

REVIEW OF PROPOSED VHF-FM  
COMMUNICATIONS SYSTEMS FOR QUITO  
AND GUAYAQUIL, ECUADOR

April 15, 1971

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REPORT OF TDY VISIT

On December 31, 1970, U.S. AID Public Safety, Quito, Ecuador, requested the TDY services of a Public Safety Telecommunications Advisor to evaluate the overall plans for their proposed VHF-FM communication systems for the cities of Quito and Guayaquil. (See Quito 05843)

This report presents general findings and recommendations on these proposed VHF-FM communication systems for Quito and Guayaquil as ascertained during the TDY visit. The review of the proposed Quito and Guayaquil systems was conducted February 8 through 19, 1971, by Mr. Albert W. Carpenter of the Technical Services Division, Office of Public Safety.

SUMMARY OF FINDINGS:

1. The plans for the proposed VHF-FM communication systems for Quito and Guayaquil, with slight modifications, are operationally sound and technically feasible.
2. The final plans for the Quito and Guayaquil systems will provide the outstanding operational flexibilities indicated below.
  - (a) The system in Quito will consist of three independent networks (Zones 1, 2 and Traffic) and will utilize a common control center and repeater site. The system for Guayaquil will only be composed of Zone 1 and 2 networks.
  - (b) Patrol units will be able to enter any of the networks depending on operational requirements.

(c) During periods of low activity, mobile units in Zones 1 and 2 can be combined onto one channel, thereby eliminating the requirement for two dispatchers.

(d) Should the base station or repeater unit of one of the networks fail, the network mobile units can transfer to one of the other operational channels and continue to be dispatched from the control center.

3. Suitable locations for the control centers and repeater sites are available for both the Quito and Guayaquil systems.

4. Communications equipment costing approximately \$35,000 will be provided by US A.I.D. for the First Phase Program.

5. The Ministry of Government in Ecuador will purchase \$47,000 worth of additional VHF-FM Mobile Transceivers (35-40 Units) of the same make and model as those to be furnished by US A.I.D.

6. The communication repair facilities at Quito and Guayaquil are capable of handling the new VHF-FM communications equipment being considered for these systems. These two facilities currently have sufficient test equipment and hand tools to handle almost any situation with which the technicians may be confronted, provided proper preventive maintenance is practiced.

7. The National Police Communication Section currently has no training program in operation for police communication technicians.

8. The Guayas Transit Commission was in the process of purchasing equipment for a communications system for the Guayas Province. The Director of the Transit Commission indicated that a mixed HF-SSB and VHF-FM system had been planned and was in the initial phase of procurement. Proposals had been received and were being evaluated. The system specifications were poorly defined, consequently the bids varied considerably in cost.

RECOMMENDATIONS:

1. The National Police Communication Control Center for Quito should be located at Reten Norte because of it's central location and availability housing for operators. The partially completed building allocated for the control center should be finished as soon as possible to permit installation of the VHF-FM Base Station equipment upon arrival in early June 1971.
2. The procurement of the property for the Quito repeater site on Puecasi Hill should be completed as soon as possible and construction started on the buildings for housing the repeater equipment and emergency electrical generator.
3. As soon as the make and model of VHF-FM mobile transceivers to be purchased by U.S. A.I.D. is determined, the Ministry of Government should be encouraged to process their order for \$47,000 worth of similar VHF-FM mobile transceiver units.
4. Many items of test equipment in the three National Police Repair Facilities are in need of repairs. These items should be sent to the Quito repair facility, spare parts ordered, and repairs made to place this equipment back into proper operating condition.
5. The National Police should establish a training program for newly hired technicians and refresher courses for the other police technicians.
6. The Government of Ecuador should suspend procurement on the system currently proposed by the Guayas Transit Commission and design and install an all VHF-FM system which will be compatible with the system proposed for the National Police in Guayaquil.

7. The low band equipment being removed from Quito and Guayaquil should be relocated in areas jointly selected by the Police and Public Safety. Exact locations should be determined after surveying all possible recipients and their requirements.

8. The skill and magnitude of the sustained effort required to complete the above recommendations within a two year period is believed to be beyond the present capability of the National Police without expert advisory assistance. It is recommended that the services of a Public Safety Telecom Advisor be offered to the National Police for a period of two years to assist in carrying out the above recommendations.

DISCUSSION:

1. Introduction:

The present Police Urban VHF-FM Communications systems being utilized in the cities of Quito and Guayaquil were established in 1960. These systems have become inadequate due to rapid population growth, growth of traffic operations and related problems. Because of these problems, it became evident to the National Police that planning not only for current needs, but for expected needs during the next fifteen years should be done. Taking all of these various factors into consideration, Mr. Segundo Almeida of the Public Safety Office in Ecuador (local contract technician), in conjunction with the National Police and U.S. A.I.D. Public Safety/Ecuador prepared a plan for the modernization and future expansion of Police Communications Systems. This plan was prepared taking into consideration the future population growth, requirement for coordination with other law-enforcement agencies, and the

expected financial resources of the Government of Ecuador.

On December 8, 1969, this plan was completed and submitted to the Office of Public Safety/Technical Services Division (OPS/TSD) for comments and evaluation. The Technical Services Division evaluated the proposed plan on the information received and provided a cost analyst for the communications equipment. However, without actually inspecting the proposed installation sites and reviewing the field requirements, it was difficult to give a realistic evaluation on the overall system. It was suggested that the Mission in Ecuador give serious consideration on requesting a TDY visit by a member of the OPS/TSD Telecommunications Branch prior to the actual ordering of equipment.

On December 30, 1970, U.S. A.I.D. Public Safety in Ecuador prepared an up-dated communications plan and submitted it to the Technical Services Division. This revised communications scheme contained plans for a three phase program for the installation of the projected Police communication systems. These three phases were as follows:

Phase One:

National Police Zone 1 and 2 Networks for Quito - Estimated Cost:  
US\$ 90,000.00.

National Police Traffic Network for Quito - Estimated Cost:  
US\$ 52,000.00.

Phase Two:

National Police Zone 1 and 2 Networks for Guayaquil - Estimated  
Cost: US\$ 90,000.00.

Phase Three:

The third phase consists of purchasing additional mobile transceivers.

A fixed price has not been established for this phase to date.

On December 21, 1970, the Ecuadorian Minister of Government and Police signed Project Agreement number 71-3 with the U. S. Agency for International Development. This Project Agreement provided funds for the implementation of Phase One National Police Zone 1 and 2 Networks in Quito. The U. S. contribution to this Phase One project is US\$ 35,000.00 while the G. O. E. is providing US\$ 47,000.00.

