

VLB ARRAY MEMO No. 563

(860725)

RFI Survey, USVI  
Page 1

VLB ARRAY MEMO No. 563

NATIONAL RADIO ASTRONOMY OBSERVATORY

Socorro, NM

RFI SURVEY FOR THE VLBA  
(With general interest comments.)

WEST INDIES LABORATORY  
FAIRLEIGH DICKINSON UNIVERSITY

TEAGUE BAY, CHRISTIANSTED, U. S. V. I.

June 1986

Jim Oty

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### Introduction

After a few months reprieve, to recover from my trip to Hawaii, I headed for the U. S. Virgin Islands to conduct RFI Survey number nine. This trip had been planned for earlier in the spring but several factors, personal and economic, delayed it until the middle of June. By waiting until the end of the formal tourist season, I was able to get lower rates on lodging and also was able to be home for my daughters graduation from high school.

This trip, like the trip to Hawaii, required that I pack all my equipment and ship it to St. Croix. The usual seven boxes were packed, unpacked, and repacked until everything fit and then hope that everything would arrive intact. After arriving in St. Croix, the problem of where to operate from was solved, the equipment was set up, and operation began. Fortunately for me, Cam Wade and Buck Peery had just returned from the island and had laid the ground work for my trip. I contacted Mr. Al Lang of the West Indies Laboratory, and he was most helpful in making the trip a success.

For those who have never been to the U.S.V.I., I will make a few comments. The island of St. Croix is one of the U. S. Virgin Islands that help make up the West Indies of the Caribbean. The island is quite small, only measuring about 28 miles long and 7 miles wide at it's widest point. The main attraction of the island is tourism. While there are a few industries such as the Hess Oil refinery and the some U. S. Navy installations, the bulk of the economy is aimed at the tourist. The island is dotted with condominiums, rental houses, hotels, and gift stores. Several cruise ships also make the island a regular tour stop. There are plenty of white sandy beaches (most of them private) and unlimited opportunity for water related activities - swimming, snorkeling, scuba diving, wind surfing, sailing, and fishing. The weather is hot and humid but the trade winds provide a little comfort. The history of the island is dominated by the sugar cane plantations and accompanying slave trade of the 1800's. The sugar cane industry is now defunct and the slaves have been freed but several problems remained. In order for the the Cruzan Rum factory to continue making their famous rum, molasses must be imported, and employment must be provided for the people. While the tourist industry provides a big demand for workers, the local and federal governments employ about one third of the work force. The rest of the locals have one of three occupations - driving taxis (there must be 200 or more on the island), selling fruits and vegetables along the roads, or hanging out on street corners.

### Shipping and Transportation.

Shipping equipment air freight to St. Croix was no problem. Two major carriers serve the island, American Airlines and Eastern Airlines. For this shipment, American Airlines was used as they listed a direct flight from Dallas/Ft.Worth. The return shipment went through New York. The equipment arrived on St. Croix in good order and I was set up and operating within a day. After the completion of the survey the equipment was repacked and returned to Albuquerque. Since the U.S.V.I. is an insular possession I encountered some problems returning the equipment to the U. S. This is covered in a seperate section of this report.

St. Croix is also served by several scheduled airlines. Again, American Airlines provided the best connections. Flying into St. Croix required only a change at Dallas/Ft. Worth and other than leaving Albuquerque at 6:30 AM, the trip was fine. Returning was somewhat of a problem if you wanted to leave early in the day to get home at a decent hour. Most major flights left in the late afternoon. Several small airlines have regular flights to San Juan with good connections from there back to DFW. These flights are fine if you don't mind flying on small airplanes and are patient when schedules are changed. I was scheduled to fly out on Aero Virgin Isles on a DC3 (vintage 1935) but when that flight cancelled out I was changed to Executive Air. In San Juan it was a DC10 non stop to DFW and then, after a plane change, on to Albuquerque. I am sure these schedules change quite often so this information is already out of date.

### U. S. Customs

Since the U.S. Virgin Islands are an insular possession and not a state or a territory, different rules apply when it comes to the U.S. Customs. Shipping equipment to the island was no problem. A simple form filled out at the airlines was sufficient. Upon arrival on St. Croix, two offices had to be cleared. The tax and revenue office and the U.S. Customs office. These were both rubber stamp operations and no questions were asked. The return to the U.S. was a different story. When I attempted to pick up my equipment from the airline freight office in Albuquerque I was informed that it had been impounded by customs and I would have to obtain a release.

In order to obtain this release I had to make a one time entry and post a bond on the equipment. The customs suggested that I enlist the aid of a customs broker. After a check with our business office, it appeared that the best way out of this situation was to use the customs broker and retrieve the equipment. The bottom line was that the fee for handling the transaction came to \$250.00. With the paperwork completed satisfactorily a Customs Officer inspected the shipment looking for equipment that was not manufactured in the U.S. Fortunately, all the equipment (at least all that was evident) was of U.S. origin so the broker got his fee, the customs protected us from foreign made merchandise, and I got my equipment back.

All of this could have been avoided in the beginning, had the proper paperwork been done from the start. There is a way to ship equipment out of the U.S. and back without any questions by using a form declaring that the items, while not necessarily made in the U.S., were once in the U.S. and were being returned.

This area of customs rules and regulations will have to be researched very carefully before we start shipping VLBA equipment to and from the island. The VLA Business Office is doing some preliminary work in this area and will have some further information shortly.

**A WORD OF CAUTION.** If anyone plans to visit the Virgin Islands and carries an expensive foreign camera (or any other item), it would be wise to declare it with customs prior to leaving the U.S. or an import tax could be imposed when returning.

#### Availability of services.

Any installation on St. Croix will have to be almost completely self contained. The island has very little to offer in the area of technical facilities. In talking to the locals it seems that here, like in Hawaii, the mail order houses do a big business. There are only two electronics parts houses, one a Radio Shack, neither well stocked. Technical support is very limited. One small company, a two man operation, seems to have almost a monopoly on the electronic business. While there are several radio and TV stations around, they rely mostly on off island support for technical problems.

In the area of construction, there are quite a few firms to choose from, a few that are reportedly good. I was advised to stay away from Puerto Rico construction firms but no specific reason was given. All construction materials must be shipped to the island. This of course will raise the cost. The cost of concrete is about \$125.00/yard. There are several local construction regulations that must be followed. One interesting regulation requires that water collection be provided for in each residential project and a storage capacity of 10 gallons for each square foot of roof area (5 gallons for industrial units) be included. There are very few water wells on the island so all fresh water must be collected from rain or produced from desalination plants.

Commercial power is available and is generated on the island by a fuel fired plant. While I was there it was quite dependable, however reports are that it is subject to frequent brownouts and occasional failures. Several of the large motel complexes had their own generators and some kept them running most of the time.

### Living and driving on St. Croix

The first thing that any visitor will notice is that you drive on the left. This is a left over from before the U.S. took possession of the island. At first this is quite confusing but after a few days there is usually no problem. Extra care must be taken when turning at intersections and in parking lots. Also, passengers departing from vehicles do so on the traffic side. The road system is adequate but most roads are narrow and winding. They also have the pothole problem and the roads are generally not well maintained. Streets in town, Christiansted and Frederiksted, are very narrow and congested and parking is at a premium. The hotel that I stayed in had only ten parking spaces for about 50 rooms.

The cost of living is high. Hotel/motel accommodations are plentiful but the cost varies with the tourist season. Condominiums and rental houses are also available. Restaurants are in abundance but are also expensive. This makes it a challenge to live on the \$25.00 a day per-diem.

### The West Indies Laboratory

The West Indies Laboratory, a marine biology teaching and research facility operated by Fairleigh Dickinson University, is located near the east end of St. Croix on Teague (pronounced Tag) Bay. In searching for a location to conduct a RFI survey for a VLBA antenna, this laboratory seemed to be ideally situated. Arrangements had been made with the Director of the laboratory, Dr. John Ogden, for help in locating a site to run these tests and Mr. Al Lang, the Administrative Manager, was most helpful. After a tour of the east end of the island, including a tour of the "castle" that was being constructed by a lady known as "The Contessa" on a hill overlooking the laboratory, I moved into a spare office at the laboratory. While this may not have been the ideal survey location, it afforded a good view to the north, east, and most of the west. The somewhat shielded view to the south and southwest was more than made up for by the creature comforts that were available. The office building was air conditioned (a must for that climate), security was provided for the equipment, facilities were available for me, and the laboratory operated a cafeteria for the employees, students, and visitors. It made a pleasant place to run my survey from.

The West Indies Laboratory (WIL), while not very large, was an interesting place. The physical plant consisted of a business office building, research office facilities, dormitories for students, living quarters for teachers, a cafeteria, swimming pool, shop facilities, salt water aquarium facilities (where salt water was circulated from the ocean, through the tanks, and back to the ocean), and a dock facility with a fleet of about 12 boats. A summer class was in session with about 10 students and several instructors.

While the lab no doubt is a top notch marine biology facility, the technical expertise there would not directly interface with radio astronomy. However, in the logistical support area, the lab could prove to be very valuable.

The personnel at WIL were very helpful to me and assisted me in any way I asked. I appreciated their help and I particularly would like to thank Mr. Al Lang.



### The RFI Survey.

The RFI survey from this location went very smooth. I only encountered one equipment problem when the computer malfunctioned. I blamed this on the fact that I turned the air conditioner off one night and the room was very hot when I returned. After the computer was turned off for a while and the room cooled down, normal operation was resumed. One night was lost due to an electrical storm that caused the power to glitch several times.

The RF environment was very mild. I did not know what to expect as there is a lot of U. S. Navy activity on the island. Most of this activity, fortunately, is situated on the west end of the island and did not appear to affect my monitoring. A Navy plane, a four engine turbo-prop with lots of antennas, circled the area regularly but nothing interesting was noted.

I conducted my usual survey, monitoring each band for several hours with the directional antenna pointed in at least four different directions. If any thing of interest was seen, more time was spent searching on that band. Also, using a list of possible interference sources provided by Bill Erundage, I spend a little extra time looking in those areas.

All bands from 75 MHz. through 11 GHz. were monitored and the following are my comments:

73 MHz. to 75 MHz. No local low band TV channels and very few FM stations.

300 MHz. to 350 MHz. Very little activity. A few air/ground signals but very intermittent. Biggest problem was ignition noise from a John Deere garden tractor at the lab.

550 MHz. to 650 MHz. Channel 40 TV station could be a problem. This station, from the north, was only on in the evening. Broadcast was in spanish. A few other low level UHF channels present.

500 MHz. to 1 GHz. Quick look at VLBA IF band. Only channel 40 to worry about.

1.35 GHz. to 1.75 GHz. Made several long term plots of this band. Some radars and a few low level signals. Nothing very significant.

2.15 GHz. to 2.35 GHz. The usual micro-wave signals were not seen in this band.

4.6 GHz. to 5.2 GHz. Most of the time no signals were detected. A one time occurrence of a radar appeared at 4.63 GHz. from the east appeared to be a sea search radar. PRF of about 30/sec and a PW of 10 ms.

5.9 GHz. to 6.4 GHz. A few very weak commercial micro-wave signals.

7.9 GHz. to 8.4 GHz. No signals.

8.4 GHz. to 11.2 GHz. No signals.

Figure 1 shows the location of the U.S.V.I. in the Caribbean.

Figure 2 is a map of St. Croix showing the two proposed VLBA locations as selected by C. Wade, and the location of the West Indies Laboratory where the RFI survey was conducted.

Table I lists the plots that are included with this report. These are typical plots intended to show items of interest. Many other plots were generated and are on file. No plot of the horizon was made from this location as it would not be indicative of the actual antenna location.

Table II is the usual table of harmful interference levels.

