AUDIO FREQUENCY
MEASUREMENTS..

PROOF OF PERFORMANCE

NAB

FORMS

ENGINEERING DEPARTMENT
NATIONAL ASSOCIATION
OF BROADCASTERS

The NAB Engineering Department has made available to the membership a booklet dealing with AM/FM proof-or-performance measurements. This booklet contains step-by-step procedures for making audio proof-of-performance measurements, pertinent FCC rules, and sample graphs for plotting the measured values.

By now, the vast majority of station engineers are familiar with this requirement and the methods employed in making such measurements. However, we do feel that a need still exists for a standard method of plotting the measured information. This booklet is designed so that it may become the permanent station record for proof-of-performance measurements and contains all the necessary forms for plotting such data.

For those stations wishing aid in making measurements, or information pertaining to specific rules, reference should be made to our recent publication entitled AUDIO FREQUENCY PROOF-OF-PERFORMANCE MEASUREMENTS (E-405) which is keyed to this publication. The two are companion documents.

While the FCC does not approve any one system of logging these measurements, they have informally concurred with this system of keeping the station record of proof-of-performance measurements.

Station Call _____ Frequency _____

City & State _____

Date _____

OVERALL AUDIO FREQUENCY RESPONSE DATA

AFP FORM **No.1**

25% MODULATION

HZ	50	100	400	1000	5000	7500
(1)						
(2)						
(3)						

50% MODULATION

HZ	50	100	400	1000	5000	7500
(1)						
(2)						
(3)						

85% MODULATION

HZ	50	100	400	1000	5000	7500
(1)						
(2)						
(3)						

100%(or %) MODULATION

HZ	50	100	400	1000	5000	7500
(1)						
(2)						
(3)						

(1) RECORD THE ATTENUATOR READING FOR THE 1000 HZ REFERENCE SIGNAL IN EACH SPACE IN THIS ROW.

(2) RECORD THE ATTENUATOR READINGS FOR THE SPECIFIED FREQUENCIES IN THIS ROW.

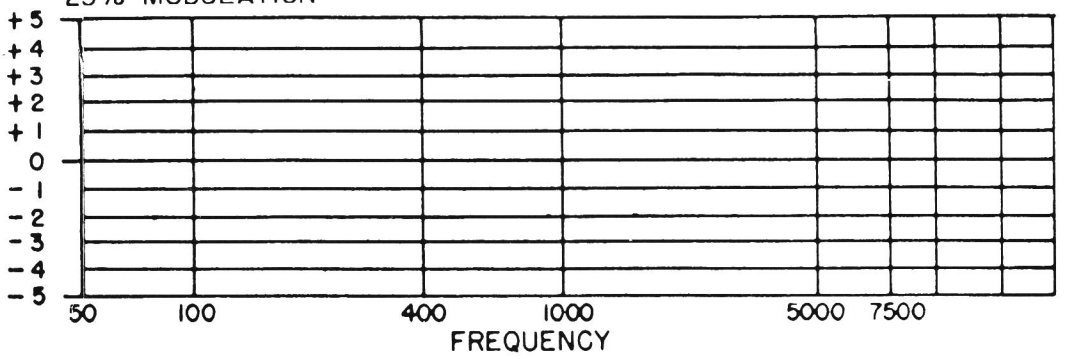
(3) RECORD THE AUDIO FREQUENCY RESPONSE VARIATION IN THIS ROW WHICH IS OBTAINED BY SUBTRACTING ROW (2) FROM ROW (1). THESE FINAL FIGURES ARE TO BE USED IN PLOTTING THE GRAPHS.