In December 1970 the Public Safety Office in Quito, Ecuador, requested the TDY services of a Telecommunications Advisor from the Office of Public Safety in Washington. This request was made to provide an overall evaluation of the proposed system and to obtain assistance in the preparation of PIO/C's for the U. S. Government's portion of the Phase One project.

2. The Proposed National Police and Traffic Commission Communications System for Quito:

The proposed National Police and Traffic Communications System for Quito consists of three independent networks.

This system provides the following operational capabilities between the three operational elements. (See attachment "A")

- (1) Operation of the three nets independently with their respective repeaters at the same location.

- (2) The patrol units of Zone 1, Zone 2 and Traffic will be able to enter any of the three nets depending on their operational requirements.
- (3) The National Police and the Traffic Commission will jointly operate a Communication Control Center at a site called Reten Norte located in La Floresta in Quito.
- (4) One local controlled base station will be installed at Regimiento Quito to provide a monitoring facility and an emergency control point should the control center or repeater site be disabled.

The site for the joint Police/Traffic Communications Control Center at Reten Norte was selected because its location would be ideal both for communication requirements and its central location with respect to the city of Quito. Presently there exists at Reten Norte a partially completed building which, upon completion, would be suitable for the Communications Control Center and housing for the radio communications equipment. (See attachment "B" for map.) Also at this location exists sufficient area for the installation of the 150 foot tower which will be required for this site.

Puecasi Hill on the east side of Quito has tentatively been selected as the repeater site for the new system. (See attachment "C".) This hill has an elevation of about 800 feet above the city of Quito which will provide an ideal location for a repeater site. Two buildings to house the emergency generator and repeater equipment will require construction within the next few months. Commercial power lines will have to be constructed for about one quarter of a mile to provide electrical power for the repeater site. The estimated costs for the

property, buildings, tower base and power lines have been estimated to be about US \$6,800 which will be provided by the Ecuadorian Government. The current Project Agreement provides a total of \$82,000 (\$35,000 in USG funds and \$47,000 in GOE funds) for the first phase of the communications program. The first phase will provide the two networks for Zones 1 and 2. The Traffic Commission Network will have to be provided at a later date when funds become available on the loan which the GOE is presently negotiating.

During the writers ten day TDY period in Ecuador, PIO/C specifications were prepared which would provide the following items of major equipment for the Zone 1 and 2 Networks.

- (1) 2 Each VHF-FM Remote Controlled Base Stations and Consoles
- (2) 2 Each VHF-FM Repeater Stations
- (3) 1 Each VHF-FM Local Controlled Base Station for Regiment.  
"Quito" (See attachment "D".)
- (4) 2 Each VHF-FM Mobile Units
- (5) 2 Each 150 Foot Towers
- (6) 2 Each 7.5 KW Generator Units

The estimated cost of the above items of equipment is \$35,000 which includes 7 percent GSA surcharge and funds for surface freight. The Mission is desirous of having this equipment in country as soon as possible; therefore, it has been recommended that this PIO/C be given a Priority "A" to help expedite the delivery of this equipment. If possible, the Mission would like all items in country by June 1, 1971, so installations can proceed.

3. The Proposed National Police Communications System for Guayaquil:

The proposed National Police Communications System for Guayaquil will consist of two independent networks. The Guayas Transit Commission is not presently included in on the overall plan of communications in Guayaquil. This is due to the fact that the Guayas Transit Commission is an autonomous agency and therefore does not come under the control of the National Police.

The National Police Headquarters in Guayaquil has been selected as the site for the Communications Control Center. One room in the Headquarters building can be made into Communications Control Center which should provide an ideal location for housing the Communications equipment.

Within the National Police Headquarters area there is sufficient area for the construction of the 150 ft. tower. (See attachment "E")

Santa Ana Hill has been tentatively selected as the repeater site for the Guayaquil system. This hill has an elevation of approximately 275 ft. above the surrounding terrain. The same considerations for housing of equipment will also be required for this location. (See attachment "E")

4. The Guayas Transit Commission Communications System:

The Guayas Transit Commission is presently in the process of purchasing a communications system for the Guayas Province. During the visit of this writer to Guayaquil, contact was made with the Executive Director of the Guayas Transit Commission to determine the type of system being considered. It was learned from Mr. Roberto Robles Sañatta, the

Executive Director of the Transit Commission, that they had let specifications which called for 14 VHF-FM (High Band) Base Stations, 14 HF-SSB Base Stations and 40 VHF-FM Mobile units. In looking over the terrain, it is the opinion of this writer that a complete VHF-FM system would be far superior to the one being considered by the Guayas Transit Commission. This statement is made based on the following considerations.

- (a) The Mixed system of HF-SSB and VHF-FM presently being proposed by the Guayas Transit Commission is not within the latest system engineering developments or the developments in communications equipment.
- (b) A system which utilizes a mixture of HF and VHF equipment cannot provide direct communications from the Guayaquil Transit control center to the mobiles out of the Guayaquil area. The mobile units will have to rely upon the various VHF/HF base stations for relaying information to and from the Guayaquil control center. It is almost certain that these fixed VHF/HF base stations scattered through the Guayas Province will not provide the 24 hour relay service required for this type of system.
- (c) The system as proposed by the Guayas Transit Commission requires the installation of a VHF-FM transceiver and a HF-SSB transceiver at each base station location. This is actually a duplication of equipment which will require the procuring and stocking of different spare parts for each type of radio being utilized.

- (d) The costs for a repeater type operation as compared to the split VHF/HF system should be close. It is the opinion of this writer that a VHF/FM repeater type system would be more ideal for their operational requirements.
- (e) It appears that the Guayas transit commission has not really considered the problems of operational effectiveness and operational control of the units in the field with their selection of split HF/VHF system.
- (f) Test equipment for maintenance and adequate hand tools are not being considered in this project. Also the question of qualified technicians has not surfaced.
- (g) It was noted that the specifications for the equipment were to general in nature. Nothing was really defined as to the exact requirements for each type installation.

5. Existing Police Communication Networks:

(a) Quito National Police VHF-FM (Low Band) Network:

The National Police Network for Quito presently consists of communications equipment which was purchased by U.S. AID in 1959. This network was established during the early part of 1960 and has been functional since 1960. The communications equipment for this system is as follows:

- (1) One Motorola VHF-FM, 60 Watts, remote controlled base station located at the National Police Quito Regiment Headquarters (Regimianto Quito). The frequencies of operation are 52 MHz Transmit and 54 MHz receive.

(2) One Motorola VHF-FM, 60 Watts, repeater (Modified Base Station) located on Puecasi Hill overlooking the city of Quito. This repeater site is about 800 feet higher in altitude than Quito and is located to the East on Quito's perimeter. The frequencies of operation are 54 MHz Transmit and 52 MHz Receive.

