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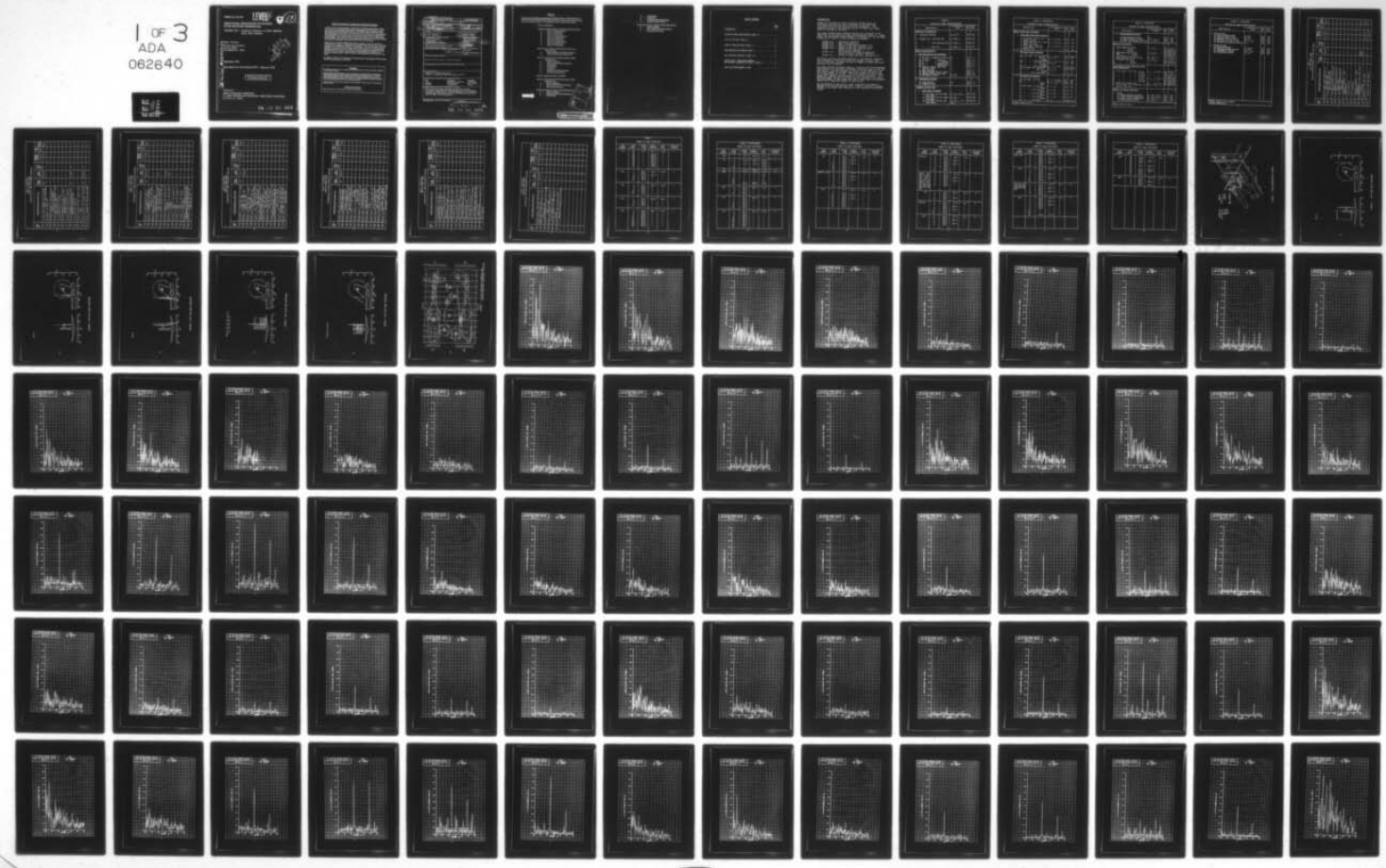

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LEVEL III

B.S. 13

INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONFIGURATION

VOLUME VII-C - Frequency Analyses of Wake Split-Film Data, Solid Hubcaps

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APPLIED TECHNOLOGY LABORATORY
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Fort Eustis, Va. 23604

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APPLIED TECHNOLOGY LABORATORY POSITION STATEMENT

In 1975 a wind tunnel test program was conducted in the Boeing-Vertol 20-foot V/STOL Wind Tunnel on a 1/5th-scale UTTAS model to investigate and find solutions for several aerodynamic problems encountered during the UTTAS flight-testing. Specifically, these tests focused upon (a) the structure of the hub/rotor wake in the vicinity of the empennage, (b) the formulation of the ground vortex and its relation to hub loads and fuselage loads during transition, and (c) the occurrence of vibratory air pressures from the blade passing over the fuselage. Only portions of the above-mentioned wind tunnel test data were reduced and analyzed in addressing the flight-test problems of the UTTAS aircraft.

Under Contract DAAJ02-77-C-0020, Boeing-Vertol completed analyses on the data to understand more completely the aerodynamic interactions that are involved and to formulate instructions for the guidance of designers in these respects. The results of these studies are applicable to all existing and future single-rotor/tail rotor helicopters. The data have been segregated according to aerodynamic interactions and associated phenomena/problem areas. From this body of knowledge, a generalized set of design guidelines meaningful to the single-rotor helicopter design concept formulation were developed and are included in these reports.

Mr. Robert P. Smith of the Aeronautical Technology Division, Aeromechanics Technical Area, served as project engineer for this effort.

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Volume VII is comprised of seven sub-volumes (A thru G)

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Wake	Interaction	Empennage
Flow	Aerodynamic Interaction	Flow Modifier
Frequency	Flow Environment	Powered Model
Spectrum	Configuration	Hub Cap

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This is the third of seven sub-volumes of Volume VII containing spectrographs of the model helicopter hub/rotor wake as it was modified by various aerodynamic devices. This sub-volume deals with the effects of solid hub caps. Here the cap underside is flat and does not share the upperside camber as with the open caps.

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PREFACE

The entire report describing the investigation of INTERACTIONAL AERODYNAMICS OF THE SINGLE-ROTOR HELICOPTER CONFIGURATION comprises eight numbered volumes bound as 33 separate documents. The complete list of these documents is as follows:

Volume I, Final Report

Volume II, Harmonic Analyses of Airframe Surface Pressure Data
- A – Runs 7-14, Forward Section
- B – Runs 7-14, Mid Section
- C – Runs 7-14, Aft Section
- D – Runs 15-22, Forward Section
- E – Runs 15-22, Mid Section
- F – Runs 15-22, Aft Section
- G – Runs 23-33, Forward Section
- H – Runs 23-33, Mid Section
- I – Runs 23-33, Aft Section

Volume III, Flow Angle and Velocity Wake Profiles in Low-Frequency Band
- A – Basic Investigations and Hubcap Variations
- B – Air Ejector Systems and Other Devices

Volume IV, One-Third Octave Band Spectrograms of Wake Split-Film Data
- A – Buildup to Baseline
- B – Basic Configuration Wake Explorations
- C – Solid Hubcaps
- D – Open Hubcaps
- E – Air Ejectors
- F – Air Ejectors With Hubcaps; Wings
- G – Fairings and Surface Devices

Volume V, Harmonic Analyses of Hub Wake

Volume VI, One-Third Octave Band Spectrograms of Wake Single Film Data
- A – Buildup to Baseline
- B – Basic Configuration Wake Exploration
- C – Hubcaps and Air Ejectors

Volume VII, Frequency Analyses of Wake Split-Film Data
- A – Buildup to Baseline
- B – Basic Configuration Wake Explorations
- C – Solid Hubcaps

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D – Open Hubcaps
E – Air Ejectors
F – Air Ejectors With Hubcaps; Wings
G – Fairings and Surface Devices

Volume VIII, Frequency Analyses of Wake Single Film Data

A – Buildup to Baseline
B – Basic Configuration Wake Exploration
C – Hubcaps and Air Ejectors

TABLE OF CONTENTS

	PAGE
INTRODUCTION	6
OUTLINE OF WAKE INVESTIGATIONS (TABLE 1).	7
LIST OF TEST RUNS (TABLE 2)	11
INDEX TO RAKE POSITIONS (TABLE 3)	18
RAKE ORIENTATION DIAGRAM (FIGURE 1)	24
HOT FILM RAKE LOCATIONS (FIGURE 2-6)	25
UTTAS 1/4.85 - SCALE MODEL GEOMETRY AND PRESSURE TRANSDUCER LOCATIONS (FIGURE 7)	30
SPLIT-FILM SPECTROGRAMS OF WAKE	31

INTRODUCTION

Volume VII presents an array of machine plotted graphs of wake angle and velocity versus frequency in the band from 4 to 240 Hz derived from the split film transducers. This encompasses data in the spectrum through 10 times rotor speed which is 1433 RPM or 23.88 Hz.

The graphs showing wake frequency spectra are sequenced in the same order as the Outline of Wake Investigations (Table I). These graphs are distributed among Volumes VII-A through VII-G by the major categories of Table I in the following arrangement:

Volume VII-A	-	Build-up to Baseline
Volume VII-B	-	Basic Configuration
Volume VII-C	-	Effect of Hub Caps Sections 1 & 2
Volume VII-D	-	Effect of Hub Caps Sections 3 & 4
Volume VII-E	-	Effect of Hub Caps Section 5 and Effect of Air Ejectors
Volume VII-F	-	Air Ejectors with Open Hub Caps and Effect of Wings and Misc. Section 1
Volume VII-G	-	Effect of Wings and Misc. Sections 2 & 3

The Table I outline and other material is included for reference and as context to the work of each sub-volume. Table 2, the List of Test Runs, arranges the runs in numerical order and gives pertinent text parameters.

The Index of Rake Positions, Table 3, lists the hot film transducer rake positions in the model coordinate system for each run and its test points. The main feature of Table 3 is the indexing of the test point number to the model water line station and butt line as it varied from run to run. The table groups the runs as they shared the indexing correspondence of point with position. It is emphasized that the runs in a group do not necessarily all share the same number of test points but they do have same correspondence within their respective ranges of test points.

The orientation of the rake is shown pictorially in Figures 1 through 6 for the various test runs. Figure 7 presents a scaled drawing of the model with reference to the three-axis coordinate system.

TABLE 1

OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code	Run No.	Base-line
Build-up to Baseline			
1. Nacelles removed	$K_{13}+H_1-N$	149	150
2. Blades off, rotating hub	$K_{13}-M+H_{1.0}$	160	156
3. " " , non-rotating hub	$K_{13}-M+H_{1.0}$	158	156
4. " " , hub off	$K_{13}-M-H_{1.0}$	159	156
Basic Configuration			
1. Wake Explorations near Empennage			
(a) 15" Long. + traverse at T/R C.L.	K_{11}	111	---
(b) 9" Vert. + " above T/R "	"	112	---
(c) 2" " " in vortex	"	113	---
(d) 8" " " (continue 112)	"	114	---
(e) 13" " " behind stab.	"	115	---
(f) Lateral traverse, left stab. (One T.P. only)	"	116	---
(g) Same continued	"	117	---
(h) Same continued (One T.P. only)	"	118	---
(i) Lateral traverse right stab.	"	119	---
(j) T/R effect on wake	$K_{11}+T_2^0$	121	115
2. Climb/Descent Studies			
(a) Climb 900 FPM	K_{11}	135	---
(b) Descent 800 FPM	"	136	---
Effect Of Hub Caps			
1. Solid Caps on Canister			
(a) 7.6" diam. 2.17" ht. soft Pitch Arms	$K_{11}-H_{1.0}+H_{1.2}$	137	136
(b) 7.6" diam. 2.17" ht. stiff Pitch Arms	$K_{13}+H_{1.2}$	153	156
(b) 7.6" diam. 2.45" ht. flt. test config.	$K_{13}+H_{1.2.1}+I_1+E_{1.0}$	207	188

TABLE 1 (CONTINUED)

OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code*	Run No.	Base-line
Effect of Hub Caps (Continued)			
2. Solid Caps Raised Above Canister			
(a) 7.6" diam. 2.45" ht. 70" depth, .55 gap	$H_{1.2.2}+I_1+E_{1.0}$	208	188
(b) 10.0" diam. 3.25" ht. 1.55" depth, .50" gap	$H_{1.8.1}+I_1+E_{1.0}$	189	188
(c) 10.0" diam. 4.125" ht. 2.05" depth, .875" gap	$H_{1.8.2}+I_1+E_{1.0}$	190	188
(d) Repeat of 189	" " "	210	188
3. Open Caps Without Underbody			
(a) 10.0" diam. 1.25" gap,blades	$H_{1.0.2}+I_1+E_{1.0}$	193	188/166
(b) " " " gap, no blades	$H_{1.0.1}-M$	166	158
(c) " " 2.05" gap,blades	$H_{1.14.1}+I_1+E_{1.0}$	211	188
(d) " " 1.75" gap, no blades	$H_{1.0.1}-M$	165	158
(e) " " 1.87" gap,blades	$H_{1.0.3}+I_1+E_{1.0}$	191	188
(f) 16" diam. 2.00" gap,blades	$H_{1.7.1}$	168	156/167
(g) " " " gap, no blades	$H_{1.7.1}-M$	167	158
(h) " " 4.00" gap,blades	$H_{1.7.2}$	169	156
4. Open Caps with Underbody			
(a) 7.6" diam. 1.25" gap	$H_{1.11.1}+I_2+E_{1.0}$	194	188
(b) " " " "	$H_{1.11.1}+I_2+E_{4.0}$	198	188
(c) " " " " center post	$H_{1.11.2}+I_2$	202	194
(d) 10.0" diam. .5" gap, no blades	$H_{1.5.1}-M$	164	158
(e) " " 1.25" gap, no blades	$H_{1.5.2}-M$	161	158
(f) " " 2.0" gap, no blades	$H_{1.5.4}-M$	163	158
(g) " " 4.0" gap, no blades	$H_{1.5.3}-M$	162	158
(h) " " 1.25" gap	$H_{1.5.2}$	154	156/161

*Basic Code is K13.

TABLE 1 (CONTINUED)

OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code*	Run No.	Base-line
5. Miscellaneous Hub Covers			
(a) Hub fairing 16" diam.	$H_{1.3}$	151	150
(b) Wham-O-Frisbee 10" diam.	$H_{1.9.0}+E_{1.2}$	182	181
(c) Fab. glass Frisbee 16" diam.	$H_{1.9.1}+E_{1.2}$	183	181
Effect of Air Ejectors			
1. Basic system no blowing	$H_{1.0}+E_{1.0}$	172	156
2. " " 40 psi	" "	173	156/172
3. " " 150 psi	" "	174	156/172
4. Wide chord shroud 40 psi	$H_{1.0}+E_{2.5.1}$	175	156/173
5. Wide " " 150 psi	" "	176	156/174
6. W/C shroud w. lip 40 psi	$H_{1.0}+E_{3.5.2}$	184	156/173
7. Same Contoured Parallel 150 psi	$H_{1.0}+E_{3.5.4}$	187	156/174
8. Bifurcated duct 0 psi	$H_{1.0}+E_{5.0}$	203	156
9. " " 40 psi	" "	204	156/203
10. " " 150 psi	" "	205	156/203
Air Ejectors with Open Hub Caps with Underbodies			
1. 7.6" diam. 1.25" gap, 0 psi	$H_{1.11.1}+I_2+E_{1.0}$	194	188/172
2. " " " " 20 psi	" " "	195	188
3. " " " " 40 psi	" " "	196	188/173
4. " " " " 150 psi	" " "	197	188/174
5. " " " " 0 psi	$H_{1.11.1}+I_2+E_{4.0}$	198	188/194
6. " " " " 40 psi	" " "	199	188/196
7. " " " " 150 psi	" " "	200	188/196
8. Same with center post	$H_{1.11.2}+I_2+E_{4.6}$	201	188/200
9. 10.0" diam. 2.0" gap wide ch'd. shroud (150 psi)	$H_{1.5.4}+E_{2.5.1}$	177	156/176
Effect of Wings and Misc.			
1. Wings			
(a) Nacelle-mounted stub wing	$H_{1.0}+W_{1.0}+E_{1.1}$	178	181
(b) Single slotted flapped wing	$H_{1.0}+W_{3.0}+E_{1.0}$	180	181
(c) Dougle slotted flapped wing	$H_{1.0}+W_{2.0}+E_{1.0}$	179	181
(d) Boom-mounted stub wing	$H_{1.0}+W_{4.0}$	186	156

*Basic Code is K13.

TABLE 1 (CONTINUED)

OUTLINE OF WAKE INVESTIGATIONS

Description	Configuration Code*	Run No.	Base-line
2. Crown Fairings			
(a) Flat top behind shaft	$K_{11}+D_1$	140	138
(b) Round top behind shaft	$K_{11}+D_2$	141	138
(c) Extended flat top fairing	H_1+D_4	170	156
(d) Flat top + 16" cap, 4" gap	$H_{1.7.2}+D_4$	171	170
(e) Forward fairing/nacelle fairing	$P_{1.0}$	152	156
3. Surface Devices			
(a) Vortex generators	$K_{11}+VG_{2.1}$	139	138
(b) Guidevane between nacelles	$K_{11}+FV_1$	142	138
(c) Longitudinal strakes	$H_{1.5.3}+S_4$	155	156
(d) 14% porosity spoiler	$K_{11}+X_1$	143	138

*Basic Code is K13 unless noted otherwise.

TABLE 2

LIST OF TEST RUNS

BASIC INVESTIGATIONS OF THE HUB WAKE

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
111	K_{11}/15" Long. wake traverse at TR center line	80	1433/0	8	6.0	-2.0	∞	Off
112	" /9" Vert. wake traverse above TR center line	"	"	"	"	"	"	"
113	" /2" Vert traverse through MR vortex	"	"	"	"	"	"	"
114	" /8" Vert. traverse below TR center line	"	"	"	"	"	"	"
115	" /13" Vert. traverse behind stabilizer	"	"	"	"	"	"	"
116	" /Lateral traverse - left stabilizer	"	"	"	"	"	"	"
117	" /116 continued	"	"	"	"	"	"	"
118	" /116 continued	"	"	"	"	"	"	"
119	" /Lateral traverse - right stabilizer	"	"	"	"	"	"	"
121	$K_{11}+T_2$/Effect of tail rotor flow on wake	"	1433/ 4500	"	"	"	"	On
135	K_{11}/Wake in 900 fpm climb	"	"	"	-6.0	-4.5	"	Off
136	" /Wake in 800 fpm descent	"	"	"	6.0	-2.0	"	"

TABLE 2 (CONTINUED)

LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG, psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
137	$K_{11}-H_{1.0}+H_{1.2}$/Effect of 7.6 inch diam. solid hub cap	80	1433/0	8	6	-3.8	∞	Off
138	K_{11}/Repeat of base run	"	"	"	"	"	"	"
139	$K_{11}+VG_{2.1}$/Effect of vortex generators on aft crown	"	"	"	"	"	"	"
140	$K_{11}+D_1$/Flat-topped "doghouse" fairing on aft crown	"	"	"	"	"	"	"
141	$K_{11}+D_2$/Rounded-top fairing	"	"	"	"	"	"	"
142	$K_{11}+FV_1$/Deflection vane on crown between nacelles	"	"	"	"	"	"	"
143	$K_{11}+X_1$/Variable porosity spoiler	"	"	"	"	"	"	"
149	$K_{13}+H_1-N_1$/Effect of nacelles off also add stiff pitch arms (K_{13})	60	1075/0	4.5	"	"	"	"
150	$K_{13}+H_1$/60 knot baseline	"	"	"	"	"	"	"
151	$K_{13}+H_{1.3}$/16 inch diam. helmet fairing	"	"	"	"	"	"	"
152	$K_{13}+P_{1.0}$/Pylon and intake fairings	80	1433/0	8	"	"	"	"
153	$K_{13}+H_{1.2}$/Repeat 137 with K_{13} pitch arms	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)

LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
154	$K_{13}+H_{1.5.2}$/10" open hub cap, 7" underbody, 1.25"gap	80	1433/0	8	6	-3.8	∞	Off
155	$K_{13}+H_{1.5.2}+S_4$/Same as 154 except strakes on aft crown	"	"	"	"	"	"	"
156	$K_{13}+H_{1.0}$/Baseline with K_{13},i.e., stiff pitch arms	"	"	"	"	"	"	"
158	$K_{13}-M+H_{1.0}$/Wake studies with blades off, hub not rotating	"	0/0	"	"	"	"	"
159	$K_{13}-M-H_{1.0}$/Wake studies with hub off	"	"	"	"	"	"	"
160	$K_{13}-M+H_{1.0}$/Same as 158 except hub is rotating	"	1433/0	"	"	"	"	"
161	$K_{13}-M+H_{1.5.2}$/Repeat of 154 without blades	"	0/0	"	"	"	"	"
162	$K_{13}-M+H_{1.5.3}$/Same as 161 except 4" gap	"	"	"	"	"	"	"
163	$K_{13}-M+H_{1.5.4}$/Same as 161 except 2" gap	"	"	"	"	"	"	"
164	$K_{13}-M+H_{1.5.1}$/Same as 161 except 0.5" gap	"	"	"	"	"	"	"
165	$K_{13}-M+H_{1.0.1}$/ 10" open hub cap,no underbody,same cap vert.position as Run 154	"	"	"	"	"	"	"
166	$K_{13}-M+H_{1.0.2}$/Same as 165 with cap lowered by 0.5"	"	"	"	"	"	"	"

TABLE 2(CONTINUED)

LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
167	K_{13}-M+$H_{1.7.1}$/16" open cap, no under-body, 2" gap	80	0/0	8	6	-3.8	∞	Off
168	K_{13}+$H_{1.7.1}$/Blades on, same cap config. as 167	"	1433/0	"	"	"	"	"
169	K_{13}+$H_{1.7.2}$/16" open cap, no under-body, 4" gap	"	"	"	"	"	"	"
170	K_{13}+$H_{1.0}$+$D_{4.0}$/Extended flat top fairing on aft crown	"	"	"	"	"	"	"
171	K_{13}+$H_{1.7.2}$+$D_{4.0}$/Same fairing as 170 same cap as 169	"	"	"	"	"	"	"
172	K_{13}+$H_{1.0}$+$E_{1.0}$(0psi)/Basic air ejector zero blowing baseline	"	"	"	"	"	"	"
173	K_{13}+$H_{1.0}$+$E_{1.0}$(40 psi)/Same as 172 with 40 psi supply	"	"	"	"	"	"	"
174	K_{13}+$H_{1.0}$+$E_{1.0}$(150 psi)/Same as 172 with 150 psi supply	"	"	"	"	"	"	"
175	K_{13}+$H_{1.0}$+$E_{2.5.1}$(40 psi)/Ejector with wide chord shroud at 40 psi	"	"	"	"	"	"	"
176	K_{13}+$H_{1.0}$+$E_{2.5.1}$(150 psi)/Same as 174 with 150 psi supply	"	"	"	"	"	"	"
177	K_{13}+$H_{1.5.4}$+$E_{2.5.1}$(150 psi)/Same as 176 with 10" cap like 163	"	"	"	"	"	"	"
178	K_{13}+$H_{1.0}$+$W_{1.0}$+$E_{1.1}$(0 psi)/Nacelle mounted wing	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)

LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
179	$K_{13}+H_{1.0}+W_{2.0}+E_{1.0}$ (0 psi)/Double slotted flapped wing	80	1433/0	8	6	-3.8	∞	Off
180	$K_{13}+H_{1.0}+W_{3.0}+E_{1.0}$ (0 psi)/Single slotted flapped wing	"	"	"	"	"	"	"
181	$K_{13}+H_{1.0}+E_{1.2}$ (0 psi)/Baseline with ejector tube moved aft	"	"	"	"	"	"	"
182	$K_{13}+H_{1.9.0}+E_{1.2}$ (0 psi)/Standard 10" frisbee	"	"	"	"	"	"	"
183	$K_{13}+H_{1.9.1}+E_{1.2}$ (0 psi)/16" fabricated frisbee	"	"	"	"	"	"	"
184	$K_{13}+H_{1.0}+E_{3.5.2}$ (40 psi)/Wide chord with lip at 40 psi	"	"	"	"	"	"	"
185	$K_{13}+H_{1.0}+E_{3.5.2}$ (150 psi)/Same as 184 with 150 psi air	"	"	"	"	"	"	"
186	$K_{13}+H_{1.0}+W_{4.0}$/Boom mounted stub wing	"	"	"	"	"	"	"
187	$K_{13}+H_{1.0}+E_{3.5.4}$ (150 psi)/Like 185 with modified shroud	"	"	"	"	"	"	"
188	$K_{13}+H_{1.0}+I_1+E_{1.0}$ (0 psi)/Baseline with I_1 instr. ring	"	"	"	"	"	"	"
189	$K_{13}+H_{1.8.1}+I_1+E_{1.0}$ (0 psi)/Solid cap, 10" diam. 3.25" height	"	"	"	"	"	"	"
190	$K_{13}+H_{1.8.2}+I_1+E_{1.0}$ (0 psi)/Same as 190 except + 4.12" height	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)
LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
191	$K_{13}+H_{1.0.2}+I_1+E_{1.0}$ (0 psi)/10" cap, no underbody, 1.87" gap	80	1433/0	8	6	-3.8	∞	Off
193	$K_{13}+H_{1.0.2}+I_1+E_{1.0}$ (0 psi)/10" cap, no underbody, 1.25" gap	"	"	"	"	"	"	"
194	$K_{13}+H_{1.11.1}+I_2+E_{1.0}$ (0 psi)/7.6" cap, underbody, 1.25" gap	"	"	"	"	"	"	"
195	$K_{13}+H_{1.11.1}+I_2+E_{1.0}$ (20 psi)/Same as 194 with 20 psi air	"	"	"	"	"	"	"
196	$K_{13}+H_{1.11.1}+I_2+E_{1.0}$ (40 psi)/Same as 194 with 40 psi air	"	"	"	"	"	"	"
197	$K_{13}+H_{1.11.1}+I_2+E_{1.0}$ (150 psi)/Same as 194 with 150 psi air	"	"	"	"	"	"	"
198	$K_{13}+H_{1.11.1}+I_2+E_{4.0}$ (0 psi)/Same as 194 except blowing tube 2" aft	"	"	"	"	"	"	"
199	$K_{13}+H_{1.11.1}+I_2+E_{4.0}$ (40 psi)/Same as 198 with 40 psi air	"	"	"	"	"	"	"
200	$K_{13}+H_{1.11.1}+I_2+E_{4.0}$ (150 psi)/Same as 198 with 150 psi air	"	"	"	"	"	"	"
201	$K_{13}+H_{1.11.2}+I_2+E_{4.0}$ (150 psi)/Same as 200 except center support cap	"	"	"	"	"	"	"
202	$K_{13}+H_{1.11.2}+I_2$/Baseline with I_2 and no blowing tube	"	"	"	"	"	"	"
203	$K_{13}+H_{1.0}+E_{5.0}$ (0 psi)/Bifurcated air duct baseline	"	"	"	"	"	"	"

TABLE 2 (CONTINUED)

LIST OF TEST RUNS

EVALUATION OF WAKE-ALTERING DEVICES

RUN NO.	CONFIGURATION/CONDITION	V_{TUN} KNOTS	RPM MR/TR	DISK LDG. psf	MODEL ANGLES		MR HT.	TAIL ROTOR
					α°	ψ°	h/d	
204	$K_{13}+H_{1.0}+E_{5.0}$ (150 psi)/Bifurcated duct with 150 psi air	80	1433/0	8	6	-3.8	∞	Off
205	$K_{13}+H_{1.0}+E_{5.0}$ (40 psi)/Same as 204 with 40 psi air	"	"	"	"	"	"	"
207	$K_{13}+H_{1.2.1}+I_1+E_{1.0}$ (0 psi)/7.6" solid cap, no gap	"	"	"	"	"	"	"
208	$K_{13}+H_{1.2.2}+I_1+E_{1.0}$ (0 psi)/Same as 207 except 0.55" gap	"	"	"	"	"	"	"
210	$K_{13}+H_{1.15.1}+I_1+E_{1.0}$ (0 psi)/Repeat of 189	"	"	"	"	"	"	"
211	$K_{13}+H_{1.14.1}+I_1+E_{1.0}$ (0 psi)/Like 189 and 210 except cap is open	"	"	"	"	"	"	"

TABLE 3

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
111	20	53.5	103.1	-7.25	1
	21	"	"	"	
	22	"	105.0	"	
	24	"	107.0	"	
	26	"	109.0	"	
	28	"	111.0	"	
	30	"	112.9	"	
	32	"	114.9	"	
	34	"	116.9	"	
	36	"	118.9	"	
112	2	48.9	107.3	-7.25	1
	4	50.8	"	"	
	6	52.7	103.3	"	
	8	54.5	"	"	
	10	56.2	"	"	
	12	57.2	"	"	
113	2	51.7	103.3	-3.25	1
	4	52.3	"	"	
	6	52.8	"	"	
	8	53.3	"	"	
	10	53.9	"	"	
	11	53.3	"	"	
114	2	44.5	103.0	-3.25	1
	4	46.4	"	"	
	6	48.2	"	"	
	8	50.0	"	"	
	10	51.9	"	"	
115	3	52.9	124.7	-3.25	1
	4	52.0	"	"	
	6	50.0	"	"	
	9	48.0	"	"	
	10	46.0	"	"	
	12	44.1	"	"	
	14	42.1	"	"	
	16	53.0	"	"	
	18	54.0	"	"	
	20	55.0	"	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
116	7	36.9	100.5	-17.5	1
117	2	37.6	100.5	-16.0	1
	4	"	"	-14.0	
	6	37.3	99.6	-12.0	
	8	"	"	-10.0	
	10	"	"	- 8.0	
118	2	37.6	100.5	- 6.0	1
119	2	37.3	99.6	+ 6.0	1
	5	"	"	8	
	8	"	"	10	
	9	"	"	"	
	14	"	"	14	
	16	"	"	16	
	20	51.5	102.5	17.5	
	25	52.3	101.7	-17.5	
121	3	62.9	129.0	+ 5.7	2
	4	53.5	"	"	
	6	50.1	"	"	
	8	46.0	"	"	
	10	42.1	"	"	
135	2	56.9	106.3	- 5.7	3
	4	54.5	"	"	
	6	52.5	"	"	
	8	50.5	"	"	
	10	48.5	"	"	
	12	46.5	"	"	
	14	44.5	"	"	
136	2	56.5	104.0	- 8.0	4
	4	54.5	"	"	
	6	52.5	"	"	
	8	50.6	"	"	
	10	48.5	"	"	
	12	46.5	"	"	
	14	44.5	"	"	
	17	37.1	"	"	
	18	39.0	"	"	
	19	41.0	"	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
137	3	38.7	98.4	- 8.0	5
	5	39.9	"	"	
	7	42.0	100.5	"	
	9	44.0	"	"	
	11	46.0	103.6	"	
	13	48.0	"	"	
	15	50.0	"	"	
	17	52.0	"	"	
	19	54.0	"	"	
138-41, 143	2	38.8	98.4	- 8.0	5
	3	40.0	"	"	
	4	42.0	100.5	"	
	5	44.0	"	"	
	6	46.0	103.6	"	
	7	48.0	"	"	
	8	50.0	"	"	
	9	52.0	"	"	
	10	54.0	"	"	
142	7	37.8	98.4	- 8.0	5
	8	"	"	"	
	9	40.2	"	"	
	10	42.0	100.5	"	
	11	44.0	"	"	
	12	46.0	103.6	"	
	13	48.0	"	"	
	14	50.0	"	"	
	15	52.0	"	"	
	16	54.0	"	"	
	17	56.8	"	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
149-151	2	38.8	98.5	- 8.0	5
	3	40.0	"	"	
	4	42.0	100.6	"	
	5	44.0	"	"	
	6	46.0	103.5	"	
	7	48.0	"	"	
	8	50.0	"	"	
	9	52.0	"	"	
	10	54.0	"	"	
152-6, 158	2	42.9	97.9	0.0	6
161-4, 166	3	44.9	"	"	
167, 169-71	4	46.9	100.6	"	
175, 177-9	5	48.9	"	"	
180,182,184	6	50.9	104.6	"	
186-8, 190	7	52.9	"	"	
191,193,194	8	54.9	"	"	
196,198,201	9	56.9	"	"	
204,207,208					
211					
159	1	54.9	104.6	0.0	6
	2	52.9	"	"	
	3	50.7	"	"	
	4	48.6	100.6	"	
	5	46.7	"	"	
160,203	5	42.9	97.9	0.0	6
	6	44.9	"	"	
	7	46.9	100.6	"	
	8	48.9	"	"	
	9	50.9	104.6	"	
	10	52.9	"	"	
	11	54.9	"	"	
165	3	44.9	97.9	0.0	6
	4	42.9	"	"	
	5	46.9	100.6	"	
	6	48.9	"	"	
	7	50.9	104.6	"	
	8	52.9	"	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
168, 183	4	42.9	97.9	0.0	6
	5	44.9	"	"	
	6	46.9	100.6	"	
	7	48.9	"	"	
	8	50.9	104.6	"	
	9	52.9	"	"	
	10	54.9	"	"	
172	3	42.9	97.9	0.0	6
	4	44.9	"	"	
	6	44.9	"	"	
	7	46.9	100.6	"	
	8	48.9	"	"	
	9	50.9	104.6	"	
	10	52.9	"	"	
	11	54.9	"	"	
173,174,176 185,195,197 199,200,205 210	1	42.9	97.9	0.0	6
	2	44.9	"	"	
	3	46.9	100.6	"	
	4	48.9	"	"	
	5	50.9	104.6	"	
	6	52.9	"	"	
	7	54.9	"	"	
181	2	42.9	97.9	0.0	6
	3	44.9	"	"	
	4	46.9	100.6	"	
	5	48.9	"	"	
	6	50.9	104.6	"	
	7	52.9	"	"	
	9	54.9	"	"	
	10	"	"	"	
	11	"	"	"	
	12	"	"	"	
	13	42.9	97.9	"	

TABLE 3 (CONTINUED)

INDEX TO RAKE POSITIONS

RUN NUMBER	TEST POINT	WATER LINE	MODEL STATION	BUTT LINE	LOCATION FIGURE
189	29	42.9	97.9	0.0	6
	30	44.9	"	"	
	31	46.9	100.6	"	
	32	48.9	"	"	
	33	"	"	"	
	34	50.9	104.6	"	
	35	"	"	"	
	36	48.9	100.6	"	
	37	50.9	104.6	"	
	38	52.9	"	"	
	39	54.9	"	"	
202	3	43.4	97.9	0.0	6
	4	44.9	"	"	
	5	46.9	100.6	"	
	6	48.9	"	"	
	7	50.9	104.6	"	

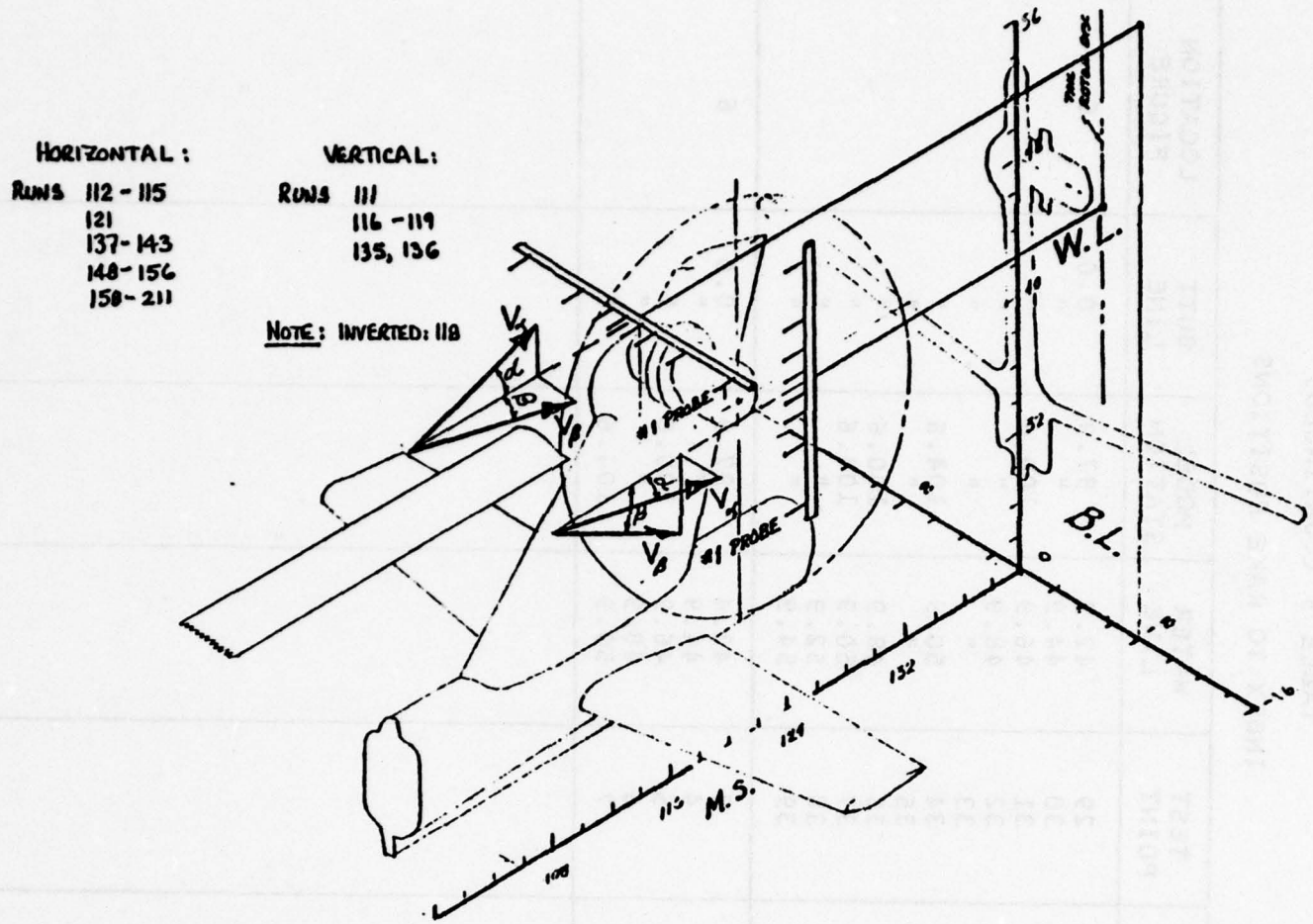


FIGURE 1 - RAKE ORIENTATION DIAGRAM

RUN 121

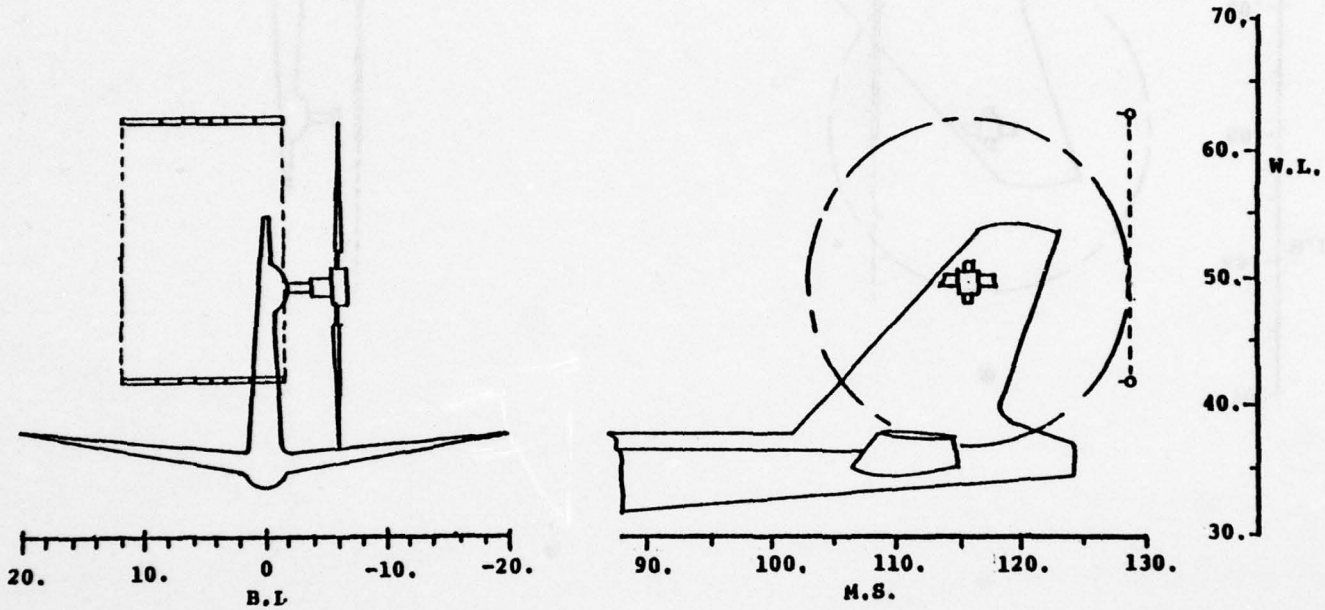


FIGURE 2 -HOT FILM RAKE LOCATIONS

RUN 135

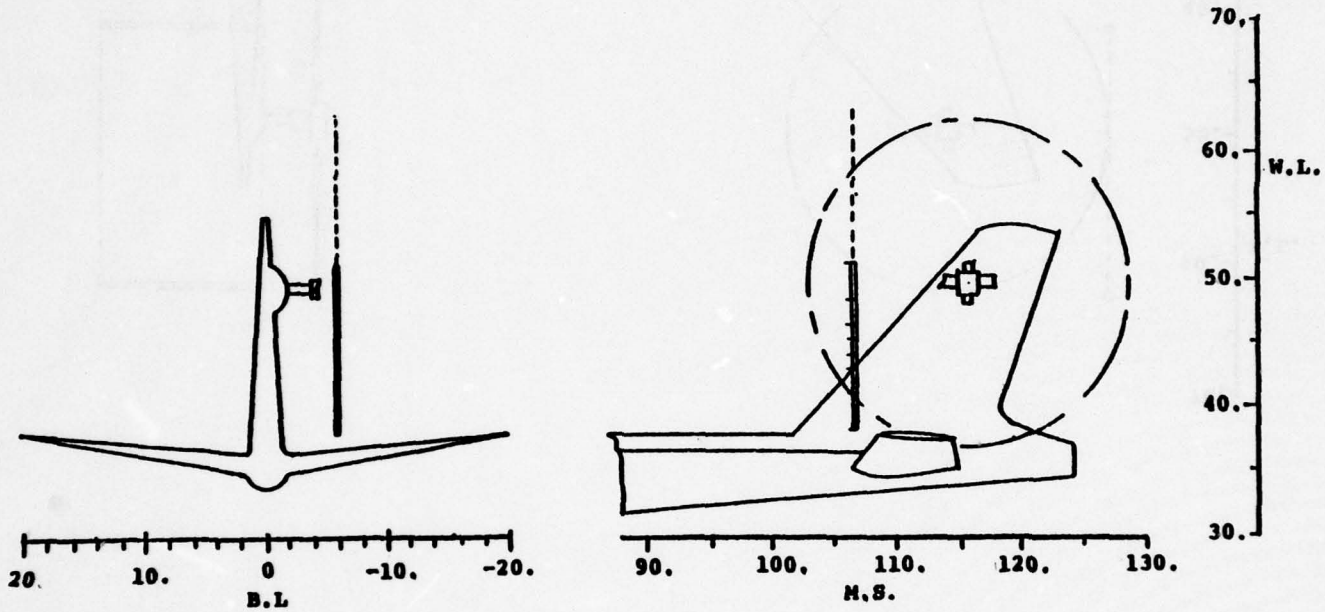


FIGURE 3 -HOT FILM RAKE LOCATIONS

RUN 136

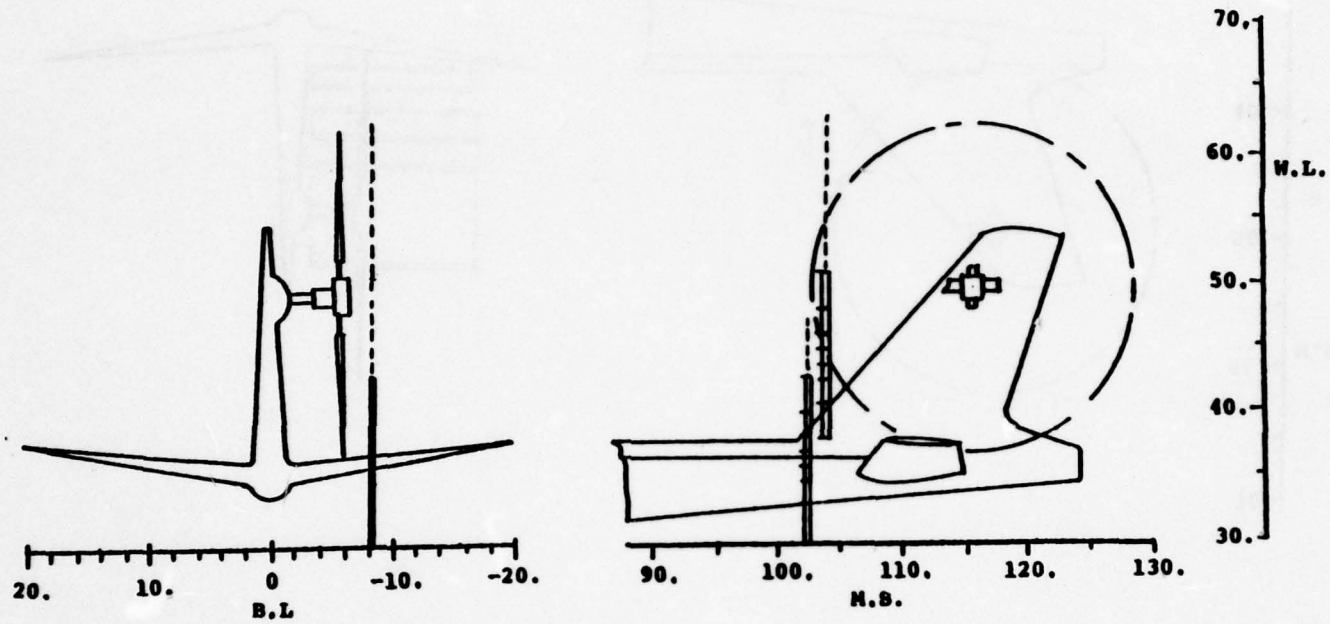


FIGURE 4 -HOT FILM RAKE LOCATIONS

RUN 137, 138, 139, 140, 141, 142,
143, 148, 149, 150, 151

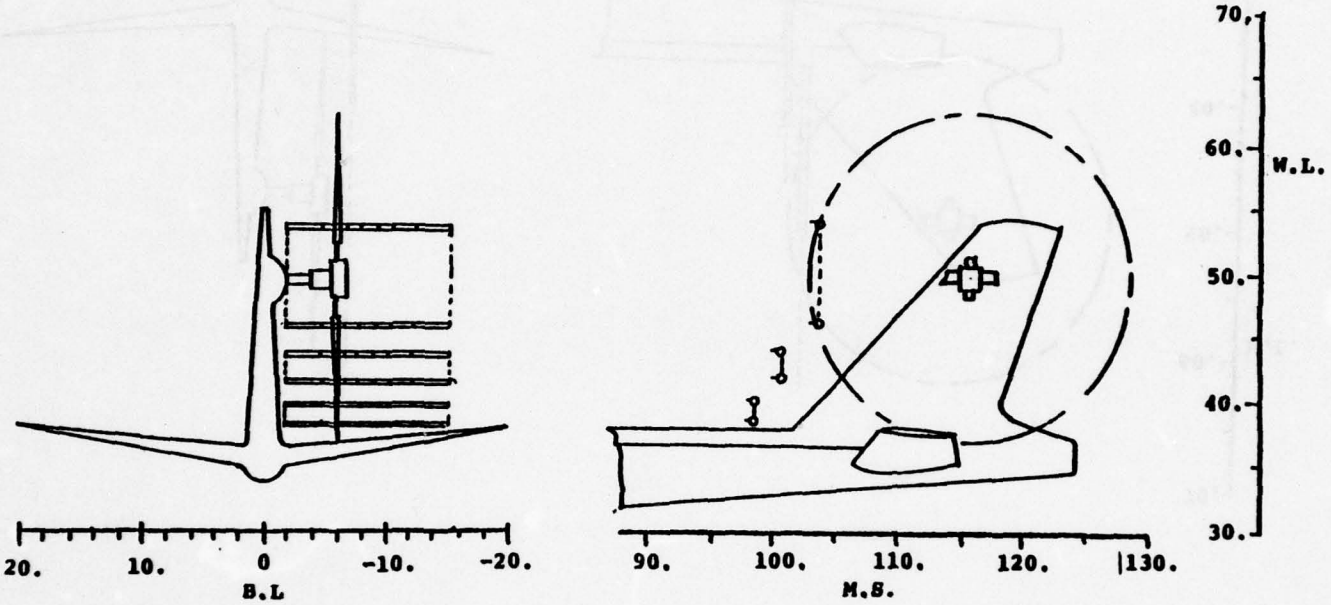


FIGURE 5 -HOT FILM RAKE LOCATIONS

RUN 152-156, 158-211

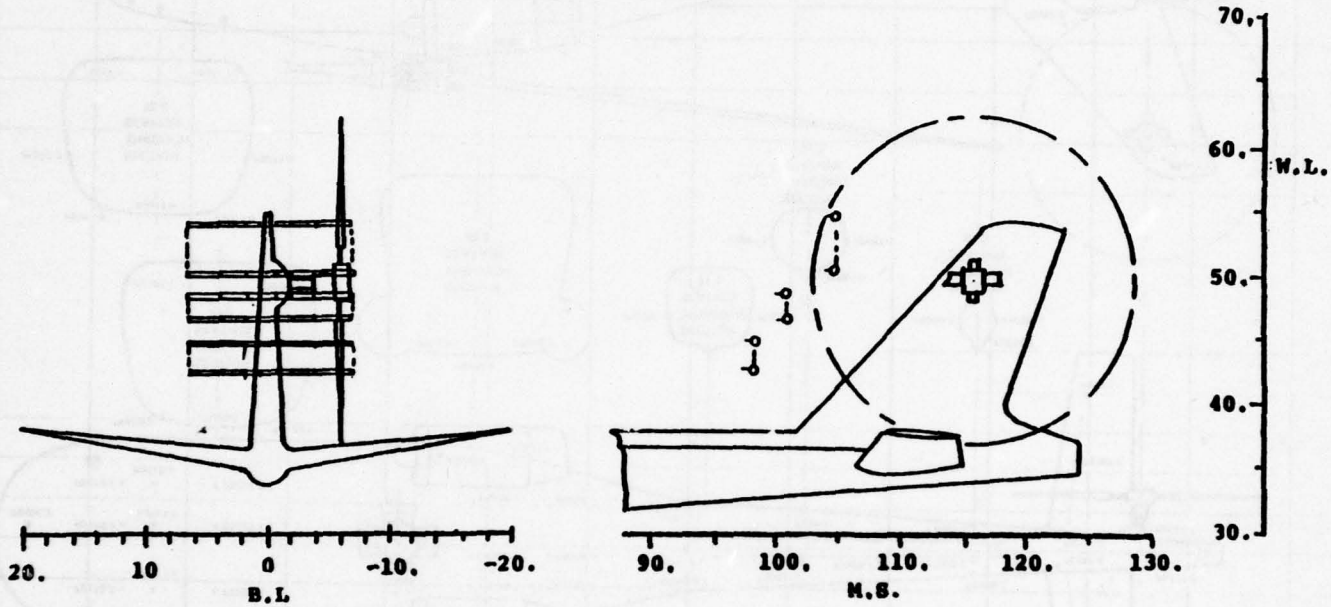


FIGURE 6 -HOT FILM RAKE LOCATIONS

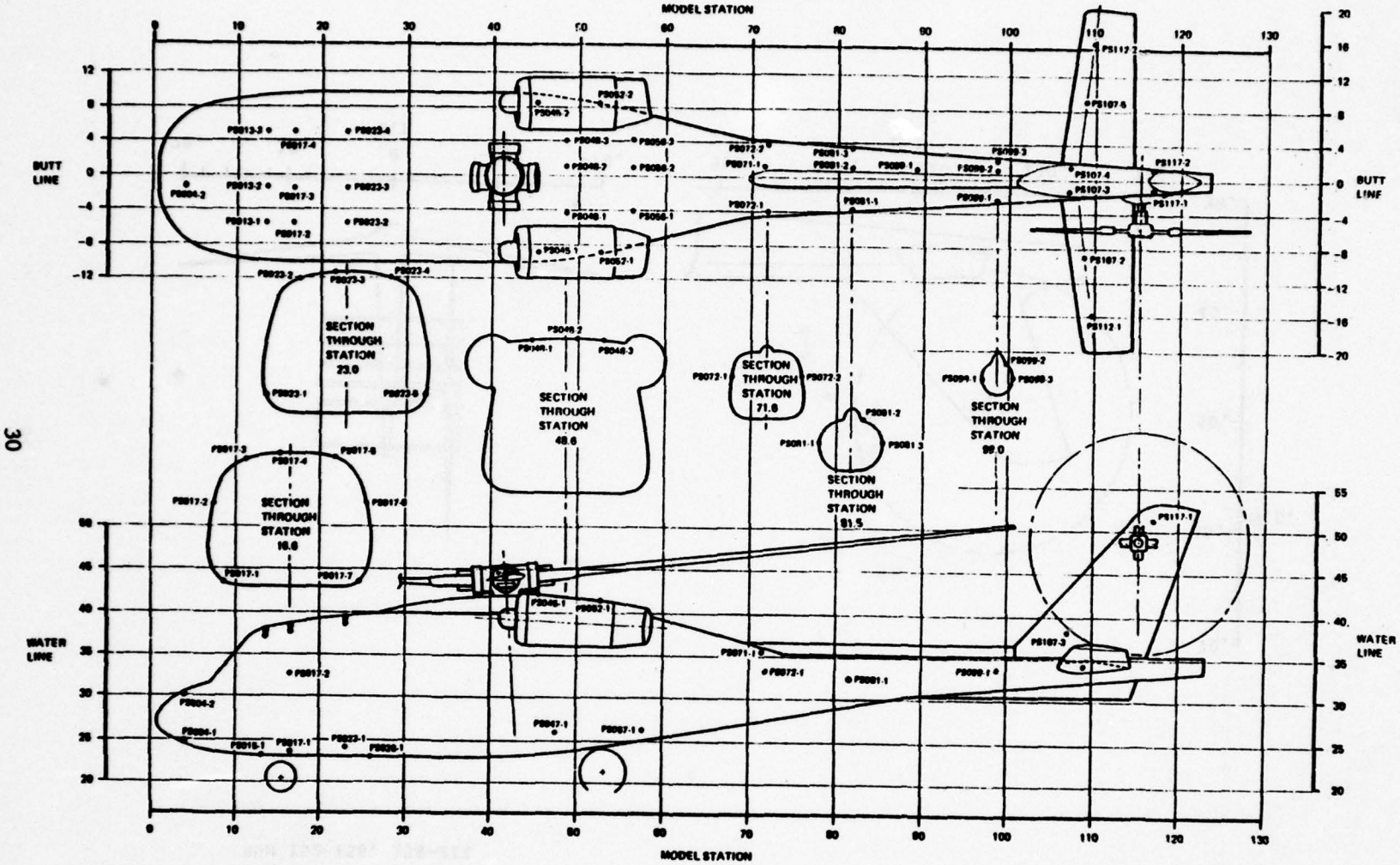
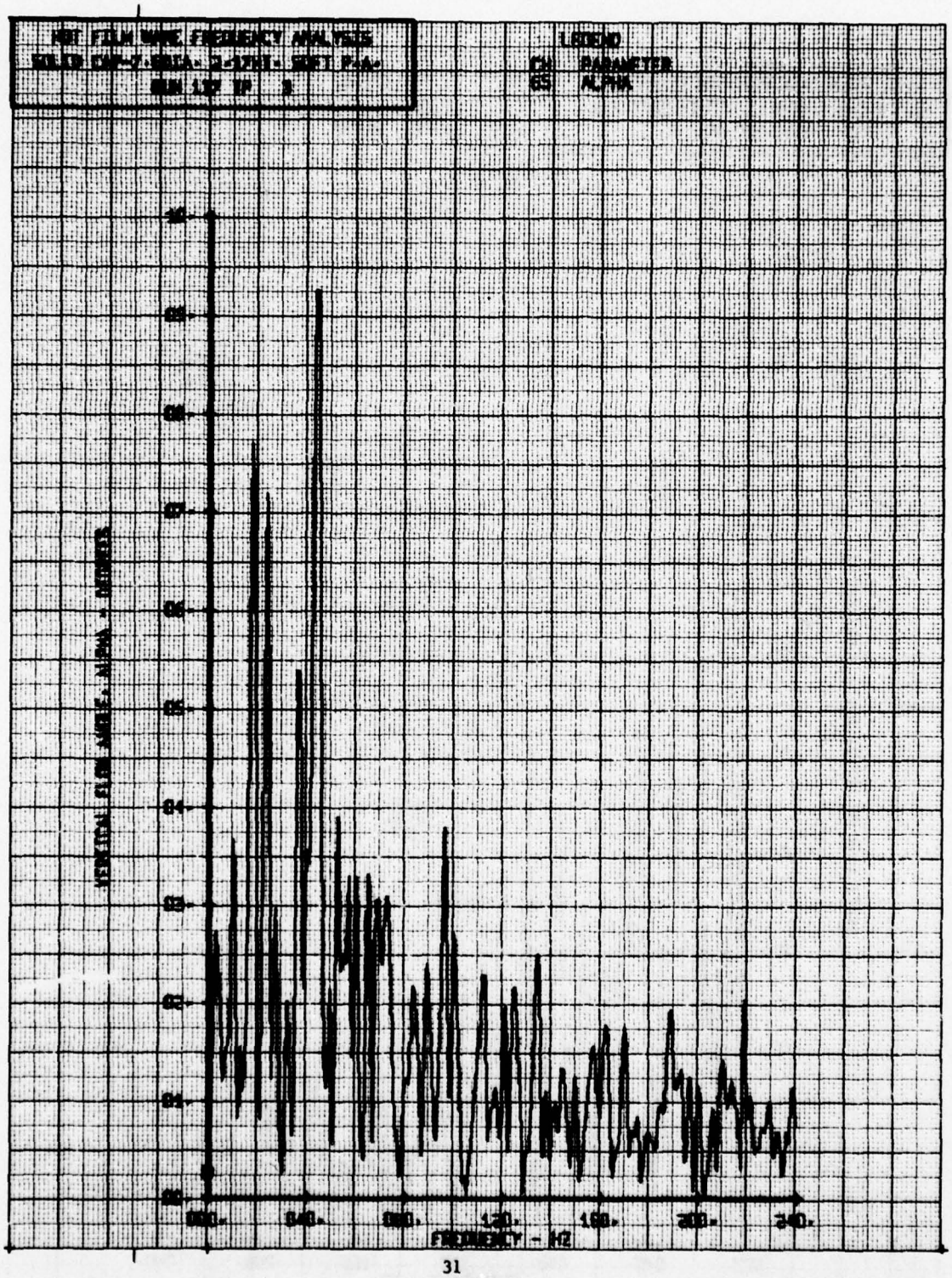
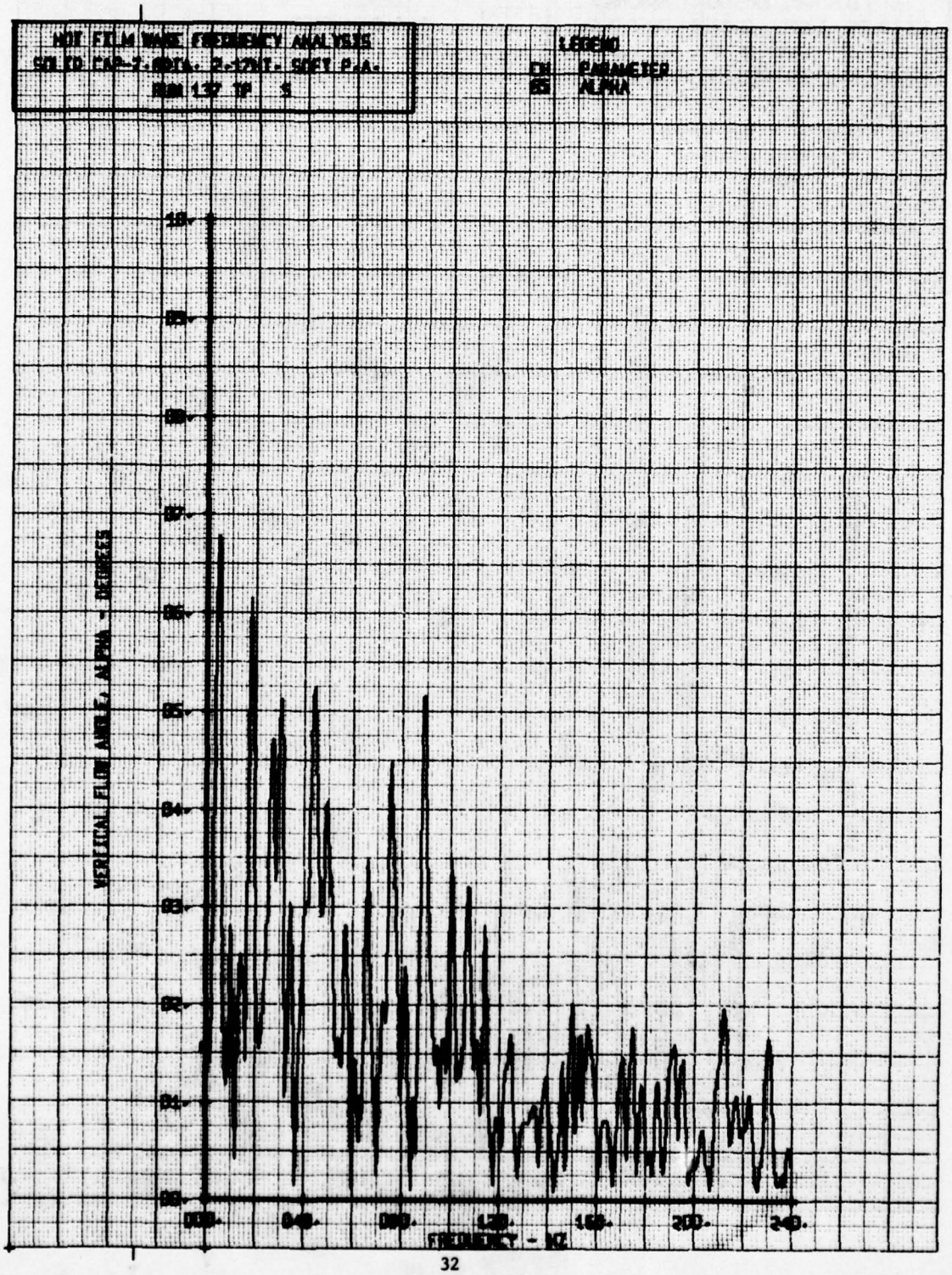
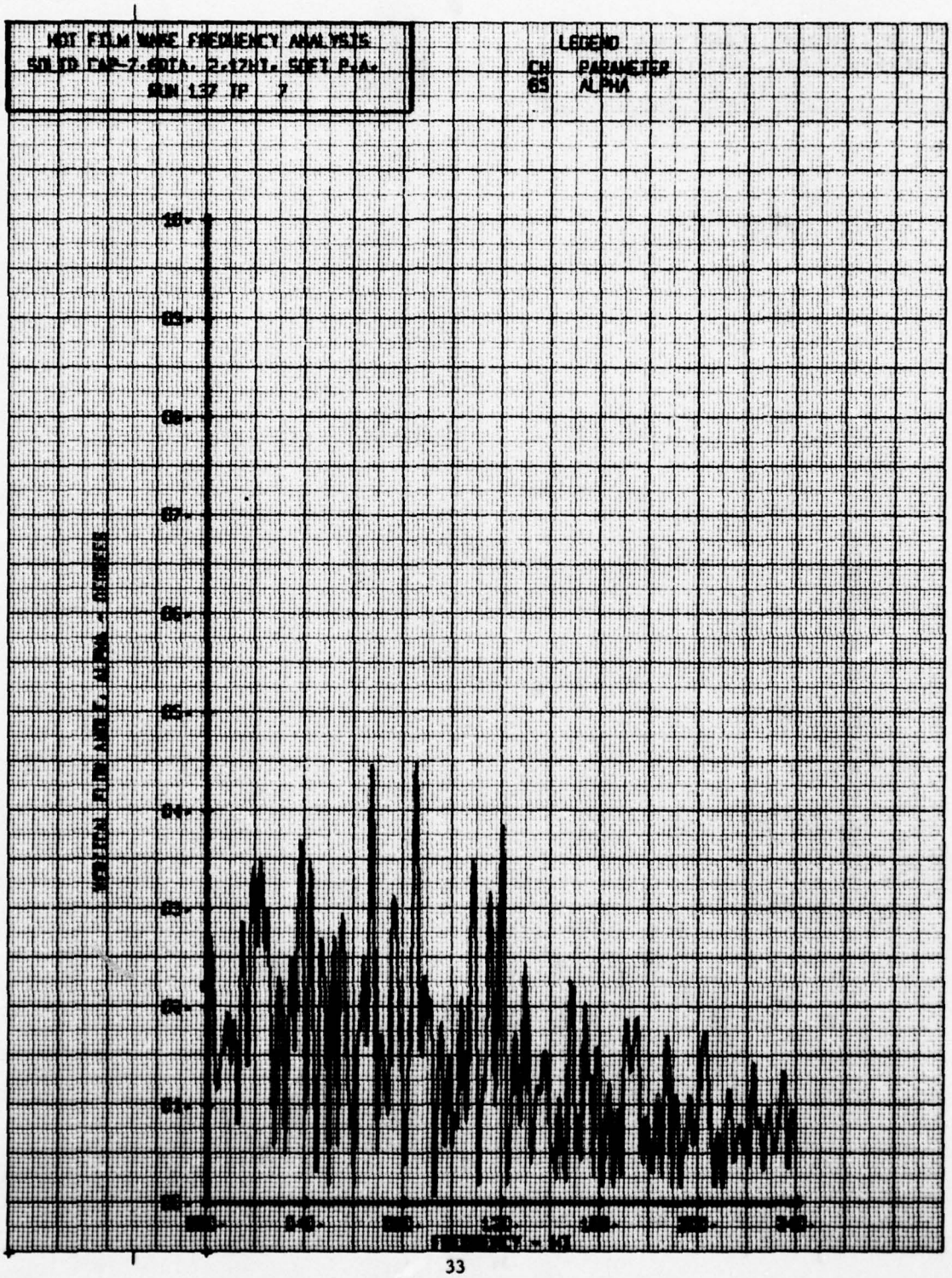
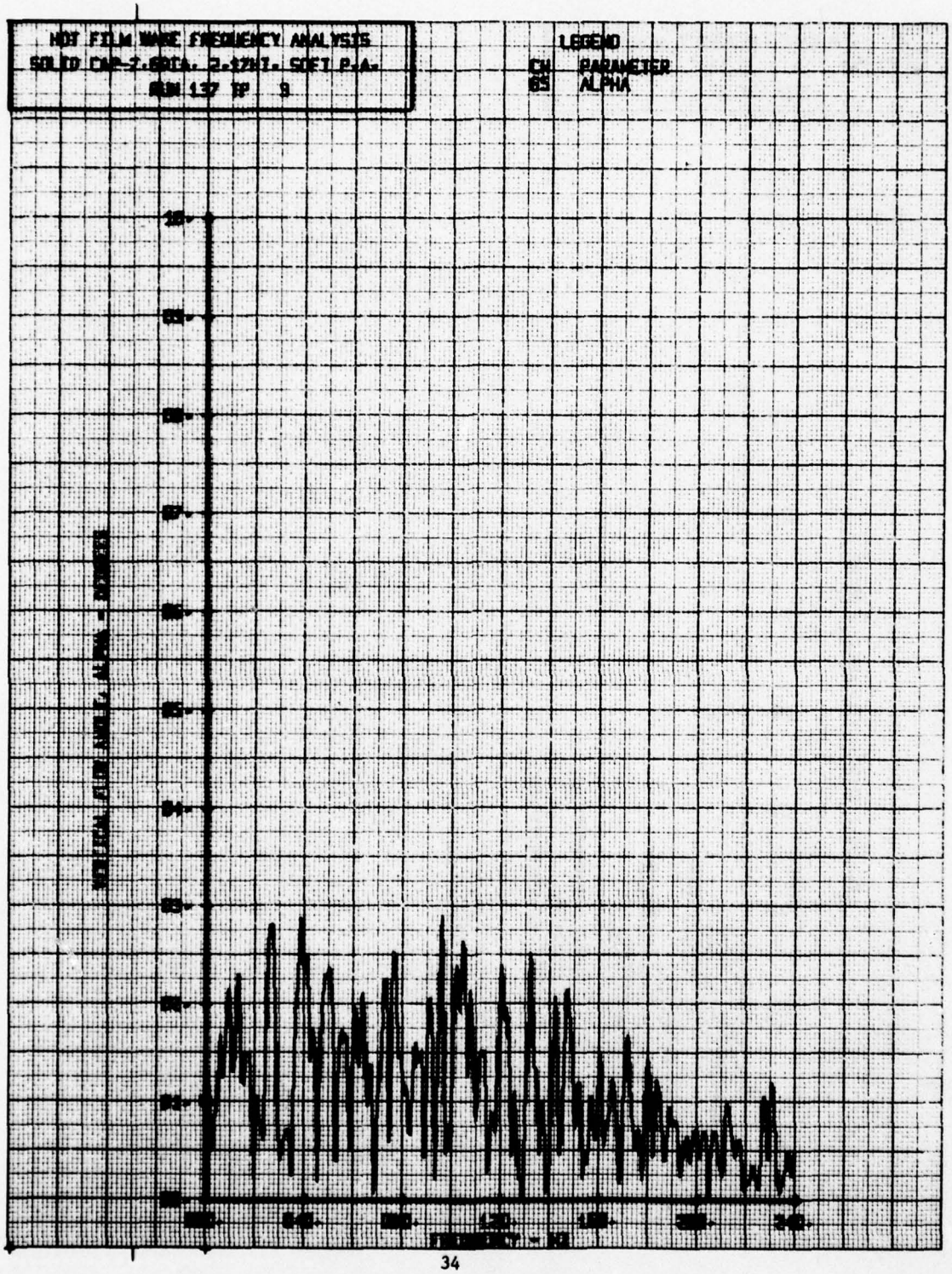


