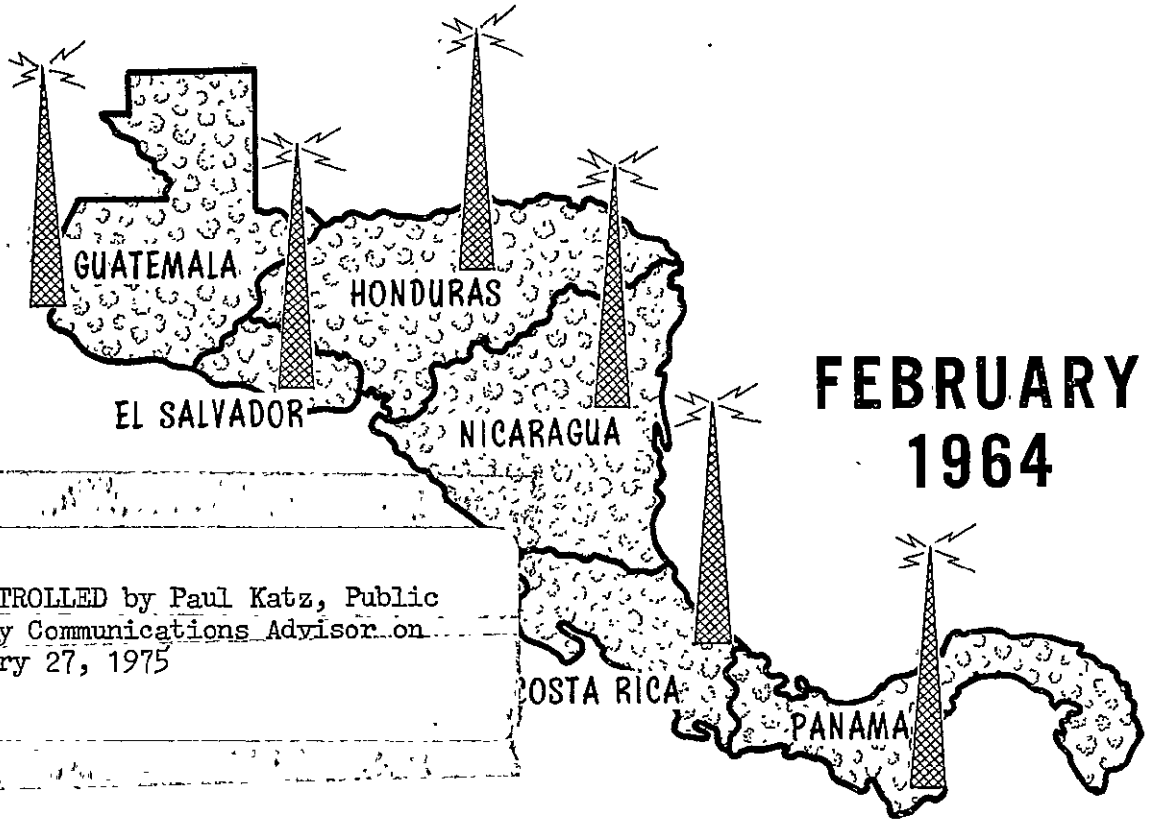
CENTRAL AMERICAN INTERNATIONAL SECURITY TELECOMMUNICATIONS SURVEY REPORT



FEBRUARY 1964

AGENCY FOR INTERNATIONAL DEVELOPMENT

OFFICE OF PUBLIC SAFETY

WASHINGTON, D.C. 20523

CENTRAL AMERICAN INTERNATIONAL SECURITY COMMUNICATIONS NETWORK SURVEY REPORT

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Office of Public Safety
Technical Services Division
Agency for International Development

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FIGURES AND ANNEXES

FOREWORD

In response to a request originating at the Second Meeting of Ministers of Government, Interior and Security of the Central American countries, Panama and the United States of America, held in San Salvador, El Salvador on January 13—16, 1964, a communications survey of five Central American countries was conducted by a telecommunications engineer from the Office of Public Safety (OPS), Agency for International Development, Washington, from January 26 to February 10, 1964.

During said survey, meetings were held with the following host country representatives as well as U.S. officials in each of the Central American countries:

COSTA RICA

Mr. Fernando Goicoechea Quiros, Minister of Public Security

Col. Fernando Figuis Quiros, Chief of Public Security

Major Udo Wenzel Karg, Chief of Communications, Public Security

Col. Springer, Chief U.S. Military Mission

Director of USAID/Costa Rica and Chief of Public Safety Division

EL SALVADOR

Col. Fidel Sanchez Hernandez, Minister of Interior

Col. Jose Alberto Medrano

Col. Miguel Angel Munoz, Sub Director National Police

Ambassador of United States, the Honorable Murat Williams

Deputy Chief of Mission, Leonard Saccio

Chief of Public Safety Division

GUATEMALA

Col. Louis Maximiliano Serrano Cordova, Minister of Government

Lt. Col. Carlos Ignacio Gonzalez Palacios, Chief of the Judicial Department

Col. Victor Rodirquez, Director General of National Police

Col. Mendizabal, Director of Border Patrol

Col. Carlos Barrera, Deputy Chief Border Patrol

Mr. Mario Diaz, Chief of Communications National Police

Mr. Robert Corrigan, Deputy Chief of Mission

Col. Harold H. Houser, Chief of U.S. Military Mission

Deputy Director USAID/Guatemala, Chief Public Safety Division

Chief Civil Aviation Advisor, ROCAP

HONDURAS

Lic. Mario Rivera Lopez, Minister of Government and Justice

Col. Alonso Flores Guerra, Director General Internal Security Forces

Major Guevera W., Inspector General Internal Security Forces

Capt. Hector R. Lagos, General Director of Communications

Ambassador of United States, the Honorable Charles R. Burrows

Deputy Chief of Mission, Clinton Knox

NICARAGUA

Dr. Lorenzo Guerrero, Minister of Government

Gen. Gustavo Montiel, Chief of National Security

Col. Francisco J. Medal Z., Director General of Communications

Col. Benjamin J. Guerra L., Director Technical Radio, Ministry of War, Marine and Aviation

Capt. Saturnino Cerda C., Director of National Radio and Television

Ambassador of United States, the Honorable Aaron S. Brown

Acting Director USAID/Nicaragua

Discussions were held regarding the possible establishment of a Central American International Security Communications Network. Details of these discussions are contained in this report.

In order to evaluate the Central American countries communications requirements, the AID/W representative traveled extensively throughout Central America and visited security and commercial communications facilities in Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

In this report, a detailed discussion is made of the following topics:

1. An evaluation of existing security and police communications equipment which could possibly be utilized in the Central American International Security Communications Network;

2. The identification of area therein where existing or proposed international communication facilities (such as commercial, government, military, etc.) are adequate and can be utilized by the security agencies of the Central American countries in preference to creating parallel and duplicate systems;

3. The identification of immediate and future communications requirements for equipment, personnel, training and logistic support, to form a basis for joint U. S. and host country planning regarding the Central American International Security Communications Network.

GLOSSARY

USAID	-	United States Agency for International Development
AID/W	-	Agency for International Development—Washington
OPS	-	Office of Public Safety
FAA	-	Federal Aviation Agency
COCESNA	-	Central American Corporation for Air Navigation Service
FOT	-	Optimum Traffic Frequency is an estimate of frequencies having ionospheric support 90% of the time.
LUF	-	Lowest Usable Frequency is an estimate of frequencies having adequate signal-to-noise ratio 90% of the time.
MUF	-	Maximum Usable Frequency is an estimate of frequencies having ionospheric support 50% of the time.
AM	-	Amplitude Modulation Modulation of the amplitude of the transmitting wave. The transmitting wave contains a fixed carrier with no intelligence (speech or a signal) and two sidebands both above and below the carrier signal. Each sideband produced by the process of modulation has the same intelligence.
CW	-	Continuous Wave - Radio Telegraph Interrupting the transmitted carrier at precise intervals permits the use of Morse Code, a telegraphic alphabet or code consisting of dots, dashes, and spaces. The transmitting wave contains a fixed carrier with no intelligence and no sidebands.
FM	-	Frequency Modulation Modulation of the frequency of the transmitting wave in accordance with speech or a signal. The transmitting wave contains a variable carrier with the intelligence and no sidebands.

HF - High Frequency

Frequencies from 3 - 30 megacycles
Used for long distance point-to-point communications. That is from one particular geographical location to another.

MCW - Modulated Carrier Wave radio transmission used to send Morse Code utilizing an interrupted audio tone signal which is modulated on an uninterrupted radio carrier wave.

MULTIPLEX - The splitting of a radio frequency channel to facilitate the transmission of two or more information components on one carrier wave simultaneously without interference.

SSB - Single Sideband

The energy normally contained in the carrier and two sidebands of AM transmission are concentrated in one sideband. The selected sideband may be either the upper or the lower and contains the same capabilities as that obtained in AM transmission.

VHF - Very High Frequencies

Frequencies from 30 - 300 megacycles
Used for line of sight communications.

INTRODUCTION

Central America, which contains some of the world's most beautiful terrain, is a narrow strip of land that joins North and South America. It is approximately 1000 miles long and varies in breadth from 50 to 350 miles. It is bordered by Mexico in the North, the Caribbean Sea to the East, the Pacific Ocean to the West, and the Republic of Colombia on the South.

Central America is divided into six sovereign nations. These nations are from north to south, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama. The total land area of these countries is 228,578 square miles. Their total population is well over 12,000,000.

COSTA RICA

Costa Rica covers an area of 19,695 square miles. It has a 125 mile coastline along the Caribbean side and 625 miles along the Pacific. There are swampy low lands along both sides of the country next to the oceans. Much of the Caribbean coastland in the northern part are still uninhabited. Most business and commercial activities center on the Pacific Ocean side.

A good system of roads connects the towns in the center of the country, known as the Central Valley. Costa Rica's Inter-American highway follows this route which goes from the border of neighboring Nicaragua to the capital at San Jose to San Isidro del General.

There are 497 miles of paved roads, 1,118 miles of all-weather roads and 436 miles of dirt roads that are useable in the dry season. Rainfall averages 40 to 80 inches on the Pacific side each year, however, a long dry season exists for a portion of the year.

EL SALVADOR

El Salvador is the smallest Central American country and is considered one of the most prosperous. San Salvador, the capital, has a population of 250,000 persons. Most of El Salvador is volcanic upland. Its shoreline extends for 160 miles on the Pacific.

The major ports of El Salvador are La Union/Catuco, La Libertad and Acajulla. La Libertad is the second largest port, handling 20% of the nation's trade. These ports have easy access via road or railroad to the interior. Most of the interior roads

are generally good even in the rainy season. The rainy season is from May to October with the average rainfall being about 72 inches.

The paved Inter-American highway runs from the Guatemalan border in the northwest to the Honduras frontier.

GUATEMALA

Guatemala is the most populous of the Central American republics. The total population is 3.8 million people with more than 10% of the population residing in Guatemala City.

The Pacific shoreline of Guatemala is 200 miles and the Caribbean side extends for 70 miles. A string of volcanoes in the southern part of Guatemala, two of which are active, creates a terrain cover of lava and volcanic ash deposits. Most of the population is centered approximately 50 miles northwest of Guatemala City.

Transportation by rail and road are limited. There are 539 miles of public service railways and 180 miles of local plantation railways. A paved highway (Pacific Highway) connects Guatemala City. Esquintla and San Jose. The Inter-American highway extends for 317 miles from the Mexican border through Guatemala City to El Salvador. There are many lower quality feeder roads serving the main route. The unpaved roads are dusty in the dry season and muddy in the rainy season due to their volcanic ash composition.

The Caribbean coastal town of Puerto Barrios located 200 miles from the capital city handles over 70% of the exports and imports of Guatemala. A paved highway runs from the capital to Puerto Barrios. San Jose is the second largest port in the country with a population of approximately 3,500 people.

HONDURAS

Honduras is sparsely settled with the majority of the population living in the northwestern portion of the country. The total land area is 43,277 square miles. The population is about 1.7 million. Only 22% of the land is developed for agriculture or commercial use since most of the country is mountainous. The Caribbean coastal area has a large rainfall and is covered with deep tropical forests. A large portion of the northeast region, known as Mosquito Plain, is unexplored.

280 of the 2,056 total miles of roads in the country are paved. The Ox cart and mule are the principal means of transportation over some of these roads in the mountainous ranges.

The capital city of Tegucigalpa has 107,000 inhabitants. Transportation to this city is by air and road as no railway line exists.

NICARAGUA

Nicaragua is the largest of the Central American Republics with a total area of 57,143 square miles. The coastline on the Caribbean side is 300 miles long and on the Pacific side approximately 200 miles long.

The total population of the country is 1.5 million, with Managua, the capital, having 10% of the population. Much of the activity and population in Nicaragua exists between the Pacific Ocean and the western shores of Lake Nicaragua.

The gravel surfaced Inter-American highway extends within the country for 230 miles from Costa Rica to the Honduras border. The main Pacific ports are Corinto, San Juan Del Sur and Puerto Samoza. The two most active Atlantic ports are Puerto Cabezas and Blue Fields.

SUMMARY

The following is a summary of the technical judgments and determinations concluded from the study of the proposed Central American International Security Telecommunications Network.

At present direct communication links between security and police agencies of the six Central American countries are non-existant. The agencies are now dependant upon limited available commercial facilities in each area to handle their external security traffic. Although the public facilities often provide adequate service, at times they are overburdened by commercial message traffic. When this occurs, urgent security telegrams cannot always receive the absolute priority they require. Even under optimum conditions, message transferral delays are considerably longer than they should be to carry out coordinated international security operations. Modern modes of transportation have imposed additional problems by reducing travel times between these countries.

In order to meet and effectively deal with mutual security problems that could arise, a capability for rapid direct communications between the Central American security agencies becomes essential. It is naturally in the interest of these nations that communications between their security forces should be as rapid and secure as possible. The more convenient the facilities, the more frequently they will be used and consequently the more effective they will become in providing a valuable tool for the maintenance of the security of the region.

A need exists and it is recommended that there be developed a point-to-point, self-sustaining Central America International security telecommunications network which is effective 24-hours-a-day and which is controlled by the security forces.

Officials in each of the five Central American countries visited expressed their appreciation to this writer for the efforts being made by the United States to assist them in the establishment of direct communications links between their security agencies. Many of the officials contacted were of the opinion that any communication system not under the direct control of the security forces would not fulfill their immediate needs. They stated that such problems as (1) increased subversive and criminal activities; (2) population mobility; and (3) increased vehicle registrations have made it necessary for the police and security forces to have at their disposal a rapid, secure and direct method of communications between the Central American countries. The officials contacted have assured this writer that the necessary technical personnel, buildings and general budgetary support of the proposed security communications network would be provided. Plans were discussed and agreed upon to coordinate their police and security personnel to assure mutual operation of the proposed network on a 24-hour-a-day basis.

In assessing the need for a separate and independent network, all existing and proposed international communications systems of these countries were examined to prevent duplicate or parallel systems. In this regard, the following steps were taken:

1. The proposed VHF/FM communication system being developed through AID/FAA and Central American Corporation for Air Navigation Service (COCESNA) project was reviewed in light of the security forces communications needs. The technical advantages of using this multiple channle VHF/FM communication system which should be completed by the end of 1964 was brought to the attention of security officials in each Central American country. As many of the officials stated, it would be undesirable to utilize a network for communicating security information when the security forces had no control over the facilities. Aside from the inconveniences involved, considerations of a security nature, particularly in periods of crisis, dictate the inadvisability of utilizing the civilian networks.

2. The feasibility of utilizing the existing U.S. communications system was investigated by this writer. This communications system cannot provide the host country security forces with a permanent communications channel, particularly in times of emergency when all channels would be fully occupied for U.S. requirements.

3. Existing radio communications equipment now in use by the various security agencies of the six Central American countries is unsuitable for operation in the proposed Central American Security Telecommunications Network. Radio equipment needed to specifically contact the security offices of the other countries is not available. Security forces in a few of these countries are using "low powered" SSB (single sideband) transceivers for internal security radio networks within their borders. The low output of these transmitters is inadequate to provide the radio circuit reliability needed. This equipment was designed for voice operation rather than radio teletype and would not be economically adaptable for reliable radio teletype use in the proposed communications network. While radio telegraph (CW) can provide the needed communication service, most of the security forces in Central America do not have sufficient qualified CW operators.

For reliable communications it is necessary to change frequencies according to the time of day. To facilitate in the selection of needed frequencies and to determine maximum reliability of each Central American high frequency circuit, AID/W requested the National Bureau of Standards to prepare tables of high frequency performance predictions. Extracts of the National Bureau of Standards report are included as Annex 2, as well as simplified frequency selection charts prepared by AID/W. Annex 3 of this report includes frequencies allocated by host countries for the proposed telecommunications network.

Figure 1

LIMITED OFFICIAL USE

CENTRAL AMERICAN INTERNATIONAL SECURITY TELECOMMUNICATIONS NETWORK

SIX MAJOR TELECOMMUNICATION FUNCTIONS

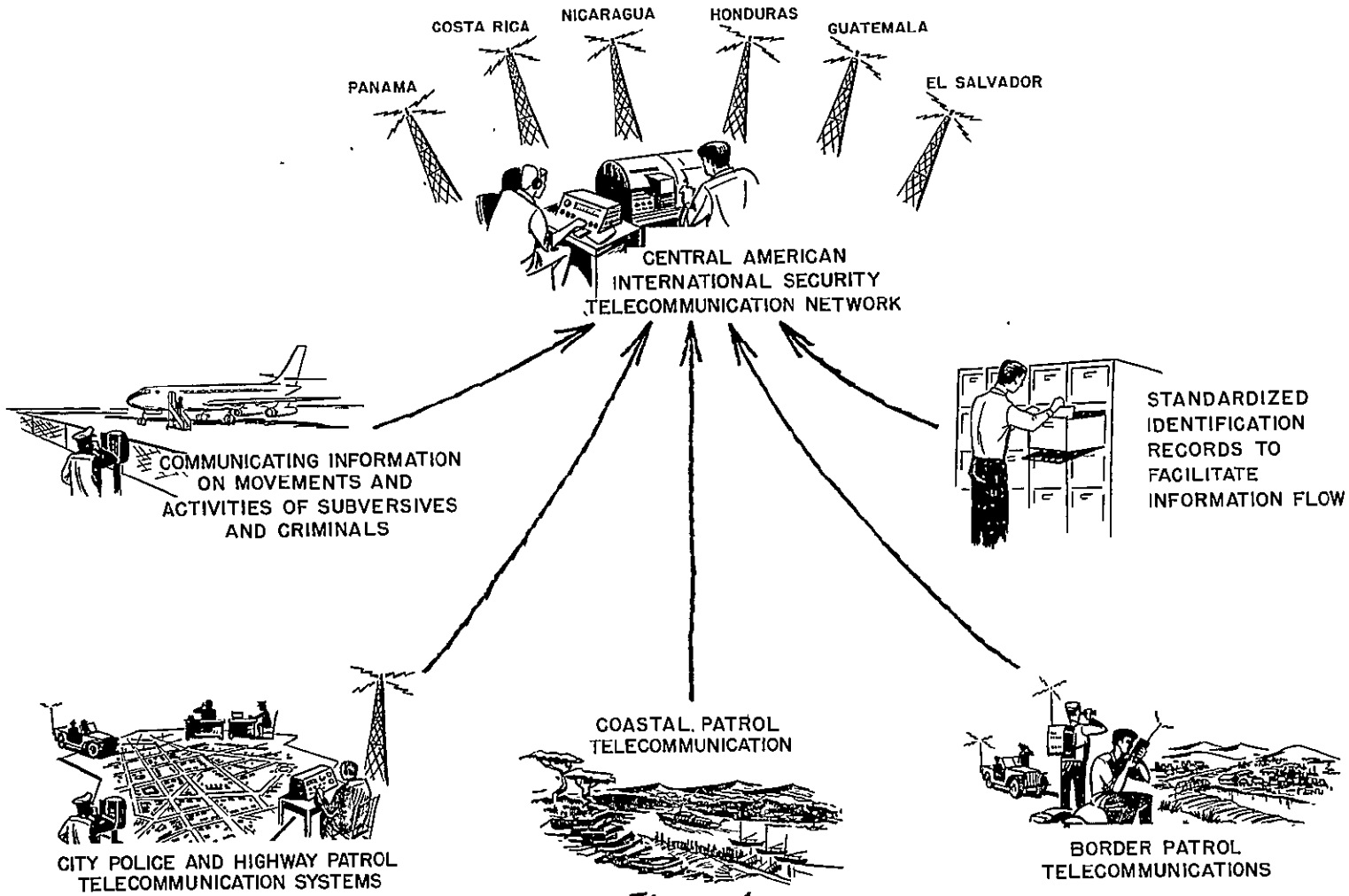


Figure 1

LIMITED OFFICIAL USE

CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS.

This study has evaluated the security agencies communications requirements of the Central American region and it is the general conclusion that a communications system plan as depicted in Figure 1 of this report is needed. The plan would provide internal radio teletype communications for both the police and other security forces for overall efficiency and improved coordination in their respective activities.

1. Existing Communications Equipment.

a. The existing communications equipment now used for internal communications by the various security agencies of the Central American countries are unsuitable for operation in the proposed International Security Telecommunications Network. The low powered single sideband SSB radio equipment used for internal communications in a few of the Central American countries is suitable for Voice and in some cases MCW operation.

b. Radio teletype operation has been determined as a definite requirement because, (1) certain security traffic must be coded; (2) MCW operation is not possible because of the limited number of trained CW operators available to the security agencies; (3) teletype operation provides maximum speed in transmitting messages (60-100 words per minute) and a permanent written record of all messages.

c. Existing communications equipment is not economically adaptable for reliable radio teletype operation. This equipment does not provide the required reliability or power output to reach many of the distant communication stations.

2. U.S. Central American Communications System.

The feasibility of utilizing U.S. communications systems was investigated. In times of unforeseen emergencies, all channels would be fully occupied solely for U.S. requirements. It is, therefore, impossible to provide the host country security forces independent and permanent communications channels of their own during such periods, when U.S. requirements would normally command priority useage of all circuits.

3. Proposed AID/FAA CECESNA Communication System.

Figures 2 and 3 show the proposed FAA COCESNA, VHF-FM Communications system phase I plan. The security forces could make use of these facilities scheduled for completion the end of 1964 to serve as alternate circuit routes when needed. Phase II of this communications system includes Panama. Technically the FAA COCESNA VHF-FM communications system is more desirable than the proposed HF system since ionospheric conditions, (which are often detrimental to HF communications) as well as optimum operating hours are unimportant. Reliability of VHF radio communications is primarily dependent upon the continued operation of the VHF equipment.

Figure 2.

PROPOSED AID/FAA COCESNA VHF-FM COMMUNICATIONS SYSTEM

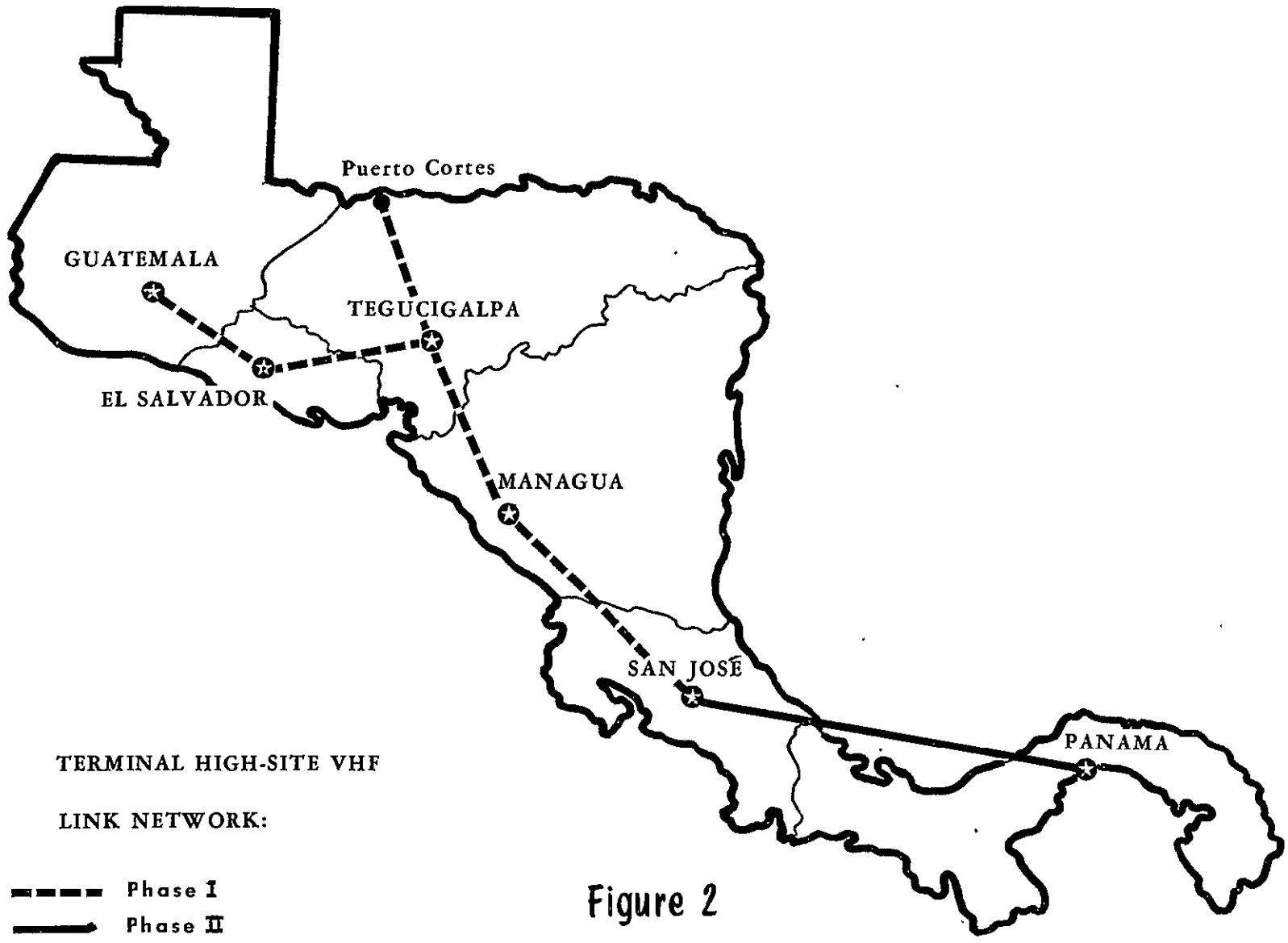


Figure 2

Figure 3.

INTER-CENTRAL AMERICAN PROPOSED AID/FAA - COCESNA

VHF-FM Communications Plan

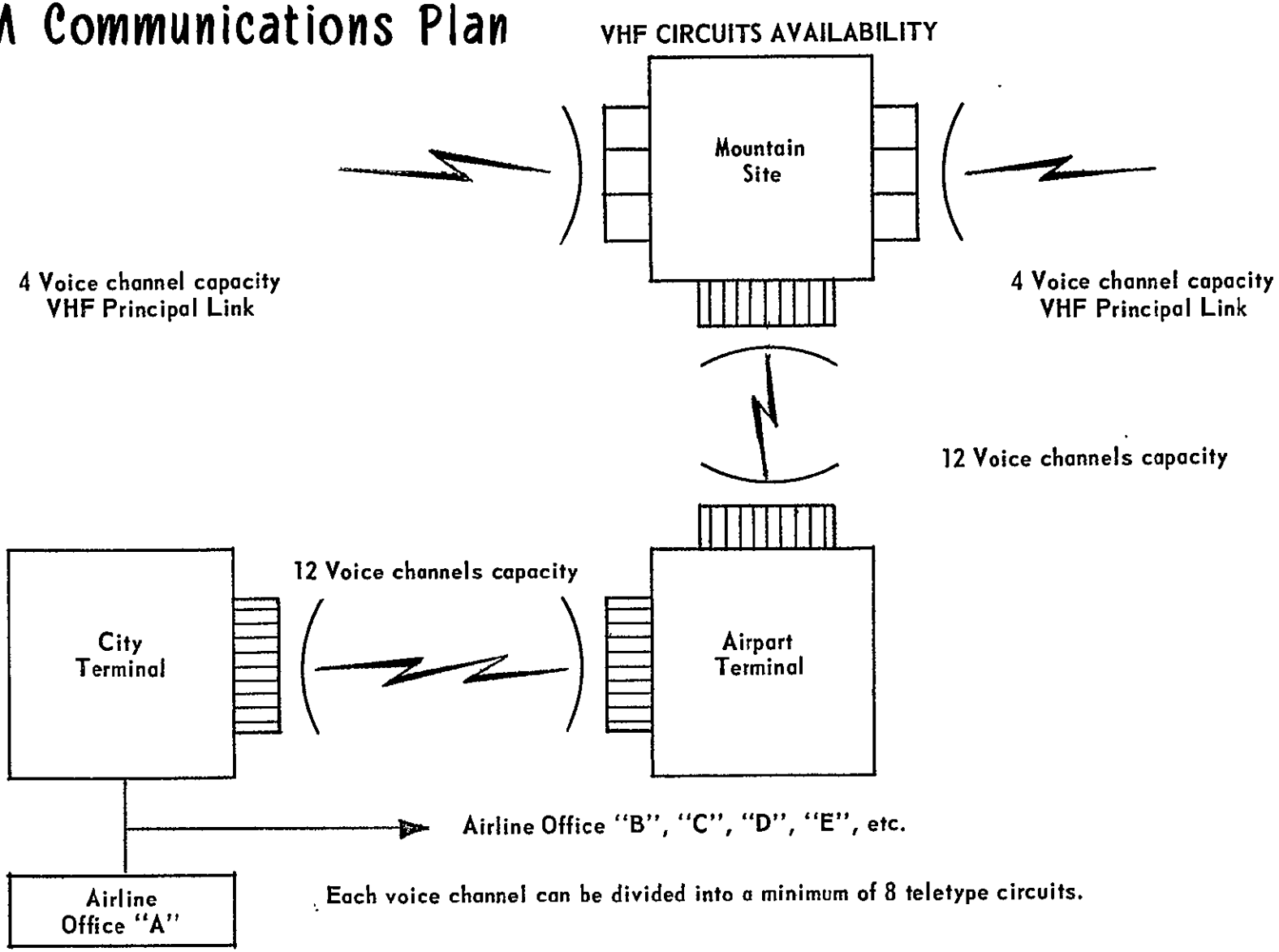


Figure 3

The COCESNA communications system is devoted to specialized use to such an extent that they might not be readily capable of handling security traffic; because of the operational nature of their traffic, as exists in Civil Airways, they would be capable of only limited use.