(3) Thirty-seven Motorola Motrac VHF-FM, 30 Watts, Mobile Transceiver units operating in the Quito area. The frequencies of operation for these mobile units are 52 MHz transmit and 54 MHz receive.

(b) Guayaquil National Police VHF-FM (Low Band) Network:

The communications equipment for the Guayaquil was purchased at the same time as that for the Quito system. This network was also established in 1960 and has been operating effectively ever since. The network consists of the following items of communications equipment:

- (1) One Motorola VHF-FM, 60 Watts, remote controlled base station located at the Guayas Regiment Headquarters in Guayaquil. The frequency of operation is 52 MHz transmit and receive.
- (2) Thirty-one Motorola Motrac VHF-FM, 30 Watts, mobile transceiver units operating in the Guayaquil area. These mobile units are operating on the same frequency as the base station listed above.

(c) Other VHF-FM (High Band) Systems in Operation:

- (1) In the city of Cuenca the National Police have a VHF-FM (High Band) Network which is composed of two Comco Base Stations and four Comco mobile units. In 1959 the Government of Ecuador purchased seventeen Comco Mobile units and three Comco base stations. The above six units are the only ones remaining in service due to the nonavailability of spare parts in Ecuador and the lack of proper funding for spare parts on the part of the Ecuadorean Government. This system operates on a frequency of 158.900 MHz transmit and receive.
- (2) In addition, there is also a small system of FM-5 transceivers located in the city of Ambato. This system is comprised of one FM-5 base station and four FM-5 mobile units and operates on a frequency of 159.700 MHz transmit and receive.

(d) National Police HF-SSB Nation-wide Communications System:

The National Police operate and maintain a voice operated High Frequency Single Side Band (HF-SSB) Network throughout Ecuador. This system is comprised of forty base stations and several mobile units and operates on a twenty-four hour basis. The equipment for this system was purchased by U.S. AID in 1962. The National Police with the aid of Mr. Segundo Almeida, the Public Safety contract technician, have managed to keep the equipment in an operational condition. A large quantity of spare parts are on-hand in the Quito warehouse; however, the majority of these

spare parts were obtained with the original equipment purchase in 1962. (See attachment "F" for locations and types of equipment.)

6. The National Police Radio Repair Facilities:

The National Police maintain three radio repair facilities in Ecuador. These radio repair facilities are located in the cities of Quito, Guayaquil and Cuenca. The repair shops are equipped with a large quantity of test equipment which should be sufficient to handle all the required repairs which may be encountered. Inventory lists for this test equipment are attached as attachment "G" to this report. This writer observed the repair facilities at Quito and Guayaquil and they appeared to be organized in a manner which would permit efficient repair operations. The Quito and Guayaquil repair facilities are located on major National Police installations which provide sufficient parking room for vehicles with radio maintenance problems. The stock rooms at each of the above two facilities were orderly and all items appeared to have a proper storage place. The stock rooms are utilizing a book system for maintaining spare parts inventory records.

7. The National Police Radio Repair Technicians:

Presently the National Police have sixteen radio repair technicians with various degrees of qualifications. Of these technicians, only about two or three could be considered qualified to maintain communications equipment without supervision. A complete list of National Police technicians and their qualifications is attached as attachment "H" to this report.

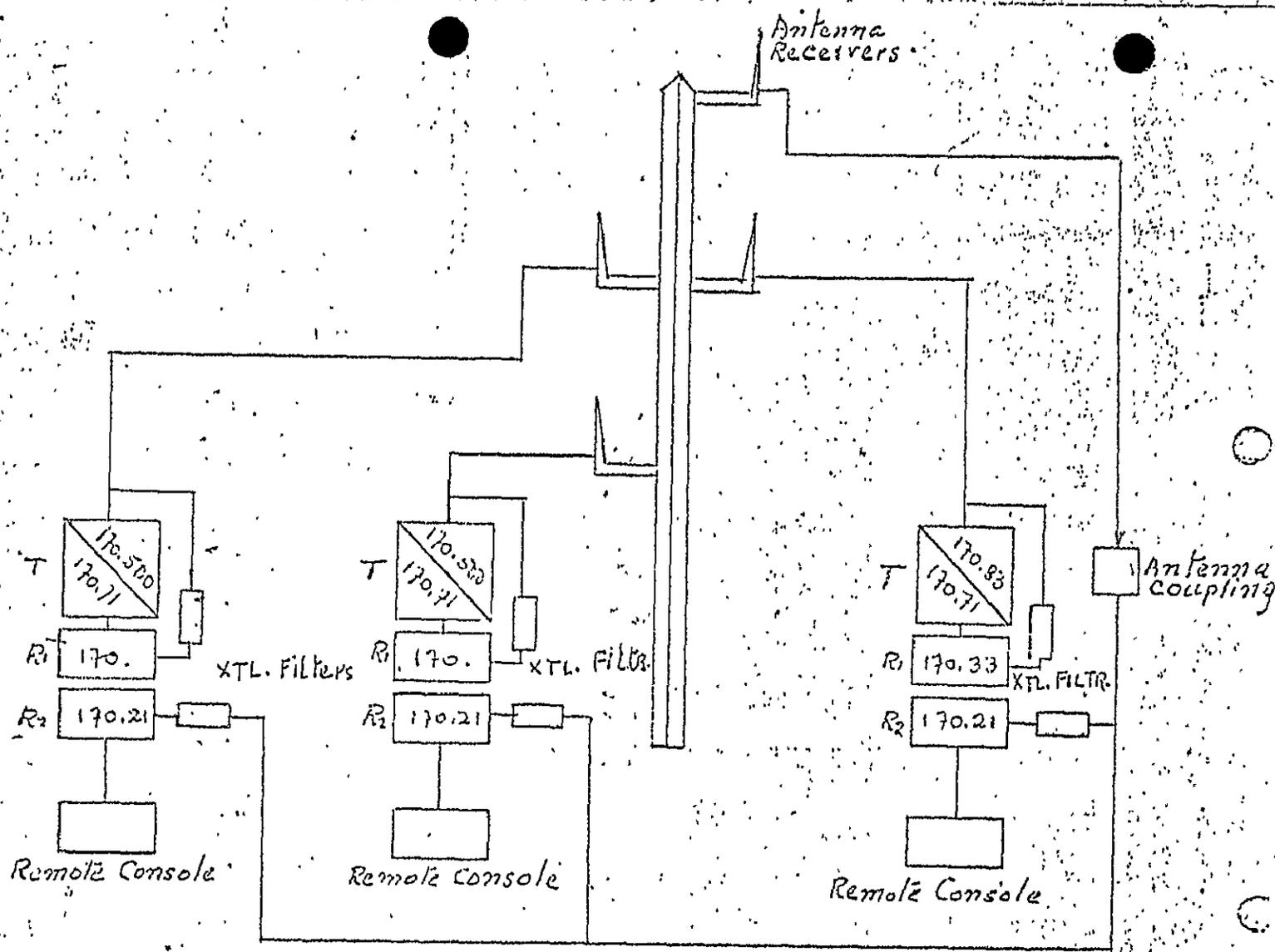
8. The National Police Training Capabilities for Radio Repairmen:

Currently there is no formal training capability within the National Police Organization for radio repair technicians.

