



# RSMS OPERATIONS REPORT

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MEASUREMENT OF FEDERAL RADIO CHANNEL  
USAGE IN NORFOLK, VIRGINIA

225-400 MHz Band  
March 1978

**NATIONAL TELECOMMUNICATIONS AND  
INFORMATION ADMINISTRATION**

**Institute for Telecommunication Sciences  
Boulder, Colorado 80303**

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MEASUREMENT OF FEDERAL RADIO CHANNEL  
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225-400 MHz Band  
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1. INTRODUCTION

These data provide the results of measurements made to determine the usage of Federal radio channels in the 225-400 MHz band at Norfolk, Virginia. These measurements were conducted during March 30-April 4, 1978 as part of the National Telecommunications and Information Administration/Spectrum Management Support Program (NTIA/SMSP). They were made with the NTIA Radio Spectrum Measurement System (RSMS) which is operated by NTIA personnel of the Institute for Telecommunication Sciences (ITS). Measurements for other bands, which constitute an additional part of this effort, are reported separately. A measurement site was selected at Sewells Point on the Norfolk Naval Air Station, Lat. N36.962°, Long. W76.328°, as shown in figure 1.1, which was about 10 feet above mean sea level.

All measurement activities were carried out in accordance with established Department of Commerce (DOC) policy and administrative procedures as defined in section 1 of the RSMS Operations Manual. A technical description of the system is also provided in the Operations Manual (sec. 2).

Objectives for this portion of the effort were as follows:

- (a) collect channel usage data for channels in the 225-400 MHz band; and
- (b) analyze the collected data to obtain spectrum usage statistics for each channel and various groups of channels.

Brief discussions of measurement and analysis procedures are provided in sections 3 and 4, respectively. Unprocessed measurements of channel usage and received power levels for each of the 3501 channels measured in this band are given in section 5, and an overall usage summary is provided in section 2. Graphs showing usage as a function of time-of-day are given in section 6.

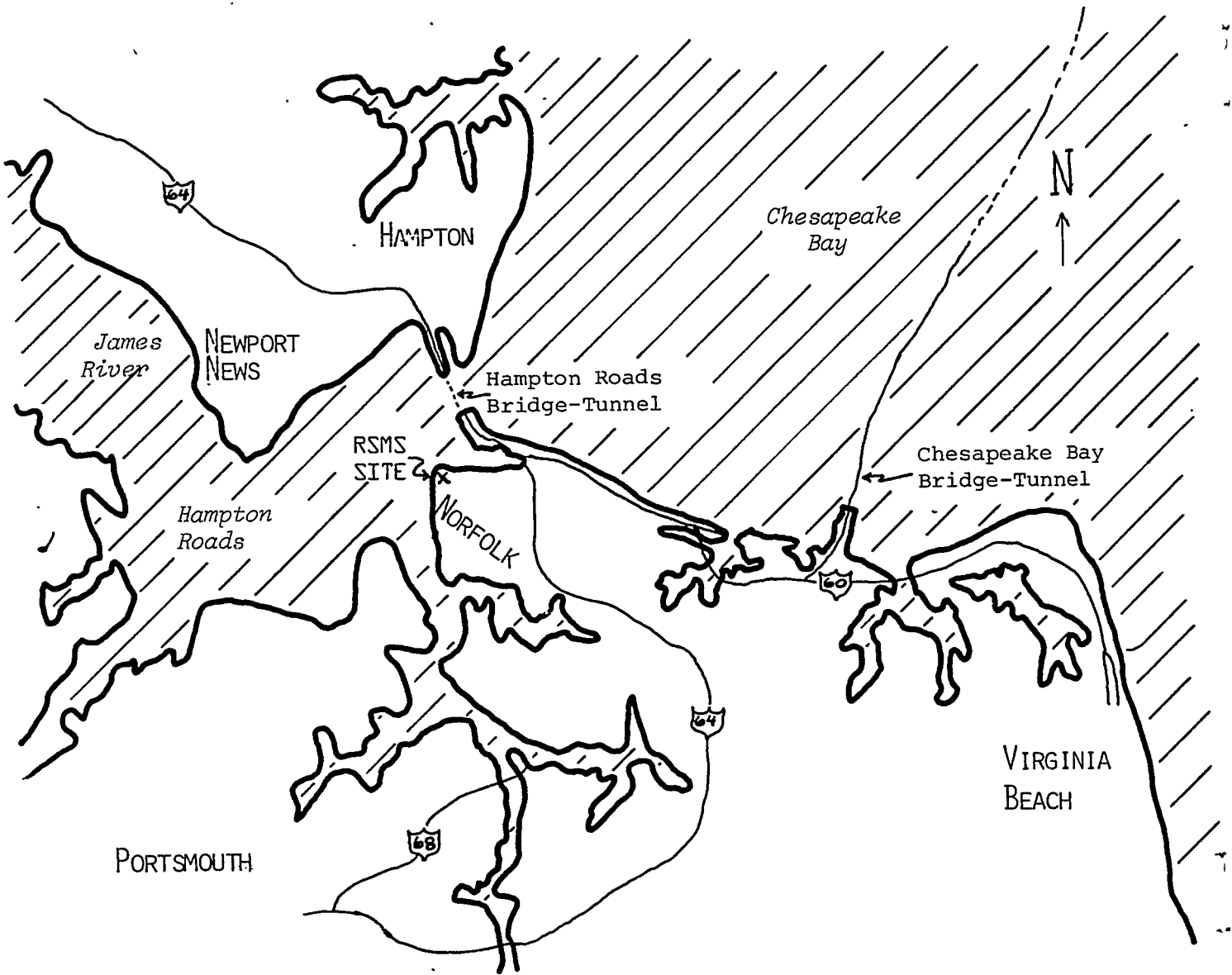


Figure 1.1. Map of Norfolk area, showing RSMS measurement site.

2. SUMMARY

A usage summary for the 225-400 MHz band at Norfolk is provided in table 2.1. The 225-400 MHz band has been broken up into nine sub-bands, the first of which is 15 MHz in size and the other eight are 20 MHz. The summary shows that 92 (33%) of the measured channels assigned within 50 miles were used for at least 0.5% of the time. And, 99 measured channels (3%) without assignments within 50 miles on the exact measured channel center frequency also had a usage of at least 0.5%.

Similar measurements were not made in Norfolk in June 1974, as had occurred for the 162-174 MHz and 406-420 MHz bands.

Time-of-day analysis of the measurements (figures 6.1-6.9) indicates that sub-band #6 (320-340 MHz) had the heaviest usage for all of the channels (figure 6.6). The maximum occupancy of 1.4% occurred at the noon hour in the 300-320 MHz sub-band (figure 6.5). An asterisk in a time slot indicates that there was no data available for that time and sub-band. It takes approximately 20 minutes to perform 400 scans in each sub-band. This means that each sub-band has measurements in only eight different hours of the day, is the reason for the large number of asterisks in each time-of-day figure.

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Table 2.1. Usage summary for 225-400 MHz band

Norfolk, Virginia  
GMF 750511

April 1978  
Scans 2674

Cass 173.389  
Threshold (dBm) -106

SUB-BAND (MHz)	CHANNELS MEASURED	MEASURED CHANNELS WITH USAGE		
		>=0.5%	0.5-0.1%	<=0.1%
225-240	15 : 286	6 : 0	2 : 51	7 : 235
240-260	21 : 379	12 : 10	0 : 43	9 : 326
260-280	45 : 355	16 : 13	5 : 20	24 : 322
260-300	38 : 362	9 : 14	4 : 5	25 : 343
300-320	40 : 360	9 : 16	4 : 17	27 : 327
320-340	20 : 380	2 : 7	1 : 2	17 : 371
340-360	51 : 349	22 : 16	4 : 18	25 : 315
360-380	22 : 378	7 : 9	0 : 11	15 : 358
380-400	30 : 370	9 : 14	0 : 9	21 : 347
	282 3219	92 99	20 176	170 2944

NOTES:

- 1) Assigned channels used are given first, and unassigned channels second; i.e., assigned:unassigned. With NO GMF all channels are taken as assigned; i.e., zero unassigned channels.
- 2) A channel is taken as assigned if it has a center frequency assignment within 50 s mi of the measurement site.
- 3) Channels are based on a 50 kHz channel spacing, where the first channel is centered at 225 MHz, the last channel is centered at 400 MHz, and both are counted. A similar scheme based on a 25 kHz spacing would result in 7001 channels.

3. MEASUREMENT PROCEDURES

Because of (1) the very large number (7001) of 25 kHz channels in the 225-400 MHz band, (2) limited computer storage, (3) hardware RF bandpass filter switching limitations, and (4) the use of amplitude modulation in this band, the following items were incorporated into the measurement process:

- 1) Measurements were done for a 50 kHz channel spacing which reduced the number of channels to 3501. Current assignments in this band are usually based on 50 kHz spacing, i.e., spacing is an integer multiple of 50 kHz.
- 2) A 30 kHz IF bandpass filter was used so that responses from transmissions 25 kHz from a measured frequency would be reduced by only 10 dB. This filter has a 55 dB rejection for adjacent channels (50 kHz away), and provides at least 70 dB of rejection at frequencies more than 200 kHz from the tuned frequency.
- 3) Nine sub-bands, each 20 MHz wide, were used to cover a 200-400 MHz range. Measurements were made for one sub-band at a time, and one cycle through the 220-400 MHz range produced nine sets (or files) of usage statistics, which were recorded on magnetic tape. Each sub-band was usually measured for about 20 minutes, so that three hours were required to cover the whole 220-400 MHz range.
- 4) Three RF bandpass filters were used to cover the 220-400 MHz range in 60 MHz segments. Three is the largest number that can easily be accommodated by the RSMS without either extensive modifications, or a sacrifice of the automatic filter switching capability. These filters provide protection against strong signals outside their bandpass which might otherwise contaminate the usage data.
- 5) Although the MSCAN subroutine was used in making the measurements, its ability to discriminate against impulsive noise (e.g., ignition noise), was not used since it would also provide discrimination against amplitude-modulated signals which might be in this band.



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- 6) The special communication measurement receiver (CMR) front-end developed for narrow-band communication channels, was not used for these measurements; the MSCAN routines developed for use with the CMR were used with the normal 8580 hardware. It might have been possible to modify the CMR to operate across the 225-400 MHz range, but the hardware is currently designed to measure across only a 20 MHz frequency range, and very substantial changes would have been necessary to cover the 175 MHz range of this band.

Data were collected on Tuesday, March 28, and Friday, March 31, through Tuesday, April 4, 1978. For 65 hours of this period, statistical summary files were recorded on magnetic tape at the end of each 20-minute period. The measurement program is designed to operate continuously in this mode without operator intervention. Overnight data were collected so that the time-of-day analysis (sec. 6) could be performed.

The statistics files contain data for each channel on:

- 1) the number of times the amplitude of the received signal was sampled during the previous measurement period and was found to be above the usage threshold. This threshold was chosen to be - 106 dBm and the reception of a signal above this amplitude was assumed to indicate that the channel was being used. This count, along with data on how many times each channel was sampled, is used to determine percent usage for each channel;

- 2) the peak signal received on each channel; and

- 3) the sum of signal amplitudes above threshold for each channel. This sum is used to calculate the average amplitude for the periods when a signal above the usage threshold was present.

In addition to the above data arrays for each channel, a 100-element parameter array contains various logistics and identification data on the whole set of measurements. Included in the parameter array are calibration information, time and location, system configuration, and number of samples taken at each frequency.

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Each statistics file contains data compiled from about 400 measurements on each of the 400 channels measured in the sub-band. Each channel is measured every four seconds, approximately, starting at the lowest frequency in the sub-band and continuing until the highest frequency in the sub-band is measured. At the conclusion of each sub-band measurement, measurement would commence in the next sub-band.

Short summaries of the usage data can be printed out after each sub-band's measurement during the several minutes while the system is waiting to begin the next sub-band's measurements. These lists are used to select channels for later subsequent monitoring. Data from monitoring was kept in a card file, with all data pertaining to a given frequency being kept on a single card. Actual monitoring results were then summarized in the RSMS Operations log.

Before starting the measurements, the system is calibrated using the 30 MHz system calibration source. This process generates calibration factors that are used automatically in the measurement process, as well as allowing the operator to check the IF bandpass characteristic. Such a bandpass characteristic is shown in figure 3.1. A frequency error in the local oscillator will show up as a shift in the center frequency of the bandpass characteristic.

This calibration does not account for transmission line loss or frequency response factors. Although these additional factors could not easily be automatically used by the measurement program to correct the measurements, it is important to know what the numbers are--partly to diagnose faulty system operation, and partly to know whether they are small enough to ignore. A second calibration procedure was performed across 60 MHz sub-bands centered at 250, 310, and 370 MHz using a noise diode at the antenna terminals, which can be used to calibrate the complete system for frequencies within the 225-400 MHz band. Such data are shown in figures 3.2-3.4, where the correction factor,  $C_{RA}$ , is shown versus frequency. Power available at the antenna input will be determined from the indicated received power at the receiver input  $P_{RR}$  by using

$$P_A = P_{RR} + C_{RA} + 1.5, \quad (1)$$

where (1) is dimensionally consistent and decibel-type units are used for all terms.

On figure 3.3, the effect of a tunable bandpass filter tuned to 282 MHz is shown by the spike. The bandpass filter was placed in the system to filter out a very strong signal that was causing all of the scans for the 280 through 340 to be eliminated because of system overload.

EFFECTIVE I.F. BANDPASS SHAPE  
30 MHZ

DATE: 780404

TIME: 165712

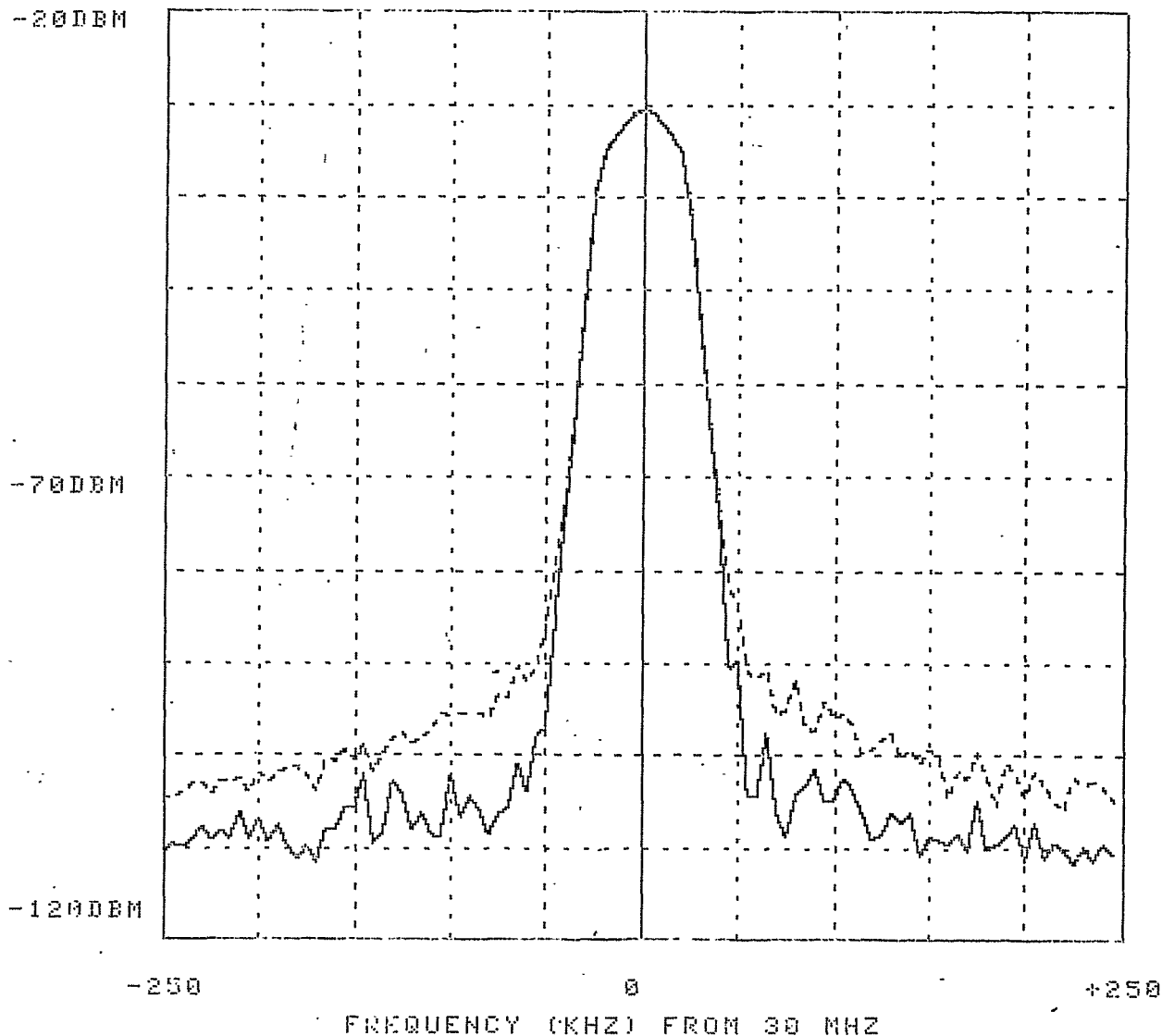


Figure 3.1. System effective IF bandpass shape is shown as a dashed line. The solid line is not applicable to measurements made in the 225-400 MHz band.

LMR RF BANDPASS NOISE DIODE CALIBRATION  
CALIBRATION POINT 0

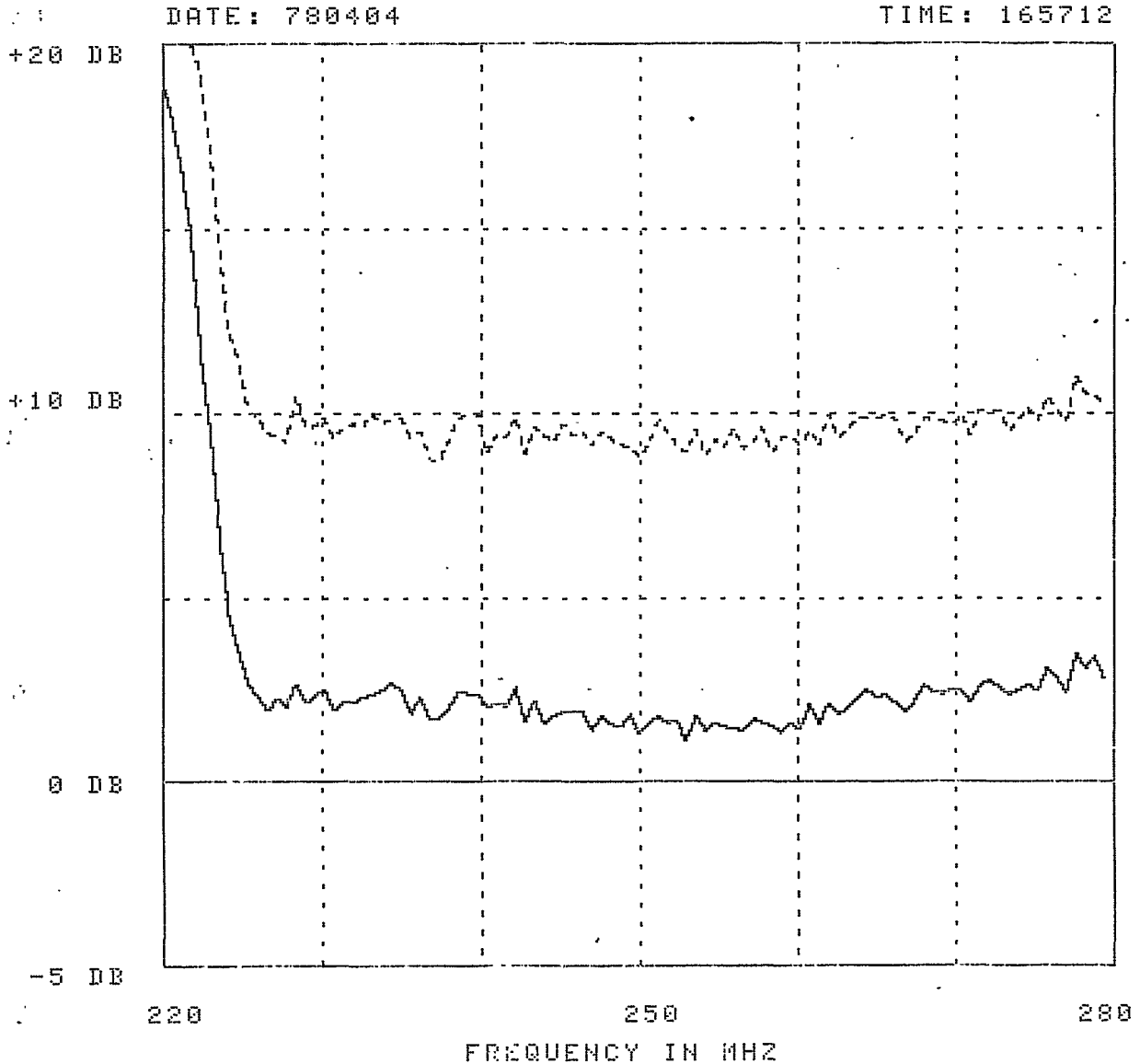


Figure 3.2. System correction factor  $C_{RA}$  (solid line) and noise figure (dashed line) for 220-280 MHz.

LMR RF BANDPASS NOISE DIODE CALIBRATION  
CALIBRATION POINT 0

DATE: 780404

TIME: 165712

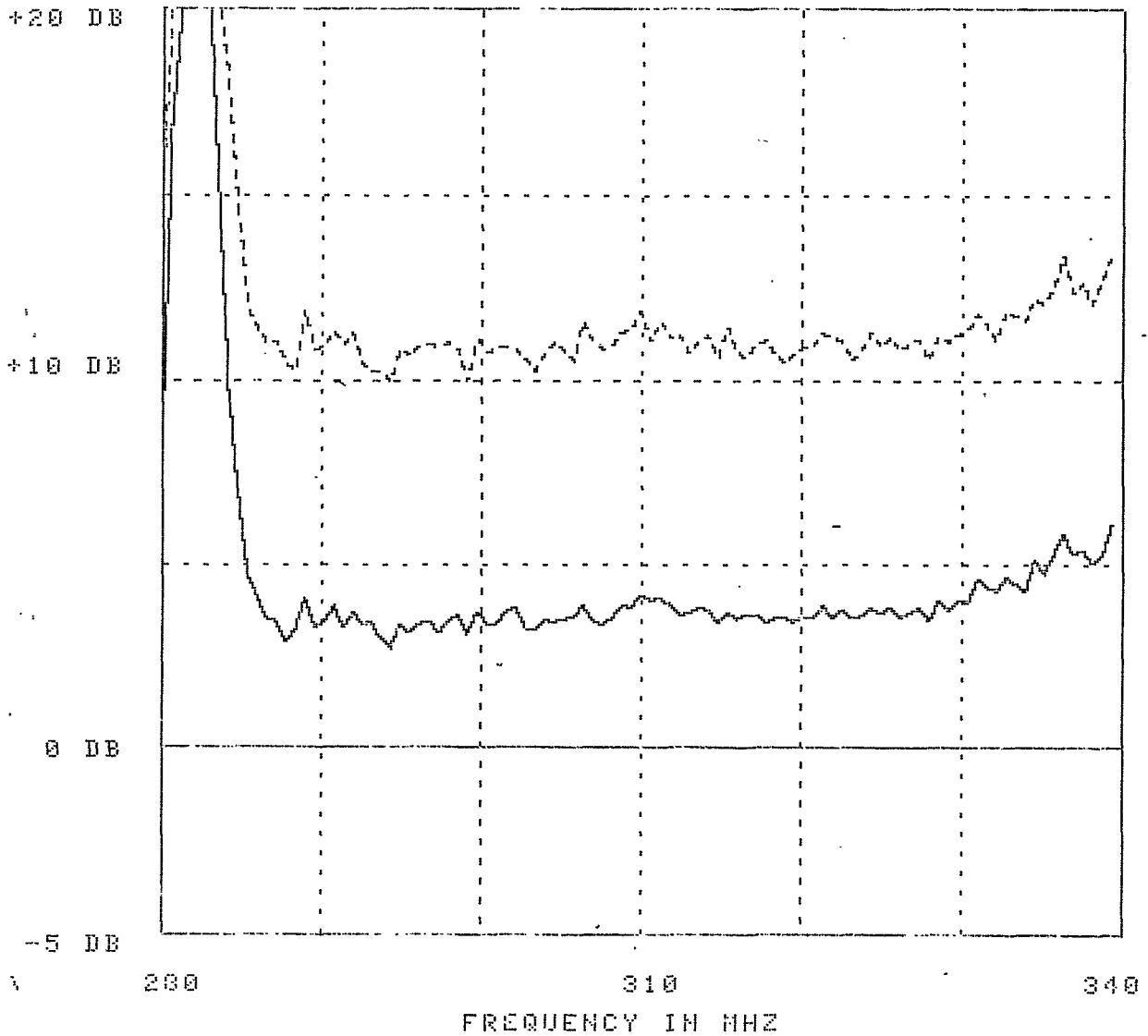


Figure 3.3. System correction factor  $C_{RA}$  (solid line) and noise figure (dashed line) for 280-340 MHz.

LMR RF BANDPASS NOISE DIODE CALIBRATION  
CALIBRATION POINT 8

DATE: 780404

TIME: 165712

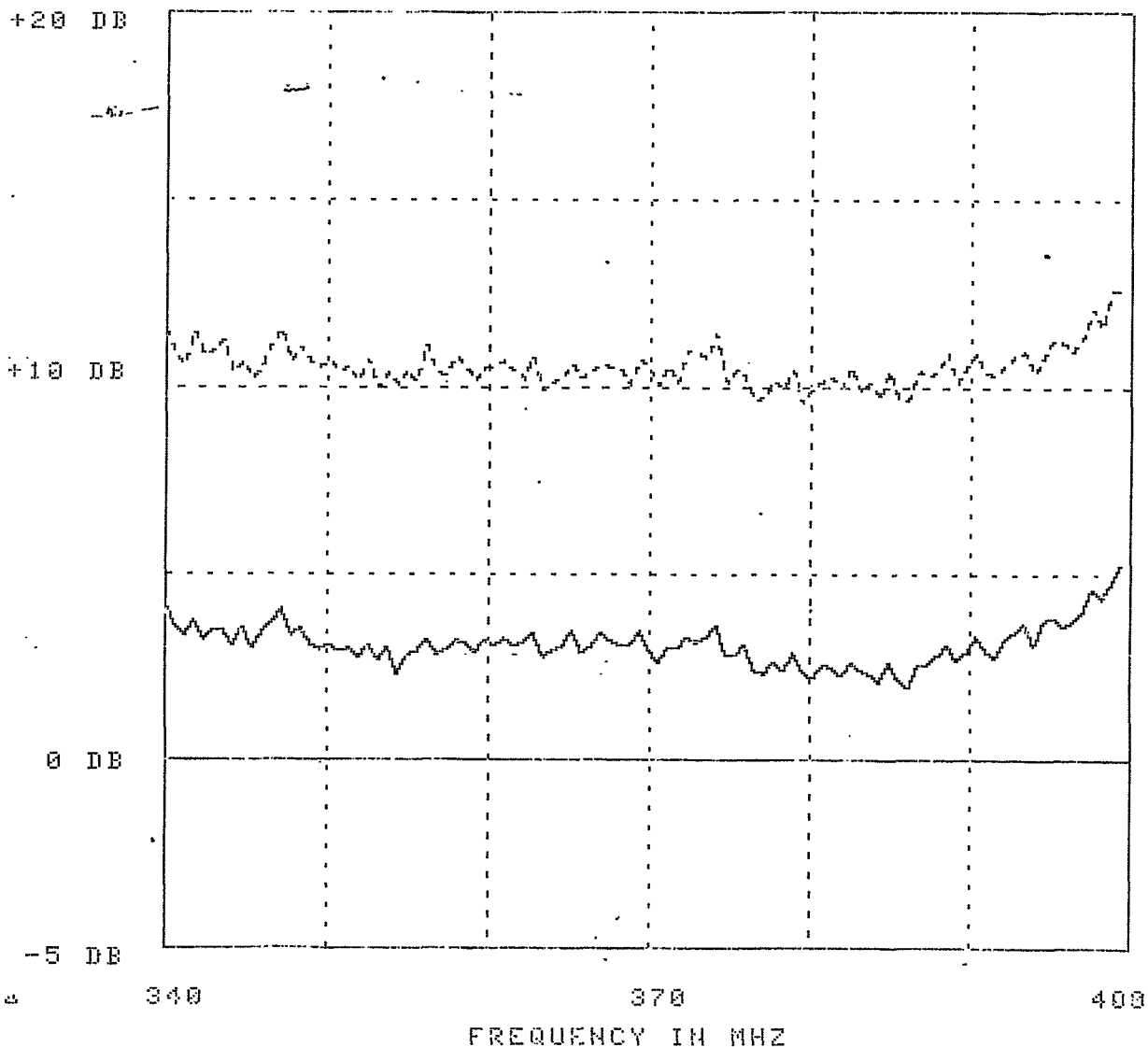


Figure 3.4. System correction factor  $C_{RA}$  (solid line) and noise figure (dashed line) for 340-400 MHz.

## 4. ANALYSIS PROCEDURES

Tapes supplied by the Frequency Management Support Division (FMSSD) of NTIA with the January 1978 GMF and May 1975 non-government assignment data for the Norfolk area were processed at ITS to obtain a Mini-GMF file (MGF). The Mini-GMF code is a six digit word that is generated from assignment files and paired with channel center frequencies measured by the RSMS to provide a concise summary of the assignment situation. Each digit of the code word indicates that number (up to 9) of assignments within a specific category. A value of 9 indicates nine or more such assignments. The first four digits are concerned with Government Master File (GMF) assignments and the last two are concerned with non-government (NG) and International Telecommunications Union File (ITUF) assignments. Details on the Mini-GMF code can be found in Table 4.1.

Table 4.1. Mini-GMF code word description.

Digit	Category
sign	Negative (-) if aural monitoring is <i>not</i> permitted (i.e., if digit 5 is non-zero). Positive (blank) if aural monitoring is permitted (i.e., digit 5 is zero). Positive (+) if digit 5 is non-zero, but a manual check of the assignment records show that the NG assignment(s) involved could not be demodulated into intelligible messages by the RSMS.
1	Fixed GMF assignments within range of expected signal reception (50 mi) and on exact frequency.
2	Fixed GMF assignments within possible signal reception range (150 mi) and on exact frequency.
3	Fixed GMF assignments within extended range that are not on the exact frequency, but have bandwidth overlap.
4	Area GMF assignments with bandwidth overlap.
5	Fixed and area NG assignments in extended range with bandwidth overlap.
6	Fixed and area non-USA ITUF assignments in extended range with bandwidth overlap.



5. CHANNEL OCCUPANCY AND AMPLITUDE STATISTICS

This section contains the results of measurements on the 220-400 MHz band in the Norfolk area. Measurements included in this analysis were collected during four weekdays between 8 a.m. and 5 p.m. This included a maximum of 3,438 measurements for sub-band 3 (260-280 MHz), and a minimum of 707 measurements for sub-band 6 (320-340 MHz). At the end of this section the data are listed and plotted according to frequency in 5 MHz blocks. The same data are used in section 7.

The measurement index number used in tables 5.1 to 5.36 is not to be construed as any sort of official designation, but is used in data analysis as a convenient means of identifying each of the 3,501 channels measured in this band. The percent usage is rounded off to the nearest 0.1% (corresponding to 3 measurements out of 3,438). The maximum and average received power is rounded to the nearest decibel. All amplitude measurements were made with the MSCAN routine, which may not accurately measure average power values, depending on modulation characteristics. When signals larger than - 30 dBm are present, general statistics are not collected, but the peak signal amplitude is recorded.

The plots of usage in figures 5.1 to 5.36 are plotted between 0.5% and 100% on a logarithmic scale with grid lines drawn on a 1-2-5-10 basis. The amplitude statistics are plotted over the range between - 120 dBm and - 20 dBm, with the bottom of the vertical line representing the average signal level during the time the signal was above - 106 dBm threshold. The top of the line is the maximum signal amplitude measured at that frequency. In both graphs, the graphed data have been offset very slightly to the right of their proper positions so that data are not hidden when they fall directly on the scale lines or edges of the graphs.

