(2)

GL-TR-89-0296

Radio Frequency Interference (RFI) Measurements made Near the Proposed Alaska OTH Receiving Site

Steven A. Estes
DuWayne Bostow
Robert D. Hunsucker

University of Alaska Fairbanks
Geophysical Institute
Fairbanks, AK 99775-0800

July 1990

Scientific Report No. 1

GEOPHYSICS LABORATORY
AIR FORCE SYSTEM COMMAND
UNITED STATES AIR FORCE
HANSCOM AIR FORCE BASE, MASSACHUSETTS 01731-5000

"This technical report has been reviewed and is approved for publication"

BALKRISHNA S. DANDEKAR
Contract Manager

WILLIAM K. VICKERY
Branch Chief

FOR THE COMMANDER

ROBERT A. SKRIVANEK
Division Director

This report has been reviewed by the ESD Public Affairs Office (PA) and is releasable to the National Technical Information Service (NTIS).

Qualified requestors may obtain additional copies from Defense Technical Information Center. All others should apply to the National Technical Information Service.

If your address has changed, or if you wish to be removed from the mailing list, or if the addressee is no longer employed by your organization, please notify GL/IMA, Hanscom AFB, MA 01731. This will assist us in maintaining a current mailing list.

Do not return copies of this report unless contractual obligations or notice on a specific document requires that it be returned.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	July 1990	Scientific Report No. 1

4. TITLE AND SUBTITLE
Radio Frequency Interference (RFI) Measurements made Near the Proposed Alaska OTH Receiving Site

5. FUNDING NUMBERS
PR 4140 TA ES WU AB
Contract F19628-87-K-0048

6. AUTHOR(S)
Steven A. Estes
DuWayne Bostow
Robert D. Hunsucker

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
University of Alaska Fairbanks
Geophysical Institute
Fairbanks, AK 99775-0800

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Geophysics Laboratory
Hanscom AFB
Massachusetts 01731-5000

Contract Manager: B. Dandekar/LIS

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
GL-TR-89-0296

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release;
Distribution unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This report describes in detail measurments of RFI and radio noise made in the vicinity of the proposed OTH receiver sites near TOK, Alaska during the period 23 September to 9 October 1987.

14. SUBJECT TERMS
Tok, Alaska OTH Radio Frequency Interference (RFI)
Radio Noise

15. NUMBER OF PAGES
68

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	SAR

TABLE OF CONTENTS

RADIO FREQUENCY INTERFERENCE (RFI) MEASUREMENTS MADE NEAR THE PROPOSED ALASKA OTH RECEIVING SITE

Steven A. Estes, DuWayne Bostow and Robert Hunsucker
Geophysical Institute, University of Alaska
Fairbanks, AK 99775-0800

INTRODUCTION

As part of our AFGL Contract on "Auroral Clutter and Radio Frequency Interference Studies in Alaska", we were requested to make field measurements of RFI and atmospheric radio noise in the vicinity of the proposed Alaska OTH Radar site near Tok, Alaska as described by "Task 2" in our proposal.

Extensive measurements of RFI and radio noise were made during the period 23 September - 9 October 1987 in the vicinity of the planned OTH radar site. Figure 1 shows the location of the proposed OTH receiver antenna systems and the 10 sites where measurements were made in relation to the "Greater Tok Metropolitan Area".

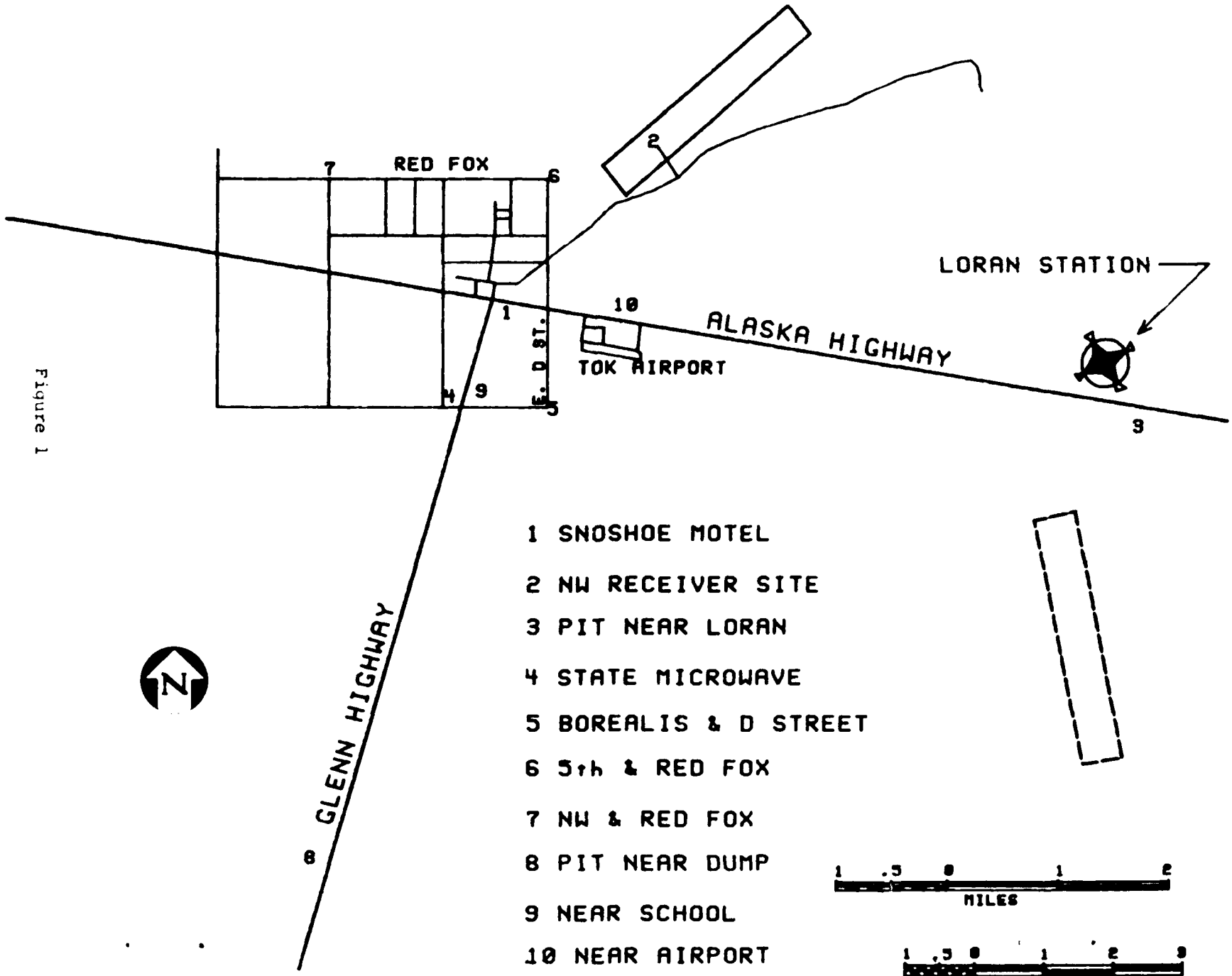
RED FOX
7
6
2
LORAN STATION
10
1
ALASKA HIGHWAY
TOK AIRPORT
E. D ST.
4
9
5
3
GLENN HIGHWAY
8
N
1 SNOSHOE MOTEL
2 NW RECEIVER SITE
3 PIT NEAR LORAN
4 STATE MICROWAVE
5 BOREALIS & D STREET
6 5th & RED FOX
7 NW & RED FOX
8 PIT NEAR DUMP
9 NEAR SCHOOL
10 NEAR AIRPORT
1 .5 0 1 2
MILES
1 .5 0 1 2 3

Figure 1

System Testing and Calibration

CALIBRATION SETUP

The test location was at the proposed northwest OTH-B receiver site (63 21.5'N, 142 55.5'W), about two miles north of the Tok, Alaska airport. The NM17/27A field intensity meter was set up in a travel trailer. The calibrated NM17/27A 41" rod antenna with four 100' radials was located about 150' to the northeast and connected to an antenna switch at the trailer with RG58/U coaxial cable. The 20' monopole with four 100' radials was located 60' to the southwest. It was connected to the antenna switch with 83'3" of Belden 8240, RG58/U coaxial cable. Between the antenna switch and the NM17/27A were a 2 MHz high pass filter and a 42 MHz low pass filter. A pickup truck with a Kenwood TS-440S transceiver used as a signal source fed into a 54" vertical mast mounted on the cab was parked about 500 feet to the southeast.

DESCRIPTION OF EQUIPMENT

As shown in figure 2. The primary instrument used for data acquisition was the Eaton/Singer/Ailtech NM17/27A EMI/Field Intensity Meter, and the associated calibrated antenna system. The NM17/27A performs EMI emission measurements from 10 kHz to 32 MHz in accordance with MIL-STD-461A. It supplies amplitude and frequency analog data output for X-Y recorder presentation. It also provides the average, quasi-peak, and direct peak field intensity, with several hold

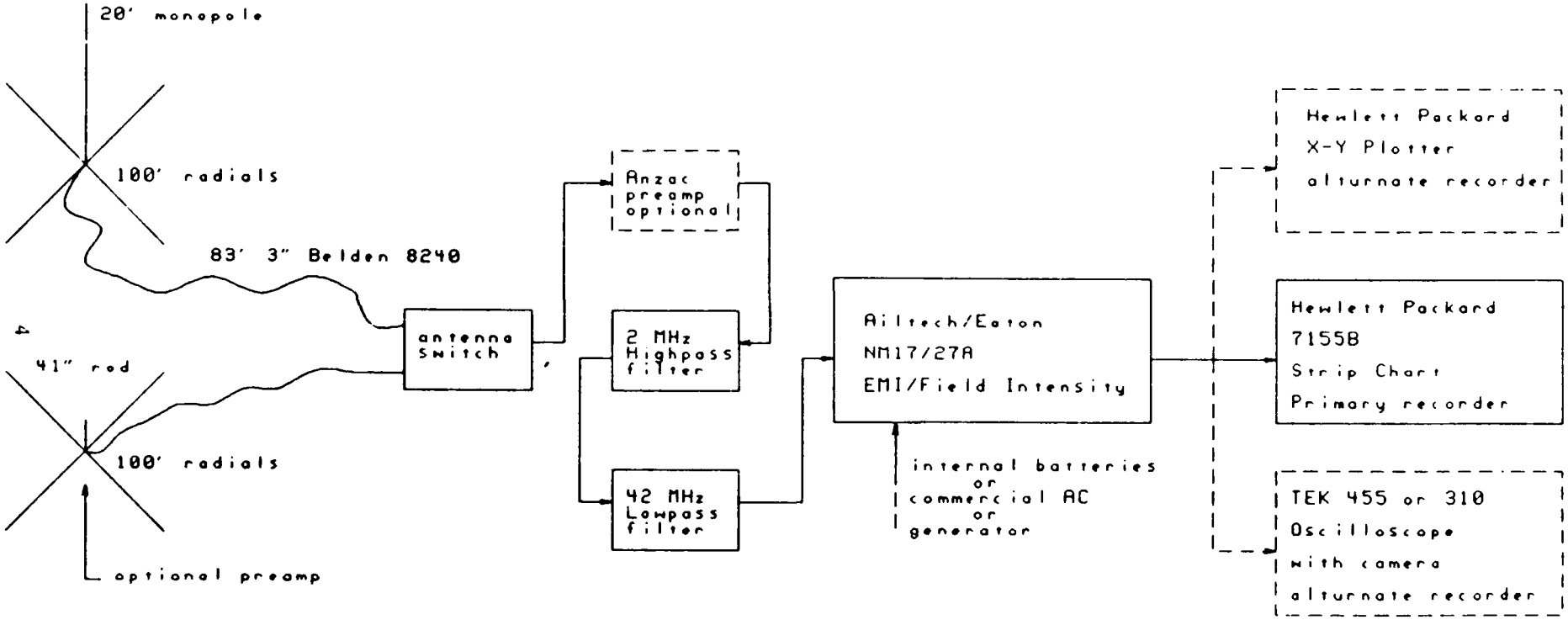

Figure 2. Simplified block diagram of measurement setup.

times and a slideback detector (for aural null indication) functions. Four bandwidths (100 Hz, 1 kHz, 10 kHz and 50 kHz) are available with internal frequency scan, variable sector width and scan rate. Excellent sensitivity, VSWR, gain flatness and spurious rejection assure accurate and dependable test results. The 60dB meter scale, along with 100dB of attenuation/gain in 20dB steps, provides an overall measurement range of 160dB (0.01 microvolt to 1.0 volt). The system operates from 115/230 VAC or from an internal rechargeable battery.

Most of the data were recorded on a battery powered Hewlett Packard 7155B strip chart recorder. When AC power was available, a Hewlett Packard X-Y recorder was often used as the recorder. TEK 455 and TEK 314 oscilloscopes and an associated camera were available and tried but produced poor results when compared to the strip chart and X-Y recorders. To increase sensitivity of the system a 20 foot tall monopole antenna was constructed and calibrated against the standard 41" rod antenna provided with the NM 17/27A.

The monopole antenna was constructed from two ten foot pieces of 3/4 inch copper pipe joined in the center by a union fitting. This allowed disassembly for easy transport. The union fitting also supports a large washer to which three guy ropes are fixed. The base is a floor flange mounted on a block of phenolic and that is attached to a

24"x24" piece of plywood. The 20' mast screws into the floor flange. An aluminum ring is attached to a 12"x19" plate of aluminum which is screwed to the plywood base to which the four 100' radial wires are fastened. A female BNC connector is mounted on the ring and the center conductor wired to the mast by means of a spade lug and a screw.

Out of band signals were rejected by filtering the input thru a 2 MHz highpass and a 42 MHz lowpass filter

PROCEDURE

To determine the antenna correction factor (A_{cf}) for the 20' monopole continuous wave (CW) signal of about three watts was transmitted from the Kenwood transceiver on 12 different frequencies as listed in Table 1. Signal levels measured alternately on the 41" rod antenna and the 20' monopole are listed as measured levels in Table 1. The antenna correction factor (A_{cf}) for the 41" rod antenna is obtained from the calibration chart provided with the NM17/27A. The A_{cf} is added to the measured level for the 41" rod antenna to obtain the corrected signal level. The A_{cf} for the monopole is obtained by subtracting the measured level on the 20' monopole from the corrected level for the 41" rod. The results are listed in Table 1.

Table 1

Test	Freq	Measured Level	A_{cf}	Corrected Level	Measured Level	Monopole A_{cf}
		<------ 41" rod ----->			< 20' monopole >	
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)
1	2.0	-104.0	33.0	- 71.0	- 98.0	27.0
2	2.8	- 82.5	32.0	- 50.5	- 73.5	23.0
3	4.0	- 85.5	32.0	- 53.5	- 66.5	13.0
4	6.0	- 82.5	32.2	- 50.3	- 58.5	8.2
5	8.0	- 78.5	33.2	- 45.3	- 49.0	3.7
6	10.0	- 67.0	24.0	- 43.0	- 42.5	- 0.5
7	12.0	- 68.0	23.5	- 44.5	- 38.0	- 6.5
8	14.0	- 67.0	24.0	- 43.0	- 39.0	- 4.0
9	16.0	- 68.0	24.8	- 43.2	- 41.0	- 2.2
10	20.0	- 66.0	26.8	- 39.2	- 37.0	- 2.2
11	24.0	- 64.0	27.5	- 36.5	- 35.0	- 1.5
12	28.0	- 60.0	28.0	- 32.0	- 33.5	1.5

SYSTEM SENSITIVITY

The specifications of the NM17/27A give a sensitivity of -16dB(uV) to produce a 3dB meter indication above noise when used as a two-terminal RF voltmeter at 10 kHz bandwidth in the field intensity mode. The antenna system response, including any preamplifier, must be considered in calculating the system sensitivity. Antenna cable losses are negligible in this case. Four cases that were utilized during the course of this study must be considered: 1) 41" rod, 2) 41" rod with NM17/27A preamplifier, 3) 20' monopole and 4) the 20' monopole with an Anzac AM-124 preamplifier.

In the first case, for the 41" rod, the system sensitivity is just the A_{cf} (antenna correction factor) as a function of frequency plus the NM17/27A sensitivity.

The second case is again for the 41" rod but this time with the rod antenna preamp. The system sensitivity for the frequency range of interest (2-28 MHz) is obtained from the NM 17/27A instruction manual (figure 2-1) as -3dB(uV/m) for 1kHz bandwidth. The sensitivity for a 10kHz bandwidth will be 10dB less or +7dB(uV/m).

The third case, for the 20' monopole used directly with the NM17/27A, is similar to the first case. It is the monopole A_{cf} plus the sensitivity of the NM17/27A.

The fourth case, the 20' monopole with the Anzac preamplifier is somewhat more complicated. The Anzac is specificd as h:ving a NF (noise figure) of 3.5dB. This, when combined with the NF of the NM17/27A and the A_{cf} yields the system sensitivity.

The sensitivity of the NM17/27A ,from above, is -16dBuV (-123dBm) at 10kHz bandwidth. Therefore, the noise power (P_n) of the NM17/27A, referenced to the input terminal is:

$P_n = kT_0B(F-1)$ where

k = Boltzmann's constant,

T_0 = absolute temperature,

B = bandwidth,

F = noise factor.

$$P_n(dB) = 10\log P_n = 10\log(kT_0)+10\log(B) \quad +10\log(F-1) \quad (1)$$

$$-123dBm = -174dBm/Hz+10\log(10kHz)+10\log(F-1)$$

$$-123dBm = -174dBm/Hz+40dBHz \quad +10\log(F-1)$$

$$-123dBm + 174dBm/Hz-40dBHz \quad =10\log(F-1)$$

$$11dBm=10\log(F-1)$$

$$\log(F-1)=1.1$$

$$(F-1)=12.6$$

solving for the noise factor: $F = 13.6$

The Anzac preamp characteristics are NF = 3.5dB and G = 14dB. Therefore F = 2.2 and G = 25.12.

The combined noise factor F′ is given as:

$$F' = F_{preamp} + (F_{NM}-1)/G_{preamp} = 2.2+12.6/25.12 = 2.70 \quad (2)$$

and finally the noise power for the combination:

$$P_n' = kT_0B(F-1)$$

$$10 \log P_n' = 10 \log(kT_0) + 10 \log B \quad + 10 \log (F'-1) \quad (3)$$

$$P_n'(dB) = -174dBm/Hz + 10 \log 10kHz + 10 \log (2.7-1)$$

$$P_n'(dB) = -174dBm/Hz + 40dBHz + 2.3dB = -131.7dBm$$

$$P_n'(dB) \sim -132dBm = -25dBuV \text{ for } 10kHz \text{ bandwidth}$$

This must be added to the A_{cf} to obtain the system sensitivity.

Sensitivities for the four cases are summarized below:

Table 2

Freq (MHz)	SYSTEM SENSITIVITY* (rounded to nearest dB) 41"rod (dBuV/m) Sens+A_{cf}	41" w/preamp (dBuV/m)	20'pole (dBuV/m) Sens+A_{cf}	20'w/preamp (dBuV/m) Sens+A_{cf}
2.5	-16+32=16	7	-16+25= 9	-25+25= 0
5	-16+32=16	7	-16+11= -5	-25+11=-14
10	-16+24= 8	7	-16- 1=-17	-25- 1=-26
15	-16+24= 8	7	-16- 3=-19	-25- 3=-28
20	-16+26=10	7	-16- 2=-18	-25- 2=-27

* Field intensity mode, B = 10 kHz.

The system sensitivity is plotted in figures 3 thru 7. They are the horizontal lines which usually continue for several days representing the time period each configuration was used. These calculated sensitivities do not compare well with the measured noise levels. The absolute minimum noise levels should plot no more than 3dB below the system sensitivity. However, as seen in figures 3 thru 7 measured values are as much as 9.5dB below the calculated values.

Sources of this error could be from calibration error, which has been observed by others in the field. The input sensitivity of the NM17/27A was checked with an IFR 1000S communications test set and no error was found. But characteristics of neither the NM17/27a 41" whip antenna nor its preamplifier were measured. The manufacturer states that "All above sensitivities are conservatively stated, worst case over the entire frequency range of the instrument. Typical average sensitivity is 2 to 4 dB better"

TIME STANDARD

All data was recorded using ADT (Alaska Daylight Time). ADT is eight hours earlier than UTC (Universal Coordinated Time). However, Tok, Alaska lies at approximately 143°W longitude. At 15 degrees/hr, Tok time should be nine and a half hours earlier than UTC - not eight hours as implied by ADT.