9. Recommendation for Public Safety Telecommunication Advisor Assignment:

It is strongly recommended that a Public Safety Telecommunications Advisor be assigned to the Ecuador Public Safety Program for a two year assignment to work with the National Police Communications Organization. This assistance is required to provide proper guidance on the installation and design aspects of the Quito and Guayaquil communication systems. This assigned telecommunication advisor would also provide needed assistance to the National Police Communications Section in the areas of Organization, Administration, Logistics and Training. Mr. Segundo Almeida, the local Public Safety Contract Technician, is currently providing part of this technical assistance to the Police Communications Section in the areas indicated above; however, Mr. Almeida may soon go into retirement.

Attachment "A-1"



REMOTE CONTROL BASE STATION

R      T

170	170.5
170.210	170.710
170.33	170.83
170.98	170.98

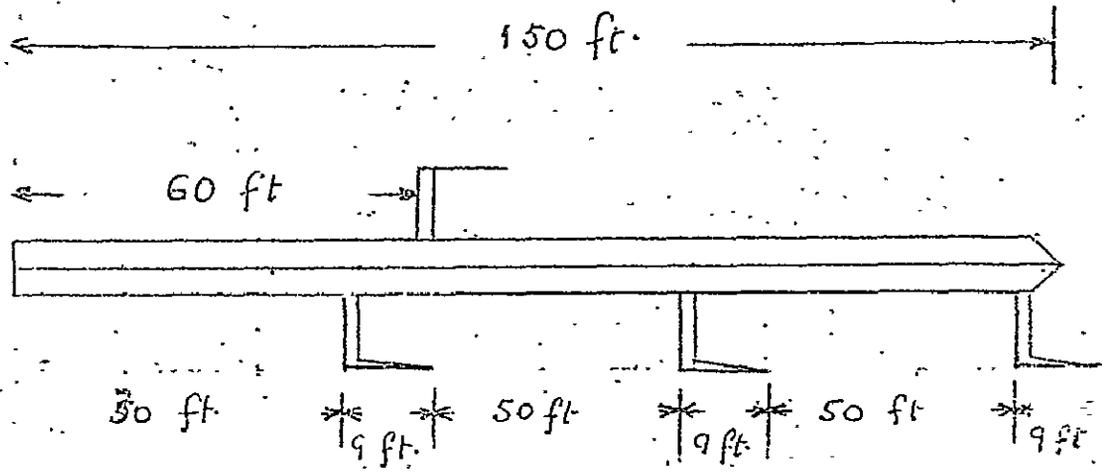
Zones 1 and 2

MOBILE UNITS

R      T

170	170.5
170.210	170.710
170.33	170.83
170.9	171.4

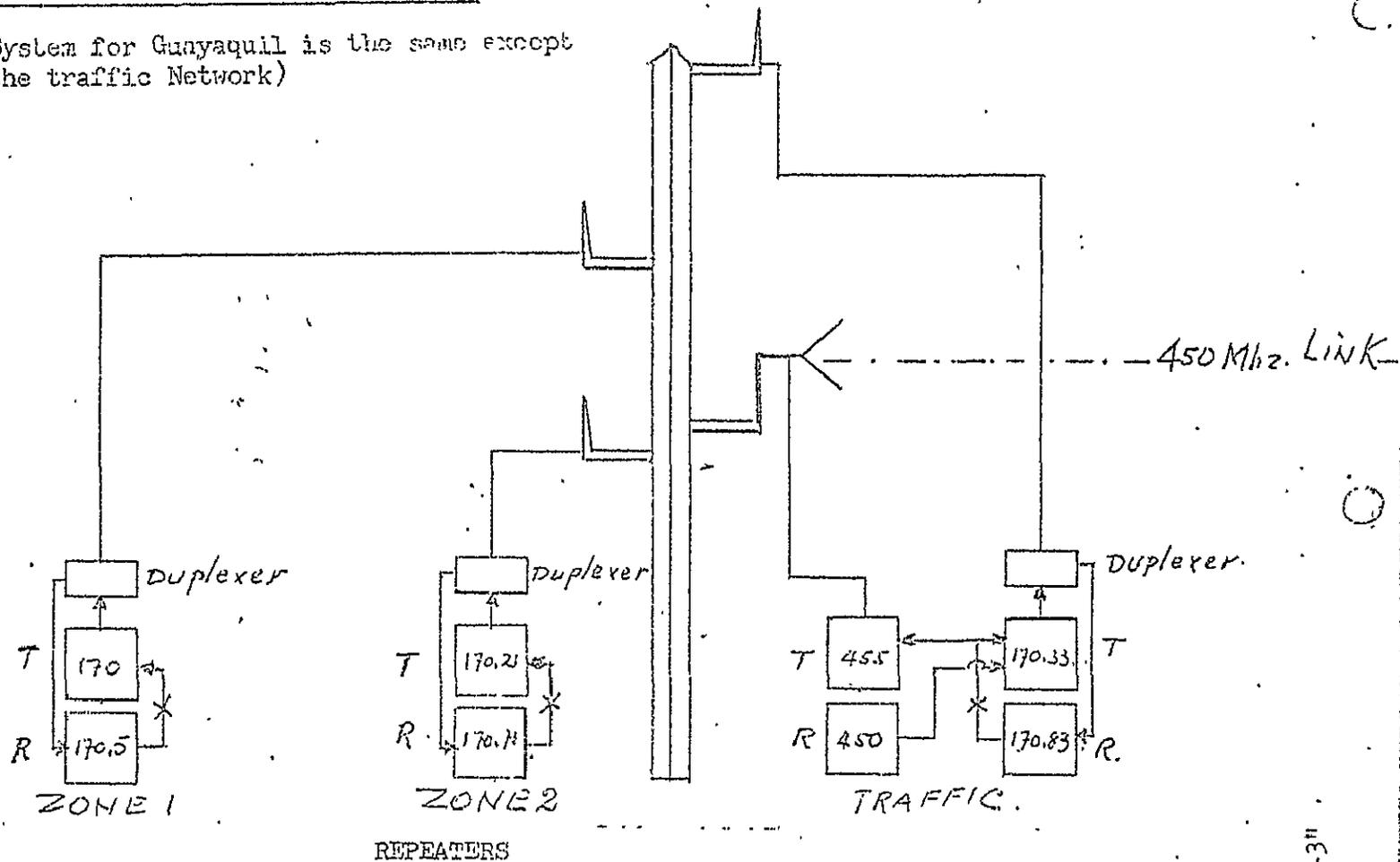
TRAFFIC

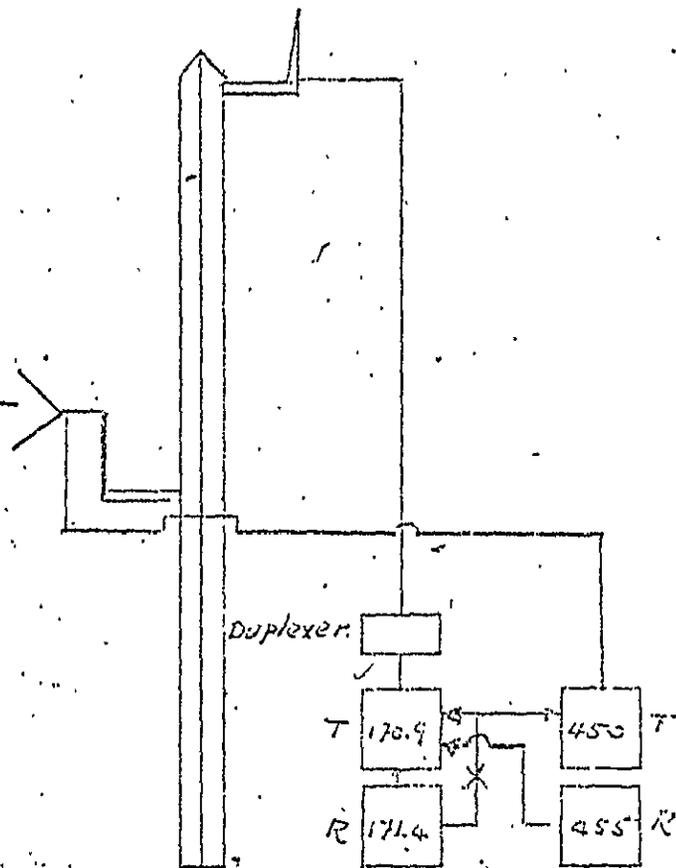


Attachment "A-2"

NATIONAL POLICE URBAN PATROL NETWORK - QUITO

(The System for Guayaquil is the same except for the traffic Network)

