

AD-A193 231

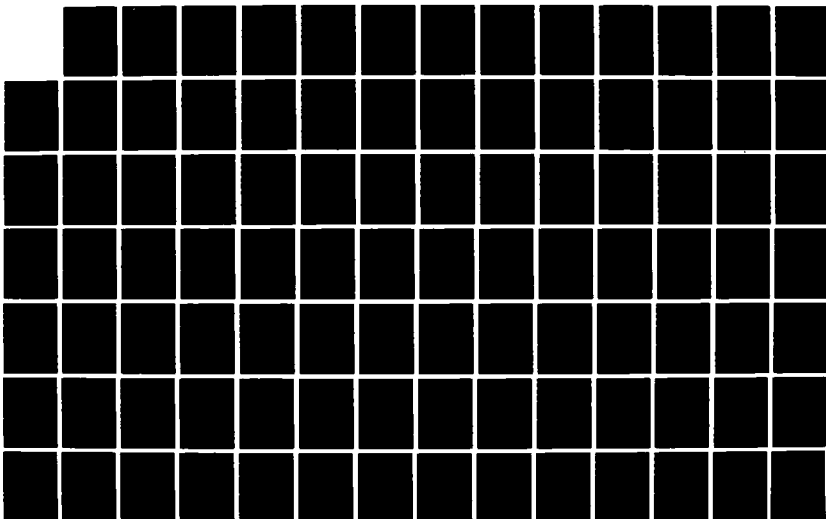
VERTICAL DIRECTIONALITY OF AMBIENT NOISE AT 32 DEG N AS 1/2
A FUNCTION OF LONG. (U) SCRIPPS INSTITUTION OF
OCEANOGRAPHY LA JOLLA CA MARINE PHYSIC.

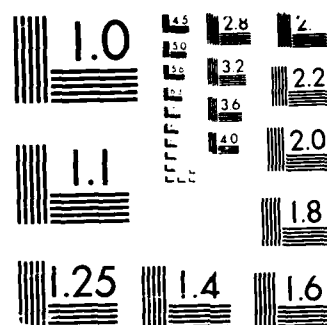
UNCLASSIFIED

N S HODGKISS ET AL. JAN 88 MPL-TM-387-B

F/G 28/1

NL





MICROCOPY RESOLUTION TEST CHART
 1963-A - STANDARDS FOR A.S.



MARINE PHYSICAL
LABORATORY

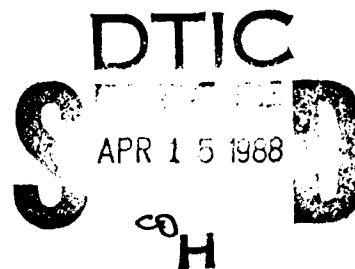
SCRIPPS INSTITUTION OF OCEANOGRAPHY

San Diego, California 92152

AD-A193 231

VERTICAL DIRECTIONALITY OF AMBIENT NOISE
AT 32° N AS A FUNCTION OF LONGITUDE:
Tape #85010

W. S. Hodgkiss and F. H. Fisher



MPL TECHNICAL MEMORANDUM 387-B

MPL-U-32/86

Approved for public release; distribution unlimited.

January 1988

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited.	
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE				
4. PERFORMING ORGANIZATION REPORT NUMBER(S) MPL TECHNICAL MEMORANDUM 387-B [MPL-U-32/86]			5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION Marine Physical Laboratory		6b. OFFICE SYMBOL (If applicable) MPL	7a. NAME OF MONITORING ORGANIZATION Office of Naval Research Department of the Navy	
6c. ADDRESS (City, State, and ZIP Code) University of California, San Diego Scripps Institution of Oceanography San Diego, CA 92152			7b. ADDRESS (City, State, and ZIP Code) 800 North Quincy Street Arlington, VA 22217-5000	
8a. NAME OF FUNDING / SPONSORING ORGANIZATION Office of Naval Research		8b. OFFICE SYMBOL (If applicable) ONR	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N00014-84-K-0097 and N00014-87-C-0127	
8c. ADDRESS (City, State, and ZIP Code) Department of the Navy 800 North Quincy Street Arlington, VA 22217-5000			10. SOURCE OF FUNDING NUMBERS	
			PROGRAM ELEMENT NO.	PROJECT NO.
11. TITLE (Include Security Classification) Vertical Directionality of Ambient Noise at 32°N as a Function of Longitude: Tape #85010				
12. PERSONAL AUTHOR(S) W.S. Hodgkiss and F. H. Fisher				
13a. TYPE OF REPORT tech memo		13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) January 1988	15. PAGE COUNT 129
16. SUPPLEMENTARY NOTATION				
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) ambient noise, vertical arrays, vertical directionality, NORDA VEKA 48-element vertical array	
FIELD	GROUP	SUB-GROUP		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Measurements have been made of the ambient noise field between 25 and 300 Hz with vertical arrays at 32°N (124°W, 136°W, and 150°W). This technical report contains the complete analysis results for the NORDA VEKA 48-element vertical array Tape #85010. The tape was recorded at 32°N, 124°W (approximately 350 nmi due west of San Diego) on 18 October 1985 beginning at 20:05 PDT. At that time, the wind speed was 6 kts.				
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL W. S. Hodgkiss			22b. TELEPHONE (Include Area Code) 619-534-1798	22c. OFFICE SYMBOL MPL

Vertical Directionality of Ambient Noise

at 32° N as a Function of Longitude:

Tape #85010

W.S. Hodgkiss and F.H. Fisher

Marine Physical Laboratory
Scripps Institution of Oceanography
San Diego, CA 92152

Abstract

Measurements have been made of the ambient noise field between 25 and 300 Hz with vertical arrays at 32° N (124° W, 136° W, and 150° W). This technical report contains the complete analysis results for the NORDA VEKA 48-element vertical array Tape #85010. The tape was recorded at 32° N, 124° W (approximately 350 nmi due west of San Diego) on 18 October 1985 beginning at 20:05 PDT. At that time, the wind speed was 6 kts.

I. Introduction

This technical report contains the complete analysis results for the NORDA VEKA 48-element vertical array Tape #85010. The tape was recorded at 32° N, 124° W (approximately 350 nmi due west of San Diego) on 18 October 1985 beginning at 20:05 PDT. At that time, the wind speed was 6 kts.

A complete description of the experiment and data analysis procedure is given in the summary technical report (TM-387-A). Here, a brief guide will be provided to the results documented in the the various sections.

Section II (Preliminary Analysis) provides a preliminary look at the data quality from 4 hydrophones spaced approximately equally across the array for the first data segment (65536 points).

The results are ordered as follows:

- (1) Channel means (A/D counts).
- (2) Time series (A/D counts) for the first 1024 points of the first segment.
- (3) Time-varying mean (A/D counts, 64-point averages).
- (4) Time-varying power (A/D counts squared, 64-point averages) (channel means have been removed).
- (5) Power spectra (dB// μ Pa/ $\sqrt{\text{Hz}}$) (channel means have been removed).

Section III (Power Spectra) provides an extended preliminary look at the power spectra from all hydrophones in the array for the first data segment (65536 points). The results are ordered as follows:

- (1) Channel means (A/D counts).
- (2) Power spectra (dB// μ Pa/ $\sqrt{\text{Hz}}$) (channel means have been removed).

Section IV (Array Response: Waterfall, KB Window) provides waterfall plots of the time-evolving vertical directionality of ambient noise for successive segments (65536 points) across the entire data tape (dB// μ Pa/ $\sqrt{\text{HzDeg}}$). A Kaiser-Bessel window ($\alpha = 1.5$) was used to amplitude shade the array elements.

Section V (Array Response: Waterfall, Rect Window) provides waterfall plots of the time-evolving

For	
I	☒
1	☐
on	☐
on/	
ity Codes	
Dist	Avail and/or Special
A-1	

vertical directionality of ambient noise for successive segments (65536 points) across the entire data tape ($\text{dB}/\mu\text{Pa}/\sqrt{\text{HzDeg}}$). A rectangular window was used to amplitude shade the array elements.

Section VI (Array Response: Panels, KB Window) provides multi-panel plots of the time-evolving vertical directionality of ambient noise for successive segments (65536 points) across the entire data tape ($\text{dB}/\mu\text{Pa}/\sqrt{\text{HzDeg}}$). A Kaiser-Bessel window ($\alpha = 1.5$) was used to amplitude shade the array elements.

Section VII (Array Response: Panels, Rect Window) provides multi-panel plots of the time-evolving vertical directionality of ambient noise for successive segments (65536 points) across the entire data tape ($\text{dB}/\mu\text{Pa}/\sqrt{\text{HzDeg}}$). A rectangular window was used to amplitude shade the array elements.

II. Preliminary Analysis.

Channel #1

1 -3.7549438476563

Channel #16

1 -7.2846832275391

Channel #32

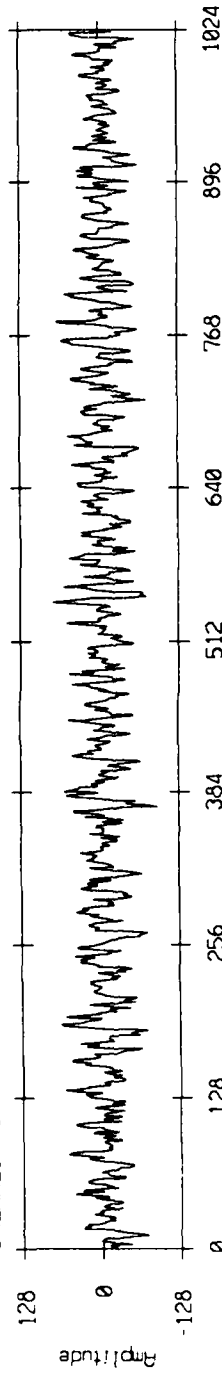
1 -18.472808837391

Channel #48

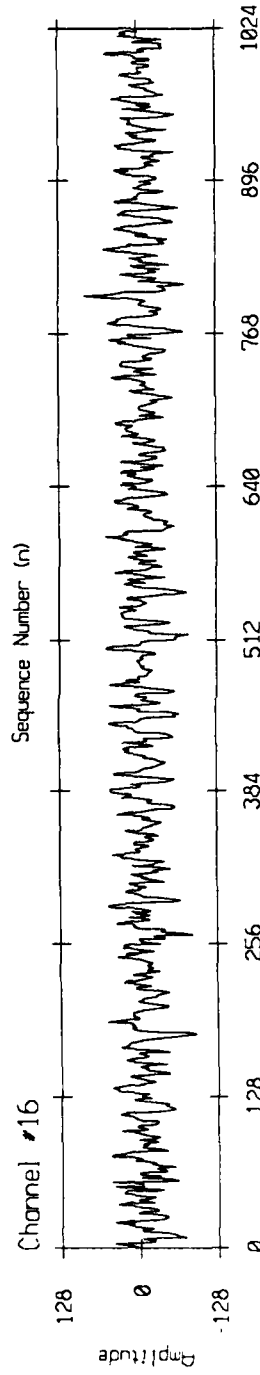
1 5.4024505615234

Time Series - 85010.1

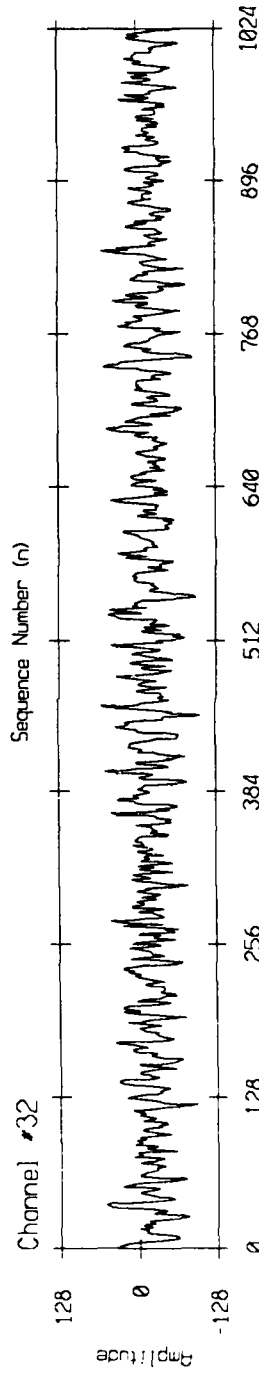
Channel #1



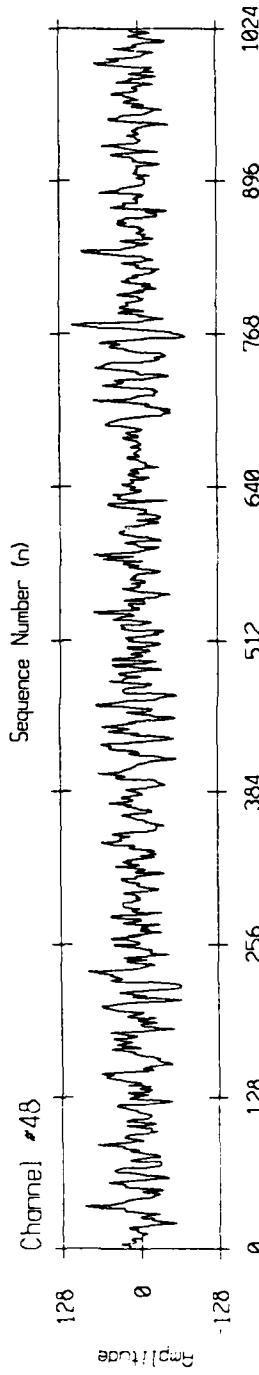
Channel #16



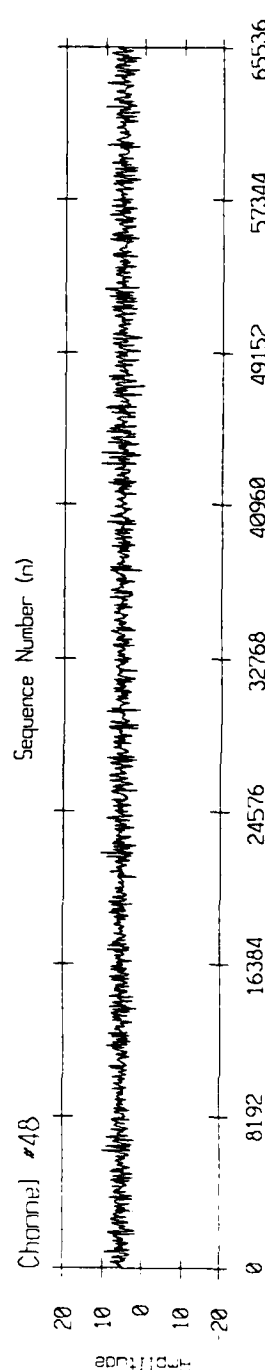
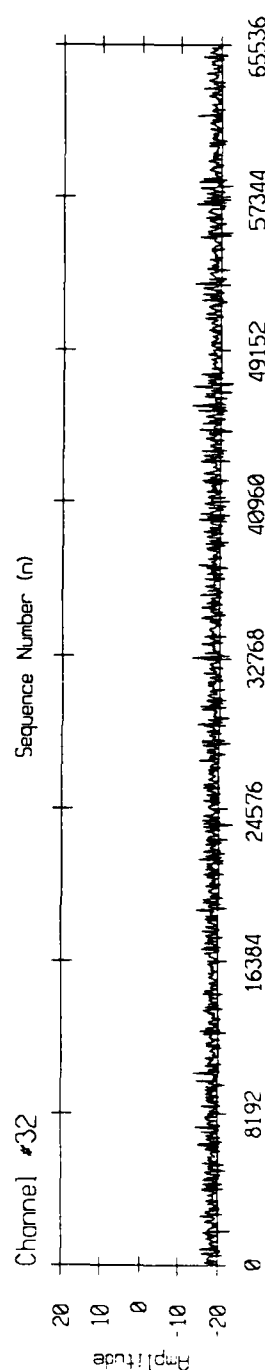
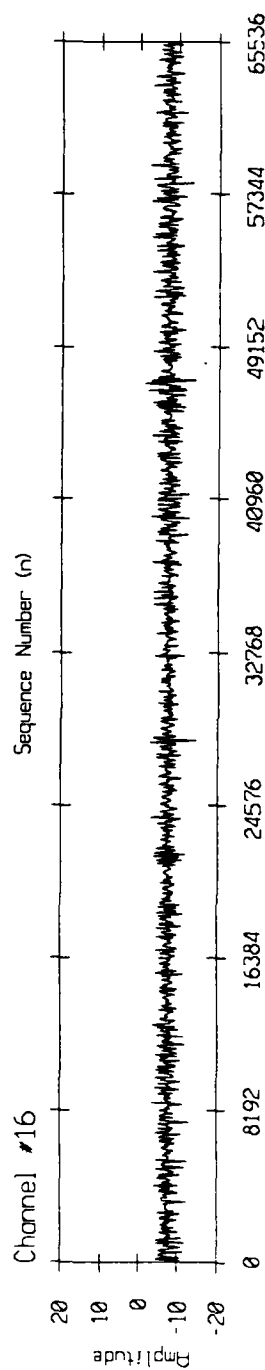
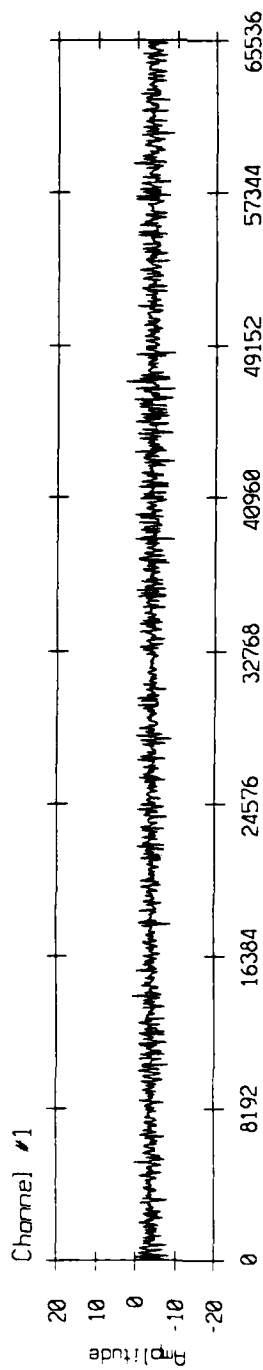
Channel #32



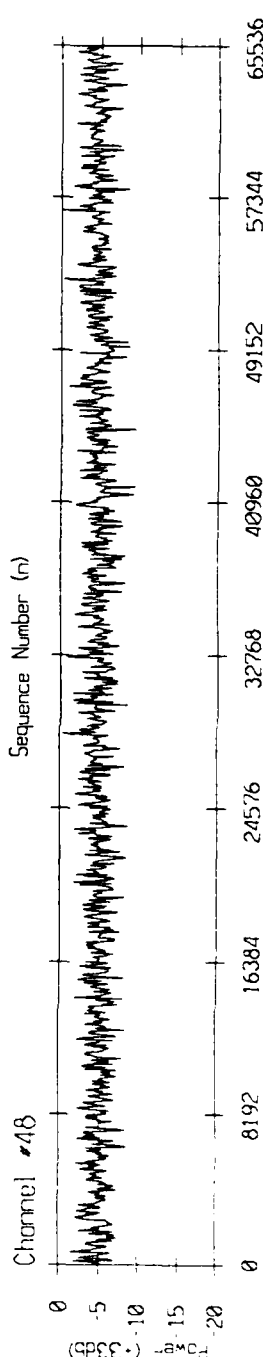
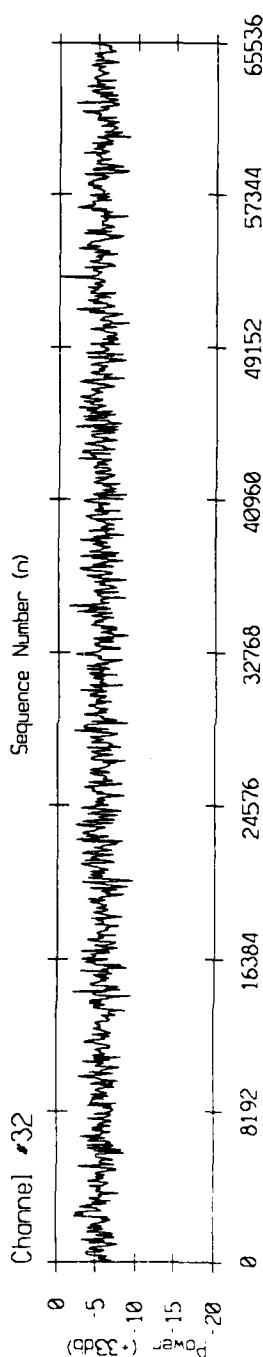
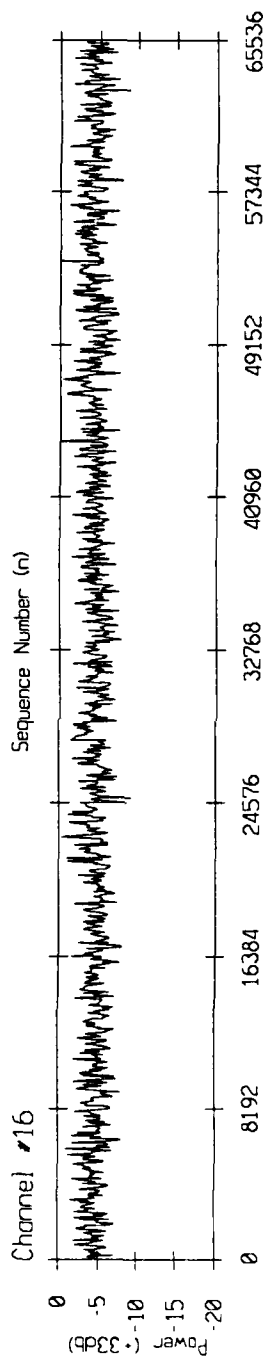
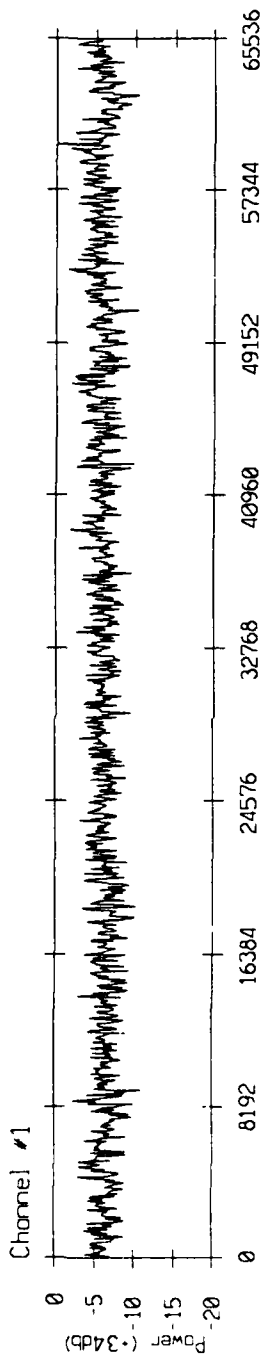
Channel #48



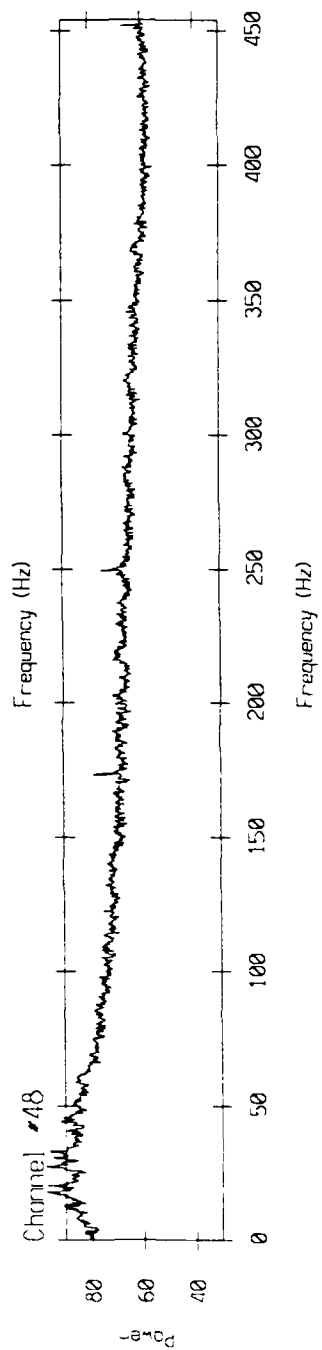
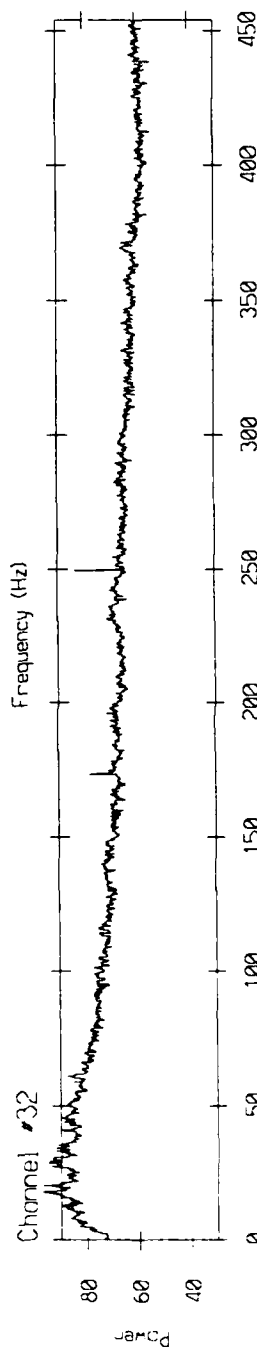
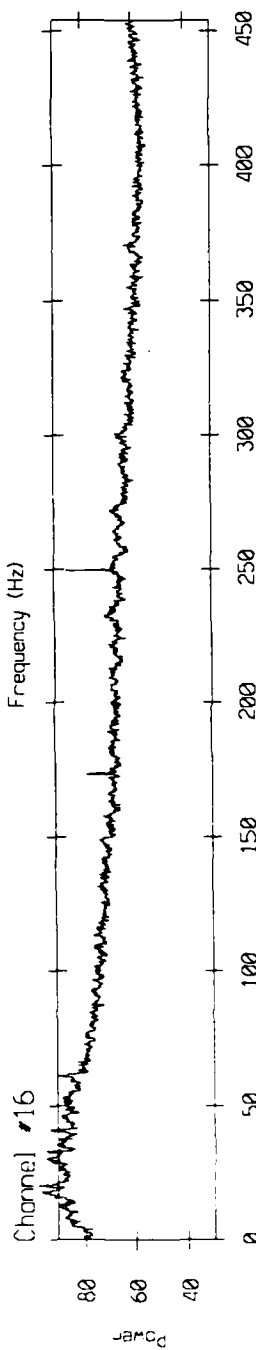
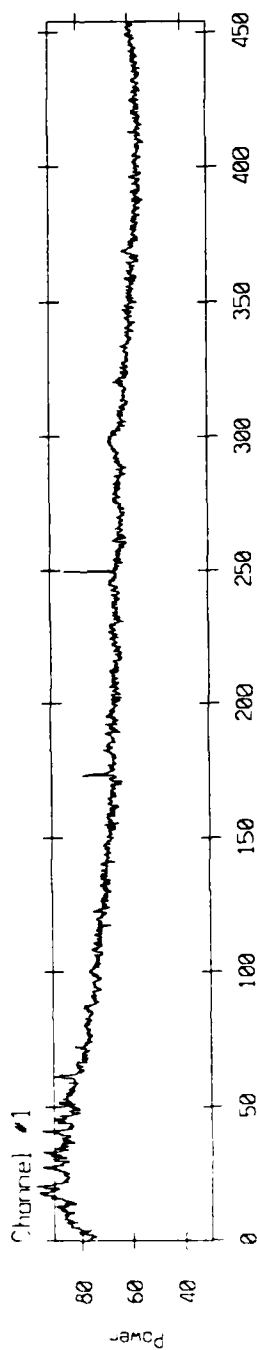
Time Series Mean - 85010.1



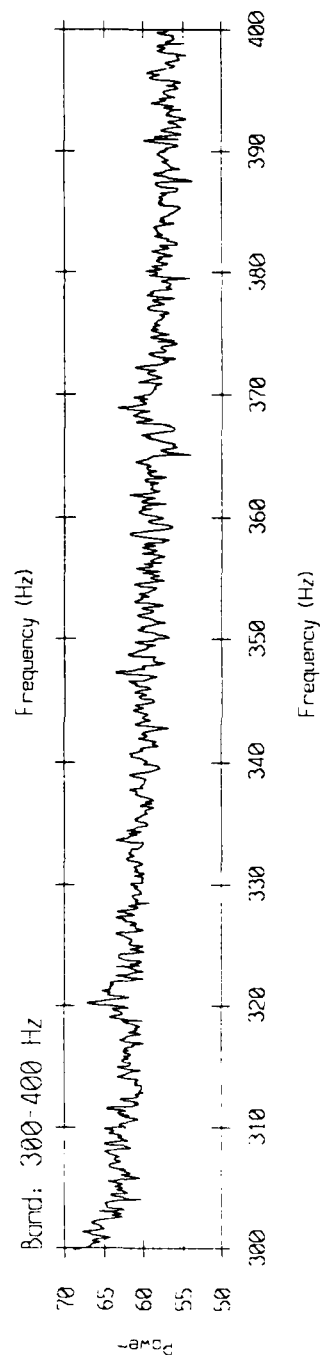
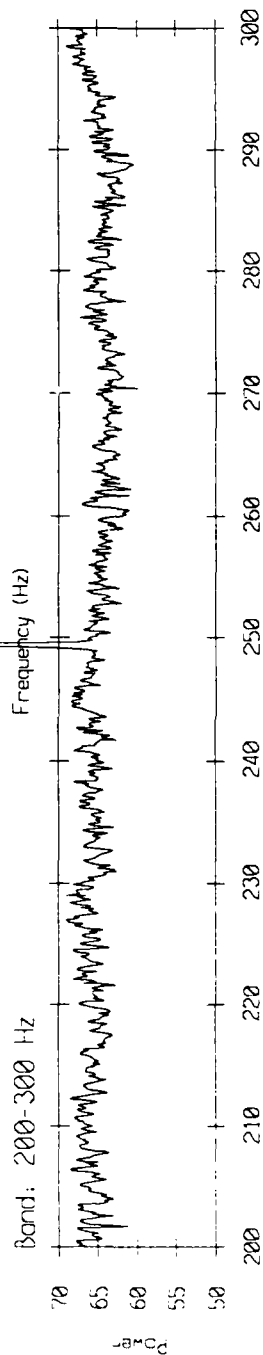
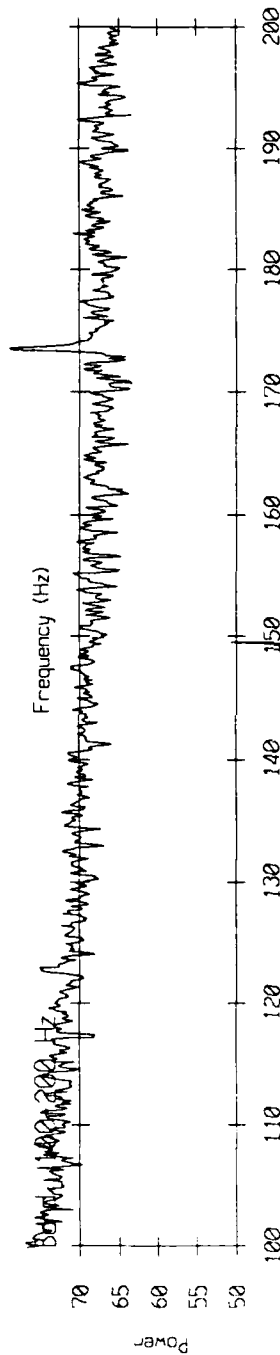
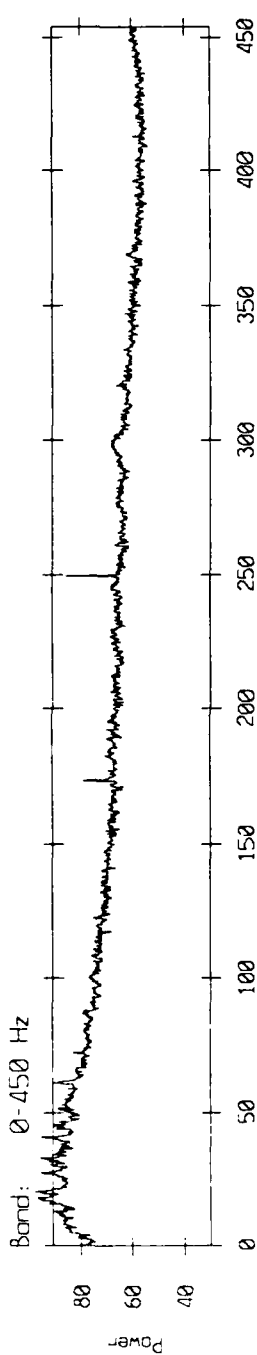
Time Series Power - 85010.1



Power Spectrum - 85010.1

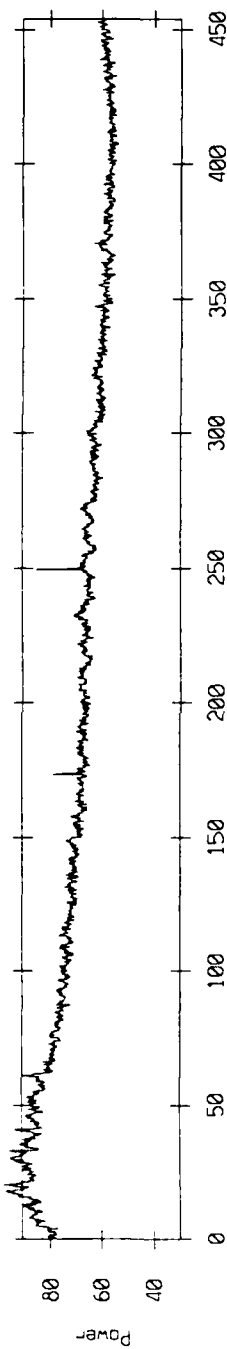


Power Spectrum - 85010.1 Channel #1

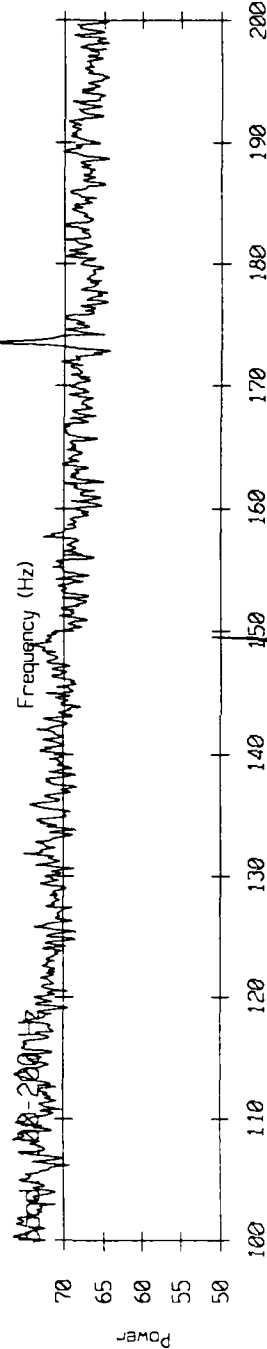


Power Spectrum - 85010.1 Channel #16

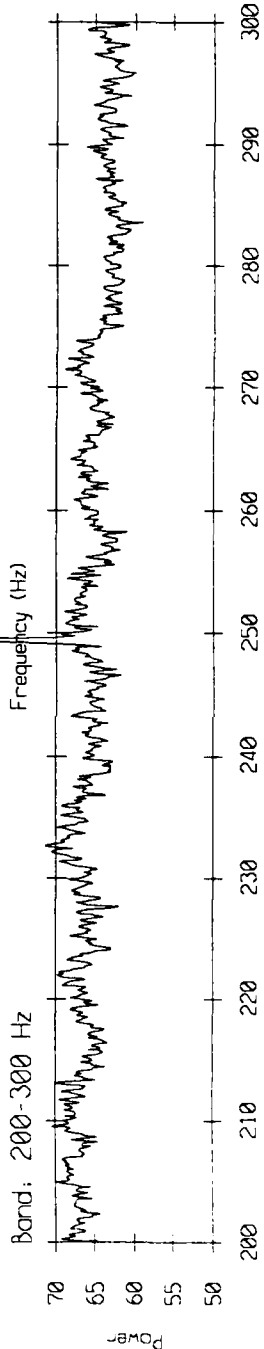
Band: 0-450 Hz



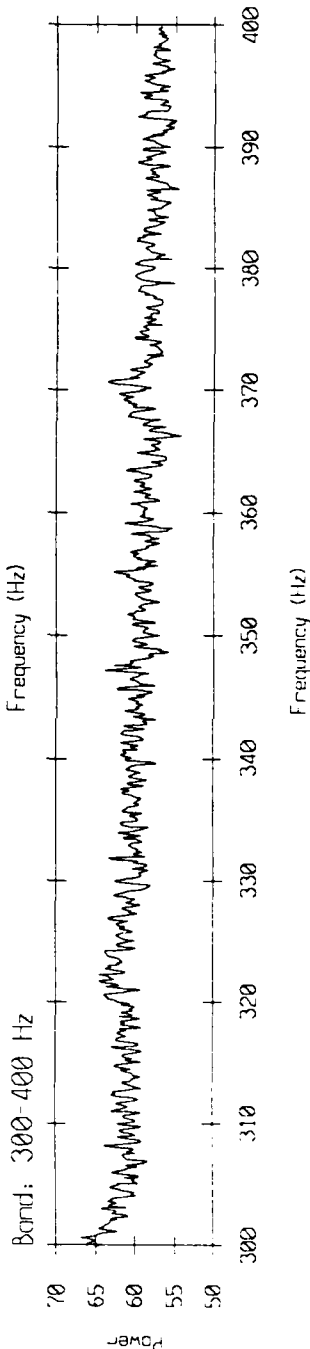
Band: 200-300 Hz



Band: 200-300 Hz

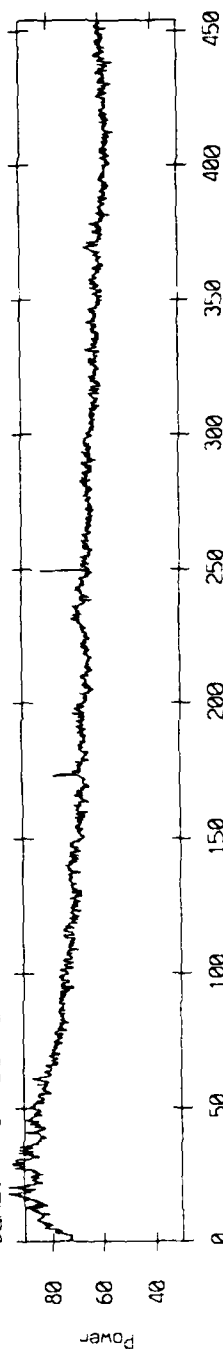


Band: 300-400 Hz

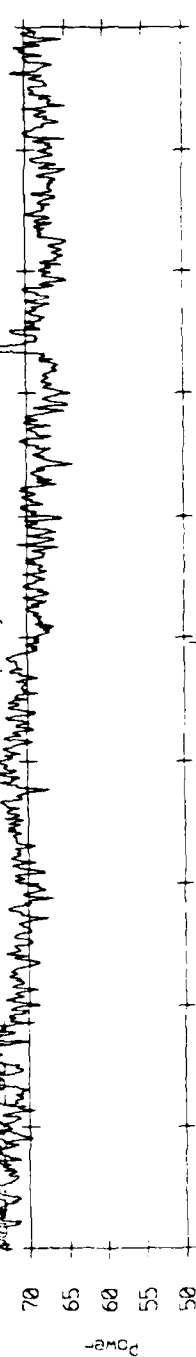


Power Spectrum - 85010.1 Channel #32

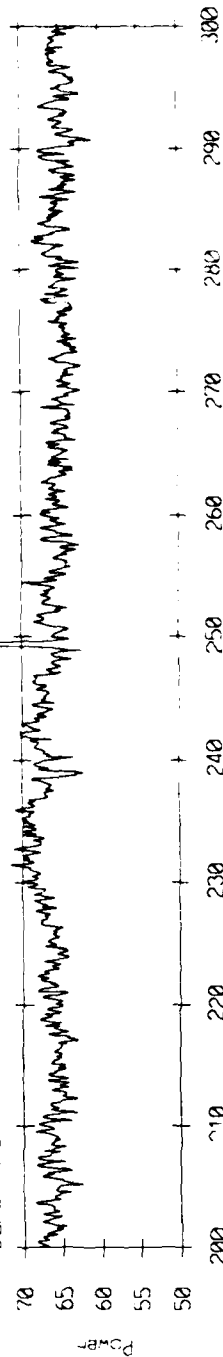
Band: 0-450 Hz



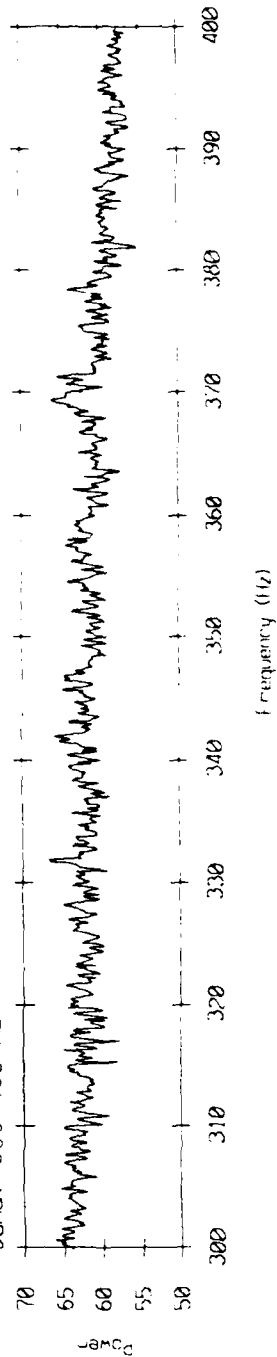
Band: 200-280 Hz



Band: 200-300 Hz

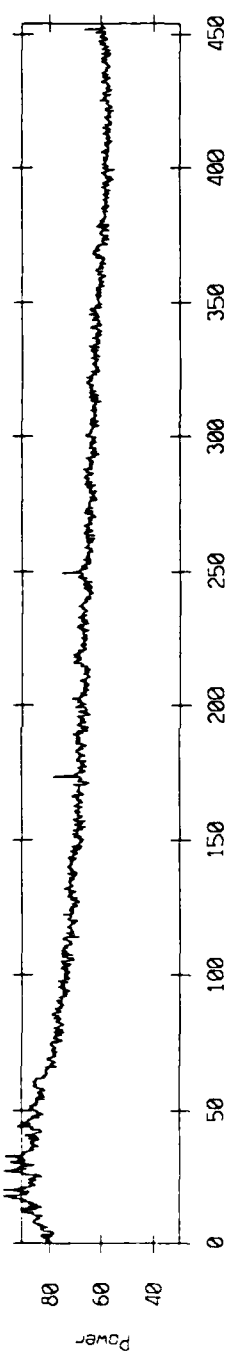


Band: 300-400 Hz

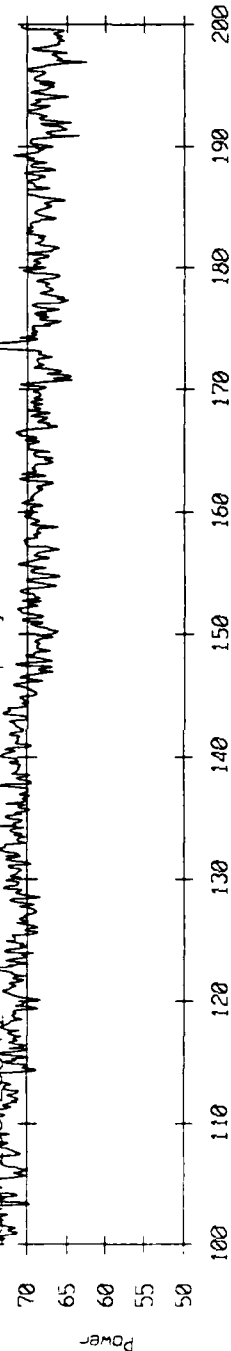


Power Spectrum - 85010.1 Channel #48

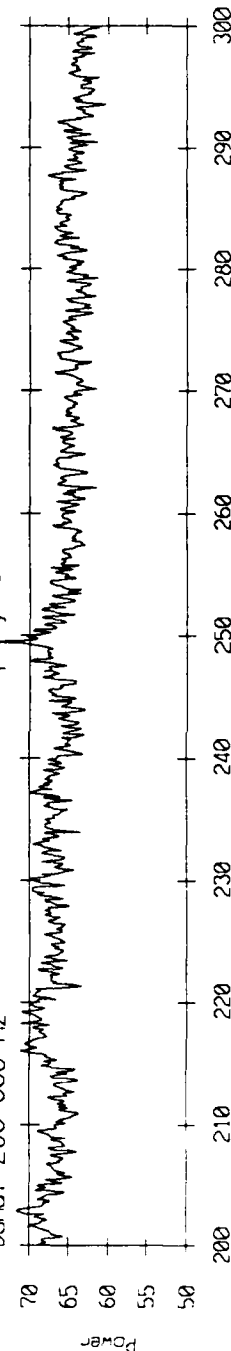
Band: 0-450 Hz



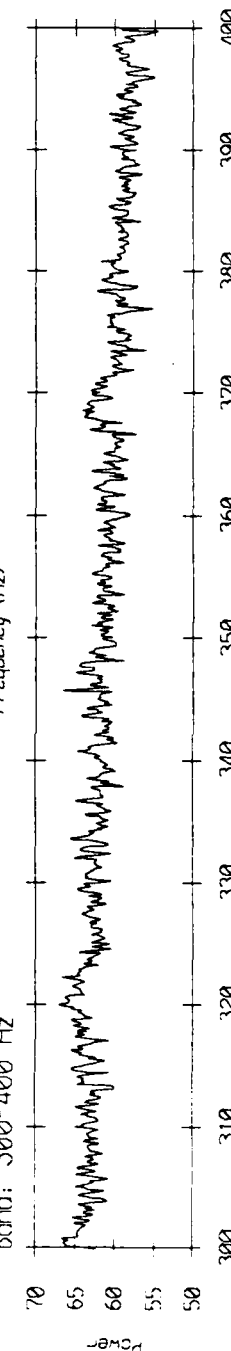
Band: 200-300 Hz



Band: 200-300 Hz



Band: 300-400 Hz

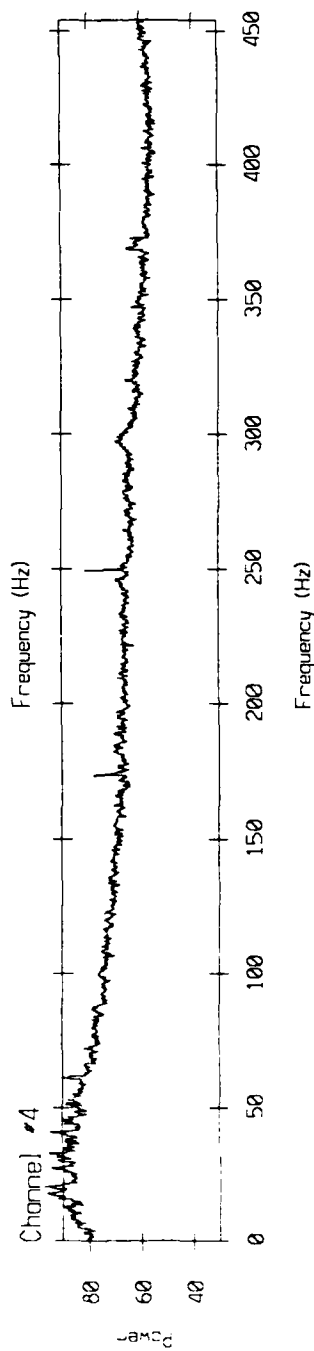
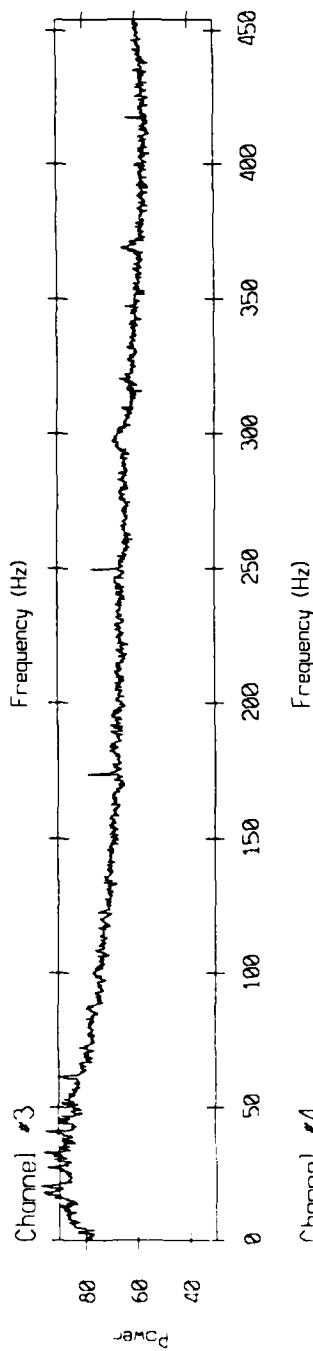
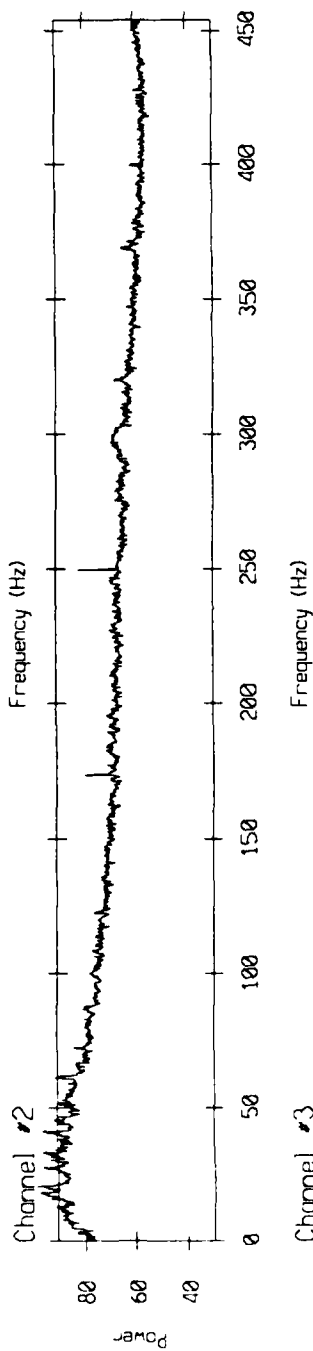
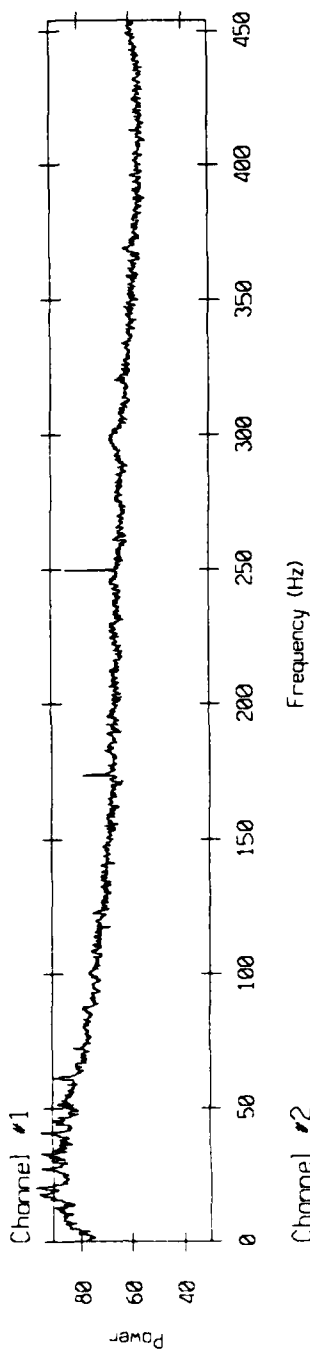


III. Power Spectra.

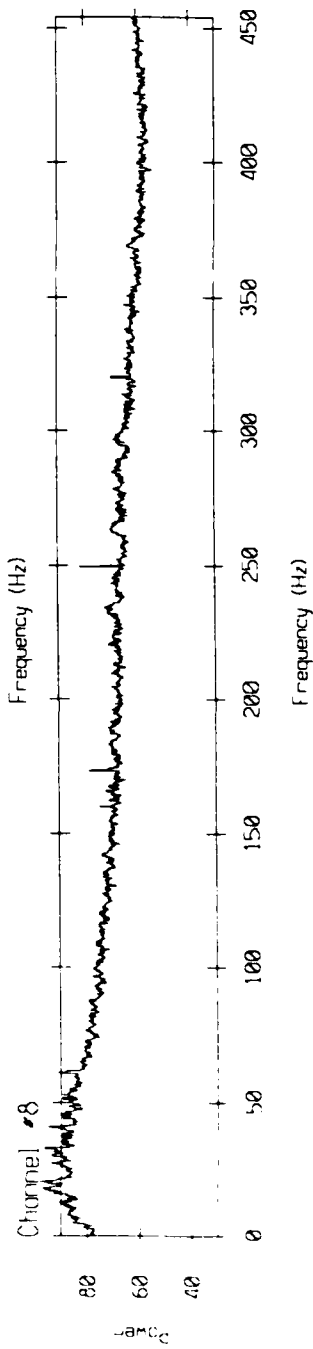
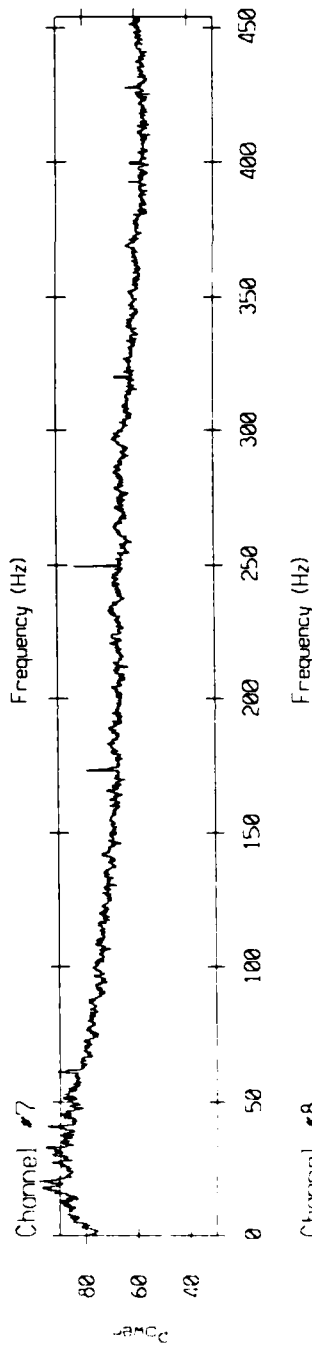
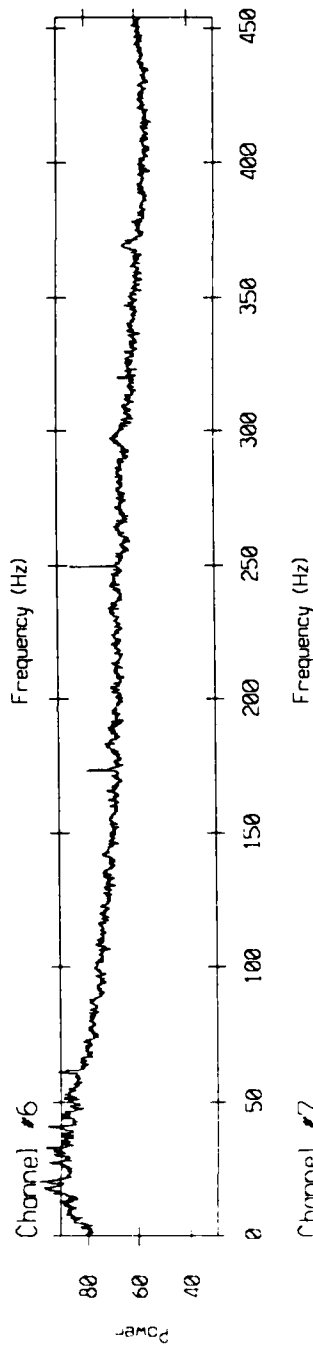
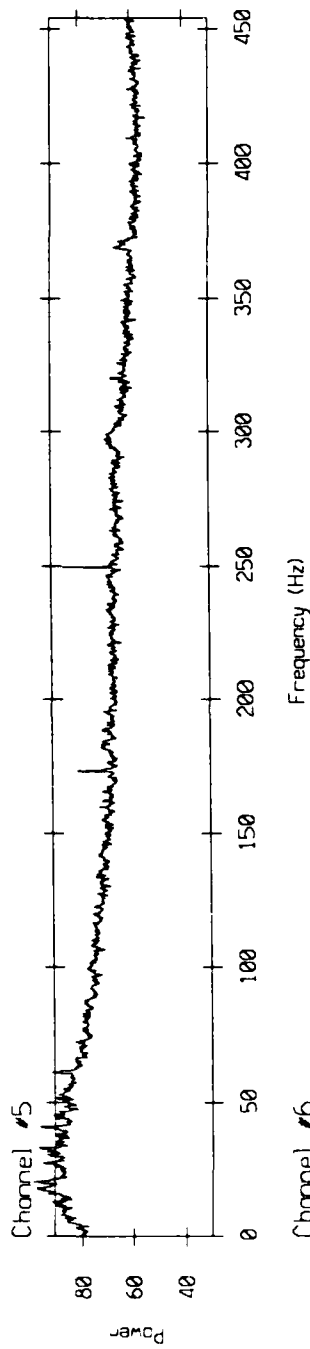
Channel #1
1 -3.7549438476383
Channel #2
1 -22.269398193359
Channel #3
1 1.2194824218750
Channel #4
1 17.464538574219
Channel #5
1 14.029907226563
Channel #6
1 20.884002683547
Channel #7
1 25.631790161133
Channel #8
1 -18.619995117186
Channel #9
1 -25.978164672852
Channel #10
1 14.312759399414
Channel #11
1 -11.118469238231
Channel #12
1 -63.520904341016
Channel #13
1 -33.608383178711
Channel #14
1 -28.023223876953
Channel #15
1 -2.0163574218750
Channel #16
1 -7.2846832275391
Channel #17
1 -38.472198486326
Channel #18
1 -76.387924194326
Channel #19
1 -310.44949340620
Channel #20
1 -8.9479370117188
Channel #21
1 9.5725402832031
Channel #22
1 16.956420398438
Channel #23
1 -5.5645446777344
Channel #24
1 -11.228286743164
Channel #25
1 -207.91111755371
Channel #26
1 0.70963886718750
Channel #27
1 -59.758209228315
Channel #28
1 17.697103271484