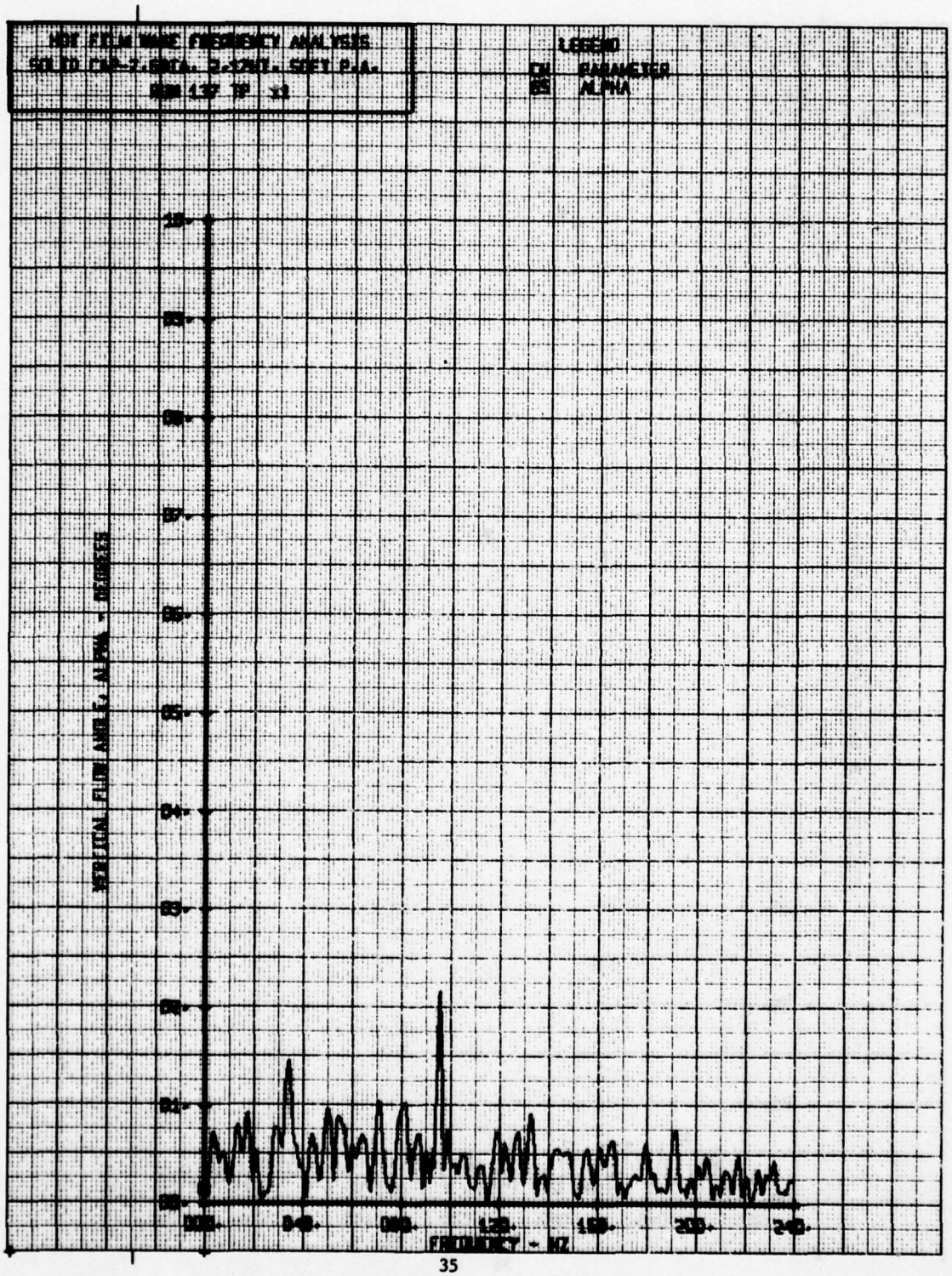
FIGURE 7 -1/4.85 SCALE MODEL GEOMETRY AND SURFACE PRESSURE TRANSDUCER LOCATIONS

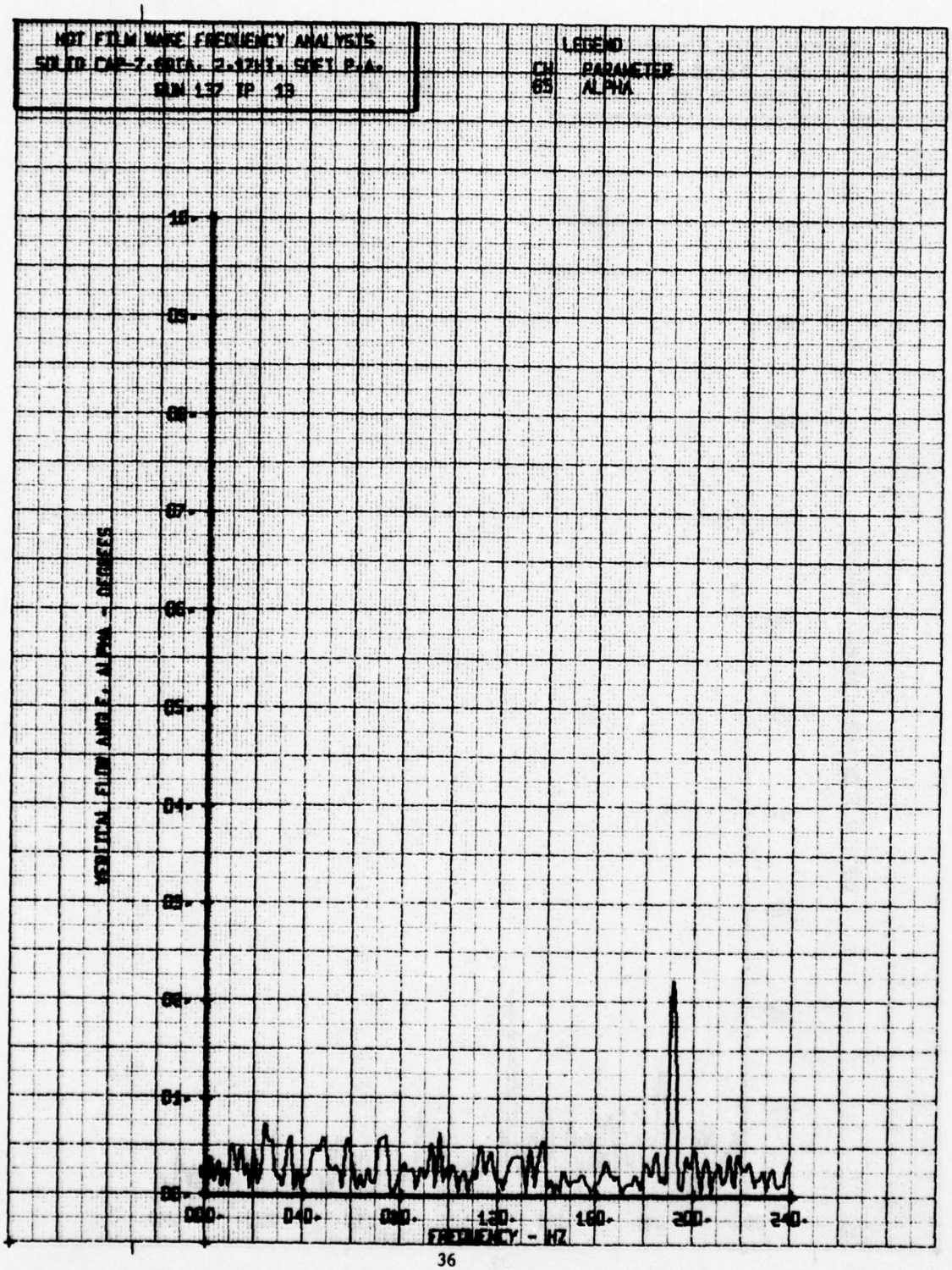

HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL CLIP LEVEL, ALPHA - DEGREES
FREQUENCY - HZ

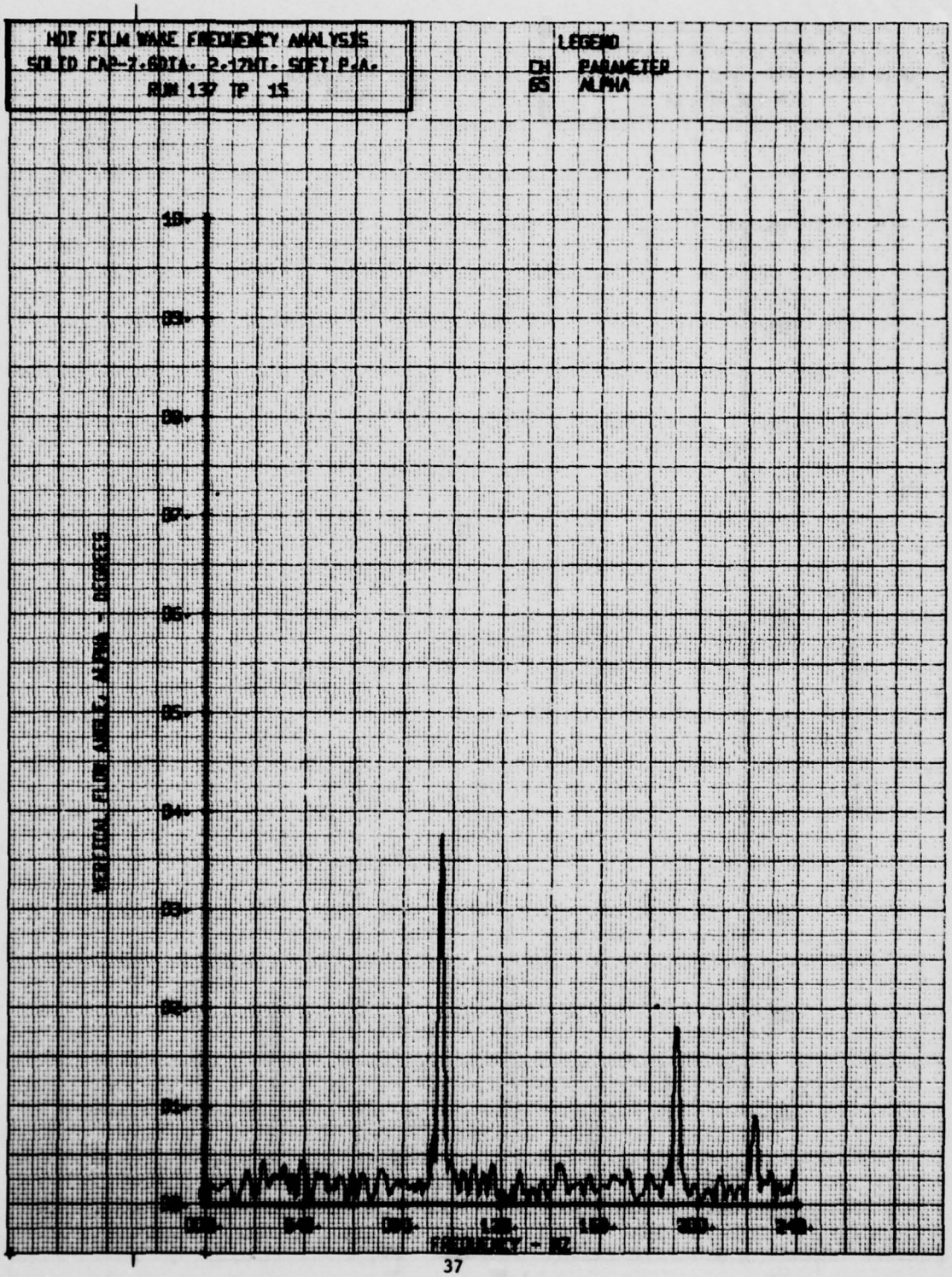

HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
05 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

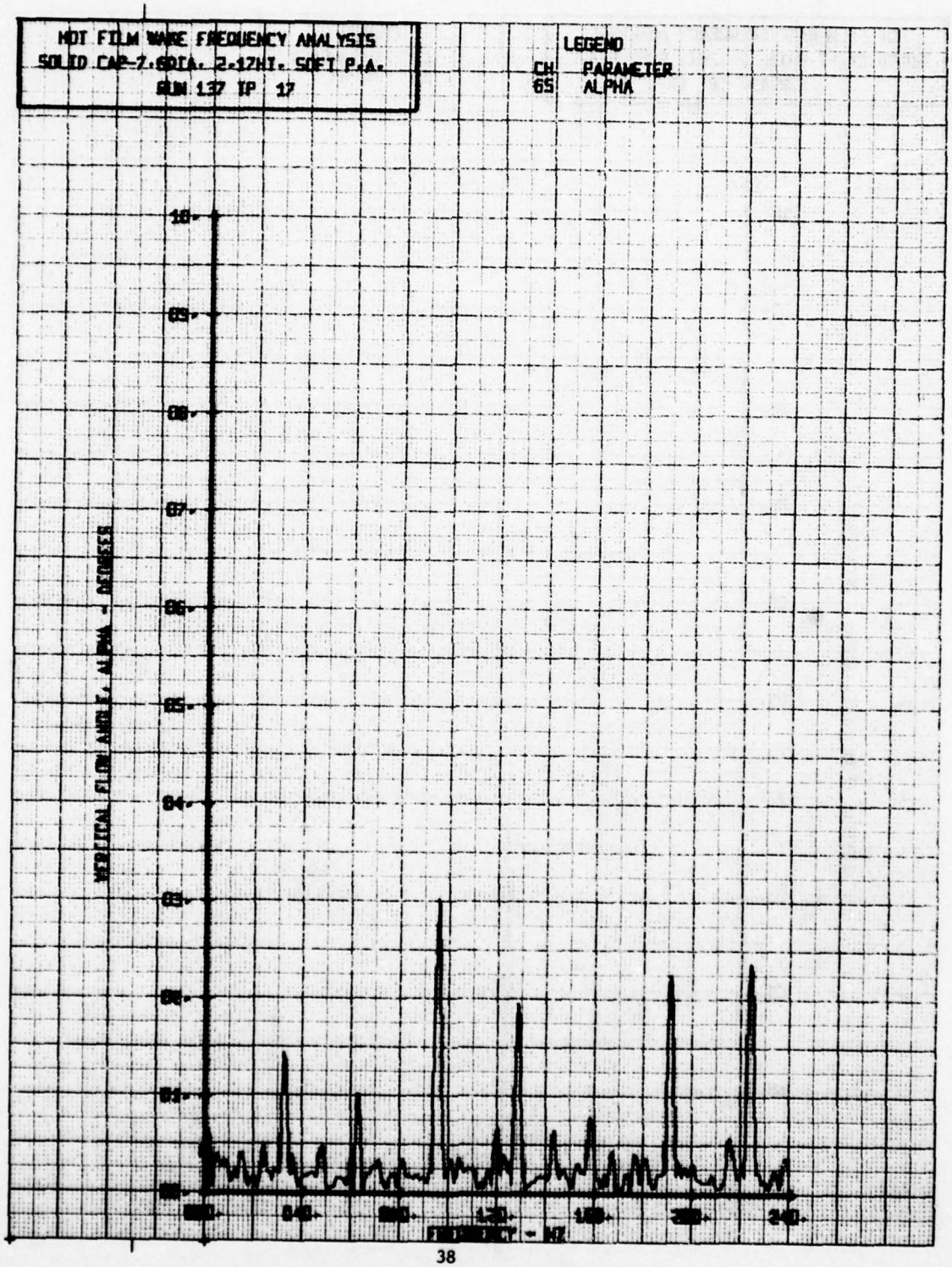

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.60DIA. 2.17HT. SOFT P.A.
RUN 137 TP 7
LEGEND
CH PARAMETER
65 ALPHA
MOTION FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

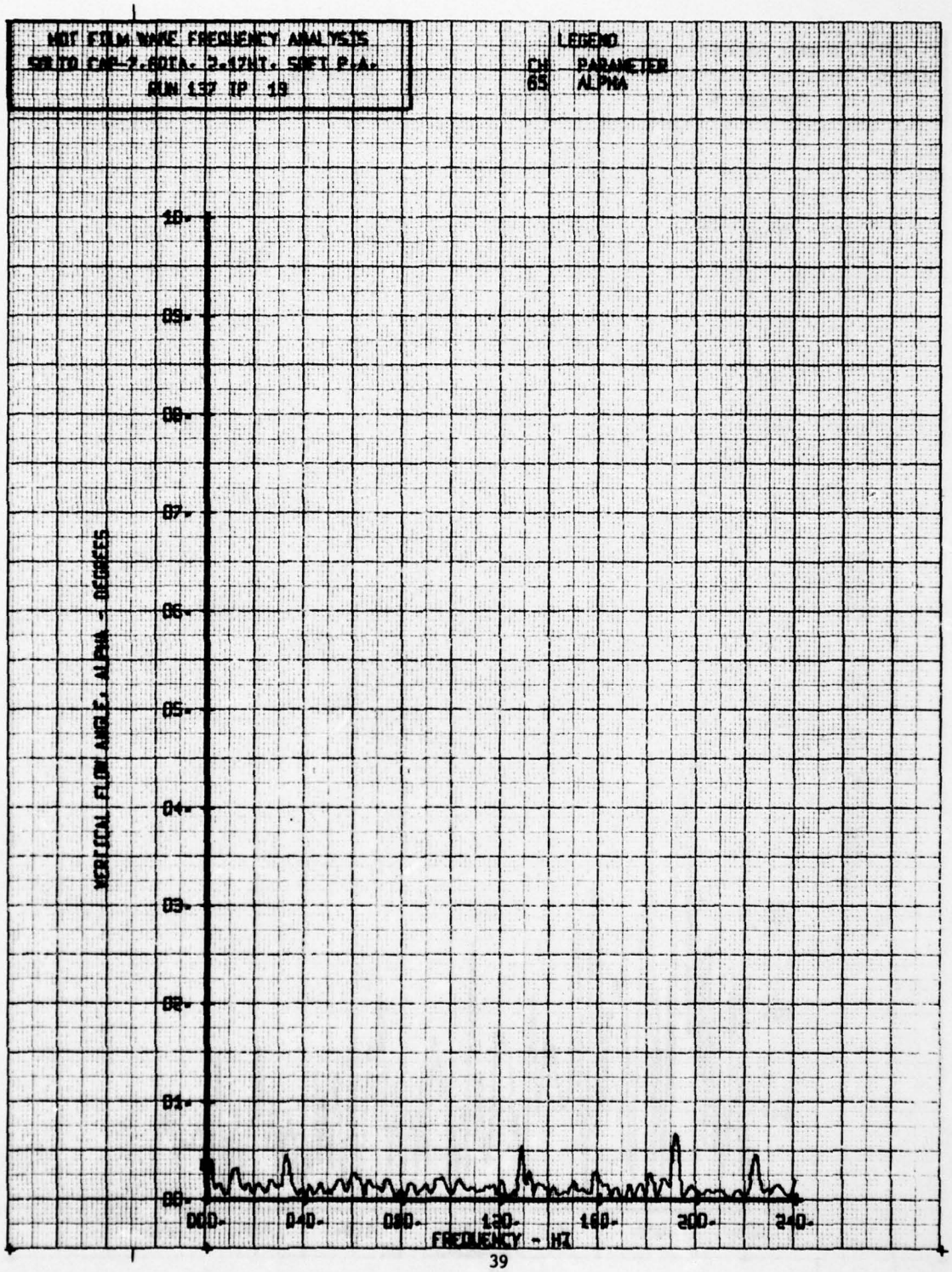

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 9
LEGEND
CH PARAMETER
65 ALPHA

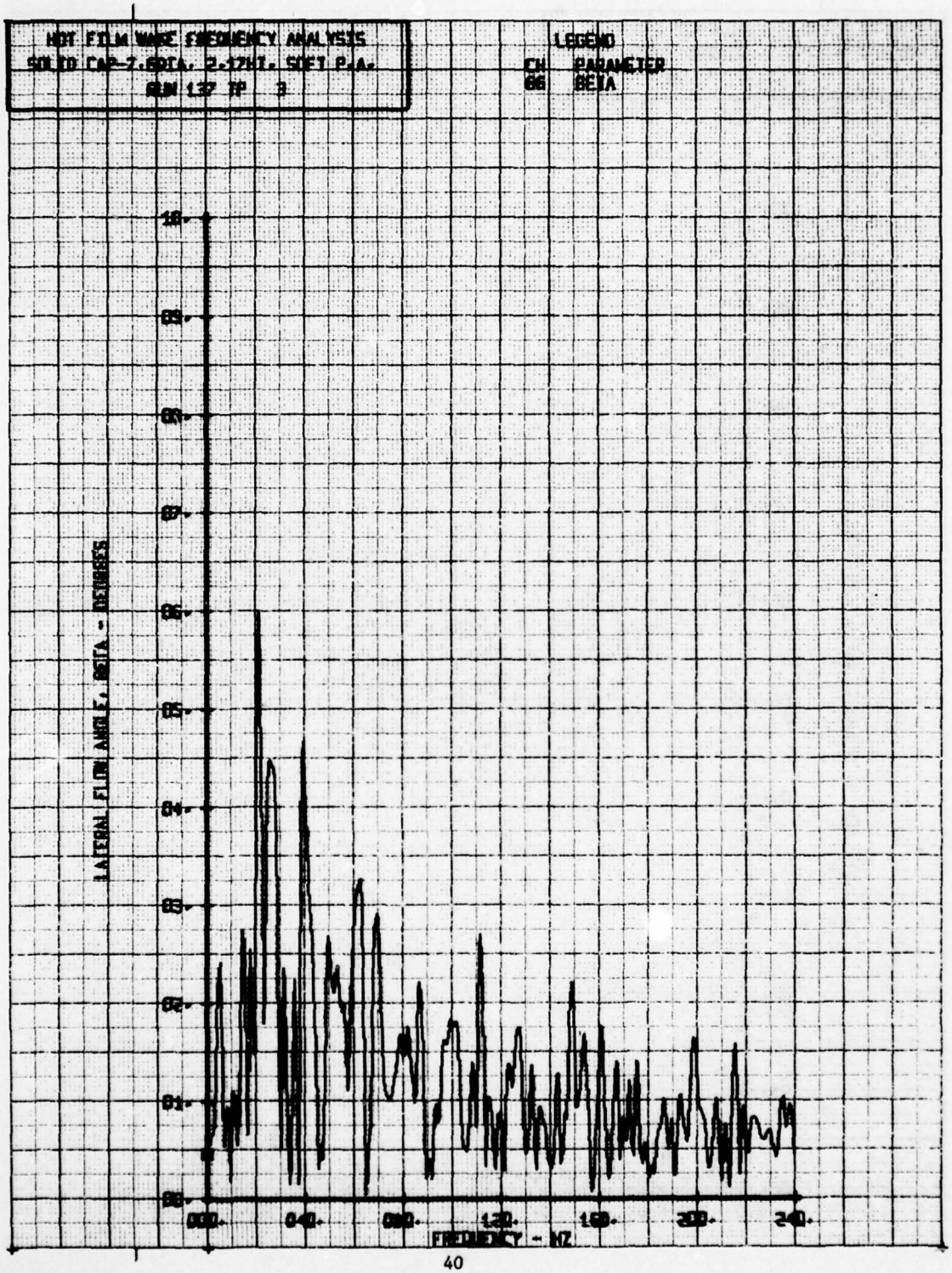

HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
PARAMETER
ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

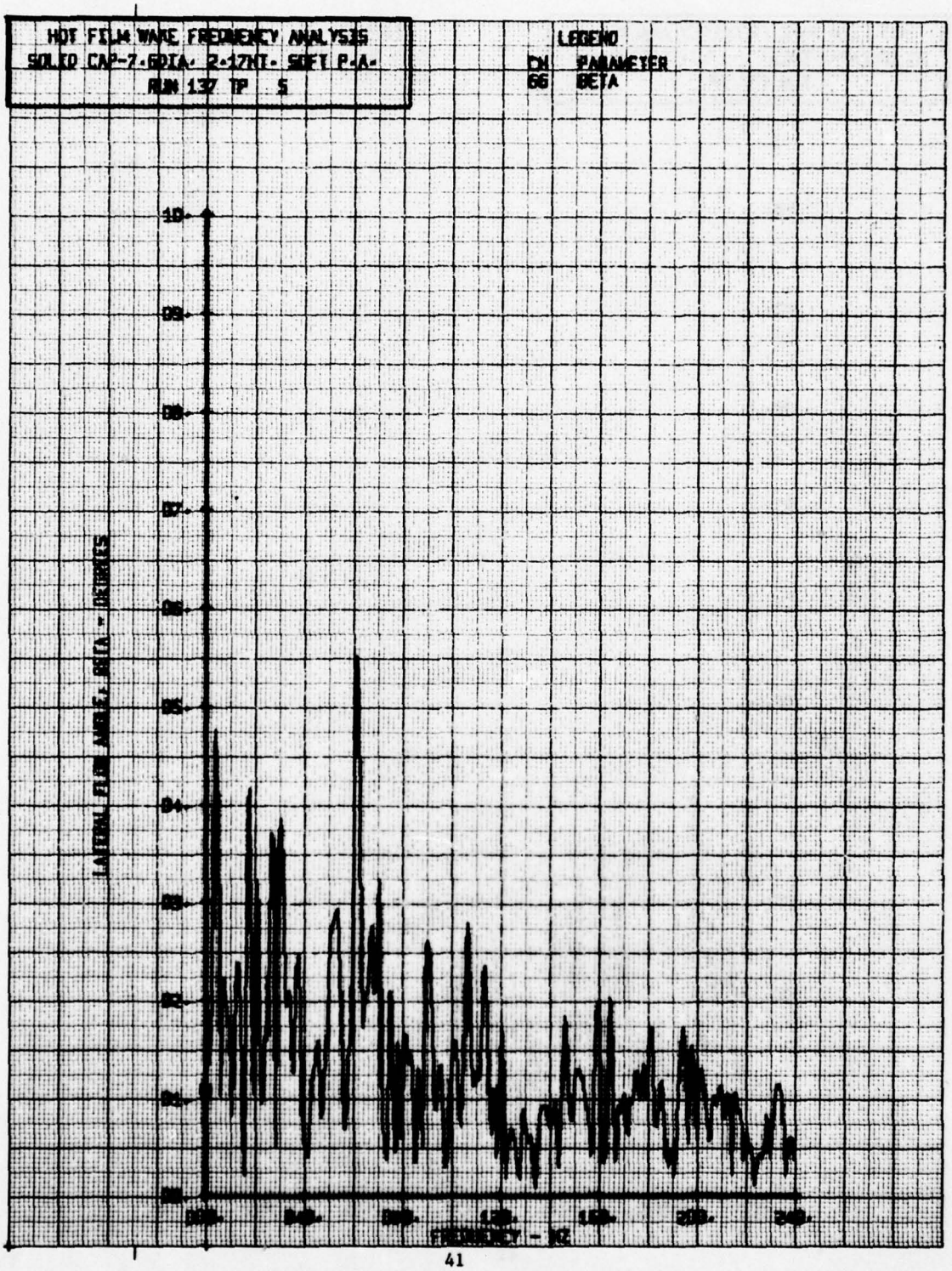

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.6DCA. 2.17H1. 50FT P.A.
RUN 137 TP 13
LEGEND
CH PARAMETER
65 ALPHA
VORTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

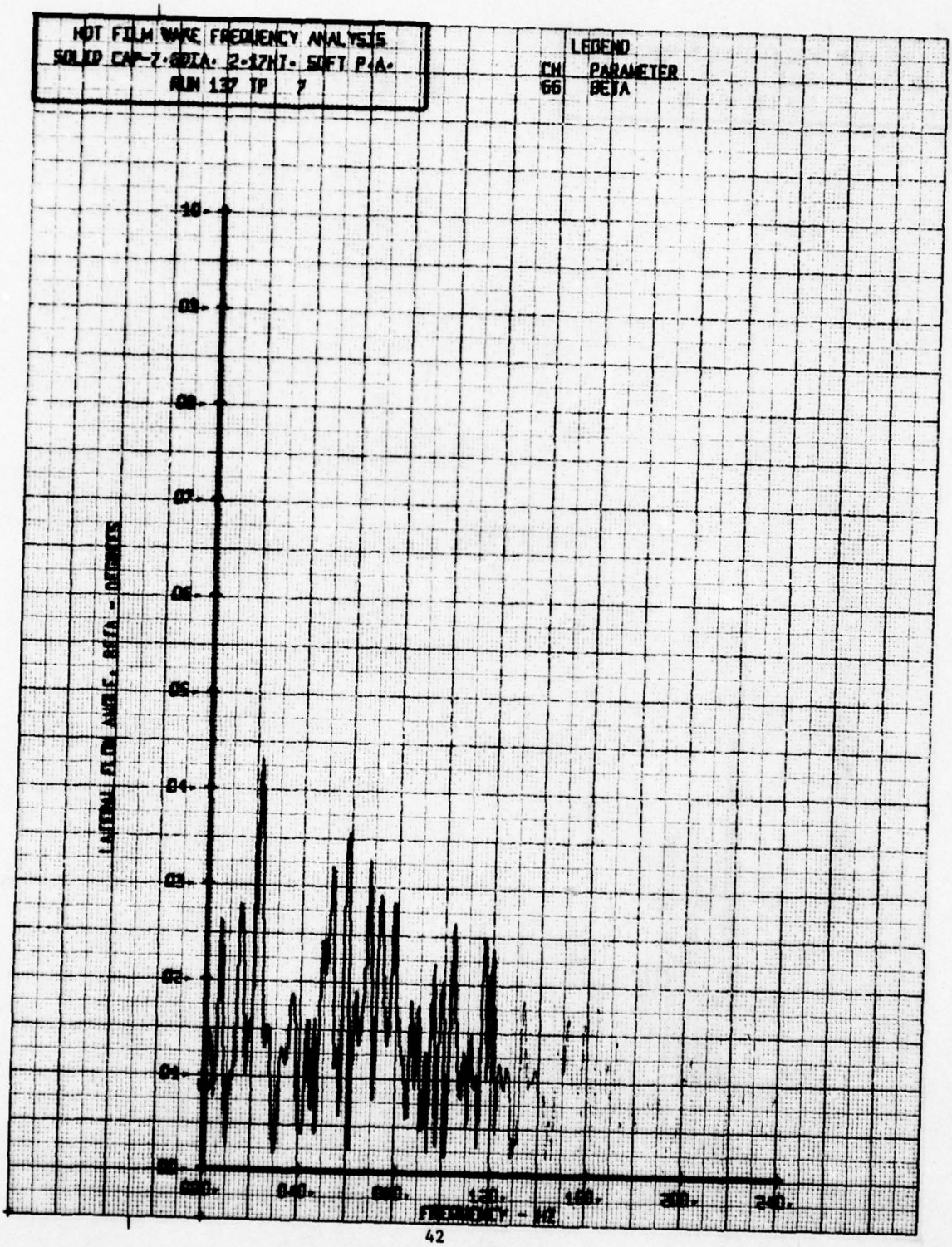

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.60DIA. 2.17HT. SOFT P.A.
RUN 137 TP 15
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

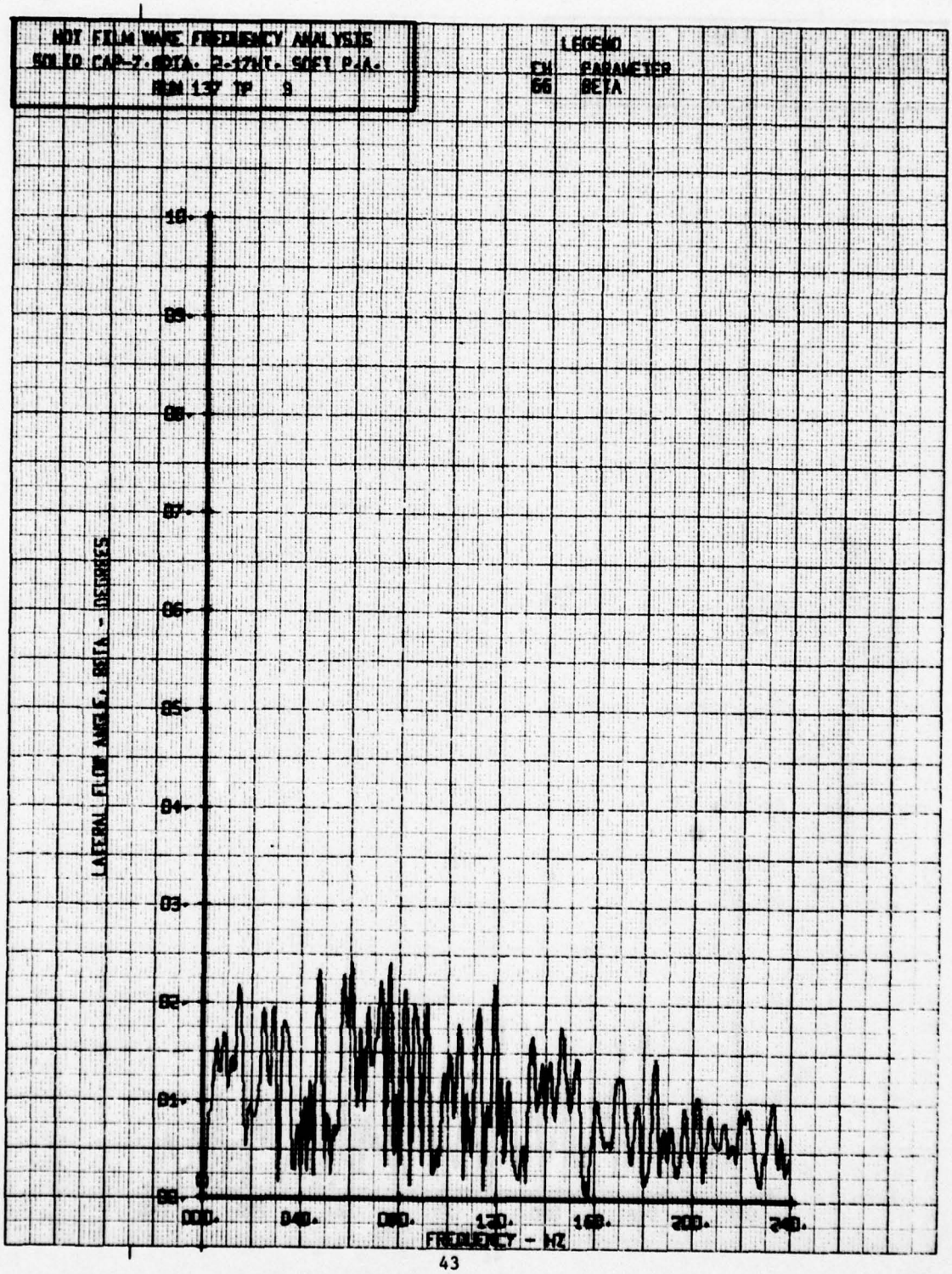

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 17
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SR70 CAP-2.60IA. 2.17HT. 50FT P.A.
RUN 137 TP 19
LEGEND
CH PARAMETER
65 ALPHA
10-
09-
08-
07-
06-
05-
04-
03-
02-
01-
00-
VERTICAL FLOW ANGLE, ALPHA - DEGREES
000-
040-
080-
120-
160-
200-
240-
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.6DIA. 2.17HT. 50FT P.A.
RUN 137 TP 3
LEGEND
CH PARAMETER
06 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.6DIA. 2.17NT. SOFT P.A.
RUN 137 TP 5
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.60IA. 2-17KT. SOFT P.A.
RUN 137 TP 7
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.BETA. 2-17KT. SOFT P.A.
RUN 137 TP 9
LEGEND
CH PARAMETER
06 BETA
10.
09.
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07.
06.
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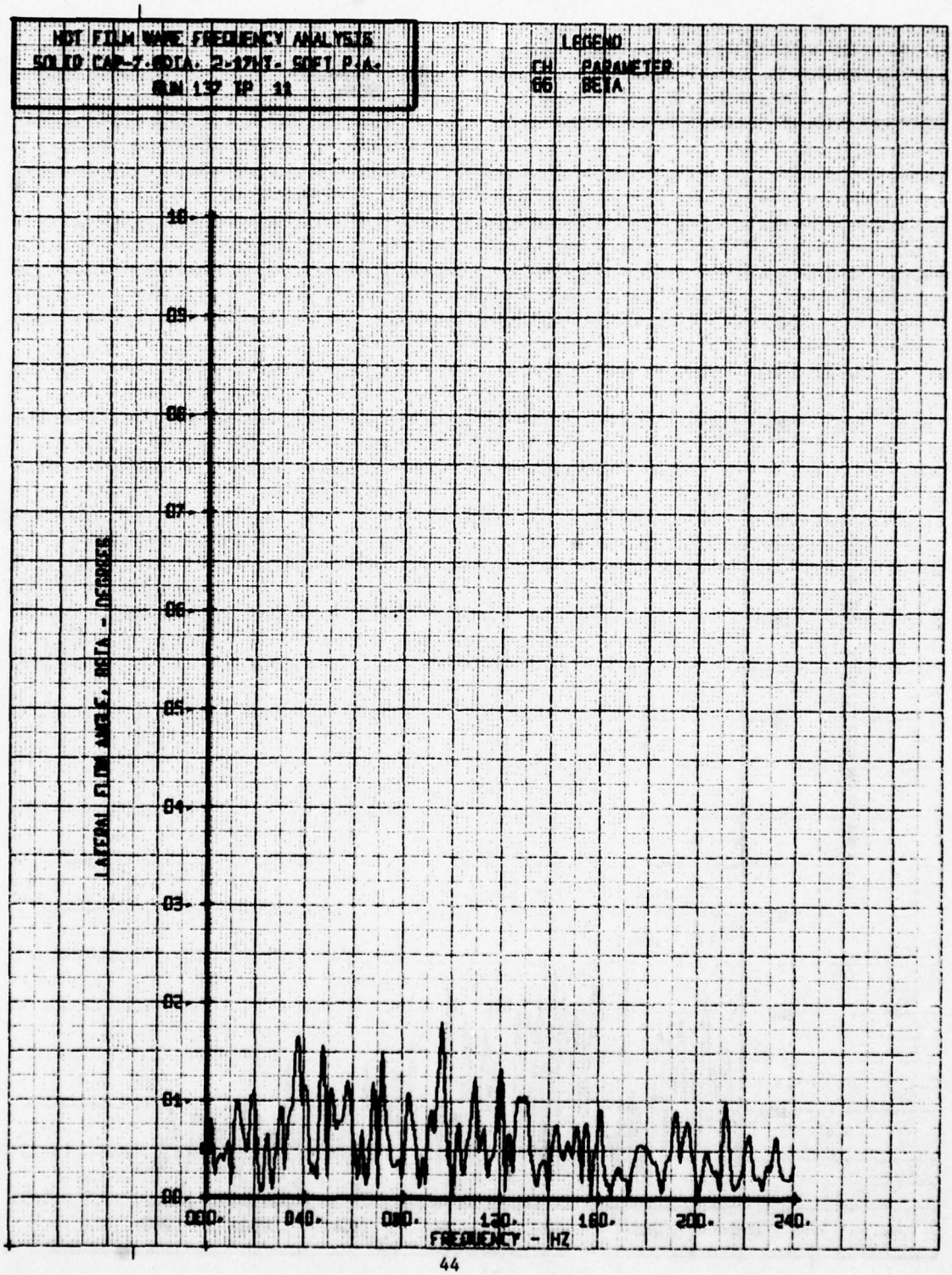
LATERAL FLOW ANGLE, BETA - DEGREES
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ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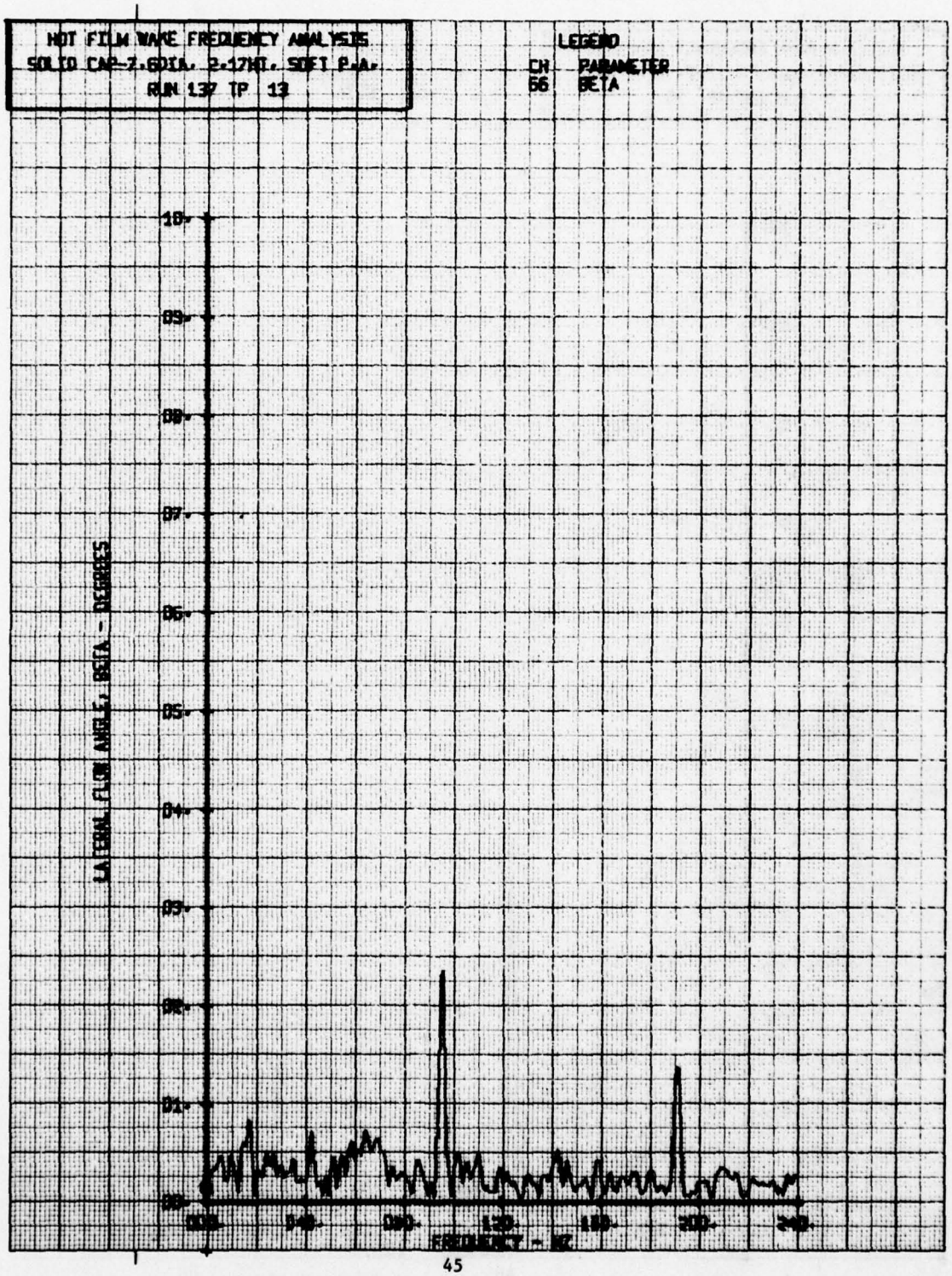
SOLID CAP-7.BETA. 2-17HZ. SOFT P.A.
RUN 137 TP 11
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ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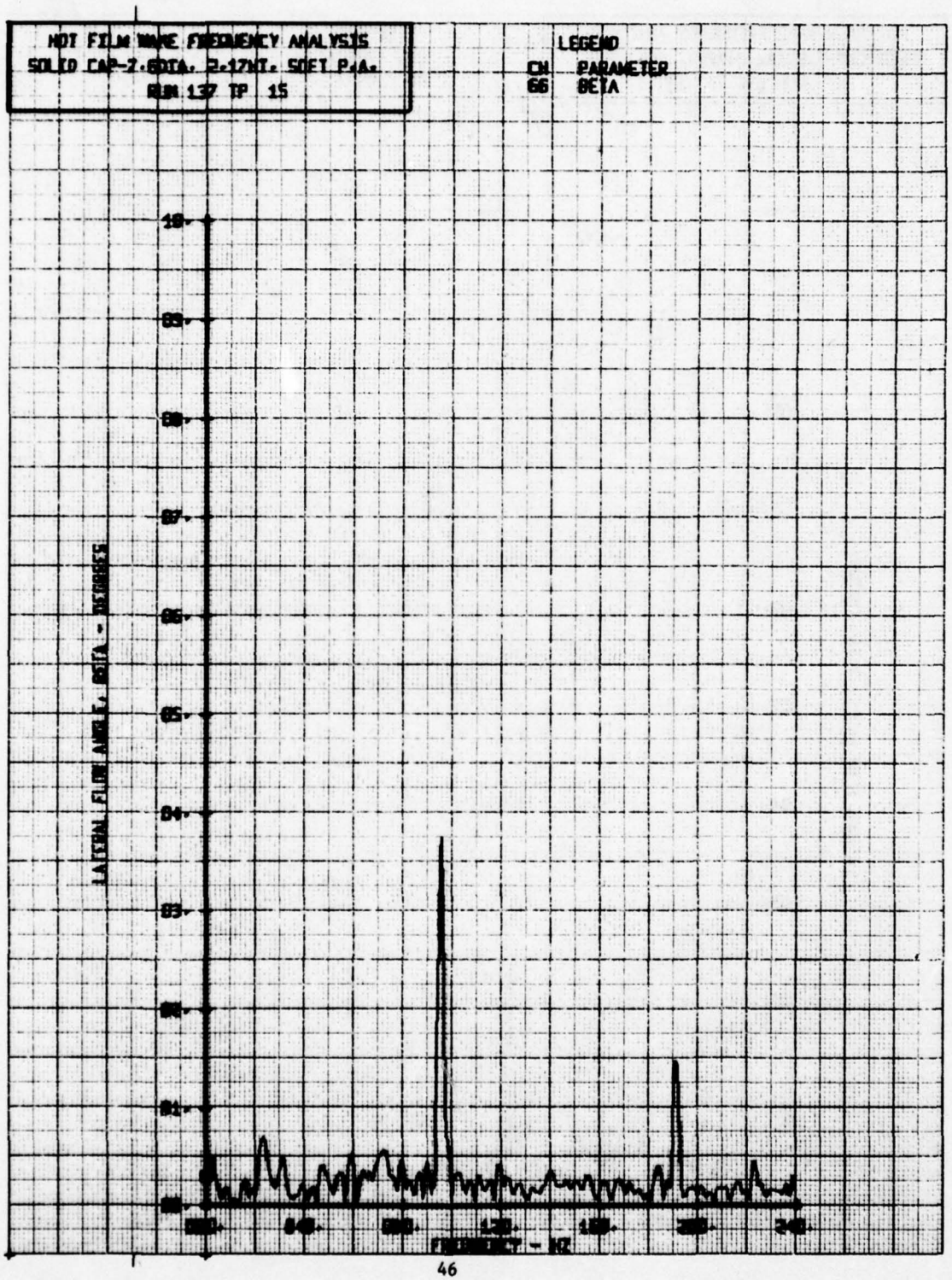
SOLID CAP-7.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 13
LEGEND
CH PARAMETER
56 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ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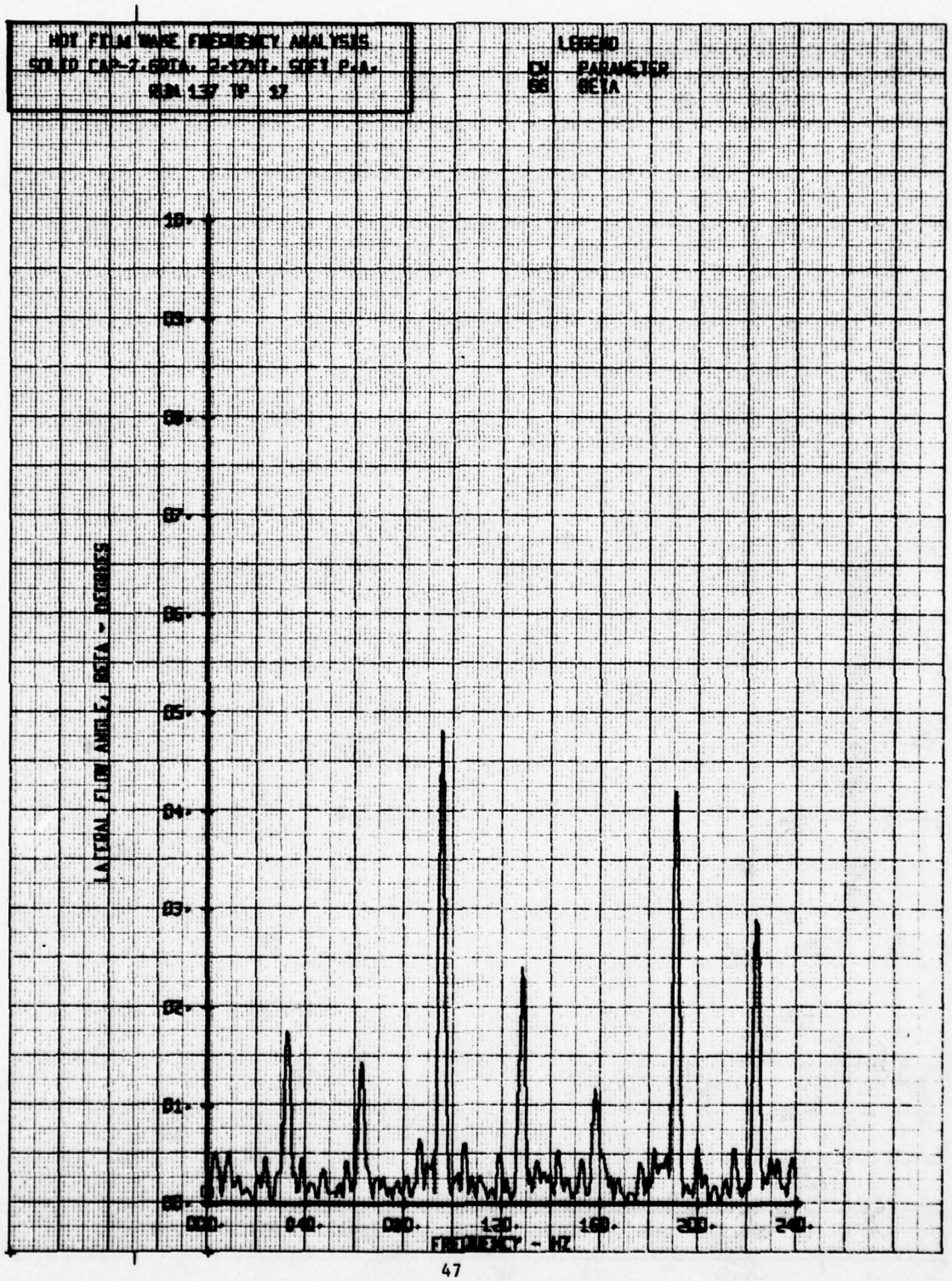
SOLID CAP-2.6DIA. P.17HT. SOFT P.A.
RUN 137 TP 15
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ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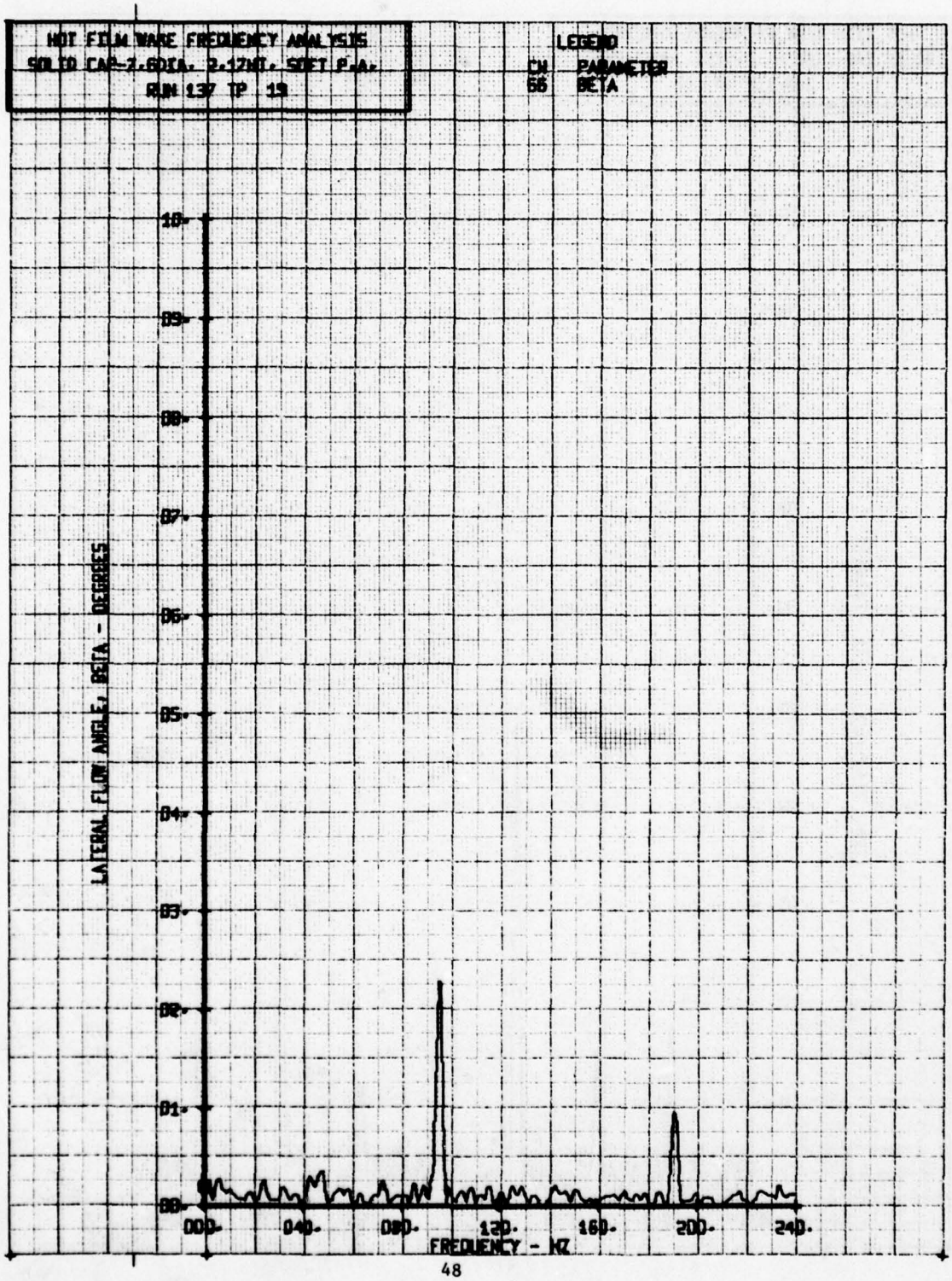
SOLID CAP-7.60DIA. 2.17DT. SQF1 P.A.
R3A 137 TP 17
LEGEND
CN PARAMETER
BS BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ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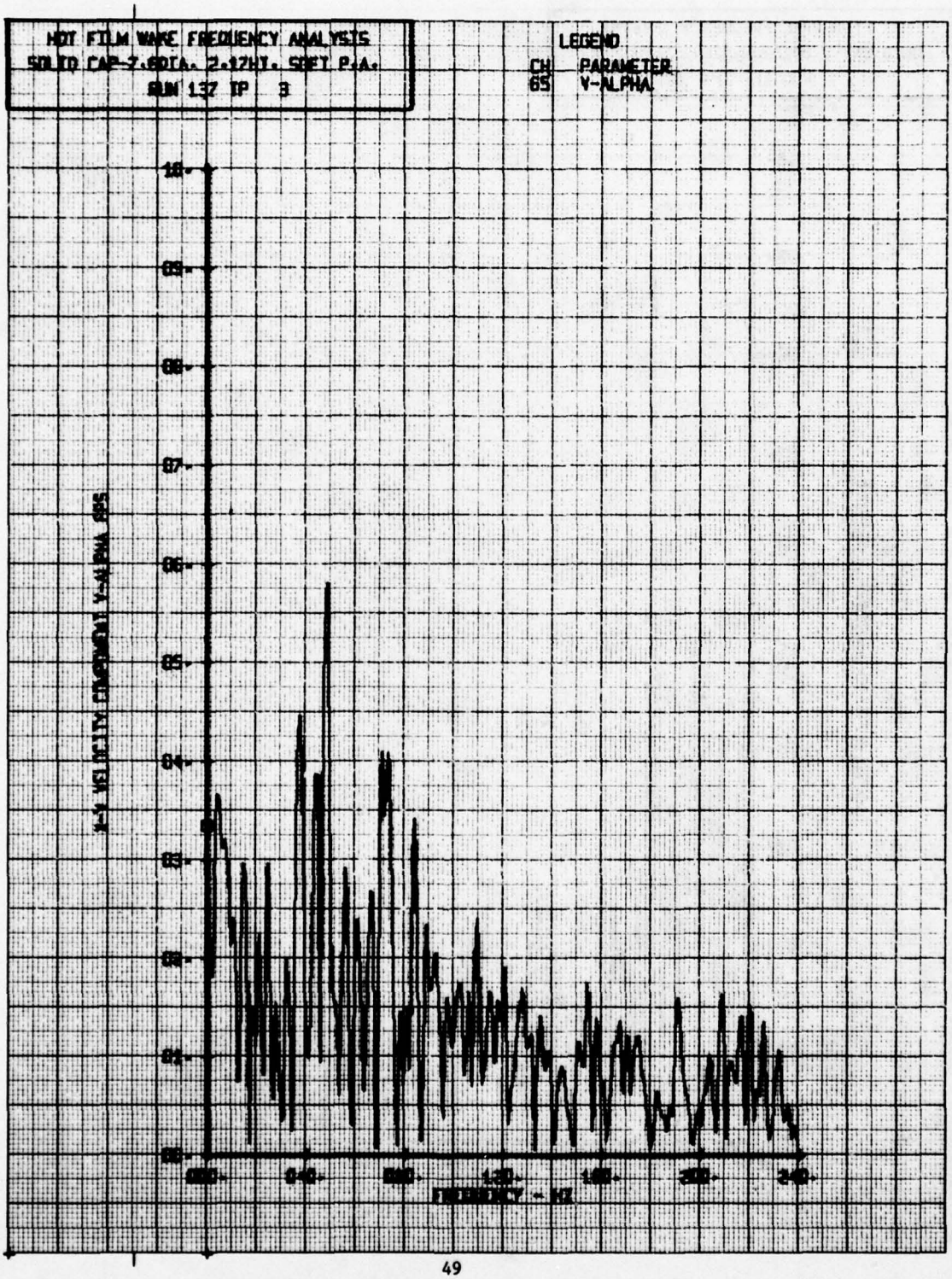
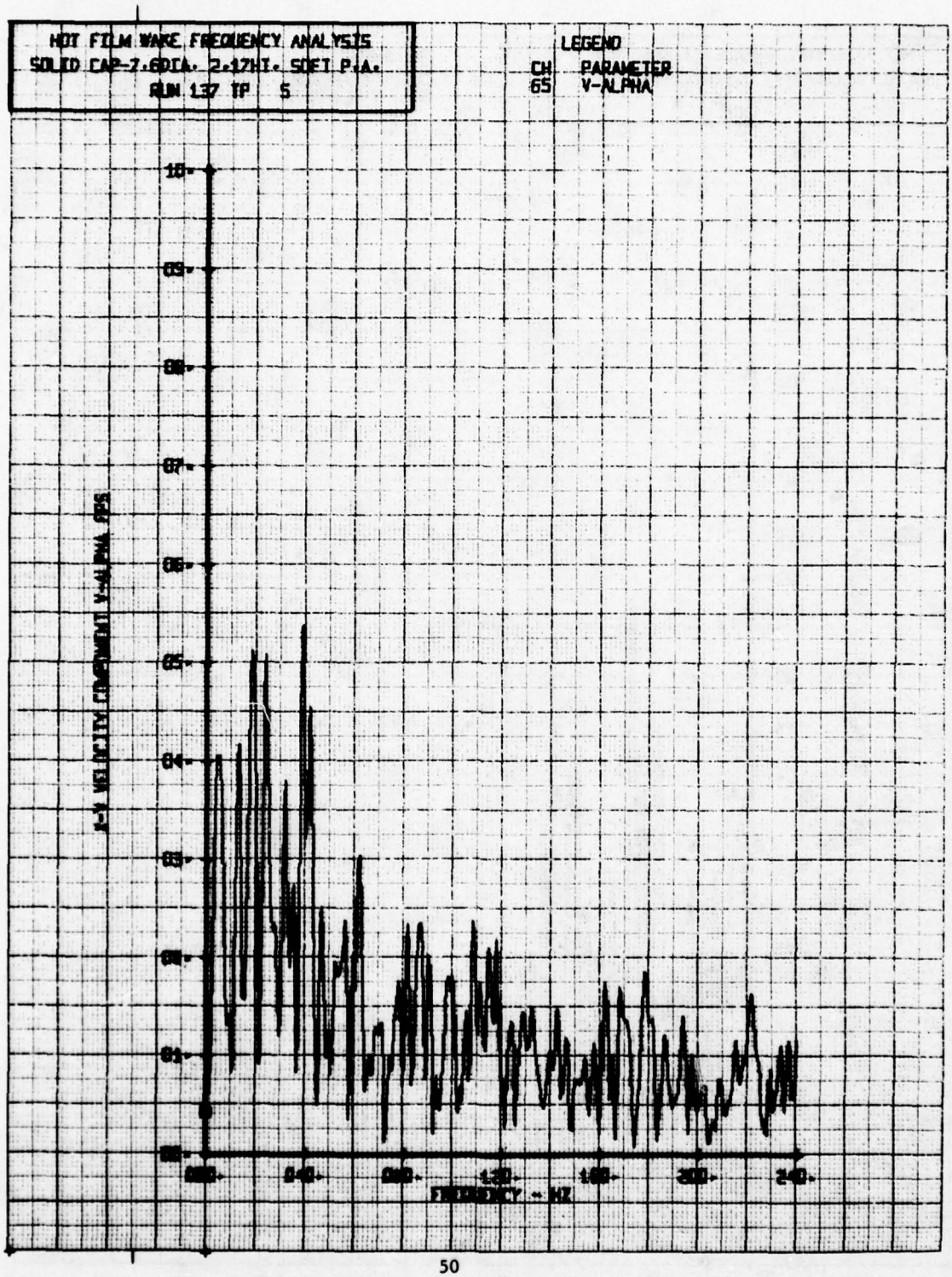
SOLID CAP-7.6DIA. 2.17HT. SOFT F.A.
RUN 137 TP 19
LEGEND
CM PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.6DIA. 2.17HT. SQFT P.A.
RUN 137 TP 3
LEGEND
CH PARAMETER
65 V-ALPHA
X-4 VELOCITY COMPONENT V-ALPHA 65
FREQUENCY - HZ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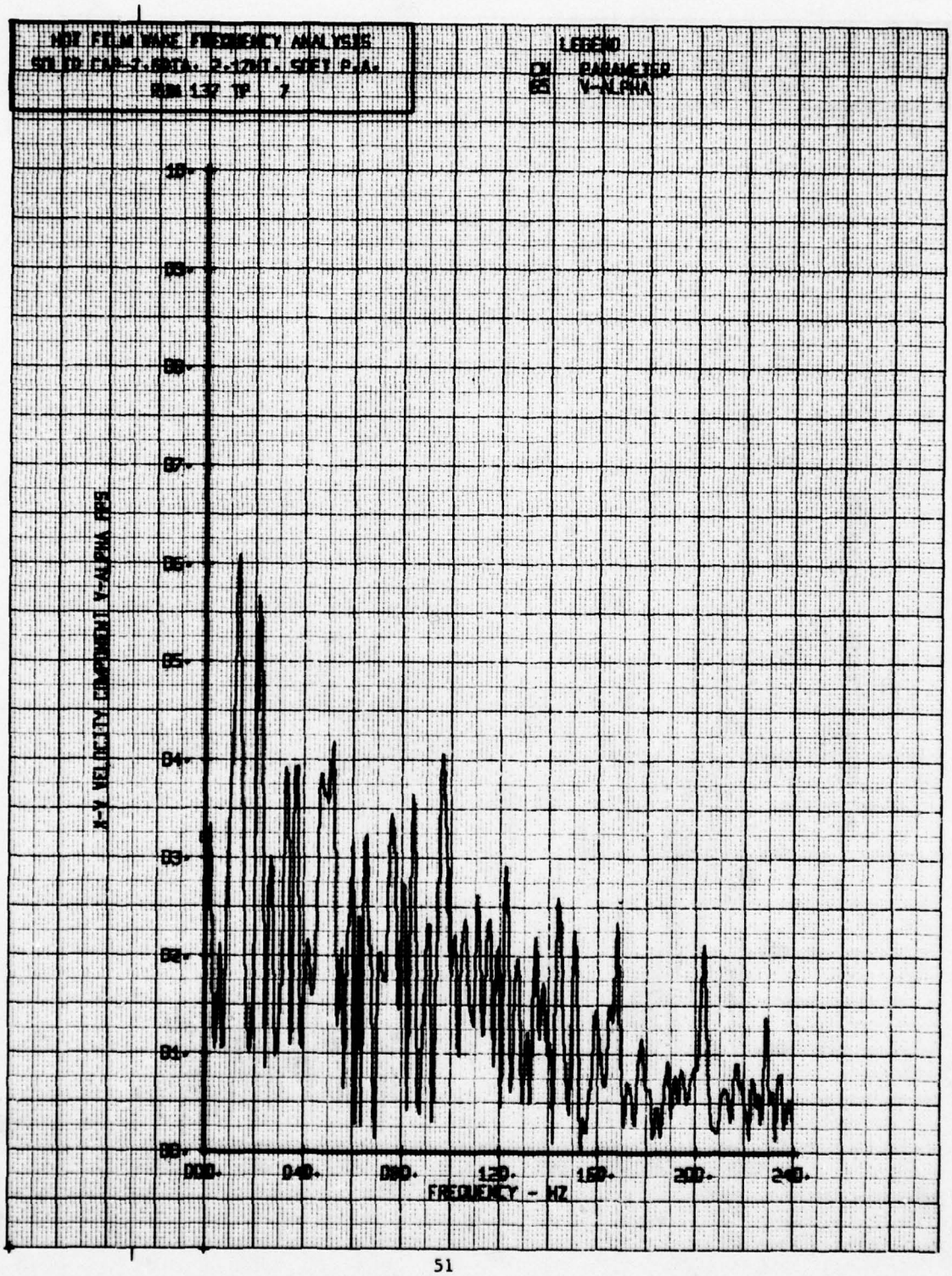
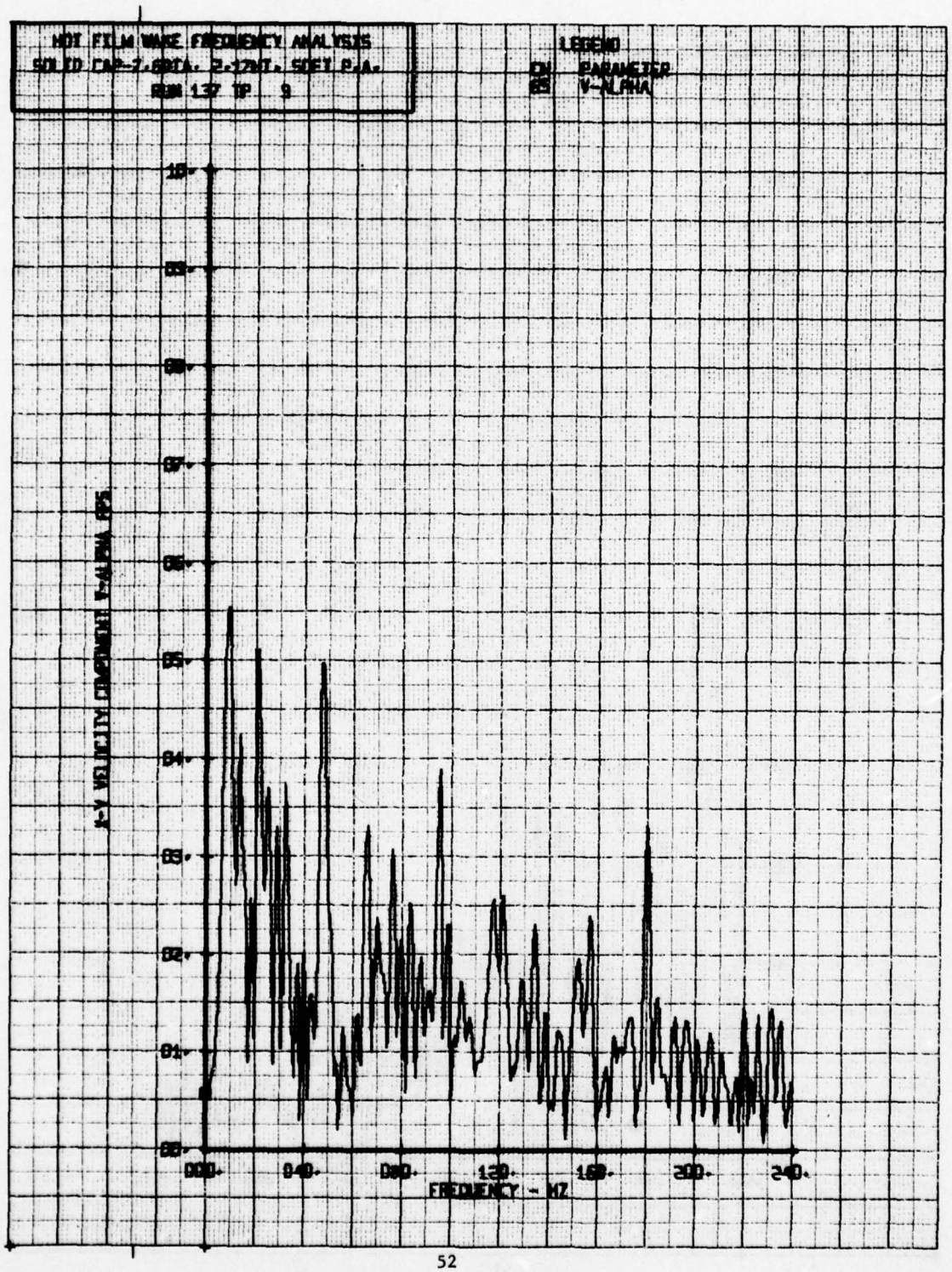
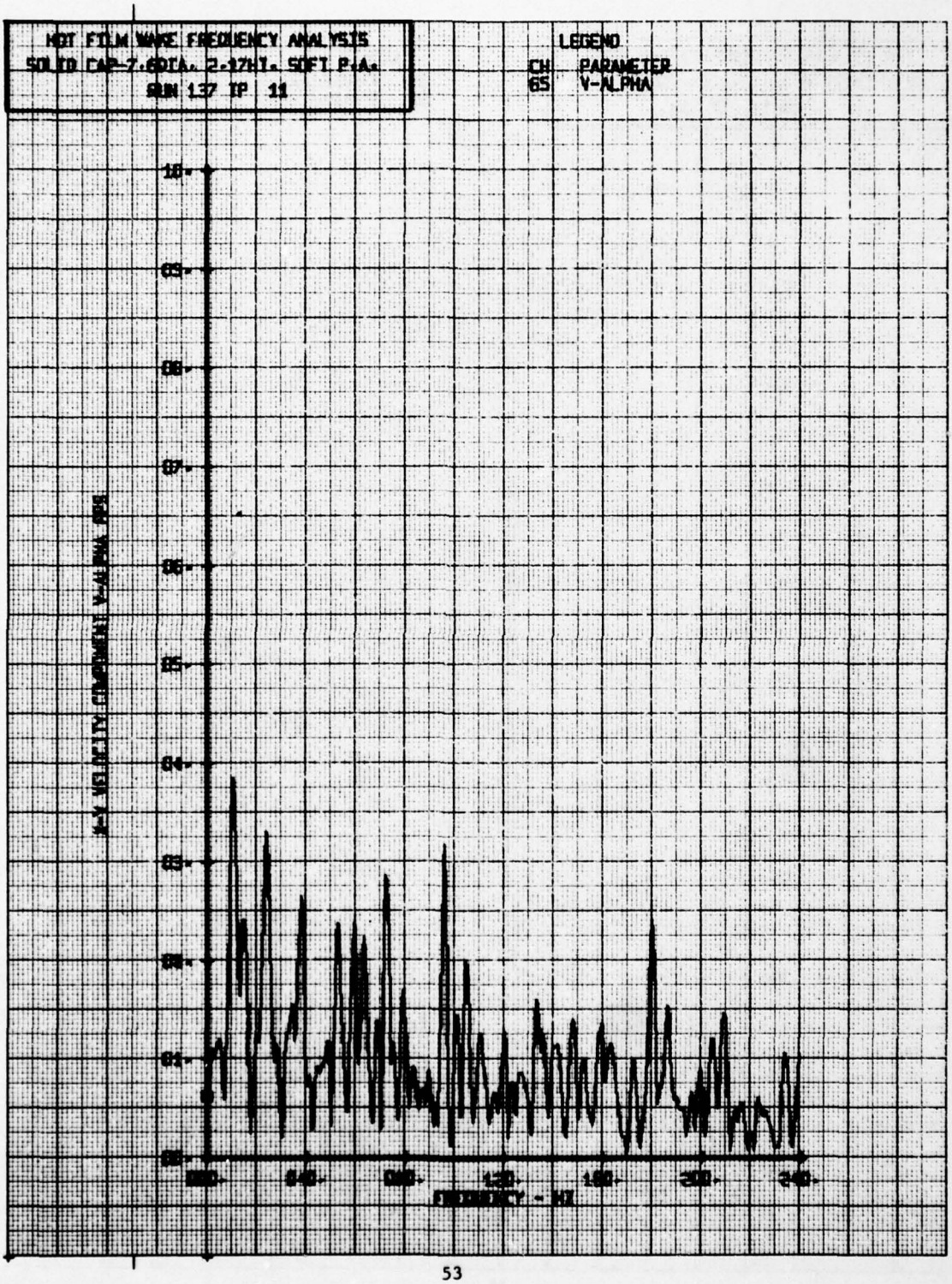
SOLID CAP-7.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 5
LEGEND
CH PARAMETER
65 V-ALPHA
A-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
05 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CYL-7.6DIA. 2.17WT. SOFT P.A.
RUN 137 TP 9
LEGEND
CN PARAMETER
85 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA 85
FREQUENCY - HZ
000.
040.
080.
120.
160.
200.
240.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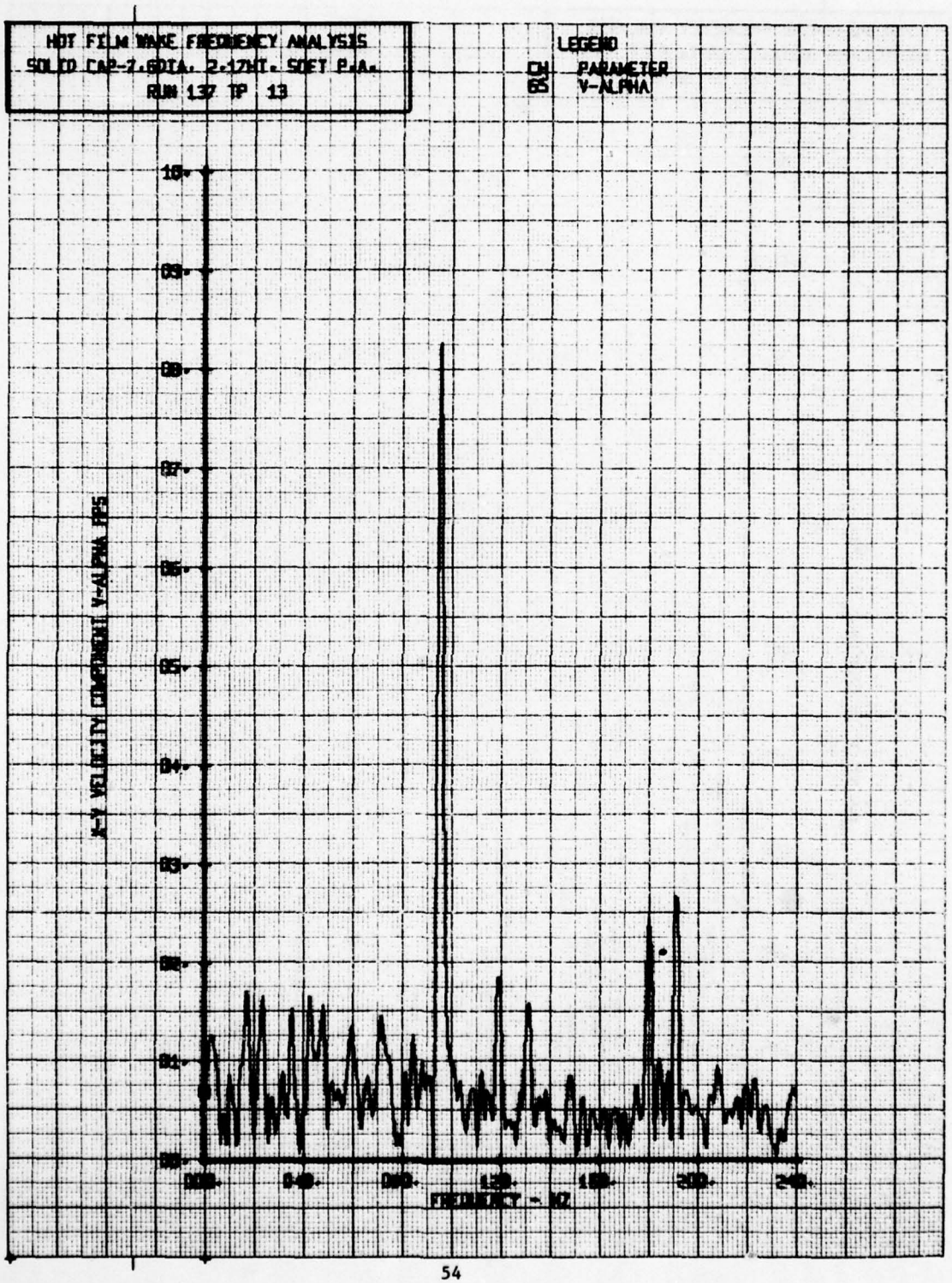
SOLID CAP-7.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 11
LEGEND
CH PARAMETER
65 V-ALPHA
FREQUENCY - HZ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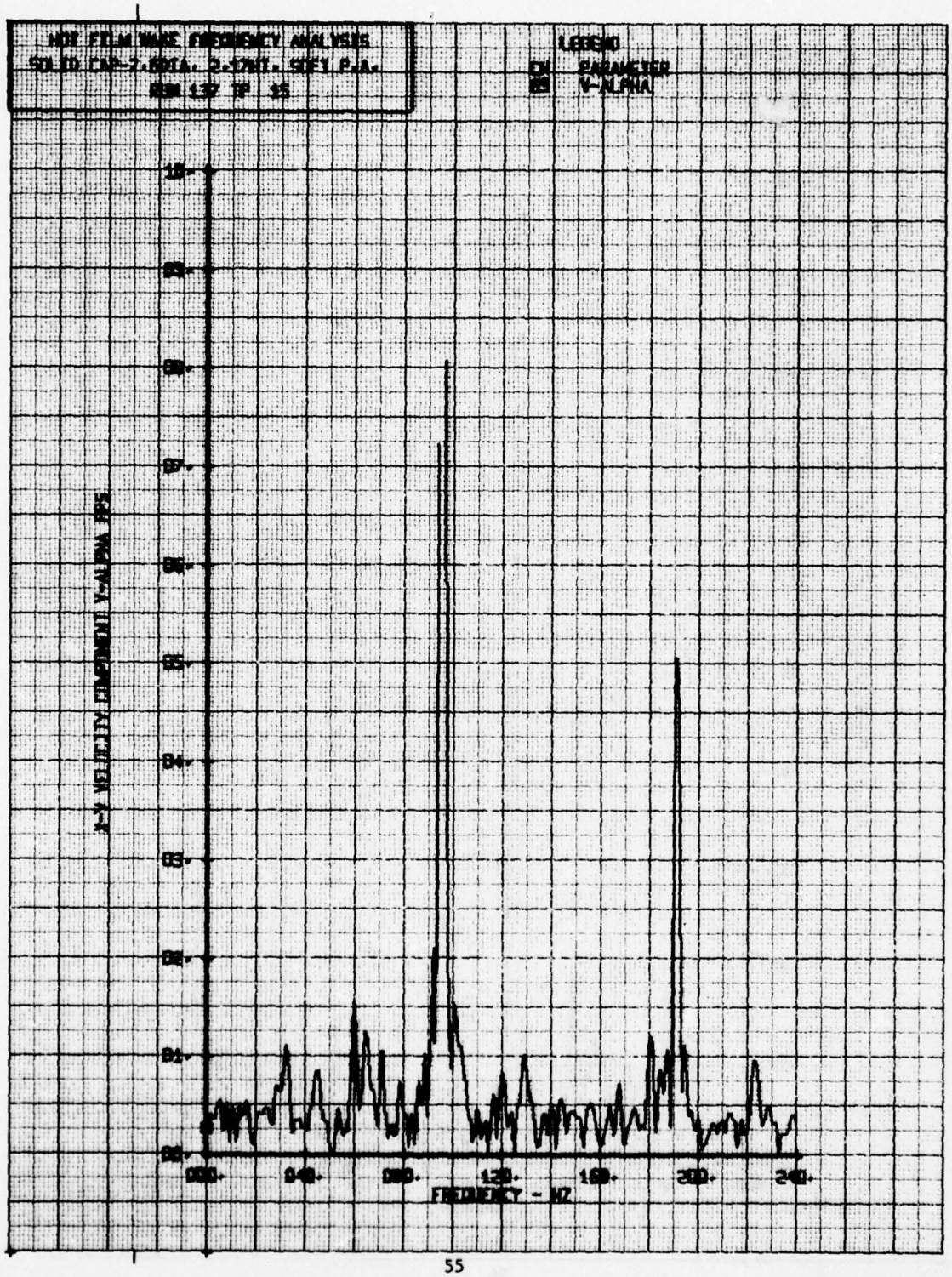
SOLID CAP-2.6DIA. 2.17HT. SOFT P.A.
RUN 137 TP 13
LEGEND
CH PARAMETER
65 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ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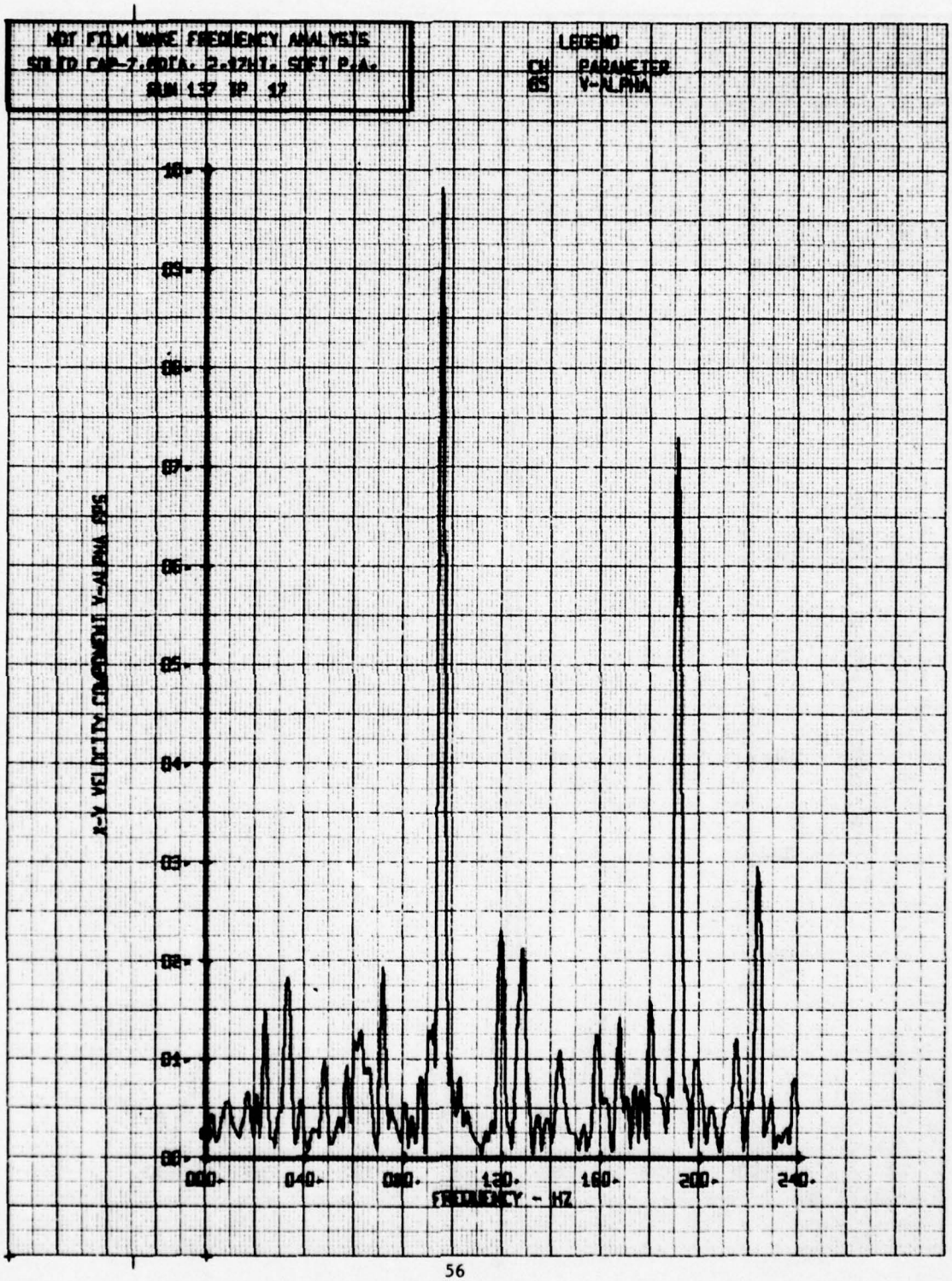
LEGEND
CH PARAMETER
V-ALPHA
X-V VELOCITY FLUCTUATION V-ALPHA RMS
FREQUENCY - HZ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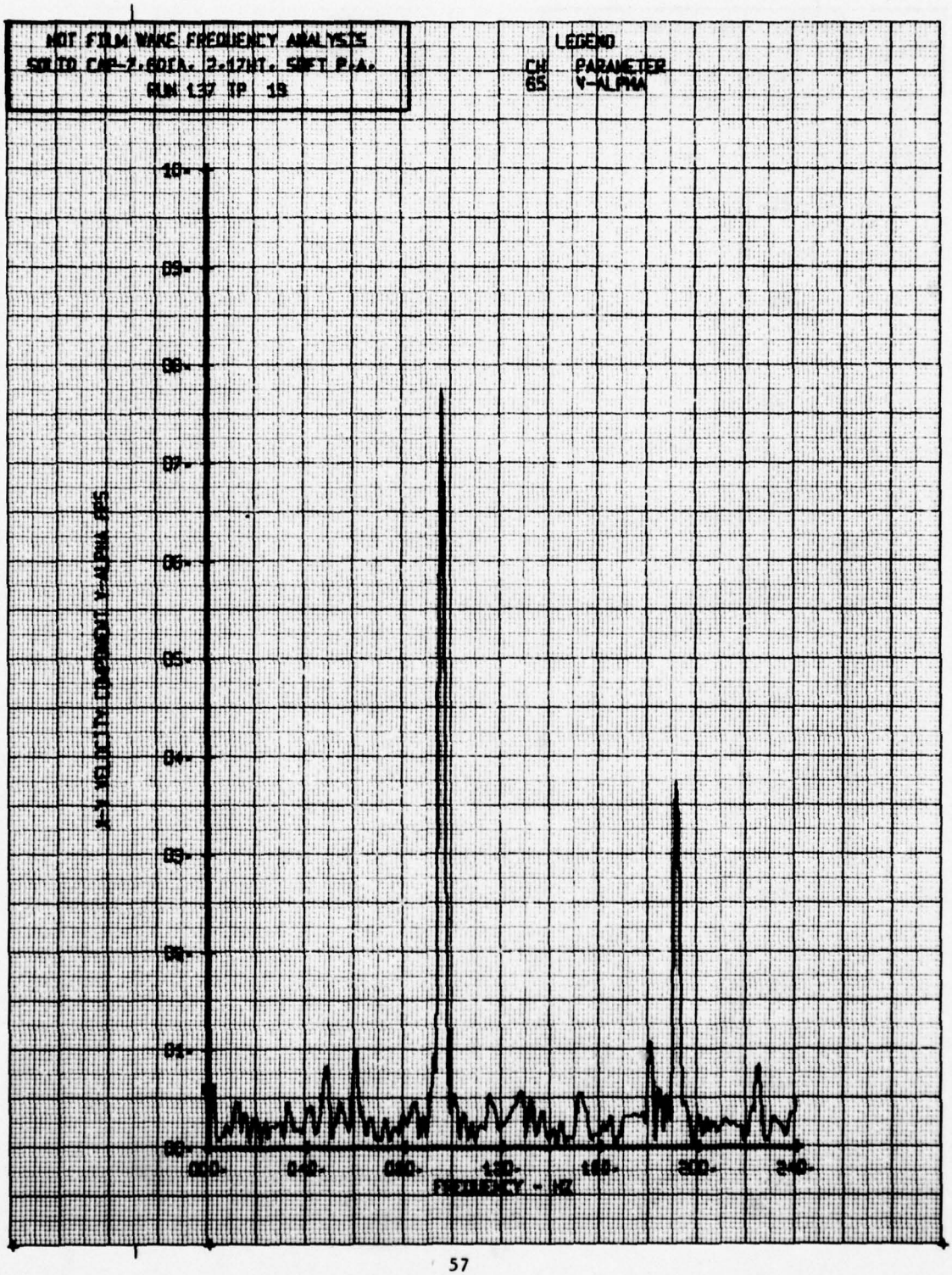
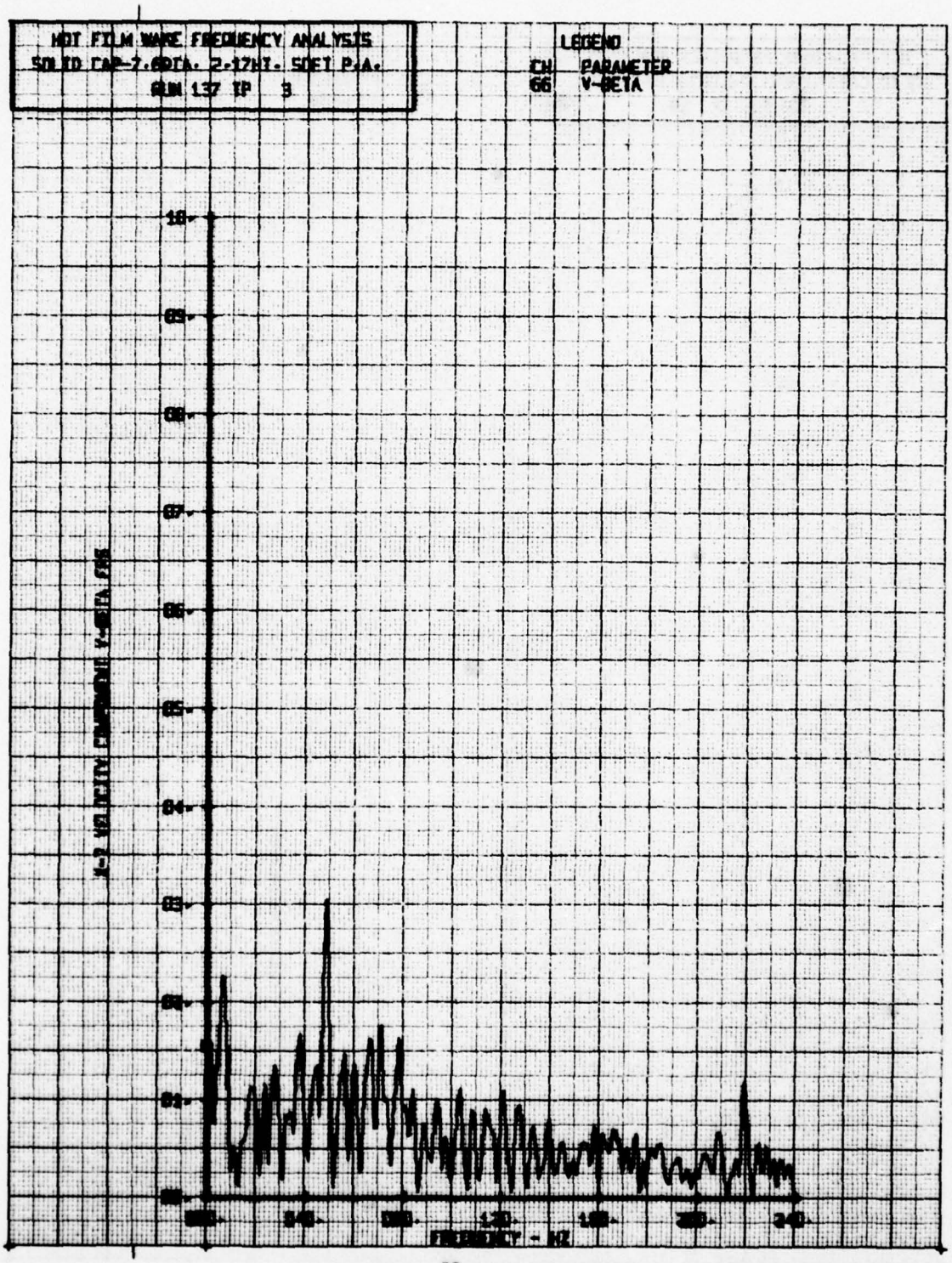
SOLID CAP-7.60DIA. 2.47HT. SOFT P.A.
RUN 137 TP 17
LEGEND
CH PARAMETER
05 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ
000
040
080
120
160
200
240