VHF relay communications systems which will be used by COCESNA are extremely vulnerable to sabotage and vandalism. Alternate routing has not been proposed: therefore the failure of any one relay station in a given country could disrupt communication between two other countries.

There are many recorded instances of the transmission of unauthorized messages designed to subvert and undermine cooperation in security agencies. Communication between security agencies can be disrupted at the discretion of operating personnel. This danger would be minimized were the security force to have physical and operational control.

Discussions with AID/FAA personnel indicate that a teletype channel over the COCESNA system could be obtained by the security forces in each Central American country. The cost of this channel cannot be estimated at this time. Many of the COCESNA terminals are outside the city limits and will require either leased telephone lines or additional VHF terminal equipment which all contribute to the total system cost. Some system flexibility is possible in that teletype equipment recommended for the proposed HF communications network can also be utilized in the COCESNA system.

4. **Host Country Requirements.**

The establishment of an international security telecommunications network will place a requirement on the host country for the required operational and technical personnel, the requirements for space in buildings for radio stations, the logistic and budgetary support for the installation and maintenance of this network and obtaining allocations of sufficient frequencies to permit a 24-hour-a-day operation.

Assurances have been received from host country officials that the necessary operational and technical personnel, general budgetary support for the installation and maintenance of the proposed equipment, would be provided. Building space in each of the host countries for the proposed radio stations have been provided.

Host countries selection of operational frequencies will be made with reference to Annex 2 and Annex 3 of this report. While communication performance of a given high-frequency radio path can be predicted from theoretical and empirical information given in Annex 2, such predictions must be heavily qualified where high priority traffic is involved.

The actual survey covered supplementary studies and analysis on other factors influencing the reliability of the proposed network. Poor maintenance, unreliable primary power, lakadaisical operation, and other such factors play a more important role in the determination of circuit reliability than equipment or propagation.

In considering the support of this project, it should be recognized that once the project is approved by the countries and USAID Missions and funds are made available, it would require approximately six months, given a high priority to order and receive the equipment and install the entire network.

Figure 4.

CENTRAL AMERICAN INTERNATIONAL SECURITY TELECOMMUNICATIONS NETWORK

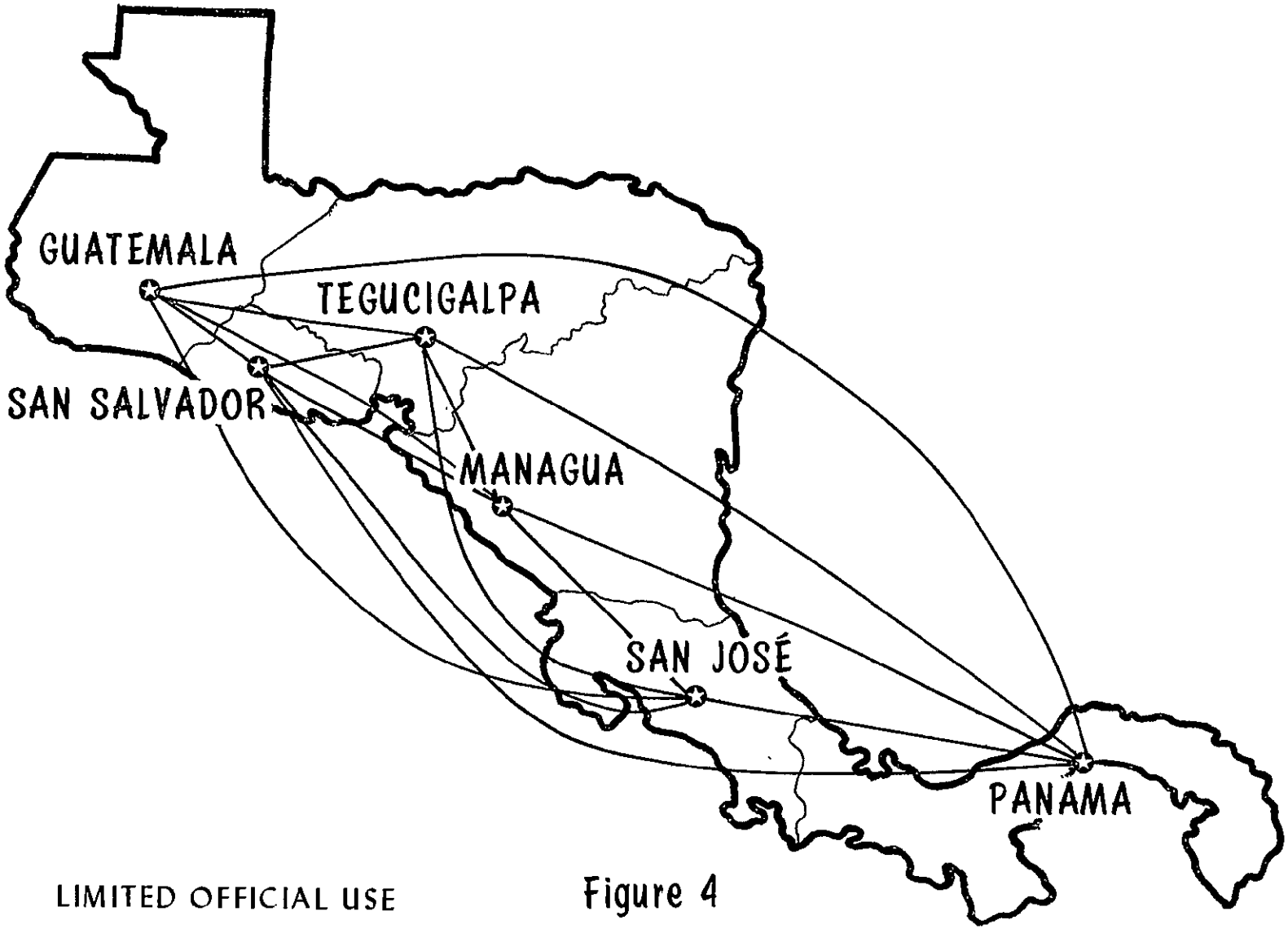


Figure 4

B. RECOMMENDATIONS.

It is recommended that the U. S., through the Office of Public Safety, provide the equipment and technical assistance necessary to assist the Central American countries establish the proposed network.

1. General.

a. It is recommended that the security forces in the Central American countries of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama operate, control and maintain an independent police and security HF point-to-point radio telecommunications network for operational and tactical use embodying proper security capabilities as shown in Figure 1 and 4.

b. It is necessary to provide the proposed security telecommunications network with a means of sending coded messages essential to certain security activities. While radio telegraph (CW) can provide this service, the police and security forces do not have qualified CW operators. It is therefore recommended that a radio teletype facility be provided which will also provide a needed permanent written record of all security traffic.

The proposed teletypes will provide an efficient operation by supplying speed and accuracy with less experienced operators. Messages can first be put on printed perforated type and then automatically sent to the addressee by passing the tape through an automatic transmitter.

c. Every effort should be made by security forces in each country to acquire a teletype channel over the proposed COCESNA VHF communication system. Adequate coordination of the independent international HF point-to-point security network and the COCESNA VHF relay system will assure maximum backup capability in time of emergency.

2. Technical Service.

a. In reviewing the proposed Public Safety communications project, it is recognized that technical assistance for the successful and prompt implementation of the network will be necessary. It is recommended that a Public Safety Communications Advisor be provided to assist the Central American countries in the installation and eventual operation of the network.

3. Commodity Support.

A detailed description and itemized list of material recommended for the proposed security telecommunications network is provided as Annex 1 of this report. A total cost of approximately $66,000 will be required for the installation in five Central American countries. At such time as Panama is included, an additional $10,000 would be required.

a. Factors and information bearing on the development of a commodity plan to implement a basic international security telecommunications network are:

(1) Reliable HF point-to-point radio teletype communications equipment to connect security headquarters in each of the Central American countries is required. Because of the particular type of terrain and distances involved, medium power single sideband equipment is recommended.

(2) It is recommended that 5 automatic send-receive teletype be provided for use with the HF international security telecommunications network. They can be used as well with the proposed COCESNA VHF Relay System. The teletype equipment with a two year supply of tape and paper will cost approximately $12,300.

(3) It is recommended that five 5-kilowatt remote controlled diesel generators be provided as standby units in event of electrical power failure. The emergency power generators will cost approximately $7,500.

4. Emergency Funds.

a. Funds should be made available for emergency procurement of miscellaneous items where the need for these items cannot be anticipated. These items will be required for the installation, maintenance and repair of the equipment proposed for procurement in this report. It is recommended that an "Open-End" type of P10/C be issued, providing up to $1,000 for the procurement of such miscellaneous items over a period of one year.

Each host country should provide an additional $500 in local currency to allow the purchase of locally-available material and services which may be required to support the implementation of the proposed security communications network.

5. Participant Training.

a. It is recommended that each mission sponsor one participant for a teletype maintenance course in the U.S. for a period of four weeks. This course should be similar to the one conducted at the tuition-free Teletype Corporation Maintenance Training School, Chicago, Illinois.

b. Each mission should sponsor one participant for courses in the maintenance and operation of SSB transmitters and receivers. This course given in the U.S. for a period of four weeks should be similar to the one conducted at Technical Material Corporation, Mamaroneck, New York.

6. Local Training.

a. Where not already available, technician training should be established locally so that technicians can effectively maintain the equipment proposed by this Public Safety communications project.

b. While some training will be conducted by the proposed Public Safety Communication Advisor when he arrives, where needed the security forces should initiate a program for basic and advanced training for new recruited

technicians. This can be done in cooperation with a local manufacturer or on a contractual arrangement with Central American technical institutes.

c. Approximately four teletype operators in each country will be required to operate the proposed security networks 24-hours-a-day. These operators can be trained through a contractual arrangement with local communication organizations.

7. Future Communications Requirements.

Communications equipment recommended for the security network has provisions for a voice capability and is adaptable should future requirements exist for simultaneous voice and teletype transmission. Additional multiplex equipment at an approximate cost of $250 per station will furnish simultaneous voice and teletype facilities to the various security headquarters.

ANNEX I

PUBLIC SAFETY COMMUNICATION COST ESTIMATE

The following cost estimates are given to assist the Central American USAID Missions in adequately funding for telecommunications commodities in FY 64. The equipment listed herein meets the immediate needs for minimum communications support to these forces in accomplishing their vital security mission. The equipment necessary to support this survey recommendations would cost approximately $66,000. At such time as the Panama Installation is scheduled and implemented, an additional $10,000 would be required.

Since this planning and subsequent implementation effort represents the initial phase of U.S. support in the establishment of a Central American International Security Telecommunications capability, each host country should fully assess its requirements for personnel and budgetary support.

If this Public Safety communications project is of an urgent or priority nature, it is recommended that the commodities be procured directly through AID/W and GSA. Other procurement channels could result in extensive delays in orders and receipt of equipment and non-phased deliveries.

ITEM NO.	QUANTITY	DESCRIPTION	
1.	5	Single sideband Transmitter, 750 Watt PEP minimum power output, continuously tuneable in 2 - 32 MC frequency range, bandswitched with ten oven-controlled crystal positions available. Frequency stability 1 PPM for 24 hour operation. Upper or lower sideband to be selectable. Exciter bandwidth to be 350 - 3300 cps. Transmitter shall be suitable for Audio Frequency-Shift Keying (AFSK) by addition of Tone Keyer (Item 2) and standard teleprinter unit (Item 3). All control and critical circuit metering to be located on front panel. Entire unit shall be completely packaged as an integral assembly in one cabinet. Unit shall be capable of heavy-duty operation in tropical and high altitude regions. Temperature range to be 0 - 55° C. Altitude to 10,000 feet. Power input shall be 115/230 volts A. C., 50/60 cycle single phase. (TMC Model GPT-750-D2 or equal)	
		@ $4,700	$23,500.

ITEM NO.	QUANTITY	DESCRIPTION	
2.	5	Audio Frequency-Shift Tone Keyer/Converter fully transistorized for use with Items 1, 3 and 4. Transistorized switching unit for providing teletype loop battery in transmit or receive mode to be included. Unit to be capable of 100 WPM single channel operation. Internal power supply shall be integral to keyer/converter. Input power to be identical to requirements of Item 1. (Telesignal Model 101 tone keyer, Model 102 converter, Model 109 Transistor switch, or equal)	
		@ $600	$3,000
3.	5	Teleprinter Send/Receive Pageprinters. Units shall be complete with tape perforators capable of producing printed "Chadless" tapes in addition to standard page copy. Keyboards shall be equipped for Spanish language characters. Each unit shall be equipped for manual and automatic operation selectable by the operator. Printers must be supplied complete with a Test DC line loop power supply. Units shall be geared for 100 WPM operation. Units shall be equipped with a metal dust-proof enclosure and be properly filtered to eliminate radio interference. Unit shall operate with power input of 115/230 volt A. C., 50/60 cycles, single phase. (Teletype Corp. Model 28 ASR or equal)	
		@ $2,000	$10,000
4.	5	Single Sideband Receiver. Frequency Range 2 - 30 MC. with upper and lower sideband selection. Units to be compatible with Item 1. Units shall be capable of operation in tropical and high altitude regions. Temperature range 0 -55° C. Altitude to 10,000 feet. Power input shall be single phase, 115/230 volts A. C. 50/60 cycles. Each Receiver to be enclosed in a metal cabinet, complete with speakers and other required accessories ready for operation. (Collins Model 51S1 or equal)	
		@ $1,375	$6,875
5.	10	Towers, Guyed, 40 foot height for radio antennas, 30 lb. wind loading, furnished complete with erection kits, hardware, fittings, guy wire and instructions for installation.	
		@ $130	$1,300

ITEM NO.	QUANTITY	DESCRIPTION	
6.	5	Terminal Installation Kit for each location to include doublet antenna (Transmit/Receive) 200 foot RG8/U cable, 100 ft. of wire #18 shielded pair, and all necessary feeders, connectors and other hardware to complete each teletype station facility.	
		@ $100	$500
7.	5	Emergency Power Generator, 5 KW Diesel, with start-stop, remote control operation. Radio interference reduction shall be incorporated for suitable operation with Items 1 - 4. Generator output shall be 120/240 volts A.C. 60 cycle, 3-wire, Single phase. (Onan 6DKB - 3R or equal)	
		@ $1,500	$7,500
8.	5	Complete sets of spare parts for all radio, teletype and generator equipment furnished by manufacturer. All parts shall be of the critical or most frequently replaced type as recommended by the manufacturer, but not to exceed ten percent of the total cost of the items furnished	
			$5,000 Total
9.	1	Teleprinter Send/Receive Pageprinter, similar to Item 3 except Perforator is deleted. For use at El Salvador facility to extend operations of communications rooms. (Teletype Corp. Model 28KSR or equal)	
		@ $1,300	$1,300
10.	1 lot	Teleprinter tapes and 3-copy paper not to exceed 10% of costs for Items 3 and 9	
		@ $1,130	$1,130

BUDGET SUMMARY

Total System Commodity Cost		$61,335
Shipping Charges		5,000
	Total	$66,335

NOTE: All cost figures shown are expected to be approximately 10% - 20% less due to discount normally accorded U.S. Government.

ANNEX 2

LONG TERM RADIO PROPAGATION PREDICTIONS FOR SELECTED HIGH FREQUENCY CIRCUITS IN CENTRAL AMERICA

At the request of the Office of Public Safety (OPS), a table of high frequency performance predictions was prepared by the National Bureau of Standards utilizing their high speed electronic computers. This information, while extremely valuable to the trained engineer, offers little assistance to the average security communications officer and operator.

To offer a convenient and easily understood operating format, the tabular information obtained from the National Bureau of Standards was utilized by the writer in preparing charts for 15 selected communications circuits in Central America. The charts included in this annex are titled "Theoretical Range of Useable High Frequencies", and give a direct display of the optimum operating frequencies for 24-hour-a-day reliable security communications over each path.

These predictions are based on a period of low solar activity (Sunspot Number 10) which is the expected performance for 1964 and 1965. Additional information is also available for the period of high solar activity (Sunspot Number 120) as would be expected in 1969 and 1970. This information, with appropriate charts, will be disseminated to interested countries at a later date. All the charts were prepared using local time for convenience in directly selecting the theoretical best useable frequency at any given time of the day.

Maximum Useable Frequency (MUF) indicates the frequency at which the ionosphere will support propagation approximately 50% of the time. Lowest Useable Frequency (LUF) indicates the frequency having adequate signal-to-noise ratio 90% of the time. The Frequency of Optimum Traffic (FOT) is the expected frequency at which optimum sky wave communications would be achieved.

It is normally necessary to change operating frequency as ionospheric conditions change between night and day or between night transition and day because of changing ionization conditions. Usually the direction of the next change to be made is known to the experienced operators because of normal ionization trends with time of day, but special conditions of disturbance sometimes raise doubts as to which way to move depending upon whether the MUF or the LUF is most disturbed. Man-made noise and station interference can play a role here.

Communications performance of a given high-frequency radio path can be predicted from theoretical and empirical information. However, such predictions should be heavily qualified, particularly where security traffic is involved. Local noise, variations in transmitter output, antenna performance, receiving system characteristics, and many other factors could effect the computed circuit performance.

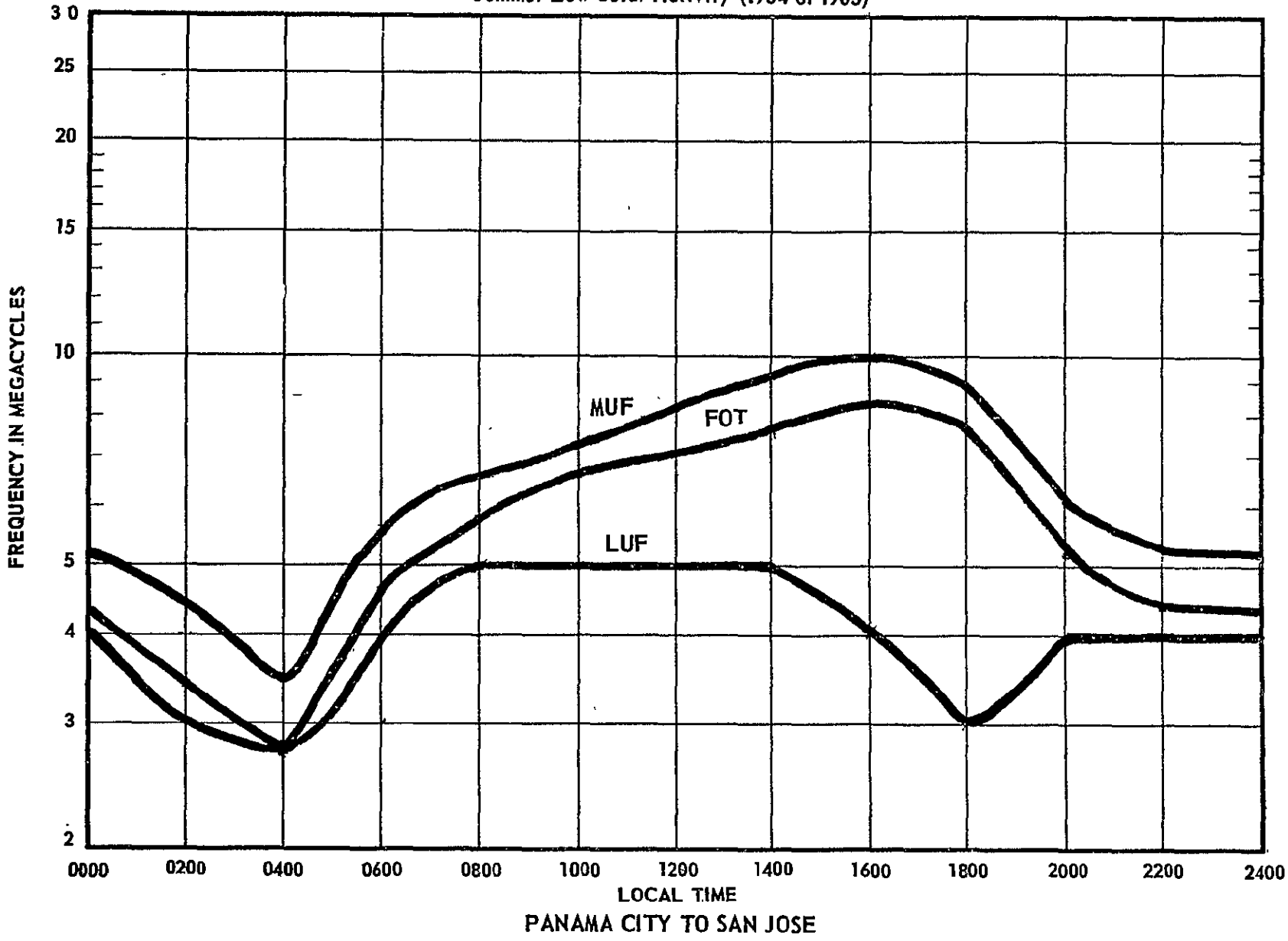
To obtain the predicted reliability, communications equipment specified in Annex 1 would be required. For all circuits, half-wave horizontal antennas 13 meters high (40 feet), are used at both terminals with 1 kw transmitters. The type of service anticipated is single channel radio teletype (Single Sideband), 60 words per minute. The required signal-to-noise-ratio assumed for this service is 40 db.

THEORETICAL RANGE OF USEABLE HIGH FREQUENCIES

Half Wave Dipole Horizontal Antennae

Elevoted 40 ft

Summer Low Solar Activity (1964 or 1965)



PANAMA CITY TO SAN JOSE

THEORETICAL RANGE OF USEABLE HIGH FREQUENCIES

Half Wave Dipole Horizontal Antennae

Elevated 40 ft.

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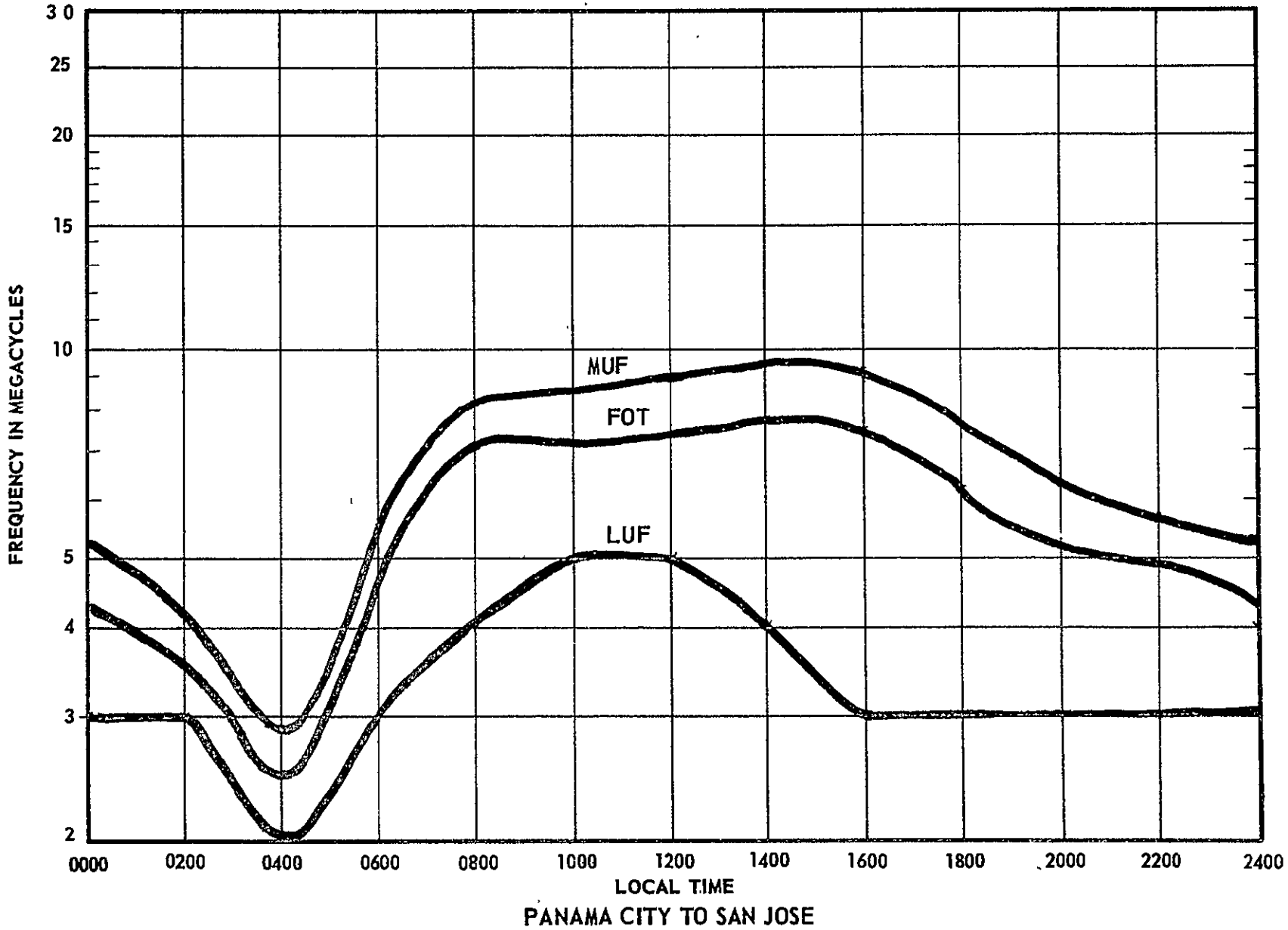

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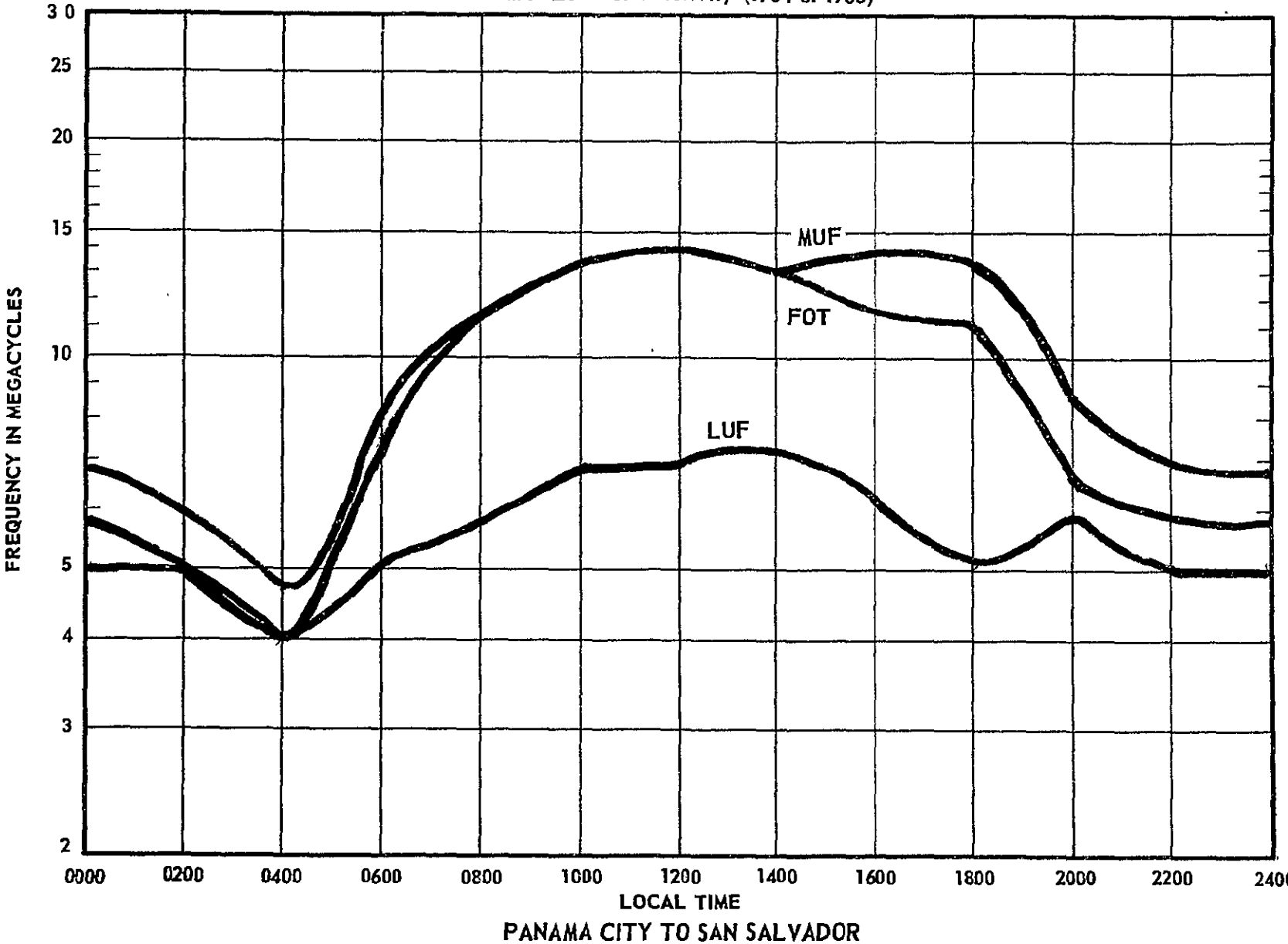
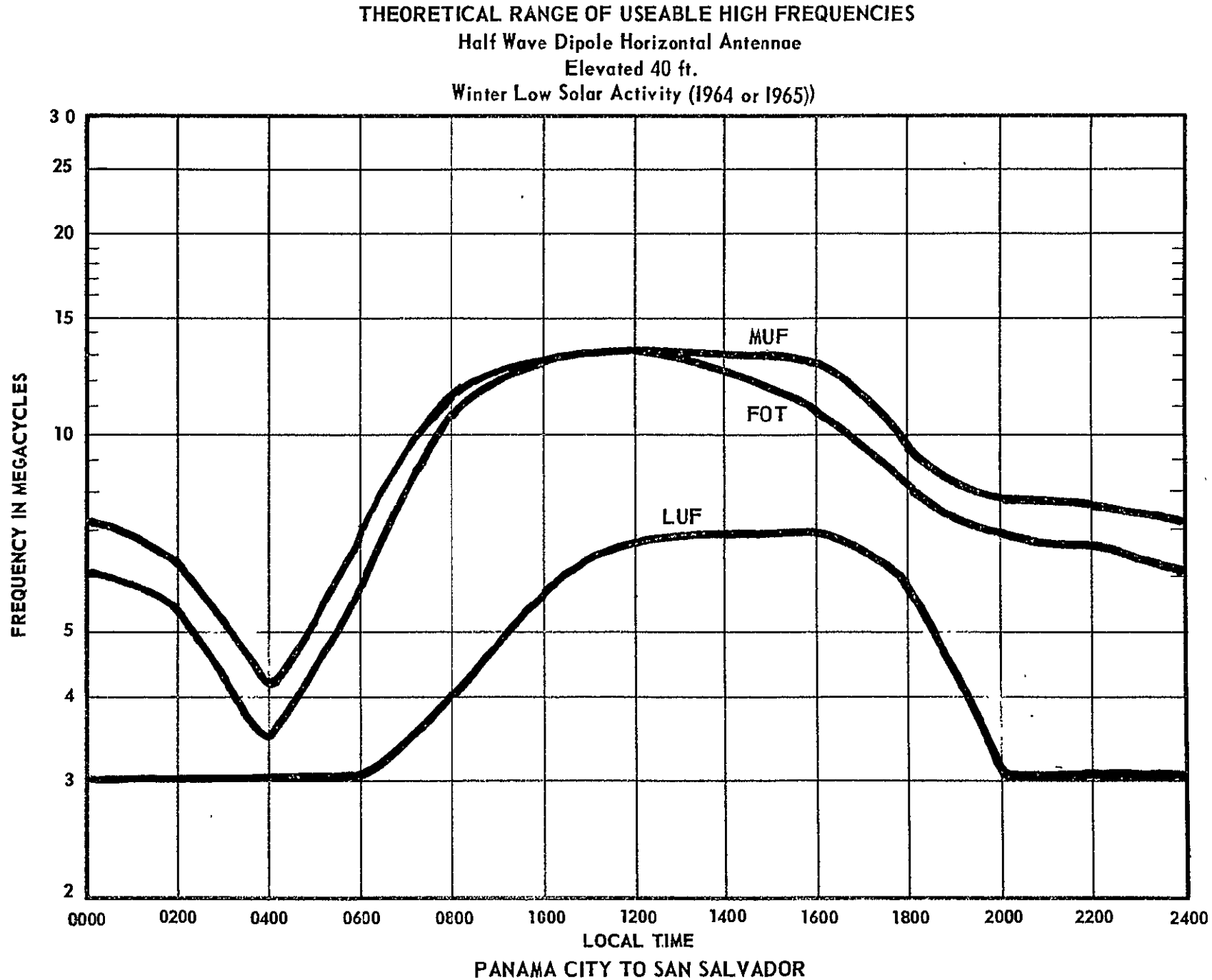