Channel #29
1 -8.4422149606202
Channel #30
1 25.149780273438
Channel #31
1 -14.122909545898
Channel #32
1 -18.472808837891
Channel #33
1 -57.708404541016
Channel #34
1 -19.113221250000
Channel #35
1 1.0378570556641
Channel #36
1 42.639373779297
Channel #37
1 27.986679077148
Channel #38
1 2.1068572998047
Channel #39
1 -4.7473449707031
Channel #40
1 45.833163293203
Channel #41
1 -39.934494013555
Channel #42
1 -5.3696594238281
Channel #43
1 43.213073730467
Channel #44
1 -16.118804931641
Channel #45
1 -36.901565551758
Channel #46
1 25.721585693359
Channel #47
1 -28.774505615234
Channel #48
1 5.4024505615234

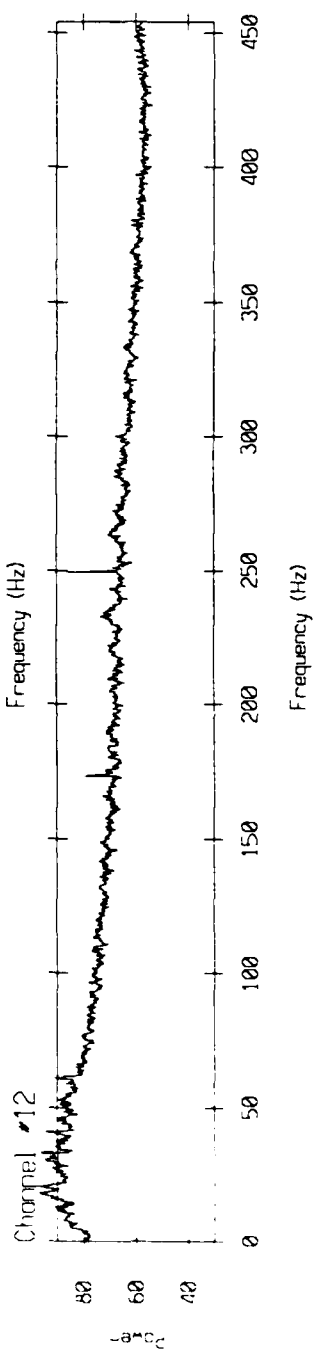
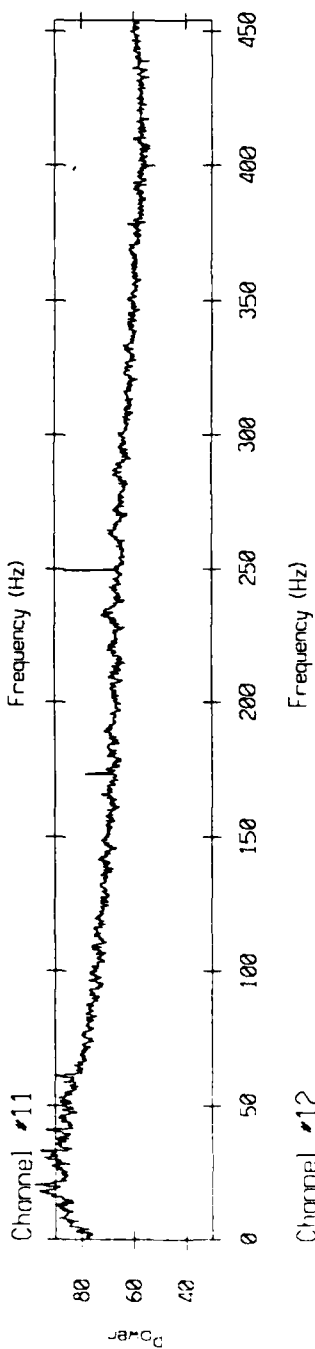
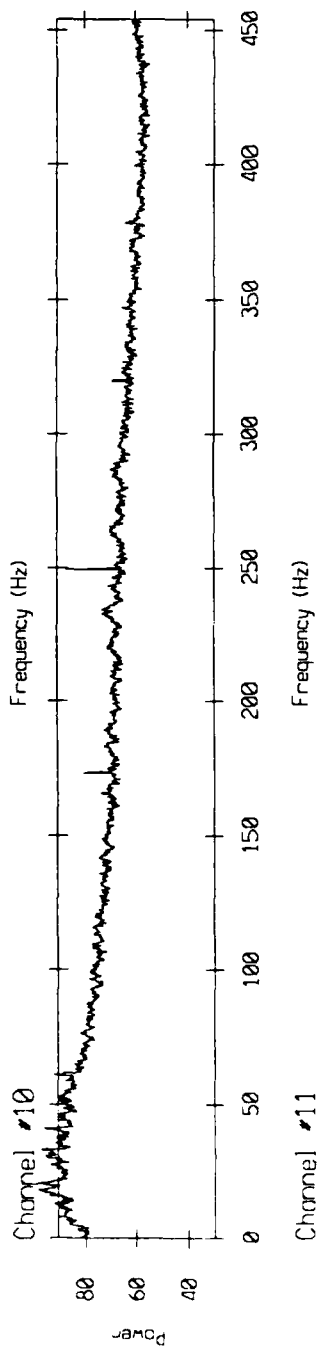
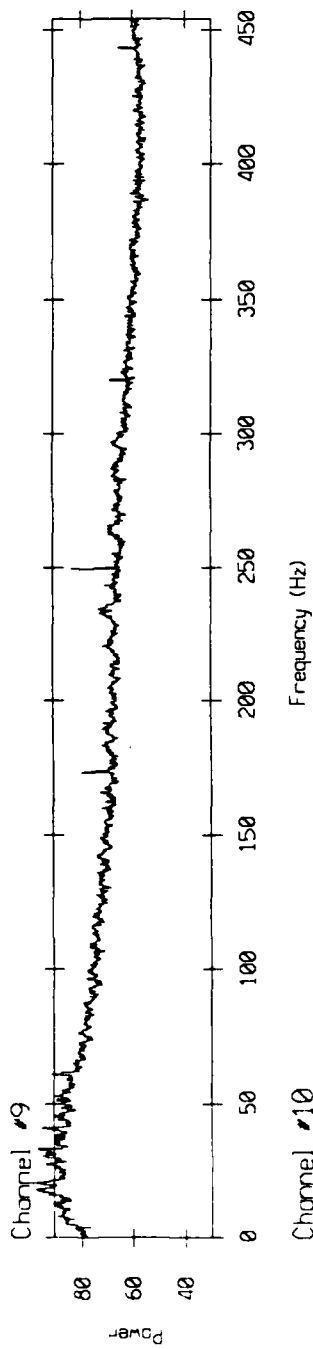
Power Spectrum - 85010.1



Power Spectrum - 85010.1

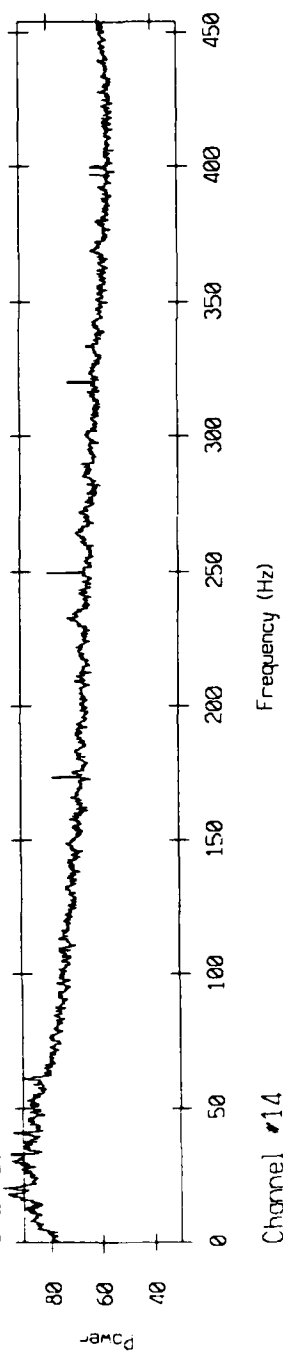


Power Spectrum - 85010.1

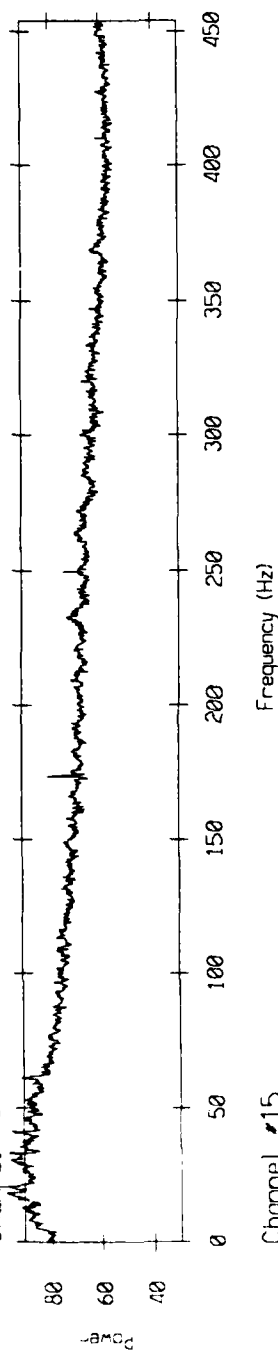


Power Spectrum - 85010.1

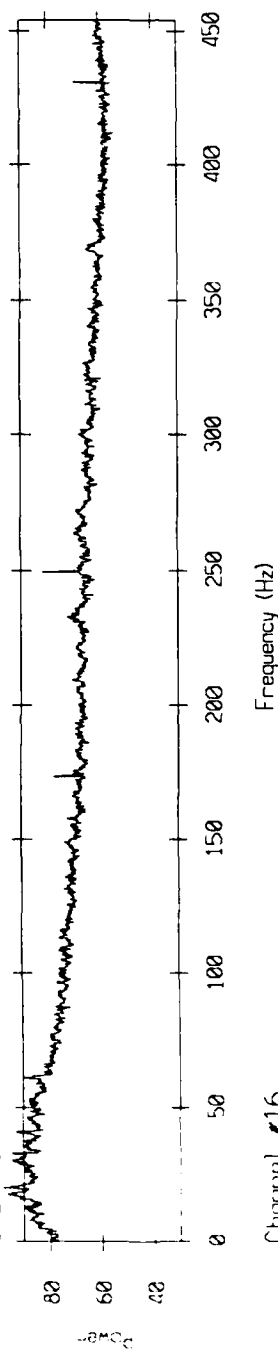
Channel #13



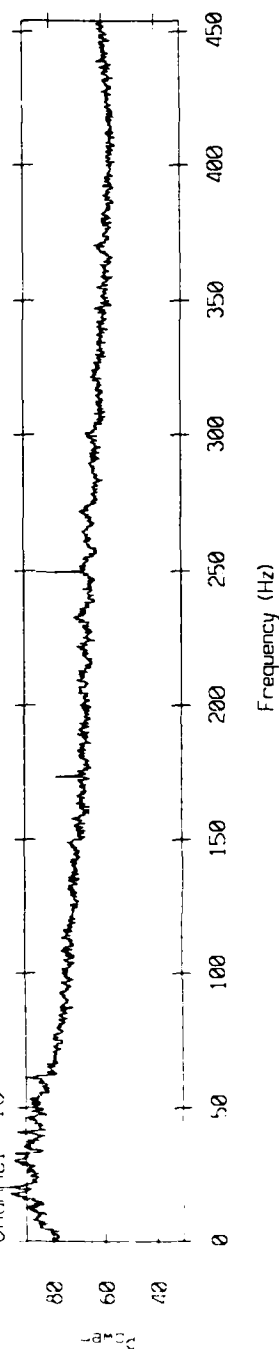
Channel #14



Channel #15

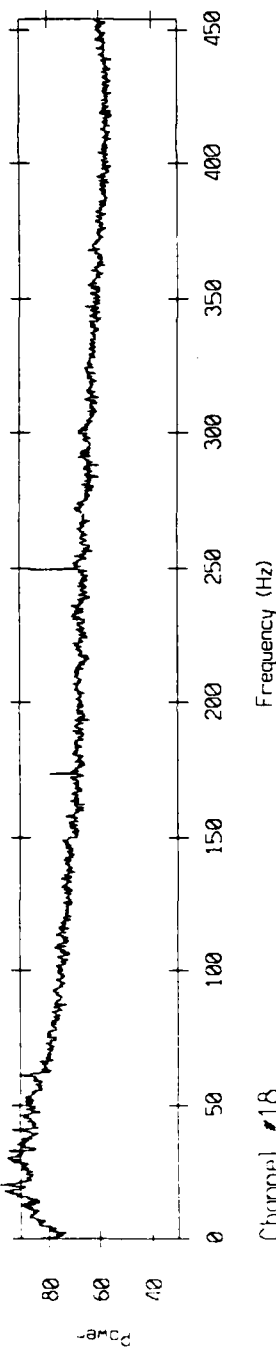


Channel #16

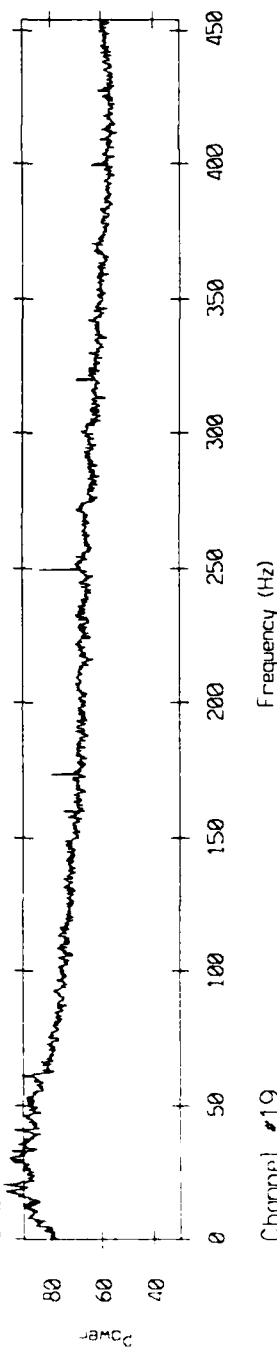


Power Spectrum - 85010.1

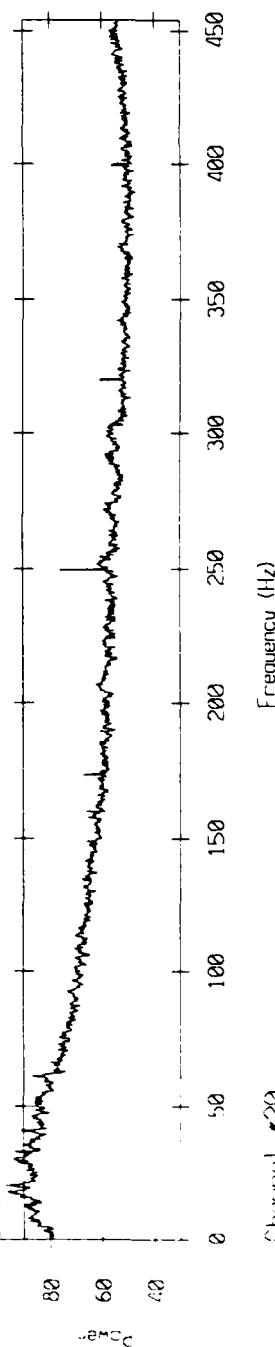
Channel #17



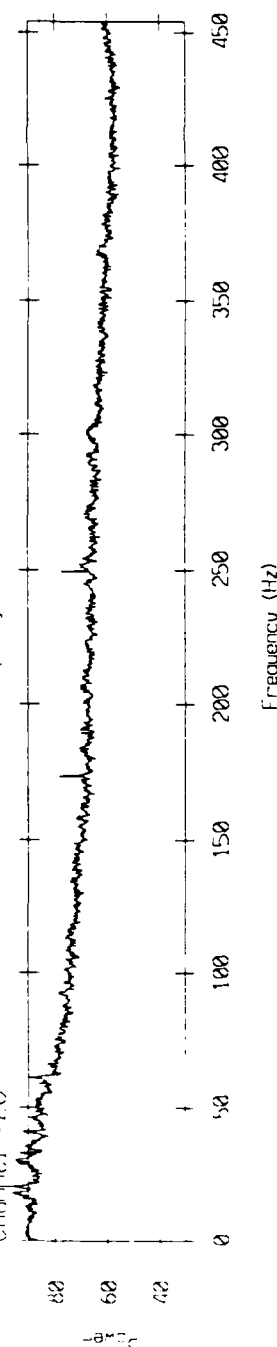
Channel #18



Channel #19

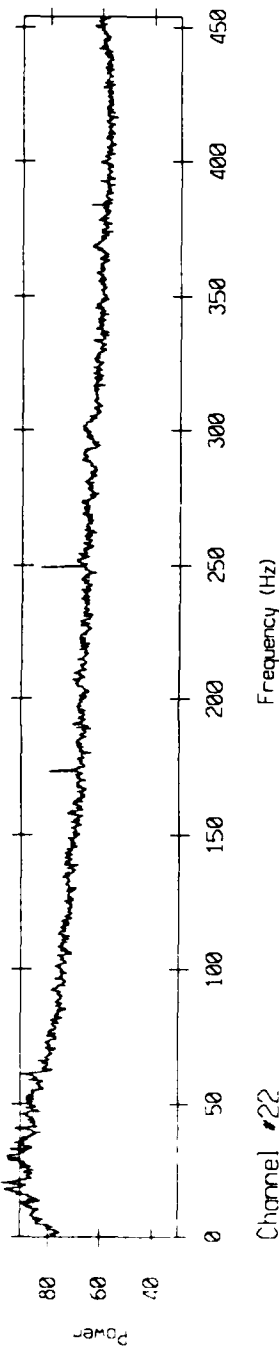


Channel #20

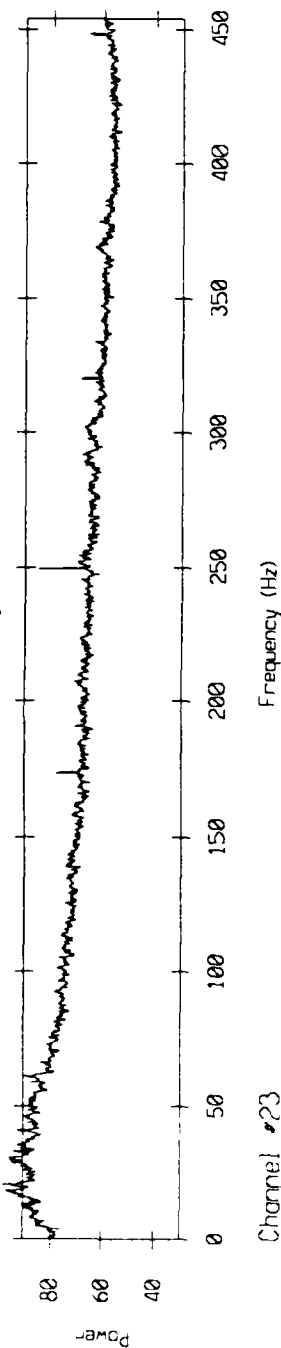


Power Spectrum - 85010.1

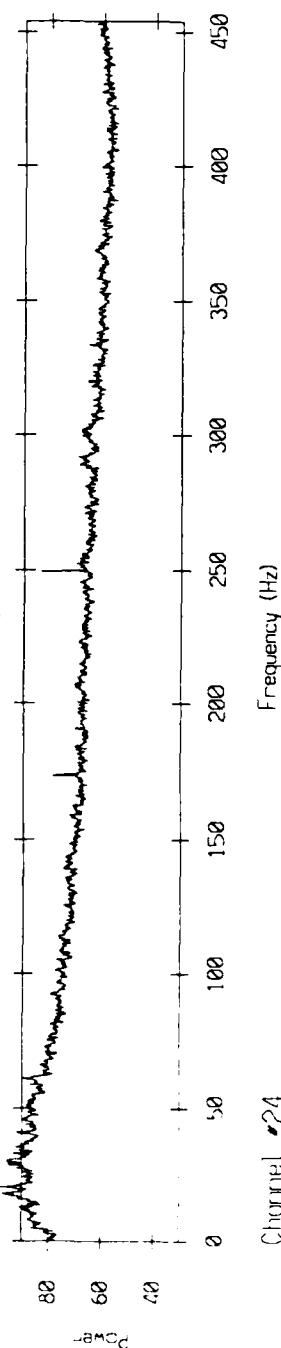
Channel #21



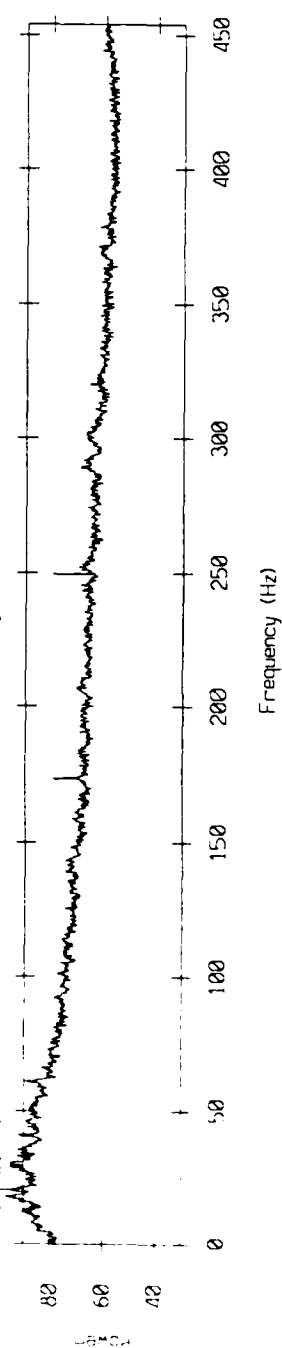
Channel #22



Channel #23

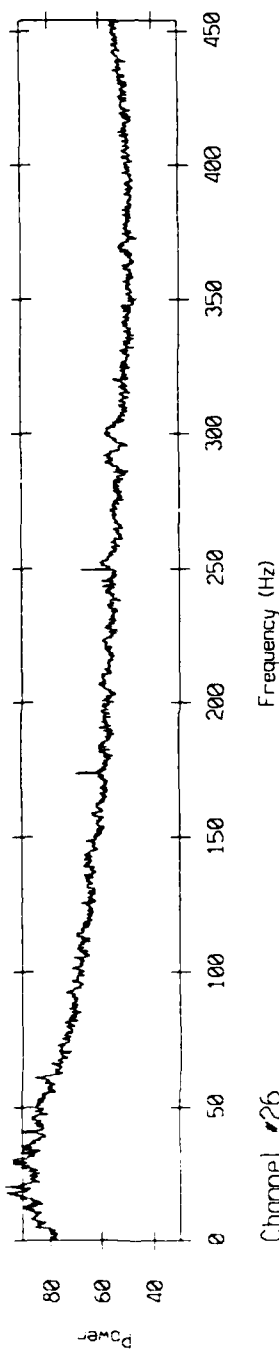


Channel #24

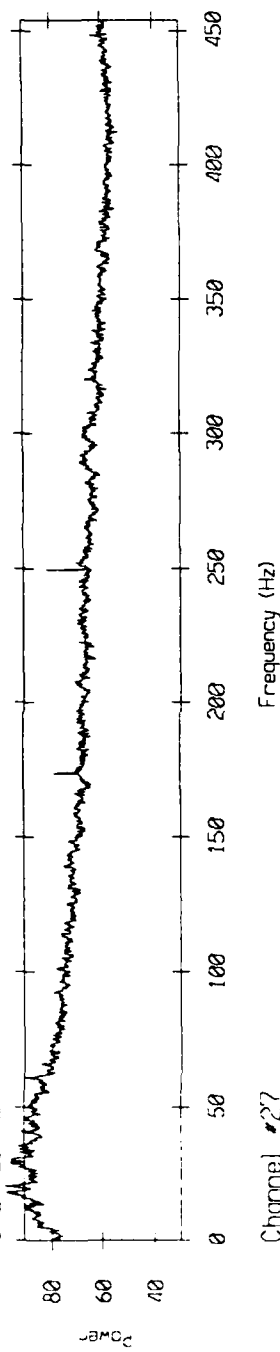


Power Spectrum - 85010.1

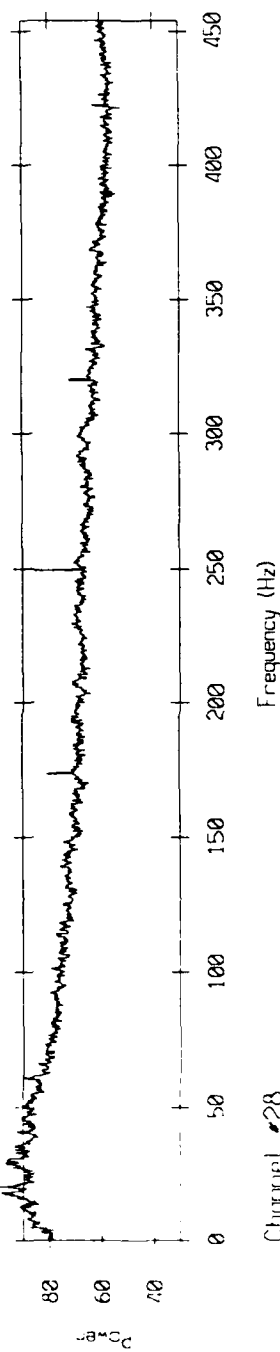
Channel #25



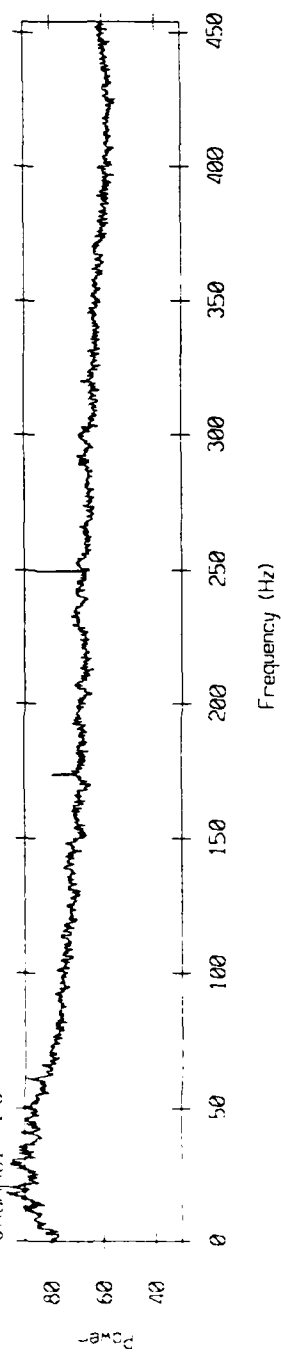
Channel #26



Channel #27

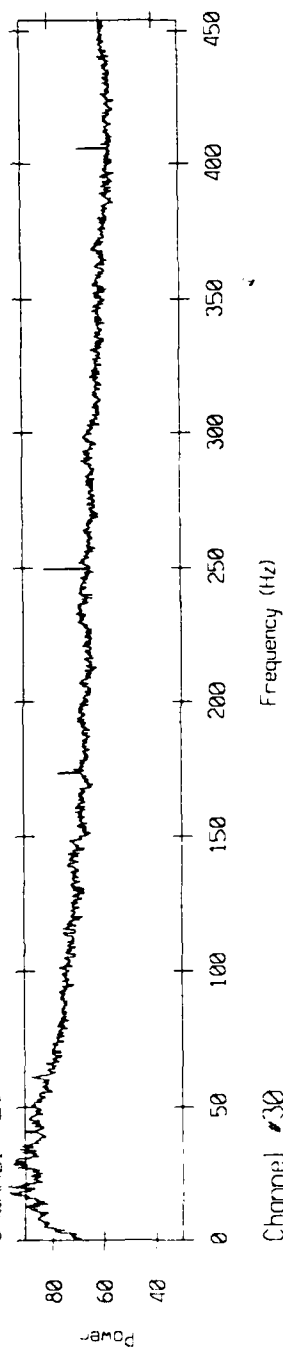


Channel #28

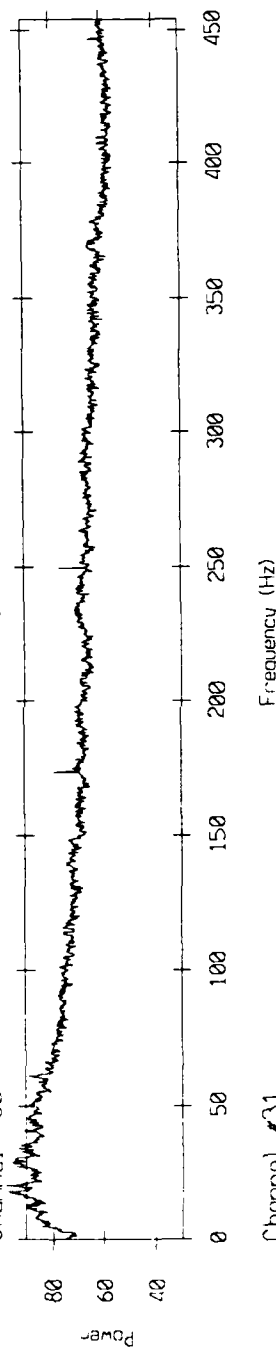


Power Spectrum - 85010.1

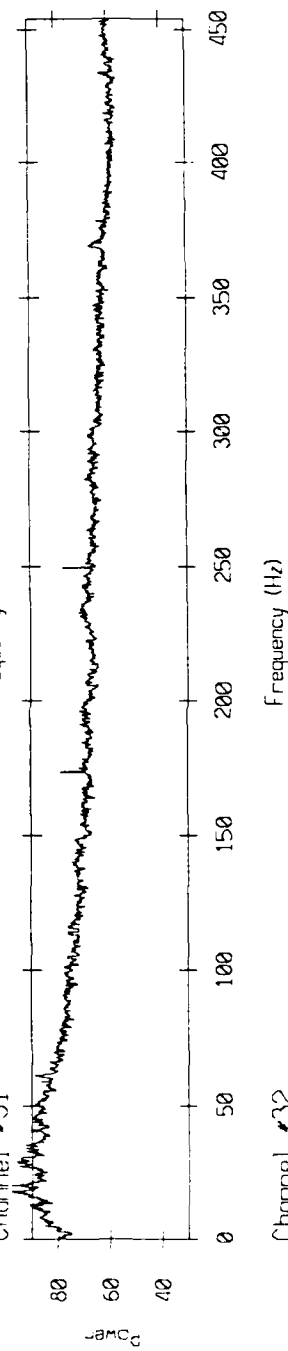
Channel #29



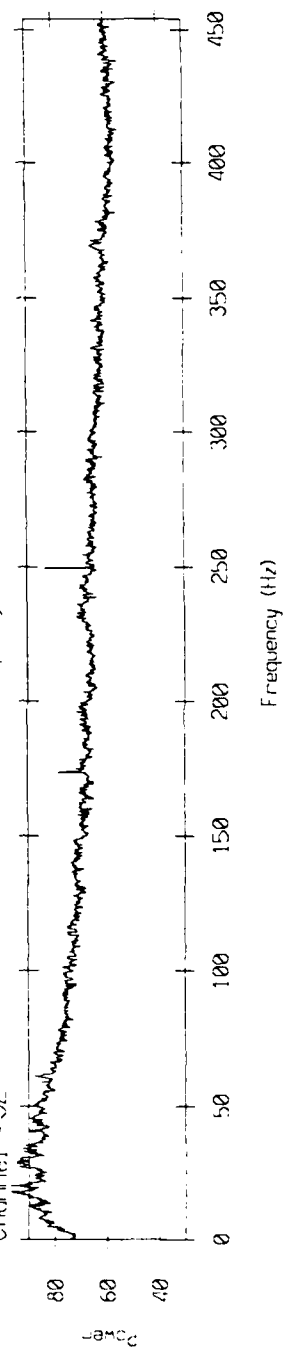
Channel #30



Channel #31

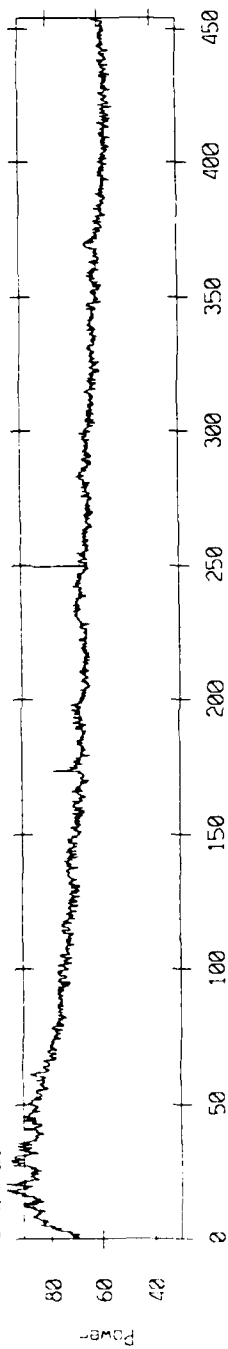


Channel #32

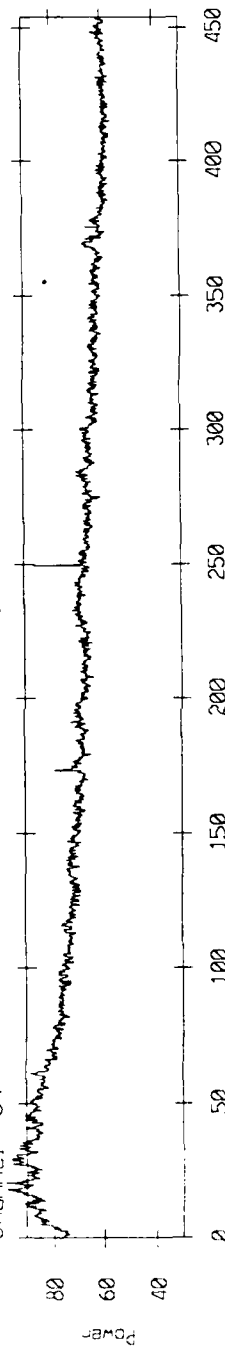


Power Spectrum - 85010.1

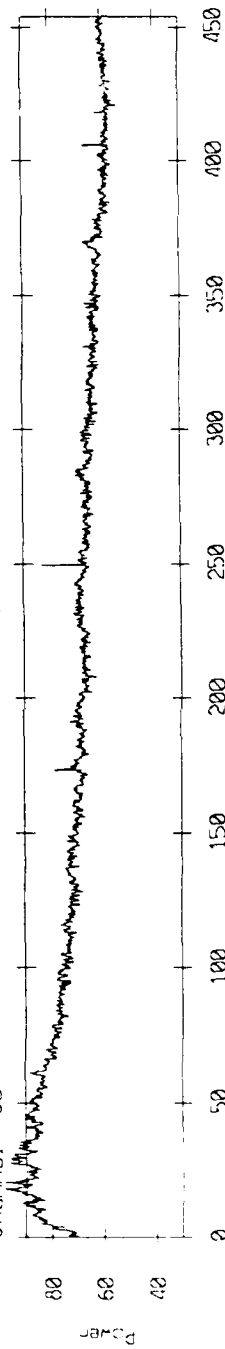
Channel #33



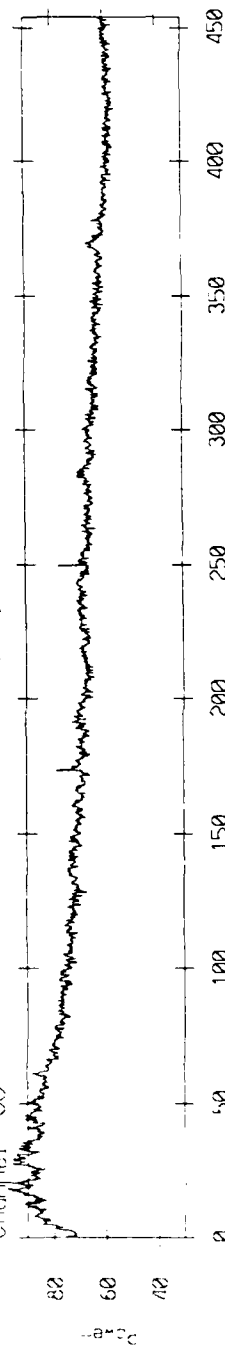
Channel #34



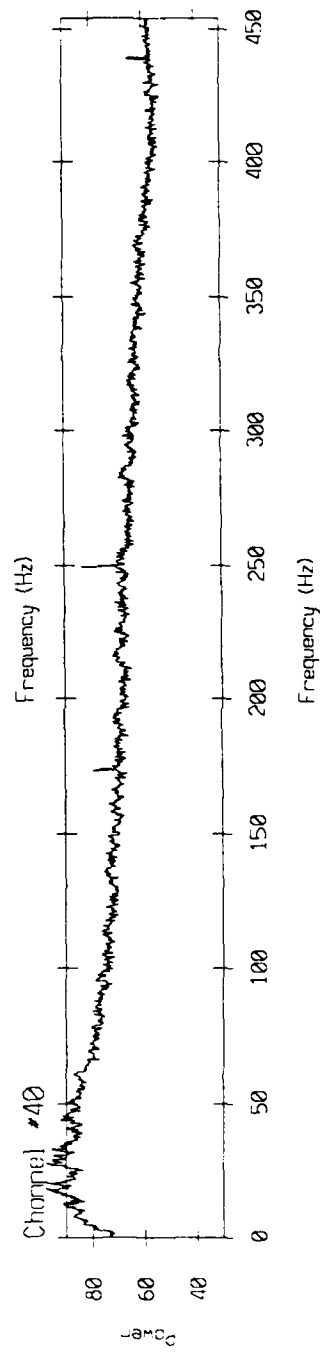
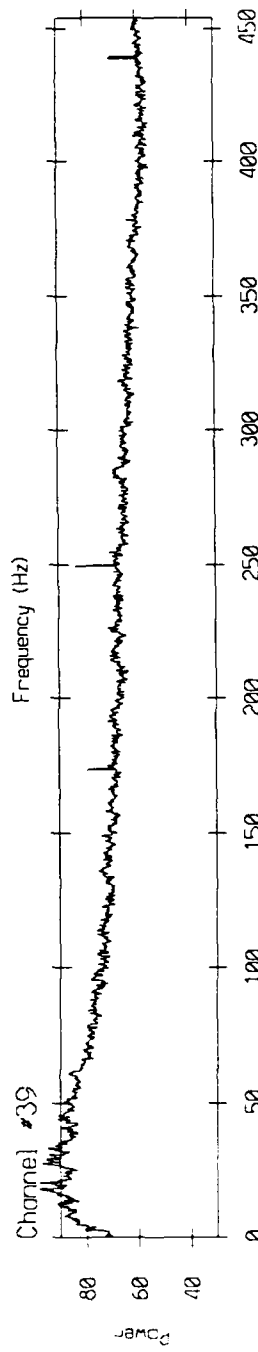
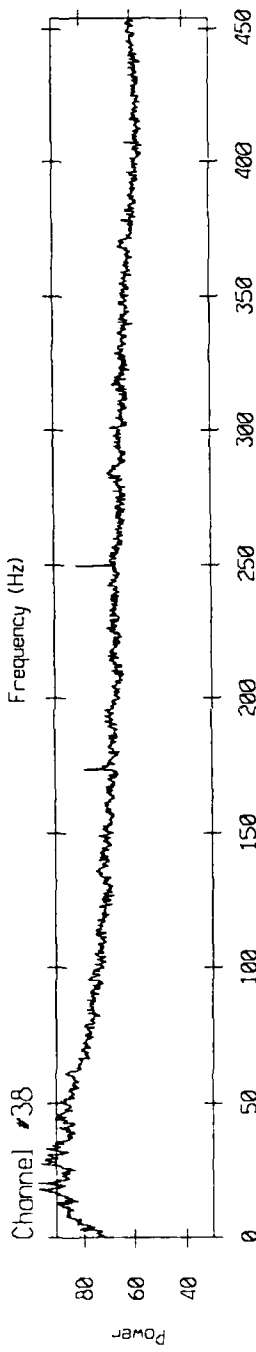
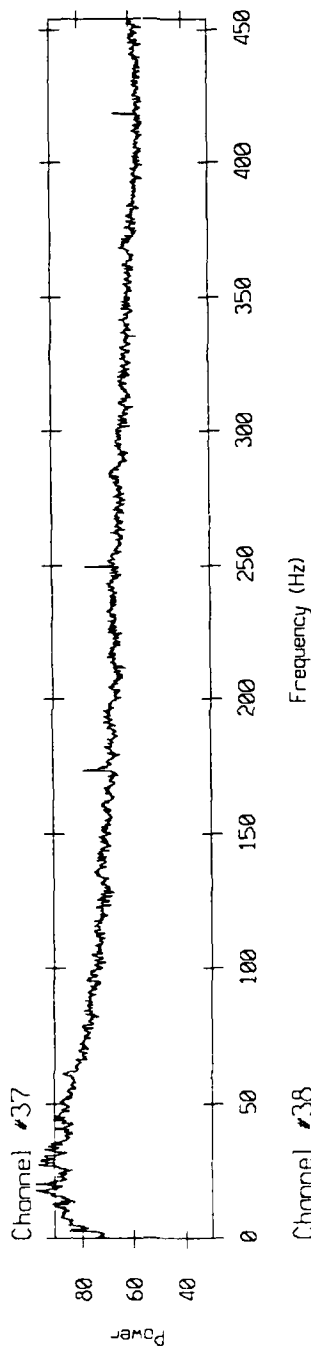
Channel #35



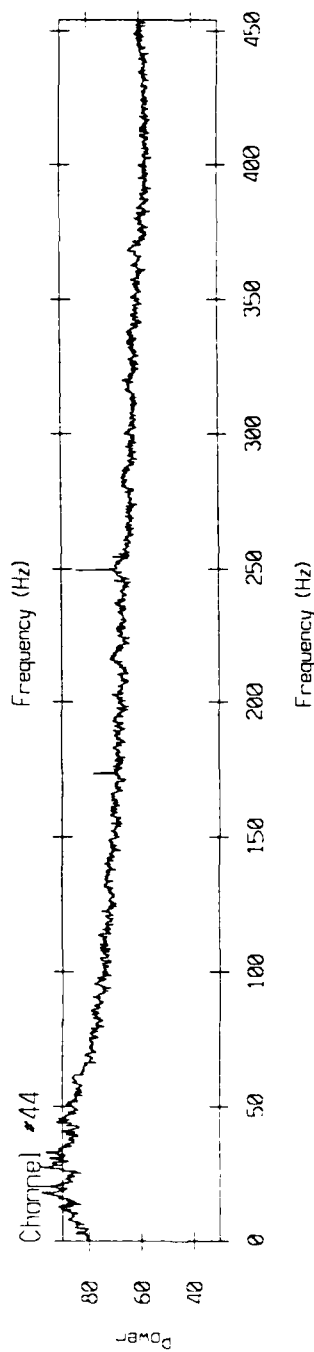
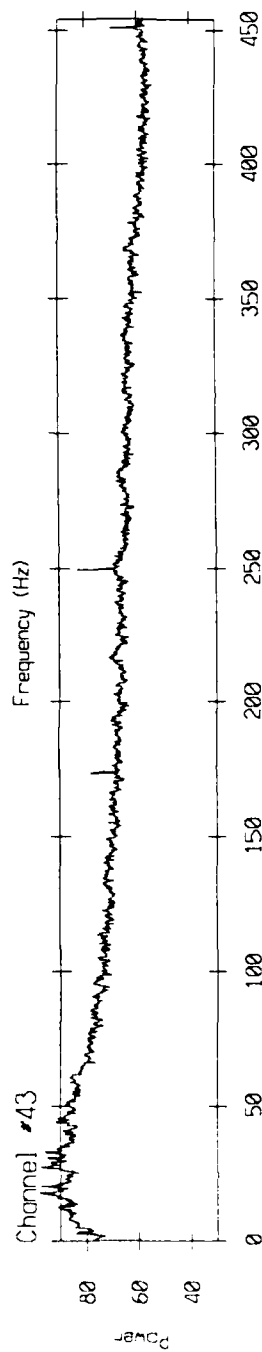
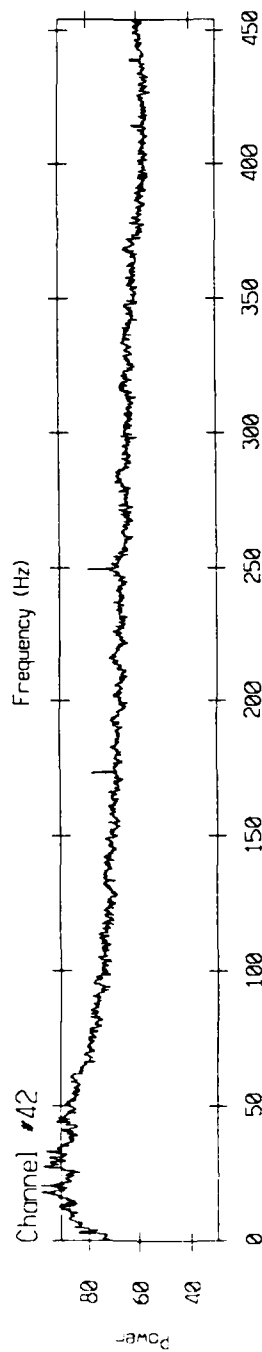
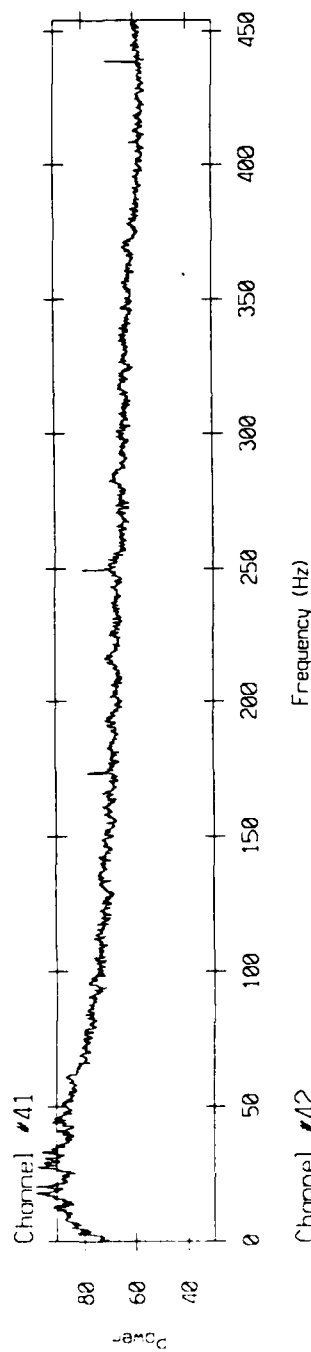
Channel #36



Power Spectrum - 85010.1

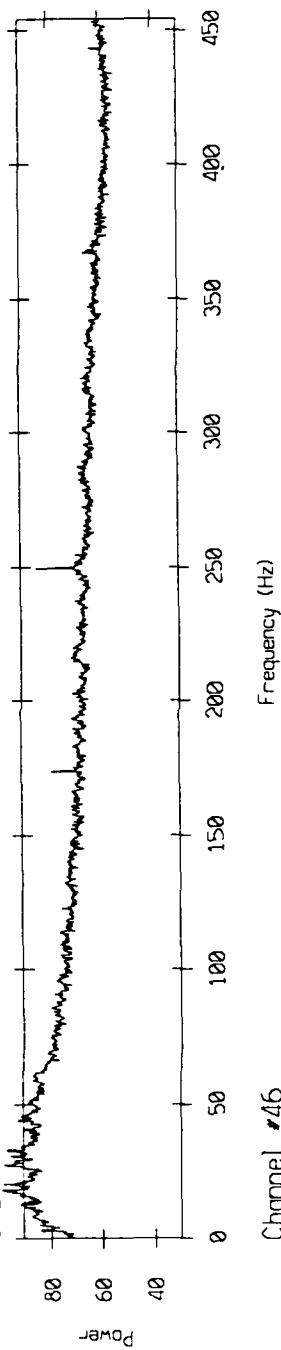


Power Spectrum - 85010.1

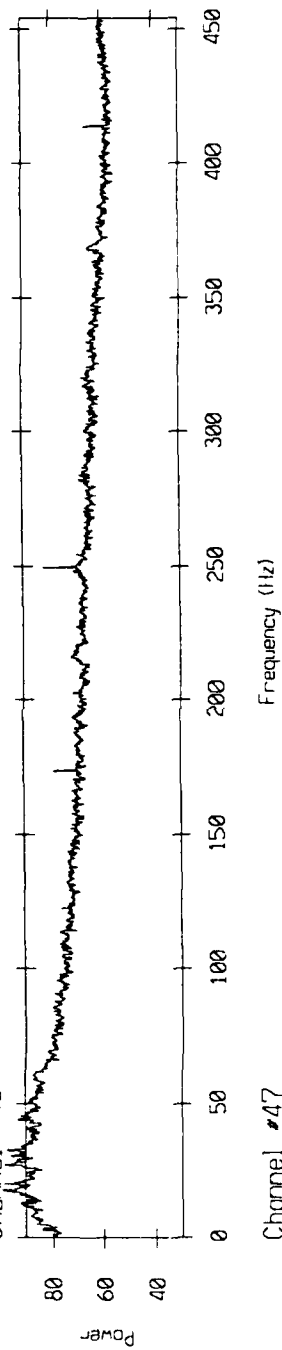


Power Spectrum - 85010.1

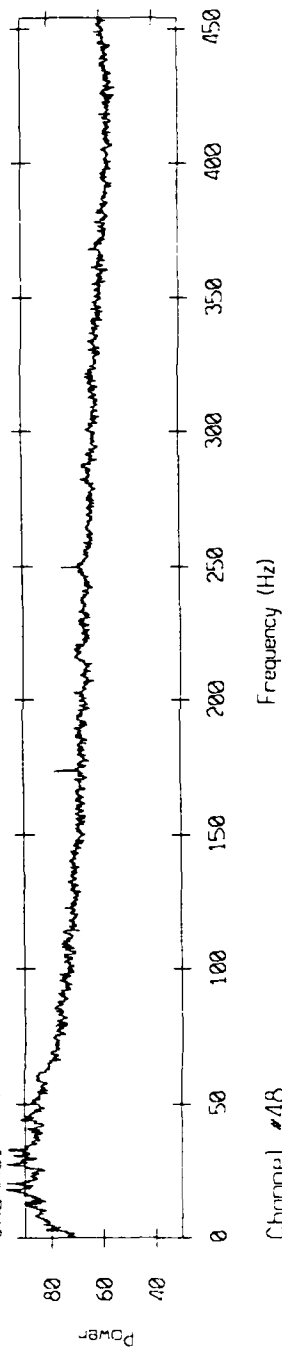
Channel #45



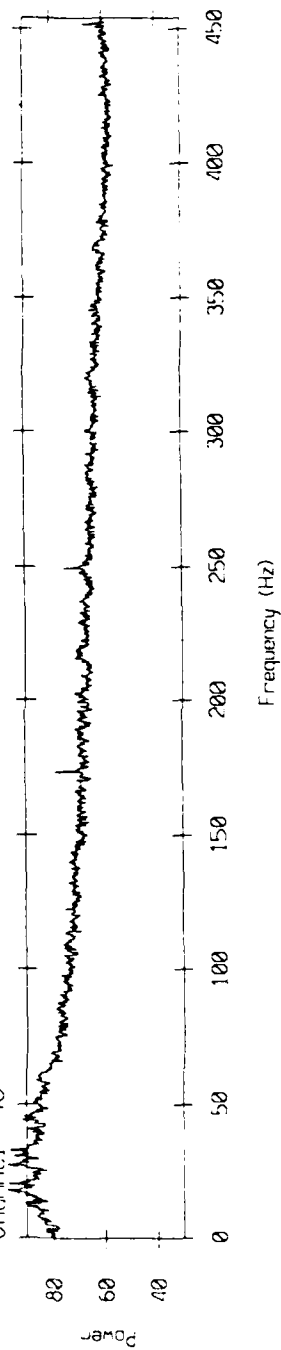
Channel #46



Channel #47

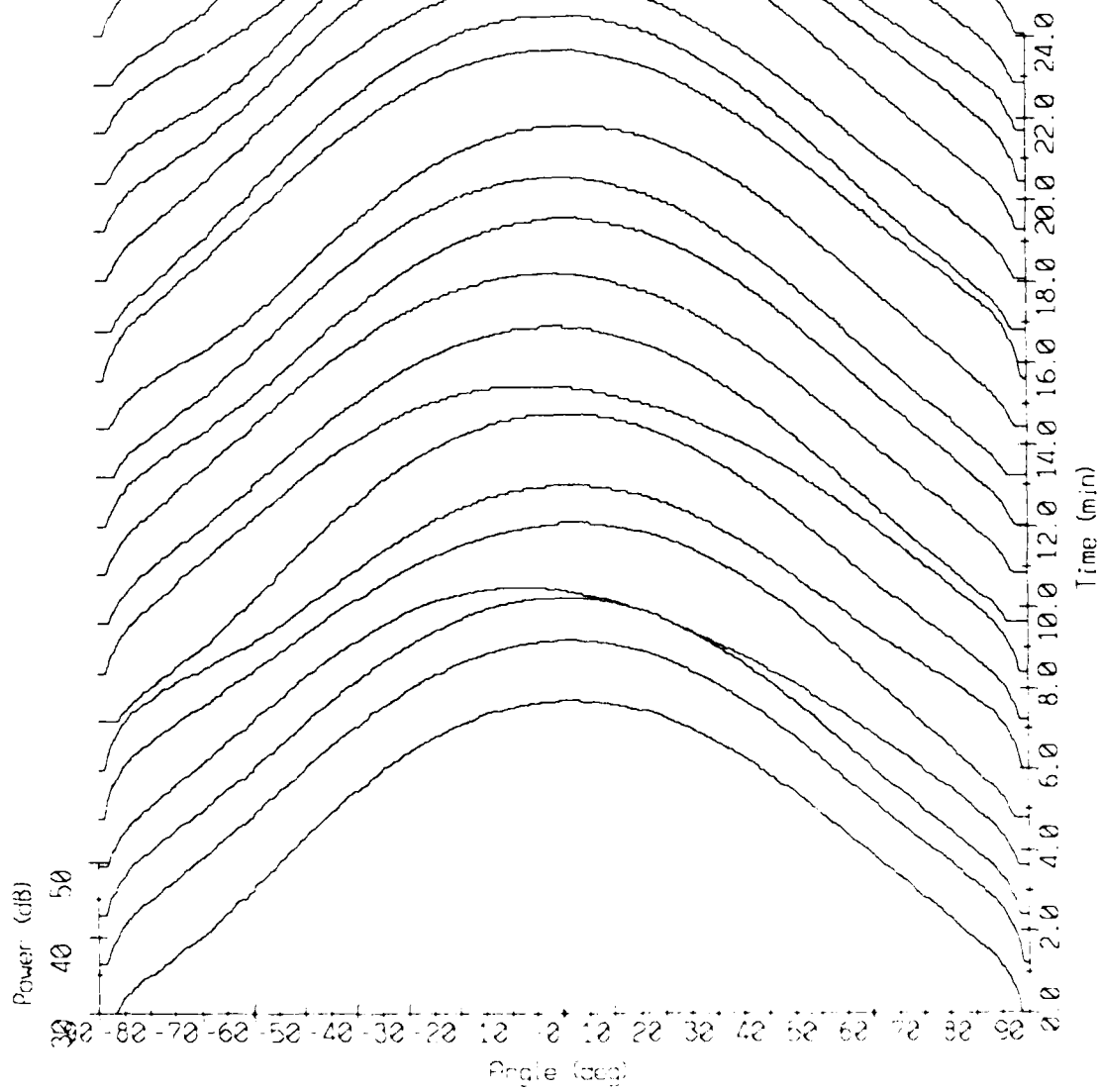


Channel #48

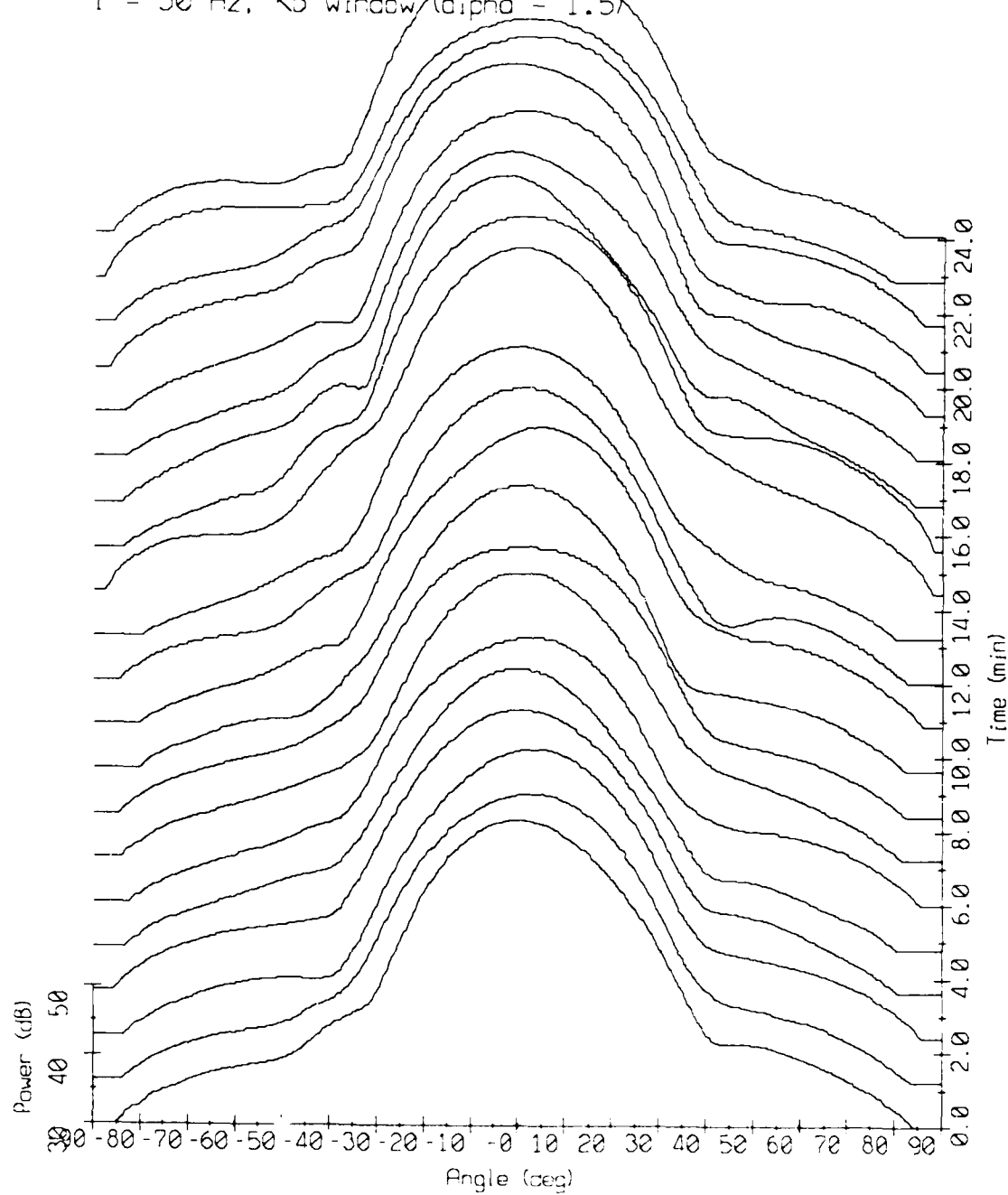


IV. Array Response: Waterfall, KB Window.

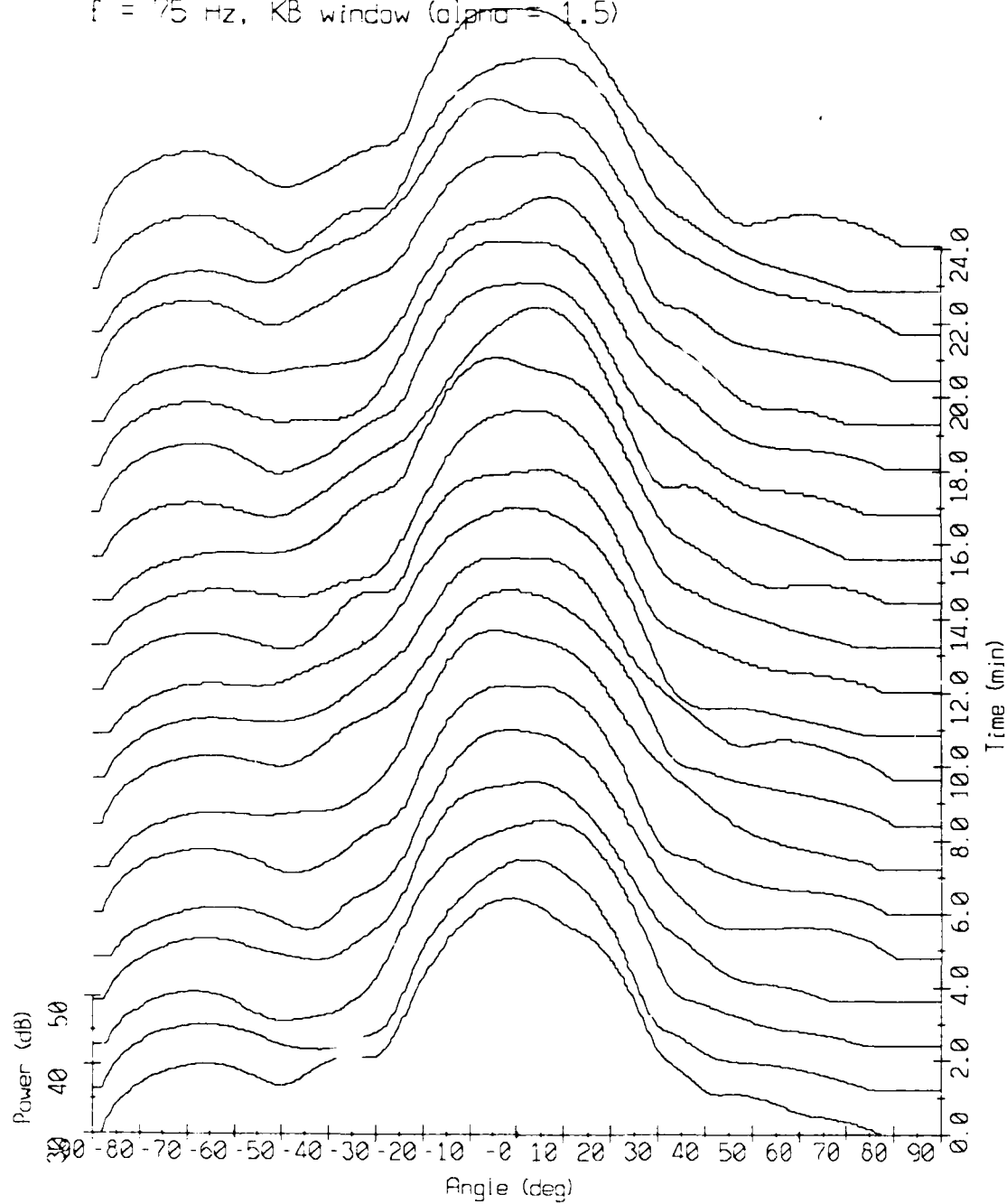
Array Response - 85010 Bin #4323
 $f = 25$ Hz, KB window (c.p.no = 1.5)