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Table 5.1. Usage Summary List For 220-225 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.221	
GMF 750511		SCANS 3389		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
49	222.45	.2	-74	-91	0
50	222.5	.4	-75	-92	0
51	222.55	.3	-78	-94	0
75	223.75	.1	-97	-101	0
81	224.05	.1	-101	-103	0
83	224.15	.1	-95	-98	0
88	224.4	.1	-104	-105	0
93	224.65	.1	-103	-103	0
94	224.7	.1	-98	-99	000300
99	224.95	.1	-100	-102	000300
100	225	.1	-96	-102	000300

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3389

CASS 173.221  
THRESHOLD (dBm) -106

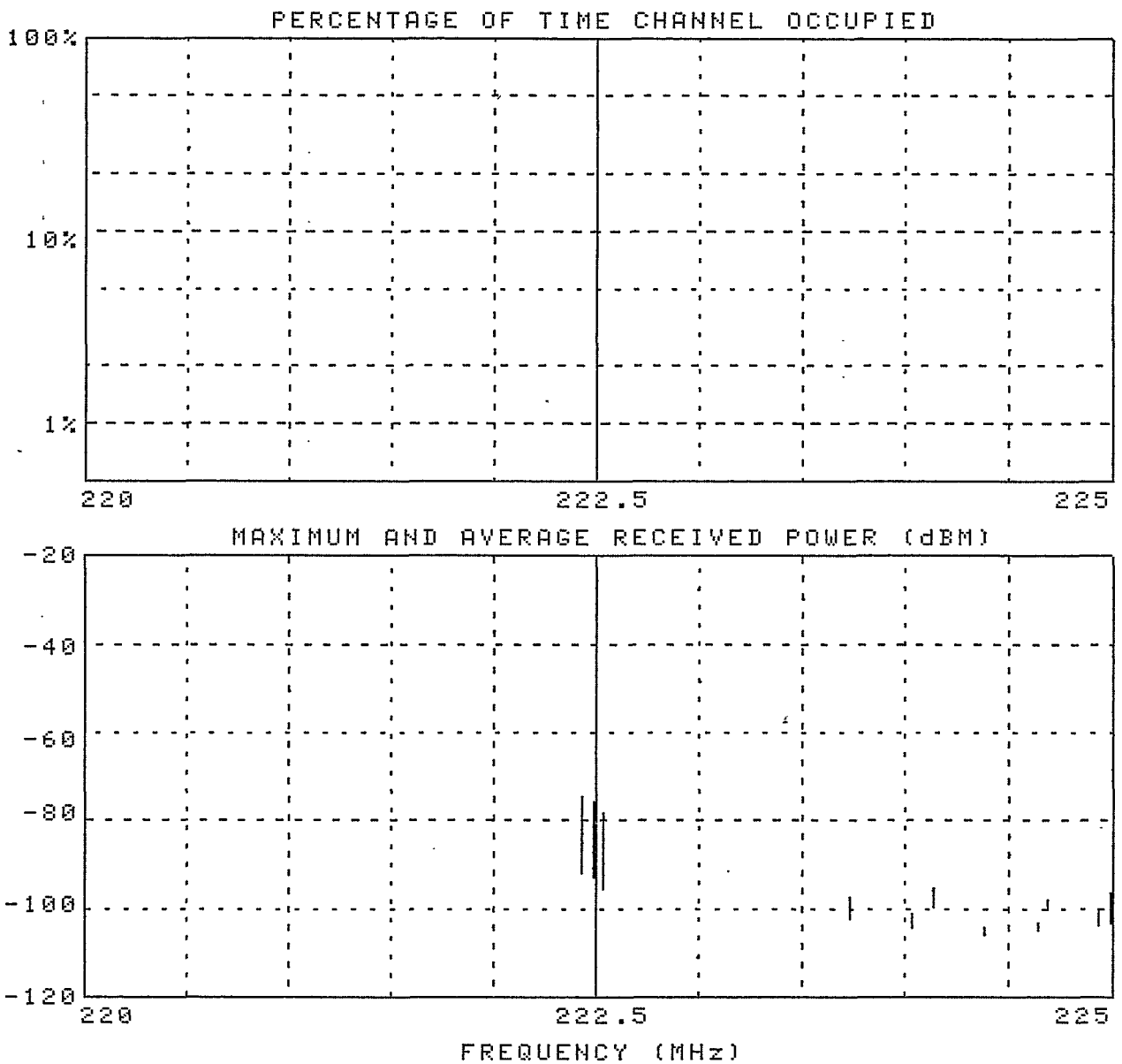


Figure 5.1. Usage summary plot for 220-225 MHz.

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Table 5.2. Usage Summary List For 225-330 MHz.

NOPFOLK, VIRGINIA APRIL 1973 CACC 173.231  
 GHF 750511 SCANS 3389 THRESHOLD (dBm) -106

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
101	225.05	.1	-100	-102	000300
102	225.1	.1	-92	-98	000300
104	225.2	.1	-98	-101	000300
105	225.25	.2	-101	-104	000300
106	225.3	.2	-100	-103	000300
107	225.35	.1	-103	-104	0
108	225.4	.1	-96	-102	300100
109	225.45	.1	-105	-105	0
110	225.5	.1	-103	-104	0
111	225.55	.1	-105	-105	0
112	225.6	.2	-101	-104	000100
113	225.65	.2	-95	-103	0
114	225.7	.1	-104	-104	0
115	225.75	.1	-97	-102	0
116	225.8	.1	-100	-103	000100
117	225.85	.1	-97	-100	0
118	225.9	.1	-97	-101	000100
120	226	.1	-105	-105	0
121	226.05	.1	-100	-103	0
122	226.1	.1	-103	-104	000100
123	226.15	.1	-100	-103	0
124	226.2	.1	-100	-103	0
125	226.25	.1	-103	-104	0
126	226.3	.1	-103	-103	0
127	226.35	.1	-98	-102	0
128	226.4	.1	-104	-105	110000
129	226.45	.1	-105	-105	0
132	226.6	.1	-85	-97	001000
133	226.65	.1	-99	-100	001000
134	226.7	.1	-100	-102	010000
136	226.8	.3	-95	-100	001000
137	226.85	.1	-97	-102	0
138	226.9	.1	-97	-102	0
139	226.95	.1	-105	-105	0
140	227	.1	-104	-104	0
142	227.1	.1	-97	-102	010100
143	227.15	.1	-102	-103	000100
145	227.25	.2	-97	-102	000100
146	227.3	.1	-94	-102	010100
147	227.35	.1	-101	-103	000100
148	227.4	.1	-94	-99	0
149	227.45	.1	-104	-104	0
150	227.5	.1	-102	-104	0
151	227.55	.1	-103	-104	0
154	227.7	.1	-101	-103	0
155	227.75	.2	-93	-101	0
156	227.8	.1	-100	-102	0
157	227.85	.1	-99	-101	0
158	227.9	.1	-100	-102	000100
159	227.95	.1	-99	-103	0
160	228	.1	-92	-99	0
161	228.05	.1	-103	-104	0
162	228.1	.2	-94	-101	000100
163	228.15	.1	-105	-105	0
164	228.2	.1	-100	-101	0
165	228.25	.1	-104	-105	0
166	228.3	.1	-104	-104	0
167	228.35	.2	-90	-102	0
168	228.4	.1	-94	-100	000100
169	228.45	.1	-104	-104	002000
170	228.5	.1	-101	-104	002000
171	228.55	.1	-102	-104	220000
172	228.6	.2	-89	-101	002000
173	228.65	.1	-104	-104	002000
174	228.7	.3	-94	-102	0
175	228.75	.1	-100	-102	0
176	228.8	0	-105	-105	140000
177	228.85	.3	-96	-103	0
178	228.9	.2	-100	-103	0
179	228.95	.2	-104	-104	0
181	229.05	.1	-104	-104	0
182	229.1	.1	-102	-102	0
183	229.15	.1	-93	-101	0
184	229.2	.1	-100	-103	0
185	229.25	.1	-102	-103	0
186	229.3	.2	-100	-102	0
187	229.35	.1	-104	-104	0
188	229.4	.1	-102	-103	010000
189	229.45	.2	-102	-104	0
190	229.5	.1	-102	-104	0
191	229.55	.1	-98	-103	0
192	229.6	.1	-98	-102	0
194	229.7	.2	-92	-102	111000
195	229.75	.1	-101	-104	010000
196	229.8	.1	-104	-104	011000
197	229.85	.2	-102	-104	001000
198	229.9	.5	-93	-97	120000
200	230	.2	-103	-104	001000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3389

CASS 173.221  
THRESHOLD (dBm) -106

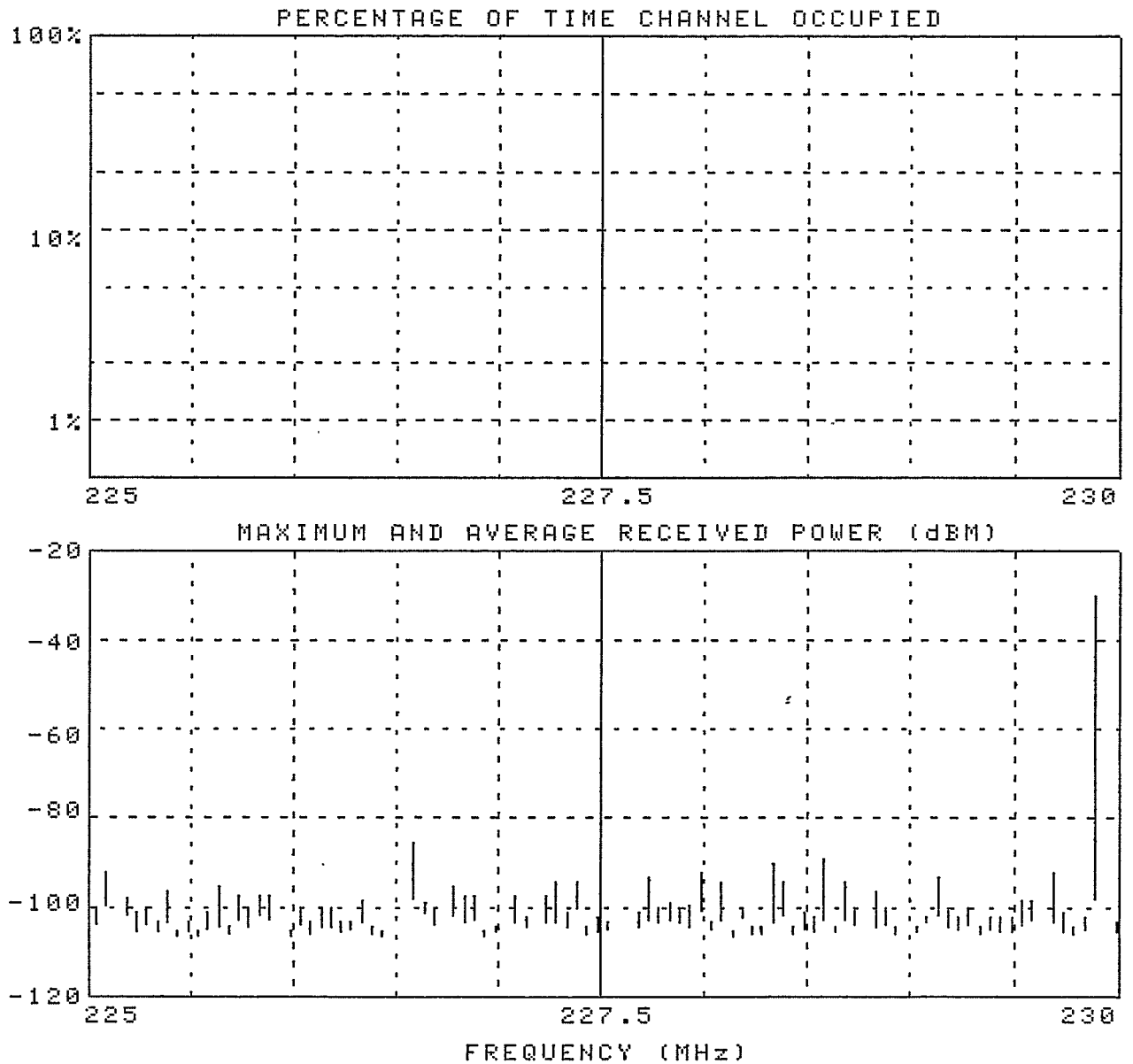


Figure 5.2. Usage summary plot for 225-230 MHz.

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
201	230.05	.1	-101	-103	001000
202	230.1	.1	-97	-102	001000
203	230.15	.2	-91	-102	001000
204	230.2	.1	-103	-104	0
205	230.25	.2	-98	-103	0
206	230.3	.1	-105	-105	001100
207	230.35	.1	-99	-101	001100
208	230.4	.2	-92	-102	001000
209	230.45	.1	-91	-100	001100
210	230.5	.1	-98	-103	001100
211	230.55	.1	-106	-104	0
212	230.6	.1	-100	-102	0
213	230.65	.2	-97	-103	0
214	230.7	.1	-97	-102	000100
215	230.75	.1	-100	-102	000100
216	230.8	.1	-99	-103	000100
217	230.85	.1	-98	-101	000100
218	230.9	.1	-100	-103	000100
220	231	.1	-101	-102	000100
221	231.05	.1	-105	-105	000100
222	231.1	.1	-102	-103	0
223	231.15	.1	-101	-103	0
225	231.25	.1	-103	-104	0
226	231.3	.2	-100	-103	010000
227	231.35	.2	-103	-104	0
229	231.45	.2	-98	-102	0
230	231.5	.1	-103	-104	0
231	231.55	.1	-103	-104	0
232	231.6	.1	-99	-103	0
233	231.65	.1	-102	-103	0
234	231.7	.1	-103	-104	0
235	231.75	.1	-90	-100	0
236	231.8	.1	-86	-98	0
237	231.85	.1	-100	-102	0
238	231.9	.1	-92	-100	0
239	231.95	.1	-92	-100	0
240	232	.2	-99	-102	0
241	232.05	.1	-95	-99	0
242	232.1	.2	-102	-104	0
243	232.15	.2	-97	-102	0
244	232.2	.1	-98	-101	0
245	232.25	.1	-105	-105	000100
246	232.3	.3	-103	-104	000100
247	232.35	.1	-104	-104	000100
248	232.4	.2	-92	-101	000100
249	232.45	.1	-100	-102	000100
250	232.5	.1	-100	-102	000100
251	232.55	.1	-100	-102	000100
252	232.6	.1	-99	-102	0
253	232.65	.1	-102	-103	0
254	232.7	.1	-99	-101	0
255	232.75	.1	-100	-102	0
256	232.8	.1	-93	-99	0
257	232.85	.1	-105	-105	0
258	232.9	.1	-102	-103	0
259	232.95	.2	-98	-102	0
261	233.05	.1	-91	-100	0
262	233.1	.1	-99	-101	0
263	233.15	.1	-100	-103	0
266	233.3	.1	-97	-101	0
267	233.35	.1	-100	-102	0
268	233.4	.2	-99	-102	0
269	233.45	.1	-103	-104	0
270	233.5	.1	-103	-104	0
271	233.55	.1	-92	-100	0
272	233.6	.2	-92	-102	0
273	233.65	.1	-98	-102	0
274	233.7	3.9	-67	-86	200000
276	233.8	.1	-101	-103	100000
277	233.85	.1	-104	-104	0
278	233.9	.1	-96	-100	010000
279	233.95	.1	-99	-102	0
280	234	.1	-100	-104	0
281	234.05	.2	-92	-99	0
283	234.15	.1	-103	-104	0
284	234.2	.1	-102	-104	0
285	234.25	.1	-96	-101	0
286	234.3	.1	-101	-103	0
287	234.35	.1	-97	-103	0
288	234.4	.1	-84	-99	120000
289	234.45	.2	-97	-103	0
290	234.5	.2	-100	-103	0
291	234.55	.1	-102	-104	0
292	234.6	.1	-103	-104	0
293	234.65	.2	-98	-103	0
294	234.7	.3	-83	-99	140000
295	234.75	.1	-99	-100	0
296	234.8	.1	-102	-102	0
297	234.85	.2	-96	-103	0
299	234.9	.1	-101	-103	0
299	234.95	.2	-100	-104	0
300	235	.2	-95	-101	0

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3389

CASS 173.221  
THRESHOLD (dBm) -106

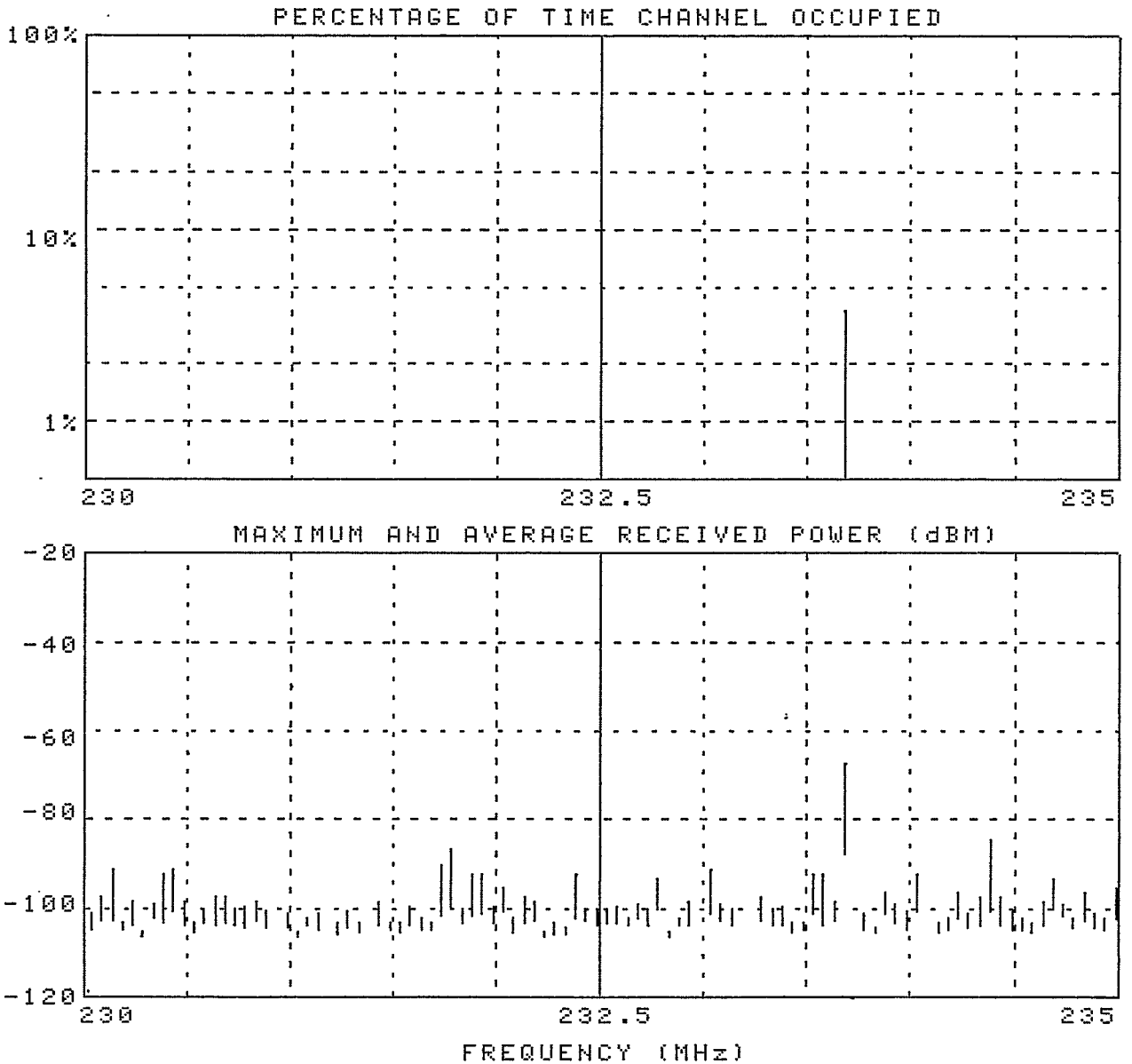


Figure 5.3. Usage summary plot for 230-235 MHz.

Table 5.4. Usage Summary List For 235-240 MHz.

NDPFOLI, VIRGINIA GNF 750511		APRIL 1978 SCAN# 3389		CACS 173.231 THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GNF CODE
301	235.05	.1	-100	-103	0
302	235.1	.2	-99	-103	330400
303	235.15	.1	-102	-103	0
304	235.2	.1	-103	-103	0
305	235.25	.1	-100	-103	0
306	235.3	.2	-93	-101	001000
307	235.35	.1	-97	-100	001000
308	235.4	.1	-82	-93	111000
309	235.45	.2	-103	-104	001000
310	235.5	.1	-98	-103	310000
311	235.55	.1	-98	-102	001000
312	235.6	.1	-96	-100	001000
313	235.65	.1	-99	-103	001000
314	235.7	.1	-97	-101	001000
315	235.75	.1	-104	-104	0
316	235.8	.1	-102	-102	0
317	235.85	.1	-101	-103	0
318	235.9	.1	-102	-103	0
319	235.95	.1	-95	-100	0
320	236.	.1	-98	-101	0
321	236.05	.1	-97	-98	0
322	236.1	.1	-100	-102	000100
323	236.15	.1	-96	-98	0
324	236.2	.1	-104	-104	110000
325	236.25	.1	-100	-101	0
326	236.3	.1	-99	-99	010000
327	236.35	.1	-97	-97	0
328	236.4	.1	-103	-104	0
330	236.5	.1	-93	-99	0
331	236.55	.1	-101	-102	0
333	236.65	.1	-100	-102	0
334	236.7	.2	-86	-100	0
335	236.75	.1	-97	-100	0
336	236.8	.1	-102	-102	0
337	236.85	.1	-98	-103	0
338	236.9	.1	-87	-100	0
339	236.95	.1	-91	-99	0
340	237.	.1	-101	-103	0
341	237.05	.1	-100	-102	0
343	237.15	.1	-101	-102	0
345	237.25	.1	-103	-104	0
346	237.3	.1	-100	-101	0
348	237.4	.1	-103	-104	0
349	237.45	.1	-90	-95	0
350	237.5	.6	-73	-86	120000
351	237.55	.1	-95	-100	0
352	237.6	.1	-102	-104	0
353	237.65	.1	-102	-102	0
354	237.7	.1	-102	-104	0
355	237.75	.1	-96	-99	0
356	237.8	.3	-97	-103	0
358	237.9	.1	-97	-101	000100
359	237.95	.1	-101	-103	0
361	238.05	.1	-99	-102	0
362	238.1	2	-74	-86	110000
363	238.15	.1	-98	-100	0
364	238.2	.1	-99	-101	0
365	238.25	.1	-103	-104	0
366	238.3	.1	-103	-104	000100
367	238.35	.1	-95	-99	0
368	238.4	.1	-105	-105	0
369	238.45	.1	-102	-103	0
370	238.5	1.5	-79	-89	130000
371	238.55	.1	-103	-104	0
372	238.6	.2	-104	-104	0
373	238.65	.1	-102	-103	0
374	238.7	.1	-102	-103	000100
375	238.75	.1	-104	-104	0
376	238.8	.1	-97	-99	210000
377	238.85	.2	-95	-100	0
379	238.95	.1	-93	-96	0
380	239.	.1	-100	-102	0
381	239.05	.1	-104	-104	0
382	239.1	.1	-102	-104	000100
383	239.15	.1	-101	-104	0
384	239.2	.1	-101	-102	0
385	239.25	.1	-101	-103	0
386	239.3	.1	-94	-102	002100
387	239.35	.1	-96	-102	002100
388	239.4	.1	-104	-104	000100
389	239.45	.2	-101	-103	002100
390	239.5	.1	-103	-104	002100
391	239.55	.1	-91	-101	0
392	239.6	.1	-104	-105	0
394	239.7	.1	-99	-103	0
395	239.75	.2	-99	-104	0
396	239.8	1.5	-63	-82	110000
397	239.85	.1	-89	-97	0
398	239.9	.3	-70	-85	0
399	239.95	.1	-104	-104	001000
400	240.	.2	-89	-101	001000



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.221

GMF 750511

SCANS 3389

THRESHOLD (dBm) -106

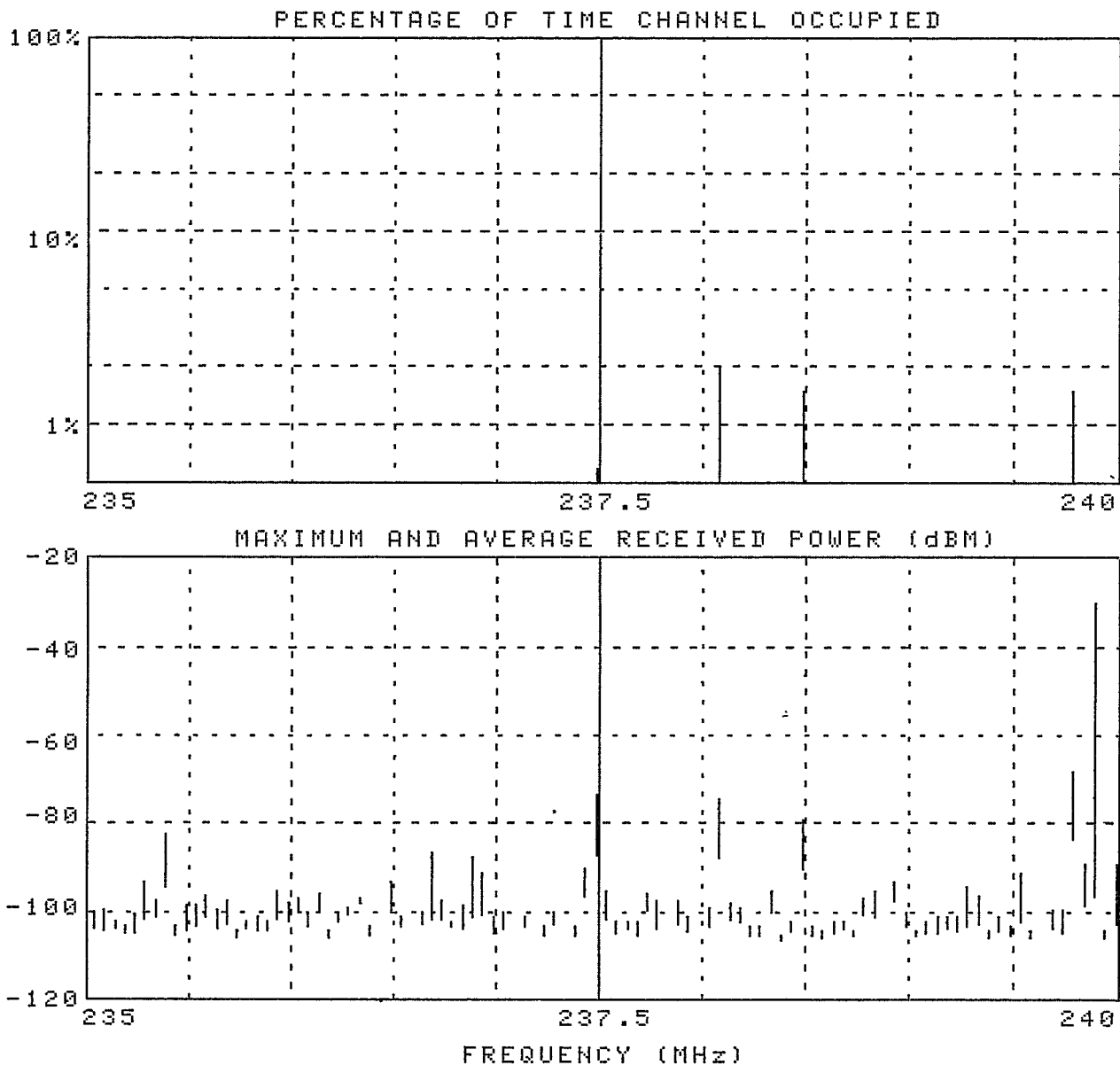


Figure 5.4. Usage summary plot for 235-240 MHz.

Table 5.5. Usage Summary List For 240-245 MHz.

NORFOLK, VIRGINIA  
GMF 750511APRIL 1978  
SCANS 2779CASS 173.242  
THRESHOLD (dBm) -106

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
2	240.1	.1	-102	-103	001100
4	240.2	0	--	--	110000
6	240.3	.1	-95	-100	001000
7	240.35	.1	-103	-104	001000
8	240.4	.1	-99	-103	001100
9	240.45	.1	-101	-102	001100
11	240.55	.2	-97	-102	000100
14	240.7	.2	-95	-102	0
15	240.75	.2	-95	-101	0
17	240.85	.1	-84	-93	0
18	240.9	.1	-95	-100	0
19	240.95	.2	-99	-103	0
20	241	.1	-97	-98	160000
21	241.05	.1	-102	-103	0
22	241.1	.2	-101	-102	0
23	241.15	.1	-97	-100	0
24	241.2	.1	-105	-105	0
25	241.25	.1	-100	-102	0
26	241.3	.2	-101	-103	0
27	241.35	.1	-102	-103	0
28	241.4	.1	-103	-103	0
30	241.5	.1	-95	-101	0
31	241.55	.1	-98	-101	0
32	241.6	.6	-97	-100	0
33	241.65	.1	-101	-103	0
36	241.8	.1	-103	-104	0
38	241.9	.1	-98	-102	0
41	242.05	.1	-104	-104	0
44	242.2	.1	-100	-103	0
46	242.3	.1	-102	-102	0
49	242.45	.1	-99	-101	0
50	242.5	0	-104	-104	110100
53	242.65	.1	-105	-105	0
54	242.7	.1	-95	-98	010000
55	242.75	.1	-96	-96	0
57	242.85	.1	-104	-104	0
59	242.95	.1	-101	-103	0
60	243	.5	-80	-97	390500
61	243.05	.1	-94	-100	0
62	243.1	.1	-102	-102	0
65	243.25	.1	-104	-104	0
66	243.3	.1	-93	-97	001000
67	243.35	.1	-102	-102	001000
70	243.5	.2	-101	-103	010000
71	243.55	.1	-100	-102	001000
72	243.6	.1	-103	-104	001000
73	243.65	.1	-102	-103	001000
75	243.75	.1	-103	-103	0
78	243.9	.1	-102	-103	130000
79	243.95	.1	-102	-103	000000
80	244	.1	-91	-99	028000
82	244.1	.1	-104	-105	029000
86	244.3	0	--	--	110000
87	244.35	.1	-101	-101	001000
92	244.6	.1	-98	-101	0
93	244.65	.2	-90	-100	000100
95	244.75	.1	-93	-98	000100
100	245	.1	-101	-103	0

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.242

GMF 750511

SCANS 2779

THRESHOLD (dBm) -106

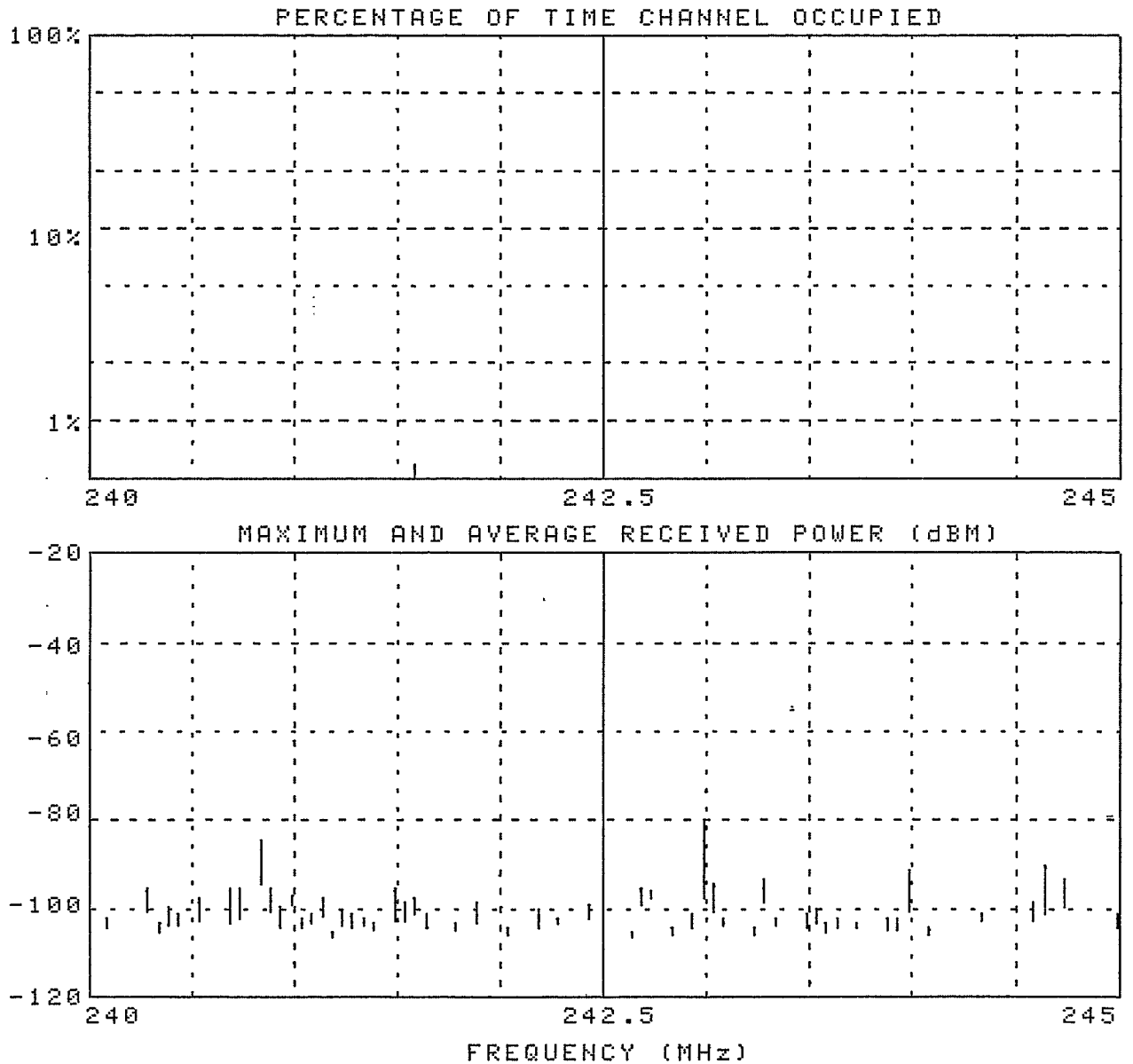


Figure 5.5. Usage summary plot for 240-245 MHz.