Figure 1.  
Map of the Caribbean

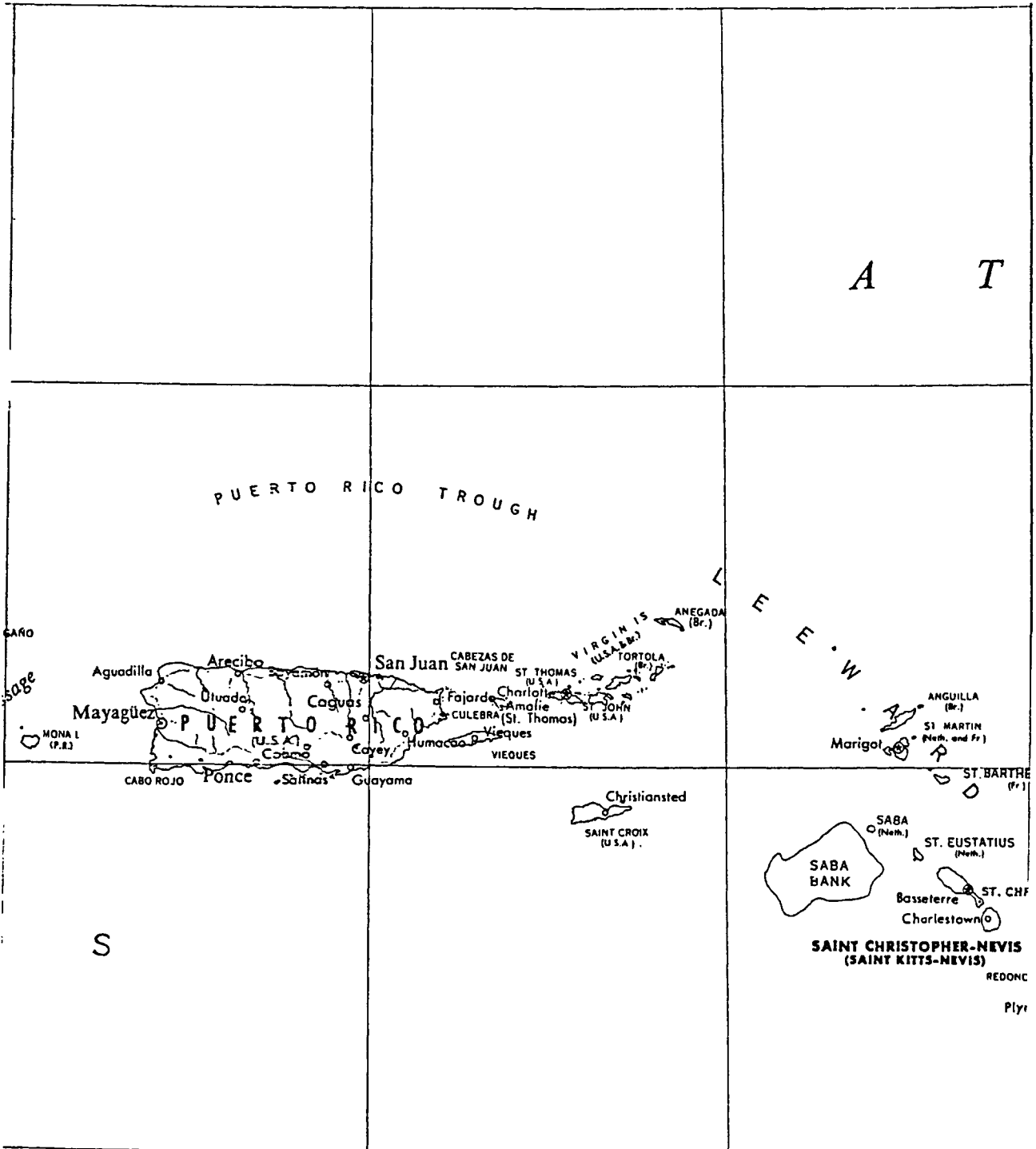


Figure 2.  
Map of St. Croix



TABLE I  
WEST INDIES LABORATORY

Plot #	Frequency	Filter Fc/BW	Comments
1	50 - 100 MHz	None	North. Typical plot.
2	50 - 100 MHz	None	West. Typical plot.
3	74 - 76 MHz	75/5%	North. Single plot showing noise floor.
4	74 - 76 MHz	75/5%	West. Single plot showing noise floor.
5	300 - 350 MHz	325/50	North. Very little air/ground activity.
6	300 - 350 MHz	325/50	West. Same as plot 5.
7	550 - 650 MHz	600/100	North. TV channel 40 is strongest. All TV stations in this range operate on a limited schedule. About 5 PM to midnight
8	550 - 650 MHz	600/100	East. When this band is quiet, it is very quiet.
9	500 - 1000 MHz	None	North. Quick look for signals in the VLBA IF band. Only channel 40.
10	500 - 1000 MHz.	None	South. Same as plot 10.
11	1300 - 1800 MHz.	1500/1000	Omni Antenna. Long term plot.
12	1300 - 1800 MHz.	1500/1000	Same as plot #11 but a few days later.
13	1350 - 1550 MHz.	1500/1000	North. A week radar at 1340 MHz. and a few intermittent signals.
14	1350 - 1550 MHz.	1500/1000	South. Radars at 1430 and 1540 MHz.
15	1550 - 1750 MHz	1500/1000	North. A few intermittent signals.

Table I (Cont.)

16	1550 - 1750 MHz.	1500/1000	West. Signal at 1673 MHz. (330 deg.) for a time.
17	2150 - 2350 MHz	HP2000	East. Lack of usual commercial micro-wave signals.
18	2150 - 2350 MHz	HP2000	West. Same as above.
19	4.6 - 4.8 GHz	HP4000	East. Only signal found in this band appeared to be a sea-search radar at 4.63 GHz. from about 90 deg.
20	4.8 - 5.0 GHz	HP4000	Typical plot.
21	5.0 - 5.2 GHz.	HP4000	Typical plot.
22	5.9 - 6.4 GHz	HP4000	East. A couple of very weak commercial micro-wave signals.
23	5.9 - 6.4 GHz.	HP4000	South. Same as above.
24	7.9 - 8.4 GHz.	HP6000	Typical plot.
25	8.4 - 8.9 GHz	HP6000	Typical plot.
26	10.2 -10.7 GHz	HP6000	Typical plot.
27	10.7 11.2 GHz	HP6000	Typical plot.

0

TABLE II  
HARMFUL INTERFERENCE LEVELS

VLBA TUNNING RANGE	HARMFUL INTERFERENCE LEVELS (Note 1)	RFI MEASURED THRESHOLD (Note 2 & 3)	FLUX DENSITY FOR 1% COMP. (Note 4)
50 - 100 MHz.	*	-142 dBW/m <sup>2</sup>	#
310 - 340 MHz.	-151 dBW/m <sup>2</sup>	-149 dBW/m <sup>2</sup>	-72 dBW/m <sup>2</sup>
580 - 640 MHz.	-146 dBW/m <sup>2</sup>	-143 dBW/m <sup>2</sup>	-67 dBW/m <sup>2</sup>
1.35 - 1.75 GHz.	-135 dBW/m <sup>2</sup>	-140 dBW/m <sup>2</sup>	-59 dBW/m <sup>2</sup>
2.175 - 2.425 GHz.	*	-138 dBW/m <sup>2</sup>	-55 dBW/m <sup>2</sup>
4.6 - 5.1 GHz.	-120 dBW/m <sup>2</sup>	-128 dBW/m <sup>2</sup>	-49 dBW/m <sup>2</sup>
4.99 - 5.0 GHz. (Sub-band)	-127 dBW/m <sup>2</sup>	-128 dBW/m <sup>2</sup>	-49 dBW/m <sup>2</sup>
5.9 - 6.4 GHz.	-120 dBW/m <sup>2</sup>	-126 dBW/m <sup>2</sup>	-47 dBW/m <sup>2</sup>
8.0 - 8.8 GHz.	*	-119 dBW/m <sup>2</sup>	-44 dBW/m <sup>2</sup>
10.2 - 11.2 GHz.	-110 dBW/m <sup>2</sup>	-115 dBW/m <sup>2</sup>	-42 dBW/m <sup>2</sup>

Note 1: These levels, from VLB Array Memo No. 81, are increased by 10 dB since ground based RFI is likely to enter the antenna through 0 dBI sidelobes rather than the +10 dBI sidelobes assumed in Memo 81.

Note 2: These levels are threshold levels from Table I plots.

Note 3: These values may vary slightly from survey to survey because of minor equipment changes.

Note 4: These levels are from VLBA Electronics Memo No. 39.

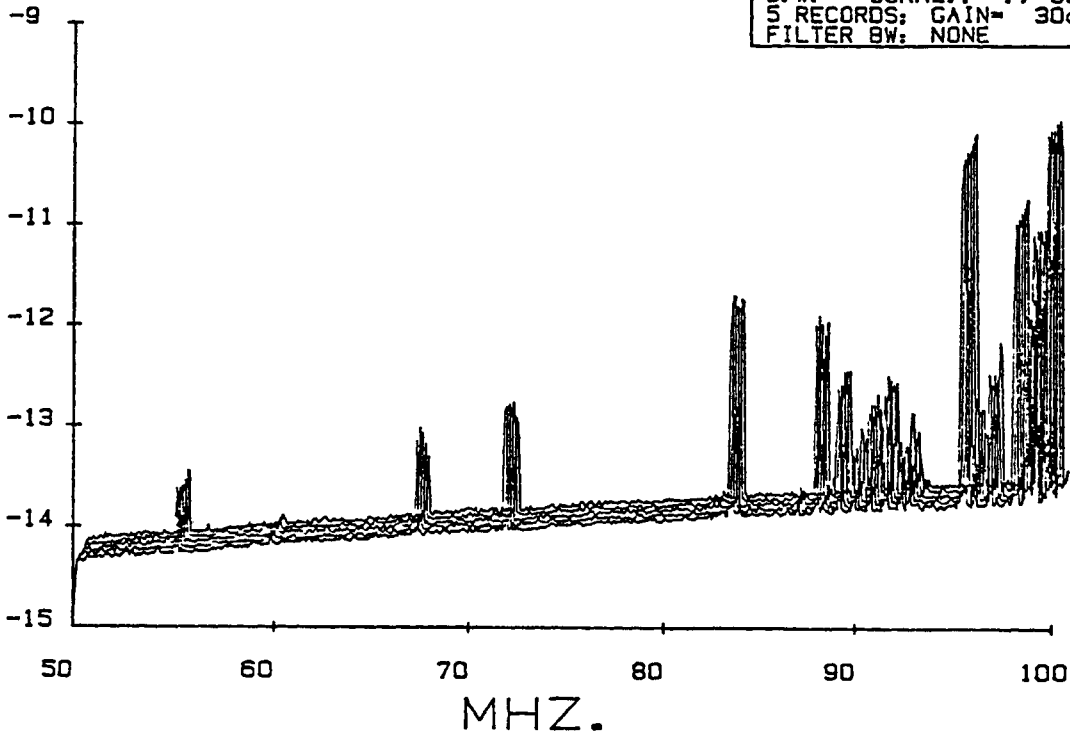
\* These frequency bands not included in memo 81.

# These frequency bands not included in memo 39.

FLUX (LOG W/SQ. M)

PLOT # 1

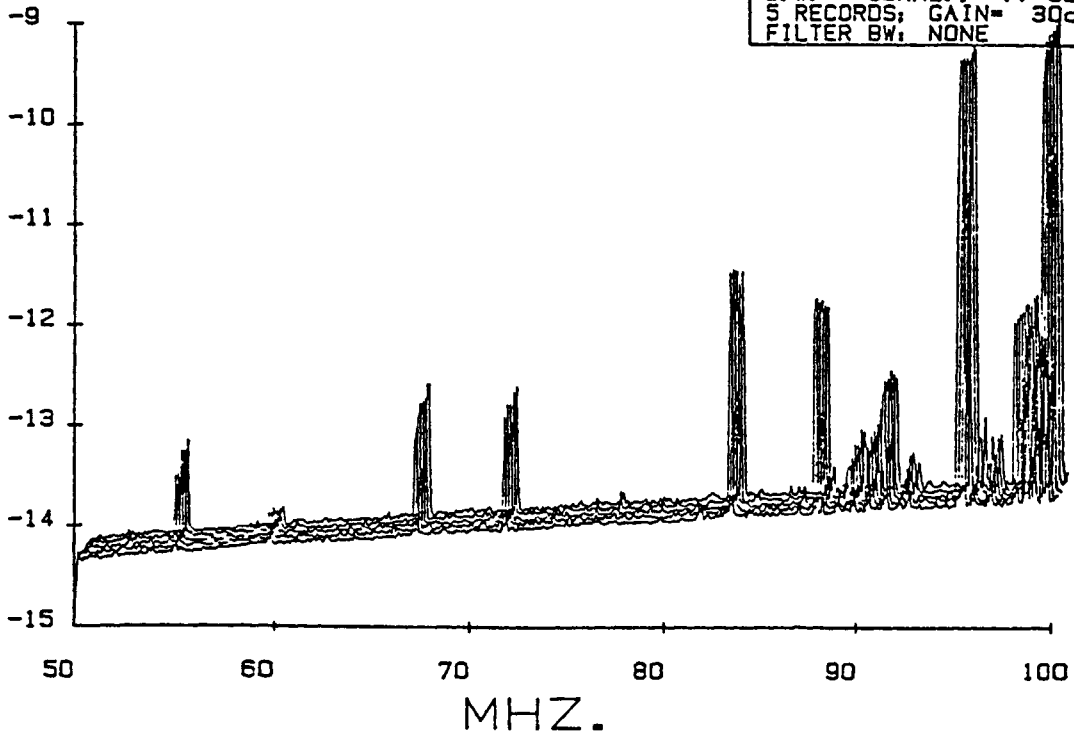
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	10:52 06-28-1986
STOP:	11:08 06-28-1986
50 TO 100 MHZ. 0 DEG AZ.	
B.W. = 30KHZ.; .7 SEC/CM.	
5 RECORDS;	GAIN= 30dB
FILTER BW: NONE	