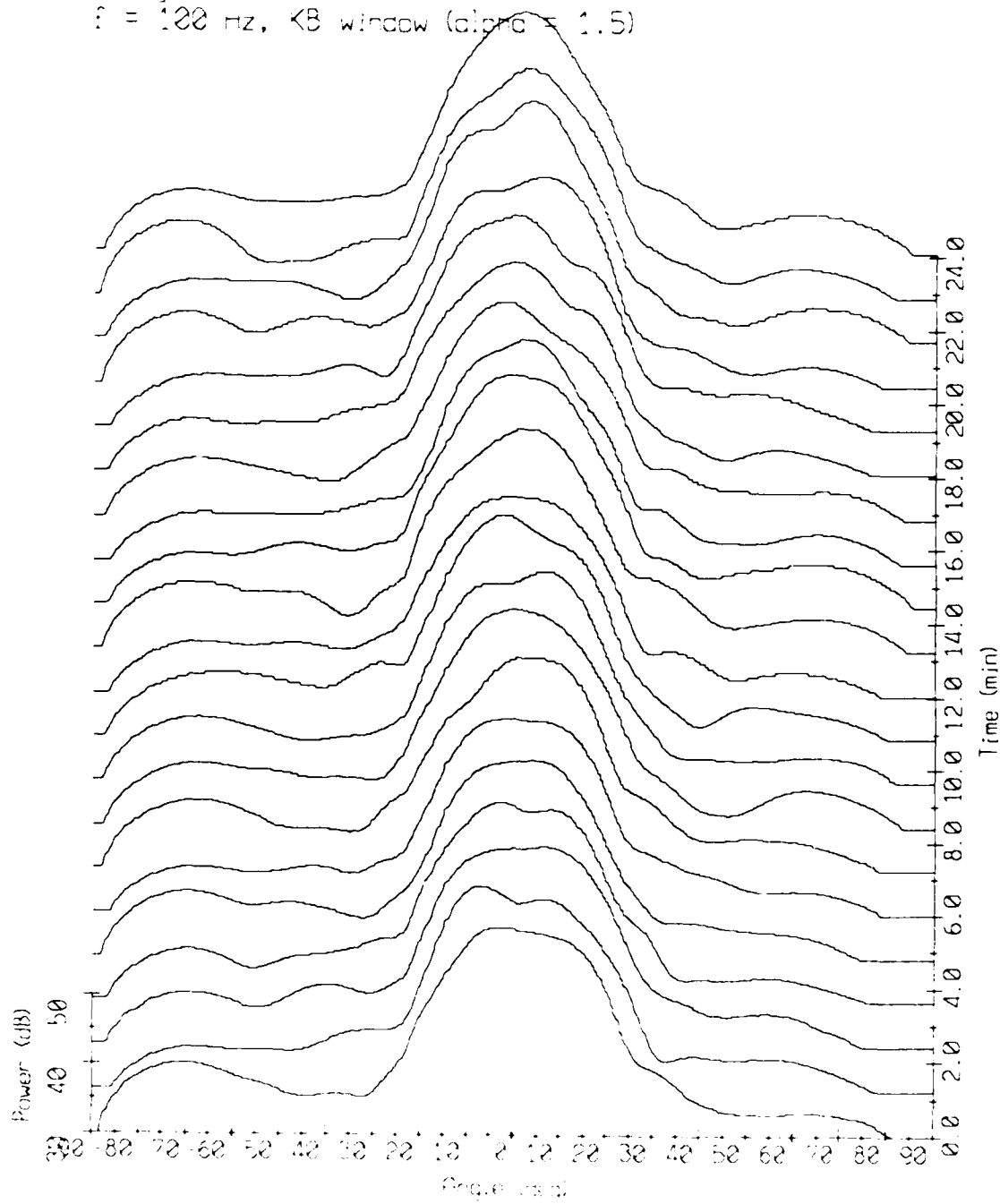
Array Response - 85010.8m *4548
f = 50 Hz, <3 window (alpha = 1.5)



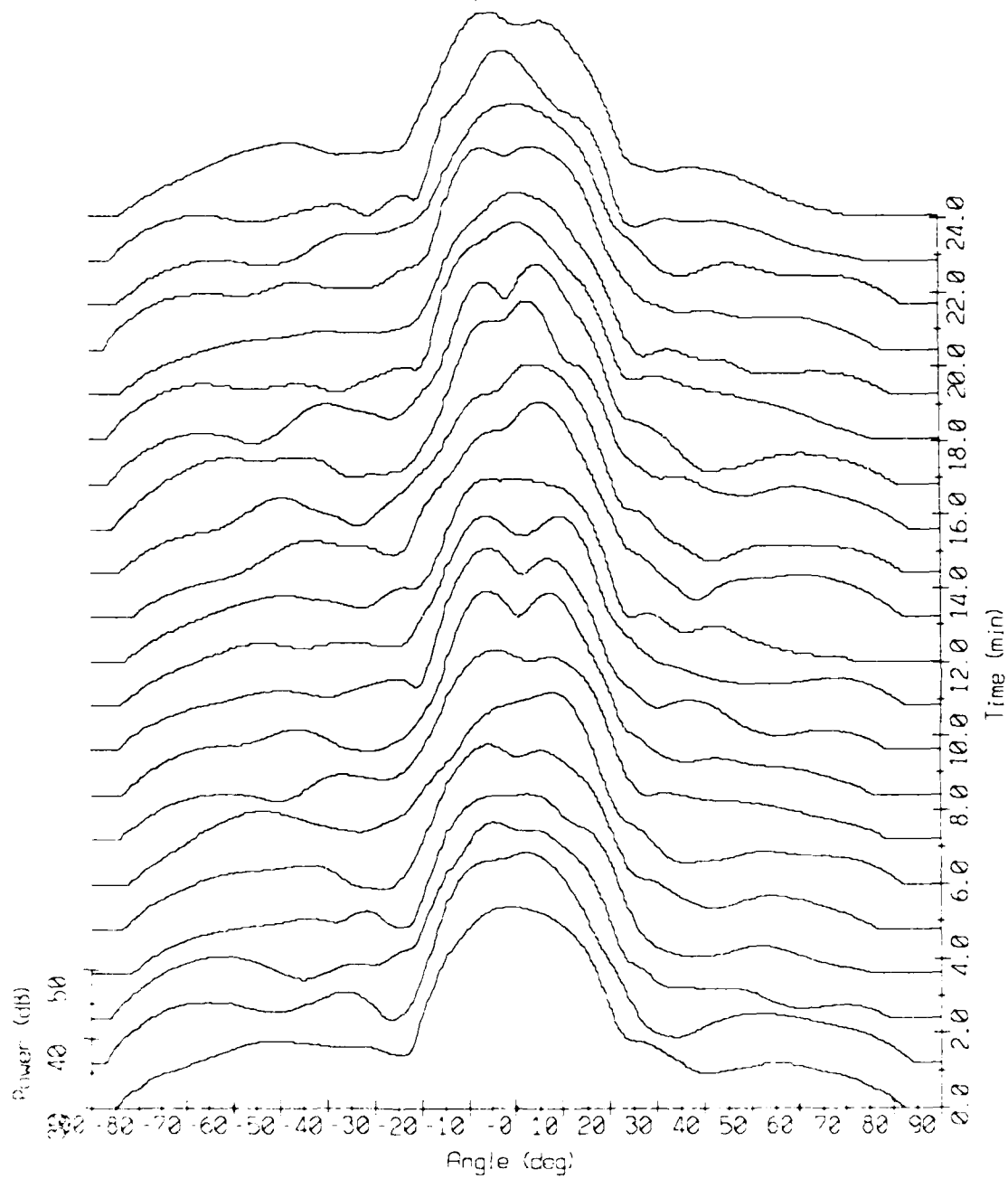
Array Response - 85010 Bin #4774
 $f = 75$ Hz, KB window ($\alpha_{\text{band}} = 1.5$)



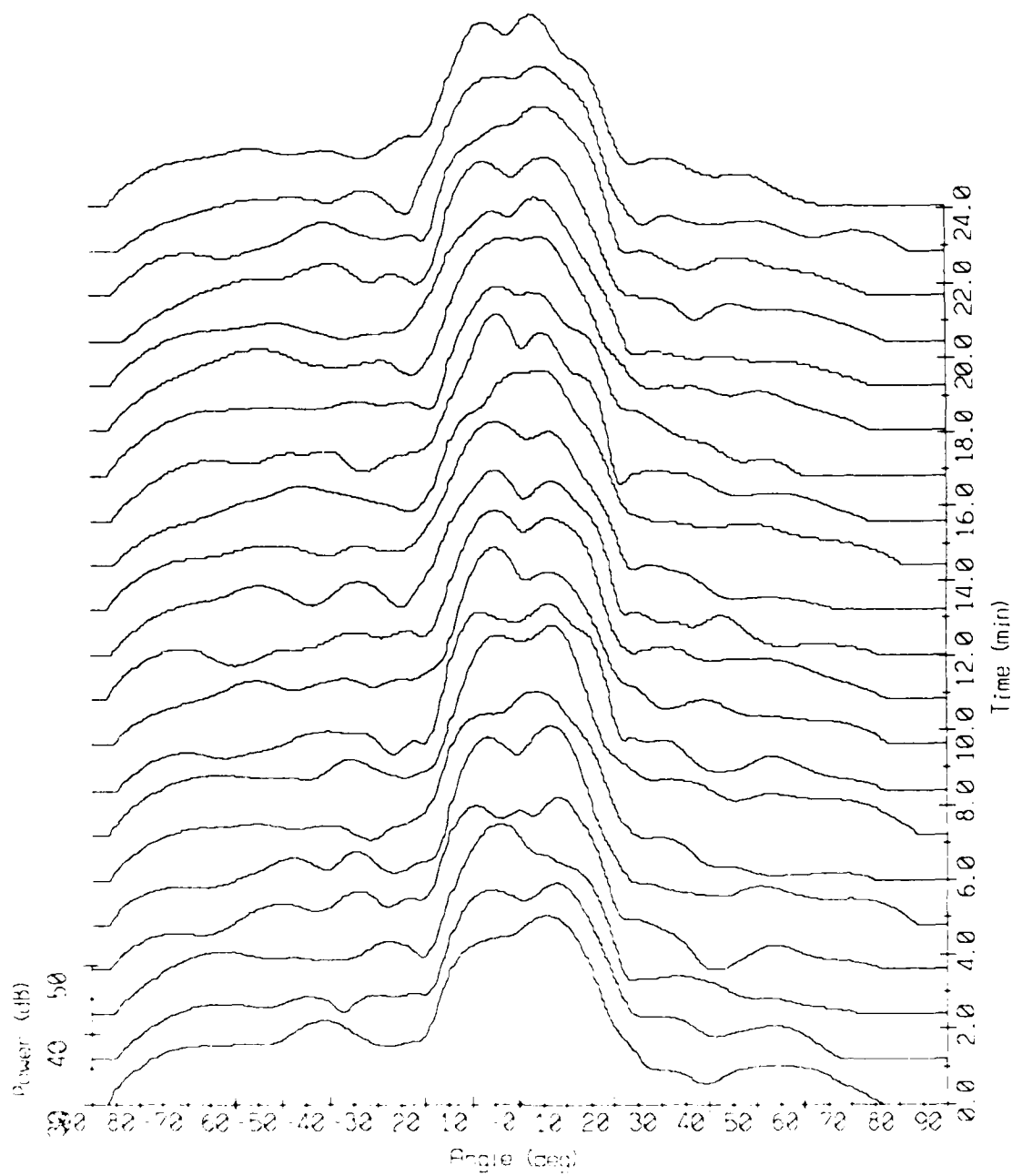
Array Response - 85010 Bin #4999
 $f = 100$ Hz, ΔB window (align = 1.5)



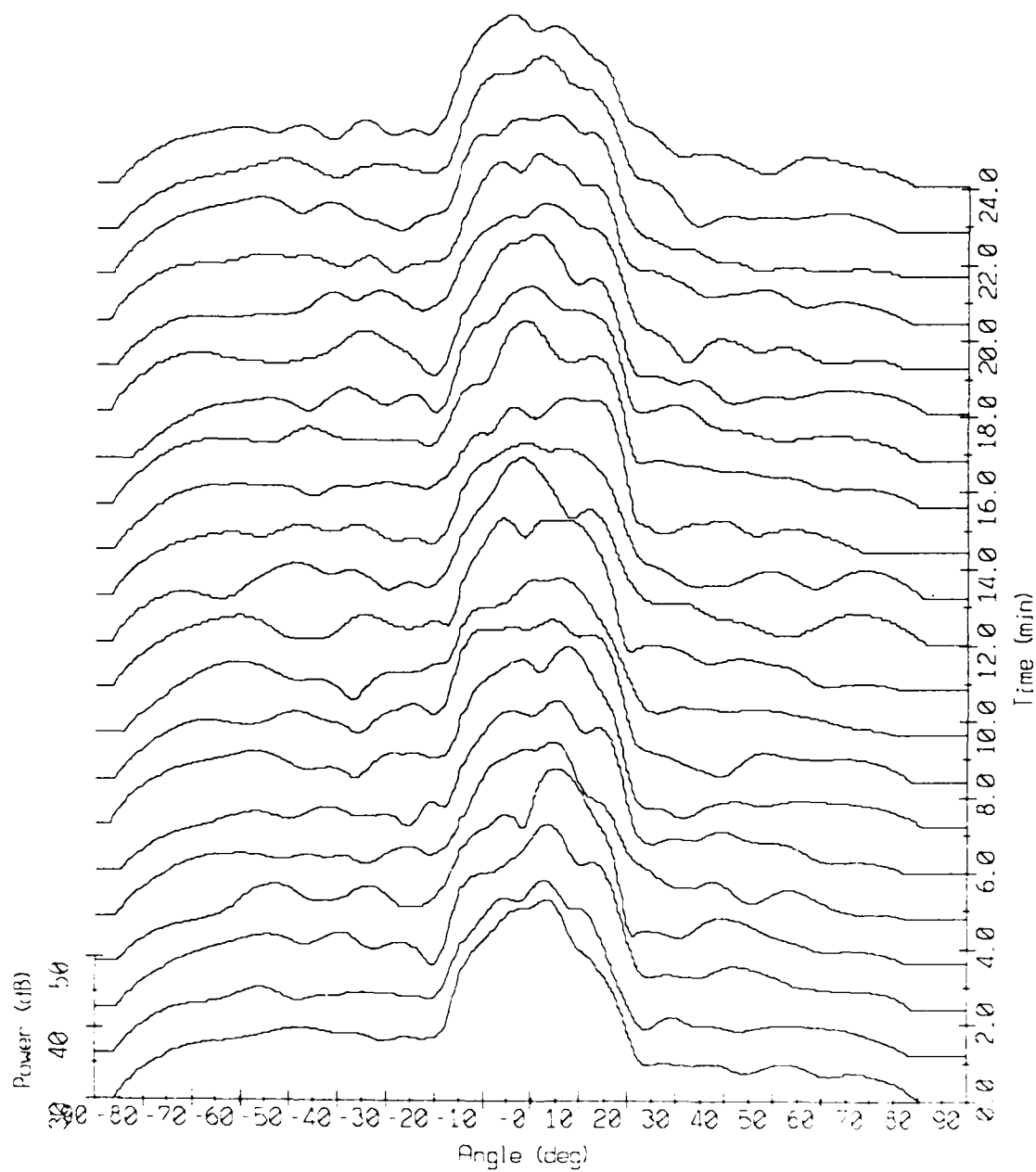
Array Response - 85010 Bin #5225
 $f = 125$ Hz, KB window ($\alpha = 1.5$)



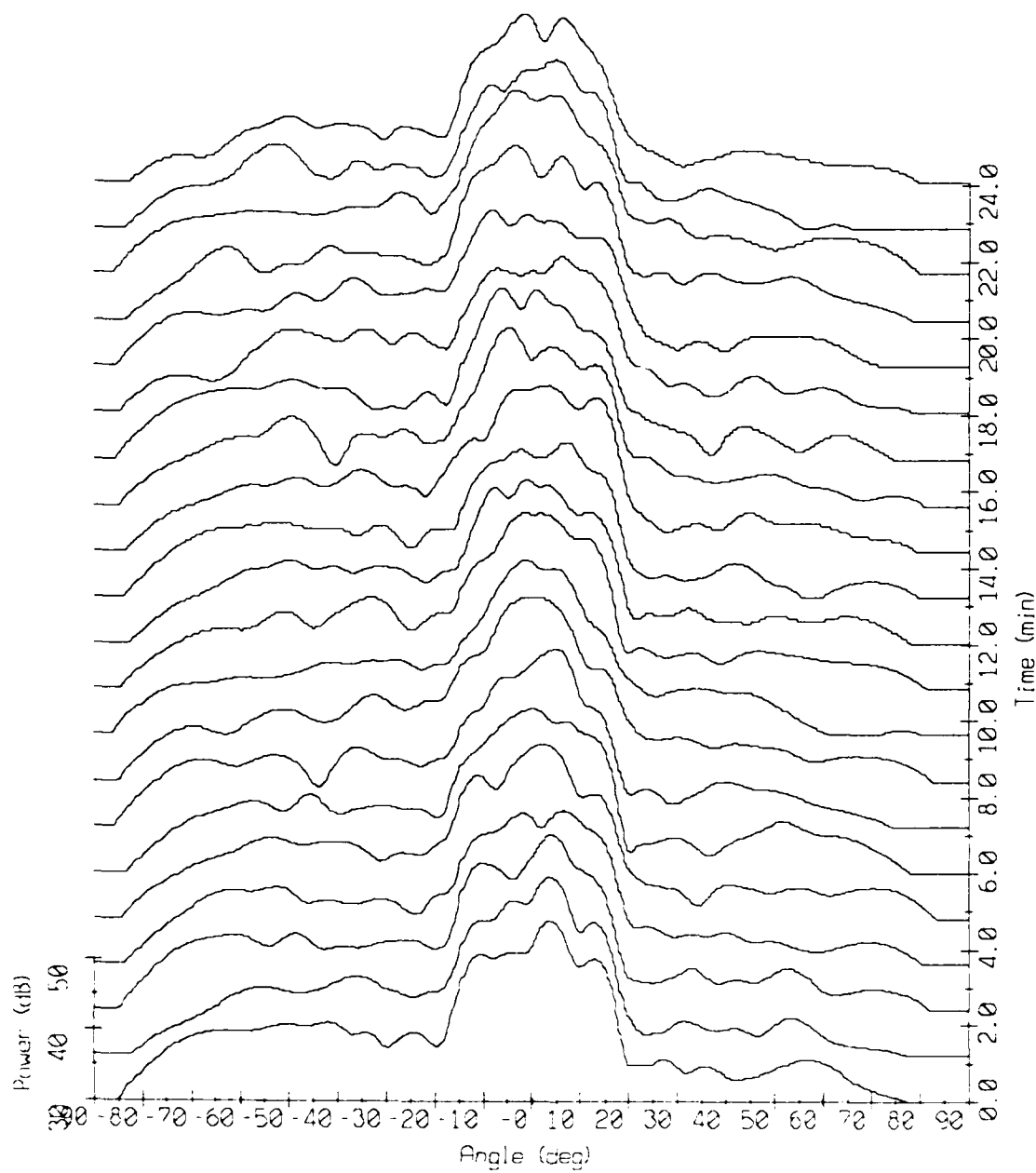
Array Response - 85010 Bin #5451
 $f = 150$ Hz, ΔB window ($\alpha = 1.5$)



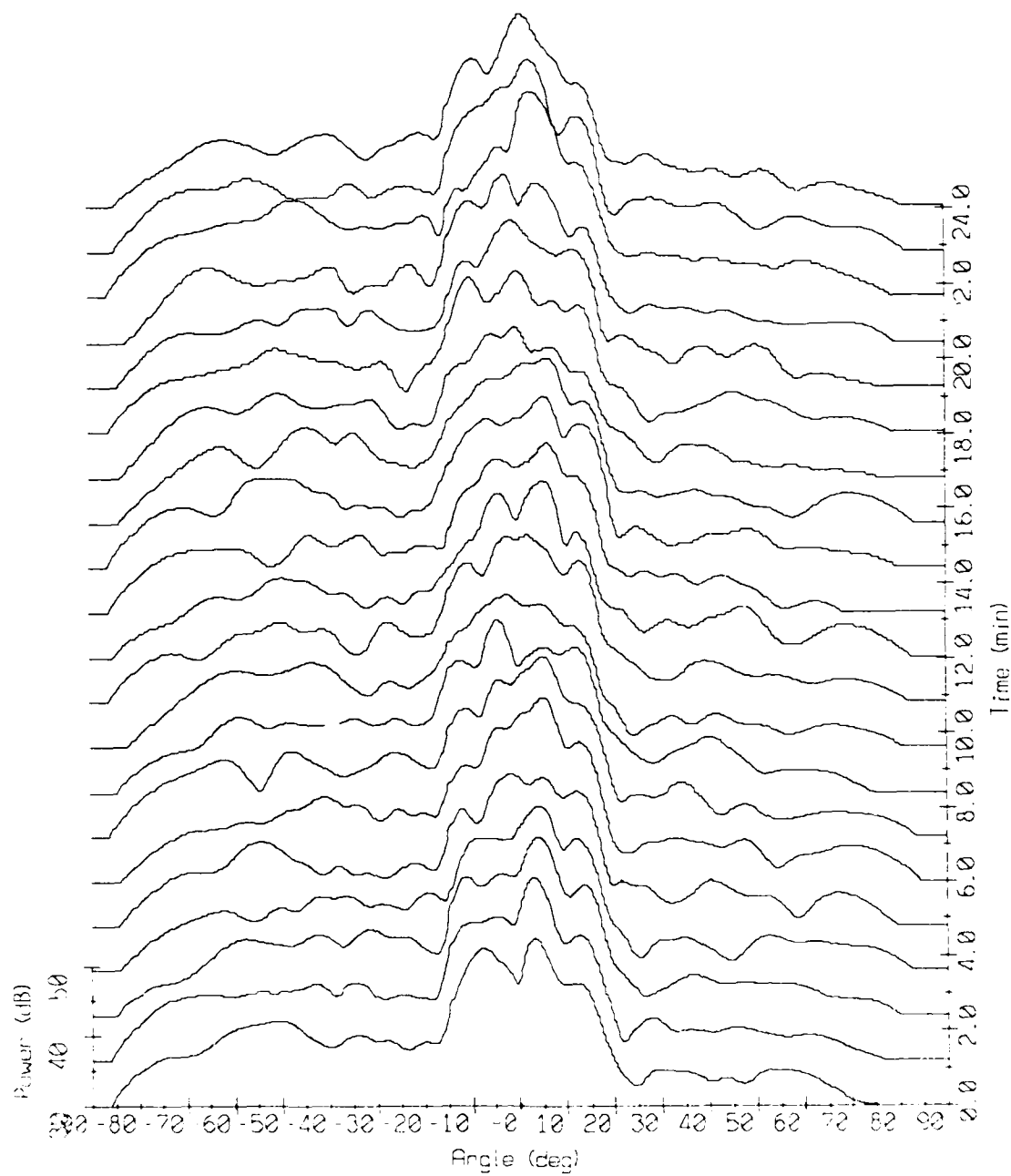
Array Response - 85010 Bin #5676
 $f = 175$ Hz, KB window ($\alpha = 1.5$)



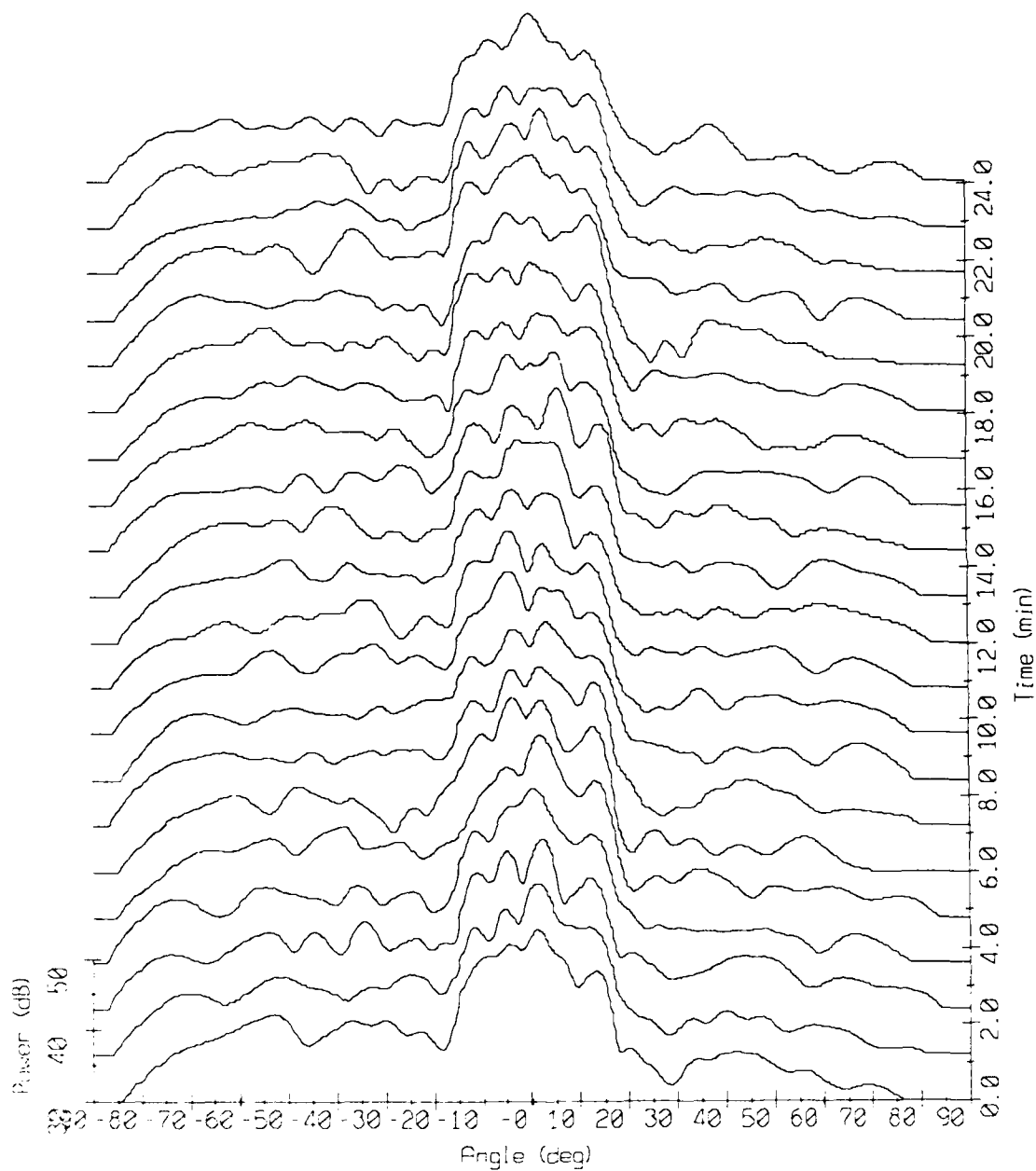
Array Response - 85010 Bin #5902
 $f = 200$ Hz, KB window ($\alpha = 1.5$)



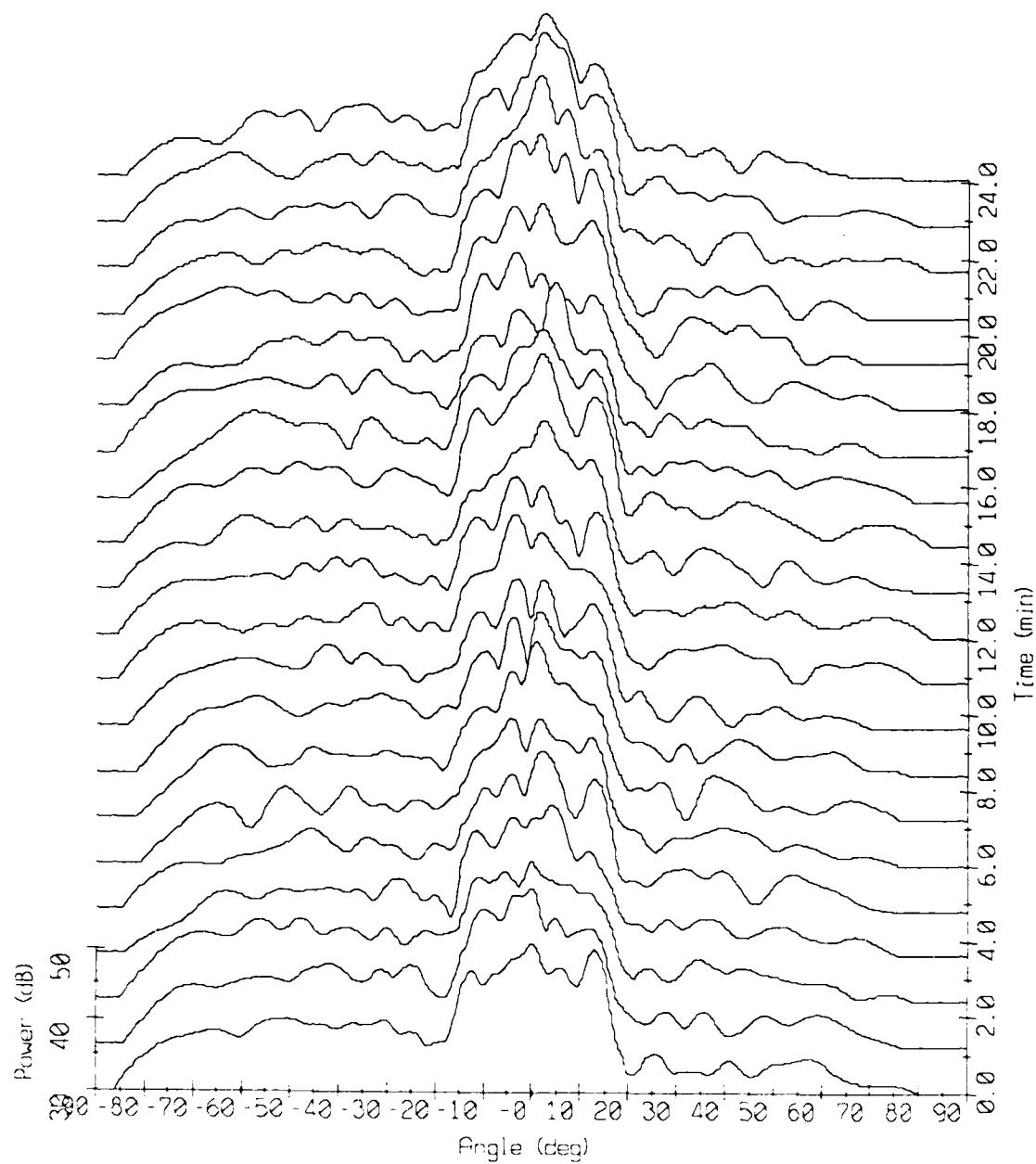
Array Response - 85010 Bin #6127
 $f = 225$ Hz, K3 window ($\alpha = 1.5$)



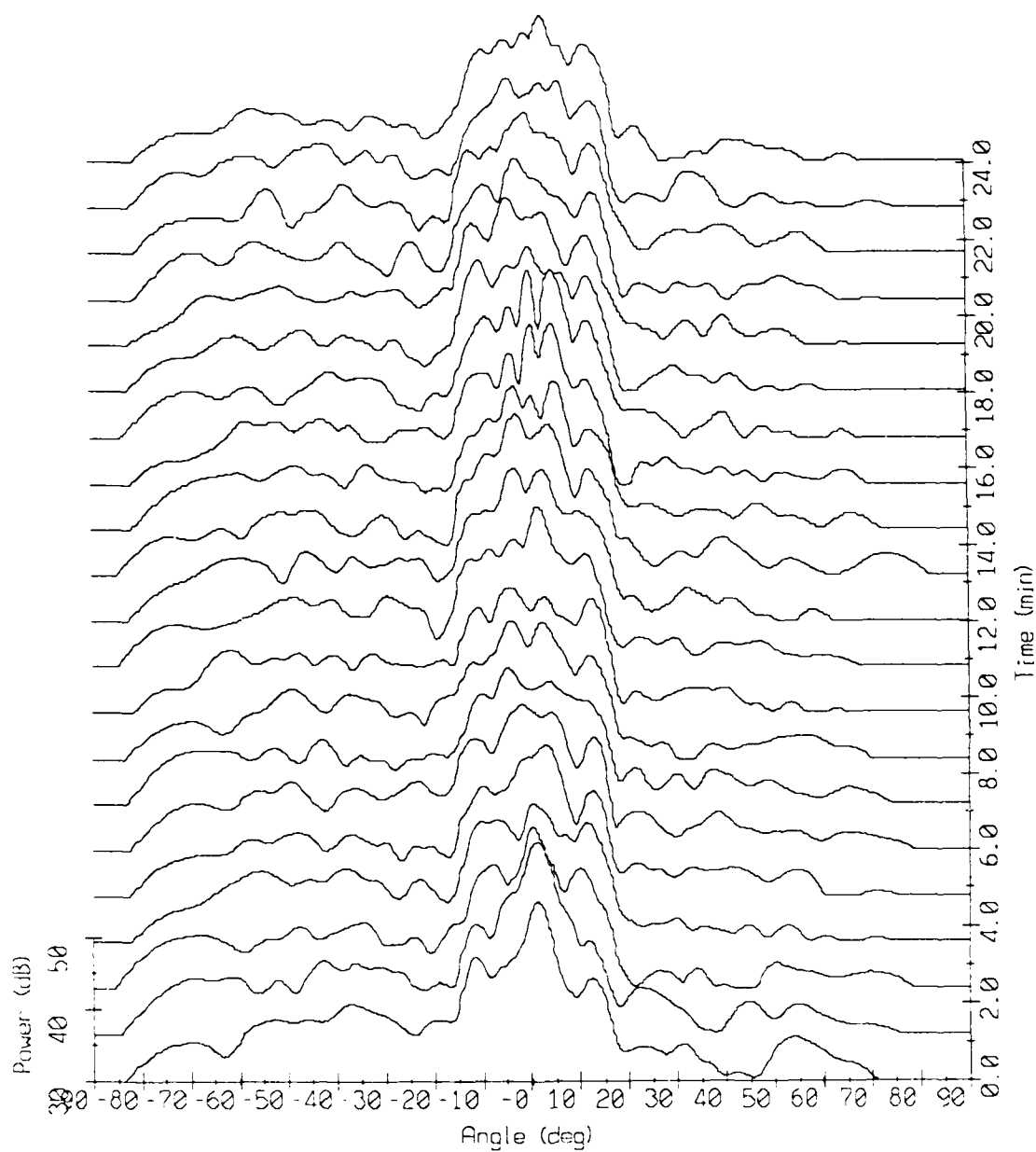
Array Response - 85010 Bin #6354
 $f = 252 \text{ Hz}$, KB window ($\alpha = 1.5$)



Array Response - 85010 Bin #6579
 $f = 275 \text{ Hz}$, KB window ($\alpha = 1.5$)

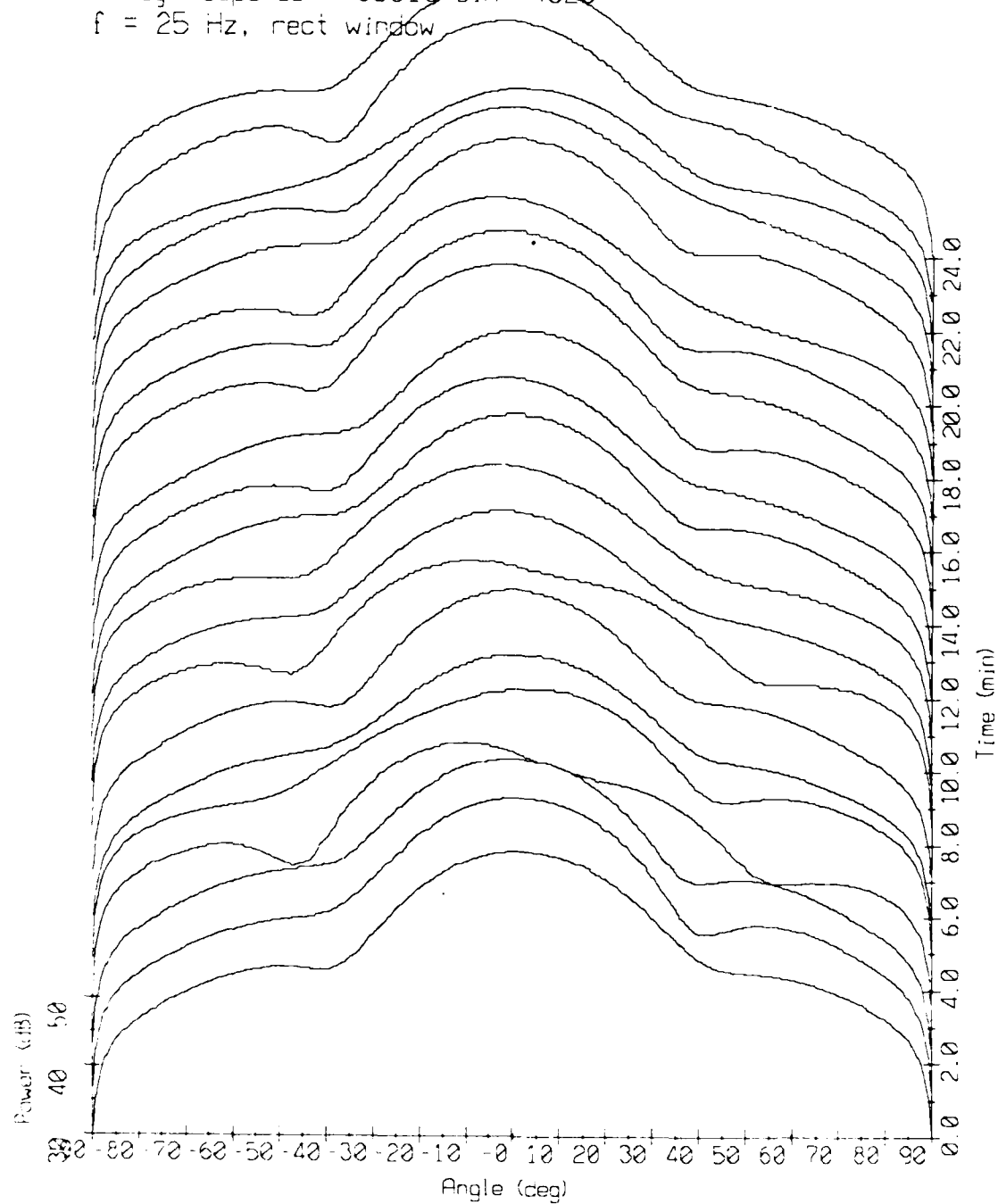


Array Response - 85010 3in #6804
 $f = 300$ Hz, KB window ($\alpha = 1.5$)

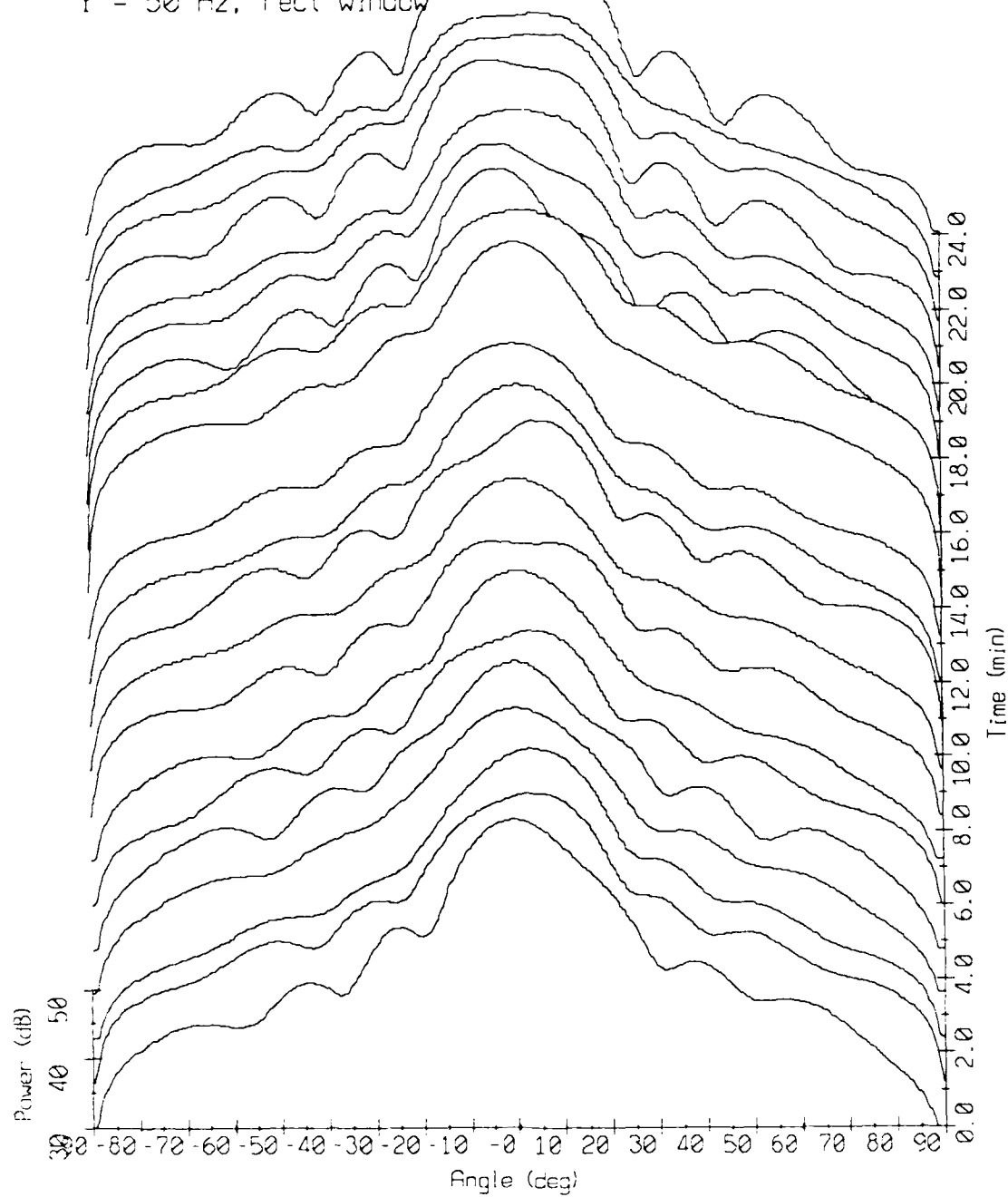


V. Array Response: Waterfall, Rect Window.

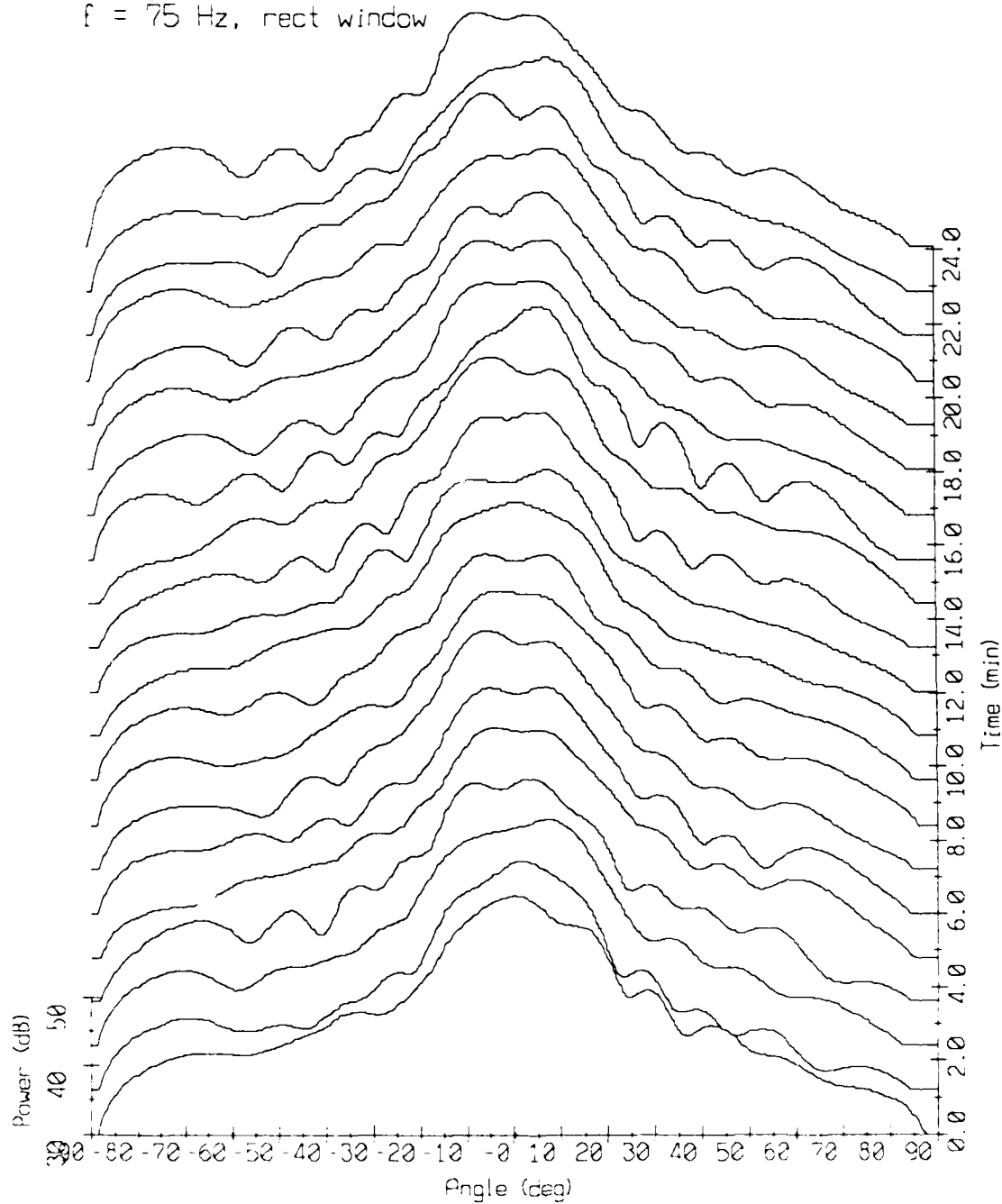
Array Response - 85010 Bin #4323
f = 25 Hz, rect window



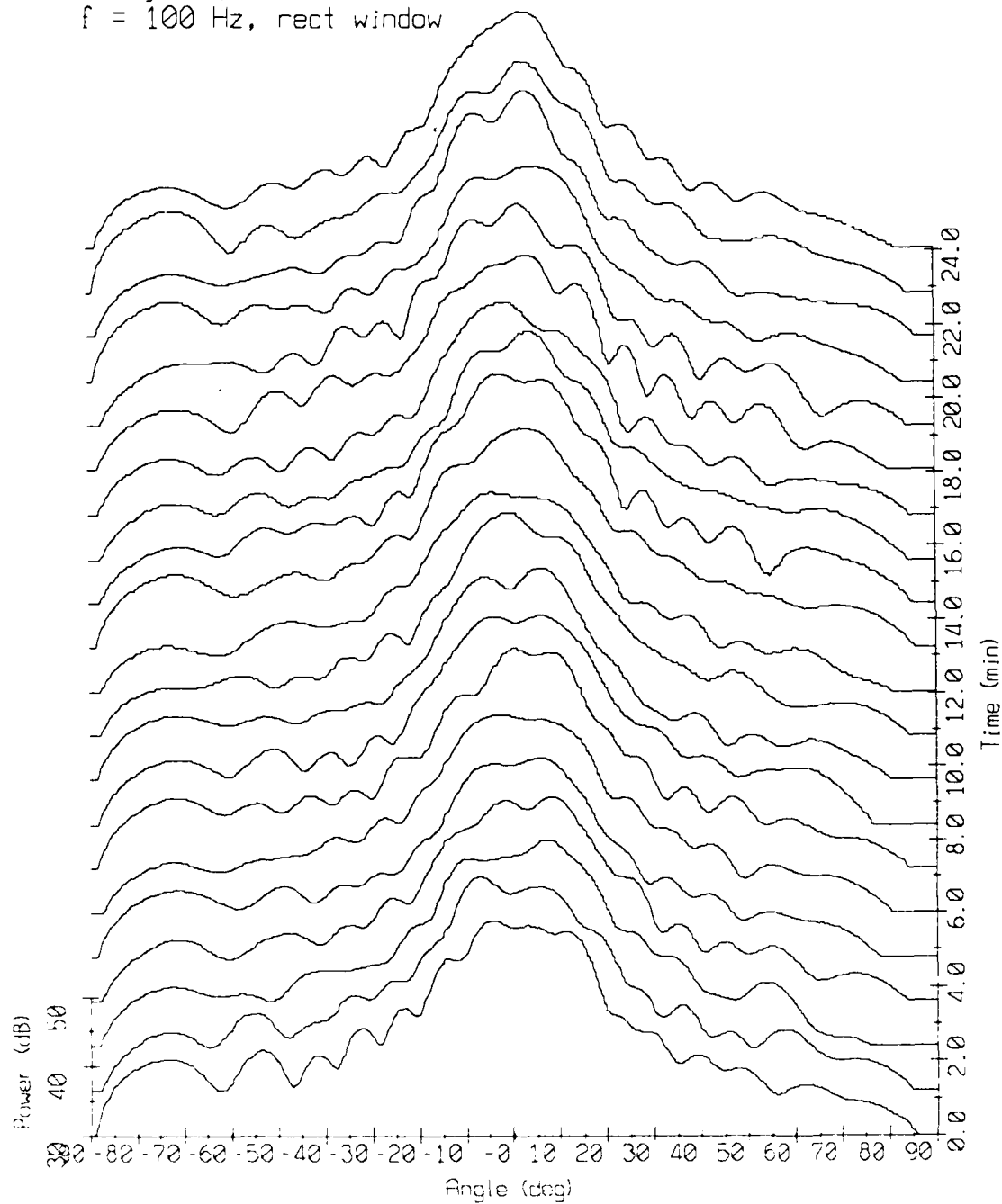
Array Response - 85010 Bin #4548
f = 50 Hz, rect window