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAM-2.60IA. 2.17HT. 50FT P.A.
RUN 137 TP 13
LEGEND
CH PARAMETER
65 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ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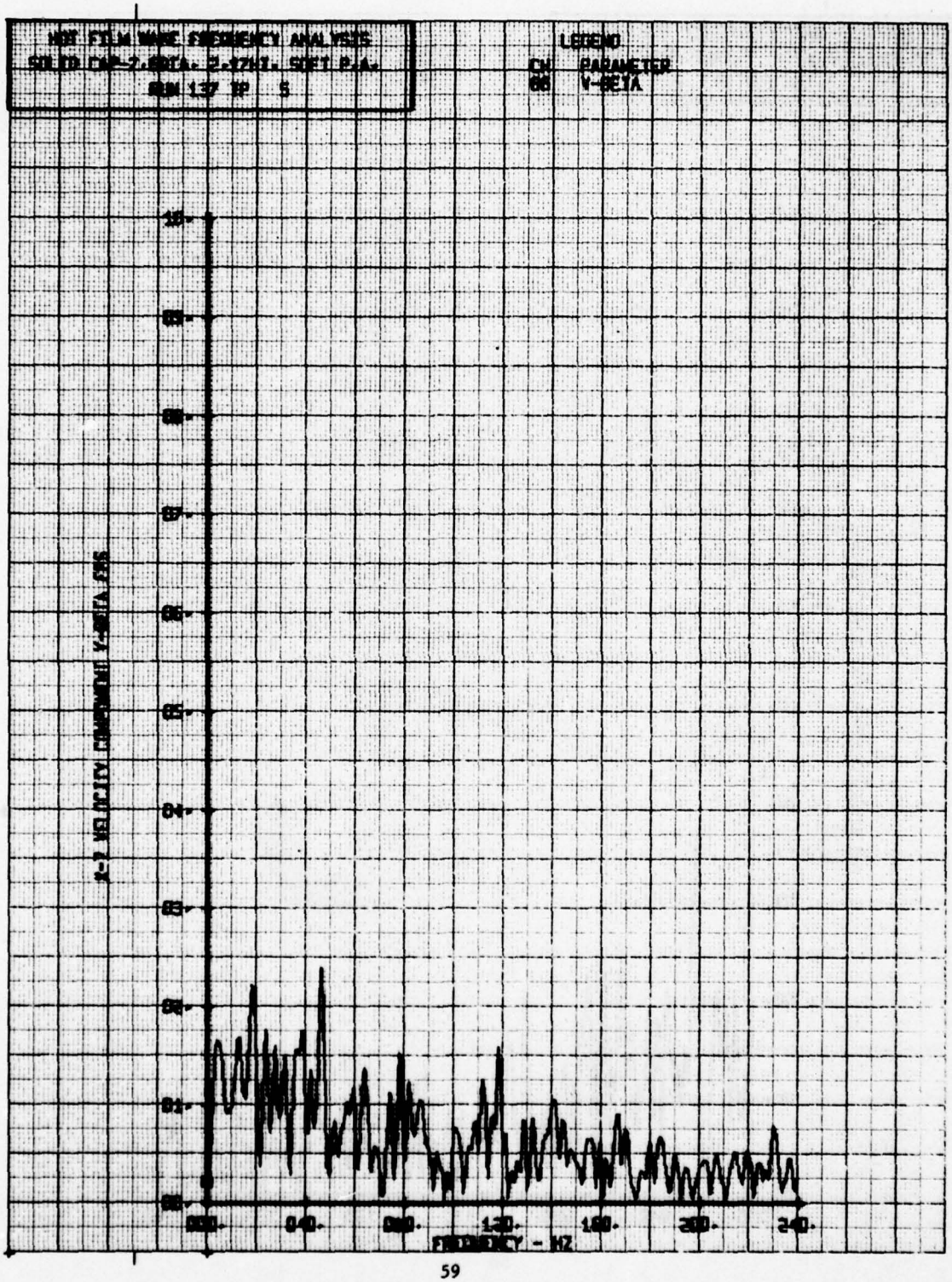
SOLID CAP-7.6DIA. 2.17HT. SDET P.A.
RUN 137 TP 3
LEGEND
CH PARAMETER
66 V-BETA
X-2 VELOCITY FLUCTUATIONS V-BETA 266
FREQUENCY - HZ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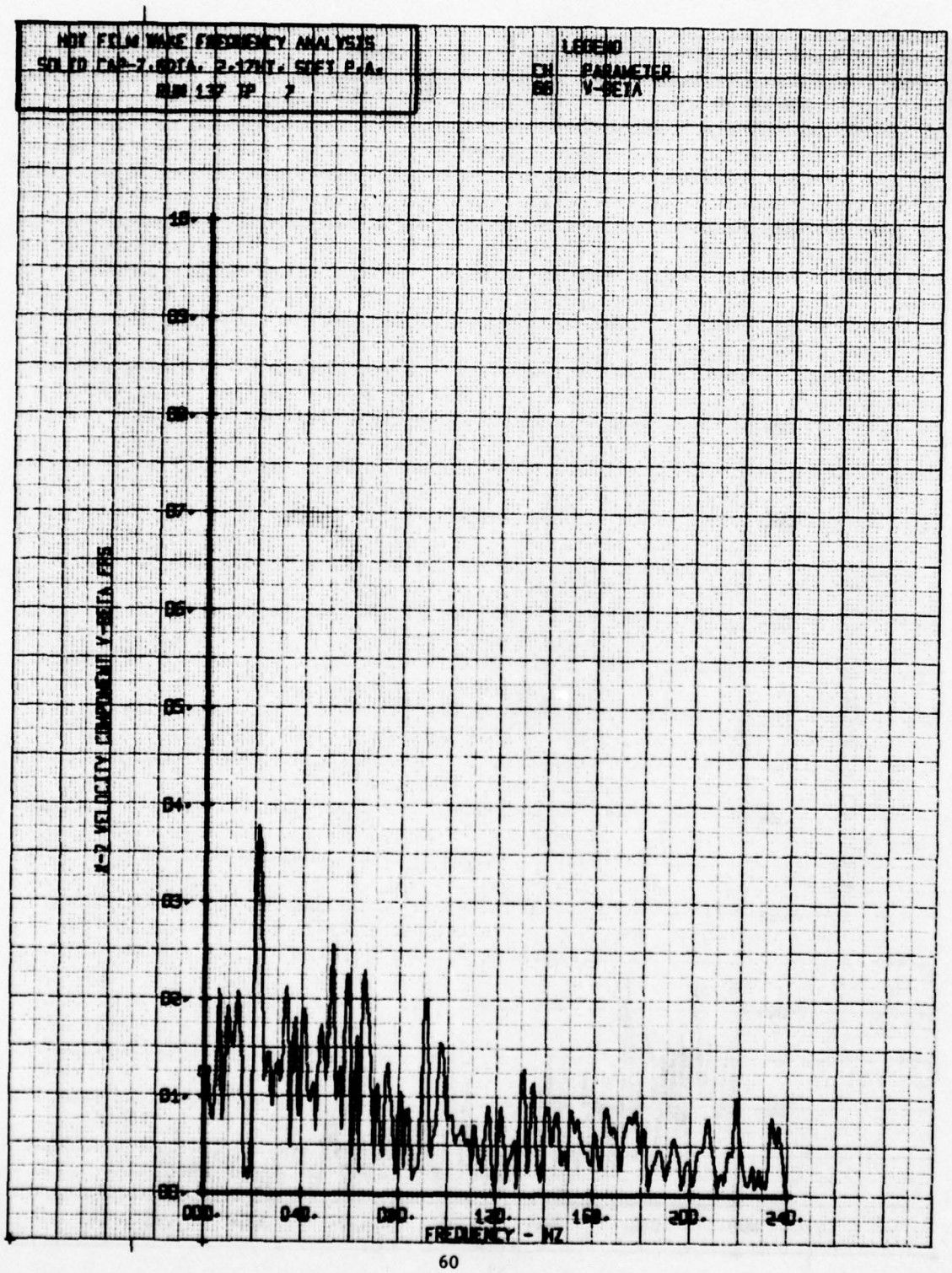
SOLID CAP-2.00IA. 2.17HI. SUET P.A.
RUN 137 TP 5
LEGEND
CH PARAMETER
00 V-BETA
X-2 VELOCITY COMPONENT V-BETA.FDS
FREQUENCY - HZ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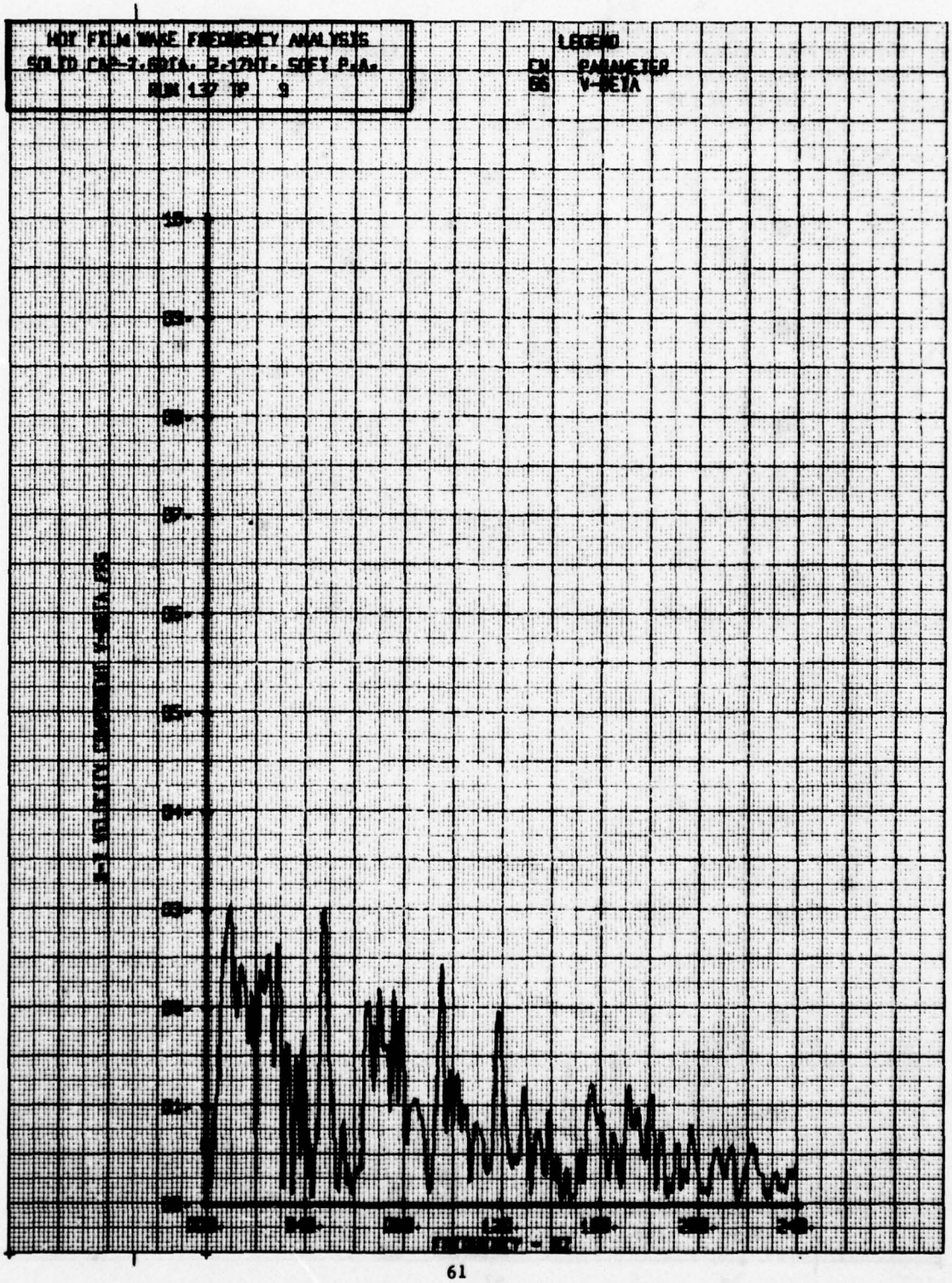
SOLID CAP-7.0DIA. 2.17HT. SDET P.A.
RUN 137 TP 7
LEGEND
CH PARAMETER
06 V-BETA
X-2 VELOCITY COMPONENT V-BETA FDS
FREQUENCY - HZ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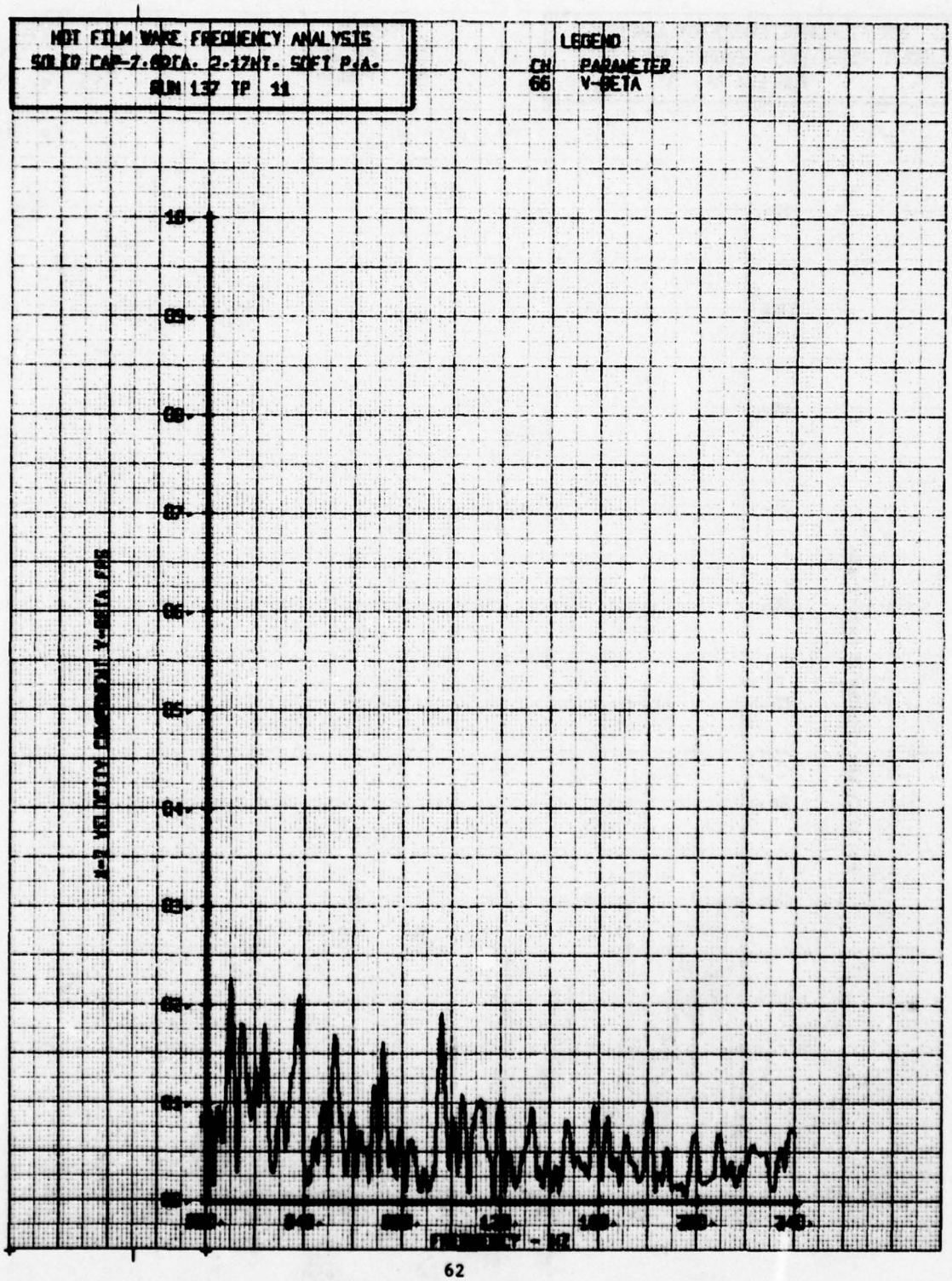
SOLID CAP-2.60IA. 2.17HT. SOFT P.A.
RUN 137 TP 9
LEGEND
CN PARAMETER
66 V-BETA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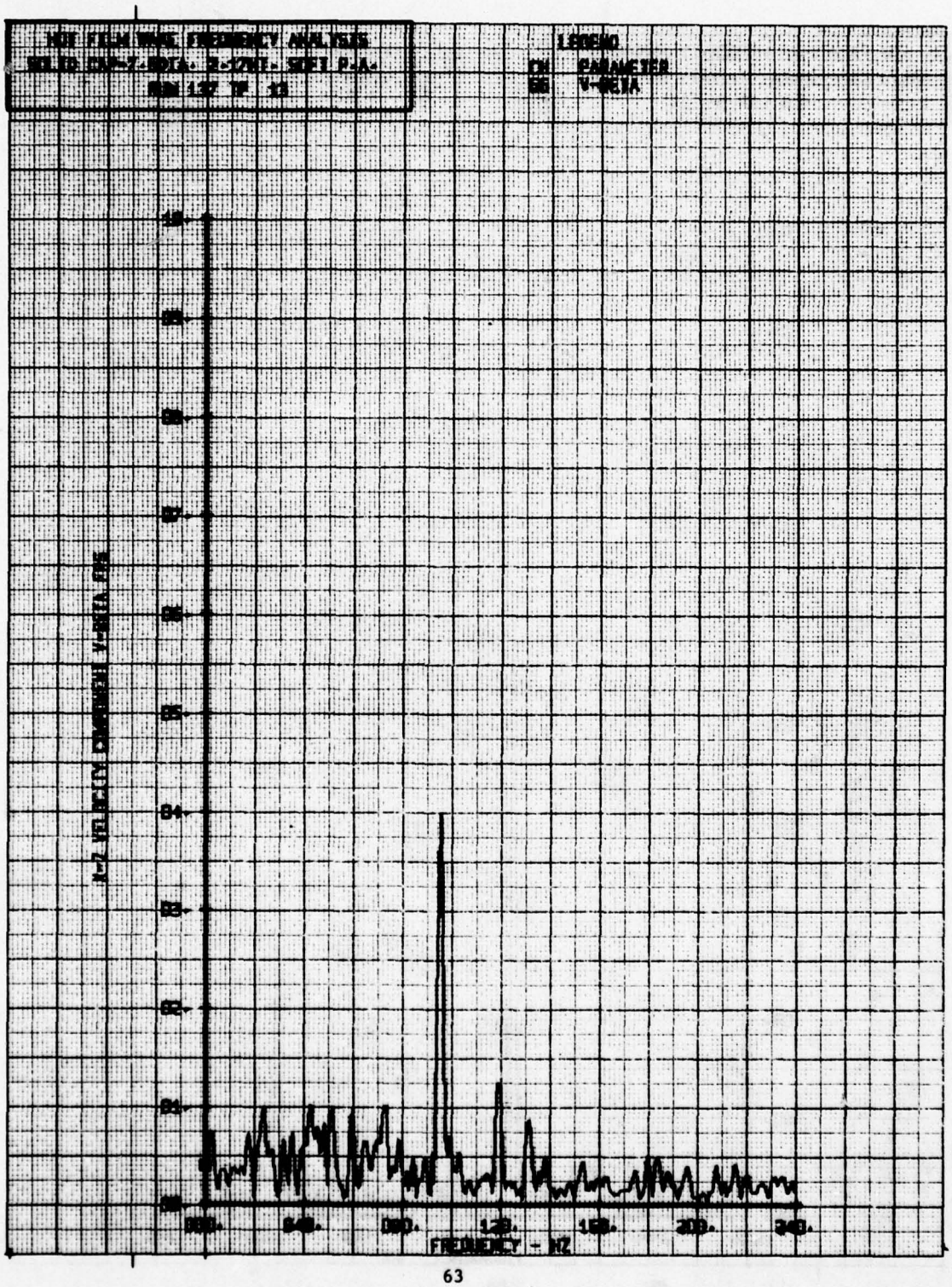
SOLID CAP-7.60TA. 2.17NT. SOFT P.A.
RUN 137 TP 11
LEGEND
CH PARAMETER
66 V-BETA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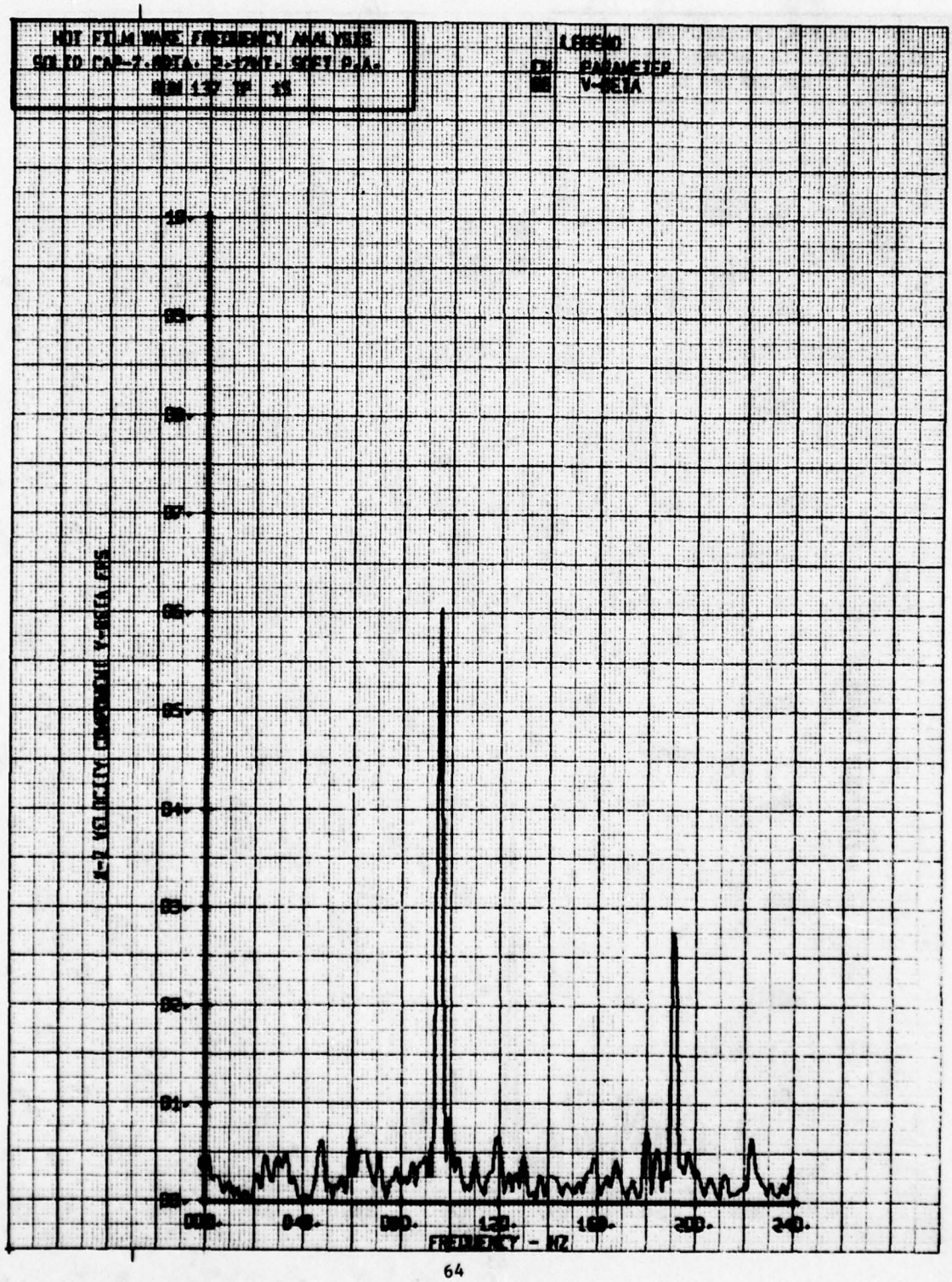
LEGEND
CH PARAMETER
V-BETA
FREQUENCY - HZ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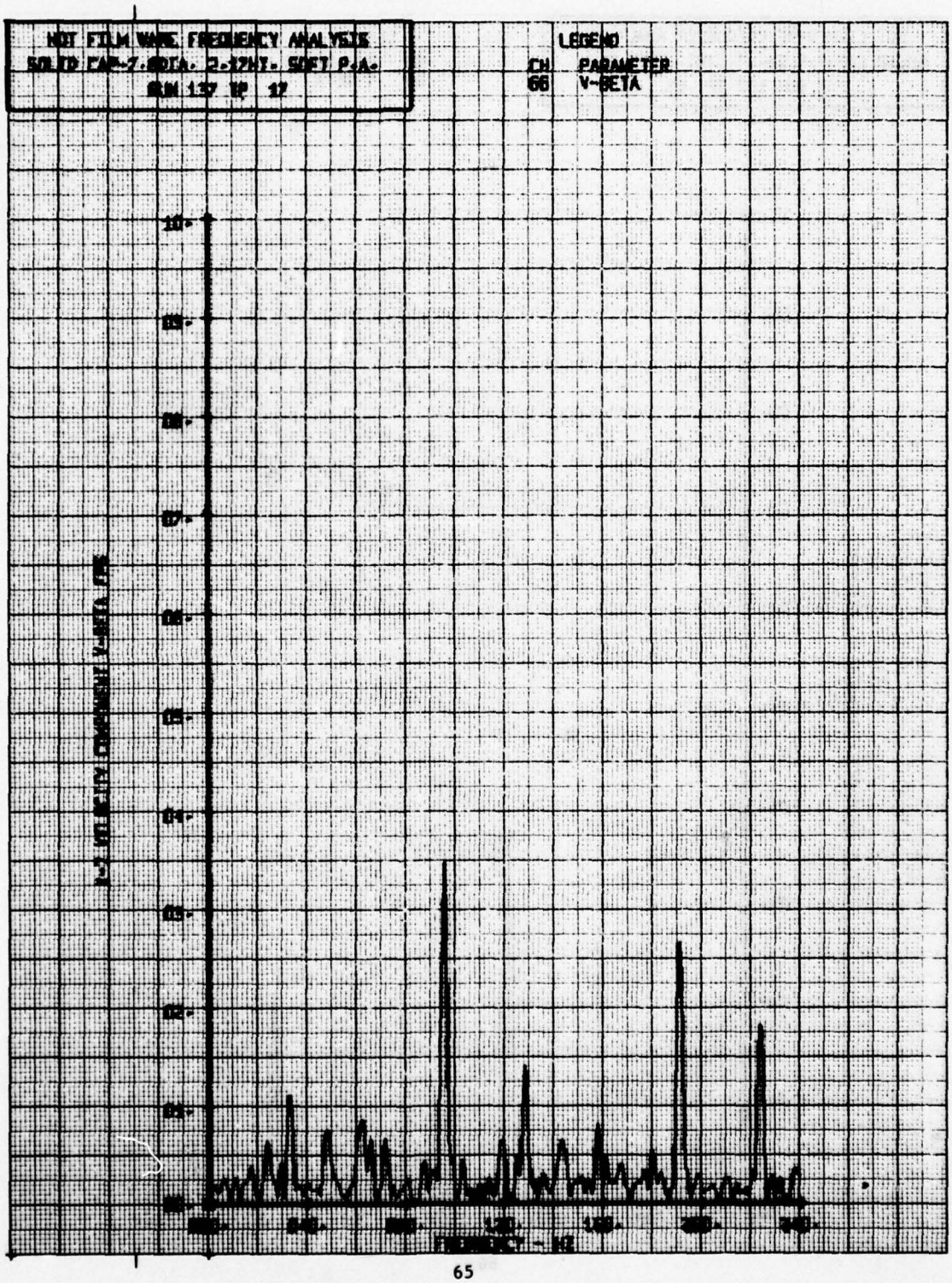
LEGEND
CH PARAMETER
V-BETA
FREQUENCY - HZ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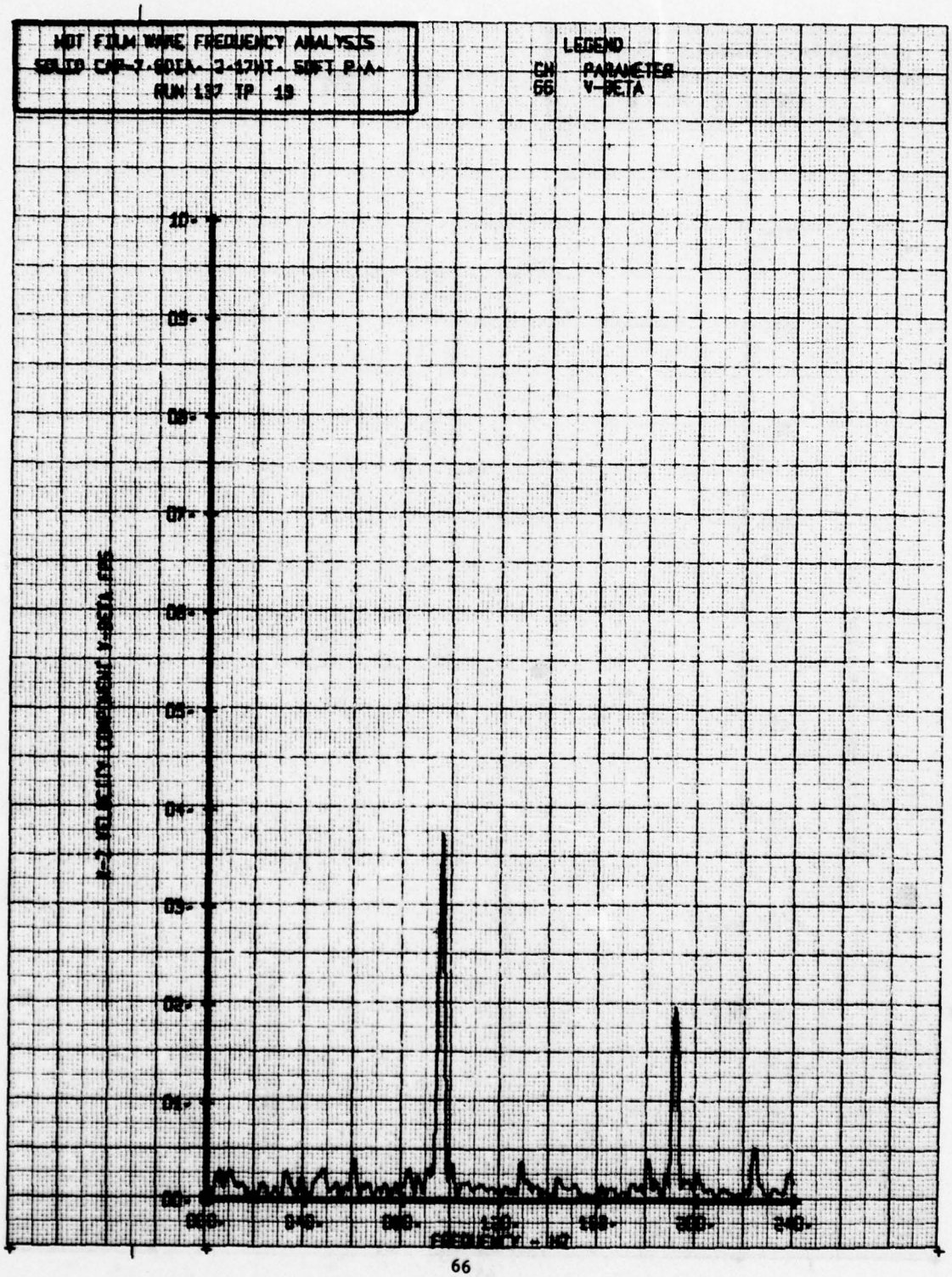
RUN 137 TP 17
LEGEND
CH PARAMETER
66 V-BETA