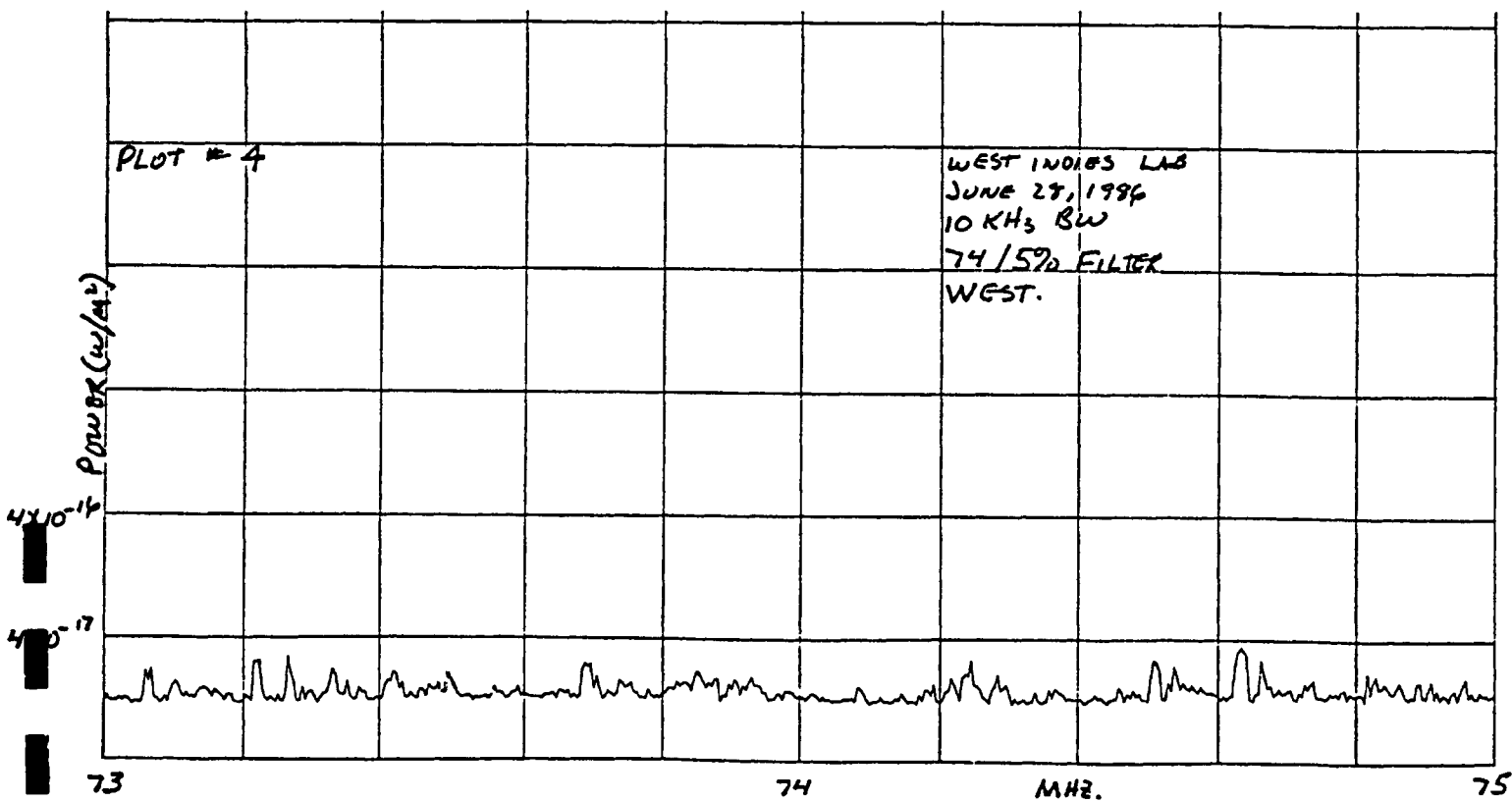
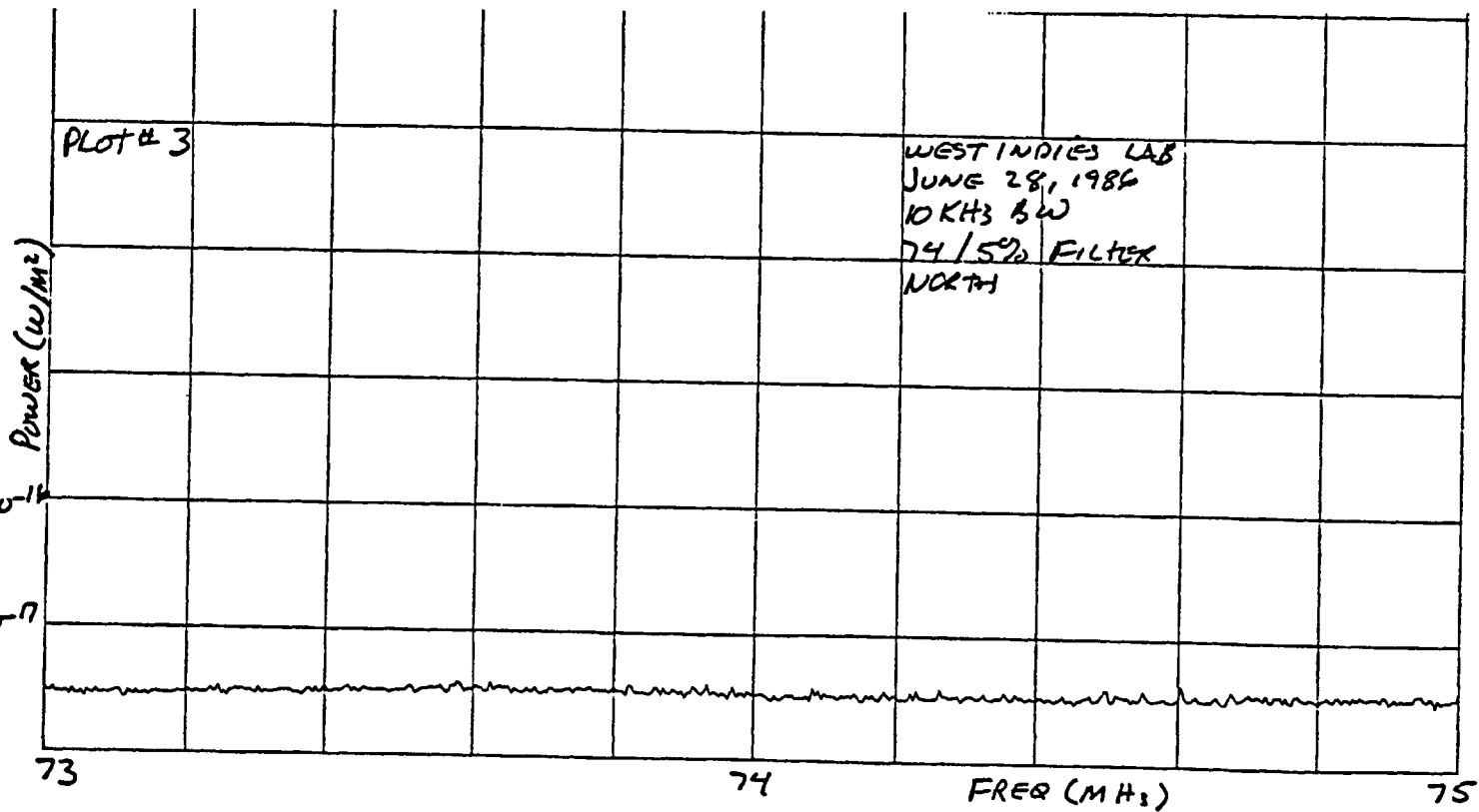
FLUX (LOG W/SQ. M)

PLOT # 2

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	11:47 06-28-1986
STOP:	12:04 06-28-1986
50 TO 100 MHZ. 270 DEG AZ.	
B.W. = 30KHZ.; .7 SEC/CM.	
5 RECORDS;	GAIN= 30dB
FILTER BW: NONE	



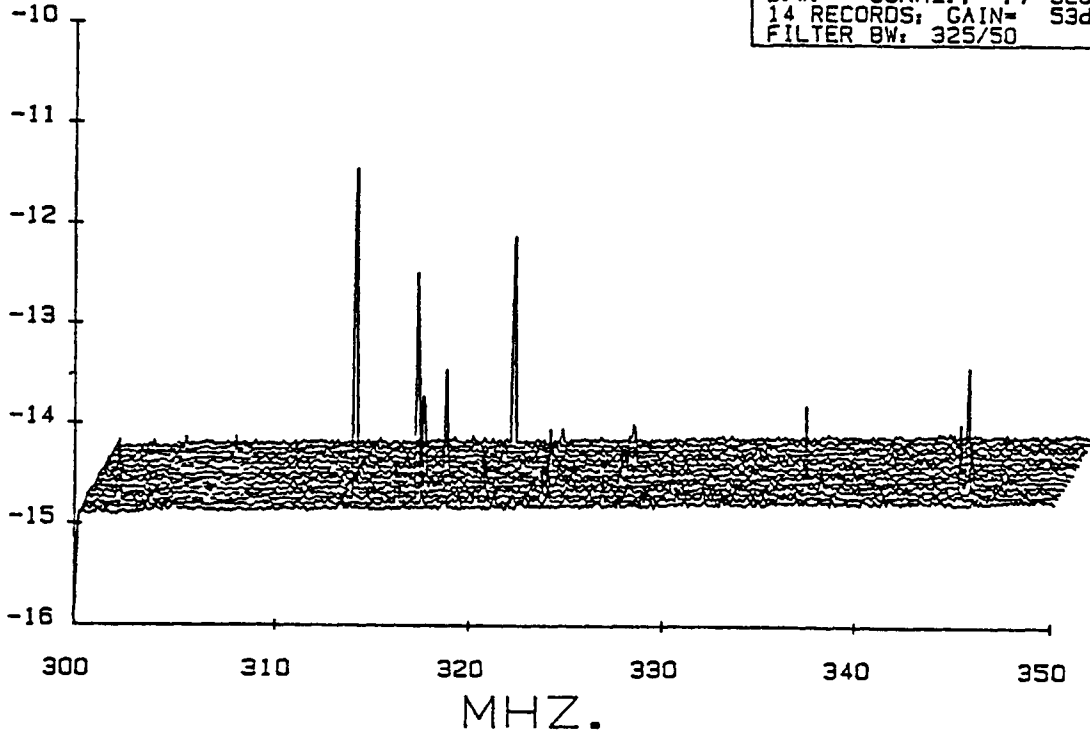




PLOT # 5

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	08:20 06-28-1986
STOP:	09:26 06-28-1986
300 TO 350 MHZ. 0 DEG AZ.	
B.W. = 30KHZ.; .7 SEC/CM.	
14 RECORDS; GAIN= 53dB	
FILTER BW: 325/50	