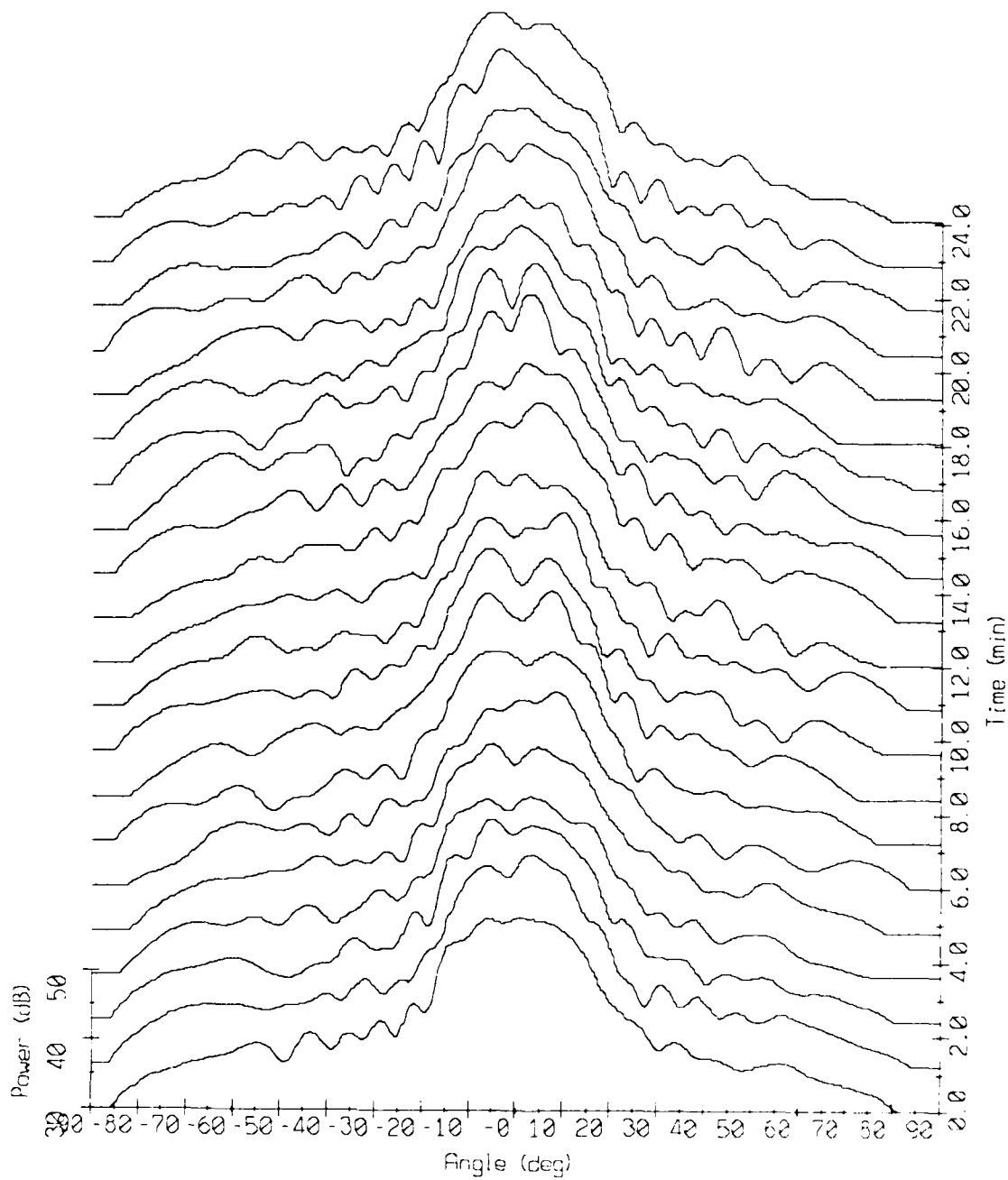
Array Response - 85010 Bin #4774
 $f = 75$ Hz, rect window



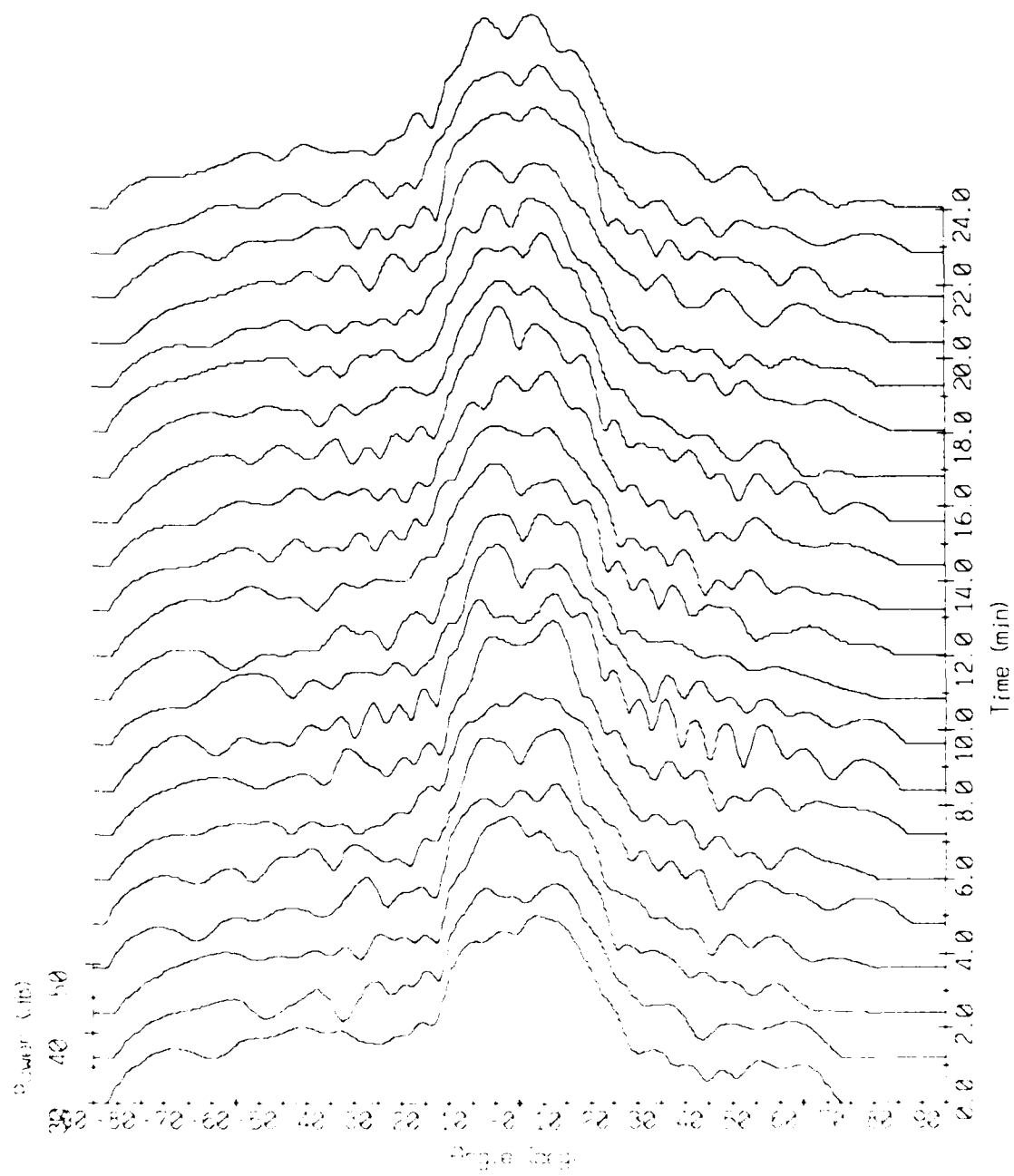
Array Response - 85010 Bin #4999
f = 100 Hz, rect window



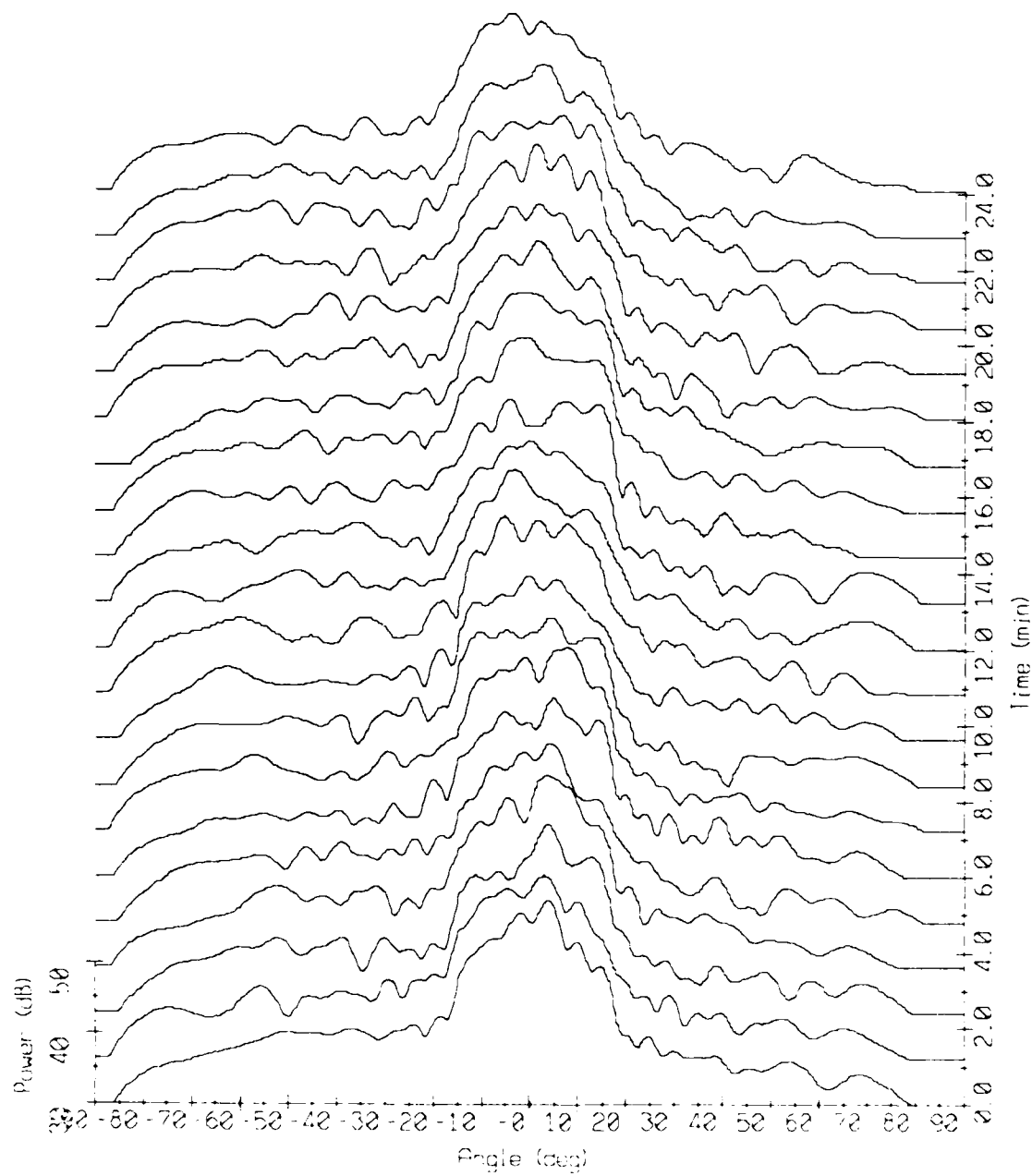
Array Response - 85010 Bin #5225
f = 125 Hz, rect window



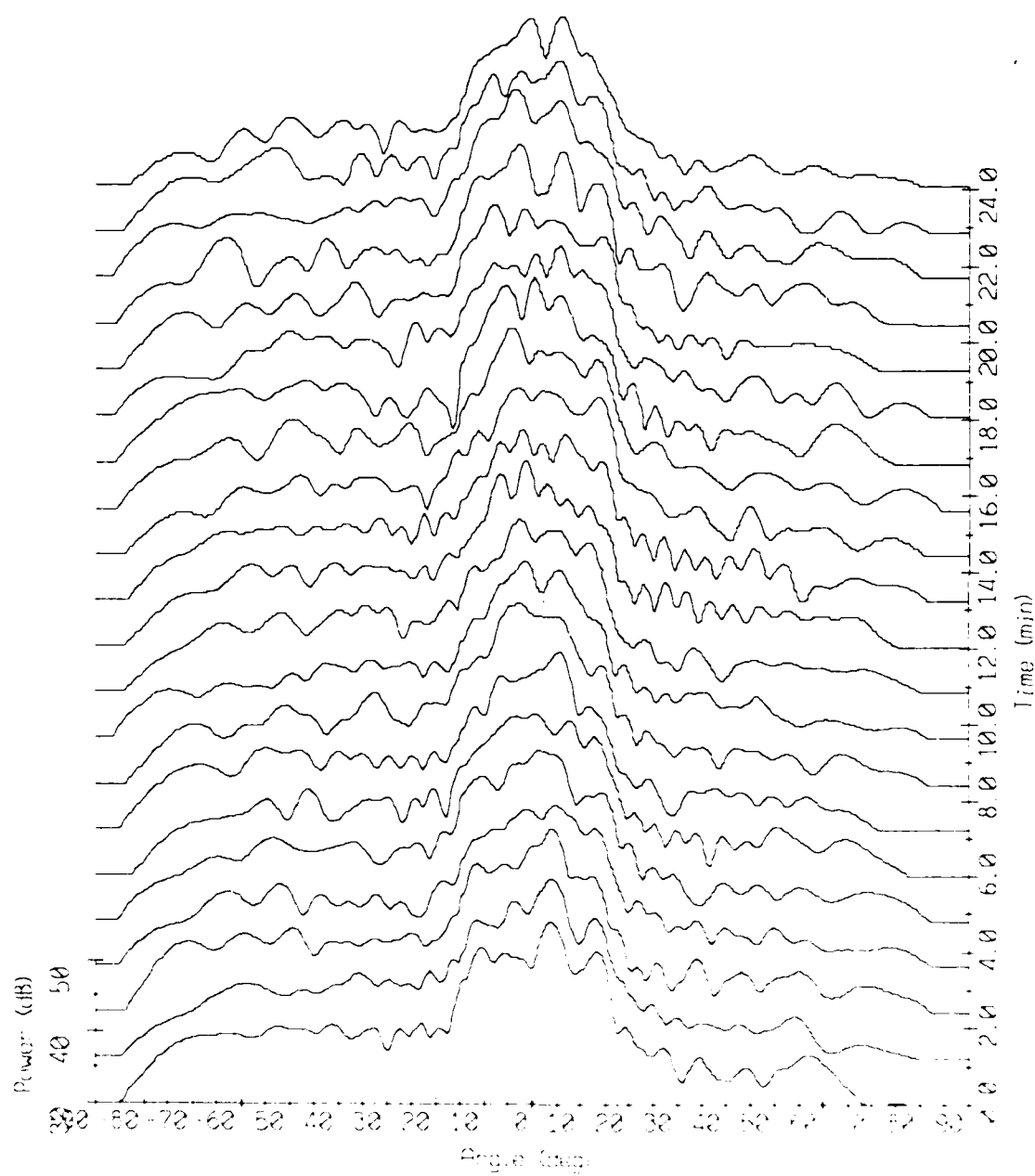
Array Response - 85010 Bin #5451
 $f = 150$ Hz, rect window



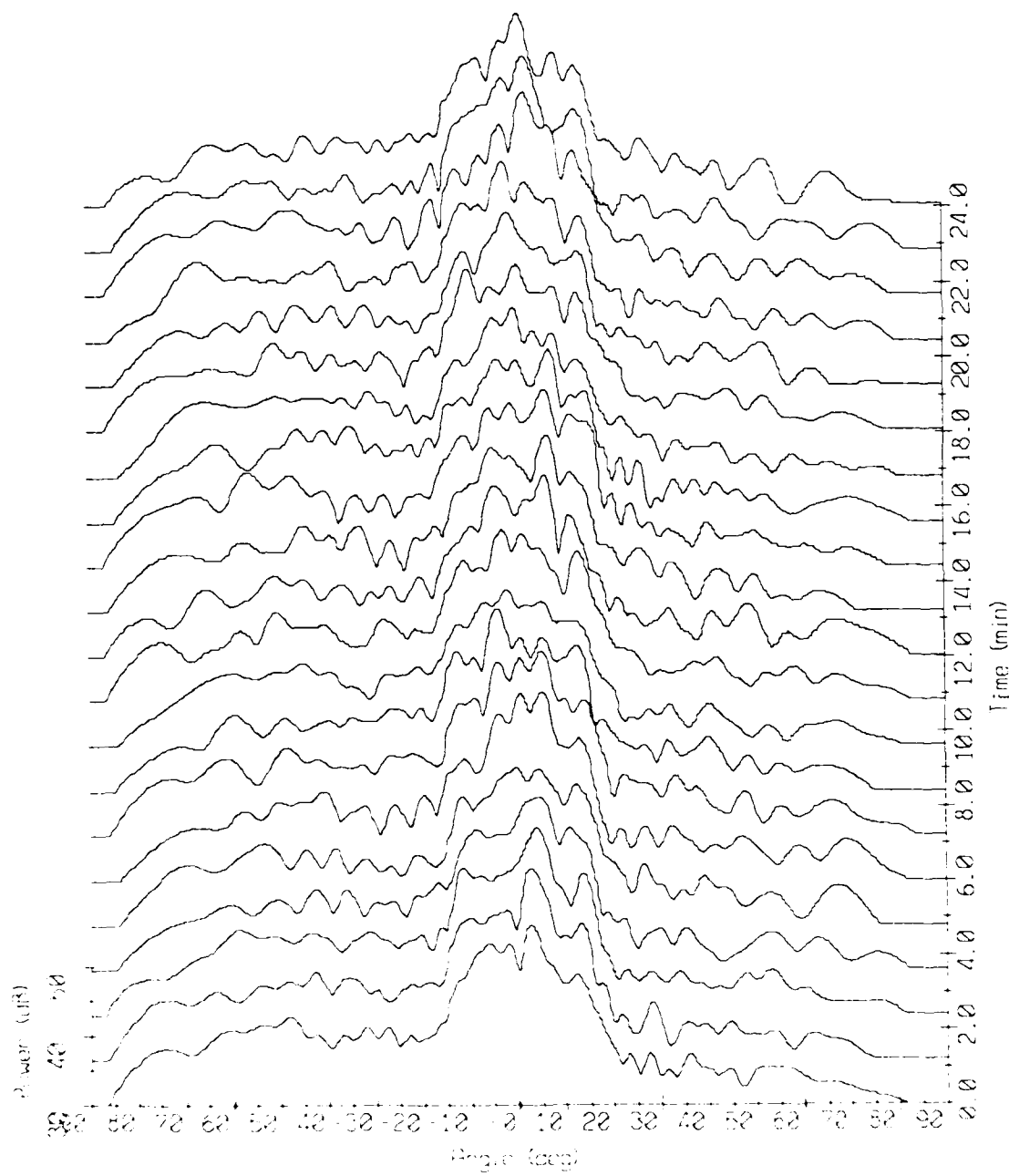
Array Response - 85010 Bin #5676
 $f = 175$ Hz, rect window



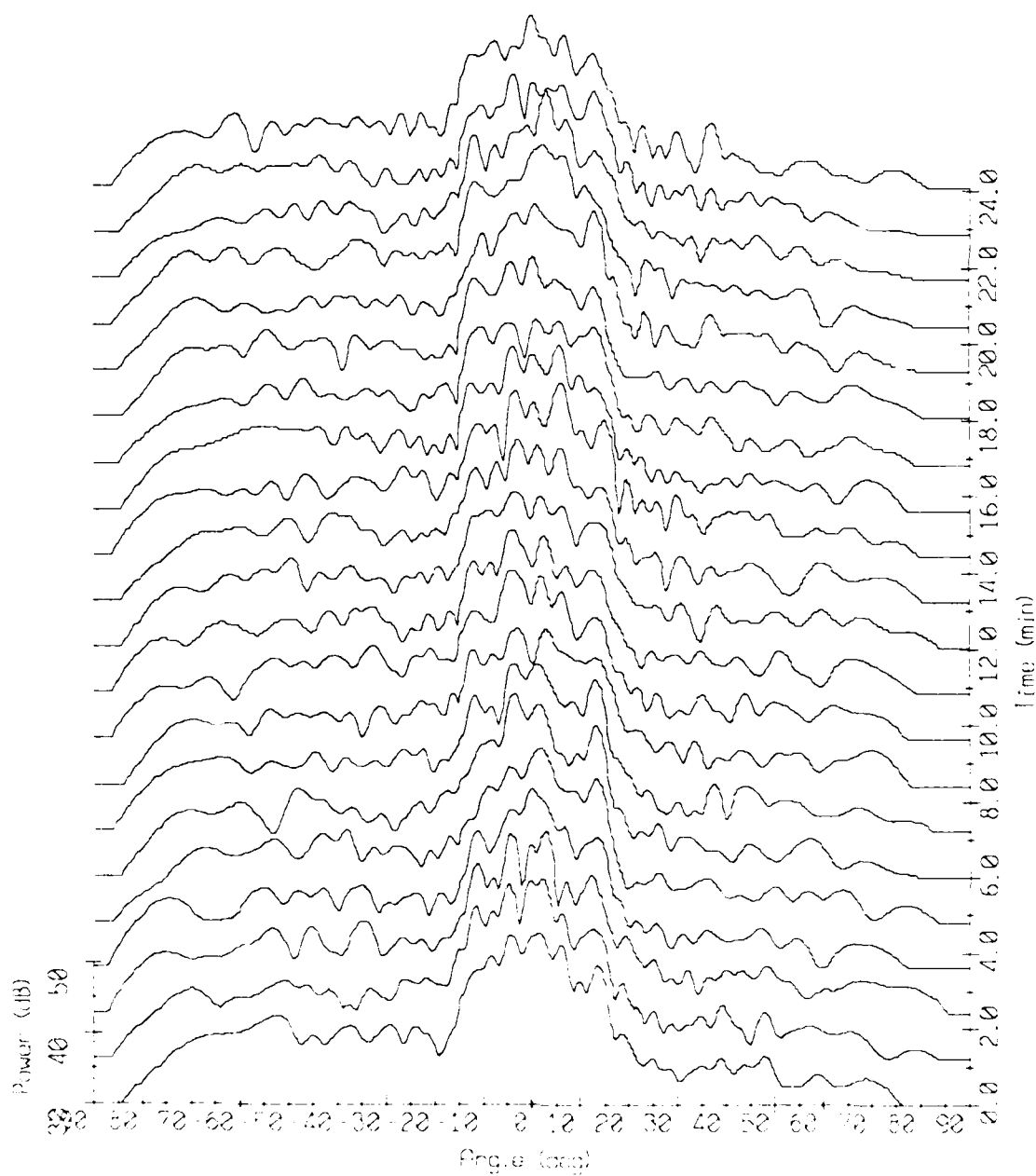
Array Response - 85010 Bin #5902
f = 200 Hz, rect window



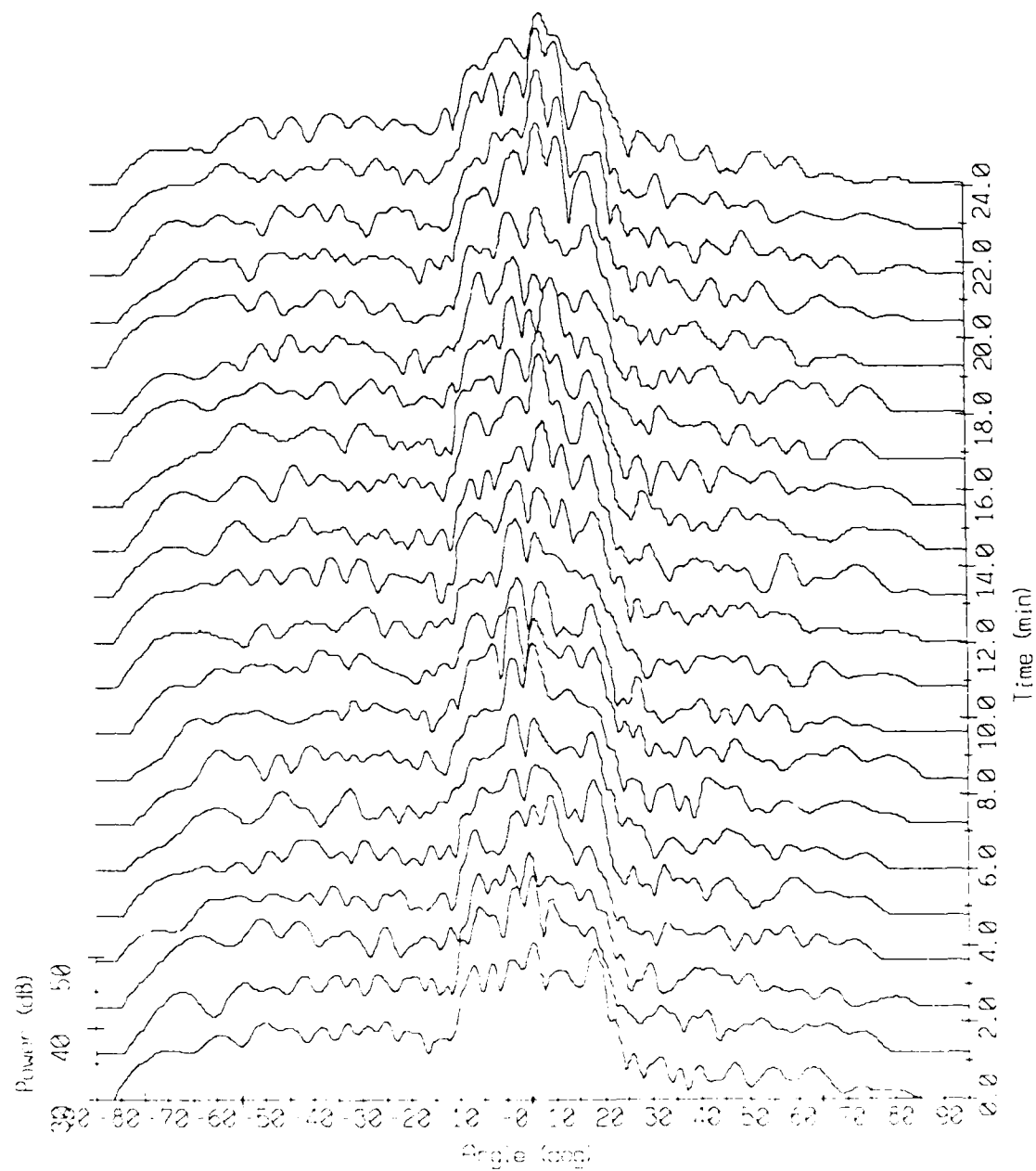
Array Response - 85010 Bin #6127
 $f = 225$ Hz, rect window



Array Response - 85010 Bin #6354
 $f = 252$ Hz, rect window

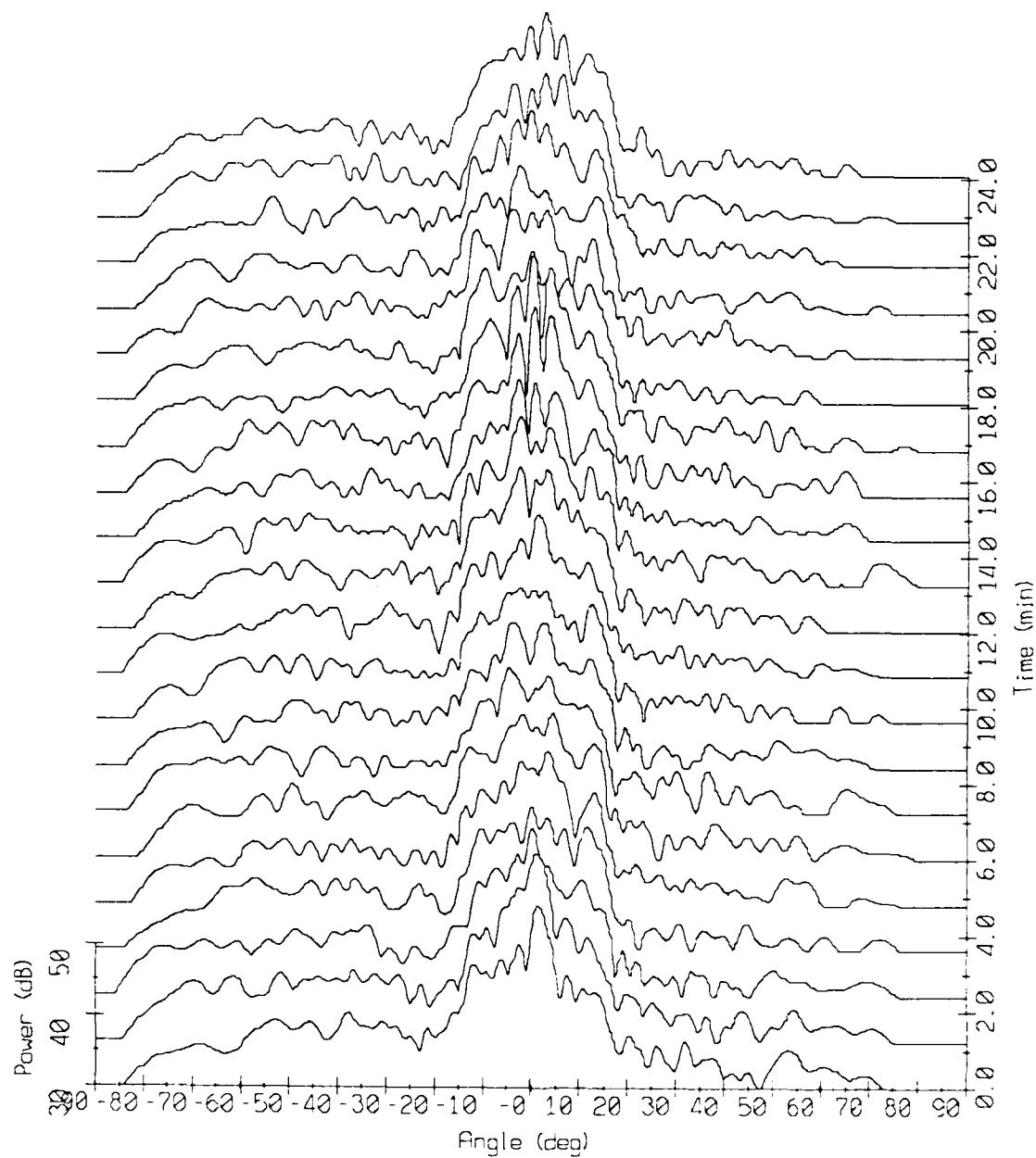


Array Response - 85010 Bin #6579
 $f = 275$ Hz, rect window



Array Response - 85010 Bin #6804

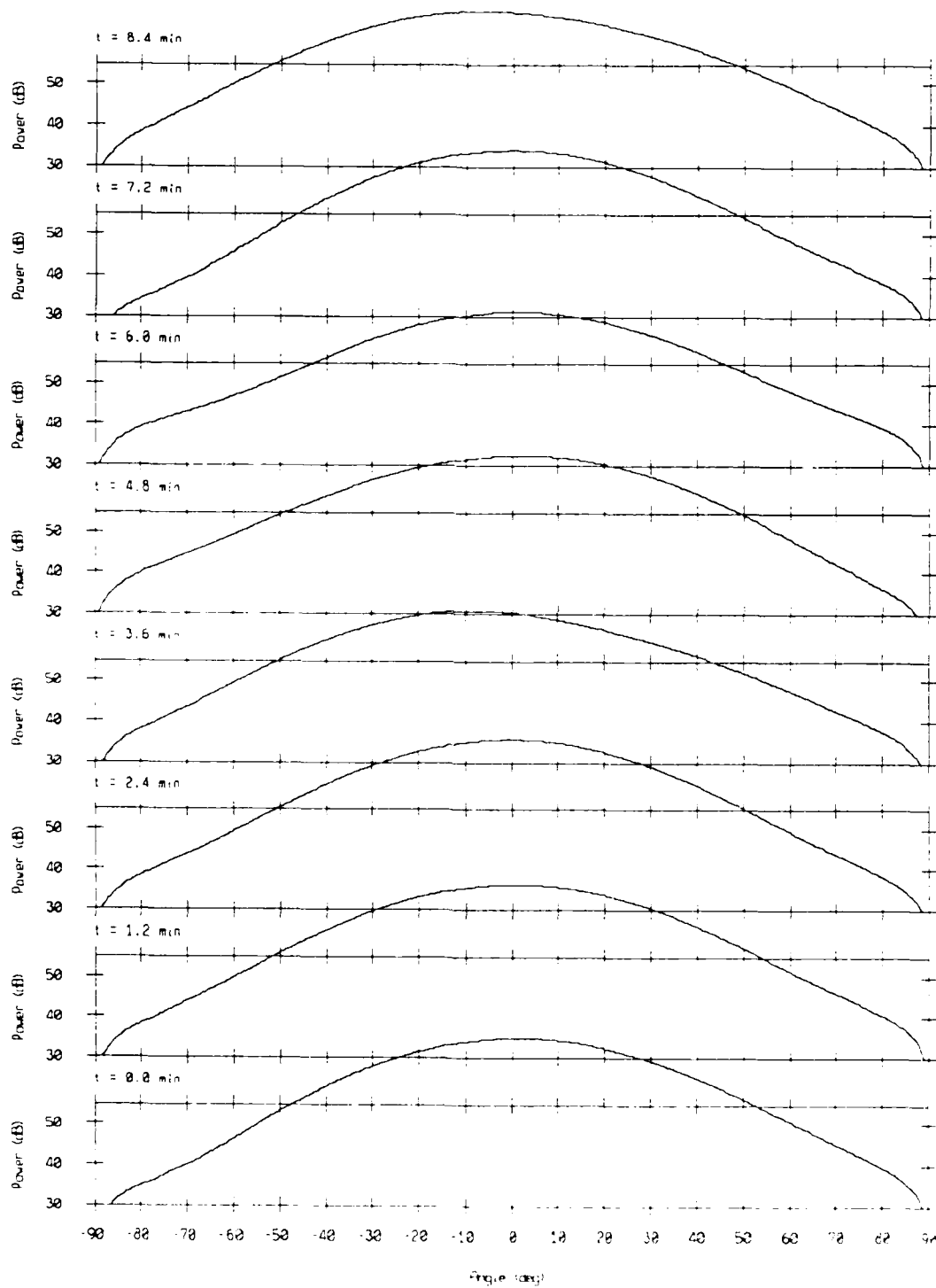
f = 300 Hz, rect window



VI. Array Response: Panels, KB Window.

Array Response - 85010 Bin #4323

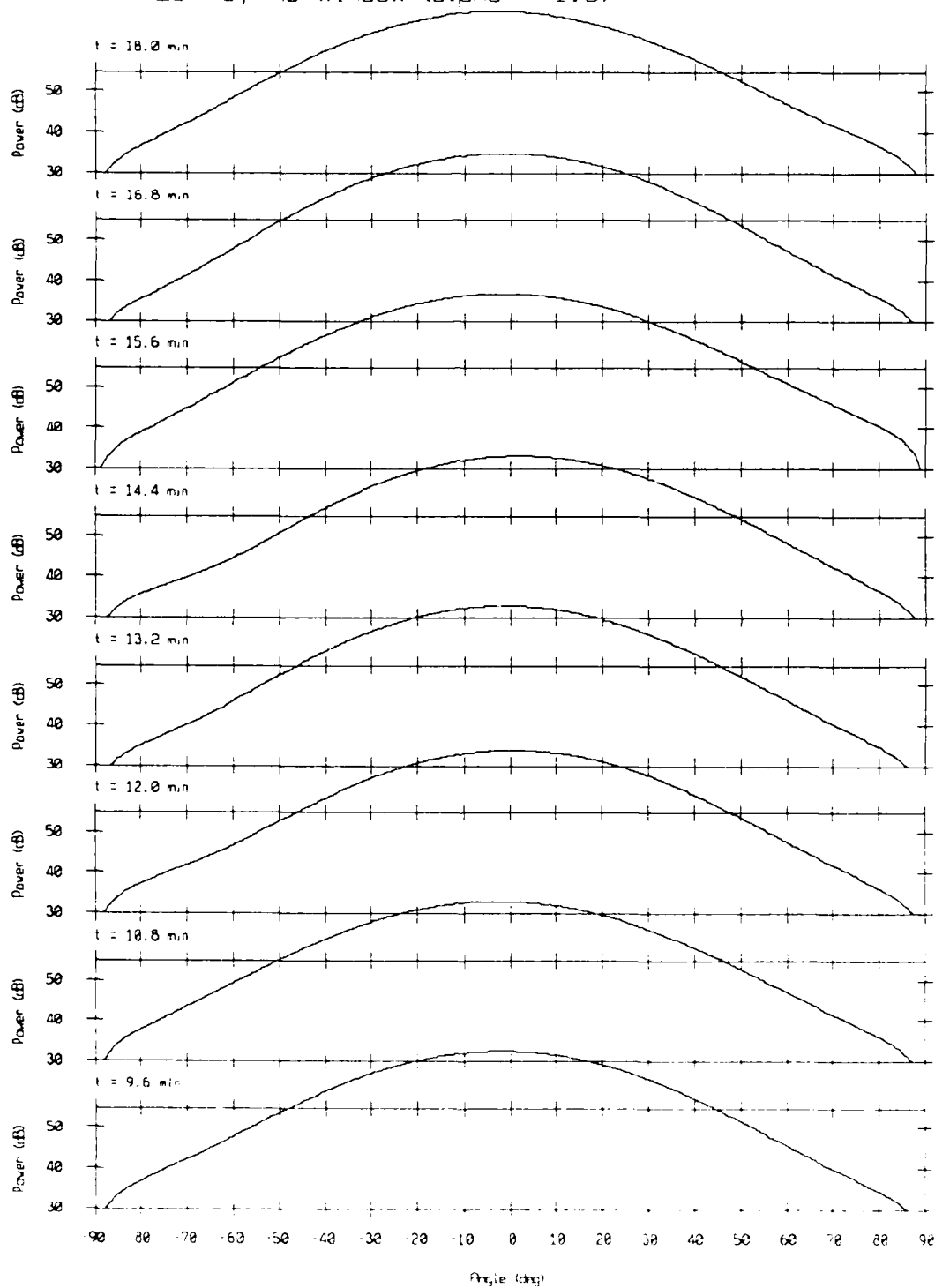
$f = 25$ Hz, KB window ($\alpha_{\text{pnc}} = 1.5$)



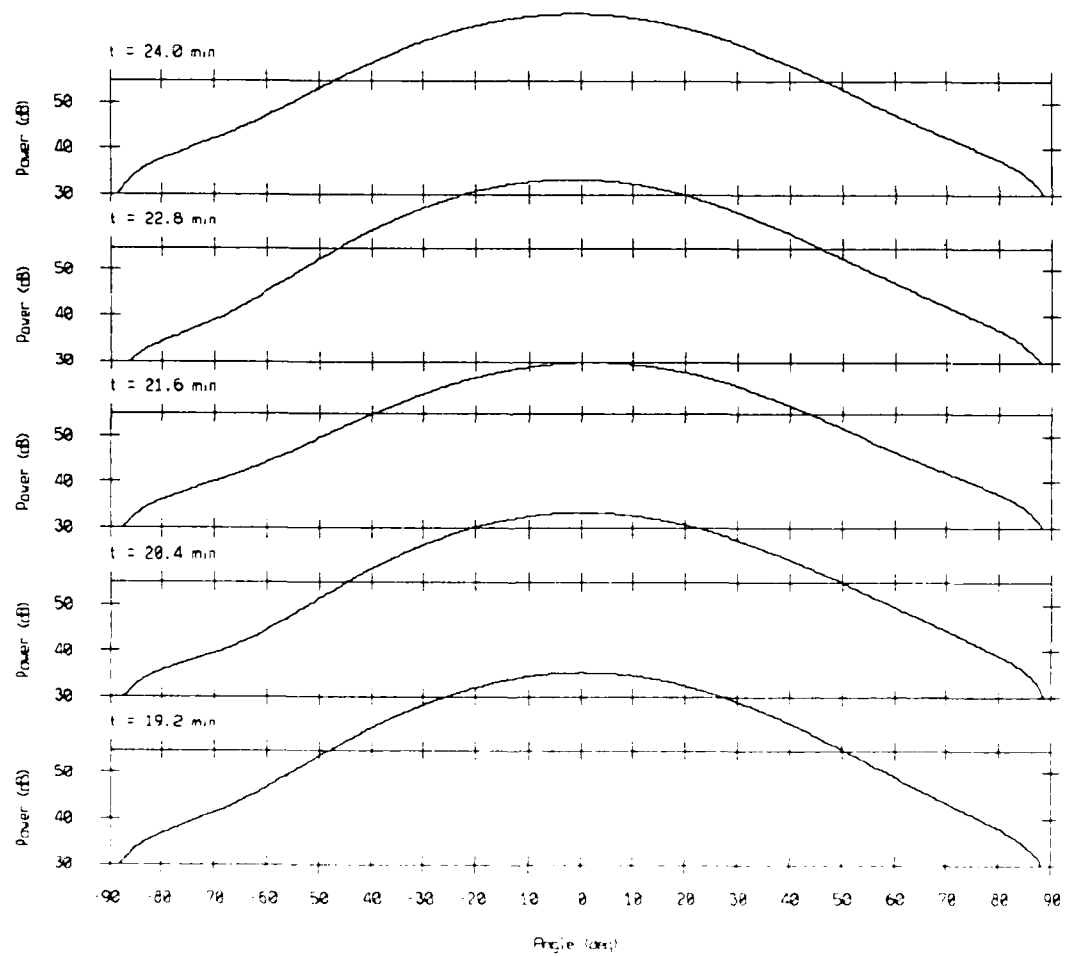
Angle (deg)

Array Response - 85010 Bin #4323

$f = 25$ Hz, KB window ($\alpha = 1.5$)

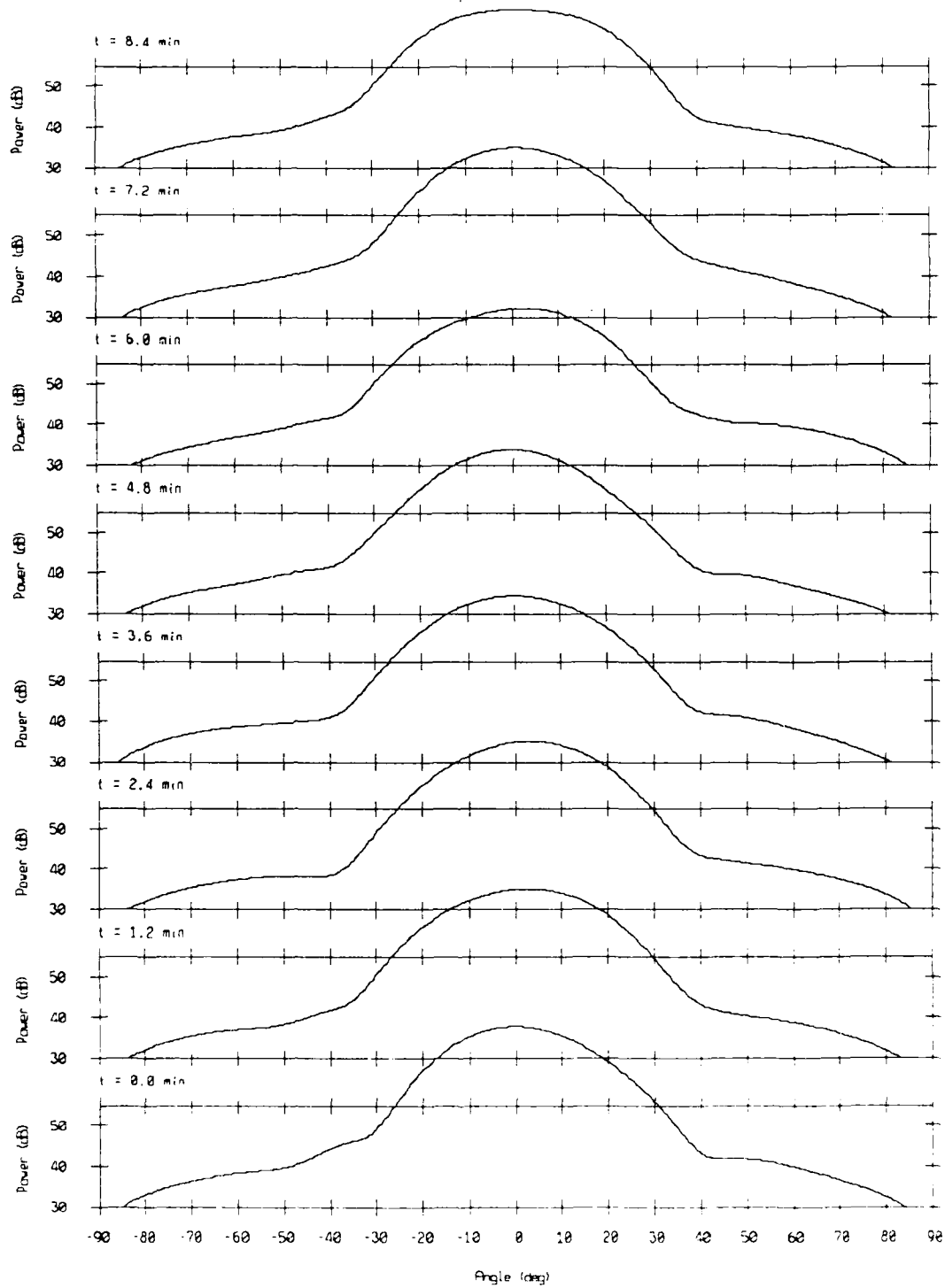


Array Response - 85010 Bin #4323
 $f = 25$ Hz, KB window ($\alpha = 1.5$)



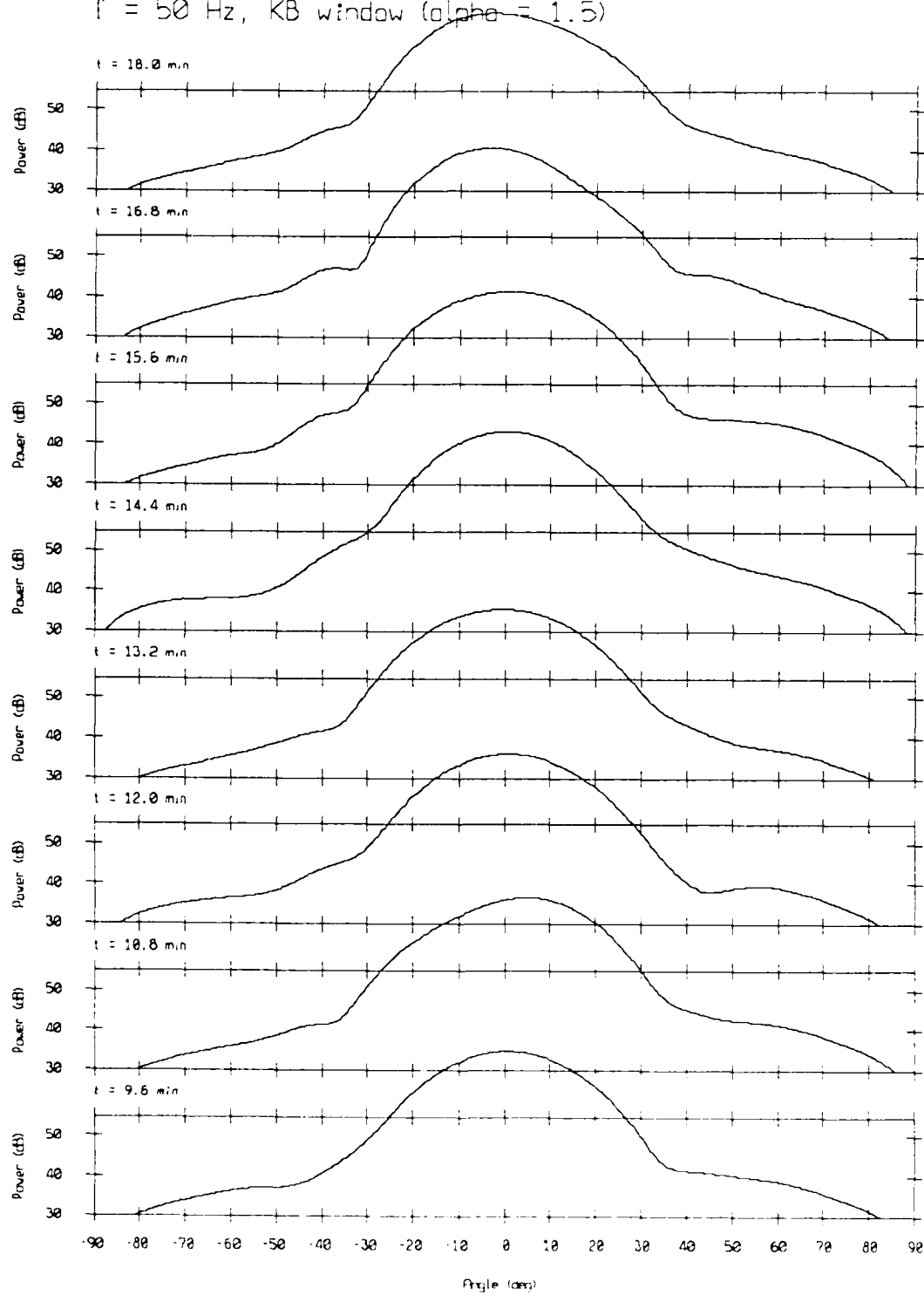
Array Response - 85010 Bin #4548

$f = 50$ Hz, KB window ($\alpha = 1.5$)



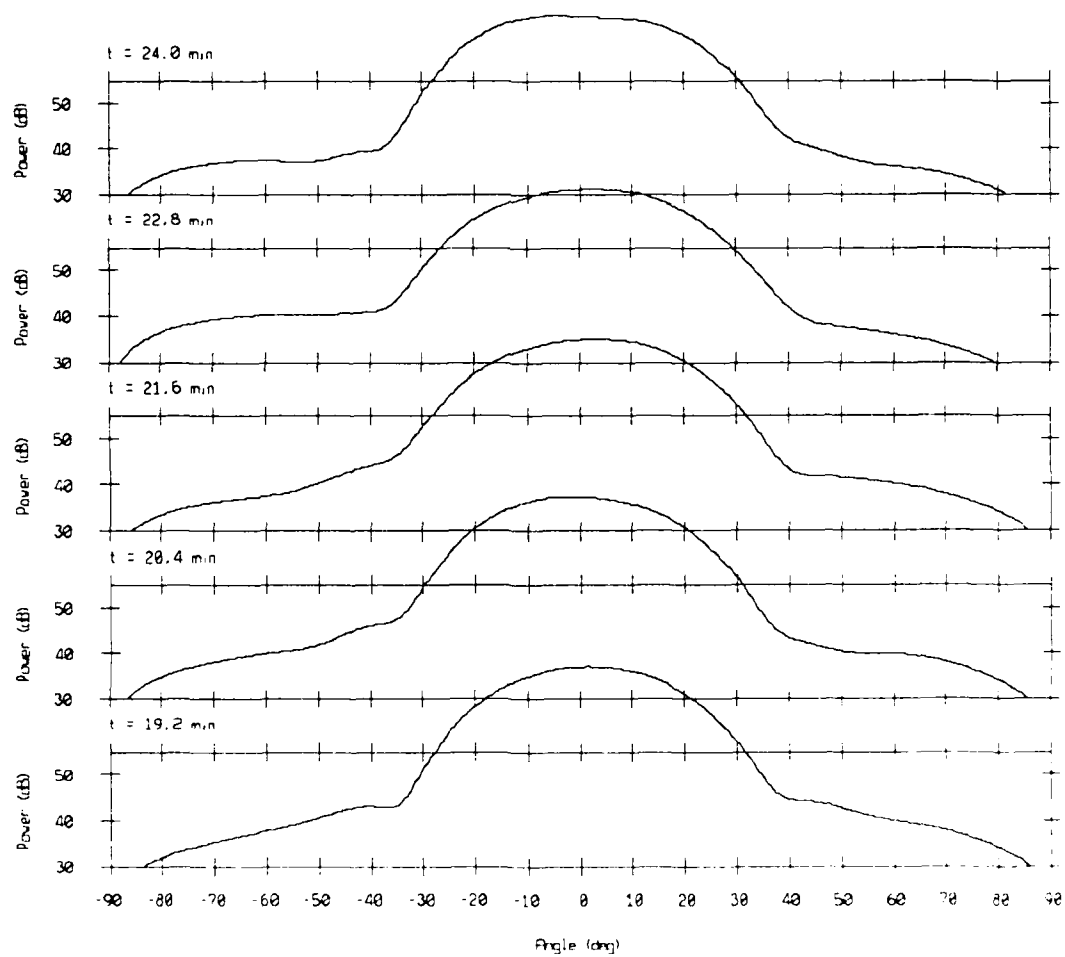
Array Response - 85010 Bin #4548

$f = 50$ Hz, KB window ($\alpha = 1.5$)



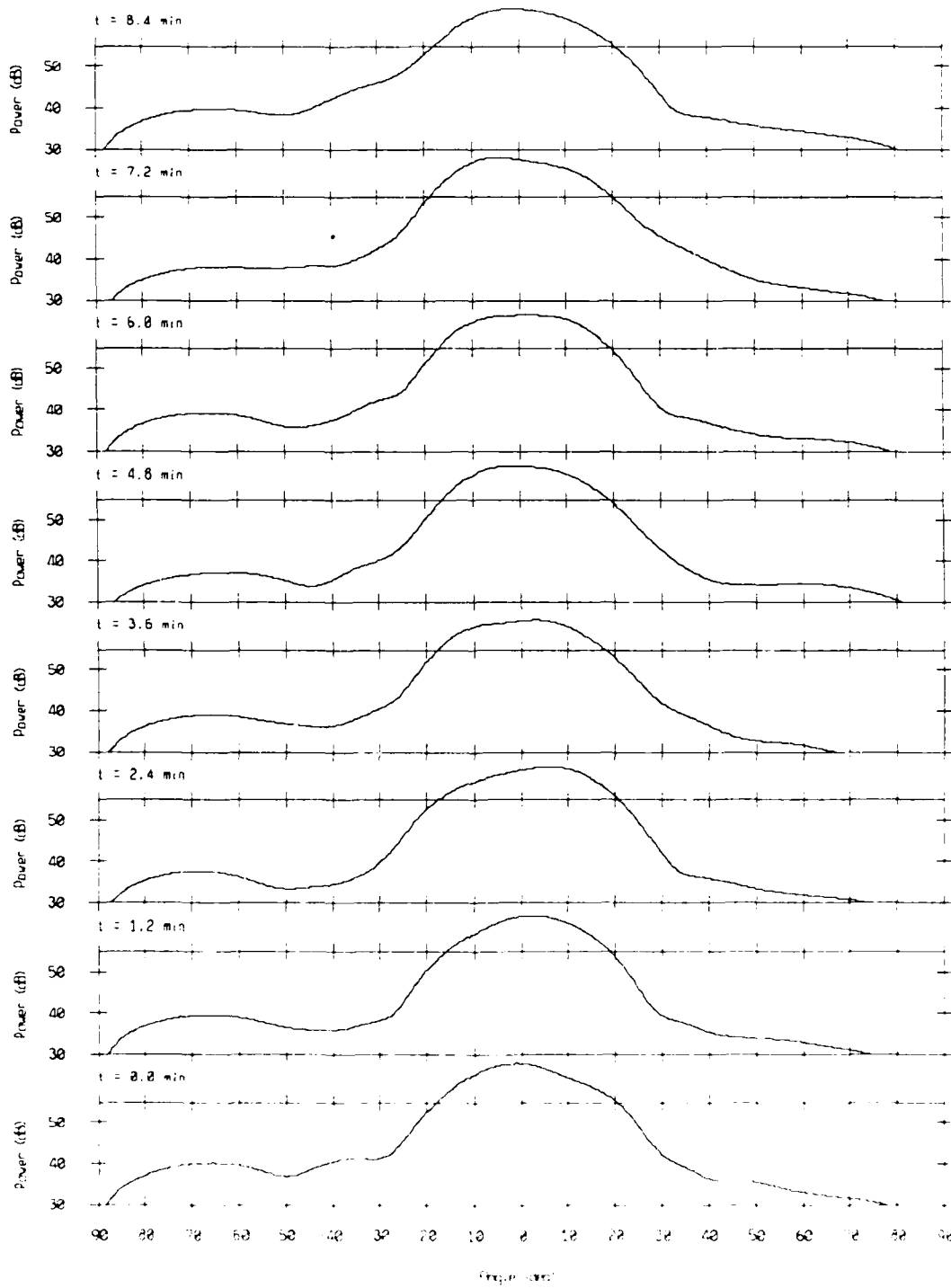
Array Response - 85010 Bin #4548

$f = 50$ Hz, KB window ($\alpha = 1.5$)



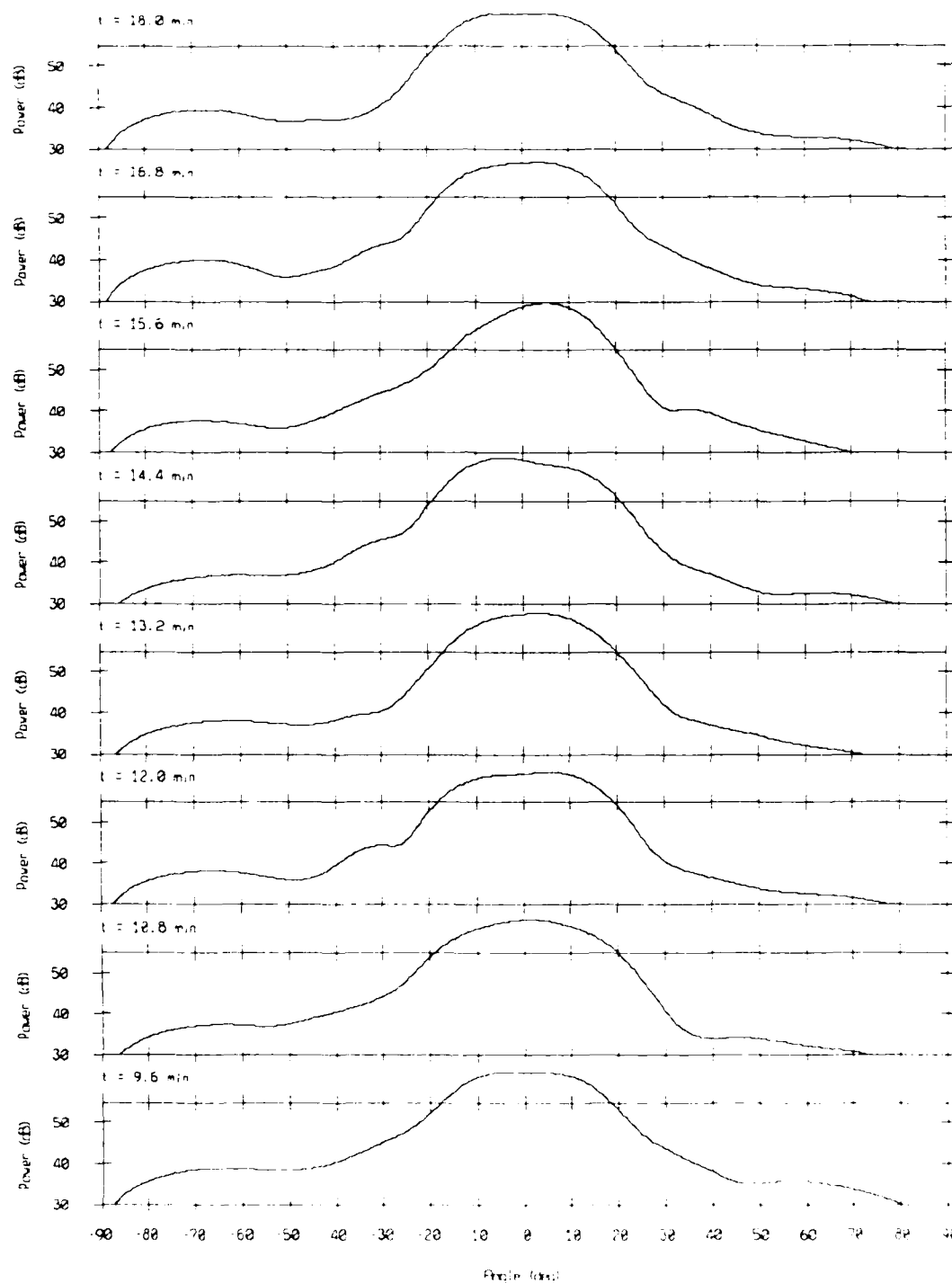
Array Response - 85010 3in #4774

$f = 75$ Hz, KB window ($\alpha = 1.5$)