Results of Measurement

ATMOSPHERIC NOISE

One of the objectives of this project was to measure the level of atmospheric noise at and near the OTH site in the 2-30 MHz frequency band. Below are tables derived from CCIR 322 and NTIA-R-85-173 for expected values of atmospheric noise for Autumn (Sept-Nov) near Tok, Alaska. These values are converted to dB above 1 microvolt (dBuV/m) and are plotted against local time as the cyclical functions in Figures 3 thru 7.

Table 3

Expected Values of Atmospheric Noise
for Autumn (Sep-Nov) near Tok, Alaska
from CCIR report 322

local time/freq	2.5	5	10	15	20MHz
	(dB above kT_0B)				
00-04	48	45	30	10	-
04-08	34	34	23	9	-
08-12	15	21	28	24	11
12-16	17	21	30	28	21
16-20	40	38	33	25	15
20-24	50	45	34	18	-
Galactic	43	36	28	25	22

Converting to electric field intensity in decibels above one microvolt per meter by:

$$E_n = F_a + 20 \log f + 10 \log B - 95.5 \quad -- (4)$$

where E_n is electric field noise strength
F_a is noise level in dB above kT_0B
f is frequency in MHz
B is bandwidth in Hz

Applying the equation (4) for 10 kHz bandwidth to the Table 3 above:

Table 4

Expected Values of Atmospheric Noise
for Autumn (Sep-Nov) near Tok, Alaska
computed from CCIR report 322

local time/freq	2.5	5	10	15	20MHz
	(dB above 1 microvolt/meter)				
00-04	0	3.5	- 5.5	-22	-
04-08	-14	- 7.5	-12.5	-23	-
08-12	-33	-20.5	- 7.5	- 8	-18.5
12-16	-31	-20.5	- 5.5	- 4	- 8.5
16-20	- 8	- 3.5	- 2.5	- 7	-14.5
20-24	2	3.5	- 1.5	-14	-
Galactic	- 5	- 5.5	- 7.5	- 7	- 7.5

Similarly for the NTIA data in Table 5 :

Table 5

Expected Values of Atmospheric Noise
for Autumn (Sep-Nov) near Tok, Alaska
from NTIA report 85-173

local time/freq	2.5	5	10	15	20MHz
	(dB above kT_0b)				
00-04	40	38	22	-	-
04-08	33	33	22	-	-
08-12	11	19	27	22	9
12-16	12	18	28	27	16
16-20	36	36	30	22	12
20-24	40	38	28	10	-
Galactic	43	36	28	25	22

Converting to electric field intensity in decibels above one microvolt per meter by applying the equation (4) for 10 kHz bandwidth to the Table 5 above:

Table 6

Expected Values of Atmospheric Noise
for Autumn (Sep-Nov) near Tok, Alaska
computed from NTIA report 85-173

local time/freq	2.5	5	10	15	20MHz
	(dB above 1 microvolt/meter)				
00-04	- 8	- 3.5	-13.5	-	-
04-08	-15	- 8.5	-13.5	-	-
08-12	-37	-22.5	- 8.5	-10	-20.5
12-16	-35	-23.5	- 7.5	- 5	-13.5
16-20	-12	- 5.5	- 5.5	-10	-17.5
20-24	- 8	- 3.5	- 7.5	-22	-
Galactic	- 5	- 5.5	- 7.5	- 7	- 7.5

A tabulation of all RF noise measurements made at the TOK OTH site is included as Appendix A to this report.

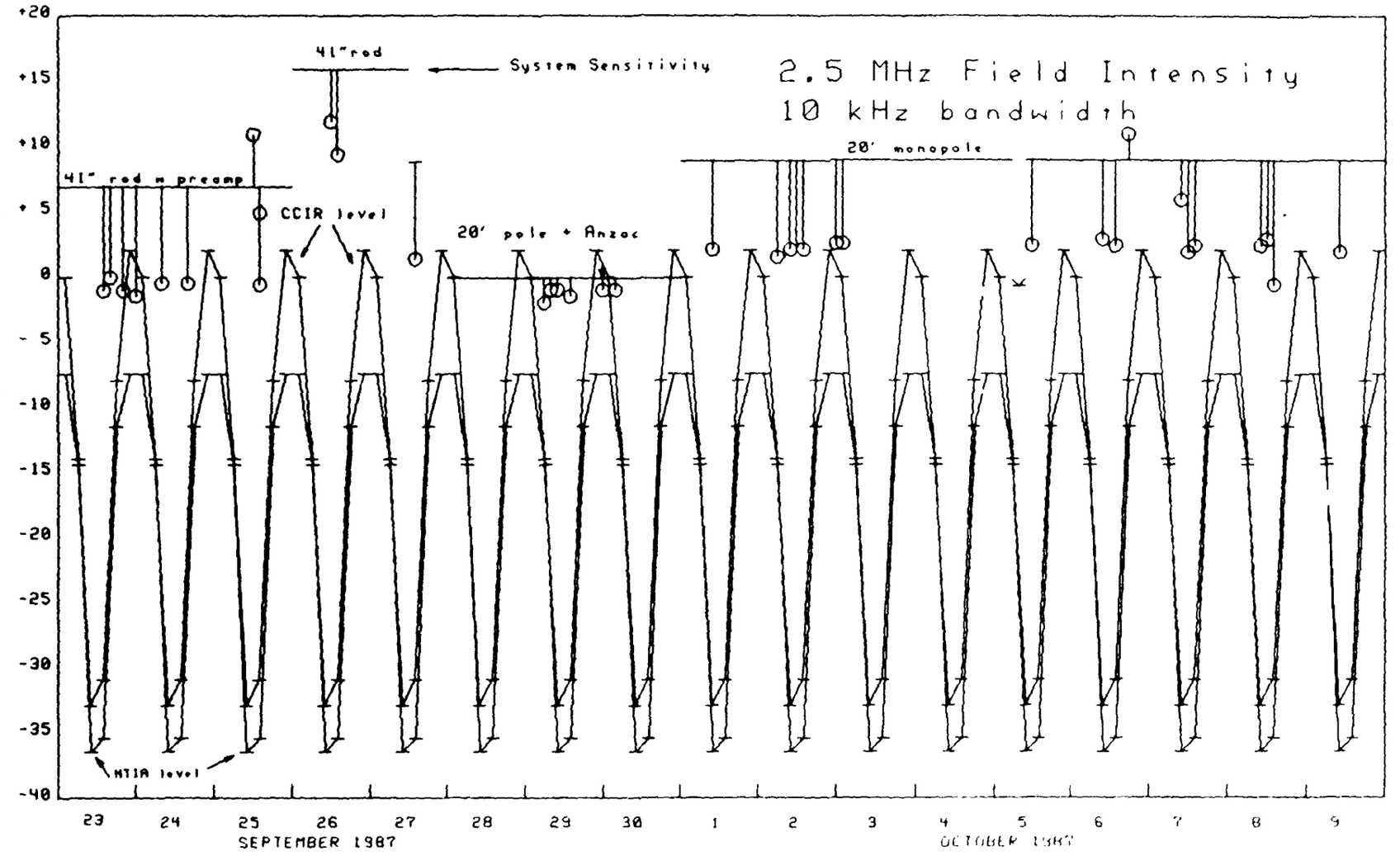
2.5 MHz Field Intensity
10 kHz bandwidth
41" rod
System Sensitivity
41" rod + preamp
CCIR level
20' pole + Anzac
20' monopole
NTIA level
dB above 1uV/m
+20
+15
+10
+ 5
0
- 5
-10
-15
-20
-25
-30
-35
-40
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
SEPTEMBER 1987
OCTOBER 1987

Figure 3

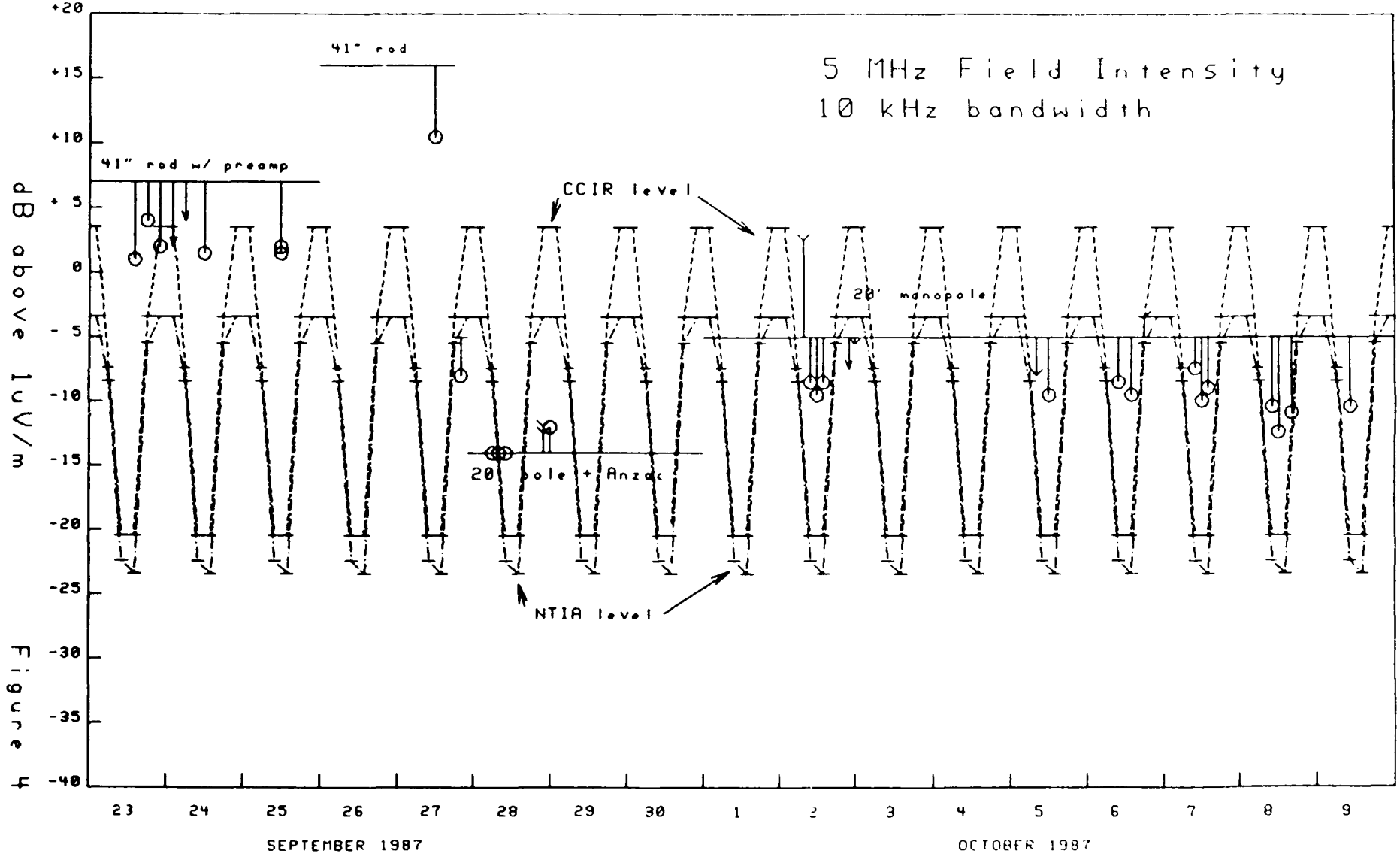
5 MHz Field Intensity
10 kHz bandwidth
41" rod
41" rod w/ preamp
CCIR level
20' monopole
20' pole + Anzac
NTIA level
dB above 1uV/m
+20
+15
+10
+5
0
-5
-10
-15
-20
-25
-30
-35
-40
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
SEPTEMBER 1987
OCTOBER 1987

Figure 4

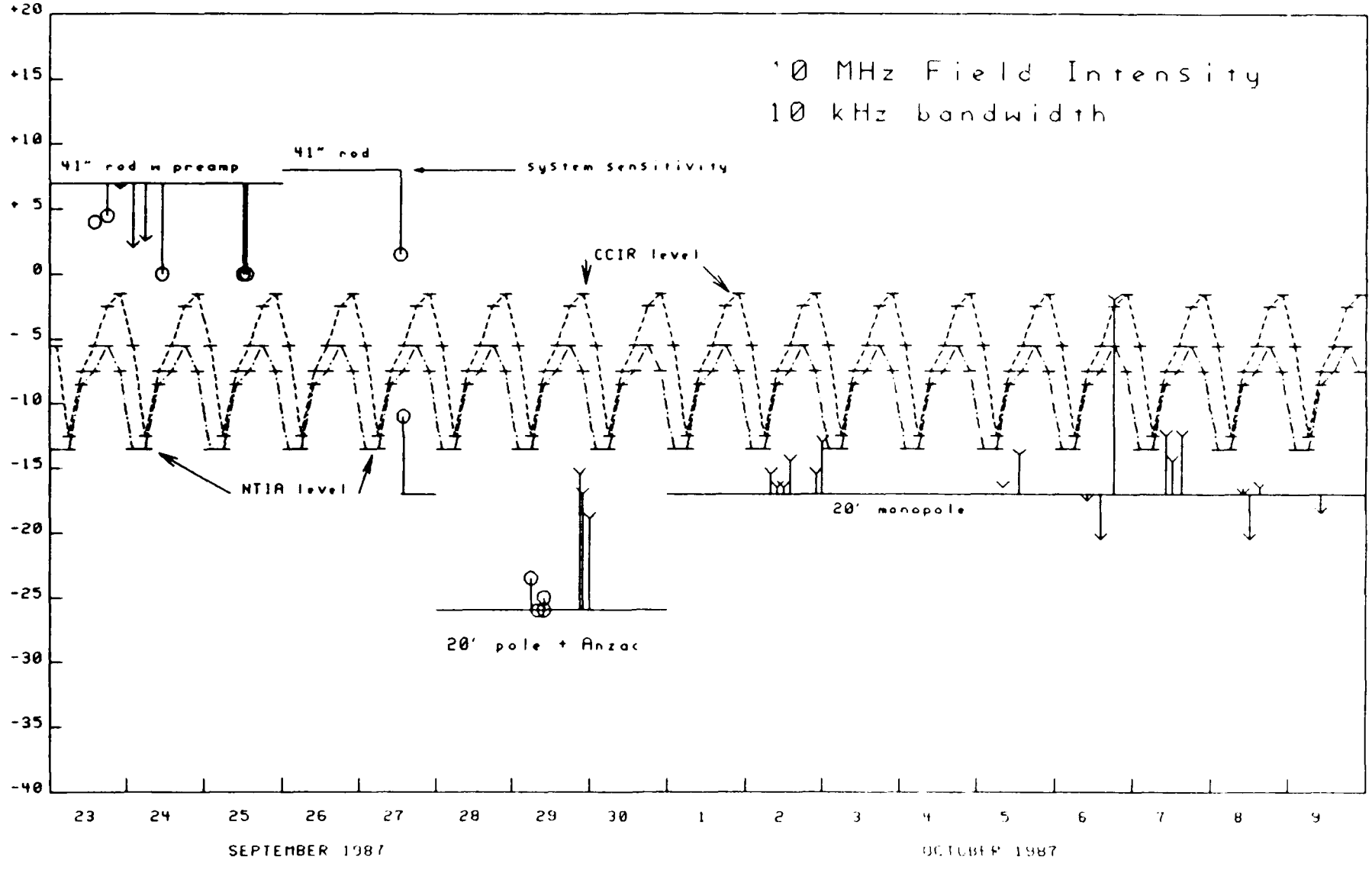
10 MHz Field Intensity
10 kHz bandwidth
41" rod w preamp
41" rod
system sensitivity
CCIR level
NTIA level
20' monopole
20' pole + Anzac
dB above 1uV/m
+20
+15
+10
+5
0
-5
-10
-15
-20
-25
-30
-35
-40
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
SEPTEMBER 1987
OCTOBER 1987

Figure 5

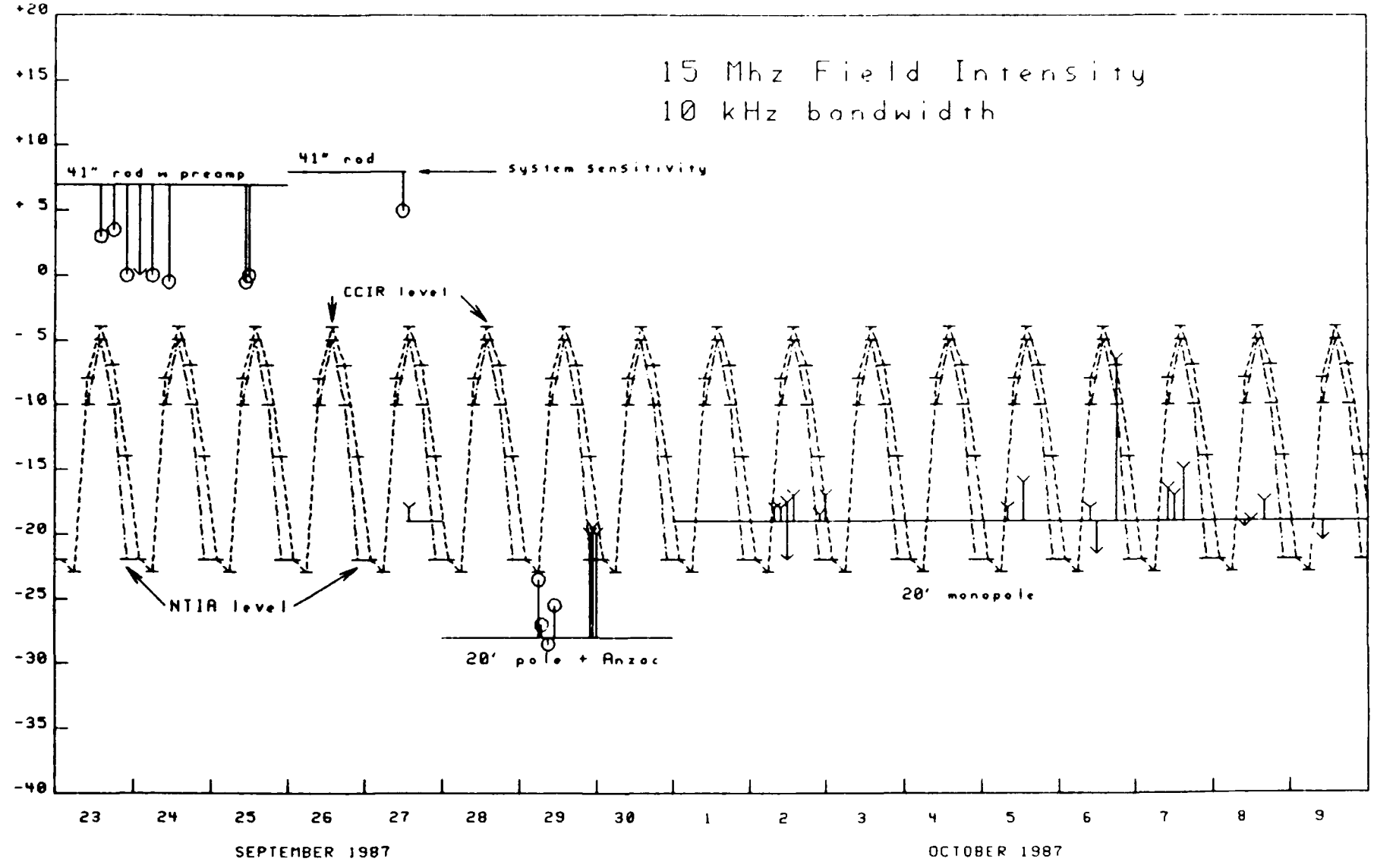
15 Mhz Field Intensity
10 kHz bandwidth
41" rod w preamp
41" rod
System Sensitivity
CCIR level
NTIA level
20' pole + Anzac
20' monopole
dB above 1uV/m
+20
+15
+10
+5
0
-5
-10
-15
-20
-25
-30
-35
-40
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
SEPTEMBER 1987
OCTOBER 1987