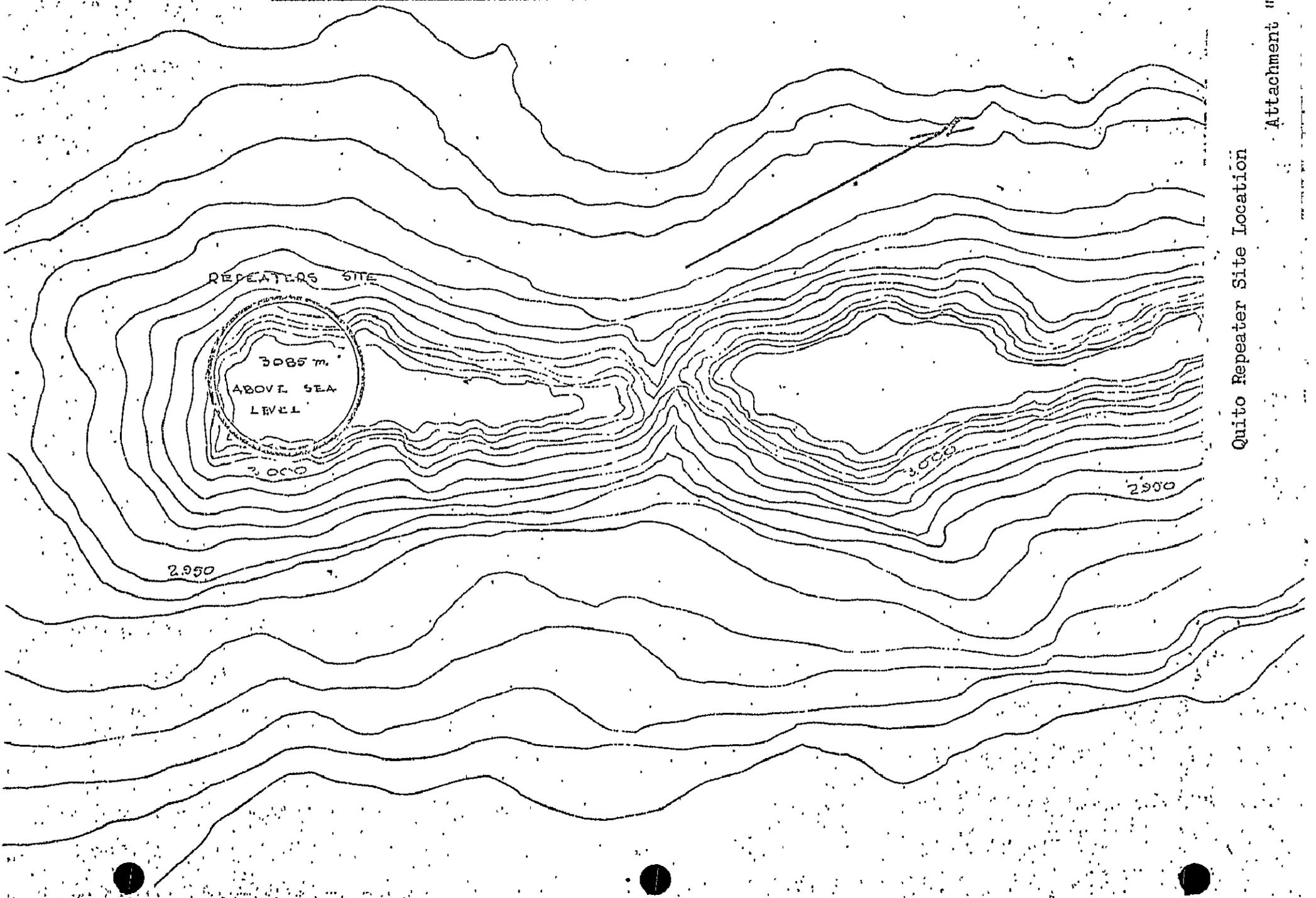




RURAL TRAFFIC REPEATER

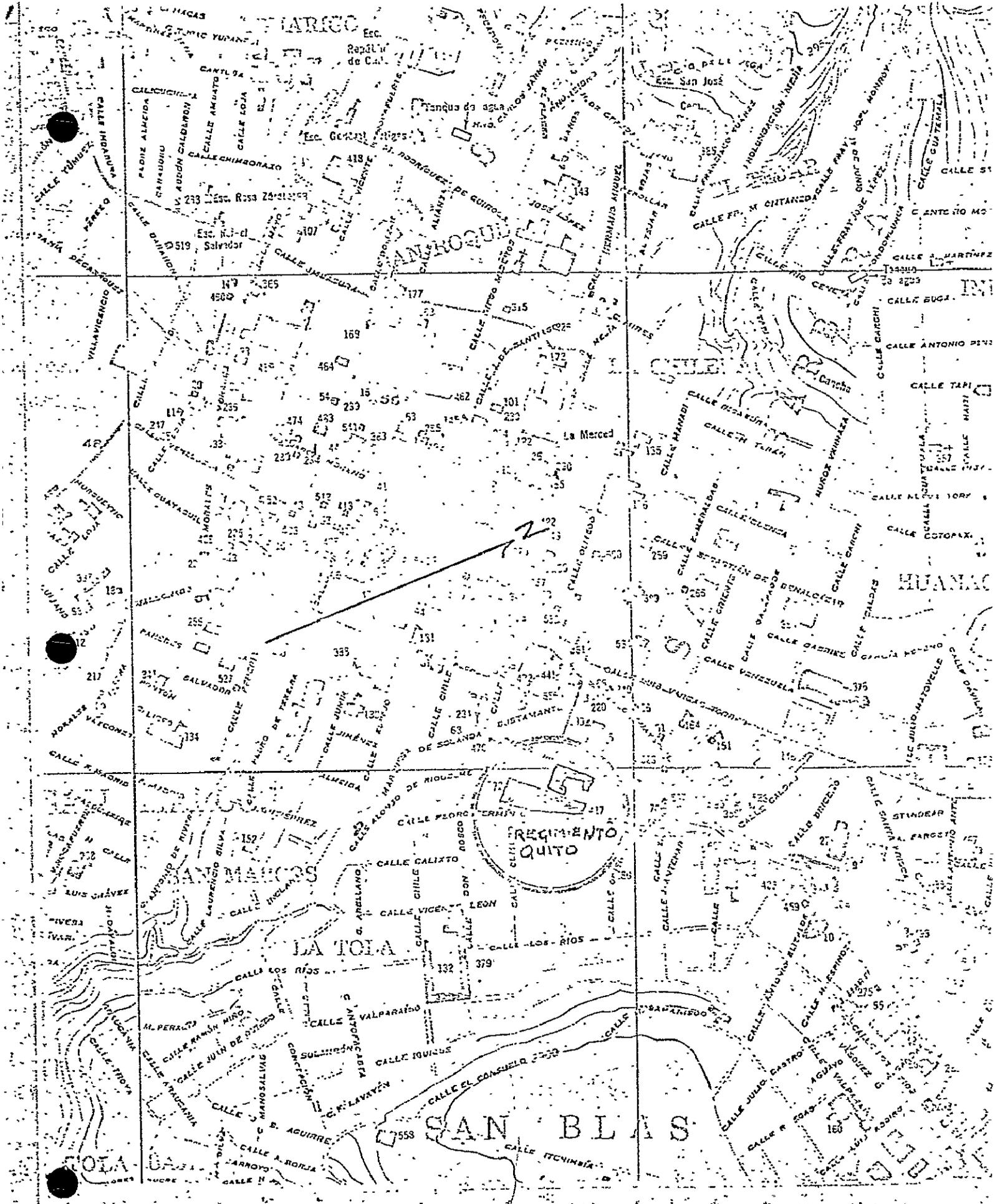