## FOR OFFICIAL USE ONLY

Table 5.6. Usage Summary List For 245-250 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.242	
GMF 750511		SCANS 2779		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
104	245.2	.1	-100	-101	010100
105	245.25	.1	-93	-99	000100
107	245.35	.1	-100	-102	000100
111	245.55	.1	-92	-95	0
114	245.7	.1	-101	-101	0
120	246	.1	-98	-101	0
124	246.2	.1	-92	-96	0
128	246.4	.1	-99	-101	0
129	246.45	.1	-100	-102	0
130	246.5	.1	-104	-104	0
131	246.55	.1	-91	-94	0
132	246.6	.1	-100	-102	0
136	246.8	.1	-103	-104	0
137	246.85	.1	-93	-101	0
138	246.9	.2	-97	-103	0
142	247.1	.1	-101	-102	0
143	247.15	.1	-102	-103	0
144	247.2	.1	-96	-99	0
145	247.25	.1	-98	-102	0
150	247.5	.1	-102	-102	0
151	247.55	.1	-95	-100	0
152	247.6	.1	-100	-103	0
153	247.65	.1	-103	-103	0
154	247.7	.1	-102	-102	0
156	247.8	.1	-102	-102	0
157	247.85	.1	-105	-105	0
159	247.95	.2	-101	-102	0
161	248.05	.1	-93	-99	0
162	248.1	.1	-90	-98	0
163	248.15	.1	-99	-102	0
164	248.2	1.8	-68	-84	120000
166	248.3	.1	-99	-100	0
169	248.45	.1	-92	-98	0
170	248.5	.1	-102	-102	012100
172	248.6	.1	-102	-103	020100
174	248.7	.1	-102	-102	002100
178	248.9	.1	-100	-101	0
180	249	.1	-93	-100	0
181	249.05	.1	-98	-101	0
192	249.6	.1	-100	-102	001000
193	249.65	.1	-104	-105	001000
194	249.7	.1	-97	-99	001000
195	249.75	.1	-99	-103	0
197	249.85	.1	-84	-98	0
198	249.9	12.7	-53	-82	110000
199	249.95	.1	-92	-95	0
200	250	.1	-30	-72	020000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2779

CASS 173.242  
THRESHOLD (dBm) -106

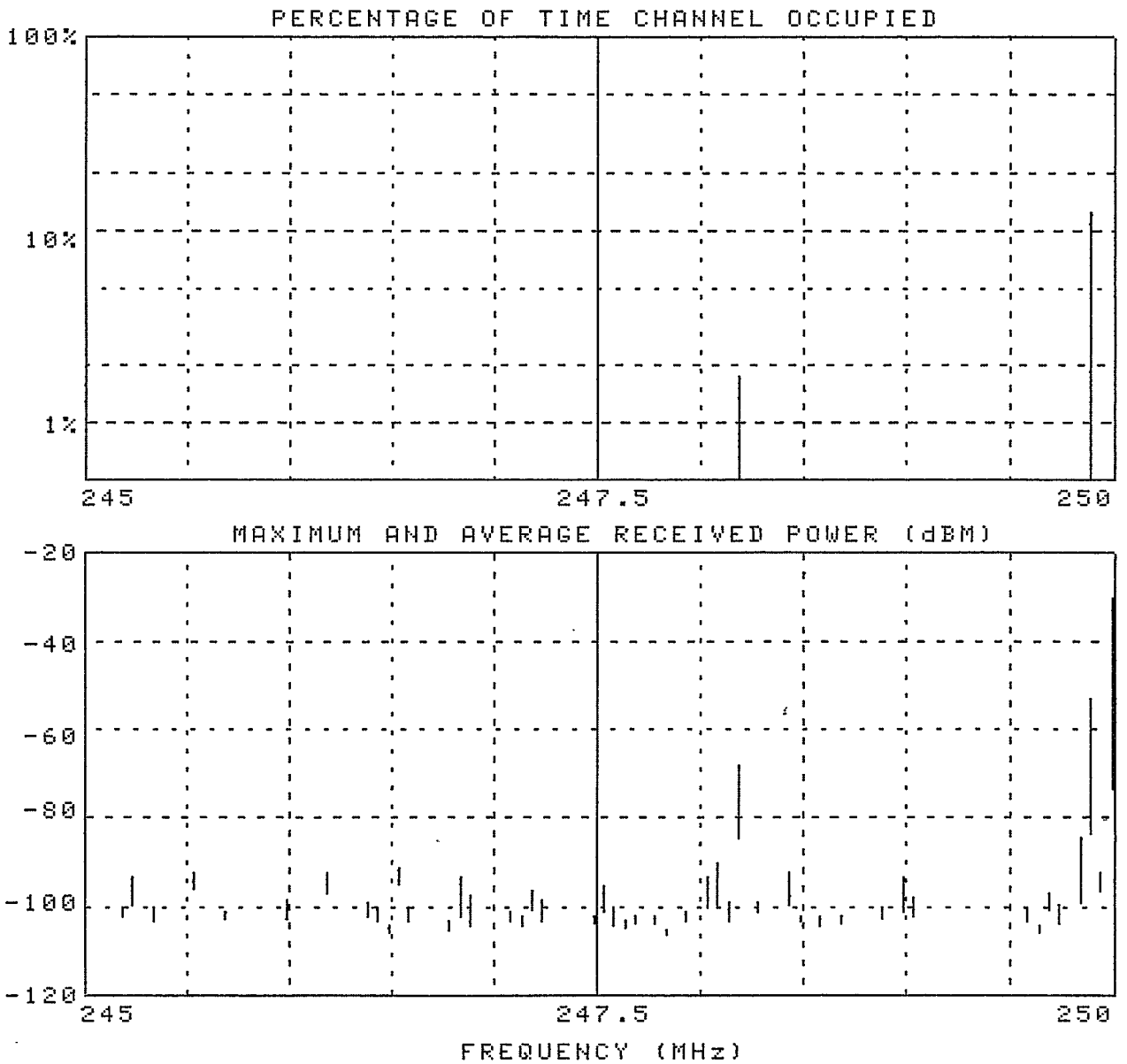


Figure 5.6. Usage summary plot for 245-250 MHz.

FOR OFFICIAL USE ONLY

Table 5.7. Usage Summary List For 250-255 MHz.

NORFOLK, VIRGINIA GMF 750511		APRIL 1978 SCANS 2779		CASE 173,242 THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
201	250.05	.1	-101	-101	0
203	250.15	.1	-91	-100	0
204	250.2	.1	-90	-96	110000
207	250.35	.1	-103	-103	0
208	250.4	.5	-91	-102	0
209	250.45	.1	-93	-99	020000
210	250.5	7.7	-68	-84	110000
212	250.6	.3	-86	-100	0
213	250.65	.3	-99	-103	020000
217	250.85	.1	-94	-98	0
219	250.95	.1	-102	-103	0
220	251	1.9	-79	-92	140000
226	251.3	0	--	--	110000
228	251.4	.1	-104	-104	0
230	251.5	.1	-91	-97	0
232	251.6	.1	-91	-100	0
234	251.7	.1	-100	-102	0
238	251.9	.1	-102	-103	120000
240	252	.1	-103	-104	0
241	252.05	.1	-101	-104	020000
243	252.15	.1	-104	-104	020000
244	252.2	.1	-104	-105	0
245	252.25	.1	-103	-104	0
246	252.3	.2	-97	-102	0
247	252.35	.1	-97	-99	0
248	252.4	.1	-101	-103	000100
249	252.45	.3	-95	-102	000100
250	252.5	.2	-101	-102	000100
251	252.55	.1	-102	-103	000100
252	252.6	.1	-103	-103	000100
253	252.65	.1	-103	-104	0
255	252.75	.3	-103	-104	0
256	252.8	.1	-104	-104	000100
257	252.85	.1	-103	-104	0
259	252.95	.1	-99	-100	0
260	253	.3	-101	-104	0
261	253.05	.3	-98	-102	0
262	253.1	.1	-101	-102	0
263	253.15	.1	-103	-103	0
264	253.2	3.7	-73	-89	110000
265	253.25	.3	-103	-104	0
266	253.3	.1	-102	-103	0
267	253.35	.1	-98	-101	010000
268	253.4	.1	-102	-103	0
269	253.45	.3	-95	-102	0
270	253.5	9.5	-58	-92	110000
271	253.55	.1	-102	-104	0
272	253.6	.1	-101	-103	010000
273	253.65	.1	-95	-99	020000
274	253.7	.3	-98	-102	0
275	253.75	.1	-102	-103	020000
276	253.8	.1	-101	-103	0
277	253.85	.2	-100	-102	020000
278	253.9	.2	-99	-103	0
279	253.95	.1	-100	-103	0
280	254	.3	-99	-103	0
281	254.05	.2	-91	-98	0
282	254.1	.5	-87	-97	0
283	254.15	.3	-91	-100	0
285	254.25	.2	-90	-101	0
286	254.3	.4	-87	-95	0
287	254.35	.3	-91	-100	0
288	254.4	.1	-99	-100	0
289	254.45	.2	-103	-104	0
292	254.6	.1	-102	-103	000200
294	254.7	.1	-103	-103	0
295	254.75	.1	-101	-104	0
296	254.8	.1	-96	-99	0
297	254.85	.1	-95	-99	0
299	254.95	.1	-103	-104	0
300	255	.1	-99	-100	0

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.242

GMF 750511

SCANS 2779

THRESHOLD (dBm) -106

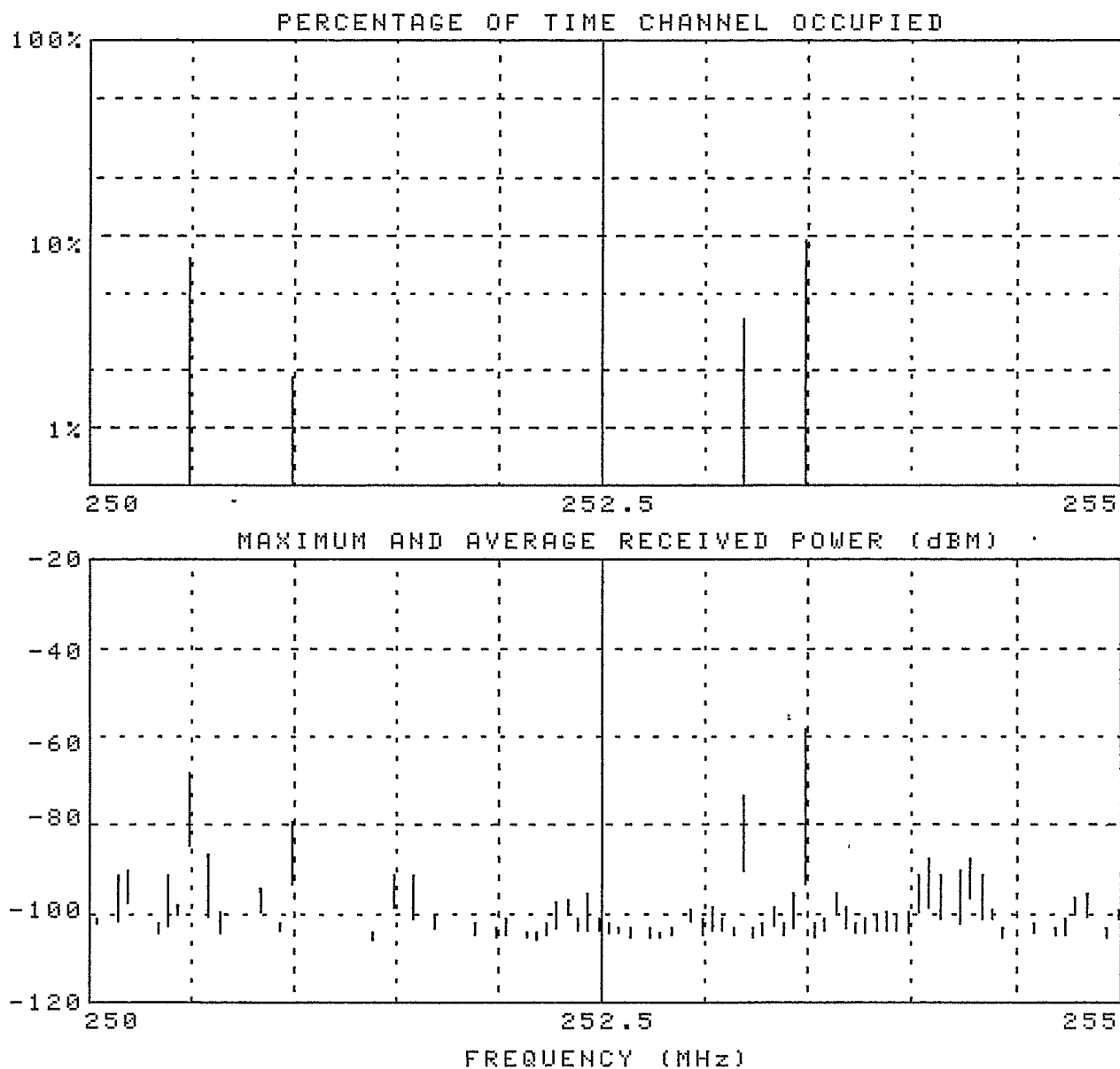


Figure 5.7. Usage summary plot for 250-255 MHz.

FOR OFFICIAL USE ONLY

Table 5.8. Usage Summary List For 255-260 MHz.

NORFOLK, VIRGINIA GMF 750511		APRIL 1978 SCANS 2779		CA3C 173.242 THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
303	255.15	.1	-100	-102	0
304	255.2	.1	-104	-104	0
305	255.25	.1	-89	-96	0
306	255.3	.1	-93	-98	0
307	255.35	.1	-99	-101	010000
308	255.4	4.3	-59	-95	170000
309	255.45	.2	-97	-102	020000
312	255.6	.3	-96	-102	010000
313	255.65	2.1	-100	-104	001000
314	255.7	12.7	-77	-87	001000
315	255.75	12.8	-61	-63	110000
316	255.8	12.7	-76	-86	001000
317	255.85	3	-98	-103	001000
318	255.9	.1	-104	-104	0
323	256.15	.1	-103	-103	000100
324	256.2	.1	-85	-94	000100
327	256.35	.1	-101	-101	000100
328	256.4	0	-105	-105	110000
329	256.45	.1	-102	-103	0
331	256.55	.1	-93	-100	0
332	256.6	2	-80	-96	140000
333	256.65	1.4	-97	-103	0
334	256.7	2.1	-88	-90	000100
335	256.75	.1	-94	-99	0
336	256.8	.1	-104	-105	0
337	256.85	.3	-96	-100	0
338	256.9	.1	-84	-88	000200
339	256.95	.1	-103	-104	020200
340	257	.3	-91	-101	000300
341	257.05	.1	-102	-103	020200
342	257.1	.1	-100	-102	000300
343	257.15	.1	-101	-103	020300
344	257.2	.3	-80	-95	010300
345	257.25	.4	-94	-100	000300
346	257.3	19.9	-44	-88	110200
347	257.35	.3	-91	-99	000200
348	257.4	.1	-102	-103	000200
349	257.45	.1	-97	-99	000300
351	257.55	.1	-97	-102	000200
352	257.6	.2	-91	-100	010300
354	257.7	.1	-97	-101	000200
355	257.75	.5	-98	-101	000300
356	257.8	5.9	-57	-93	120300
357	257.85	.2	-95	-100	000300
358	257.9	.1	-90	-100	000300
359	257.95	.1	-102	-103	000300
361	258.05	.1	-84	-95	000300
363	258.15	.1	-101	-103	000300
364	258.2	.1	-93	-99	000300
366	258.3	.1	-104	-104	000300
367	258.35	.1	-104	-104	000200
368	258.4	.1	-100	-102	000200
369	258.45	.1	-88	-96	020300
370	258.5	.1	-98	-98	000200
371	258.55	.2	-98	-103	020300
373	258.65	.1	-99	-101	020300
374	258.7	.1	-103	-103	000300
376	258.8	.1	-92	-99	000300
377	258.85	.1	-102	-103	000300
378	258.9	.1	-101	-102	010200
379	258.95	.1	-99	-100	000200
380	259	.2	-85	-99	000300
382	259.1	.1	-98	-102	000200
384	259.2	.1	-101	-102	000200
387	259.35	.1	-97	-100	000300
388	259.4	.1	-100	-102	000200
389	259.45	.2	-97	-102	000300
393	259.55	.1	-102	-103	001300
394	259.7	.1	-102	-103	010300
396	259.8	.1	-100	-100	001400
397	259.85	.1	-103	-104	000300
400	260	.2	-30	-34	000300



NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2779

CASS 173.242  
THRESHOLD (dBm) -106

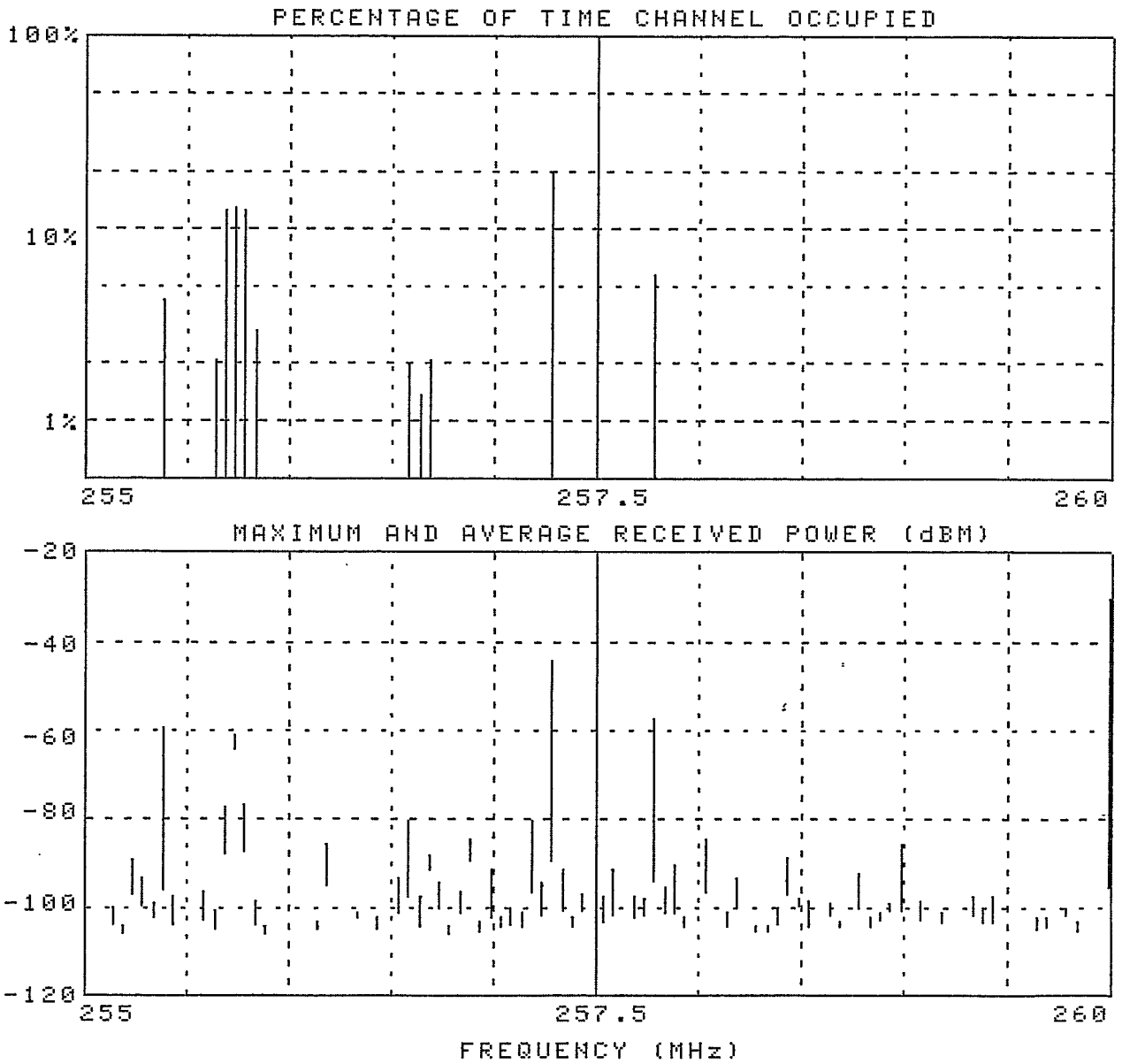


Figure 5.8. Usage summary plot for 255-260 MHz.

FOR OFFICIAL USE ONLY

Table 5.9. Usage Summary List For 260-265 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CLASS 173.263	
GMF 750511		SCANS 3438		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
1	260.05	.1	-100	-100	000200
2	260.1	.1	-102	-103	000300
4	260.2	.1	-93	-98	000400
5	260.25	.1	-98	-102	000300
7	260.35	.1	-102	-103	000200
8	260.4	.1	-88	-96	000200
10	260.5	.1	-95	-99	000200
11	260.55	.1	-100	-103	000200
13	260.65	.1	-95	-97	000200
14	260.7	.1	-97	-101	000200
15	260.75	.1	-99	-103	000200
16	260.8	.1	-102	-102	000200
17	260.85	.1	-93	-101	000200
19	260.95	.1	-103	-103	000200
21	261.05	.1	-92	-97	000200
22	261.1	.1	-101	-101	000200
25	261.25	.1	-102	-102	000200
27	261.35	.1	-101	-103	000200
30	261.5	.1	-102	-102	110200
32	261.6	.1	-104	-104	000200
33	261.65	.1	-104	-104	000200
34	261.7	.1	-94	-99	000200
35	261.75	.1	-81	-98	000200
36	261.8	.1	-97	-99	000200
39	261.95	.1	-86	-96	000200
40	262	.3	-88	-92	110200
44	262.2	.1	-103	-104	000200
45	262.25	.1	-101	-103	000200
46	262.3	.1	-83	-93	000200
50	262.5	.1	-91	-97	000200
51	262.55	.1	-95	-103	000300
52	262.6	.8	-85	-100	000200
53	262.65	.1	-89	-100	000200
54	262.7	0	-100	-100	110200
55	262.75	.1	-103	-104	000200
56	262.8	.1	-102	-104	120200
57	262.85	.1	-102	-102	000200
58	262.9	1.4	-72	-79	110200
59	262.95	.1	-95	-99	000200
60	263	.1	-102	-104	000200
62	263.1	.1	-88	-93	000200
63	263.15	.1	-98	-102	000200
64	263.2	.2	-87	-100	140200
65	263.25	.1	-96	-98	000200
66	263.3	2.7	-78	-95	110200
67	263.35	.1	-86	-94	000200
68	263.4	.8	-71	-82	110200
69	263.45	.1	-104	-104	000200
70	263.5	.1	-85	-97	110200
72	263.6	0	--	--	110200
74	263.7	.1	-88	-99	000200
77	263.85	0	--	--	110200
79	263.95	.1	-87	-97	001200
80	264	.5	-86	-96	020200
84	264.2	.1	-83	-94	230200
85	264.25	.1	-100	-102	000200
86	264.3	.1	-95	-100	000200
87	264.35	.1	-101	-102	000200
88	264.4	.1	-95	-100	000200
89	264.45	.1	-93	-96	000200
90	264.5	.1	-101	-103	000200
93	264.65	.1	-102	-103	000200
94	264.7	.2	-90	-98	000200
100	265	.1	-98	-103	000200

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.263

GMF 750511

SCANS 3438

THRESHOLD (dBm) -106

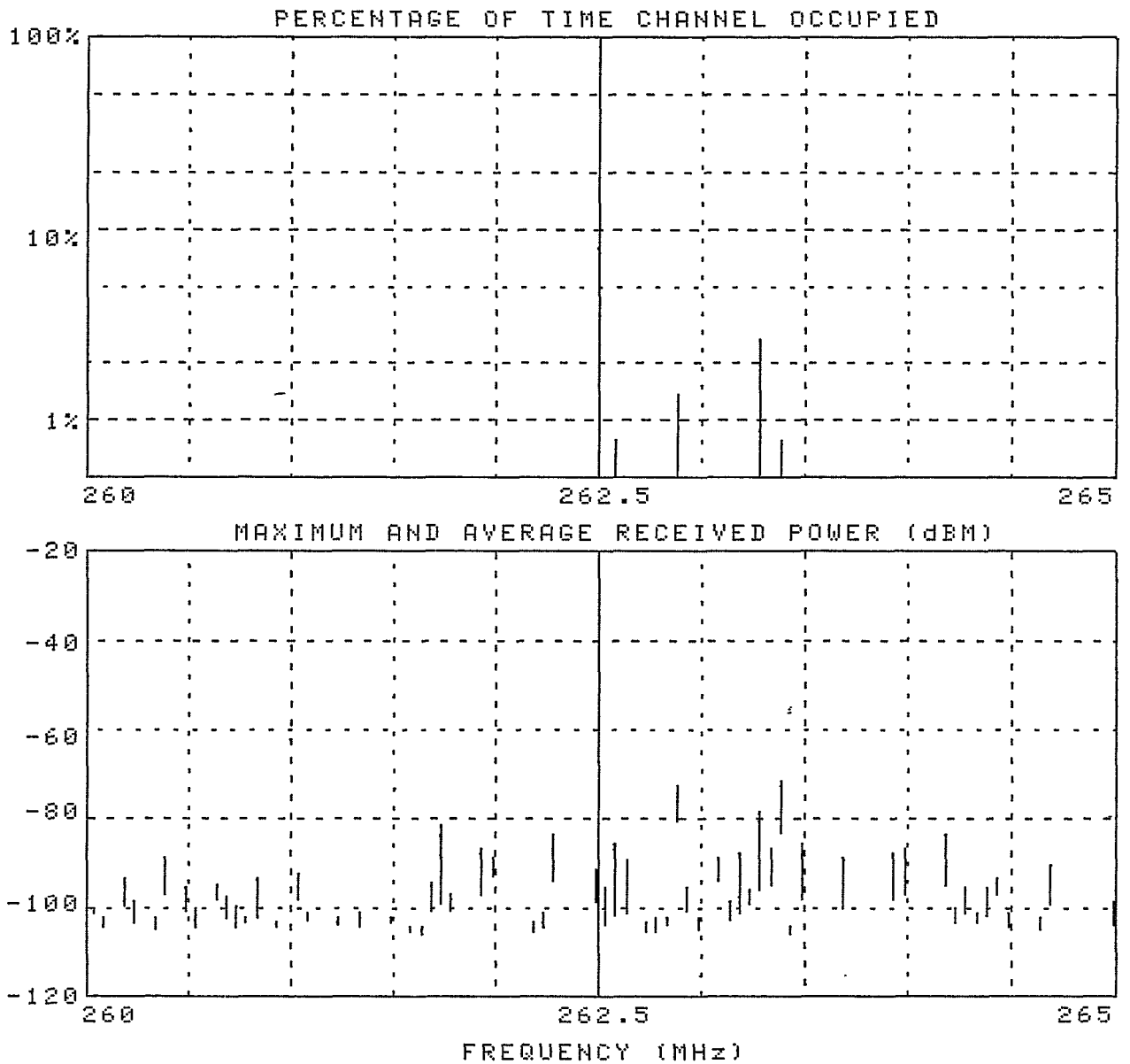


Figure 5.9. Usage summary plot for 260-265 MHz.

Table 5.10. Usage Summary List For 265-270 MHz.

NOFFOLK, VIRGINIA		APRIL 1978		CACC 173.263	
GMF 750511		SCANS 3438		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
102	265.1	.1	-93	-93	110200
103	265.15	.1	-92	-99	000200
105	265.25	.1	-105	-105	000200
106	265.3	.1	-96	-100	020200
107	265.35	.1	-93	-97	020200
108	265.4	.1	-103	-103	000200
109	265.45	.1	-96	-100	020200
110	265.5	.1	-81	-96	000200
111	265.55	.1	-93	-101	020200
112	265.6	.1	-94	-99	010200
113	265.65	.1	-104	-105	000200
114	265.7	.1	-86	-95	110200
115	265.75	.1	-104	-104	000200
116	265.8	0	-98	-98	120200
117	265.85	.1	-95	-99	000200
118	265.9	.1	-94	-101	000200
120	266	.1	-90	-94	000200
122	266.1	.1	-95	-98	000200
123	266.15	.1	-100	-102	000200
125	266.25	.1	-100	-102	000200
126	266.3	.1	-97	-98	000200
128	266.4	.1	-101	-101	000200
129	266.45	.1	-100	-102	000200
131	266.55	.1	-88	-95	001200
132	266.6	.1	-88	-99	001300
133	266.65	.1	-89	-99	110200
134	266.7	0	-104	-104	111200
136	266.8	1.7	-73	-100	000200
139	266.95	.1	-87	-95	020000
142	267.1	.1	-94	-100	0
143	267.15	.1	-97	-100	0
144	267.2	.1	-99	-103	110000
145	267.25	.1	-91	-99	0
148	267.4	.1	-94	-98	120000
149	267.45	.1	-90	-96	0
150	267.5	.2	-81	-95	0
151	267.55	.1	-103	-104	0
152	267.6	.1	-95	-100	010000
153	267.65	.1	-98	-103	0
156	267.8	.1	-97	-100	000100
157	267.85	.1	-101	-103	0
158	267.9	.2	-97	-102	010000
159	267.95	.1	-100	-101	0
160	268	.9	-77	-82	020000
161	268.05	.1	-103	-103	0
162	268.1	.2	-85	-100	0
164	268.2	.7	-87	-96	110000
165	268.25	.1	-99	-101	020000
167	268.35	.1	-75	-93	020000
168	268.4	.1	-95	-100	0
169	268.45	.1	-99	-102	020000
170	268.5	.2	-93	-99	0
171	268.55	.2	-95	-103	0
172	268.6	.1	-86	-96	0
173	268.65	.1	-99	-101	0
174	268.7	1.6	-72	-94	0
175	268.75	.1	-102	-103	0
176	268.8	.2	-78	-85	110000
177	268.85	.3	-90	-101	0
178	268.9	2.2	-43	-78	110000
179	268.95	.3	-94	-100	0
180	269	.1	-93	-100	010000
181	269.05	.2	-83	-99	0
182	269.1	.2	-93	-100	0
184	269.2	.1	-96	-101	0
186	269.3	.1	-104	-104	010000
187	269.35	.3	-91	-98	0
188	269.4	1.4	-65	-85	010000
189	269.45	.2	-92	-101	0
190	269.5	.1	-85	-92	010000
191	269.55	.2	-97	-98	0
192	269.6	.4	-91	-99	0
194	269.7	.1	-101	-103	010000
195	269.75	.1	-93	-99	020000
196	269.8	.9	-60	-88	0
197	269.85	.1	-94	-97	020000
198	269.9	.1	-78	-89	010000
200	270	.1	-90	-96	0

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3438

CASS 173.263  
THRESHOLD (dBm) -106

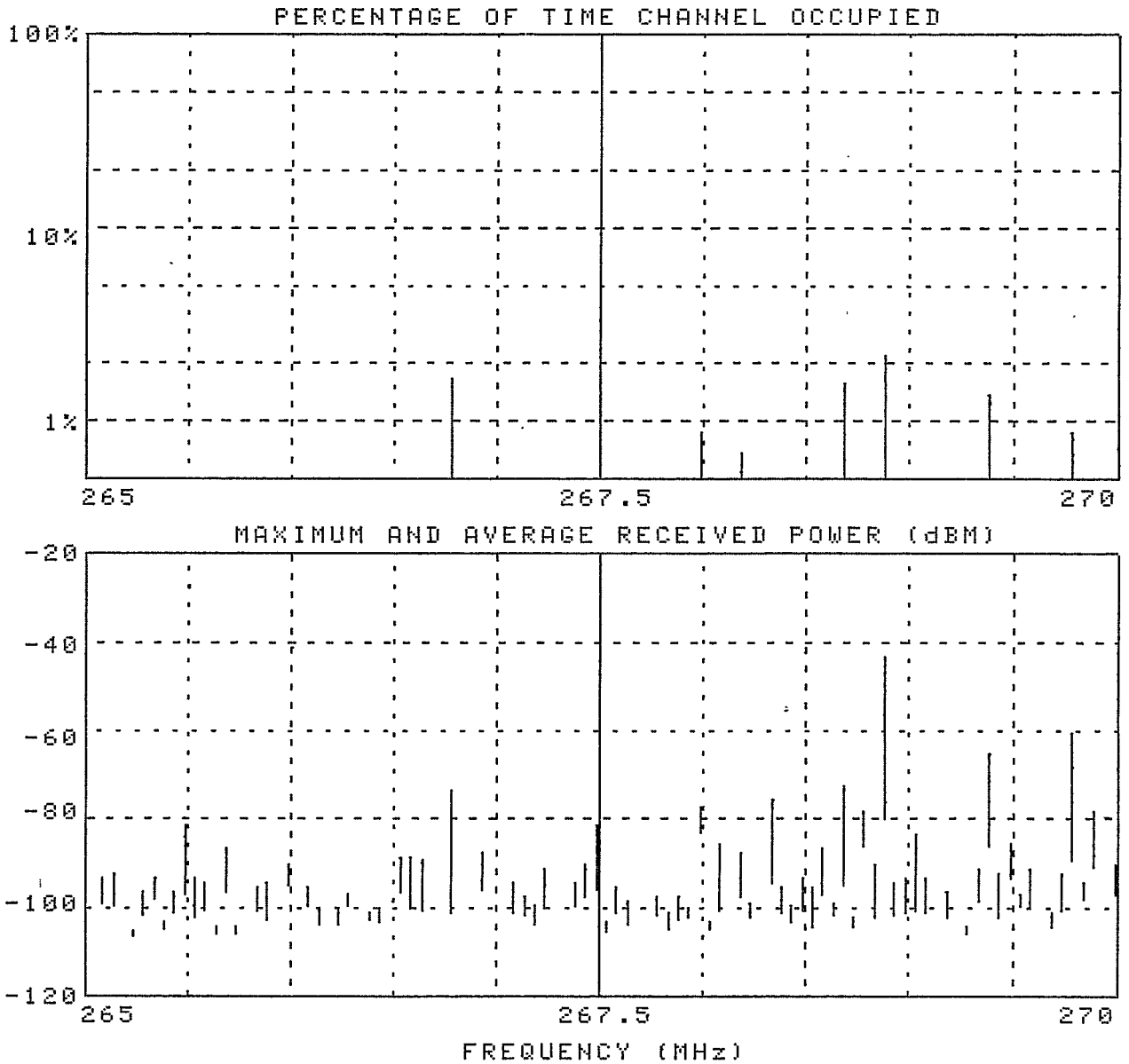


Figure 5.10. Usage summary plot for 265-270 MHz.