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.00IA. 3.17WT. 50FT P.A.
RUN 137 TP 19
LEGEND
CH PARAMETER
66 V-BETA
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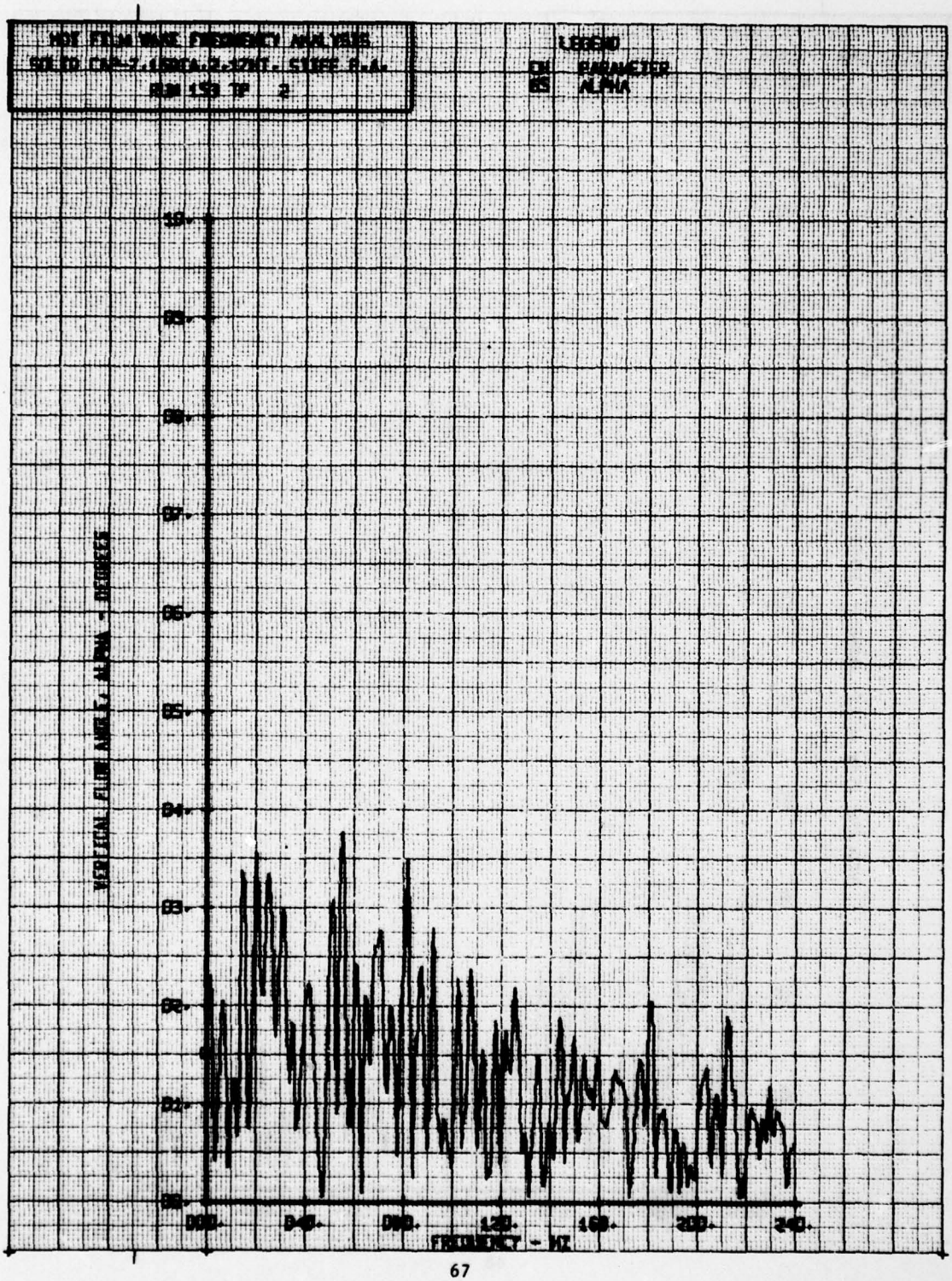
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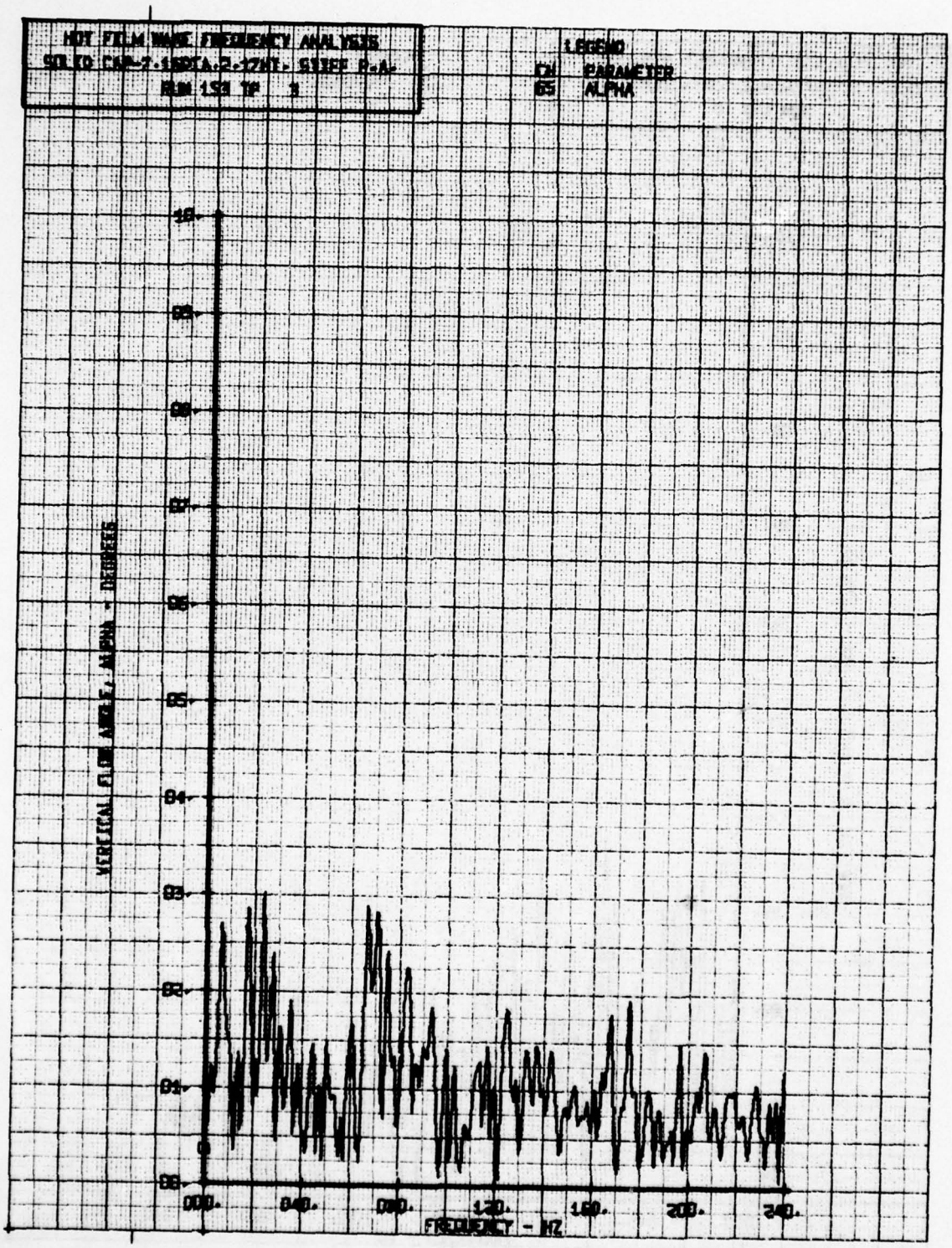
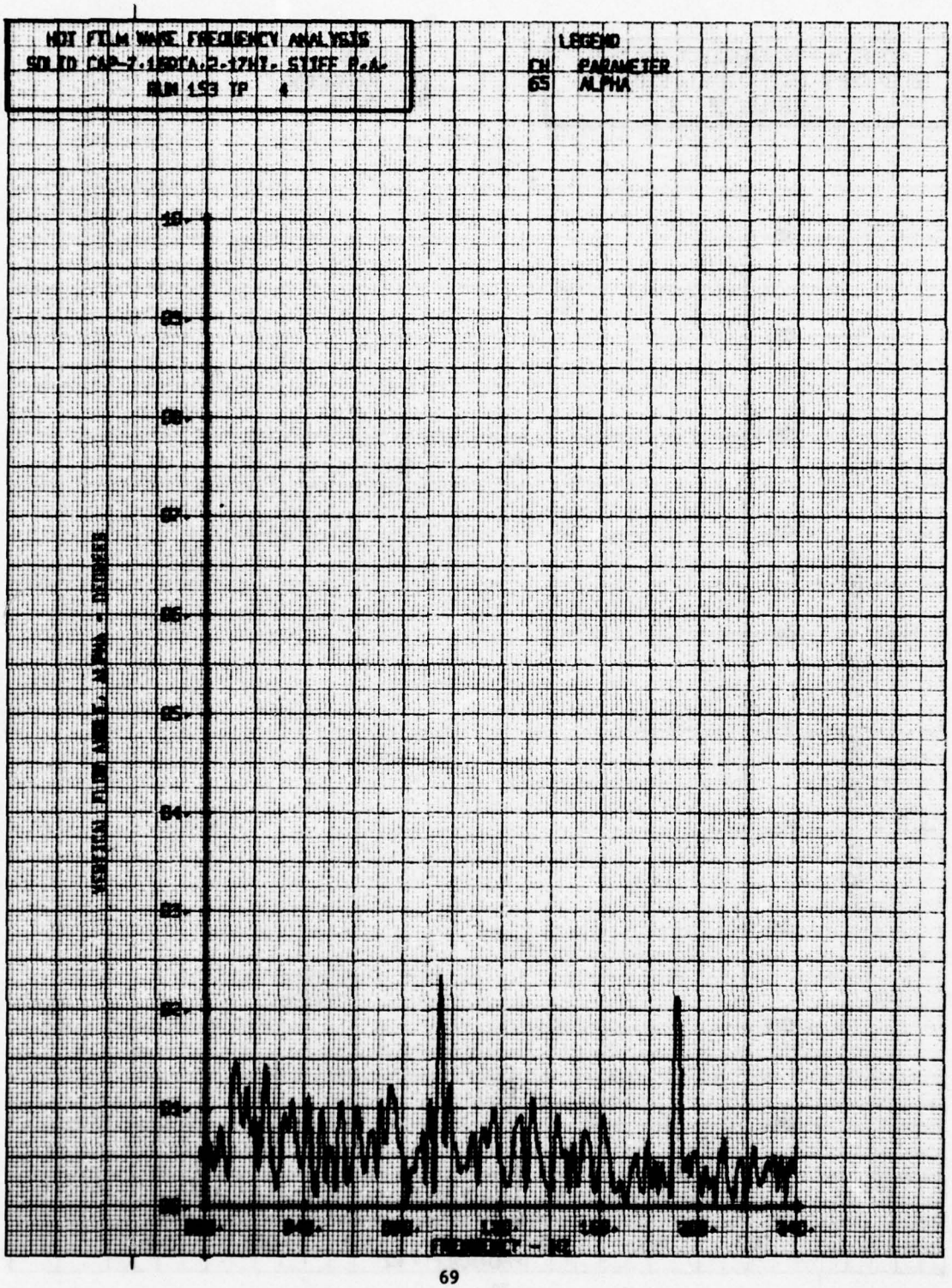
SOLID CAP-7.18MA.2.37KT. SIDE F.A.
RUN 150 TP 2
LEGEND
CH PARAMETER
05 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAR-7.18DIA.2.17HT. SIEFF P.A.
RUN 153 TP 3
LEGEND
CH PARAMETER
05 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ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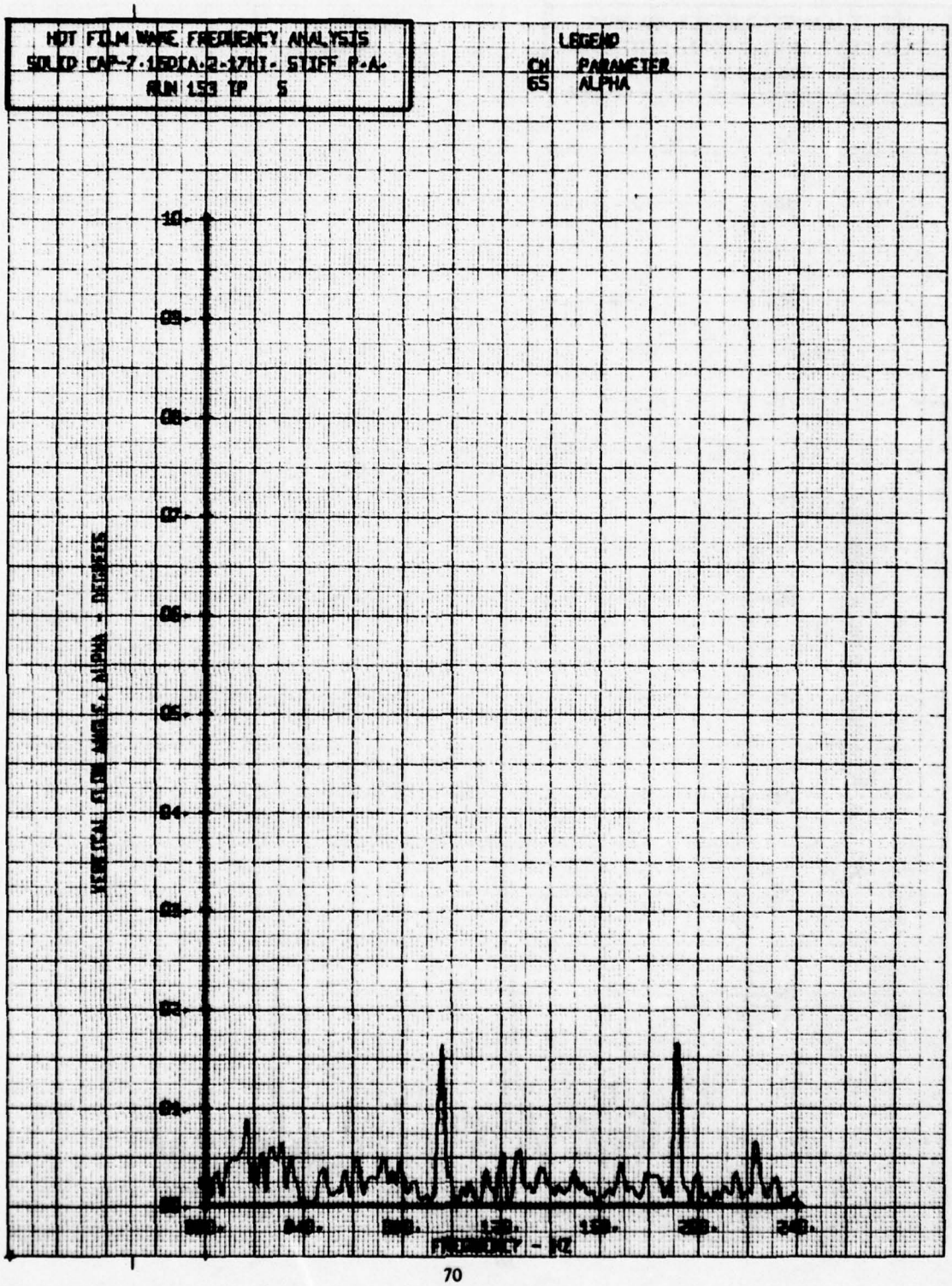
SOLID CAP-7.150DIA.2.17HT. STIFF R.A.
RUN 153 TP 4
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ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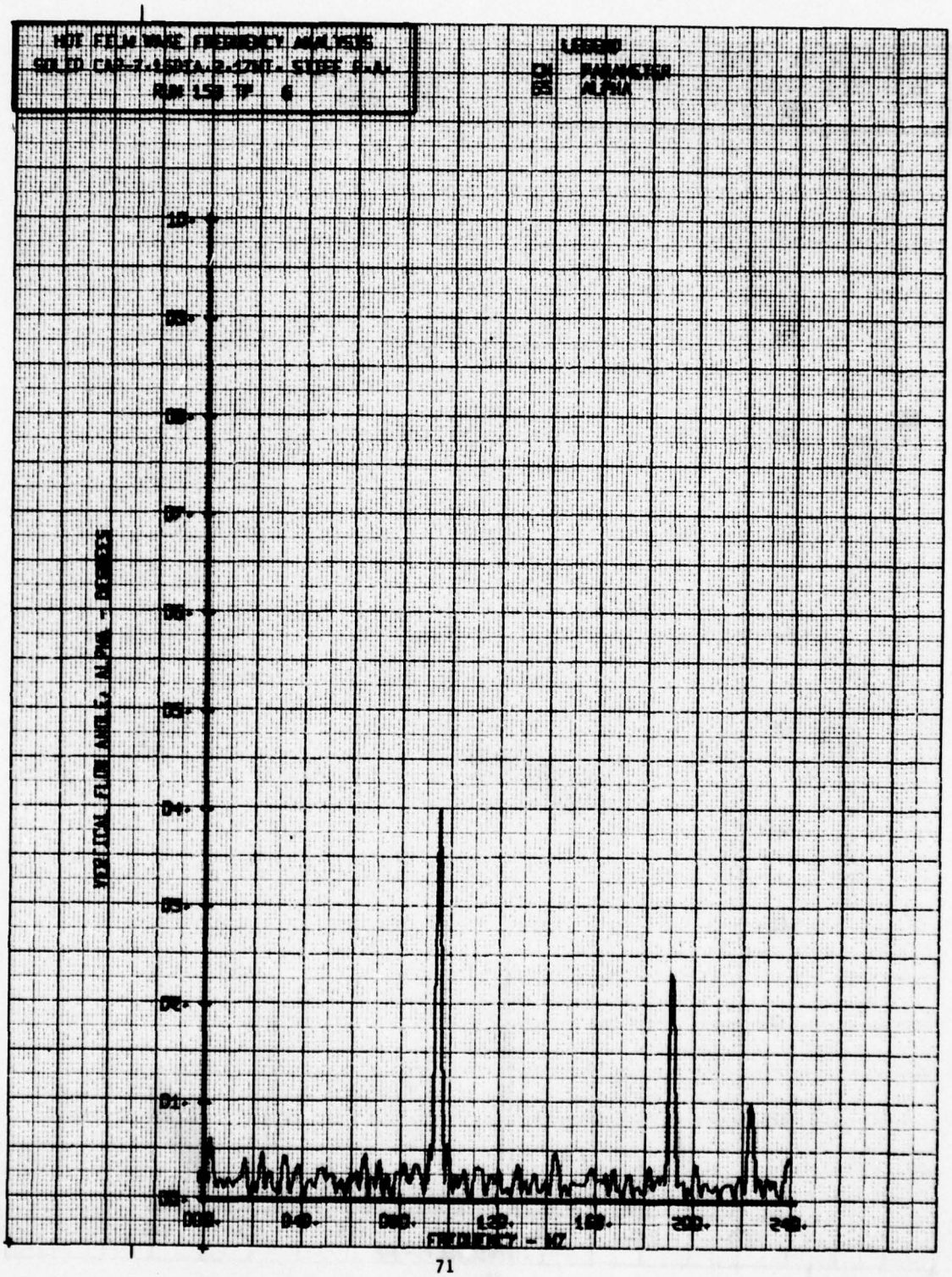
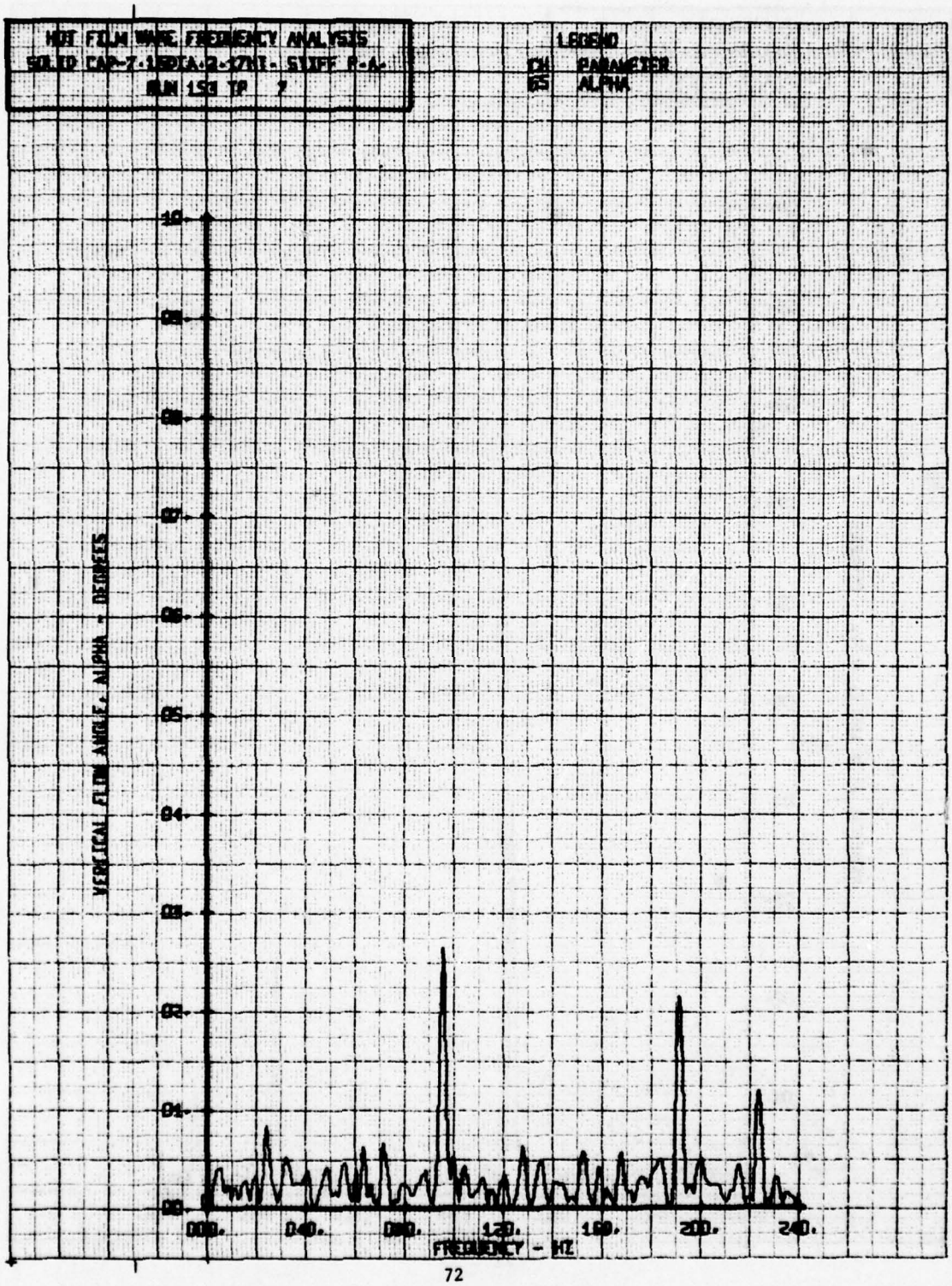
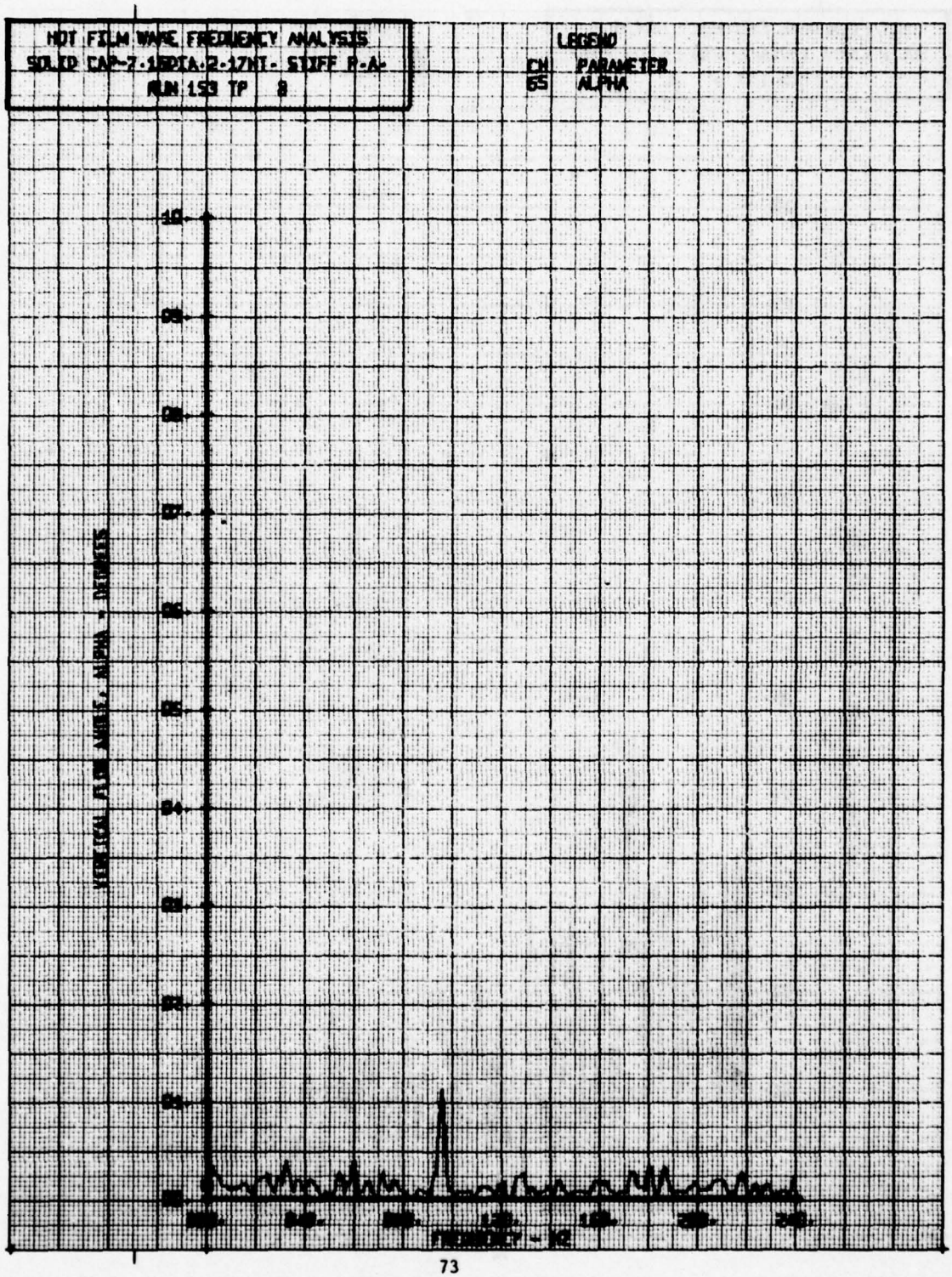
SOLID CAP-7.15DIA.2.17HT. STIFF R.A.
RUN 153 TP 5
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 159 TP 6
LEGEND
CH PARAMETER
DS ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.18DIA.2.17HI- STIFF R-A.
RUN 150 TP 7
LEGEND
CH PARAMETER
05 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
000.
040.
080.
120.
160.
200.
240.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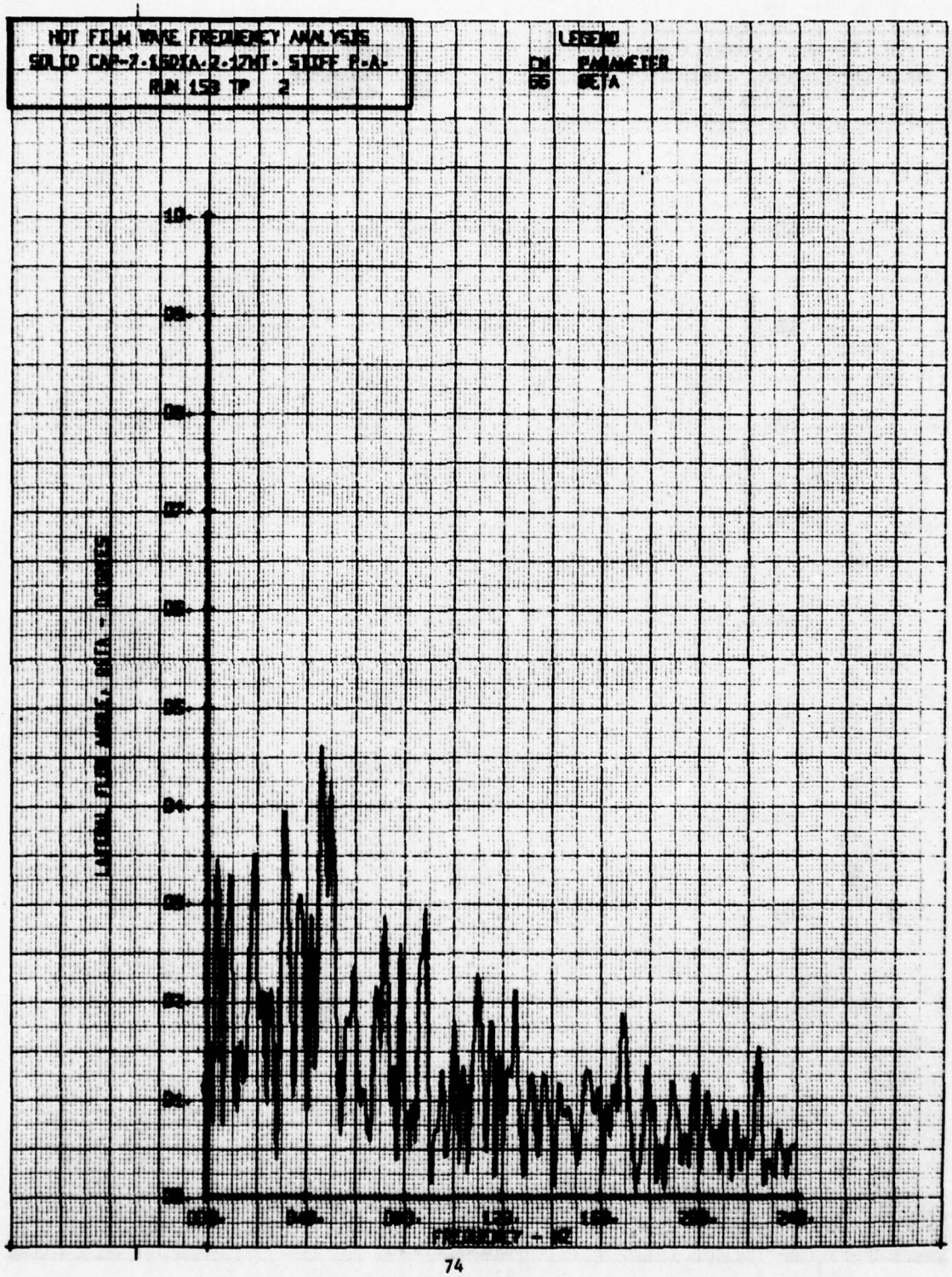
SOLID CAP-7.1BDIA.2.17NT- STIFF R-A-
RUN 153 TP 8
LEGEND
CH PARAMETER
65 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ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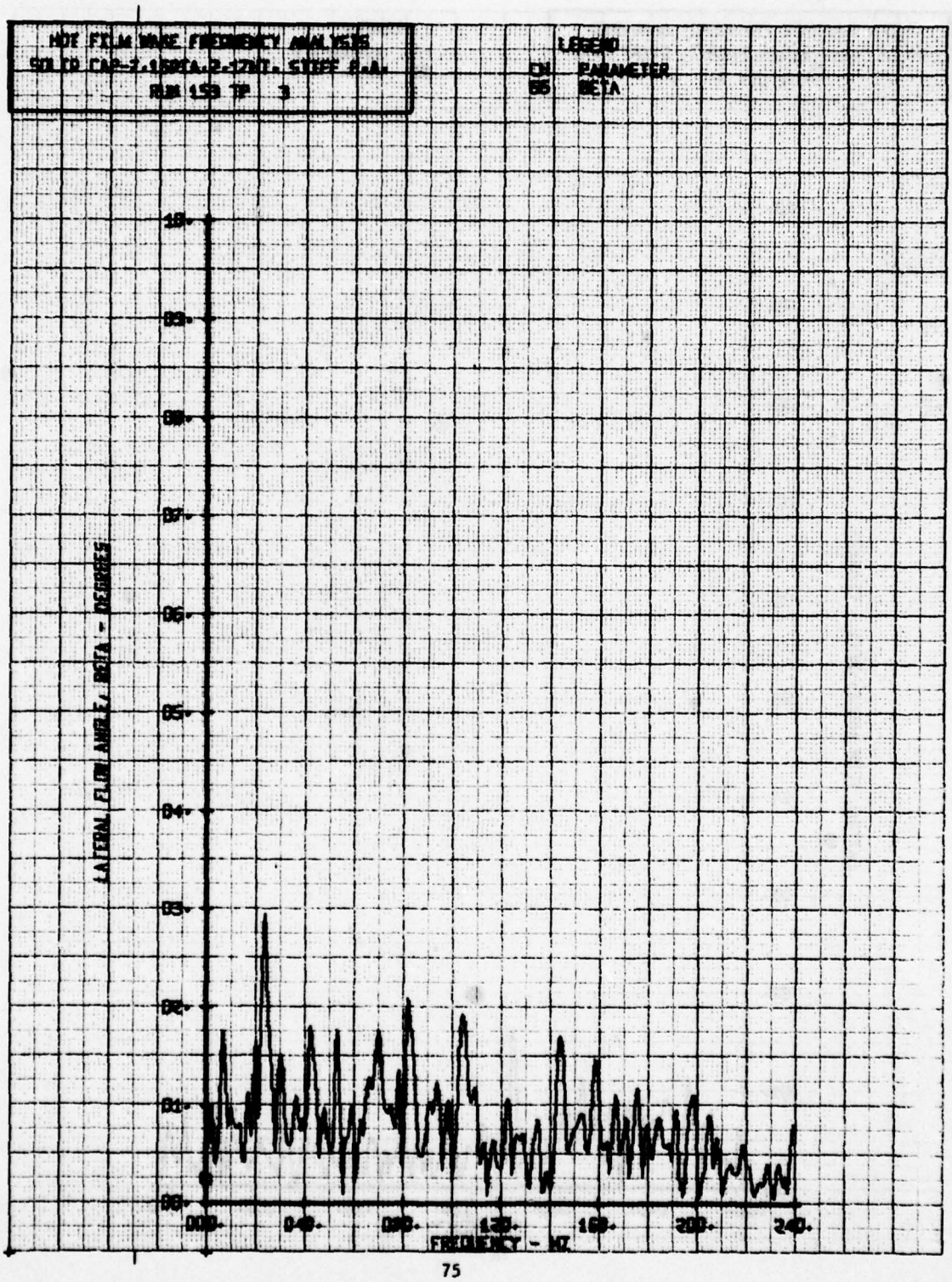
SOLID CAP-7.150DIA.2.17HT. STIFF P.A.
RUN 153 TP 2
LEGEND
CH PARAMETER
55 BETA
LATERAL FILM ANGLE, BETA - DEGREES
FREQUENCY - HZ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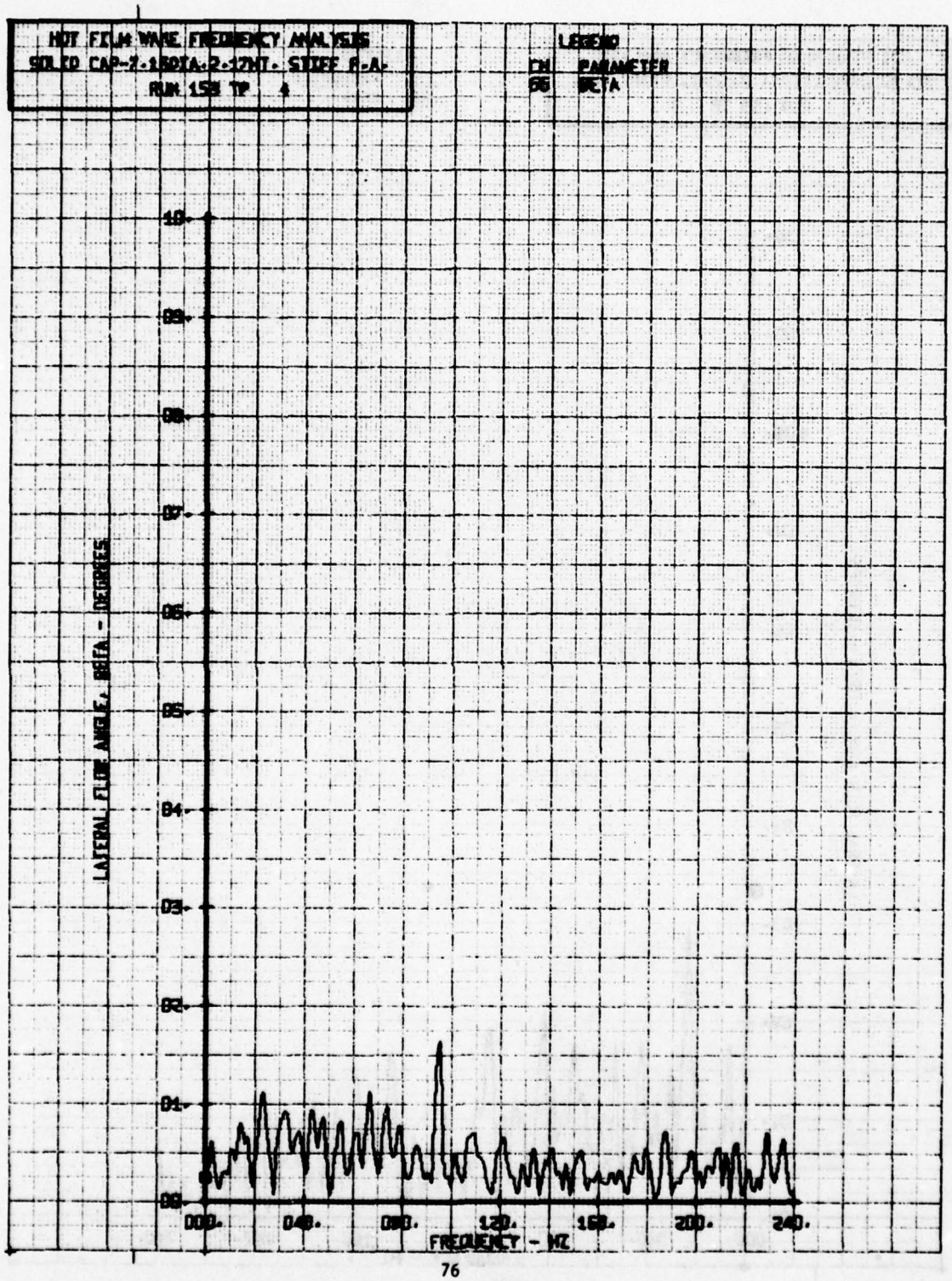
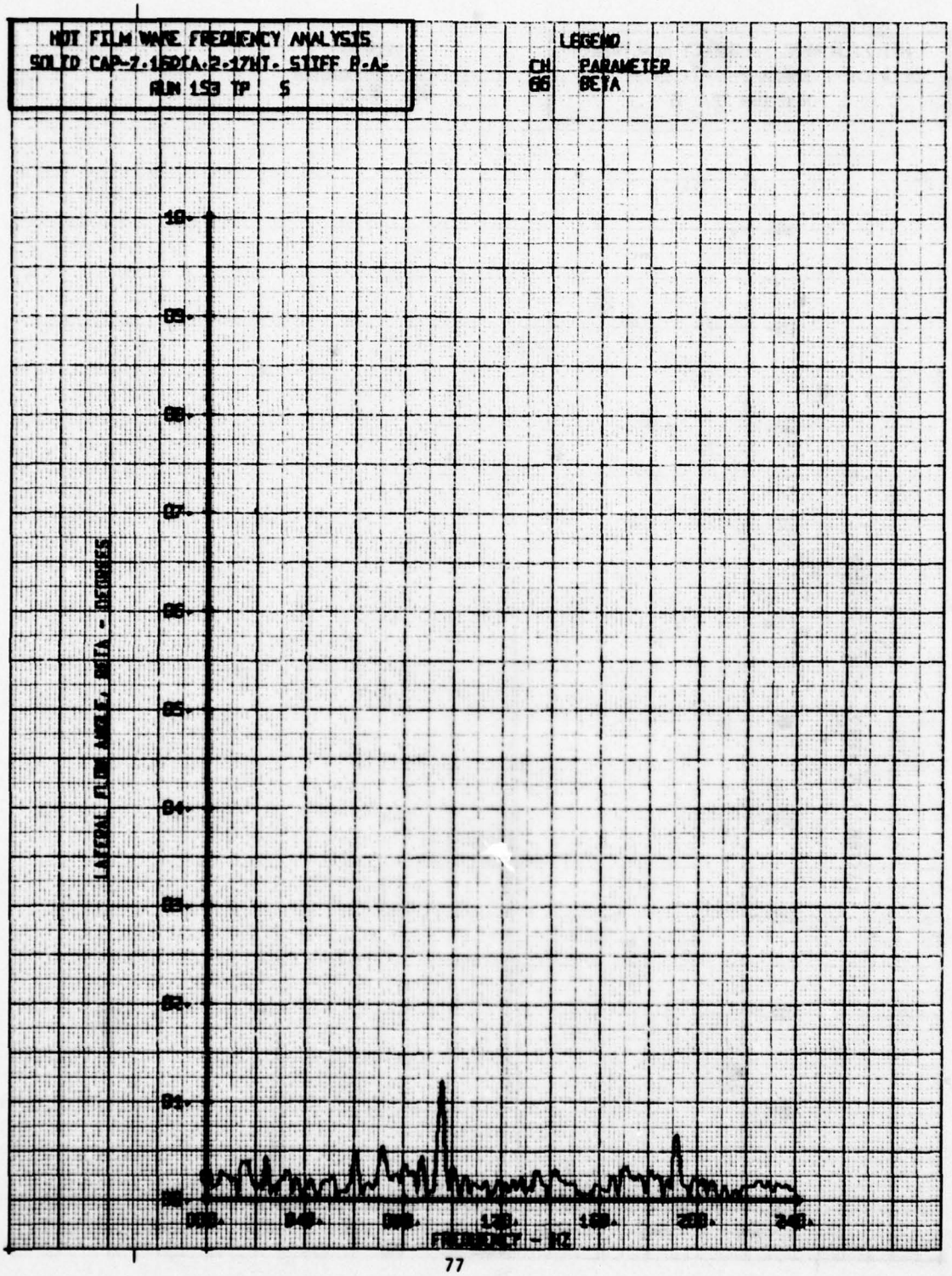
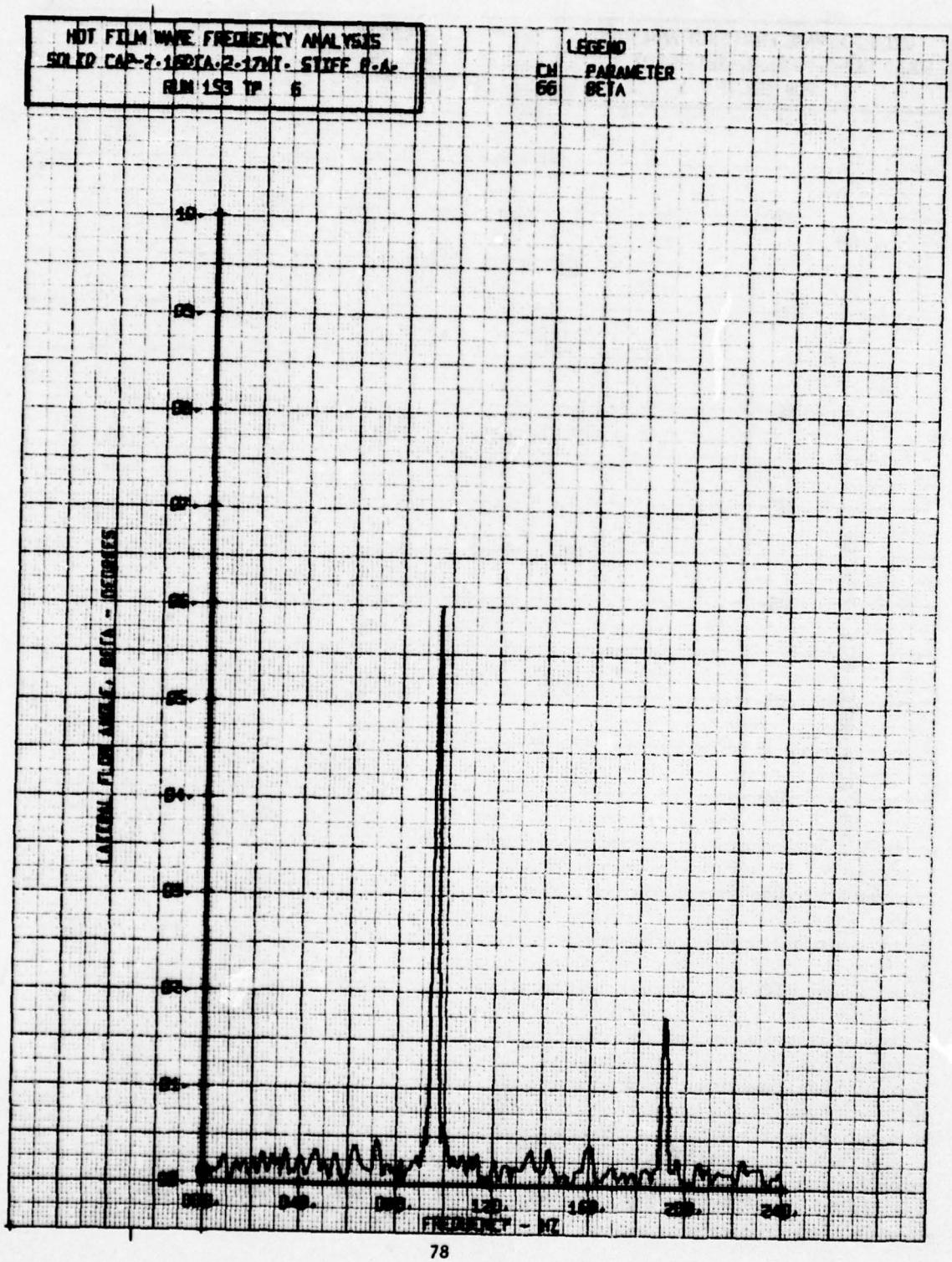
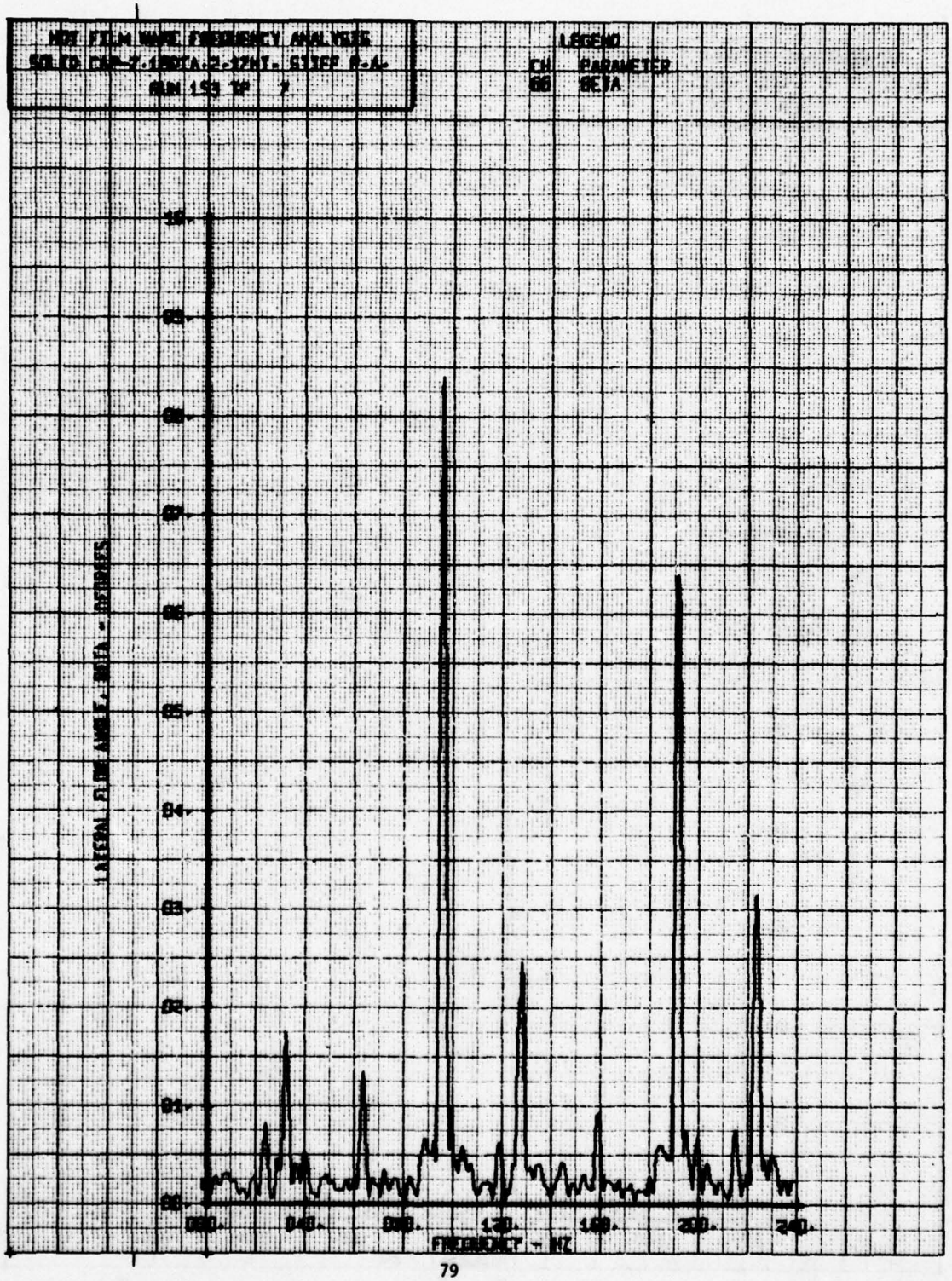
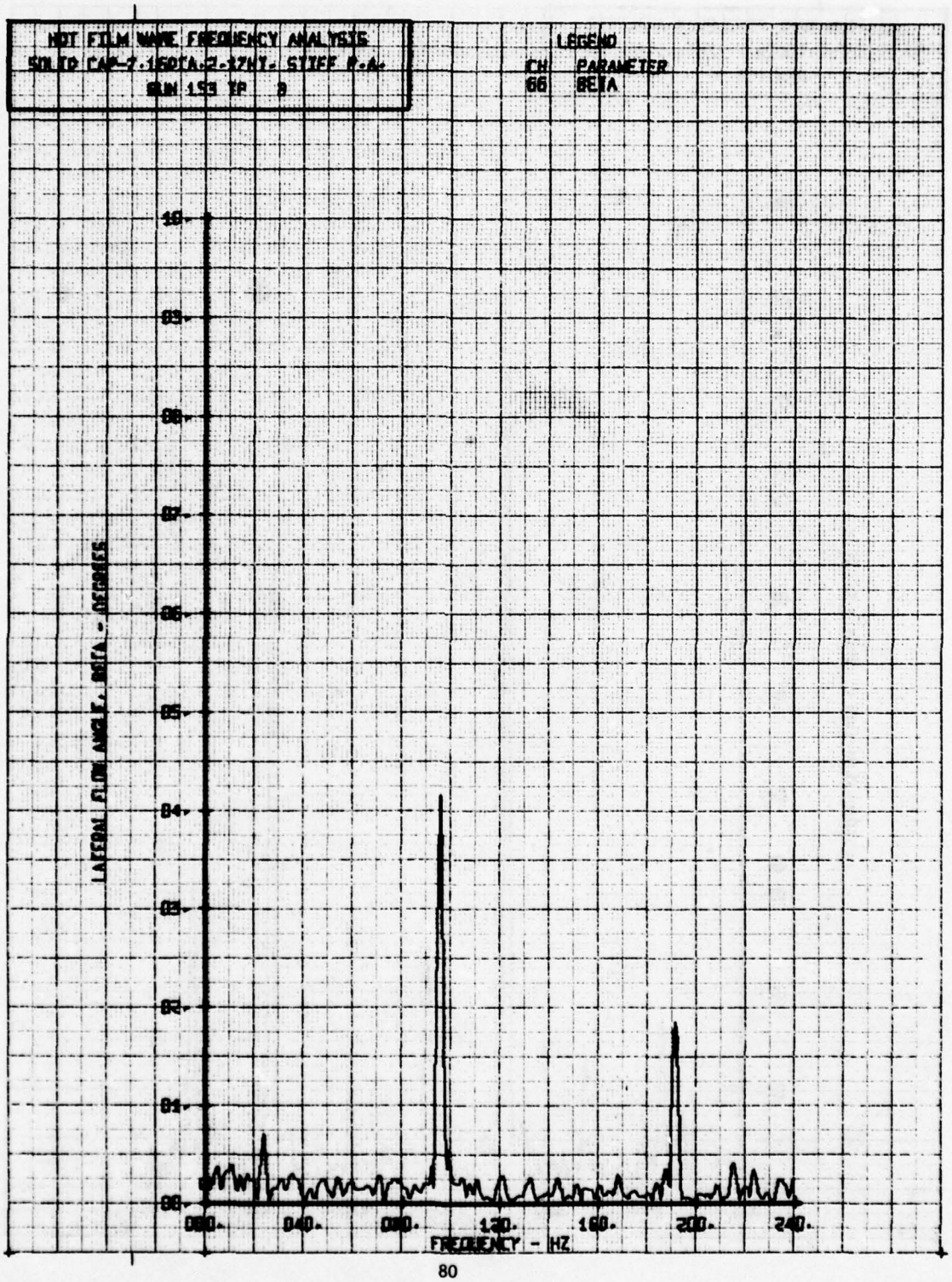
SOLID CAP-2.1BETA.2.17KT. STIFF R.A.
RUN 153 TP 3
LEGEND
CH PARAMETER
05 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ

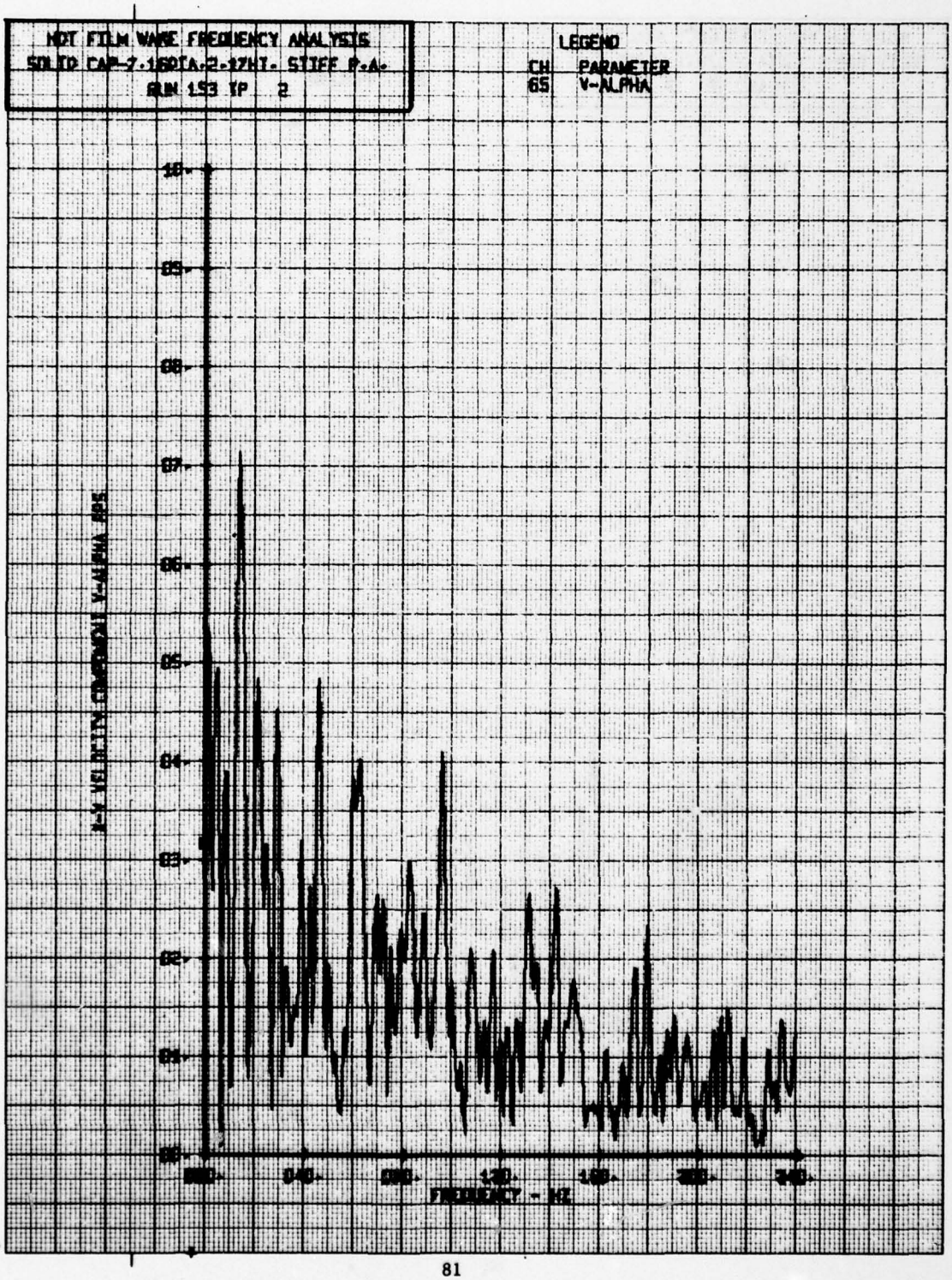

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.150DIA.2.17HT. STIFF R.A.
RUN 153 TP 4
LEGEND
CH PARAMETER
06 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

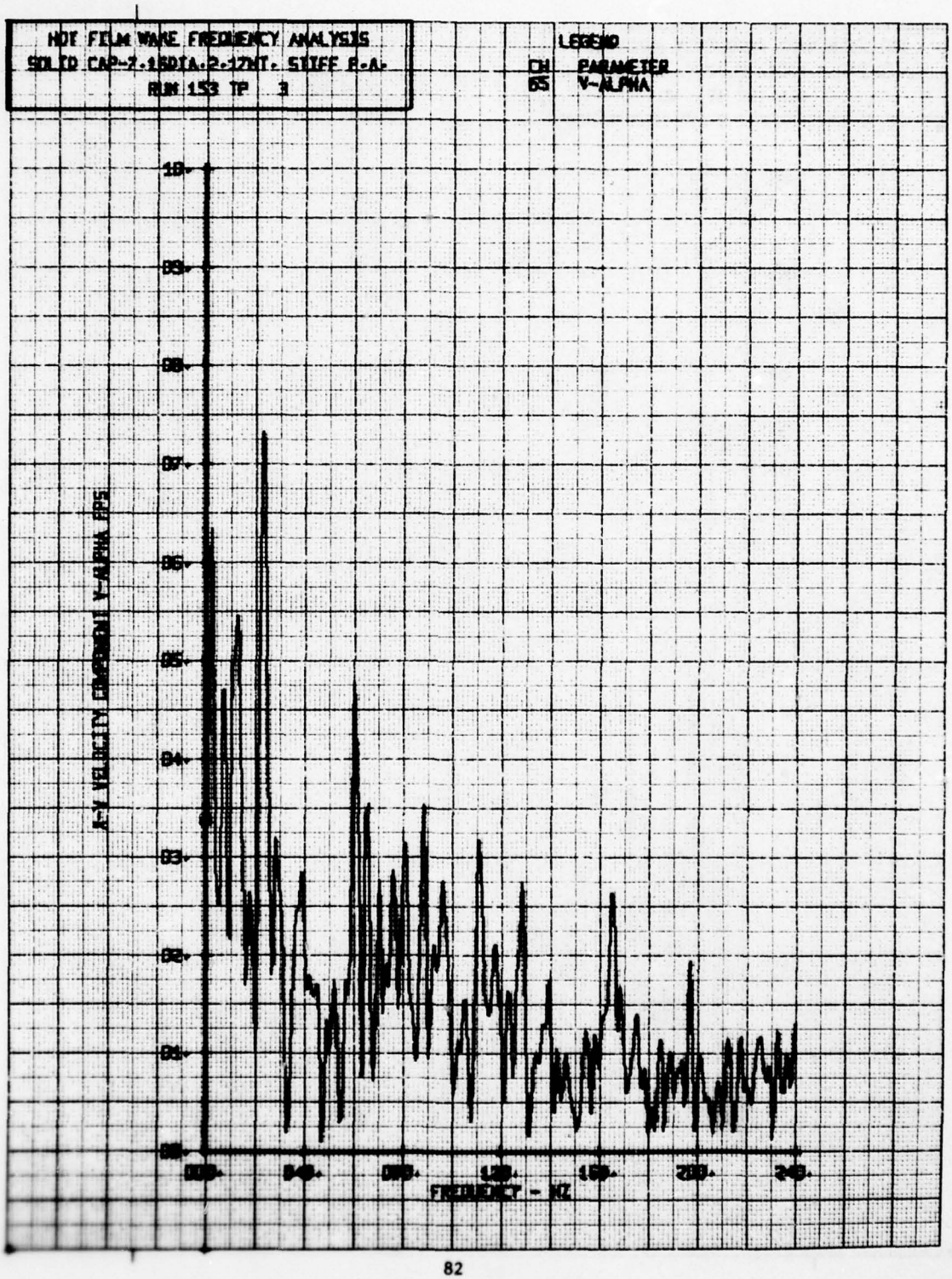

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.15DIA.2.17HT. STIFF P.A.
RUN 153 TP 5
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ

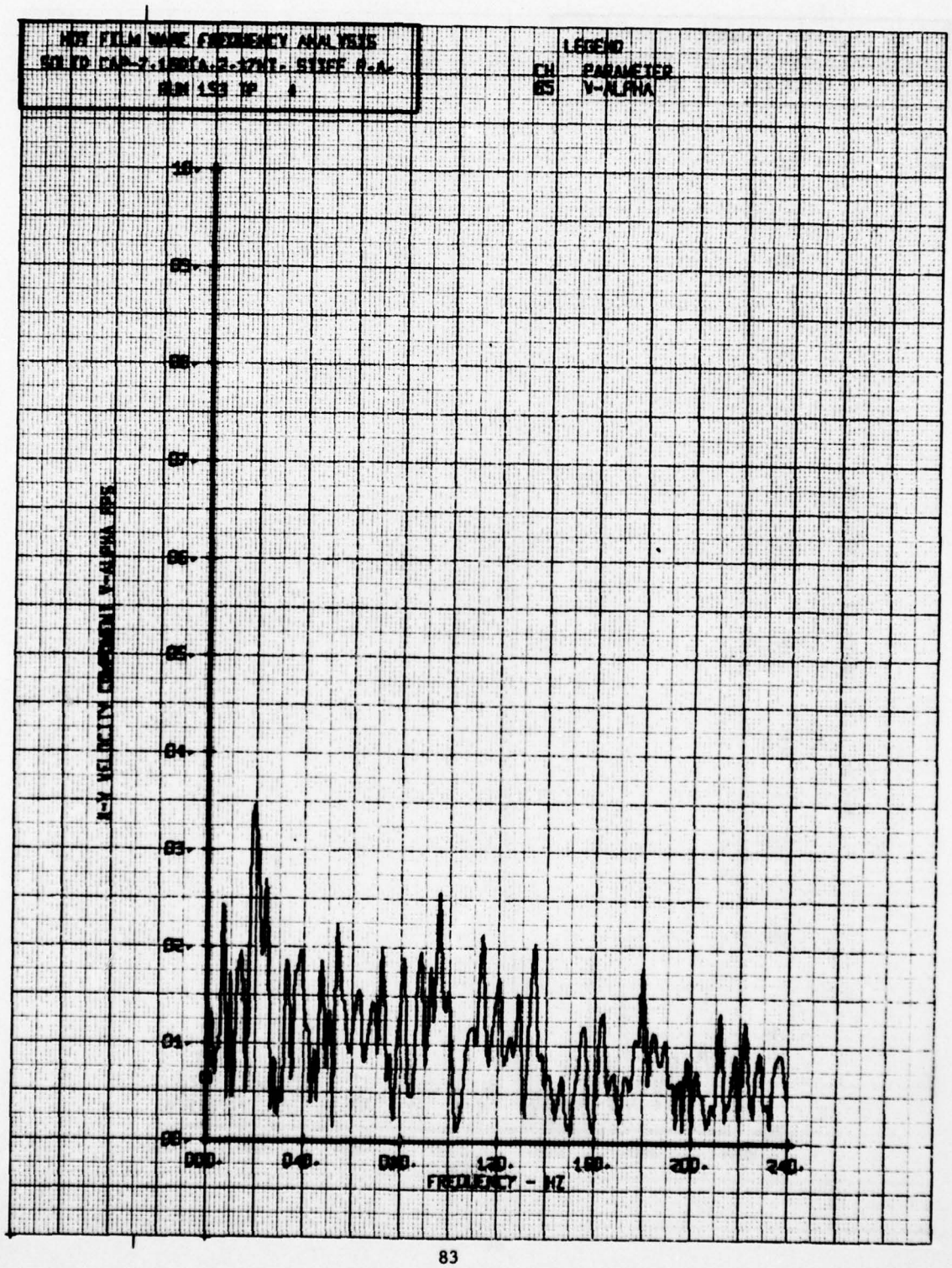

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.15DIA.2.17MT. STIFF R.A.
RUN 153 TP 6
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ

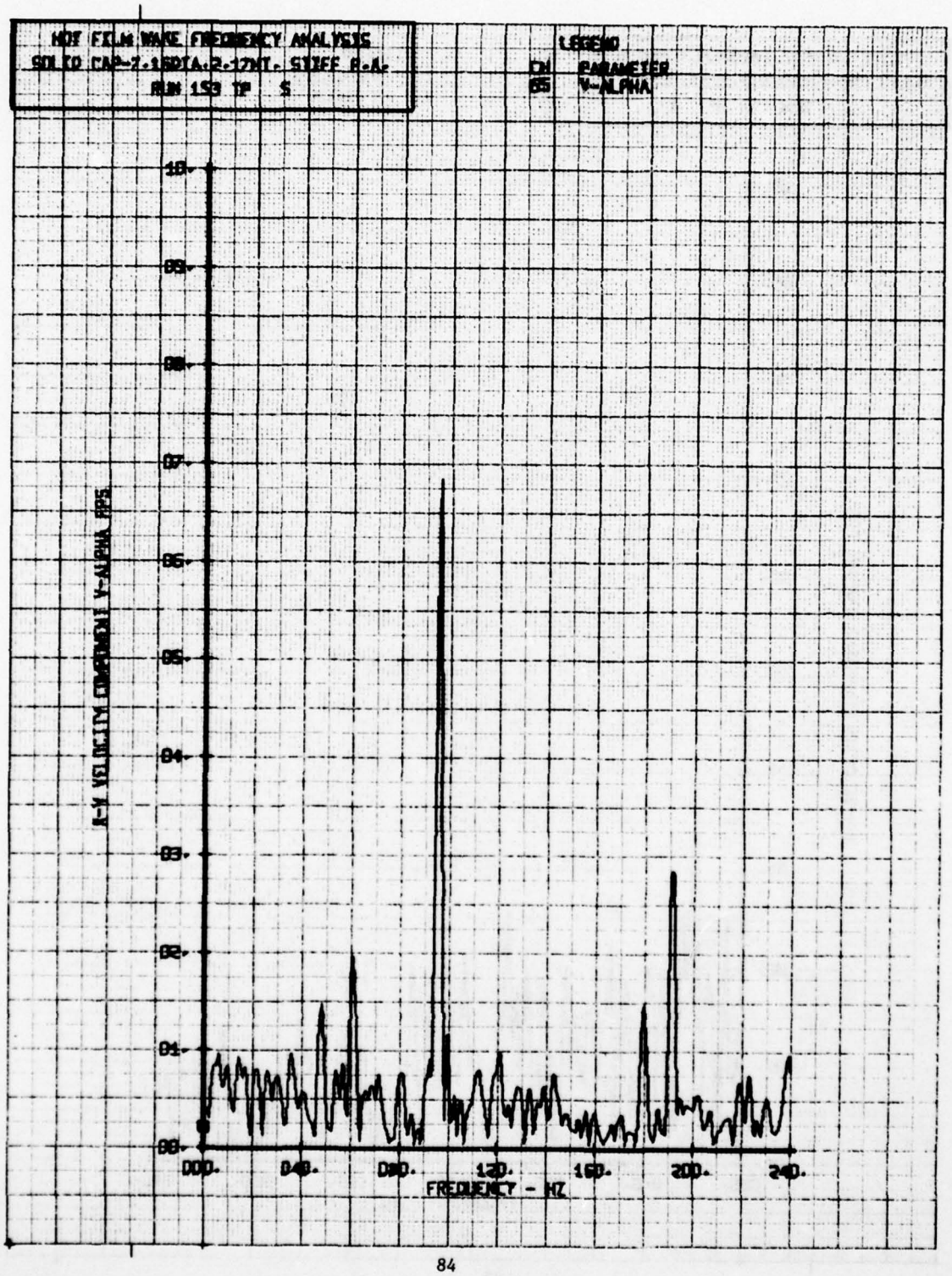

HOT FILM WAVE FREQUENCY ANALYSIS
RUN 153 TP 7
LEGEND
CH PARAMETER
06 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ

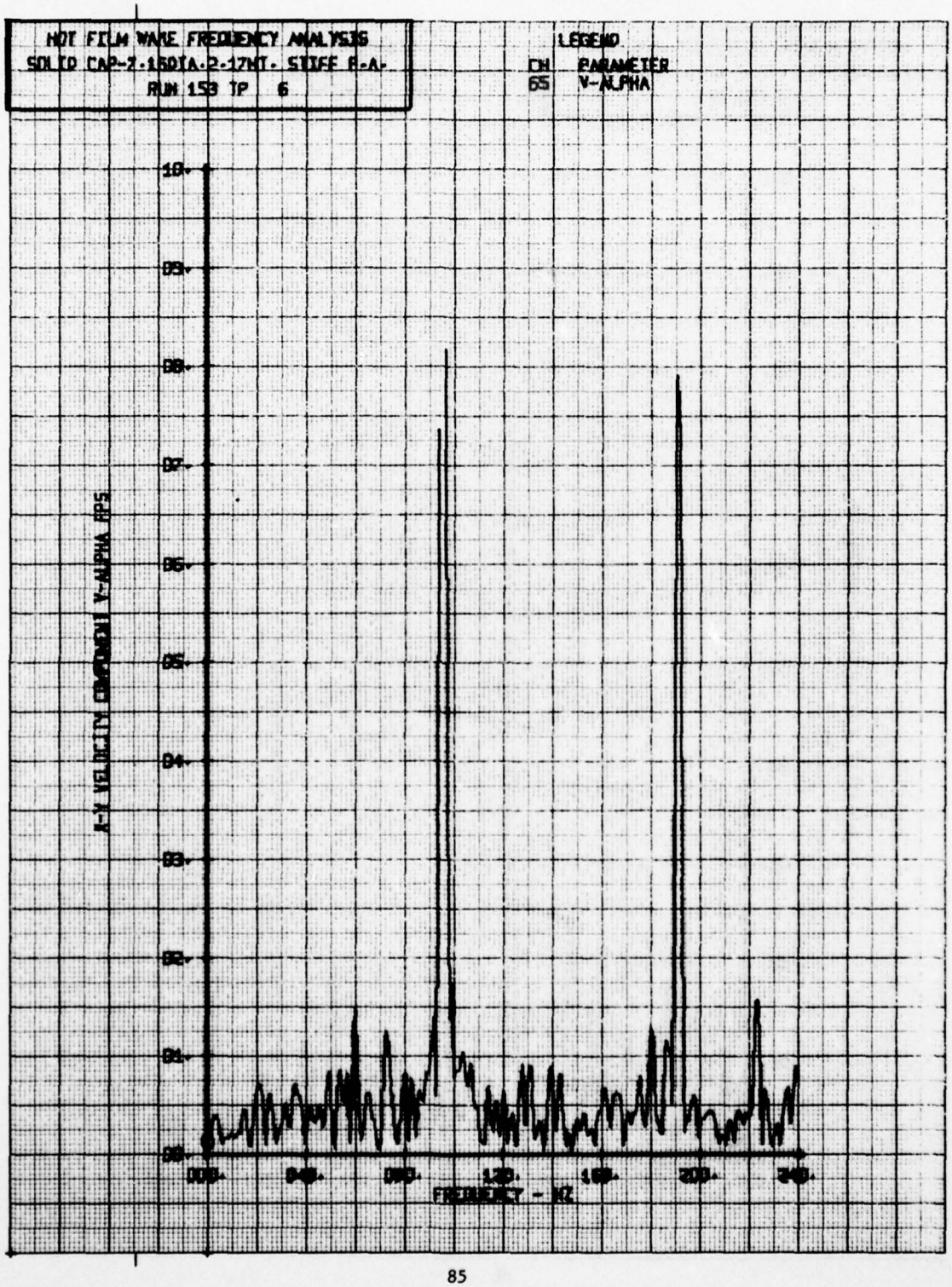

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.160TA.2.17HT. STIFF R.A.
RUN 159 TP 9
LEGEND
CH PARAMETER
66 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ
040.
120.
160.
200.
240.