ENGINEER _____ DATE _____

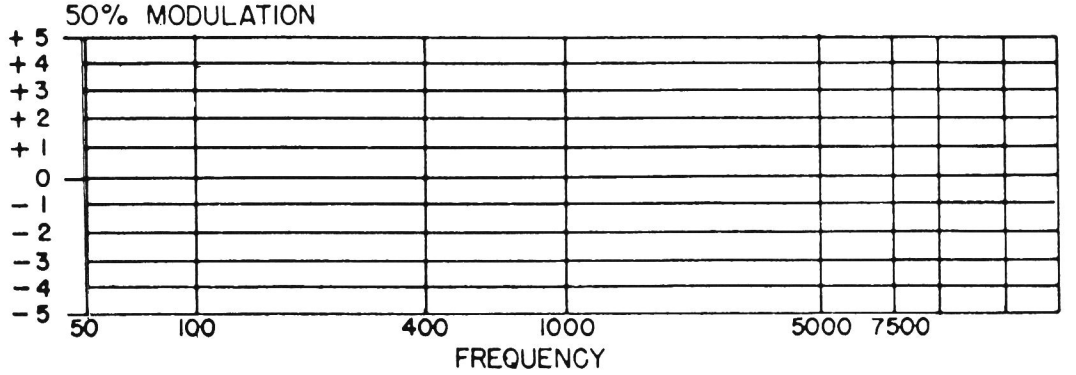
OVERALL AUDIO FREQUENCY RESPONSE CURVES

AFP FORM No. 2

25% MODULATION

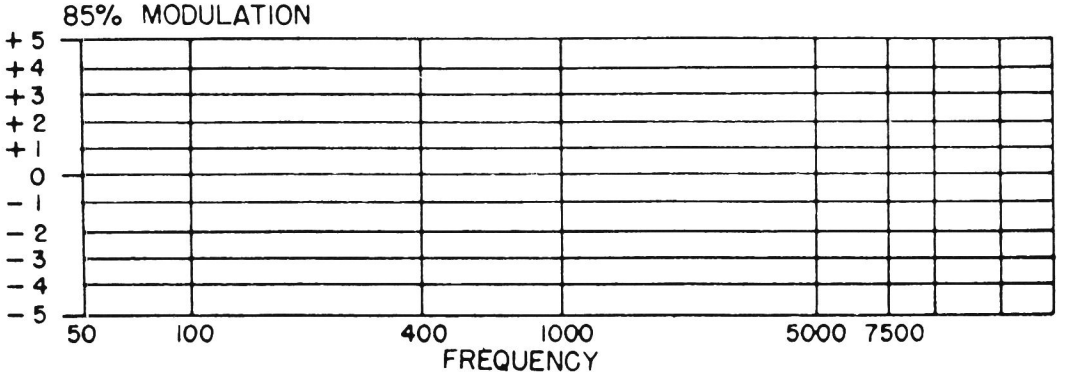


50% MODULATION

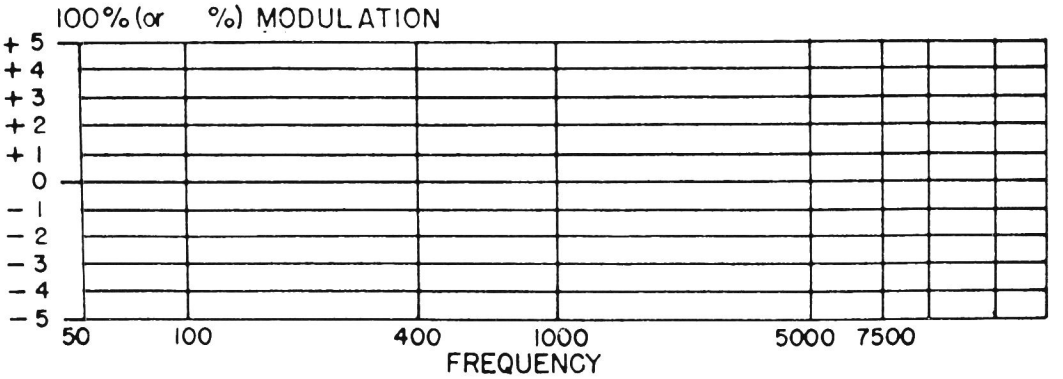


FREQUENCY RESPONSE (db)