PUEGASI HILL

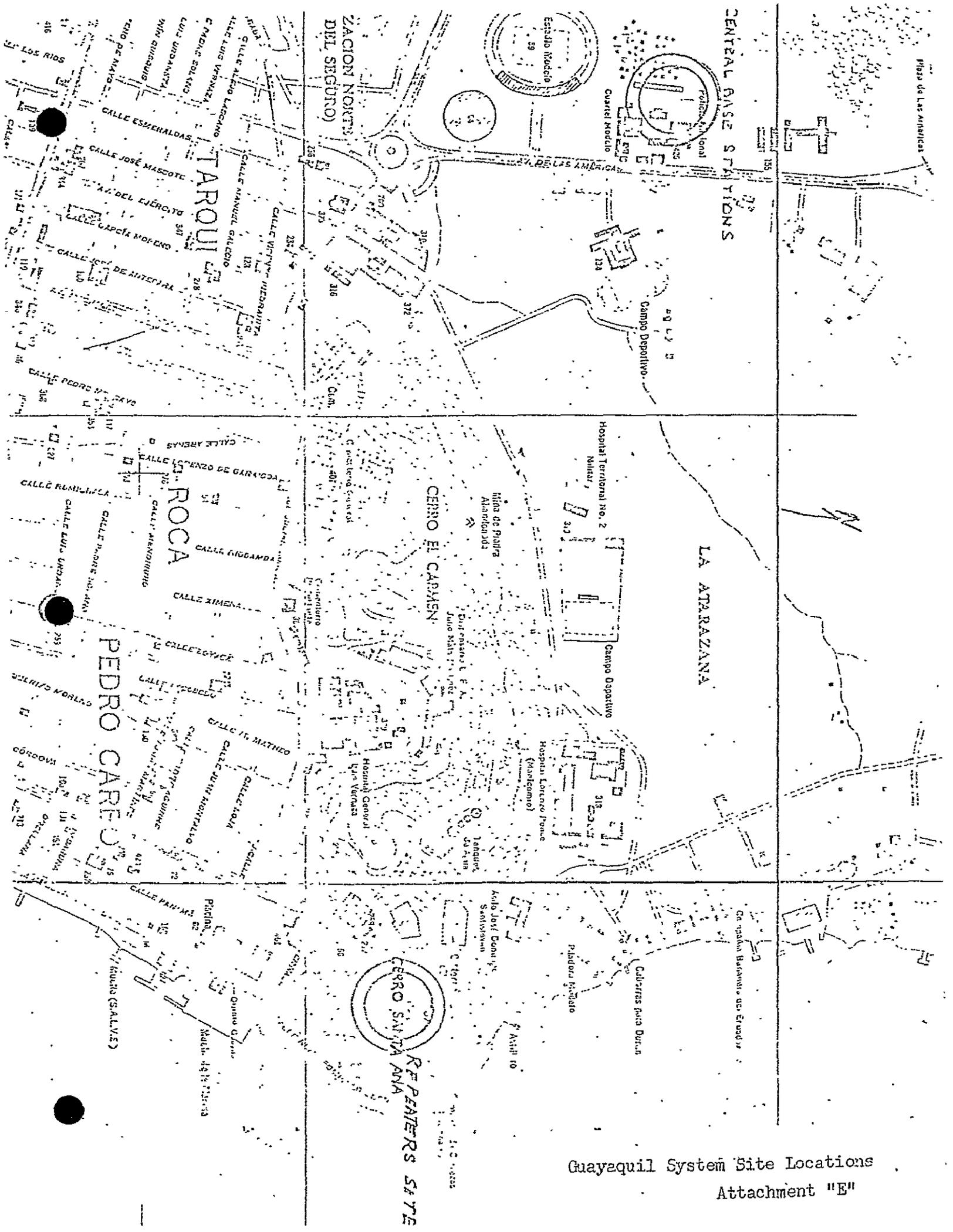


Quito Repeater Site Location

Attachment "C"