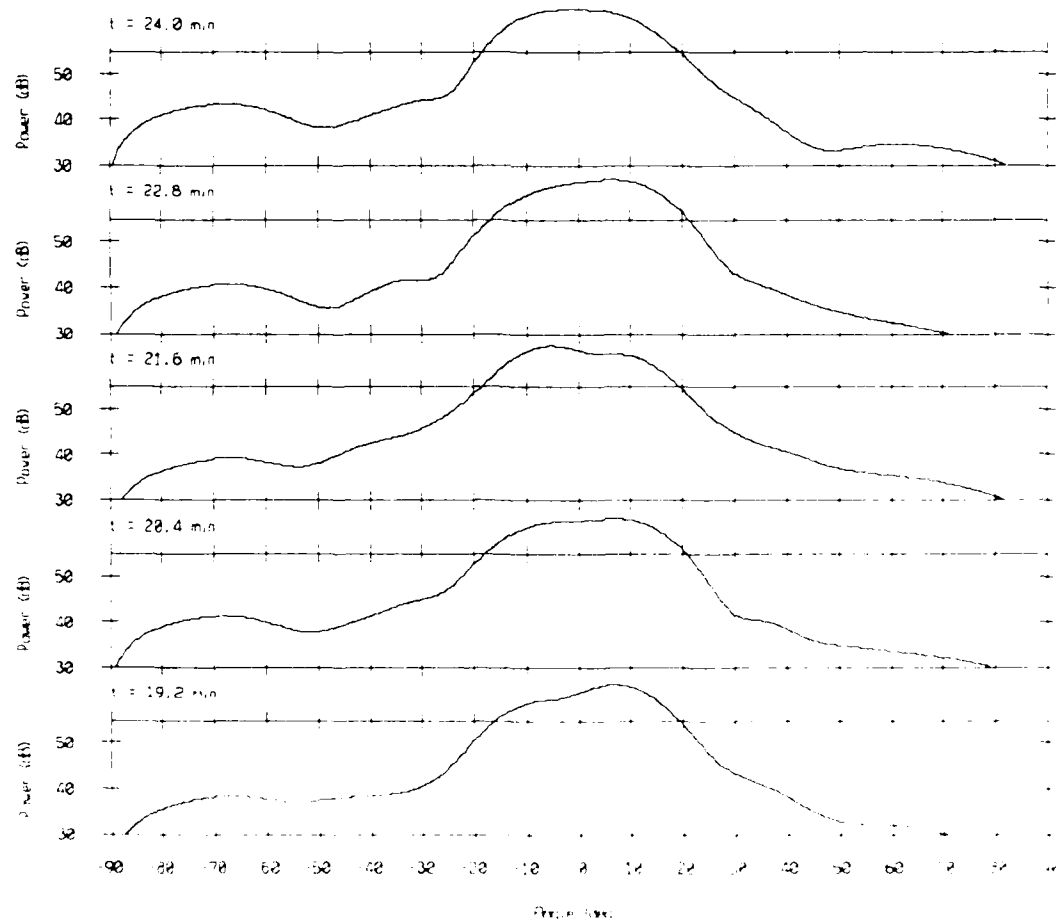
Acq. Response - 85010 Bin #4774

$f = 75$ Hz, ΔB window (alone) = 1.5



Ampl. Response - 85012 3in #4774

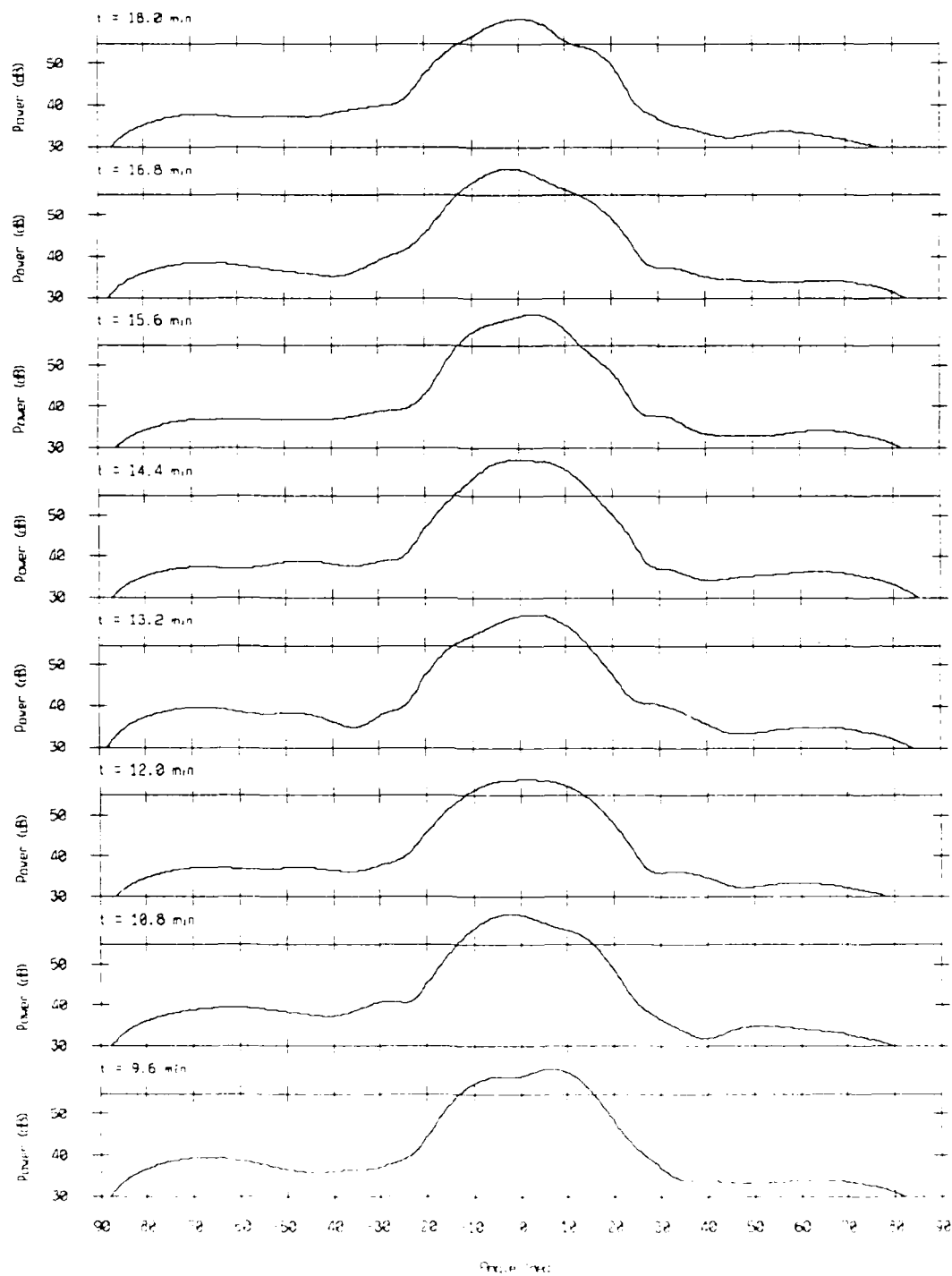
$f = 75$ Hz, Δf window (octave) = 1.5



$f = 100 \text{ Hz}$, K5 window (align = 1.5)

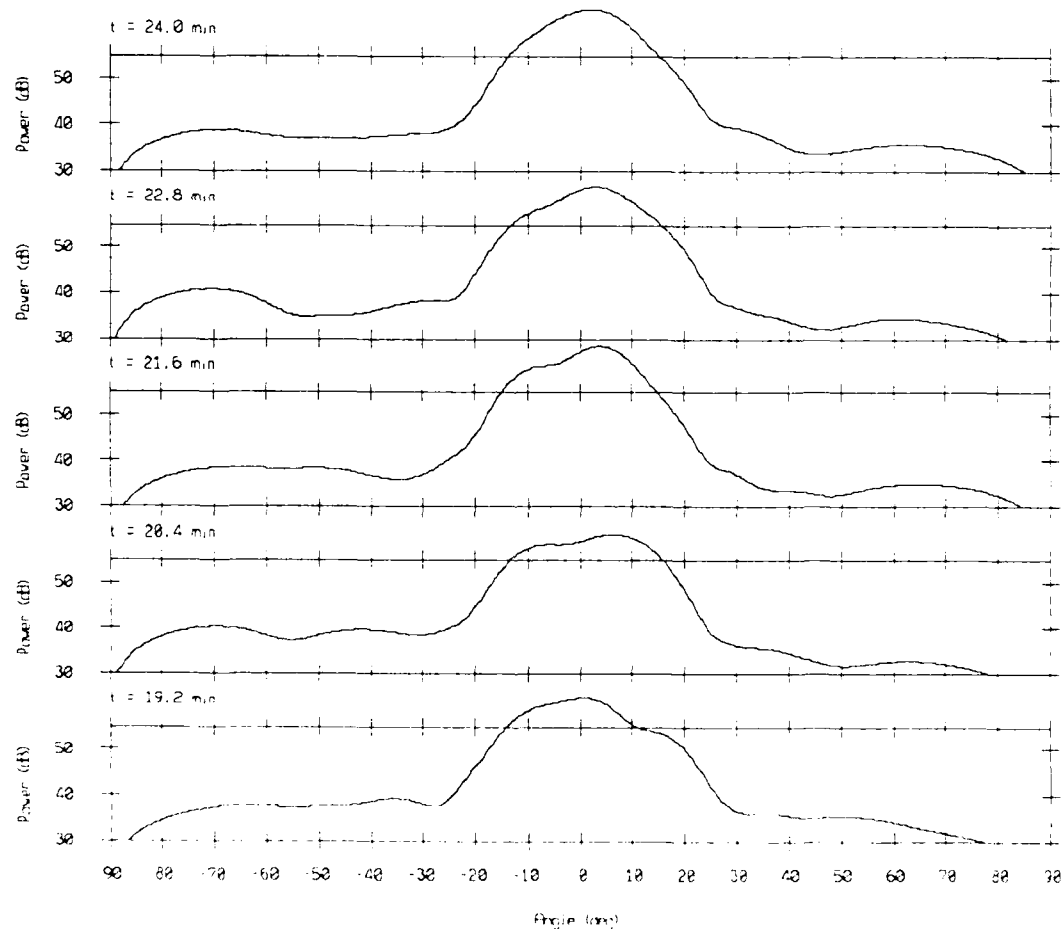
Array Response - 85010 Bin #4999

$f = 100$ Hz, KB window ($\alpha = 1.5$)



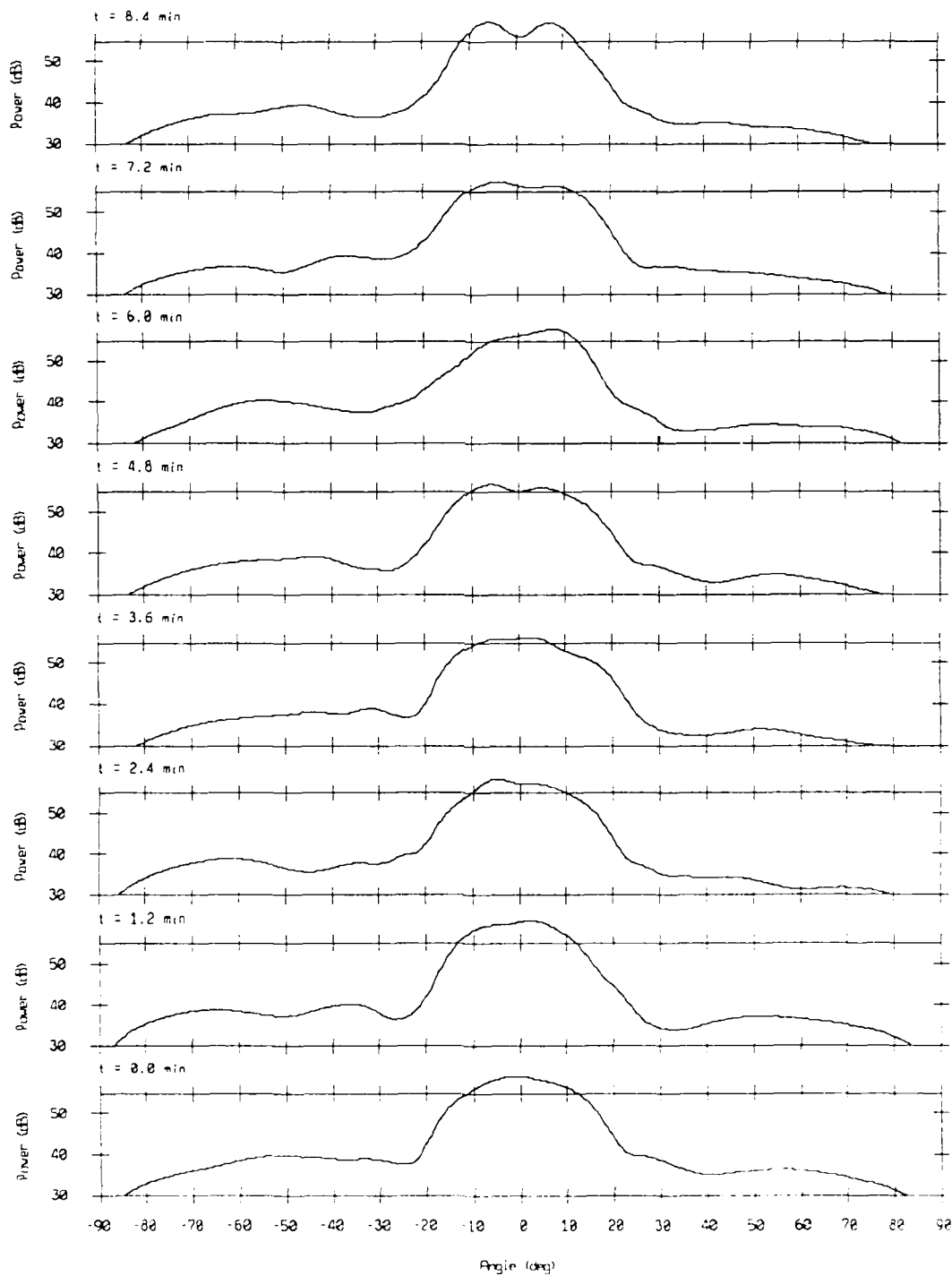
Array Response - 85010 Bin #4999

$f = 120$ Hz, KB window ($\alpha = 1.5$)



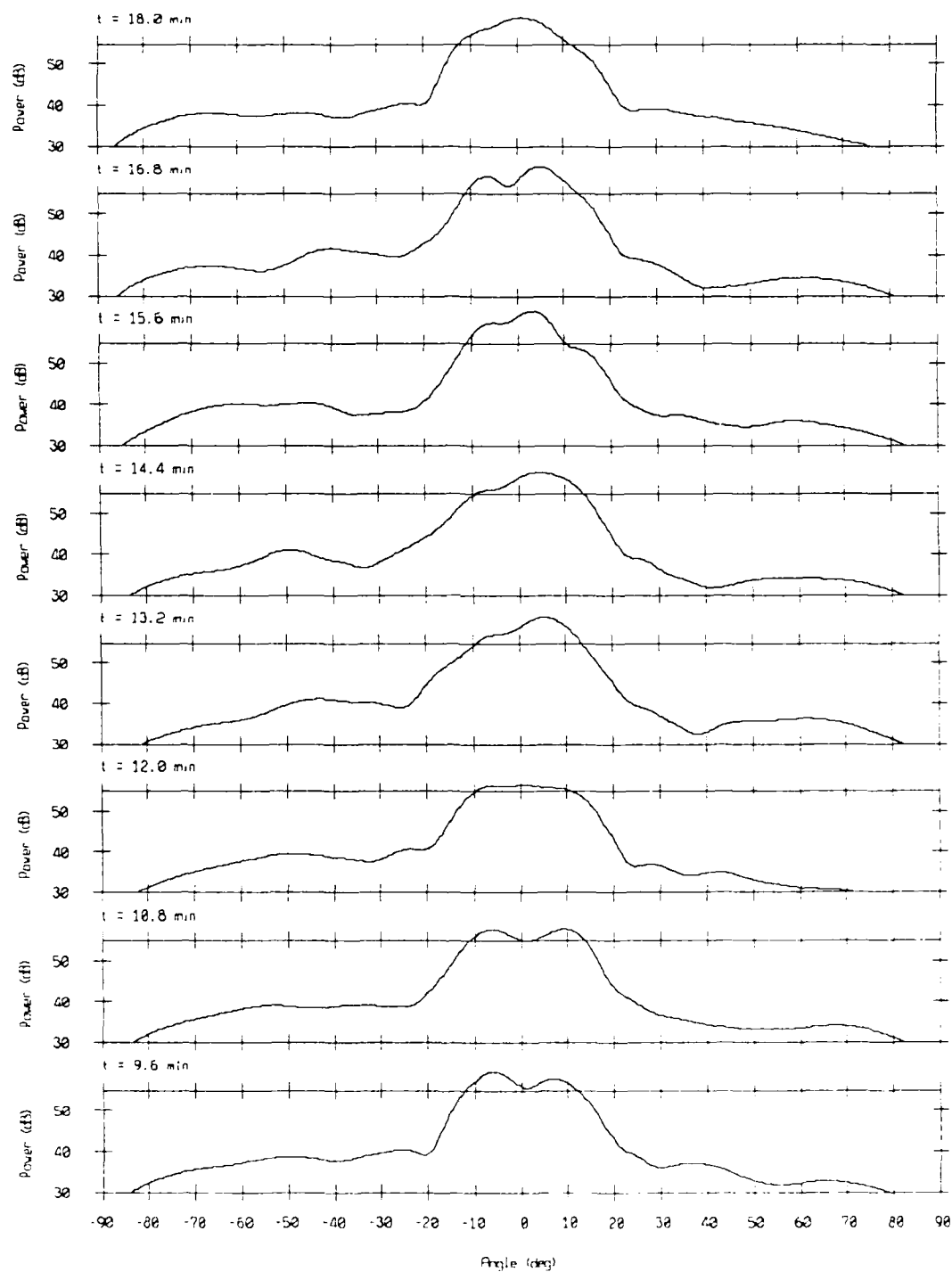
Array Response - 85010 Bin #5225

$f = 125$ Hz, KB window ($\alpha = 1.5$)



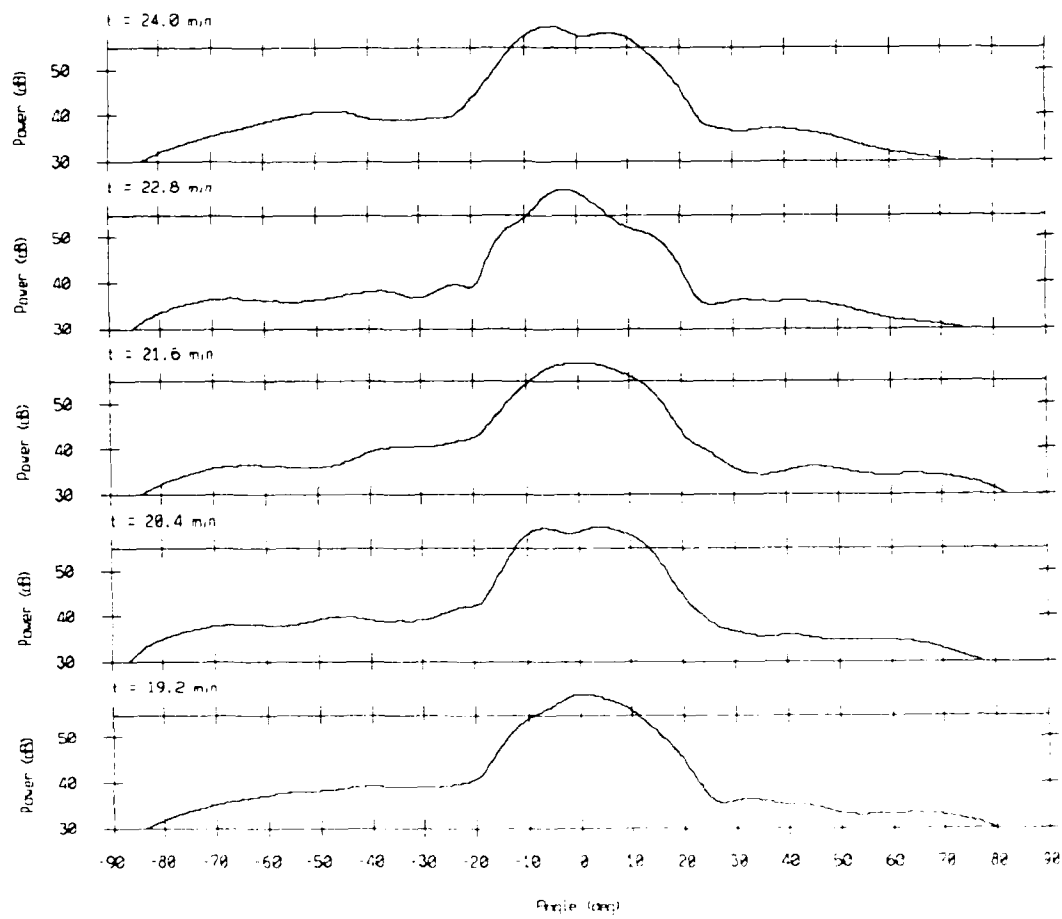
Array Response - 85010 Bin #5225

$f = 125$ Hz, KB window ($\alpha = 1.5$)



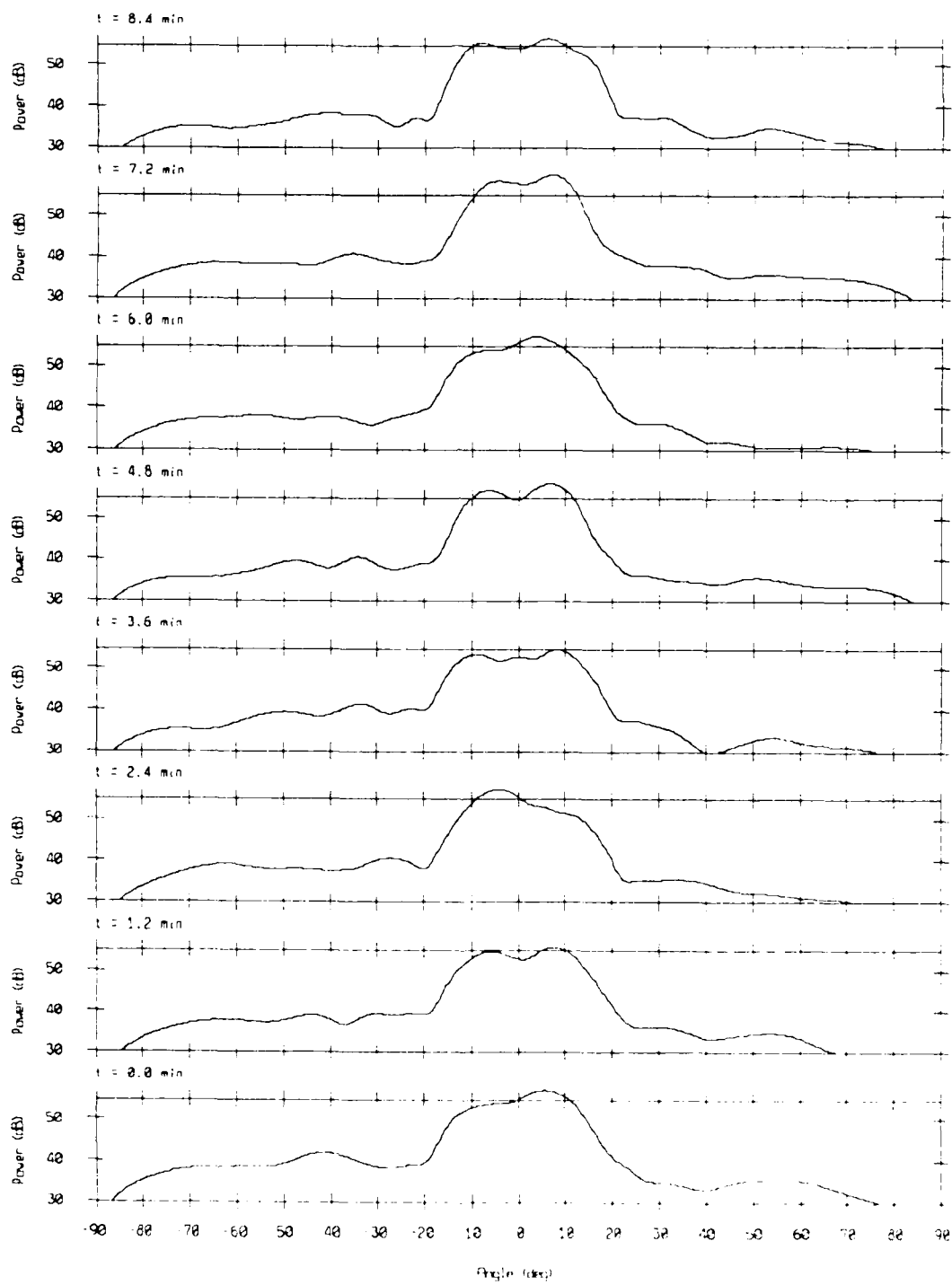
Array Response - 85010 Bin #5225

$f = 125$ Hz, KB window ($\alpha = 1.5$)



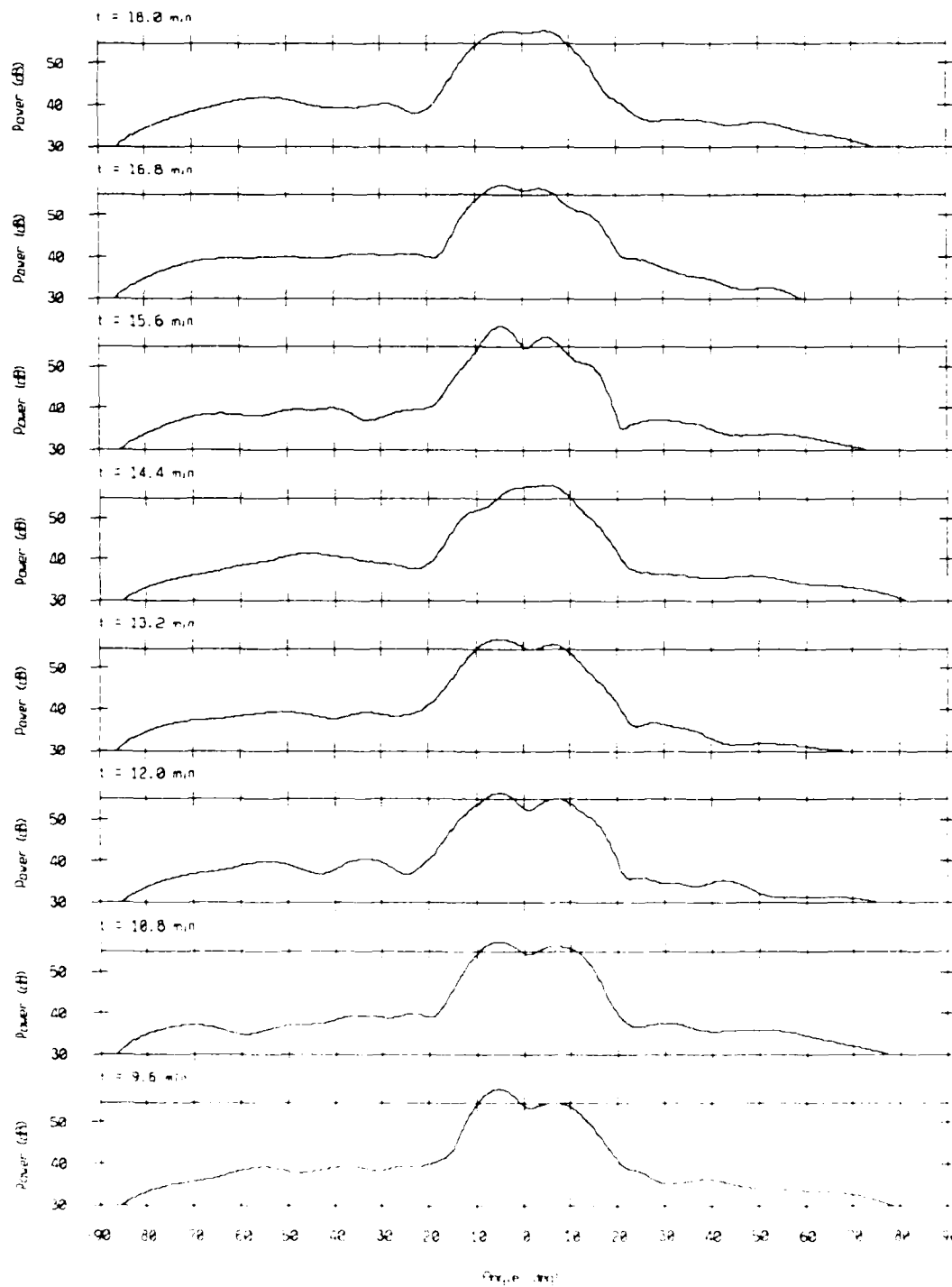
Array Response - 85010 Bin #5451

$f = 150$ Hz, KB window ($\alpha_{\text{prc}} = 1.5$)



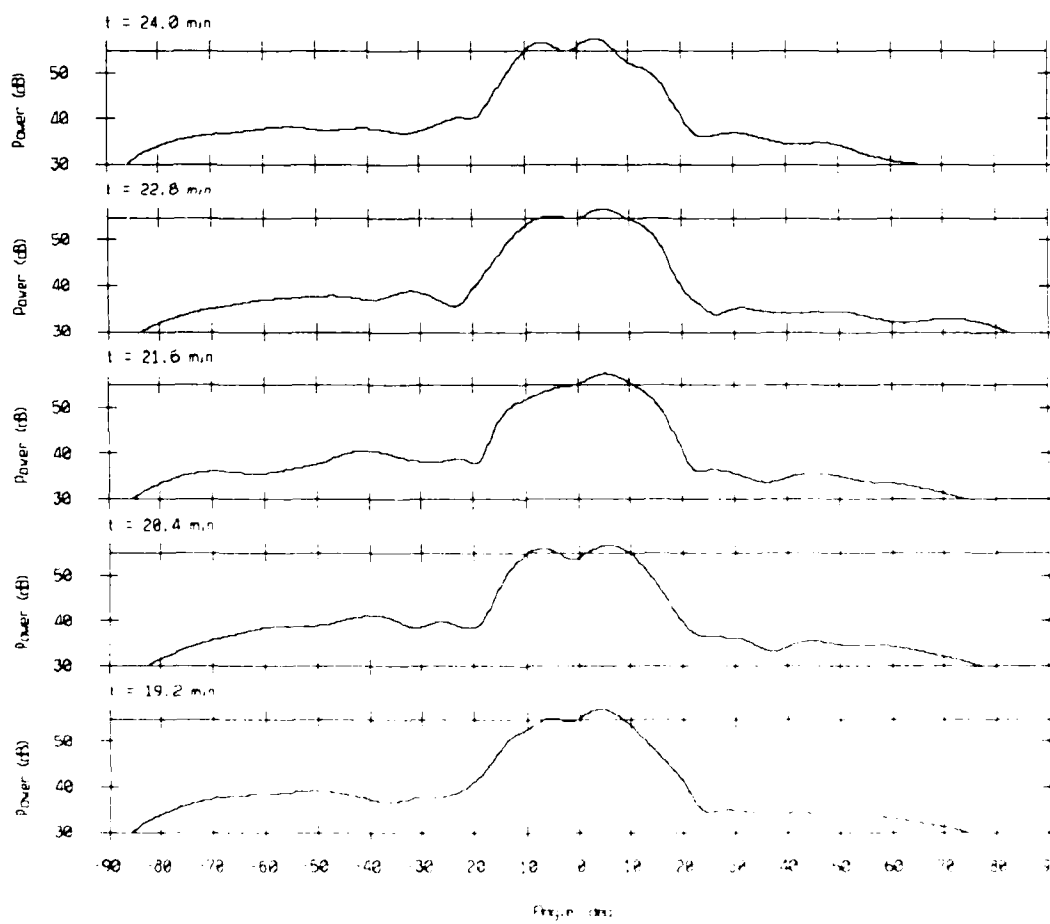
Array Response - 85010 Bin #5451

$f = 150$ Hz, KB window ($\alpha = 1.5$)



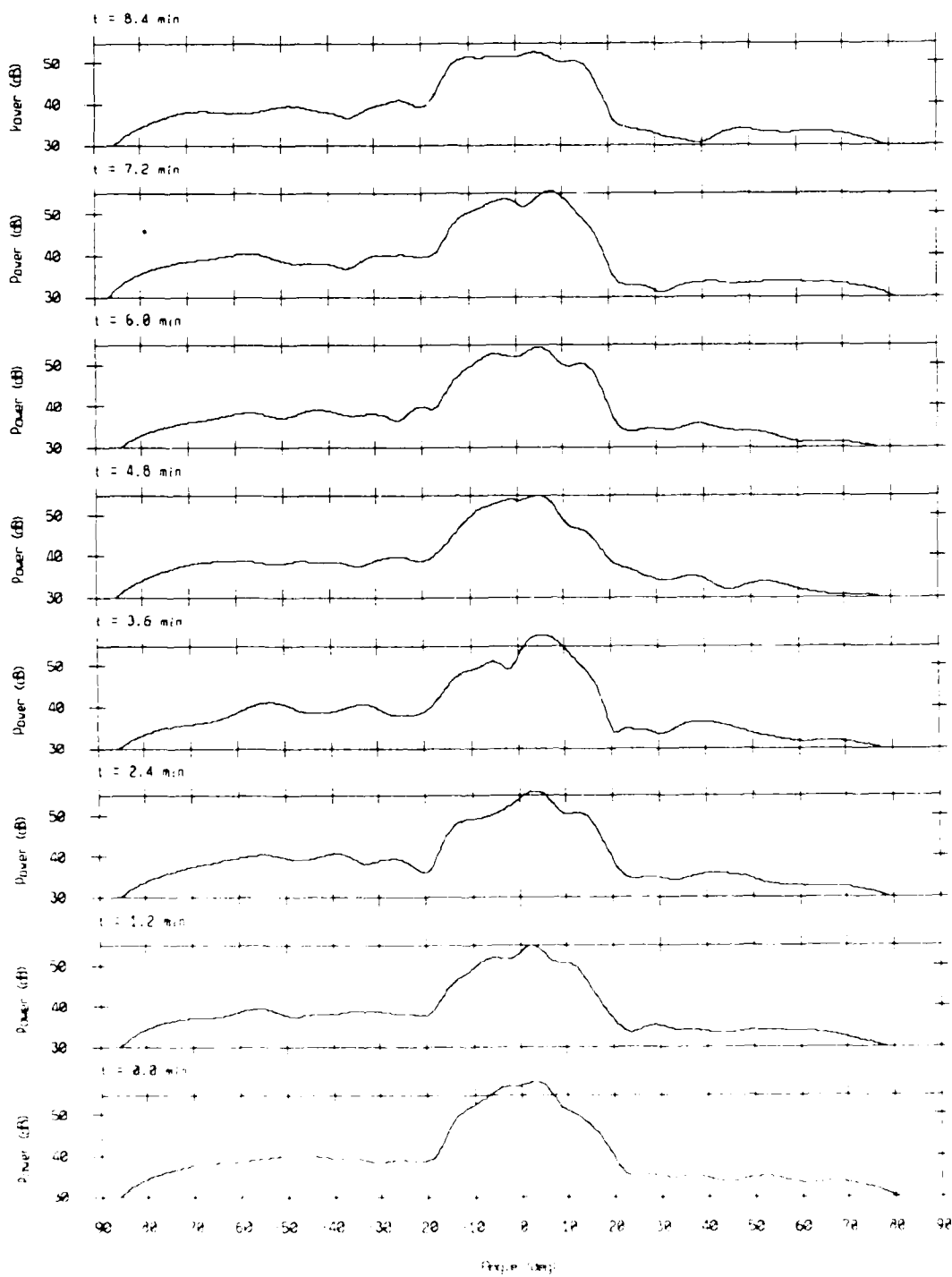
Array Response - 85010 Bin #5451

$f = 150$ Hz, KB window ($\alpha = 1.5$)

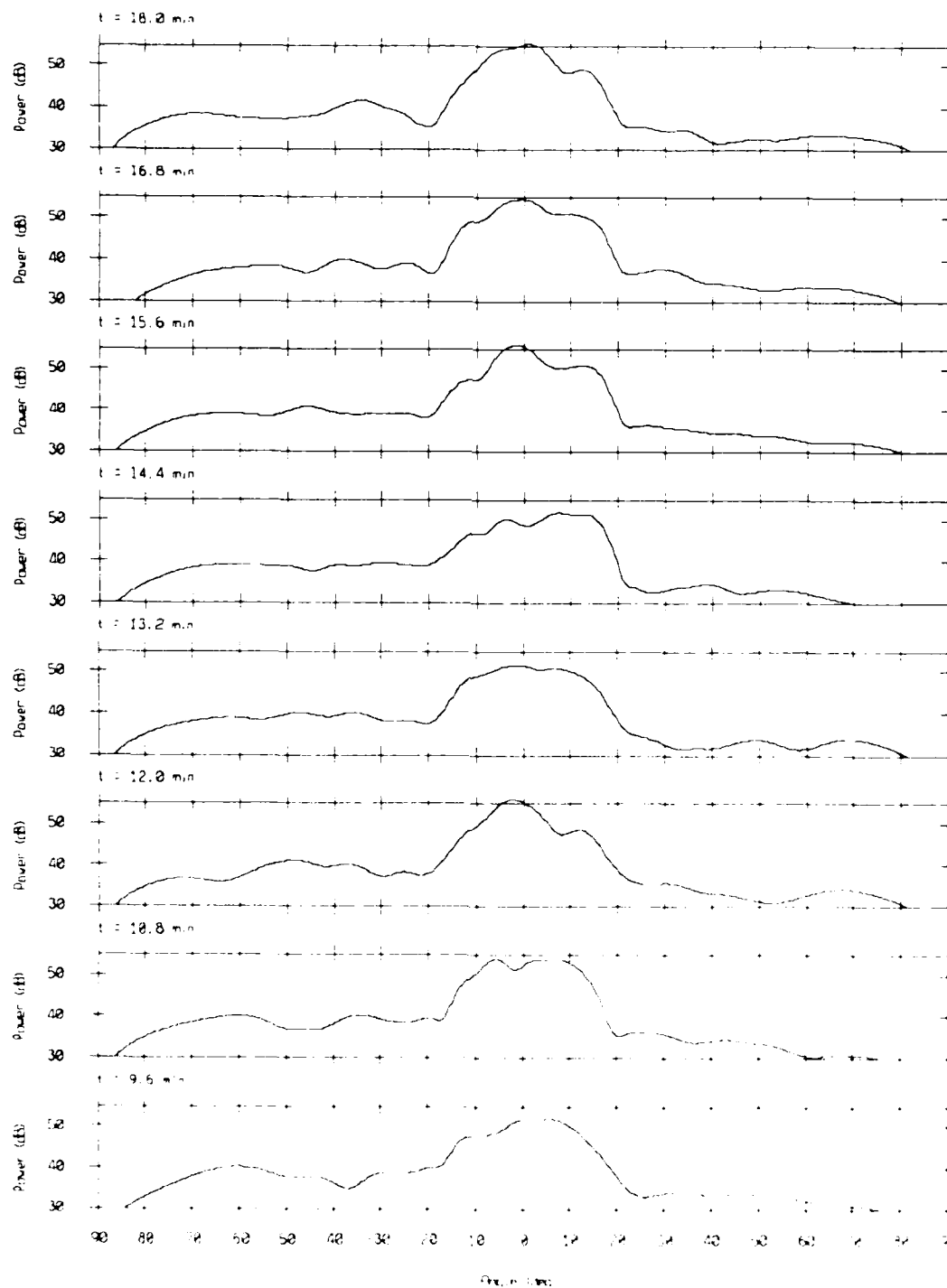


Array Response - 85010 Bin #5676

$f = 175$ Hz, KB window ($\alpha = 1.5$)

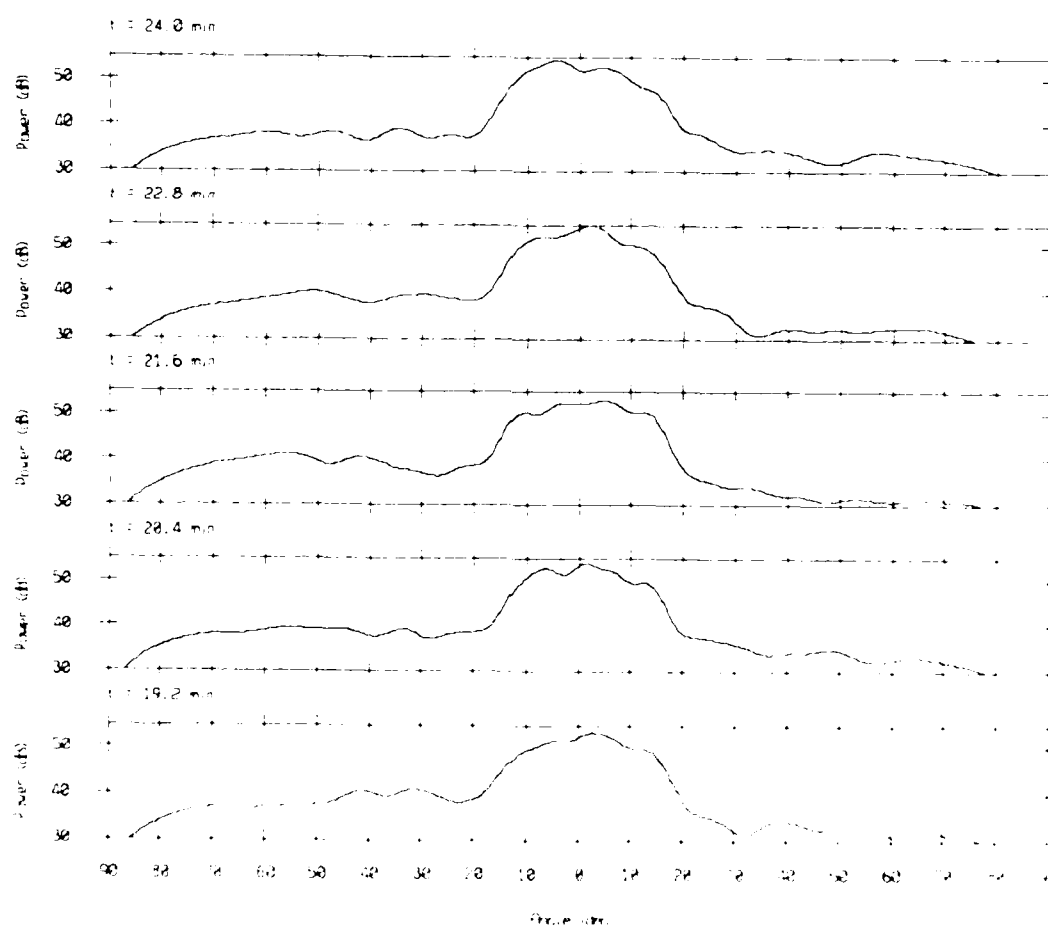


$f = 175$ Hz, KB window (alpha = 1.5)



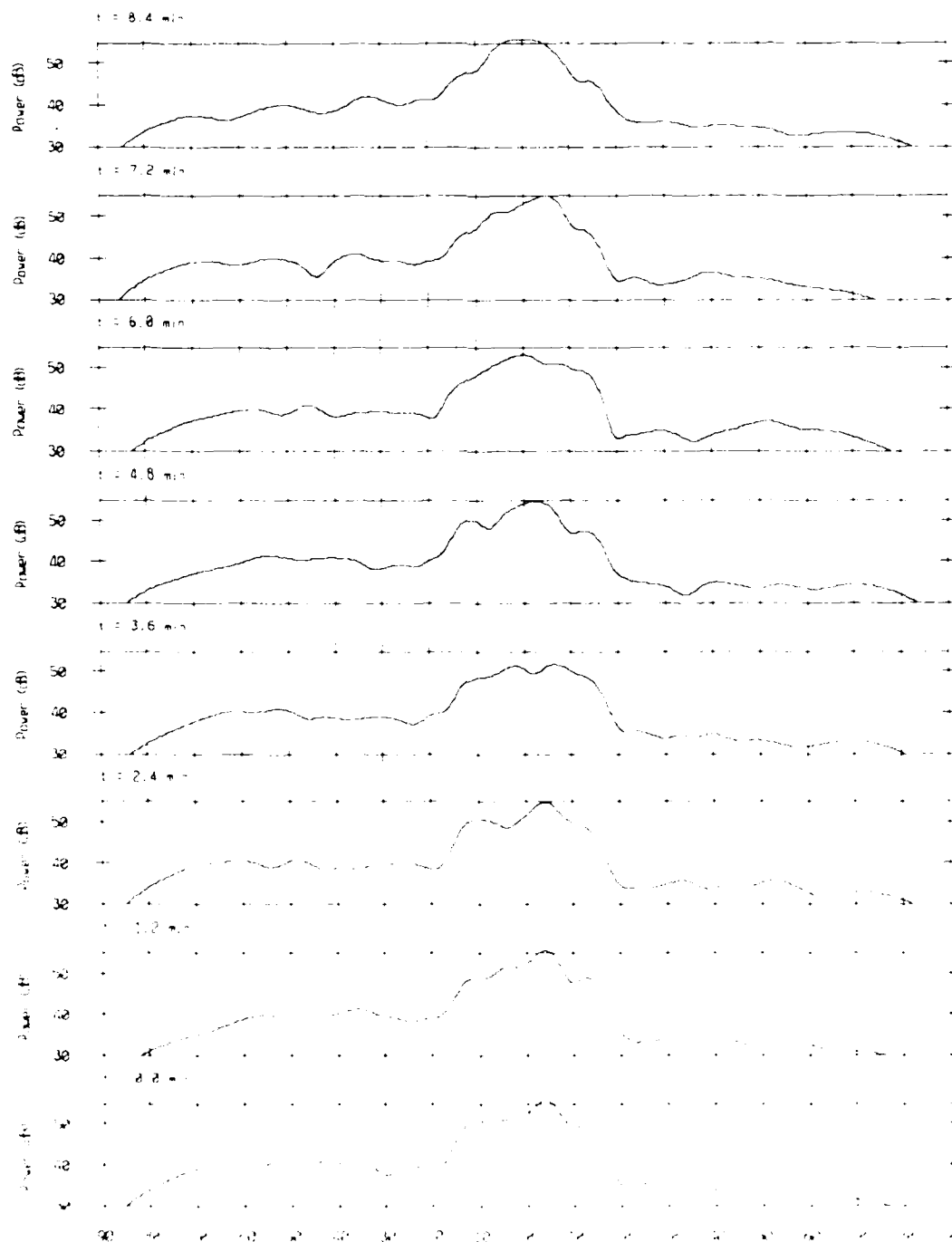
Energy Response - 85010 BIn #5676

$f = 175$ Hz, ΔB window (alpha = 1.5)



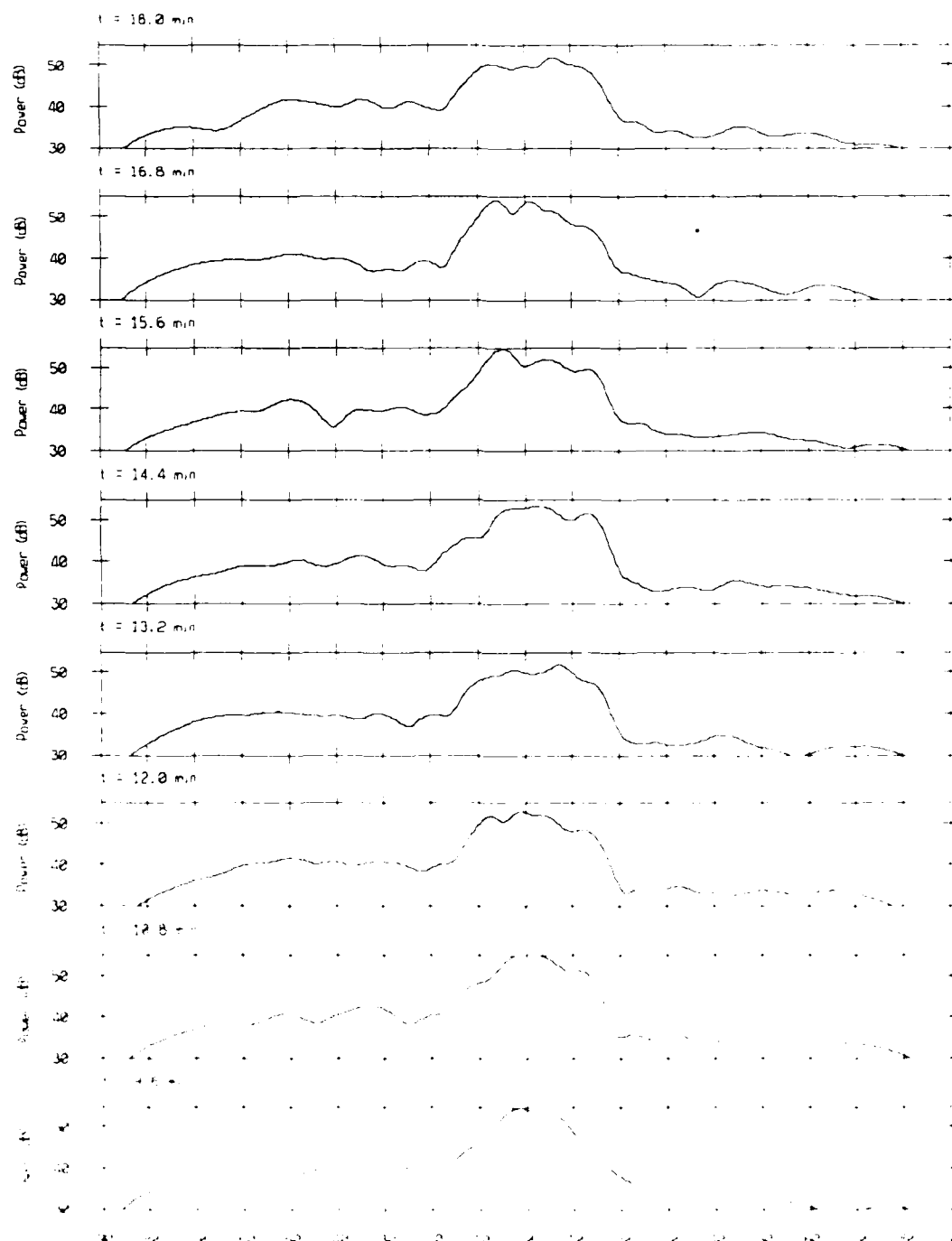
Binary Response - 85010 31r #5922

f = 200 Hz, K3 window (slope = 1.5)

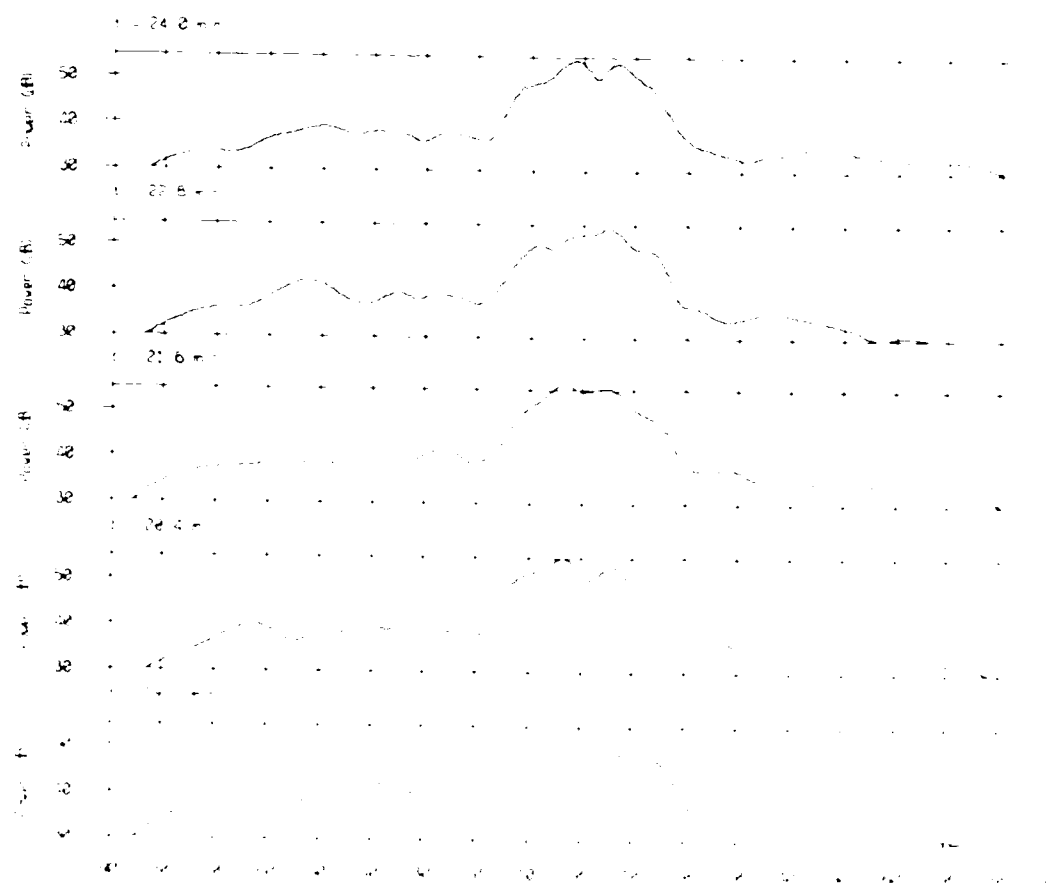


Proc. Response - 85010 Bin #5902

$f = 202$ Hz, KB window (alpha = 1.5)