85% MODULATION



100% (or %) MODULATION



ENGINEER _____ DATE _____

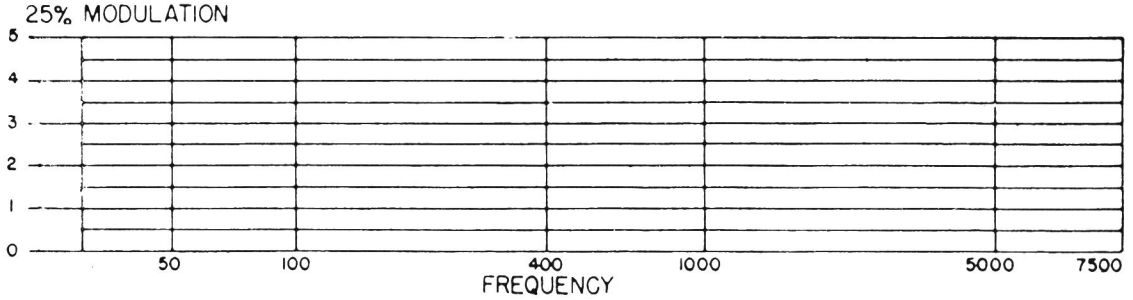
AUDIO FREQUENCY HARMONIC CONTENT
DATA AND CURVES