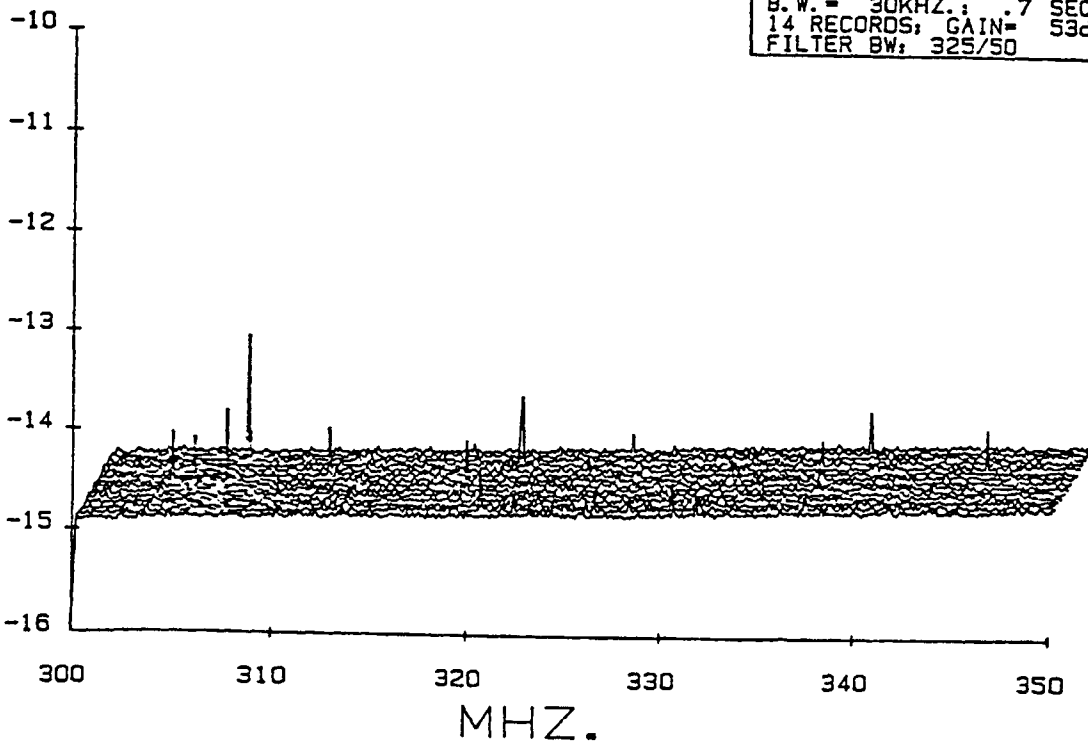
FLUX (LOG W/SQ. M)



PLOT # 6

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	15:22 06-27-1986
STOP:	16:28 06-27-1986
300 TO 350 MHZ. 270 DEG AZ.	
B.W. = 30KHZ.; .7 SEC/CM.	
14 RECORDS; GAIN= 53dB	
FILTER BW: 325/50	

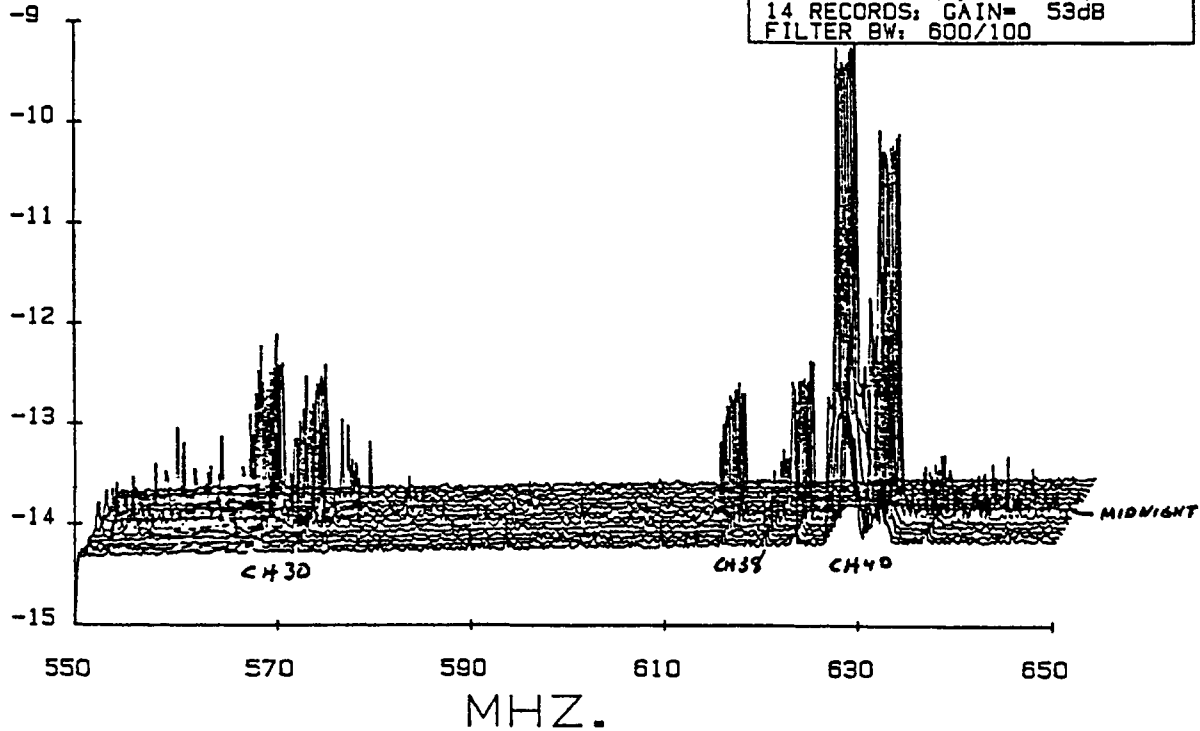
FLUX (LOG W/SQ. M)



FLUX (LOG W/SQ. M)

Plot # 7

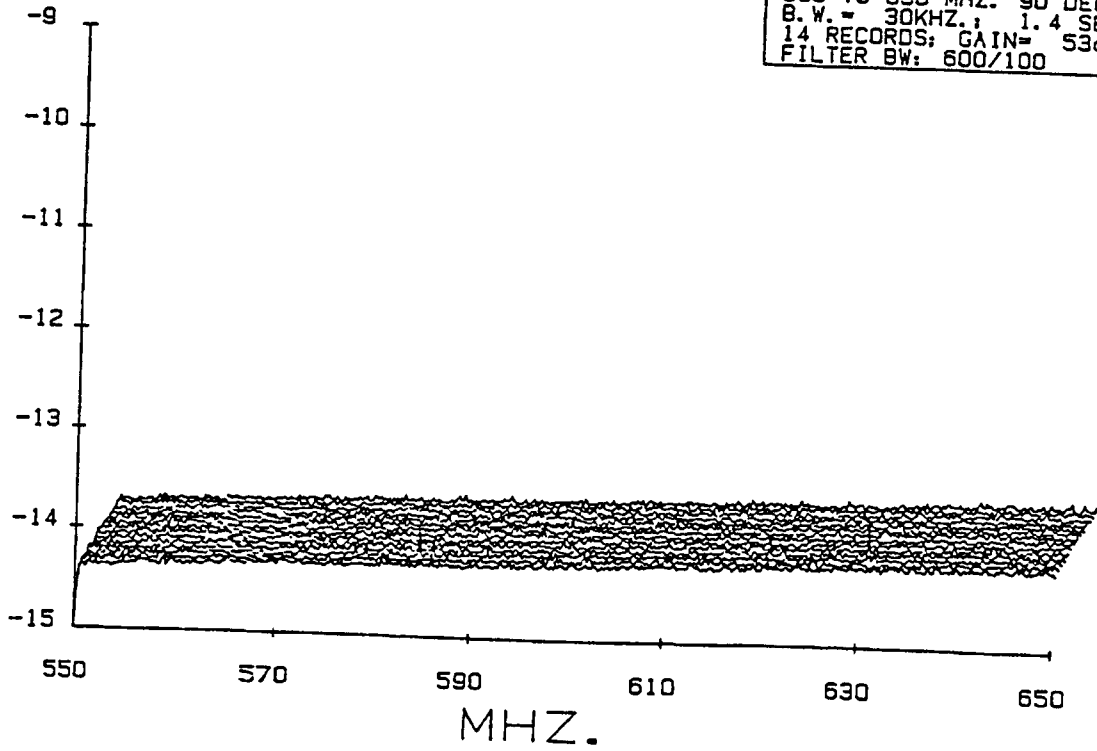
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	18:39 06-27-1986
STOP:	02:48 06-28-1986
550 TO 650 MHZ. 0 DEG AZ.	
B.W. = 30KHZ.; 1.4 SEC/CM.	
14 RECORDS; GAIN= 53dB	
FILTER BW: 600/100	

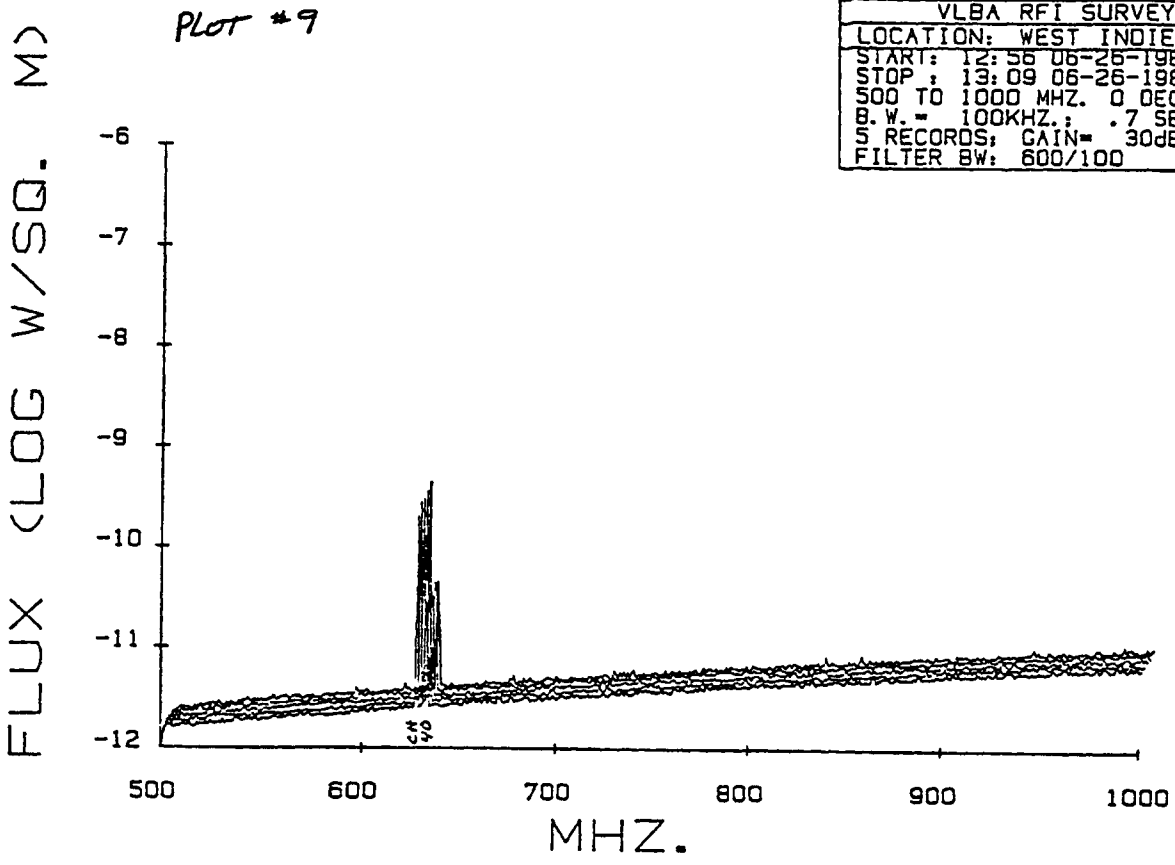


FLUX (LOG W/SQ. M)