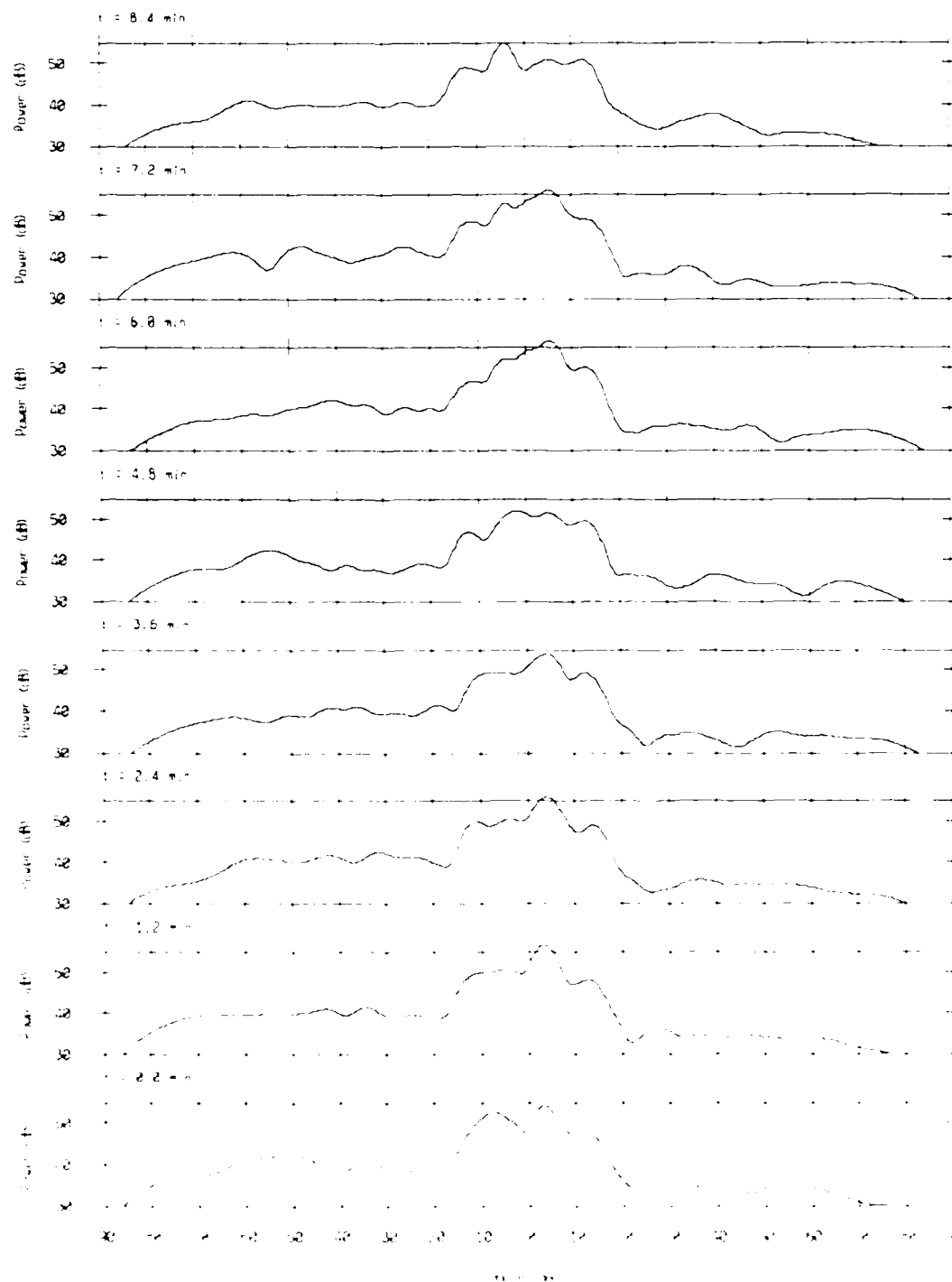


Array Response - 85012 Bin #5922
 $f = 220 \text{ Hz}$, Δf window (band) = 1.5



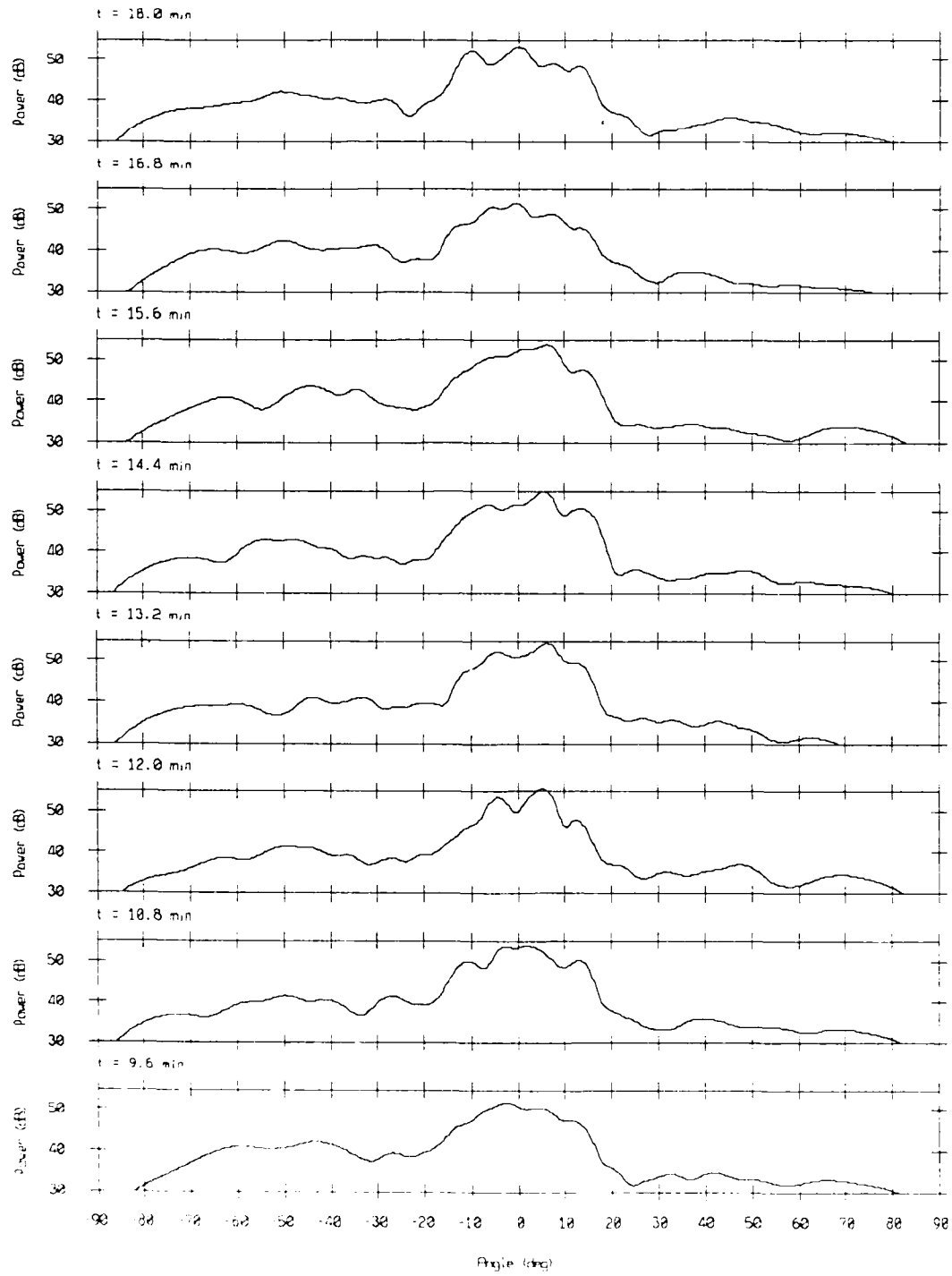
Array Response - 85010 Bin #6127

$f = 225$ Hz, ΔB window (alpha = 1.5)

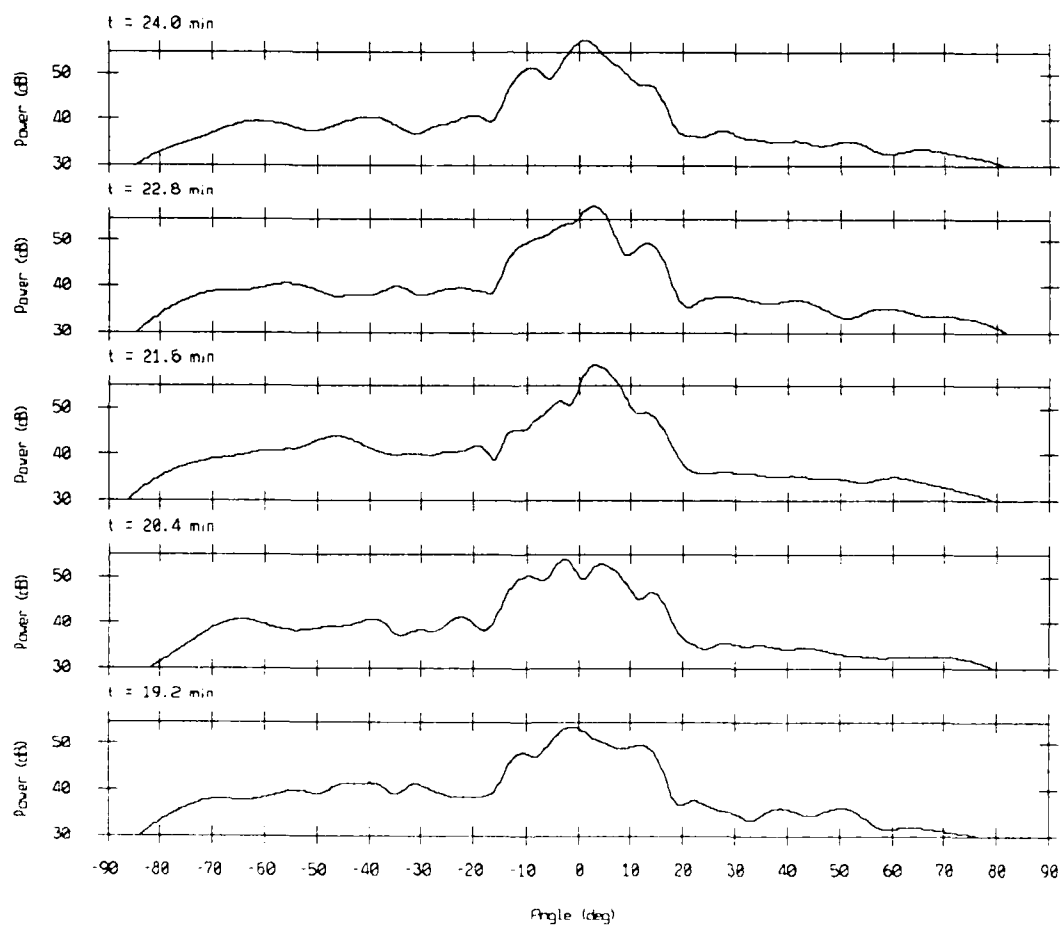


Array Response - 85010 Bin #6127

$f = 225$ Hz, KB window ($\alpha = 1.5$)

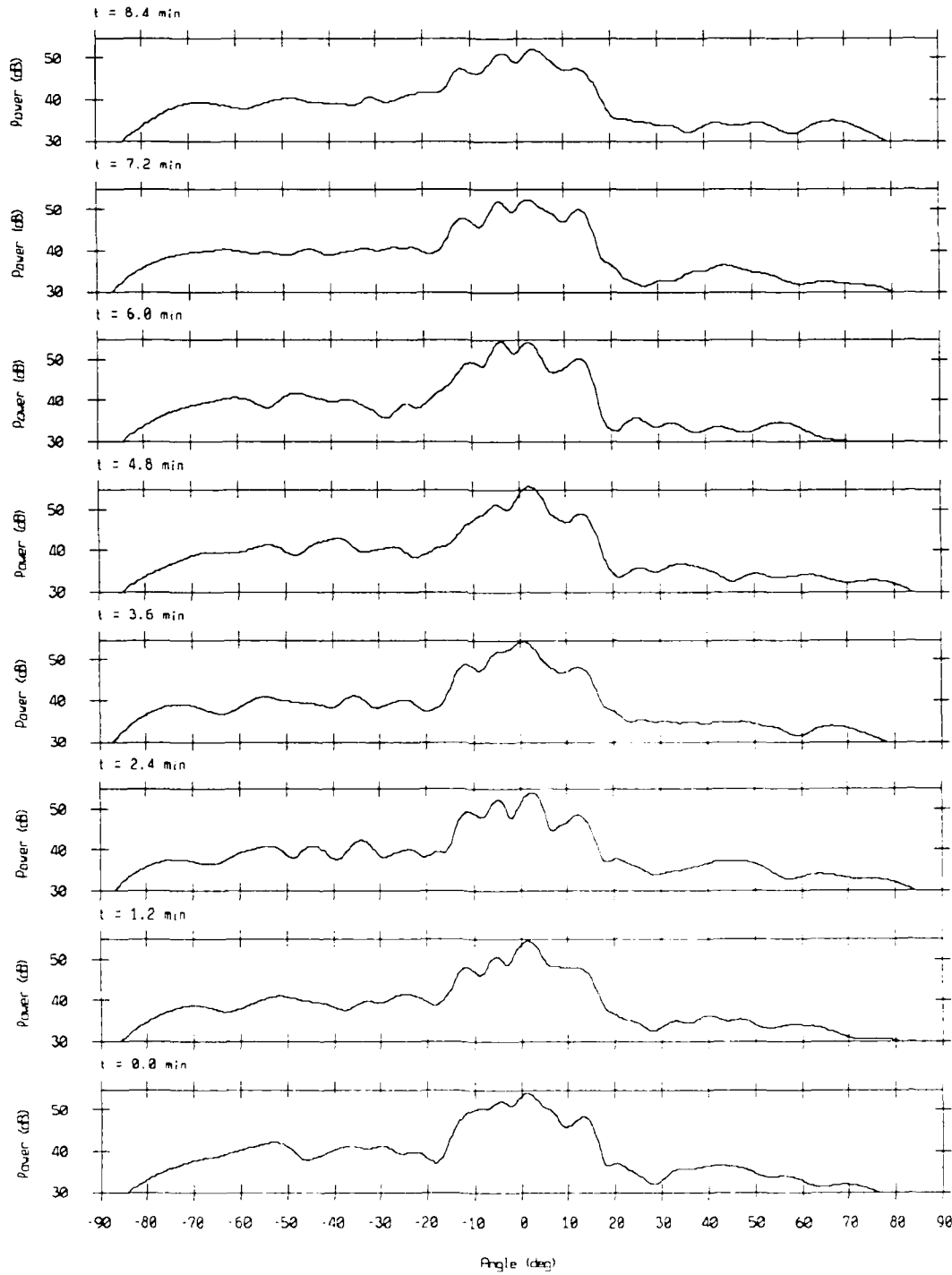


Array Response - 85010 Bin #6127
 $f = 225$ Hz, KB window ($\alpha = 1.5$)



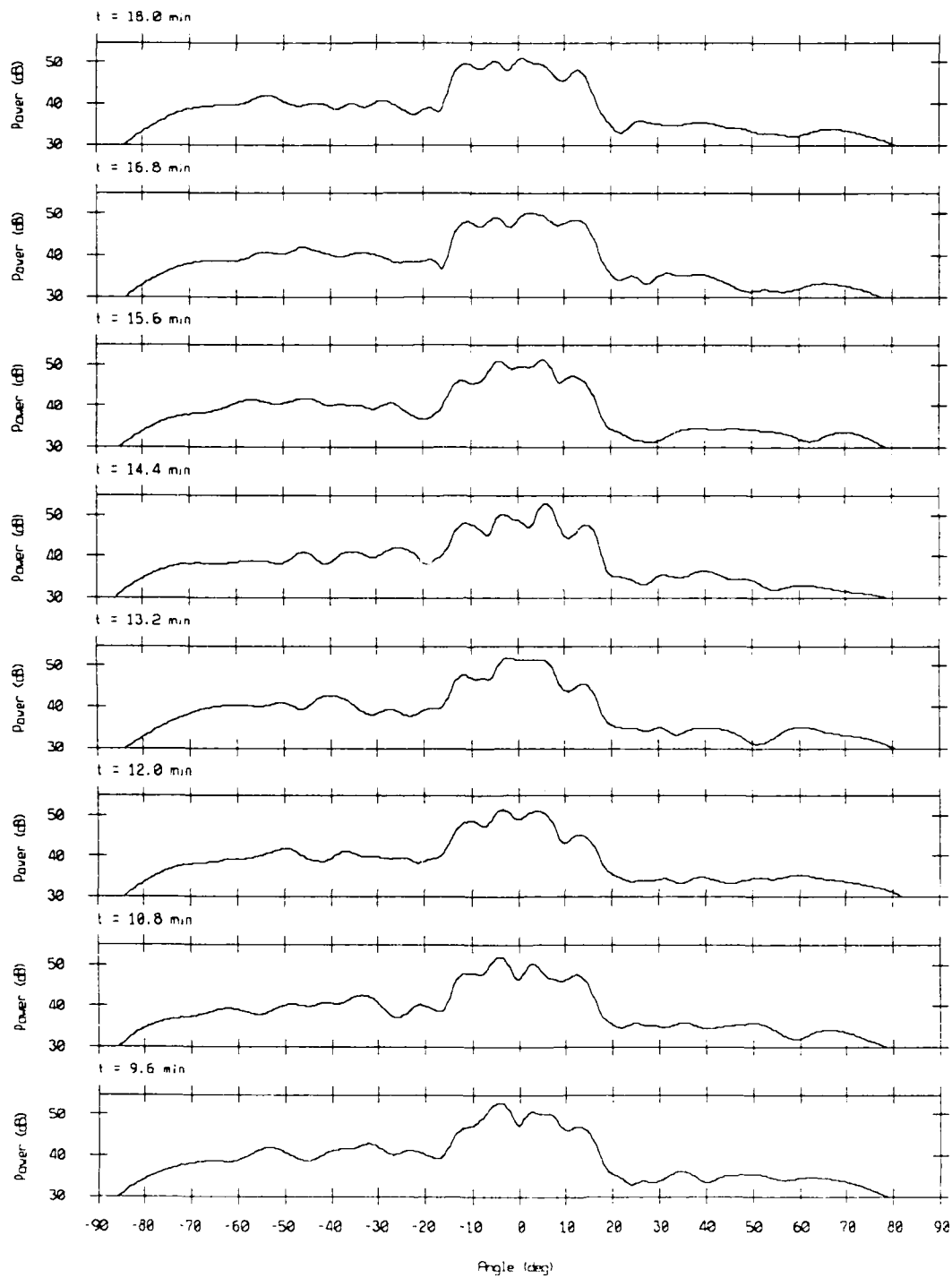
Array Response - 85010 Bin #6354

$f = 250$ Hz, KB window ($\alpha = 1.5$)



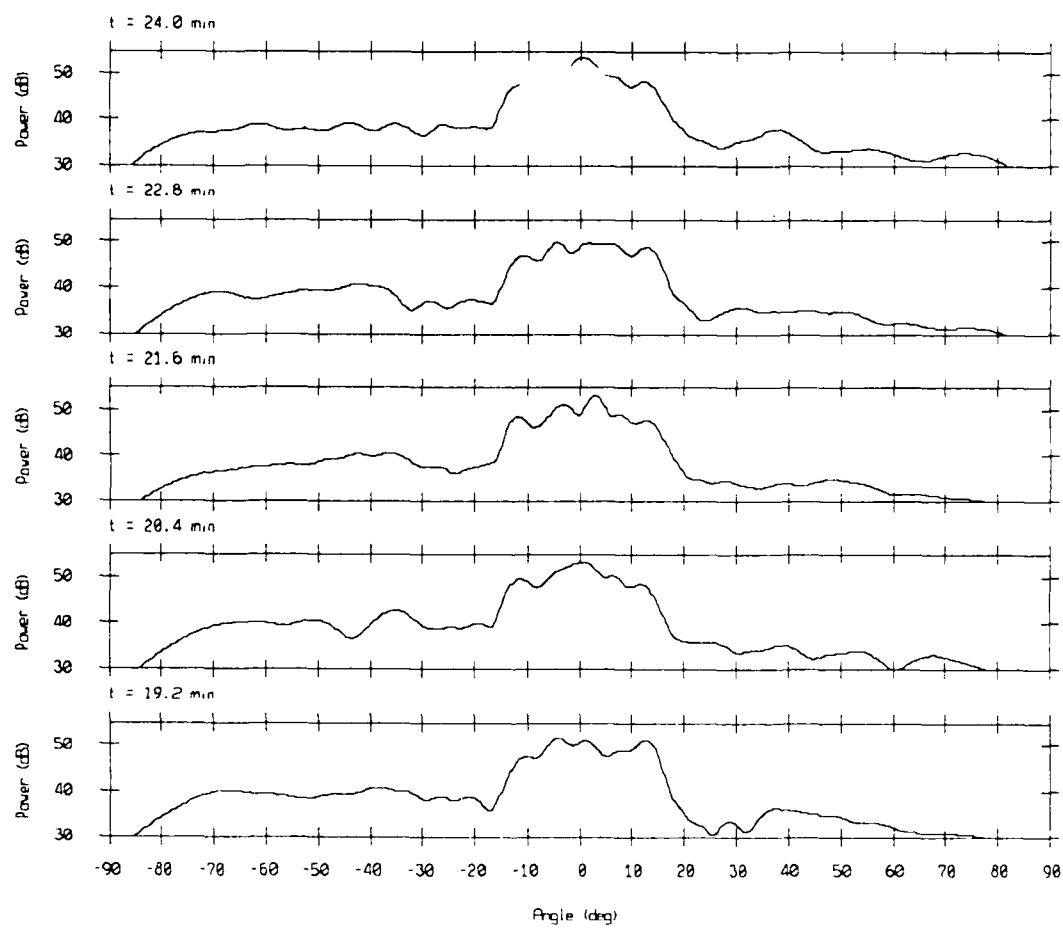
Array Response - 85010 Bin #6354

$f = 250$ Hz, KB window ($\alpha = 1.5$)



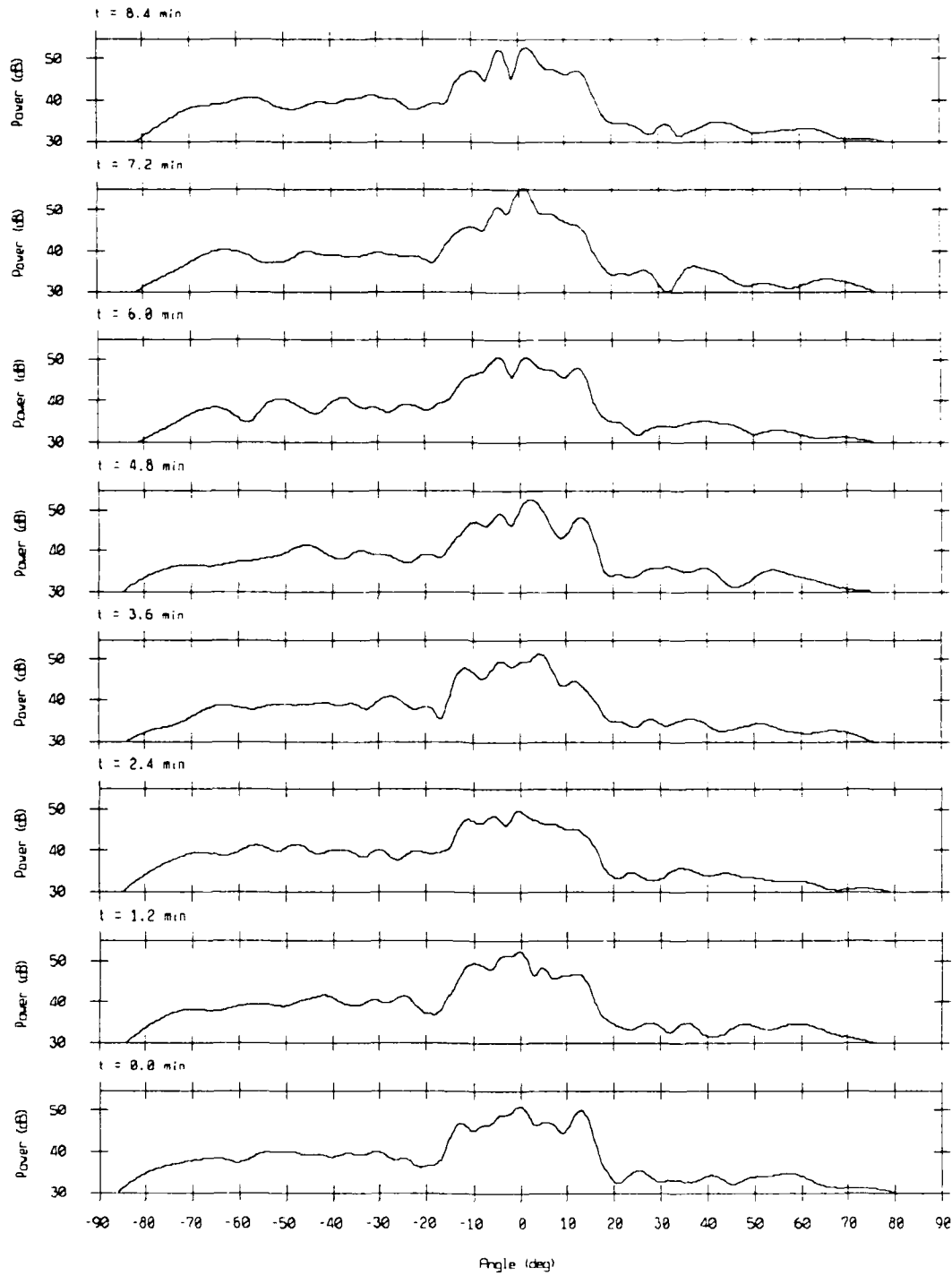
Array Response - 85010 Bin #6354

$f = 250$ Hz, KB window ($\alpha = 1.5$)



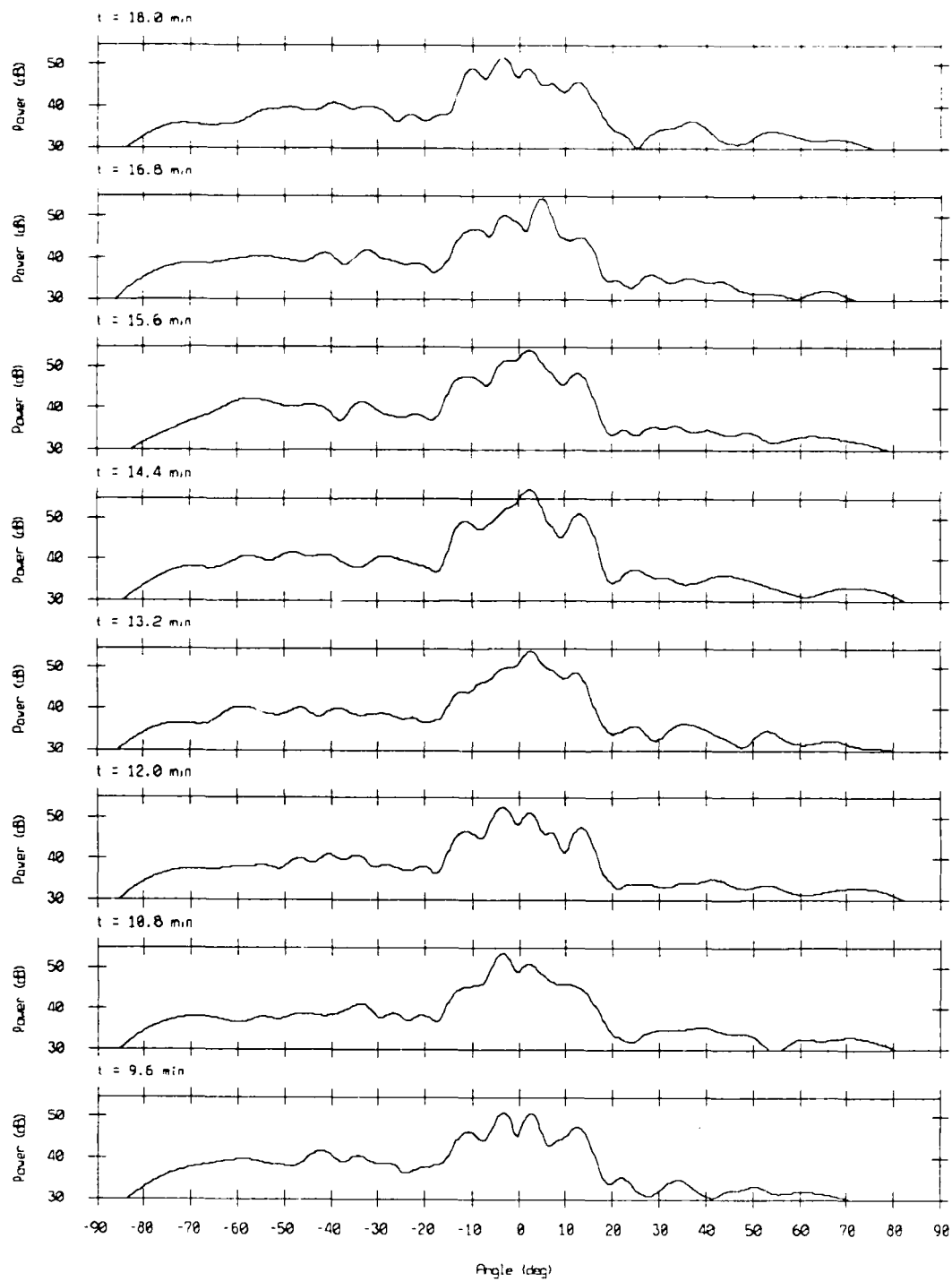
Array Response - 85010 Bin #6579

$f = 275$ Hz, KB window (alpha = 1.5)



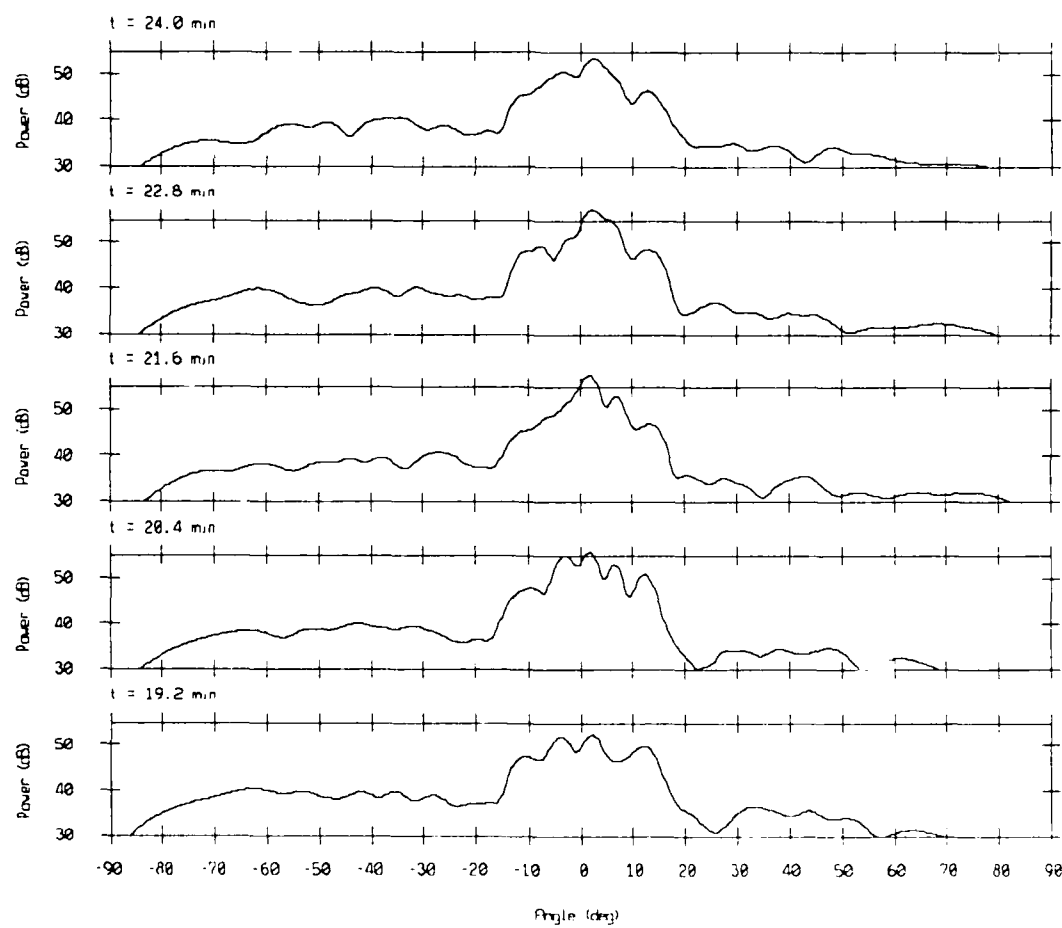
Array Response - 85010 Bin #6579

$f = 275$ Hz, KB window ($\alpha = 1.5$)



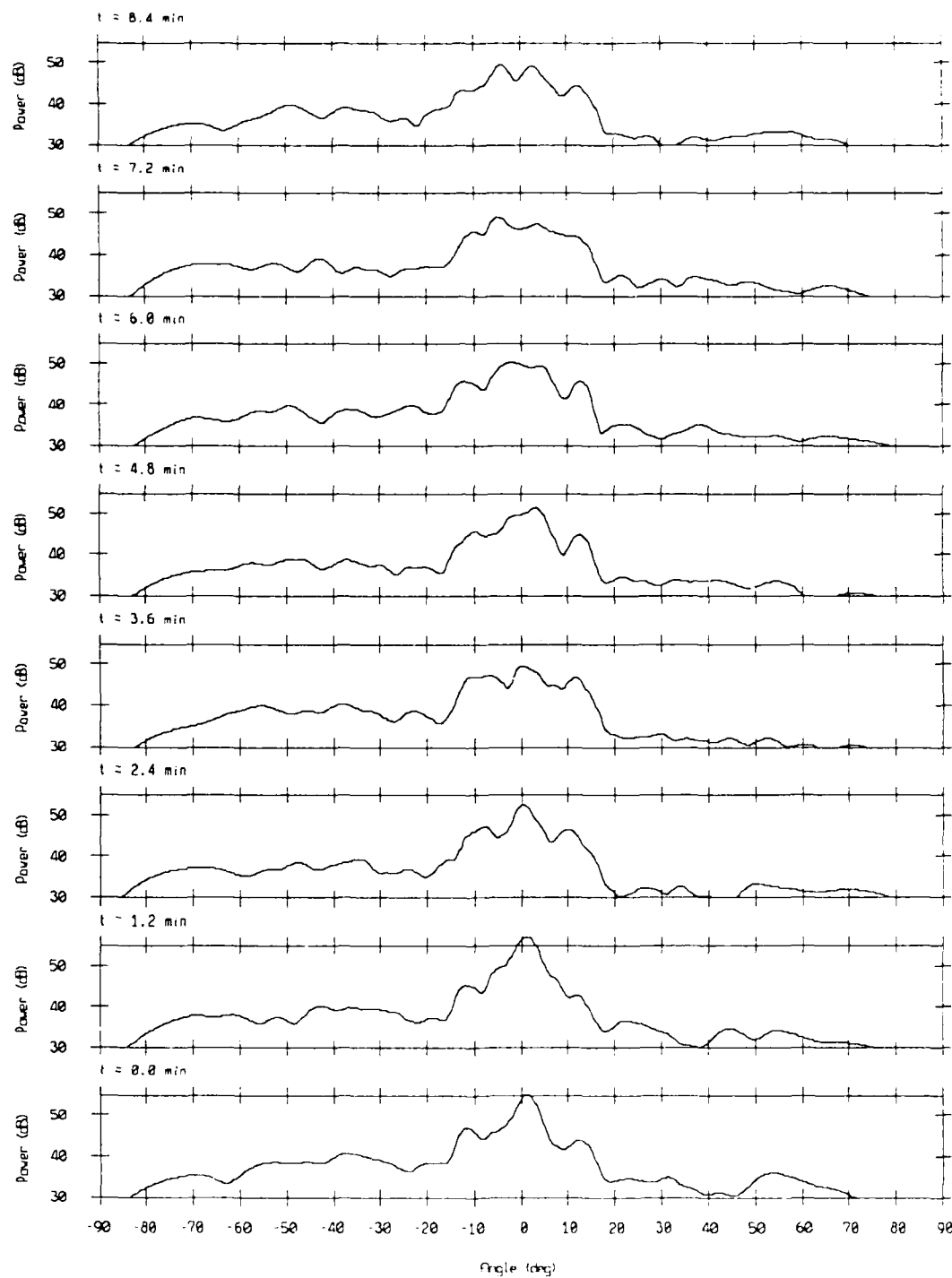
Array Response - 85010 Bin #6579

$f = 275$ Hz, KB window ($\alpha = 1.5$)



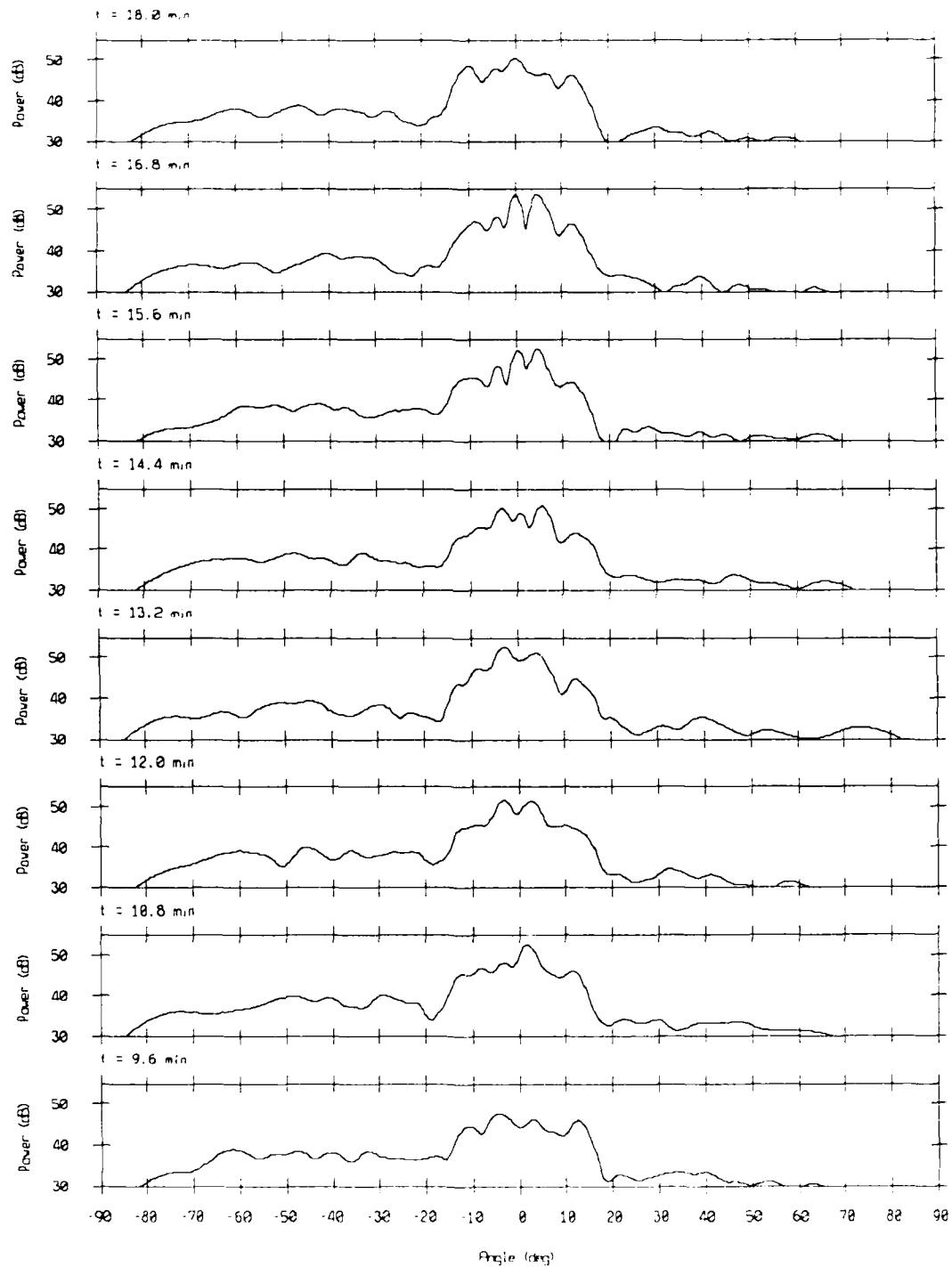
Array Response - 85010 Bin #6804

$f = 300$ Hz, ΔB window ($\alpha = 1.5$)



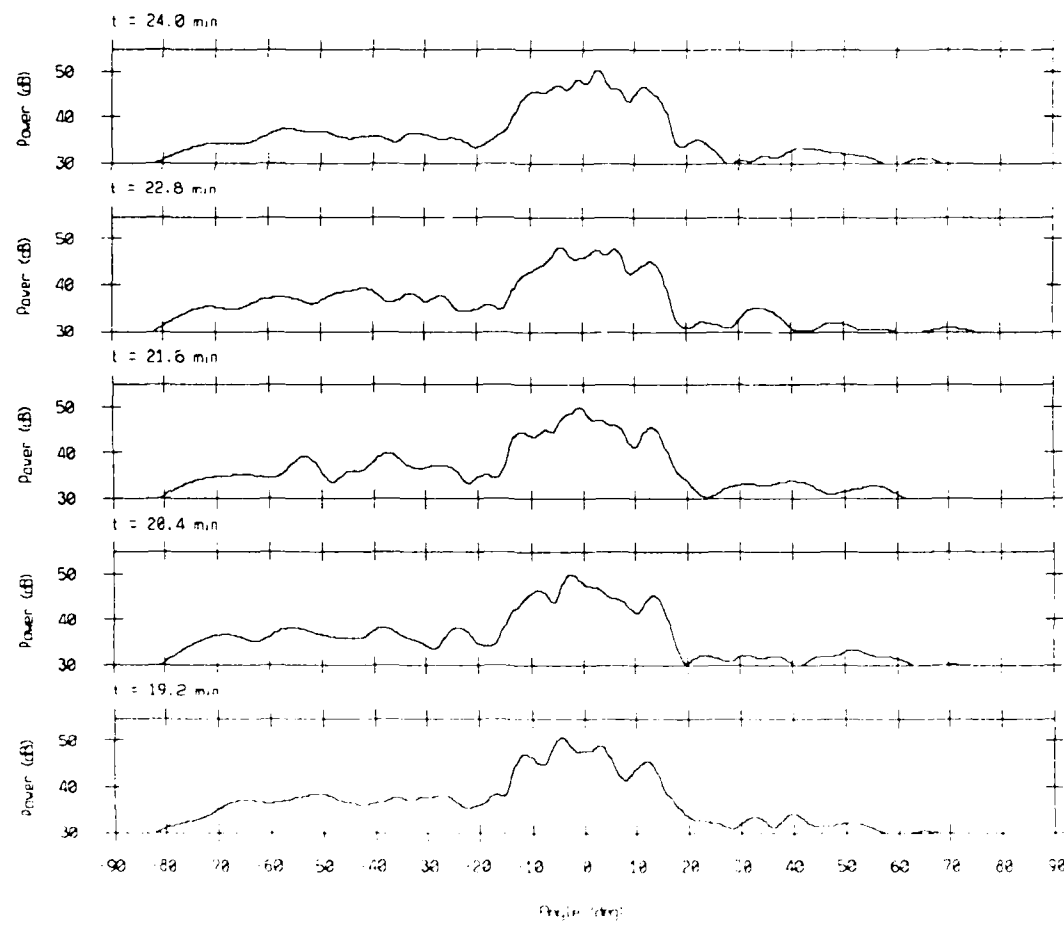
Array Response - 85010 Bin #6804

$f = 300$ Hz, KB window (alpha = 1.5)



Array Response - 85010 Bin #0824

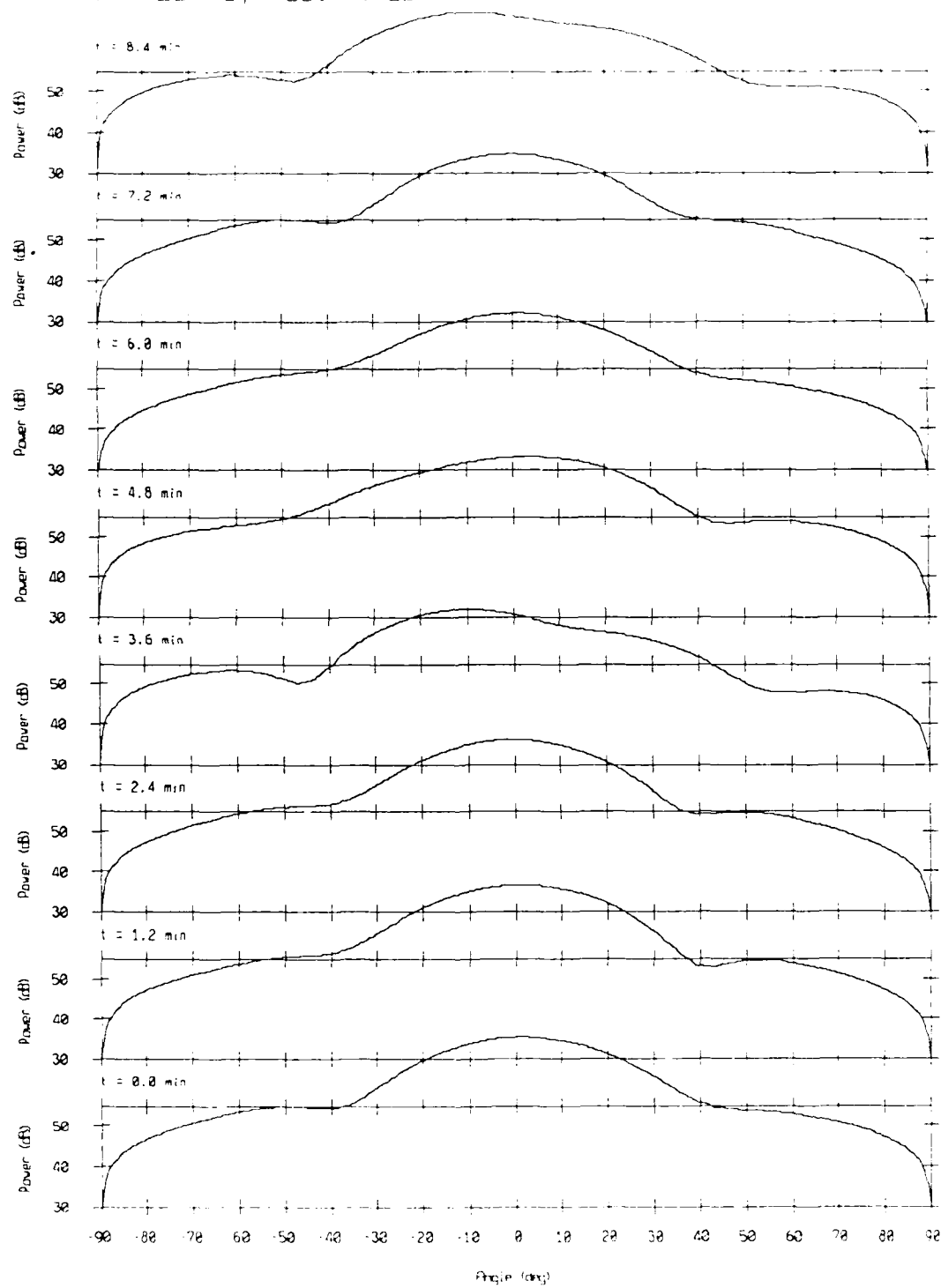
$f = 320$ Hz, K5 window (alpha = 1.5)



VII. Array Response: Panels, Rect Window.

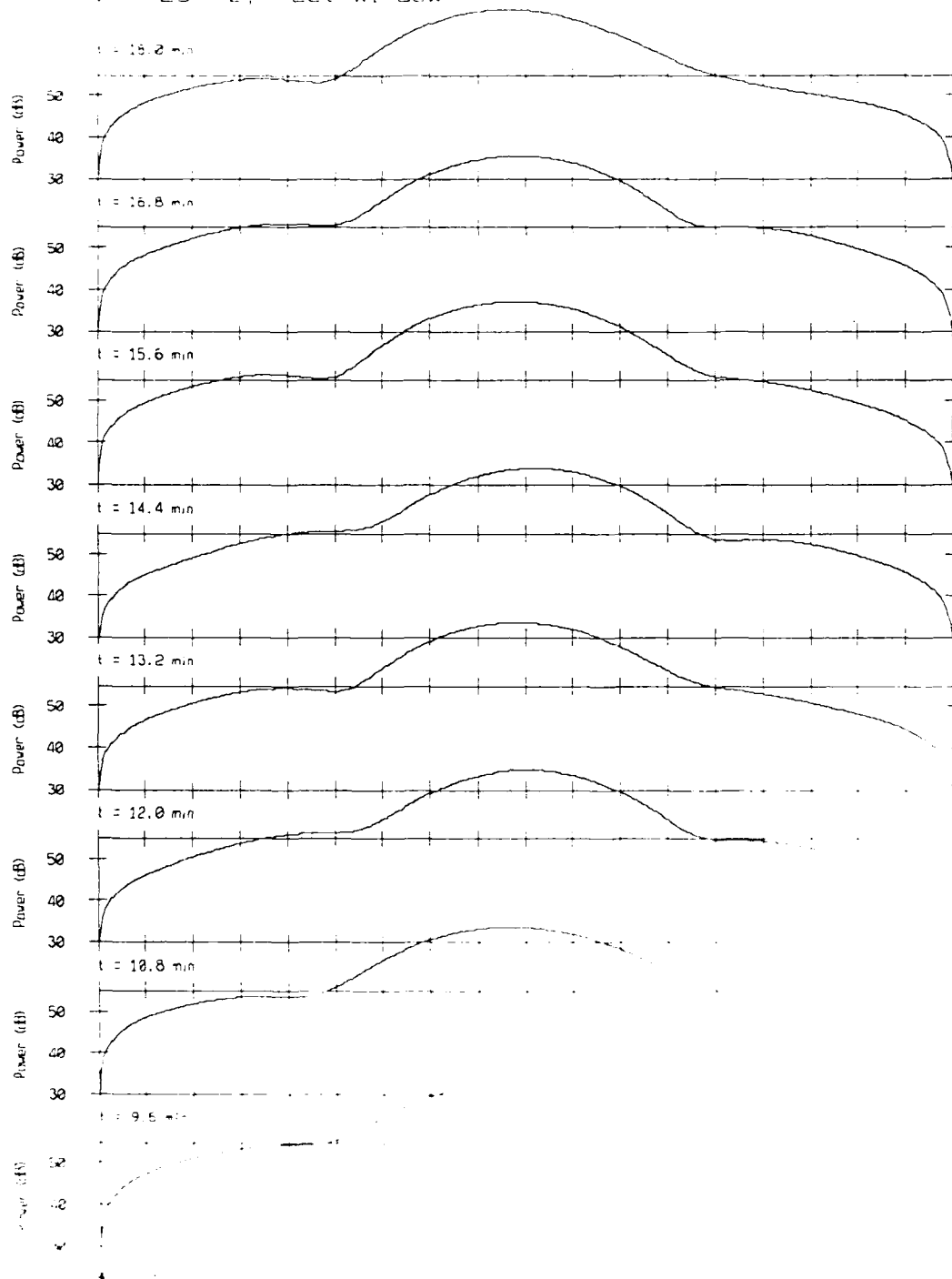
Pinch Response 85012 3/1 #4373

$f = 25$ Hz, rect window



Grating Response - 85010 B/n #4323

$f = 25$ Hz, rect window

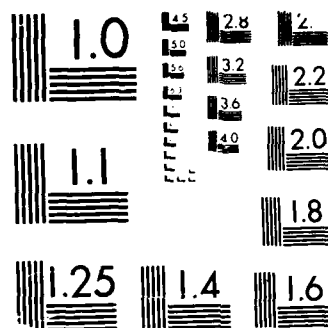


AD-A193 231 VERTICAL DIRECTIONALITY OF AMBIENT NOISE AT 32 DEG N AS 2/2
A FUNCTION OF LON.. (U) SCRIPPS INSTITUTION OF
OCEANOGRAPHY LA JOLLA CA MARINE PHYSIC..
UNCLASSIFIED M 5 HODGKISS ET AL. JAN 88 MPL-TM-387-B F/G 20/1 NL