Figure 6

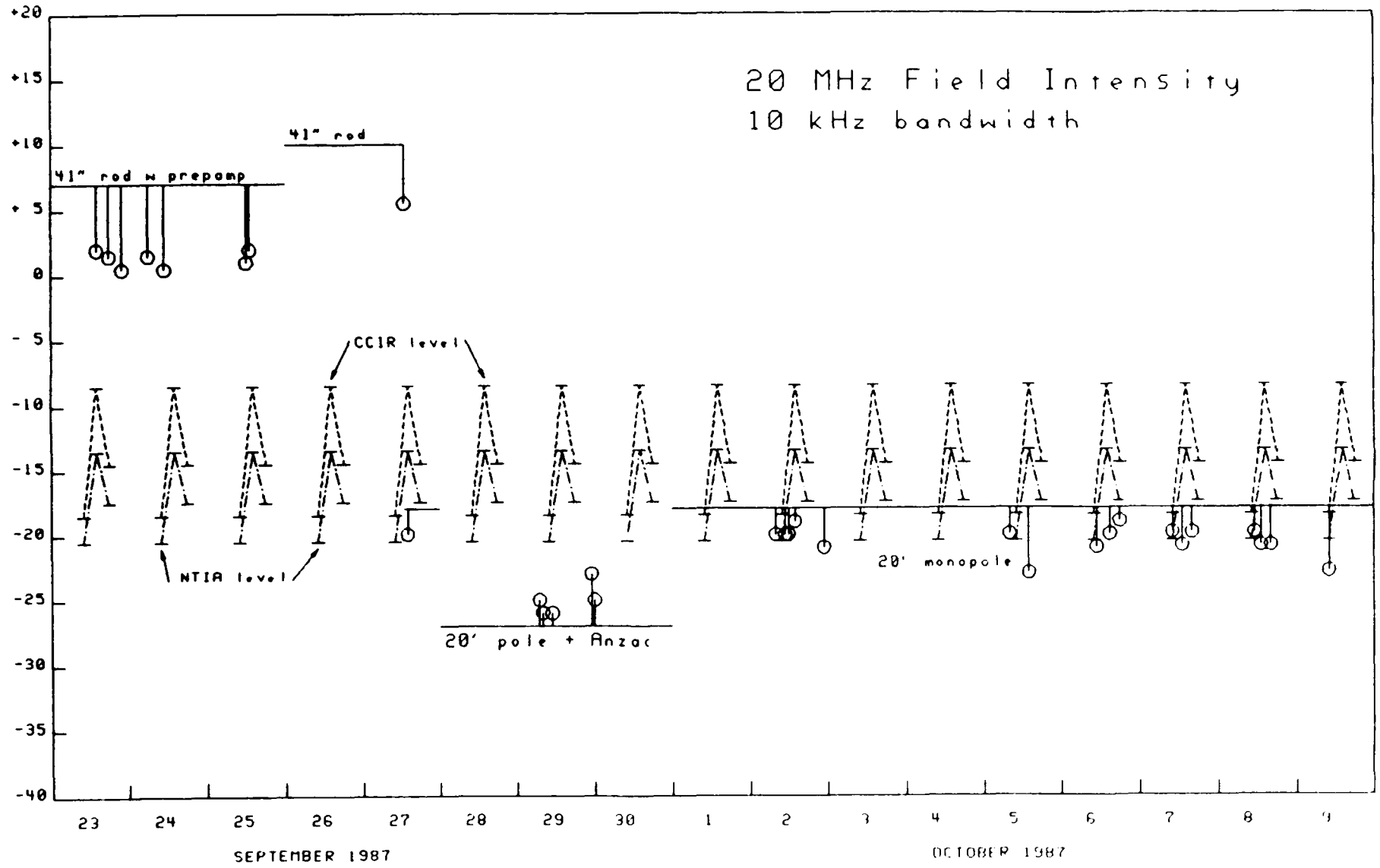
20 MHz Field Intensity
10 kHz bandwidth
41" rod
41" rod w prepamp
CCIR level
NTIA level
20' pole + Anzac
20' monopole
dB above 1uV/m
+20
+15
+10
+5
0
-5
-10
-15
-20
-25
-30
-35
-40
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
SEPTEMBER 1987
OCTOBER 1987

Figure 7

Ambient Noise Measurements

A tabulation of all measurements of ambient noise, corrected for antenna response, is included as Appendix B, and they are plotted as a function of frequency, intensity and time in Figures 3 thru 7 as circles and down-ward pointing arrows. The circles represent the scaled readings free of interference from transmissions from communication, radar and navigation systems and the like. Data possibly contaminated by interference are represented as arrows; meaning that the value of atmospheric or locally generated noise is probably less than the value plotted. The vertical lines extending from the symbols allows the data to be referred to the system calculated sensitivity. Recall that the calculated system sensitivity is defined as three decibels above calculated system noise. For comparison, the short horizontal lines connected by the cyclical functions, are the expected values of atmospheric noise from Tables 4 and 6. At any specific time the CCIR values are always larger than the NTIA values.

Local "TOK" Noises

The raw spectral data obtained from the NM17/27A and Hewlett Packard chart recorders were not easily comparable due to fluctuations in sweep speed, differences in recorder type, different system sensitivities and attenuator settings.

Thus, some of data were digitized, and antenna corrections applied to form a uniform database for easy comparison of one set of measurements with another. The 0.3 second peak function was chosen because it was the only mode which enhanced pulse type signals, particularly the Loran signals. The results of measurements made throughout the TOK area and at Jan Lake, a quiet site about 33 miles to the northwest, are shown in Figures 8 thru 26. These represent peak signal levels in the 2-32 MHz frequency range at all the measurement sites on the various dates during the measurement campaign. The NM17/27A, the 20 ft monopole, and battery power were used for these measurements. The Anzac preamp was used only for data acquired in figures 8,9 and 10. The sensitivity scales -30 to +70 dB relate to 1 microvolt/m, the frequency scan was 2-32 MHz.

RFI generated by the Loran system is best characterized by data taken at the gravel pit about 0.3 mile south-southeast of the transmitter site as presented in figure 17. Loran interference dominates the background level below 8 MHz. Above 8 MHz no Loran was identified. A comparison of figures 8,9,11,12,13,14 (Loran off) with figures 10,15 and 16 (Loran on) at the Northwest receiver site does not reveal any significant interference due to the Loran station. However many of the smaller peaks (figures 10,15 and 16) in the 2 to 5 MHz range can be attributed to the Loran

transmitter about 3.5 miles to the southeast. A much more sensitive system would be needed to quantify them.

The first nine peak RFI plots, figures 8 thru 16, were taken at the OTH Northwest Receiver Site. Figure 12 shows the highest peak RFI (for the plots shown) of E ~50 dBuV/m peak at f ~10-11 MHz. The "quietest" RFI level for these plots seemed to occur on figures 8 and 10. This however, may be due to signal overload of the Anzac preamplifier.

Of the remaining RFI plots obtained at the other sites, the highest noise levels (~58 dBuV/m) occurred at the Snoshoe Motel site, figure 20 , and the lowest (max ~35 dBuV/m) at the Borealis and East D Street site, figure 19 which was next to a power line.

Discussion and Conclusions

Three procedures were used to analyze the data. To begin, the data were organized and inventoried, (see appendix A). Selected items were chosen from this list for analysis. Data which were taken while using generator power are polluted with noise and are generally not used. Those which were taken with the Anzac preamplifier in line may have strong signal overload problems and thus may show reduced gain and intermodulation products contamination. First, the field intensity was scaled at 2.5,5,10,15 and 20 MHz on the records which were produced using a 10 kHz bandwidth and field intensity, on battery or commercial power. Second, selected 10kHz bandwidth, 0.3s peak records were digitized, antenna corrections applied and plotted. Comparisons were made between records to determine quantity of local noise present. Third, a large signal inventory was made to get an idea of maximum signal levels and in some cases the sources of large signals.

Our tentative conclusions and caveats concerning radio noise and RFI measurements made near the proposed Alaskan OTH are:

1.- This measurement campaign was quite successful in obtaining quantitative values of ambient (man-made and naturally occurring) noise and RFI levels near the Alaskan OTH site valid for near sunspot minimum (SSN ~ 40), early

fall, moderately geomagnetic active conditions the College, Alaska "Equivalent daily Amplitude (A_k index)* was:

29 September	48	moderately disturbed
2 October	11	quiet
3 October	57	moderately disturbed
5 October	12	quiet

*This is a "local" index and relates to the measurements better than the "planetary" A_p value

2.- A 20 ft monopole had to be constructed and utilized to increase the sensitivity of the NM17/27A system.

3.- The receiving system noise floor was not low enough for us to obtain strictly accurate noise measurements (see figures 3-7).

4.- We did not measure peak RFI levels above -58 dBuV/m during this campaign.

5.- Comparison of data from the "quiet" Jan Lake site and data from the Tok area show surprisingly little difference.

6.- Man-made noise generated at Tok was not found to be a significant problem, however, this conclusion must be

tempered by the aforementioned limitations of the measurement system.

7.- More radio noise and RFI data are needed to obtain sunspot cycle, seasonal, and magnetic activity effects.

8.- Many of the field intensity measurements made were below those predicted for atmospheric noise by both CCIR 322 and NTIA 85-173. Neither the CCIR or the NTIA noise curves adequately sample the auroral regions, nor do they give the dependence of noise on geomagnetic activity.

Acknowledgements

The technical advice of Brett S. Delana and the skill in digitizing seemingly endless records of data by Guy Tytgat both of the Geophysical Institute staff are gratefully acknowledged.

The review of this report by George Hagn of SRI International , Jurgen Buchau of AFGL and Leo Collins of MITRE corporation contributed greatly to its clarity, content and readability.

References

CCIR Report 322, 1964 Published by the International Telecommunications Union.

Hagn, George (1979), Interim DOD Radio Noise and Electromagnetic Interference (EMI) Handbook, SRI Project 6512.

Spaulding, A D and J.S. Washburn (1985), Atmospheric Radio Noise: Worldwide Levels and other characteristics, NITA Rep. 85-173.

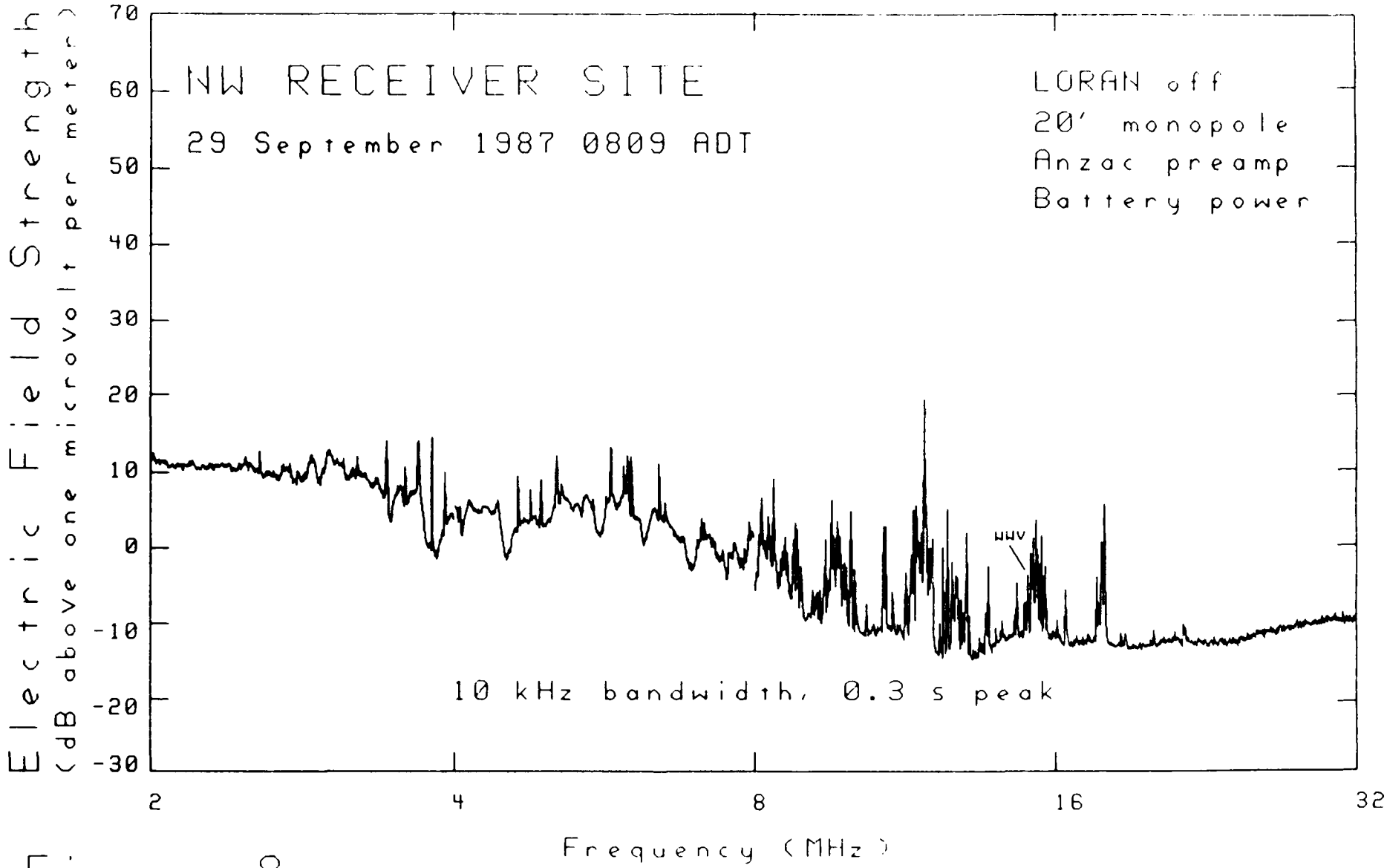
NW RECEIVER SITE
29 September 1987 0809 ADT
LORAN off
20' monopole
Anzac preamp
Battery power
WWV
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 8.

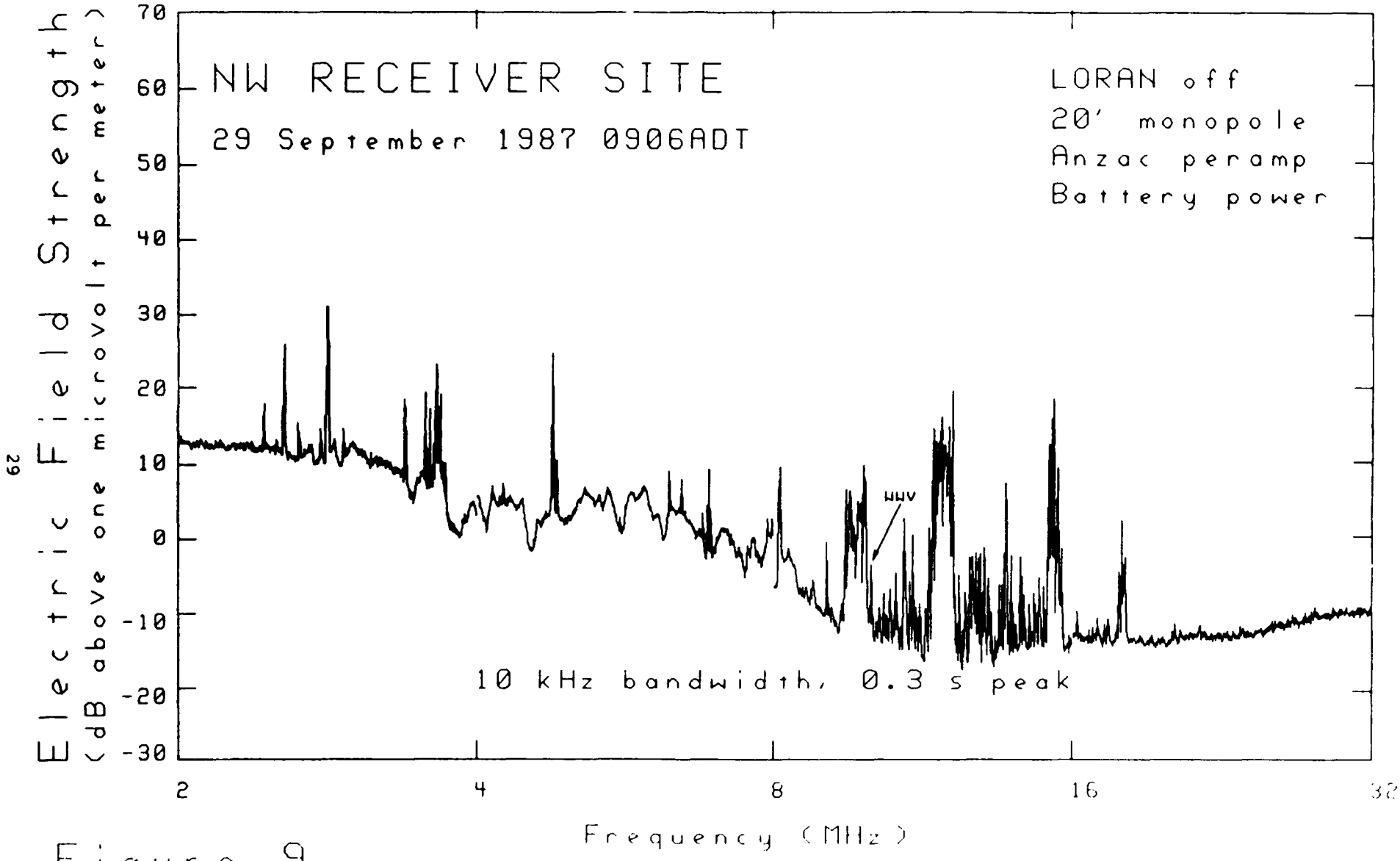
NW RECEIVER SITE
29 September 1987 0906ADT
LORAN off
20' monopole
Anzac peramp
Battery power
WWV
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 9.

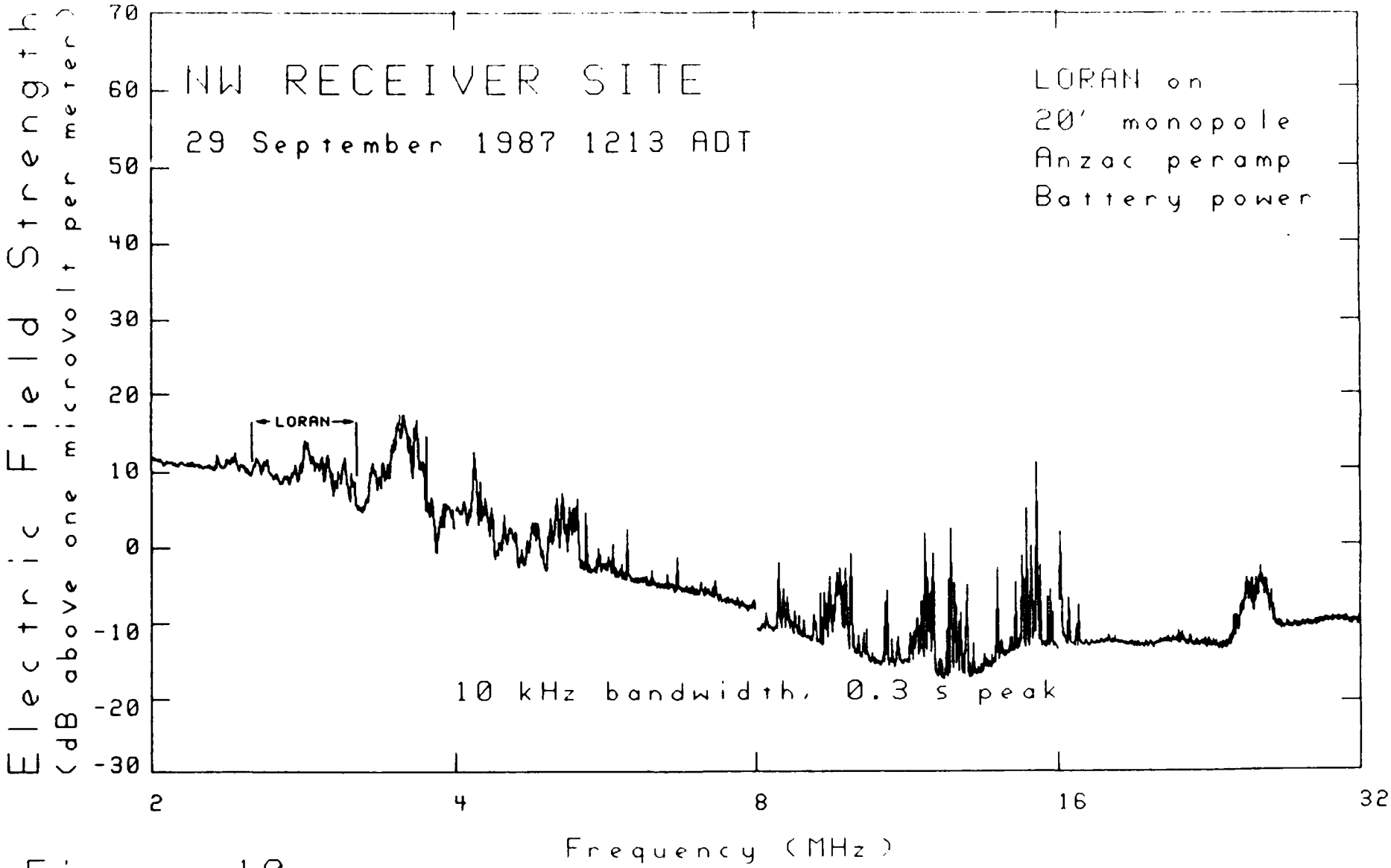
NW RECEIVER SITE
29 September 1987 1213 ADT
LORAN on
20' monopole
Anzac peramp
Battery power
LORAN
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 10.