PANAMA CITY TO SAN SALVADOR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Half Wave Dipole Horizontal Antennae
Elevated 40 ft.
Winter Low Solar Activity (1964 or 1965))
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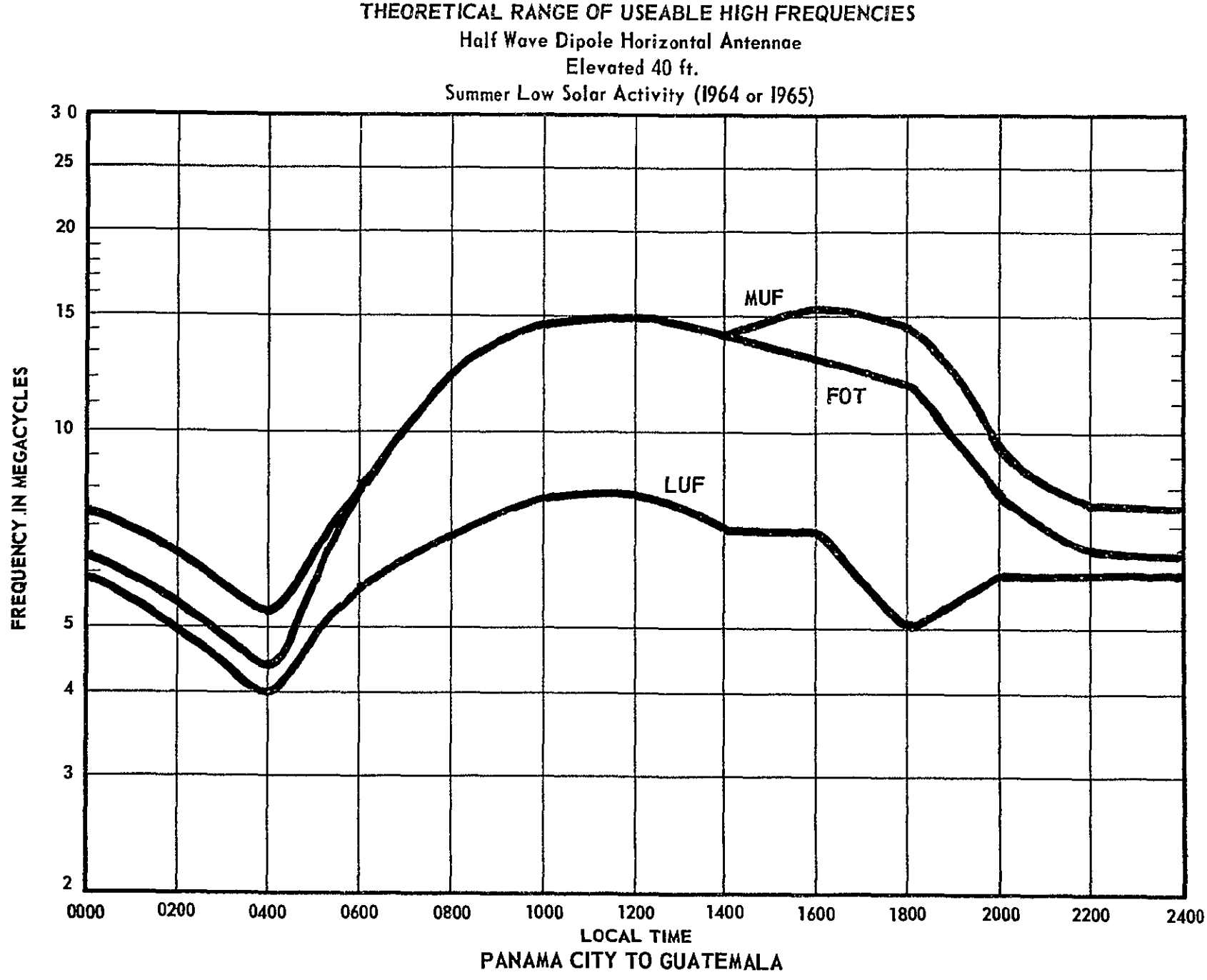
PANAMA CITY TO SAN SALVADOR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PANAMA CITY TO GUATEMALA

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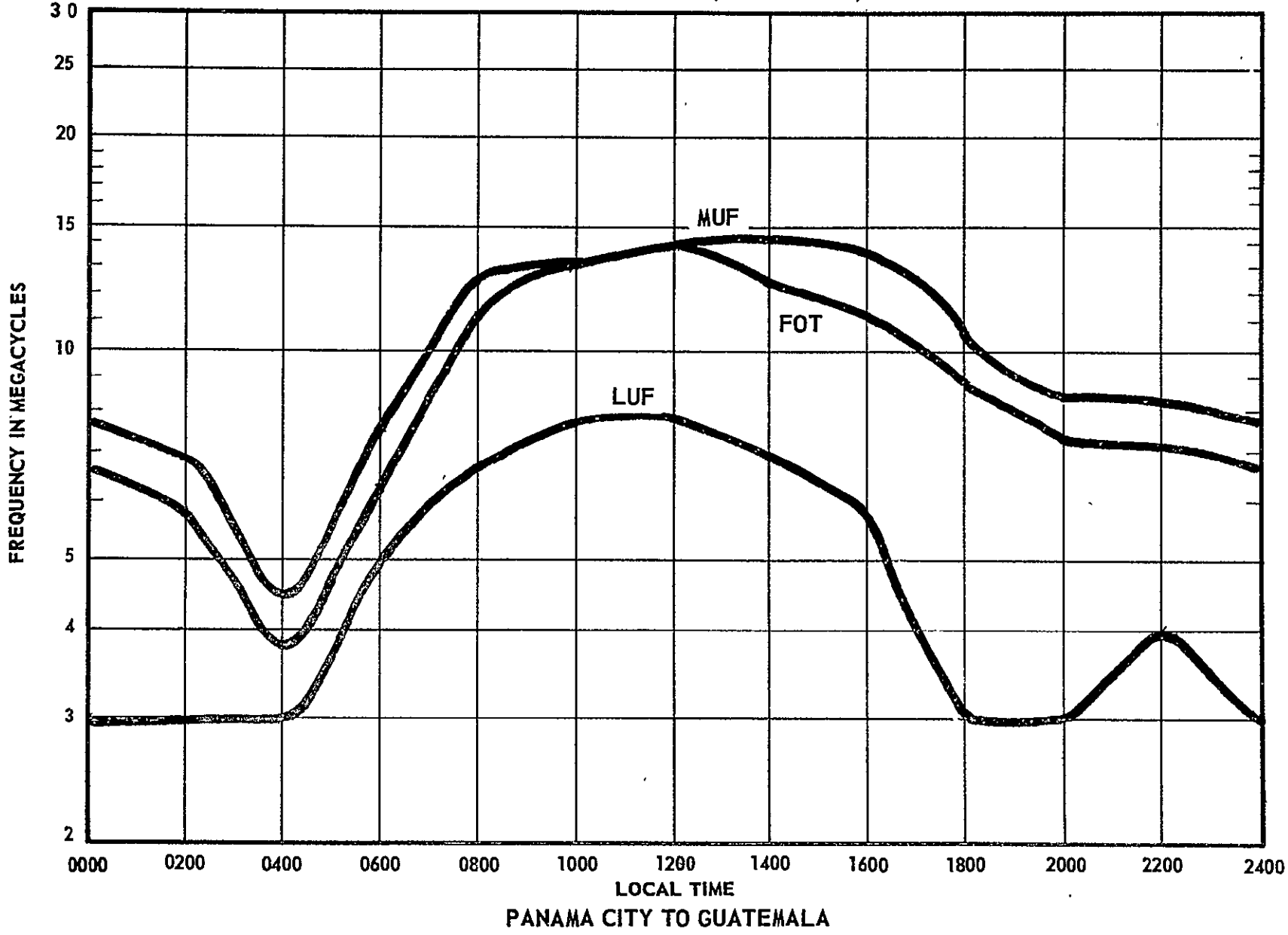
Half Wave Dipole Horizontal Antennae
Elevated 40 ft.
Winter Low Solar Activity (1964 or 1965)



PANAMA CITY TO GUATEMALA

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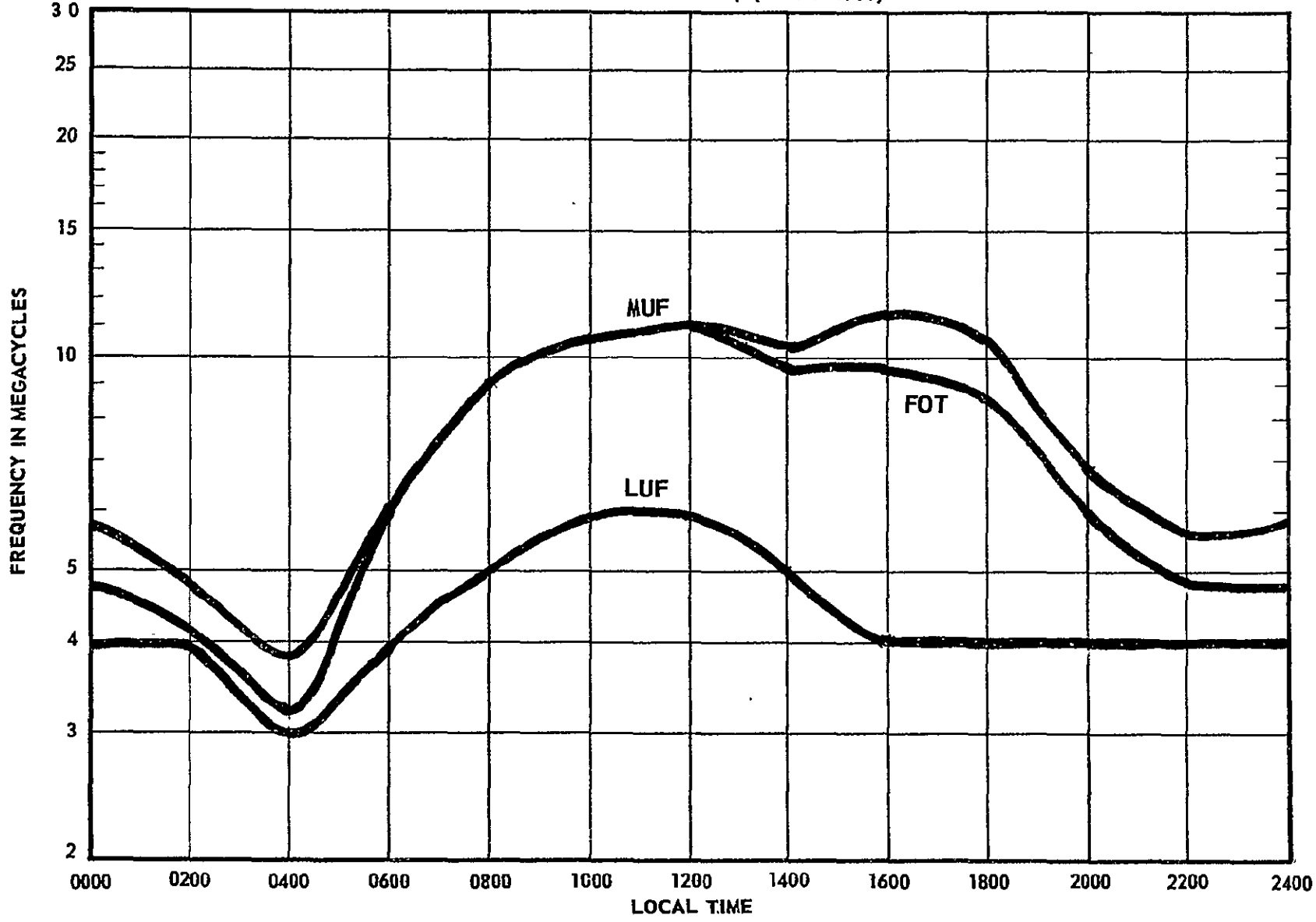

PANAMA CITY TO MANAGUA

THEORETICAL RANGE OF USEABLE HIGH FREQUENCIES

Half Wave Dipole Horizontal Antennae

Elevated 40 ft.

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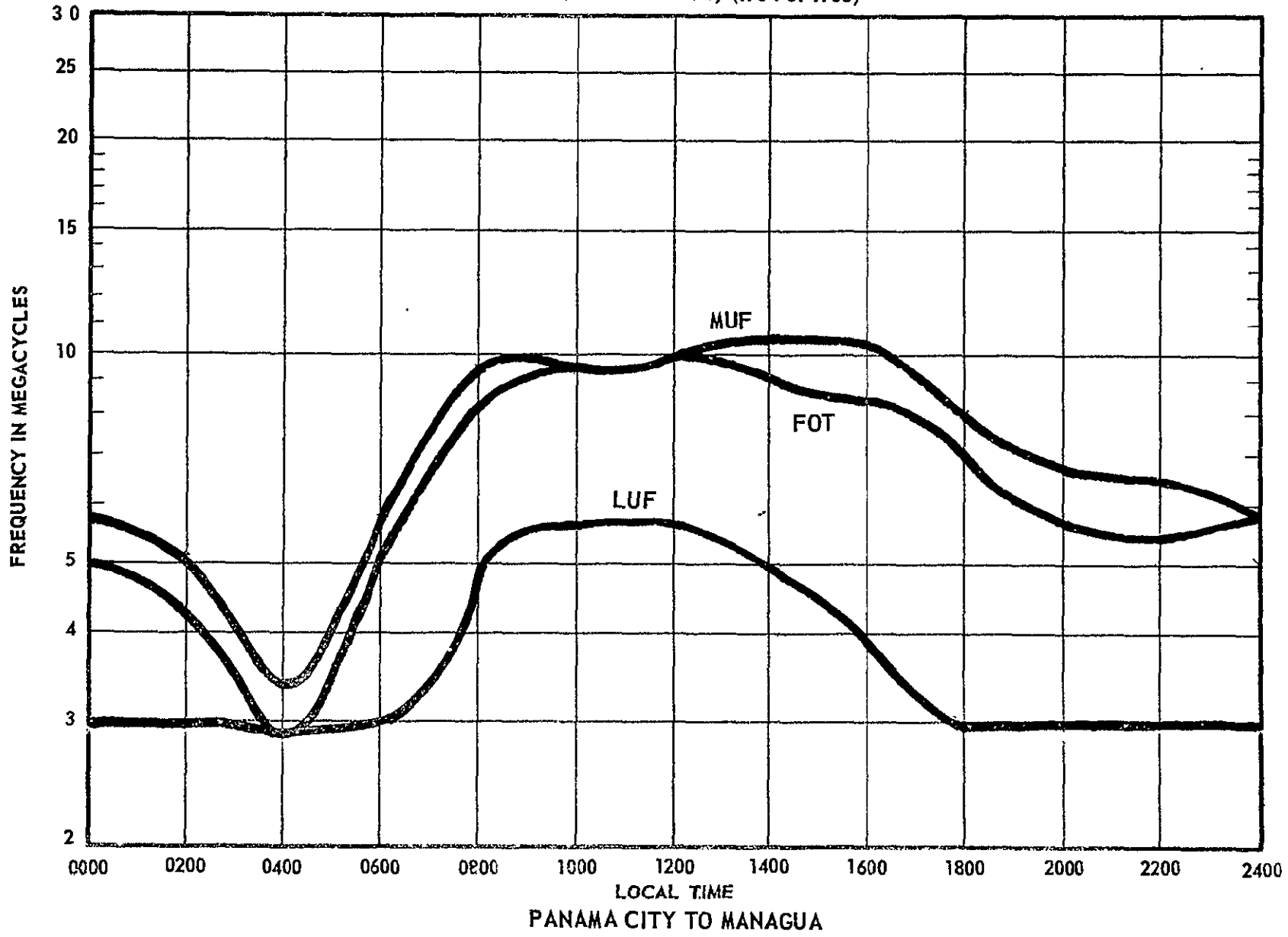
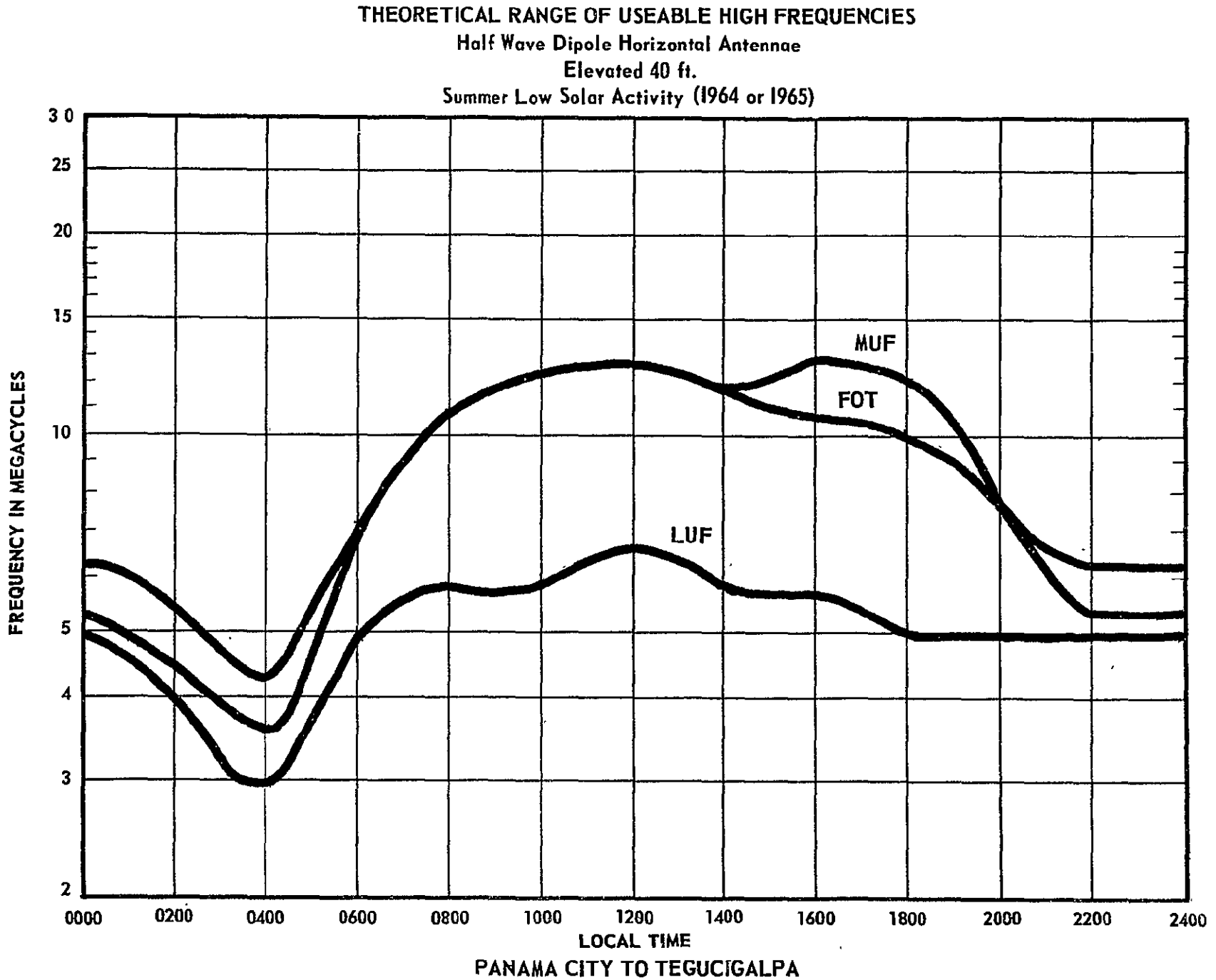


PANAMA CITY TO MANAGUA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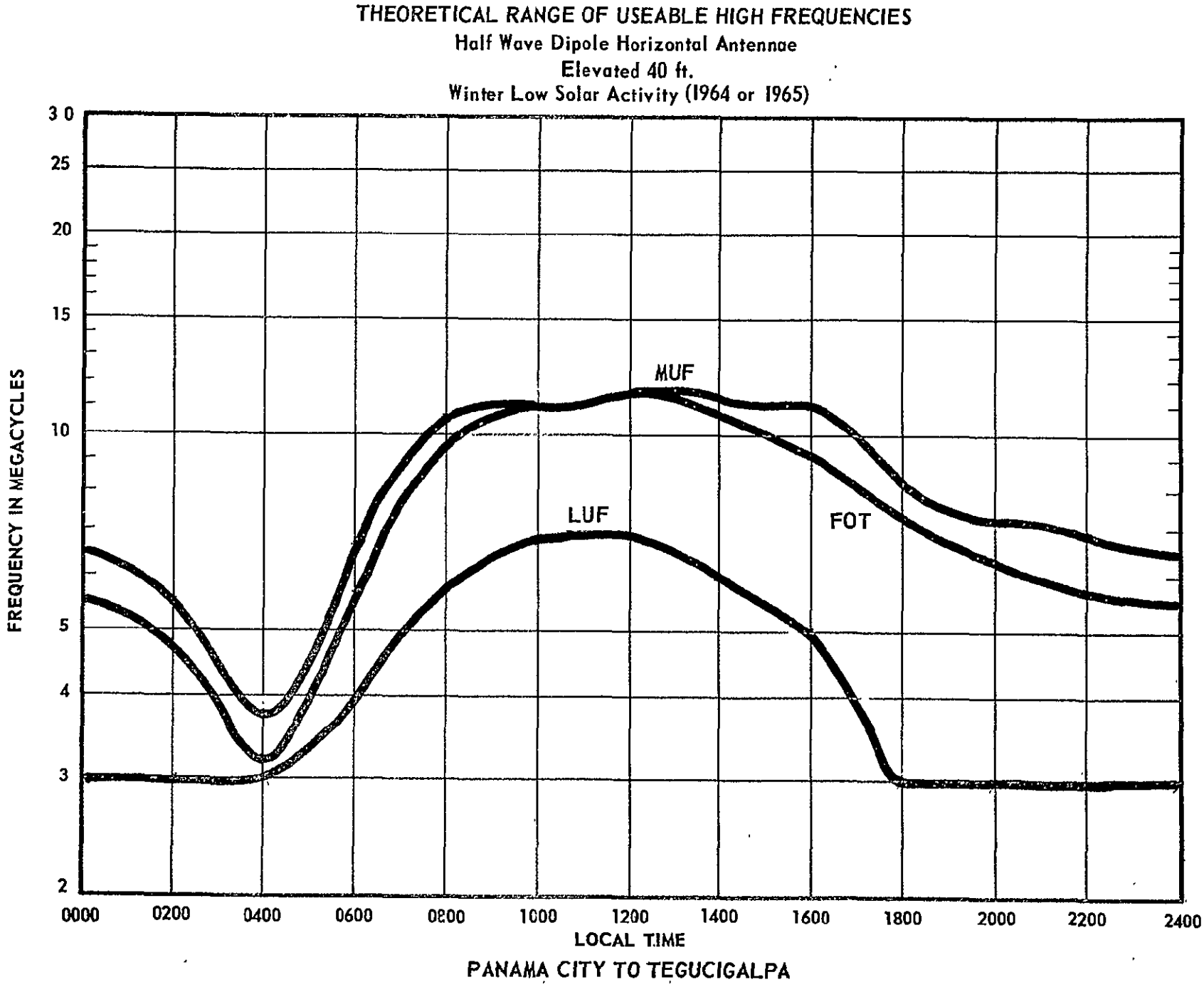
PANAMA CITY TO TEGUCIGALPA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PANAMA CITY TO TEGUCIGALPA

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Half Wave Dipole Horizontal Antennae

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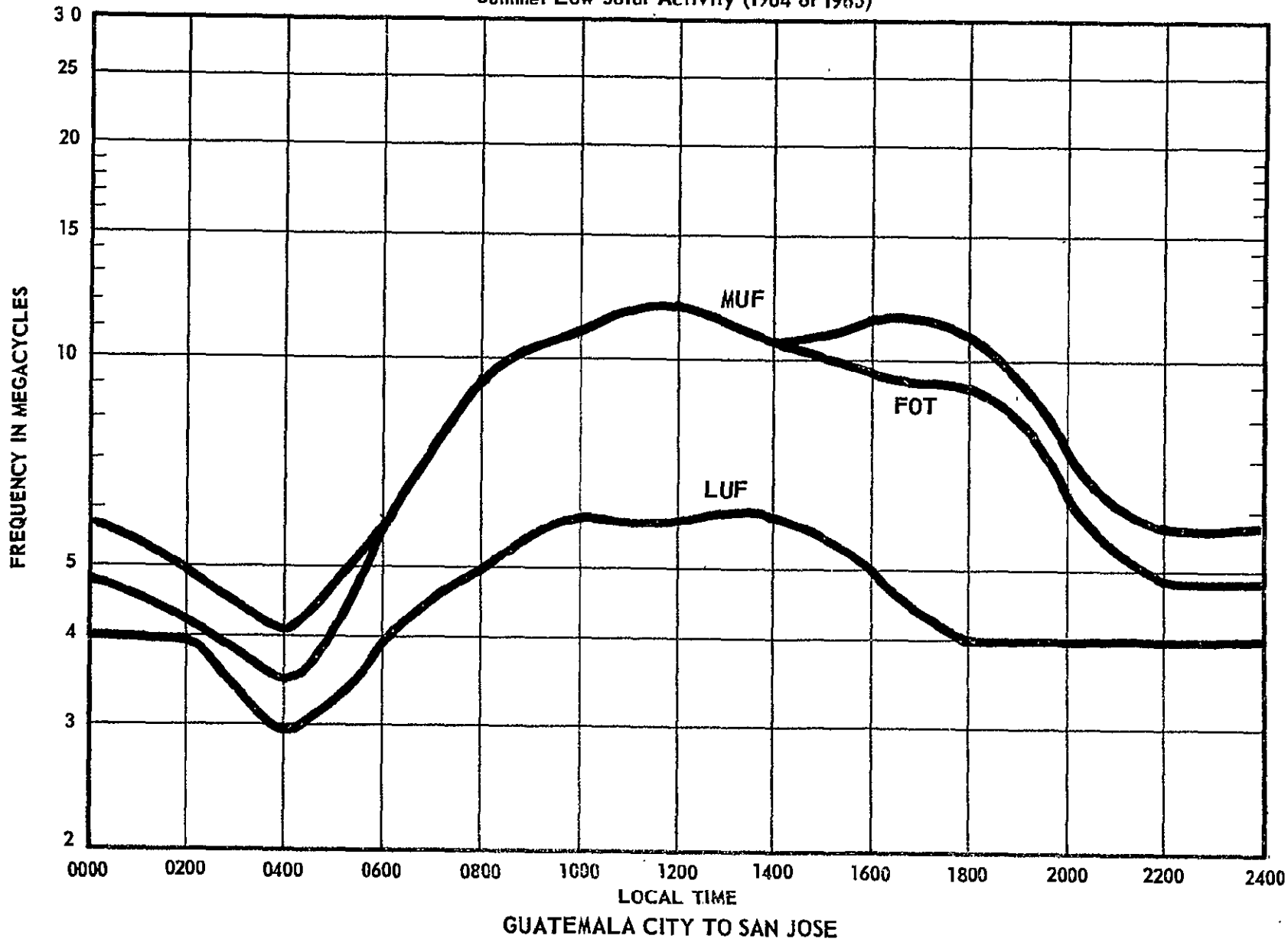