AFP
FORM
No.3

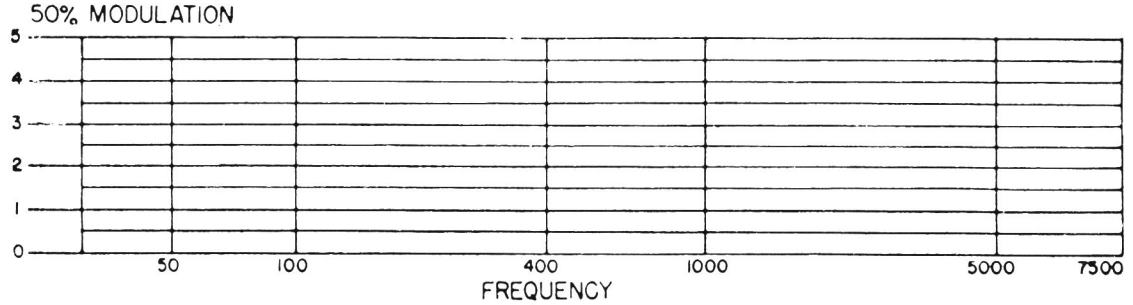
HARMONIC DISTORTION

% MOD. HZ	50	100	400	1000	5000	7500
25						
50						
85						
100						

25% MODULATION

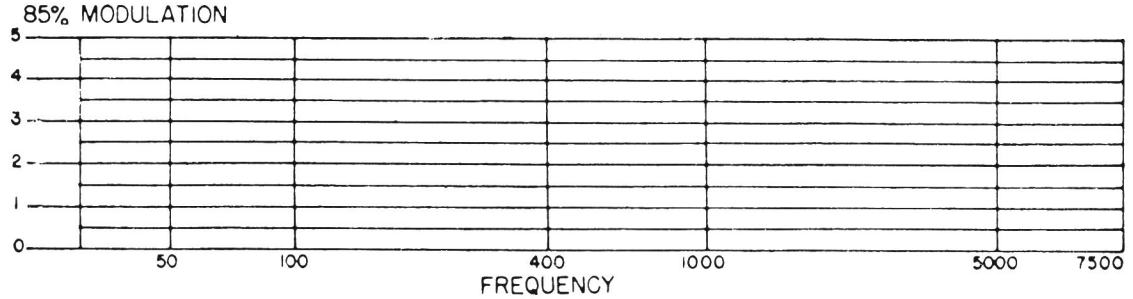


50% MODULATION

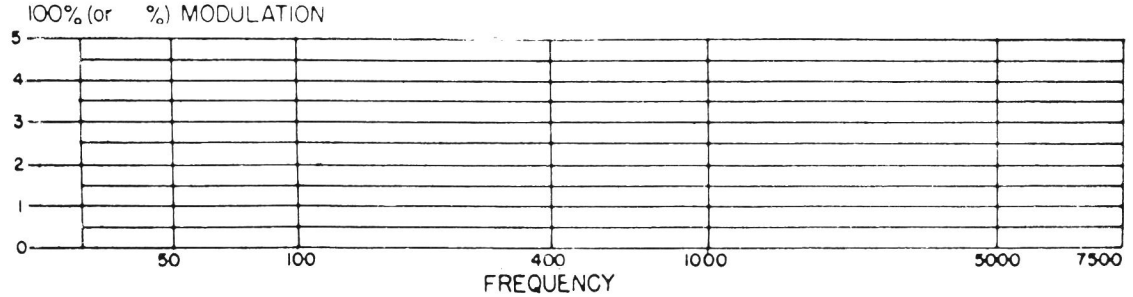


% DISTORTION

85% MODULATION



100% (or %) MODULATION



ENGINEER _____ DATE _____

CARRIER SHIFT AND COMBINED NOISE AND HUM DATA

AFP FORM **No. 4**

CARRIER SHIFT DATA (at 400 Hz)

% MOD.	25	50	85	100
(1)				
(2)				
(3)				
(4)				

COMBINED NOISE AND HUM

DB	%

(1) RECORD DC VOLTMETER READING WITHOUT MODULATION IN EACH SPACE IN THIS ROW.

(2) RECORD DC VOLTMETER READINGS WITH MODULATION IN THIS ROW.

(3) SUBTRACT ROW (2) FROM ROW (1) AND RECORD DIFFERENCE IN THIS ROW.

(4) COMPUTE CARRIER SHIFT BY EQUATION: $\frac{\text{ROW (3)}}{\text{ROW (1)}} \times 100$, AND RECORD RESULTS IN THIS ROW.

1. ON A GENERAL COVERAGE COMMUNICATIONS TYPE RECEIVER, SLOWLY SCAN THE RADIO SPECTRUM FROM 540 KC TO 30 MC FOR ANY INDICATION OF SPURIOUS EMISSIONS (OTHER THAN HARMONIC RADIATION) AND RECORD RESULTS.

FREQUENCY	DESCRIPTION AND INTENSITY OF EMISSION

2. USING THE SAME RECEIVER, MAKE OBSERVATIONS ON HARMONICALLY RELATED FREQUENCIES UP TO AND INCLUDING THE 15TH HARMONIC, NOTING IN THE BOX THE S METER OR AUDIBLE RESULTS FOR EACH HARMONIC.

HARMONIC	S-METER READING OR AUDIBILITY RATING
2nd	
3rd	
4th	
5th	
6th	
7th	
8th	
9th	
10th	
11th	
12th	
13th	
14th	
15th	

ENGINEER _____ DATE _____

OVERALL AUDIO FREQUENCY RESPONSE DATA

AFP FORM **No. 5**

25% MODULATION

HZ	50	100	400	1000	5000	10000	15000
(1)							
(2)							
(3)							

50% MODULATION

HZ	50	100	400	1000	5000	10000	15000
(1)							
(2)							
(3)							

100% MODULATION

HZ	50	100	400	1000	5000	10000	15000
(1)							
(2)							
(3)							

____% MODULATION

HZ	50	100	400	1000	5000	10000	15000
(1)							
(2)							
(3)							

(1) RECORD THE ATTENUATOR READING FOR THE 1000 HZ REFERENCE SIGNAL IN EACH SPACE IN THIS ROW.