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Table 5.11. Usage Summary List For 270-275 MHz.

NORFOLK, VIRGINIA GMF 750511		APRIL 1978 SCANS 3438	CLASS 173.263 THRESHOLD (dBm) -106		
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
202	270.1	.1	-103	-104	110100
203	270.15	.1	-84	-98	0
205	270.25	.1	-97	-100	0
205	270.3	.1	-104	-104	0
208	270.4	2.3	-73	-92	140000
210	270.5	.1	-95	-99	010000
211	270.55	.1	-100	-102	0
212	270.6	.3	-72	-85	110000
213	270.65	.1	-99	-100	0
215	270.75	.1	-83	-87	0
216	270.8	.8	-74	-91	120000
221	271.05	.1	-102	-103	0
223	271.15	.1	-91	-99	0
224	271.2	.1	-90	-97	0
226	271.3	1.6	-42	-69	330000
227	271.35	.1	-99	-101	0
228	271.4	.2	-98	-102	110000
229	271.45	.1	-102	-103	0
232	271.6	.1	-101	-103	000100
233	271.65	.2	-91	-98	0
234	271.7	.1	-30	-96	0
235	271.75	.1	-93	-99	0
236	271.8	.1	-81	-90	0
237	271.85	.1	-104	-104	0
238	271.9	.1	-100	-102	0
240	272	.1	-99	-100	0
241	272.05	.1	-82	-95	0
244	272.2	.1	-104	-104	011100
245	272.25	.1	-99	-102	110000
247	272.35	.1	-99	-102	001000
248	272.4	.1	-95	-99	0
249	272.45	.1	-102	-103	0
250	272.5	.1	-91	-96	0
251	272.55	.1	-78	-95	0
253	272.65	.1	-102	-102	0
254	272.7	2	-82	-98	010000
255	272.75	.1	-98	-101	0
256	272.8	.1	-82	-96	0
257	272.85	.2	-99	-101	0
260	273	.1	-99	-102	220000
261	273.05	.1	-101	-102	0
263	273.15	.1	-99	-102	0
265	273.25	.1	-104	-104	0
270	273.5	.1	-101	-102	010100
272	273.6	.1	-94	-95	0
273	273.65	.1	-94	-97	0
275	273.8	0	-105	-105	110000
277	273.95	.1	-99	-100	0
278	273.9	.1	-96	-102	010000
280	274	0	-91	-91	110100
282	274.1	.1	-85	-87	001000
284	274.2	1.1	-54	-87	120000
285	274.25	.3	-98	-100	0
286	274.3	99.8	-50	-97	110000
287	274.35	.1	-102	-104	0
290	274.5	.1	-91	-100	010000
292	274.6	.1	-96	-102	110000
294	274.7	.5	-79	-86	1100.0
295	274.8	0	-100	-100	240000
297	274.75	.1	-99	-101	0
298	274.9	0	--	--	240000
299	274.95	.1	-104	-105	0
300	275	0	--	--	140000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3438

CASS 173.263  
THRESHOLD (dBm) -106

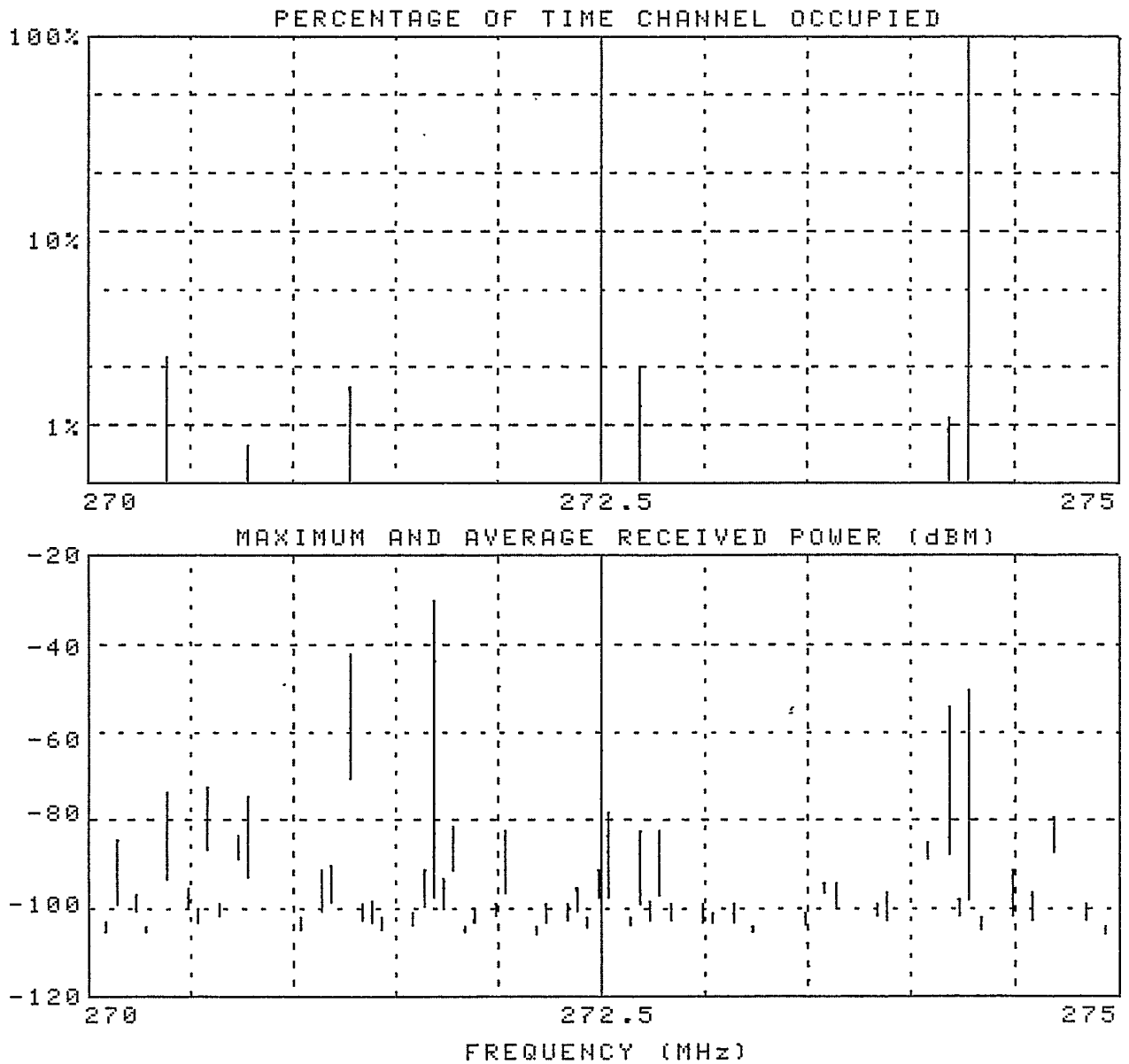


Figure 5.11. Usage summary plot for 270-275 MHz.

NORFOLK, VIRGINIA  
GMF 750511APRIL 1978  
SCANS 3438CASS 173.263  
THRESHOLD (dBm) -106

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
301	275.05	.1	-93	-97	0
303	275.15	.1	-97	-100	0
305	275.25	.1	-99	-102	0
307	275.35	.1	-89	-95	0
308	275.4	.9	-69	-82	110000
309	275.45	.1	-103	-104	0
310	275.5	0	-30	-95	0
316	275.8	8.5	-85	-98	140100
319	275.95	.1	-96	-100	0
321	276.05	.1	-97	-100	0
324	276.2	.1	-88	-99	020000
325	276.25	.1	-94	-97	0
326	276.3	.1	-101	-103	0
327	276.35	.1	-92	-97	0
331	276.55	.1	-94	-100	0
332	276.6	.1	-93	-100	0
333	276.65	.1	-95	-100	0
334	276.7	.1	-99	-100	0
335	276.75	.1	-99	-102	0
337	276.85	.1	-96	-99	0
338	276.9	.1	-93	-98	0
340	277	.7	-81	-92	120000
342	277.1	.1	-94	-99	0
344	277.2	.1	-95	-98	010000
346	277.3	0	--	--	110000
348	277.4	1.3	-73	-90	010000
350	277.5	.1	-95	-98	0
351	277.55	.1	-101	-103	0
352	277.6	.1	-95	-101	0
355	277.75	.1	-102	-103	0
356	277.8	.1	-30	-72	000100
357	277.85	.1	-100	-101	0
358	277.9	.1	-104	-104	0
360	278	.1	-96	-98	010000
363	278.15	.1	-98	-101	0
367	278.35	.1	-96	-100	0
370	278.5	.1	-98	-100	0
371	278.55	3.3	-87	-96	0
372	278.6	22	-71	-96	130000
373	278.65	.9	-83	-98	0
374	278.7	.1	-85	-92	0
375	278.75	.1	-91	-93	0
378	278.9	.1	-91	-97	0
381	279.05	.1	-98	-101	0
382	279.1	.1	-93	-97	0
384	279.2	8.3	-62	-90	0
385	279.25	.1	-100	-101	0
387	279.35	.1	-92	-97	0
388	279.4	.1	-105	-105	0
389	279.45	.3	-94	-100	0
390	279.5	.1	-89	-96	000100
392	279.6	16.1	-64	-84	110000
395	279.75	.3	-94	-97	0
396	279.8	.2	-89	-101	000600
398	279.9	.6	-75	-87	0
399	279.95	.1	-105	-105	0
400	280	.1	-73	-73	0



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.263

GMF 750511

SCANS 3438

THRESHOLD (dBm) -106

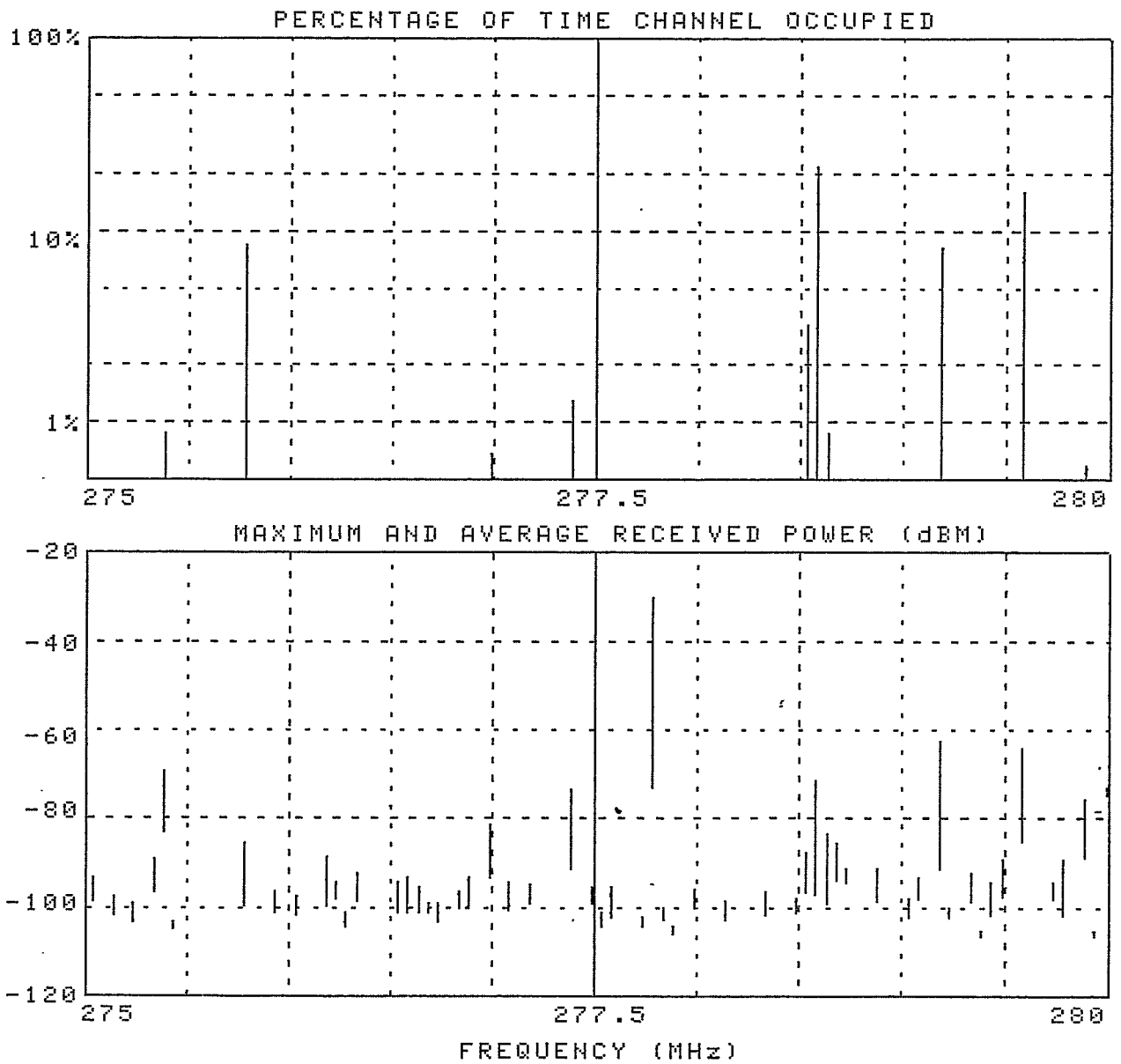


Figure 5.12. Usage summary plot for 275-280 MHz.

## FOR OFFICIAL USE ONLY

Table 5.13. Usage Summary List For 280-285 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.284	
GMF 750511		SCANS 1411		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
2	280.1	.4	-81	-84	110000
10	280.5	0	--	--	120000
24	281.2	0	--	--	110000
36	281.8	2	-89	-96	010200
39	281.95	7.1	-101	-104	000200
40	282	80.1	-79	-83	110200
41	282.05	13.1	-98	-103	000200
60	283	0	--	--	110200
62	283.1	0	--	--	230200
64	283.2	0	--	--	110200
68	283.4	.1	-44	-91	000200
70	283.5	0	--	--	110200
78	283.9	.4	-103	-103	000000
79	283.95	.6	-95	-98	000400
80	284	6.9	-71	-89	330400
81	284.05	1	-83	-92	000400
82	284.1	1.5	-78	-96	000400
83	284.15	13	-72	-101	000400
84	284.2	98.9	-46	-63	110400
85	284.25	14.8	-71	-99	000400
86	284.3	2.8	-74	-96	000400
87	284.35	1.2	-80	-97	000400
88	284.4	.6	-90	-95	000400
89	284.45	.4	-97	-102	000400
90	284.5	.1	-97	-98	110400
99	284.95	.4	-99	-101	000400
100	285	.4	-60	-60	010400

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.284

GMF 750511

SCANS 1411

THRESHOLD (dBm) -106

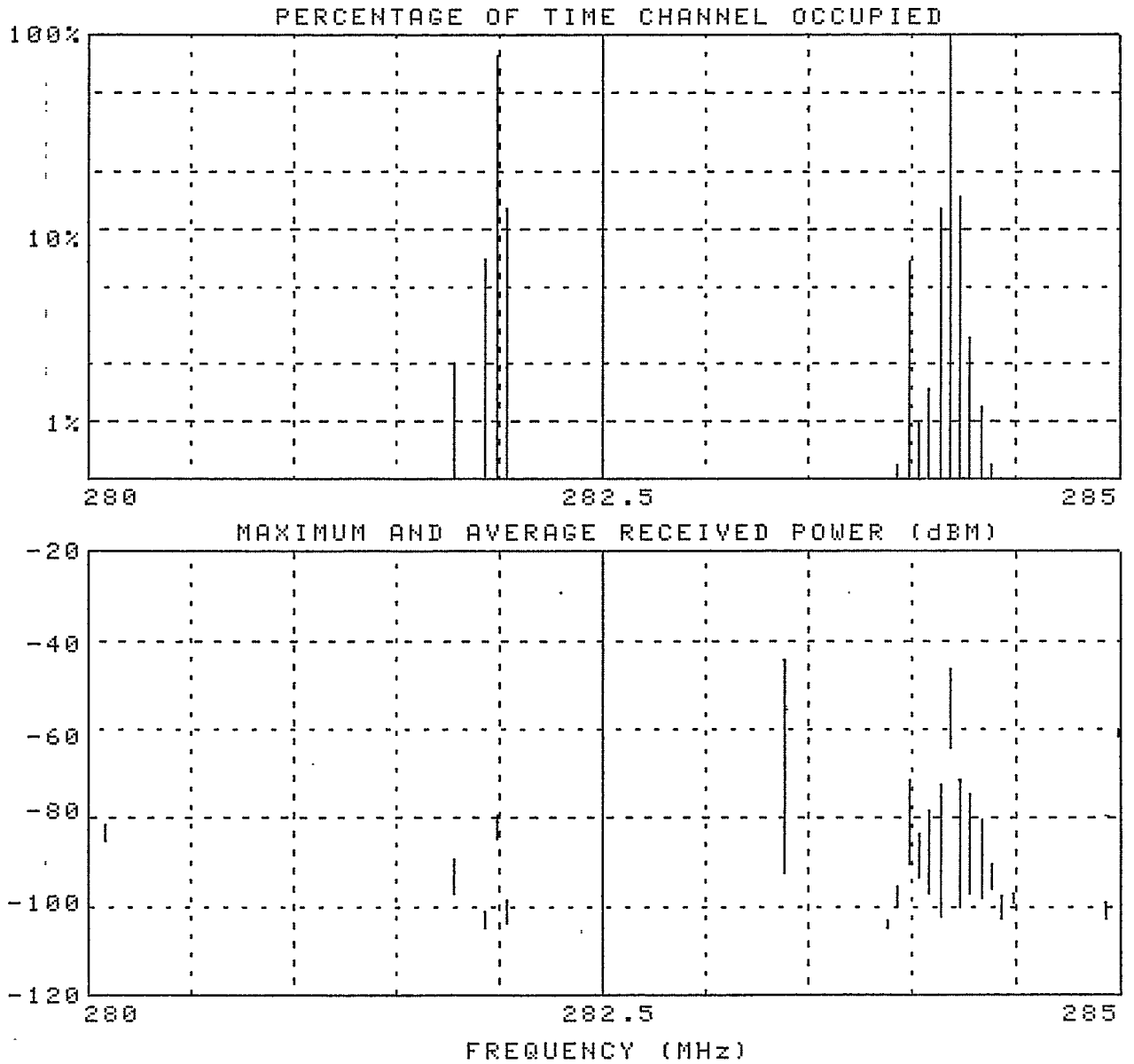


Figure 5.13. Usage summary plot for 280-285 MHz.

## FOR OFFICIAL USE ONLY

Table 5.14. Usage Summary List For 285-290 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.284	
GMF 750511		SCANS 1411		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
108	285.4	.1	-103	-104	010400
109	285.45	.1	-103	-103	000400
110	285.5	.6	-87	-96	010400
115	285.75	.1	-100	-100	000400
116	285.8	.1	-104	-104	110400
141	287.05	.1	-102	-102	000400
156	287.8	.1	-94	-96	140400
158	287.9	.1	-103	-103	000400
160	288	.1	-96	-96	000400
163	288.15	.1	-98	-98	000400
169	288.45	.1	-103	-103	000400
180	289	.5	-88	-91	110400
188	289.4	5	-63	-81	110500
198	289.9	.3	-90	-97	110400

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.284

GMF 750511

SCANS 1411

THRESHOLD (dBm) -106

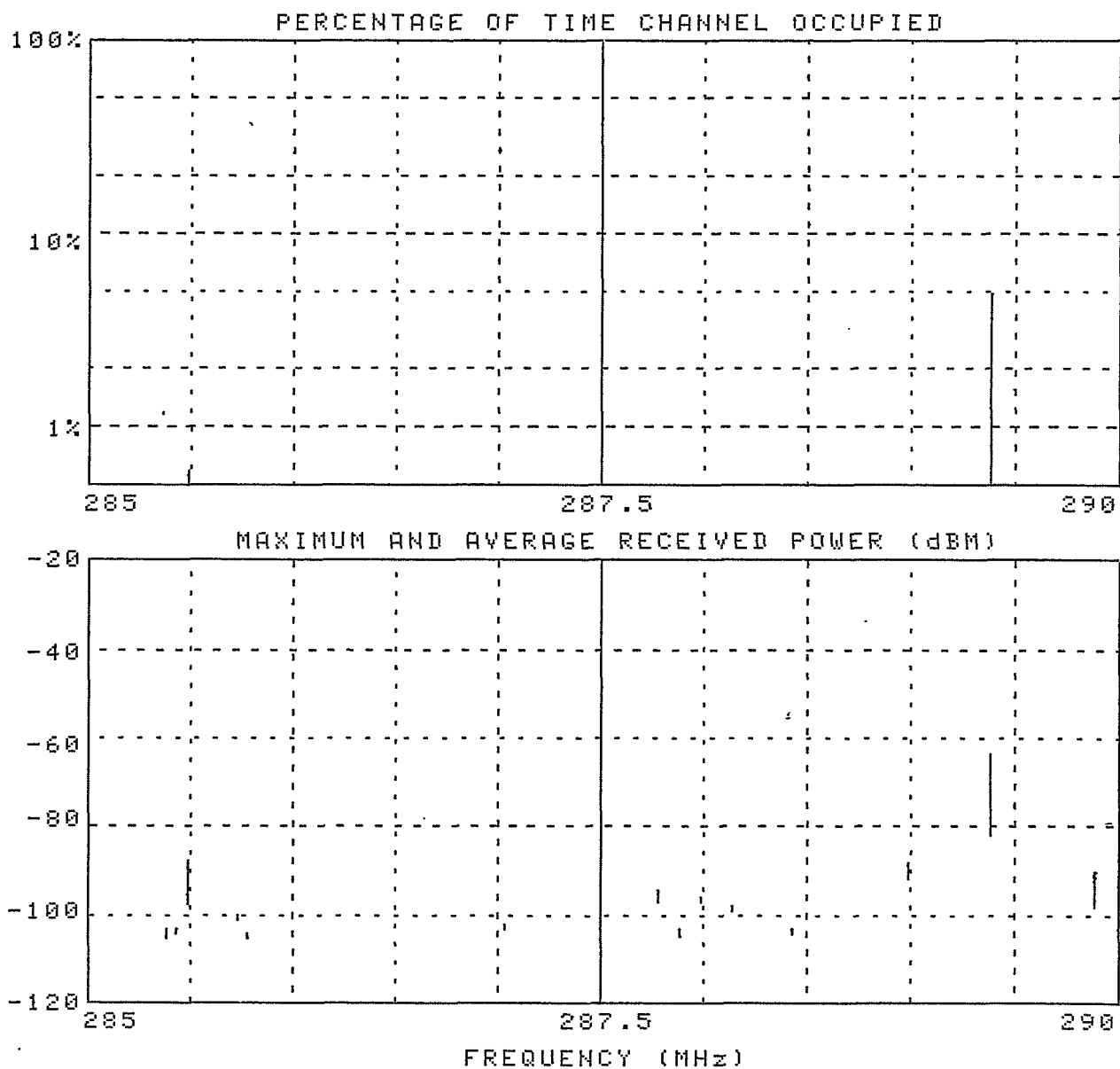


Figure 5.14. Usage summary plot for 285-290 MHz.

## FOR OFFICIAL USE ONLY

Table 5.15. Usage Summary List For 290-295 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.284	
GMF 750511		SCANS 1411		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
204	290.2	.1	-82	-82	000400
210	290.5	.1	-91	-95	000400
220	291	.1	-102	-102	000400
224	291.2	.4	-91	-94	110400
225	291.25	.1	-100	-100	000400
226	291.3	0	--	--	120400
242	292.1	.1	-103	-103	000300
246	292.3	8.6	-76	-88	110200
249	292.45	.1	-96	-100	000200
254	292.7	3.8	-91	-101	140200
255	292.75	.1	-100	-100	000200
258	292.9	.4	-102	-103	000200
259	292.95	52.7	-86	-88	240200
260	293	6.4	-92	-101	000600
261	293.05	.2	-105	-105	240200
267	293.35	.1	-92	-95	000400
268	293.4	3.6	-85	-91	110400
271	293.55	.1	-98	-98	000400
284	294.2	0	--	--	110200
293	294.65	0	--	--	240200
295	294.75	0	--	--	240200
298	294.9	0	--	--	110200

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.284

GMF 750511

SCANS 1411

THRESHOLD (dBm) -106

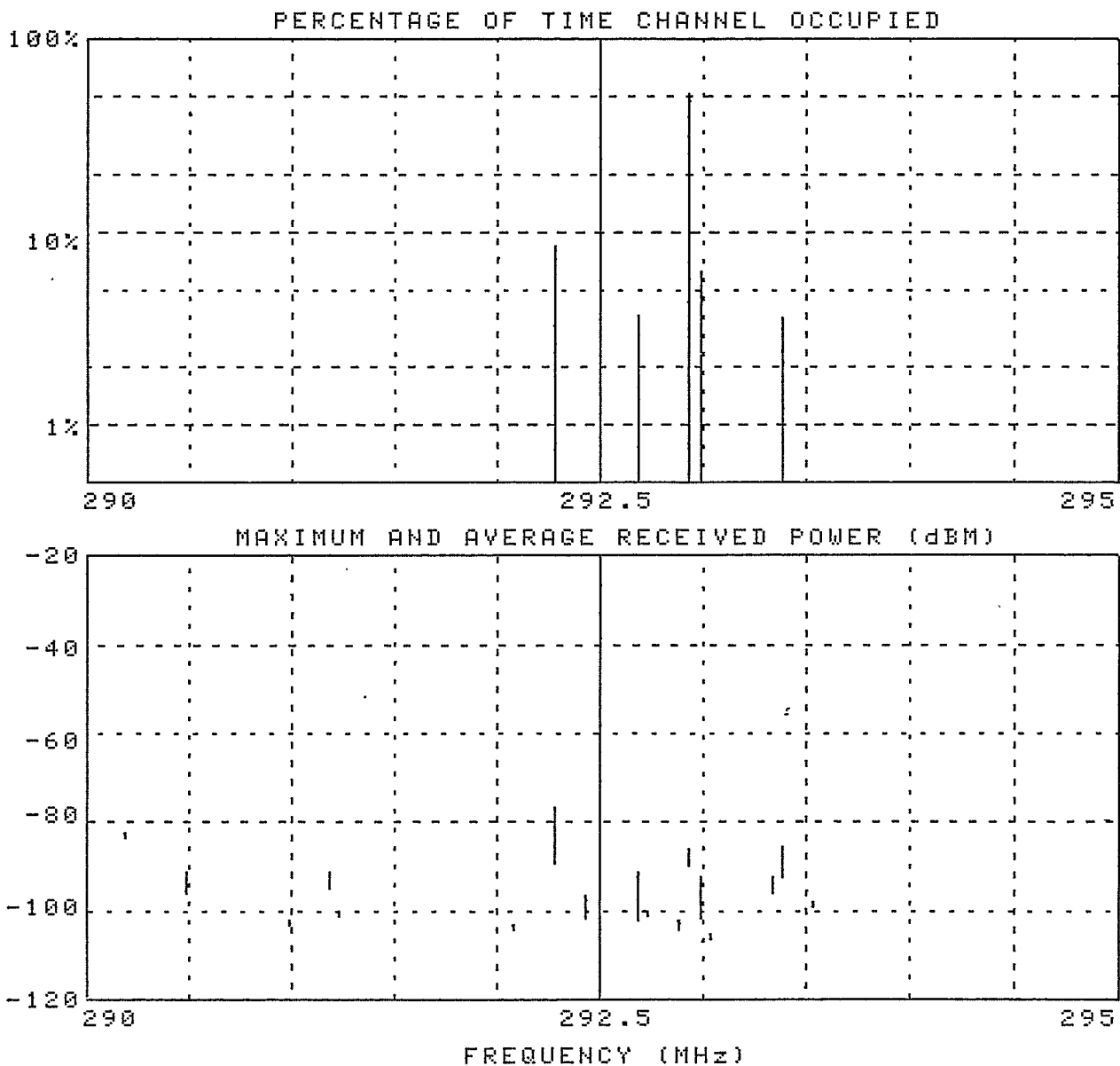


Figure 5.15. Usage summary plot for 290-295 MHz.

Table 5.16. Usage Summary List For 295-300 MHz.

NORFOLK, VIRGINIA		APRIL 1978	CASS 173.284		
GMF 750511		SCANS 1411	THRESHOLD (dBm) -106		
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
314	295.7	0	--	--	110200
327	296.35	0	--	--	240200
329	296.45	0	--	--	240200
334	296.7	.1	-104	-104	110200
348	297.4	0	--	--	110200
359	297.95	0	--	--	240200
361	298.05	0	--	--	240200
368	298.4	.8	-101	-103	000200
370	298.5	.1	-103	-103	130200
376	298.8	.1	-104	-104	000200
389	299.45	0	--	--	240200
390	299.5	0	--	--	110200
391	299.55	0	--	--	240200



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.284

GMF 750511

SCANS 1411

THRESHOLD (dBm) -106

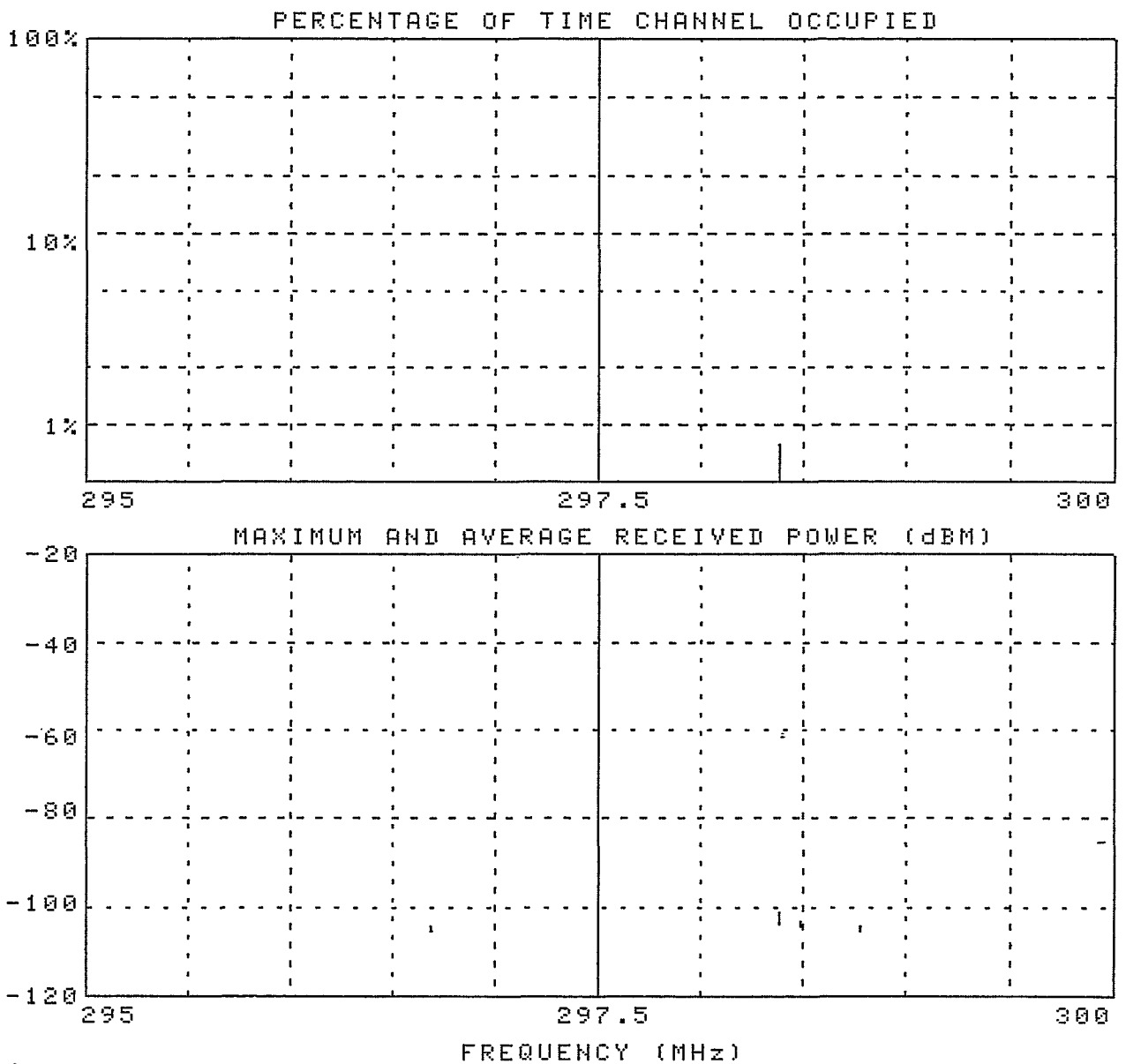


Figure 5.16. Usage summary plot for 295-300 MHz.