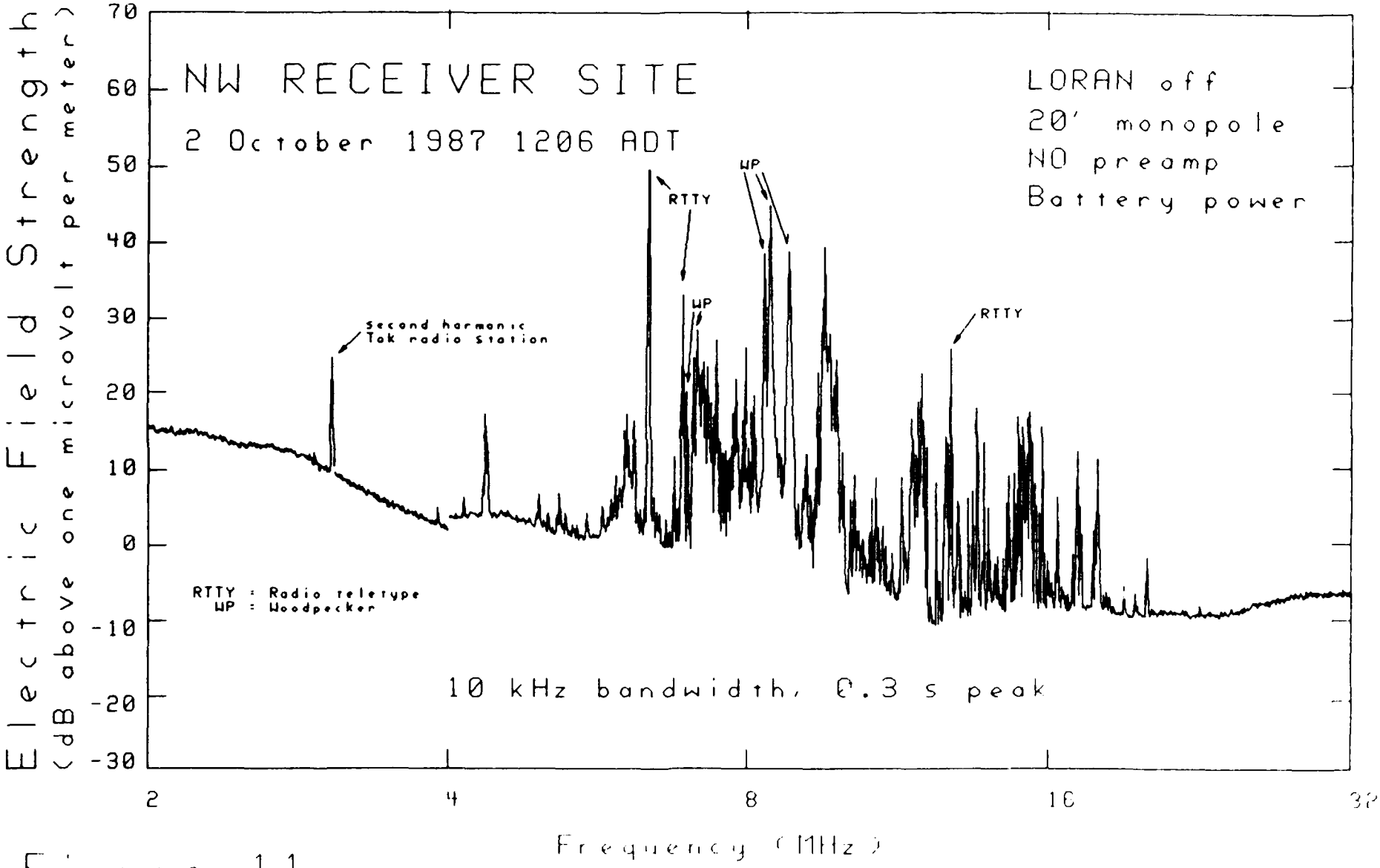
NW RECEIVER SITE
2 October 1987 1206 ADT
LORAN off
20' monopole
NO preamp
Battery power
RTTY
WP
WP
RTTY
Second harmonic
Tok radio station
RTTY : Radio teletype
WP : Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 11.

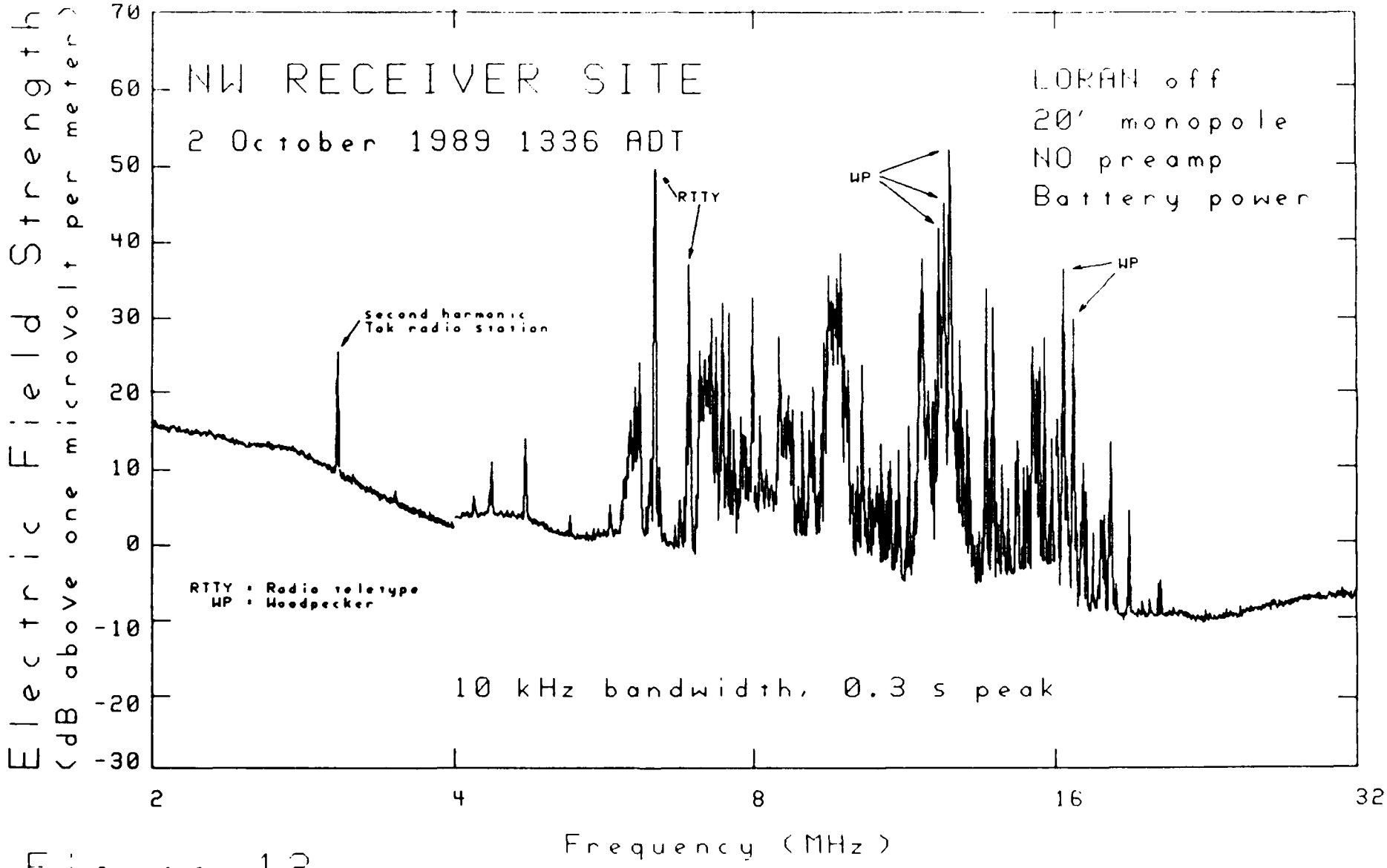
NW RECEIVER SITE
2 October 1989 1336 ADT
LORAN off
20' monopole
NO preamp
Battery power
RTTY
WP
WP
Second harmonic
Tok radio station
RTTY : Radio teletype
WP : Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 12.

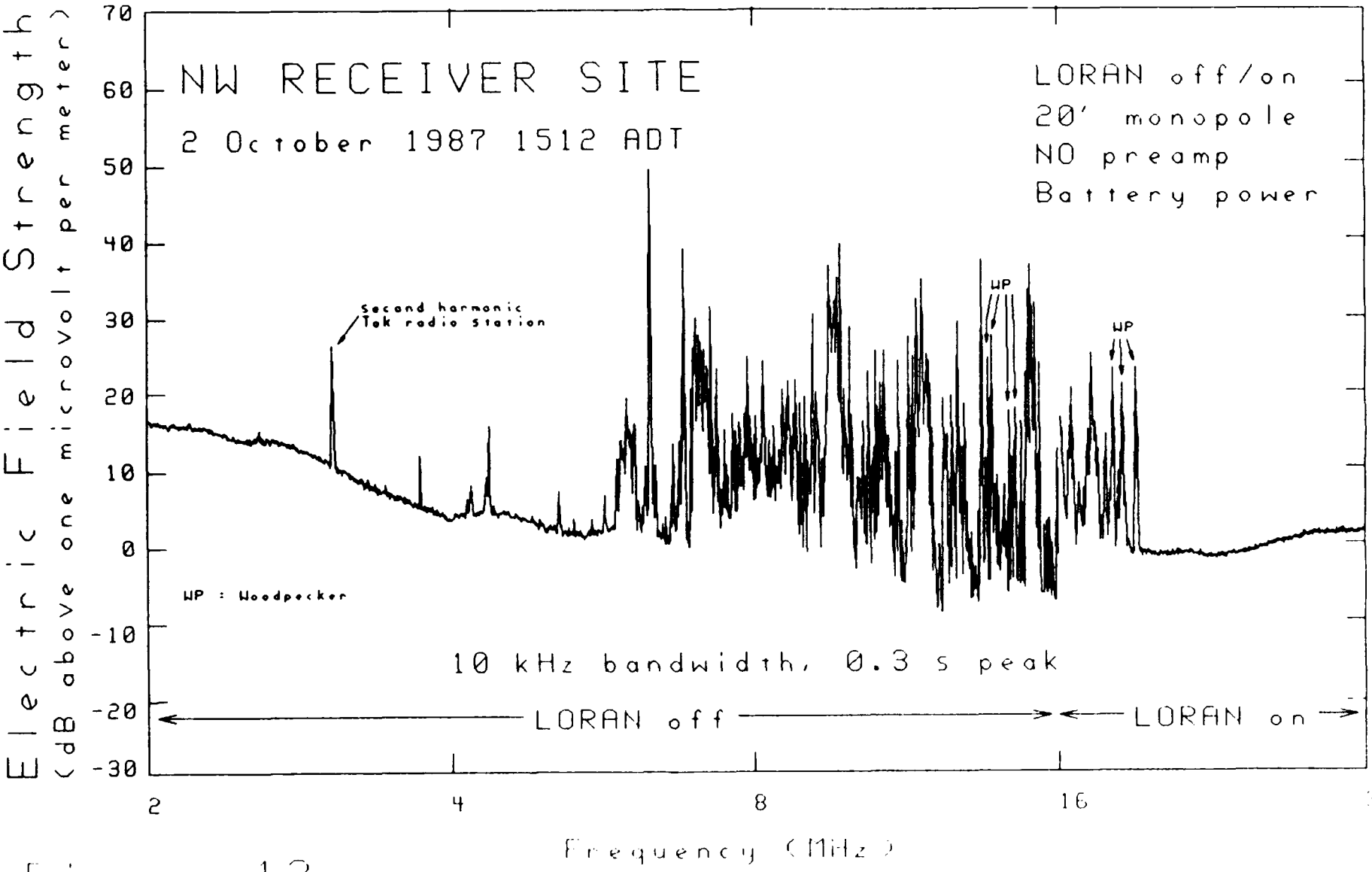
NW RECEIVER SITE
2 October 1987 1512 ADT
LORAN off/on
20' monopole
NO preamp
Battery power
second harmonic
Tok radio station
WP
WP
WP : Woodpecker
10 kHz bandwidth, 0.3 s peak
LORAN off
LORAN on
Electric Field Strength
(dB above one microVolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
Frequency (MHz)

Figure 13.

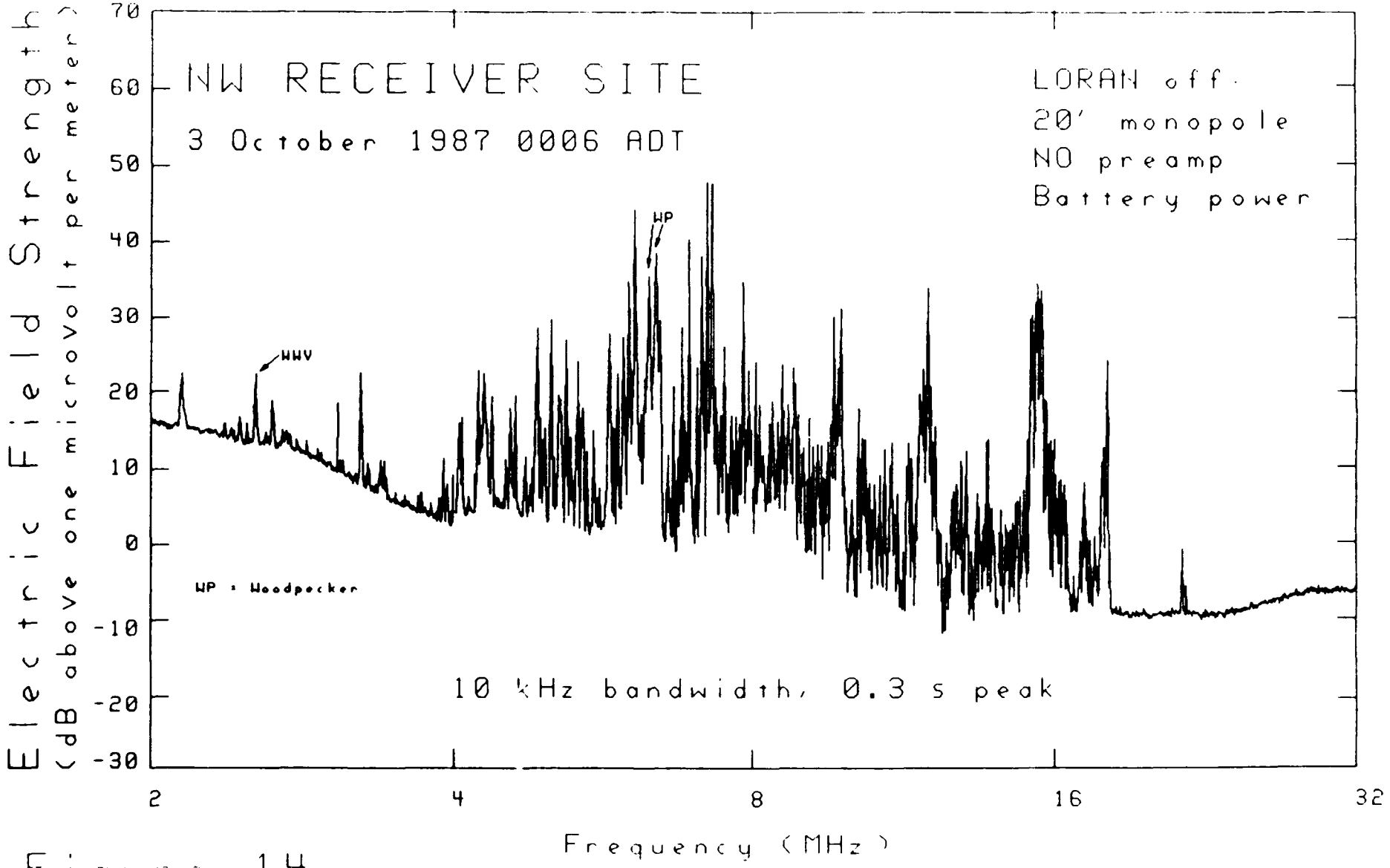
NW RECEIVER SITE
3 October 1987 0006 ADT
LORAN off
20' monopole
NO preamp
Battery power
WP
WWV
WP = Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 14.

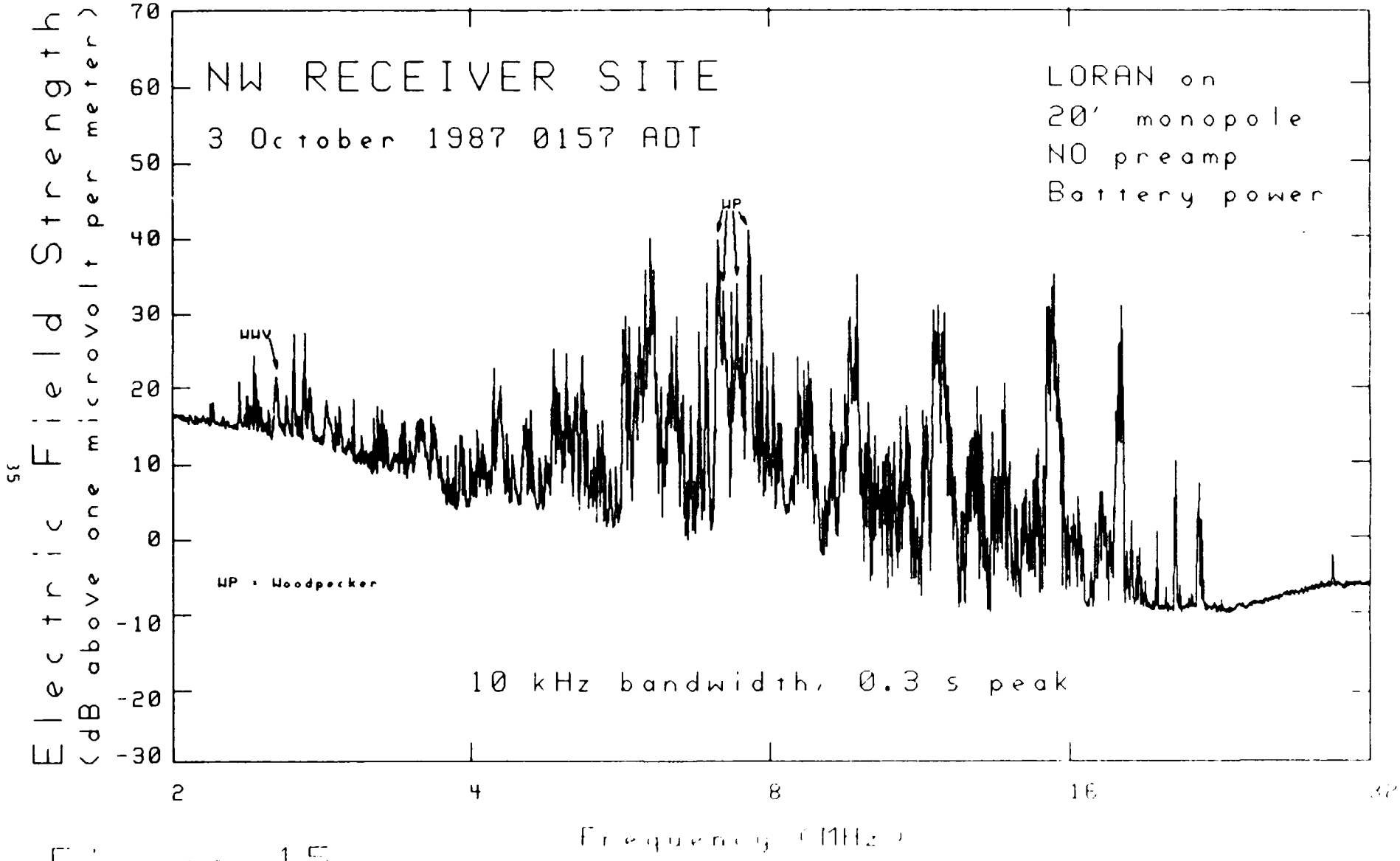
NW RECEIVER SITE
3 October 1987 0157 ADT
LORAN on
20' monopole
NO preamp
Battery power
WWV
WP
WP = Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
Frequency (MHz)

Figure 15.