GUATEMALA CITY TO SAN JOSE

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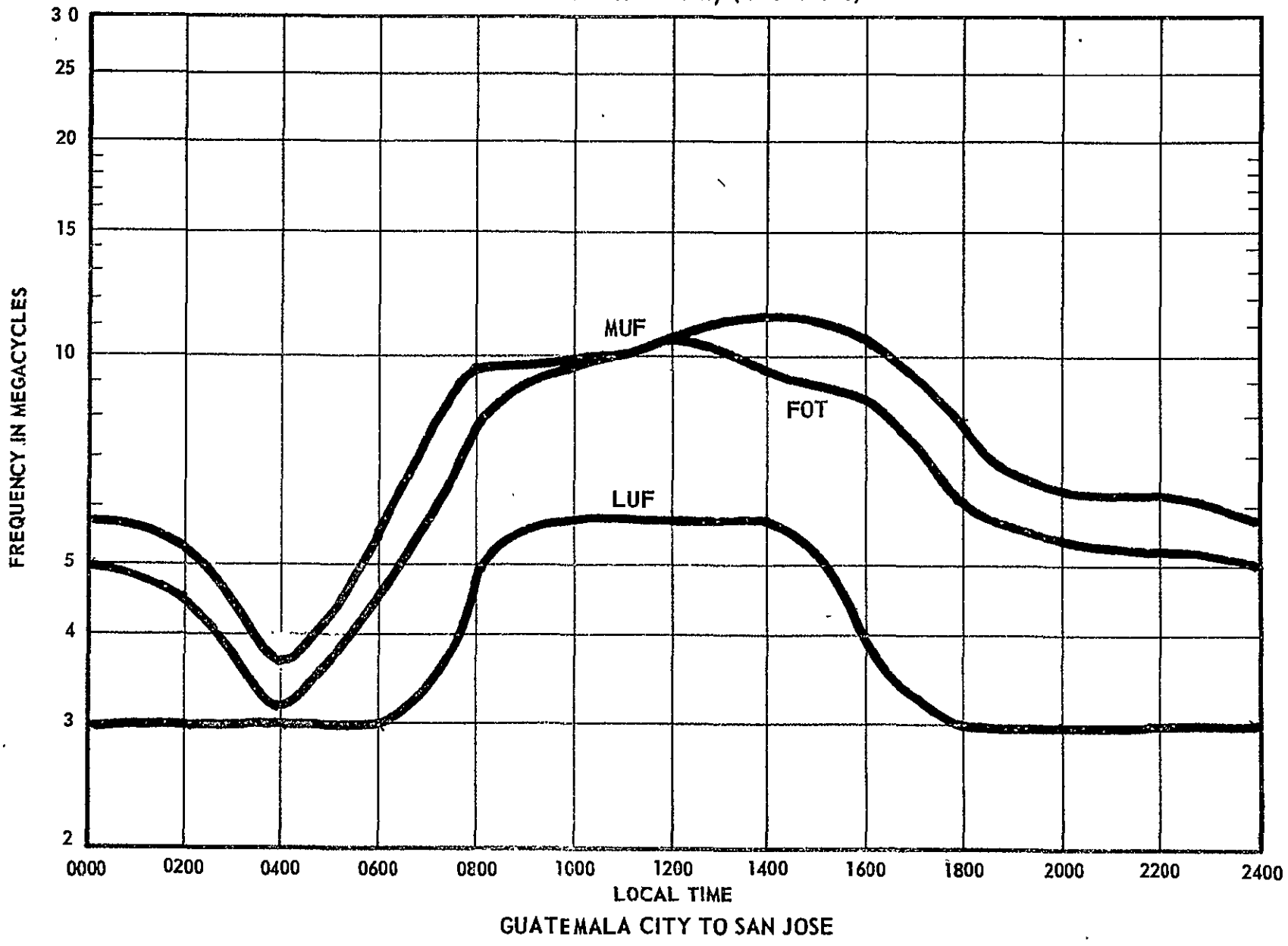

GUATEMALA CITY TO SAN JOSE

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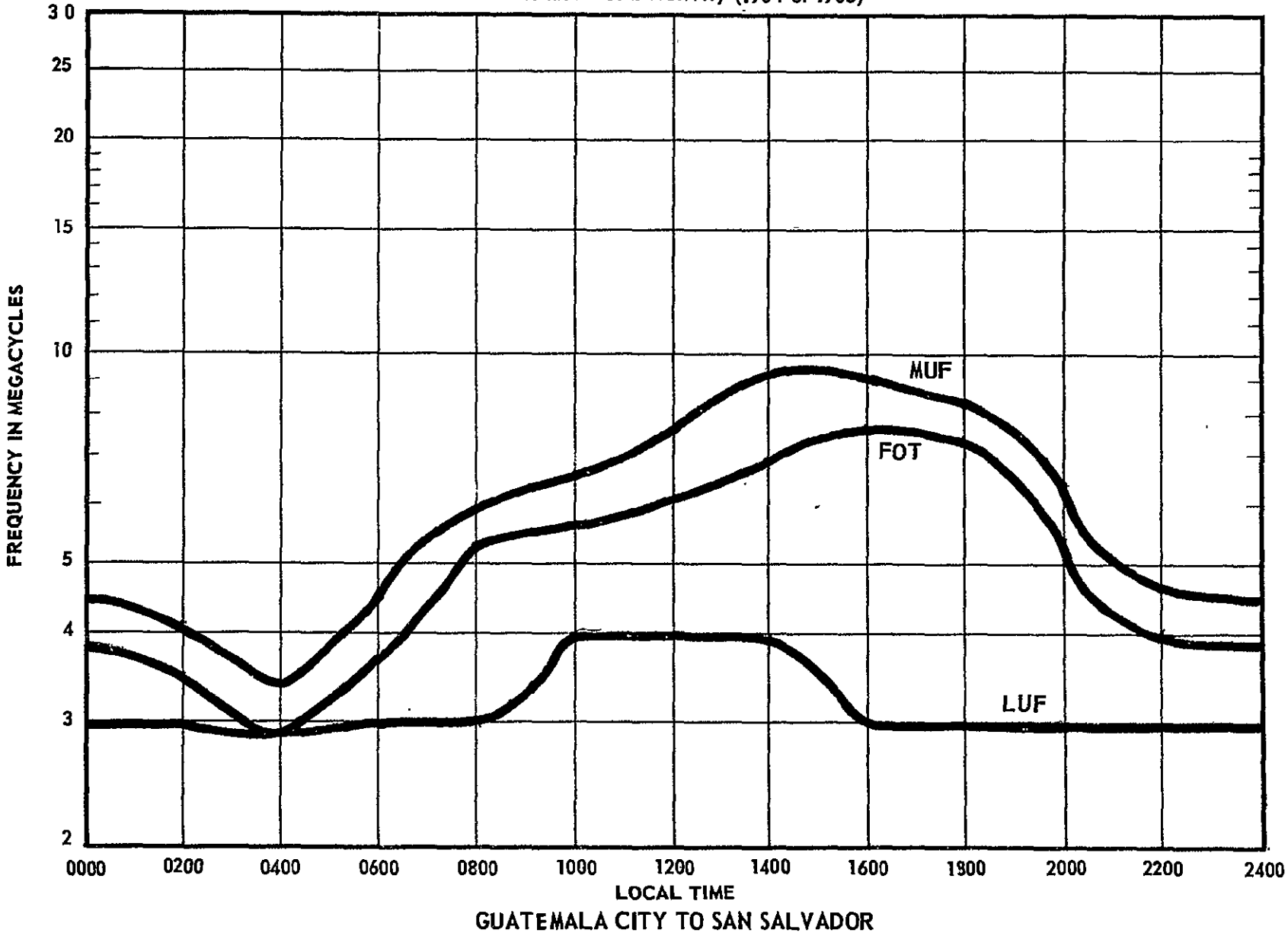

GUATEMALA CITY TO SAN SALVADOR

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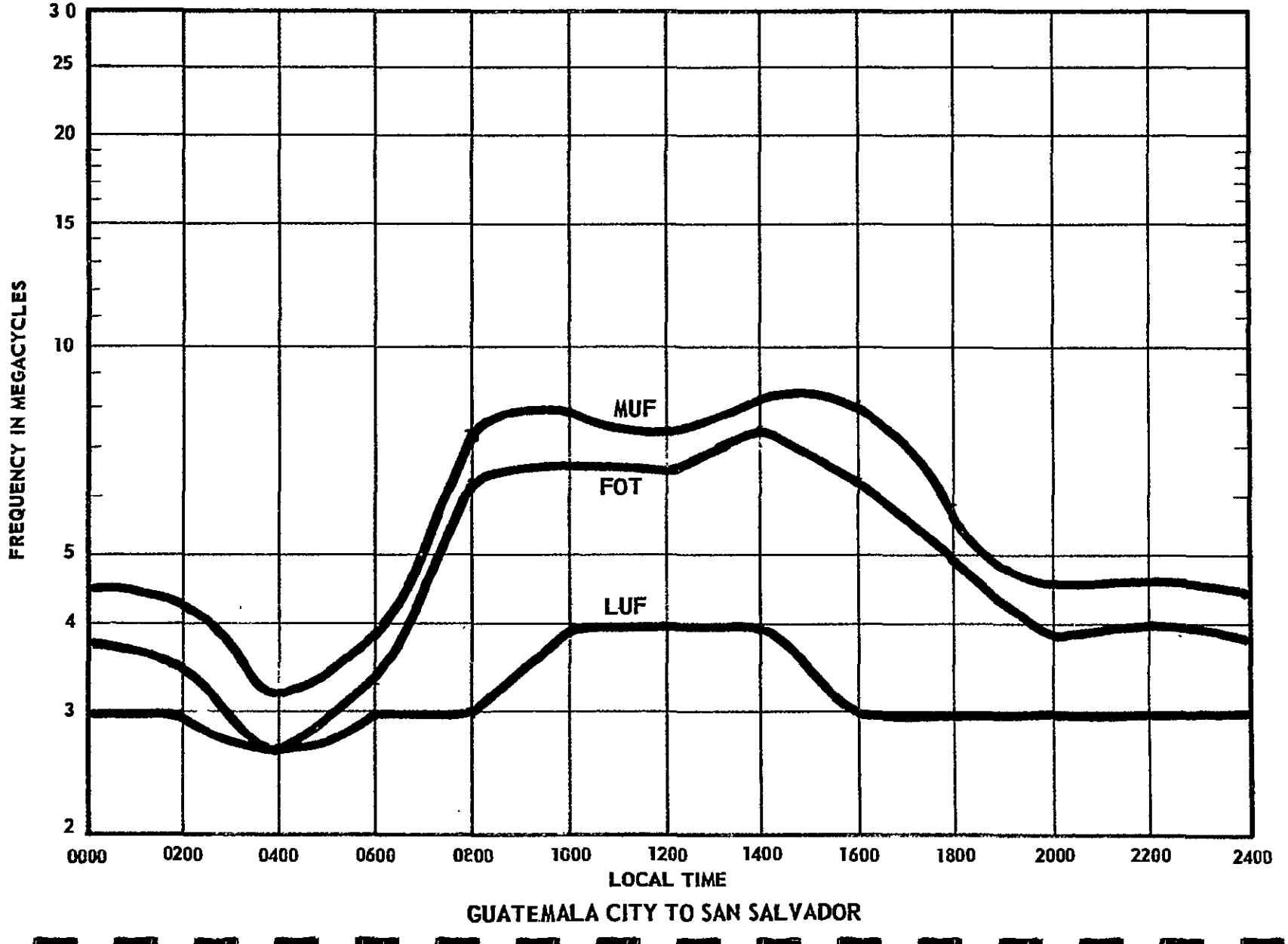

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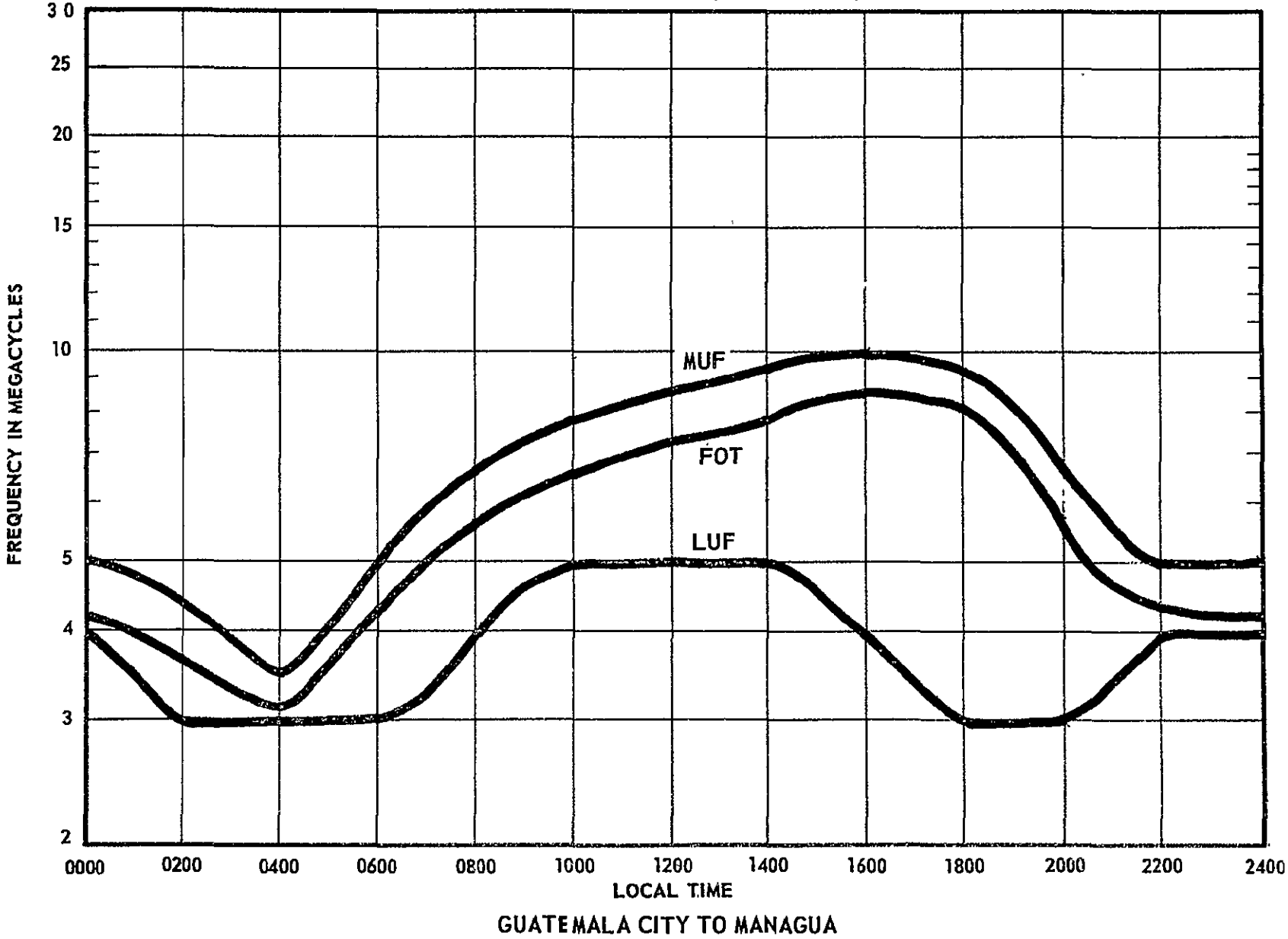

GUATEMALA CITY TO MANAGUA

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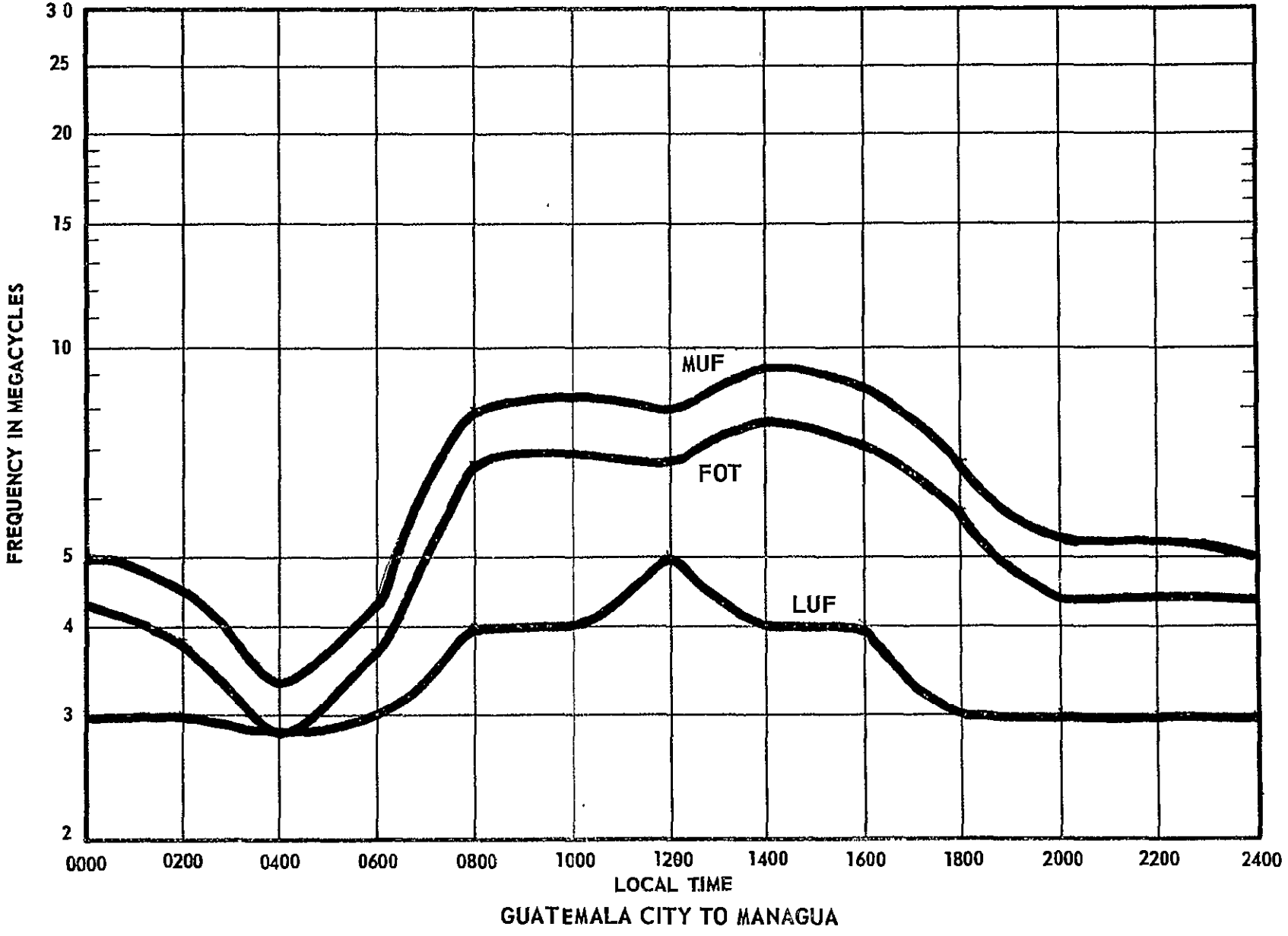

GUATEMALA CITY TO MANAGUA

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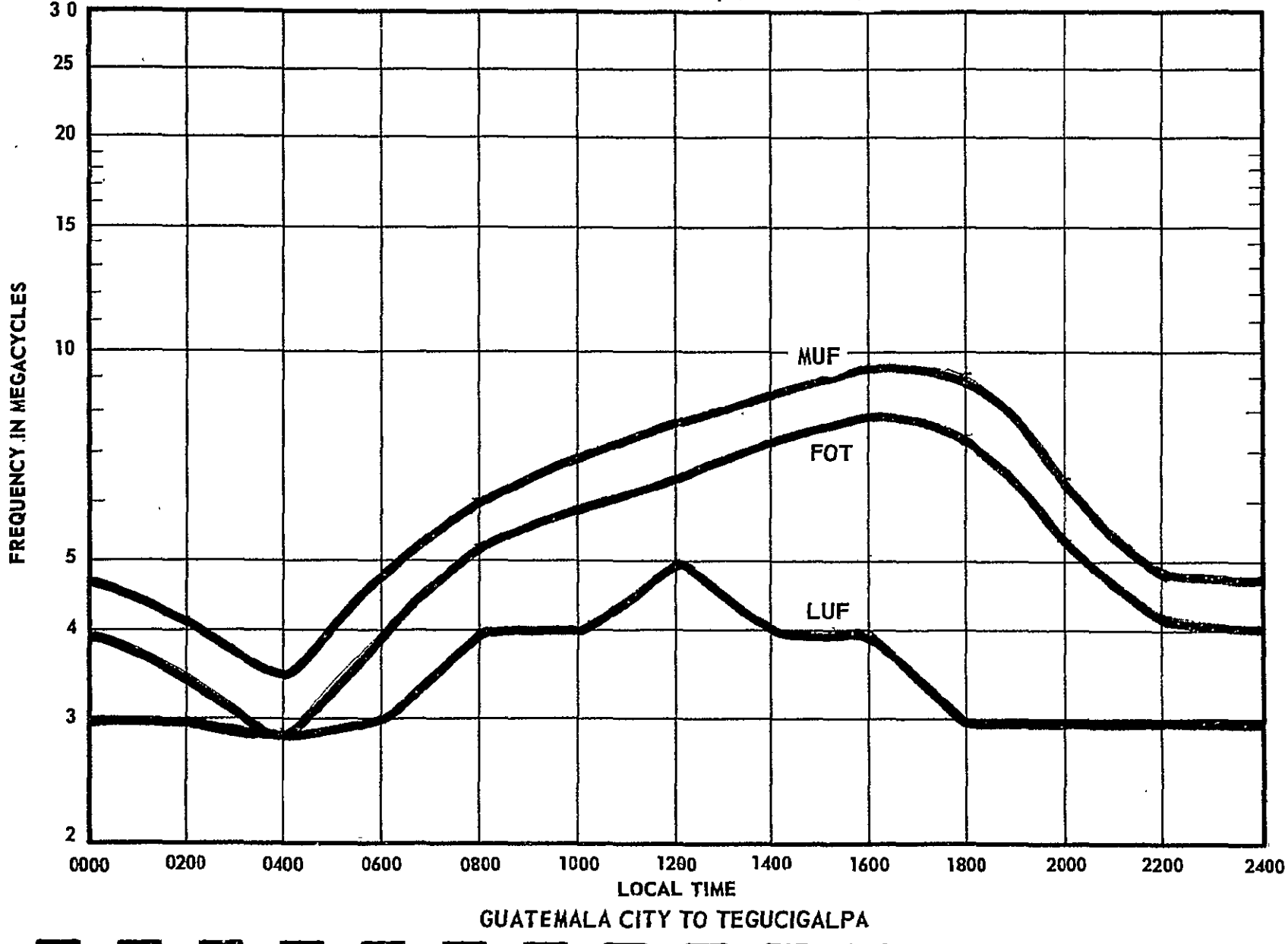

GUATEMALA CITY TO TEGUCIGALPA

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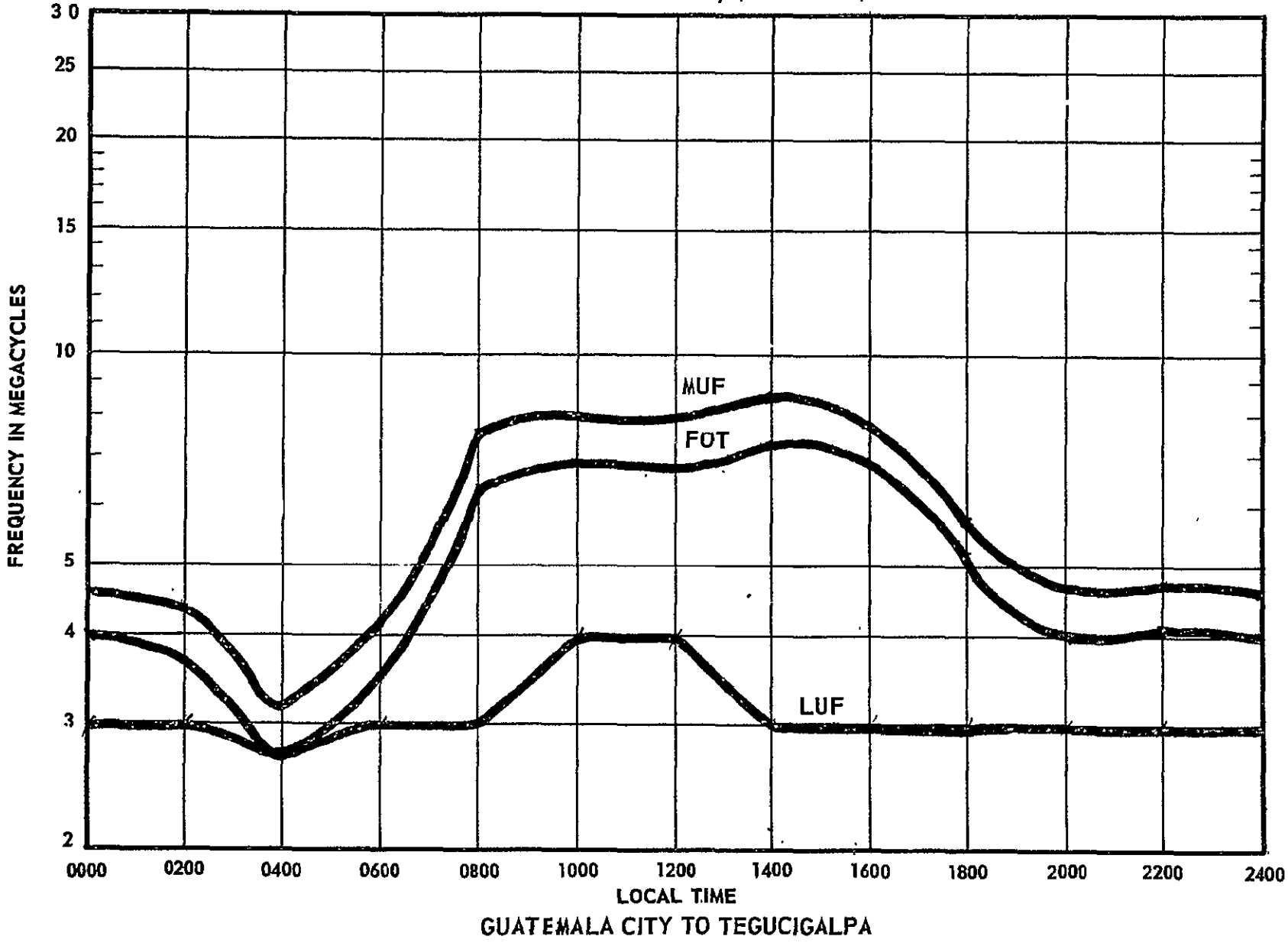