## FOR OFFICIAL USE ONLY

Table 5.17. Usage Summary List For 300-305 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.305	
GMF 750511		SCANS 1459		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
6	300.3	.7	-92	-93	000200
10	300.5	.1	-100	-100	110200
12	300.6	.1	-102	-102	000300
20	301	0	--	--	110200
24	301.2	.1	-103	-104	010200
30	301.5	.3	-90	-94	010200
36	301.8	.1	-103	-103	000200
38	301.9	0	--	--	110200
39	301.95	.2	-88	-99	000200
40	302	10.6	-54	-84	220200
41	302.05	.1	-81	-90	000200
44	302.2	.1	-104	-104	000200
48	302.4	.1	-102	-102	140200
49	302.45	.2	-100	-101	009500
50	302.5	.1	-99	-99	009500
51	302.55	44.2	-80	-94	009500
52	302.6	38	-94	-97	009500
53	302.65	2.9	-59	-66	009500
54	302.7	.3	-85	-98	291500
55	302.75	18.1	-49	-93	009500
56	302.8	18.2	-74	-92	009500
57	302.85	.3	-100	-102	009500
58	302.9	.1	-90	-92	009500
59	302.95	.1	-100	-101	009500
61	303.05	.1	-105	-105	001200
62	303.1	.3	-94	-95	001200
68	303.4	0	--	--	221100
80	304	0	--	--	111000
82	304.1	0	--	--	121000
84	304.2	0	--	--	121000
86	304.3	.1	-105	-105	001000
91	304.55	.1	-97	-97	001000
93	304.65	.1	-99	-99	001000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 1459

CASS 173.305  
THRESHOLD (dBm) -106

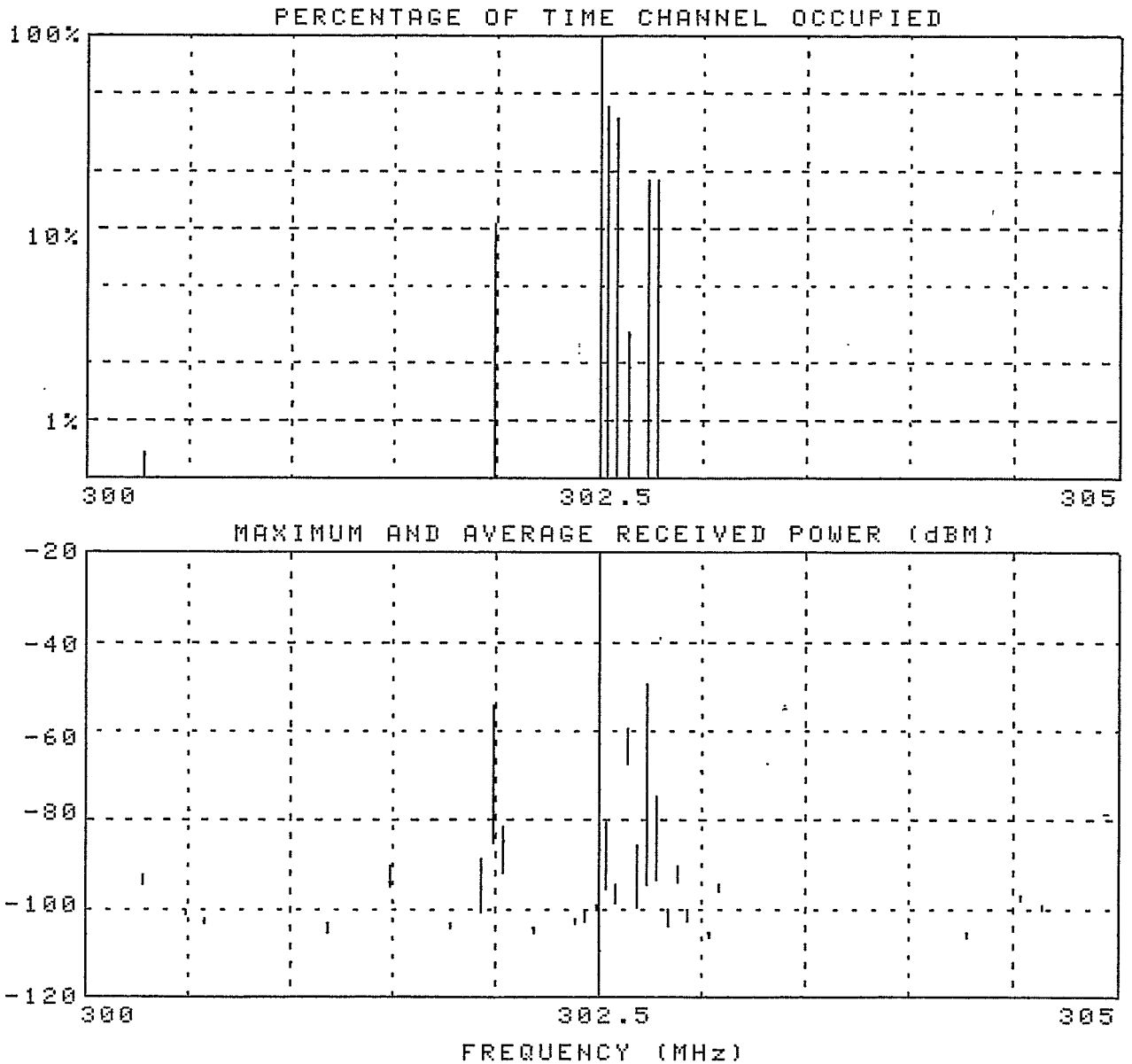


Figure 5.17. Usage summary plot for 300-305 MHz.

## FOR OFFICIAL USE ONLY

Table 5.18. Usage Summary List For 305-310 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.305	
GMF 750511		SCANS 1459		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
104	305.2	.1	-90	-90	021000
115	305.75	.1	-104	-104	001000
116	305.8	.1	-104	-104	-111110
118	305.9	.5	-95	-99	001000
120	306	.1	-100	-102	111000
121	306.05	.1	-101	-101	001000
122	306.1	.1	-93	-96	001000
123	306.15	.3	-91	-96	001000
125	306.25	.2	-88	-96	001000
126	306.3	.3	-90	-99	011000
127	306.35	.4	-84	-93	241000
128	306.4	.7	-81	-97	141000
129	306.45	13.2	-66	-71	241000
130	306.5	13.2	-68	-73	001000
131	306.55	.4	-82	-87	021000
132	306.6	.4	-83	-92	011000
133	306.65	.3	-88	-96	001000
134	306.7	.1	-100	-102	121000
135	306.75	.3	-94	-98	001000
136	306.8	.1	-102	-102	001000
138	306.9	11.1	-62	-88	111000
139	306.95	.1	-104	-104	001000
140	307	.1	-104	-104	001000
143	307.15	.1	-97	-97	001000
144	307.2	.9	-76	-88	011000
150	307.5	0	--	--	110000
155	307.75	0	--	--	161000
157	307.85	0	--	--	241000
159	307.95	13.6	-62	-63	241000
161	308.05	.4	-62	-63	021000
165	308.25	.1	-104	-104	001000
172	308.6	0	--	--	111000
180	309	0	--	--	111000
181	309.05	.5	-82	-92	001000
182	309.1	.1	-103	-103	001000
183	309.15	.1	-96	-96	001000
184	309.2	4.5	-52	-87	001000
185	309.25	.1	-101	-102	241000
186	309.3	.1	-100	-102	001000
187	309.35	.4	-81	-92	241000

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.305

GMF 750511

SCANS 1459

THRESHOLD (dBm) -106

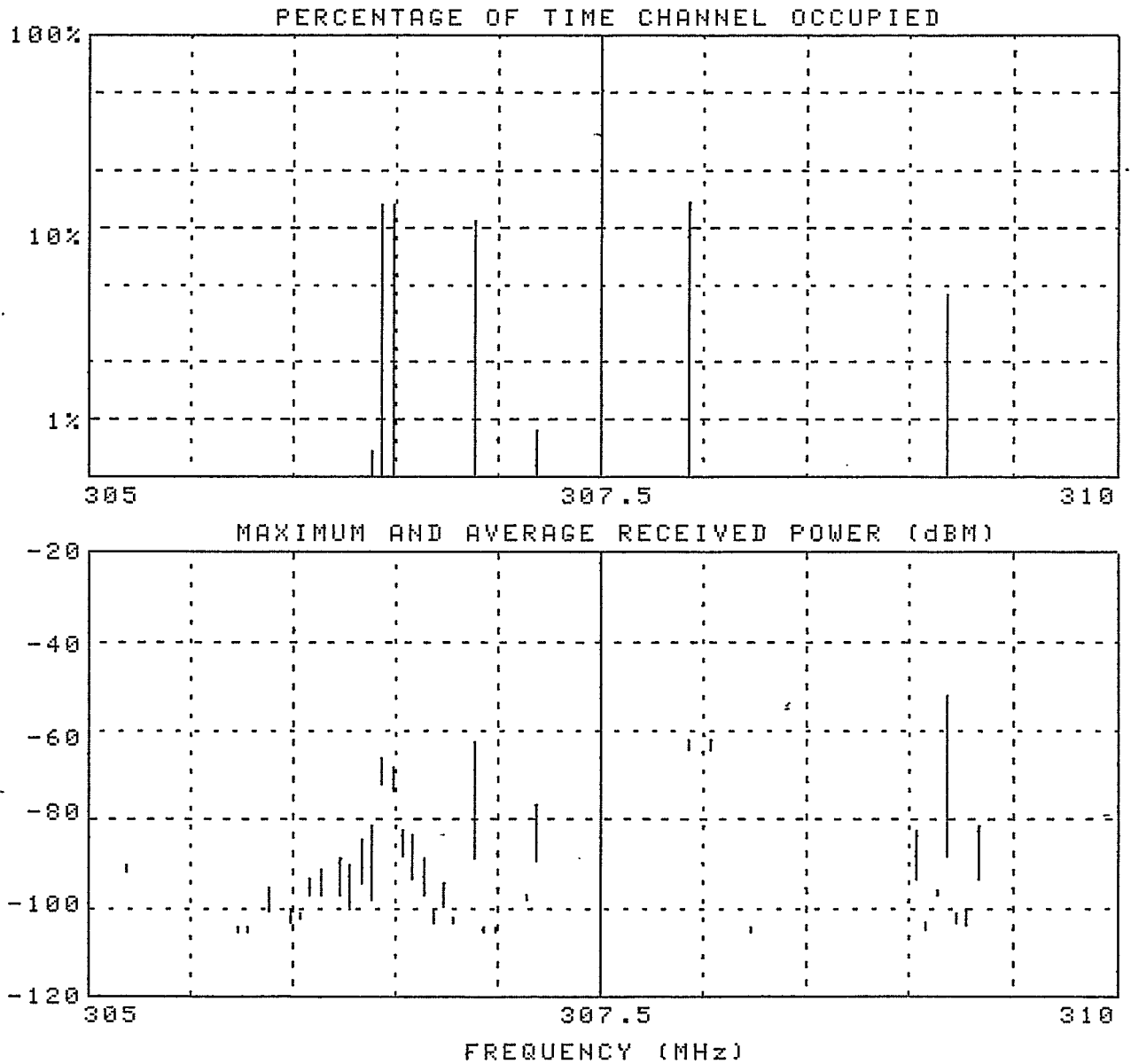


Figure 5.18. Usage summary plot for 305-310 MHz.

## FOR OFFICIAL USE ONLY

Table 5.19. Usage Summary List For 310-315 MHz.

NORFOLK, VIRGINIA		APRIL 1978	CASS 173.305		
GMF 750511		SCANS 1459	THRESHOLD (dBm) -106		
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
213	310.65	.1	-98	-98	001000
215	310.75	0	--	--	241000
216	310.8	1.4	-70	-87	001000
217	310.85	0	--	--	241000
220	311	1	-81	-86	243100
221	311.05	.4	-103	-104	003100
222	311.1	1	-98	-102	002100
223	311.15	99.4	-81	-89	161000
224	311.2	1.8	-100	-102	122000
228	311.4	0	--	--	112000
230	311.5	0	--	--	111000
244	312.2	.1	-90	-90	011000
245	312.25	.1	-104	-104	001000
246	312.3	.1	-103	-103	001000
247	312.35	.8	-72	-100	001000
248	312.4	6.7	-50	-63	111000
249	312.45	1.2	-76	-99	001000
250	312.5	.1	-91	-91	001000
258	312.9	.4	-103	-104	110000
260	313	0	--	--	120000
266	313.3	.2	-102	-103	0
276	313.8	0	--	--	110000
278	313.9	0	--	--	110000
284	314.2	0	--	--	110000
292	314.6	0	--	--	-250220

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.305

GMF 750511

SCANS 1459

THRESHOLD (dBm) -106

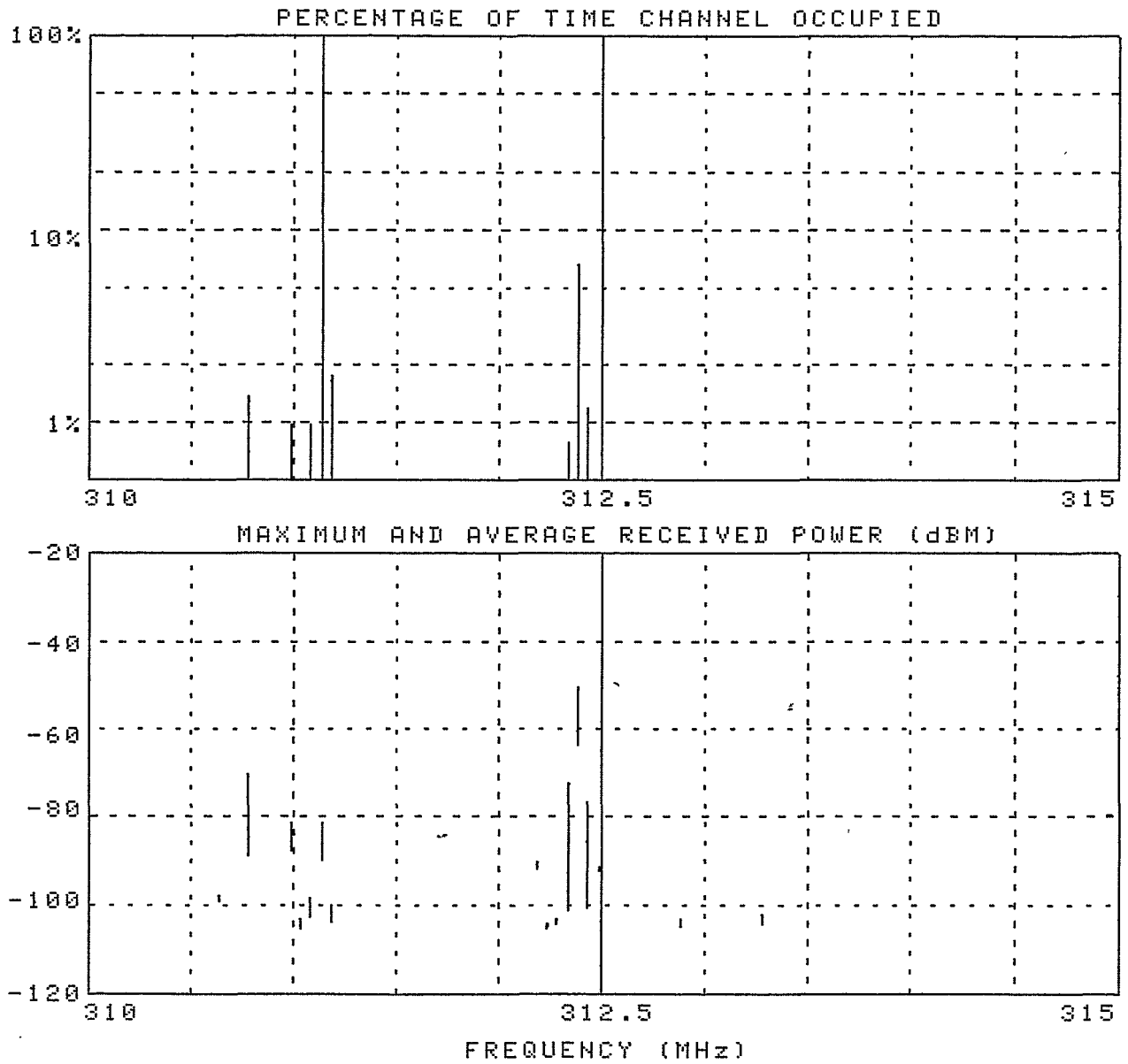


Figure 5.19. Usage summary plot for 310-315 MHz.

## FOR OFFICIAL USE ONLY

Table 5.20. Usage Summary List For 315-320 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.305	
GMF 750511		SCANS 1459		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
306	315.3	0	--	--	130000
331	316.55	.1	-101	-101	0
338	316.9	.1	-104	-104	010000
342	317.1	.1	-100	-101	028000
344	317.2	11.7	-96	-104	028000
350	317.5	.3	-87	-91	0
354	317.7	.3	-84	-87	010000
357	317.85	.1	-102	-102	0
363	318.15	.1	-104	-104	0
373	318.65	.1	-102	-102	0
381	319.05	.1	-103	-103	0
394	319.7	.1	-105	-105	000100
396	319.8	.1	-104	-104	010000
397	319.85	.1	-97	-97	0
400	320	.1	-103	-103	0



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.305

GMF 750511

SCANS 1459

THRESHOLD (dBm) -106

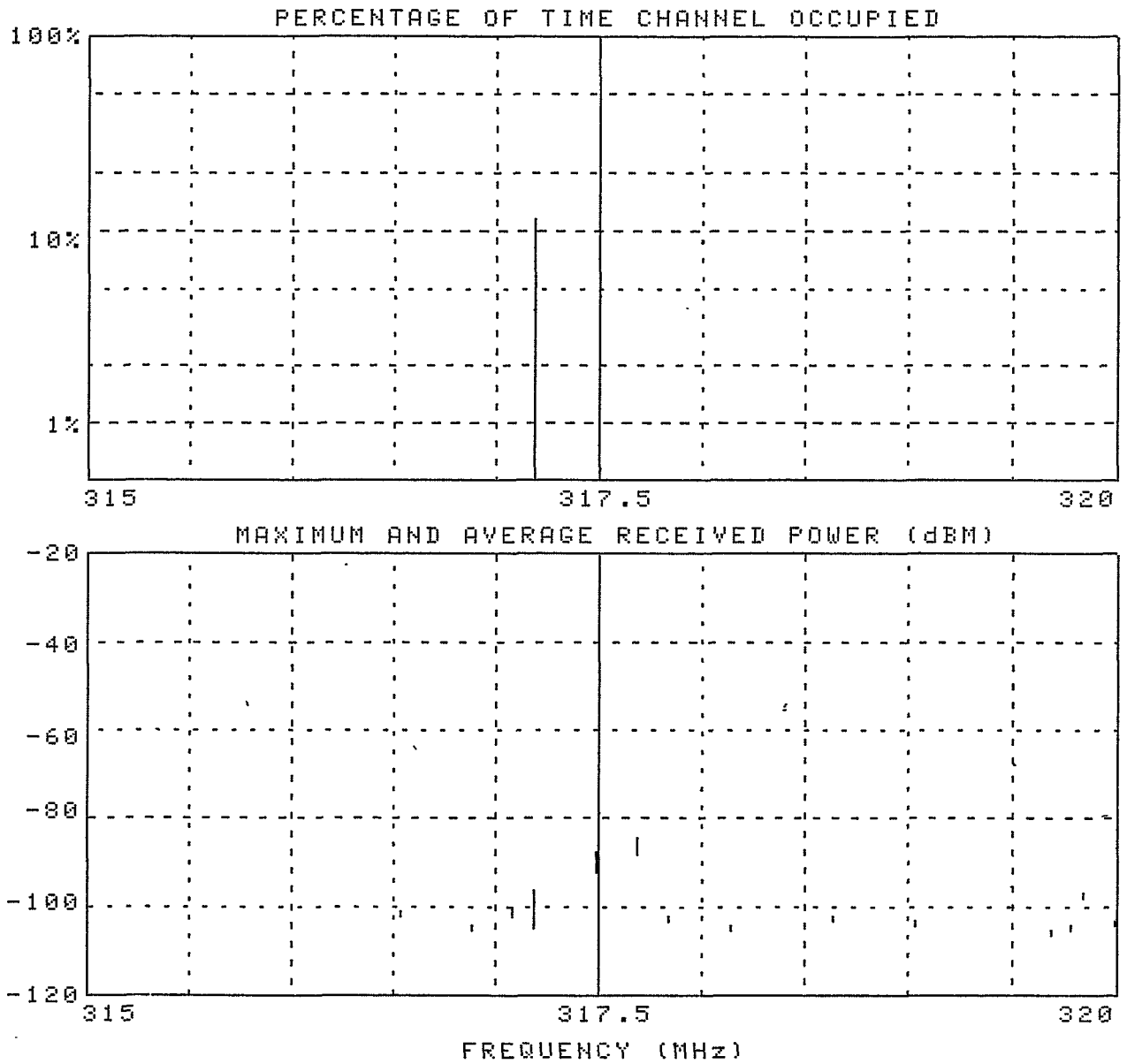


Figure 5.20. Usage summary plot for 315-320 MHz.

Table 5.21. Usage Summary List For 320-325 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.326	
GMF 750511		SCANS 707		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
4	320.2	.4	-97	-101	110000
10	320.5	0	--	--	120000
20	321	0	--	--	240000
24	321.2	0	--	--	110000
40	322	1.6	-85	-95	0
49	322.45	.1	-91	-91	0
53	322.65	.1	-99	-99	0
60	323	2	-82	-88	110000
68	323.4	0	--	--	110000

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.326

GMF 750511

SCANS 707

THRESHOLD (dBm) -106

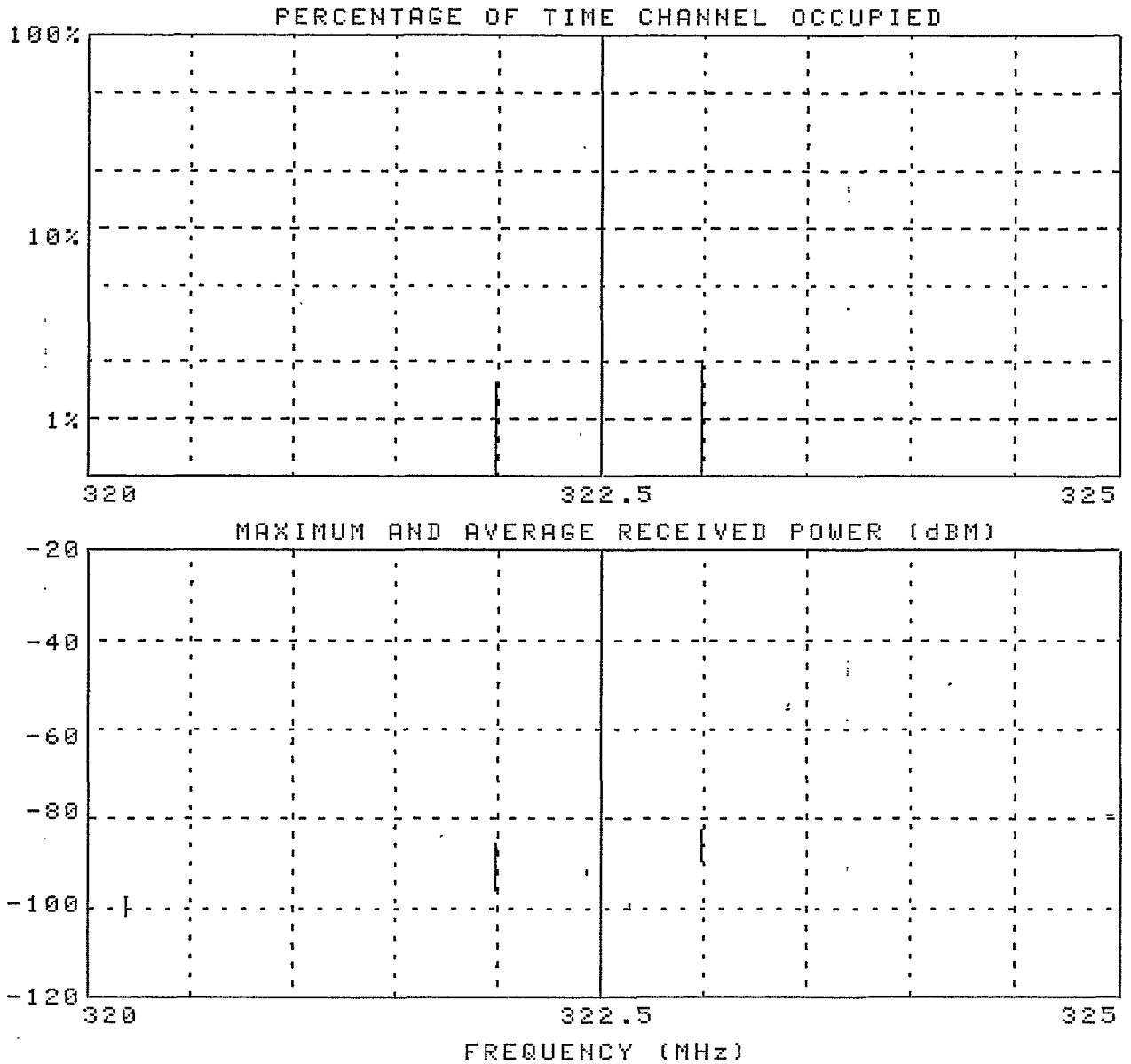


Figure 5.21. Usage summary plot for 320-325 MHz.

## FOR OFFICIAL USE ONLY

Table 5.22. Usage Summary List For 325-330 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.326	
GMF 750511		SCANS 707		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
104	325.2	.4	-77	-78	0
108	325.4	0	--	--	110000
110	325.5	0	--	--	140000
130	326.5	3.4	-98	-103	010000
131	326.55	37.2	-93	-102	0
132	326.6	99.3	-33	-52	0
133	326.65	52.5	-92	-101	0
134	326.7	2.1	-100	-104	0
164	328.2	0	--	--	220000
165	328.25	.1	-105	-105	0
166	328.3	1.3	-71	-85	110000
168	328.4	.1	-101	-101	010000
200	330	19.5	-90	-96	0

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.326

GMF 750511

SCANS 707

THRESHOLD (dBm) -106

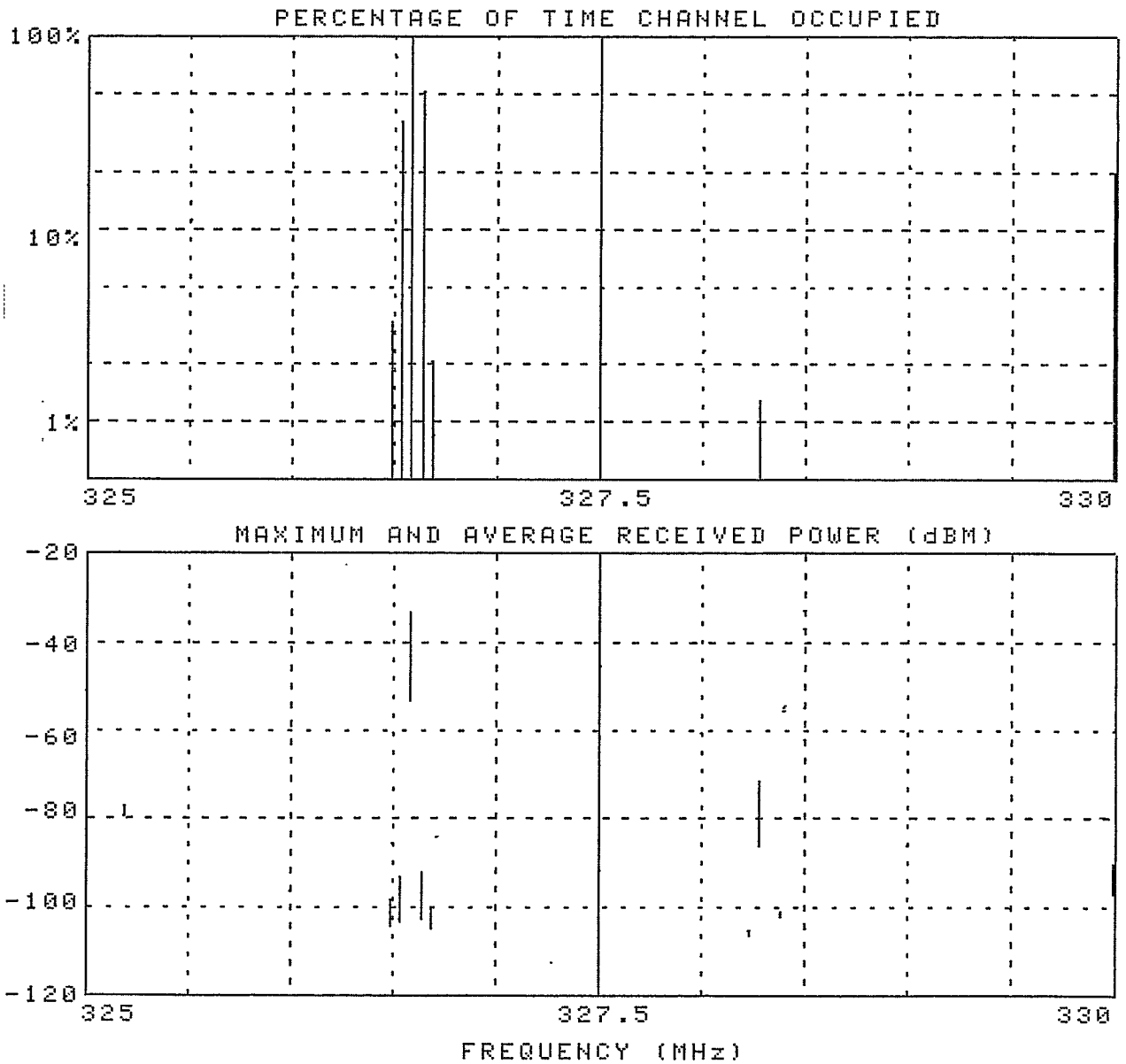


Figure 5.22. Usage summary plot for 325-330 MHz.

Table 5.23. Usage Summary List For 330-335 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.326	
GMF 750511		SCANS 707		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
228	331.4	0	--	--	220000
276	333.8	0	--	--	130000
288	334.4	0	--	--	110200
294	334.7	0	--	--	-110290

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 707

CASS 173.326  
THRESHOLD (dBm) -106

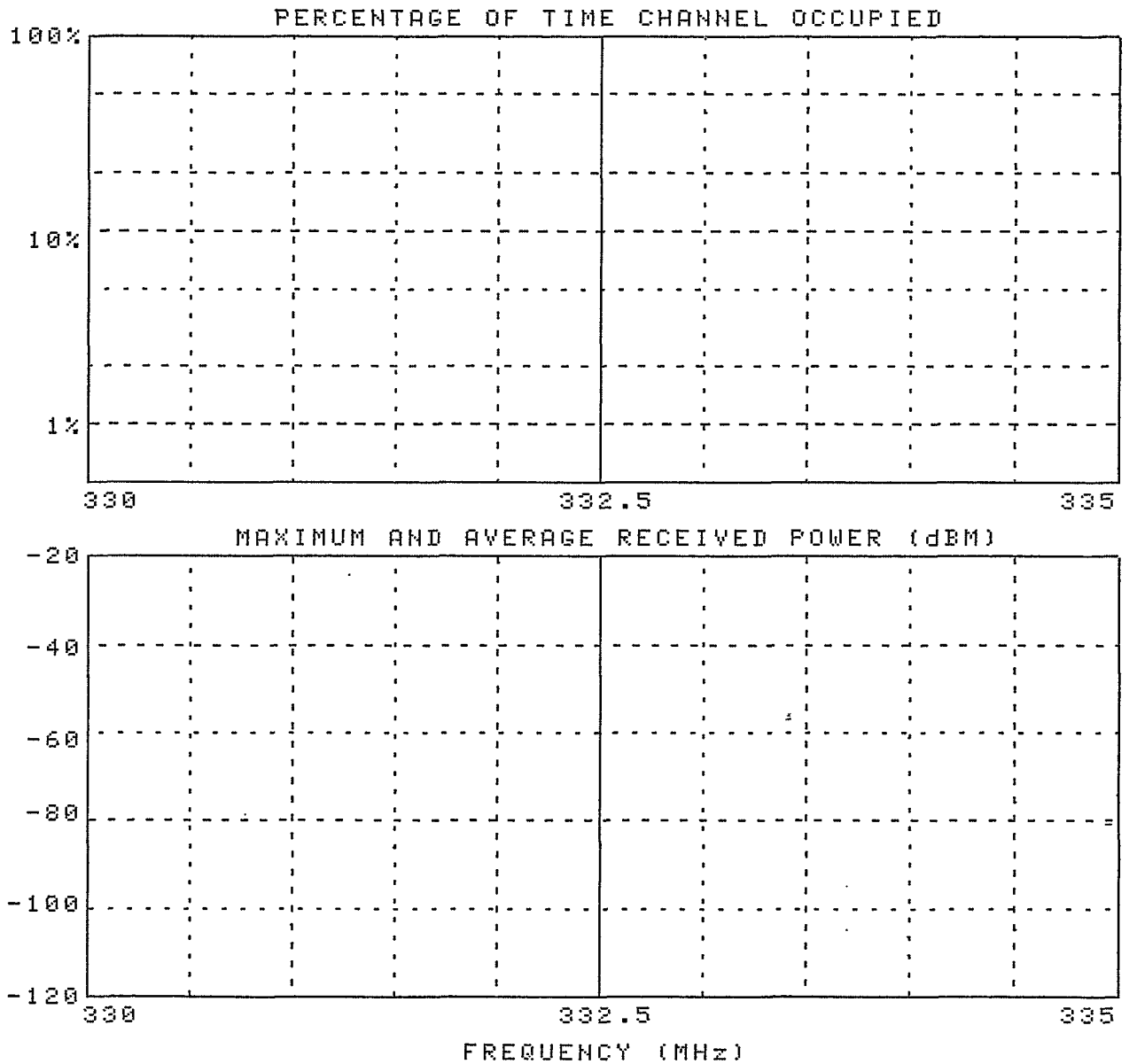


Figure 5.23. Usage summary plot for 330-335 MHz.