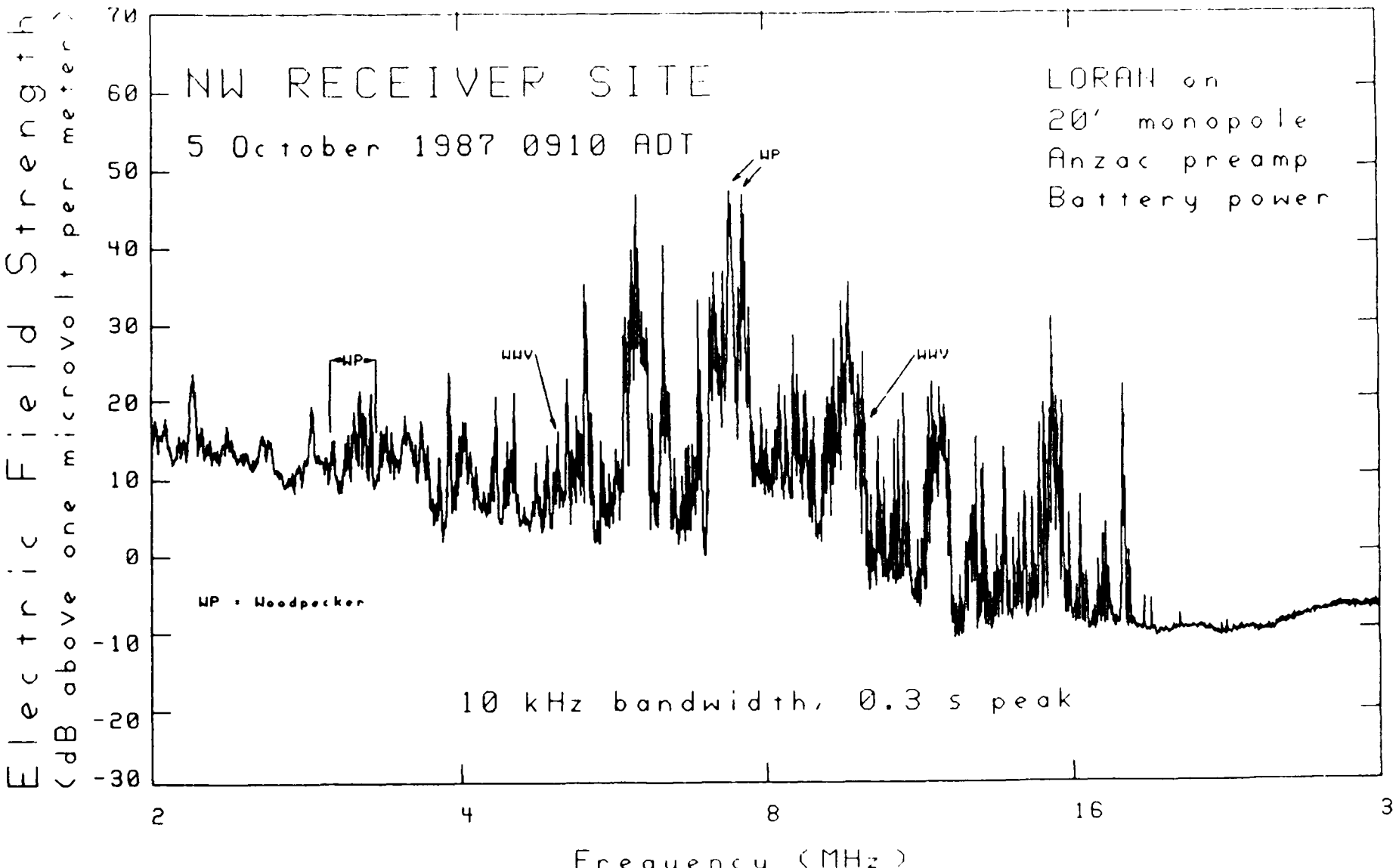
NW RECEIVER SITE
5 October 1987 0910 ADT
LORAN on
20' monopole
Anzac preamp
Battery power
WP
WP
WWV
WWV
WP = Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microVolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 16.

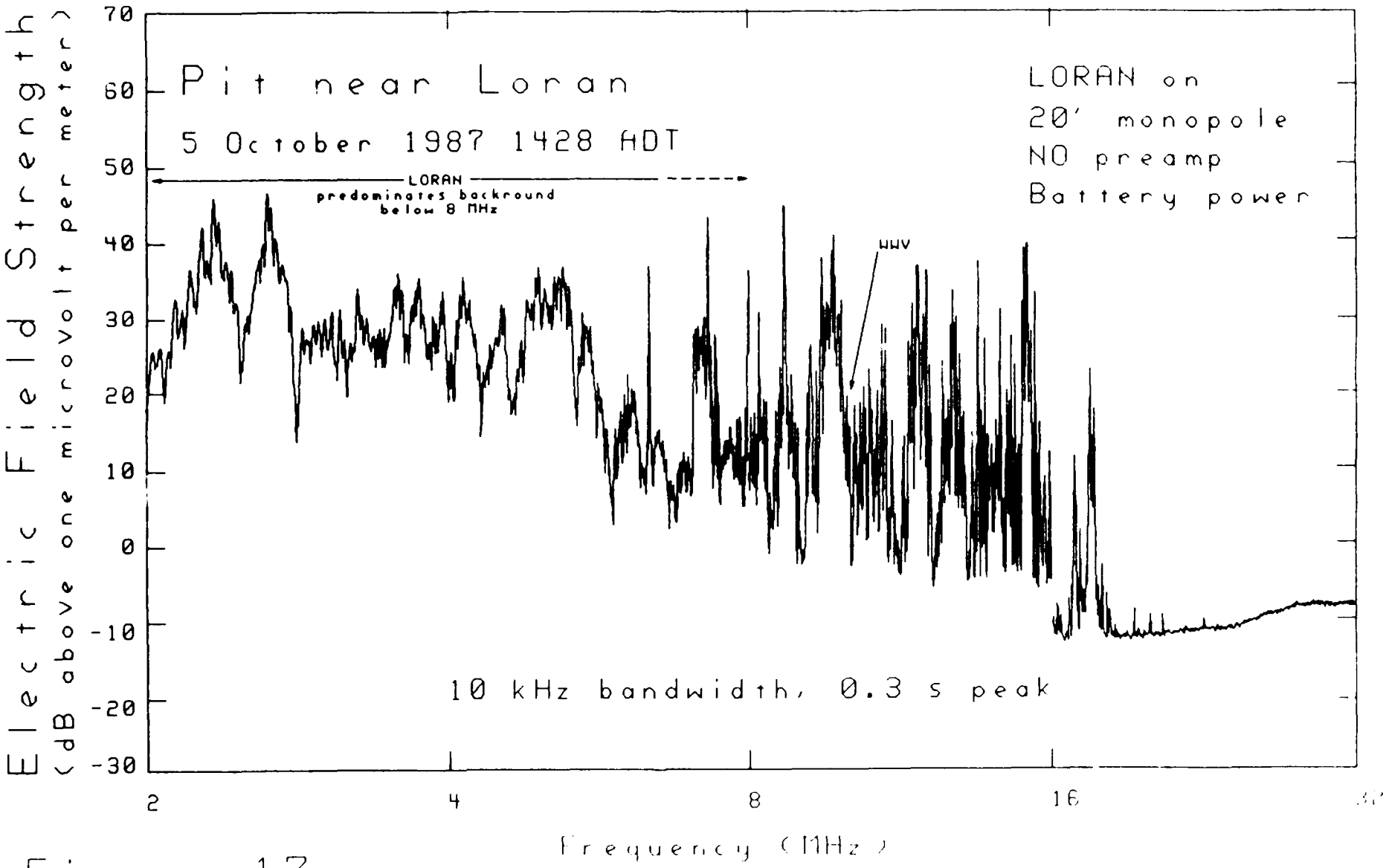
Pit near Loran
5 October 1987 1428 ADT
LORAN on
20' monopole
NO preamp
Battery power
LORAN
predominates backround
below 8 MHz
WWV
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
Frequency (MHz)

Figure 17.

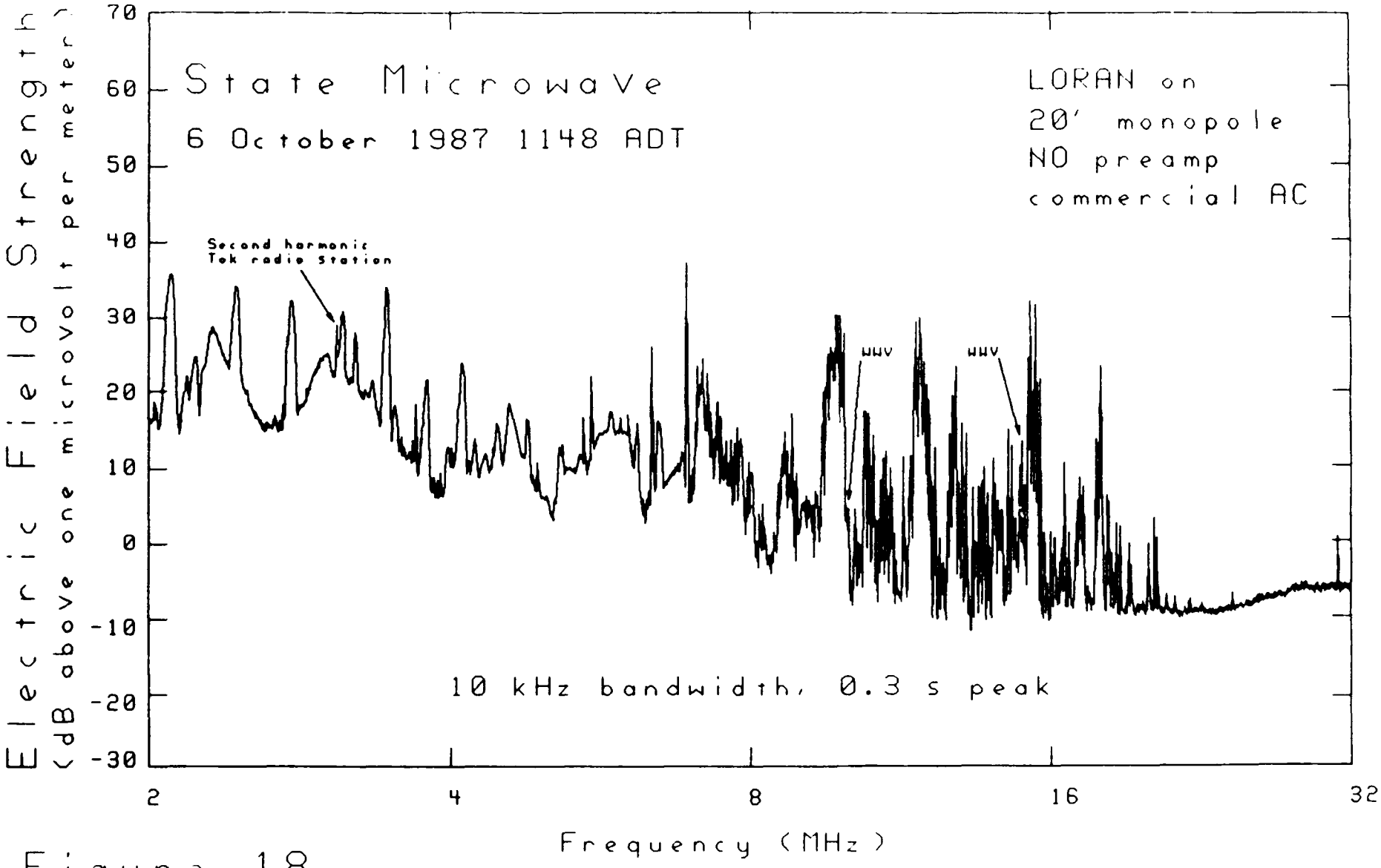
State Microwave
6 October 1987 1148 ADT
LORAN on
20' monopole
NO preamp
commercial AC
Second harmonic
Tok radio station
WWV
WWV
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
RF
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 18.

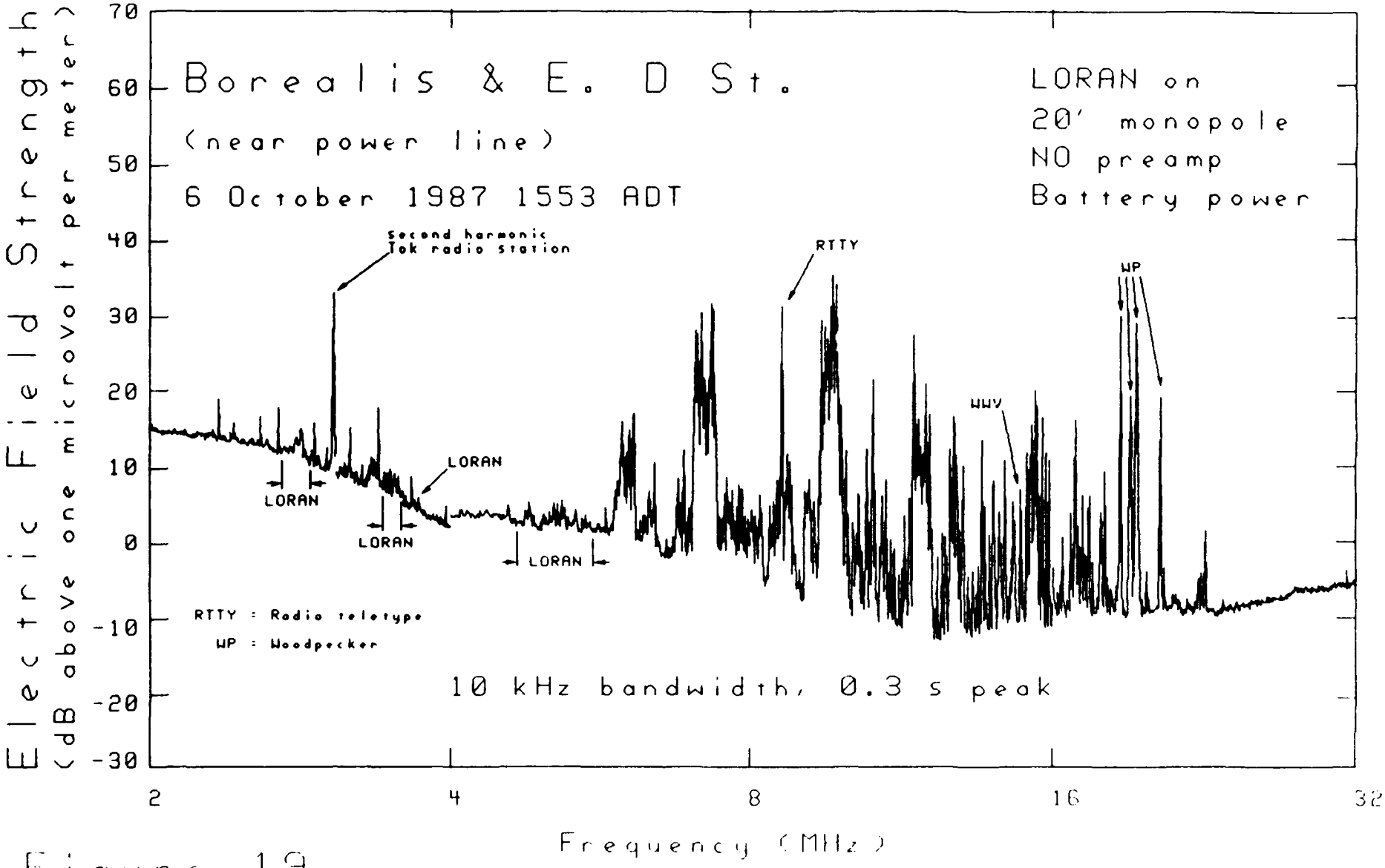
Borealis & E. D St.
(near power line)
6 October 1987 1553 ADT
LORAN on
20' monopole
NO preamp
Battery power
Second harmonic
Tok radio station
RTTY
WP
WWV
LORAN
LORAN
LORAN
LORAN
RTTY : Radio teletype
WP : Woodpecker
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 19.

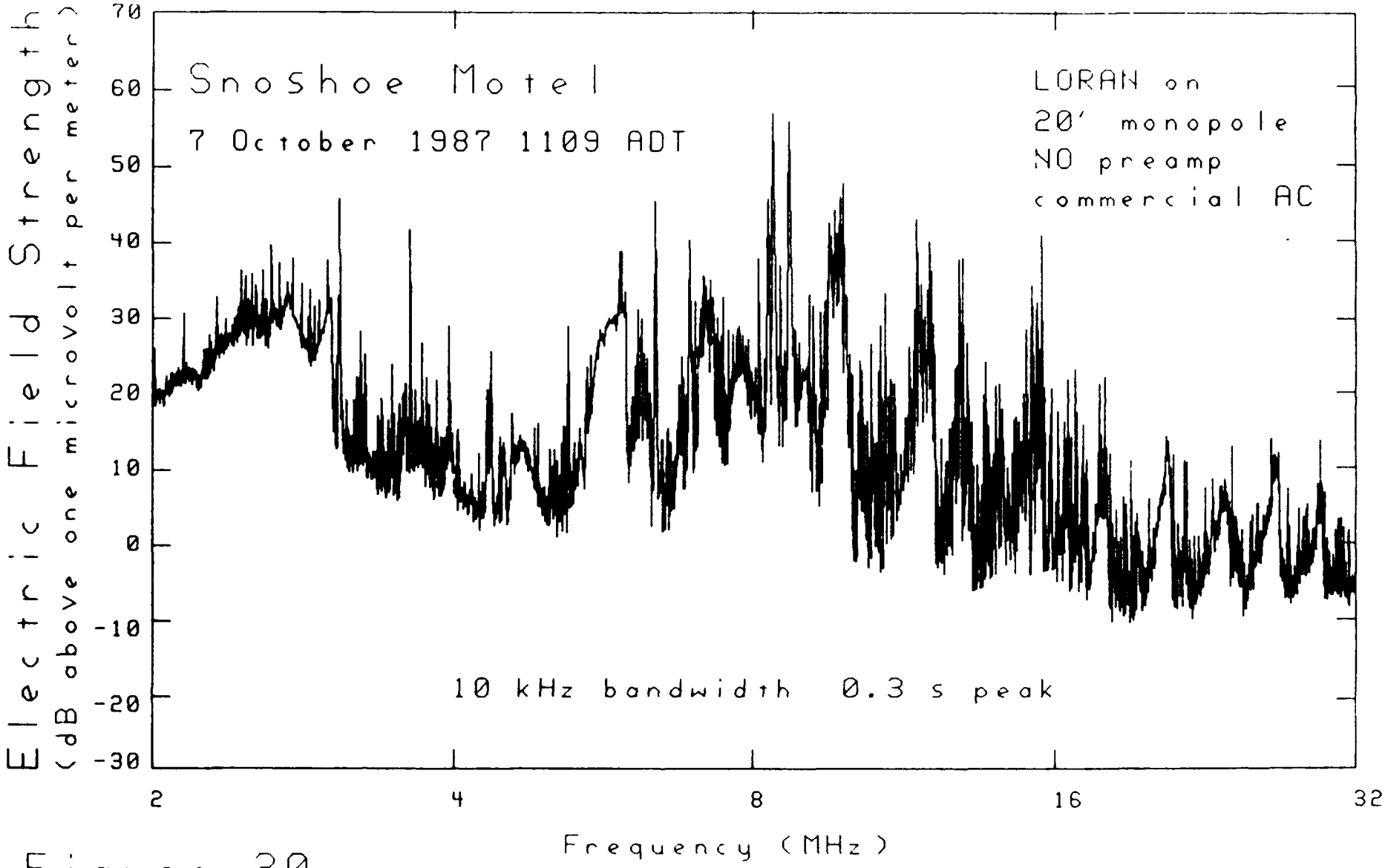
Snoshoe Motel
7 October 1987 1109 ADT
LORAN on
20' monopole
NO preamp
commercial AC
10 kHz bandwidth 0.3 s peak
Electric Field Strength
(dB above one microVolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 20.