Quito Base Station Site Location



CENTRAL BASE STATIONS

LA ATARAZANA

CERRO EL CARMEN

CERRO SANTA ANA

TARQUI

ROCA

PEDRO CARDO

Guayaquil System Site Locations  
Attachment "E"

HF-SSB BASE STATION LOCATIONS AND TYPES OF EQUIPMENT

R.C.A. SSB-1 Stations

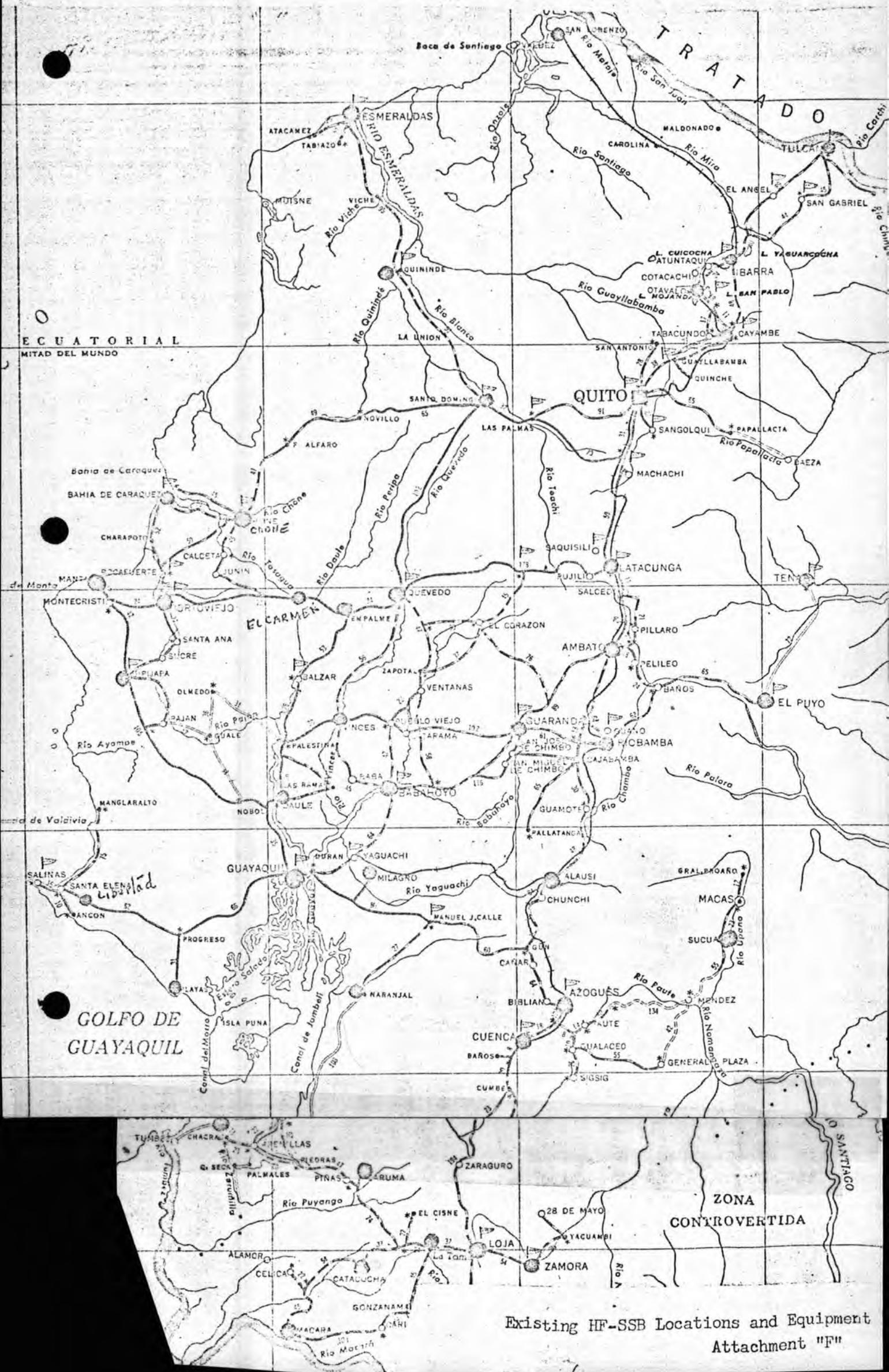
1 QUITO COMANDANCIA GENERAL  
1 SANTO DOMINGO  
~~2~~ LABORATORIO QUITO  
1 GUAYAQUIL  
1 MACHALA  
1 HUAQUILLAS  
1 PORTOVIEJO  
1 RIOBAMBA  
1 CUENCA  
1 LOJA  
1 BABAHOYO  
1 QUEVEDO  
1 AMBATO  
1 TULCAN  
1 IBARRA  
1 LATACUNGA  
1 ESMERALDAS

TOTAL - 18 STATIONS

R.C.A. SSB-5 Stations

1 CAYAMBE  
2 LABORATORIO QUAYAQUIL  
1 DAULE  
1 ZARUMA  
1 MANTA  
1 CHONE  
1 JIPIJAPA  
1 ALAUSI  
1 LABORATORIO CUENCA  
1 TENA  
1 CATACocha  
1 MACARA  
1 MILAGRO  
1 GUARANDA  
1 OTAVALO  
1 SAN LORENZO  
1 QUININDE  
1 AZOGUES  
1 PUYO  
1 SUCUA  
1 ZAMORA

TOTAL - 22 STATIONS



Existing HF-SSB Locations and Equipment  
Attachment "F"