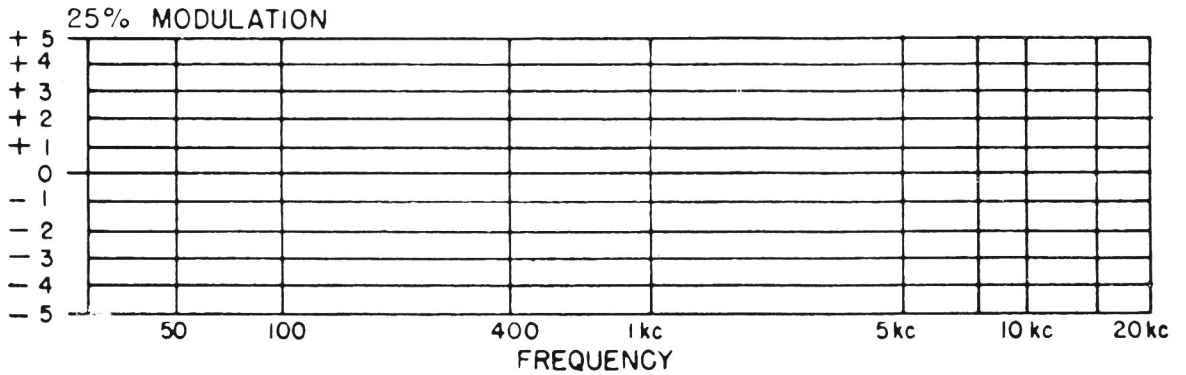
(2) RECORD THE ATTENUATOR READINGS FOR THE SPECIFIED FREQUENCIES IN THIS ROW.

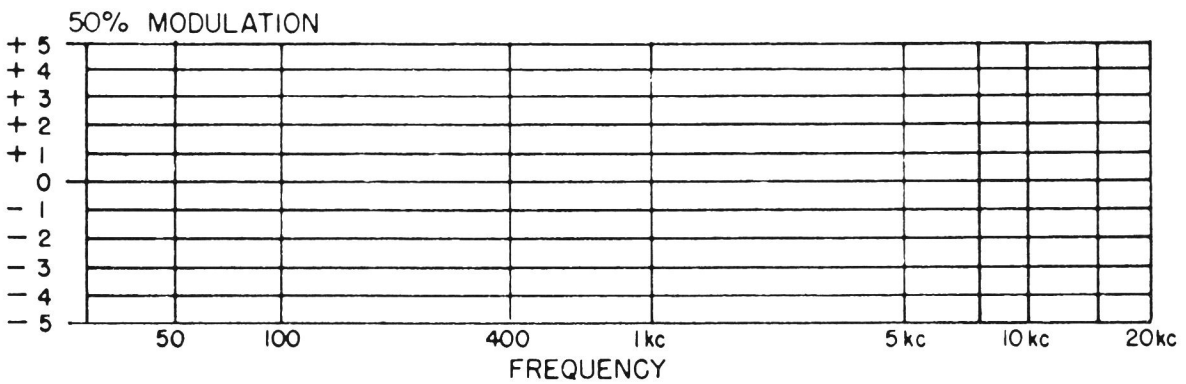
(3) RECORD THE AUDIO FREQUENCY RESPONSE VARIATION IN THIS ROW WHICH IS OBTAINED BY SUBTRACTING ROW (2) FROM ROW (1). THESE FINAL FIGURES ARE TO BE USED IN PLOTTING THE GRAPHS.