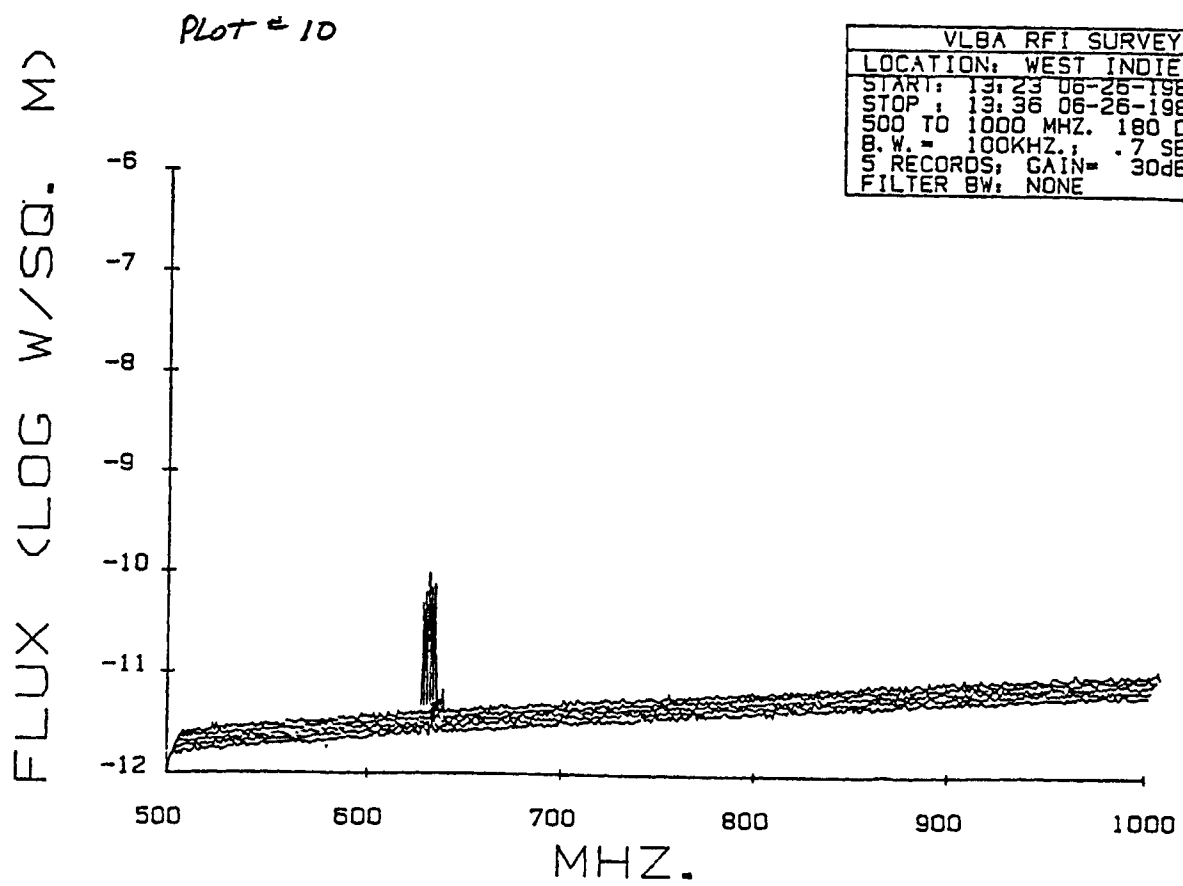
Plot # 8

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	08:17 06-27-1986
STOP:	08:58 06-27-1986
550 TO 650 MHZ. 90 DEG AZ.	
B.W. = 30KHZ.; 1.4 SEC/CM.	
14 RECORDS; GAIN= 53dB	
FILTER BW: 600/100	





VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 12:56 06-26-1986	
STOP : 13:09 06-26-1986	
500 TO 1000 MHZ. 0 DEG AZ.	
B.W. = 100KHZ.; .7 SEC/CM.	
5 RECORDS; GAIN= 30dB	
FILTER BW: 600/100	

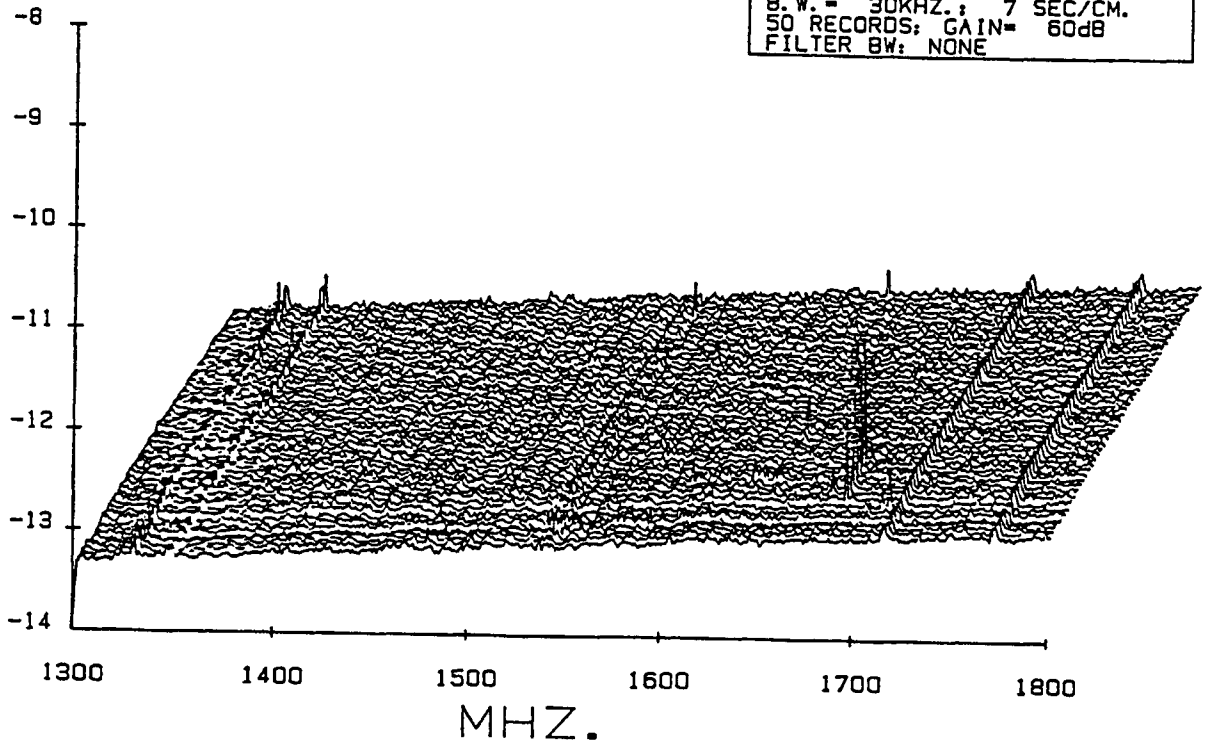


VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 13:23 06-26-1986	
STOP : 13:36 06-26-1986	
500 TO 1000 MHZ. 180 DEG AZ.	
B.W. = 100KHZ.; .7 SEC/CM.	
5 RECORDS; GAIN= 30dB	
FILTER BW: NONE	

FLUX (LOG W/SQ. M)

PLOT # 11

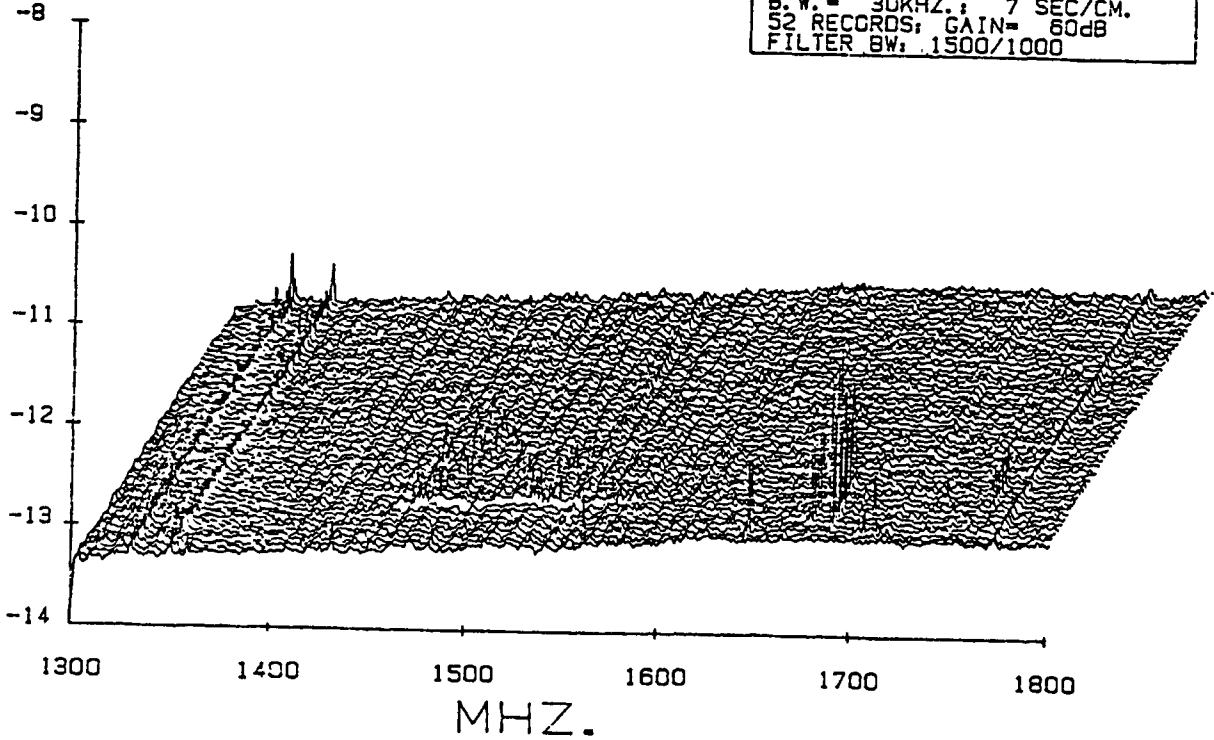
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	17:22 06-17-1986
STOP:	04:49 06-18-1986
1300 TO 1800 MHZ. 360 DEG AZ.	
B.W. =	30KHZ. 7 SEC/CM.
50 RECORDS; GAIN=	60dB
FILTER BW:	NONE



FLUX (LOG W/SQ. M)

PLOT # 12

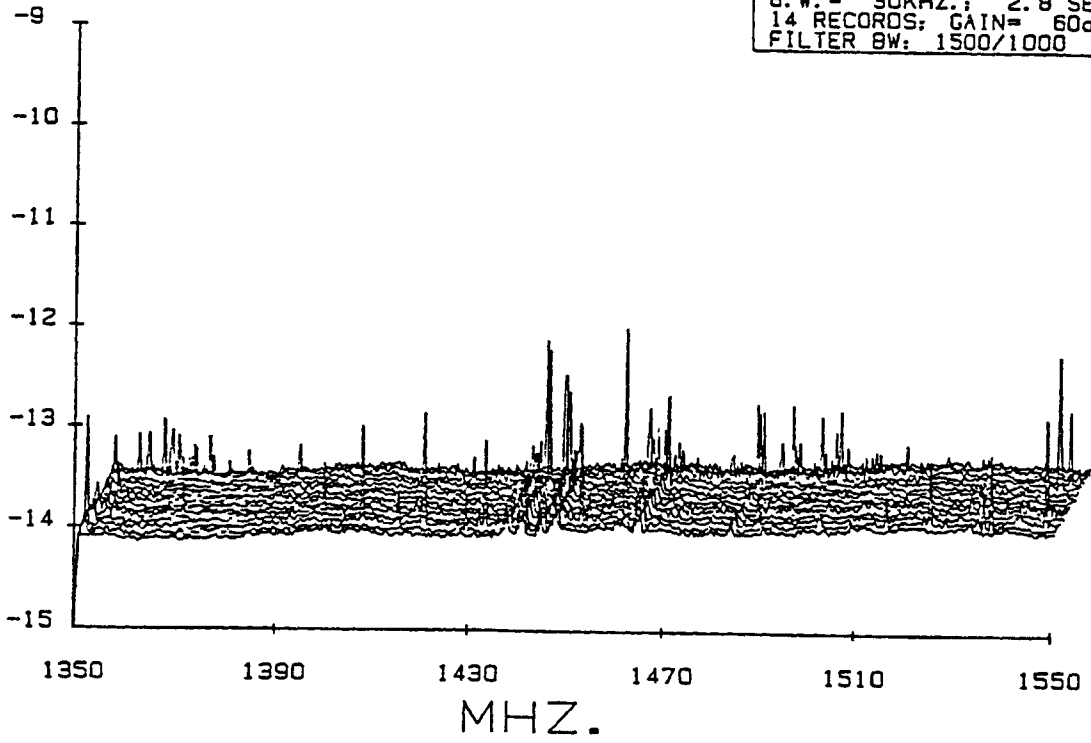
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	18:31 05-25-1986
STOP:	06:41 06-26-1986
1300 TO 1800 MHZ. 360 DEG AZ.	
B.W. =	30KHZ. 7 SEC/CM.
52 RECORDS; GAIN=	60dB
FILTER BW:	1500/1000



PLOT # 13

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	12:39 06-17-1986
STOP:	16:52 06-17-1986
1350 TO 1550 MHZ. 0 DEG AZ.	
B.W.:	30KHZ.; 2.8 SEC/CM.
14 RECORDS; GAIN= 60dB	
FILTER BW: 1500/1000	