UNCLASSIFIED

F/G 20/1

NL

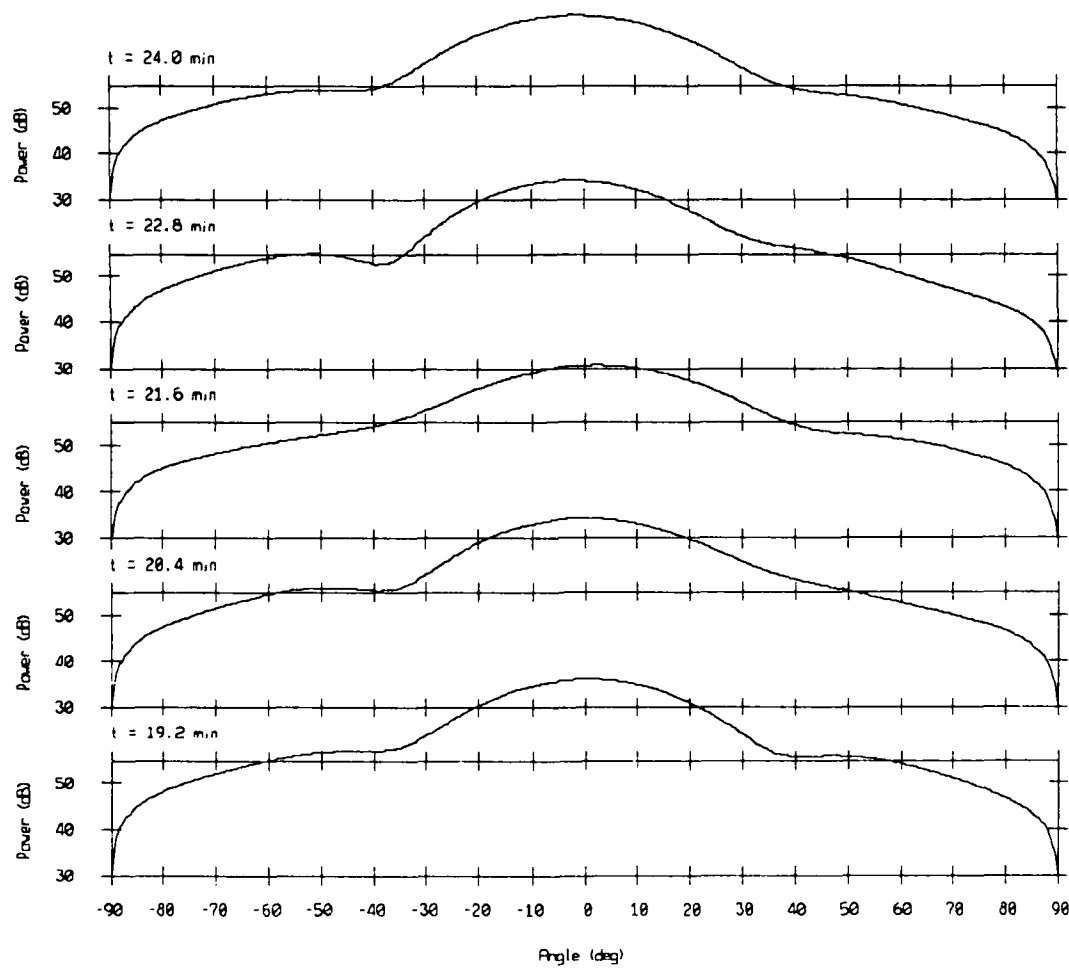


MICROCOPY RESOLUTION TEST CHART

1963A1 STANDARDS 1963A1

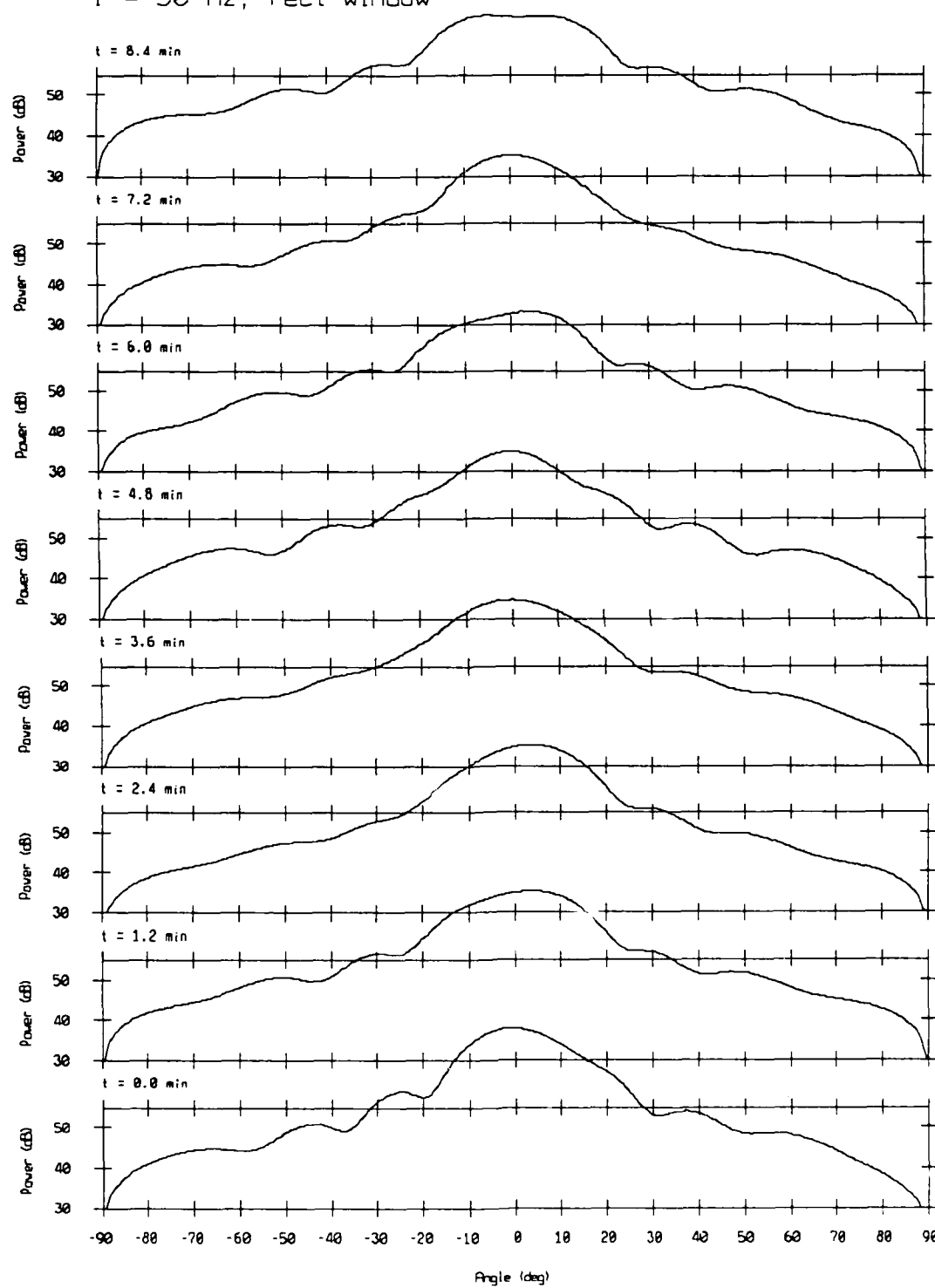
Array Response - 85010 Bin #4323

$f = 25$ Hz, rect window



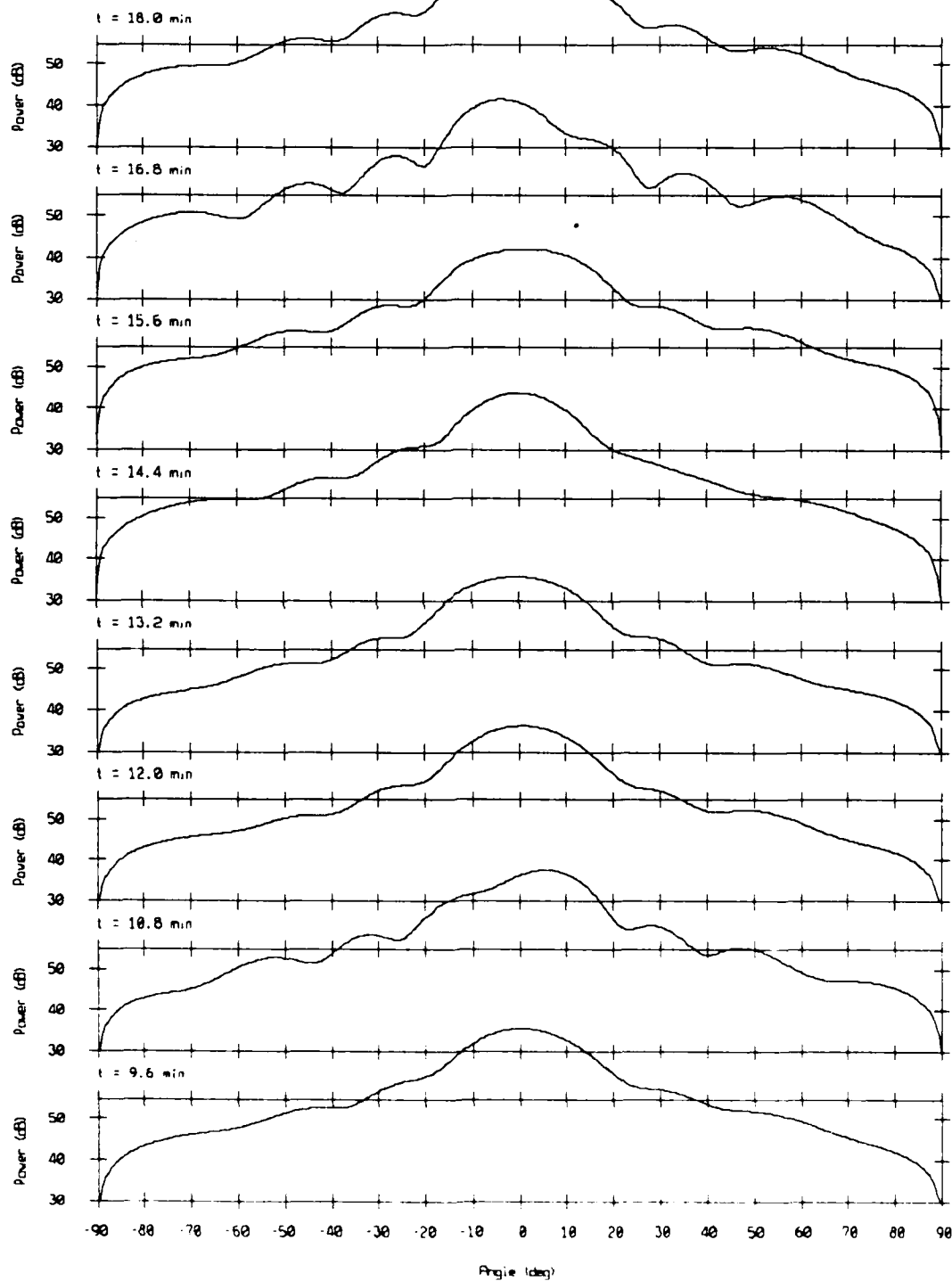
Array Response - 85010 Bin #4548

$f = 50$ Hz, rect window



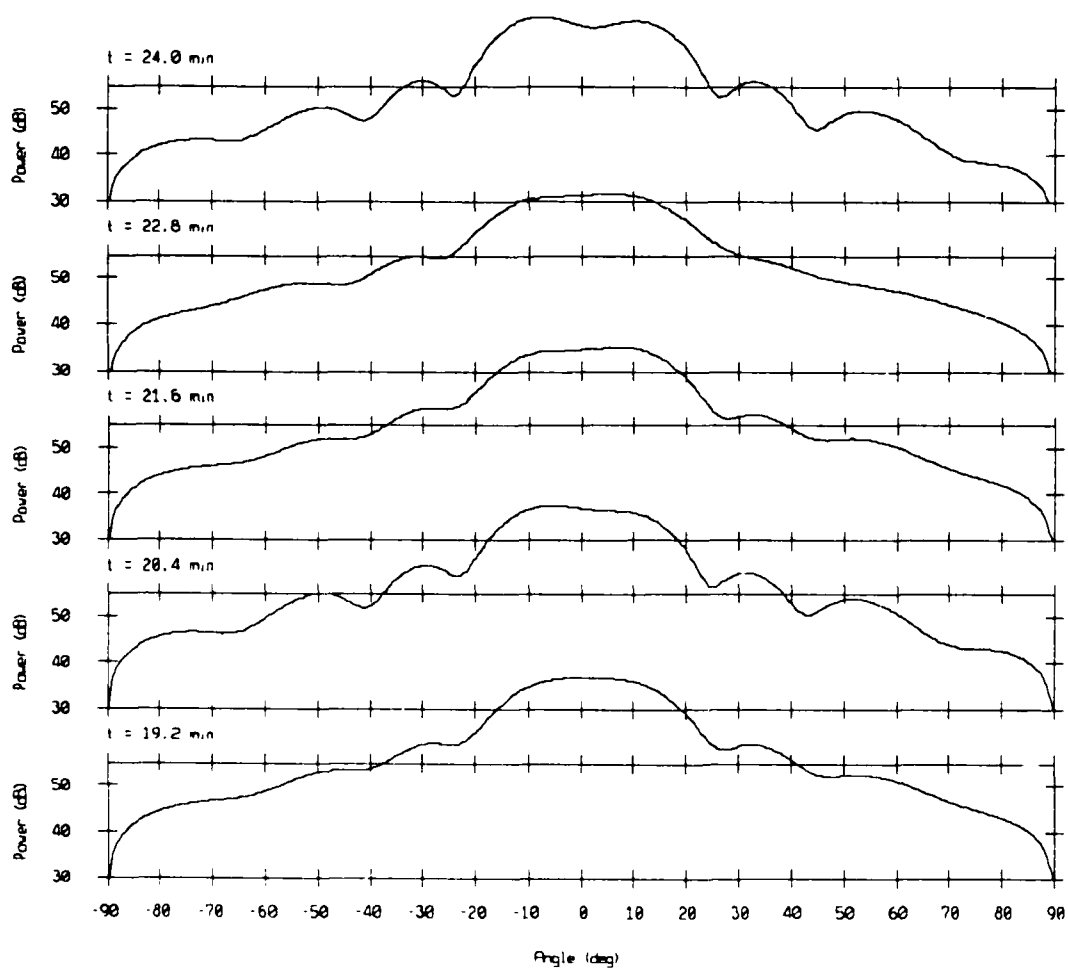
Array Response - 85010 Bin #4548

$f = 50$ Hz, rect window



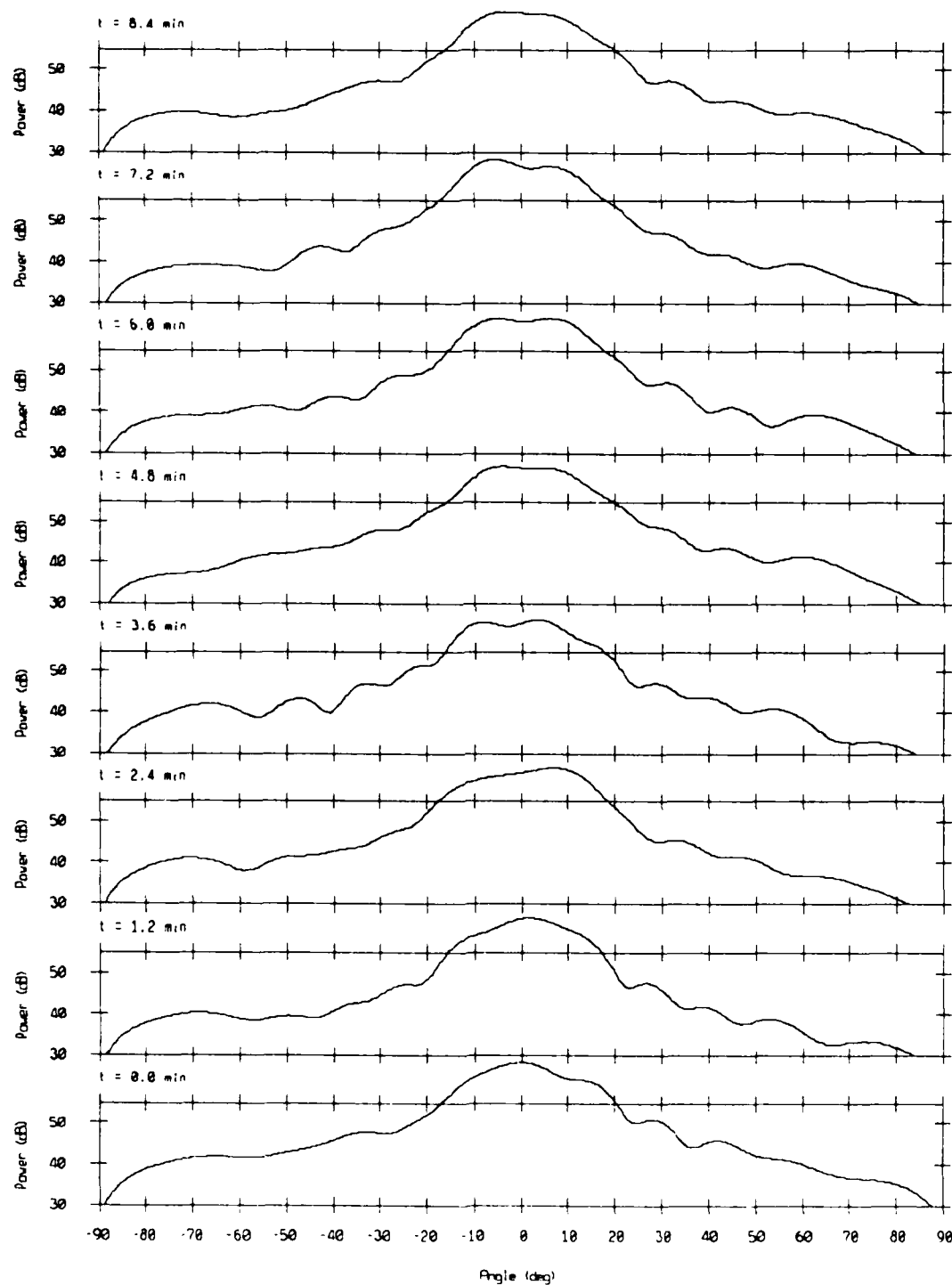
Array Response - 85010 Bin #4548

$f = 50$ Hz, rect window



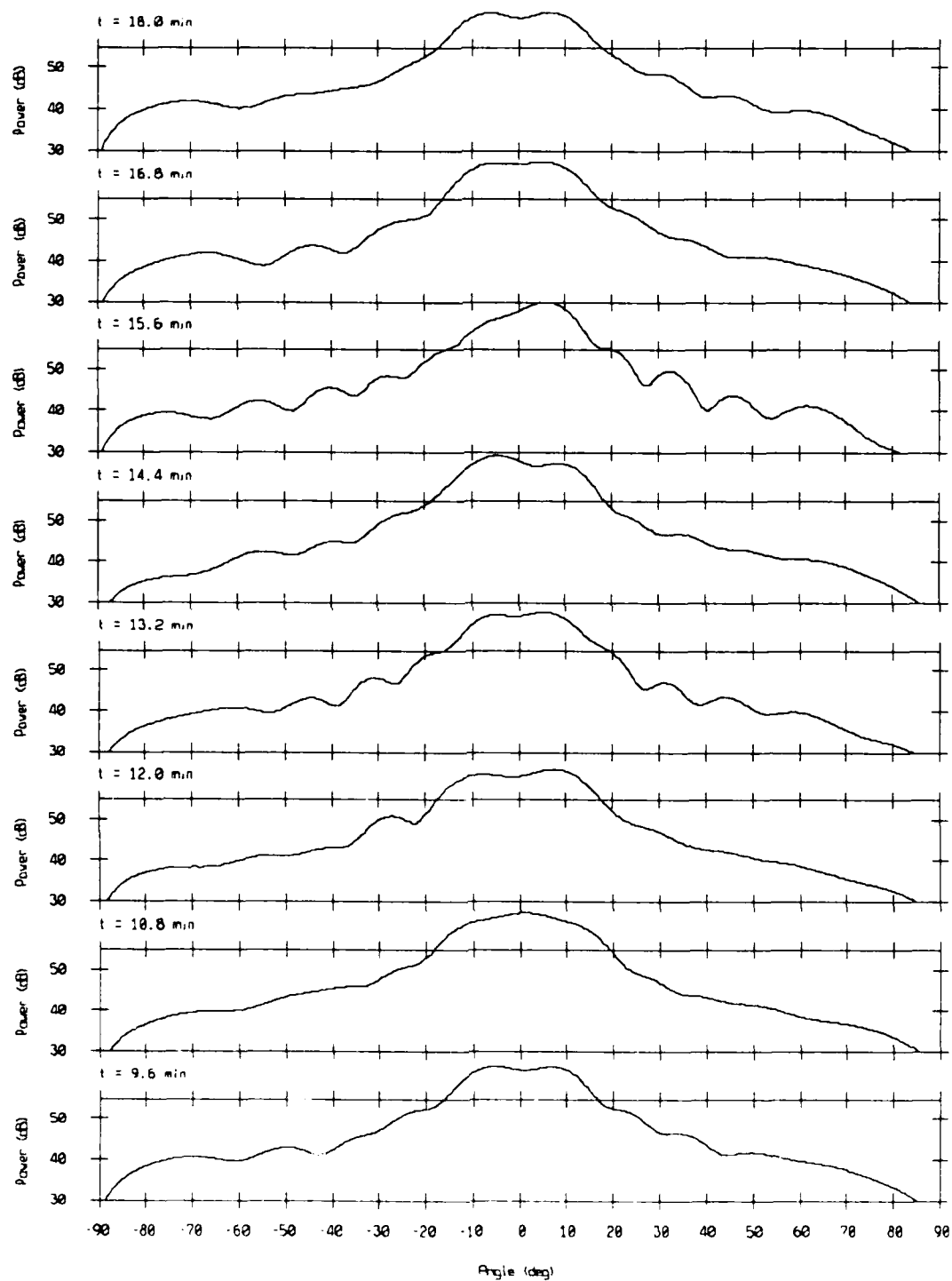
Array Response - 85010 Bin #4774

$f = 75$ Hz, rect window



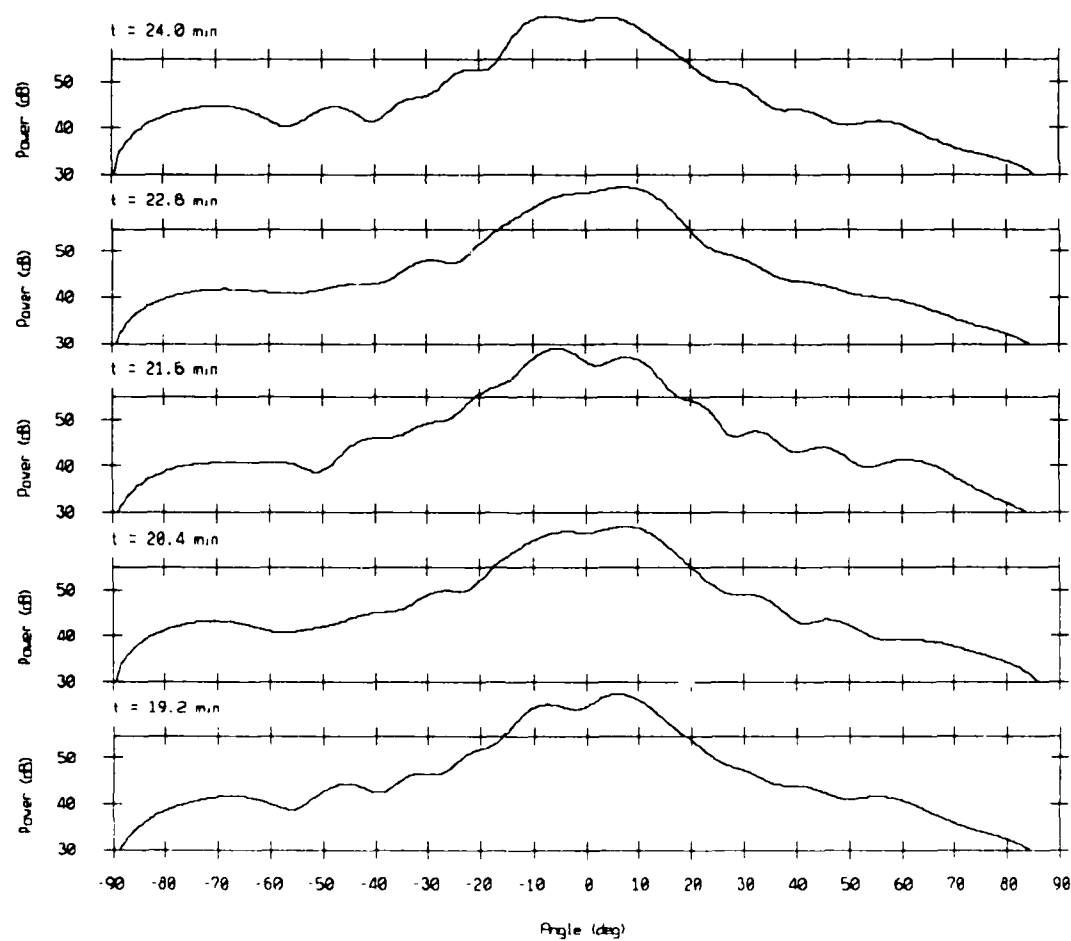
Array Response - 85010 Bin #4774

$f = 75$ Hz, rect window



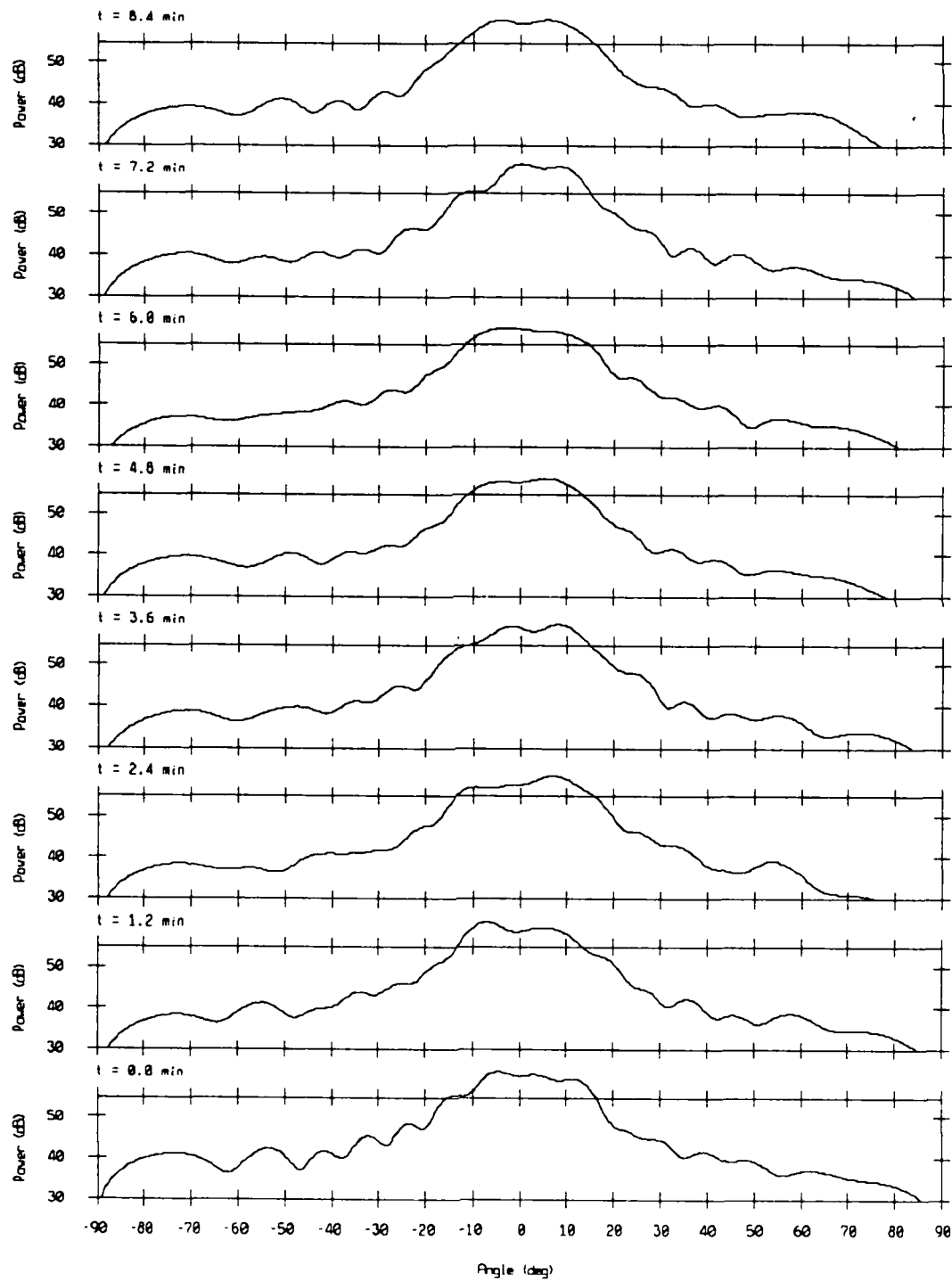
Array Response - 85010 Bin #4774

$f = 75$ Hz, rect window



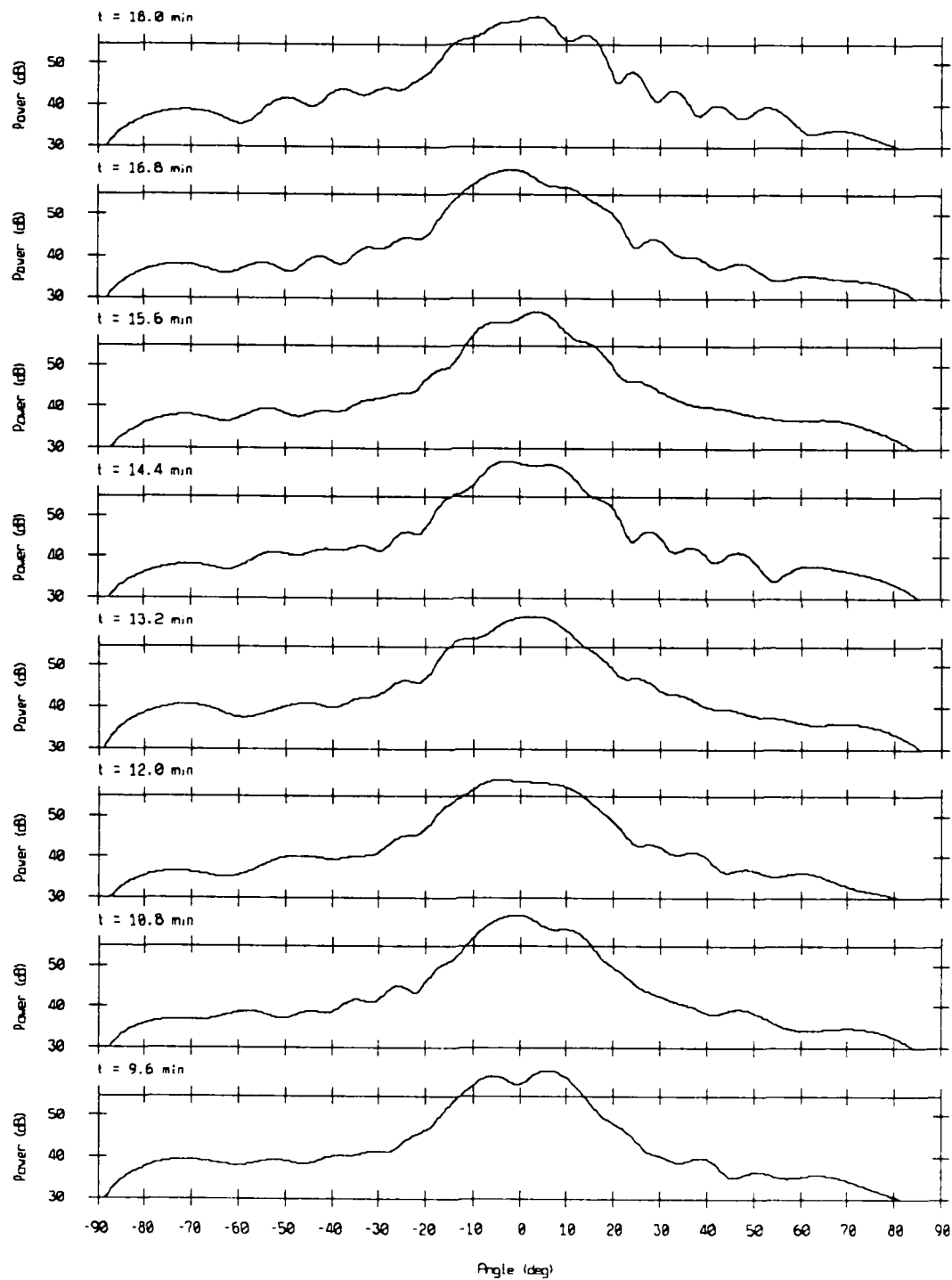
Array Response - 85010 Bin #4999

$f = 100$ Hz, rect window



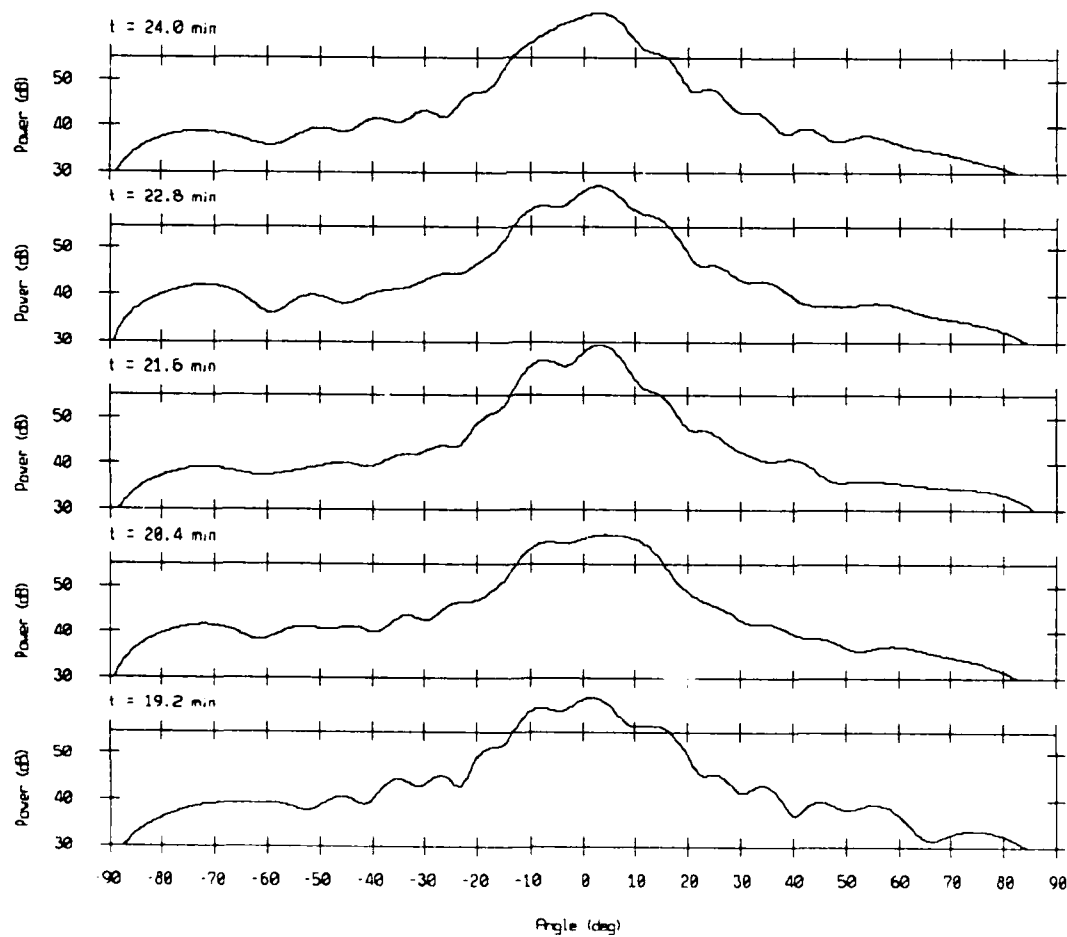
Array Response - 85010 Bin #4999

$f = 100$ Hz, rect window



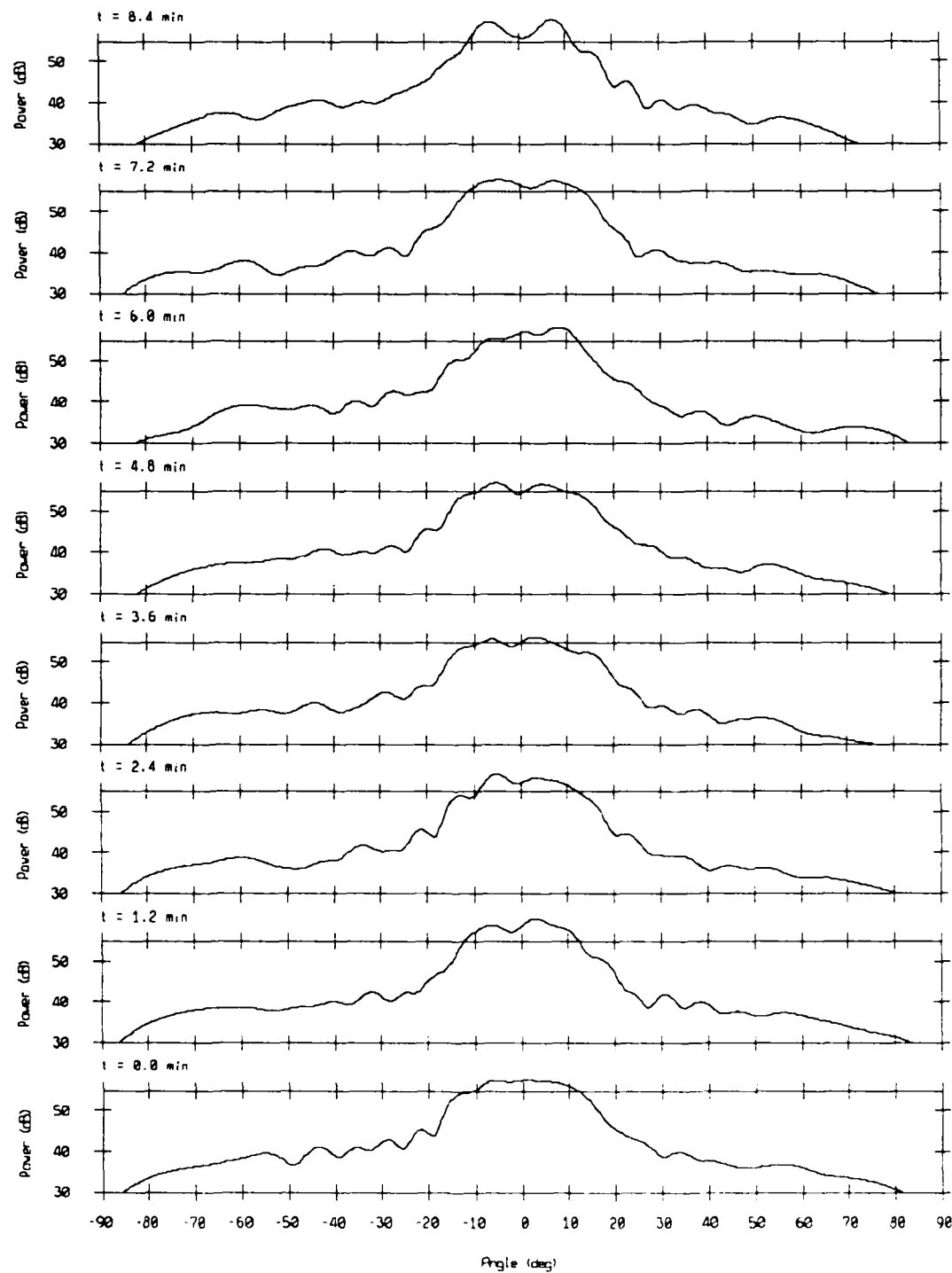
Array Response - 85010 Bin #4999

$f = 100$ Hz, rect window



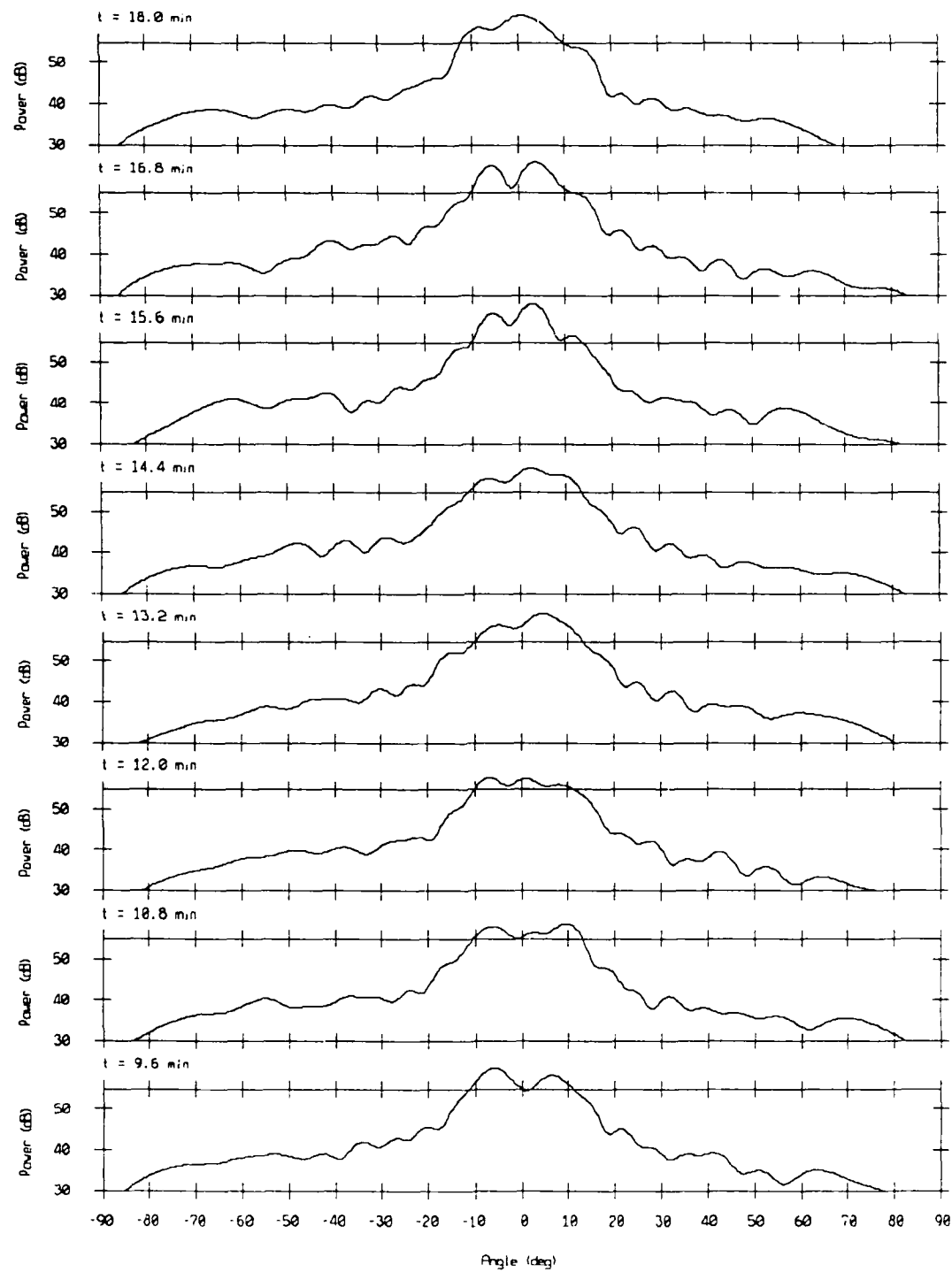
Array Response - 85010 Bin #5225

$f = 125$ Hz, rect window



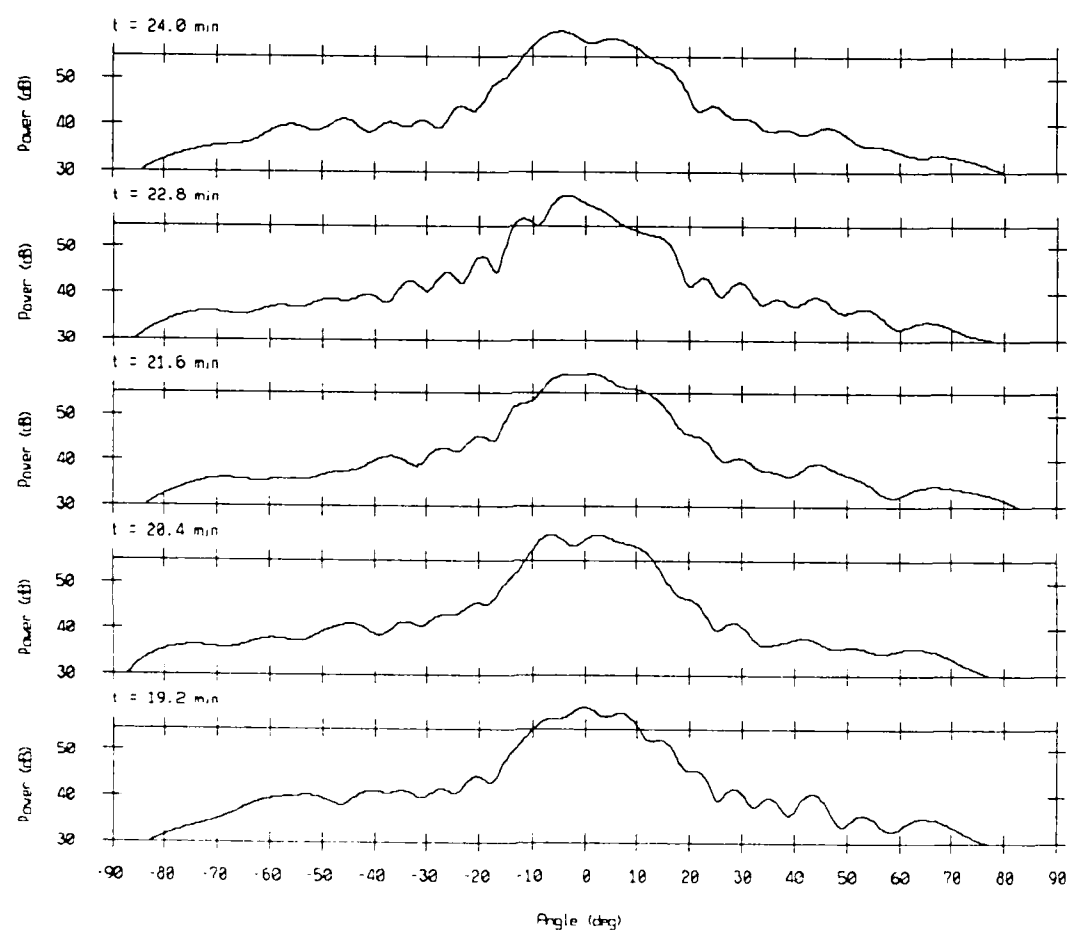
Array Response - 85010 Bin #5225

$f = 125$ Hz, rect window



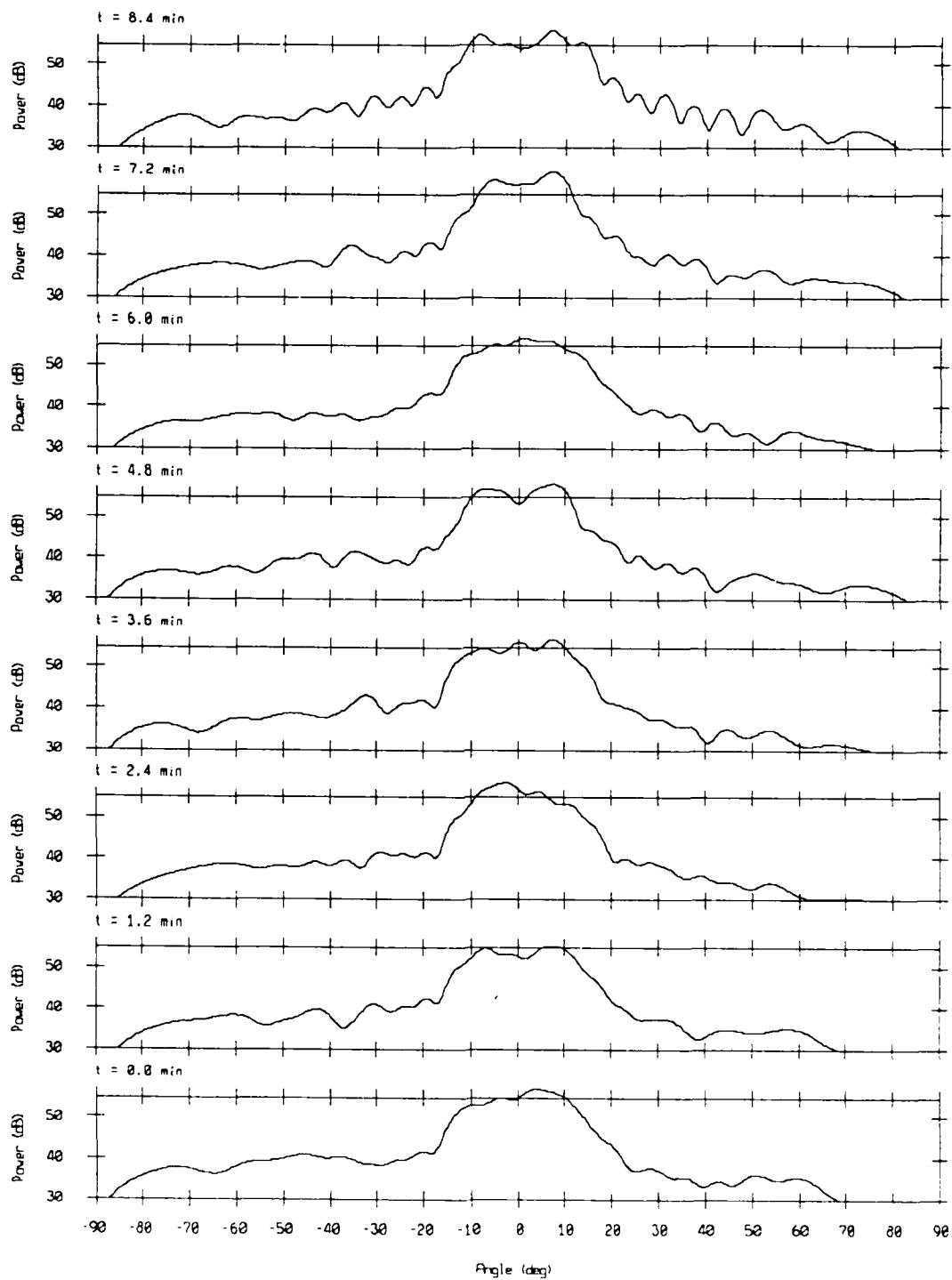
Array Response - 85010 Bin #5225

$f = 125$ Hz, rect window



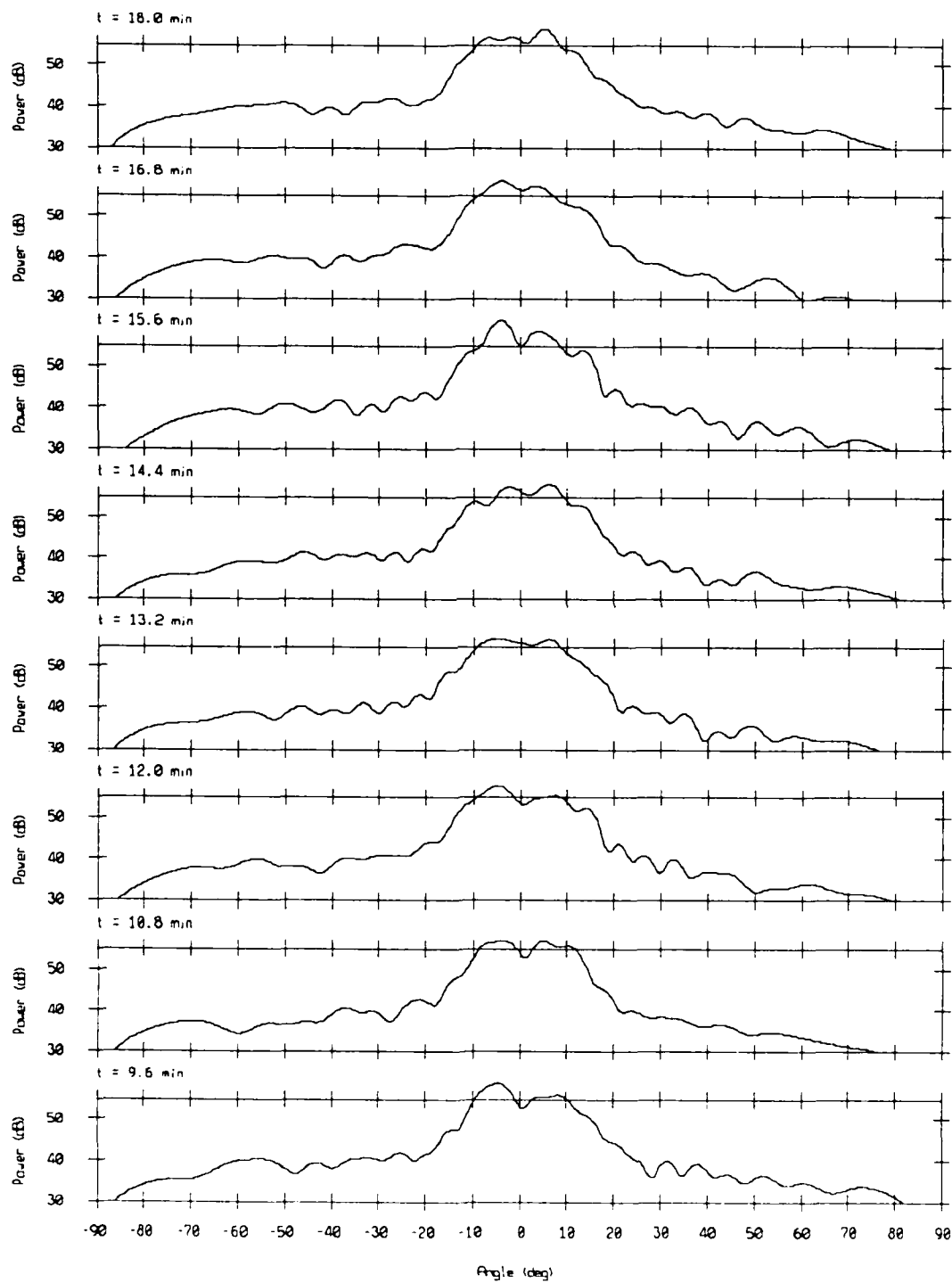
Array Response - 85010 Bin #5451

$f = 150$ Hz, rect window



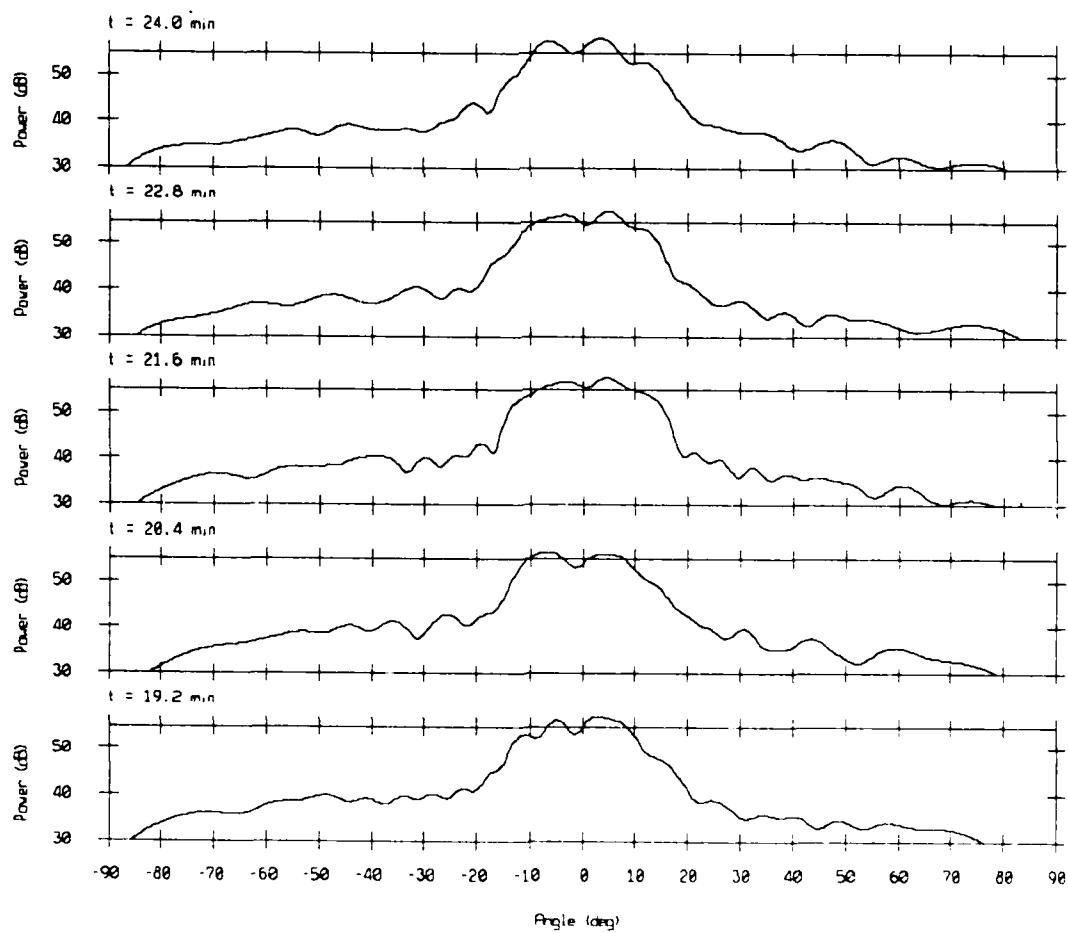
Array Response - 85010 Bin #5451

$f = 150$ Hz, rect window



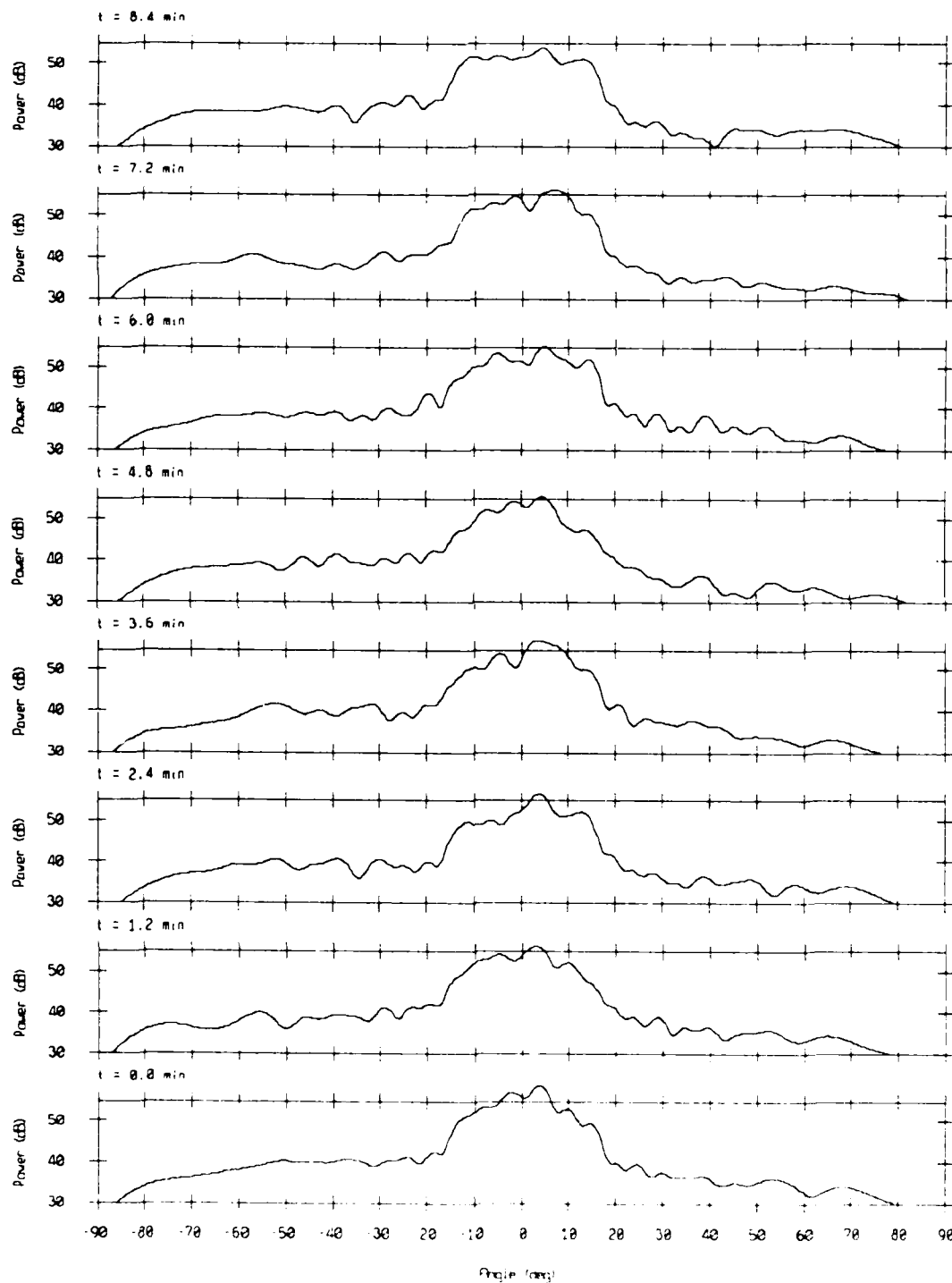
Array Response - 85010 Bin #5451

$f = 150$ Hz, rect window



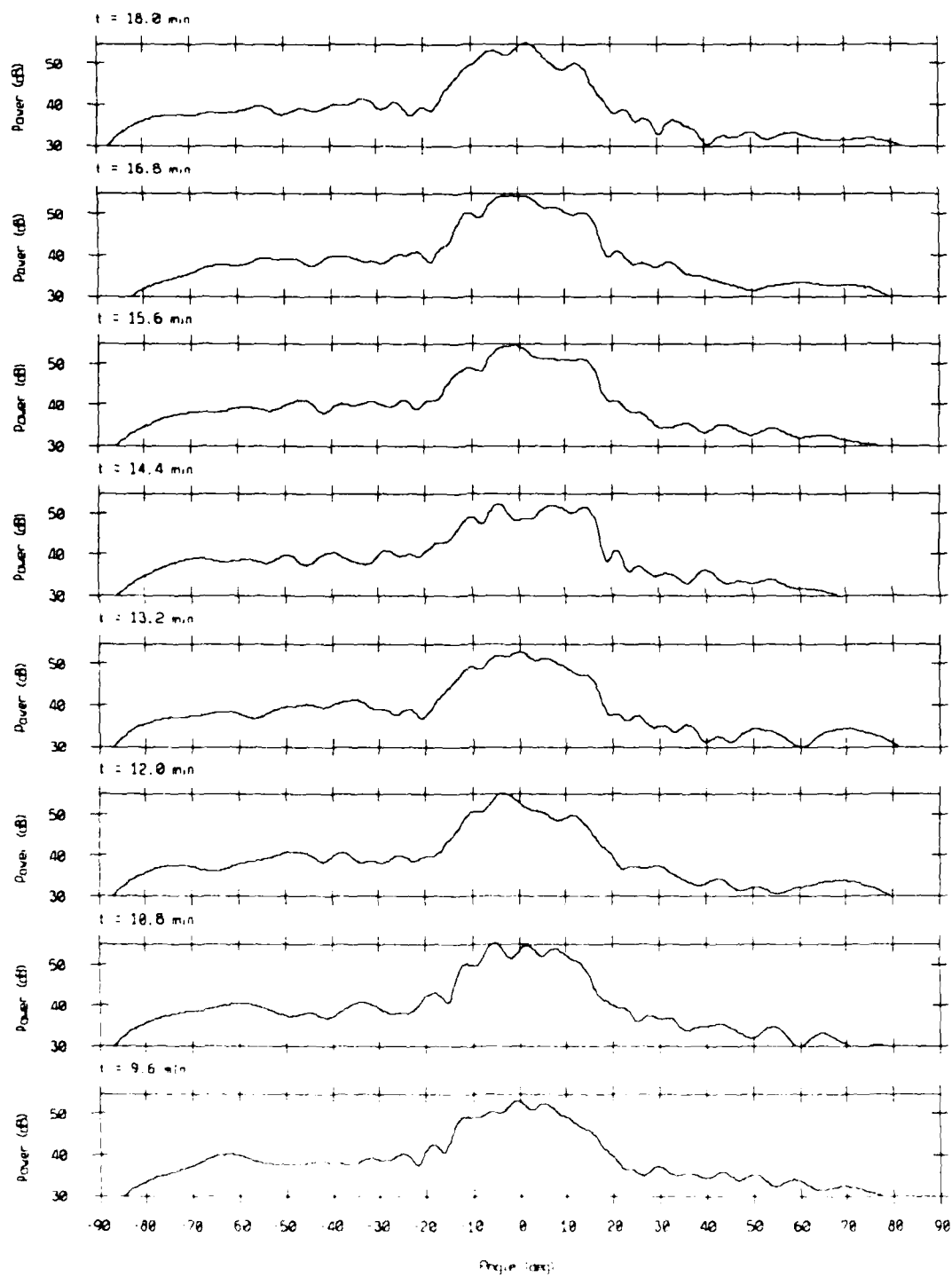