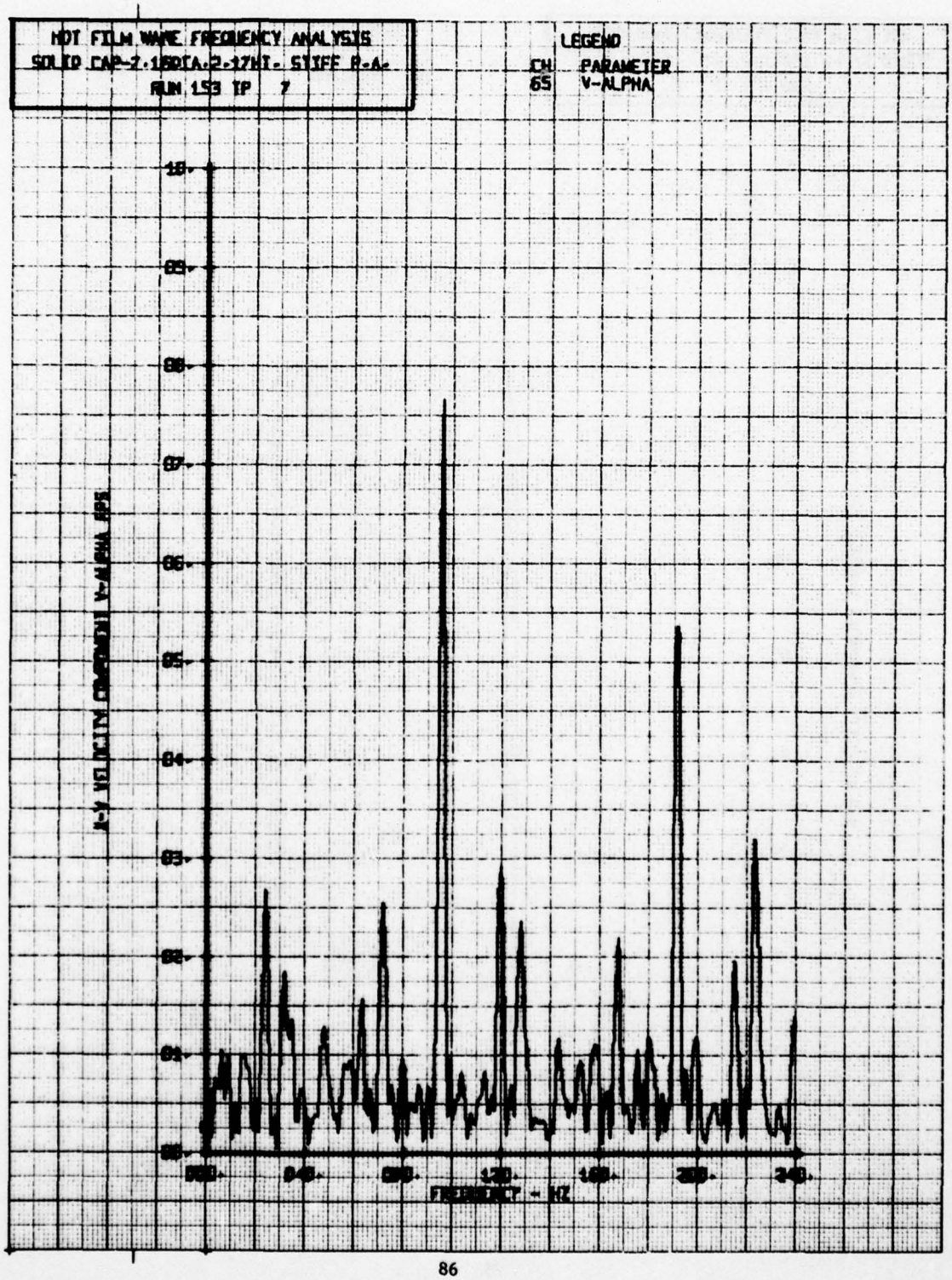

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.160TA.2.17HT. STIFF P.A.
RUN 153 TP 2
LEGEND
CH PARAMETER
65 V-ALPHA
FREQUENCY - HZ

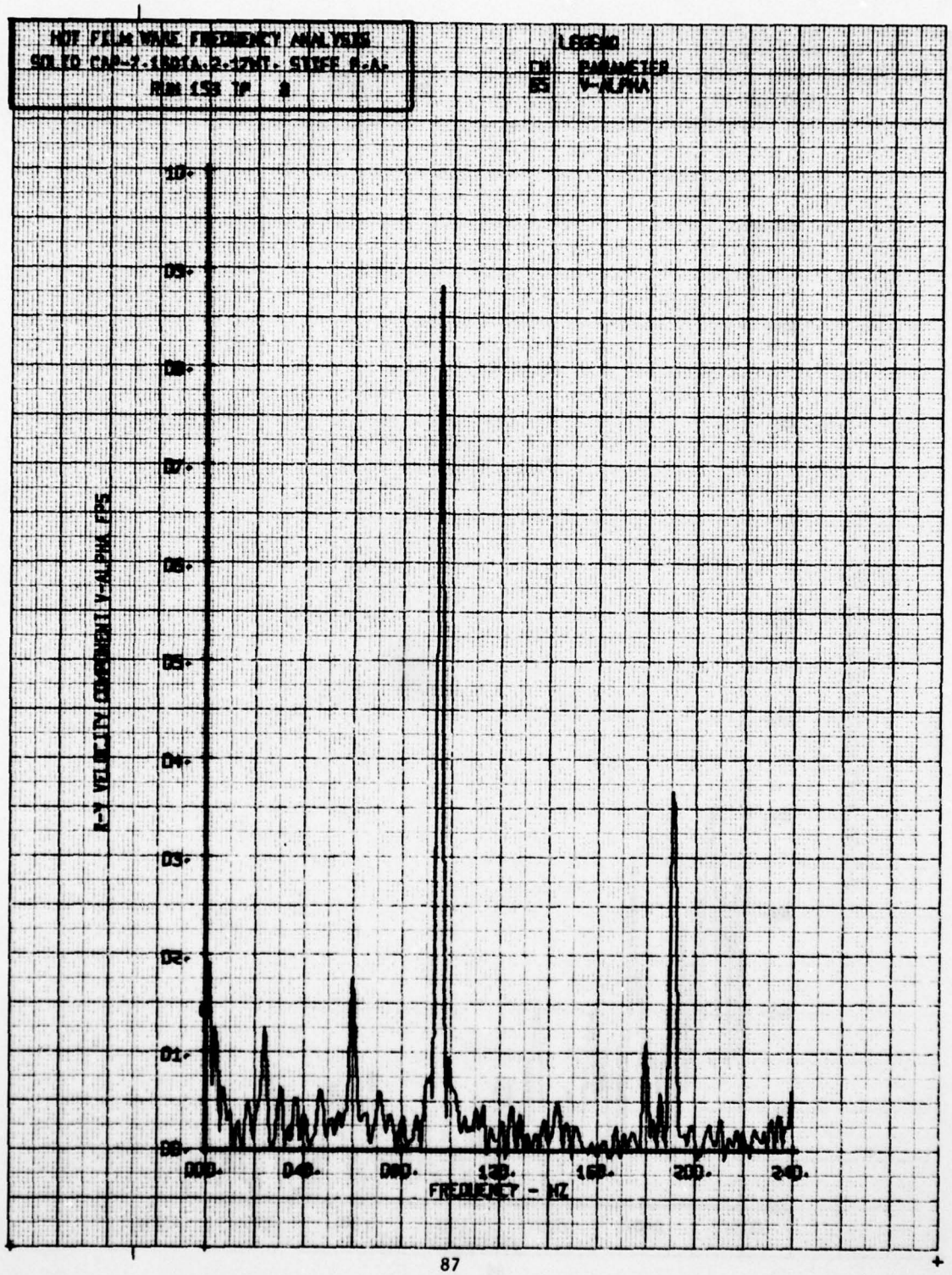

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.15DIA.2.17HT. STIFF F.A.
RUN 153 TP 3
LEGEND
CH PARAMETER
65 V-ALPHA
A-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ

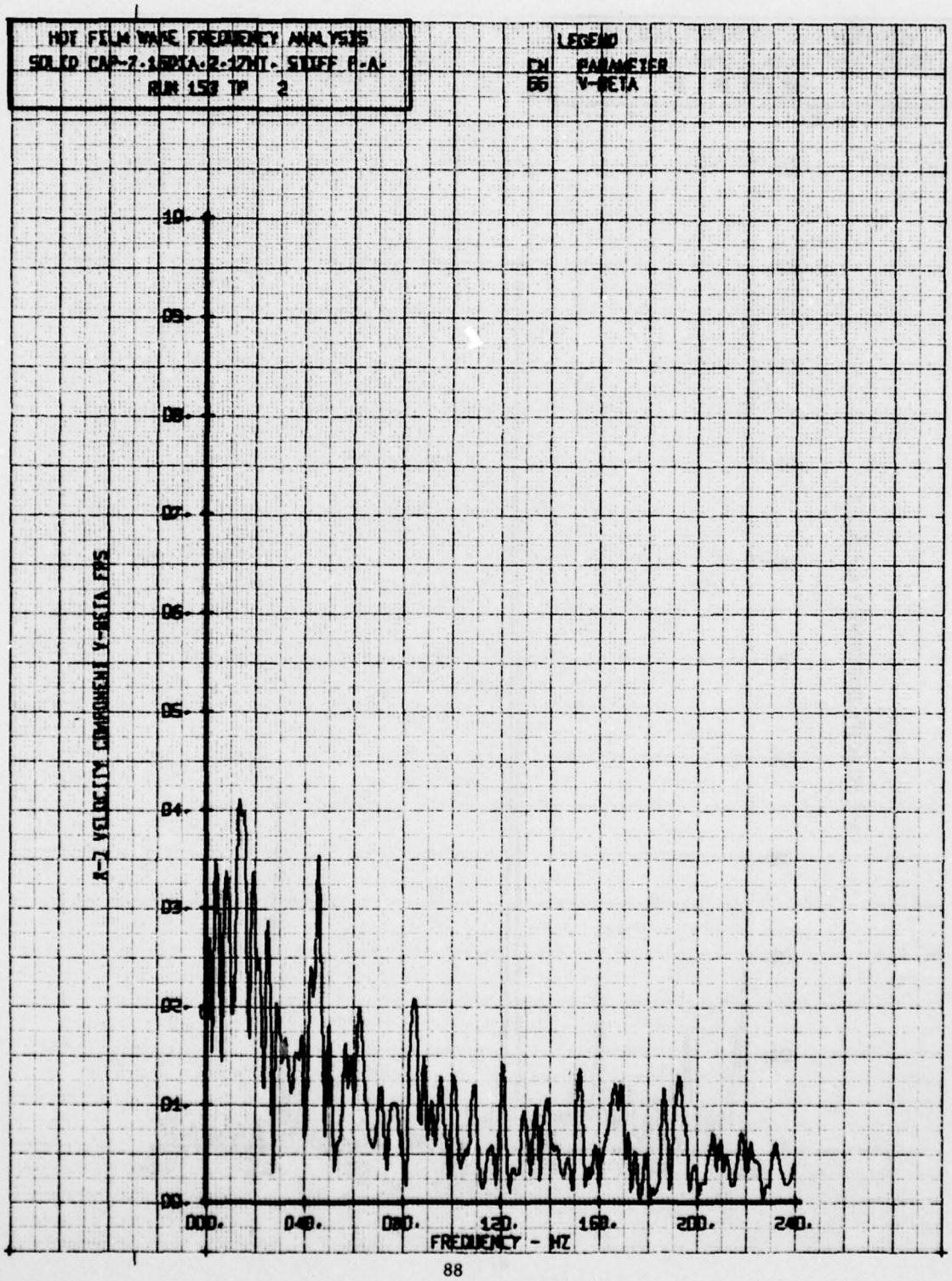

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.180TA.2.17MT. SIXEF R.A.
RUN 153 TP 4
LEGEND
CH PARAMETER
85 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA RPS
FREQUENCY - HZ
000.
040.
080.
120.
160.
200.
240.


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.15DIA.2.17HT. STIFF R.A.
RUN 153 TP 5
LEGEND
CH PARAMETER
05 V-ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
U-V VELOCITY COMPONENT V-ALPHA RPS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.16DIA.2.17HT. STIFF A-A.
RUN 153 TP 6
LEGEND
CH PARAMETER
65 V-ALPHA
A-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAVE FREQUENCY ANALYSIS
SOLID CAP-7.18DIA.2.17HT. STIFF P.A.
RUN 153 TP 7
LEGEND
CH PARAMETER
65 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.180DIA.2.17KT. STEEP S.A.
RUN 153 TP 8
LEGEND
CH PARAMETER
05 V-ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
V-V VELOCITY COMPONENT V-ALPHA FPS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.1BDIA.2.17WT. STIFF B-A-
RUN 153 TP 2
LEGEND
CH PARAMETER
66 V-BETA
A-2 VELOCITY COMPONENT V-BETA FPS
10.
09.
08.
07.
06.
05.
04.
03.
02.
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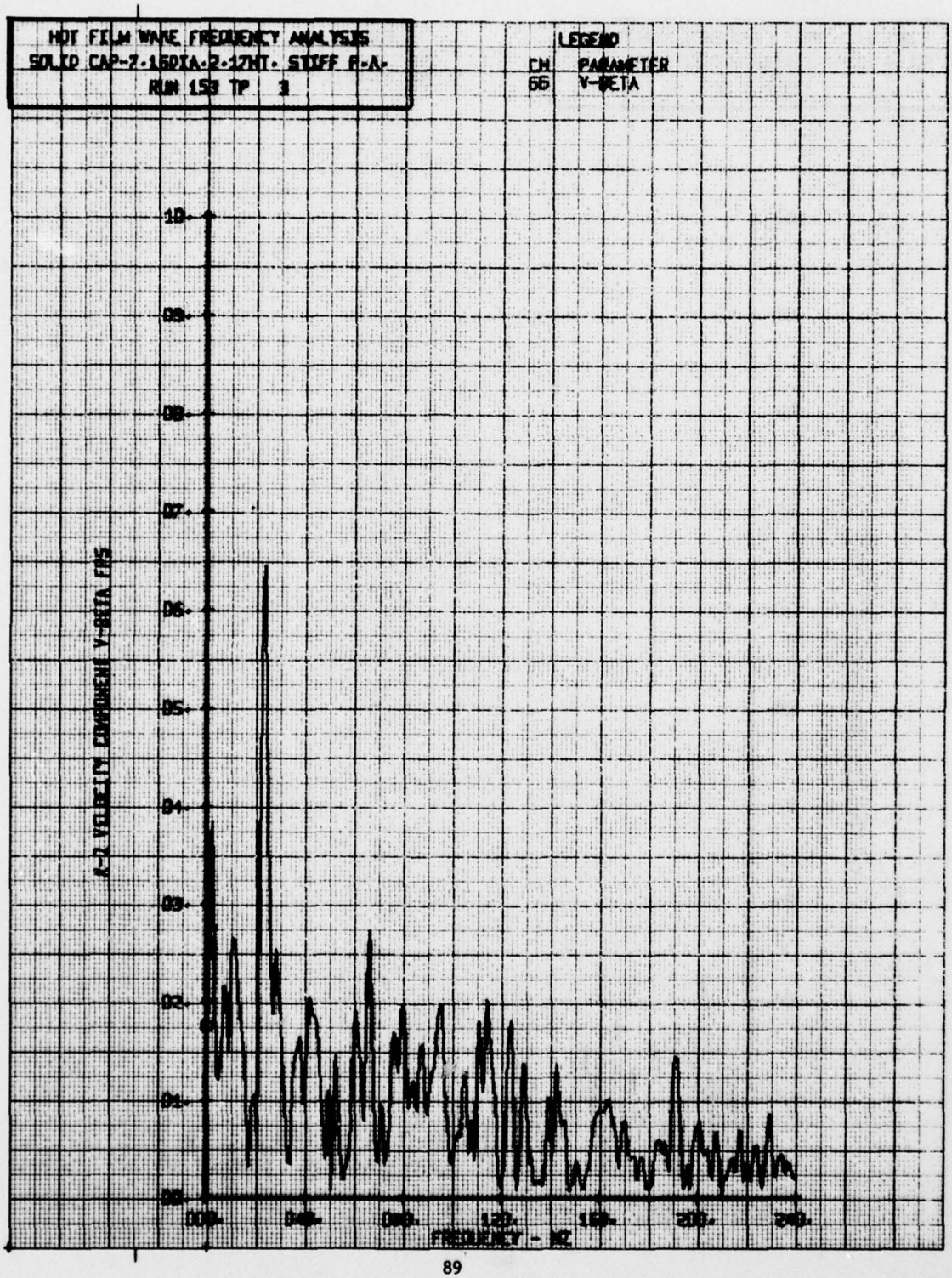
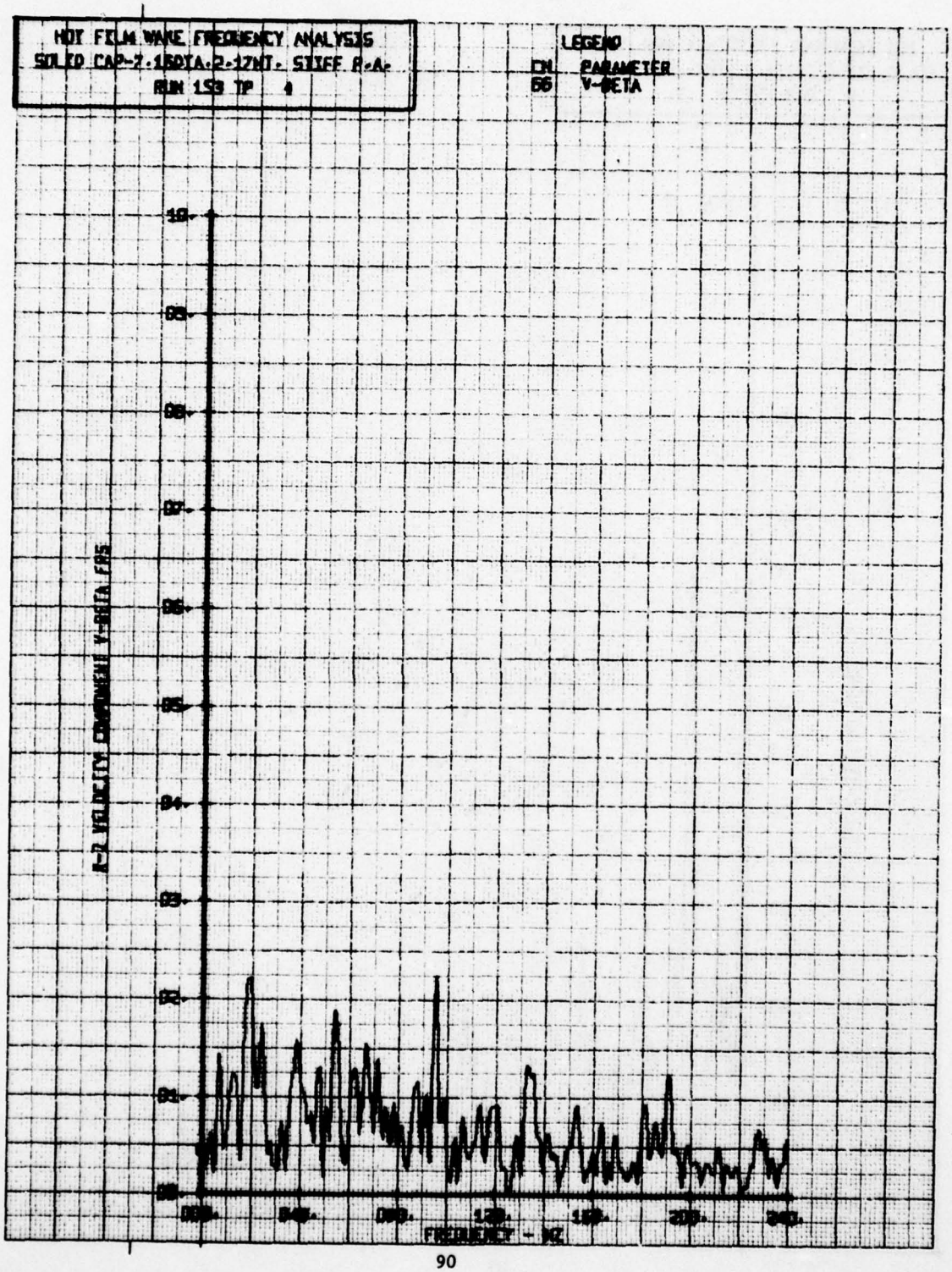
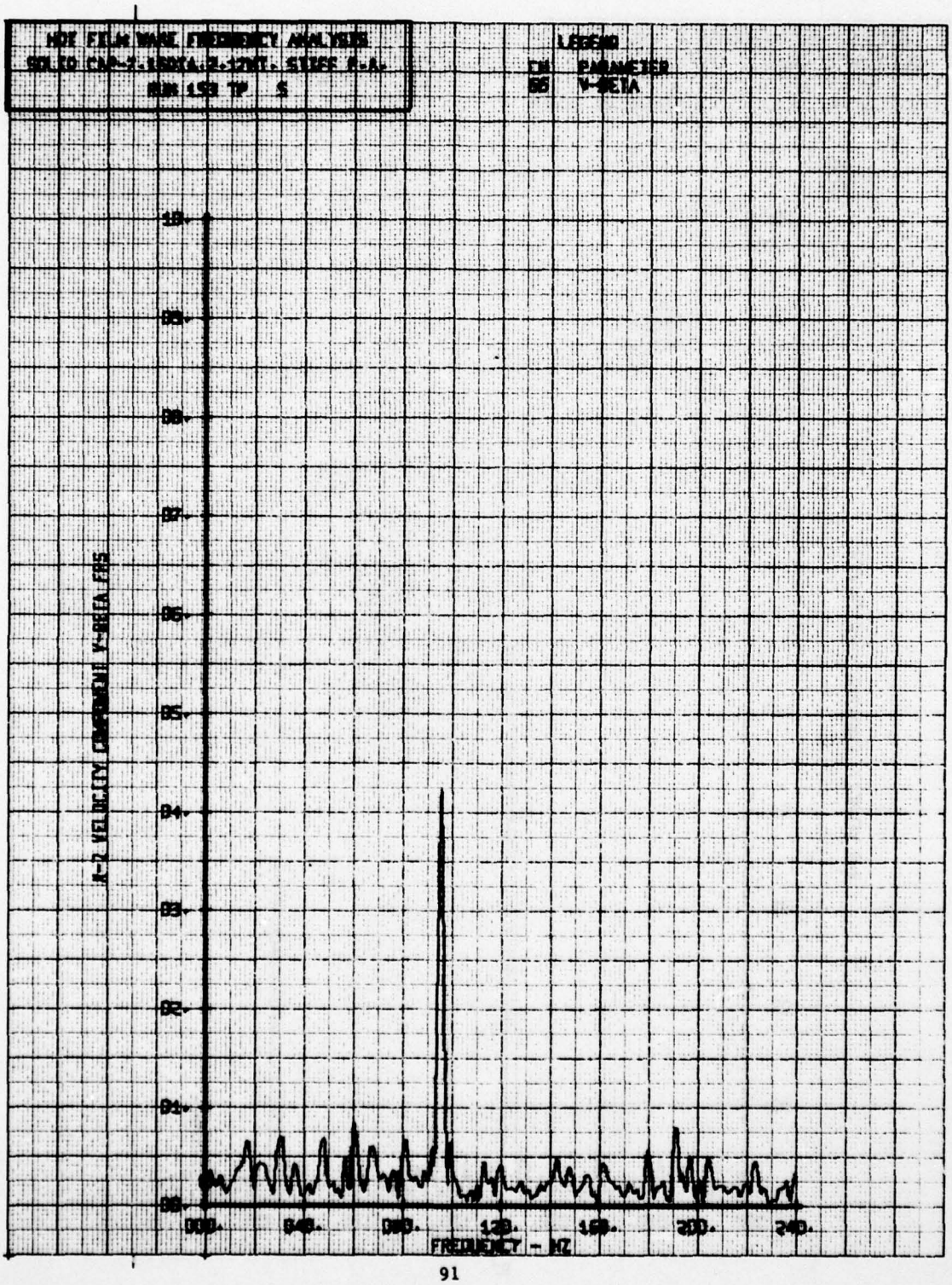
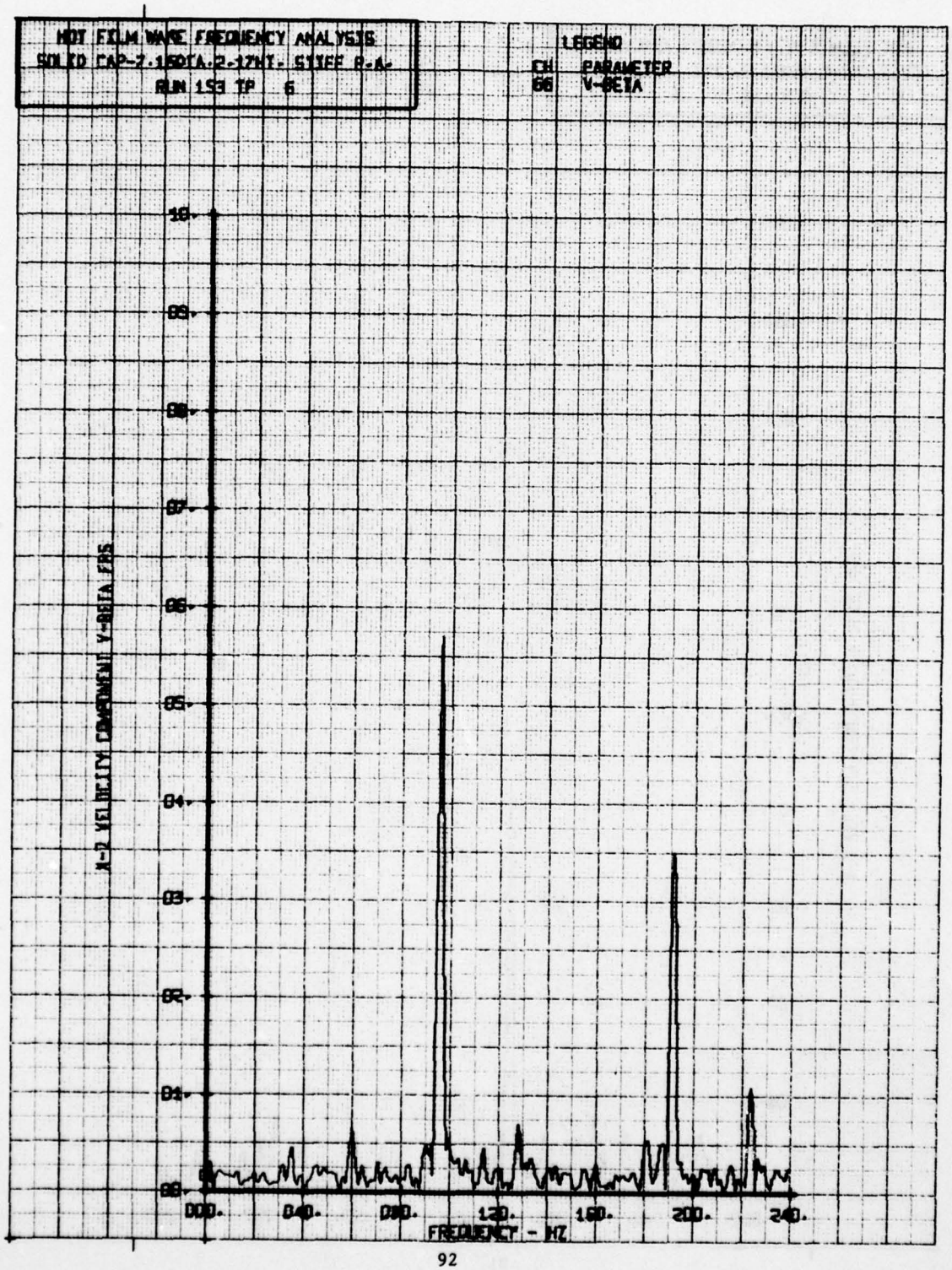
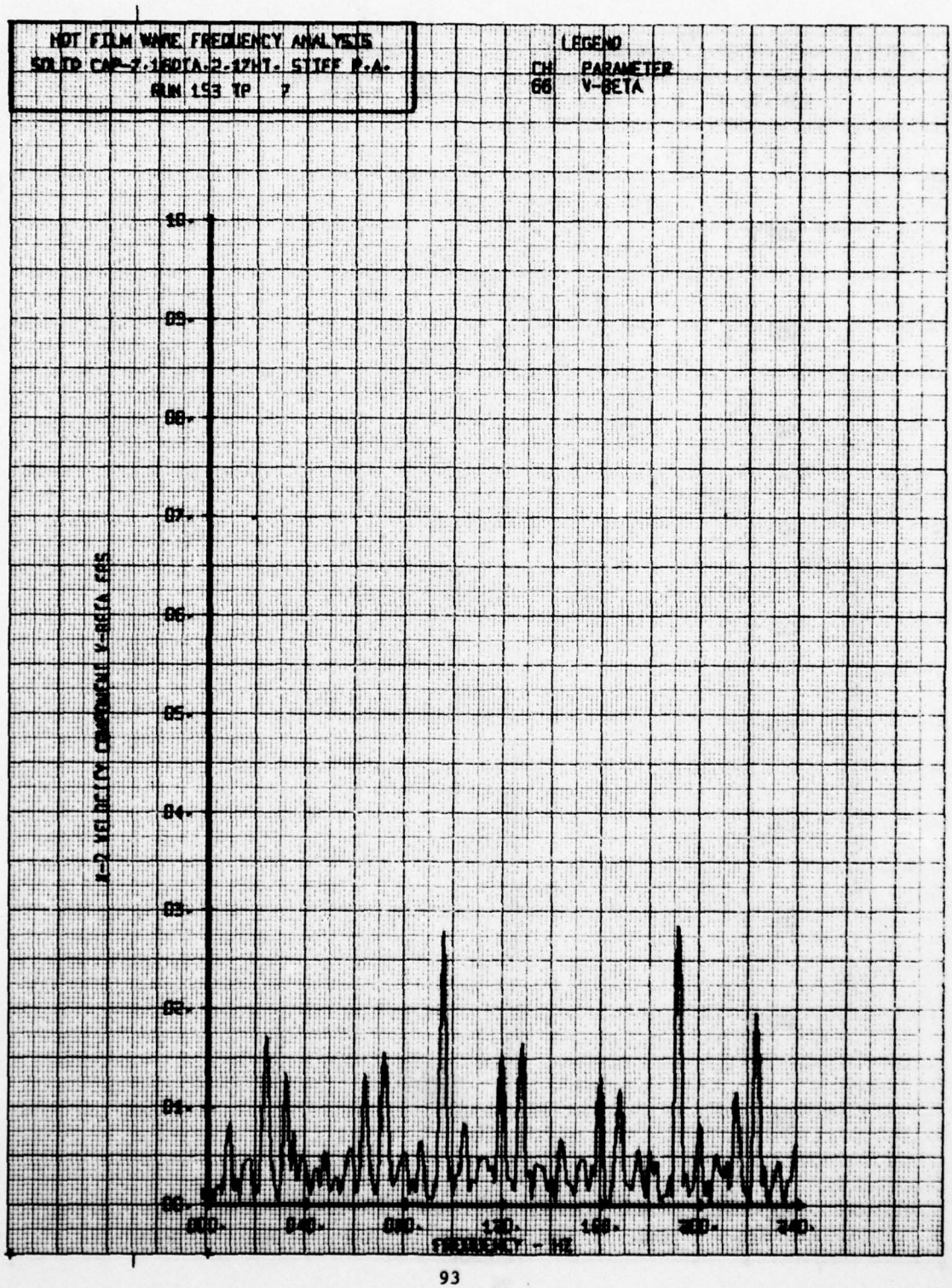
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

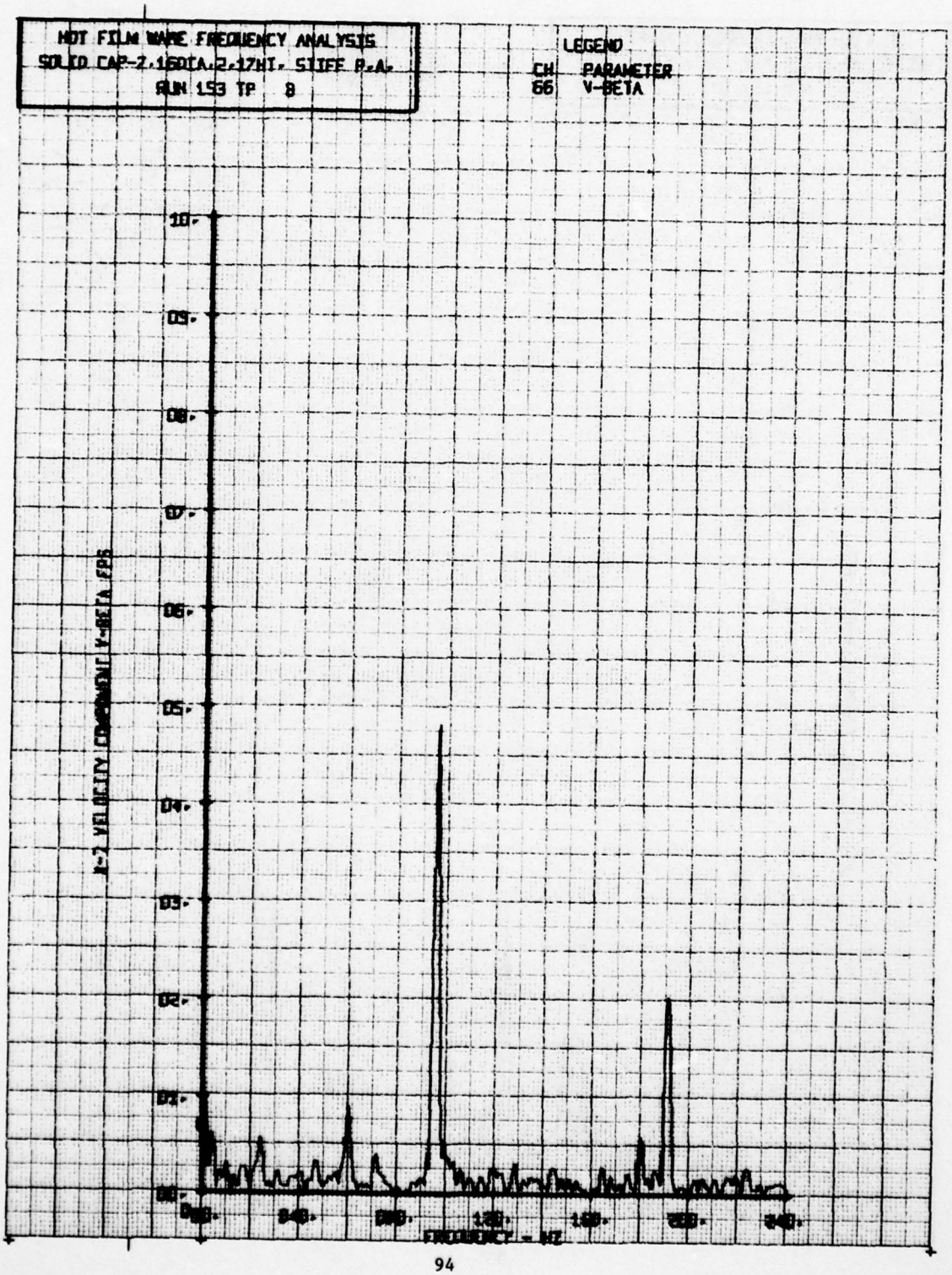

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.15DIA.2.17HT. STIFF F.A.
RUN 153 TP 3
LEGEND
CH PARAMETER
66 V-BETA
A-2 VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ

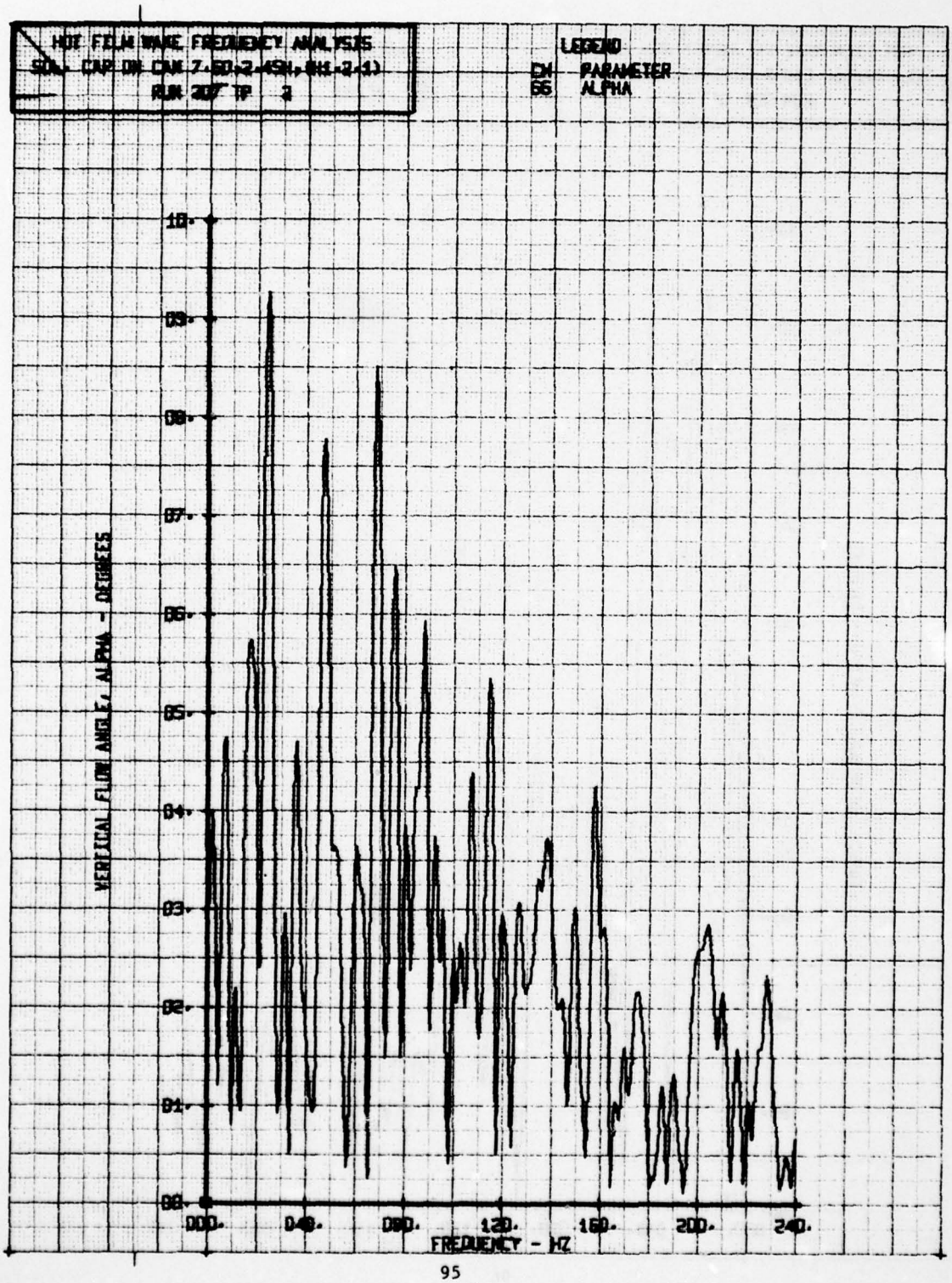

HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.150DIA.2-17NT. STIFF R.A.
RUN 153 TP 4
LEGEND
CH. PARAMETER
56 V-BETA
A-2 VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-1.180DIA.2.17WT. STIFF R.A.
RUN 158 TP 5
LEGEND
CH PARAMETER
06 V-BETA
A-2 VELOCITY COMPONENT V-BETA.E05
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.150IA.2-17NT. STIFF R.A.
RUN 153 TP 6
LEGEND
CH PARAMETER
66 V-BETA
X-2 VELOCITY COMPONENT V-BETA FRS
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-7.16DIA-2.17HT. STIFF R.A.
RUN 153 TP 7
LEGEND
CH PARAMETER
66 V-BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
K-2 VELOCITY COMPONENT V-BETA CBS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOLID CAP-2.160IA.2.17HI. STIFF P.A.
RUN 153 TP 8
LEGEND
CH PARAMETER
66 V-BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
X-7 VELOCITY COMPONENT V-BETA FPS
0.0.
40.
80.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 207 TP 2
LEGEND
CH PARAMETER
06 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

AD-A062 640 BOEING VERTOL CO PHILADELPHIA PA F/G 1/3
INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONFI--ETC(U)
SEP 78 P F SHERIDAN DAAJ02-77-C-0020
UNCLASSIFIED USARTL-TR-78-23G-V-7C NL

2 OF 3
ADA
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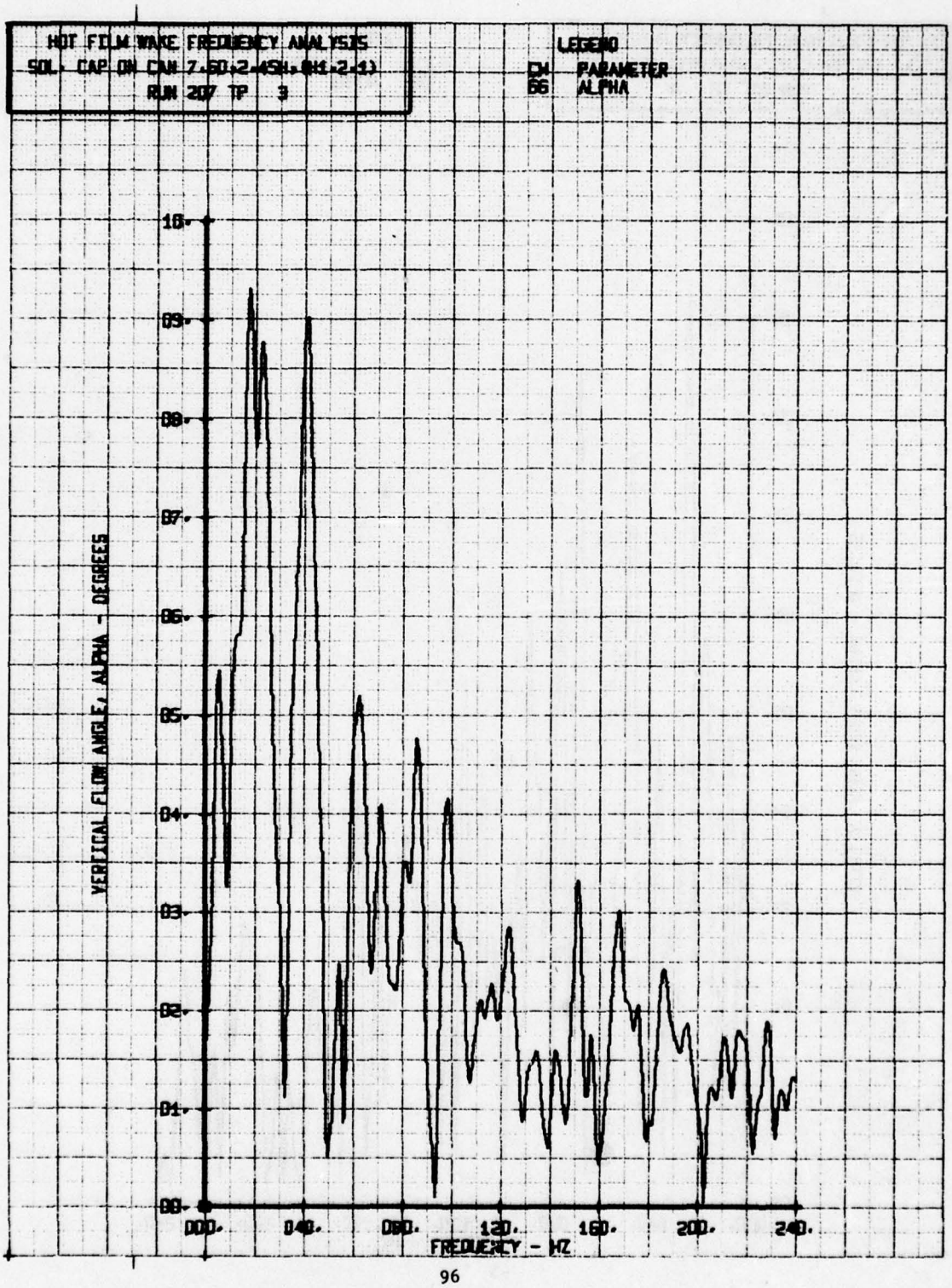
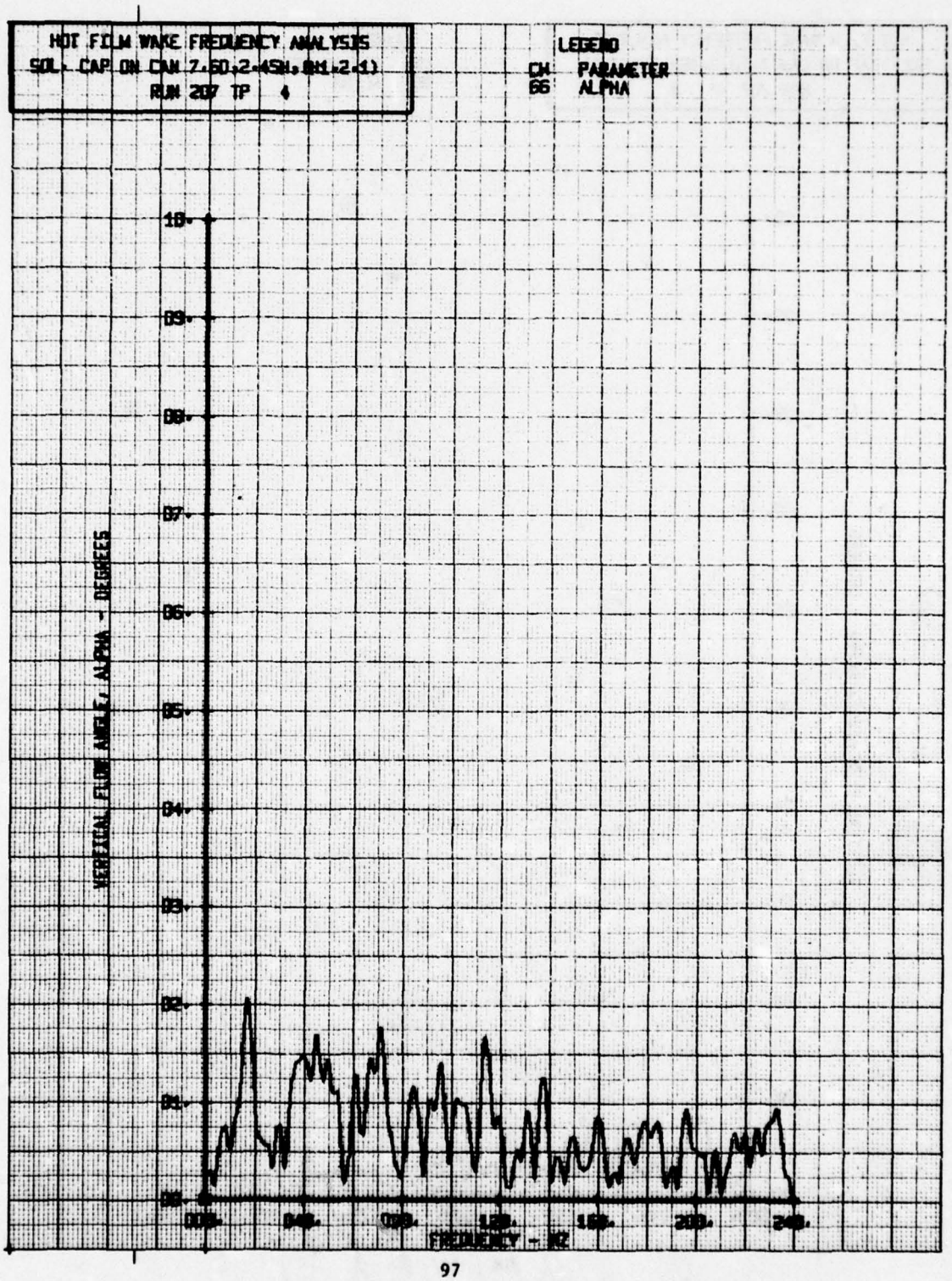
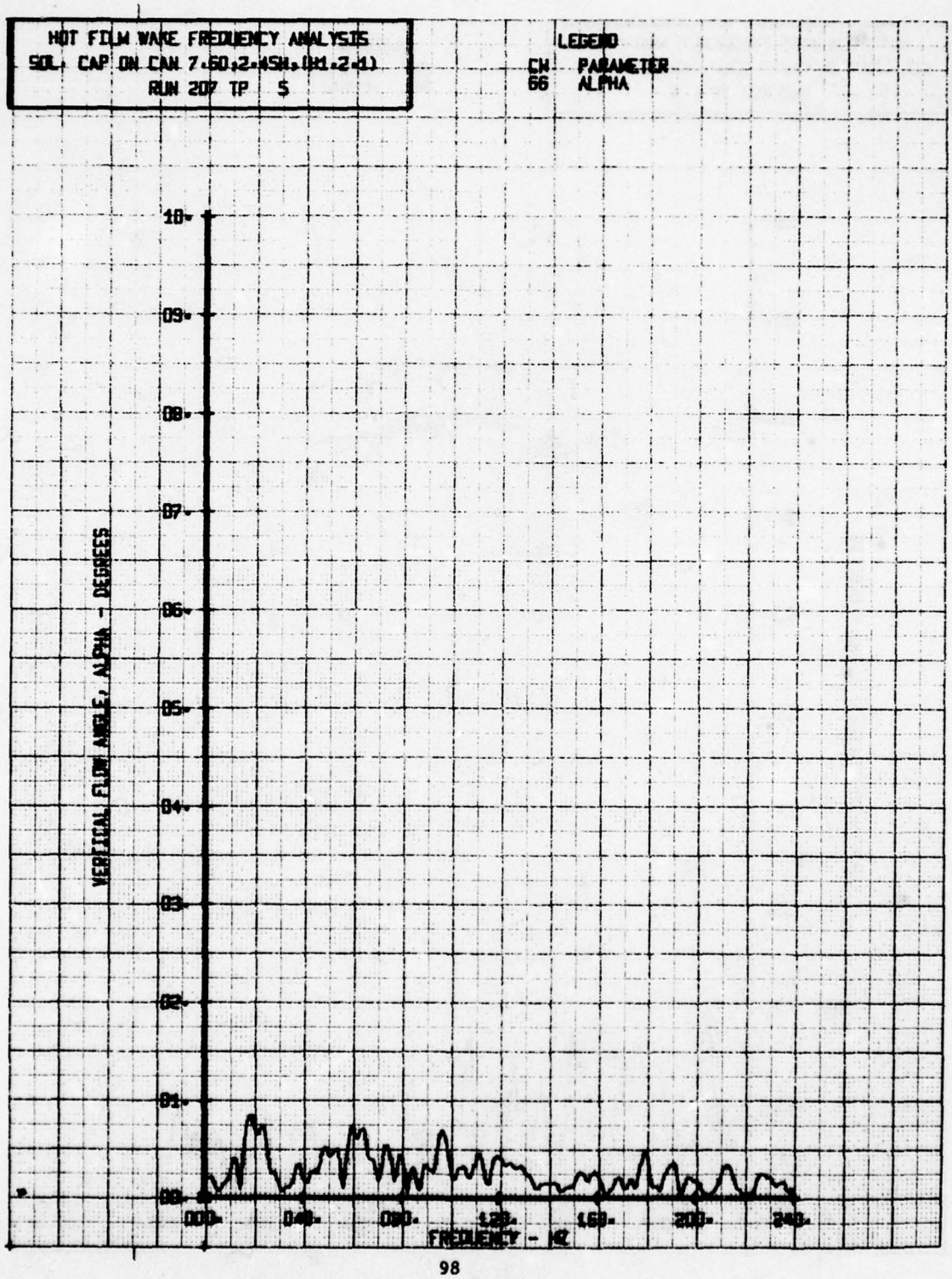
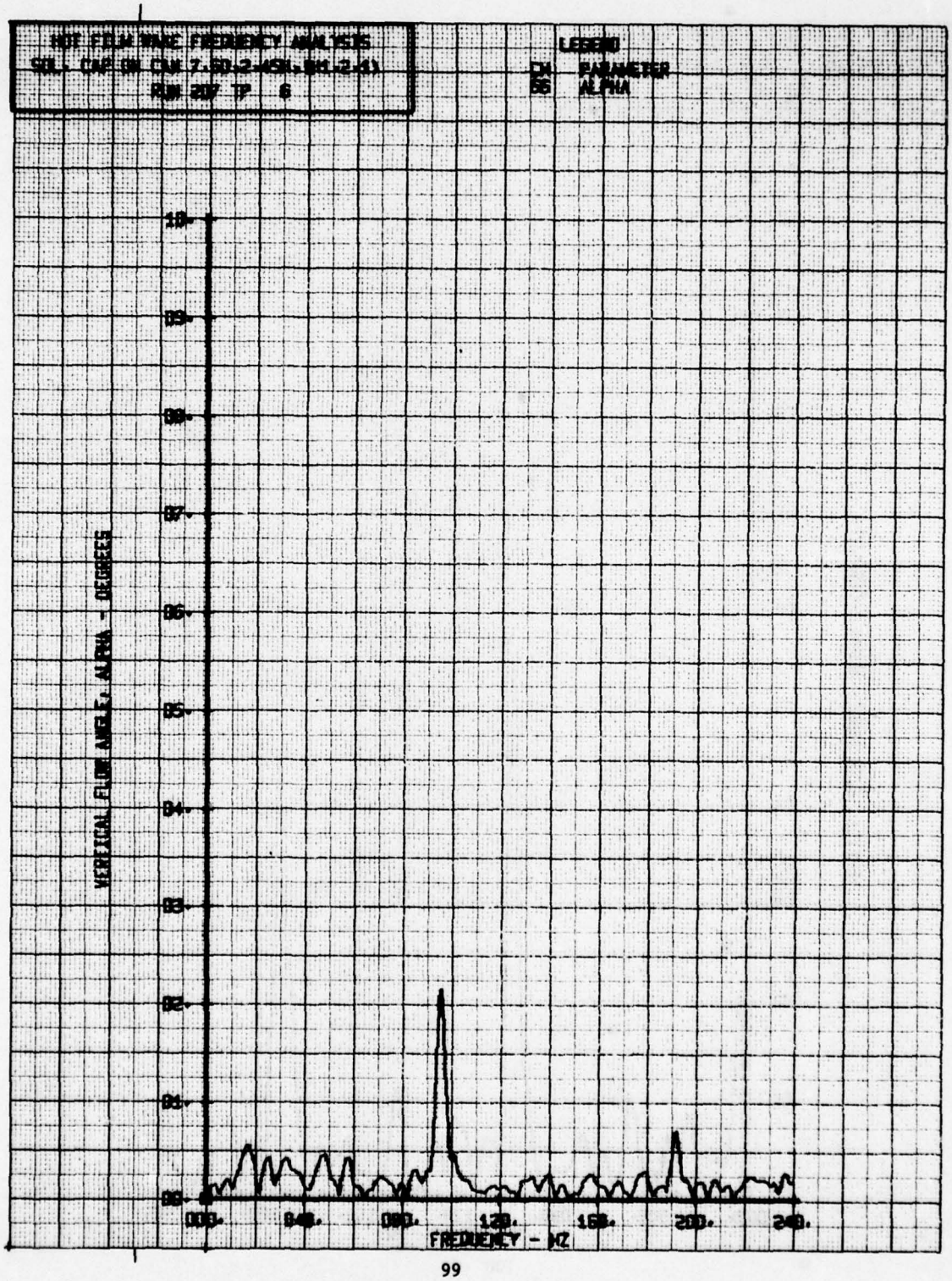
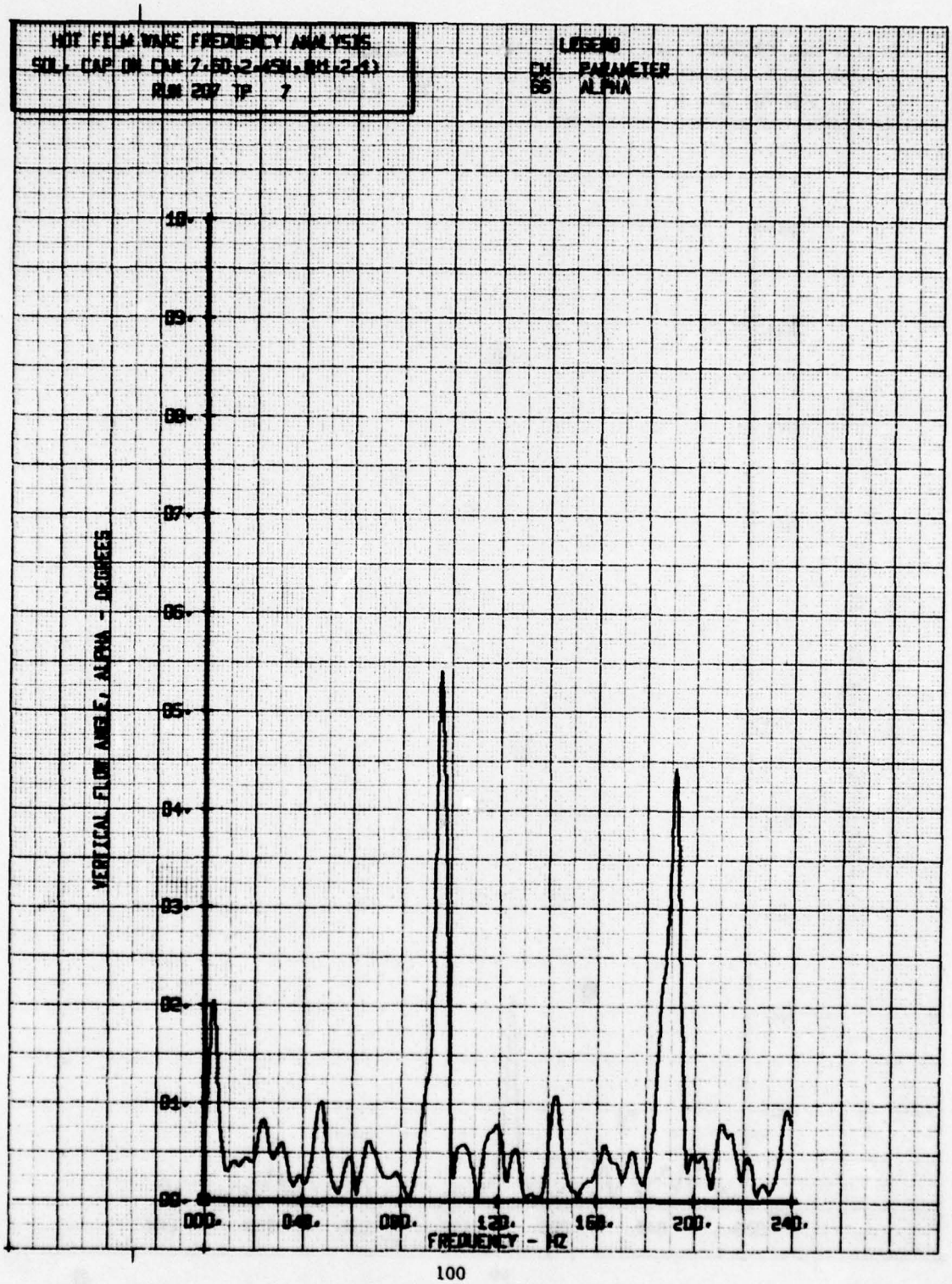
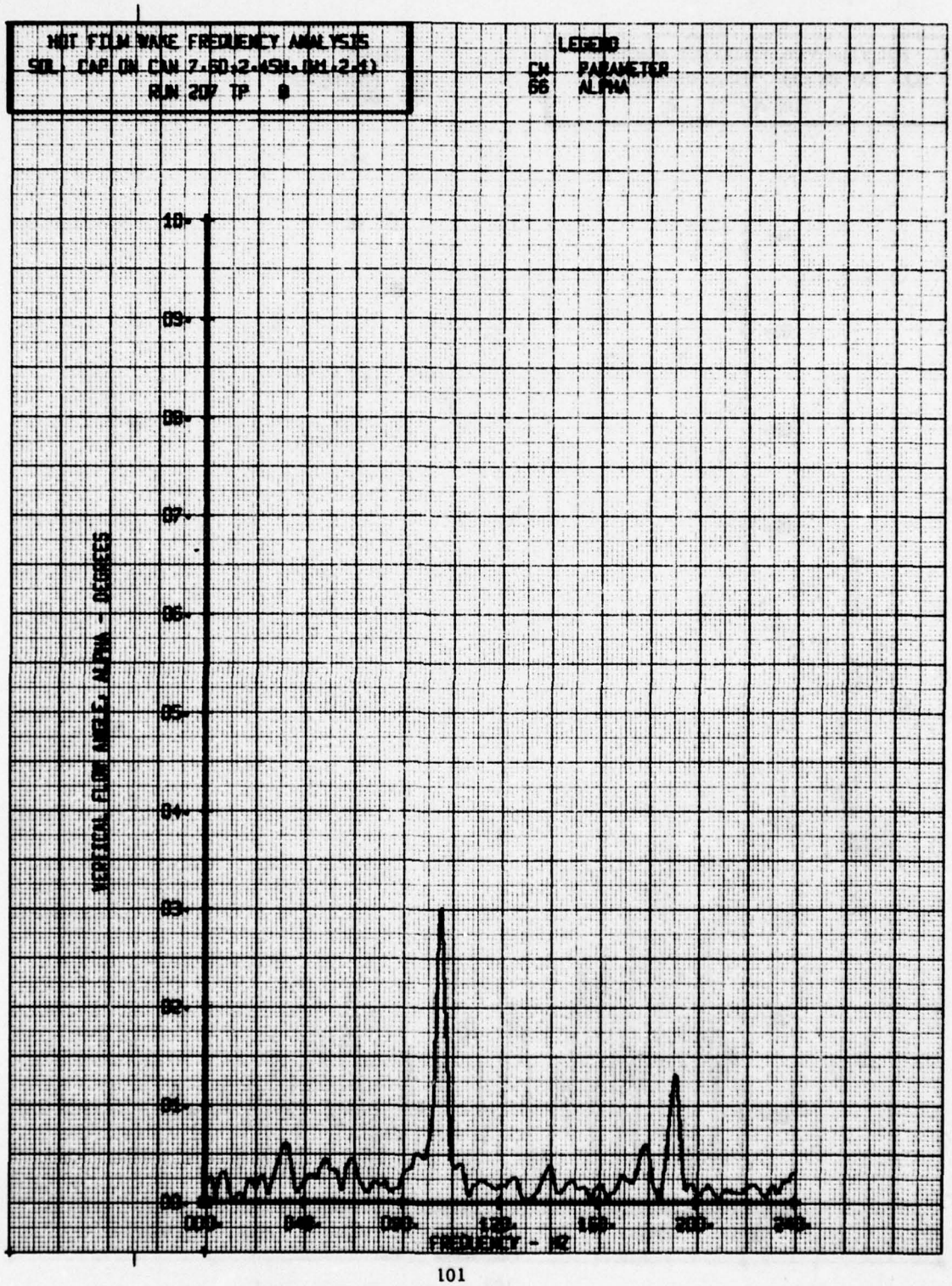

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50,2.45H,0H1.2.1)
RUN 207 TP 3
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.

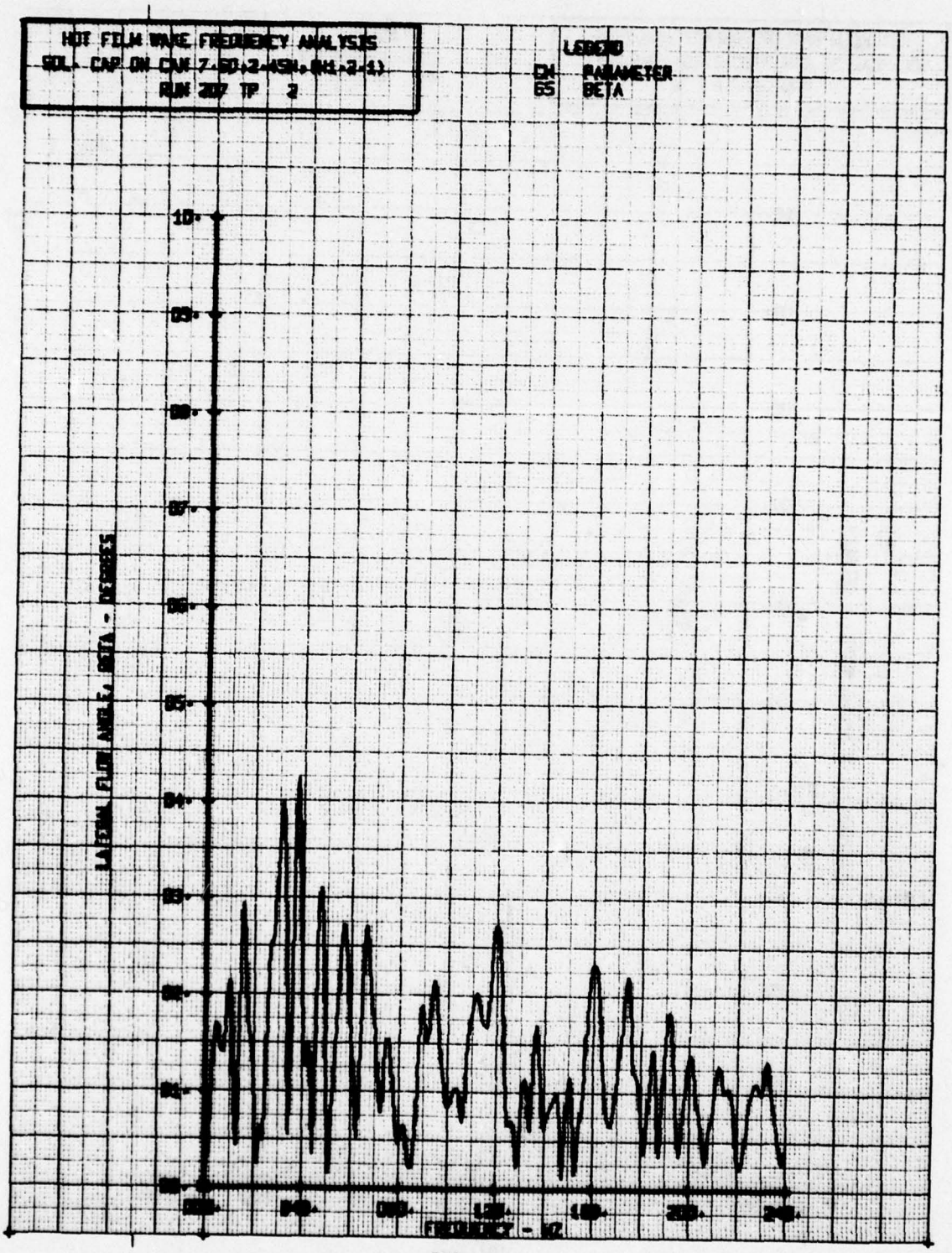

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.60,2.45H,8M.2.1)
RUN 207 TP 4
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

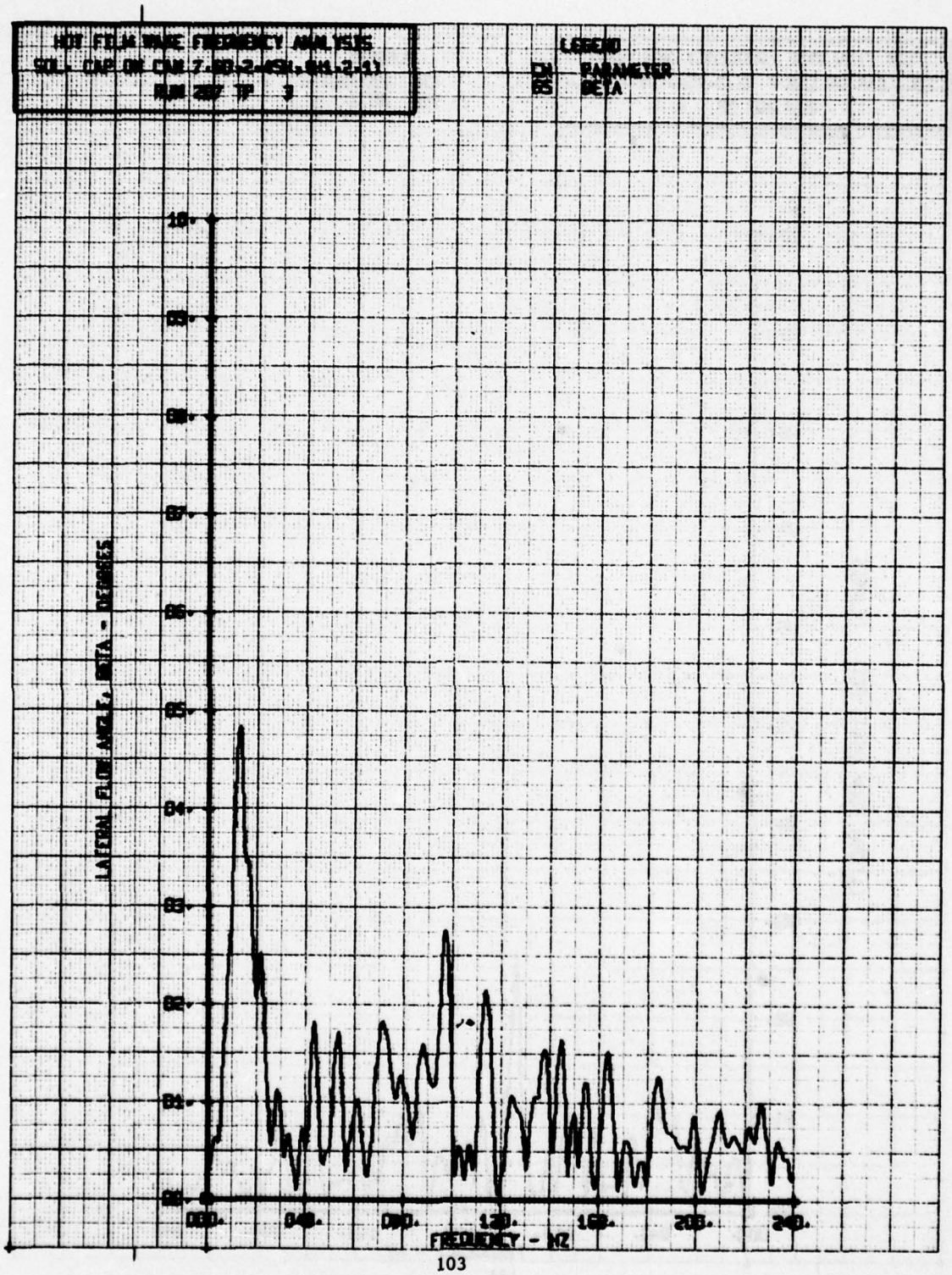

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.60,2.45H,DH1.2.1)
RUN 207 TP 5
LEGEND
CW PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

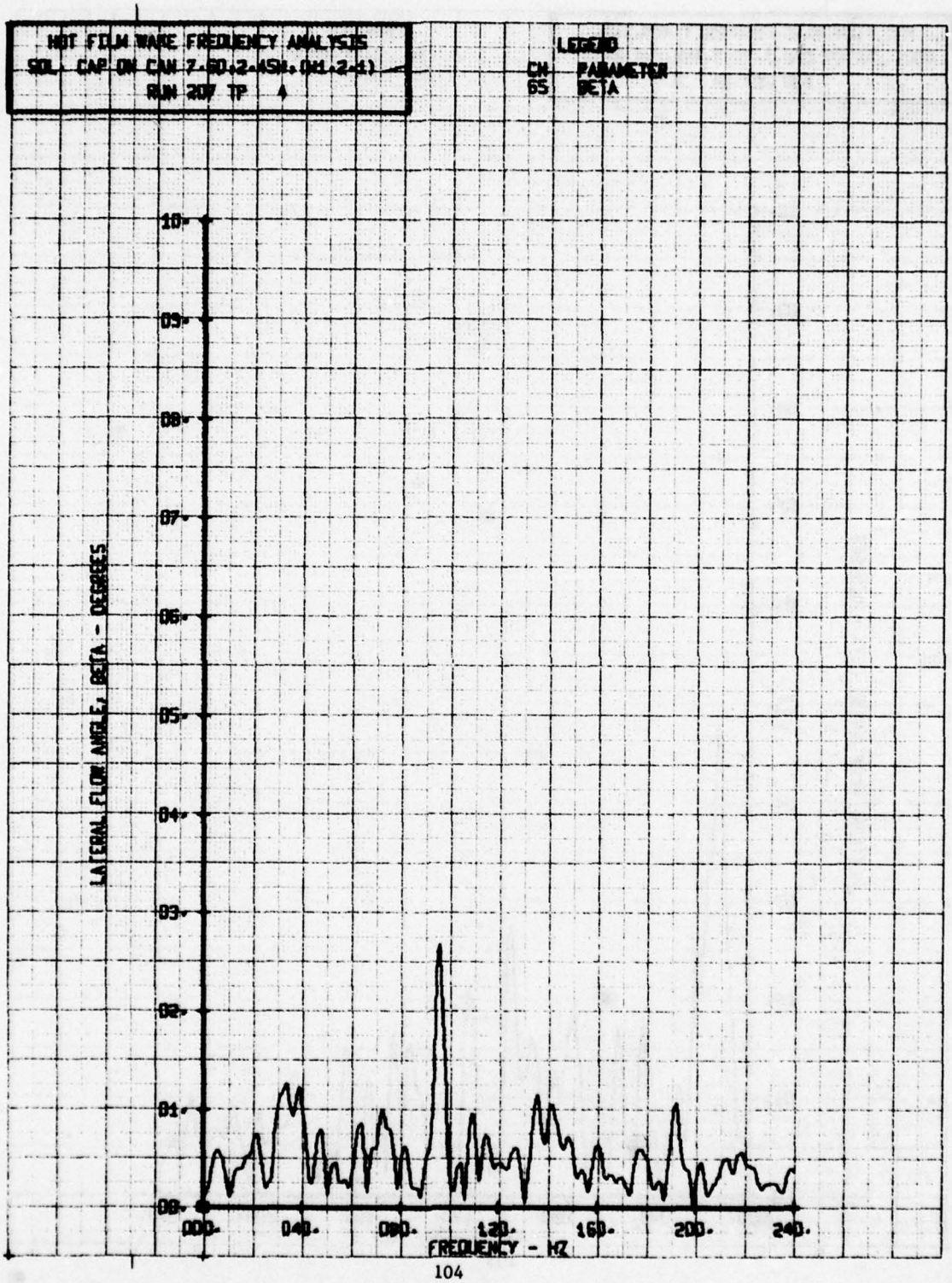

HOT FILM WAKE FREQUENCY ANALYSIS
RUN 207 TP 6
LEGEND
CH PARAMETER
06 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAM 7.50,2.45N,0X1.2.41
RUN 207 TP 7
LEGEND
CH PARAMETER
06 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
000.
040.
080.
120.
160.
200.
240.