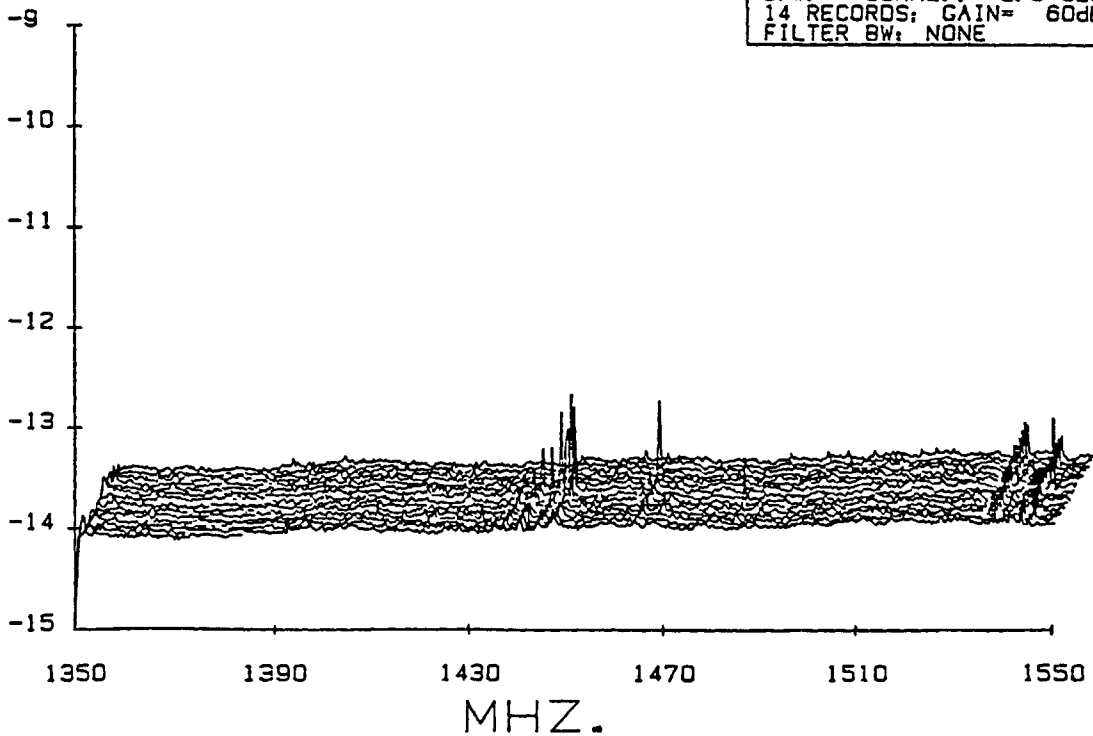
FLUX (LOG W/SQ. M)

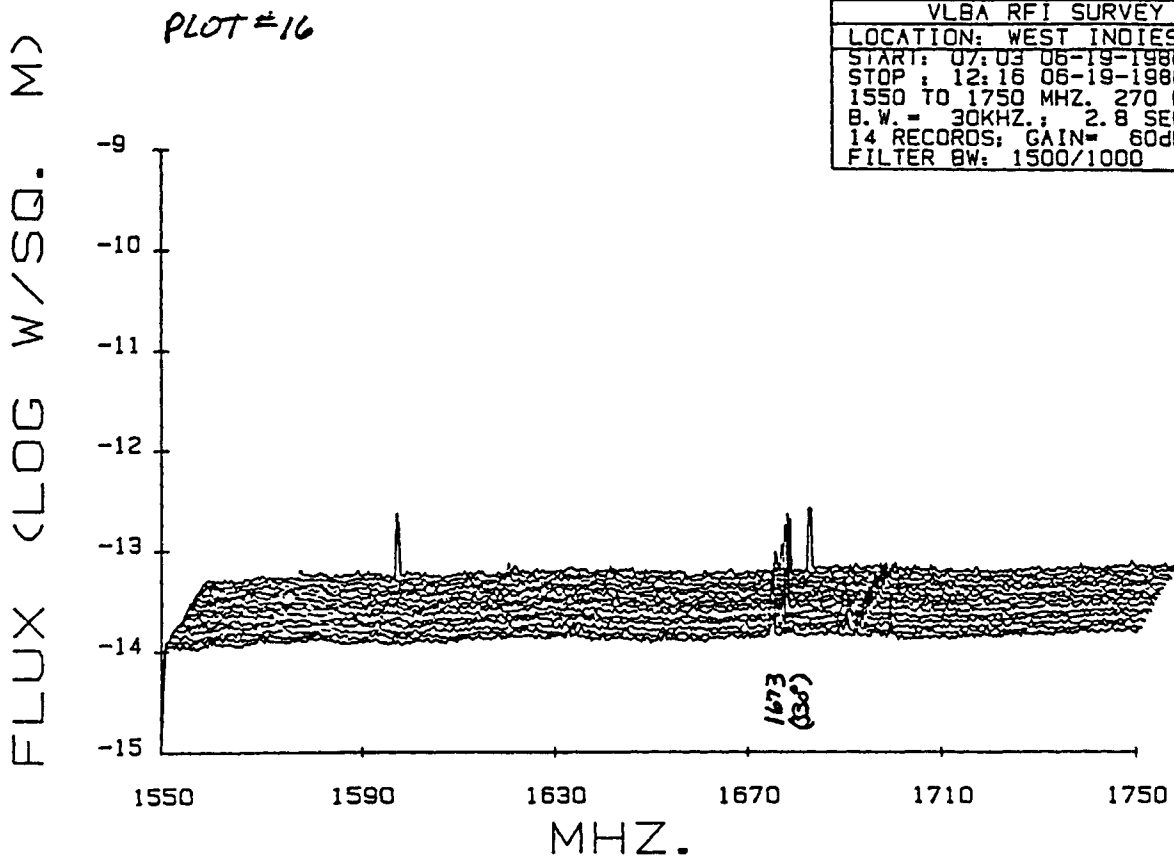
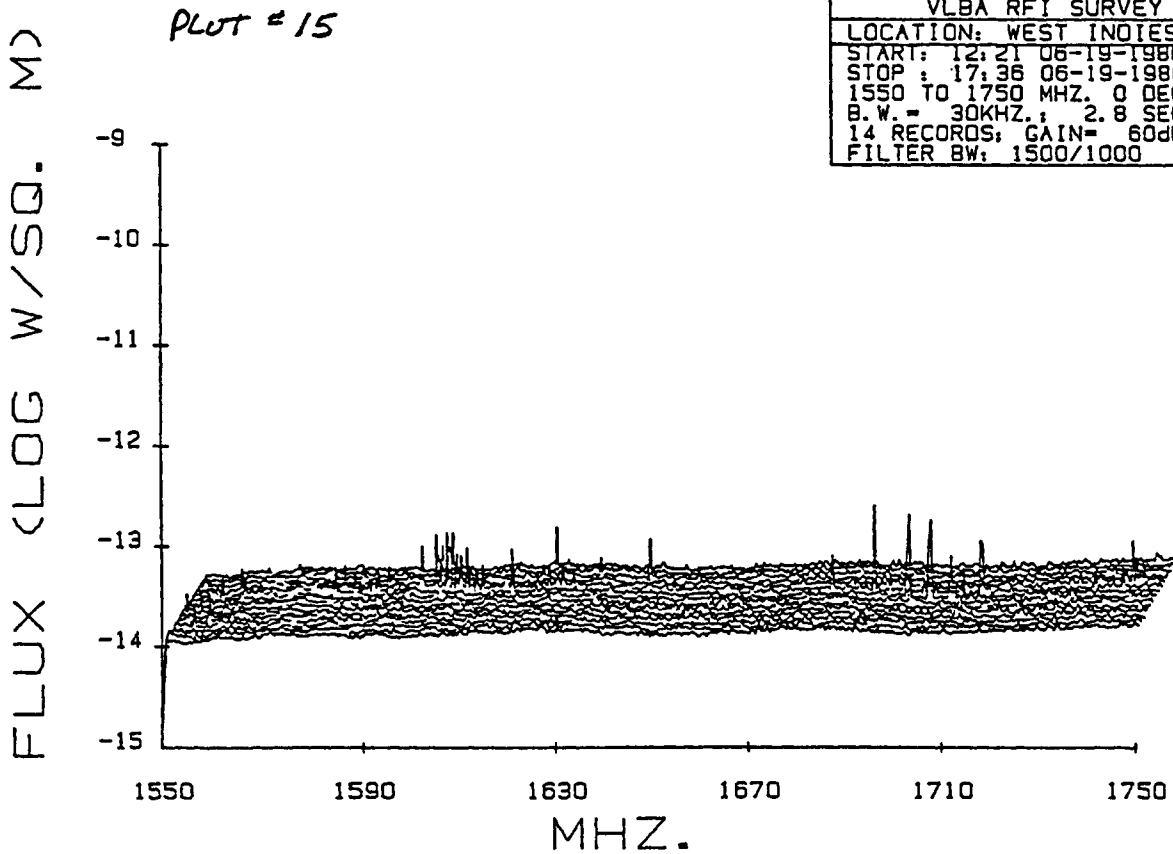


PLOT # 14

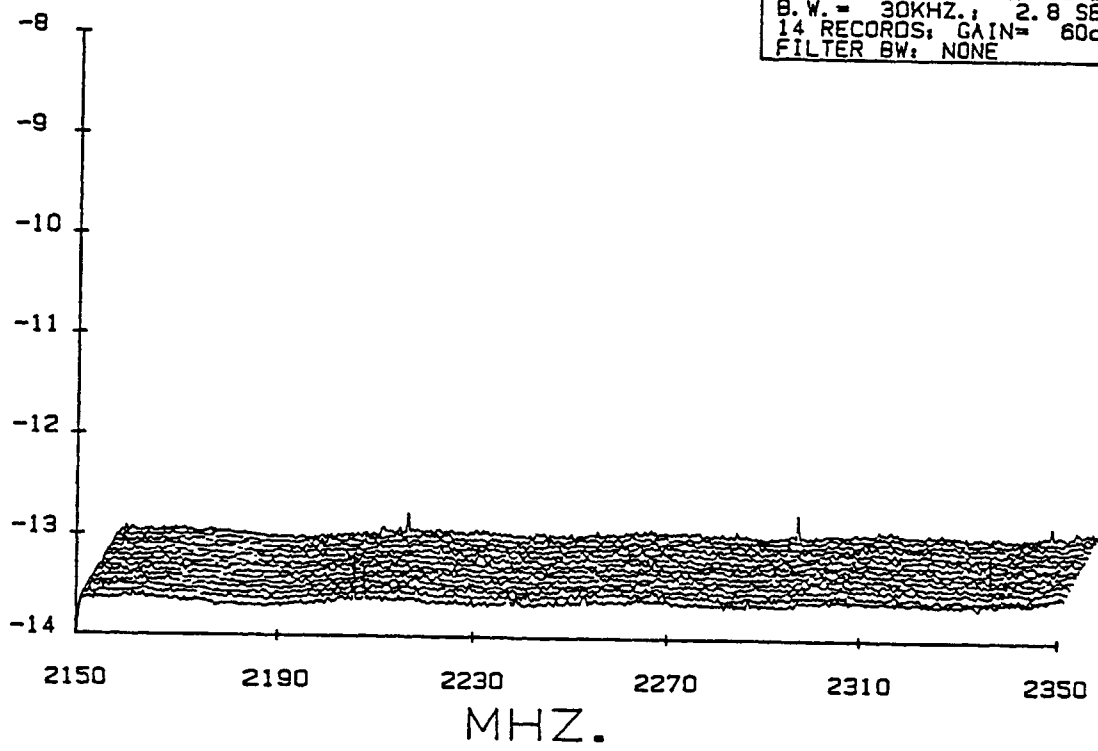
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	12:30 06-18-1986
STOP:	17:33 06-18-1986
1350 TO 1550 MHZ. 180 DEG AZ.	
B.W.:	30KHZ.; 2.8 SEC/CM.
14 RECORDS; GAIN= 60dB	
FILTER BW: NONE	

FLUX (LOG W/SQ. M)