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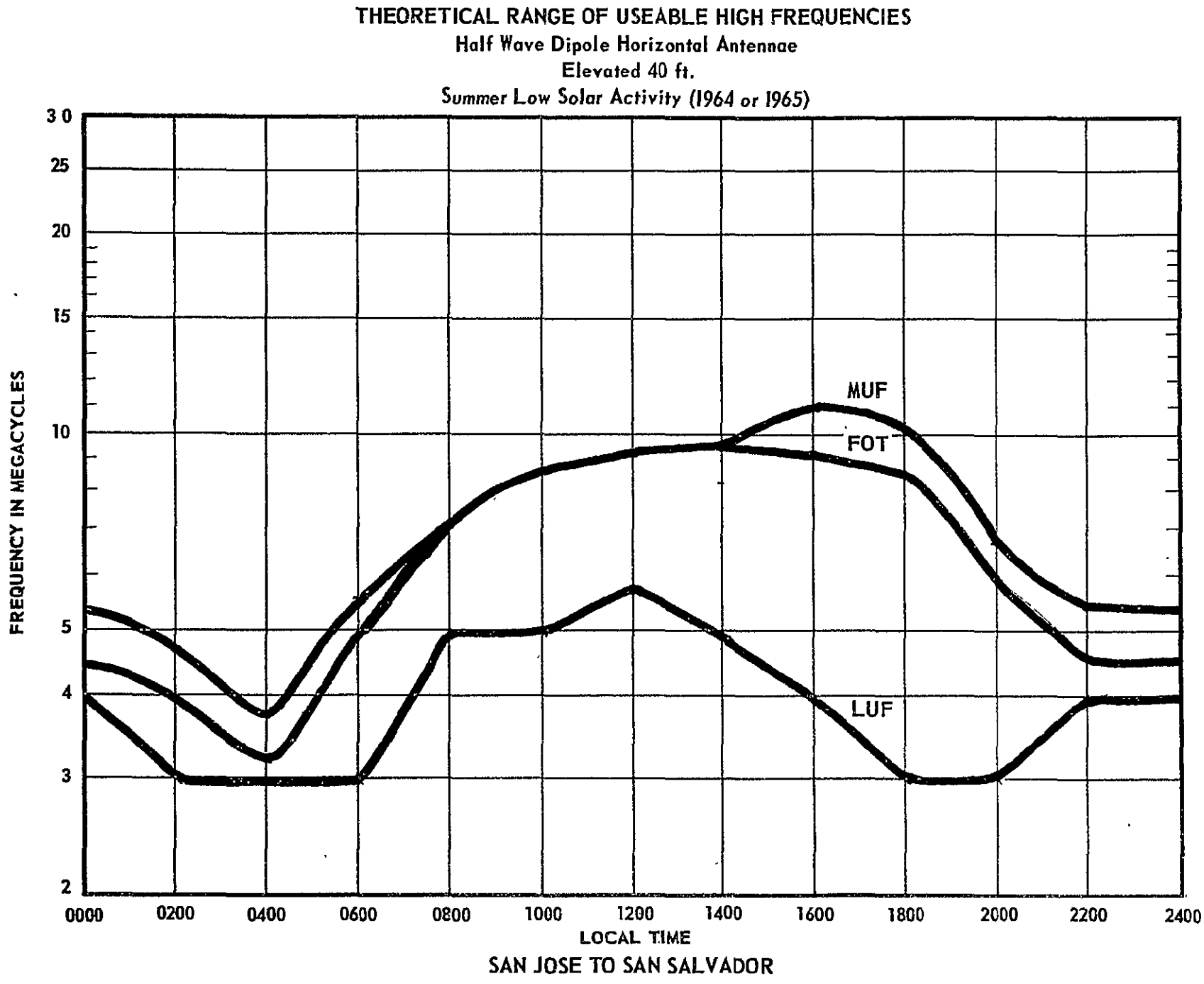
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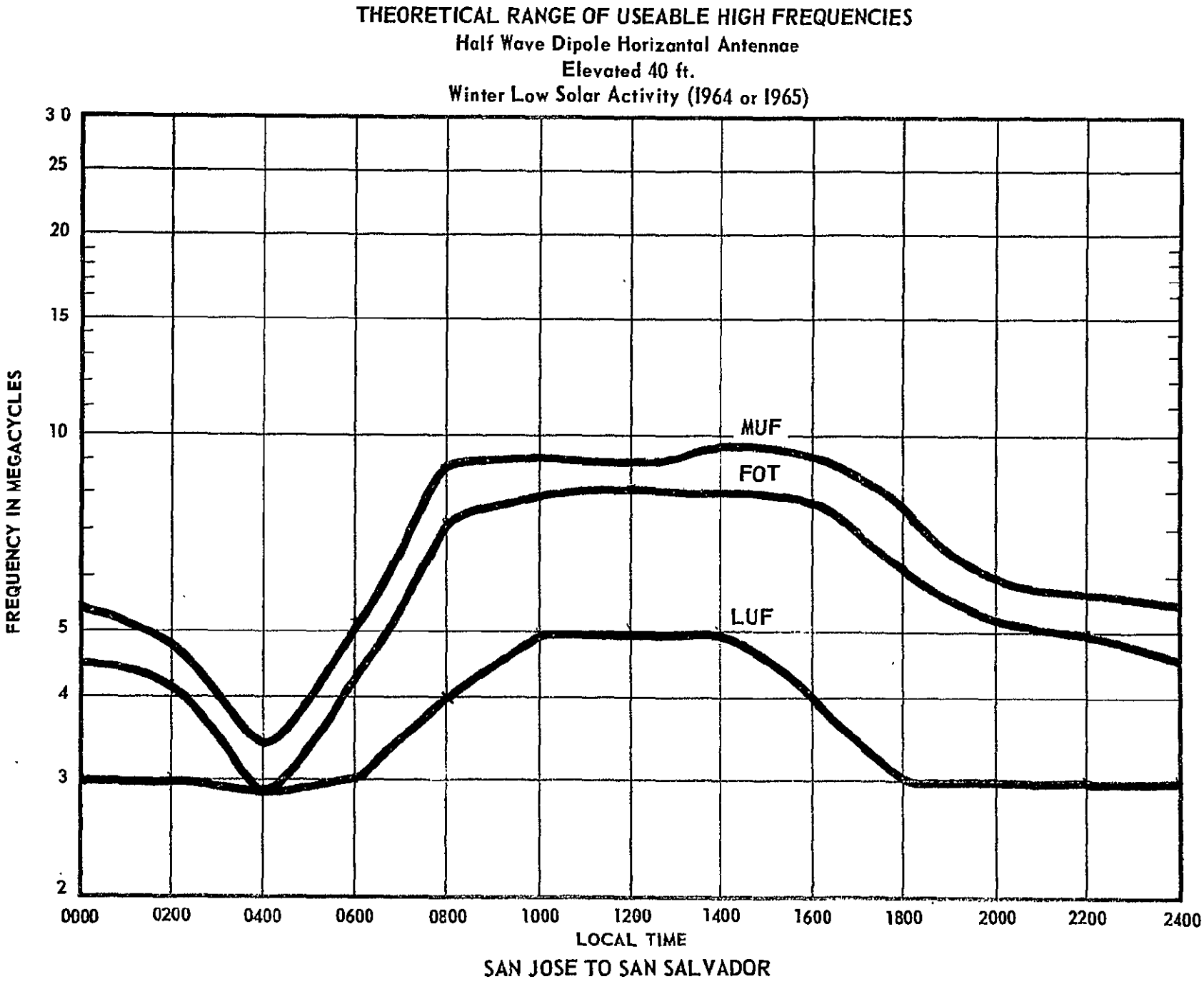
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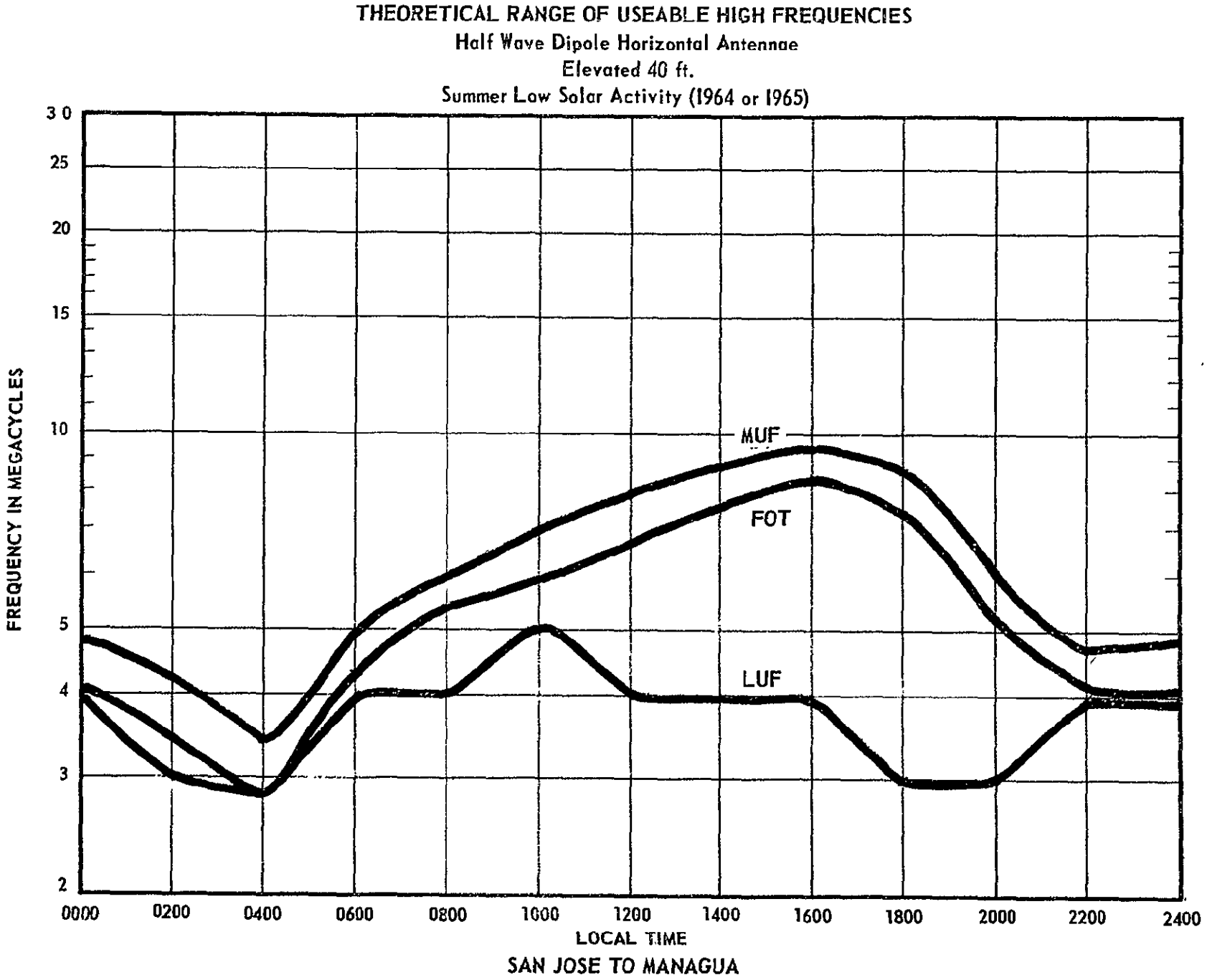
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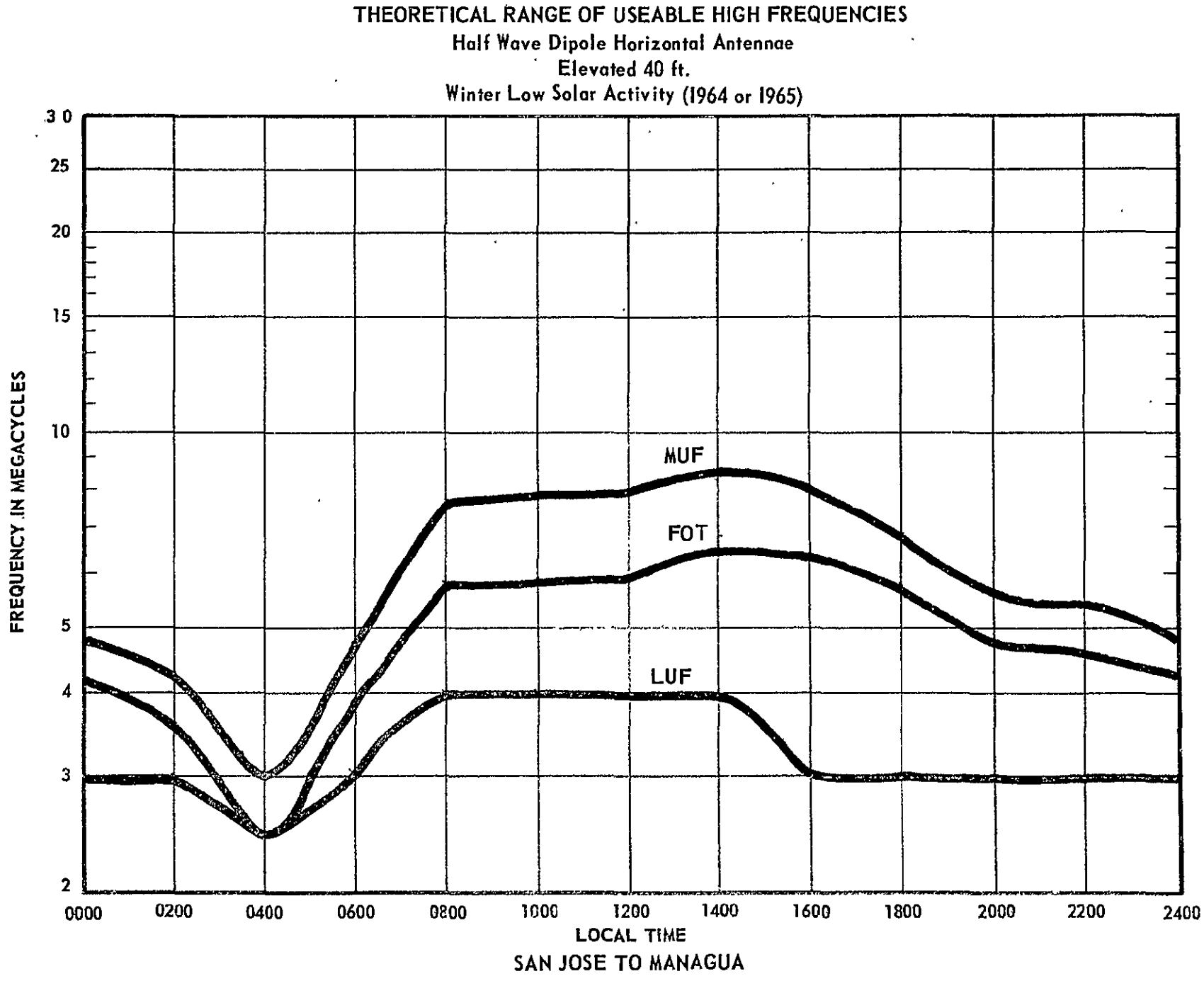
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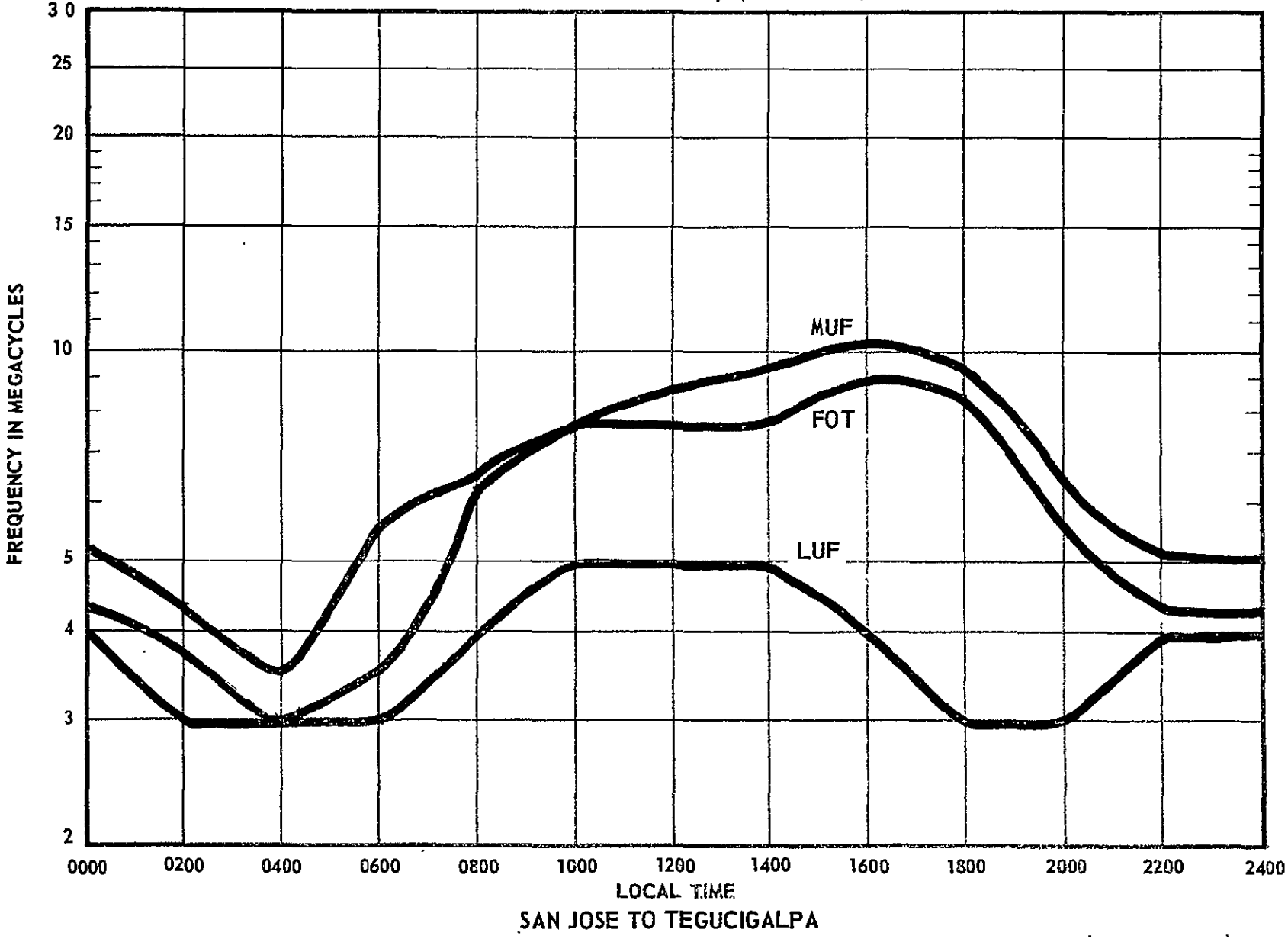
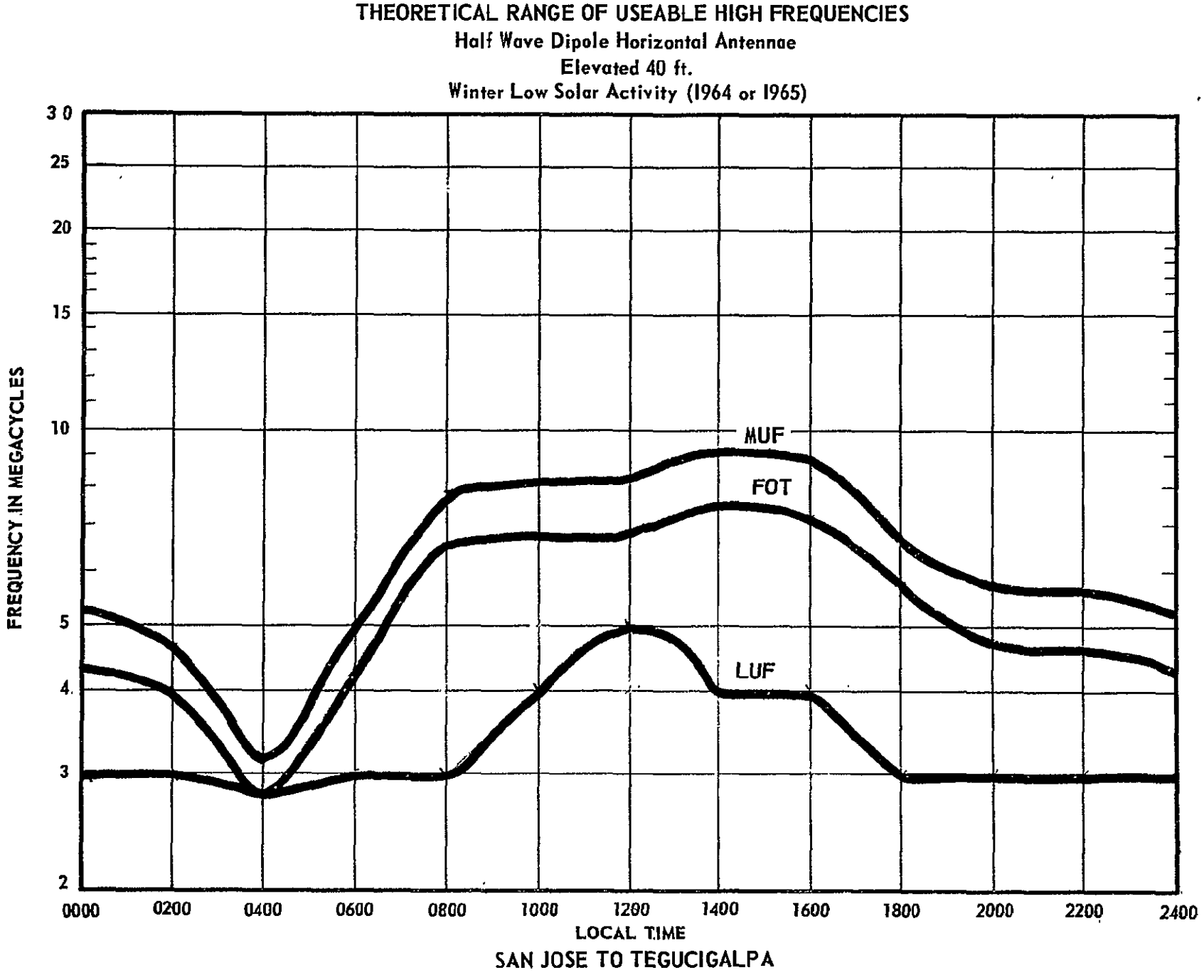


SAN JOSE TO TEGUCIGALPA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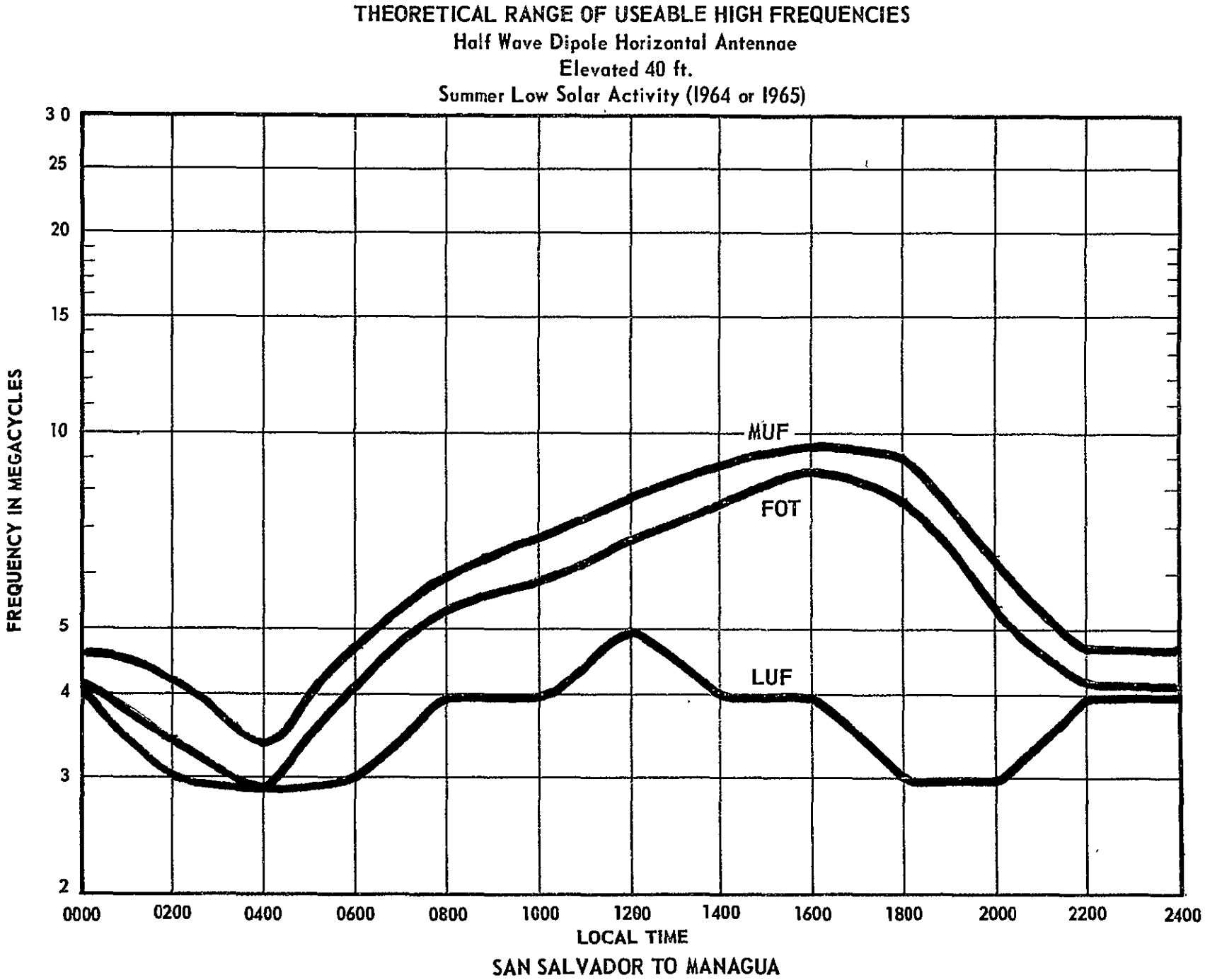
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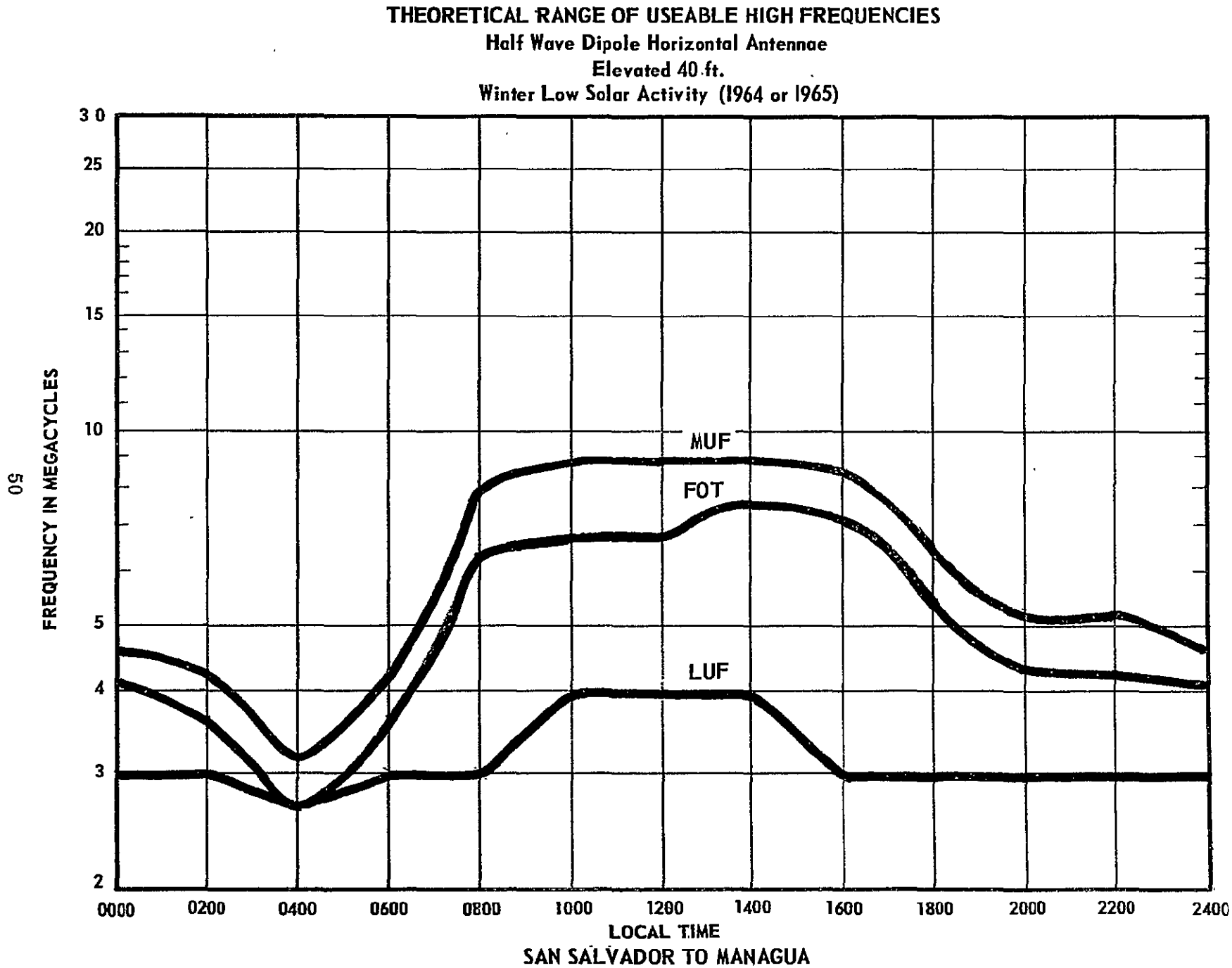
SAN SALVADOR TO MANAGUA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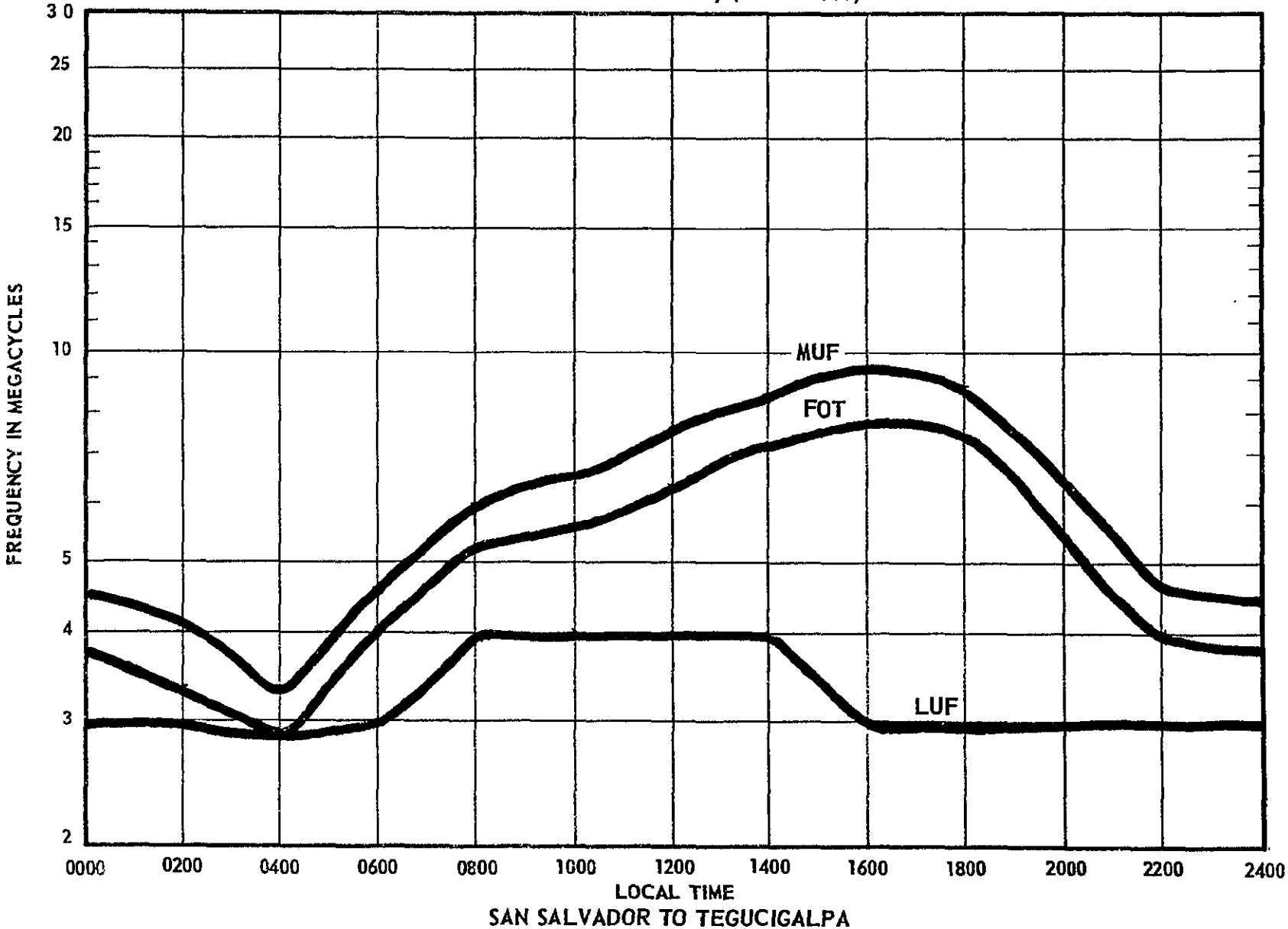