## FOR OFFICIAL USE ONLY

Table 5.24. Usage Summary List For 335-340 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.326	
GMF 750511		SCANS 707		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
324	336.2	.1	-98	-98	110200
328	336.4	.4	-100	-101	010200
340	337	0	--	--	120200
342	337.1	0	--	--	110200
356	337.8	.1	-85	-85	000200
368	338.4	0	--	--	140500
380	339	.1	-105	-105	000500
388	339.4	0	--	--	110500
390	339.5	0	--	--	110500



NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 707

CASS 173.326  
THRESHOLD (dBm) -106

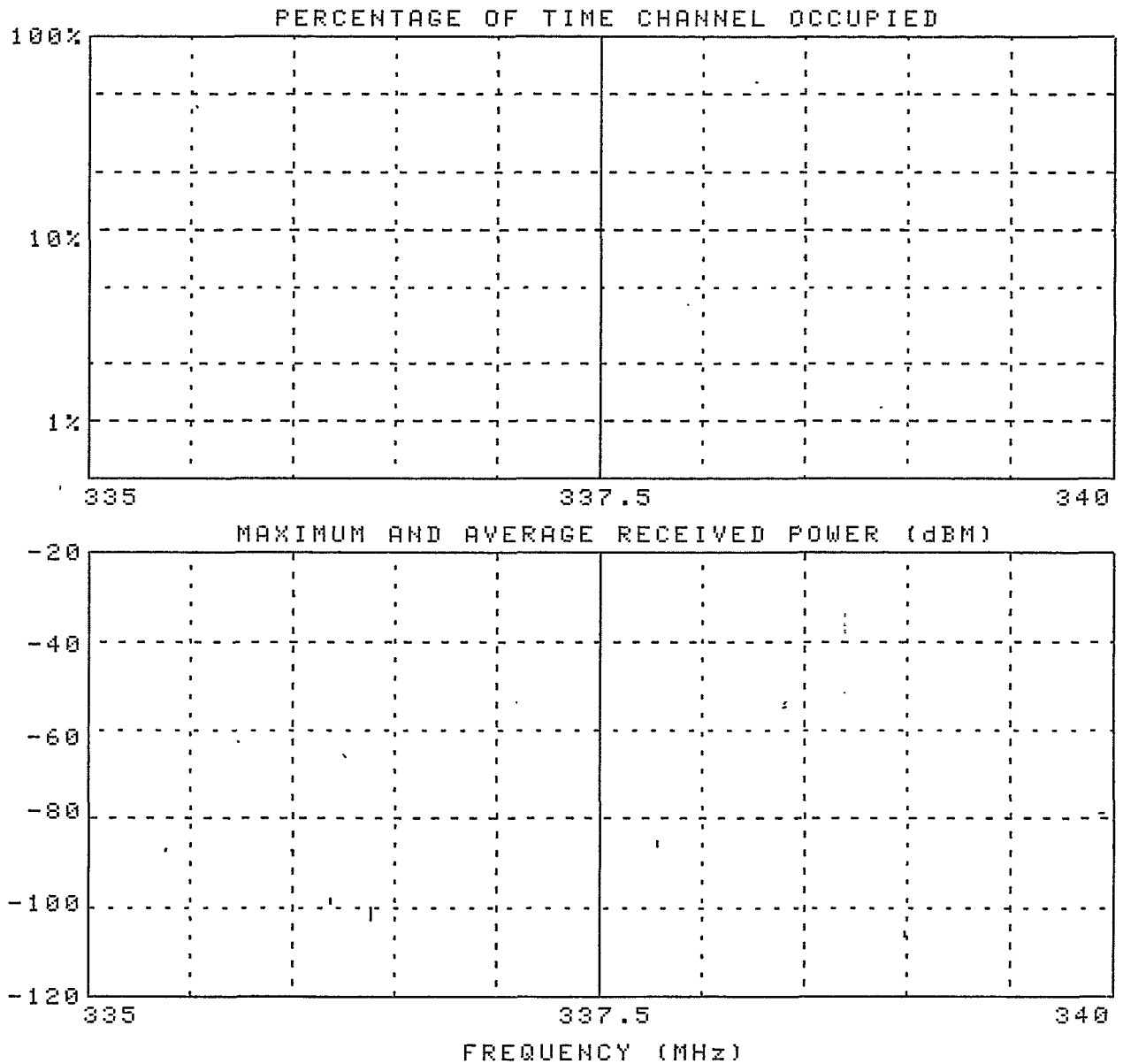


Figure 5.24. Usage summary plot for 335-340 MHz.

## FOR OFFICIAL USE ONLY

Table 5.25. Usage Summary List For 340-345 MHz.

NORFOLK, VIRGINIA  
GMF 750511APRIL 1978  
SCANS 3097CASS 173.347  
THRESHOLD (dBm) -106

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
1	340.05	.1	-103	-104	000500
2	340.1	.2	-100	-102	000500
3	340.15	.3	-92	-100	000500
4	340.2	17.2	-44	-80	130500
5	340.25	.5	-95	-100	000500
6	340.3	.1	-93	-99	000500
7	340.35	.1	-101	-102	000500
8	340.4	.3	-86	-95	120500
10	340.5	.1	-91	-99	000500
12	340.6	.1	-96	-99	000600
16	340.8	.1	-103	-103	110500
17	340.85	.2	-96	-101	000500
20	341	0	--	--	110500
24	341.2	.1	-83	-90	110500
30	341.5	.1	-103	-104	000500
41	342.05	.1	-104	-104	000500
52	342.6	.4	-93	-96	110500
54	342.7	.5	-80	-92	000500
56	342.8	0	--	--	110500
62	343.1	.1	-89	-97	000500
67	343.35	.1	-104	-104	000500
74	343.7	.1	-88	-97	010500
76	343.8	.2	-93	-100	000500
80	344	0	--	--	140500
83	344.15	.1	-92	-97	000500
84	344.2	.7	-70	-78	110500
86	344.3	0	-104	-104	110300
88	344.4	.2	-84	-100	010300
90	344.5	0	-81	-81	110300
92	344.6	.4	-101	-104	010300
96	344.8	4.8	-67	-97	110300
100	345	0	--	--	-110310

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.347

GMF 750511

SCANS 3097

THRESHOLD (dBm) -106

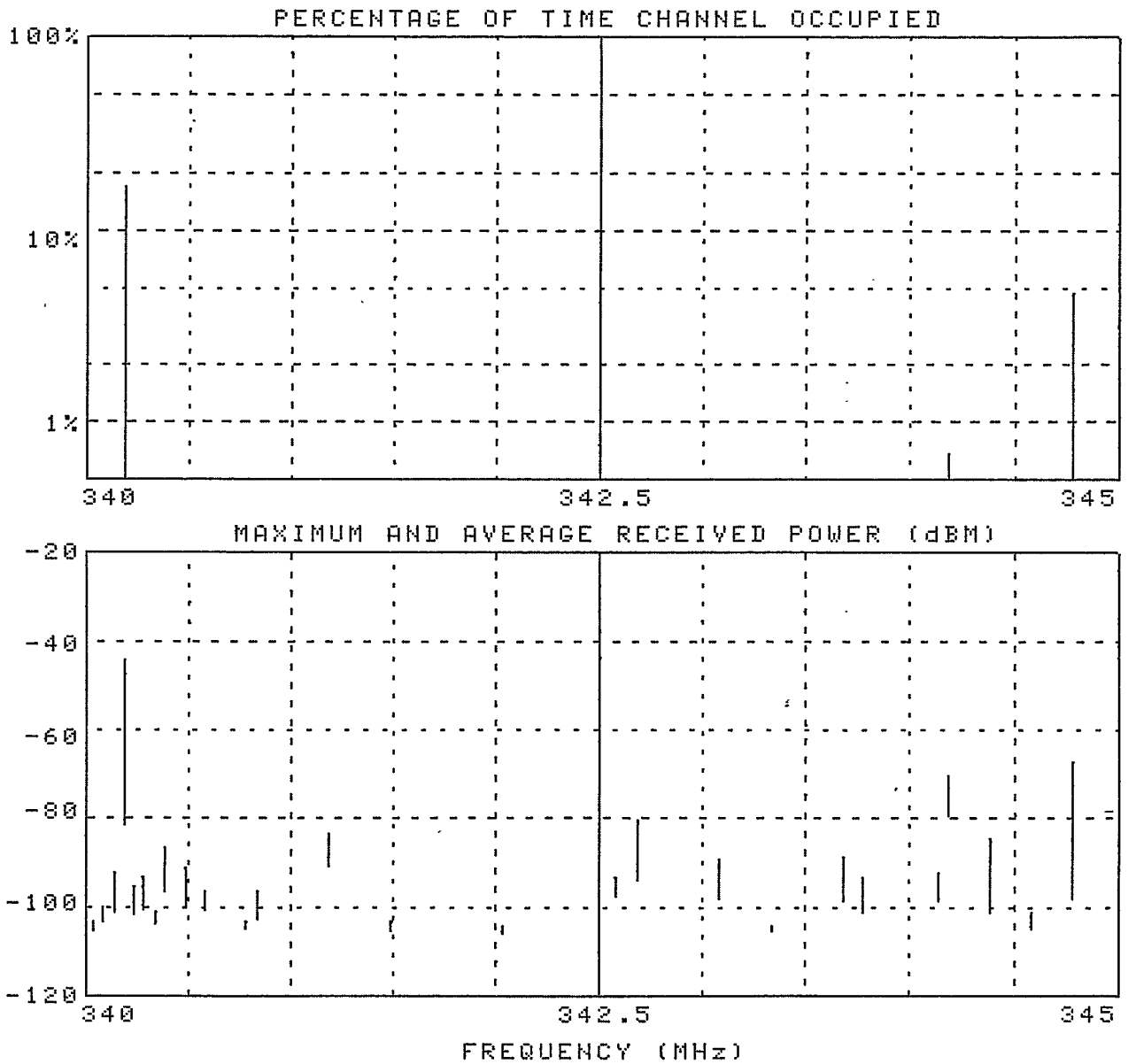


Figure 5.25. Usage summary plot for 340-345 MHz.

## FOR OFFICIAL USE ONLY

Table 5.26. Usage Summary List For 345-350 MHz.

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3097

CASS 173.347  
THRESHOLD (dBm) -106

INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
102	345.1	.6	-64	-80	230300
112	345.6	.1	-104	-104	000300
118	345.9	0	-105	-105	110300
120	346	1.1	-69	-85	000300
122	346.1	.1	-102	-102	000300
128	346.4	.2	-83	-97	000300
132	346.6	0	-104	-104	110300
136	346.8	7.8	-56	-91	220300
153	347.65	.1	-101	-103	000300
155	347.75	.2	-100	-102	000300
156	347.8	.8	-62	-78	440300
160	348	.7	-89	-99	010300
162	348.1	.1	-103	-103	000300
172	348.6	.2	-104	-105	130000
182	349.1	.6	-95	-101	020000
188	349.4	.1	-88	-91	110200
191	349.55	.1	-103	-104	0
192	349.6	1	-82	-89	0
196	349.8	2.7	-45	-86	220000
198	349.9	0	-104	-104	110000
199	349.95	.1	-104	-104	0
200	350	5.9	-80	-97	130000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 3097

CASS 173.347  
THRESHOLD (dBm) -106

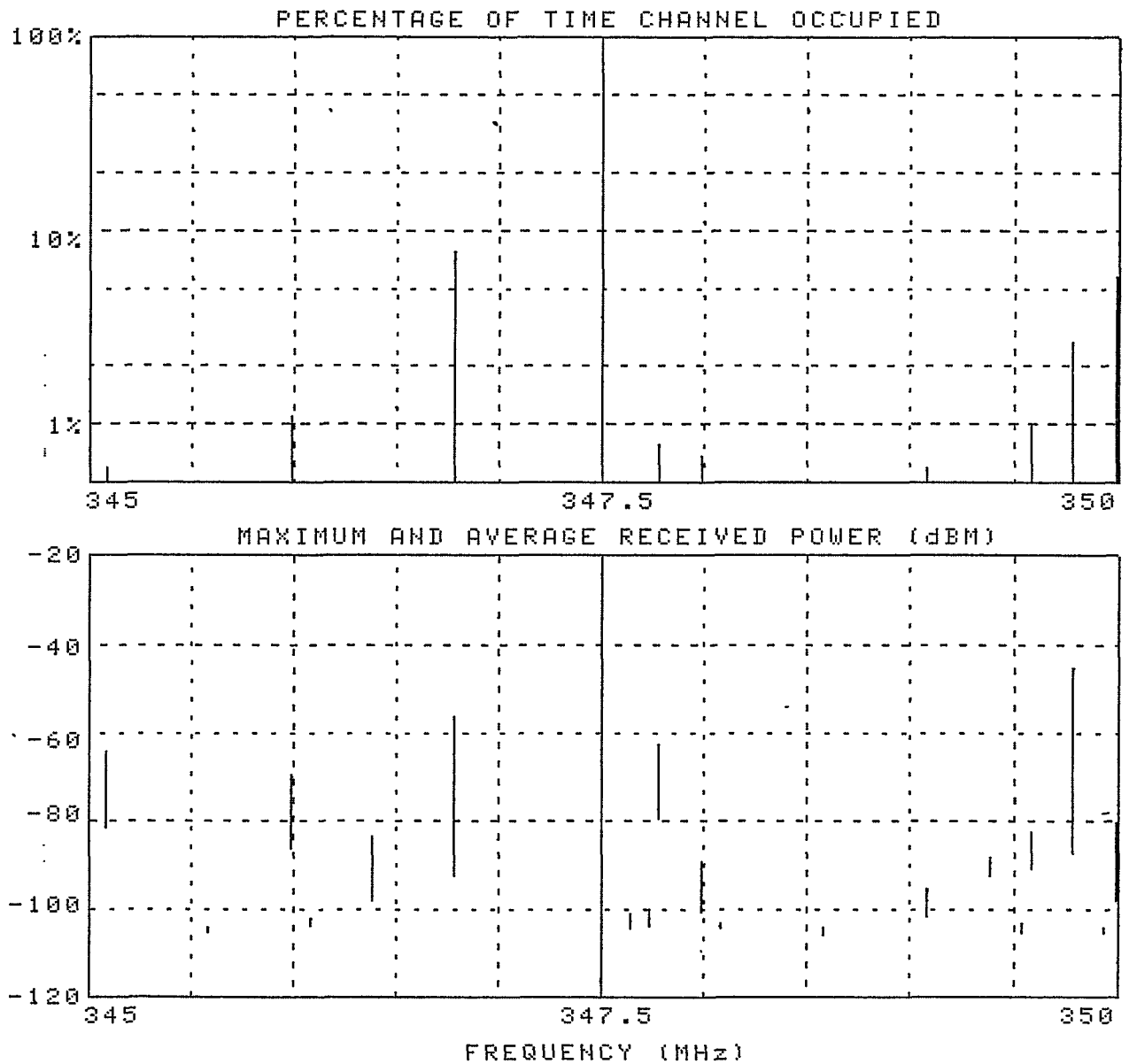


Figure 5.26. Usage summary plot for 345-350 MHz.

## FOR OFFICIAL USE ONLY

Table 5.27. Usage Summary List For 350-355 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.347	
GMF 750511		SCANS 3097		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
202	350.1	0	--	--	110000
204	350.2	.1	-102	-102	010000
206	350.3	3.6	-63	-78	220000
207	350.35	.1	-99	-100	0
211	350.55	.1	-105	-105	0
212	350.6	4.4	-87	-97	110000
216	350.8	0	-98	-98	110000
218	350.9	1.6	-80	-93	010000
220	351	2.6	-80	-93	110000
230	351.5	.1	-95	-99	0
231	351.55	.1	-100	-103	0
235	351.75	.1	-104	-104	0
236	351.8	.2	-95	-100	020000
238	351.9	1.3	-84	-91	010000
240	352	.8	-82	-89	0
241	352.05	.1	-104	-104	0
242	352.1	.2	-100	-101	0
243	352.15	.2	-90	-92	0
244	352.2	1.3	-30	-95	220000
245	352.25	.1	-94	-94	0
246	352.3	.7	-73	-90	110000
247	352.35	3.3	-89	-100	0
248	352.4	14.1	-46	-76	110000
249	352.45	1.2	-92	-102	0
250	352.5	.2	-102	-104	0
252	352.6	.1	-86	-96	000300
259	352.95	.1	-101	-102	0
260	353	.4	-70	-76	0
261	353.05	.1	-103	-104	0
264	353.2	0	-101	-101	110000
265	353.25	.1	-103	-104	0
266	353.3	.1	-102	-102	010000
267	353.35	.1	-99	-102	0
268	353.4	0	--	--	110000
269	353.45	.1	-98	-100	0
273	353.65	.1	-97	-101	0
274	353.7	12.4	-54	-96	110000
278	353.9	.1	-93	-93	0
281	354.05	.2	-99	-102	0
282	354.1	0	--	--	110000
288	354.4	.1	-103	-103	0
292	354.6	0	-105	-105	110000
296	354.8	.3	-85	-89	010000
300	355	0	--	--	110000

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.347

GMF 750511

SCANS 3097

THRESHOLD (dBm) -106

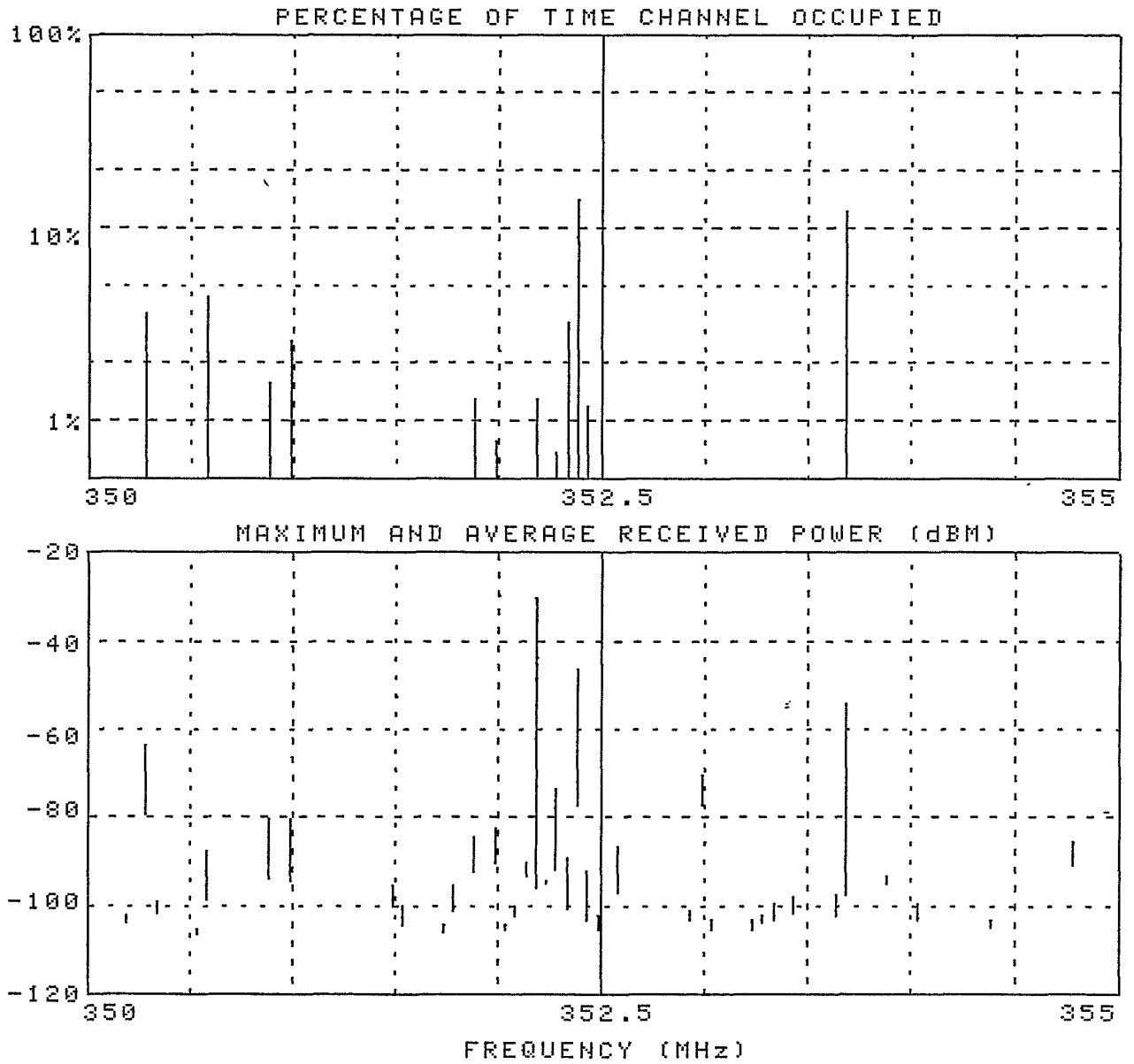


Figure 5.27. Usage summary plot for 350-355 MHz.

## FOR OFFICIAL USE ONLY

Table 5.28. Usage Summary List For 355-360 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.347	
GMF 750511		SCANS 3097		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
302	355.1	.9	-69	-79	110000
304	355.2	.3	-98	-103	0
305	355.25	15	-95	-103	0
306	355.3	100	-51	-58	110000
307	355.35	17.4	-95	-103	0
308	355.4	.2	-104	-105	010000
310	355.5	0	--	--	110000
311	355.55	.1	-103	-103	0
312	355.6	1	-81	-93	020100
316	355.8	0	--	--	110000
319	355.95	.1	-105	-105	0
320	356	0	-105	-105	140000
321	356.05	.1	-101	-103	0
324	356.2	.6	-30	-94	230000
333	356.65	.1	-104	-104	0
336	356.8	.1	-103	-104	000100
342	357.1	0	--	--	110000
346	357.3	.1	-74	-84	0
348	357.4	.1	-100	-102	0
355	357.75	7.7	-101	-104	000100
356	357.8	7.5	-73	-103	120100
358	357.9	.5	-82	-94	000200
362	358.1	.1	-101	-102	0
364	358.2	0	--	--	110100
372	358.6	0	--	--	110000
374	358.7	.1	-103	-103	0
375	358.75	.1	-105	-105	0
376	358.8	1.3	-83	-94	110000
386	359.3	.3	-82	-87	0
388	359.4	1.9	-59	-90	110000
390	359.5	.5	-86	-95	110000
392	359.6	.4	-70	-85	120000
395	359.75	.1	-96	-99	0
398	359.9	.1	-104	-104	0
400	360	.1	-100	-103	0



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.347

GMF 750511

SCANS 3097

THRESHOLD (dBm) -106

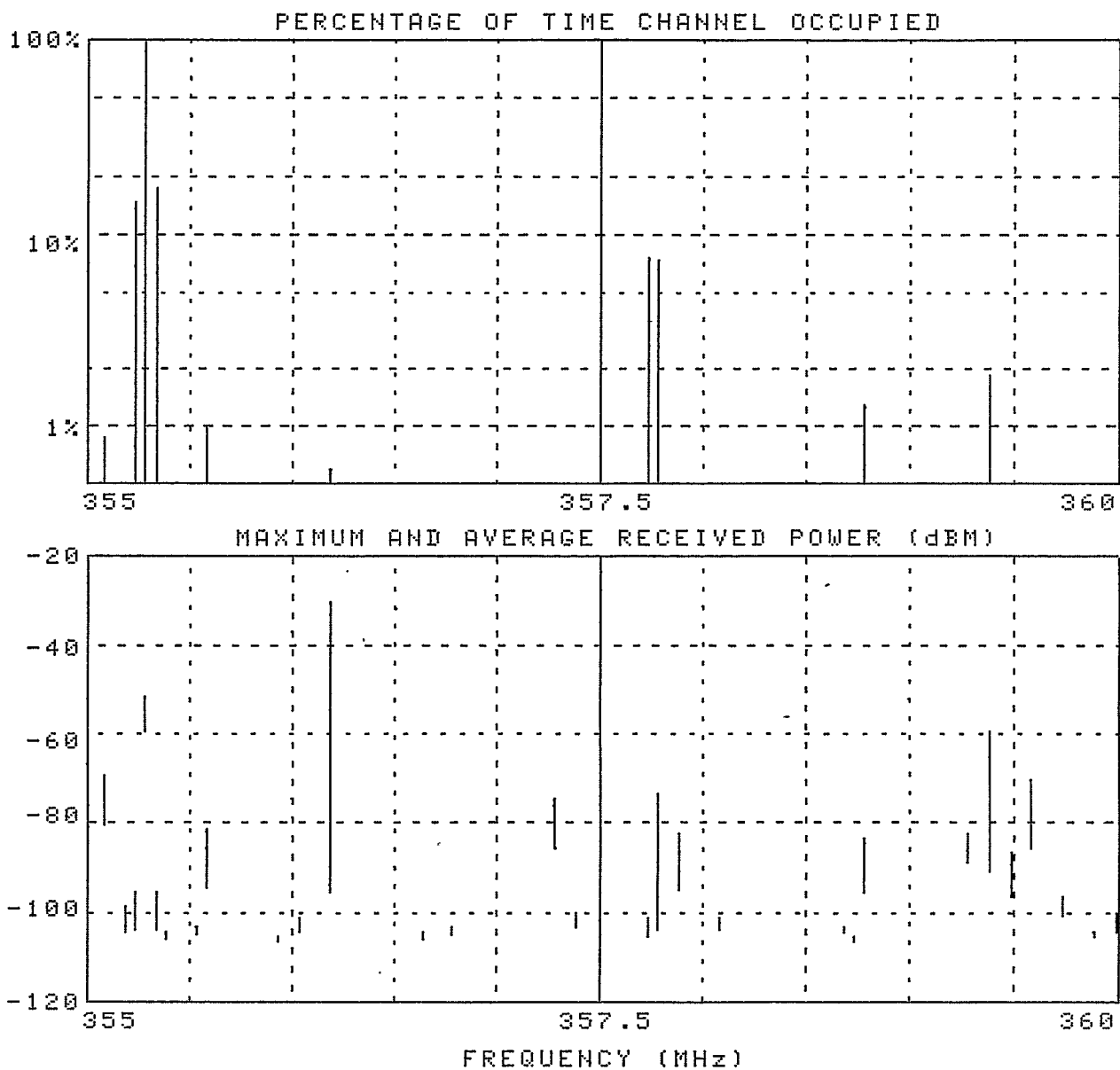


Figure 5.28. Usage summary plot for 355-360 MHz.

## FOR OFFICIAL USE ONLY

Table 5.29. Usage Summary List For 360-365 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.368	
GMF 750511		SCANS 2606		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
3	360.15	.8	-81	-85	0
4	360.2	5.7	-70	-93	120000
6	360.3	0	-97	-97	110000
8	360.4	1	-94	-101	0
12	360.6	11	-79	-89	220000
13	360.65	.1	-92	-95	0
15	360.75	.1	-98	-101	0
19	360.95	.1	-104	-104	0
20	361	0	--	--	220000
24	361.2	1	-30	-101	010000
26	361.3	0	--	--	110000
27	361.35	.1	-92	-97	0
31	361.55	.1	-98	-101	0
36	361.8	.1	-99	-100	0
38	361.9	0	--	--	110000
46	362.3	.2	-89	-96	0
48	362.4	0	--	--	110000
50	362.5	0	-104	-104	110000
51	362.55	.1	-83	-92	0
52	362.6	.4	-81	-95	010000
54	362.7	.2	-51	-55	001000
55	362.75	.1	-102	-103	001000
56	362.8	0	-84	-84	110000
59	362.95	.1	-98	-100	0
60	363	.4	-83	-92	010000
68	363.4	0	-99	-99	240000
70	363.5	0	--	--	110000
72	363.6	.1	-96	-100	0
76	363.8	.1	-87	-95	020000
77	363.85	.1	-91	-99	0
78	363.9	2.8	-75	-87	110100
79	363.95	.1	-102	-103	0
80	364	.1	-86	-91	110000
84	364.2	.1	-96	-97	140000
95	364.75	.1	-103	-103	0
97	364.85	.1	-96	-100	0

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.368

GMF 750511

SCANS 2606

THRESHOLD (dBm) -106

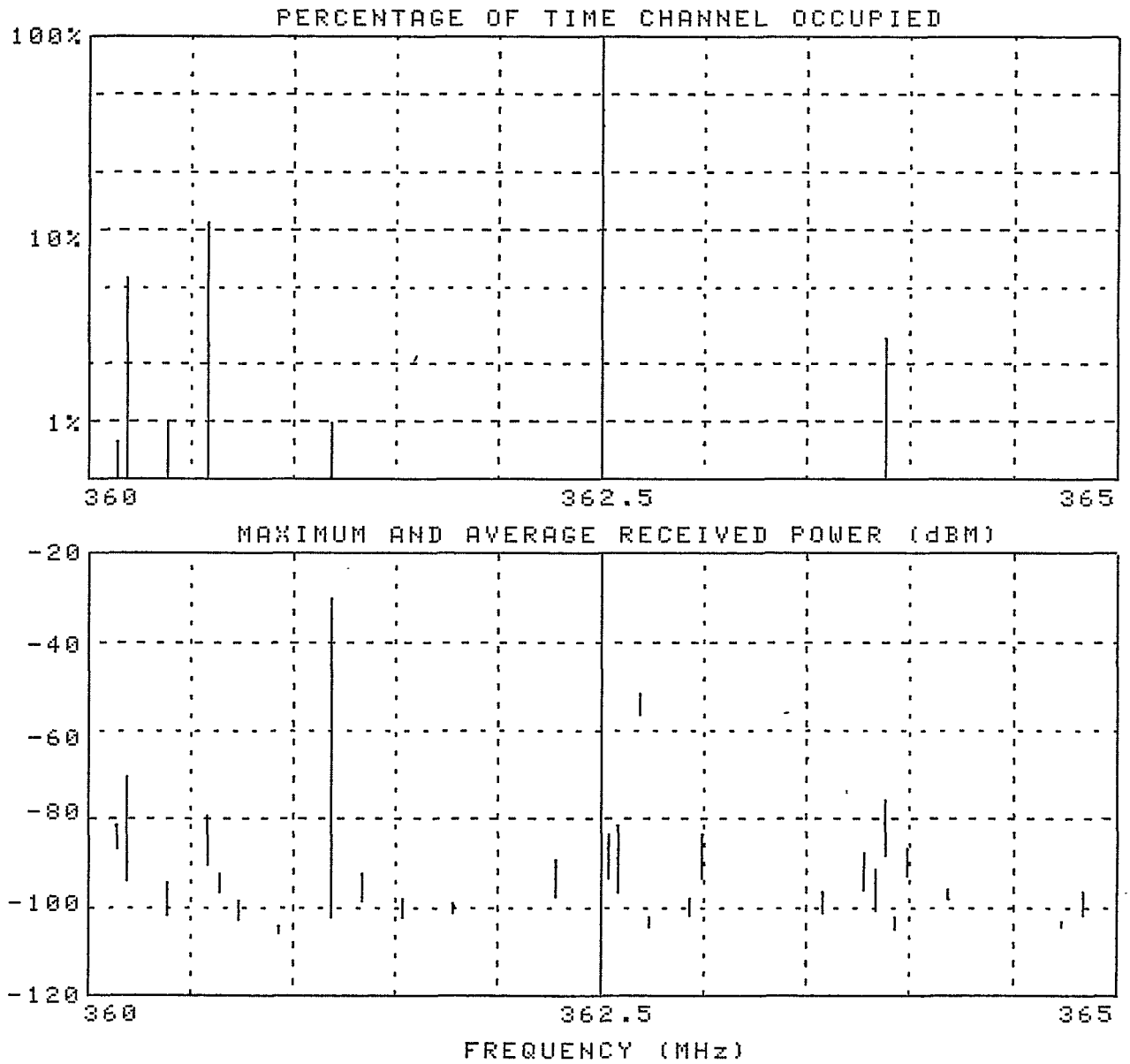


Figure 5.29. Usage summary plot for 360-365 MHz.

## FOR OFFICIAL USE ONLY

Table 5.30. Usage Summary List For 365-370 MHz.