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50,2.45%,DM1.2-1)
RUN 207 TP 8
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 207 TP 2
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
05 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50,2.45M,(M1.2-1)
RUN 207 TP 4
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
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02.
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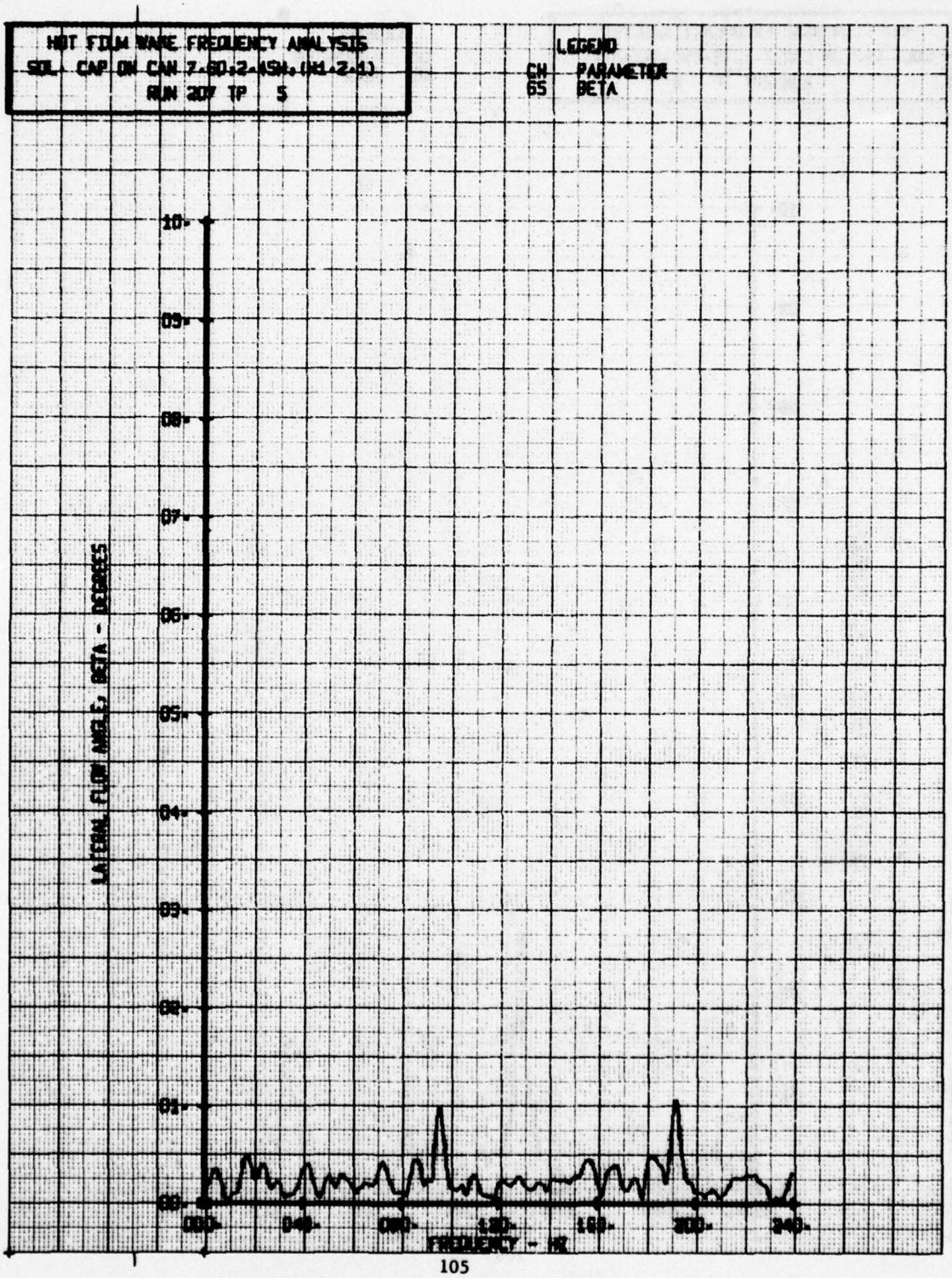
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.60.2.4SH.(H5.2.4)
RUN 207 TP 5
LEGEND
CH PARAMETER
05 BETA
10.
09.
08.
07.
06.
05.
04.
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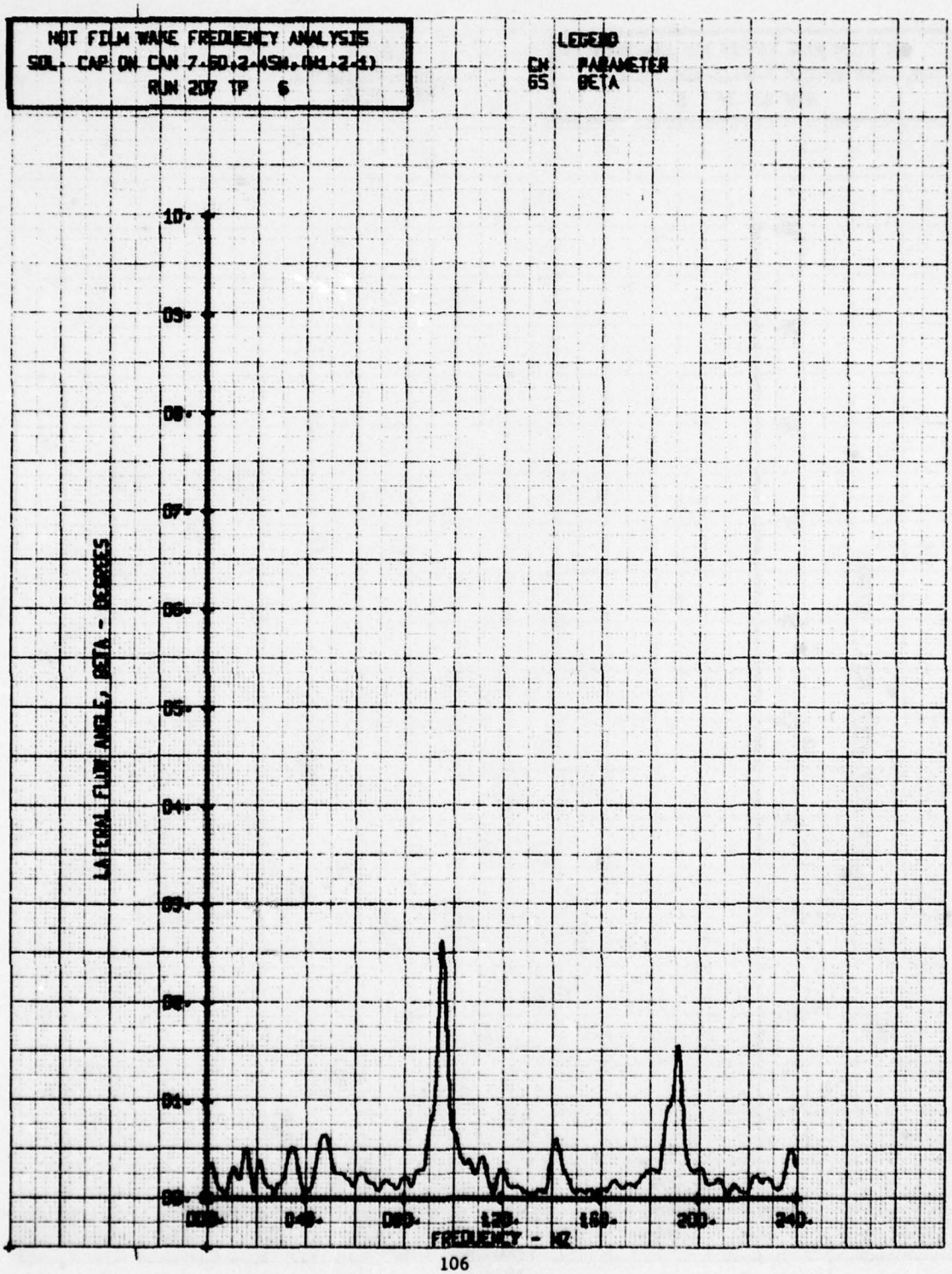
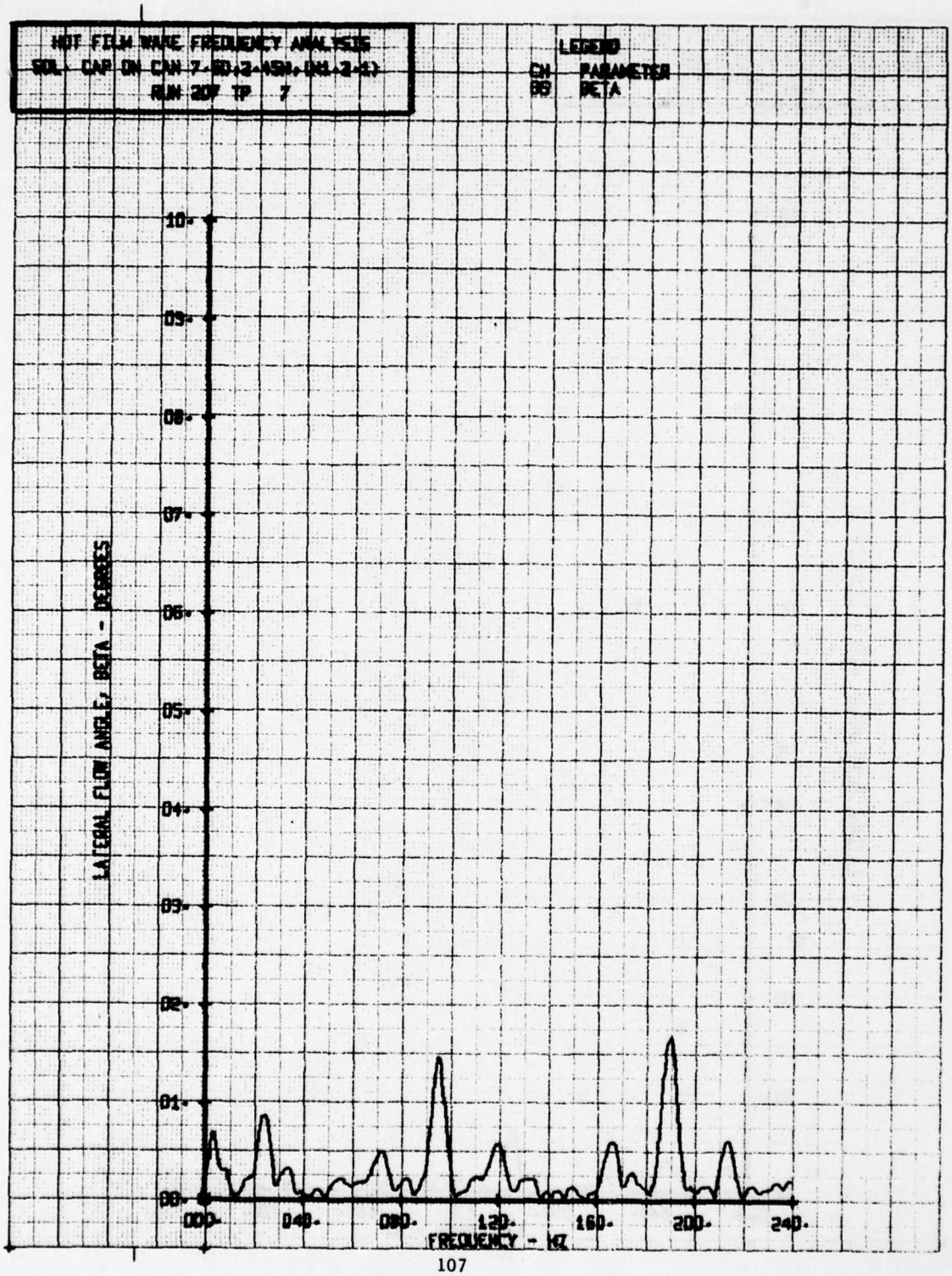
LATERAL FLOW ANGLE, BETA - DEGREES
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50,2.45M,0H1.2.1)
RUN 207 TP 6
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7-80,2-ASM,(M1,2-1)
RUN 20F TP 7
LEGEND
CH PARAMETER
09 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
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080.
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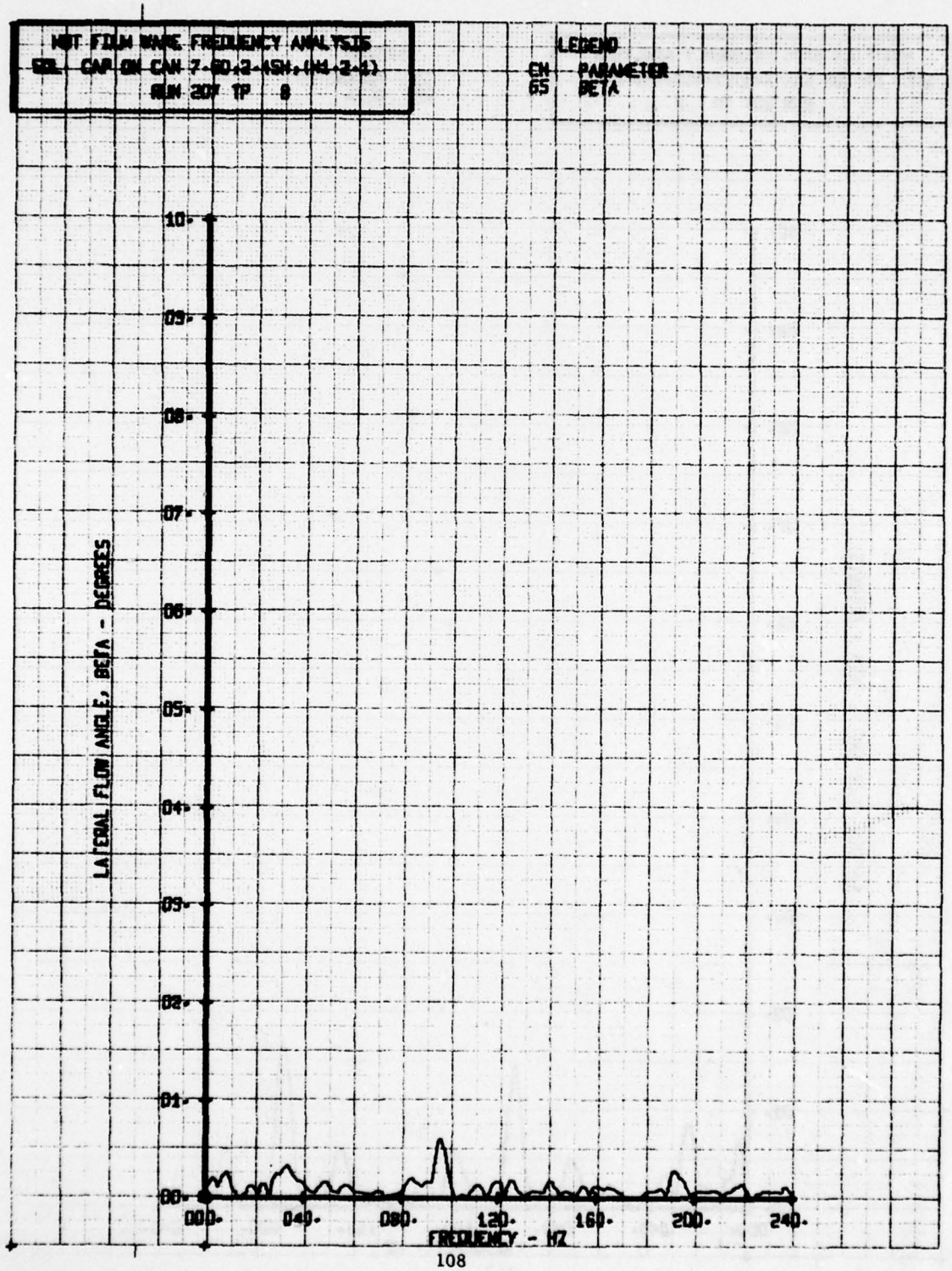
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SEL CAP ON CAN 7-60,2-45H,(H1-2-1)
RUN 207 TP 8
LEGEND
CN PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
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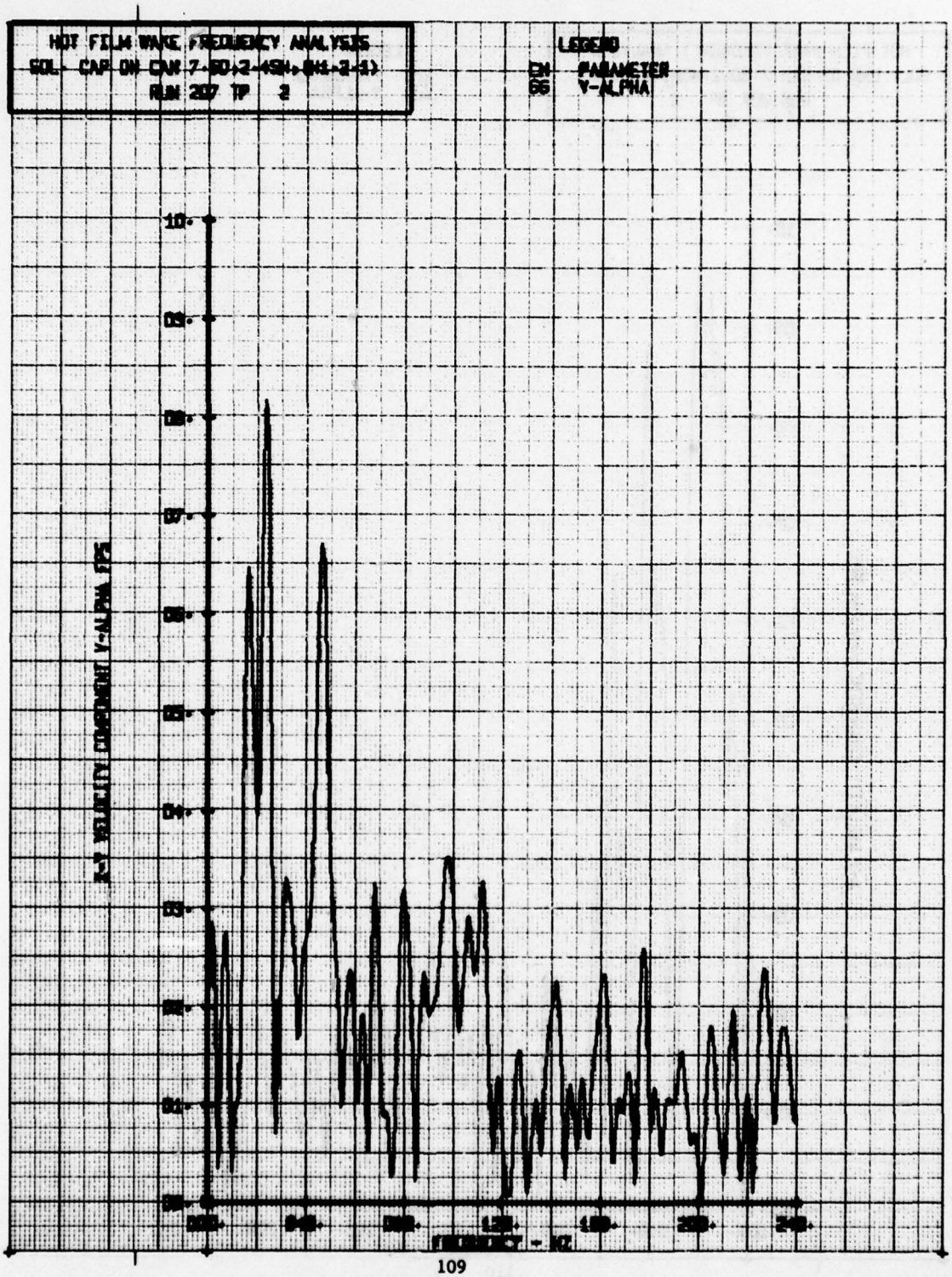
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7-50)2-4SN)8H)-2-1)
RUN 207 TP 2
LEGEND
CH PARAMETER
66 V-ALPHA
10.
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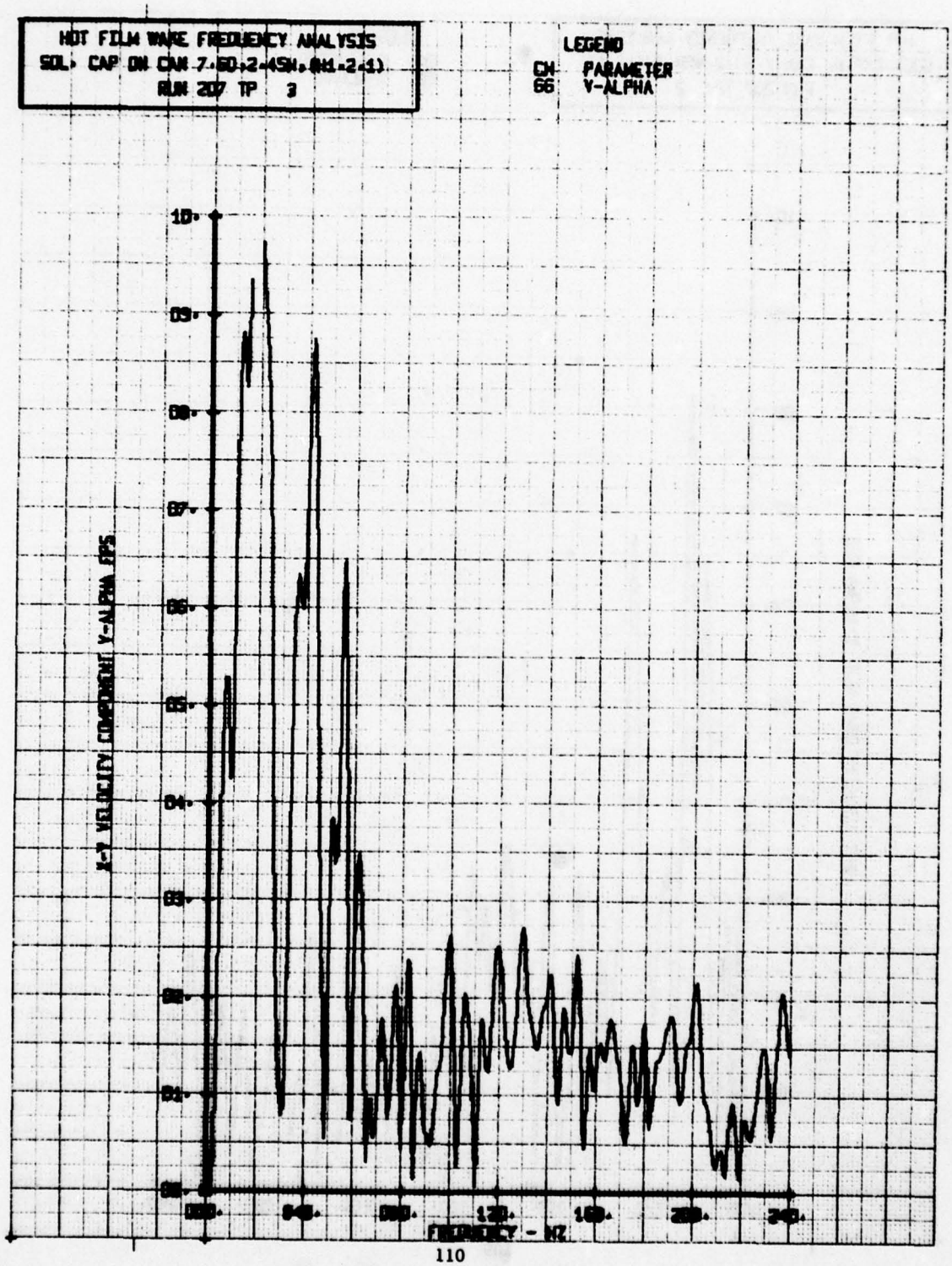
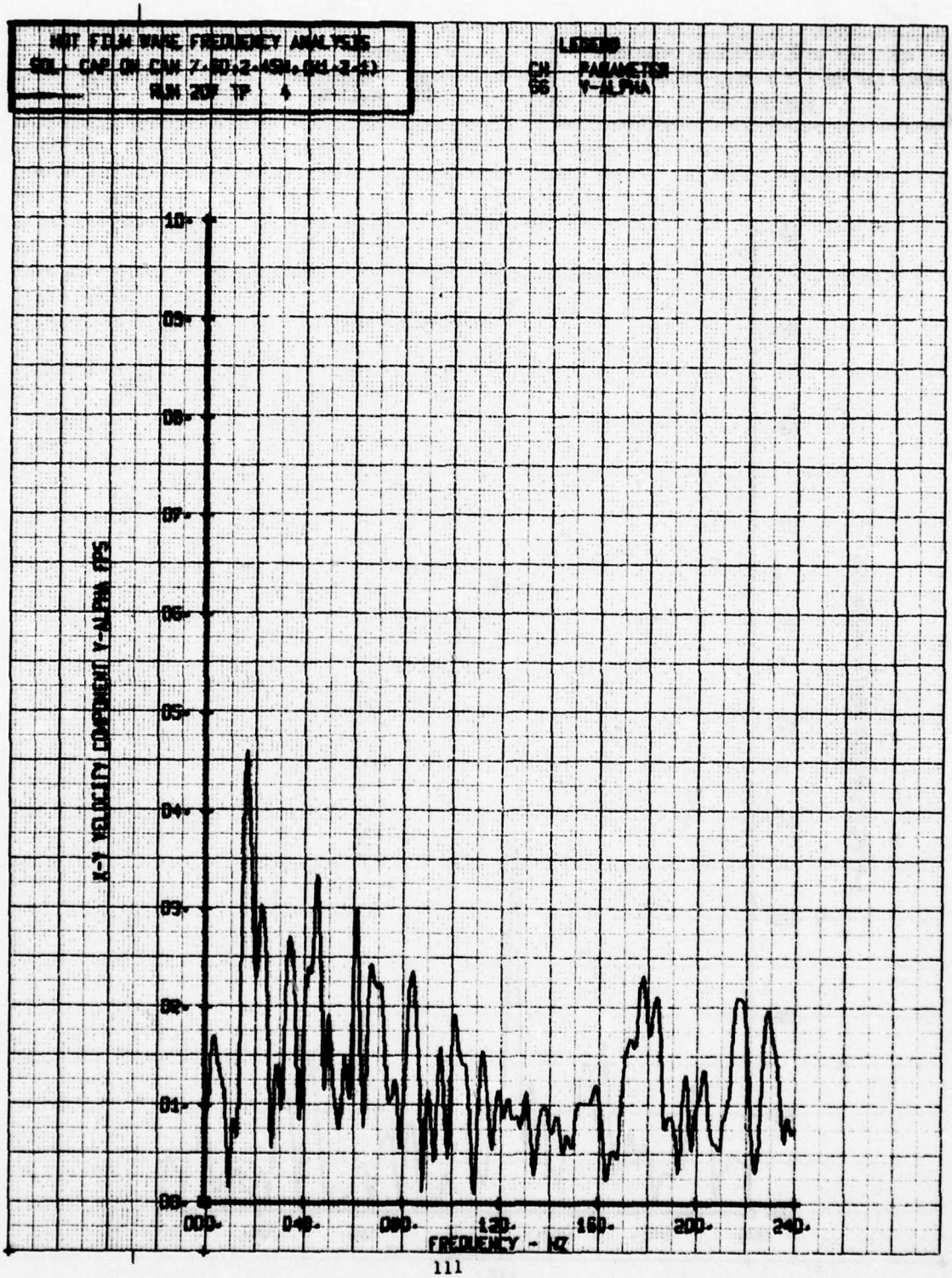
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CHN 7.60,2.45N,0H1.2.1)
RUN 207 TP 3
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.(0.2-45M.04.2.4)
RUN 20F TP 4
LEGEND
CH PARAMETER
06 Y-ALPHA
X-Y VELOCITY COMPONENT Y-ALPHA FPS
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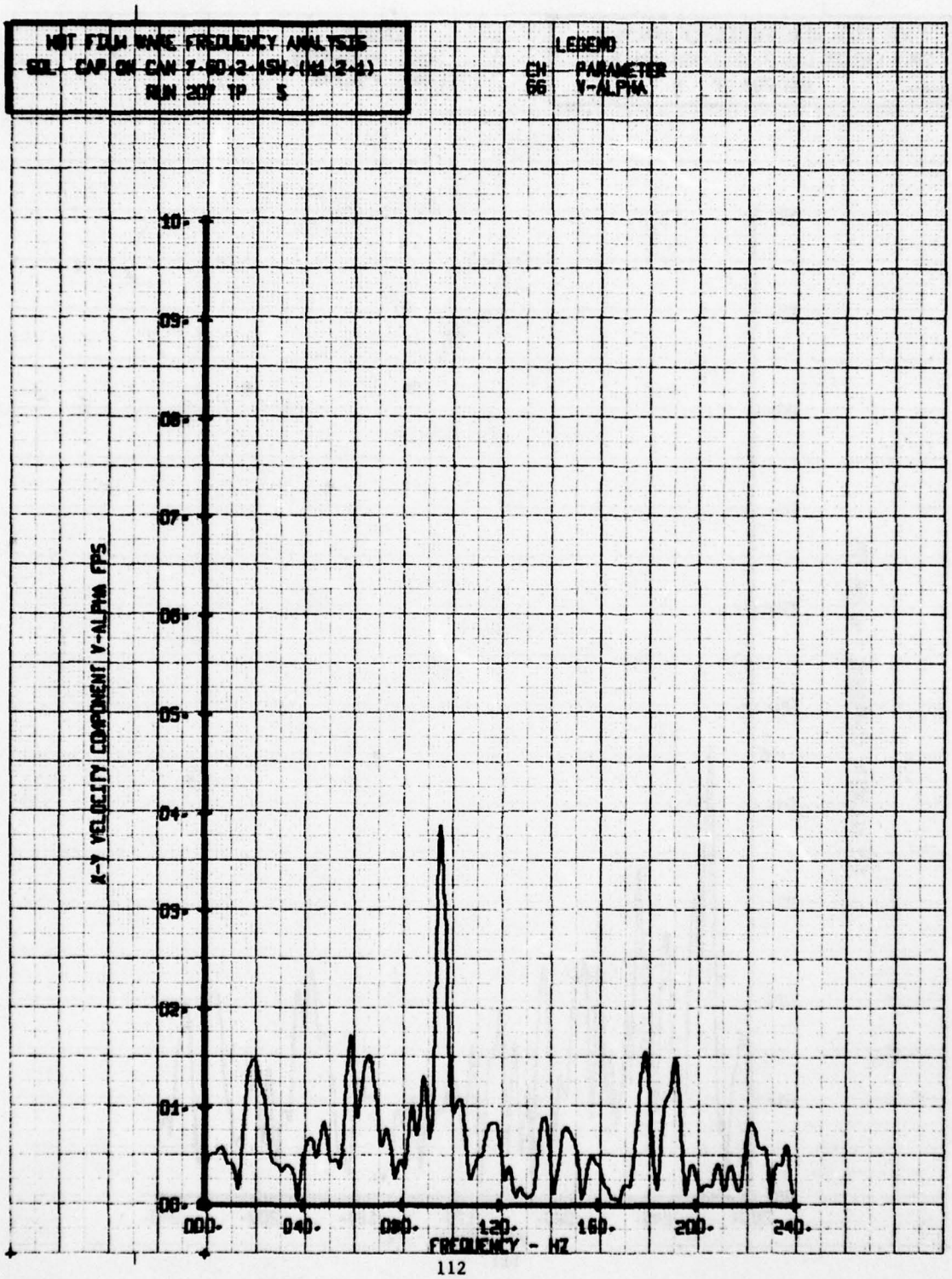
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7-80-2-45W,(M1-2-1)
RUN 202 TP 5
LEGEND
CH PARAMETER
06 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
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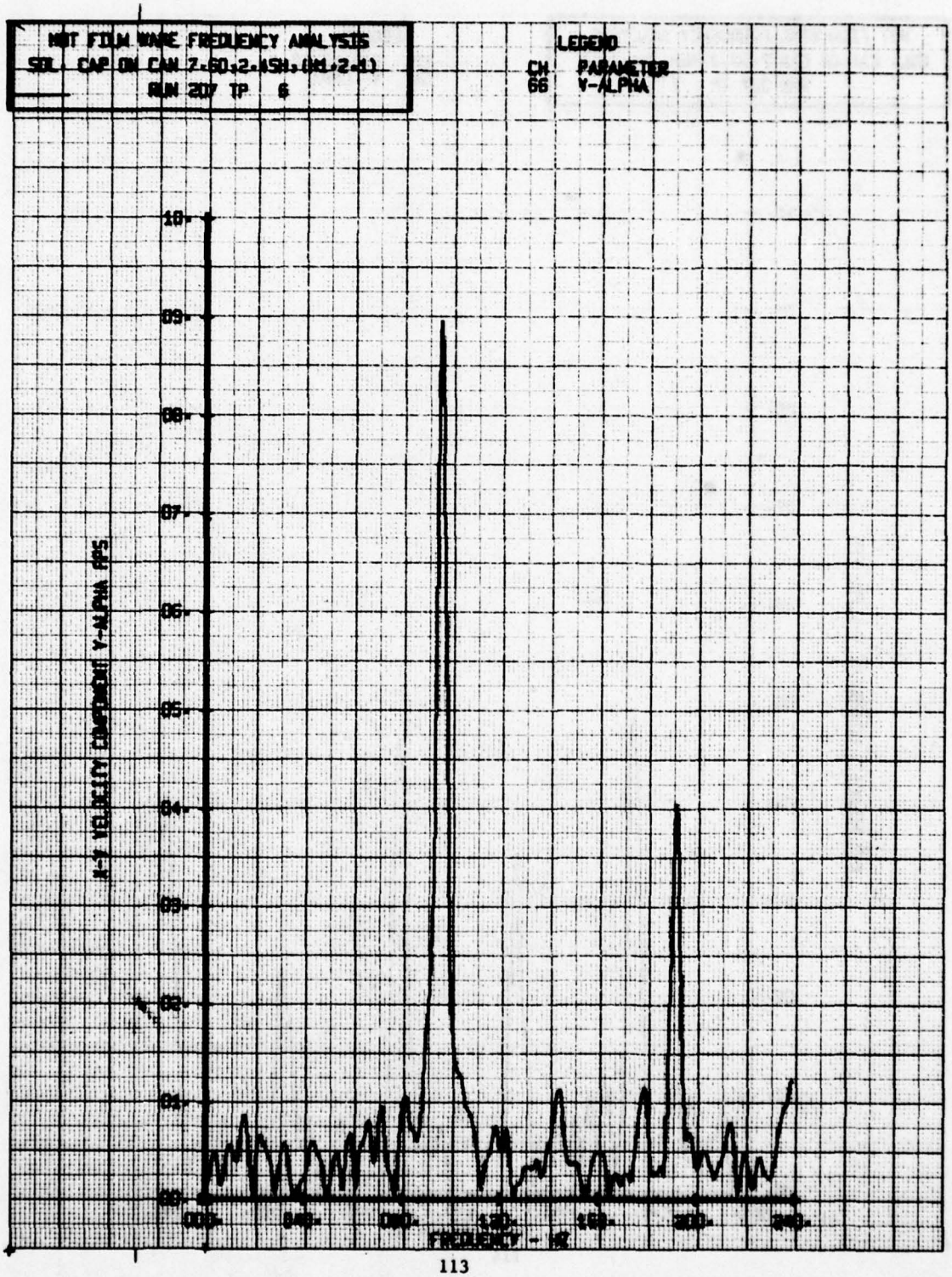
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SEL. CAP ON CAN 7.60,2.45H,(R1,2.1)
RUN 207 TP 6
LEGEND
CH PARAMETER
66 V-ALPHA
10.
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X-Y VELOCITY COMPONENT V-ALPHA FPS
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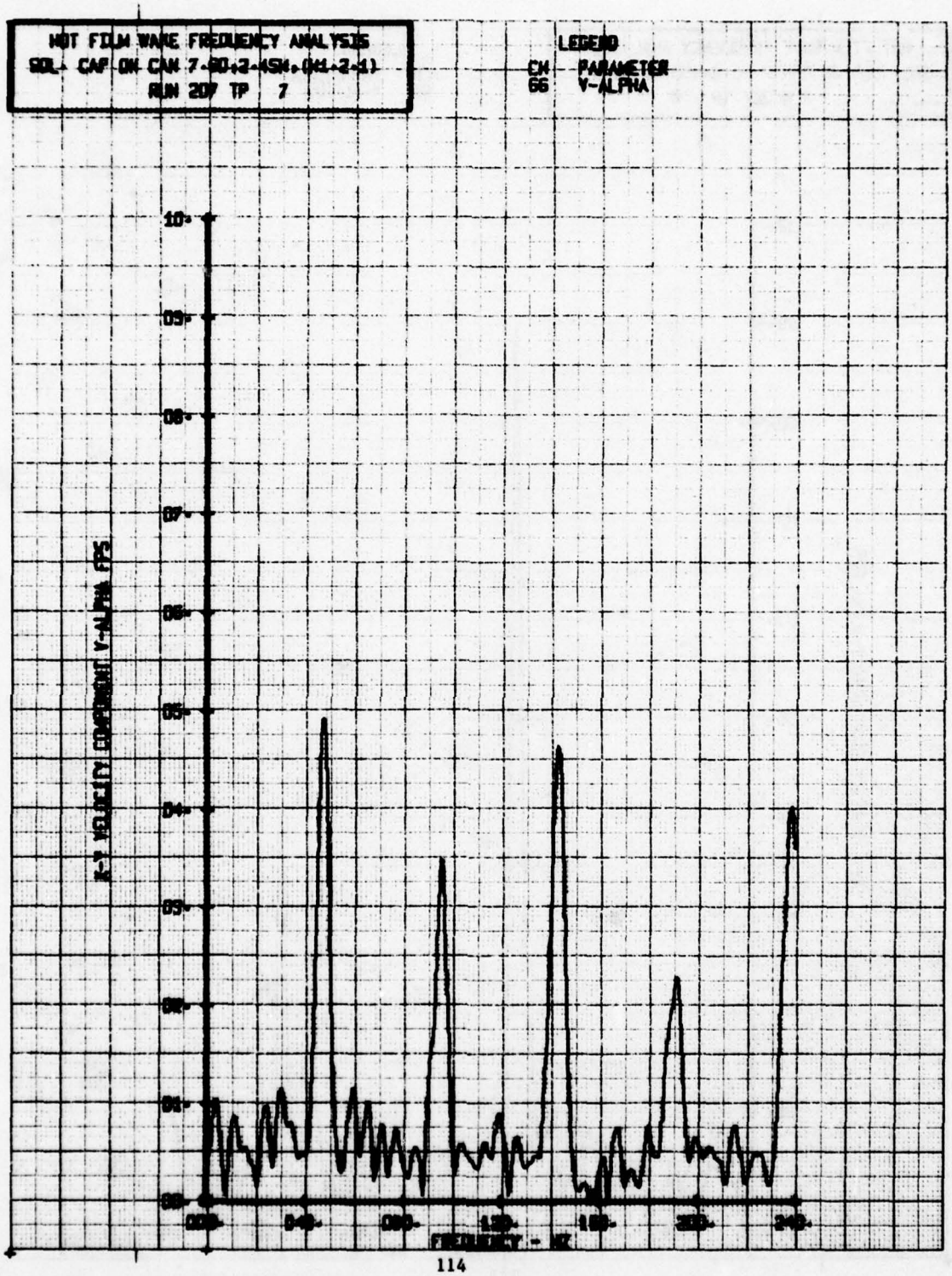
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL- CAF ON CAN 7-80+2-4SH+(H1+2-1)
RUN 207 TP 7
LEGEND
CH PARAMETER
66 V-ALPHA
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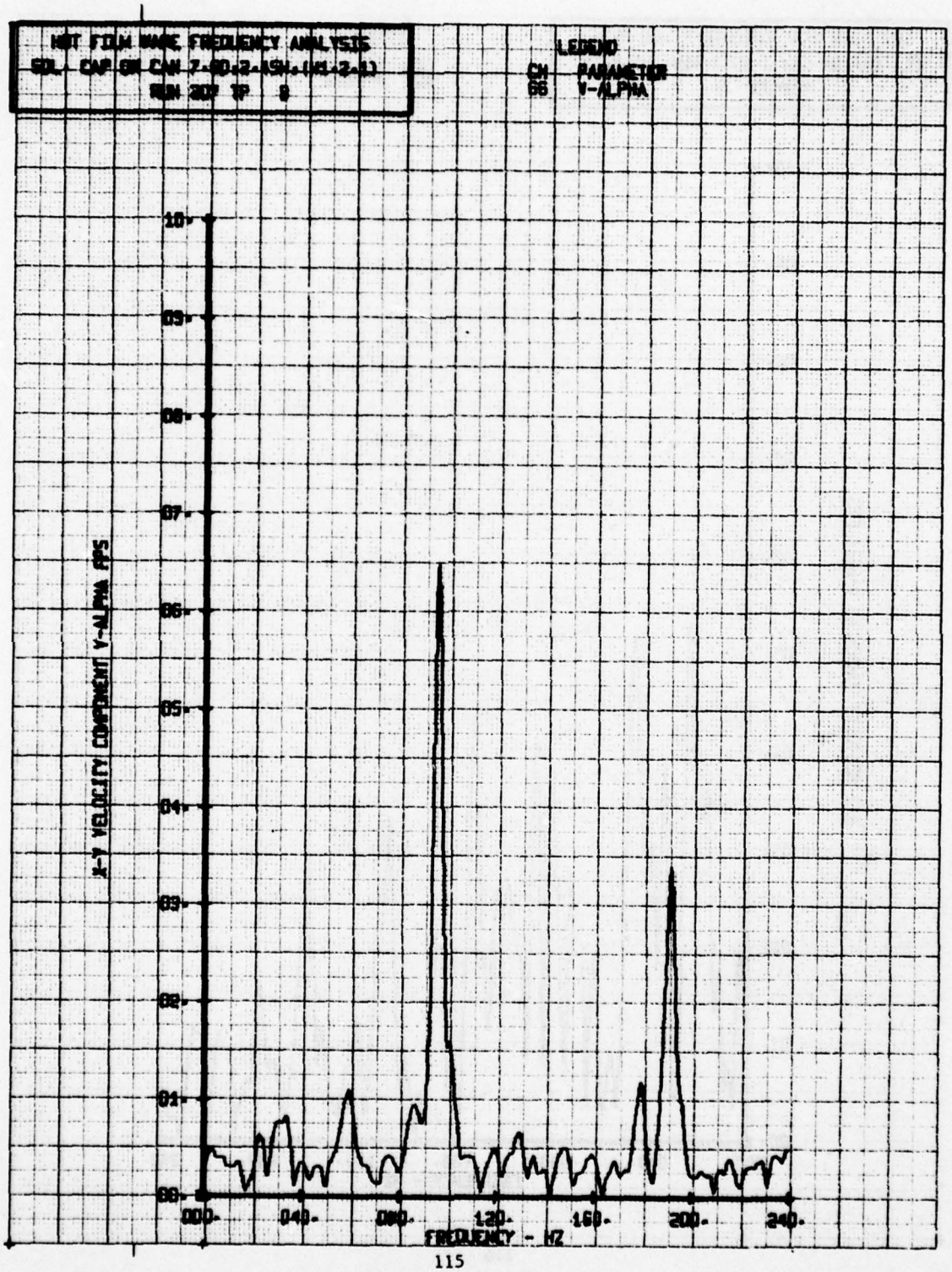
240
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
06 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
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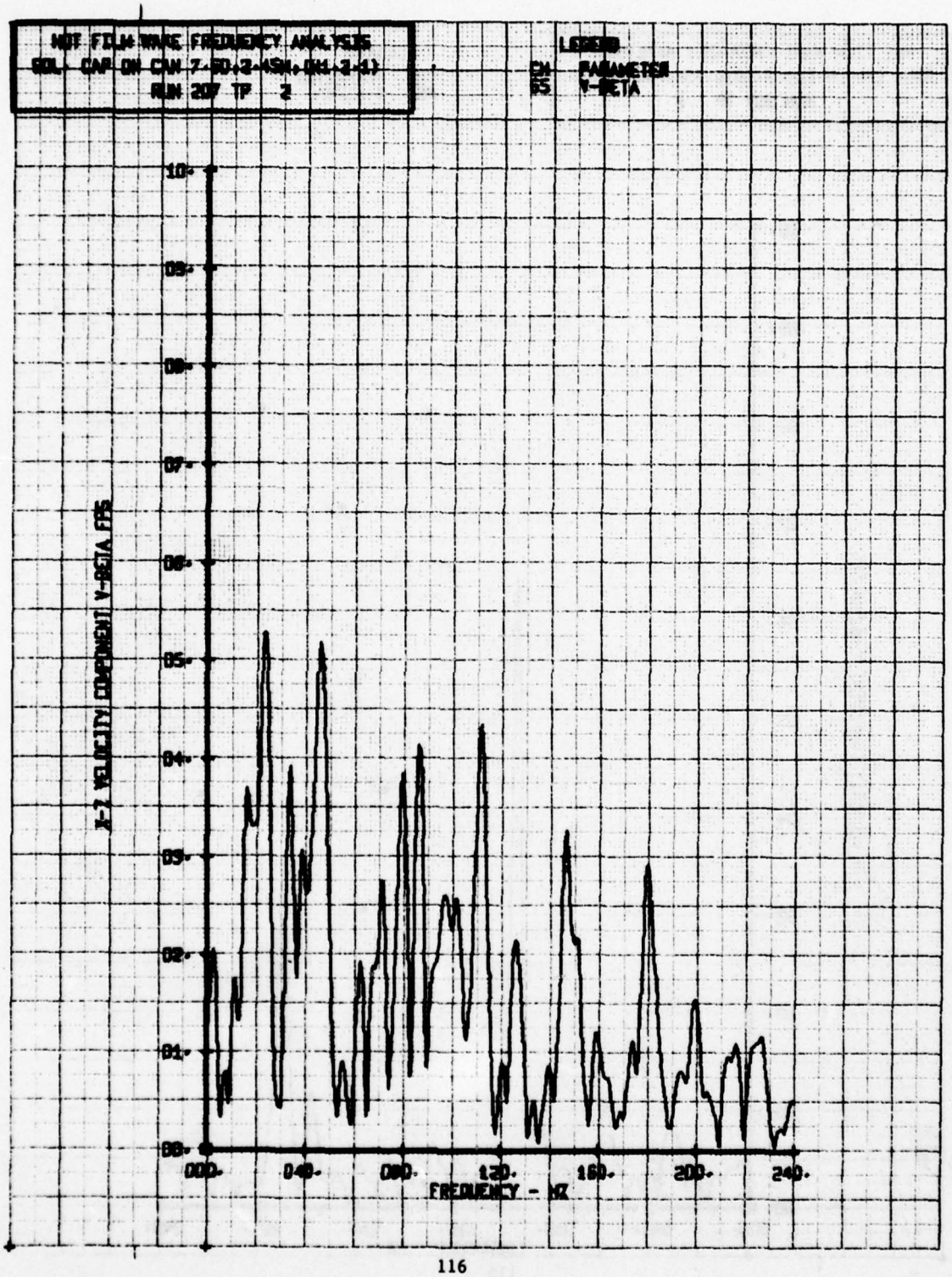
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
COL. CAP ON CHN 7-50-2-4SN,CH1-2-1)
RUN 207 TP 2
LEGEND
CH PARAMETER
05 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
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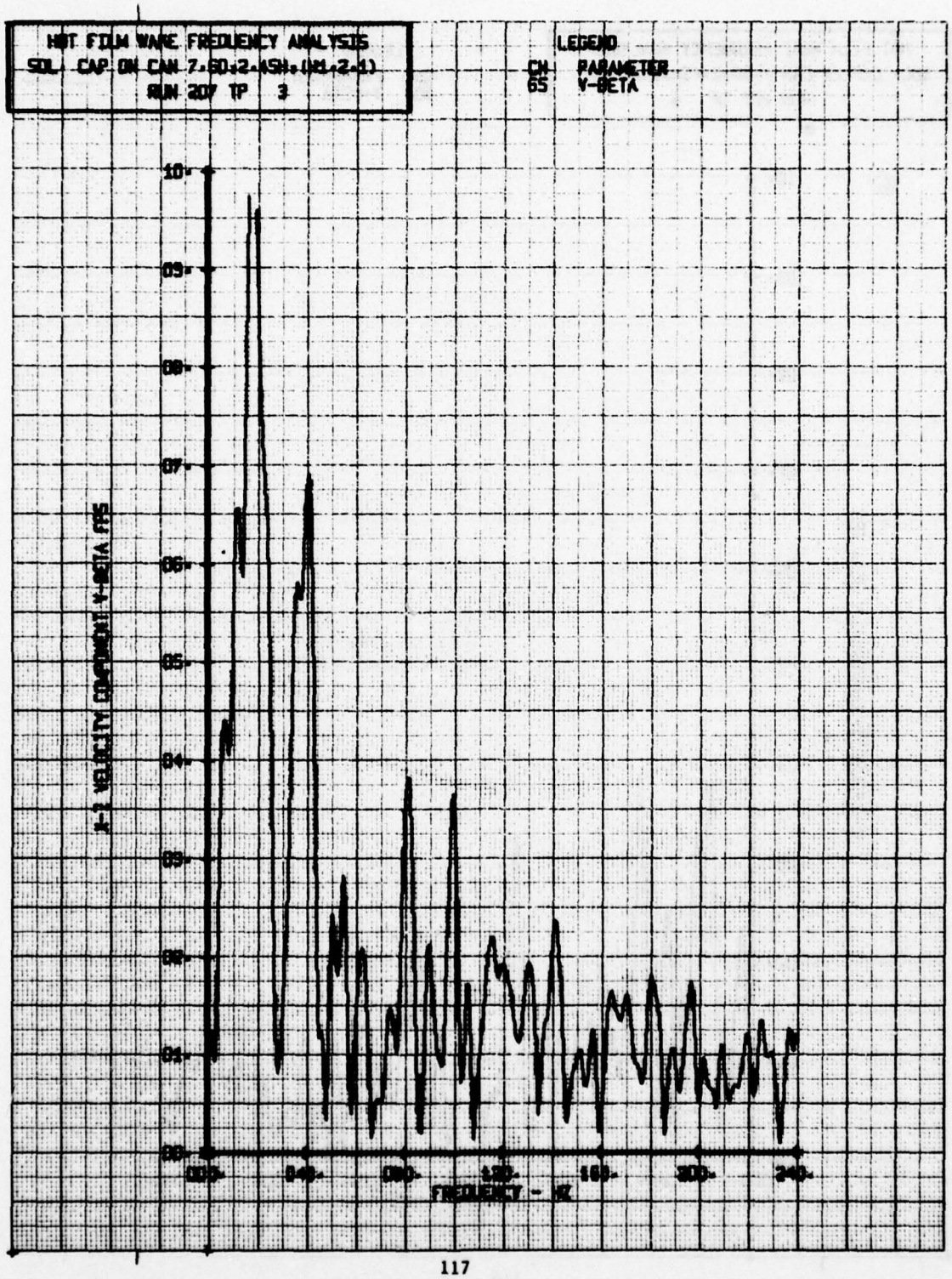
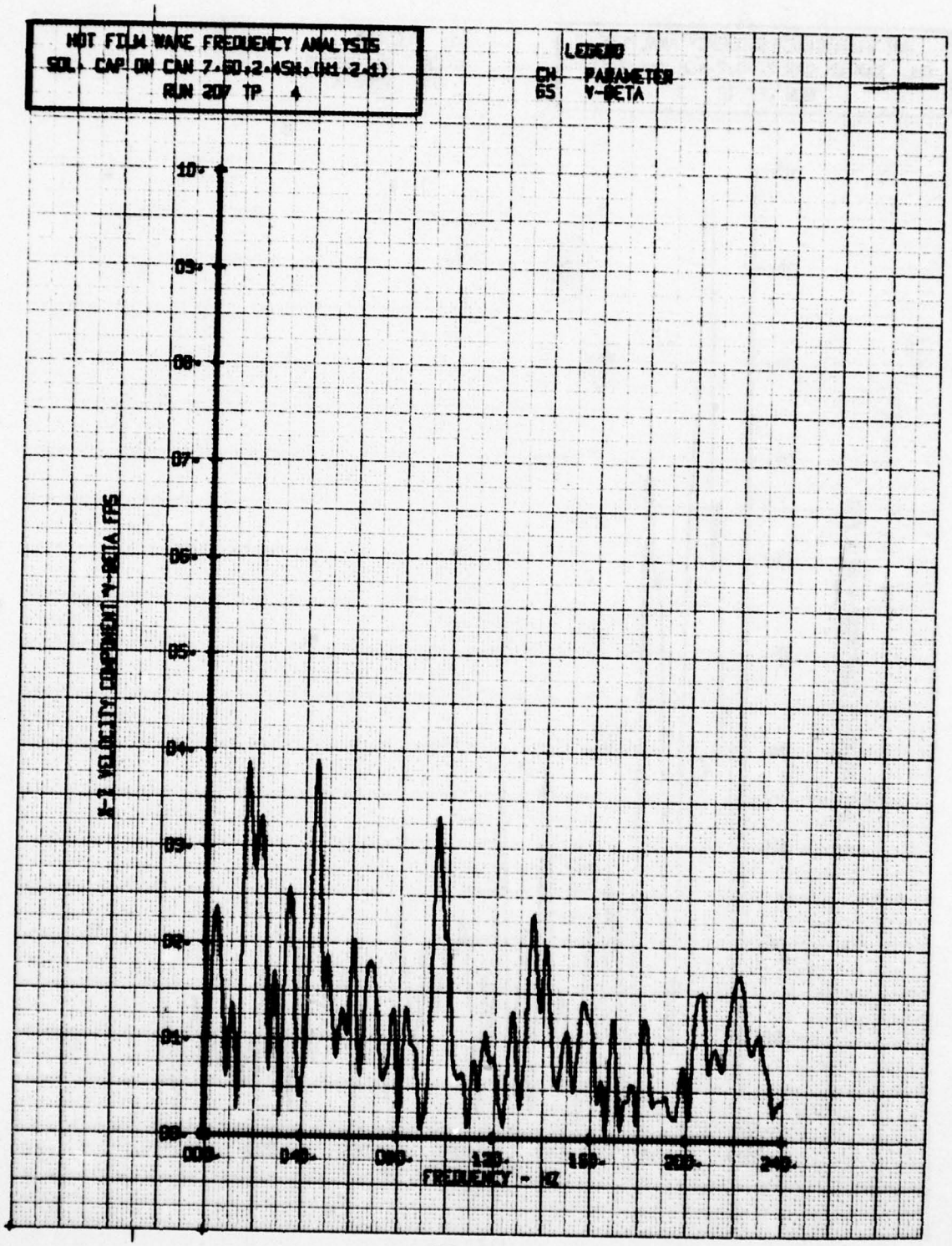
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50:2.45H.(M1.2.1)
RUN 207 TP 3
LEGEND
CH PARAMETER
65 V-BETA
X-3 VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAVE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.50,2.45H,DH1,2.41
RUN 207 TP 4
LEGEND
CH PARAMETER
65 V-BETA
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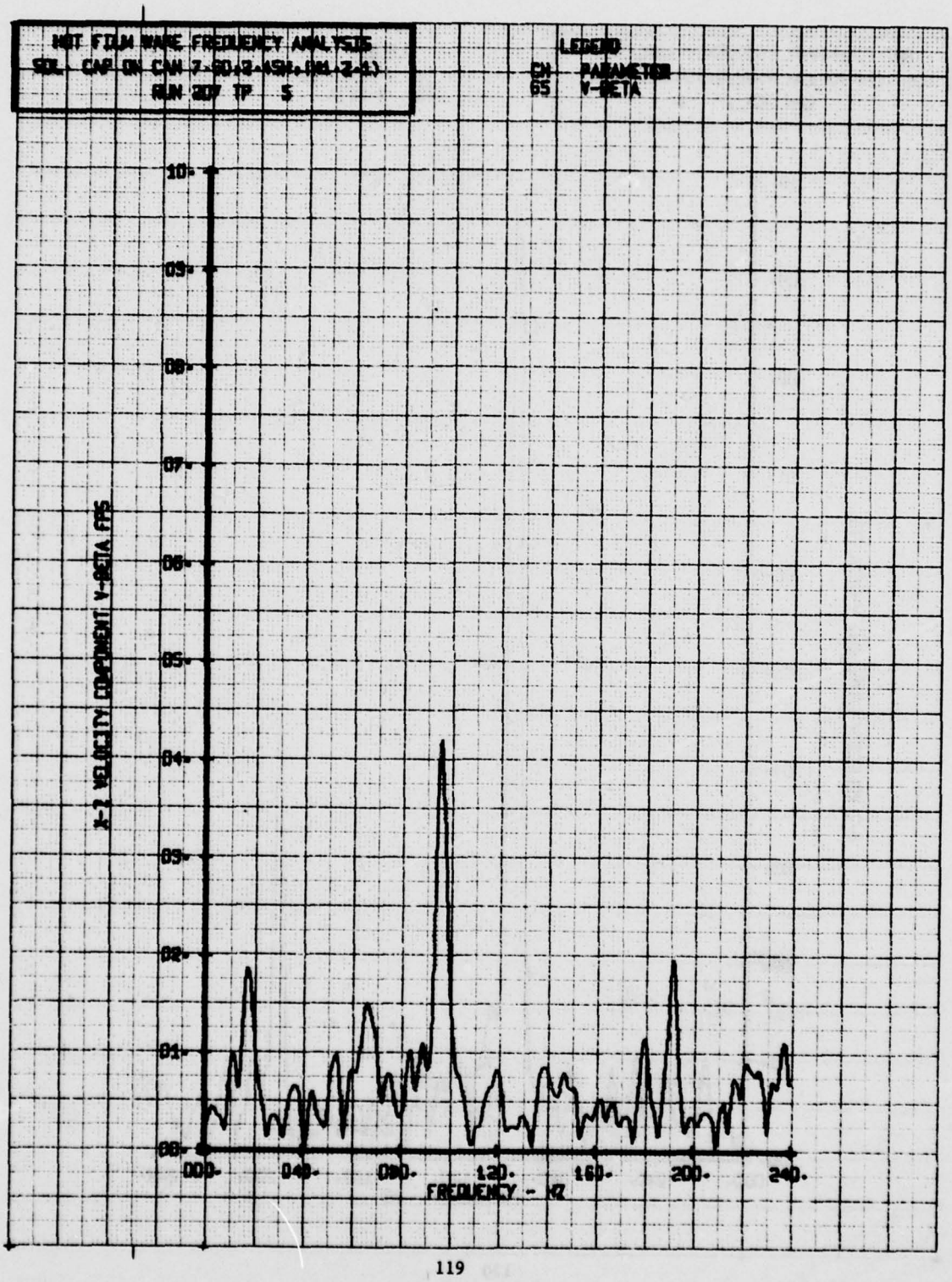
200.
240.
FREQUENCY - HZ
X-2 VELOCITY COMPONENT V-BETA,FPS


