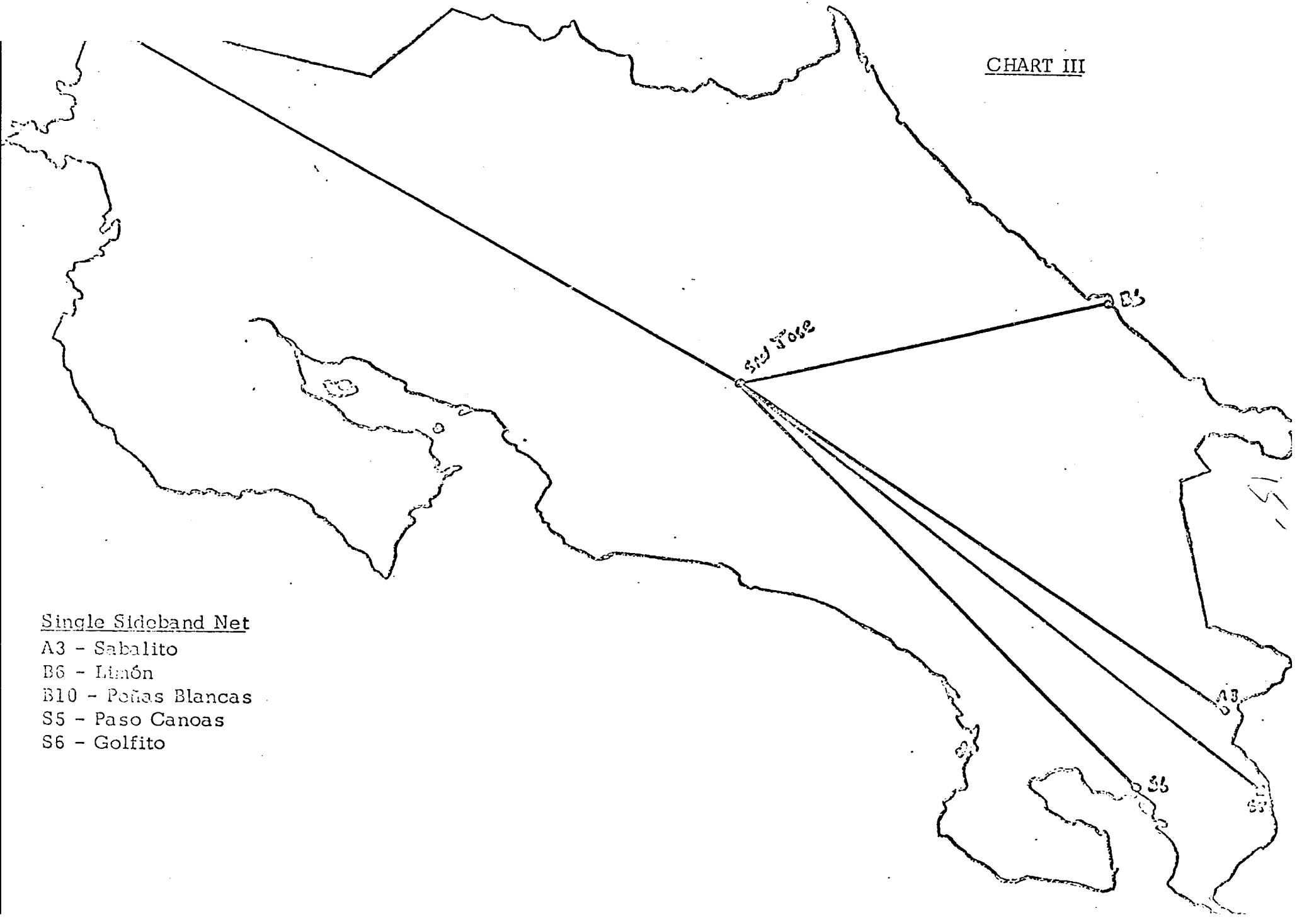
CHART II



Administrative Net

B2 - Puntarenas
B3 - Heredia
B4 - Alajuela
B5 - Liberia
B6 - Limón
B7 - Cartago
B8 - El Coco
B10 - Peñas Blancas
B12 - Atenas
B14 - San Ramón
B15 - Ciudad Quesada
B20 - Turrialba
N2 - Nicoya
N3 - Los Chiles
N4 - Boca San Carlos
N5 - Barra Colorado
N9 - Puerto Viejo
S2 - Quepos
S3 - San Isidro
S4 - Palmar Sur
S5 - Paso Canoas
S6 - Golfito
S7 - Sixaola
S12 - Las Delicias
3 - Patrol Boats
4 - Aircraft
22 - VIP Vehicles