ENGINEER _____ DATE _____

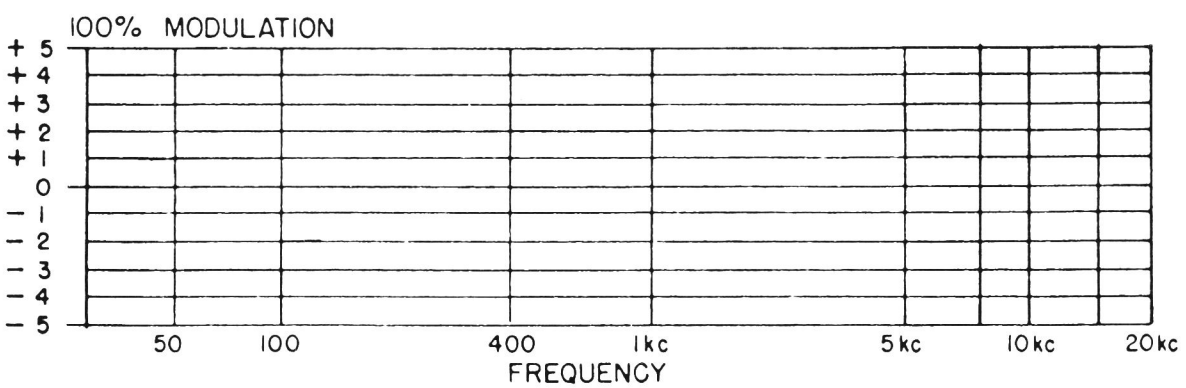
OVERALL AUDIO FREQUENCY RESPONSE CURVES

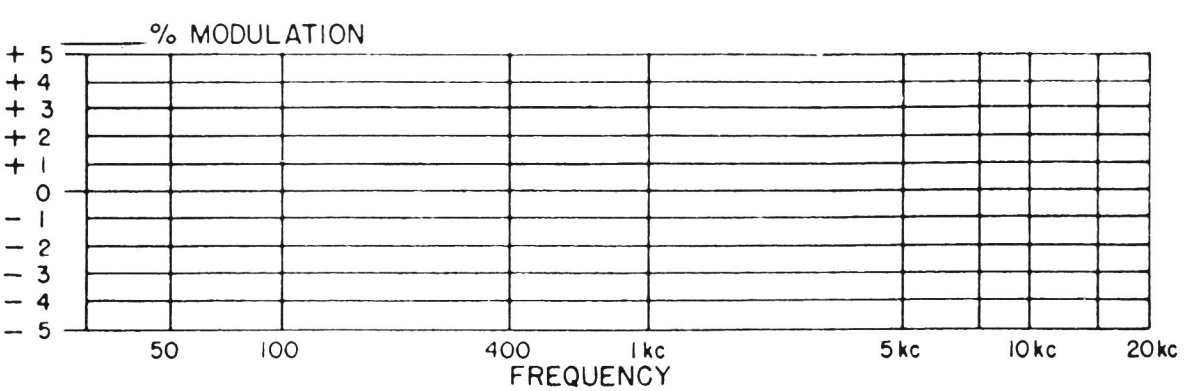
AFP FORM **No. 6**





FREQUENCY RESPONSE (db)