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAH 7-90.2-4SH.001.2-1)
RUN 207 TP 5
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
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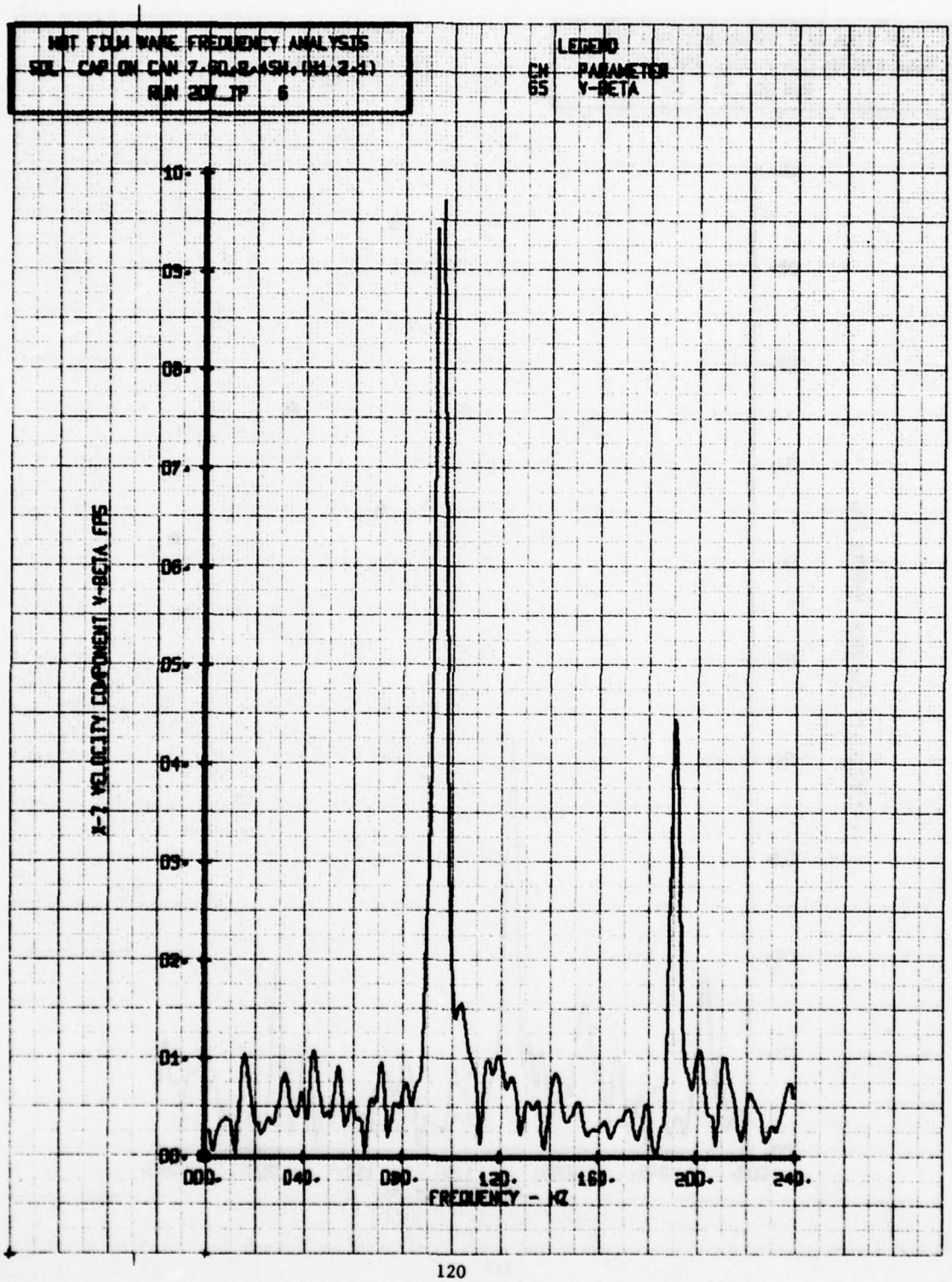
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7-90,8,4SH,(X1,Z-1)
RUN 207 TP 6
LEGEND
CH PARAMETER
65 Y-BETA
X-Z VELOCITY COMPONENT Y-BETA FPS
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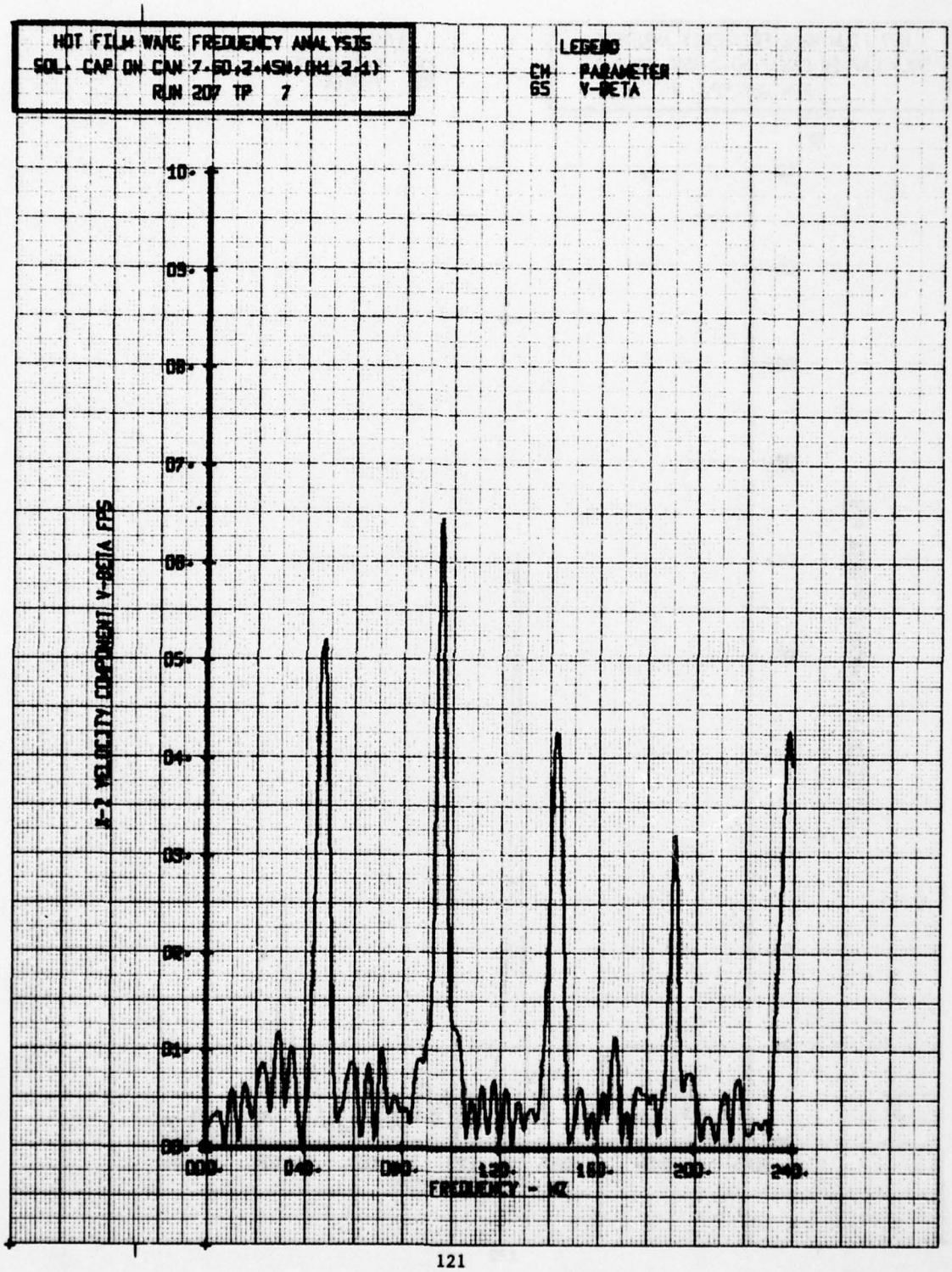
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7-50,2-4SN,CH1-2-1)
RUN 207 TP 7
LEGEND
CH PARAMETER
65 V-BETA
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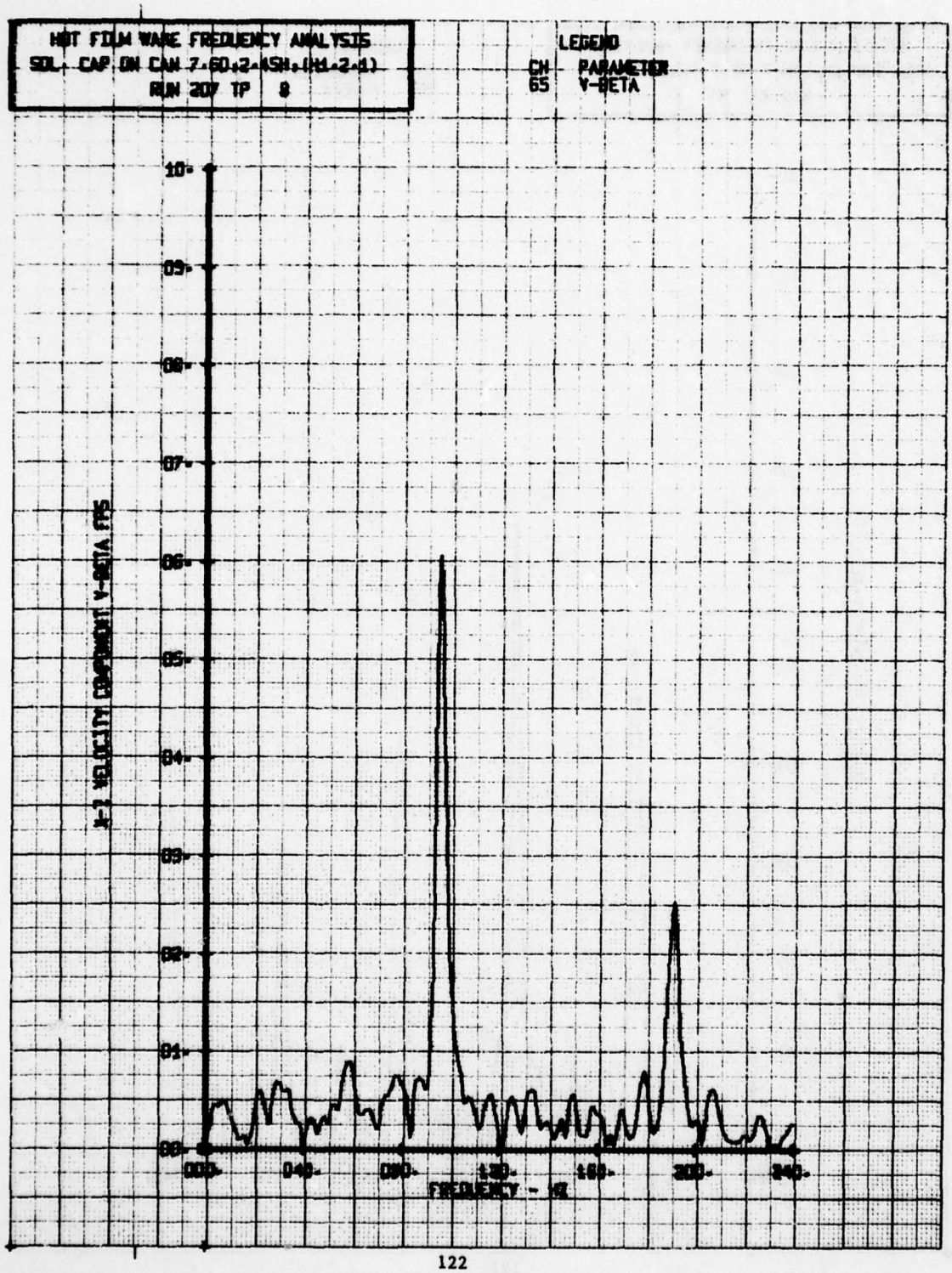
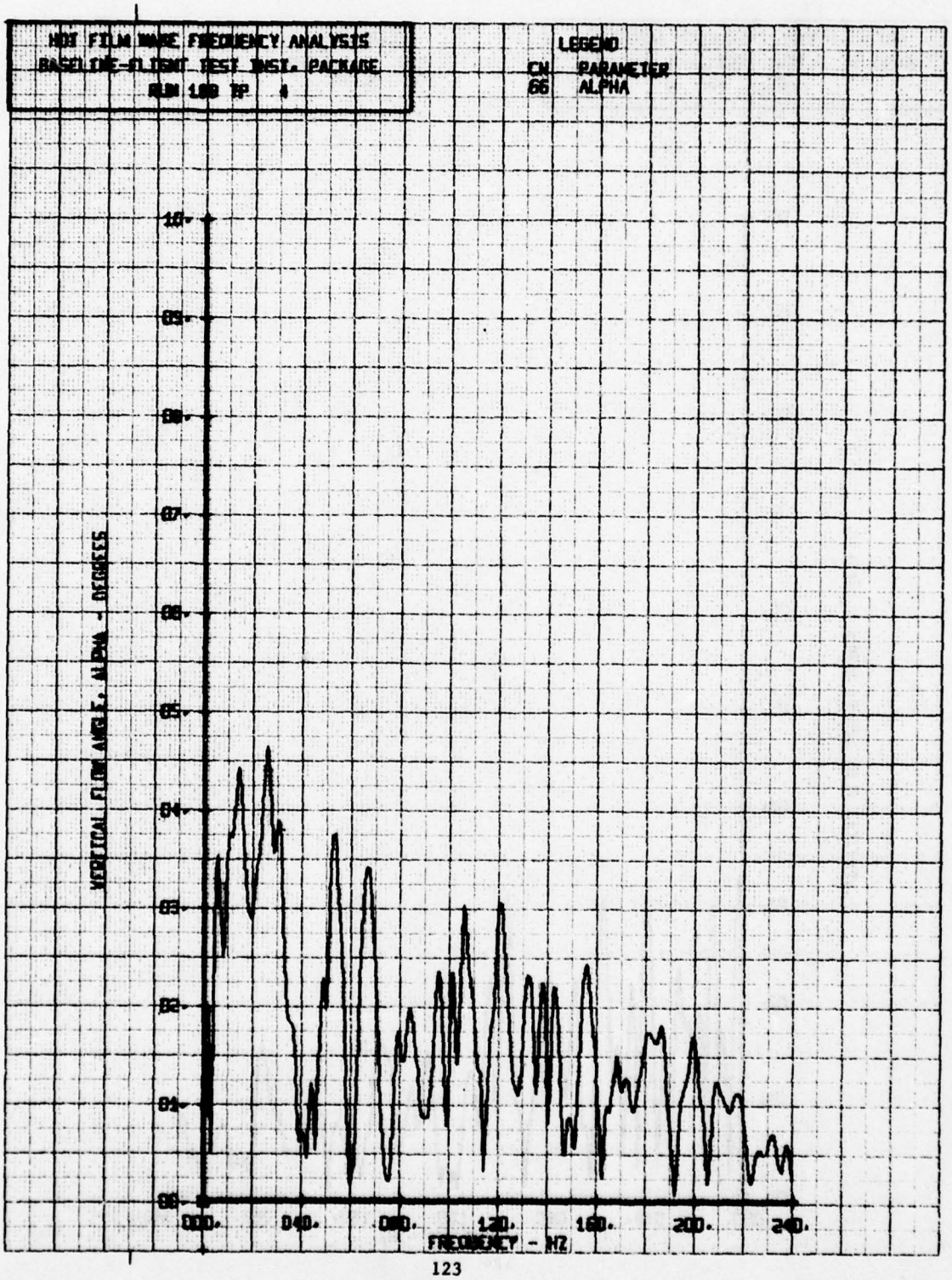
FREQUENCY - HZ
X-2 VELOCITY COMPONENT V-BETA FPS


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ON CAN 7.60.2.ASH.(H1.2.1)
RUN 207 TP 8
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 4
LEGEND
CN PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
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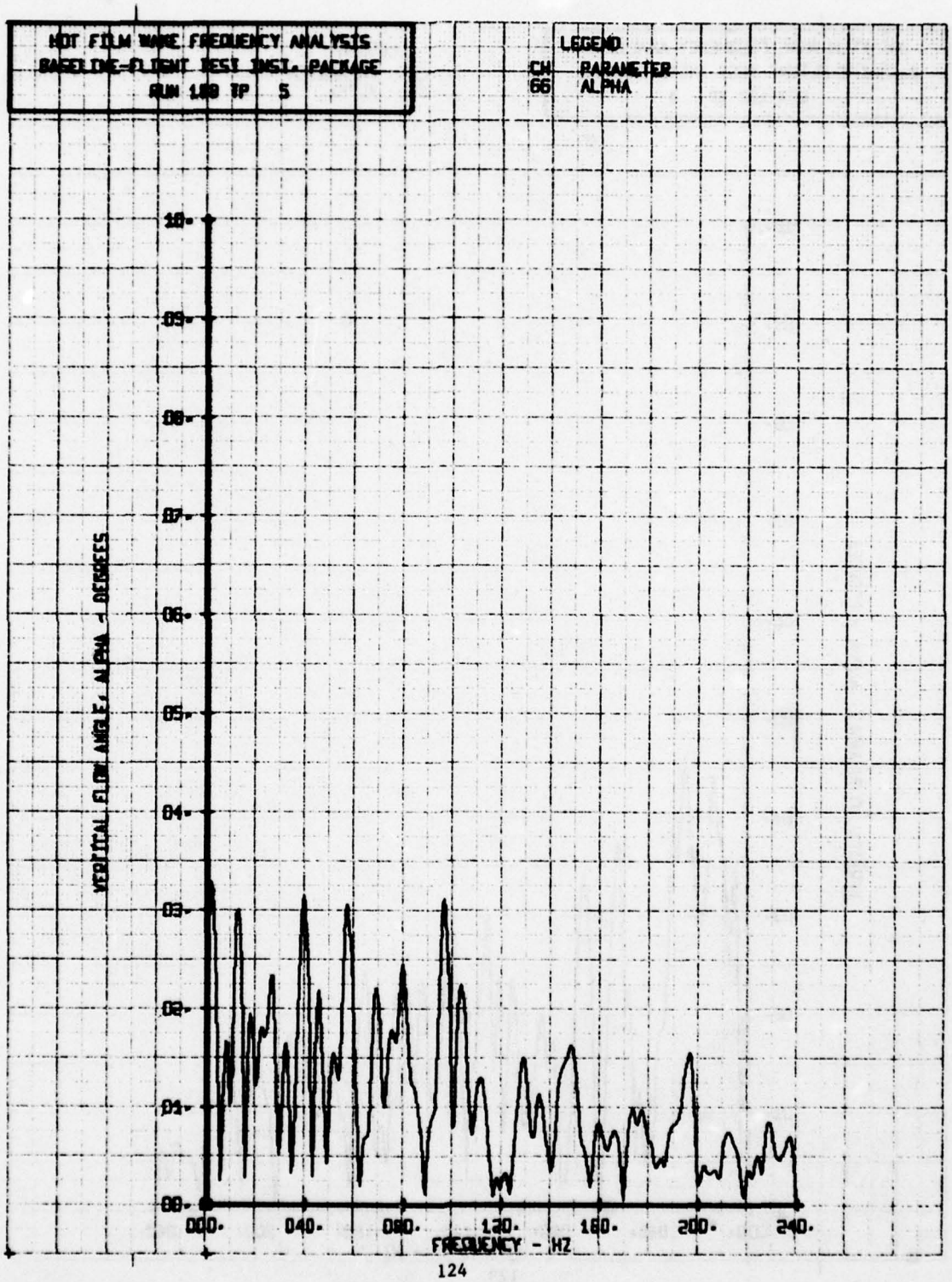
HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 5
LEGEND
CH PARAMETER
66 ALPHA
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VERTICAL FLOW ANGLE, ALPHA - DEGREES
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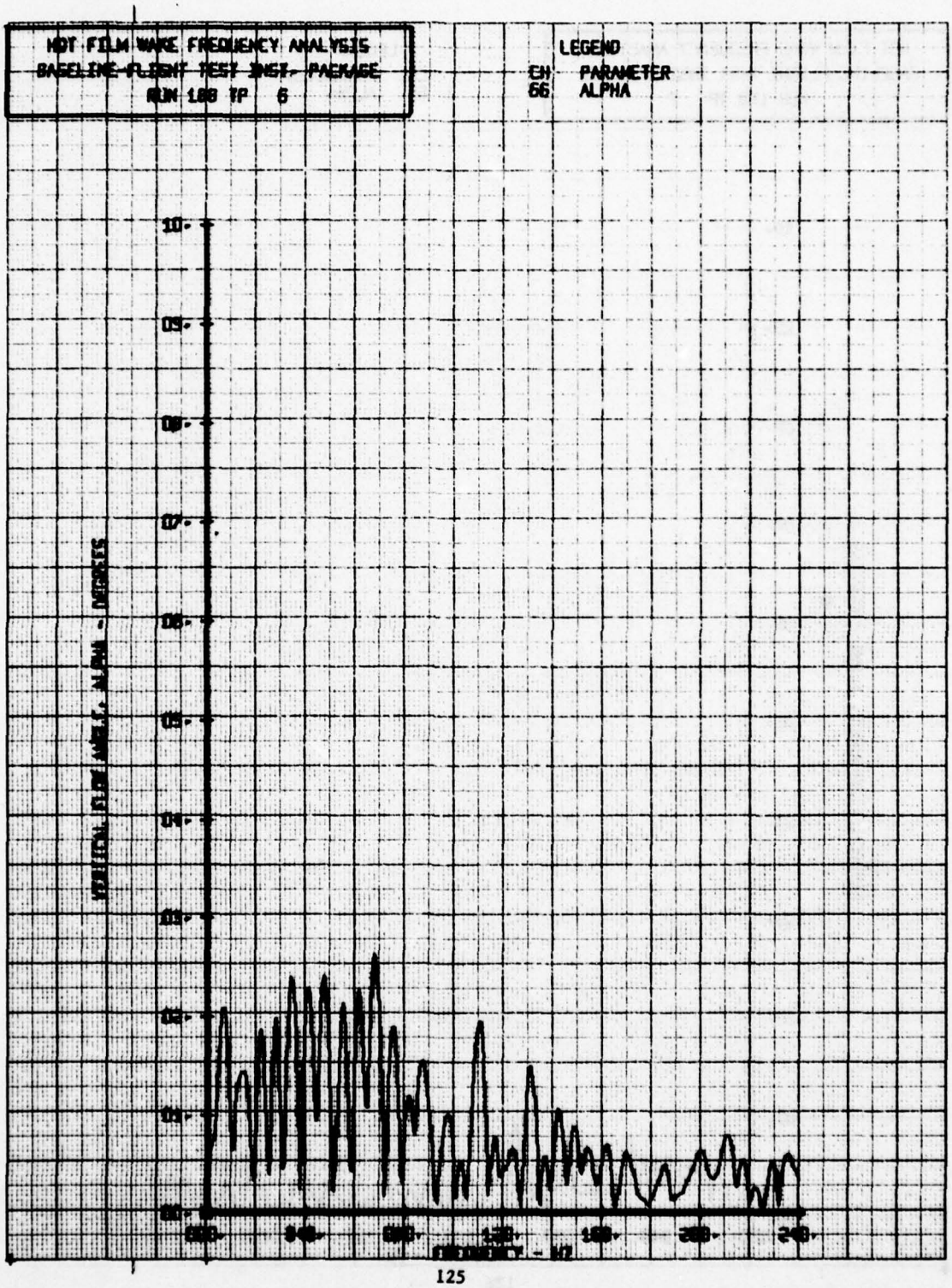
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 6
LEGEND
CH PARAMETER
66 ALPHA
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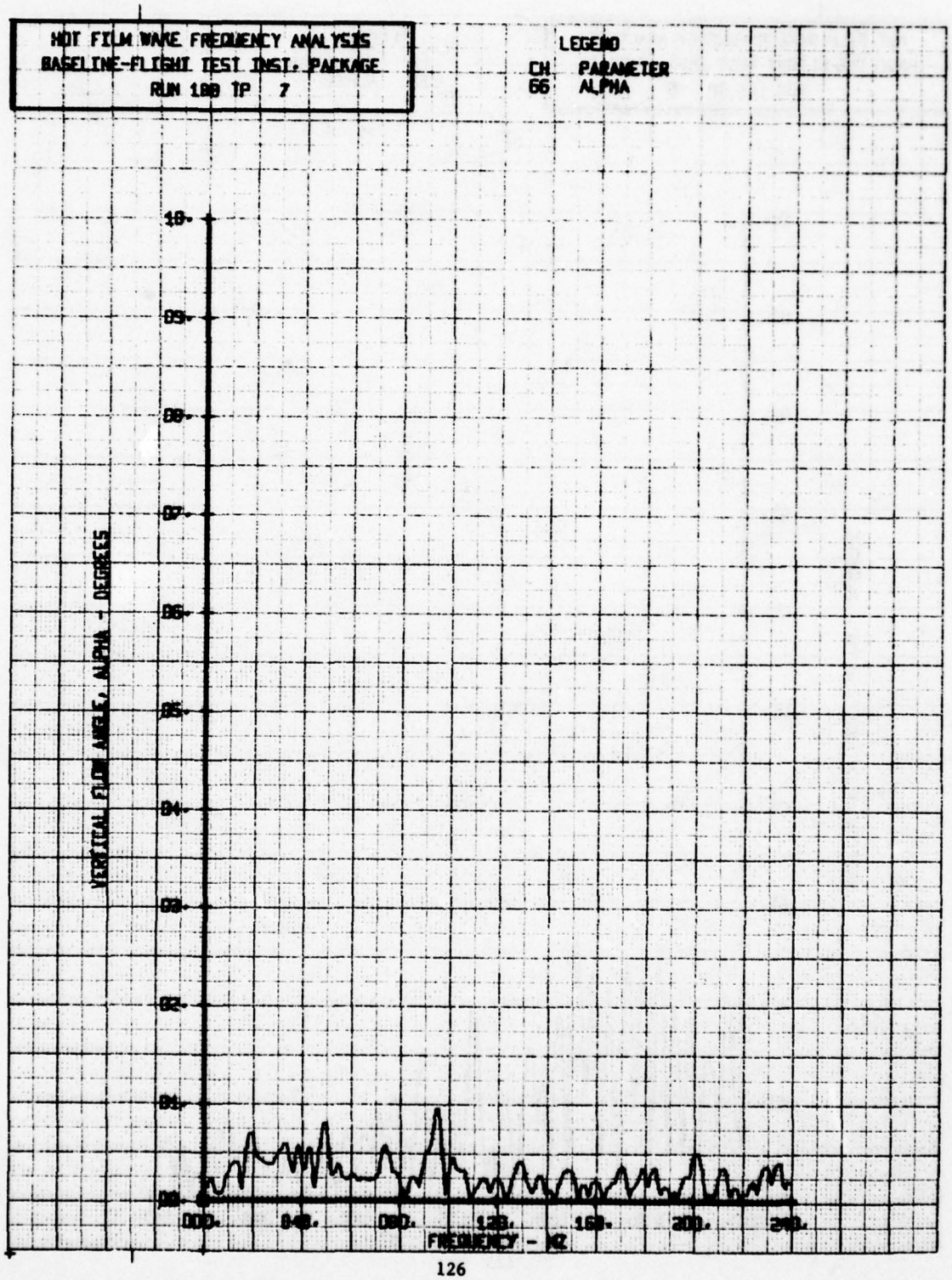
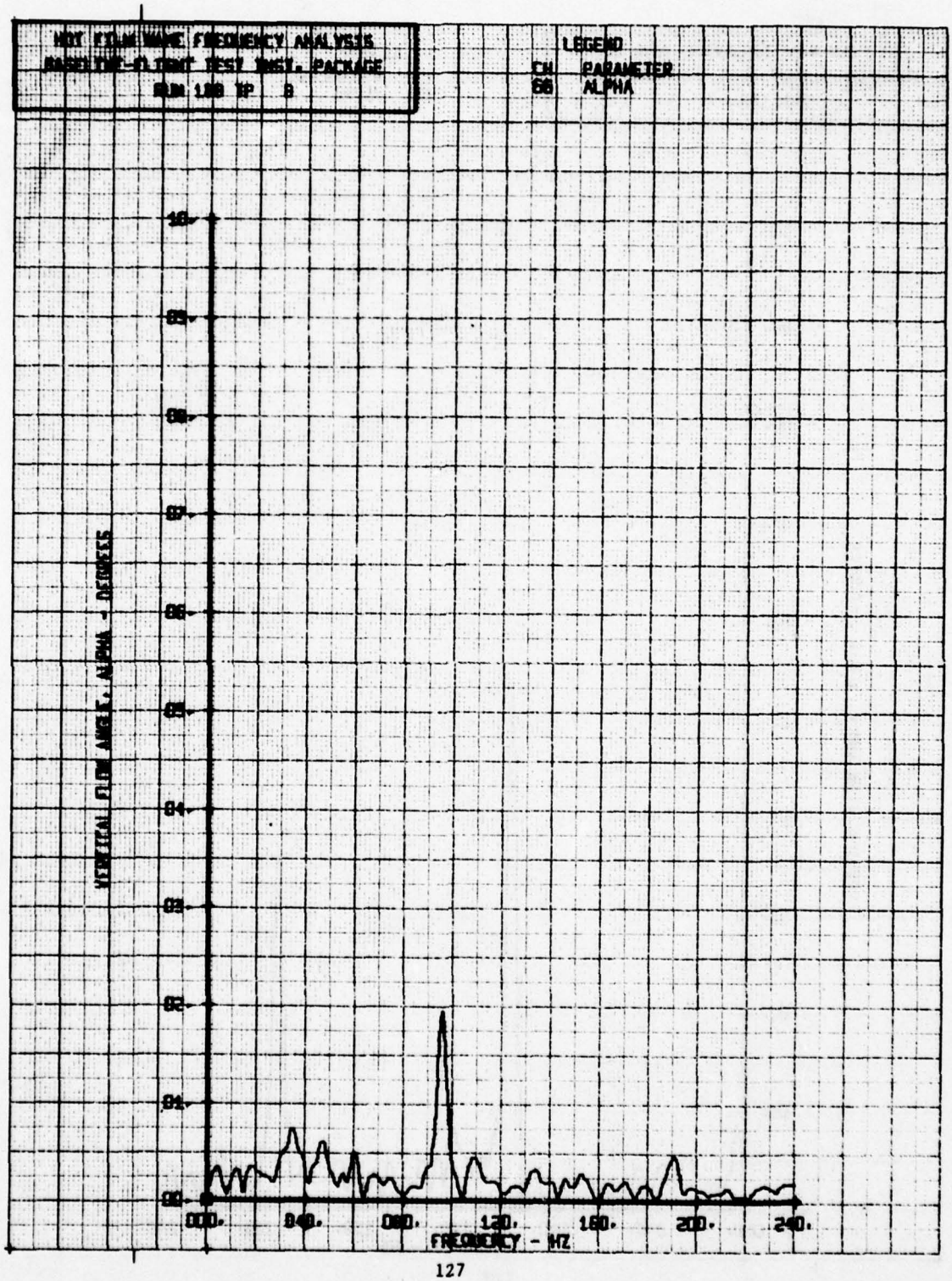
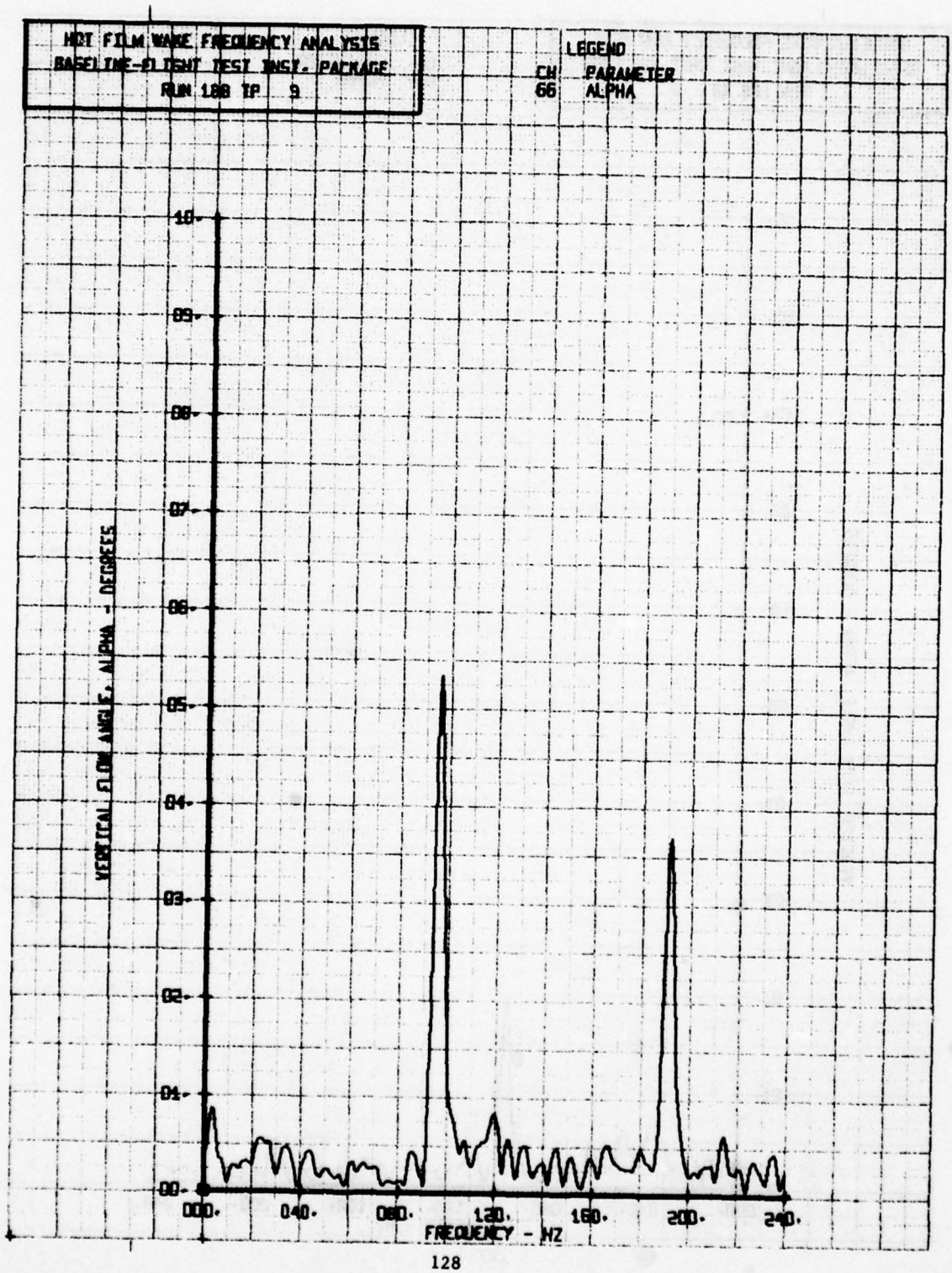
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 7
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 9
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
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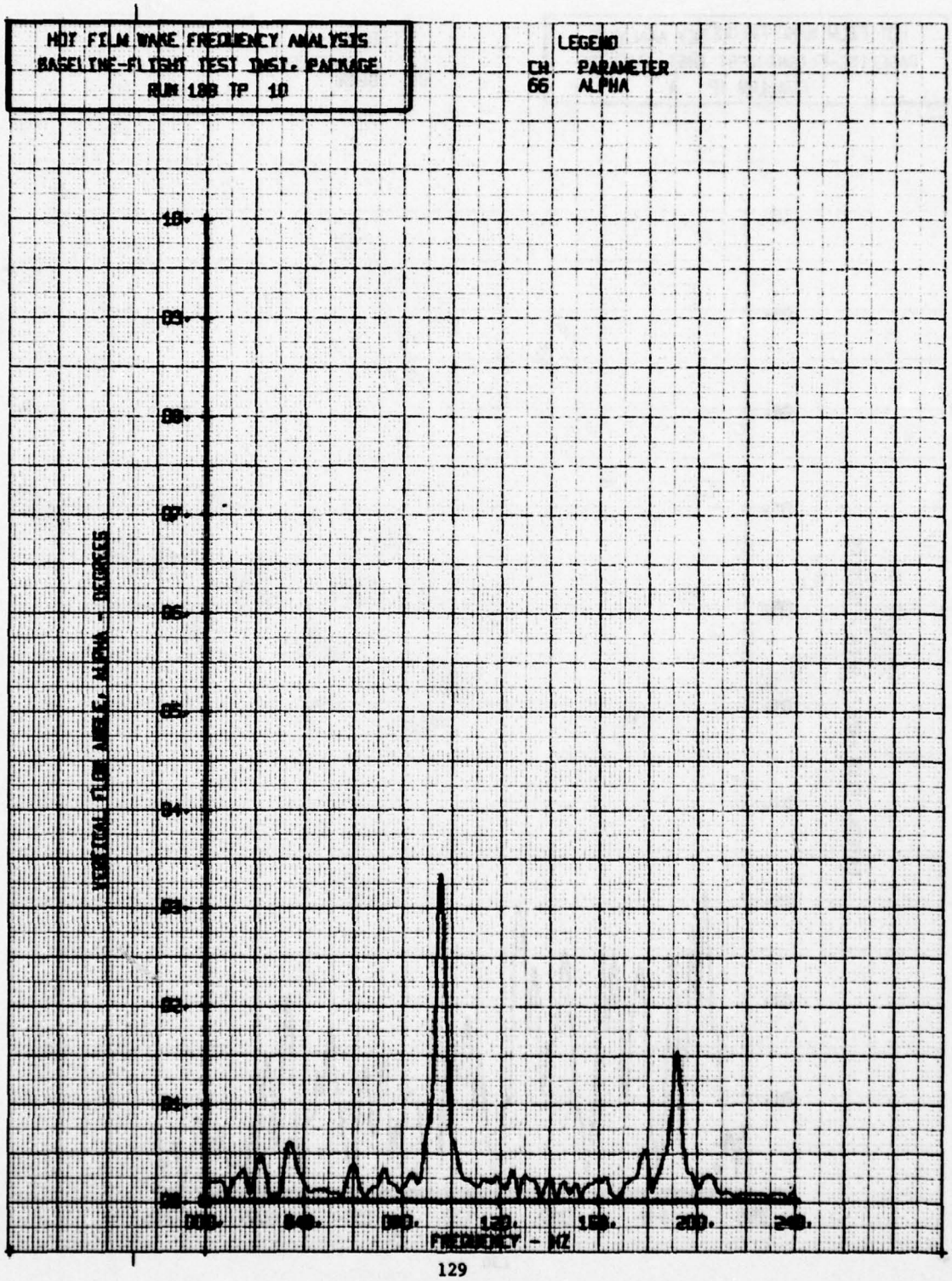
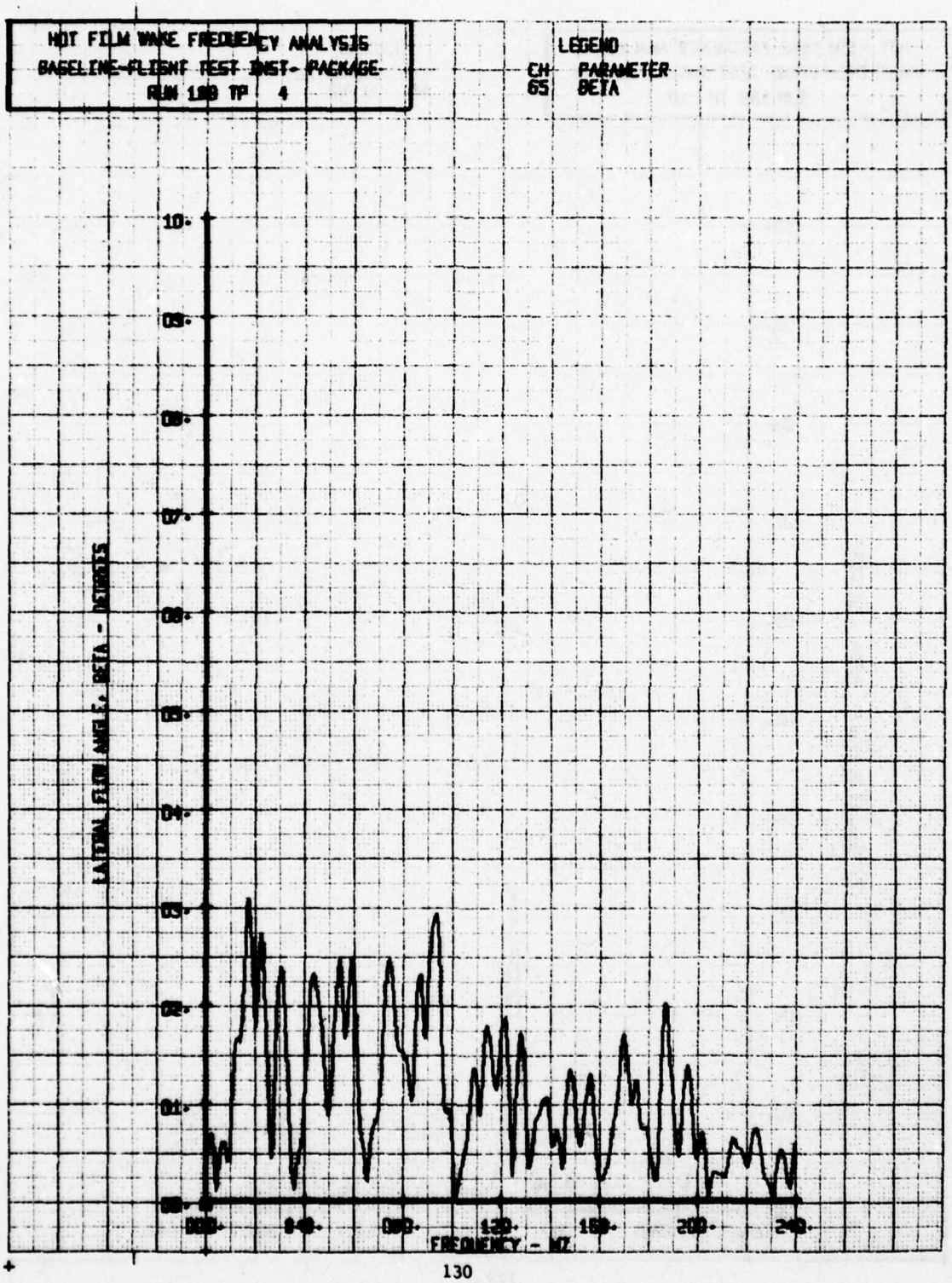
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 10
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST- PACKAGE
RUN 100 TP 4
LEGEND
CH PARAMETER
65 BETA
10.
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LATERAL FLOW ANGLE, BETA - DEGREES
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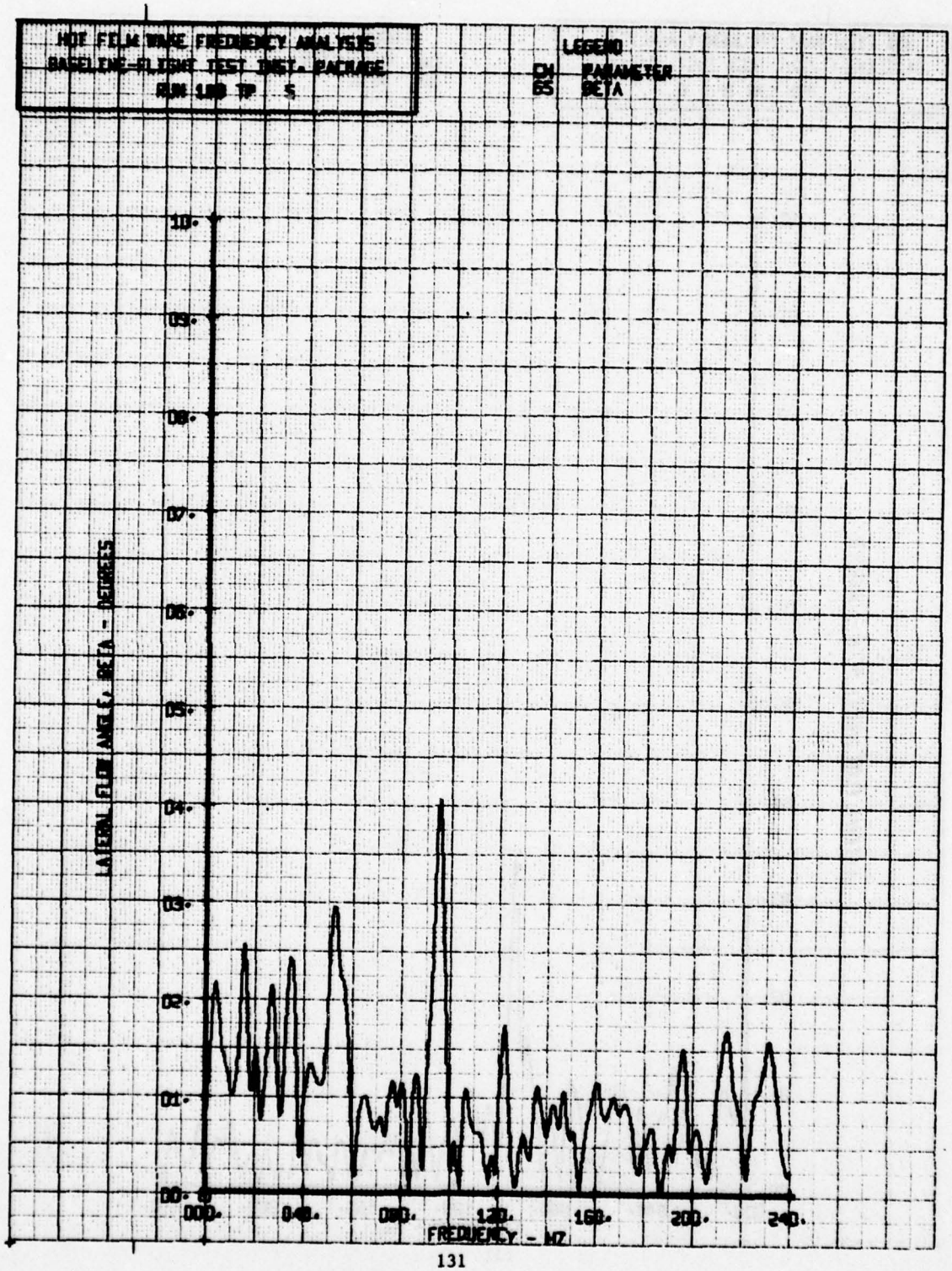
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 5
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
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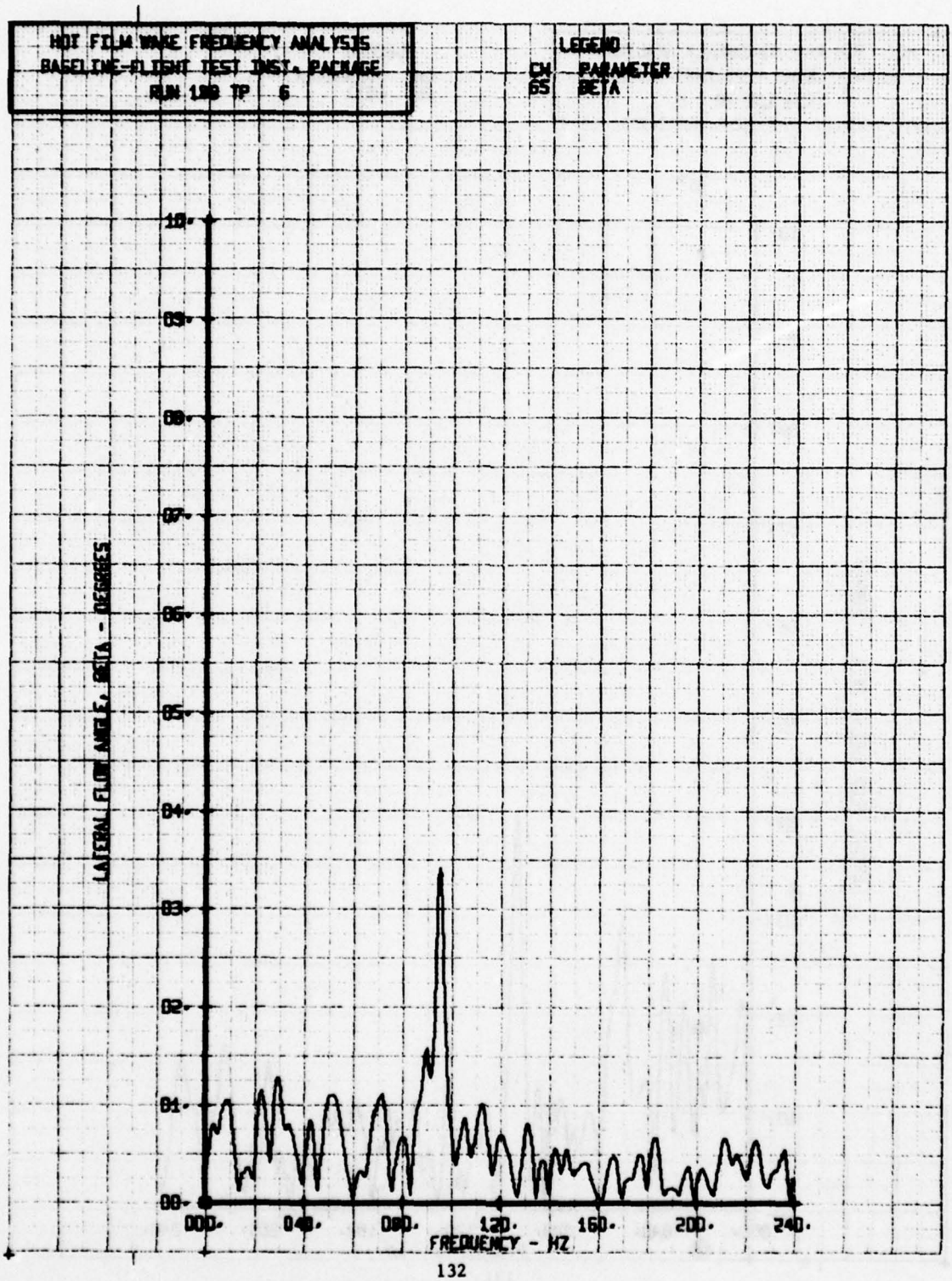
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 109 TP 6
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
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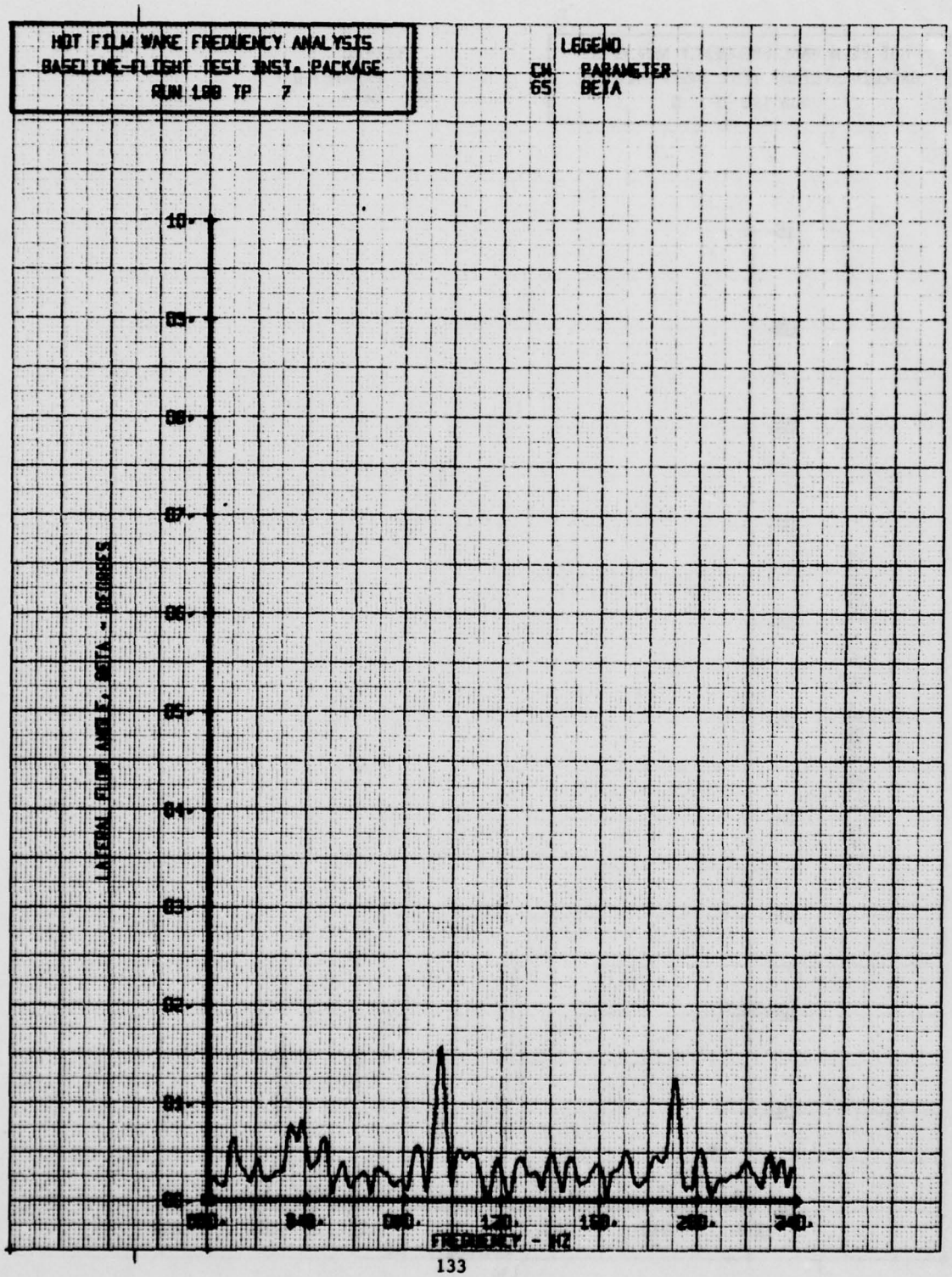
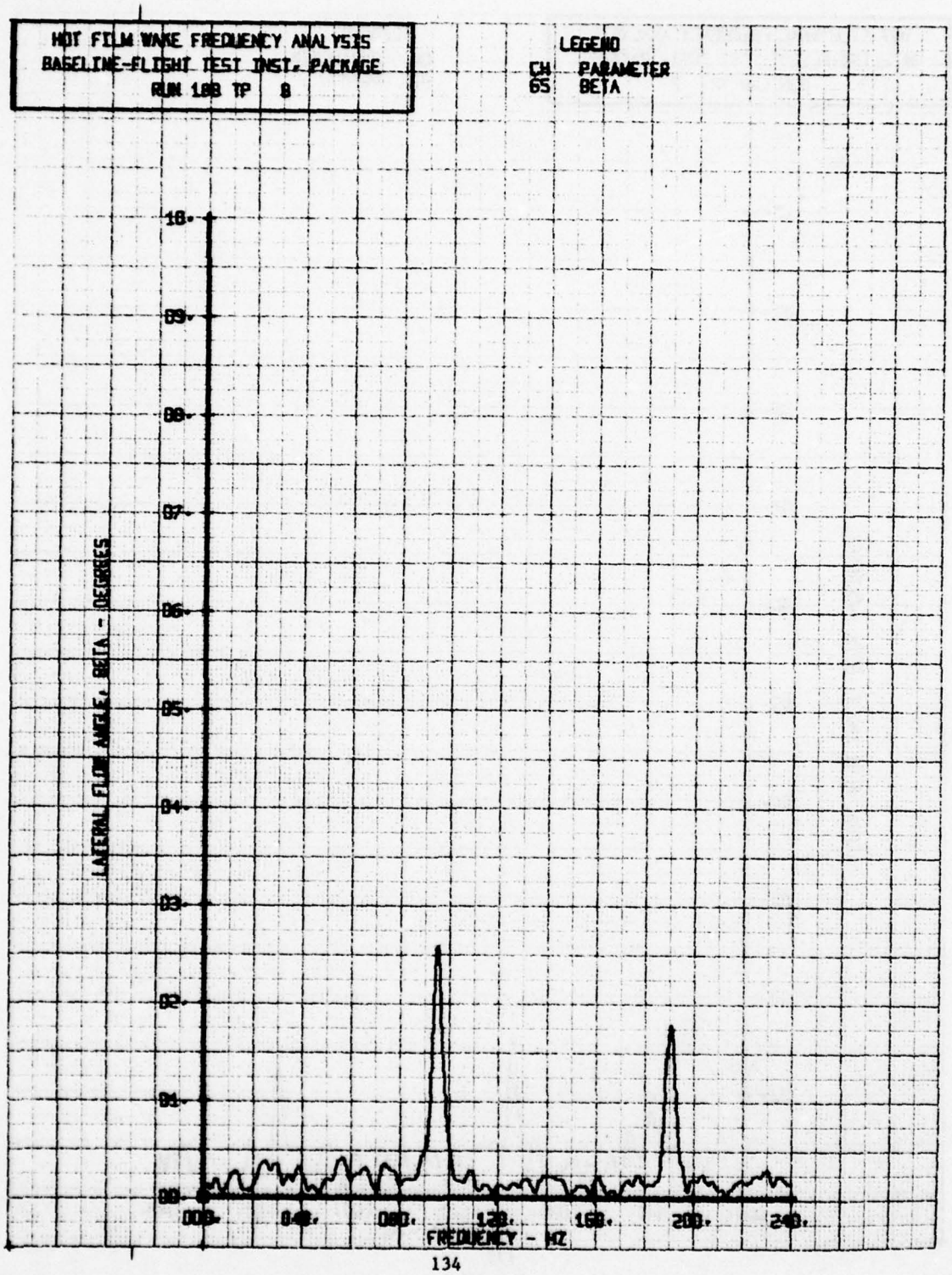
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 180 TP 7
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 8
LEGEND
CH PARAMETER
65 BETA
10.
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LATERAL FLOW ANGLE, BETA - DEGREES
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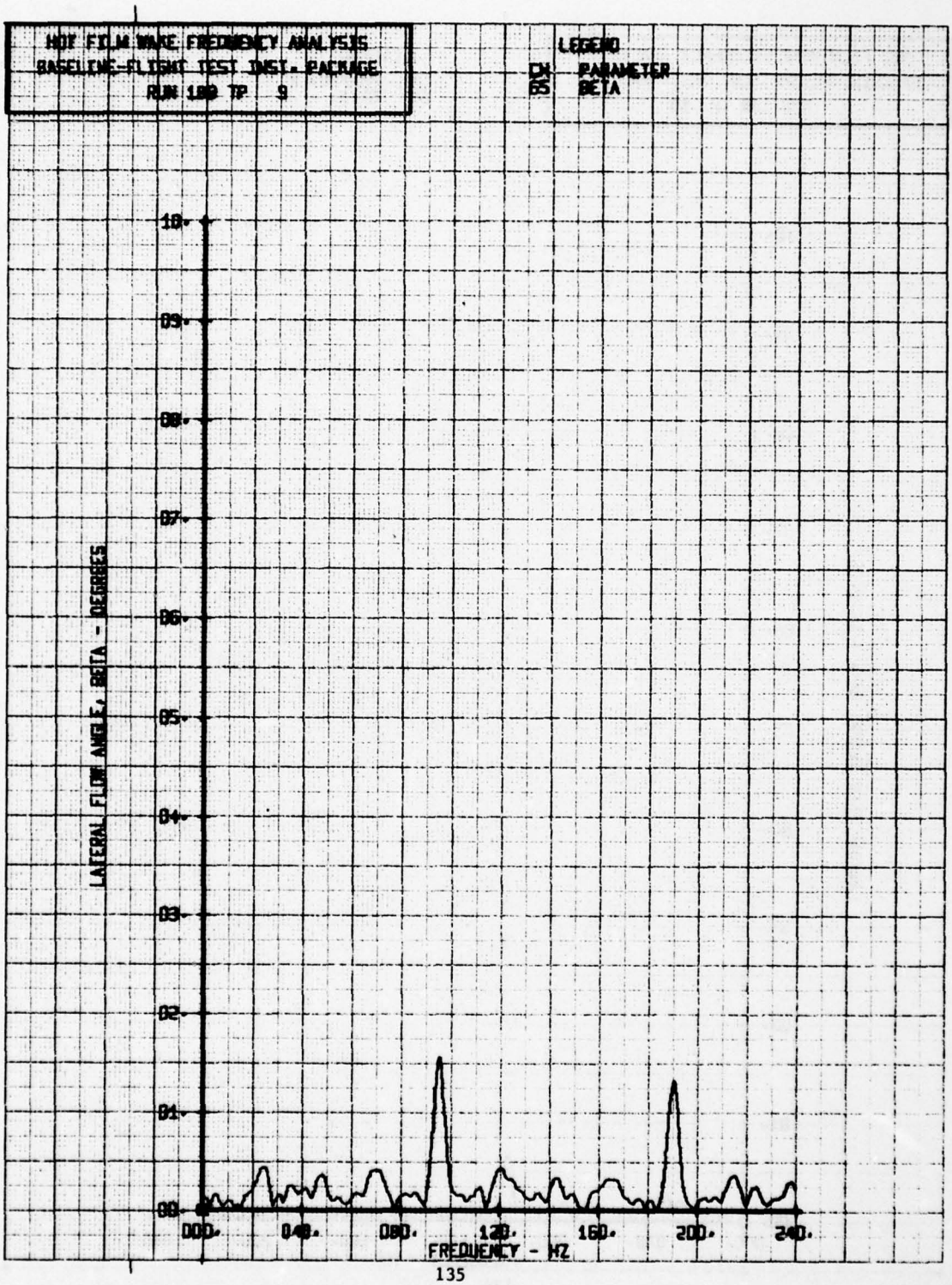
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 9
LEGEND
CH PARAMETER
05 BETA
10.
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LATERAL FLOW ANGLE, BETA - DEGREES
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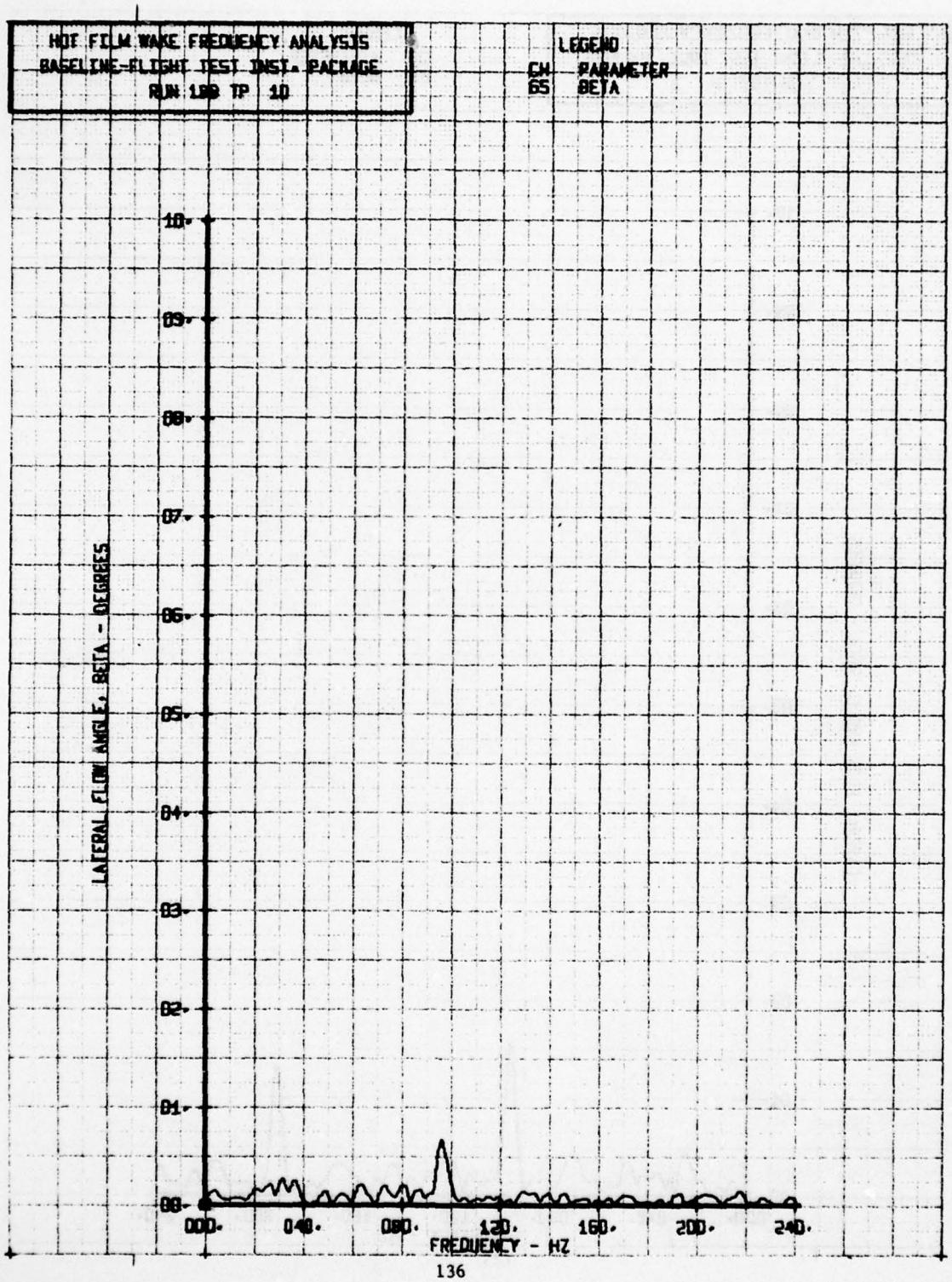
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 10
LEGEND
CH PARAMETER
65 BETA
10.
09.
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LATERAL FLOW ANGLE, BETA - DEGREES
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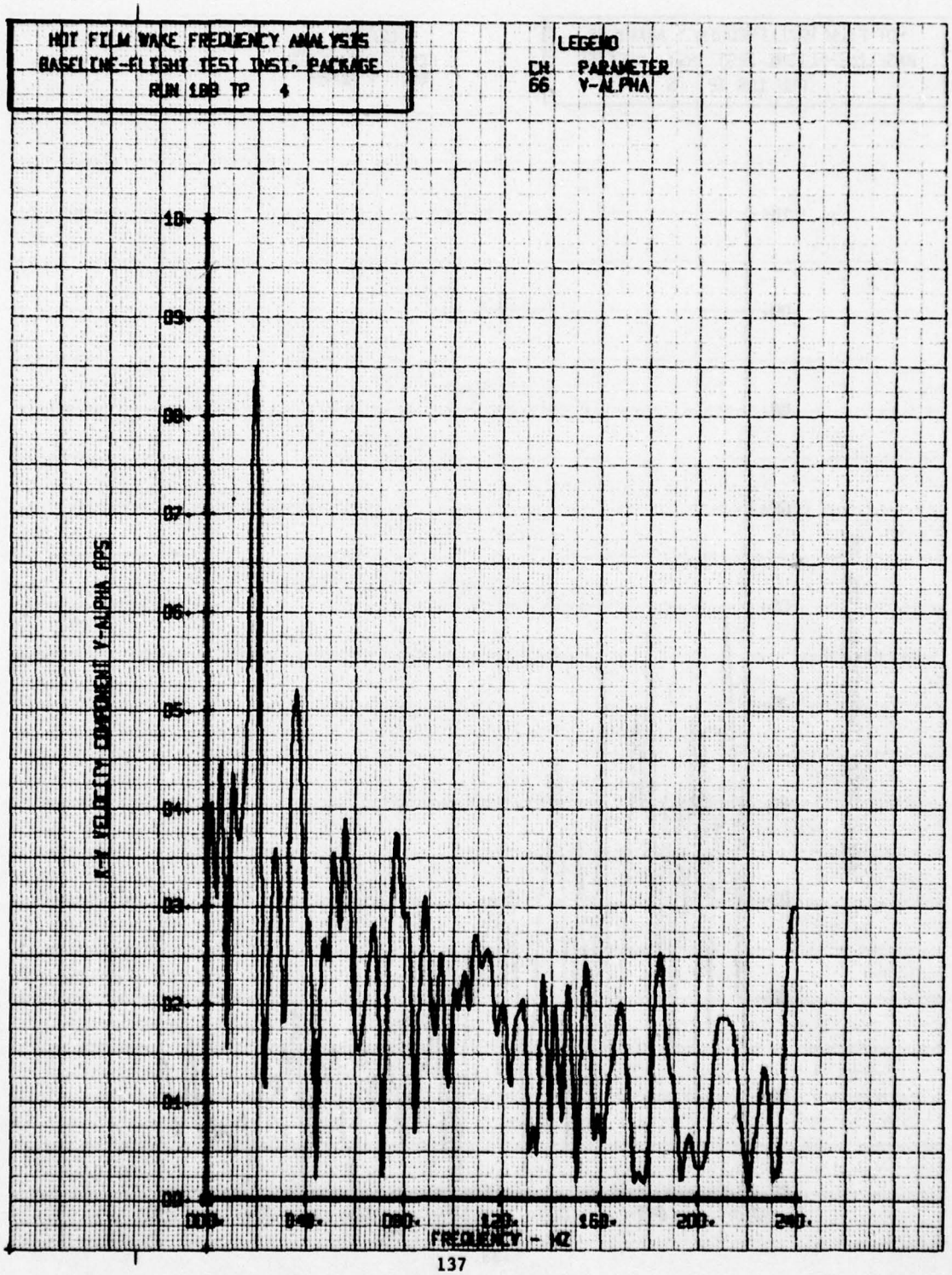
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 4
LEGEND
CH PARAMETER
66 V-ALPHA
10.
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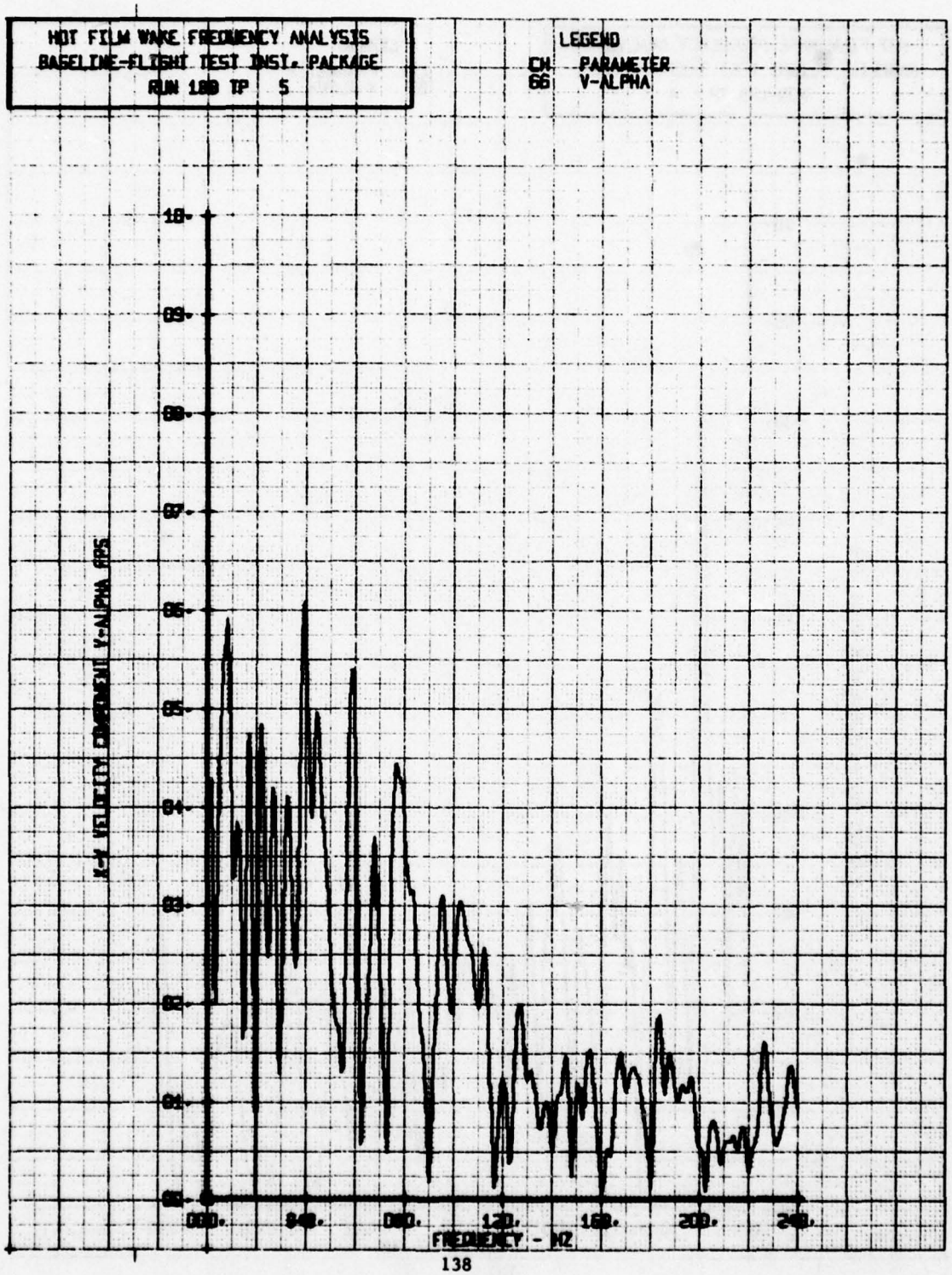
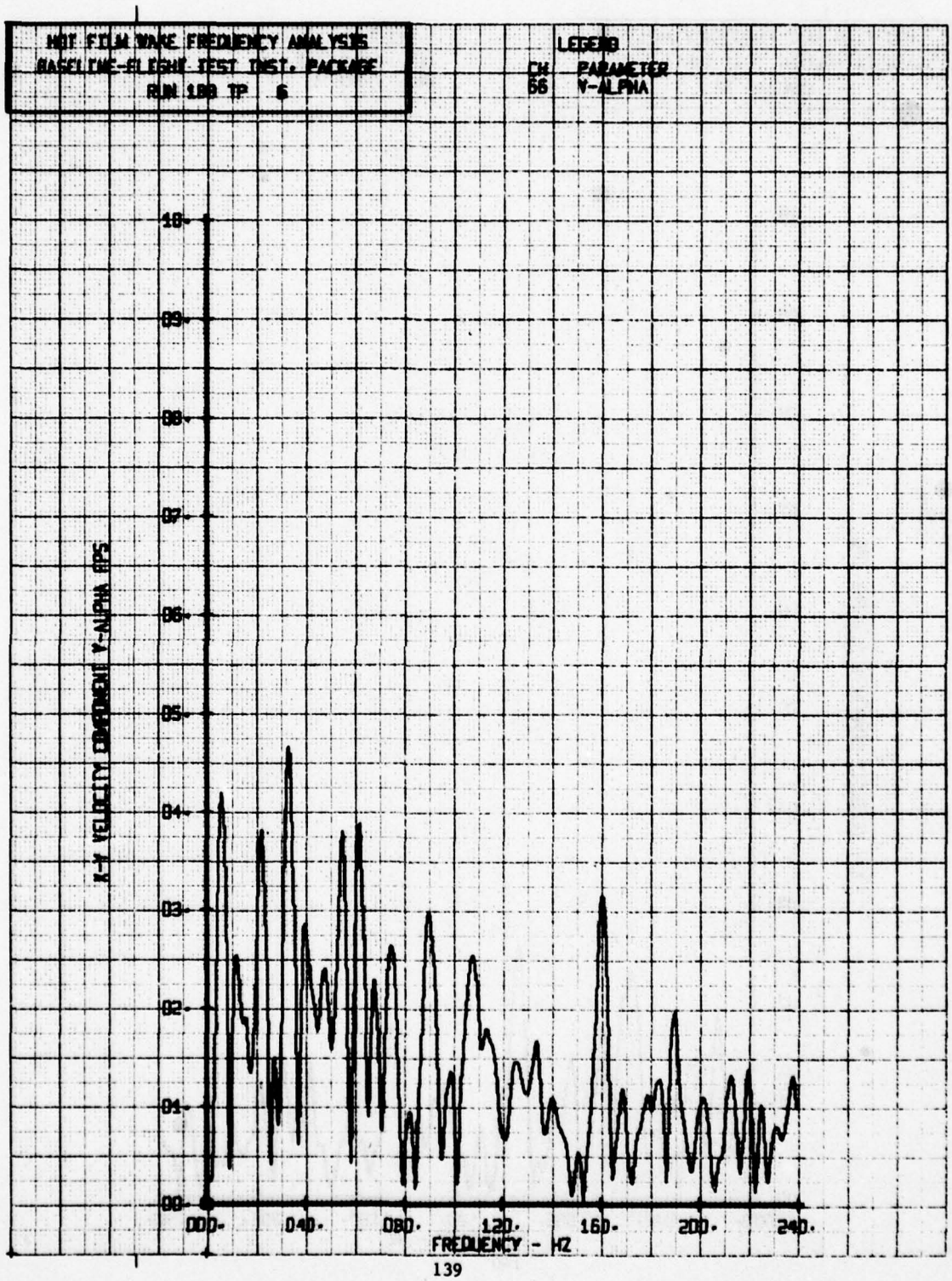
FREQUENCY - HZ
X-V VELOCITY COMPONENT V-ALPHA FPS