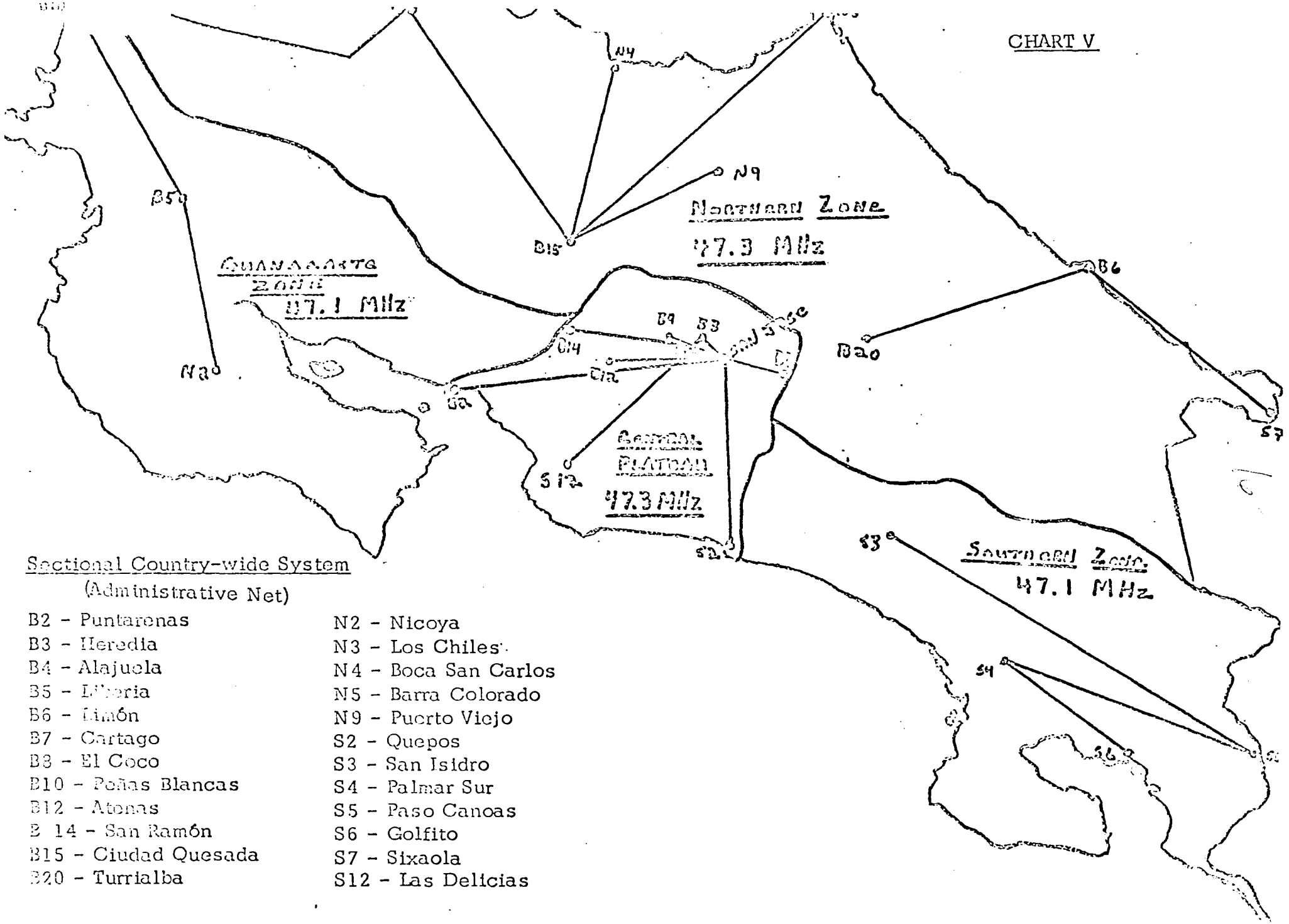
CHART III



Single Sideband Net

A3 - Sabalito
B6 - Limón
B10 - Peñas Blancas
S5 - Paso Canoas
S6 - Golfito

CHART V



Sectional Country-wide System

(Administrative Net)

B2 - Puntarenas
B3 - Heredia
B4 - Alajuela
B5 - Liberia
B6 - Limón
B7 - Cartago
B8 - El Coco
B10 - Peñas Blancas
B12 - Atenas
B 14 - San Ramón
B15 - Ciudad Quesada
B20 - Turrialba

N2 - Nicoya
N3 - Los Chiles
N4 - Boca San Carlos
N5 - Barra Colorado
N9 - Puerto Viejo
S2 - Quepos
S3 - San Isidro
S4 - Palmar Sur
S5 - Paso Canoas
S6 - Golfito
S7 - Sixaola
S12 - Las Delicias