SAN SALVADOR TO TEGUCIGALPA

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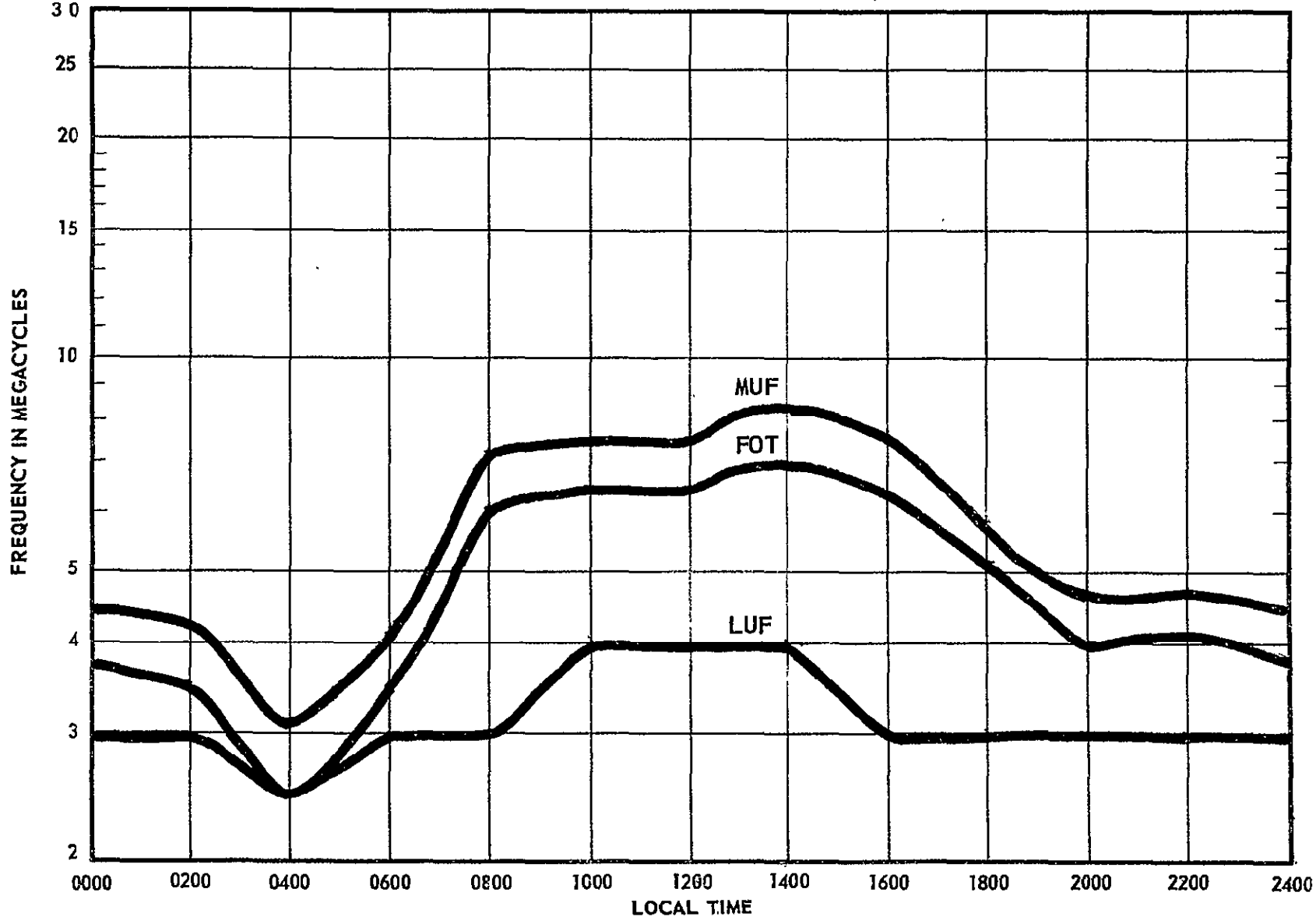
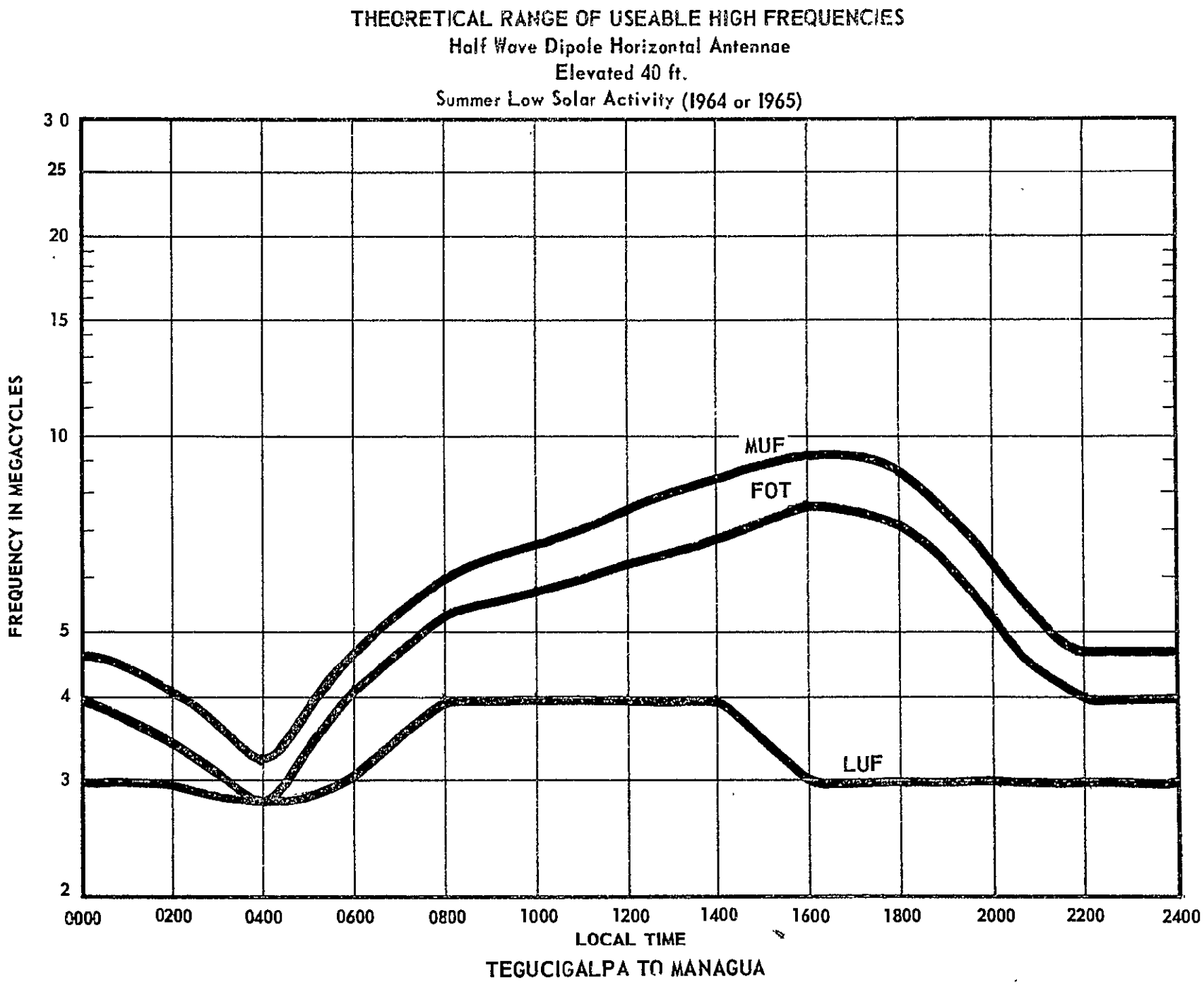


SAN SALVADOR TO TEGUCIGALPA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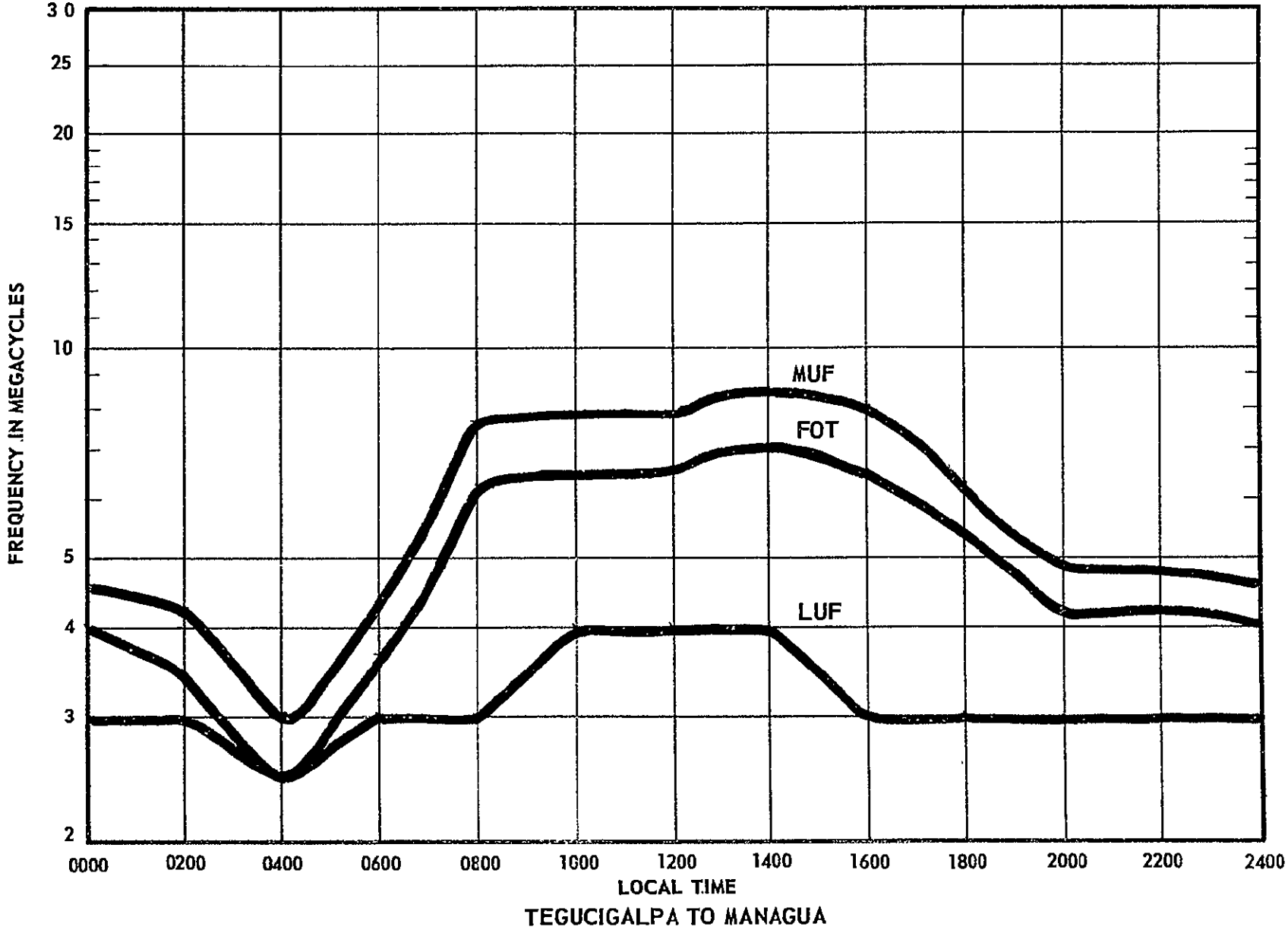

TEGUCIGALPA TO MANAGUA

RELIABILITY PREDICTIONS

(Extract of Report 8210, U.S. Department of Commerce, National Bureau of Standards, Boulder Laboratories, January 20, 1964)

Theoretical reliability tabulations show the upper limit of frequencies having ionospheric support for each hour followed by more detailed computations at alternate hours (each even hour of Greenwich Mean Time (GMT). Normally an estimate of frequencies having ionospheric support 50% of the time and those having support 90% of the time are adequate as estimates of upper frequency limits for systems planning. These limits are shown in columns 2 and 3 with the MUF (Maximum Usable Frequency) as an estimate of the maximum frequency having ionospheric support on 50% or more of the days and the FOT (Optimum Traffic Frequency) as an estimate of the frequency having ionospheric support on 90% or more of the days.

Predictions of the dominant mode of propagation, the associated vertical angle, and the theoretical reliability are made at descrete frequencies at two-hour intervals in the remaining columns. The dominant mode of propagation corresponds to the ray path having the least loss during transmission and is expressed as 1F for 1 hop via F-region reflection, 2E for 2 hops via E-region reflection, etc., with X indicating a mixed mode, i.e., a propagation path involving both E and F-region reflections. The vertical angle of departure and arrival in degrees is tabulated directly below the dominant mode of propagation, and the theoretical reliability is tabulated below the vertical angle. The theoretical reliability is expressed as the percent of days within the month that satisfactory service may be expected and is based solely upon the expected signal-to-noise ratios. No reliabilities are estimated at frequencies above the FOT.

Since the propagation model assumes ray path geometry along a short-great-circle between the earth and concentric ionospheric region, there are situations in which no mode of propagation is obtained at certain frequencies particularly at or near the FOT. The prediction of the MUF and FOT are dependent upon empirical methods which partially account for the effect of tilted ionospheres, high angle rays, etc.; but since the transmission losses associated with these modes are less well known than for the better defined modes, no estimate of signal levels are currently made for these less predictable modes of propagation.

A general description of the circuit parameters used in the calculations are shown in the heading of each computer print-out. Starting at the top of the page and reading left to right, the heading may be described as follows:

Line 1: Numerical sequence in which the computation was made; the month for which the prediction applies; the solar activity level in 12-month moving average Zurich Sunspot Number for which the prediction applies; and a circuit code number with the letter code indicating the receiver location followed by a numerical code showing the bearing of the transmitter location in tens of degrees before the decimal, and the distance in hundreds of nautical miles following the decimal.

Line 2 & 3: The transmitter location to the nearest hundredth of a degree; the receiver location to the nearest hundredth of a degree; the bearing of the receiver at the transmitter; the bearing of the transmitter at the receiver, and the great-circle distance in nautical miles.

Line 4: The transmitting antenna type and physical dimensions H = height in meters, L = leg length in meters, followed by the tilt angle in degrees for rhombics. (If the antenna is other than half-wave horizontal, vertical or rhombic, an estimate of the gain is shown.)

For vertical antennas with height expressed in wave length, a minus number is used in the height designation followed by two digits to express the number of wave lengths. Fractional wave lengths are shown as two digits with -14 indicating a quarter wave length, -12 indicating a half wave length, etc.

The man-made noise in the receiving area; one (1) indicates man-made noise typical of industrial areas; two (2) indicates residential areas; three (3) indicates rural areas; and four (4) indicates remote unpopulous areas. The receiving antenna type and physical dimensions.

Line 5: Peak envelope power at the transmitter antenna input; the operating frequency caption above the increments of frequencies in Mc/s at which probable modes, vertical angles, and reliabilities are calculated; the required signal-to-noise ratio associated with the type of service required. (This ratio is the hourly median peak envelope power in the occupied bandwidth relative to median noise in a one-cycle bandwidth.)

PANAMA CITY TO SAN JOSE

1 JUN SSN= 10. SJ 10.003

TRANSMITTER 8.95N - 79.50W | RECEIVER 9.98N - 84.07W | BEARINGS 283.2 102.5 | N.MILES 277.5

H-DIPOLE 13H -OL -0DEG | NOISE= 3 | H-DIPOLE 13H -OL -0DEG

PWR= 1.00KW | OPERATING FREQUENCIES | REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.5	6.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			43	43	43	0	0	0	0	0	0	0	43	ANGLE
2	6.1	5.2	97	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.4	4.6												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	44	0	0	0	0	0	0	0	0	44	ANGLE
4	5.1	4.4	90	97	0	0	0	0	0	0	0	0	98	RELIABILITY
5	5.2	4.4												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	44	0	0	0	0	0	0	0	0	44	ANGLE
6	5.1	4.4	90	97	0	0	0	0	0	0	0	0	98	RELIABILITY
7	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			43	0	0	0	0	0	0	0	0	0	43	ANGLE
8	4.4	3.7	93	0	0	0	0	0	0	0	0	0	97	RELIABILITY
9	4.0	3.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			41	0	0	0	0	0	0	0	0	0	41	ANGLE
10	3.4	2.9	98	0	0	0	0	0	0	0	0	0	98	RELIABILITY
11	4.0	3.4												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	44	0	0	0	0	0	0	0	0	44	ANGLE
12	5.6	4.8	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.5	5.5												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			22	49	49	49	0	0	0	0	0	0	49	ANGLE
14	6.6	6.1	0	98	99	99	0	0	0	0	0	0	99	RELIABILITY
15	6.9	6.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			22	52	52	52	0	0	0	0	0	0	52	ANGLE
16	7.4	7.0	0	82	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.8	7.2												
			1E	2F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	69	53	53	53	0	0	0	0	0	53	ANGLE
18	8.3	7.2	0	0	99	99	99	0	0	0	0	0	99	RELIABILITY
19	8.7	7.4												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	51	51	51	51	0	0	0	0	0	51	ANGLE
20	9.1	7.8	0	93	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.7	8.2												
			2F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			65	47	47	47	47	47	0	0	0	0	47	ANGLE
22	10.0	8.5	4	99	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.8	8.3												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			43	43	43	43	43	0	0	0	0	0	43	ANGLE
24	9.0	7.7	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

PANAMA CITY TO SAN JOSE

1 DEC SSN= 10. SJ 10.003

TRANSMITTER	RECEIVER	BEARINGS	N.MILES
8.95N - 79.50W	9.98N - 84.07W	283.2 102.5	277.5

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	6.5	5.5												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			42	42	42	0	0	0	0	0	0	0	42	ANGLE
2	6.3	5.3	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	6.2	5.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	43	0	0	0	0	0	0	0	0	43	ANGLE
4	5.8	4.9	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	5.4	4.6												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	44	0	0	0	0	0	0	0	0	44	ANGLE
6	5.2	4.4	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.9	4.1												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			44	0	0	0	0	0	0	0	0	0	44	ANGLE
8	4.4	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.2												
			00	00	00	00	00	00	00	00	00	00	1F	MODE
			0	0	0	0	0	0	0	0	0	0	42	ANGLE
10	2.9	2.5	0	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.3	2.8												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	43	0	0	0	0	0	0	0	0	43	ANGLE
12	5.6	4.7	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	7.7	6.5												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	45	45	45	45	0	0	0	0	0	45	ANGLE
14	8.4	7.2	0	99	99	99	99	0	0	0	0	0	99	RELIABILITY
15	8.5	7.2												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	47	47	47	47	0	0	0	0	0	47	ANGLE
16	8.4	7.1	0	88	99	99	99	0	0	0	0	0	99	RELIABILITY
17	8.3	7.0												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	48	48	48	48	0	0	0	0	0	48	ANGLE
18	8.7	7.4	0	85	99	99	99	0	0	0	0	0	99	RELIABILITY
19	9.1	7.8												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			22	48	48	48	48	0	0	0	0	0	48	ANGLE
20	9.3	7.9	0	97	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.4	8.0												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			46	46	46	46	46	0	0	0	0	0	46	ANGLE
22	9.2	7.8	98	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	8.4	7.2												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			44	44	44	44	0	0	0	0	0	0	44	ANGLE
24	7.4	6.3	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY

PANAMA CITY TO SAN SALVADOR

2 JUN SSN= 10. SS 11.006

TRANSMITTER 8.95N - 79.50W | RECEIVER 13.67N - 89.17W | BEARINGS 297.4 115.4 | N.MILES 635.4

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	11.0	9.3												
			2F	2F	1F	1F	1F	00	00	00	00	00	1F	MODE
			39	39	20	20	20	0	0	0	0	0	20	ANGLE
2	8.7	7.4	78	87	94	98	99	0	0	0	0	0	99	RELIABILITY
3	7.4	6.3												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			40	40	21	0	0	0	0	0	0	0	21	ANGLE
4	6.9	5.9	58	72	84	0	0	0	0	0	0	0	90	RELIABILITY
5	6.9	5.9												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			40	40	21	0	0	0	0	0	0	0	21	ANGLE
6	6.9	5.9	58	72	84	0	0	0	0	0	0	0	90	RELIABILITY
7	6.4	5.5												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			39	39	20	0	0	0	0	0	0	0	20	ANGLE
8	6.0	5.1	55	72	83	0	0	0	0	0	0	0	83	RELIABILITY
9	5.5	4.7												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			37	19	0	0	0	0	0	0	0	0	19	ANGLE
10	4.7	4.0	77	85	0	0	0	0	0	0	0	0	85	RELIABILITY
11	5.3	4.6												
			2F	2F	1F	1F	1F	1E	00	00	00	00	1E	MODE
			40	40	21	21	21	8	0	0	0	0	8	ANGLE
12	8.0	8.0	16	66	98	99	99	96	0	0	0	0	96	RELIABILITY
13	10.3	10.3												
			1E	2F	2F	1F	1F	1F	1E	1E	00	00	1E	MODE
			8	44	44	24	24	24	8	8	0	0	8	ANGLE
14	11.7	11.7	0	0	20	95	99	99	68	91	0	0	99	RELIABILITY
15	12.7	12.7												
			1E	3F	2F	1F	1F	1F	1F	1E	1E	00	1E	MODE
			8	59	48	27	27	27	27	8	8	0	8	ANGLE
16	13.5	13.5	0	0	1	82	98	99	99	56	96	0	99	RELIABILITY
17	13.9	13.9												
			1E	3F	2F	1F	1F	1F	1F	1F	1E	00	1E	MODE
			8	60	49	28	28	28	28	28	8	0	8	ANGLE
18	14.0	14.0	0	0	0	78	97	99	99	99	94	0	99	RELIABILITY
19	13.6	13.6												
			1E	2F	2F	1F	1F	1F	1F	1F	1F	00	1E	MODE
			8	47	47	27	27	27	27	27	27	0	8	ANGLE
20	12.9	12.9	0	0	3	89	98	99	99	99	99	0	99	RELIABILITY
21	13.2	12.0												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1F	MODE
			8	43	43	24	24	24	24	24	0	0	24	ANGLE
22	13.9	11.8	0	6	46	98	99	99	99	99	0	0	99	RELIABILITY
23	13.9	11.8												
			2F	1F	1F	1F	1F	1F	1F	1F	00	00	1F	MODE
			40	21	21	21	21	21	21	21	0	0	21	ANGLE
24	13.1	11.1	51	89	98	99	99	99	99	99	0	0	99	RELIABILITY

PANAMA CITY TO SAN SALVADOR

2 DEC SSN= 10. SS 11.006

TRANSMITTER 8.95N - 79.50W | RECEIVER 13.67N - 89.17W | BEARINGS 297.4 115.4 | N.MILES 635.4

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	8.3	7.1												
			2F	2F	1F	1F	00	00	00	00	00	00	1F	MODE
			38	38	20	20	0	0	0	0	0	0	20	ANGLE
2	7.9	6.7	97	98	99	99	0	0	0	0	0	0	99	RELIABILITY
3	8.0	6.8												
			2F	2F	1F	1F	00	00	00	00	00	00	1F	MODE
			39	39	20	20	0	0	0	0	0	0	20	ANGLE
4	7.7	6.6	96	98	98	99	0	0	0	0	0	0	99	RELIABILITY
5	7.3	6.2												
			2F	2F	1F	1F	00	00	00	00	00	00	1F	MODE
			40	40	21	21	0	0	0	0	0	0	21	ANGLE
6	7.2	6.1	97	98	99	99	0	0	0	0	0	0	99	RELIABILITY
7	6.9	5.9												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			40	40	21	0	0	0	0	0	0	0	21	ANGLE
8	6.3	5.4	97	98	99	0	0	0	0	0	0	0	99	RELIABILITY
9	5.5	4.6												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			38	0	0	0	0	0	0	0	0	0	20	ANGLE
10	4.2	3.5	97	0	0	0	0	0	0	0	0	0	97	RELIABILITY
11	4.2	3.6												
			2F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			38	20	20	20	0	0	0	0	0	0	20	ANGLE
12	7.1	6.0	75	97	99	99	0	0	0	0	0	0	99	RELIABILITY
13	10.5	9.0												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1F	MODE
			8	40	40	21	21	21	21	21	0	0	21	ANGLE
14	11.9	10.7	0	4	41	96	99	99	99	99	0	0	99	RELIABILITY
15	12.0	11.8												
			1E	3F	2F	2F	1F	1F	1F	1F	1E	00	1E	MODE
			8	54	42	42	23	23	23	23	8	0	8	ANGLE
16	12.5	12.5	0	0	3	32	97	99	99	99	98	0	99	RELIABILITY
17	12.9	12.9												
			1E	3F	2F	2F	1F	1F	1F	1F	1E	00	1E	MODE
			8	55	43	43	24	24	24	24	8	0	8	ANGLE
18	13.0	13.0	0	0	1	24	97	99	99	99	97	0	99	RELIABILITY
19	12.7	12.7												
			1E	2F	2F	1F	1F	1F	1F	1F	1F	00	1F	MODE
			8	43	43	23	23	23	23	23	23	0	23	ANGLE
20	12.8	12.0	0	0	12	92	99	99	99	99	99	0	99	RELIABILITY
21	12.9	11.0												
			3F	2F	1F	1F	1F	1F	1F	1F	00	00	1F	MODE
			53	41	22	22	22	22	22	22	0	0	22	ANGLE
22	12.6	10.7	0	34	94	99	99	99	99	99	0	0	99	RELIABILITY
23	11.4	9.7												
			2F	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			39	39	21	21	21	21	0	0	0	0	21	ANGLE
24	9.7	8.2	99	99	99	99	99	99	0	0	0	0	99	RELIABILITY

PANAMA CITY TO GUATEMALA

3 JUN SSN= 10. GC 11.007

TRANSMITTER 8.95N - 79.50W | RECEIVER 14.64N - 90.37W | BEARINGS 299.2 116.9 | N.MILES 723.8

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	12.3	10.4												
			2F	2F	2F	1F	1F	1F	00	00	00	00	1F	MODE
			35	35	35	17	17	17	0	0	0	0	17	ANGLE
2	9.7	8.3	76	86	92	95	98	99	0	0	0	0	99	RELIABILITY
3	8.2	6.9												
			2F	2F	2F	1F	00	00	00	00	00	00	1F	MODE
			36	36	36	18	0	0	0	0	0	0	18	ANGLE
4	7.5	6.4	71	80	88	93	0	0	0	0	0	0	96	RELIABILITY
5	7.5	6.4												
			2F	2F	2F	1F	00	00	00	00	00	00	1F	MODE
			36	36	36	18	0	0	0	0	0	0	18	ANGLE
6	7.5	6.4	58	70	81	88	0	0	0	0	0	0	90	RELIABILITY
7	7.0	6.0												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			35	35	17	0	0	0	0	0	0	0	17	ANGLE
8	6.5	5.5	58	70	78	0	0	0	0	0	0	0	83	RELIABILITY
9	6.0	5.1												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			34	16	0	0	0	0	0	0	0	0	16	ANGLE
10	5.2	4.4	75	77	0	0	0	0	0	0	0	0	83	RELIABILITY
11	5.7	4.9												
			2F	2F	1F	1F	1F	1F	00	00	00	00	1E	MODE
			36	36	18	18	18	18	0	0	0	0	6	ANGLE
12	8.6	8.6	3	39	81	97	99	99	0	0	0	0	81	RELIABILITY
13	11.0	11.0												
			1E	2F	2F	2F	1F	1F	1F	1E	1E	00	1E	MODE
			6	40	40	40	21	21	21	6	6	0	6	ANGLE
14	12.5	12.5	0	0	12	52	98	99	99	62	96	0	98	RELIABILITY
15	13.6	13.6												
			1E	3F	2F	2F	1F	1F	1F	1F	1E	00	1E	MODE
			6	56	44	44	24	24	24	24	6	0	6	ANGLE
16	14.5	14.5	0	0	0	12	92	99	99	99	73	0	98	RELIABILITY
17	15.0	15.0												
			1E	3F	2F	2F	1F	1F	1F	1F	1E	1E	1E	MODE
			6	57	45	45	25	25	25	25	6	6	6	ANGLE
18	15.0	15.0	0	0	0	7	92	98	99	99	67	99	99	RELIABILITY
19	14.7	14.7												
			1E	3F	2F	2F	1F	1F	1F	1F	1F	00	1E	MODE
			6	55	44	44	24	24	24	24	24	0	6	ANGLE
20	13.9	13.9	0	0	1	20	96	99	99	99	99	0	98	RELIABILITY
21	14.4	12.9												
			1E	2F	2F	1F	1F	1F	1F	1F	1F	00	1F	MODE
			6	40	40	21	21	21	21	21	21	0	21	ANGLE
22	15.3	13.0	0	2	36	94	99	99	99	99	99	0	99	RELIABILITY
23	15.4	13.1												
			2F	2F	1F	1F	1F	1F	1F	1F	1F	00	1F	MODE
			36	36	18	18	18	18	18	18	18	0	18	ANGLE
24	14.5	12.3	37	78	95	99	99	99	99	99	99	0	99	RELIABILITY