Array Response - 85010 Bin #5676

$f = 175$ Hz, rect window



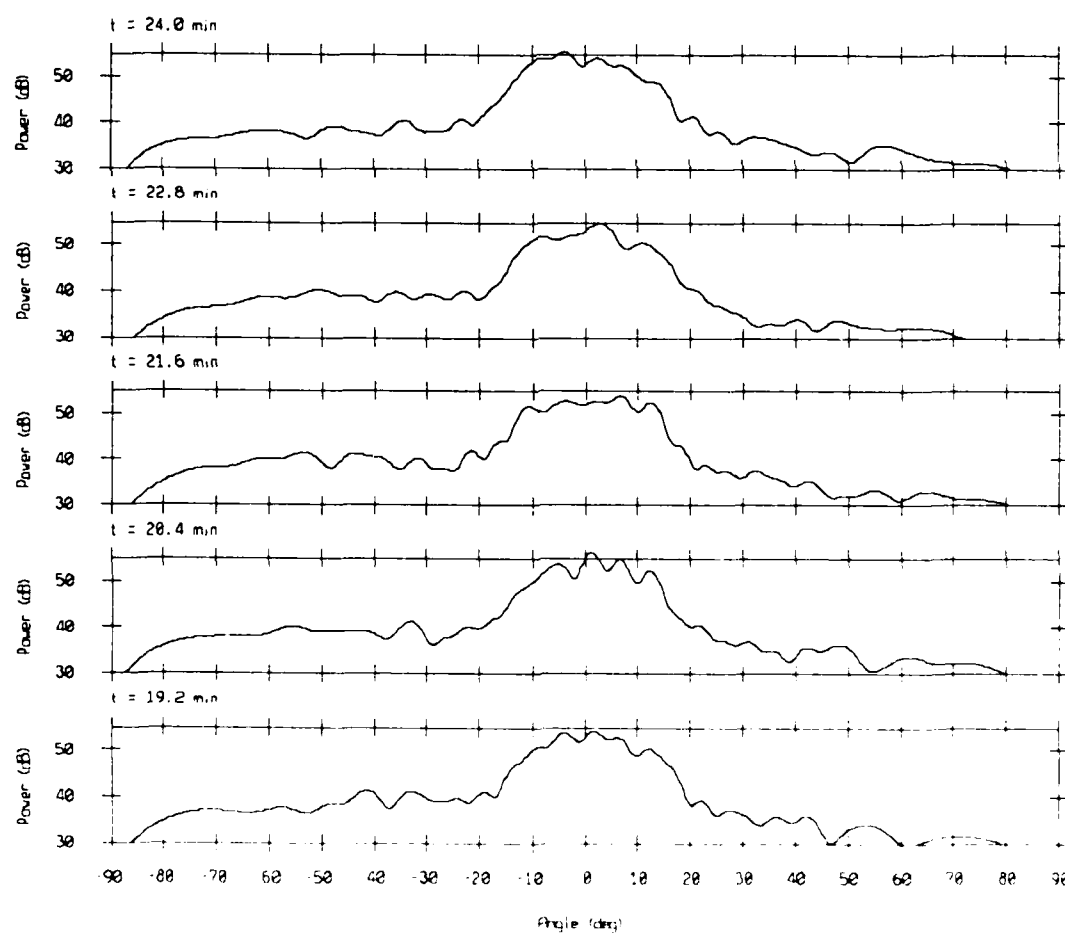
Array Response - 85010 Bin #5676

$f = 175$ Hz, rect window



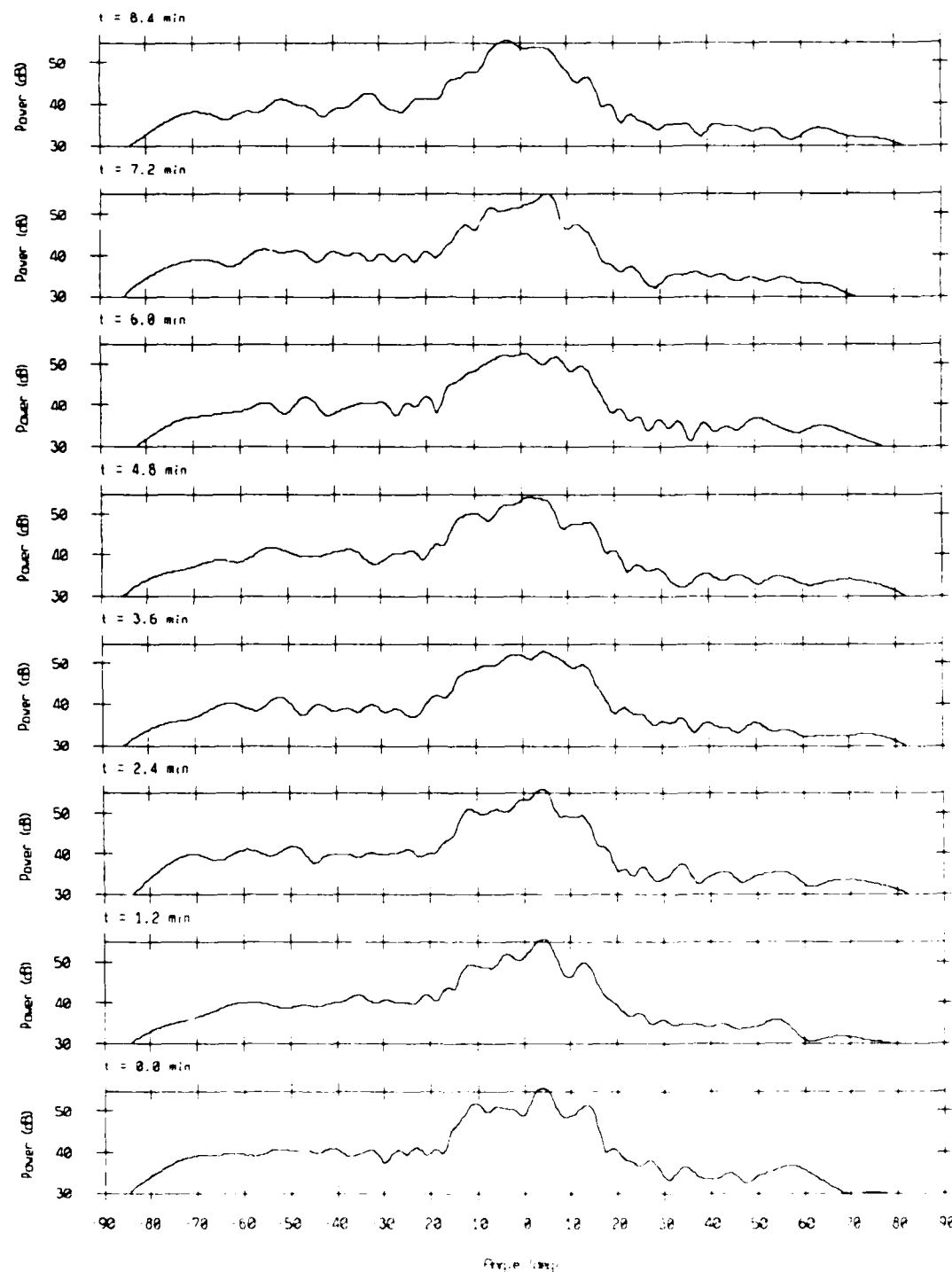
Array Response - 85010 Bin #5676

$f = 175$ Hz, rect window



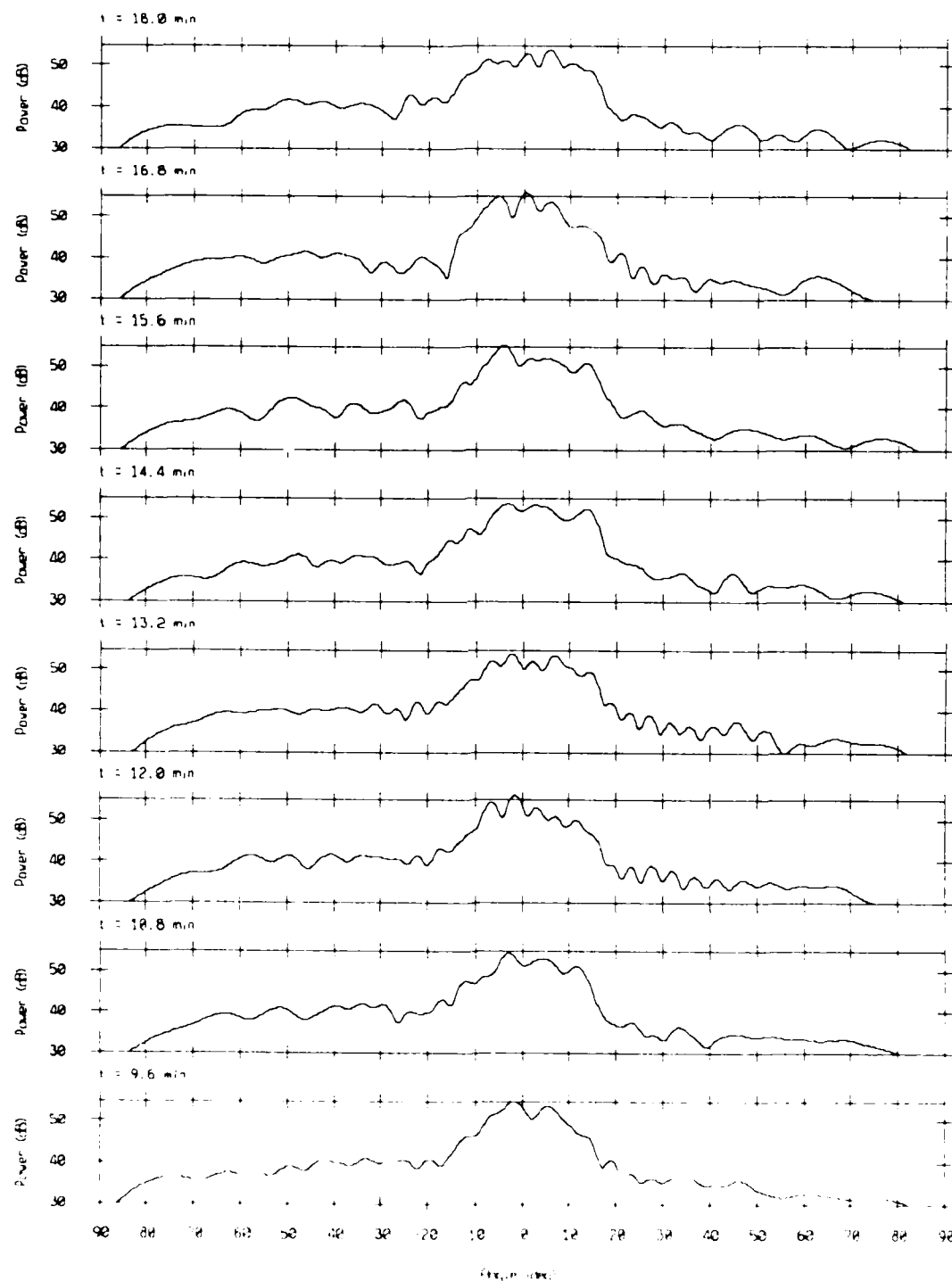
Array Response - 85010 Bin #5902

$f = 200$ Hz, rect window



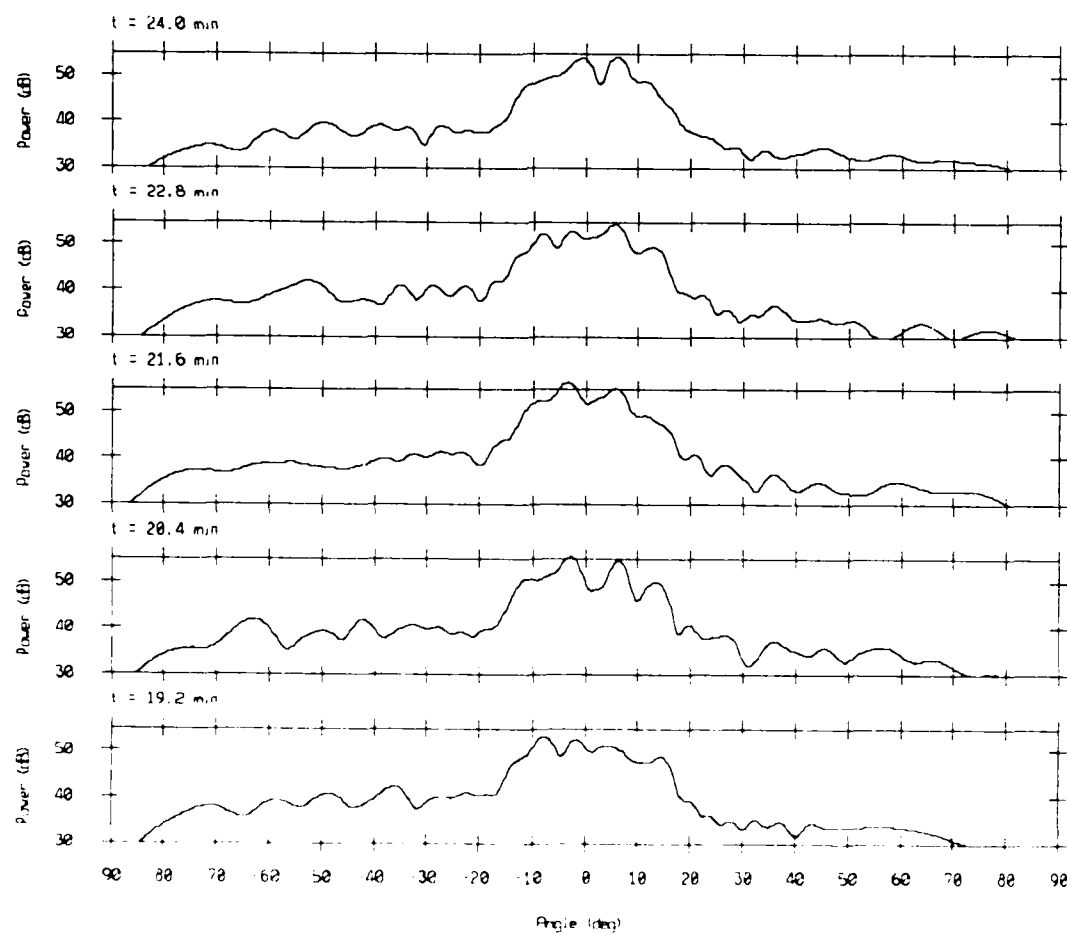
Array Response - 85010 Bin #5902

$f = 200$ Hz, rect window



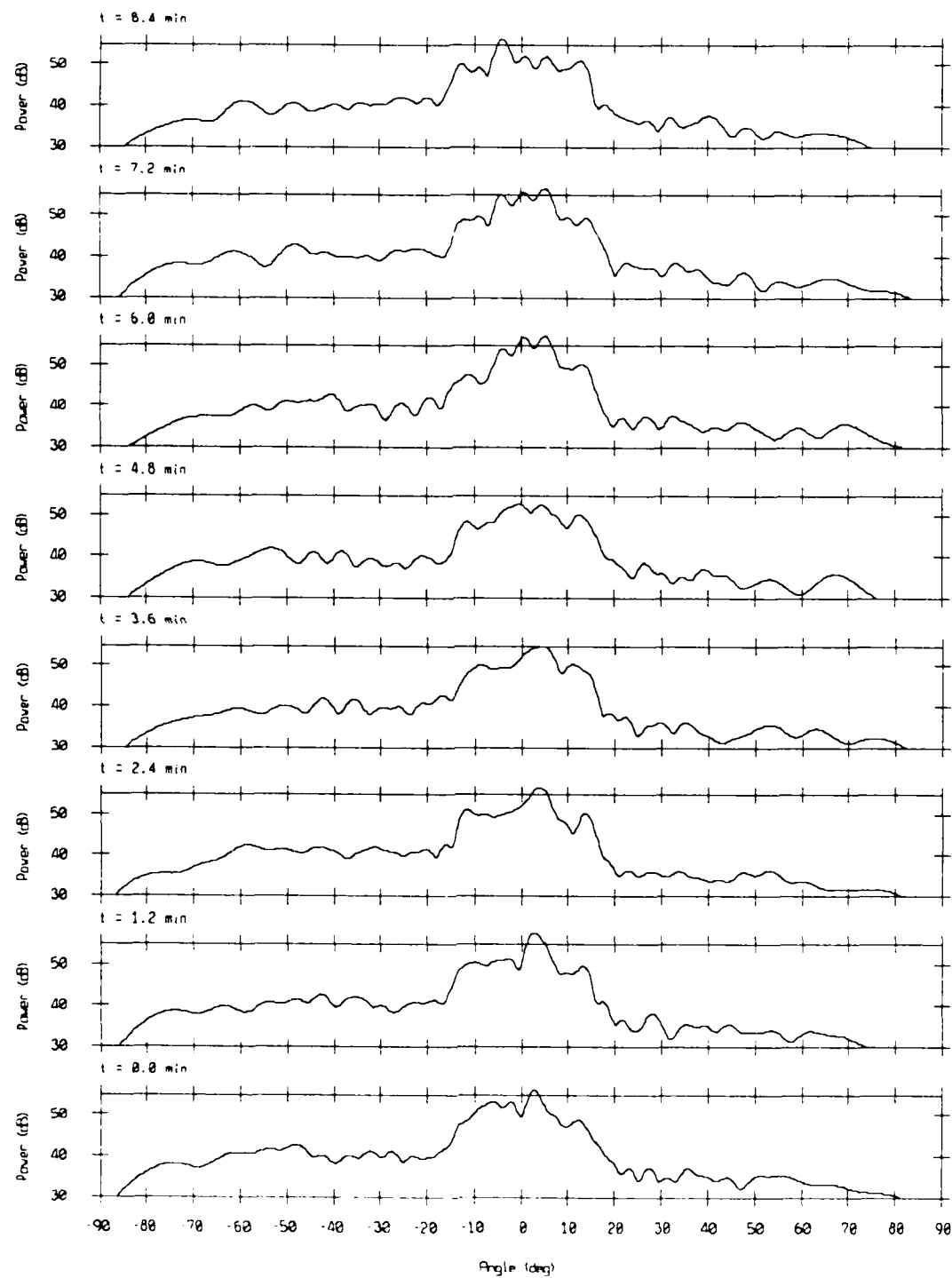
Array Response - 85010 Bin #5902

$f = 200$ Hz, rect window



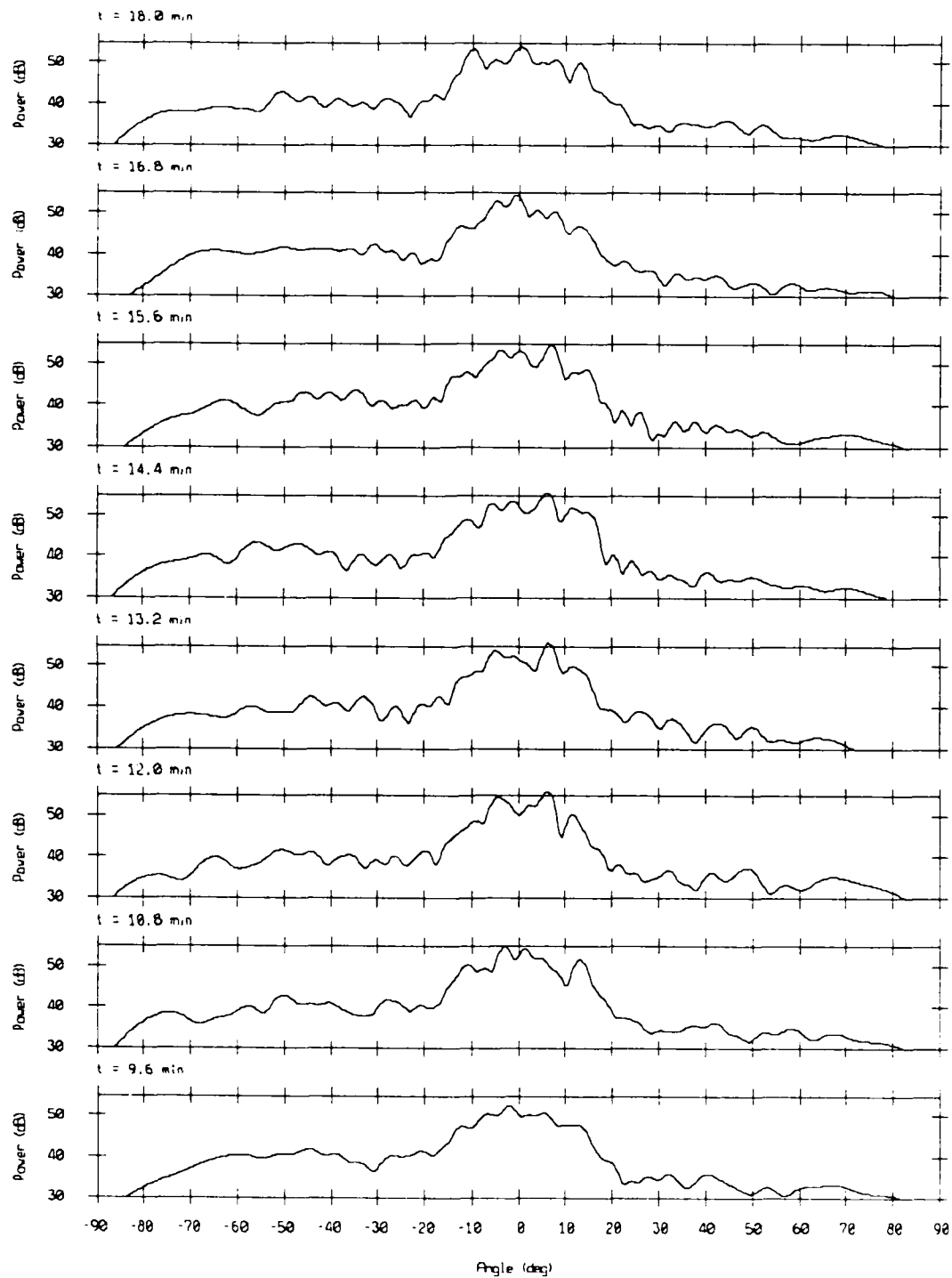
Array Response - 85010 Bin #6127

$f = 225$ Hz, rect window



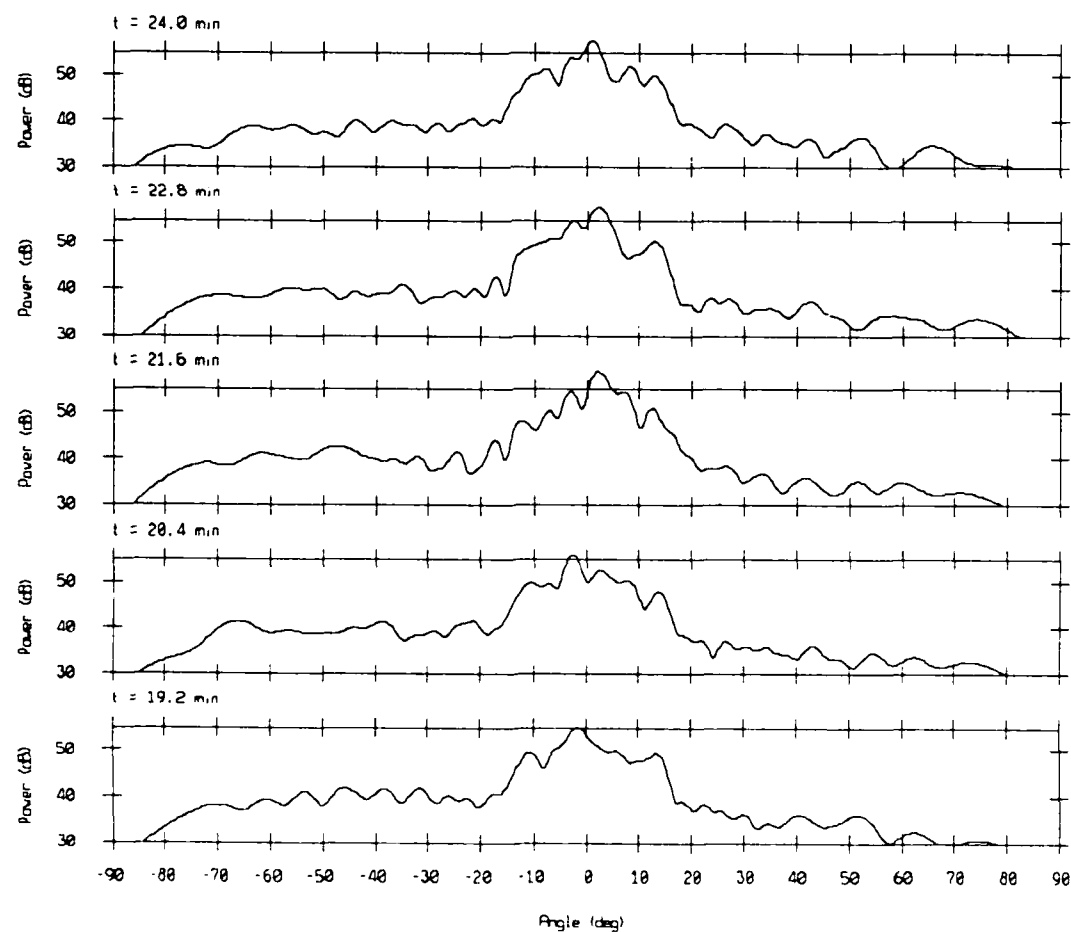
Array Response - 85010 Bin #6127

$f = 225$ Hz, rect window



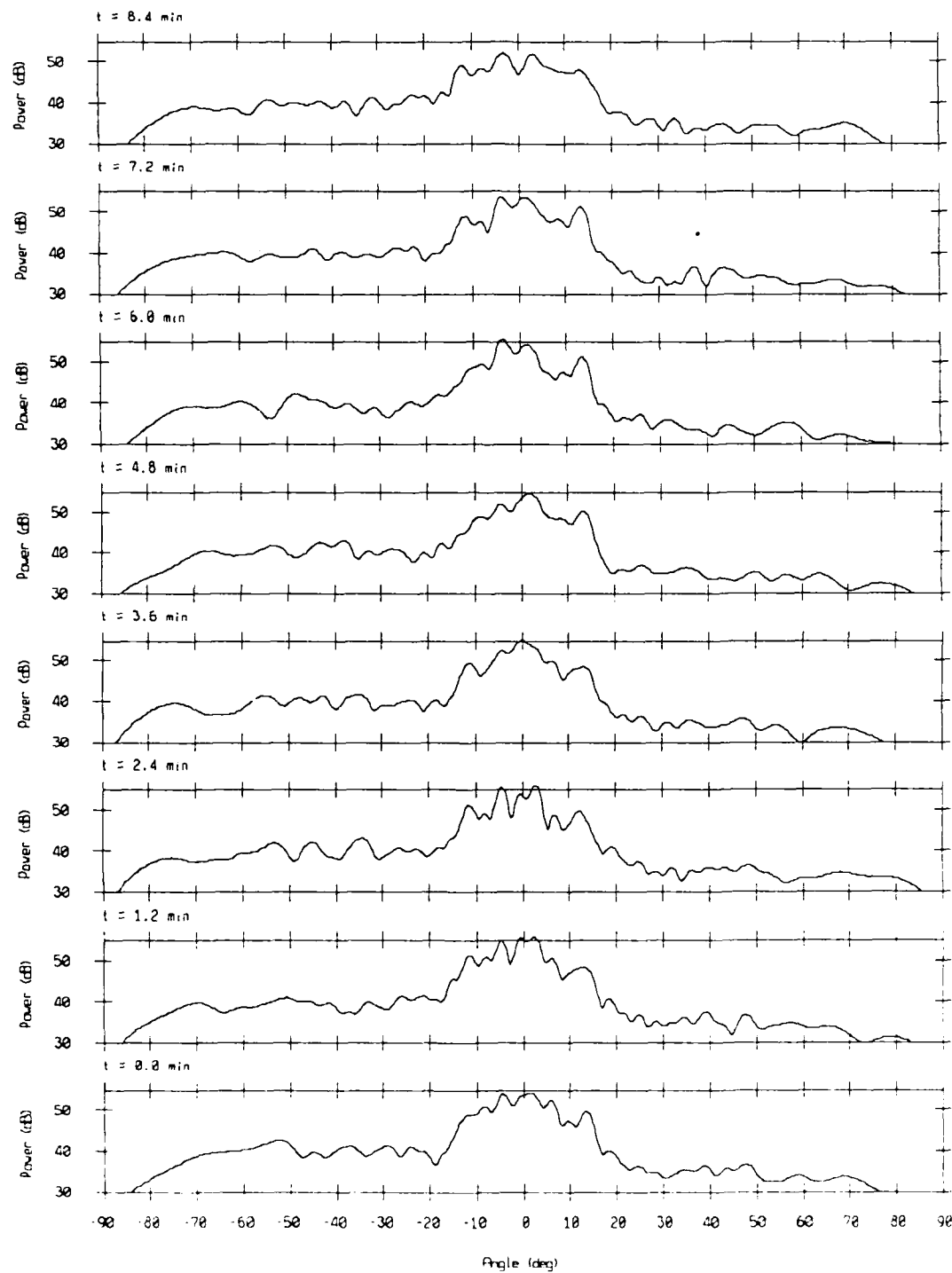
Array Response - 85010 Bin #6127

$f = 225$ Hz, rect window



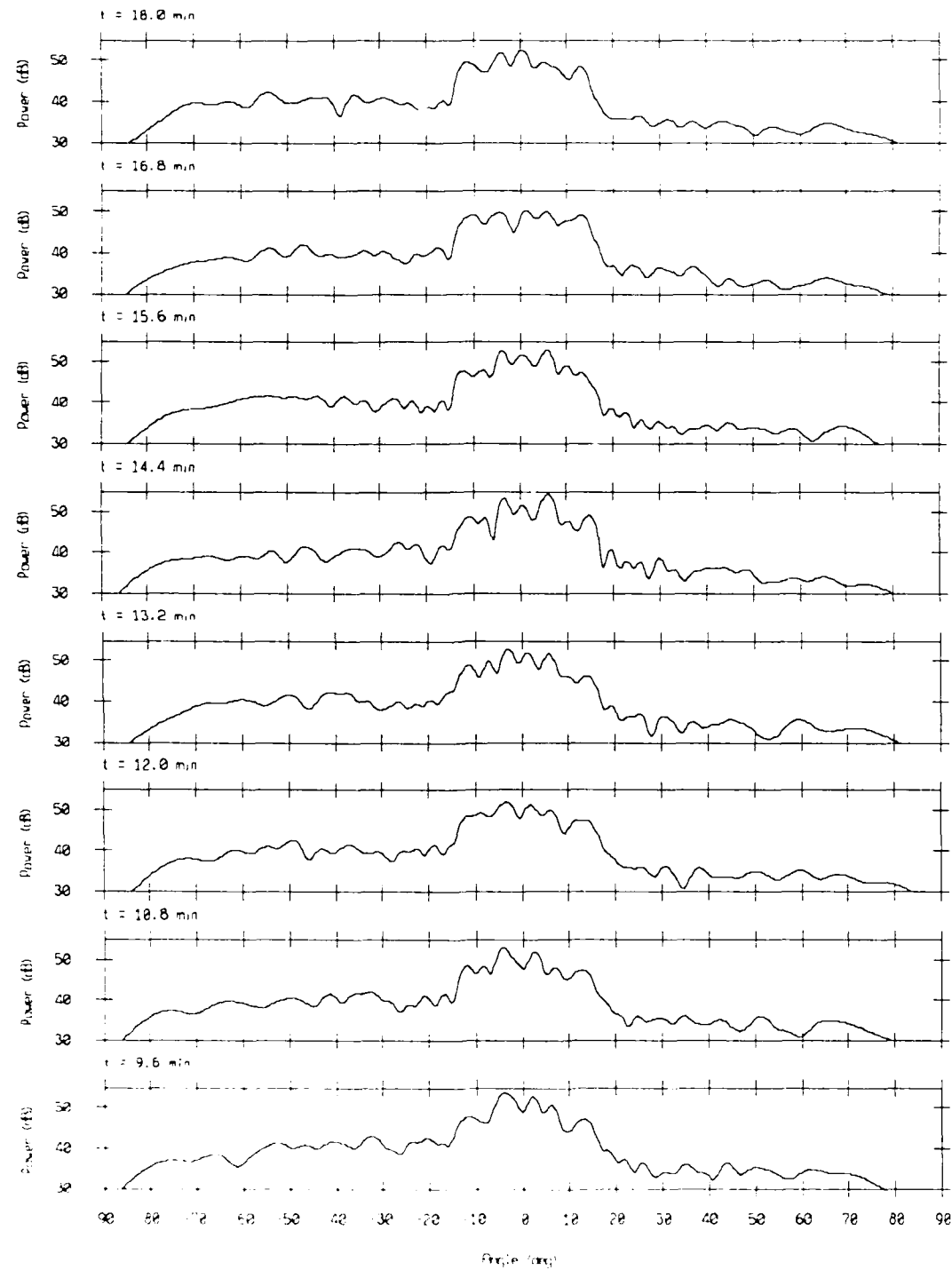
Array Response - 85010 Bin #6354

$f = 250$ Hz, rect window



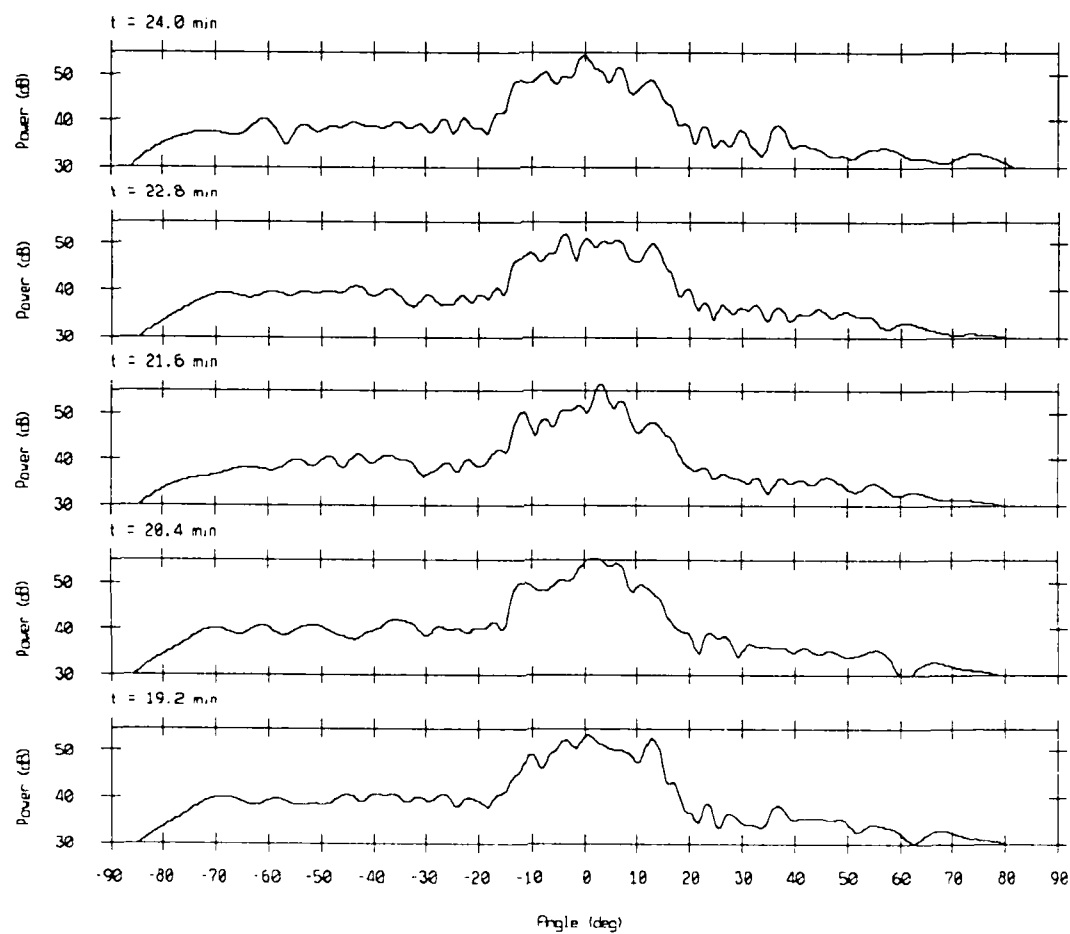
Array Response - 85010 Bin #6354

$f = 250$ Hz, rect window



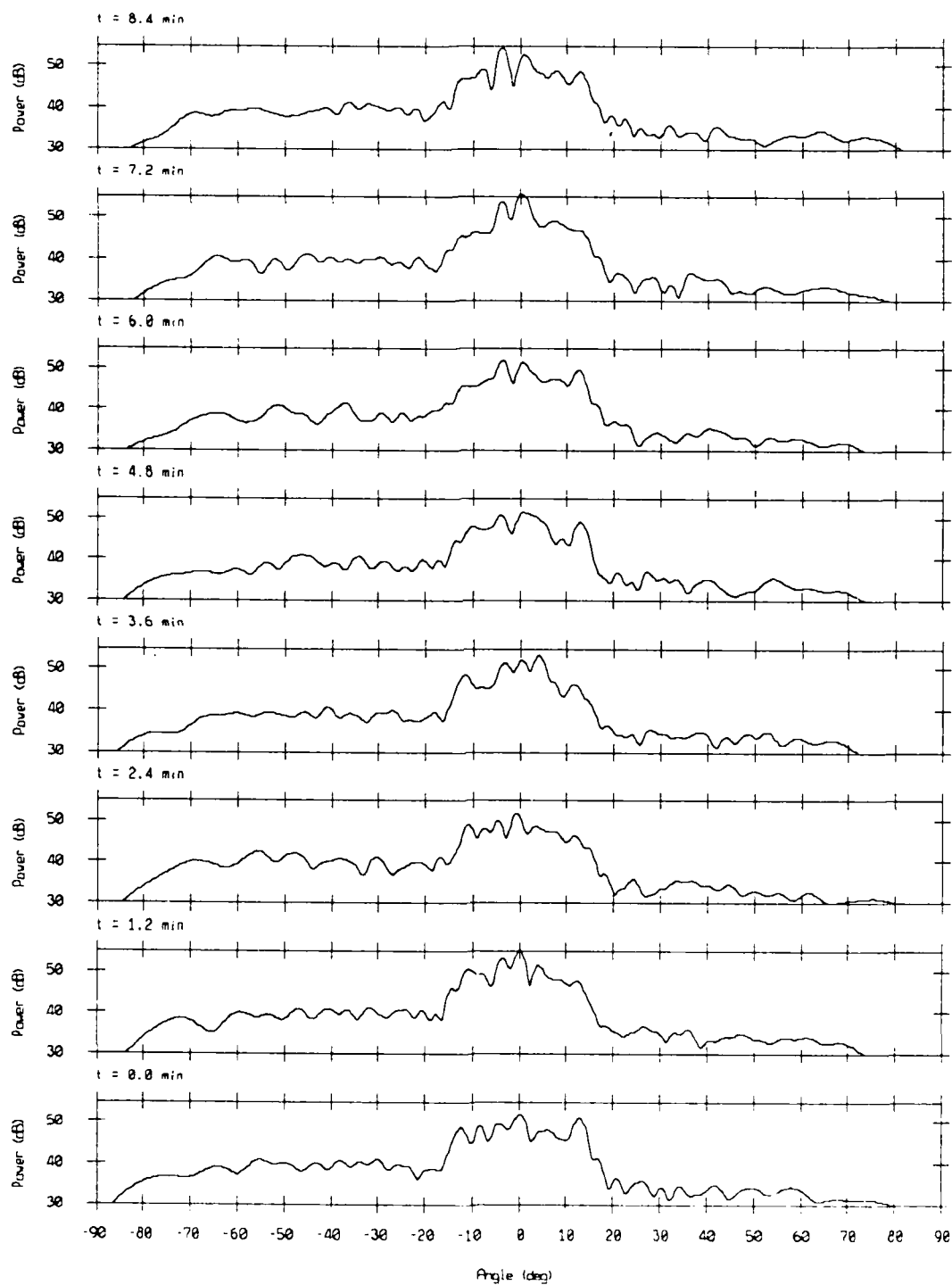
Array Response - 85010 Bin #6354

$f = 250$ Hz, rect window



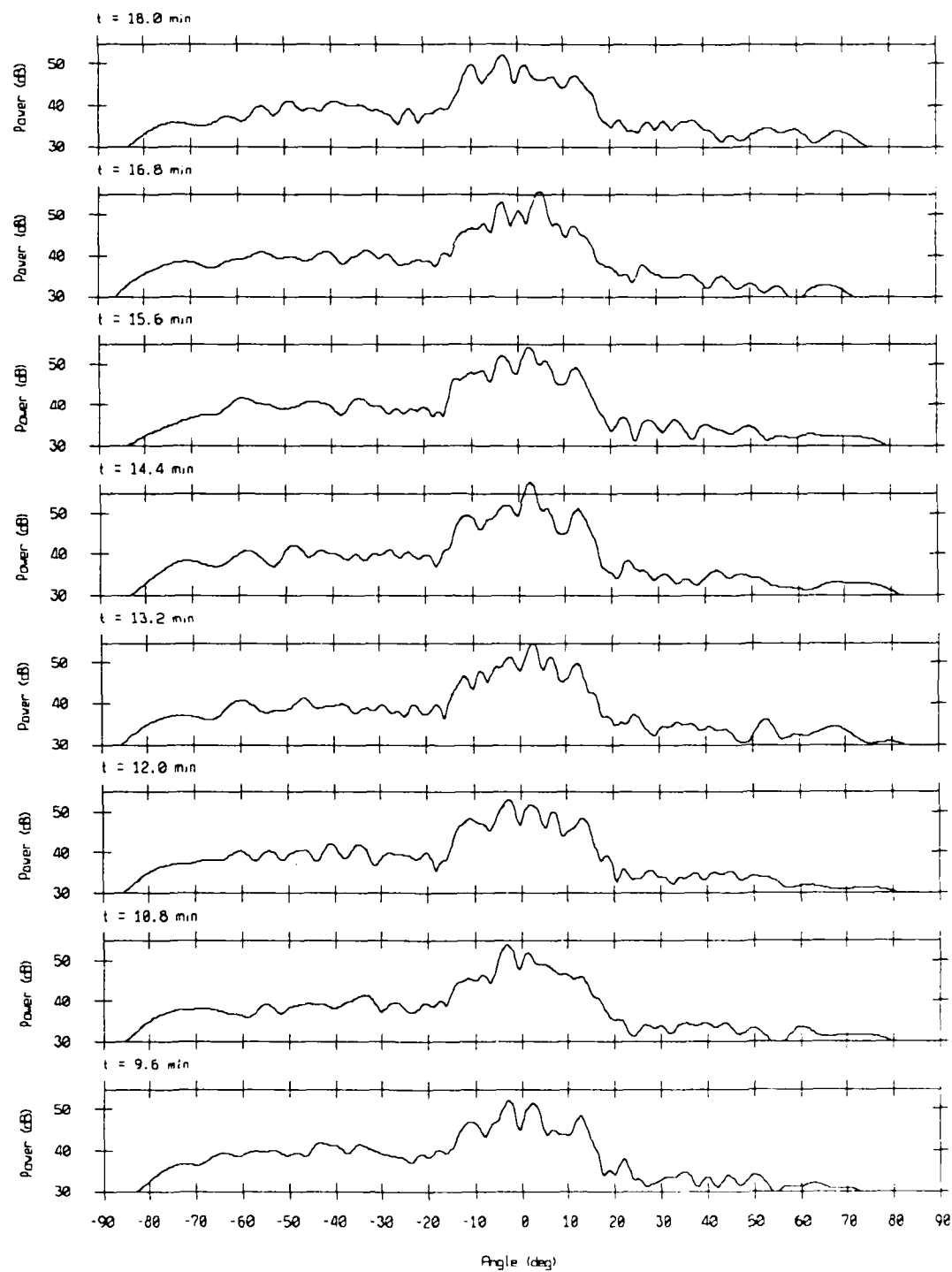
Array Response - 85010 Bin #6579

$f = 275$ Hz, rect window



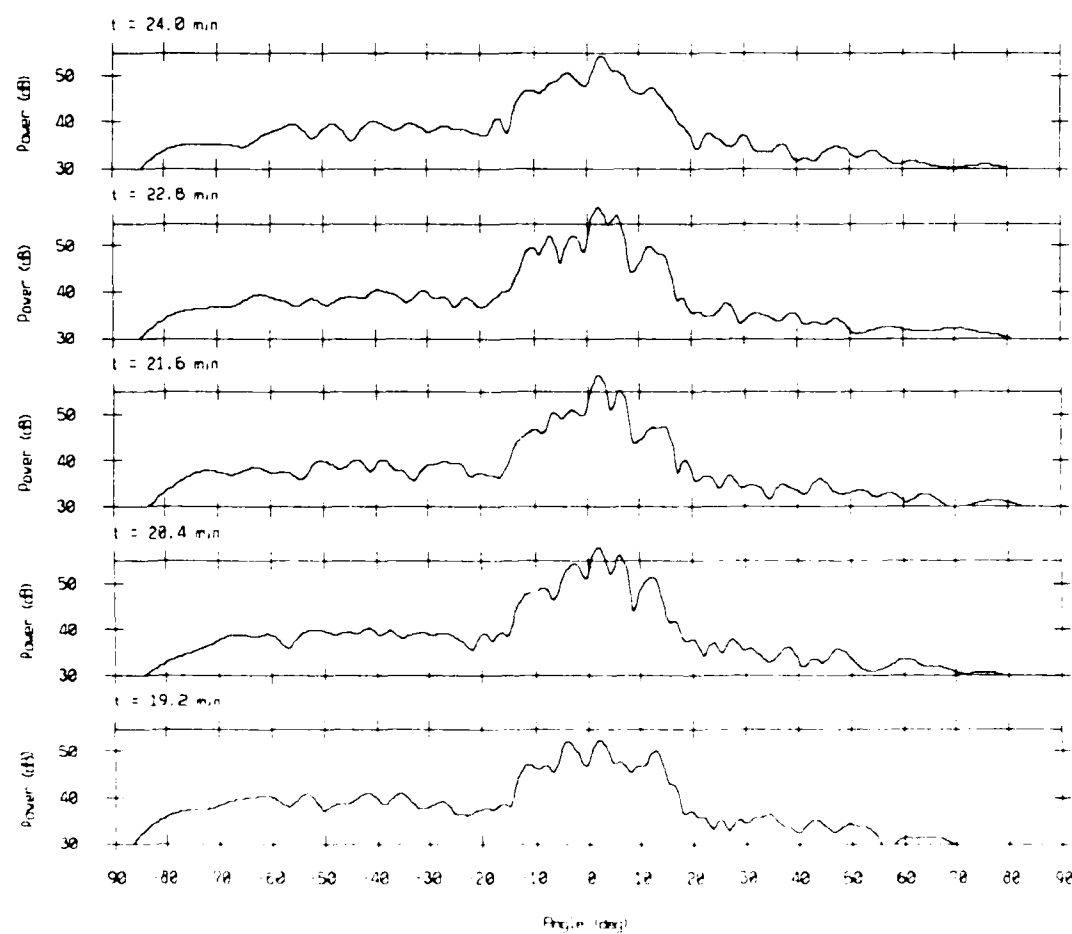
Array Response - 85010 Bin #6579

$f = 275$ Hz, rect window



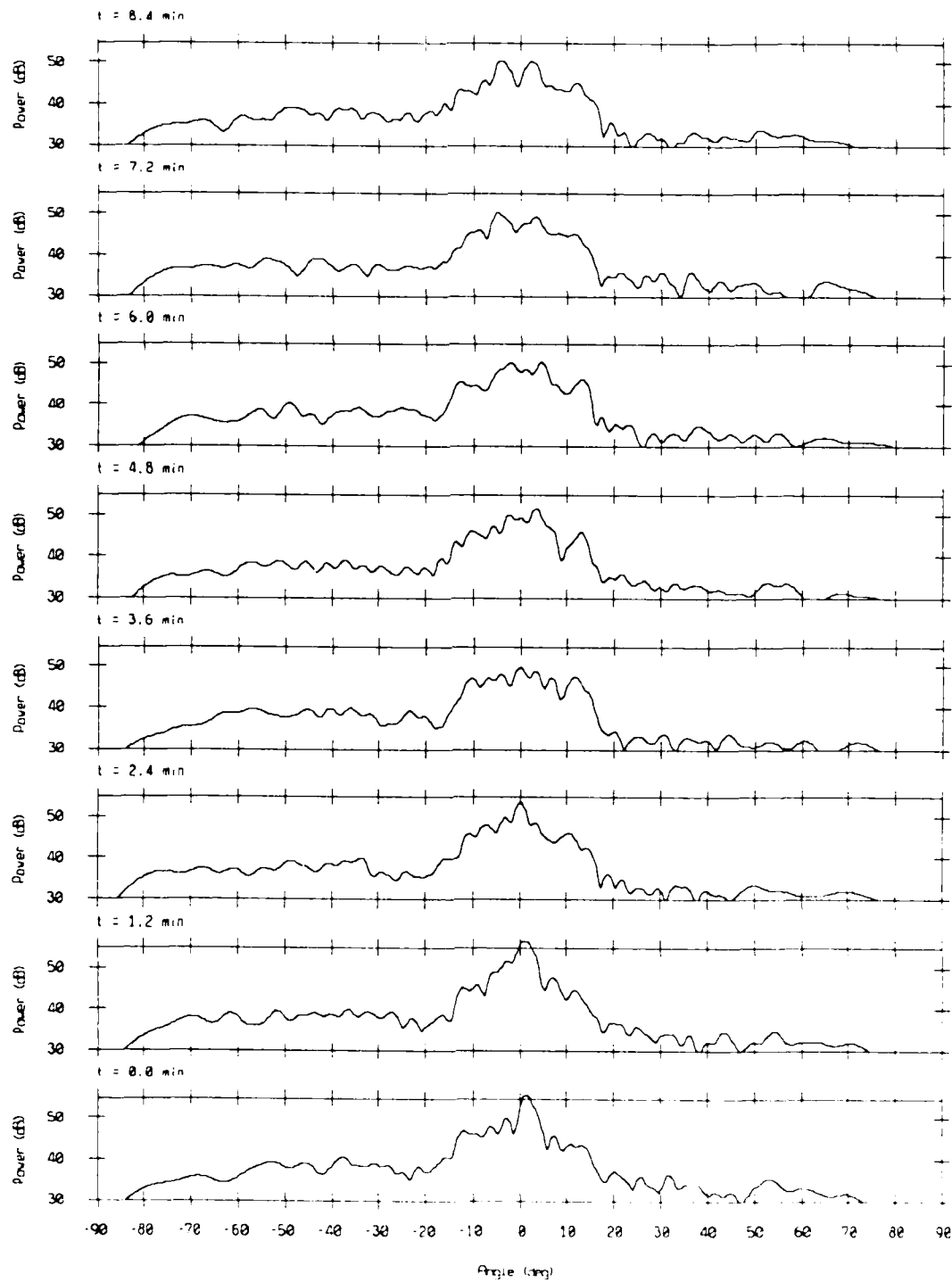
Array Response - 85010 Bin #6579

$f = 275$ Hz rect window



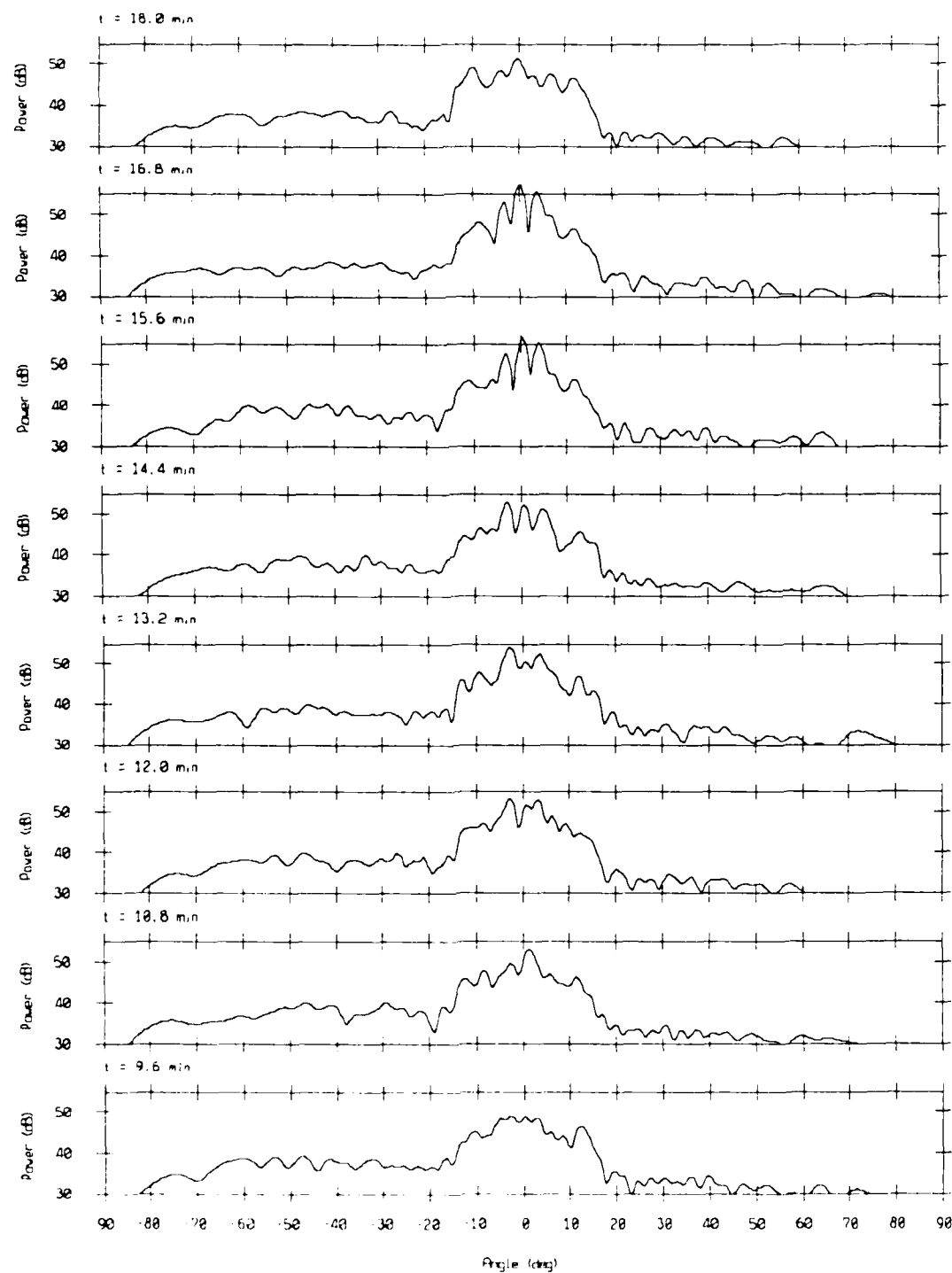
Array Response - 85010 Bin #6804

$f = 302$ Hz, rect window



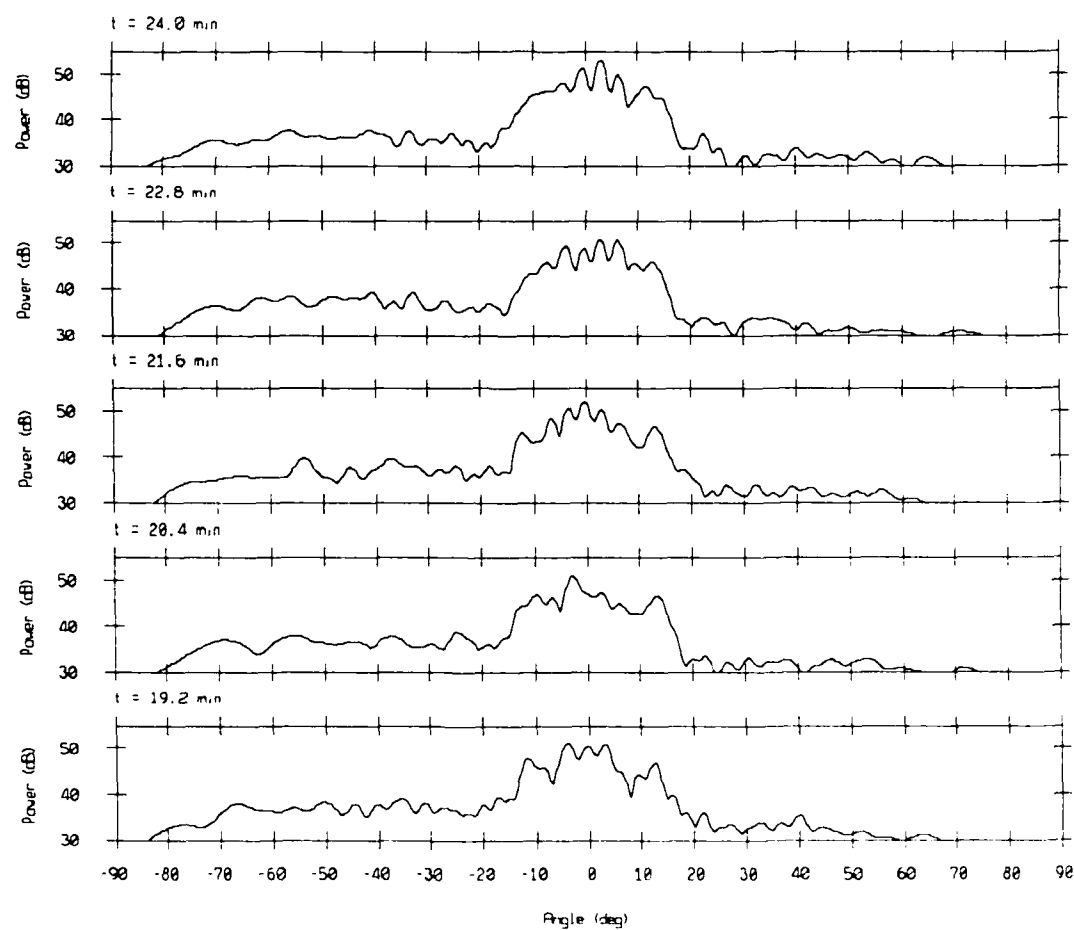
Array Response - 85210 Bin #6824

f = 300 Hz, rect window



Array Response - 85010 Bin #6804

$f = 300$ Hz, rect window



END

DATE

FILMED

DTIC

JULY 88