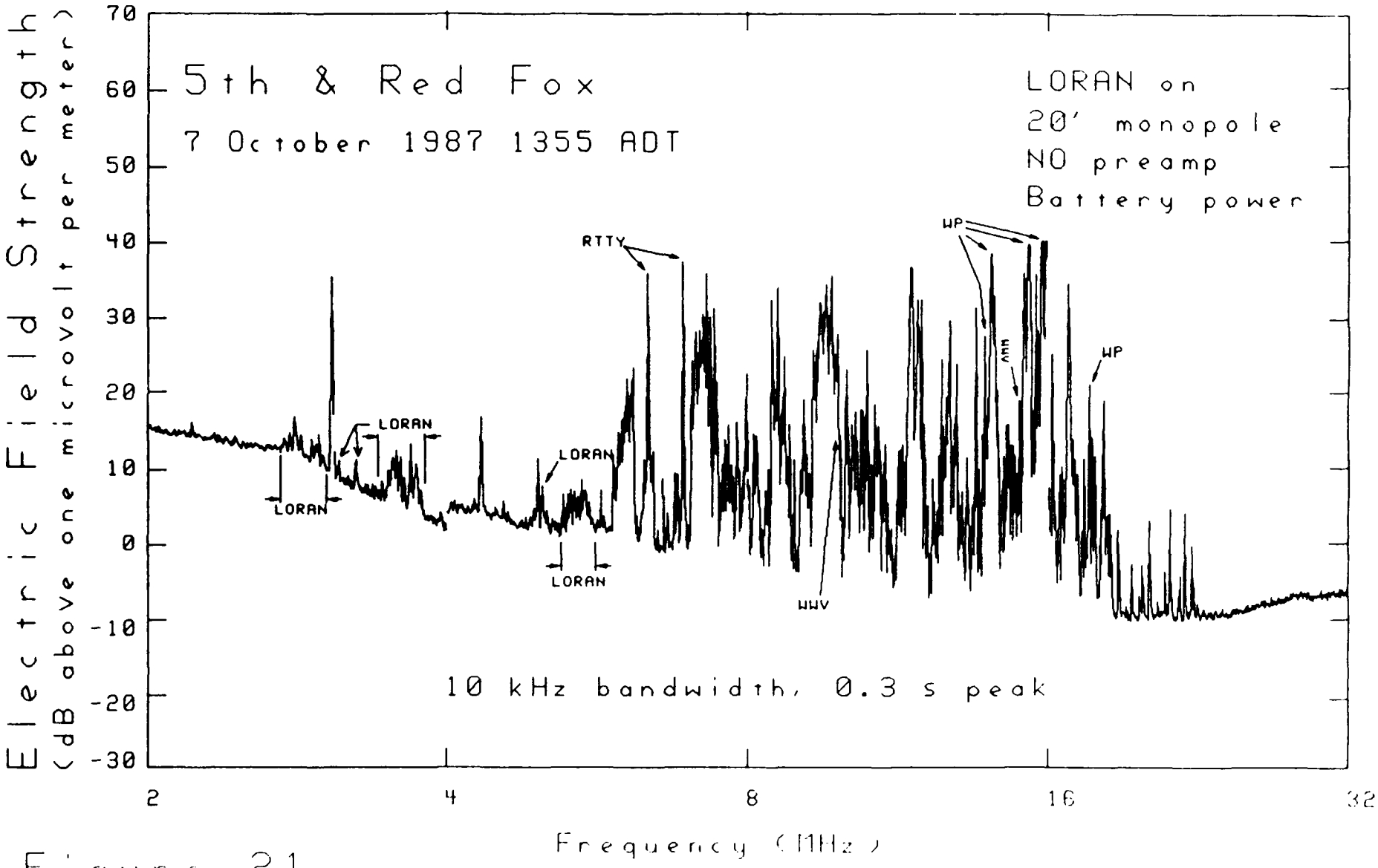
5th & Red Fox
7 October 1987 1355 ADT
LORAN on
20' monopole
NO preamp
Battery power
RTTY
WP
WWV
LORAN
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
Frequency (MHz)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32

Figure 21.

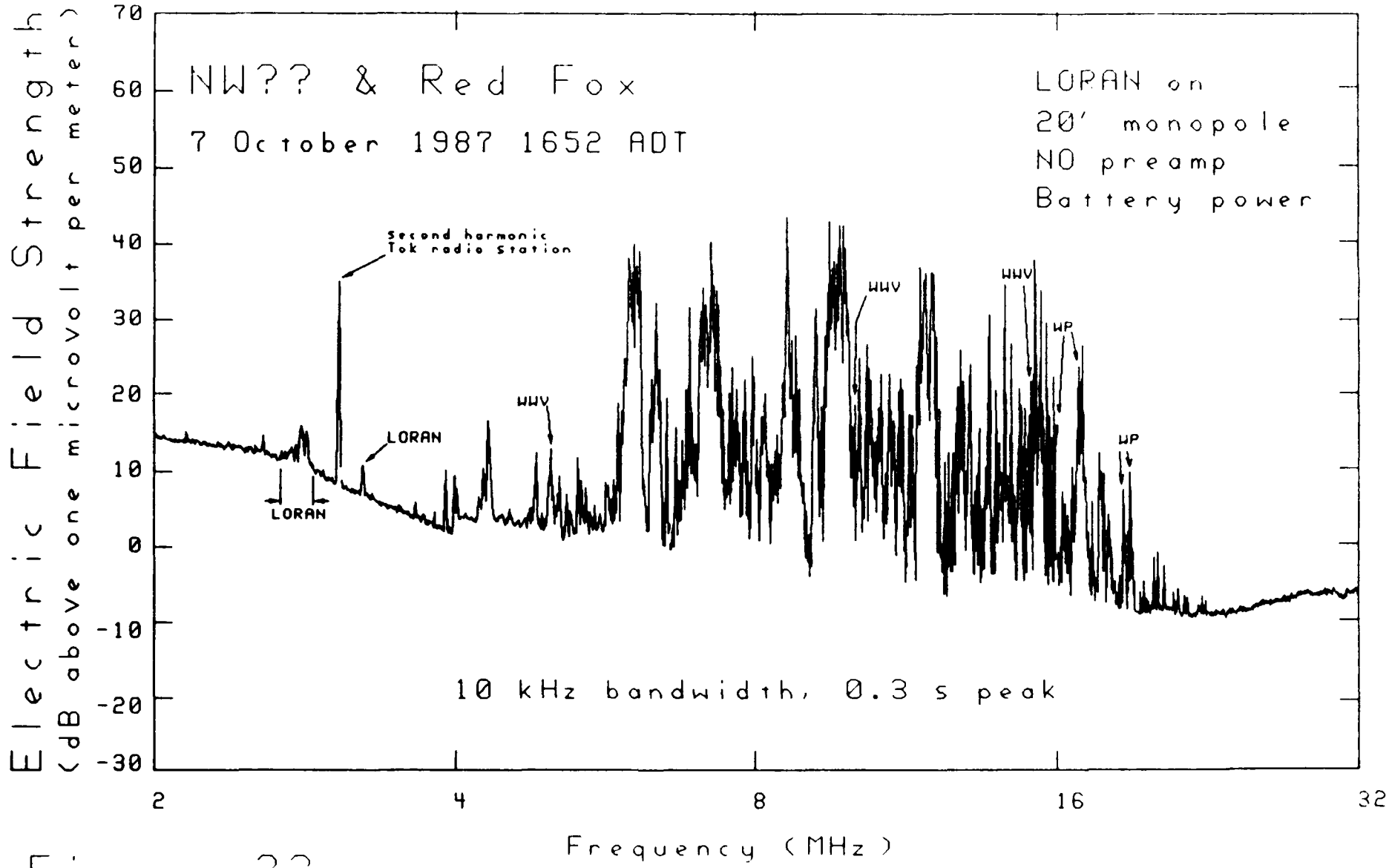
NW?? & Red Fox
7 October 1987 1652 ADT
LORAN on
20' monopole
NO preamp
Battery power
Second harmonic
Tok radio station
WWV
LORAN
WWV
WWV
WP
WP
LORAN
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 22.

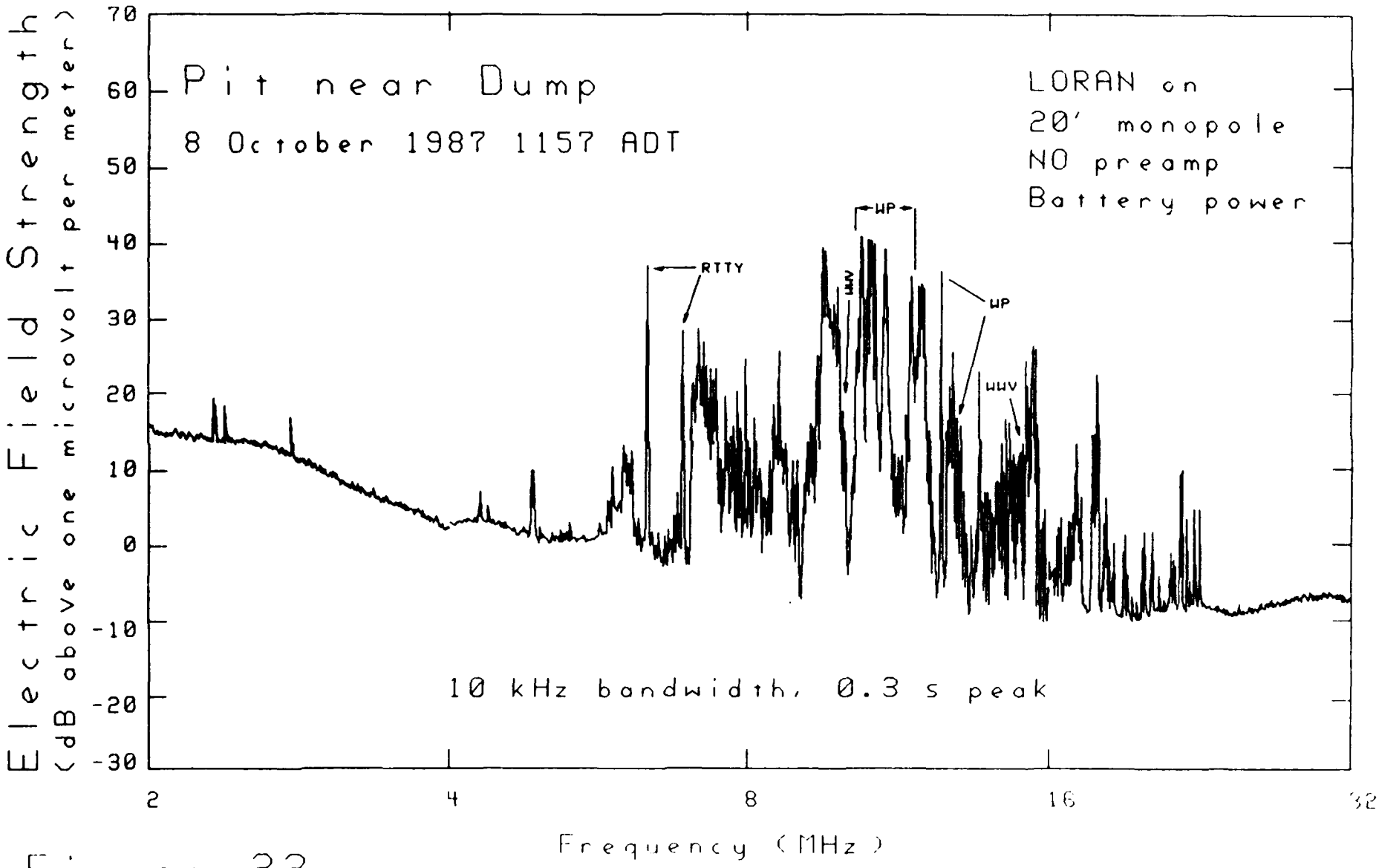
Pit near Dump
8 October 1987 1157 ADT
LORAN on
20' monopole
NO preamp
Battery power
RTTY
WP
WP
WWV
WWV
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 23.

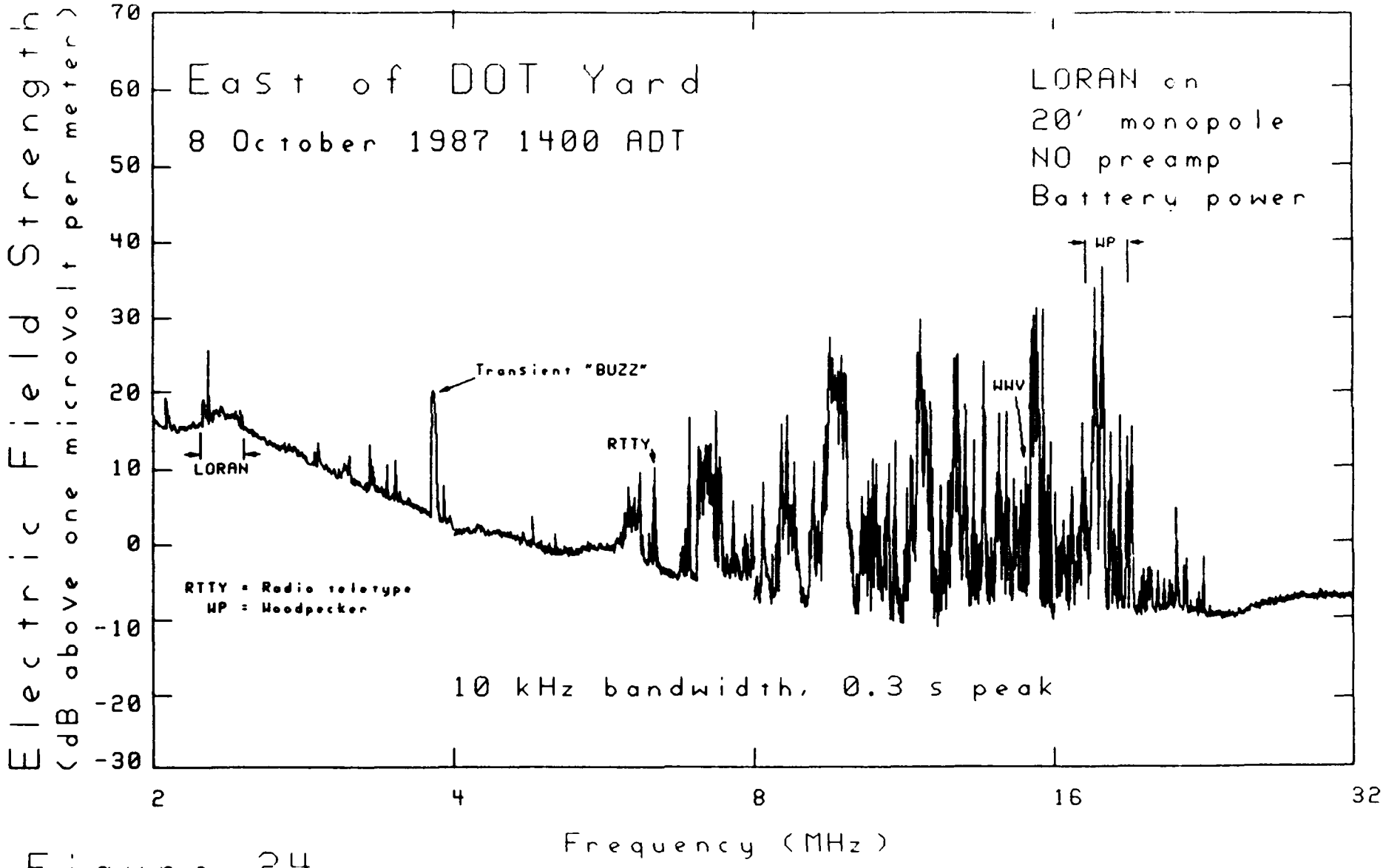
East of DOT Yard
8 October 1987 1400 ADT
LORAN on
20' monopole
NO preamp
Battery power
Electric Field Strength
(dB above one microVolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)
LORAN
Transient "BUZZ"
RTTY
WWV
WP
RTTY = Radio teletype
WP = Woodpecker
10 kHz bandwidth, 0.3 s peak

Figure 24.

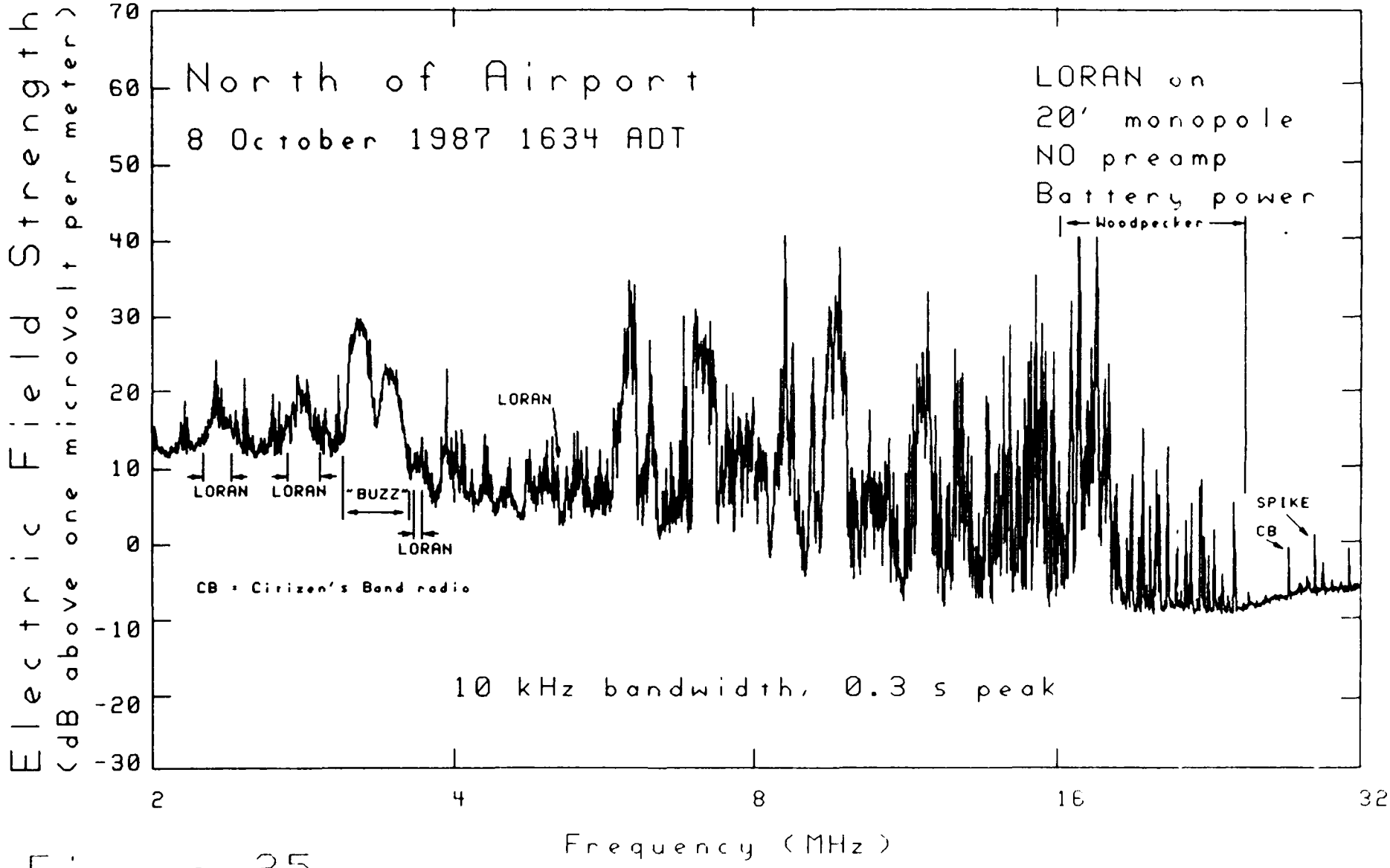
North of Airport
8 October 1987 1634 ADT
LORAN on
20' monopole
NO preamp
Battery power
Woodpecker
LORAN
LORAN
LORAN
BUZZ
LORAN
SPIKE
CB
CB = Citizen's Band radio
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 25.