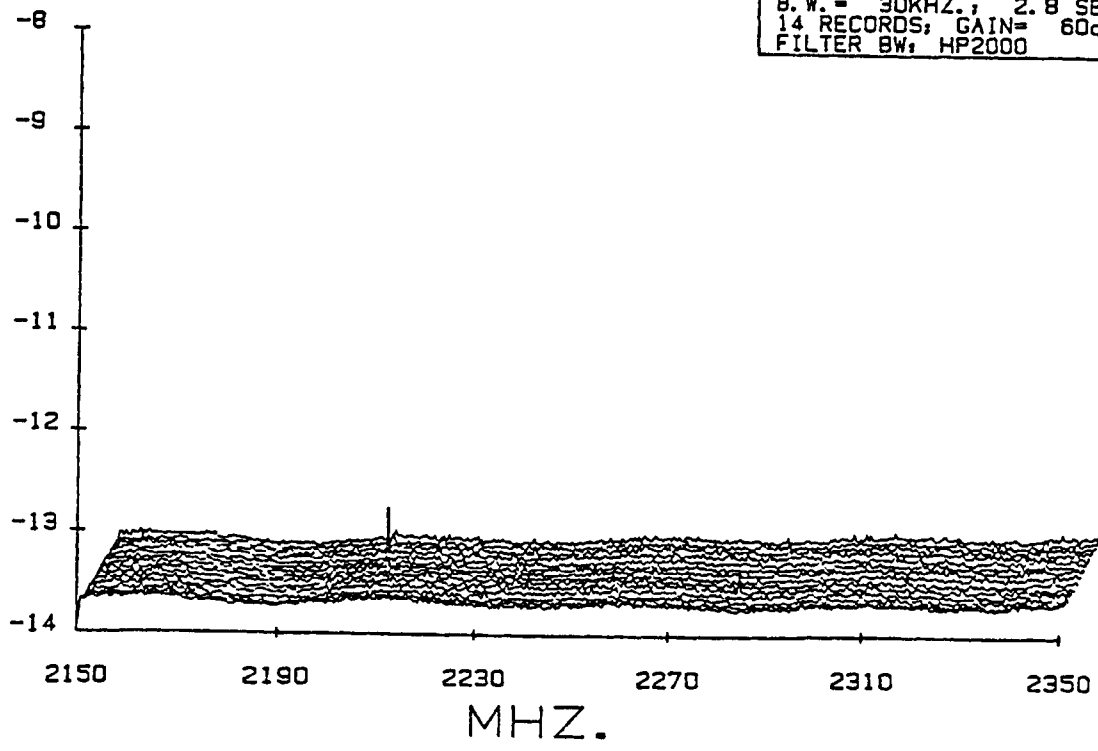


Plot 17  
FLUX (LOG W/SQ. M)



VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 18:19 06-20-1986	
STOP : 03:35 06-21-1986	
2150 TO 2350 MHZ. 90 DEG AZ.	
B.W. = 30KHZ.	2.8 SEC/CM.
14 RECORDS; GAIN= 60dB	
FILTER BW: NONE	

Plot #18  
FLUX (LOG W/SQ. M)

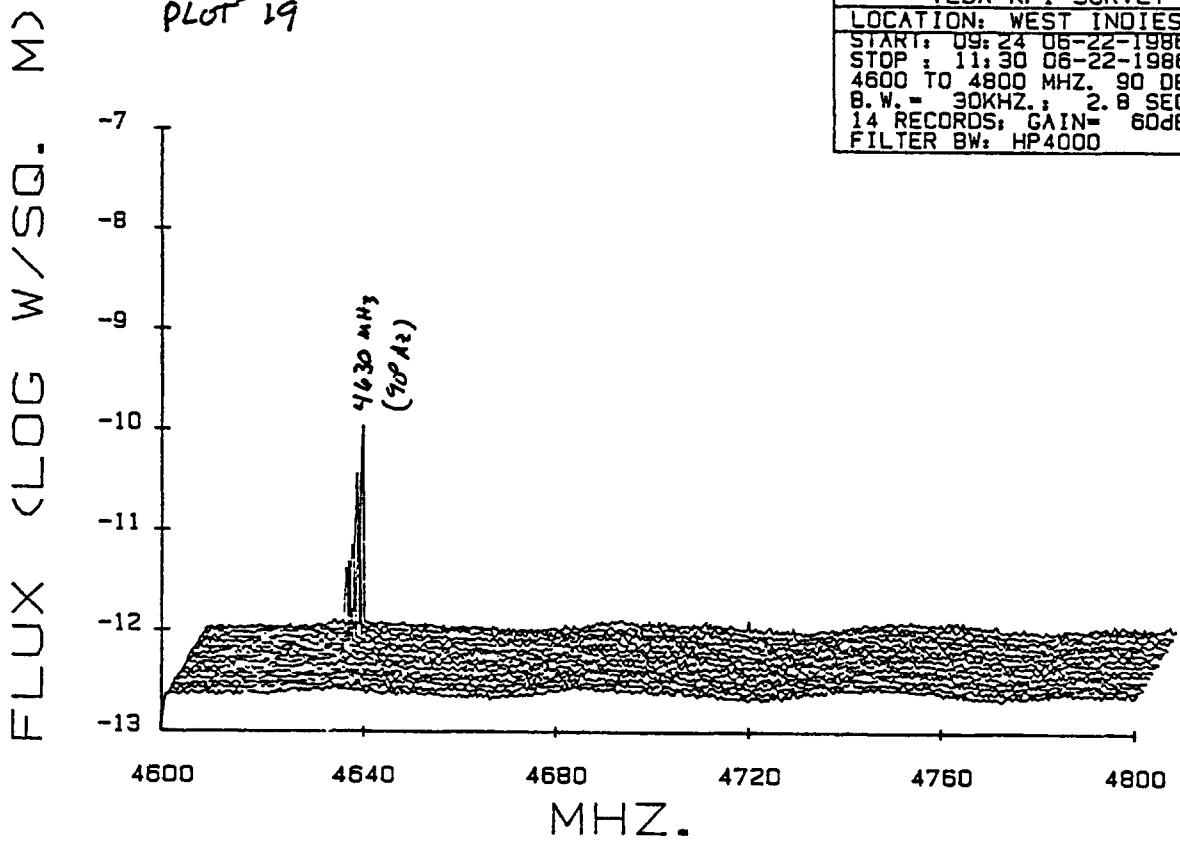


VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 12:06 06-21-1986	
STOP : 16:48 06-21-1986	
2150 TO 2350 MHZ. 270 DEG AZ.	
B.W. = 30KHZ.	2.8 SEC/CM.
14 RECORDS; GAIN= 60dB	
FILTER BW: HP2000	



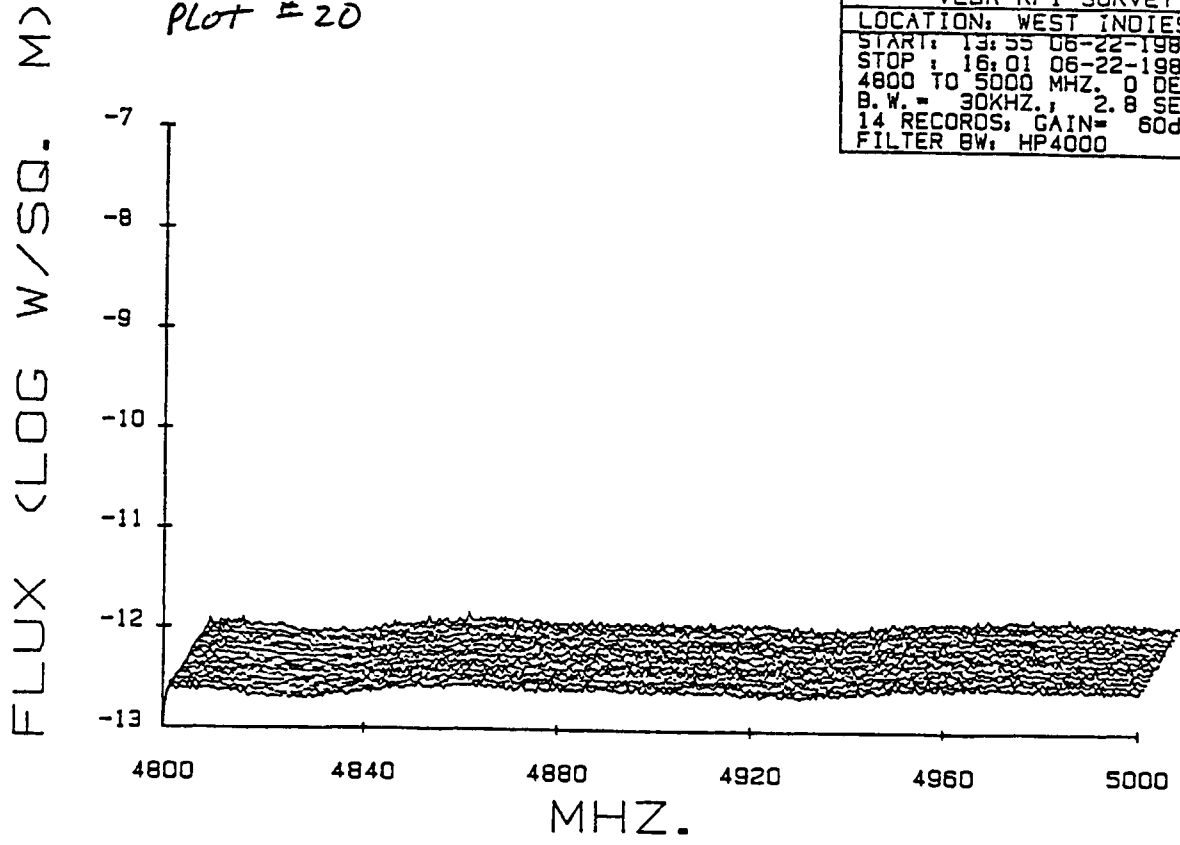
PLOT # 19

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	09:24 06-22-1986
STOP:	11:30 06-22-1986
4600 TO 4800 MHZ, 90 DEG AZ.	
B.W. =	30KHZ, 2.8 SEC/CM.
14 RECORDS;	GAIN= 60dB
FILTER BW: HP4000	



PLOT # 20

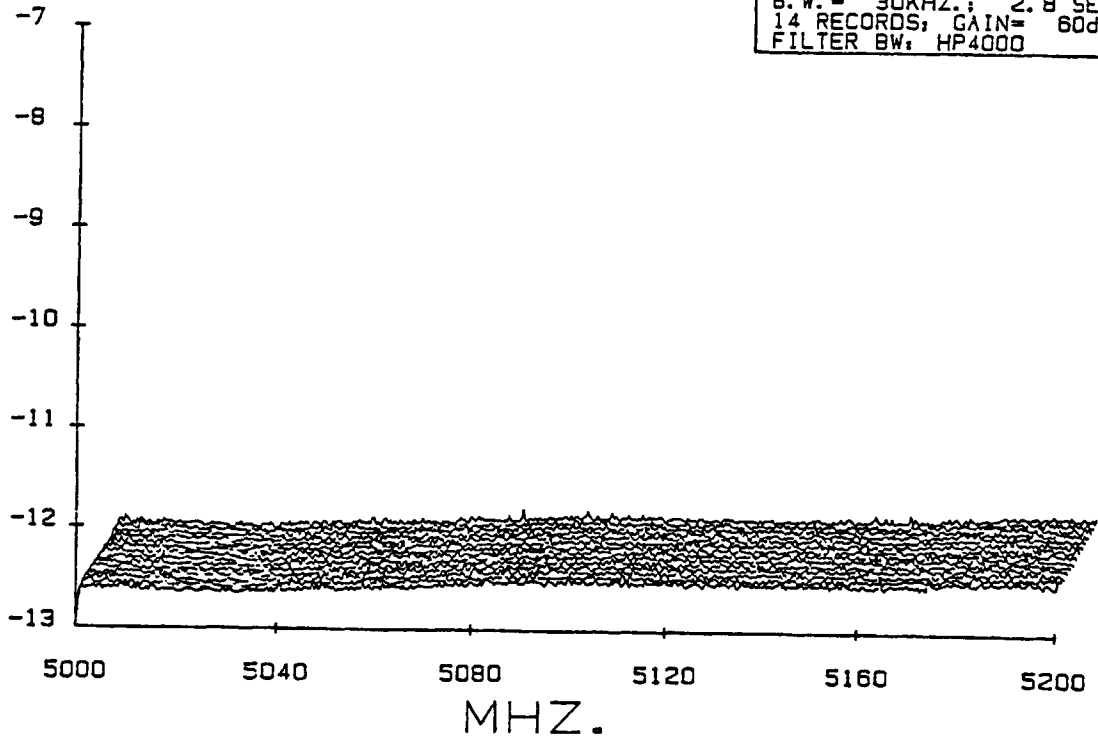
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	13:55 06-22-1986
STOP:	16:01 06-22-1986
4800 TO 5000 MHZ, 0 DEG AZ.	
B.W. =	30KHZ, 2.8 SEC/CM.
14 RECORDS;	GAIN= 60dB
FILTER BW: HP4000	