PANAMA CITY TO GUATEMALA

3 DEC SSN= 10. GC 11.007

TRANSMITTER 8.95N - 79.50W RECEIVER 14.64N - 90.37W BEARINGS 299.2 116.9 N.MILES 723.8

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	9.0	7.6												
			2F	2F	2F	1F	1F	00	00	00	00	00	1F	MODE
			34	34	34	17	17	0	0	0	0	0	17	ANGLE
2	8.5	7.2	95	97	98	99	99	0	0	0	0	0	99	RELIABILITY
3	8.6	7.3												
			2F	2F	2F	1F	1F	00	00	00	00	00	1F	MODE
			35	35	35	17	17	0	0	0	0	0	17	ANGLE
4	8.4	7.1	94	97	98	99	99	0	0	0	0	0	99	RELIABILITY
5	7.9	6.7												
			2F	2F	2F	1F	00	00	00	00	00	00	1F	MODE
			36	36	36	18	0	0	0	0	0	0	18	ANGLE
6	7.8	6.7	95	97	98	99	0	0	0	0	0	0	99	RELIABILITY
7	7.6	6.5												
			2F	2F	1F	00	00	00	00	00	00	00	1F	MODE
			36	36	18	0	0	0	0	0	0	0	18	ANGLE
8	7.0	6.0	95	97	98	0	0	0	0	0	0	0	99	RELIABILITY
9	6.1	5.2												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			34	0	0	0	0	0	0	0	0	0	17	ANGLE
10	4.6	3.9	95	0	0	0	0	0	0	0	0	0	96	RELIABILITY
11	4.5	3.9												
			2F	2F	2F	1F	00	00	00	00	00	00	1F	MODE
			34	34	34	17	0	0	0	0	0	0	17	ANGLE
12	7.6	6.5	65	93	99	99	0	0	0	0	0	0	99	RELIABILITY
13	11.5	9.8												
			1E	2F	2F	2F	1F	1F	1F	1F	00	00	1F	MODE
			6	36	36	36	18	18	18	18	0	0	18	ANGLE
14	13.2	11.4	0	1	27	73	98	99	99	99	0	0	99	RELIABILITY
15	13.3	12.6												
			1E	3F	2F	2F	2F	1F	1F	1F	1F	00	1E	MODE
			6	50	38	38	38	19	19	19	19	0	6	ANGLE
16	13.4	13.4	0	0	1	20	62	98	99	99	99	0	98	RELIABILITY
17	13.9	13.9												
			1E	3F	2F	2F	2F	1F	1F	1F	1F	00	1E	MODE
			6	51	39	39	39	20	20	20	20	0	6	ANGLE
18	13.9	13.9	0	0	0	14	51	98	99	99	99	0	98	RELIABILITY
19	13.6	13.6												
			1E	3F	2F	2F	1F	1F	1F	1F	1F	00	1F	MODE
			6	51	39	39	20	20	20	20	20	0	20	ANGLE
20	14.1	12.9	0	0	4	37	96	99	99	99	99	0	99	RELIABILITY
21	14.2	12.0												
			3F	2F	2F	1F	1F	1F	1F	1F	00	00	1F	MODE
			50	37	37	19	19	19	19	19	0	0	19	ANGLE
22	13.8	11.7	0	19	66	97	99	99	99	99	0	0	99	RELIABILITY
23	12.5	10.6												
			2F	2F	2F	1F	1F	1F	00	00	00	00	1F	MODE
			35	35	35	18	18	18	0	0	0	0	18	ANGLE
24	10.5	8.9	98	99	99	99	99	99	0	0	0	0	99	RELIABILITY

PANAMA CITY TO MANAGUA

4 JUN SSN= 10. MG 11.004

TRANSMITTER 8.95N - 79.50W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3 H-DIPOLE 13H -0L -0DEG

BEARINGS 295.8 114.6 N.MILES 443.4

REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	8.8	7.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			29	29	29	0	0	0	0	0	0	0	29	ANGLE
2	7.0	6.0	86	95	98	0	0	0	0	0	0	0	99	RELIABILITY
3	6.1	5.2												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			31	31	0	0	0	0	0	0	0	0	31	ANGLE
4	5.7	4.9	71	84	0	0	0	0	0	0	0	0	93	RELIABILITY
5	5.8	4.9												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			30	30	0	0	0	0	0	0	0	0	30	ANGLE
6	5.8	4.9	71	84	0	0	0	0	0	0	0	0	93	RELIABILITY
7	5.3	4.5												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			29	29	0	0	0	0	0	0	0	0	29	ANGLE
8	4.9	4.2	71	86	0	0	0	0	0	0	0	0	88	RELIABILITY
9	4.5	3.8												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			28	0	0	0	0	0	0	0	0	0	28	ANGLE
10	3.9	3.3	88	0	0	0	0	0	0	0	0	0	91	RELIABILITY
11	4.5	3.8												
			2F	1F	1F	1F	00	00	00	00	00	00	1E	MODE
			51	30	30	30	0	0	0	0	0	0	13	ANGLE
12	6.3	6.3	39	99	99	99	0	0	0	0	0	0	98	RELIABILITY
13	8.0	8.0												
			1E	2F	1F	1F	1F	1E	1E	00	00	00	1E	MODE
			13	55	35	35	35	13	13	0	0	0	13	ANGLE
14	9.0	9.0	0	6	97	99	99	97	99	0	0	0	99	RELIABILITY
15	9.8	9.8												
			1E	2F	1F	1F	1F	1F	1E	1E	00	00	1E	MODE
			13	58	38	38	38	38	13	13	0	0	13	ANGLE
16	10.4	10.4	0	0	88	99	99	99	96	99	0	0	99	RELIABILITY
17	10.7	10.7												
			1E	2F	1F	1F	1F	1F	1F	1E	00	00	1E	MODE
			13	59	39	39	39	39	39	13	0	0	13	ANGLE
18	10.7	10.7	0	0	84	99	99	99	99	98	0	0	99	RELIABILITY
19	10.4	10.4												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			13	57	37	37	37	37	37	0	0	0	37	ANGLE
20	10.3	9.8	0	0	94	99	99	99	99	0	0	0	99	RELIABILITY
21	11.0	9.3												
			3F	1F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			64	33	33	33	33	33	33	0	0	0	33	ANGLE
22	11.4	9.7	0	85	99	99	99	99	99	0	0	0	99	RELIABILITY
23	11.3	9.6												
			1F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			30	30	30	30	30	30	0	0	0	0	30	ANGLE
24	10.5	8.9	92	99	99	99	99	99	0	0	0	0	99	RELIABILITY

PANAMA CITY TO MANAGUA

4 DEC SSN= 10. MG 11.004

TRANSMITTER 8.95N - 79.50W RECEIVER 12.10N - 86.30W BEARINGS 295.8 114.6 N.MILES 443.4

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.1	6.0												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			29	29	29	0	0	0	0	0	0	0	29	ANGLE
2	6.8	5.8	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	6.8	5.8												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			29	29	29	0	0	0	0	0	0	0	29	ANGLE
4	6.5	5.5	98	99	99	0	0	0	0	0	0	0	99	RELIABILITY
5	6.0	5.1												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			30	30	30	0	0	0	0	0	0	0	30	ANGLE
6	5.9	5.0	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
7	5.6	4.8												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			30	30	0	0	0	0	0	0	0	0	30	ANGLE
8	5.1	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.4	3.7												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			29	0	0	0	0	0	0	0	0	0	29	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.6	3.1												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			29	29	29	0	0	0	0	0	0	0	29	ANGLE
12	6.1	5.2	98	99	99	0	0	0	0	0	0	0	99	RELIABILITY
13	8.7	7.4												
			3F	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			62	51	31	31	31	31	0	0	0	0	31	ANGLE
14	9.7	8.3	0	23	99	99	99	99	0	0	0	0	99	RELIABILITY
15	9.7	9.1												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1E	MODE
			13	53	33	33	33	33	33	0	0	0	13	ANGLE
16	9.7	9.7	0	0	88	99	99	99	99	0	0	0	99	RELIABILITY
17	10.0	10.0												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1E	MODE
			13	54	34	34	34	34	34	0	0	0	13	ANGLE
18	10.0	10.0	0	0	84	99	99	99	99	0	0	0	99	RELIABILITY
19	10.3	9.7												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			13	54	33	33	33	33	33	0	0	0	33	ANGLE
20	10.5	9.2	0	2	96	99	99	99	99	0	0	0	99	RELIABILITY
21	10.6	9.0												
			2F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			52	32	32	32	32	32	0	0	0	0	32	ANGLE
22	10.4	8.8	18	98	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.4	8.0												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			30	30	30	30	0	0	0	0	0	0	30	ANGLE
24	8.1	6.9	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY

PANAMA CITY TO TEGUCIGALPA

5 JUN SSN= 10. TG 12.005

TRANSMITTER 8.95N - 79.50W H-DIPOLE 13H -OL -ODEG PWR= 1.00KW

RECEIVER 14.08N - 87.23W NOISE= 3 H-DIPOLE 13H -OL -ODEG

BEARINGS 304.8 123.3 N.MILES 548.8

REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	9.8	8.4												
			2F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			43	24	24	24	0	0	0	0	0	0	24	ANGLE
2	7.8	6.7	78	90	96	98	0	0	0	0	0	0	99	RELIABILITY
3	6.7	5.7												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			25	25	25	0	0	0	0	0	0	0	25	ANGLE
4	6.3	5.3	60	76	88	0	0	0	0	0	0	0	90	RELIABILITY
5	6.3	5.3												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			44	25	25	0	0	0	0	0	0	0	25	ANGLE
6	6.3	5.3	56	76	88	0	0	0	0	0	0	0	90	RELIABILITY
7	5.8	4.9												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	24	0	0	0	0	0	0	0	0	24	ANGLE
8	5.4	4.6	59	78	0	0	0	0	0	0	0	0	84	RELIABILITY
9	5.0	4.2												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			42	0	0	0	0	0	0	0	0	0	23	ANGLE
10	4.3	3.7	80	0	0	0	0	0	0	0	0	0	87	RELIABILITY
11	4.9	4.4												
			2F	1F	1F	1F	1E	00	00	00	00	00	1E	MODE
			44	25	25	25	10	0	0	0	0	0	10	ANGLE
12	7.5	7.5	24	93	99	99	95	0	0	0	0	0	98	RELIABILITY
13	9.4	9.4												
			1E	2F	1F	1F	1F	1F	1E	1E	00	00	1E	MODE
			10	49	28	28	28	28	10	10	0	0	10	ANGLE
14	10.7	10.7	0	1	88	99	99	99	93	98	0	0	99	RELIABILITY
15	11.6	11.6												
			1E	2F	2F	1F	1F	1F	1E	1E	1E	00	1E	MODE
			10	52	52	32	32	32	10	10	10	0	10	ANGLE
16	12.3	12.3	0	0	2	95	99	99	56	88	99	0	99	RELIABILITY
17	12.6	12.6												
			1E	3F	2F	1F	1F	1F	1F	1F	1E	00	1E	MODE
			10	64	53	33	33	33	33	33	10	0	10	ANGLE
18	12.7	12.7	0	0	1	94	99	99	99	99	99	0	99	RELIABILITY
19	12.3	12.3												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1E	MODE
			10	52	52	31	31	31	31	31	0	0	10	ANGLE
20	11.7	11.7	0	0	9	97	99	99	99	99	0	0	99	RELIABILITY
21	12.2	10.8												
			3F	2F	1F	1F	1F	1F	1F	1F	00	00	1F	MODE
			59	48	27	27	27	27	27	27	0	0	27	ANGLE
22	12.7	10.8	0	12	94	99	99	99	99	99	0	0	99	RELIABILITY
23	12.6	10.8												
			1F	1F	1F	1F	1F	1F	1F	1F	00	00	1F	MODE
			24	24	24	24	24	24	24	24	0	0	24	ANGLE
24	11.8	10.0	72	94	99	99	99	99	99	99	0	0	99	RELIABILITY

PANAMA CITY TO TEGUCIGALPA

5 DEC SSN= 10. TG 12.005

TRANSMITTER 8.95N - 79.50W | RECEIVER 14.08N - 87.23W | BEARINGS 304.8 123.3 | N.MILES 548.8

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.5	6.4												
			2F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			42	23	23	23	0	0	0	0	0	0	23	ANGLE
2	7.2	6.1	97	99	99	99	0	0	0	0	0	0	99	RELIABILITY
3	7.2	6.2												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			43	24	24	0	0	0	0	0	0	0	24	ANGLE
4	7.0	5.9	97	98	99	0	0	0	0	0	0	0	99	RELIABILITY
5	6.6	5.6												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			44	25	25	0	0	0	0	0	0	0	25	ANGLE
6	6.5	5.6	97	98	99	0	0	0	0	0	0	0	99	RELIABILITY
7	6.3	5.3												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	24	0	0	0	0	0	0	0	0	24	ANGLE
8	5.7	4.9	97	98	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.9	4.2												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			42	0	0	0	0	0	0	0	0	0	23	ANGLE
10	3.8	3.2	97	0	0	0	0	0	0	0	0	0	98	RELIABILITY
11	4.0	3.4												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			43	23	23	0	0	0	0	0	0	0	23	ANGLE
12	6.7	5.7	83	99	99	0	0	0	0	0	0	0	99	RELIABILITY
13	9.7	8.2												
			1E	2F	2F	1F	1F	1F	1F	00	00	00	1F	MODE
			10	44	44	25	25	25	25	0	0	0	25	ANGLE
14	10.9	9.8	0	11	56	99	99	99	99	0	0	0	99	RELIABILITY
15	10.9	10.7												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1E	MODE
			10	46	46	26	26	26	26	26	0	0	10	ANGLE
16	11.4	11.4	0	0	9	94	99	99	99	99	0	0	99	RELIABILITY
17	11.7	11.7												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1E	MODE
			10	48	48	27	27	27	27	27	0	0	10	ANGLE
18	11.7	11.7	0	0	4	94	99	99	99	99	0	0	99	RELIABILITY
19	11.4	11.4												
			1E	2F	2F	1F	1F	1F	1F	1F	00	00	1F	MODE
			10	47	47	27	27	27	27	27	0	0	27	ANGLE
20	11.6	10.8	0	0	24	98	99	99	99	99	0	0	99	RELIABILITY
21	11.7	9.9												
			2F	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			46	46	26	26	26	26	26	0	0	0	26	ANGLE
22	11.3	9.6	7	59	99	99	99	99	99	0	0	0	99	RELIABILITY
23	10.2	8.6												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			44	24	24	24	24	0	0	0	0	0	24	ANGLE
24	8.6	7.3	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO SAN JOSE

6 JUN SSN= 10. SJ 30.005

TRANSMITTER 14.67N - 90.37W — RECEIVER 9.98N - 84.07W — BEARINGS 126.6 308.0 — N.MILES 464.3

H-DIPOLE 13H -0L -0DEG — NOISE= 3 — H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW — OPERATING FREQUENCIES — REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	9.5	8.1												
			2F	2F	2F	2F	00	00	00	00	00	00	1F	MODE
			48	48	48	48	0	0	0	0	0	0	28	ANGLE
2	7.6	6.5	94	98	98	99	0	0	0	0	0	0	99	RELIABILITY
3	6.4	5.4												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			50	50	0	0	0	0	0	0	0	0	29	ANGLE
4	5.8	4.9	82	92	0	0	0	0	0	0	0	0	94	RELIABILITY
5	5.7	4.9												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			49	49	0	0	0	0	0	0	0	0	29	ANGLE
6	5.8	4.9	82	92	0	0	0	0	0	0	0	0	94	RELIABILITY
7	5.5	4.6												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			49	49	0	0	0	0	0	0	0	0	29	ANGLE
8	5.0	4.3	85	94	0	0	0	0	0	0	0	0	90	RELIABILITY
9	4.7	4.0												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			47	0	0	0	0	0	0	0	0	0	47	ANGLE
10	4.1	3.5	96	0	0	0	0	0	0	0	0	0	97	RELIABILITY
11	4.2	3.6												
			2F	1F	1F	1F	00	00	00	00	00	00	1E	MODE
			49	29	29	12	0	0	0	0	0	0	12	ANGLE
12	6.0	6.0	86	99	99	98	0	0	0	0	0	0	98	RELIABILITY
13	8.0	8.0												
			1E	2F	1F	1F	1F	1E	1E	00	00	00	1E	MODE
			12	53	33	33	33	12	12	0	0	0	12	ANGLE
14	9.2	9.2	0	26	97	99	99	97	99	0	0	0	99	RELIABILITY
15	10.0	10.0												
			1E	2F	1F	1F	1F	1F	1E	1E	00	00	1E	MODE
			12	57	36	36	36	36	12	12	0	0	12	ANGLE
16	10.7	10.7	0	0	84	99	99	99	93	99	0	0	99	RELIABILITY
17	11.1	11.1												
			1E	2F	1F	1F	1F	1F	1F	1E	00	00	1E	MODE
			12	58	38	38	38	38	38	12	0	0	12	ANGLE
18	11.2	11.2	0	0	76	98	99	99	99	98	0	0	99	RELIABILITY
19	10.9	10.9												
			1E	2F	1F	1F	1F	1F	1F	1F	00	00	1E	MODE
			12	57	36	36	36	36	36	36	0	0	12	ANGLE
20	10.4	10.4	0	1	91	99	99	99	99	99	0	0	99	RELIABILITY
21	11.0	9.7												
			3F	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			64	53	33	33	33	33	33	0	0	0	33	ANGLE
22	11.6	9.8	0	33	97	99	99	99	99	0	0	0	99	RELIABILITY
23	11.6	9.9												
			2F	2F	2F	2F	1F	1F	1F	00	00	00	1F	MODE
			49	49	49	49	29	29	29	0	0	0	29	ANGLE
24	11.0	9.4	75	97	99	99	99	99	99	0	0	0	99	RELIABILITY

GUATEMALA C. TO SAN JOSE

6 DEC SSN= 10. SJ 30.005

TRANSMITTER 14.67N - 90.37W H-DIPOLE 13H -OL -ODEG PWR= 1.00KW

RECEIVER 9.98N - 84.07W NOISE= 3

BEARINGS 126.6 308.0 N.MILES 464.3

H-DIPOLE 13H -OL -ODEG REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	6.8	5.7												
			2F	2F	2F	00	00	00	00	00	00	00	1F	MODE
			47	47	47	0	0	0	0	0	0	0	27	ANGLE
2	6.3	5.4	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	6.4	5.4												
			2F	2F	2F	00	00	00	00	00	00	00	1F	MODE
			48	48	48	0	0	0	0	0	0	0	28	ANGLE
4	6.3	5.3	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
5	5.9	5.1												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			49	49	0	0	0	0	0	0	0	0	29	ANGLE
6	5.9	5.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	5.8	4.9												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			49	49	0	0	0	0	0	0	0	0	29	ANGLE
8	5.3	4.5	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.7	4.0												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			48	0	0	0	0	0	0	0	0	0	48	ANGLE
10	3.7	3.2	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.4	2.9												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			47	47	0	0	0	0	0	0	0	0	27	ANGLE
12	5.3	4.5	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	8.3	7.1												
			3F	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			60	49	29	29	29	29	0	0	0	0	29	ANGLE
14	9.9	8.4	0	69	99	99	99	99	0	0	0	0	99	RELIABILITY
15	10.1	9.2												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			12	51	31	31	31	31	31	0	0	0	31	ANGLE
16	9.9	9.8	0	3	88	99	99	99	99	0	0	0	99	RELIABILITY
17	10.2	10.2												
			1E	2F	2F	1F	1F	1F	1F	1E	00	00	1E	MODE
			12	52	52	32	32	32	32	12	0	0	12	ANGLE
18	10.3	10.3	0	0	36	98	99	99	99	99	0	0	99	RELIABILITY
19	10.3	10.1												
			1E	2F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			12	52	32	32	32	32	32	0	0	0	32	ANGLE
20	10.7	9.6	0	9	93	99	99	99	99	0	0	0	99	RELIABILITY
21	10.6	9.0												
			2F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			51	30	30	30	30	30	0	0	0	0	30	ANGLE
22	10.3	8.8	21	95	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.3	7.9												
			2F	2F	2F	2F	00	00	00	00	00	00	1F	MODE
			49	49	49	49	0	0	0	0	0	0	28	ANGLE
24	7.9	6.7	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO SAN SALVADOR

7 JUN SSN= 10. SS 31.001

TRANSMITTER 14.67N - 90.37W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 13.67N - 89.17W NOISE= 3 H-DIPOLE 13H -0L -0DEG

BEARINGS 130.5 310.8

N.MILES 92.1

REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.7	6.6												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			70	70	70	0	0	0	0	0	0	0	70	ANGLE
2	6.3	5.3	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.2	4.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
4	4.7	4.0	98	0	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
6	4.6	3.9	98	0	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.4	3.7												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
8	4.1	3.5	98	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			70	0	0	0	0	0	0	0	0	0	70	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.3	2.8												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
12	4.5	3.8	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	5.7	4.8												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			73	73	73	0	0	0	0	0	0	0	73	ANGLE
14	6.1	5.2	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.3	5.4												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			52	76	76	0	0	0	0	0	0	0	76	ANGLE
16	6.8	5.8	55	99	99	0	0	0	0	0	0	0	99	RELIABILITY
17	7.3	6.2												
			1E	1E	1F	1F	00	00	00	00	00	00	1F	MODE
			52	52	76	76	0	0	0	0	0	0	76	ANGLE
18	7.7	6.6	32	98	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.2	6.9												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			52	76	76	76	76	0	0	0	0	0	76	ANGLE
20	8.5	7.2	55	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.9	7.5												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			74	74	74	74	74	0	0	0	0	0	74	ANGLE
22	9.2	7.8	98	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	9.2	7.8												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			72	72	72	72	72	0	0	0	0	0	72	ANGLE
24	8.8	7.5	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO SAN SALVADOR

7 DEC SSN= 10. SS 31.001

TRANSMITTER 14.67N - 90.37W — RECEIVER 13.67N - 89.17W — BEARINGS 130.5 310.8 — N.MILES 92.1

H-DIPOLE 13H -0L -0DEG — NOISE= 3 — H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW — OPERATING FREQUENCIES — REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.0	4.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			70	0	0	0	0	0	0	0	0	0	70	ANGLE
2	4.6	3.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
3	4.7	4.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			70	70	0	0	0	0	0	0	0	0	70	ANGLE
4	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.5	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
6	4.5	3.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.5	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			71	0	0	0	0	0	0	0	0	0	71	ANGLE
8	4.3	3.6	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			70	0	0	0	0	0	0	0	0	0	70	ANGLE
10	3.2	2.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.7	2.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			70	0	0	0	0	0	0	0	0	0	70	ANGLE
12	3.9	3.3	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.1	5.2												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			71	71	71	71	0	0	0	0	0	0	71	ANGLE
14	7.6	6.5	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.0	6.8												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			52	72	72	72	0	0	0	0	0	0	72	ANGLE
16	8.0	6.8	91	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.8	6.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			52	73	73	73	0	0	0	0	0	0	73	ANGLE
18	7.8	6.7	75	99	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.3	7.0												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			52	73	73	73	73	0	0	0	0	0	73	ANGLE
20	8.5	7.2	93	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.3	7.1												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			72	72	72	72	0	0	0	0	0	0	72	ANGLE
22	7.9	6.7	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
23	7.1	6.0												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			71	71	71	0	0	0	0	0	0	0	71	ANGLE
24	5.9	5.0	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO MANAGUA

8 JUN SSN= 10. MG 30.003

TRANSMITTER 14.67N - 90.37W H-DIPOLE 13H -OL -ODEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3

BEARINGS 122.5 303.4 H-DIPOLE 13H -OL -ODEG

N.MILES 283.2 REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	8.3	7.0												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			61	42	42	0	0	0	0	0	0	0	42	ANGLE
2	6.7	5.7	97	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.6	4.7												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			44	44	0	0	0	0	0	0	0	0	44	ANGLE
4	5.0	4.3	87	96	0	0	0	0	0	0	0	0	97	RELIABILITY
5	4.9	4.2												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	43	0	0	0	0	0	0	0	0	43	ANGLE
6	5.0	4.2	87	96	0	0	0	0	0	0	0	0	97	RELIABILITY
7	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			43	0	0	0	0	0	0	0	0	0	43	ANGLE
8	4.4	3.7	89	0	0	0	0	0	0	0	0	0	95	RELIABILITY
9	4.1	3.5												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			60	0	0	0	0	0	0	0	0	0	60	ANGLE
10	3.6	3.1	97	0	0	0	0	0	0	0	0	0	97	RELIABILITY
11	3.7	3.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	43	0	0	0	0	0	0	0	0	43	ANGLE
12	5.0	4.2	99	99	0	0	0	0	0	0	0	0	99	PELIABILITY
13	6.3	5.3												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			21	47	47	47	0	0	0	0	0	0	47	ANGLE
14	6.6	6.0	0	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	6.8	6.6												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	51	51	51	51	0	0	0	0	0	51	ANGLE
16	7.4	7.0	0	85	99	99	99	0	0	0	0	0	99	RELIABILITY
17	7.8	7.3												
			1E	2F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	69	53	53	53	0	0	0	0	0	53	ANGLE
18	8.3	7.4	0	0	99	99	99	0	0	0	0	0	99	RELIABILITY
19	8.8	7.5												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	51	51	51	51	0	0	0	0	0	51	ANGLE
20	9.1	7.8	0	88	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.6	8.2												
			1E	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			21	48	48	48	48	48	0	0	0	0	48	ANGLE
22	10.0	8.5	0	98	99	99	99	99	0	0	0	0	99	RELIABILITY
23	10.0	8.5												
			1F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			43	43	43	43	43	43	0	0	0	0	43	ANGLE
24	9.5	8.1	98	99	99	99	99	99	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO MANAGUA

8 DEC SSN= 10. MG 30.003

TRANSMITTER 14.67N - 90.37W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3

BEARINGS 122.5 303.4 H-DIPOLE 13H -0L -0DEG

N.MILES 283.2 REQ.S/N= 400B

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.6	4.7												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			61	41	0	0	0	0	0	0	0	0	41	ANGLE
2	5.2	4.4	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	5.3	4.5												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			61	42	0	0	0	0	0	0	0	0	42	ANGLE
4	5.2	4.5	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	5.0	4.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			43	43	0	0	0	0	0	0	0	0	43	ANGLE
6	5.0	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	5.0	4.2												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			43	0	0	0	0	0	0	0	0	0	43	ANGLE
8	4.6	3.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.1	3.5												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			61	0	0	0	0	0	0	0	0	0	61	ANGLE
10	3.3	2.8	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.9	2.5												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			41	0	0	0	0	0	0	0	0	0	41	ANGLE
12	4.4	3.8	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.9	5.9												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			62	43	43	43	43	0	0	0	0	0	43	ANGLE
14	8.4	7.2	36	99	99	99	99	0	0	0	0	0	99	RELIABILITY
15	8.7	7.4												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	45	45	45	45	0	0	0	0	0	45	ANGLE
16	8.6	7.3	0	95	99	99	99	0	0	0	0	0	99	RELIABILITY
17	8.4	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	46	46	46	46	0	0	0	0	0	46	ANGLE
18	8.5	7.2	0	88	99	99	99	0	0	0	0	0	99	RELIABILITY
19	9.0	7.6												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			21	46	46	46	46	0	0	0	0	0	46	ANGLE
20	9.2	7.8	0	96	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.1	7.7												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			63	45	45	45	45	0	0	0	0	0	45	ANGLE
22	8.7	7.4	55	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	7.8	6.6												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			43	43	43	0	0	0	0	0	0	0	43	ANGLE
24	6.6	5.6	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO TEGUCIGALPA

9 JUN SSN= 10. TG 28.002

TRANSMITTER 14.67N - 90.37W — RECEIVER 14.08N - 87.23W — BEARINGS 100.6 281.4 — N.MILES 185.9

H-DIPOLE 13H -0L -0DEG — NOISE= 3 — H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW — OPERATING FREQUENCIES — REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.9	6.7												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			54	54	54	0	0	0	0	0	0	0	54	ANGLE
2	6.4	5.4	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.3	4.5												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
4	4.8	4.1	95	98	0	0	0	0	0	0	0	0	98	RELIABILITY
5	4.7	4.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
6	4.7	4.0	95	98	0	0	0	0	0	0	0	0	98	RELIABILITY
7	4.5	3.8												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			55	0	0	0	0	0	0	0	0	0	55	ANGLE
8	4.2	3.5	96	0	0	0	0	0	0	0	0	0	98	RELIABILITY
9	3.9	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			53	0	0	0	0	0	0	0	0	0	53	ANGLE
10	3.5	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.5	3.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
12	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	5.9	5.0												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			32	59	59	0	0	0	0	0	0	0	59	ANGLE
14	6.3	5.3	25	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.5	5.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	62	62	62	0	0	0	0	0	0	62	ANGLE
16	7.1	6.0	0	97	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.5	6.4												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	64	64	64	0	0	0	0	0	0	64	ANGLE
18	8.0	6.8	0	93	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.4	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			32	63	63	63	63	0	0	0	0	0	63	ANGLE
20	8.7	7.4	0	98	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.1	7.8												
			1E	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			32	59	59	59	59	59	0	0	0	0	59	ANGLE
22	9.5	8.1	20	99	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.5	8.1												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			56	56	56	56	56	0	0	0	0	0	56	ANGLE
24	9.0	7.7	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

GUATEMALA C. TO TEGUCIGALPA

9 DEC SSN= 10. TG 28.002

TRANSMITTER	RECEIVER	BEARINGS	N.MILES
14.67N - 90.37W	14.08N - 87.23W	100.6 281.4	185.9

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.1	4.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			53	53	0	0	0	0	0	0	0	0	53	ANGLE
2	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	4.8	4.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
4	4.8	4.1	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			55	0	0	0	0	0	0	0	0	0	55	ANGLE
6	4.7	4.0	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			56	0	0	0	0	0	0	0	0	0	56	ANGLE
8	4.4	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.9	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			54	0	0	0	0	0	0	0	0	0	54	ANGLE
10	3.2	2.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.8	2.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			54	0	0	0	0	0	0	0	0	0	54	ANGLE
12	4.1	3.5	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.5	5.5												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			55	55	55	55	0	0	0	0	0	0	55	ANGLE
14	8.0	6.8	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.3	7.1												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	57	57	57	0	0	0	0	0	0	57	ANGLE
16	8.2	7.0	4	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	8.0	6.8												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	58	58	58	0	0	0	0	0	0	58	ANGLE
18	8.1	6.9	0	98	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.5	7.3												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			32	58	58	58	58	0	0	0	0	0	58	ANGLE
20	8.7	7.4	7	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.5	7.3												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			56	56	56	56	0	0	0	0	0	0	56	ANGLE
22	8.1	6.9	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
23	7.2	6.1												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			55	55	55	0	0	0	0	0	0	0	55	ANGLE
24	6.0	5.1	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

SAN JOSE TO SAN SALVADOR

10 JUN SSN= 10. SS 12.004

TRANSMITTER 9.98N - 84.07W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 13.67N - 89.17W NOISE= 3 OPERATING FREQUENCIES