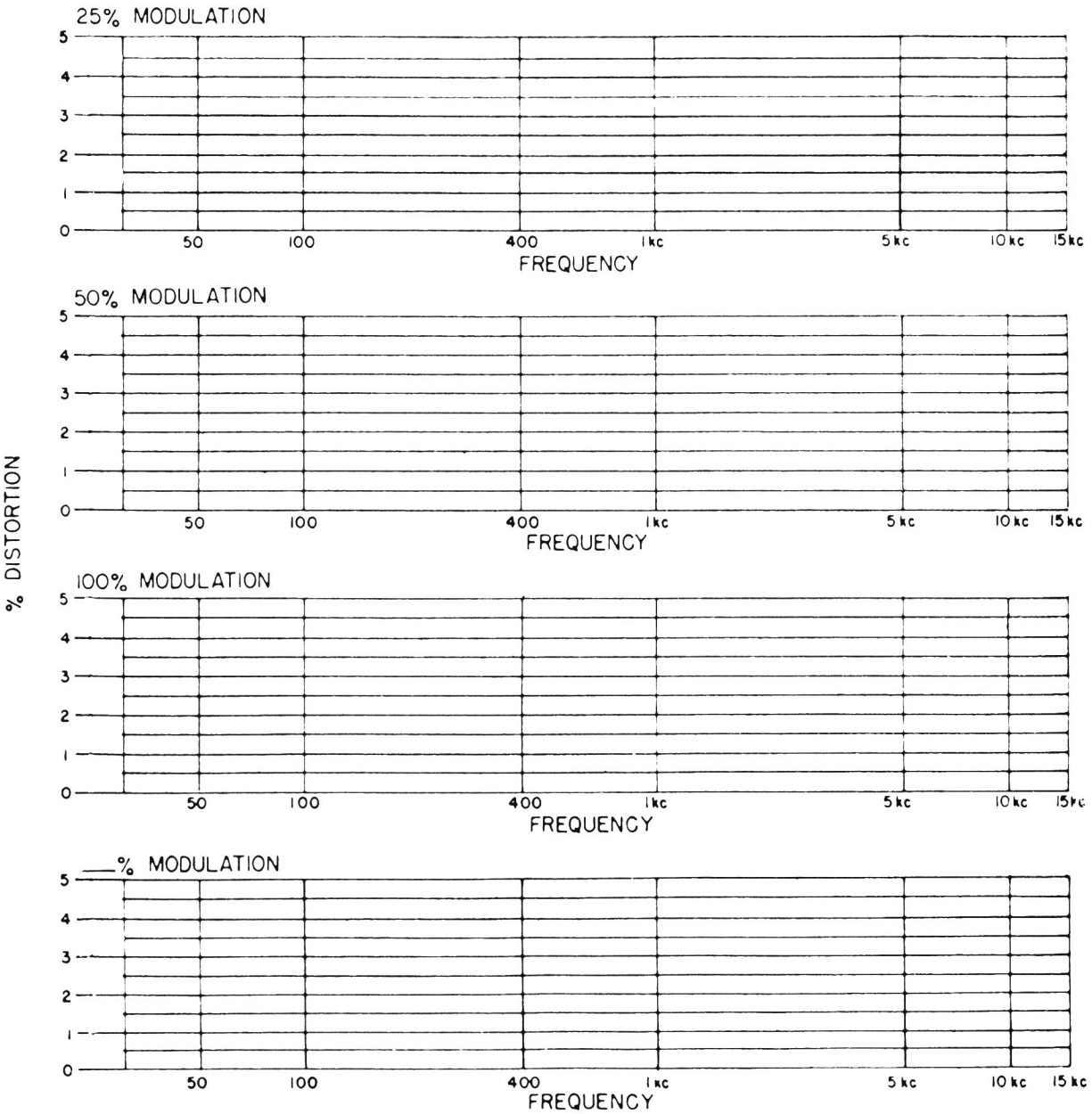
ENGINEER _____ DATE _____

AUDIO FREQUENCY HARMONIC CONTENT DATA AND CURVES

AFP FORM **No. 7**

HARMONIC DISTORTION

% MOD \ HZ	50	100	400	1000	5000	10000	15000
25							
50							
100							



ENGINEER _____ DATE _____

OUTPUT NOISE LEVEL
DATA

AFP
FORM
No. 8

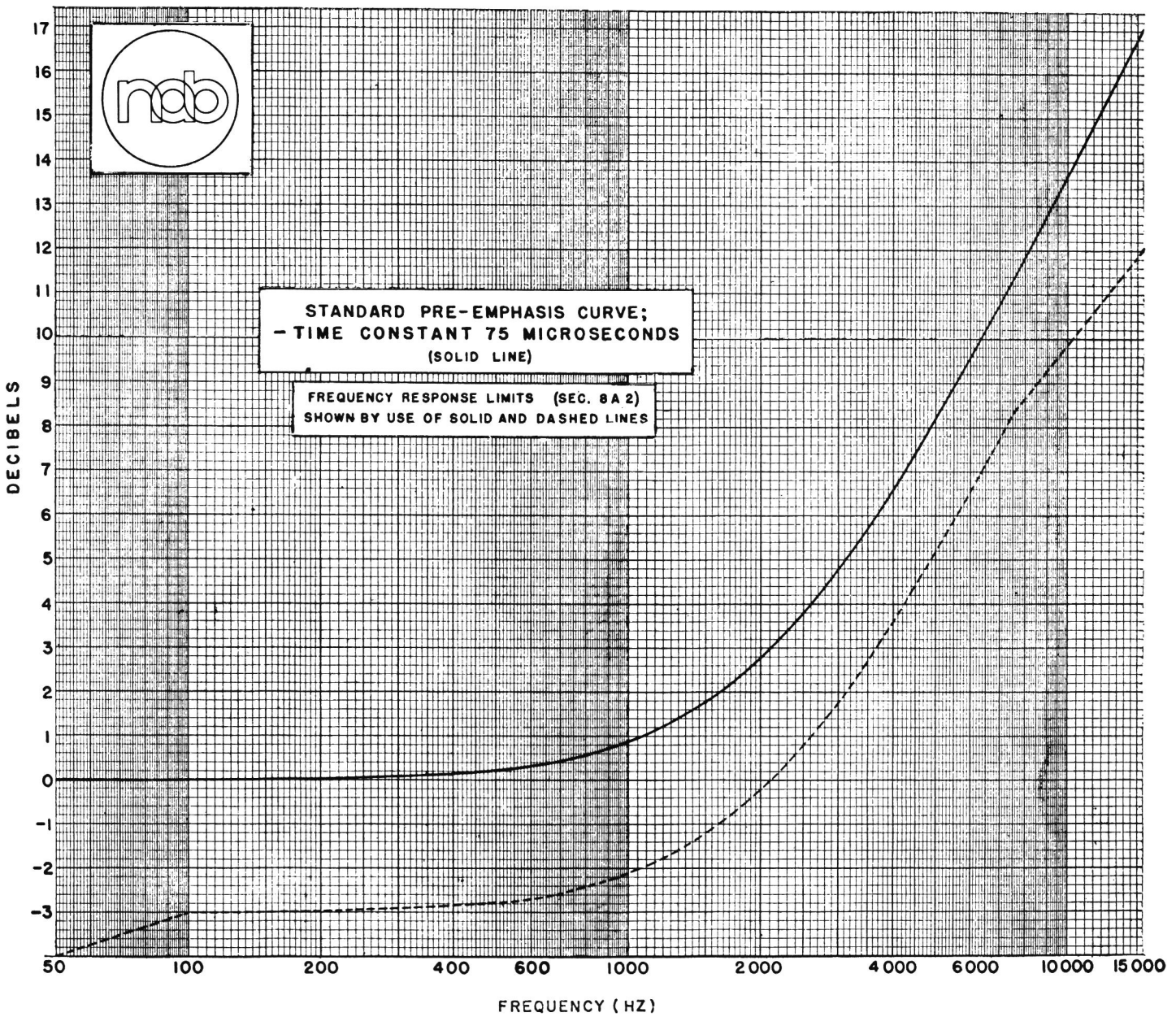
OUTPUT NOISE LEVEL
(Frequency modulation)

VM READING AT 100% MODULATION	NOISE VOLTAGE	% NOISE: $\frac{\text{COLUMN 2}}{\text{COLUMN 1}} \times 100$	DB DOWN

OUTPUT NOISE LEVEL
(Amplitude modulation)

VM READING AT 100% MODULATION	NOISE VOLTAGE	% NOISE: $\frac{\text{COLUMN 2}}{\text{COLUMN 1}} \times 100$	DB DOWN

ENGINEER _____ DATE _____


STANDARD PRE-EMPHASIS CURVE;
– TIME CONSTANT 75 MICROSECONDS
(SOLID LINE)
FREQUENCY RESPONSE LIMITS (SEC. 8 A 2)
SHOWN BY USE OF SOLID AND DASHED LINES
DECIBELS
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
50
100
200
400
600
1000
2000
4000
6000
10000
15000
FREQUENCY (HZ)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