NORFOLK, VIRGINIA		APRIL 1978	CASS 173.368		
GMF 750511		SCANS 2606	THRESHOLD (dBm) -106		
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
104	365.2	.1	-98	-100	0
105	365.25	.1	-94	-94	0
111	365.55	.1	-99	-102	0
115	365.75	.1	-98	-100	0
124	366.2	.1	-97	-99	0
128	366.4	.1	-94	-98	0
131	366.55	.1	-90	-93	0
135	366.75	.2	-104	-104	0
140	367	.1	-97	-100	0
141	367.05	.1	-88	-96	0
142	367.1	2.6	-79	-92	0
145	367.25	.1	-83	-92	0
153	367.65	.1	-102	-102	0
156	367.8	.1	-88	-92	0
157	367.85	.1	-96	-99	0
159	367.95	.1	-92	-95	0
162	368.1	.1	-96	-100	0
172	368.6	.1	-94	-98	000100
177	368.85	.1	-97	-98	0
180	369	0	--	--	140000
182	369.1	.1	-81	-90	000100
191	369.55	.1	-88	-89	000100
196	369.8	.1	-96	-99	0

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2606

CASS 173.368  
THRESHOLD (dBm) -106

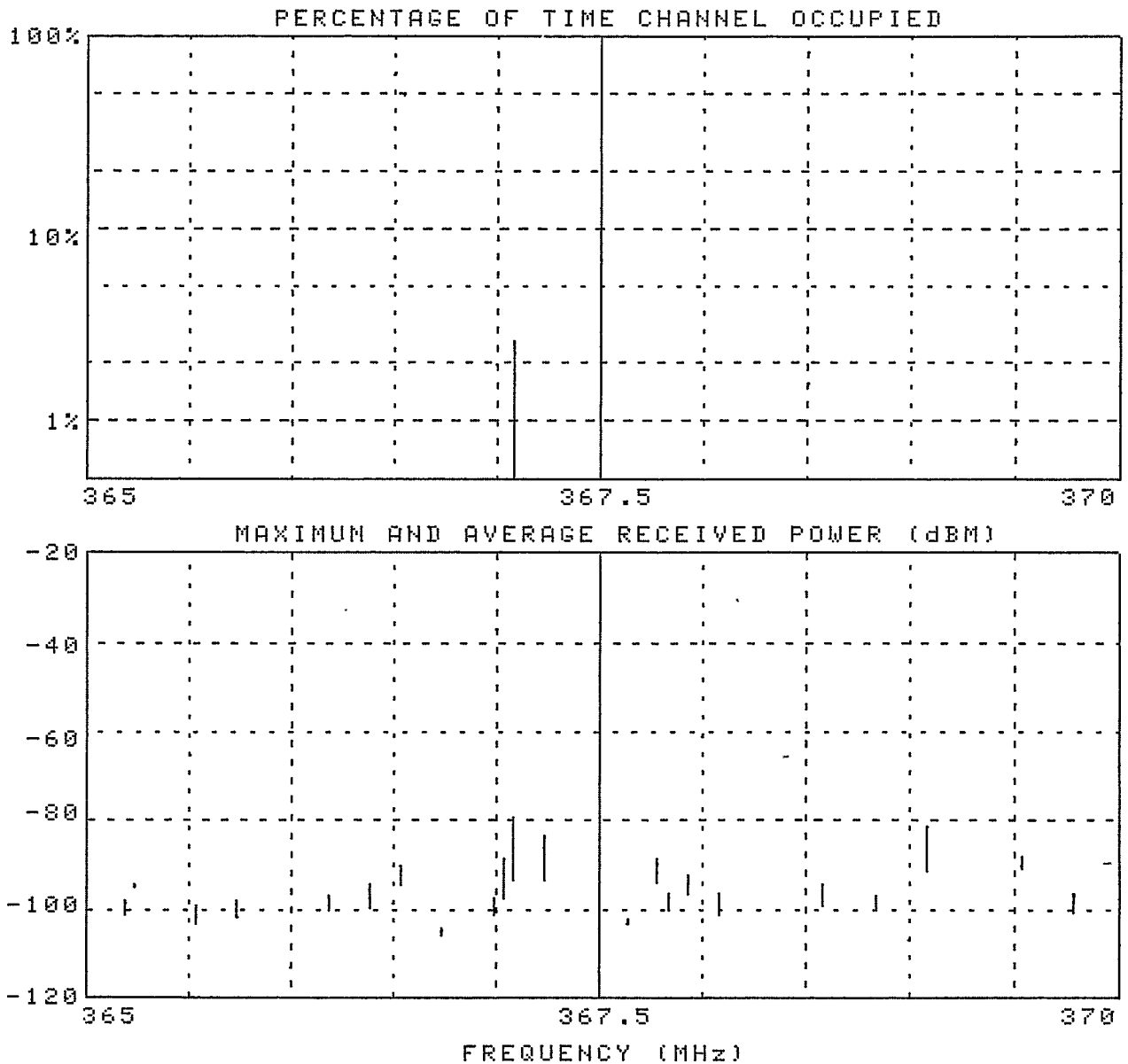


Figure 5.30. Usage summary plot for 365-370 MHz.

## FOR OFFICIAL USE ONLY

Table 5.31. Usage Summary List For 370-375 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.368	
GMF 750511		SCANS 2606		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
207	370.35	.1	-101	-102	0
208	370.4	.1	-102	-103	000100
211	370.55	.1	-95	-98	0
216	370.8	.1	-87	-94	0
217	370.85	.1	-97	-100	0
221	371.05	.1	-91	-97	0
224	371.2	.1	-102	-102	0
226	371.3	.1	-85	-94	0
229	371.45	.1	-96	-100	0
235	371.75	.1	-90	-99	0
236	371.8	.1	-87	-94	0
238	371.9	.5	-87	-94	0
240	372	.1	-86	-97	0
242	372.1	.1	-96	-100	0
244	372.2	.2	-78	-90	020000
246	372.3	.1	-99	-101	000100
250	372.5	6.4	-92	-102	000100
256	372.8	.1	-98	-102	0
261	373.05	.1	-92	-98	0
262	373.1	7	-72	-86	110000
275	373.75	.1	-101	-102	0
285	374.25	.1	-99	-100	0
291	374.55	.1	-103	-103	0
294	374.7	.1	-97	-97	0
295	374.75	.3	-84	-90	0
296	374.8	19.2	-72	-98	0

FOR OFFICIAL USE ONLY

NORFOLK, VIRGINIA

APRIL 1978

CASS 173.368

GMF 750511

SCANS 2606

THRESHOLD (dBm) -106

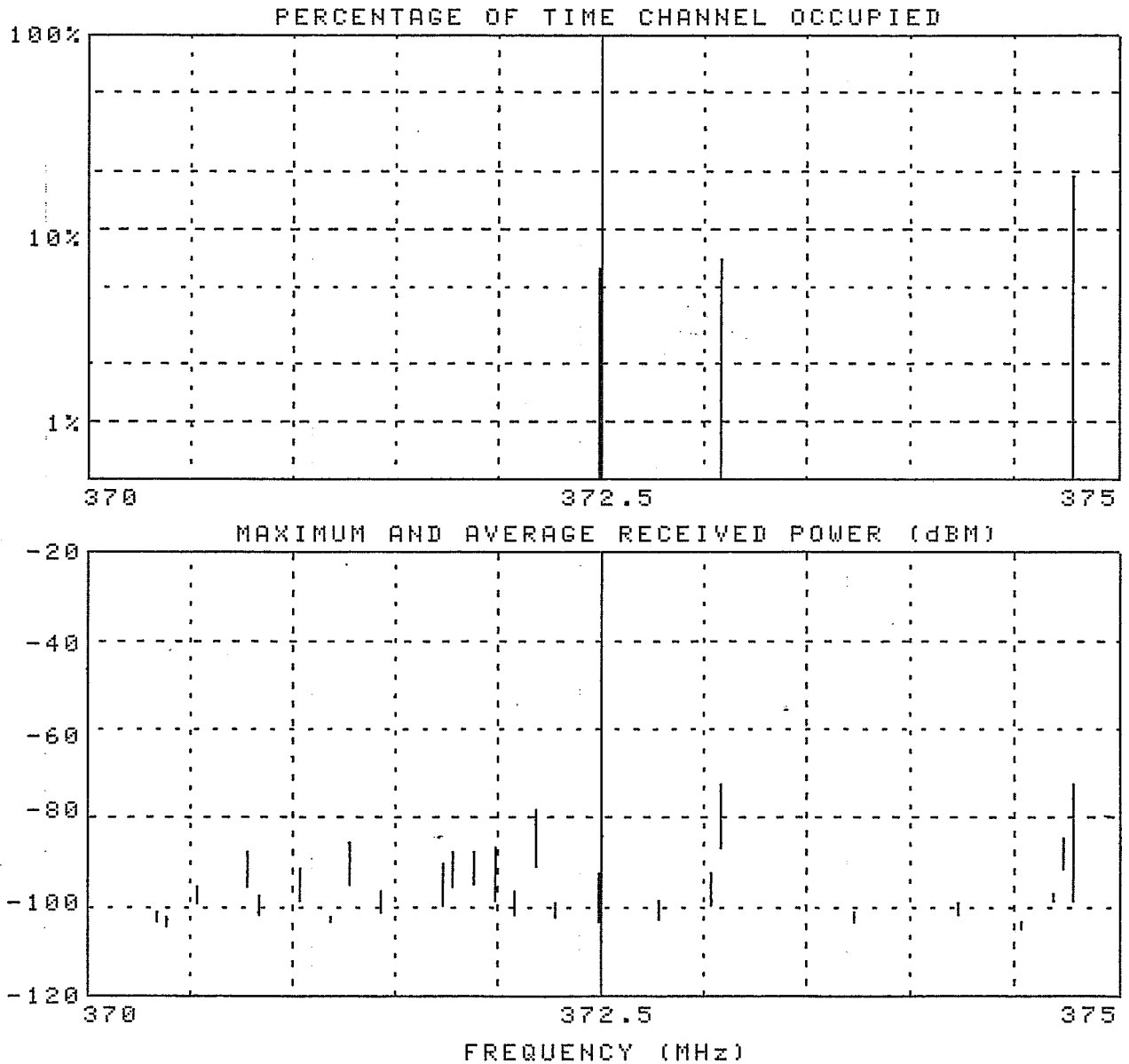


Figure 5.31. Usage summary plot for 370-375 MHz.

## FOR OFFICIAL USE ONLY

Table 5.32. Usage Summary List For 375-380 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.368	
GMF 750511		SCANS 2606		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
302	375.1	0	--	--	140000
304	375.2	1.2	-89	-96	010000
306	375.3	.1	-102	-103	001000
311	375.55	.1	-95	-101	001000
313	375.65	.2	-81	-96	001000
314	375.7	.1	-101	-103	001400
316	375.8	.1	-90	-97	0
318	375.9	.1	-101	-102	0
320	376	2	-63	-85	110000
324	376.2	.2	-83	-95	0
326	376.3	.2	-94	-99	0
332	376.6	.1	-84	-94	0
336	376.8	0	--	--	120000
338	376.9	.1	-98	-100	0
340	377	.1	-98	-101	0
341	377.05	1.4	-88	-103	0
342	377.1	9.9	-80	-87	110000
344	377.2	0	-100	-100	110000
345	377.25	.1	-84	-96	001000
346	377.3	.1	-86	-95	001000
348	377.4	.1	-84	-92	001000
360	378	.1	-80	-96	0
363	378.15	.1	-95	-100	0
370	378.5	.1	-104	-104	000100
371	378.55	.2	-96	-99	000100
376	378.8	.1	-96	-97	0
382	379.1	.9	-62	-94	220000
384	379.2	.1	-87	-95	010000
391	379.55	.1	-102	-102	0



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.368

GMF 750511

SCANS 2606

THRESHOLD (dBm) -106

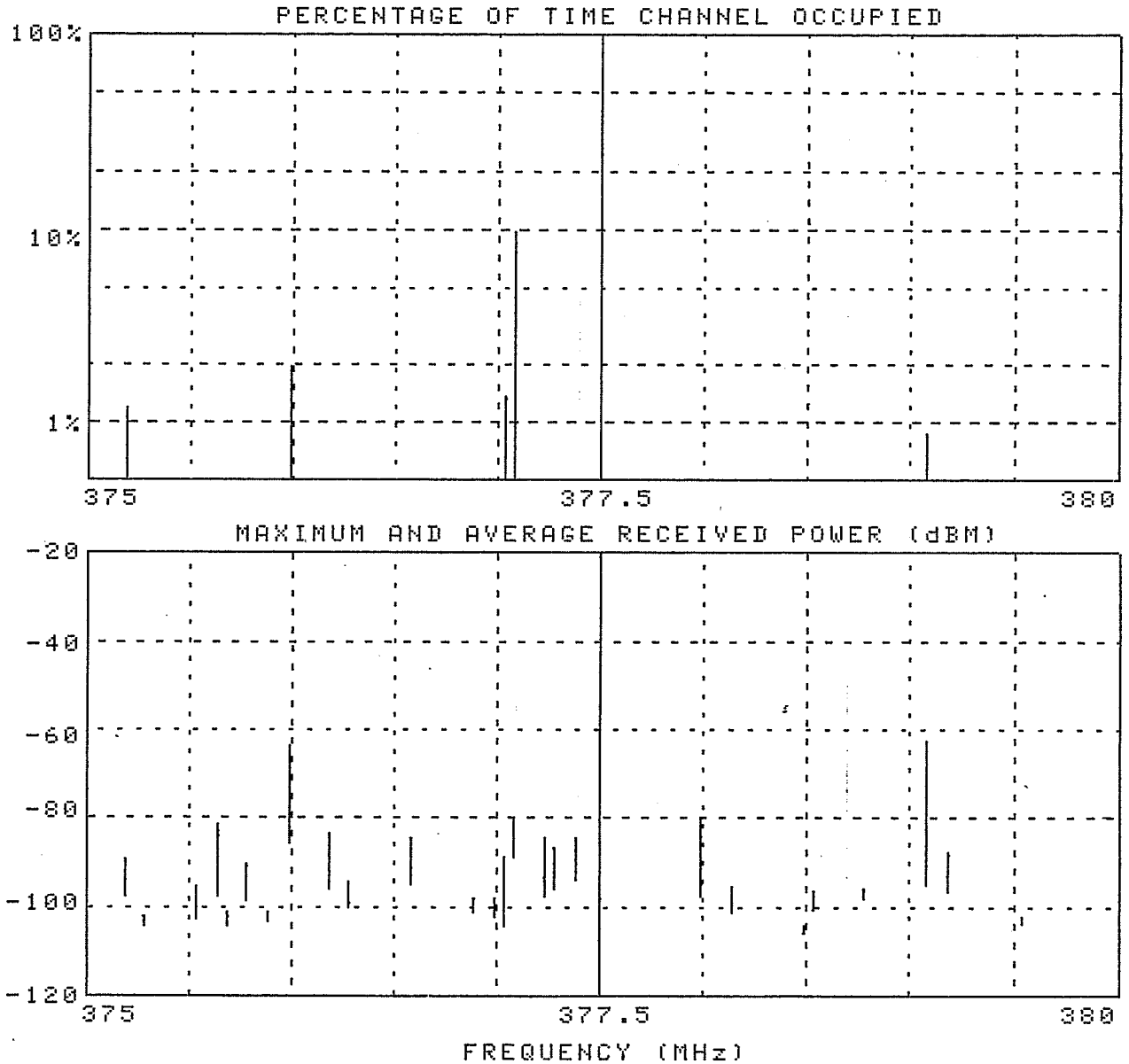


Figure 5.32. Usage summary plot for 375-380 MHz.

## FOR OFFICIAL USE ONLY

Table 5.33. Usage Summary List For 380-385 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.389	
GMF 750511		SCANS 2674		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
3	380.15	.1	-101	-104	0
4	380.2	.4	-88	-93	010000
5	380.25	.1	-100	-101	0
6	380.3	.3	-87	-89	0
9	380.45	.1	-99	-100	0
10	380.5	.7	-98	-102	0
12	380.6	0	--	--	220000
14	380.7	0	--	--	330000
23	381.15	.1	-98	-100	0
26	381.3	0	--	--	120000
27	381.35	.1	-101	-104	0
30	381.5	1	-72	-87	010000
36	381.8	.9	-81	-96	010200
40	382	0	--	--	110000
42	382.1	0	--	--	240000
50	382.5	1.1	-96	-101	110000
52	382.6	0	--	--	-120220
55	382.75	.1	-98	-99	0
64	383.2	.1	-103	-103	110000
68	383.4	.6	-82	-92	120300
76	383.8	0	-97	-97	110200
81	384.05	.1	-98	-100	000200
82	384.1	0	-87	-87	110200
84	384.2	1	-80	-85	230200
87	384.35	2	-77	-82	000200
88	384.4	3.6	-31	-60	120200
89	384.45	.6	-77	-98	000200
97	384.85	.1	-103	-103	000200
99	384.95	.1	-97	-98	000200
100	385	2.4	-43	-92	230200

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2674

CASS 173.389  
THRESHOLD (dBm) -106

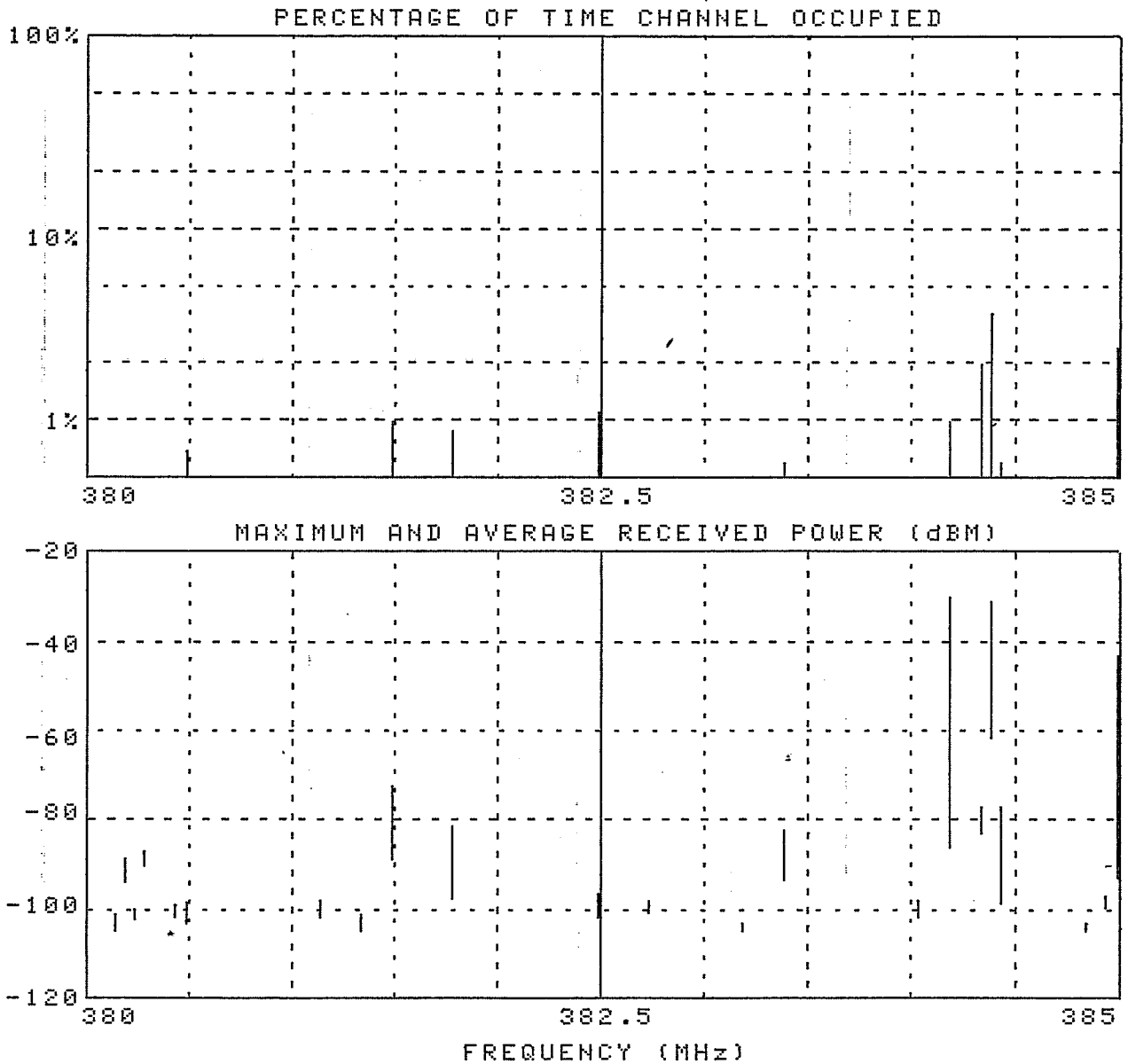


Figure 5.33. Usage summary plot for 380-385 MHz.

FOR OFFICIAL USE ONLY

Table 5.34. Usage Summary List For 385-390 MHz.

NORFOLK, VIRGINIA GMF 750511		APRIL 1978 SCANS 2674		CASS 173.389 THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
102	385.1	.6	-77	-94	220200
104	385.2	.6	-80	-91	010200
106	385.3	0	--	--	110200
108	385.4	.1	-96	-99	000200
117	385.85	.1	-103	-103	000200
124	386.2	0	-102	-102	140200
126	386.3	.1	-104	-104	000200
130	386.5	.1	-102	-102	000200
146	387.3	.1	-92	-96	000200
147	387.35	.1	-102	-103	000200
148	387.4	0	--	--	110200
154	387.7	.1	-92	-97	000200
176	388.8	0	--	--	110200
182	389.1	0	-104	-104	110200
183	389.15	.2	-92	-101	000200
191	389.55	.1	-100	-102	000200
196	389.8	.4	-87	-95	010200
197	389.85	.5	-91	-99	000200
198	389.9	15.5	-53	-87	110200
199	389.95	.4	-57	-94	000200
200	390	2.1	-75	-88	110200

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2674

CASS 173.389  
THRESHOLD (dBm) -106

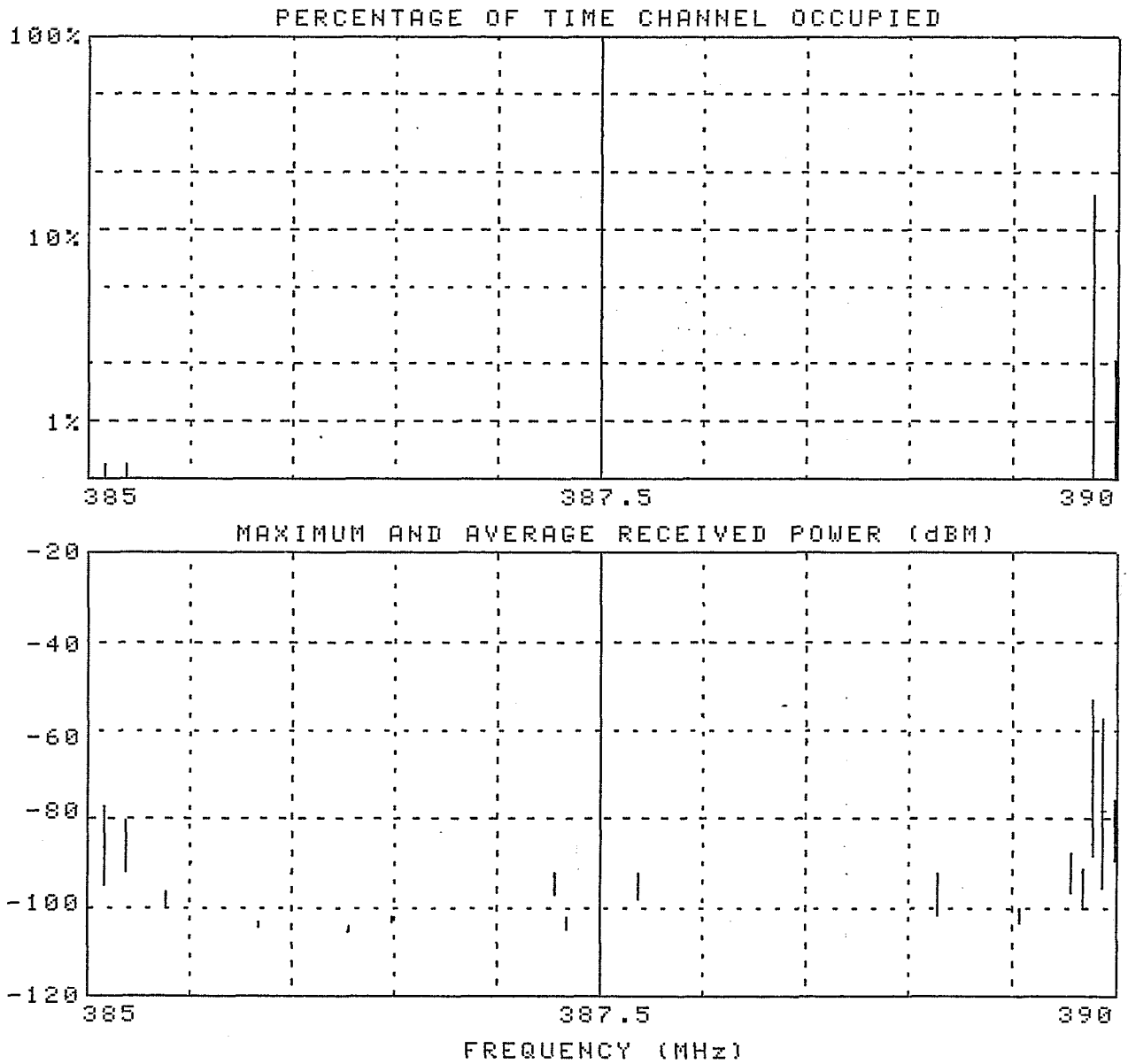


Figure 5.34. Usage summary plot for 385-390 MHz.

## FOR OFFICIAL USE ONLY

Table 5.35. Usage Summary List For 390-395 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.389	
GMF 750511		SCANS 2674		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
210	390.5	.1	-99	-99	000300
213	390.65	.2	-88	-99	000200
216	390.8	3.2	-63	-85	330200
218	390.9	.1	-96	-99	010200
224	391.2	0	-99	-99	110200
237	391.85	.1	-102	-103	000200
239	391.95	.1	-101	-102	000200
240	392	.1	-90	-94	000200
243	392.15	.1	-100	-102	000200
249	392.45	2	-98	-102	000300
250	392.5	5.4	-79	-87	000300
251	392.55	2.1	-97	-103	000300
256	392.8	0	--	--	140200
264	393.2	.1	-102	-103	000200
267	393.35	.1	-99	-99	000200
268	393.4	.1	-103	-103	000200
276	393.8	.1	-84	-90	0
277	393.85	.1	-99	-100	0
285	394.25	.1	-98	-98	0
286	394.3	.1	-99	-101	011000
288	394.4	0	--	--	111000

NORFOLK, VIRGINIA  
GMF 750511

APRIL 1978  
SCANS 2674

CASS 173.389  
THRESHOLD (dBm) -106

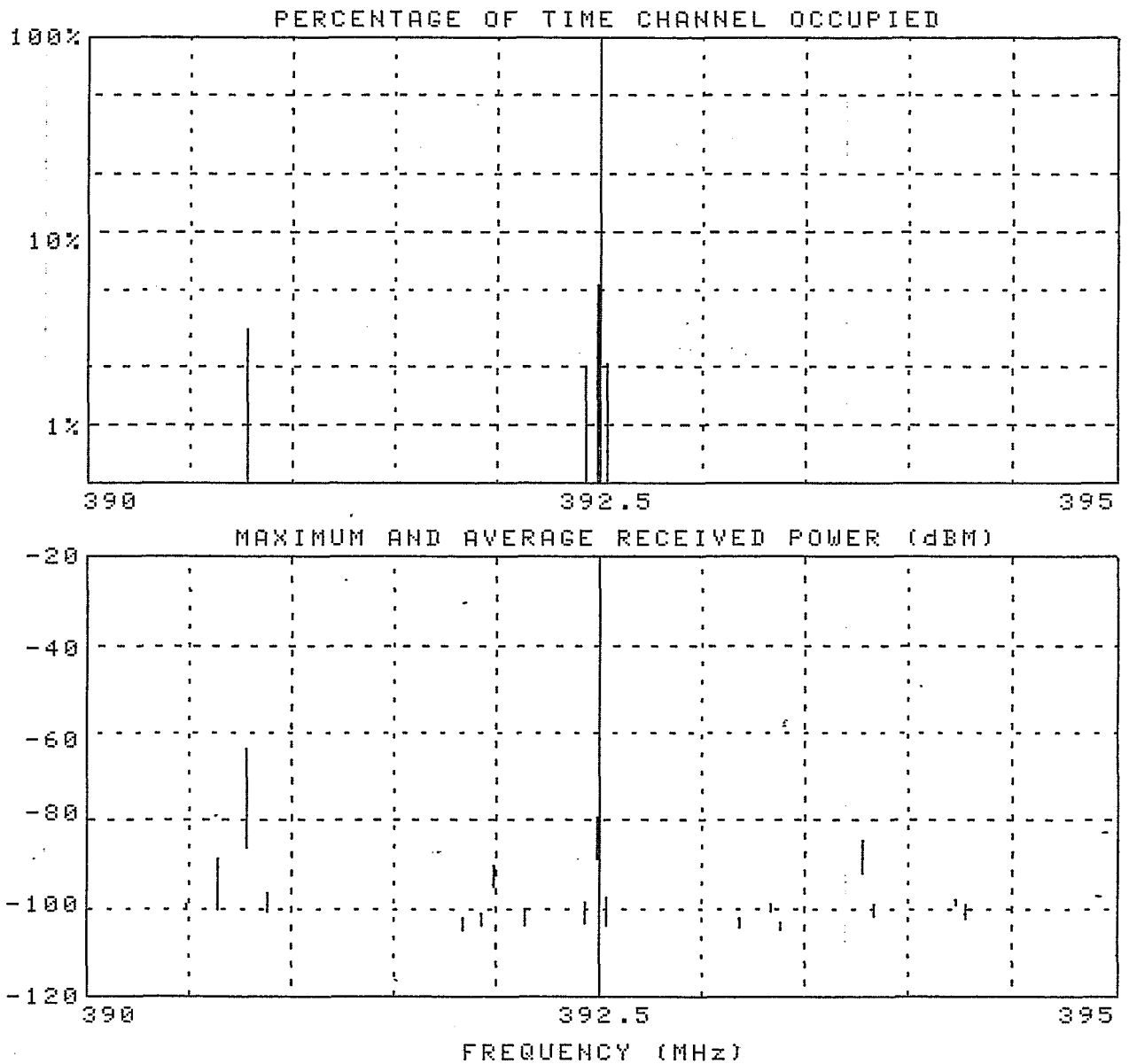


Figure 5.35. Usage summary plot for 390-395 MHz.

## FOR OFFICIAL USE ONLY

Table 5.36. Usage Summary List For 395-400 MHz.

NORFOLK, VIRGINIA		APRIL 1978		CASS 173.389	
GMF 750511		SCANS 2674		THRESHOLD (dBm) -106	
INDEX	FREQUENCY (MHz)	USAGE (%)	MAXIMUM (dBm)	AVERAGE (dBm)	MINI-GMF CODE
310	395.5	14.4	-95	-97	0
314	395.7	1	-95	-99	0
315	395.75	.7	-98	-101	0
316	395.8	.4	-97	-99	0
317	395.85	.1	-98	-101	0
318	395.9	.1	-97	-100	010000
319	395.95	.1	-96	-99	0
321	396.05	.1	-88	-96	0
324	396.2	.1	-98	-99	000300
328	396.4	0	--	--	110000
338	396.9	0	-97	-97	110000
342	397.1	0	--	--	110000
353	397.65	.1	-100	-101	0
359	397.95	.1	-100	-102	0
364	398.2	.1	-84	-89	010000
377	398.85	.3	-99	-101	0
378	398.9	.1	-104	-105	0
379	398.95	.1	-102	-103	0
396	399.8	0	--	--	110000
397	399.85	.3	-97	-103	0
398	399.9	1.4	-70	-96	0
400	400	.1	-90	-97	0



NORFOLK, VIRGINIA

APRIL 1978

CASS 173.389

GMF 750511

SCANS 2674

THRESHOLD (dBm) -106

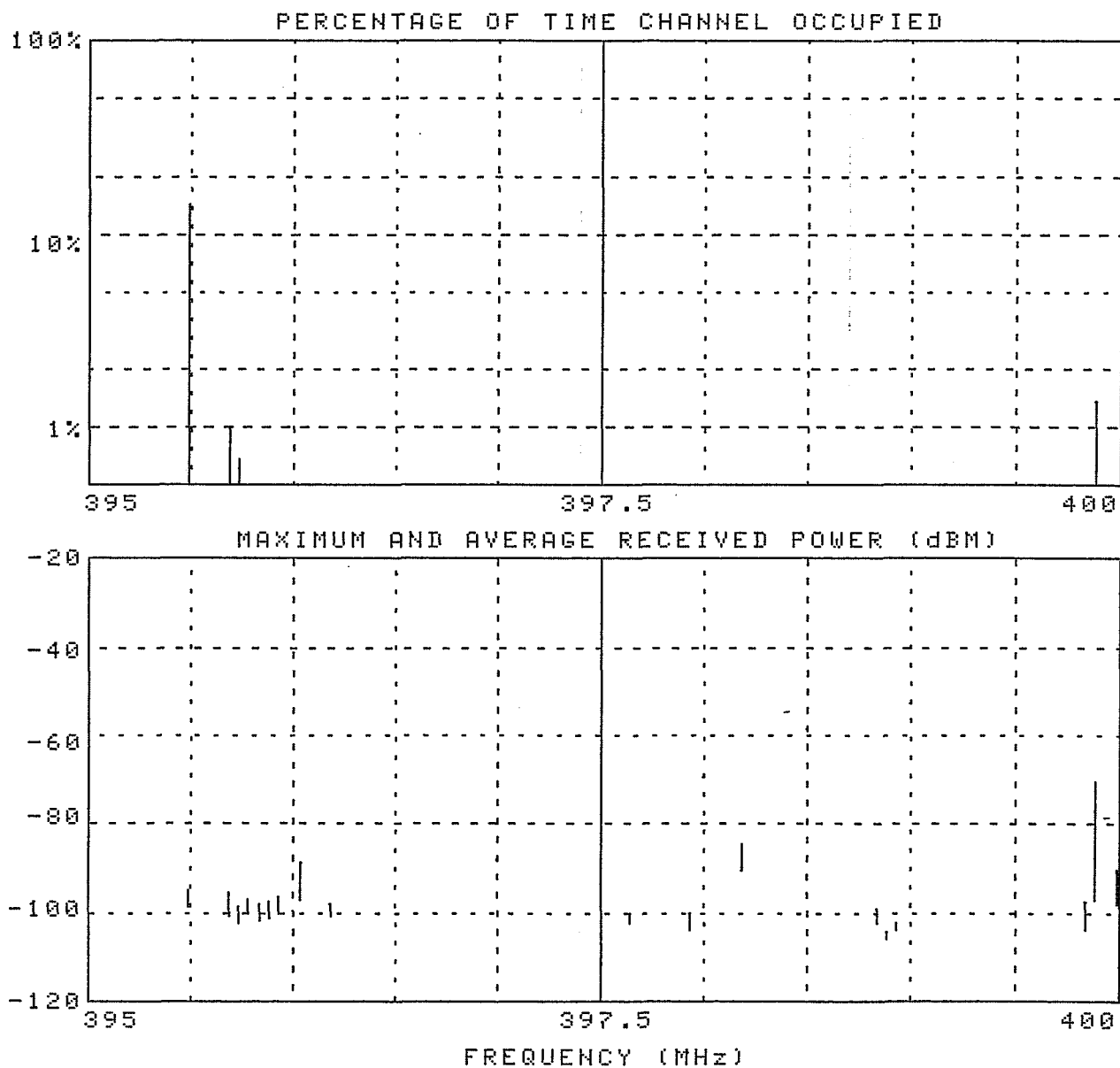


Figure 5.36. Usage summary plot for 395-400 MHz.