BEARINGS 307.0 125.9 N.MILES 372.5

H-DIPOLE 13H -0L -0DEG REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	8.7	7.4												
			2F	2F	2F	00	00	00	00	00	00	00	1F	MODE
			54	54	54	0	0	0	0	0	0	0	34	ANGLE
2	6.9	5.9	97	98	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.9	5.0												
			2F	2F	00	00	00	00	00	00	00	00	2F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
4	5.4	4.6	88	95	0	0	0	0	0	0	0	0	97	RELIABILITY
5	5.3	4.5												
			2F	2F	00	00	00	00	00	00	00	00	2F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
6	5.4	4.6	88	95	0	0	0	0	0	0	0	0	97	RELIABILITY
7	5.1	4.3												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			55	0	0	0	0	0	0	0	0	0	55	ANGLE
8	4.7	4.0	88	0	0	0	0	0	0	0	0	0	95	RELIABILITY
9	4.4	3.7												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			53	0	0	0	0	0	0	0	0	0	53	ANGLE
10	3.8	3.2	97	0	0	0	0	0	0	0	0	0	97	RELIABILITY
11	3.9	3.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			35	35	35	0	0	0	0	0	0	0	35	ANGLE
12	5.5	5.0	97	99	99	0	0	0	0	0	0	0	99	RELIABILITY
13	6.8	6.6												
			1E	1F	1F	1F	1E	00	00	00	00	00	1E	MODE
			16	39	39	39	16	0	0	0	0	0	16	ANGLE
14	7.6	7.6	0	91	99	99	97	0	0	0	0	0	99	RELIABILITY
15	8.3	8.3												
			1E	2F	1F	1F	1F	1E	00	00	00	00	1E	MODE
			16	62	43	43	43	16	0	0	0	0	16	ANGLE
16	8.9	8.9	0	1	97	99	99	97	0	0	0	0	99	RELIABILITY
17	9.2	9.2												
			1E	2F	1F	1F	1F	1F	1E	00	00	00	1E	MODE
			16	63	44	44	44	44	16	0	0	0	16	ANGLE
18	9.3	9.3	0	0	94	99	99	99	99	0	0	0	99	RELIABILITY
19	9.3	9.1												
			1E	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			16	62	43	43	43	43	0	0	0	0	43	ANGLE
20	9.7	8.6	0	3	97	99	99	99	0	0	0	0	99	RELIABILITY
21	10.3	8.7												
			3F	1F	1F	1F	1F	1F	1F	00	00	00	1F	MODE
			68	39	39	39	39	39	39	0	0	0	39	ANGLE
22	10.7	9.1	0	96	99	99	99	99	99	0	0	0	99	RELIABILITY
23	10.7	9.1												
			1F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			35	35	35	35	35	35	0	0	0	0	35	ANGLE
24	10.1	8.6	96	99	99	99	99	99	0	0	0	0	99	RELIABILITY

SAN JOSE TO SAN SALVADOR

10 DEC SSN= 10. SS 12.004

TRANSMITTER 9.98N - 84.07W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 13.67N - 89.17W NOISE= 3 OPERATING FREQUENCIES

BEARINGS 307.0 125.9 H-DIPOLE 13H -0L -0DEG REQ.S/N= 40DB

N.MILES 372.5

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	6.4	5.4												
			2F	2F	2F	00	00	00	00	00	00	00	2F	MODE
			54	54	54	0	0	0	0	0	0	0	54	ANGLE
2	6.0	5.1	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	6.0	5.1												
			2F	2F	2F	00	00	00	00	00	00	00	2F	MODE
			54	54	54	0	0	0	0	0	0	0	54	ANGLE
4	5.9	5.0	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
5	5.6	4.7												
			2F	2F	00	00	00	00	00	00	00	00	2F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
6	5.5	4.6	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	5.3	4.5												
			2F	2F	00	00	00	00	00	00	00	00	2F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
8	4.9	4.2	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.3	3.7												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			54	0	0	0	0	0	0	0	0	0	54	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.2	2.7												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			33	33	0	0	0	0	0	0	0	0	33	ANGLE
12	5.1	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	7.7	6.6												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			55	35	35	35	35	0	0	0	0	0	35	ANGLE
14	9.0	7.7	11	97	99	99	99	0	0	0	0	0	99	RELIABILITY
15	9.2	7.9												
			1E	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			16	57	37	37	37	37	0	0	0	0	37	ANGLE
16	9.1	8.2	0	11	97	99	99	99	0	0	0	0	99	RELIABILITY
17	8.8	8.5												
			1E	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			16	58	38	38	38	38	0	0	0	0	38	ANGLE
18	9.0	8.6	0	3	96	99	99	99	0	0	0	0	99	RELIABILITY
19	9.6	8.4												
			1E	2F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			16	58	38	38	38	38	0	0	0	0	38	ANGLE
20	9.8	8.4	0	19	99	99	99	99	0	0	0	0	99	RELIABILITY
21	9.8	8.4												
			2F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			57	37	37	37	37	37	0	0	0	0	37	ANGLE
22	9.6	8.1	36	99	99	99	99	99	0	0	0	0	99	RELIABILITY
23	8.7	7.4												
			2F	2F	1F	1F	00	00	00	00	00	00	1F	MODE
			55	55	35	35	0	0	0	0	0	0	35	ANGLE
24	7.4	6.3	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY

SAN JOSE TO MANAGUA

11 JUN SSN= 10. MG 13.002

TRANSMITTER 9.98N - 84.07W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3

BEARINGS 314.3 133.9 H-DIPOLE 13H -0L -0DEG

N.MILES 182.8 REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.5	6.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			55	55	55	0	0	0	0	0	0	0	55	ANGLE
2	6.1	5.1	98	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.2	4.4												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
4	4.8	4.1	94	98	0	0	0	0	0	0	0	0	98	RELIABILITY
5	4.8	4.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
6	4.9	4.1	94	98	0	0	0	0	0	0	0	0	98	RELIABILITY
7	4.5	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			55	0	0	0	0	0	0	0	0	0	55	ANGLE
8	4.2	3.6	95	0	0	0	0	0	0	0	0	0	97	RELIABILITY
9	3.9	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			54	0	0	0	0	0	0	0	0	0	54	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.6	3.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
12	5.0	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.1	5.2												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			32	60	60	0	0	0	0	0	0	0	60	ANGLE
14	6.3	5.3	16	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.6	5.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	63	63	63	0	0	0	0	0	0	63	ANGLE
16	7.1	6.0	0	97	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.5	6.4												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	64	64	64	0	0	0	0	0	0	64	ANGLE
18	8.0	6.8	0	93	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.4	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			32	62	62	62	62	0	0	0	0	0	62	ANGLE
20	8.8	7.5	0	98	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.2	7.9												
			1F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			59	59	59	59	59	59	0	0	0	0	59	ANGLE
22	9.6	8.1	94	99	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.5	8.0												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			56	56	56	56	56	0	0	0	0	0	56	ANGLE
24	8.8	7.5	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

SAN JOSE TO MANAGUA

11 DEC SSN= 10. MG 13.002

TRANSMITTER 9.98N - 84.07W | RECEIVER 12.10N - 86.30W | BEARINGS 314.3 133.9 | N.MILES 182.8

H-DIPOLE 13H -0L -0DEG | NOISE= 3 | H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW | OPERATING FREQUENCIES | REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.9	5.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
2	5.6	4.7	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	5.6	4.8												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
4	5.4	4.6	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	5.0	4.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			56	56	0	0	0	0	0	0	0	0	56	ANGLE
6	4.9	4.2	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			56	0	0	0	0	0	0	0	0	0	56	ANGLE
8	4.3	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.2												
			00	00	00	00	00	00	00	00	00	00	1F	MODE
			0	0	0	0	0	0	0	0	0	0	54	ANGLE
10	3.0	2.5	0	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.9	2.5												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
12	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	7.0	5.9												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	56	56	56	0	0	0	0	0	0	56	ANGLE
14	8.0	6.8	55	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.2	7.0												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	58	58	58	0	0	0	0	0	0	58	ANGLE
16	8.1	6.9	1	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.9	6.7												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			32	59	59	59	0	0	0	0	0	0	59	ANGLE
18	8.1	6.9	0	98	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.6	7.3												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			32	59	59	59	59	0	0	0	0	0	59	ANGLE
20	8.8	7.5	6	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.8	7.5												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			57	57	57	57	57	0	0	0	0	0	57	ANGLE
22	8.5	7.3	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	7.8	6.6												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			55	55	55	0	0	0	0	0	0	0	55	ANGLE
24	6.7	5.7	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

SAN JOSE TO TEGUCIGALPA

12 JUN SSN= 10. TG 14.003

TRANSMITTER 9.98N - 84.07W RECEIVER 14.08N - 87.23W BEARINGS 323.3 142.6 N.MILES 308.1

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	8.1	6.9												
			2F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			59	39	39	0	0	0	0	0	0	0	39	ANGLE
			97	98	99	0	0	0	0	0	0	0	99	RELIABILITY
2	6.5	5.5												
3	5.5	4.7												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			61	41	0	0	0	0	0	0	0	0	41	ANGLE
			87	95	0	0	0	0	0	0	0	0	97	RELIABILITY
4	5.1	4.3												
5	5.1	4.3												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			60	41	0	0	0	0	0	0	0	0	41	ANGLE
			87	95	0	0	0	0	0	0	0	0	97	RELIABILITY
6	5.1	4.4												
7	4.8	4.1												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			60	0	0	0	0	0	0	0	0	0	40	ANGLE
			88	0	0	0	0	0	0	0	0	0	95	RELIABILITY
8	4.4	3.8												
9	4.1	3.5												
			2F	00	00	00	00	00	00	00	00	00	2F	MODE
			58	0	0	0	0	0	0	0	0	0	58	ANGLE
			97	0	0	0	0	0	0	0	0	0	97	RELIABILITY
10	3.6	3.0												
11	3.8	3.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			41	41	0	0	0	0	0	0	0	0	41	ANGLE
			99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
12	5.4	4.6												
13	6.5	5.7												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			20	45	45	45	0	0	0	0	0	0	45	ANGLE
			0	98	99	99	0	0	0	0	0	0	99	RELIABILITY
14	6.7	6.5												
15	7.1	7.1												
			1E	2F	1F	1F	1F	00	00	00	00	00	1E	MODE
			20	67	49	49	49	0	0	0	0	0	20	ANGLE
			0	2	99	99	99	0	0	0	0	0	99	RELIABILITY
16	7.6	7.6												
17	7.9	7.8												
			1E	2F	1F	1F	1F	00	00	00	00	00	1F	MODE
			20	68	50	50	50	0	0	0	0	0	50	ANGLE
			0	0	98	99	99	0	0	0	0	0	99	RELIABILITY
18	8.5	7.9												
19	8.9	7.7												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			20	48	48	48	48	0	0	0	0	0	48	ANGLE
			0	85	99	99	99	0	0	0	0	0	99	RELIABILITY
20	9.3	7.9												
21	9.9	8.4												
			2F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			64	45	45	45	45	45	0	0	0	0	45	ANGLE
			5	98	99	99	99	99	0	0	0	0	99	RELIABILITY
22	10.2	8.7												
23	10.2	8.6												
			1F	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			41	41	41	41	41	41	0	0	0	0	41	ANGLE
			98	99	99	99	99	99	0	0	0	0	99	RELIABILITY
24	9.6	8.1												

SAN JOSE TO TEGUCIGALPA

12 DEC SSN= 10. TG 14.003

TRANSMITTER 9.98N - 84.07W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 14.08N - 87.23W NOISE= 3

BEARINGS 323.3 142.6 H-DIPOLE 13H -0L -0DEG

N.MILES 308.1 REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	6.0	5.1												
			2F	2F	00	00	00	00	00	00	00	00	1F	MODE
			59	59	0	0	0	0	0	0	0	0	39	ANGLE
2	5.7	4.8	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	5.7	4.9												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			59	40	0	0	0	0	0	0	0	0	40	ANGLE
4	5.6	4.7	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	5.3	4.5												
			2F	1F	00	00	00	00	00	00	00	00	1F	MODE
			60	41	0	0	0	0	0	0	0	0	41	ANGLE
6	5.2	4.4	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	5.1	4.3												
			2F	00	00	00	00	00	00	00	00	00	1F	MODE
			60	0	0	0	0	0	0	0	0	0	41	ANGLE
8	4.7	4.0	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	4.1	3.5												
			1F	00	00	00	00	00	00	00	00	00	2F	MODE
			39	0	0	0	0	0	0	0	0	0	59	ANGLE
10	3.2	2.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.1	2.6												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			39	39	0	0	0	0	0	0	0	0	39	ANGLE
12	5.0	4.2	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	7.5	6.3												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			60	41	41	41	41	0	0	0	0	0	41	ANGLE
14	8.6	7.3	18	99	99	99	99	0	0	0	0	0	99	RELIABILITY
15	8.8	7.5												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			20	43	43	43	43	0	0	0	0	0	43	ANGLE
16	8.7	7.4	0	88	99	99	99	0	0	0	0	0	99	RELIABILITY
17	8.4	7.2												
			1E	2F	1F	1F	1F	00	00	00	00	00	1F	MODE
			20	63	44	44	44	0	0	0	0	0	44	ANGLE
18	8.7	7.4	0	7	99	99	99	0	0	0	0	0	99	RELIABILITY
19	9.2	7.8												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			20	44	44	44	44	0	0	0	0	0	44	ANGLE
20	9.4	8.0	0	95	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.3	7.9												
			2F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			62	42	42	42	42	0	0	0	0	0	42	ANGLE
22	9.0	7.7	55	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	8.1	6.9												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			40	40	40	0	0	0	0	0	0	0	40	ANGLE
24	6.9	5.9	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

SAN SALVADOR TO MANAGUA

13 JUN SSN= 10. MG 29.0C2

TRANSMITTER 13.67N - 89.17W H-DIPOLE 13H -OL -ODEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3

BEARINGS 119.C 299.6 H-DIPOLE 13H -OL -ODEG

N.MILES 192.5 REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.8	6.6												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			53	53	53	0	0	0	0	0	0	0	53	ANGLE
2	6.3	5.4	98	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.3	4.5												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			55	55	0	0	0	0	0	0	0	0	55	ANGLE
4	4.8	4.1	94	98	0	0	0	0	0	0	0	0	98	RELIABILITY
5	4.7	4.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
6	4.8	4.1	94	98	0	0	0	0	0	0	0	0	98	RELIABILITY
7	4.5	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			54	0	0	0	0	0	0	0	0	0	54	ANGLE
8	4.2	3.6	95	0	0	0	0	0	0	0	0	0	97	RELIABILITY
9	3.9	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			52	0	0	0	0	0	0	0	0	0	52	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.5	3.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
12	4.8	4.1	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.0	5.1												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			31	58	58	0	0	0	0	0	0	0	58	ANGLE
14	6.3	5.3	16	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.6	5.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			31	62	62	62	0	0	0	0	0	0	62	ANGLE
16	7.1	6.0	0	97	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.5	6.4												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			31	63	63	63	0	0	0	0	0	0	63	ANGLE
18	8.0	6.8	0	93	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.4	7.2												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			31	62	62	62	62	0	0	0	0	0	62	ANGLE
20	8.8	7.5	0	98	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.2	7.8												
			1E	1F	1F	1F	1F	1F	00	00	00	00	1F	MODE
			31	58	58	58	58	58	0	0	0	0	58	ANGLE
22	9.6	8.1	16	99	99	99	99	99	0	0	0	0	99	RELIABILITY
23	9.5	8.1												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			55	55	55	55	55	0	0	0	0	0	55	ANGLE
24	9.0	7.7	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

SAN SALVADOR TO MANAGUA

13 DEC SSN= 10. MG 29.002

TRANSMITTER 13.67N - 89.17W | RECEIVER 12.10N - 86.30W | BEARINGS 119.0 299.6 | N.MILES 192.5

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.4	4.6												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			53	53	0	0	0	0	0	0	0	0	53	ANGLE
2	5.1	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	5.2	4.4												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			53	53	0	0	0	0	0	0	0	0	53	ANGLE
4	5.1	4.3	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.9	4.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			54	54	0	0	0	0	0	0	0	0	54	ANGLE
6	4.8	4.1	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.7	4.0												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			55	0	0	0	0	0	0	0	0	0	55	ANGLE
8	4.4	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.9	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			53	0	0	0	0	0	0	0	0	0	53	ANGLE
10	3.2	2.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.8	2.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			53	0	0	0	0	0	0	0	0	0	53	ANGLE
12	4.3	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.7	5.7												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			54	54	54	54	0	0	0	0	0	0	54	ANGLE
14	8.0	6.8	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.3	7.0												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			31	56	56	56	0	0	0	0	0	0	56	ANGLE
16	8.2	7.0	1	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	8.0	6.8												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			31	57	57	57	0	0	0	0	0	0	57	ANGLE
18	8.1	6.9	0	98	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.6	7.3												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			31	57	57	57	57	0	0	0	0	0	57	ANGLE
20	8.8	7.5	3	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.7	7.4												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			56	56	56	56	56	0	0	0	0	0	56	ANGLE
22	8.3	7.1	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	7.5	6.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			54	54	54	0	0	0	0	0	0	0	54	ANGLE
24	6.4	5.4	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

SAN SALVADOR TO TEGUCIGALPA

14 JUN SSN= 10. TG 25.001

TRANSMITTER 13.67N - 89.17W H-DIPOLE 13H -OL -ODEG PWR= 1.00KW

RECEIVER 14.08N - 87.23W NOISE= 3

BEARINGS 77.5 258.0 H-DIPOLE 13H -OL -ODEG

N.MILES 115.7 REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.6	6.5												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			66	66	66	0	0	0	0	0	0	0	66	ANGLE
2	6.2	5.3	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.2	4.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
4	4.7	4.0	97	0	0	0	0	0	0	0	0	0	98	RELIABILITY
5	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
6	4.6	3.9	97	0	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.4	3.7												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
8	4.1	3.4	97	0	0	0	0	0	0	0	0	0	98	RELIABILITY
9	3.8	3.2												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			65	0	0	0	0	0	0	0	0	0	65	ANGLE
10	3.4	2.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.4	2.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
12	4.7	4.0	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	5.8	4.9												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			45	70	70	0	0	0	0	0	0	0	70	ANGLE
14	6.1	5.2	91	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.4	5.4												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			45	72	72	0	0	0	0	0	0	0	72	ANGLE
16	6.9	5.9	25	99	99	0	0	0	0	0	0	0	99	RELIABILITY
17	7.4	6.3												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			45	73	73	73	0	0	0	0	0	0	73	ANGLE
18	7.8	6.6	9	97	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.2	7.0												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			45	72	72	72	72	0	0	0	0	0	72	ANGLE
20	8.6	7.3	28	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.0	7.6												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			70	70	70	70	70	0	0	0	0	0	70	ANGLE
22	9.3	7.9	97	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	9.3	7.9												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			67	67	67	67	67	0	0	0	0	0	67	ANGLE
24	8.8	7.5	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

SAN SALVADOR TO TEGUCIGALPA

14 DEC SSN= 10. TG 25.001

TRANSMITTER 13.67N - 89.17W | RECEIVER 14.08N - 87.23W | BEARINGS 77.5 258.0 | N.MILES 115.7

H-DIPOLE 13H -OL -0DEG NOISE= 3 H-DIPOLE 13H -OL -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.1	4.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			65	65	0	0	0	0	0	0	0	0	65	ANGLE
2	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	4.8	4.1												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			66	66	0	0	0	0	0	0	0	0	66	ANGLE
4	4.8	4.1	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
6	4.6	3.9	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			67	0	0	0	0	0	0	0	0	0	67	ANGLE
8	4.3	3.6	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.3												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			66	0	0	0	0	0	0	0	0	0	66	ANGLE
10	3.1	2.6	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.8	2.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			65	0	0	0	0	0	0	0	0	0	65	ANGLE
12	4.1	3.5	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.4	5.4												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			66	66	66	66	0	0	0	0	0	0	66	ANGLE
14	7.8	6.6	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.1	6.9												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			45	68	68	68	0	0	0	0	0	0	68	ANGLE
16	8.0	6.8	70	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.8	6.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			45	69	69	69	0	0	0	0	0	0	69	ANGLE
18	7.9	6.7	41	99	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.3	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			45	69	69	69	69	0	0	0	0	0	69	ANGLE
20	8.5	7.2	75	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.4	7.1												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			68	68	68	68	0	0	0	0	0	0	68	ANGLE
22	7.9	6.8	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
23	7.1	6.0												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			66	66	66	0	0	0	0	0	0	0	66	ANGLE
24	5.9	5.1	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

TEGUCIGALPA TO MANAGUA

15 JUN SSN= 10. MG 33.001

TRANSMITTER 14.08N - 87.23W H-DIPOLE 13H -0L -0DEG PWR= 1.00KW

RECEIVER 12.10N - 86.30W NOISE= 3

BEARINGS 155.3 335.5 H-DIPOLE 13H -0L -0DEG

N.MILES 130.7

REQ.S/N= 40DB

OPERATING FREQUENCIES

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	7.5	6.4												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			63	63	63	0	0	0	0	0	0	0	63	ANGLE
2	6.1	5.2	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY
3	5.1	4.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			65	0	0	0	0	0	0	0	0	0	65	ANGLE
4	4.7	4.0	96	0	0	0	0	0	0	0	0	0	98	RELIABILITY
5	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			64	0	0	0	0	0	0	0	0	0	64	ANGLE
6	4.7	4.0	96	0	0	0	0	0	0	0	0	0	98	RELIABILITY
7	4.4	3.7												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			64	0	0	0	0	0	0	0	0	0	64	ANGLE
8	4.1	3.5	97	0	0	0	0	0	0	0	0	0	98	RELIABILITY
9	3.8	3.2												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			62	0	0	0	0	0	0	0	0	0	62	ANGLE
10	3.3	2.8	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	3.5	3.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			64	64	0	0	0	0	0	0	0	0	64	ANGLE
12	4.8	4.1	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
13	5.9	5.0												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			41	67	67	0	0	0	0	0	0	0	67	ANGLE
14	6.1	5.2	79	99	99	0	0	0	0	0	0	0	99	RELIABILITY
15	6.5	5.5												
			1E	1F	1F	00	00	00	00	00	00	00	1F	MODE
			41	70	70	0	0	0	0	0	0	0	70	ANGLE
16	7.0	5.9	9	98	99	0	0	0	0	0	0	0	99	RELIABILITY
17	7.4	6.3												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			41	71	71	71	0	0	0	0	0	0	71	ANGLE
18	7.9	6.7	2	97	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.3	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			41	70	70	70	70	0	0	0	0	0	70	ANGLE
20	8.6	7.3	16	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	9.1	7.7												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			67	67	67	67	67	0	0	0	0	0	67	ANGLE
22	9.4	8.0	96	99	99	99	99	0	0	0	0	0	99	RELIABILITY
23	9.3	7.9												
			1F	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			64	64	64	64	64	0	0	0	0	0	64	ANGLE
24	8.8	7.5	99	99	99	99	99	0	0	0	0	0	99	RELIABILITY

TEGUCIGALPA TO MANAGUA

15 DEC SSN= 10. MG 33.001

TRANSMITTER	RECEIVER	BEARINGS	N.MILES
14.08N - 87.23W	12.10N - 86.30W	155.3 335.5	130.7

H-DIPOLE 13H -0L -0DEG NOISE= 3 H-DIPOLE 13H -0L -0DEG

PWR= 1.00KW OPERATING FREQUENCIES REQ.S/N= 40DB

GMT	MUF	FOT	3	4	5	6	7	8	9	10	12	15	FOT	
1	5.2	4.4												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			63	63	0	0	0	0	0	0	0	0	63	ANGLE
2	4.9	4.2	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
3	5.0	4.3												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			63	63	0	0	0	0	0	0	0	0	63	ANGLE
4	4.9	4.2	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
5	4.7	4.0												
			1F	1F	00	00	00	00	00	00	00	00	1F	MODE
			64	64	0	0	0	0	0	0	0	0	64	ANGLE
6	4.7	4.0	99	99	0	0	0	0	0	0	0	0	99	RELIABILITY
7	4.6	3.9												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			64	0	0	0	0	0	0	0	0	0	64	ANGLE
8	4.3	3.6	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
9	3.8	3.2												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			63	0	0	0	0	0	0	0	0	0	63	ANGLE
10	3.0	2.6	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
11	2.8	2.4												
			1F	00	00	00	00	00	00	00	00	00	1F	MODE
			63	0	0	0	0	0	0	0	0	0	63	ANGLE
12	4.4	3.7	99	0	0	0	0	0	0	0	0	0	99	RELIABILITY
13	6.6	5.7												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			64	64	64	64	0	0	0	0	0	0	64	ANGLE
14	7.9	6.7	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
15	8.1	6.9												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			41	66	66	66	0	0	0	0	0	0	66	ANGLE
16	8.0	6.8	46	99	99	99	0	0	0	0	0	0	99	RELIABILITY
17	7.8	6.6												
			1E	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			41	66	66	66	0	0	0	0	0	0	66	ANGLE
18	8.0	6.8	21	99	99	99	0	0	0	0	0	0	99	RELIABILITY
19	8.4	7.1												
			1E	1F	1F	1F	1F	00	00	00	00	00	1F	MODE
			41	66	66	66	66	0	0	0	0	0	66	ANGLE
20	8.6	7.3	55	99	99	99	99	0	0	0	0	0	99	RELIABILITY
21	8.4	7.2												
			1F	1F	1F	1F	00	00	00	00	00	00	1F	MODE
			65	65	65	65	0	0	0	0	0	0	65	ANGLE
22	8.1	6.9	99	99	99	99	0	0	0	0	0	0	99	RELIABILITY
23	7.2	6.1												
			1F	1F	1F	00	00	00	00	00	00	00	1F	MODE
			64	64	64	0	0	0	0	0	0	0	64	ANGLE
24	6.1	5.2	99	99	99	0	0	0	0	0	0	0	99	RELIABILITY

ANNEX 3

FREQUENCIES ALLOCATED

The following lists of frequencies and bands of frequencies have been provided for the selection of optimum operational frequencies in each country for use in the proposed network. In this regard, each country, by utilizing the information in Annex 2 to this report, will select for their required circuits the frequencies that will permit reliable 24-hour-a-day communications.

Ministerio De Seguridad Publica
Section Communicaciones
San Jose, Costa Rica

To: Don Fernando Goigoechea
Ministro De Seguridad Publica

From: Mayor Udo Wenzel Karg
Jefe De Comunicaciones

Subject: Frequencies requested for the SSB System (Lateral Band only).

Dear Mr. Minister:

Attached are enumerated all the available frequencies in the 3 to 21 megacycle band in accord with your order and the request of Mr. Katz.

3250	to	3285	kilocycles	9091 to 9152	kilocycles
3730	"	3890	"	9950 " 9980	"
4750	"	4805	"	10100 " 10175	"
5070	"	5090	"	11525 " 11690	"
5540	"	5570	"	12000 " 12090	"
6799	"	6820	"	12210 " 12320	"
6840	kc.			13520 " 13590	"
7410	"			13400 " 13490	"
7560	"			14785 " 14885	"
7632	"			15496 " 15590	"
7820	to	7832	"	16005 " 16200	"
8014	kc.			17535 " 17595	"
8079	"			18040 " 18140	"
8142	"			19160 " 19260	"
8570	to	8620	"	20450 " 20550	"

All these frequencies and bands of frequencies have been frozen provisionally in the National Radios Service.

Cuartel General General, Guardia Nacional De Nicaragua
Oficina Del Jefe De Radio G. N.
Managua, D. N. - Nicaragua

To: Jefe de Seguridad Nacional

From: Jefe del Radio GN. y Nacional

Subject: Frequencies requested for the SSB System (Lateral Band only).

1. Conforming to the subject below I am presenting to you the list of frequencies which are free in the 3 to 21 megacycle band, in accord with today's conference.

3250	to	3285	Kcs.
3730	"	3740	"
3760	"	3890	"
4760	"	4800	"
5540	"	5570	"
6799	"	6820	"
6840			
7410			
7560			
7632			
7820	to	7832	Kcs.
8014			
8079			
8142			
9091	to	9152	"
9970	"	9980	"
10150	"	10175	"
11550	"	11610	"
12290	"	12300	"
13520	"	13550	"
14785	"	14850	"
15496	"	15550	"
16005	"	16100	"
17545	"	17580	"
18040	"	18140	"
19160	"	19260	"
20500	"	20550	"

Please acknowledge receipt of this letter.

SATURNINO CERDA C.,
Capt. (R) GN.
Jefe del Radio GN. y Nacional

Ministerio De Comunicaciones
Republica Guatemala, C. A.

Dear Mr. Minister:

In attention to the request through the Minister of Government, this agency permits itself to advise the frequencies that are found free between 3 and 21 megacycles.

3010 Kcs.
3050 to 3130 Kcs.
3300 " 3310 "
3500 Kcs.
3510 "
3590 "
3650 to 3690 "
3710 " 3800 "
3860 Kcs.
3880 "
3900 "
3930 "
3940 "
4110 to 4170 "
4230 " 4280 "
4650 Kcs.
4660 "
4670 "
5630 to 5670 "
6200 " 6250 "
6340 " 6370 "
6460 " 6480 "
6570 Kcs.
6580 "
6660 to 6700 "
7690 " 7700 "
8650 " 8740 "
8970 " 9000 "
9070 Kcs.
9080 "
9150 "
9180 Kcs.
9200 "
9210 "
9230 "
9240 "
9290 "
9300 "
9320 "
9330 "
9360 to 9410 Kcs.
9460 " 9650 "
9950 " 10000 "
10030 " 10100 "
10190 " 10210 "
10295 " 10370 "
10395 " 10460 "
11000 " 11160 "
11200 " 11300 "
11590 " 11610 "
12125 " 12230 "
12300 " 12370 "
13440 " 13720 "
14785 " 14820 "
15110 " 15500 "
16370 " 16500 "
17920 " 18000 "
18010 " 18200 "
18220 " 18540 "
18700 " 19240 "
19380 " 19570 "
19630 " 19900 "
20130 " 20810 "

It is begged to give notice of the frequencies which are utilized for your control and protection.

Senor Ingeniero
Joaquin Olivares M.
Ministro de Comunicaciones

EFRAIN MORALES ZAPATA
Internacionales De Radio

Cuerpo Especial De Seguridad
Direccion General

Tegucigalpa, D. C.

	3,050 Kcs.
3-4-Mcs 2 Channels	3,670 Kcs.
	4,430 Kcs.
4-5-Mcs 2 Channels	4,910 Kcs.
	5,180 Kcs.
5-6-Mcs 2 Channels	5,820 Kcs.
	6,220 Kcs.
6-7-Mcs 2 Channels	6,880 Kcs.
	7,310 Kcs.
6-8-Mcs 2 Channels	7,810 Kcs.
	8,010 Kcs.
8-9-Mcs 2 Channels	9,210 Kcs.
	9,430 Kcs.
9-10-Mcs 2 Channels	9,970 Kcs.
	10,230 Kcs.
10-11-Mcs 2 Channels	10,890 Kcs.
	11,020 Kcs.
11-12-Mcs 2 Channels	11,990 Kcs.
	12,110 Kcs.
12-13-Mcs 2 Channels	12,950 Kcs.