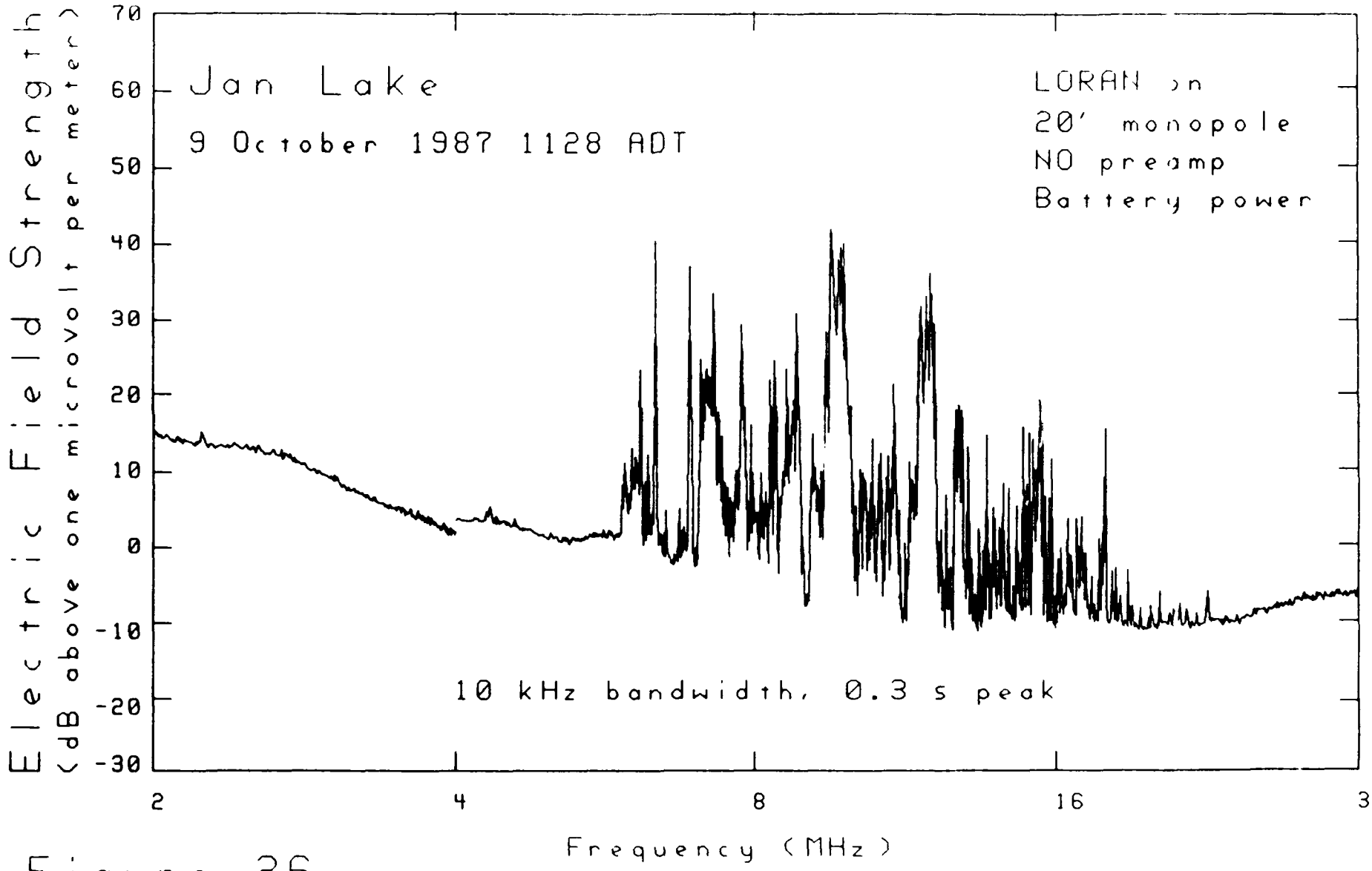
Jan Lake
9 October 1987 1128 ADT
LORAN on
20' monopole
NO preamp
Battery power
10 kHz bandwidth, 0.3 s peak
Electric Field Strength
(dB above one microvolt per meter)
70
60
50
40
30
20
10
0
-10
-20
-30
2
4
8
16
32
Frequency (MHz)

Figure 26.

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870923	1517	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1607	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1616	08-16	10	-20	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1622	16-32	10	-20	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1633	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1939	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1946	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	1952	08-16	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2000	16-32	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2201	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2208	02-04	10	-20	QP	41"ROD	NM17	BATTERY	JAN LAKE
870923	2219	04-08	01	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2307	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2317	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2344	08-16	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870923	2350	16-32	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0345	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0352	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0358	08-16	10	-20	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0406	16-32	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0417	04-08	01	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0748	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0756	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0802	04-08	01	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0809	08-16	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	0816	16-32	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	1214	02-04	10	-20	FI	41"ROD	NM17	AC HONDA	JAN LAKE
870924	1220	04-08	10	-20	FI	41"ROD	NM17	AC HONDA	JAN LAKE
870924	1226	08-16	10	-20	FI	41"ROD	NM17	AC HONDA	JAN LAKE
870924	1234	16-32	10	-20	FI	41"ROD	NM17	AC HONDA	JAN LAKE
870924	1303	02-04	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	1309	04-08	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	1326	16-32	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870924	1335	02-04	10	-40	FI	NONE	NONE	BATTERY	JAN LAKE
870924	1340	04-08	10	-40	FI	NONE	NONE	BATTERY	JAN LAKE
870924	1345	08-16	10	-40	FI	NONE	NONE	BATTERY	JAN LAKE
870924	1350	16-32	10	-40	FI	NONE	NONE	BATTERY	JAN LAKE
870924	13??	08-16	10	-40	FI	41"ROD	NM17	BATTERY	JAN LAKE
870925	1130	.01-	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1140	.25-	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1145	.5-1	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1150	1-2	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1155	02-04	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1200	04-08	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1205	08-16	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870925	1210	16-32	10	+60	0.3 S	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1312	02-04	10	-20	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1338	02-04	10	-40	FI	41"ROD	NM17	BATTERY	MOTEL, TOK
870925	1343	04-08	10	-40	FI	41"ROD	NM17	BATTERY	MOTEL, TOK
870925	1348	08-16	10	-40	FI	41"ROD	NM17	BATTERY	MOTEL, TOK
870925	1353	16-32	10	-40	FI	41"ROD	NM17	BATTERY	MOTEL, TOK
870925	1415	02-04	10	-40	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1421	04-08	10	-40	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1426	08-16	10	-40	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1430	08-16	10	-40	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870925	1435	16-32	10	-40	FI	41"ROD	NM17	AC COMM	MOTEL, TOK
870926	1125	02-04	10	-40	FI	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1135	02-04	10	-40	FI	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1145	02-04	10	-40	FI	NONE	NONE	AC COMM	MOTEL, TOK
870926	1208	16-32	50	-20	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1220	02-04	50	-20	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1220	04-08	50	-20	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1246	08-16	50	-20	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1322	02-04	1	-40	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1408	04-08	1	-40	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1424	08-16	1	-40	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870926	1443	16-32	1	-40	QP	41"ROD	NONE	AC COMM	MOTEL, TOK
870927	1353	9.1	10	-20	QP	41 VS 20	NONE	BATTERY	NW REC SITE
870927	1403	02-04	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1407	04-08	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1409	16-32	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1412	08-16	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1424	02-04	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1430	04-08	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1434	08-16	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1440	16-32	50	-20	QP	41"ROD	NONE	BATTERY	NW REC SITE
870927	1453	02-04	10	-40	FI	41"ROD	NONE	BATTERY	NW REC SITE
870927	1502	16-32	10	-40	FI	41"ROD	NONE	BATTERY	NW REC SITE
870927	1511	02-04	10	-40	FI	NONE	NONE	BATTERY	NW REC SITE
870927	1538	02-04	50	-20	QP	20' POLE	NONE	BATTERY	NW REC SITE
870927	1545	04-08	50	-20	QP	20' POLE	NONE	BATTERY	NW REC SITE
870927	1548	08-16	50	-20	QP	20' POLE	NONE	BATTERY	NW REC SITE
870927	1554	16-32	50	-20	QP	20' POLE	NONE	BATTERY	NW REC SITE
870927	15??	16-32	10	-40	FI	NONE	NONE	BATTERY	NW REC SITE
870927	15??	04-08	10	-40	FI	NONE	NONE	BATTERY	NW REC SITE
870927	15??	08-16	10	-40	FI	NONE	NONE	BATTERY	NW REC SITE
870927	1617	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
870927	1621	04-08	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
870927	1624	08-16	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
870927	1627	16-32	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870927	1639	6.1	10	-20	QP	41 VS 20	NONE	BATTERY	NW REC SITE
870927	1650	13.6	10	-20	QP	41 VS 20	NONE	BATTERY	NW REC SITE
870927	1???	08-16	10	-40	FI	41"ROD	NONE	BATTERY	NW REC SITE
870927	1???	04-08	10	-40	FI	41"ROD	NONE	BATTERY	NW REC SITE
870928	1854	02-04	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1900	02-04	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1911	04-08	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1925	04-08	10	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1938	08-16	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1946	08-16	10	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1952	08-16	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	1959	16-32	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	19??	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	19??	04-08	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2005	16-32	10	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2011	16-32	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2044	02-04	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2103	02-04	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2109	02-04	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870928	2116	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0627	02-04	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0637	02-04	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0641	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0649	04-08	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0657	04-08	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0703	04-08	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0709	08-16	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0716	08-16	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0726	08-16	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0733	16-32	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0739	16-32	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0744	16-32	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	0800	02-04	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0804	02-04	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0809	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0813	02-04	10	-40	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0817	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0821	04-08	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0825	04-08	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0829	04-08	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0834	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0838	08-16	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0842	08-16	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0846	16-32	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0850	16-32	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870929	0855	16-32	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0902	02-04	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0906	02-04	10	-40	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0908	02-04	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0917	04-08	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0923	04-08	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0926	04-08	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0934	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0940	08-16	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0946	08-16	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	0954	16-32	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1001	16-32	10	-40	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1006	16-32	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1013	02-04	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1017	02-04	10	-40	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1021	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1035	04-08	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1041	04-08	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1046	04-08	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1055	08-16	50	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1059	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	10??	02-04	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1103	08-16	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1107	02-04	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1112	02-04	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1118	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1122	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1127	04-08	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1131	04-08	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1140	08-16	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1144	08-16	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1148	08-16	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1153	16-32	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	11??	04-08	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1209	02-04	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1213	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1217	02-04	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1222	04-08	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1226	04-08	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1232	04-08	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1236	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1240	08-16	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1244	08-16	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1249	16-32	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1254	16-32	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870929	1257	16-32	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	1312	02-04	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1317	02-04	10	-40	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1321	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1329	04-08	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1333	04-08	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1338	04-08	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1357	08-16	50	???	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1406	08-16	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1414	08-16	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1419	08-16	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1428	16-32	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1433	16-32	10	-40	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1438	16-32	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1451	02-04	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1501	02-04	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1512	02-04	10	-40	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1518	02-04	10	-40	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1525	02-04	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1532	04-08	10	-40	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1537	04-08	10	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1548	04-08	50	-20	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1556	08-16	10	-20	FI	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1613	08-16	10	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	1618	08-16	50	0	0.3 S	20' POLE	ANZAC	AC GEN	NW REC SITE
870929	2305	02-04	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2312	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2317	02-04	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2324	04-08	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2329	04-08	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2334	04-08	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2342	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	2347	08-16	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870929	23??	08-16	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0001	02-04	10	-40	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0007	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0017	04-08	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0022	04-08	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0027	04-08	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0032	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0036	08-16	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0041	08-16	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0047	16-32	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0052	16-32	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0056	16-32	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
870930	00??	02-04	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0103	02-04	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0108	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0112	02-04	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0119	04-08	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0124	04-08	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0129	04-08	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0141	08-16	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0145	08-16	10	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0149	08-16	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0159	16-32	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0204	16-32	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
870930	0210	16-32	50	0	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
871001	1055	02-04	10	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1101	02-04	01	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1108	02-04	10	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1111	02-04	01	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1114	02-04	50	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1119	02-04	50	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1129	02-04	10	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1132	02-04	01	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1136	02-04	10	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1140	02-04	01	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1145	02-04	50	-20	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1148	02-04	50	-40	FI	20' POLE	NONE	AC GEN	NW REC SITE
871001	1209	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871001	1222	02-04	10	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1238	02-04	10	-40	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1244	02-04	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1249	02-04	01	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1252	02-04	.1	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1354	04-08	10	-20	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1400	08-16	10	-20	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1404	16-32	10	-20	0.3 S	20' POLE	NONE	AC GEN	NW REC SITE
871001	1547	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1552	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1556	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871001	1603	08-16	10	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0900	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	0904	02-04	1	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	0908	02-04	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0912	04-08	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	0915	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0919	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	0924	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments
made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871002	0927	08-16	10	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0932	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0941	16-32	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	0944	16-32	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	0947	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1045	02-04	10	-40	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1048	02-04	10	-40	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1053	04-08	10	-40	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1057	04-08	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1104	08-16	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1107	08-16	10	-20	C.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1112	16-32	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1130	16-32	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1201	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1206	02-04	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1210	02-04	50	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1215	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1220	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1225	04-08	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1231	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1235	08-16	10	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1239	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1243	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1249	16-32	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1254	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1258	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1332	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1336	02-04	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1340	02-04	50	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1347	04-08	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1352	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1357	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1403	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1409	08-16	10	+20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1412	08-16	10	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1417	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1423	16-32	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1426	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1429	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1434	02-04	01	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1438	02-04	01	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1442	04-08	01	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1445	04-08	01	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1449	08-16	01	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1453	08-16	01	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871002	1458	16-32	01	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1502	16-32	01	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1509	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1512	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1516	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1520	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1523	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1527	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1531	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1534	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1540	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1546	16-32	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871002	1550	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871002	1602	02-04	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1607	02-04	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1612	02-04	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	16 7	02-04	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1630	02-04	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1642	02-04	10	-40	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1647	02-04	10	-40	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1651	04-08	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1657	04-08	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1702	08-16	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1707	08-16	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	1715	16-32	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	1719	16-32	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	2321	08-16	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	2326	08-16	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	2330	08-16	10	0	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	2334	16-32	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	2339	16-32	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871002	2345	04-08	10	-20	FI	20' POLE	NONE	AC B&S	NW REC SITE
871002	2349	04-08	10	-20	0.3 S	20' POLE	NONE	AC B&S	NW REC SITE
871003	0002	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0006	02-04	10	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0010	02-04	50	-40	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0015	04-08	50	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0020	04-08	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0027	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0031	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0039	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0044	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0049	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0055	16-32	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0100	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871003	0113	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0117	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0121	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0126	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0130	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0135	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0141	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871003	0146	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0150	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0157	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	01??	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0202	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0207	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871003	0211	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	0906	02-04	10	-20	FI	20' POLE	ANZAC	BATTERY	NW REC SITE
871005	0916	02-04	50	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
871005	0919	02-04	10	-20	0.3 S	20' POLE	ANZAC	BATTERY	NW REC SITE
871005	0922	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871005	0927	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	0932	04-08	50	0	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	0938	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871005	0943	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	0948	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	0953	16-32	10	-20	FI	20' POLE	NONE	BATTERY	NW REC SITE
871005	0958	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	1004	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW REC SITE
871005	1422	02-04	10	-40	FI	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1428	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1433	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1439	04-08	10	-40	FI	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1444	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1449	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1455	08-16	10	-20	FI	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1501	08-16	10	-20	0.03S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1506	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1512	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1554	16-32	10	-40	FI	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1559	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871005	1612	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NR LORAN ST
871006	1141	02-04	10	-40	FI	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1148	02-04	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1202	02-04	50	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1211	04-08	10	-20	FI	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1219	04-08	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1225	04-08	50	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871006	1238	08-16	10	-20	FI	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1249	08-16	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1256	08-16	50	0	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1305	16-32	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1311	16-32	10	-20	FI	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1317	16-32	50	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1324	02-04	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1332	04-08	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1340	08-16	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1347	16-32	10	-20	0.3 S	20' POLE	NONE	AC COMM	STATE MICROWAVE
871006	1548	02-04	10	-40	FI	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1553	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1558	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1603	04-08	10	-40	FI	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1607	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1615	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1624	08-16	10	-40	FI	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1629	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1634	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1640	16-32	10	-20	FI	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1646	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1651	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1701	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1707	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1712	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1717	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	BOREALIS & E. D
871006	1921	02-04	10	-40	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1927	02-04	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1932	02-04	50	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1938	04-08	10	-20	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1944	04-08	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1950	04-08	50	0	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	1957	08-16	10	-20	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	2004	08-16	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	2009	08-16	50	0	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	2016	16-32	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	2021	16-32	10	-20	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871006	2027	16-32	50	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1101	02-04	10	-40	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1109	02-04	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1114	02-04	50	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1120	04-08	10	-40	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1128	04-08	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1135	04-08	50	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1141	08-16	10	-20	FI	20' POLE	NONE	AC COMM	MOTEL, TOK

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871007	1148	08-16	10	0	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1154	08-16	50	0	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1204	16-32	10	-20	FI	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1208	16-32	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1221	16-32	10	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1227	16-32	50	-20	0.3 S	20' POLE	NONE	AC COMM	MOTEL, TOK
871007	1351	02-04	10	-40	FI	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1355	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1358	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1403	04-08	10	-40	FI	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1407	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1407	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1416	08-16	10	-20	FI	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1419	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1423	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1427	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1434	16-32	10	-20	FI	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1438	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1441	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	5TH & RED FOX
871007	1648	02-04	10	-40	FI	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1652	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1656	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1700	04-08	10	-20	FI	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1704	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1708	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1713	08-16	10	-20	FI	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1718	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1721	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1727	16-32	10	-20	FI	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1730	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871007	1734	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	NW?? & RED FOX
871008	1153	02-04	10	-40	FI	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1157	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1200	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1209	04-08	10	-40	FI	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1213	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1216	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1222	08-16	10	-20	FI	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1225	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1229	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1232	08-16	50	+20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1239	16-32	10	-20	FI	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1242	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1246	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	PIT NEAR DUMP
871008	1358	02-04	10	-40	FI	20' POLE	NONE	BATTERY	EAST OF DOT YRD

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871008	1400	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1403	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1408	04-08	10	-40	FI	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1413	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1417	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1424	08-16	10	-40	FI	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1428	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1433	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1439	16-32	10	-40	FI	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1443	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1449	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	EAST OF DOT YRD
871008	1630	02-04	10	-40	FI	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1634	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1638	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1644	04-08	10	-40	FI	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1649	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1653	04-08	50	0	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1736	08-16	10	-20	FI	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1741	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1745	08-16	50	0	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1750	16-32	10	-20	FI	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1755	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871008	1759	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	N. OF AIRPORT
871009	1124	02-04	10	-40	FI	20' POLE	NONE	BATTERY	JAN LAKE
871009	1128	02-04	10	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1132	02-04	50	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1137	04-08	10	-40	FI	20' POLE	NONE	BATTERY	JAN LAKE
871009	1140	04-08	10	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1144	04-08	50	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1150	08-16	10	-20	FI	20' POLE	NONE	BATTERY	JAN LAKE
871009	1154	08-16	10	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1158	08-16	50	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1203	16-32	10	-40	FI	20' POLE	NONE	BATTERY	JAN LAKE
871009	1207	16-32	10	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871009	1211	16-32	50	-20	0.3 S	20' POLE	NONE	BATTERY	JAN LAKE
871013	1411	.5-1	10	-20	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1417	.5-1	10	+20	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1426	.5-1	10	+40	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1434	.1-.2	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1444	.1-.2	01	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1449	.1-.2	01	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1455	.1-.2	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1501	.1-.2	10	-20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1507	,2-.5	10	-20	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1514	,2-.5	10	+20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS

Appendix A

Summary of Radio Frequency Noise Measurments made near Tok, Alaska, September and October 1987.