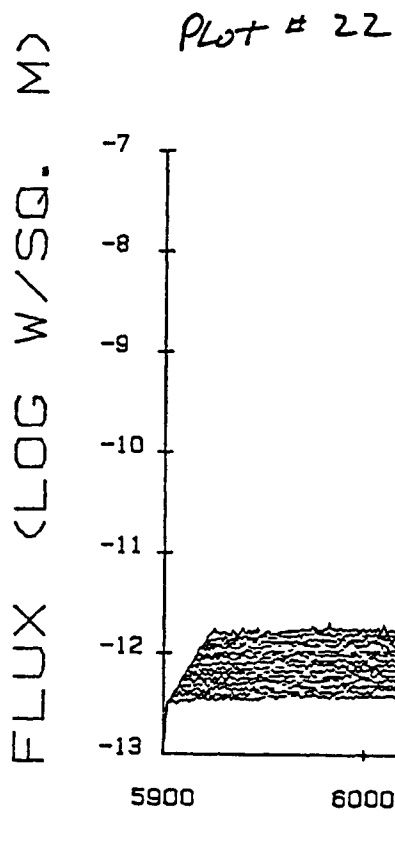


Plot # 21

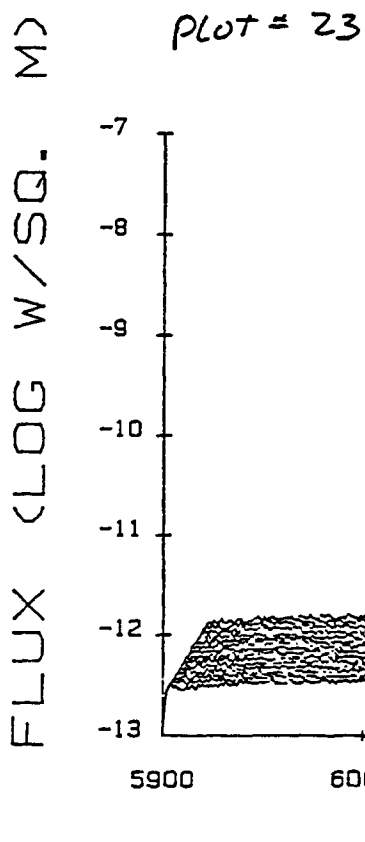
VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	09:20 06-23-1986
STOP :	11:26 06-23-1986
5000 TO 5200 MHZ. 0 DEG AZ.	
B.W. =	30KHZ.; 2.8 SEC/CM.
14 RECORDS;	GAIN= 60dB
FILTER BW: HP4000	

FLUX (LOG W/SQ. M)





VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 16:05 06-23-1986	
STOP : 18:17 06-23-1986	
5900 TO 6400 MHZ. 90 DEG AZ.	
B.W. = 30KHZ.; 7 SEC/CM.	
14 RECORDS; GAIN= 60dB	
FILTER BW: HP4000	

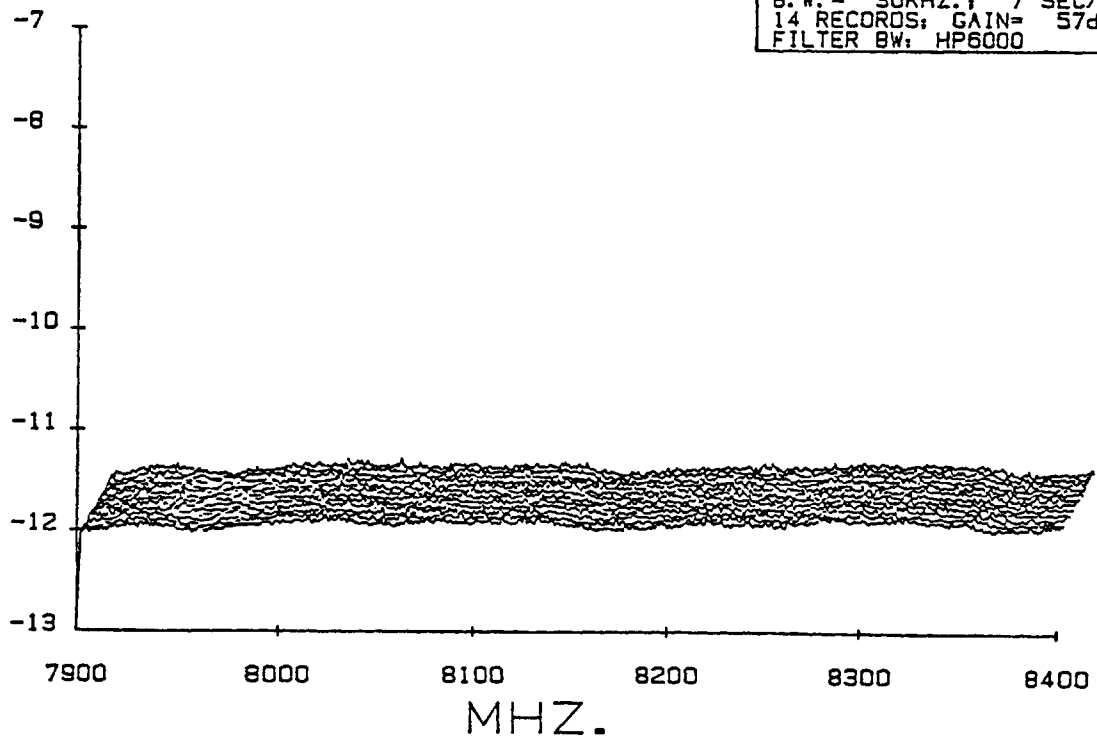


VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START: 09:35 06-24-1986	
STOP : 11:46 06-24-1986	
5900 TO 6400 MHZ. 180 DEG AZ.	
B.W. = 30KHZ.; 7 SEC/CM.	
14 RECORDS; GAIN= 60dB	
FILTER BW: HP4000	

PLOT # 24

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	16:17 06-24-1986
STOP:	18:09 06-24-1986
7900 TO 8400 MHZ. 0 DEG AZ.	
B.W.:	30KHZ.; 7 SEC/CM.
14 RECORDS;	GAIN= 57dB
FILTER BW: HP6000	

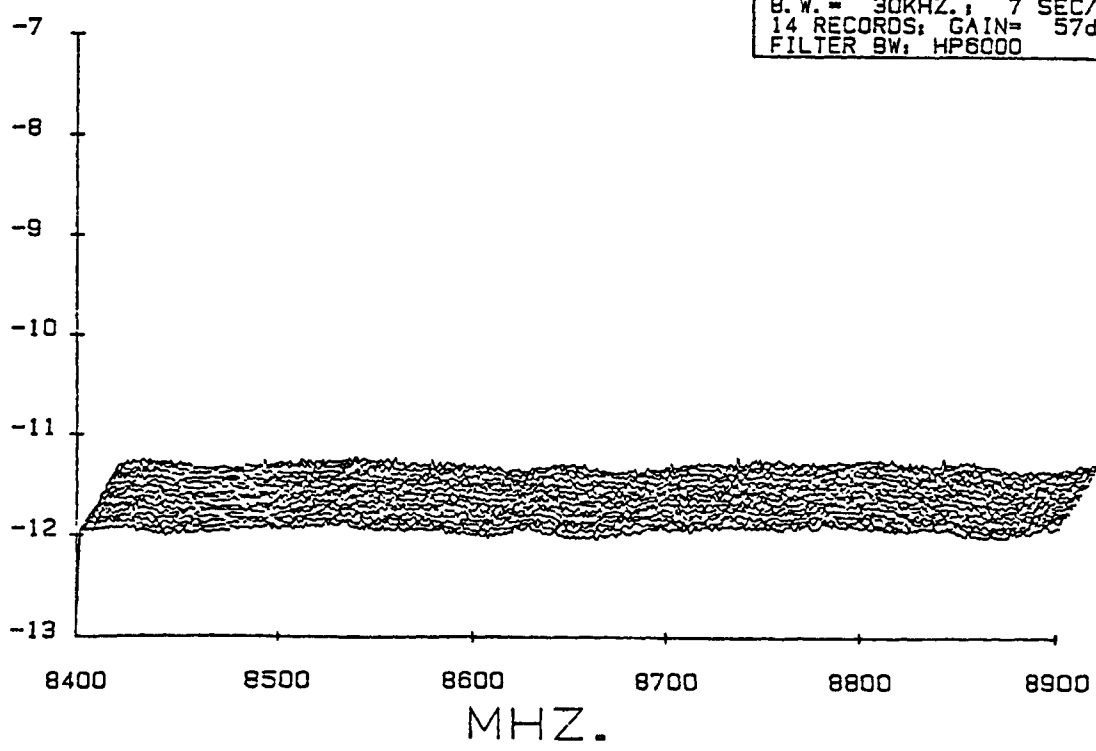
FLUX (LOG W/SQ. M)



PLOT # 25

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	09:18 06-25-1986
STOP:	11:30 06-25-1986
8400 TO 8900 MHZ. 0 DEG AZ.	
B.W.:	30KHZ.; 7 SEC/CM.
14 RECORDS;	GAIN= 57dB
FILTER BW: HP6000	

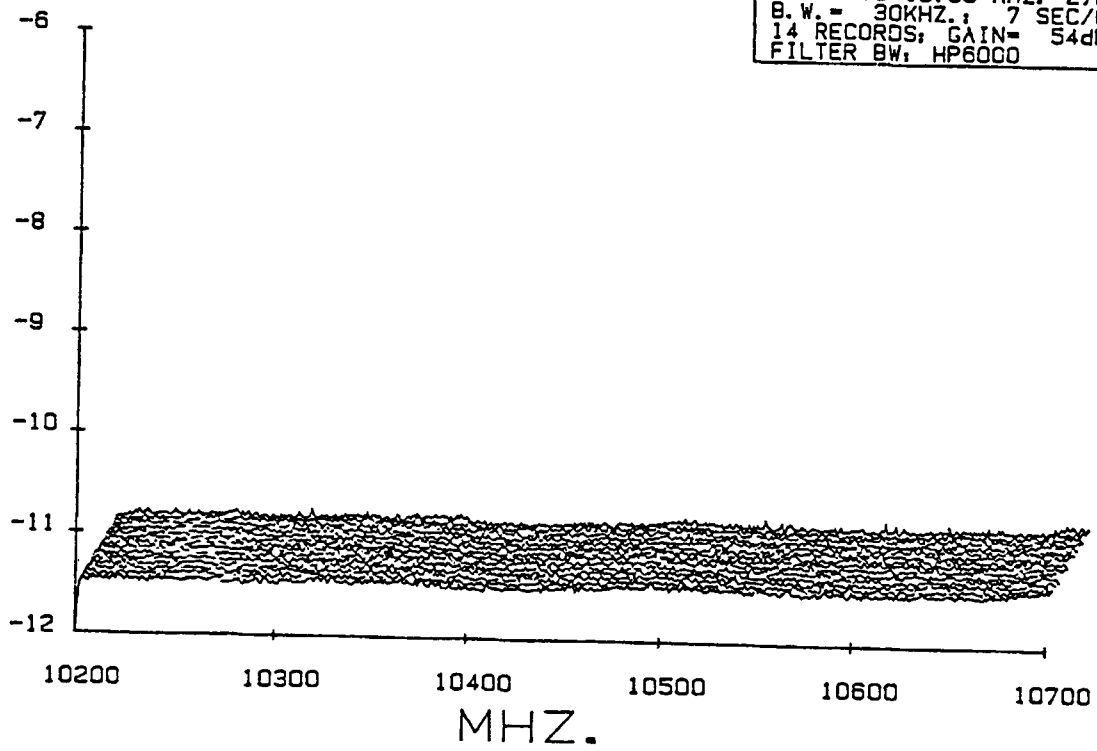
FLUX (LOG W/SQ. M)



FLUX (LOG W/SQ. M)

Plot # 26

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	14:59 06-25-1986
STOP :	16:06 06-25-1986
10200 TO 10700 MHZ. 270 DEG AZ.	
B.W. =	30KHZ.; 7 SEC/CM.
14 RECORDS;	GAIN= 54dB
FILTER BW: HP6000	



FLUX (LOG W/SQ. M)

Plot # 27

VLBA RFI SURVEY	
LOCATION: WEST INDIES LAB	
START:	07:06 06-26-1986
STOP :	08:06 06-26-1986
10700 TO 11200 MHZ. 360 DEG AZ.	
B.W. =	30KHZ.; 7 SEC/CM.
14 RECORDS;	GAIN= 54dB
FILTER BW: HP6000	