TEST EQUIPMENT AT THE QUITO RADIO REPAIR FACILITY

<u>TYPE AND MAKE</u>	<u>MODEL</u>	<u>SERIAL</u>	<u>CONDITION</u>
1. Motorola Frequency Meter	T-1098A	898	Good Condition
2. Motorola Frequency Generator	T-1034C	---	Good Condition
3. Motorola Test Set	S-1057A	E-67572	Good Condition except Cable
4. Motorola Oscilloscope	T-1014B	34442	Good Condition
5. Motorola Multimeter	S-1063A	608446	Good Condition
6. Motorola Voltmeter	S-1051A	101	No Batteries
7. Motorola Tone Generator	T-1A	---	No Batteries
8. Motorola Pulse Generator	TEK-21A	---	No Batteries
9. Motorola Motrac Antenna Holder	---	71980	Good Condition
10. Motorola Test Meter	TEK-7A	---	Good Condition
11. R.C.A. Oscilloscope	WO-91A	CONDEN-1-3	Good Condition
12. Heathkit Transistor Tester	IM-30	6387B	Good Condition
13. Heathkit Voltage Regulator	IP-20	6393	Good Condition
14. R.C.A. Audio Generator	WA-44C	---	Good Condition
15. R.C.A. V.T.V.M.	WV-98B	79752	Bad Condition
16. Heathkit RF Field Meter	PM-2	6497	Good Condition
17. Motorola Battery Eliminator	T-1012	1809	Good Condition
18. Heathkit Signal Tracer	IT-12	5036618	Good Condition
19. Heathkit Battery Eliminator	IP-12	---	Good Condition
20. Heathkit Impedance Bridge	IB-2A	---	Good Condition
21. R.C.A. Signal Generator	WR-50A	2016	Good Condition
22. AC Power Supply for R.C.A. SSB-5 Transceiver	---	---	Good Condition
23. Motorola Multimeter	S-1052B	D-74941	No Batteries
24. Motorola RF Load	T-1013A	---	Good Condition
25. R.C.A. Tube Tester	---	24210797	Fair Condition

Test Equipment - ATTACHMENT "G"

	<u>TYPE AND MAKE</u>	<u>MODEL</u>	<u>SERIAL</u>	<u>CONDITION</u>
26.	Motorola AC Voltmeter	S-1051B	E-35174	No Batteries
27.	Station Meter	52-KW4	1647	Bad Condition
28.	Simpson Multimeter	260	---	Bad Condition
29.	Simpson Multimeter	230	---	Bad Condition
30.	Heathkit Dipper	HM-10A	---	Good Condition
31.	Transistor Adapter	For Simpson 260	---	Bad Condition
32.	Motorola Battery Charger for Handie-Talkie	---	---	Fair Condition
33.	Bird Wattmeter	43	30889	Good Condition
34.	Heathkit Station Meter	HM-15	2105	Bad Condition
35.	Craftsman Air Compressor	C-2124CC-G-G2	---	Bad Condition
36.	Heathkit Multimeter	MM-1	833-1756A	2 Ea Bad Condition
37.	Hallicrafters Test Set	TS-20/35	0031	2 Ea Bad Condition

TEST EQUIPMENT AT THE QUAYAQUIL RADIO REPAIR FACILITY

1.	Motorola Multimeter	S-1063A	D-79079	Good Condition
2.	Motorola Voltmeter	S-1051A	E-35180	Good Condition
3.	Motorola Frequency Meter	T-1098A	72	Good Condition
4.	Motorola Signal Generator	T-1034C	681	Good Condition
5.	Motorola Test Set	S-1057A	A-63907	Bad Condition
6.	Motorola Tone Generator	T-1A	---	2 Ea Good Condition
7.	Bird Wattmeter	43	20761	Good Condition
8.	Motorola RF Load	T-1013A	E-28306	2 Ea Good Condition
9.	Motorola Battery Eliminator	T-1012	12-1330	Good Condition
10.	Motorola Test Set	TEK-7A	---	Good Condition
11.	Motorola RF Probe	---	---	Good Condition
12.	Hallicrafters Test Set	TS-20/35	0030	Good Condition

	<u>TYPE AND MAKE</u>	<u>MODEL</u>	<u>SERIAL</u>	<u>CONDITION</u>
13.	R.C.A. Audio Generator	WA-44C	---	Good Condition
14.	Heathkit Station Meter	HM-15	---	Good Condition
15.	R.C.A. Signal Generator	UR-50-A	---	Good Condition
16.	Heathkit Tube Tester	---	---	Good Condition
17.	Heathkit Multitester	---	---	Good Condition
18.	Simpson Multimeter	260	---	Bad Condition
19.	Simpson Multimeter	230	---	Bad Condition
20.	R.C.A. V.T.V.M.	WV-98-C	---	Good Condition
21.	R.C.A. RF Probe	WG-301-A	---	Good Condition
22.	R.C.A. Tube Tester	WT-110-A	---	Bad Condition

TEST EQUIPMENT AT THE CUENCA RADIO REPAIR FACILITY

1.	Bird Wattmeter	43	30874	Good Condition
2.	Motorola RF Load	T-1013A	1698	Good Condition
3.	Motorola Battery Eliminator	T-1012	1339	Good Condition
4.	Motorola Signal Generator	T-1034	3013	Good Condition
5.	Heathkit Multimeter	IM-13	---	Good Condition
6.	Heathkit Impedance Bridge	IT-13	507-6617	Good Condition
7.	Heathkit RF Signal Generator	IG-102	---	Good Condition
8.	Heathkit Tube Tester	IT-21	5056811	Good Condition
9.	Heathkit Multimeter	MM-1	8331756-A	Bad Condition
10.	Simpson Multimeter	260	---	Bad Condition
11.	Simpson Multimeter	230	---	2 Ea Bad Condition
12.	R.C.A. AC Power Supply for SSB-5	---	62307	Good Condition
13.	Heathkit Dipper	HM-15	836-2105	Good Condition
14.	Heathkit RF Field Meter	PM-2	501-06497	Good Condition
15.	Heathkit Signal Tracer	IT-12	503-6618	Good Condition

Inspector (Captain)  
Carlos Guerrero  
Police Radio Comm.  
VII-30-64 to I-30-65  
General Electric- New York

Sargeant  
Jaime Araujo  
Police Radio Comm.  
IV-65 to XI-65  
Dallas

Sargeant  
Wilson Fuentes  
Police Radio Comm.  
VII-64 to I-65 Gzal. Electric

Sargeant  
Luis Aguilar  
Police Radio Comm.  
IV-65 to XI-65  
Dallas

Corporal  
Gonzalo Balarezo

Policeman  
José Molina    Edmundo Muriel    Víctor Zapata    Vicente Achig    Edmundo Mera  
Lautaro Madrid

Subinspector 1<sup>o</sup> (Lieutenant)  
Rubén Fonseca  
Electronics  
III-28-67 to X-4-67  
Pasadena

Sargeant  
Jorge Suarez  
Police Radio Comm.  
VII-30-64 to I-30-65  
General Electric-New York

Sargeant  
Bolivar Duque  
Police Radio Comm.  
IV-65 to XI-65. Dallas

Sargeant  
Vicente Garnica  
Police Radio Comm.  
IV-65 to XI-65  
Dallas

Corporal  
Gonzalo Hernández

RADIO TECHNICIAN - NATIONAL POLICE