DATE	TIME ADT	BAND (MHz)	BW kHz	ATN dB	FUNC	ANTENNA	PREAMP	POWER	LOCATION
871013	1519	,2-.5	10	-20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1525	.5-1	10	-20	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1531	1-2	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1545	2-4	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1554	2-4	10	-20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1602	4-8	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1613	8-16	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1623	16-32	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1634	04-08	01	-40	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1642	04-08	10	-20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1648	04-08	10	-20	0.3 S	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS
871013	1655	02-04	10	-40	FI	41" ROD	NONE	AC COMM	BOB'S FAIRBANKS

Appendix B
Ambient Noise Measurements Near Tok, Alaska
September - October 1987
2.5 MHz, 10 kHz bandwidth

Date yymmdd	Time (ADT) hhmm	Location	Antenna	Preamp	Level (dBuV)	Acf (dB)	Field Intensity (dBuV/m)
870923	1517	JAN LAKE	41"ROD	NM17	-21.0	20.0	-1.0
870923	1633	JAN LAKE	41"ROD	NM17	-20.0	20.0	0.0
870923	1939	JAN LAKE	41"ROD	NM17	-21.0	20.0	-1.0
870923	2307	JAN LAKE	41"ROD	NM17	-21.5	20.0	-1.5
870924	0748	JAN LAKE	41"ROD	NM17	-20.5	20.0	-0.5
870924	1303	JAN LAKE	41"ROD	NM17	-20.5	20.0	-0.5
870925	1312	MOTEL, TOK	41"ROD	NM17	-9.5	20.0	10.5
870925	1338	MOTEL, TOK	41"ROD	NM17	-20.5	20.0	-0.5
870925	1415	MOTEL, TOK	41"ROD	NM17	-15.0	20.0	5.0
870926	1125	MOTEL, TOK	41"ROD	NONE	-20.0	32.0	12.0
870926	1135	MOTEL, TOK	41"ROD	NONE	-20.0	32.0	12.0
870927	1453	NW REC SITE	41"ROD	NONE	-22.5	32.0	9.5
870927	1617	NW REC SITE	20' POLE	NONE	-23.0	24.5	1.5
870929	0800	NW REC SITE	20' POLE	ANZAC	-12.5	10.5	-2.0
870929	0804	NW REC SITE	20' POLE	ANZAC	-12.5	10.5	-2.0
870929	0902	NW REC SITE	20' POLE	ANZAC	-11.5	10.5	-1.0
870929	1013	NW REC SITE	20' POLE	ANZAC	-11.5	10.5	-1.0
870929	1209	NW REC SITE	20' POLE	ANZAC	-11.5	10.5	-1.0
870929	1501	NW REC SITE	20' POLE	ANZAC	-12.0	10.5	-1.5
870929	2305	NW REC SITE	20' POLE	ANZAC	<-10.5	10.5	< 0.0
870930	0001	NW REC SITE	20' POLE	ANZAC	-11.5	10.5	-1.0
870930	0103	NW REC SITE	20' POLE	ANZAC	-11.5	10.5	-1.0
871001	1209	NW REC SITE	20' POLE	NONE	-22.5	24.5	2.0
871002	0900	NW REC SITE	20' POLE	NONE	-23.0	24.5	1.5
871002	1201	NW REC SITE	20' POLE	NONE	-22.5	24.5	2.0
871002	1332	NW REC SITE	20' POLE	NONE	-22.5	24.5	2.0
871002	1509	NW REC SITE	20' POLE	NONE	-22.5	24.5	2.0
871003	0002	NW REC SITE	20' POLE	NONE	-22.0	24.5	2.5
871003	0113	NW REC SITE	20' POLE	NONE	-22.0	24.5	2.5
871005	0906	NW REC SITE	20' POLE	ANZAC	<-11.0	10.5	< -0.5
871005	1422	PIT NR LORAN ST	20' POLE	NONE	-22.0	24.5	2.5
871006	1141	STATE MICROWAVE	20' POLE	NONE	-21.5	24.5	3.0
871006	1548	BOREALIS & E. D	20' POLE	NONE	-22.0	24.5	2.5
871006	1921	MOTEL, TOK	20' POLE	NONE	-13.5	24.5	11.0
871007	1101	MOTEL, TOK	20' POLE	NONE	-18.5	24.5	6.0
871007	1351	5TH & RED FOX	20' POLE	NONE	-22.5	24.5	2.0
871007	1648	NW?? & RED FOX	20' POLE	NONE	-22.0	24.5	2.5
871008	1153	PIT NEAR DUMP	20' POLE	NONE	-22.0	24.5	2.5
871008	1358	EAST OF DOT YRD	20' POLE	NONE	-21.5	24.5	3.0
871008	1630	N. OF AIRPORT	20' POLE	NONE	-25.0	24.5	-0.5
871009	1124	JAN LAKE	20' POLE	NONE	-22.5	24.5	2.0
871013	1545	BOB'S FAIRBANKS	41" ROD	NONE	-20.5	32.0	11.5
871013	1655	BOB'S FAIRBANKS	41" ROD	NONE	-18.0	32.0	14.0

Appendix B
Ambient Noise Measurements Near Tok, Alaska
September - October 1987
5.0 MHz, 10 kHz bandwidth

Date yymmdd	Time (ADT) hhmm	Location	Antenna	Preamp	Level (dBuV)	Acf (dB)	Field Intensity (dBuV/m)
870923	1607	JAN LAKE	41"ROD	NM17	-19.0	20.0	1.0
870923	1946	JAN LAKE	41"ROD	NM17	-16.0	20.0	4.0
870923	2317	JAN LAKE	41"ROD	NM17	-18.0	20.0	2.0
870924	0352	JAN LAKE	41"ROD	NM17	<-18.0	20.0	< 2.0
870924	0756	JAN LAKE	41"ROD	NM17	<-16.0	20.0	< 4.0
870924	1309	JAN LAKE	41"ROD	NM17	-18.5	20.0	1.5
870925	1343	MOTEL, TOK	41"ROD	NM17	-18.5	20.0	1.5
870925	1421	MOTEL, TOK	41"ROD	NM17	-18.0	20.0	2.0
870927	1621	NW REC SITE	20' POLE	NONE	-19.0	10.6	-8.4
870927	1???	NW REC SITE	41"ROD	NONE	-19.5	30.0	10.5
870929	0821	NW REC SITE	20' POLE	ANZAC	-10.5	-3.4	-13.9
870929	0917	NW REC SITE	20' POLE	ANZAC	-10.5	-3.4	-13.9
870929	1035	NW REC SITE	20' POLE	ANZAC	-10.5	-3.4	-13.9
870929	1222	NW REC SITE	20' POLE	ANZAC	-10.0	-3.4	-13.4
870929	2324	NW REC SITE	20' POLE	ANZAC	< -8.5	-3.4	<-11.9
870930	0017	NW REC SITE	20' POLE	ANZAC	< -9.0	-3.4	<-12.4
870930	0119	NW REC SITE	20' POLE	ANZAC	-8.5	-3.4	-11.9
871002	0912	NW REC SITE	20' POLE	NONE	< -8.0	10.6	< 2.6
871002	1215	NW REC SITE	20' POLE	NONE	-19.0	10.6	-8.4
871002	1347	NW REC SITE	20' POLE	NONE	-20.0	10.6	-9.4
871002	1520	NW REC SITE	20' POLE	NONE	-19.0	10.6	-8.4
871003	0031	NW REC SITE	20' POLE	NONE	<-18.0	10.6	< -7.4
871003	0126	NW REC SITE	20' POLE	NONE	<-16.0	10.6	< -5.4
871005	0922	NW REC SITE	20' POLE	NONE	<-18.5	10.6	< -7.9
871005	1439	PIT NR LORAN ST	20' POLE	NONE	-20.0	10.6	-9.4
871006	1211	STATE MICROWAVE	20' POLE	NONE	-19.0	10.6	-8.4
871006	1603	BOREALIS & E. D	20' POLE	NONE	-20.0	10.6	-9.4
871006	1938	MOTEL, TOK	20' POLE	NONE	<-14.0	10.6	< -3.4
871007	1120	MOTEL, TOK	20' POLE	NONE	-18.0	10.6	-7.4
871007	1403	5TH & RED FOX	20' POLE	NONE	-20.5	10.6	-9.9
871007	1700	NW?? & RED FOX	20' POLE	NONE	-19.5	10.6	-8.9
871008	1209	PIT NEAR DUMP	20' POLE	NONE	-21.0	10.6	-10.4
871008	1408	EAST OF DOT YRD	20' POLE	NONE	-23.0	10.6	-12.4
871008	1644	N. OF AIRPORT	20' POLE	NONE	<-21.5	10.6	<-10.9
871009	1137	JAN LAKE	20' POLE	NONE	-21.0	10.6	-10.4
871013	1602	BOB'S FAIRBANKS	41" ROD	NONE	-18.0	30.0	12.0

Appendix B
Ambient Noise Measurements Near Tok, Alaska
September - October 1987
10.0 MHz, 10 kHz bandwidth

Date yymmdd	Time (ADT) hhmm	Location	Antenna	Preamp	Level (dBuV)	Acf (dB)	Field Intensity (dBuV/m)
870923	1616	JAN LAKE	41"ROD	NM17	-16.0	20.0	4.0
870923	1952	JAN LAKE	41"ROD	NM17	-15.5	20.0	4.5
870923	2344	JAN LAKE	41"ROD	NM17	<-12.5	20.0	< 7.5
870924	0358	JAN LAKE	41"ROD	NM17	<-18.0	20.0	< 2.0
870924	0809	JAN LAKE	41"ROD	NM17	<-17.5	20.0	< 2.5
870924	13??	JAN LAKE	41"ROD	NM17	-20.0	20.0	0.0
870925	1348	MOTEL, TOK	41"ROD	NM17	-20.0	20.0	0.0
870925	1426	MOTEL, TOK	41"ROD	NM17	-20.0	20.0	0.0
870925	1430	MOTEL, TOK	41"ROD	NM17	-20.0	20.0	0.0
870927	1624	NW REC SITE	20' POLE	NONE	<-10.5	-0.5	<-11.0
870927	1???	NW REC SITE	41"ROD	NONE	-22.5	24.0	1.5
870929	0834	NW REC SITE	20' POLE	ANZAC	-9.0	-14.5	-23.5
870929	0934	NW REC SITE	20' POLE	ANZAC	-11.5	-14.5	-26.0
870929	1059	NW REC SITE	20' POLE	ANZAC	-11.5	-14.5	-26.0
870929	1236	NW REC SITE	20' POLE	ANZAC	-10.5	-14.5	-25.0
870929	2342	NW REC SITE	20' POLE	ANZAC	< -1.0	-14.5	<-15.5
870930	0032	NW REC SITE	20' POLE	ANZAC	< -2.5	-14.5	<-17.0
870930	0141	NW REC SITE	20' POLE	ANZAC	< -4.5	-14.5	<-19.0
871002	0924	NW REC SITE	20' POLE	NONE	<-15.0	-0.5	<-15.5
871002	1231	NW REC SITE	20' POLE	NONE	<-16.0	-0.5	<-16.5
871002	1403	NW REC SITE	20' POLE	NONE	<-16.0	-0.5	<-16.5
871002	1531	NW REC SITE	20' POLE	NONE	<-14.0	-0.5	<-14.5
871003	0039	NW REC SITE	20' POLE	NONE	<-15.0	-0.5	<-15.5
871003	0141	NW REC SITE	20' POLE	NONE	<-12.5	-0.5	<-13.0
871005	0938	NW REC SITE	20' POLE	NONE	<-16.0	-0.5	<-16.5
871005	1455	PIT NR LORAN ST	20' POLE	NONE	<-13.5	-0.5	<-14.0
871006	1238	STATE MICROWAVE	20' POLE	NONE	<-17.0	-0.5	<-17.5
871006	1624	BOREALIS & E. D	20' POLE	NONE	<-20.0	-0.5	<-20.5
871006	1957	MOTEL, TOK	20' POLE	NONE	< -1.5	-0.5	< -2.0
871007	1141	MOTEL, TOK	20' POLE	NONE	<-12.0	-0.5	<-12.5
871007	1416	5TH & RED FOX	20' POLE	NONE	<-14.0	-0.5	<-14.5
871007	1713	NW?? & RED FOX	20' POLE	NONE	<-12.0	-0.5	<-12.5
871008	1222	PIT NEAR DUMP	20' POLE	NONE	<-16.5	-0.5	<-17.0
871008	1424	EAST OF DOT YRD	20' POLE	NONE	<-20.0	-0.5	<-20.5
871008	1736	N. OF AIRPORT	20' POLE	NONE	<-16.0	-0.5	<-16.5
871009	1150	JAN LAKE	20' POLE	NONE	<-18.0	-0.5	<-18.5
871013	1613	BOB'S FAIRBANKS	41" ROD	NONE	-17.5	24.0	6.5

Appendix B
Ambient Noise Measurements Near Tok, Alaska
September - October 1987
15 MHz, 10 kHz bandwidth

Date yymmdd	Time (ADT) hhmm	Location	Antenna	Preamp	Level (dBuV)	Acf (dB)	Field Intensity (dBuV/m)
870923	1616	JAN LAKE	41"ROD	NM17	-17.0	20.0	3.0
870923	1952	JAN LAKE	41"ROD	NM17	-16.5	20.0	3.5
870923	2344	JAN LAKE	41"ROD	NM17	-20.0	20.0	0.0
870924	0358	JAN LAKE	41"ROD	NM17	<-20.0	20.0	< 0.0
870924	0809	JAN LAKE	41"ROD	NM17	-20.0	20.0	0.0
870924	13??	JAN LAKE	41"ROD	NM17	-20.5	20.0	-0.5
870925	1348	MOTEL, TOK	41"ROD	NM17	-20.5	20.0	-0.5
870925	1426	MOTEL, TOK	41"ROD	NM17	-20.0	20.0	0.0
870925	1430	MOTEL, TOK	41"ROD	NM17	-20.0	20.0	0.0
870927	1624	NW REC SITE	20' POLE	NONE	<-15.0	-3.1	<-18.1
870927	1???	NW REC SITE	41"ROD	NONE	-23.0	24.0	1.0
870929	0834	NW REC SITE	20' POLE	ANZAC	-6.5	-17.1	-23.6
870929	0934	NW REC SITE	20' POLE	ANZAC	-10.0	-17.1	-27.1
870929	1059	NW REC SITE	20' POLE	ANZAC	-11.5	-17.1	-28.6
870929	1236	NW REC SITE	20' POLE	ANZAC	-8.5	-17.1	-25.6
870929	2342	NW REC SITE	20' POLE	ANZAC	< -3.0	-17.1	<-20.1
870930	0032	NW REC SITE	20' POLE	ANZAC	< -2.5	-17.1	<-19.6
870930	0141	NW REC SITE	20' POLE	ANZAC	< -3.0	-17.1	<-20.1
871002	0924	NW REC SITE	20' POLE	NONE	<-15.0	-3.1	<-18.1
871002	1231	NW REC SITE	20' POLE	NONE	<-15.0	-3.1	<-18.1
871002	1403	NW REC SITE	20' POLE	NONE	<-14.5	-3.1	<-17.6
871002	1531	NW REC SITE	20' POLE	NONE	<-14.0	-3.1	<-17.1
871003	0039	NW REC SITE	20' POLE	NONE	<-15.5	-3.1	<-18.6
871003	0141	NW REC SITE	20' POLE	NONE	<-14.0	-3.1	<-17.1
871005	0938	NW REC SITE	20' POLE	NONE	<-15.0	-3.1	<-18.1
871005	1455	PIT NR LORAN ST	20' POLE	NONE	<-13.0	-3.1	<-16.1
871006	1238	STATE MICROWAVE	20' POLE	NONE	<-15.0	-3.1	<-18.1
871006	1624	BOREALIS & E. D	20' POLE	NONE	<-18.5	-3.1	<-21.6
871006	1957	MOTEL, TOK	20' POLE	NONE	< -9.5	-3.1	<-12.6
871007	1141	MOTEL, TOK	20' POLE	NONE	<-13.5	-3.1	<-16.6
871007	1416	5TH & RED FOX	20' POLE	NONE	<-14.0	-3.1	<-17.1
871007	1713	NW?? & RED FOX	20' POLE	NONE	<-12.0	-3.1	<-15.1
871008	1222	PIT NEAR DUMP	20' POLE	NONE	<-16.5	-3.1	<-19.6
871008	1424	EAST OF DOT YRD	20' POLE	NONE	<-16.0	-3.1	<-19.1
871008	1736	N. OF AIRPORT	20' POLE	NONE	<-14.5	-3.1	<-17.6
871009	1150	JAN LAKE	20' POLE	NONE	<-17.5	-3.1	<-20.6
871013	1613	BOB'S FAIRBANKS	41" ROD	NONE	-17.5	24.0	6.5

Appendix B
Ambient Noise Measurements Near Tok, Alaska
September - October 1987
20.0 MHz, 10 kHz bandwidth

Date yymmdd	Time (ADT) hhmm	Location	Antenna	Preamp	Level (dBuV)	Acf (dB)	Field Intensity (dBuV/m)
870923	1622	JAN LAKE	41"ROD	NM17	-18.0	20.0	2.0
870923	2000	JAN LAKE	41"ROD	NM17	-18.5	20.0	1.5
870923	2350	JAN LAKE	41"ROD	NM17	-19.5	20.0	0.5
870924	0816	JAN LAKE	41"ROD	NM17	-18.5	20.0	1.5
870924	1326	JAN LAKE	41"ROD	NM17	-19.5	20.0	0.5
870925	1353	MOTEL, TOK	41"ROD	NM17	-19.0	20.0	1.0
870925	1435	MOTEL, TOK	41"ROD	NM17	-18.0	20.0	2.0
870927	1502	NW REC SITE	41"ROD	NONE	-20.5	26.0	5.5
870927	1627	NW REC SITE	20' POLE	NONE	-17.5	-2.2	-19.7
870929	0846	NW REC SITE	20' POLE	ANZAC	-9.0	-16.2	-25.2
870929	0954	NW REC SITE	20' POLE	ANZAC	-10.0	-16.2	-26.2
870929	1249	NW REC SITE	20' POLE	ANZAC	-9.5	-16.2	-25.7
870930	0047	NW REC SITE	20' POLE	ANZAC	-7.0	-16.2	-23.2
870930	0159	NW REC SITE	20' POLE	ANZAC	-8.5	-16.2	-24.7
871002	0941	NW REC SITE	20' POLE	NONE	-18.0	-2.2	-20.2
871002	1249	NW REC SITE	20' POLE	NONE	-17.5	-2.2	-19.7
871002	1423	NW REC SITE	20' POLE	NONE	-18.0	-2.2	-20.2
871002	1546	NW REC SITE	20' POLE	NONE	-17.0	-2.2	-19.2
871003	0055	NW REC SITE	20' POLE	NONE	-19.0	-2.2	-21.2
871005	0953	NW REC SITE	20' POLE	NONE	-18.0	-2.2	-20.2
871005	1554	PIT NR LORAN ST	20' POLE	NONE	-21.0	-2.2	-23.2
871006	1311	STATE MICROWAVE	20' POLE	NONE	-18.5	-2.2	-20.7
871006	1640	BOREALIS & E. D	20' POLE	NONE	-18.0	-2.2	-20.2
871006	2021	MOTEL, TOK	20' POLE	NONE	-17.0	-2.2	-19.2
871007	1204	MOTEL, TOK	20' POLE	NONE	-18.0	-2.2	-20.2
871007	1434	5TH & RED FOX	20' POLE	NONE	-18.5	-2.2	-20.7
871007	1727	NW?? & RED FOX	20' POLE	NONE	-17.5	-2.2	-19.7
871008	1239	PIT NEAR DUMP	20' POLE	NONE	-18.0	-2.2	-20.2
871008	1439	EAST OF DOT YRD	20' POLE	NONE	-18.5	-2.2	-20.7
871008	1750	N. OF AIRPORT	20' POLE	NONE	-18.0	-2.2	-20.2
871009	1203	JAN LAKE	20' POLE	NONE	-20.0	-2.2	-22.2
871013	1623	BOB'S FAIRBANKS	41" ROD	NONE	-20.0	26.0	6.0