6. OCCUPANCY BY TIME-OF-DAY

Statistics files of usage data collected around-the-clock during March 28 and 31, and April 3-4, 1978, were used to generate the hourly band occupancy vs. time-of-day plot shown in figures 6.1-6.9. Each figure indicates the occupancy for each sub-band. Sub-band #6 (320-340 MHz) has the most occupancy for the total period, and the maximum occupancy was 1.4% at the noon hour for the 300-320 MHz band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #1 220-240 MHZ

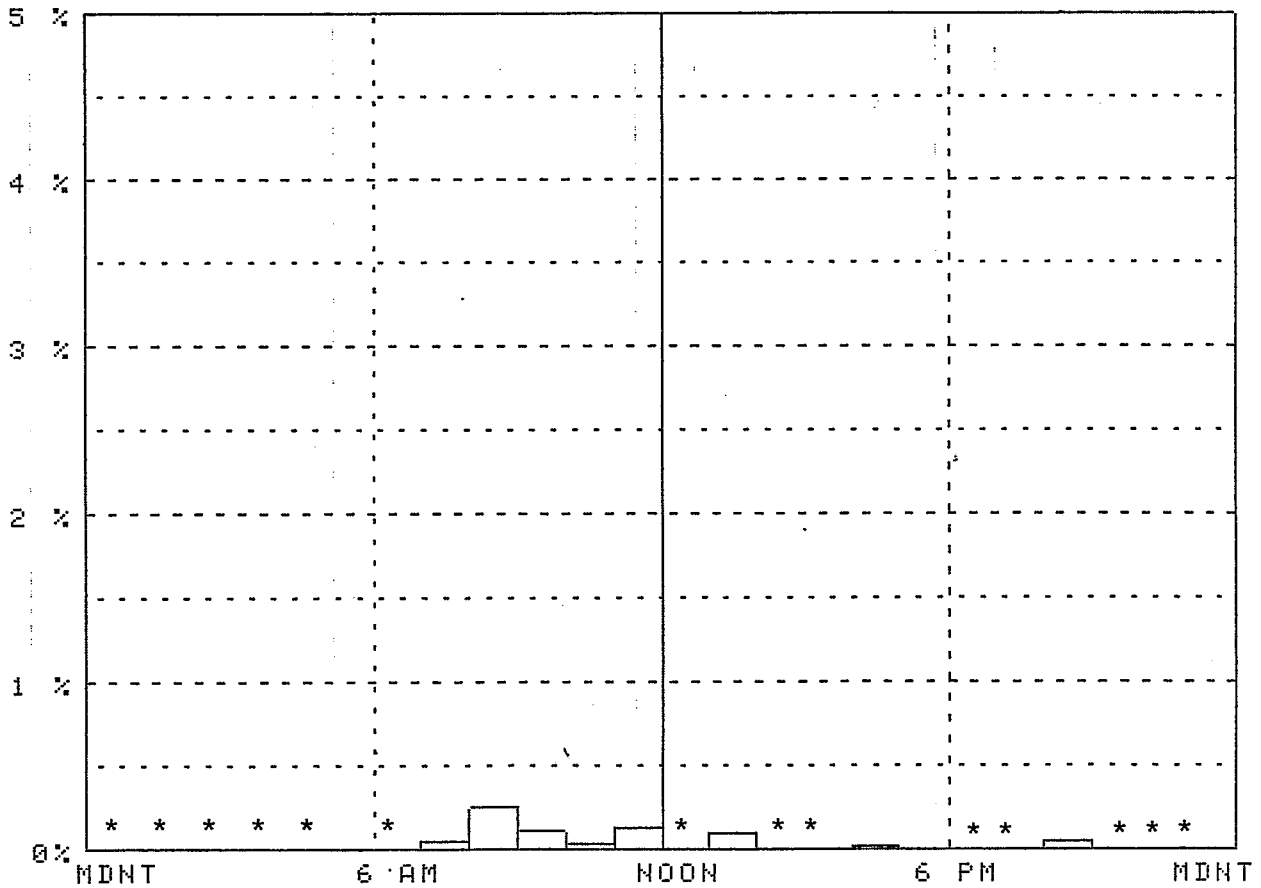


Figure 6.1. Time-of-day usage for 220-240 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #2 240-260 MHZ

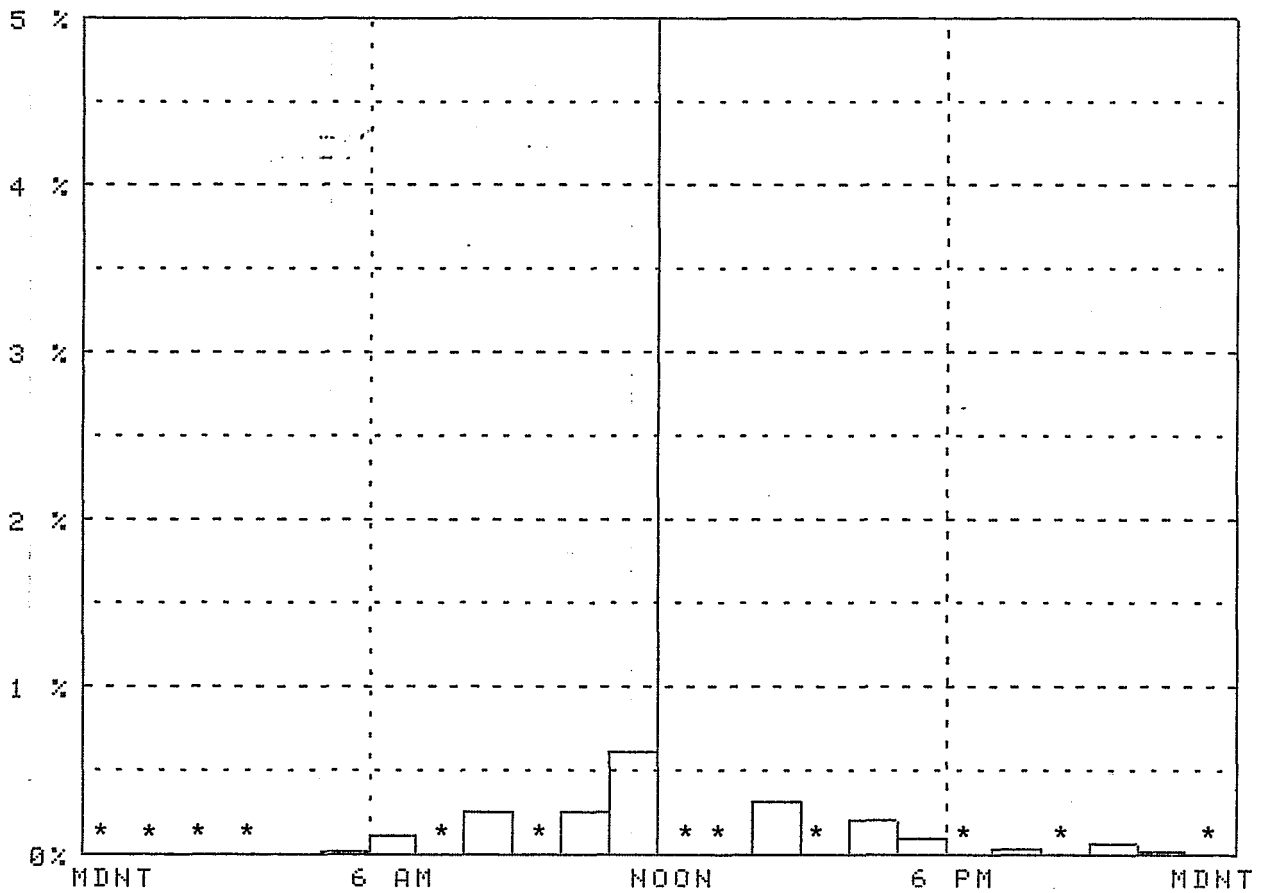


Figure 6.2. Time-of-day usage for 240-260 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #3 260-280 MHZ

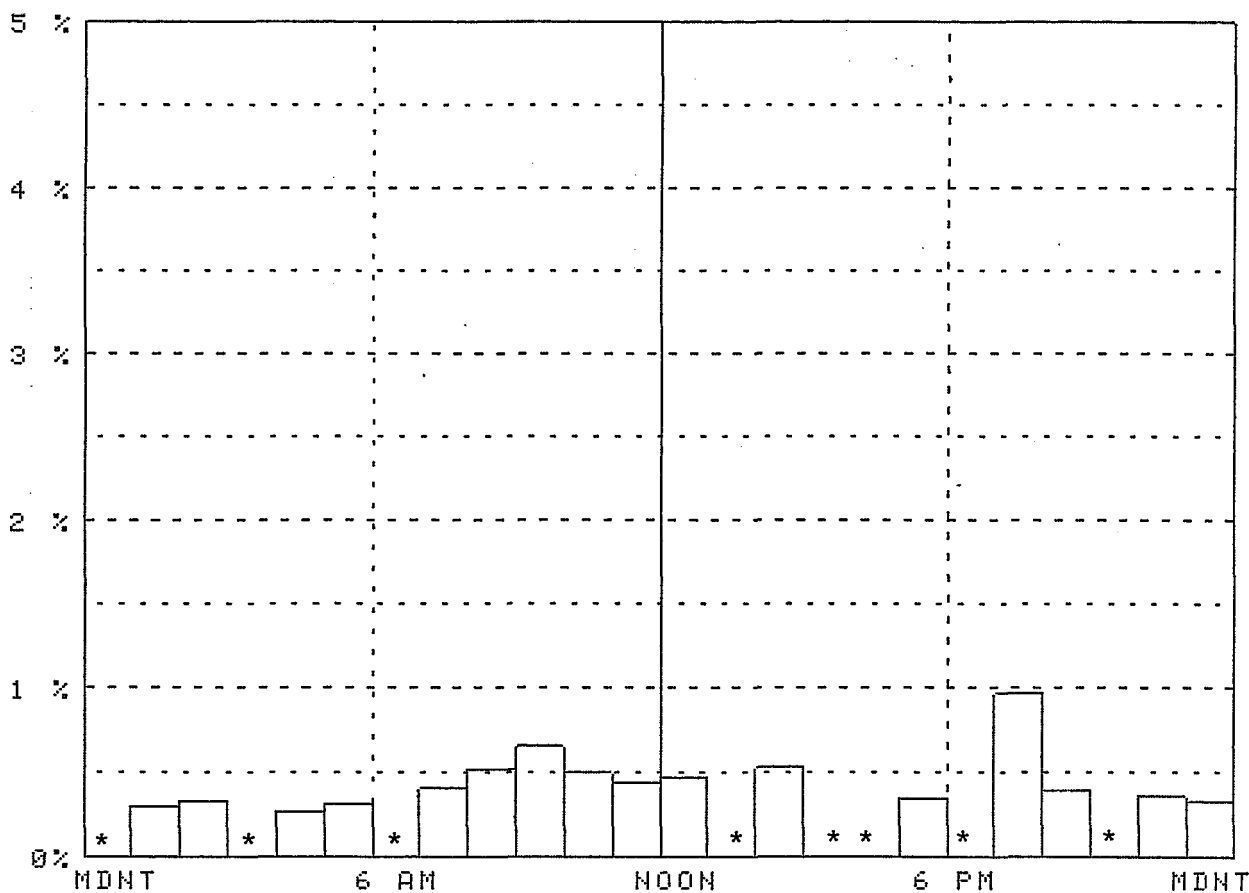


Figure 6.3. Time-of-day usage for 260-280 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #4 280-300 MHZ

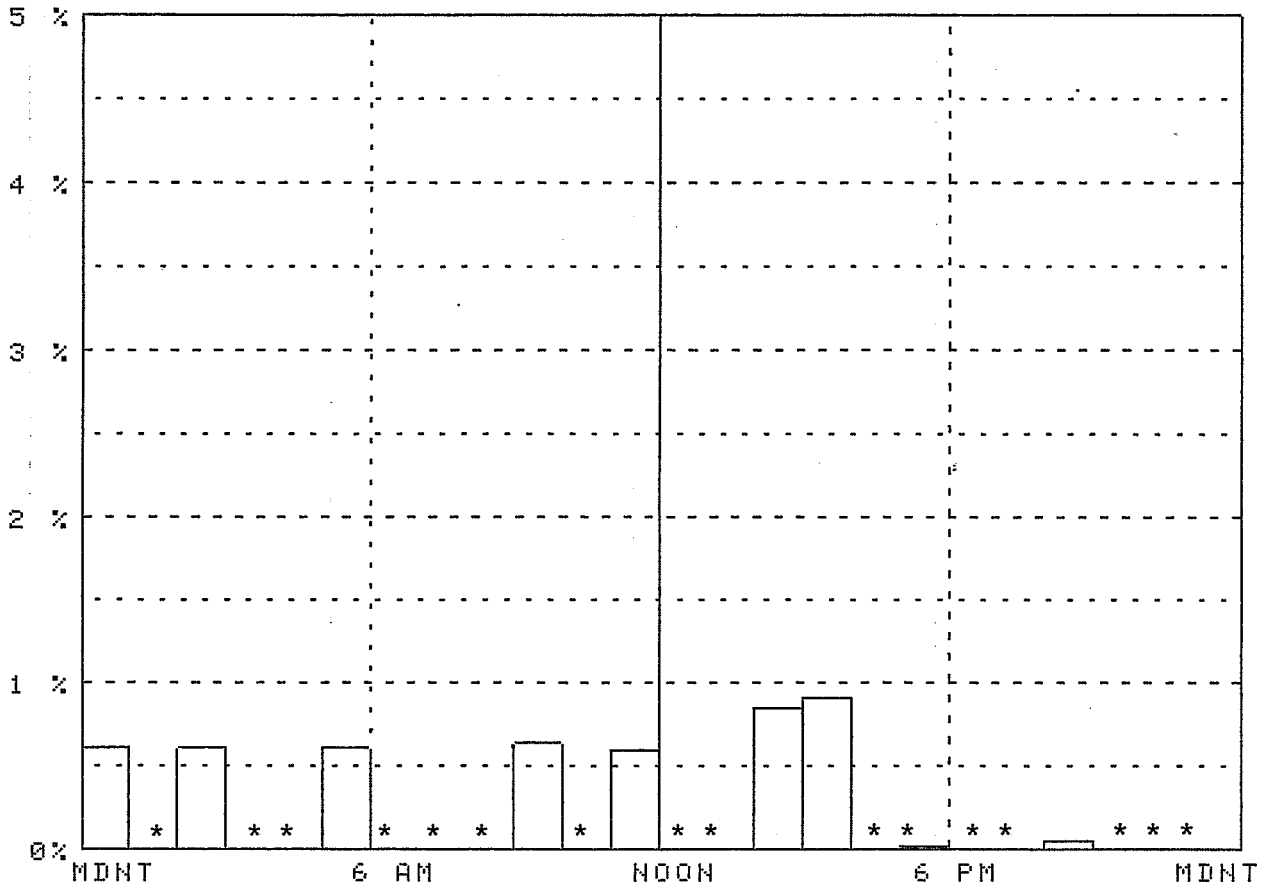


Figure 6.4. Time-of-day usage for 280-300 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #5 300-320 MHZ

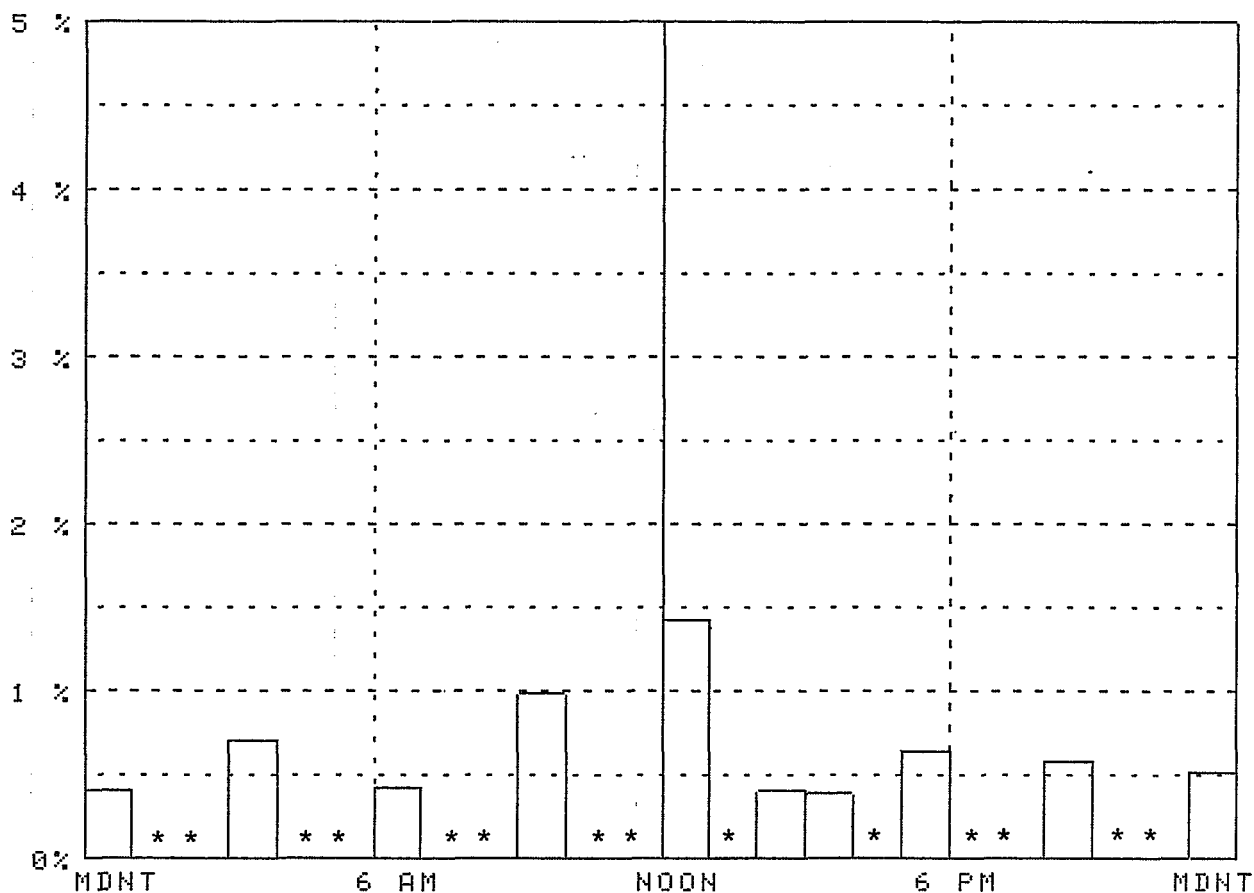


Figure 6.5. Time-of-day usage for 300-320 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #6 320-340 MHZ

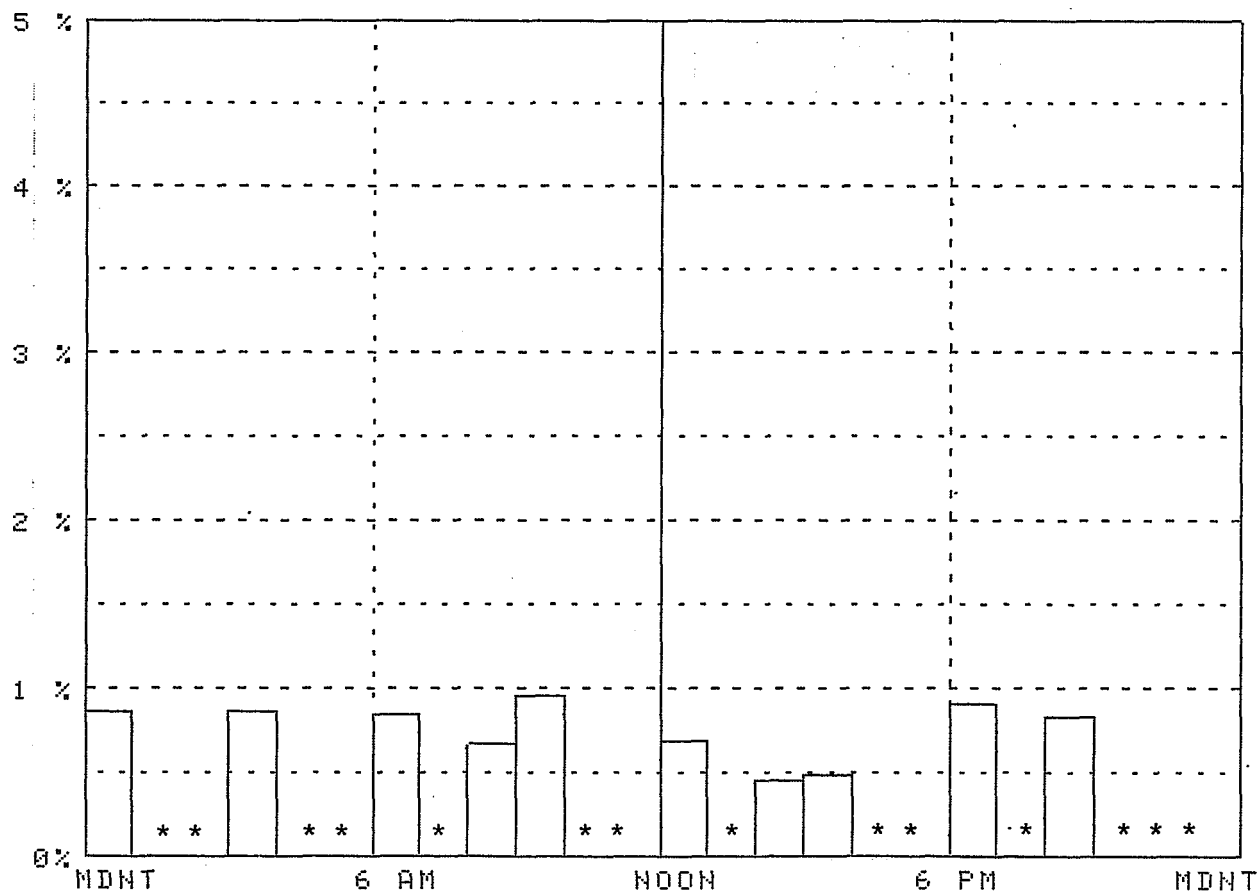


Figure 6.6. Time-of-day usage for 320-340 MHz sub-band.



NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #7 340-360 MHZ

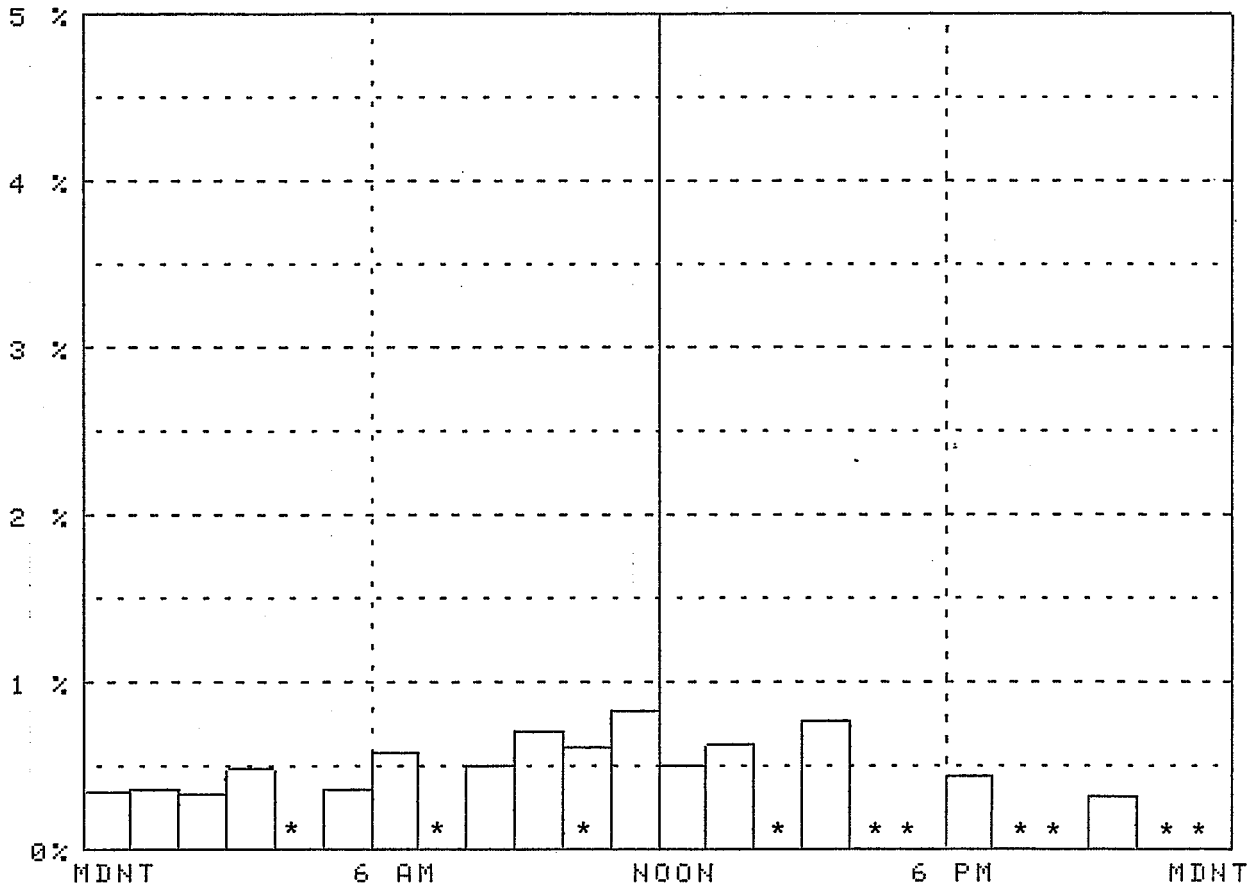


Figure 6.7. Time-of-day usage for 340-360 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #8 360-380 MHZ

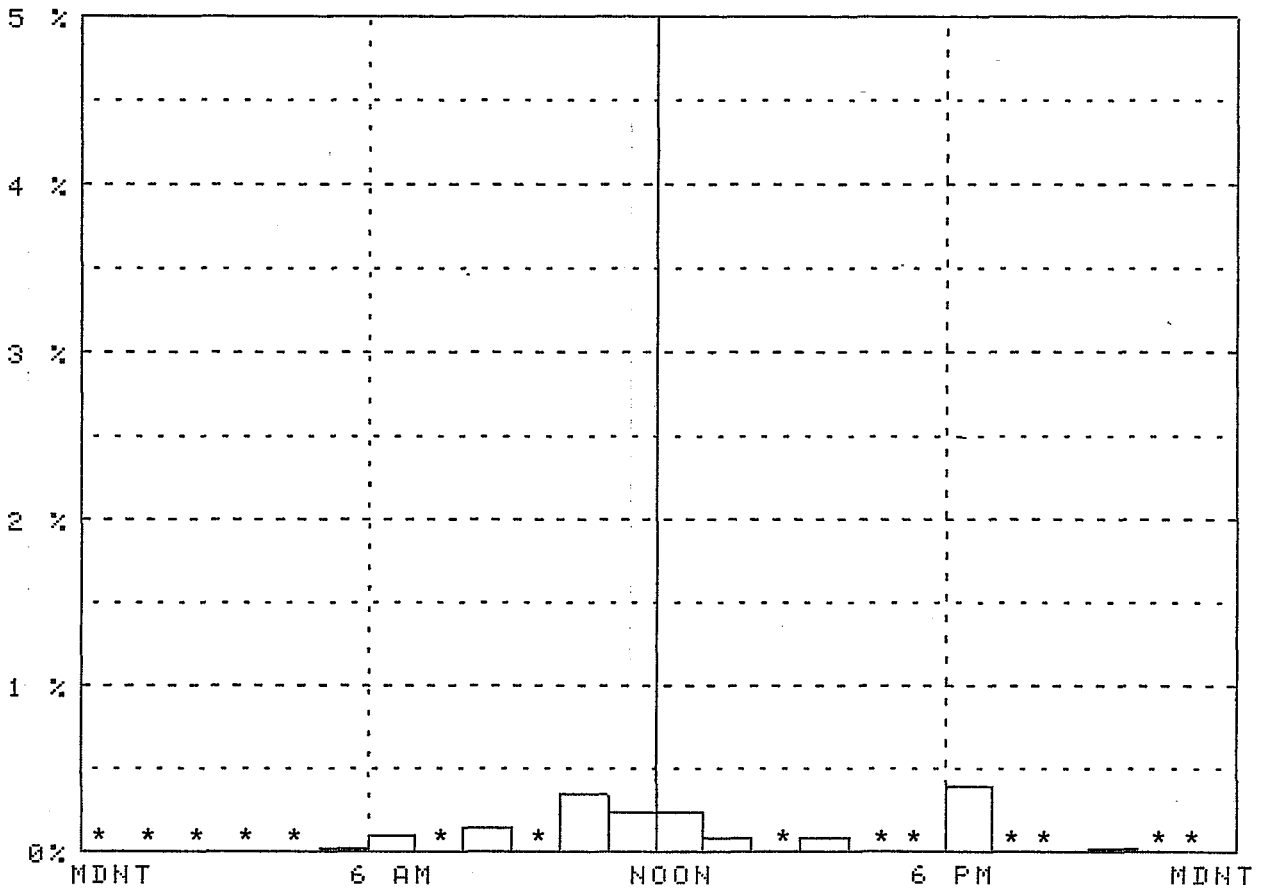


Figure 6.8. Time-of-day usage for 360-380 MHz sub-band.

NORFOLK, VIRGINIA

APRIL 1978

\* INDICATES NO DATA

225-400 MHZ OCCUPANCY VS. TIME-OF-DAY

BAND #9 380-400 MHZ

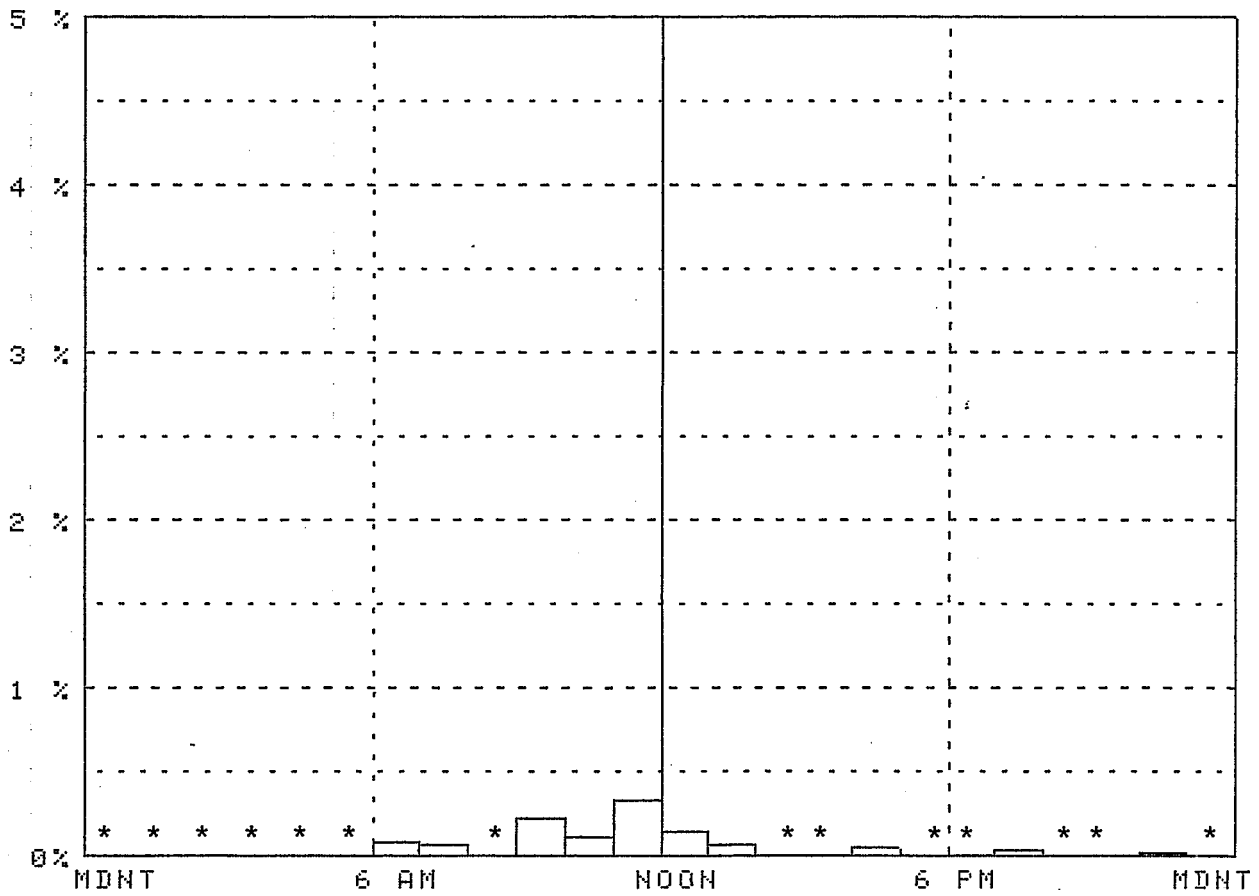


Figure 6.9. Time-of-day usage for 380-400 MHz sub-band.

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20 20 20

20 20 20

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