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 189 TP 5
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA RMS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 6
LEGEND
CH PARAMETER
56 V-ALPHA
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X-V VELOCITY COMPONENT V-ALPHA RPS
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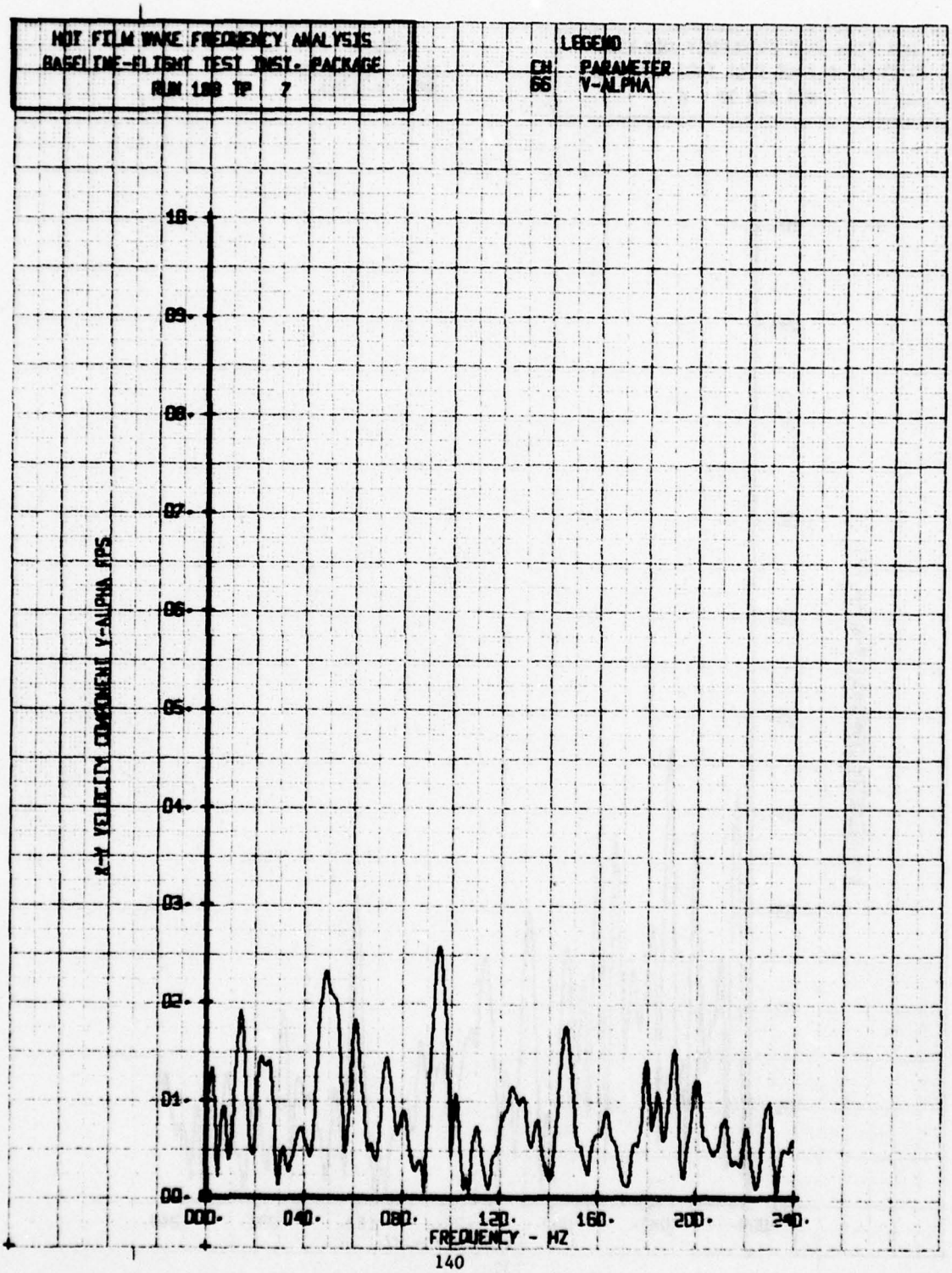
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 1B3 TP 7
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
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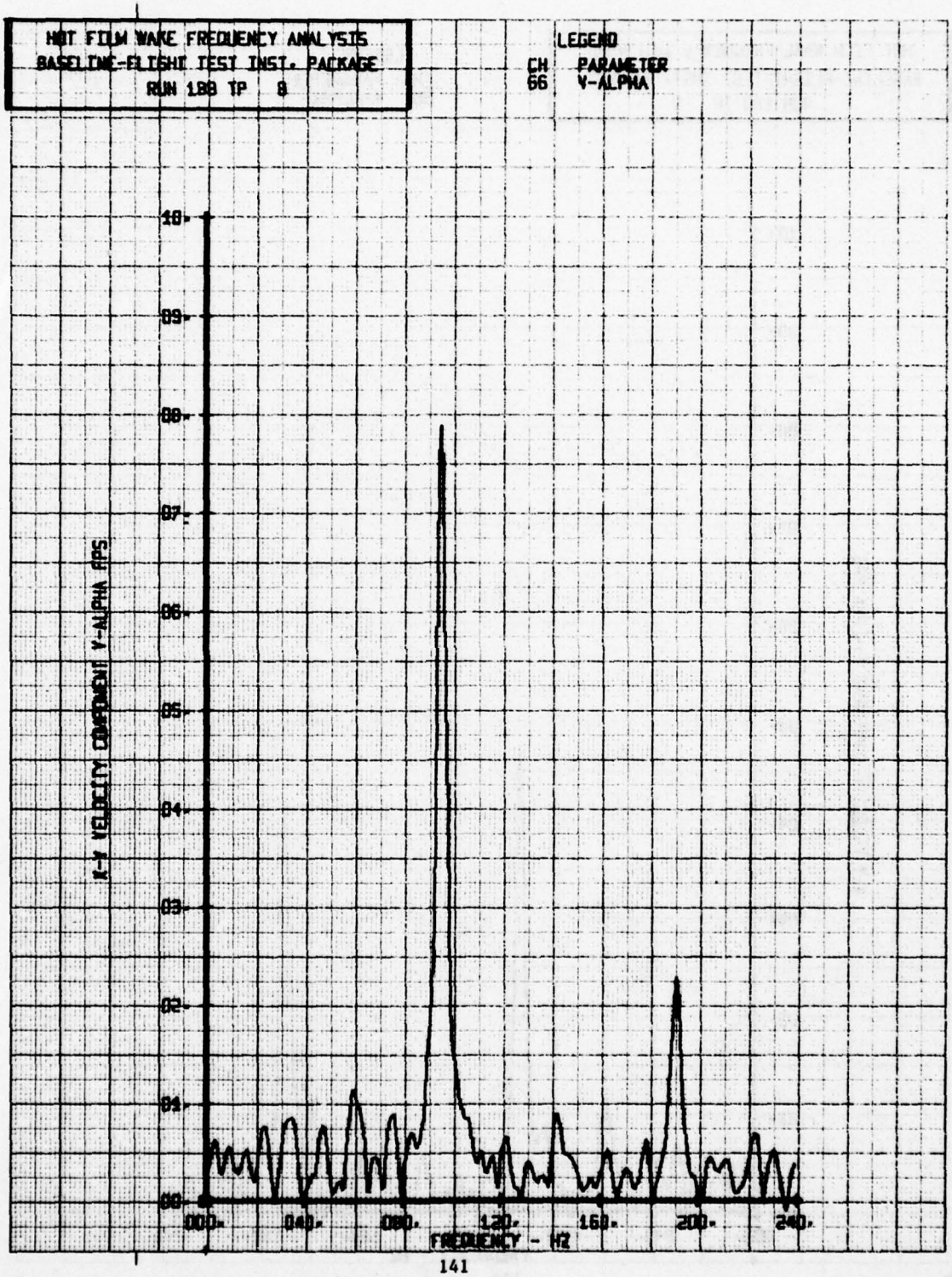
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 8
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
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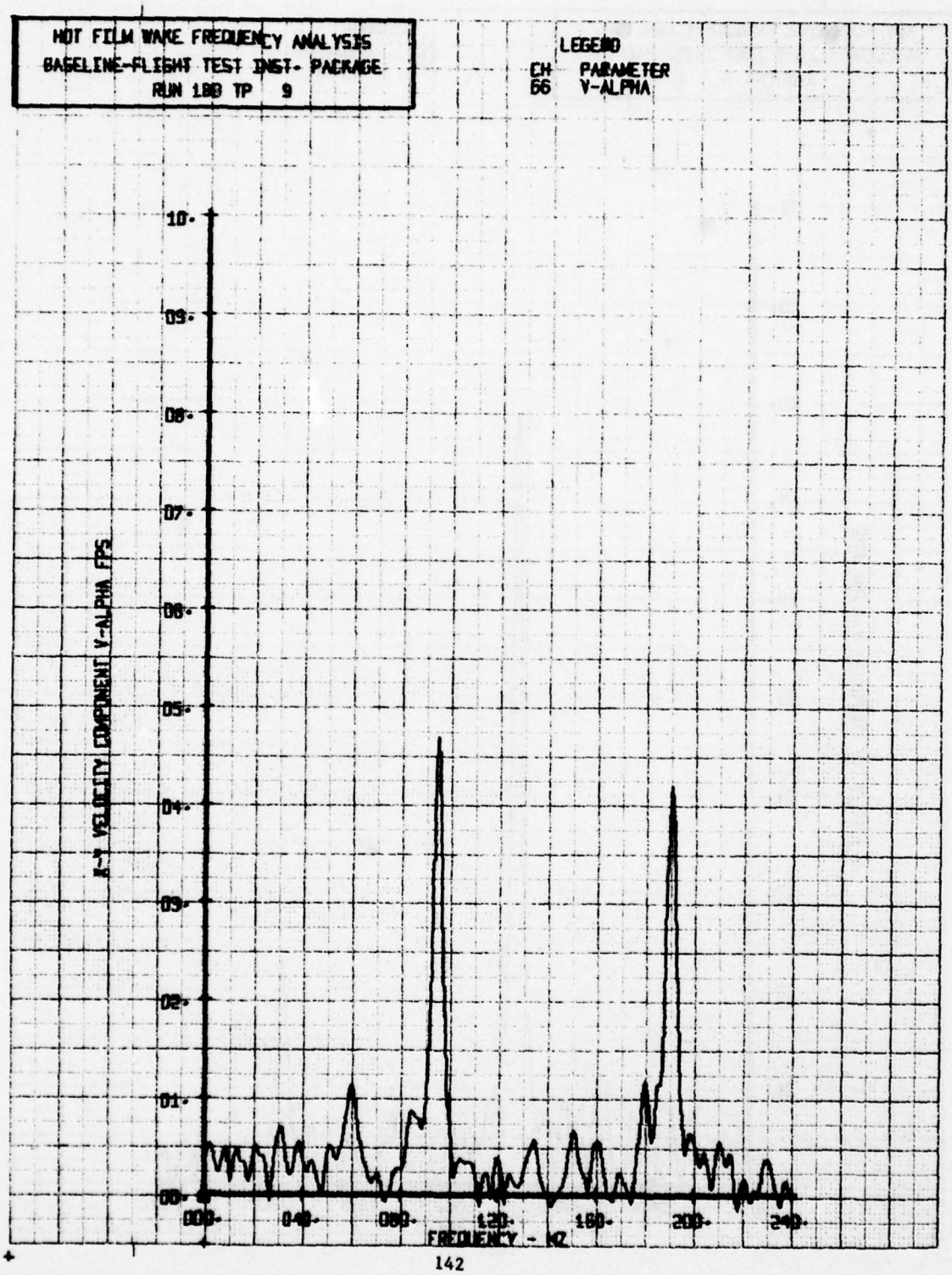
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 180 TP 9
LEGEND
CH PARAMETER
66 V-ALPHA
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A-V VELOCITY COMPONENT V-ALPHA FPS
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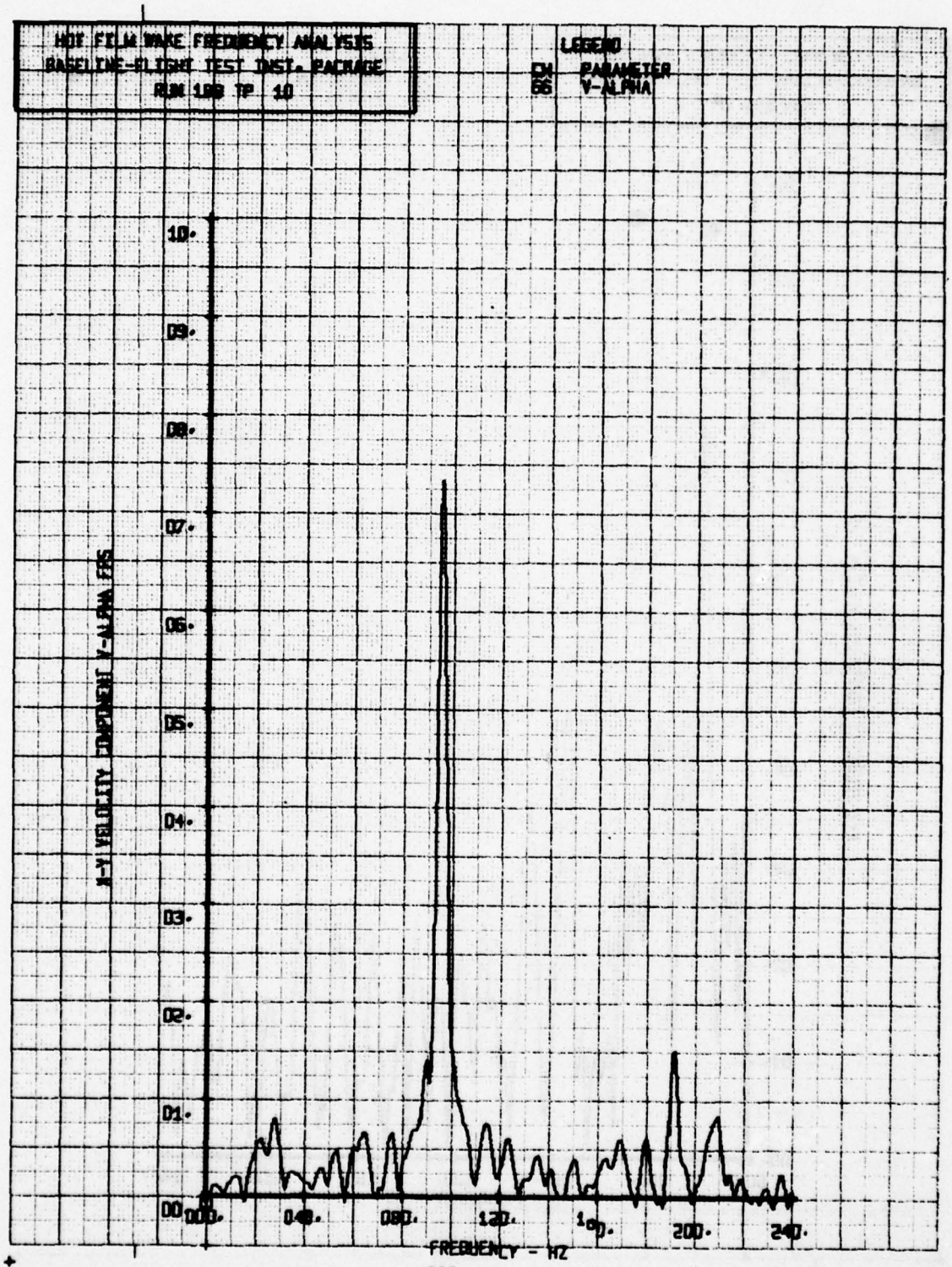
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 10
LEGEND
CH PARAMETER
55 V-ALPHA
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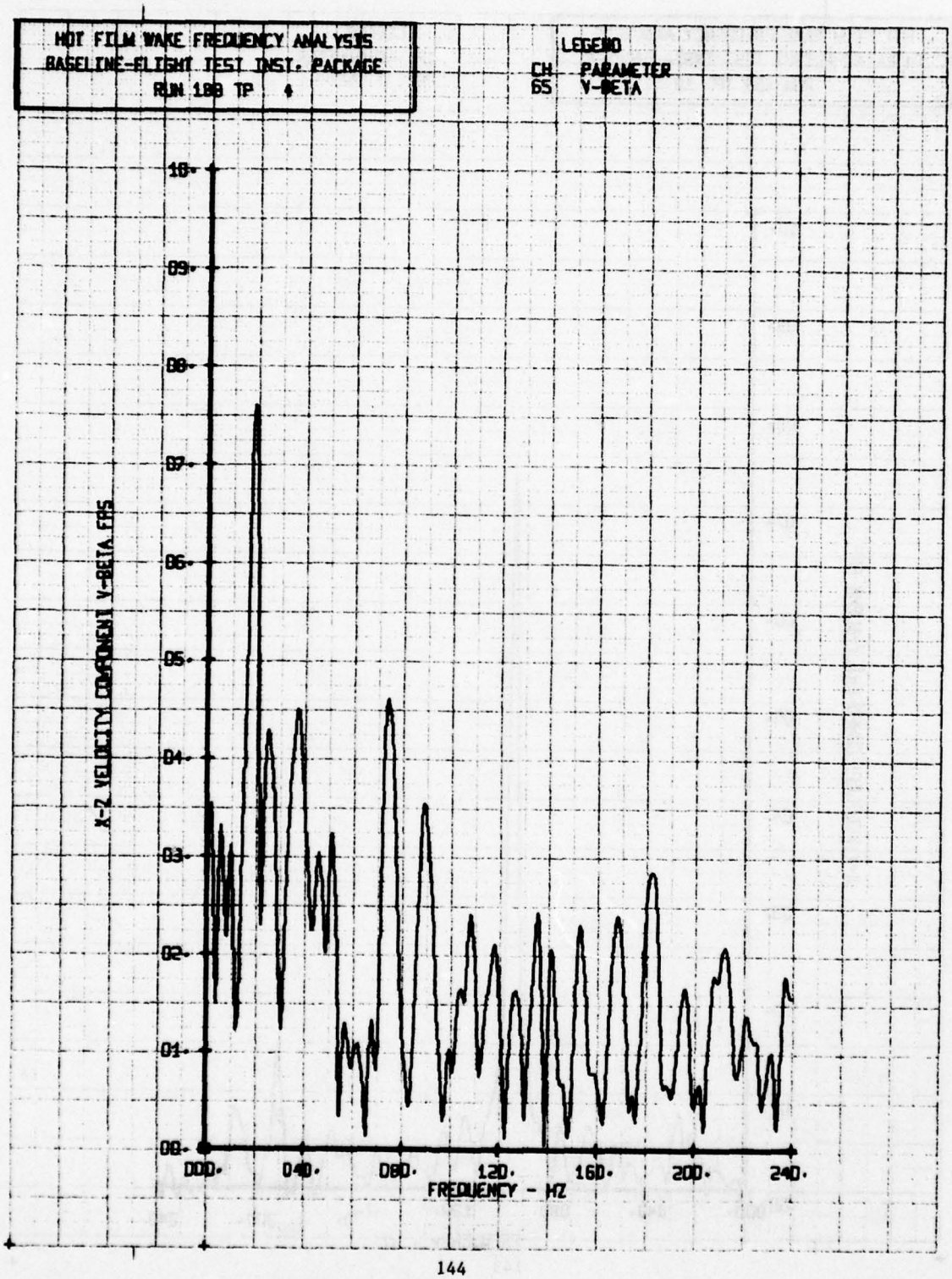
FREQUENCY - HZ
X-Y VELOCITY COMPONENT V-ALPHA FPS


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 4
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
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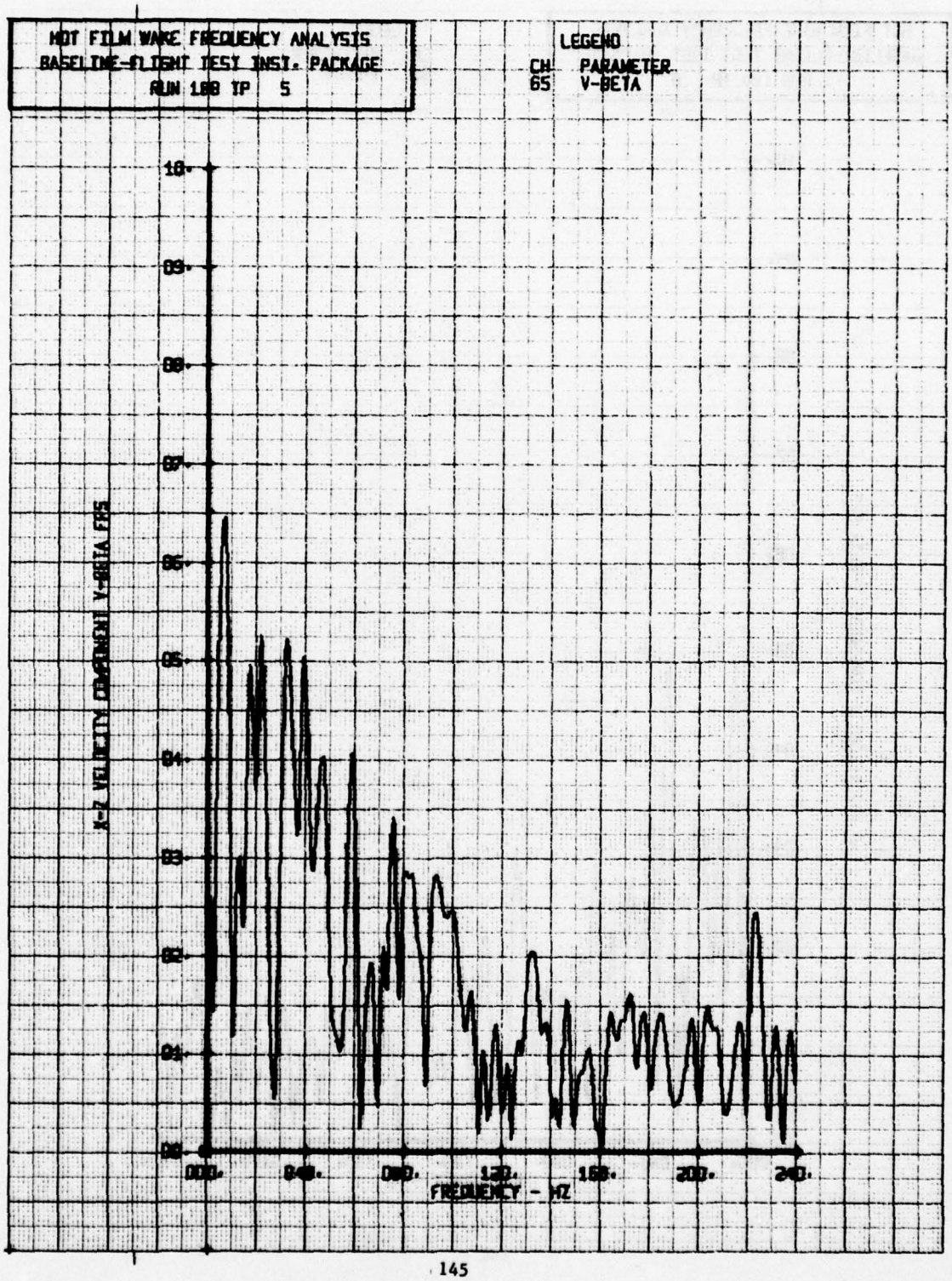
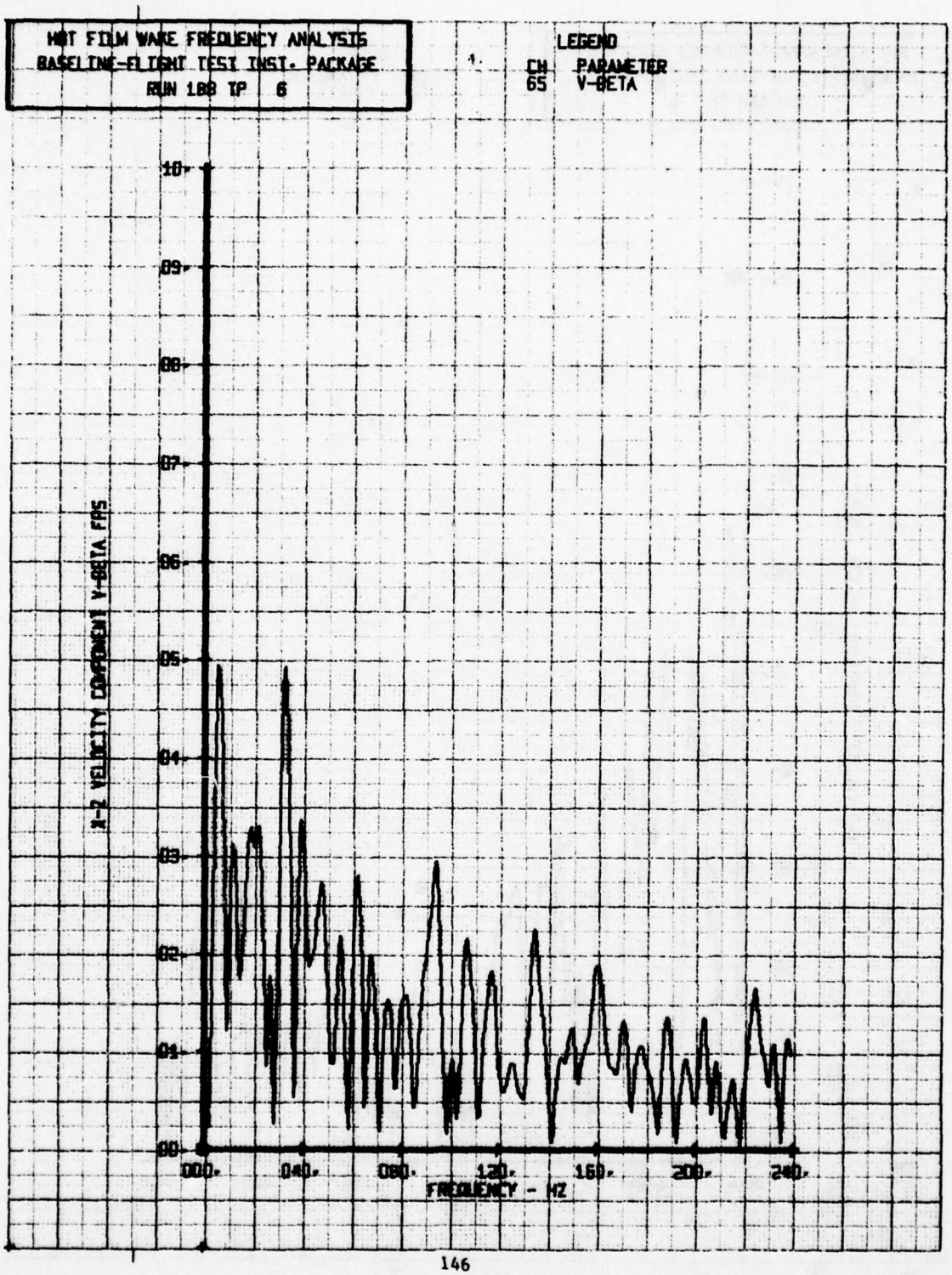
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 100 TP 5
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 6
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
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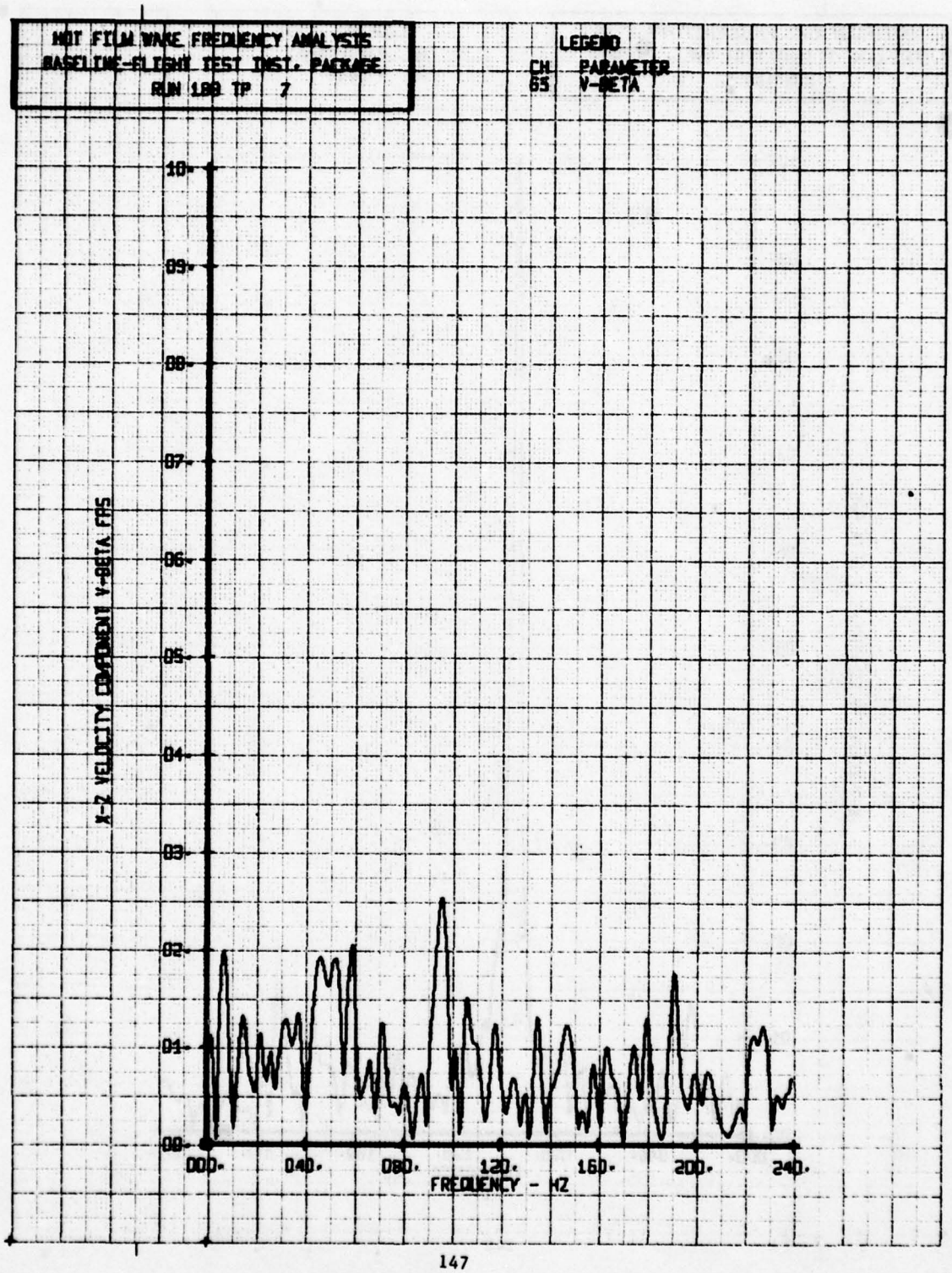
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 180 TP 7
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
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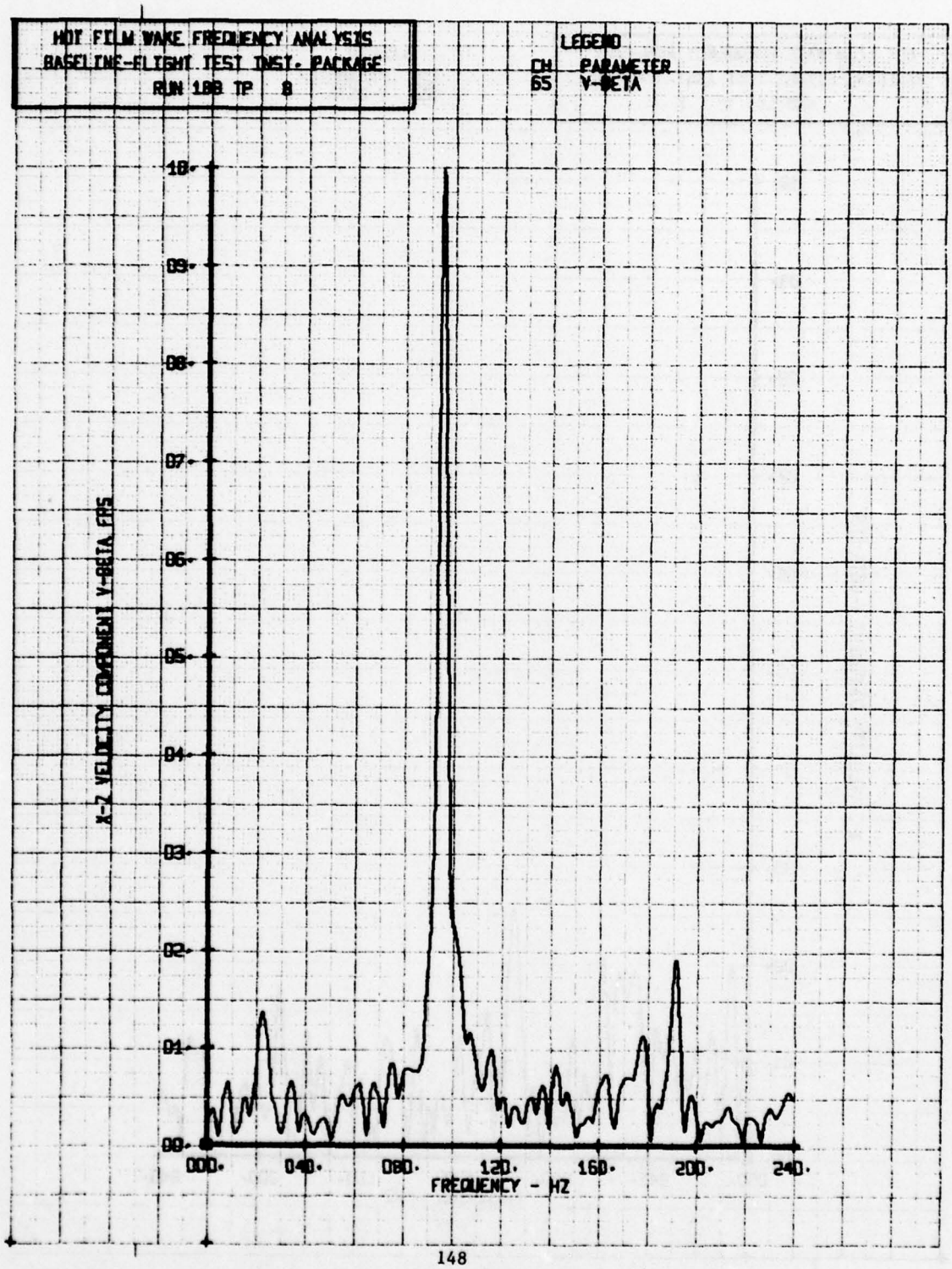
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 8
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
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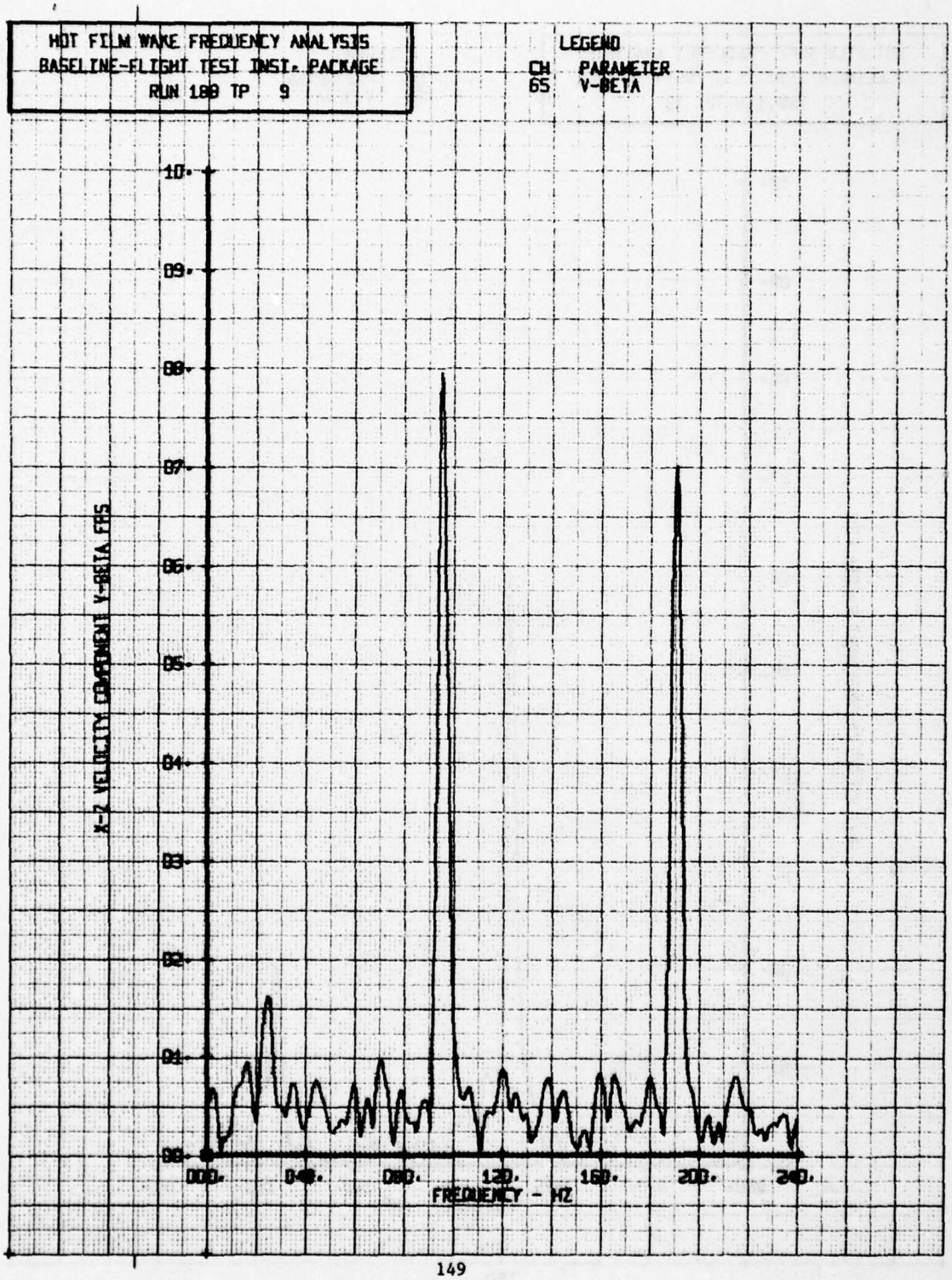
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 9
LEGEND
CH PARAMETER
65 V-BETA
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X-Z VELOCITY COMPONENT V-BETA FRS
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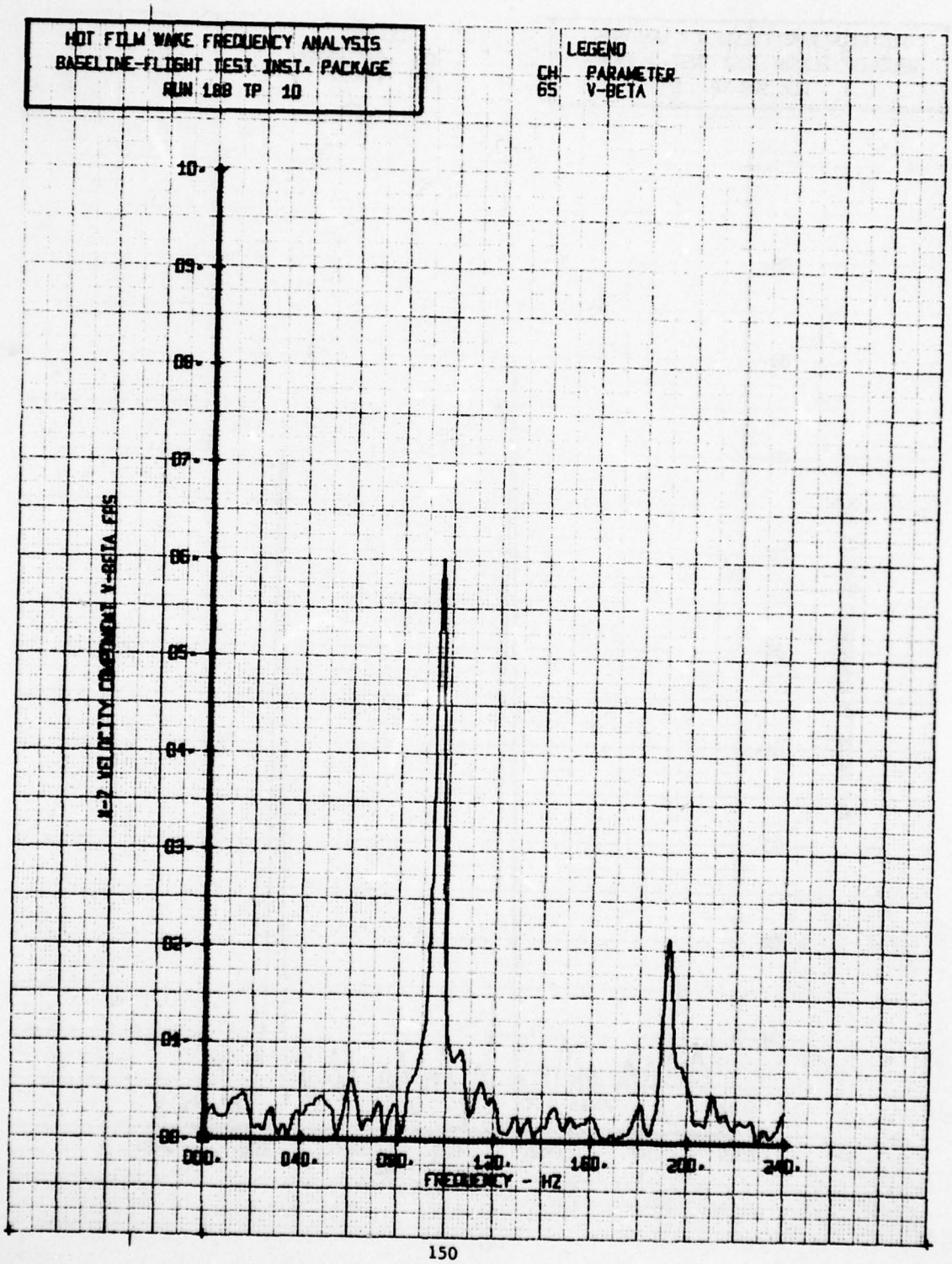
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
BASELINE-FLIGHT TEST INST. PACKAGE
RUN 188 TP 10
LEGEND
CH PARAMETER
65 V-BETA
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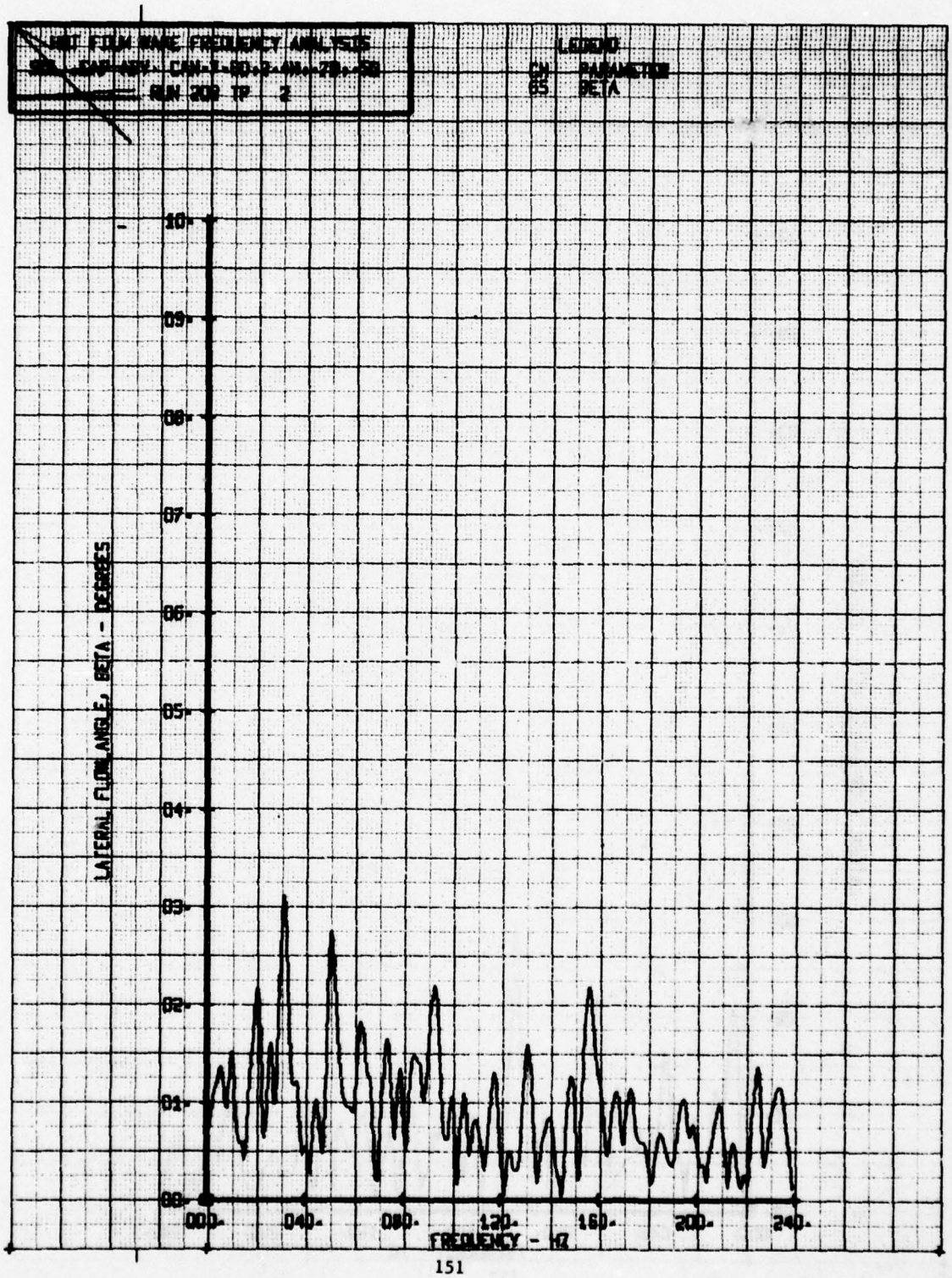
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 209 TP 2
LEGEND
CH PARAMETER
05 BETA
10.
09.
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LATERAL FLOW ANGLE, BETA - DEGREES
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160.
200.
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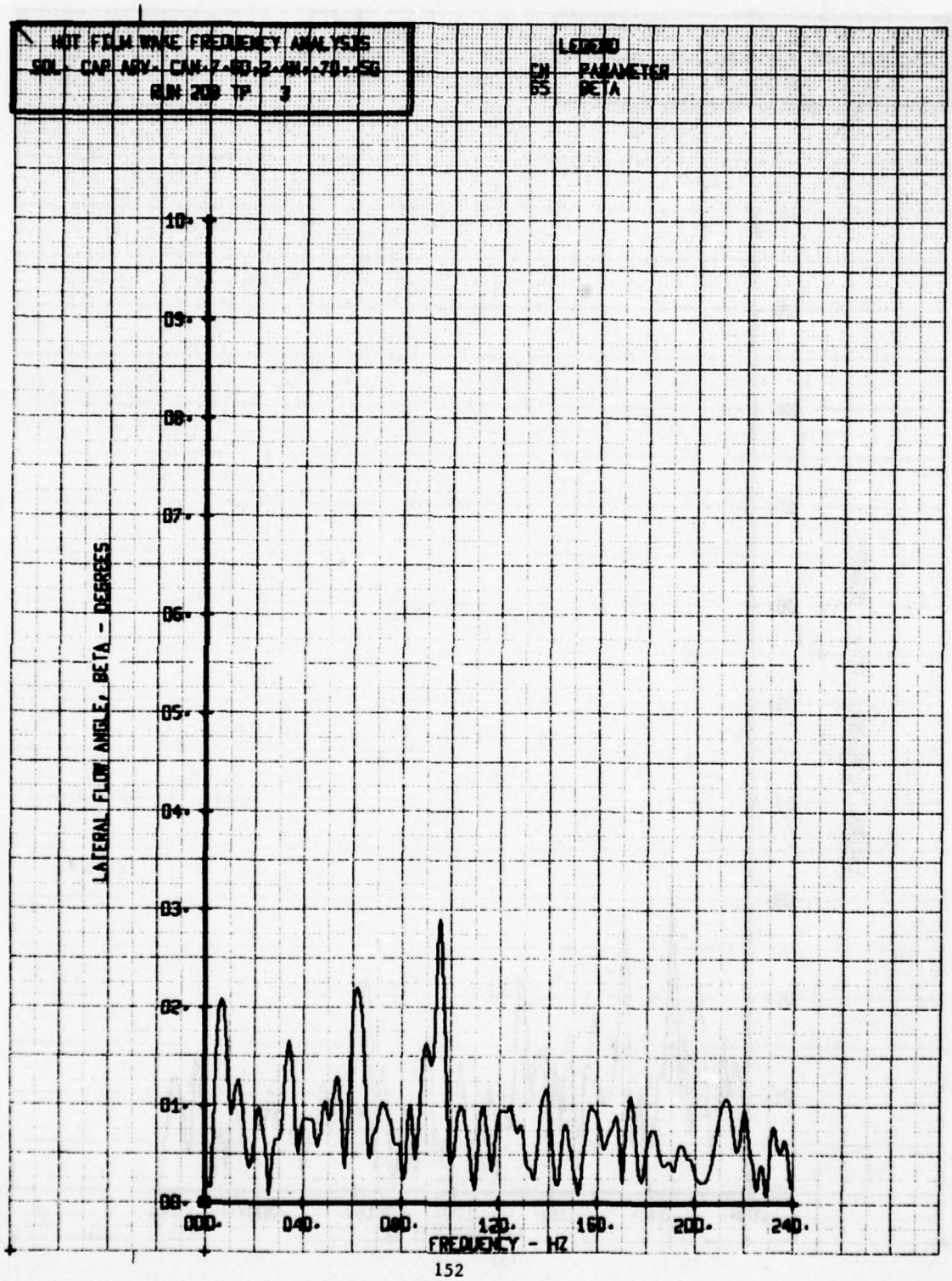
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARV. CAN.7.MD.2.AN.-70.-SG
RUN 208 TP 3
LEGEND
CH PARAMETER
65 BETA
10.
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LATERAL FLOW ANGLE, BETA - DEGREES
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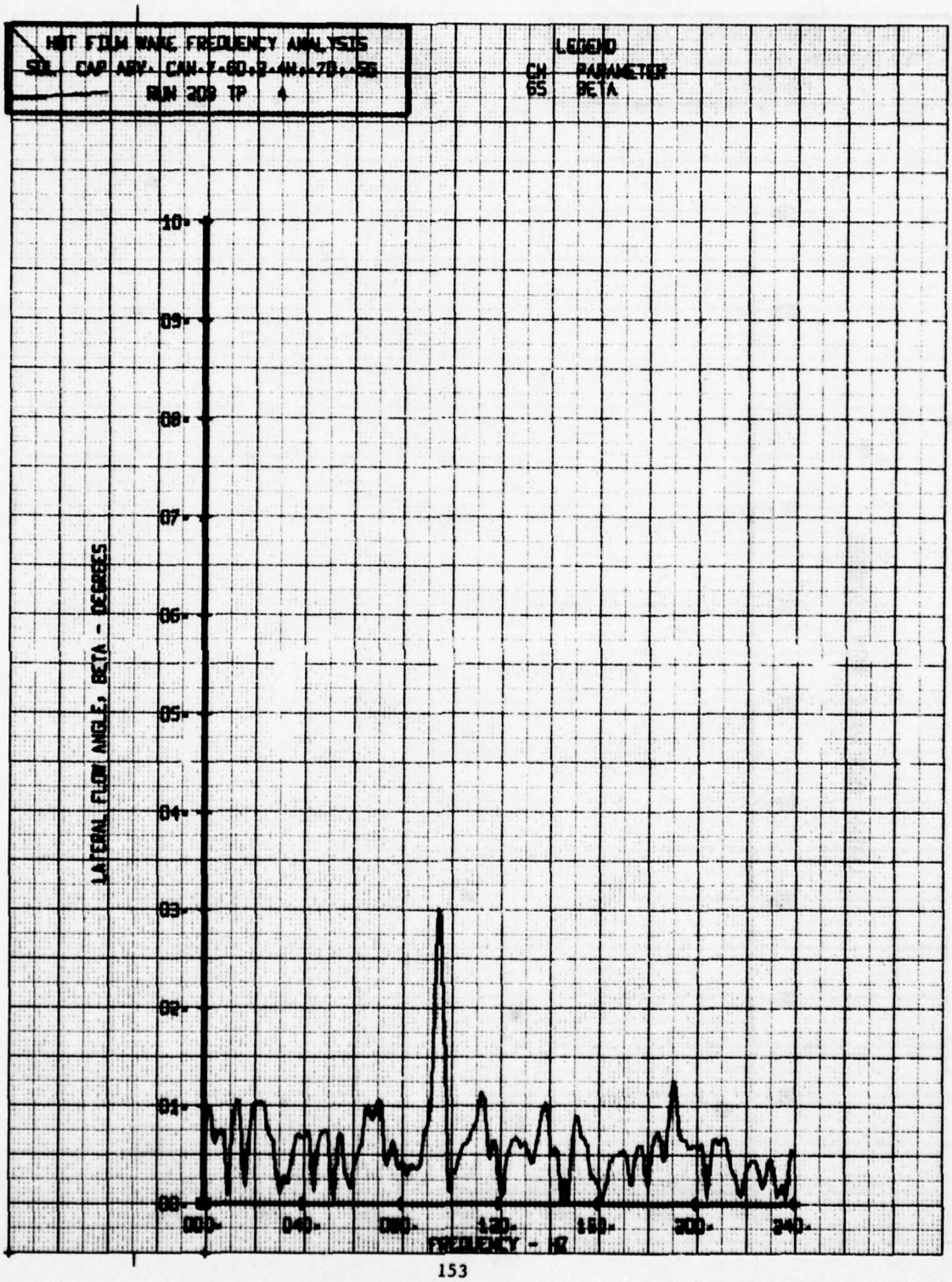
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.Y.60.2.4H.-70.-55
RUN 208 TP 4
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
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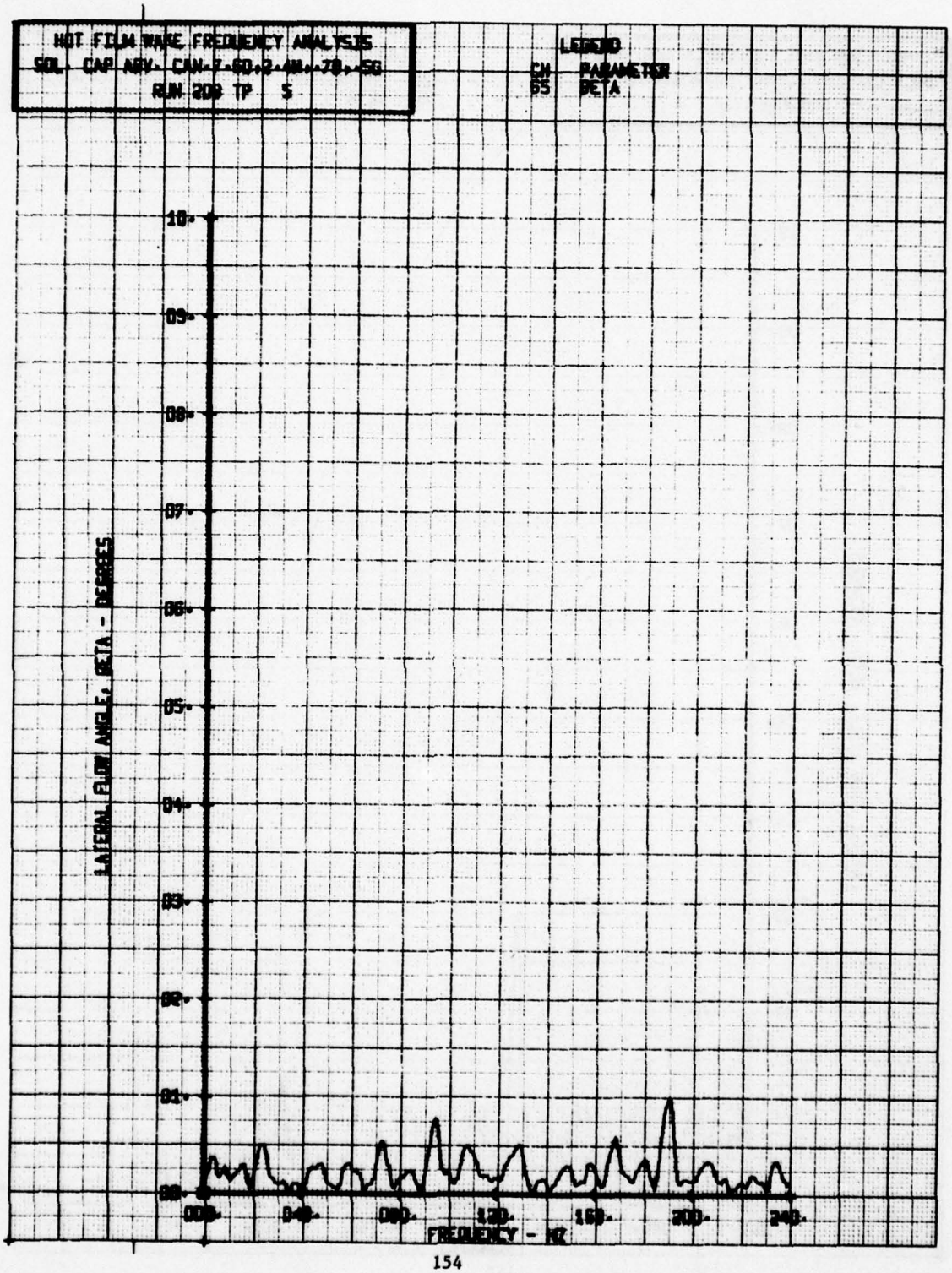
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN-7.60,2.48,.70,.56
RUN 208 TP 5
LEGEND
CH PARAMETER
65 BETA
10.
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LATERAL FLOW ANGLE, BETA - DEGREES
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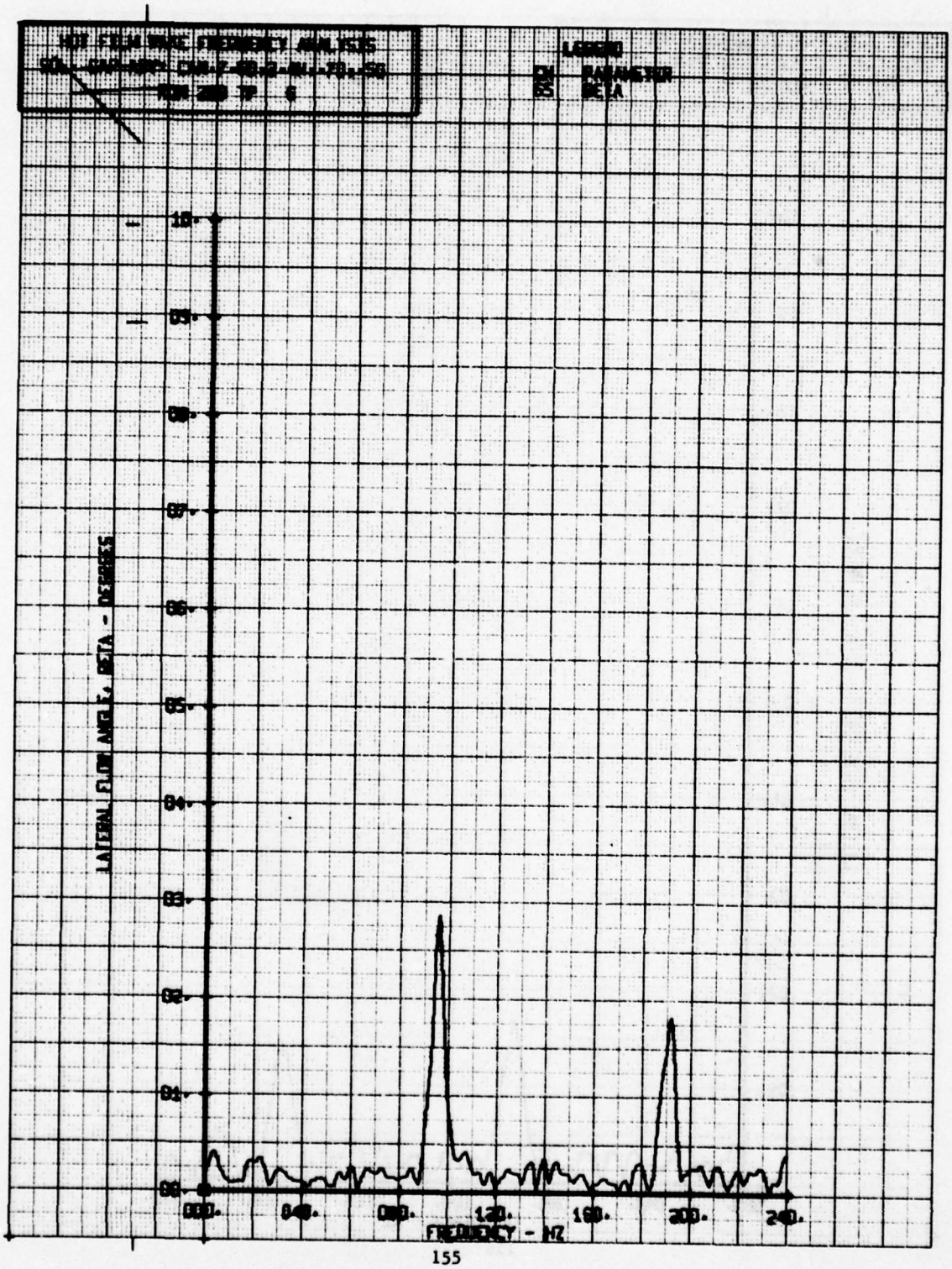
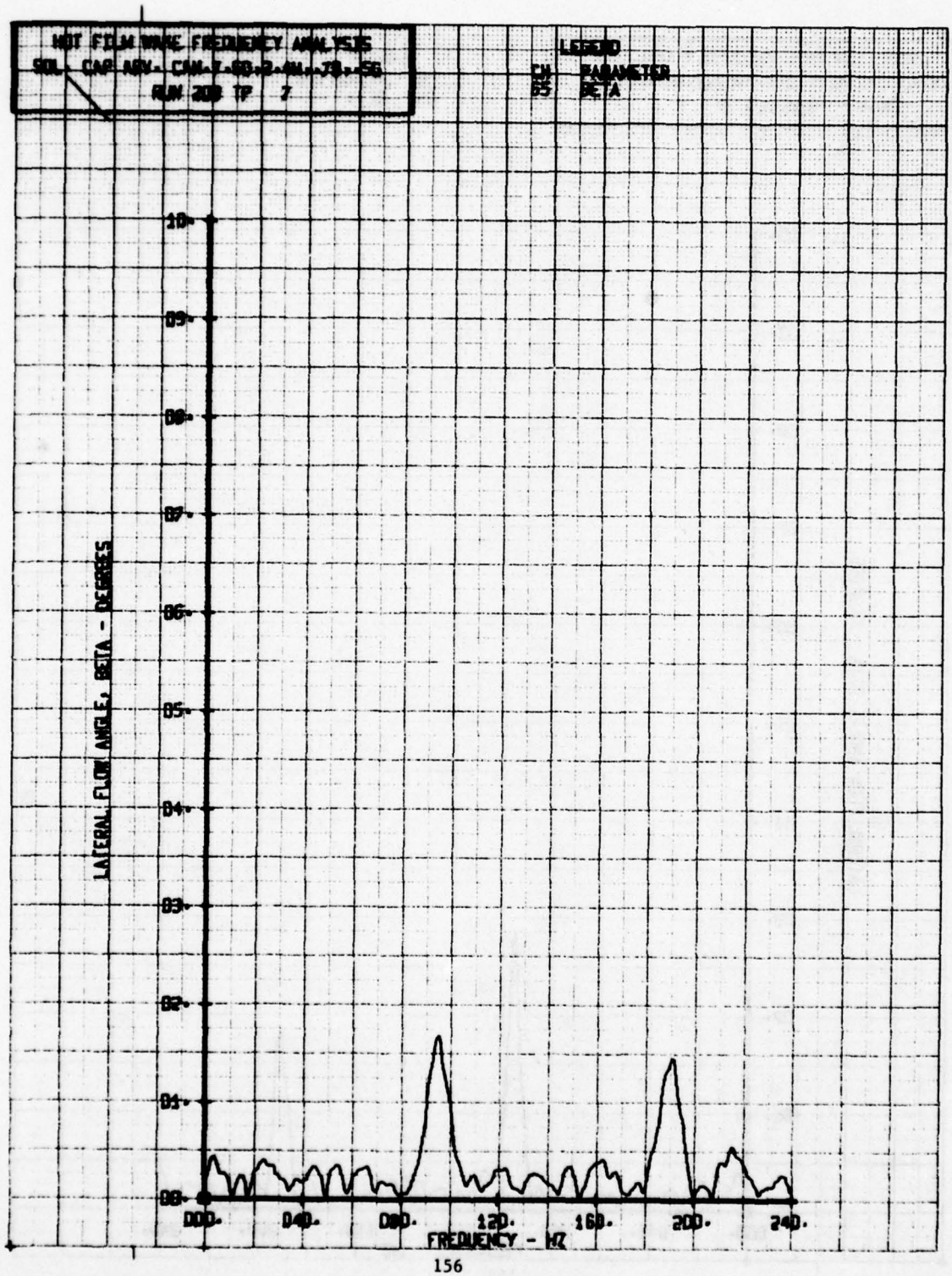
FREQUENCY - HZ


LEGEND
BETA
LATERAL SLOPE ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 208 TP 7
LEGEND
CH PARAMETER
05 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
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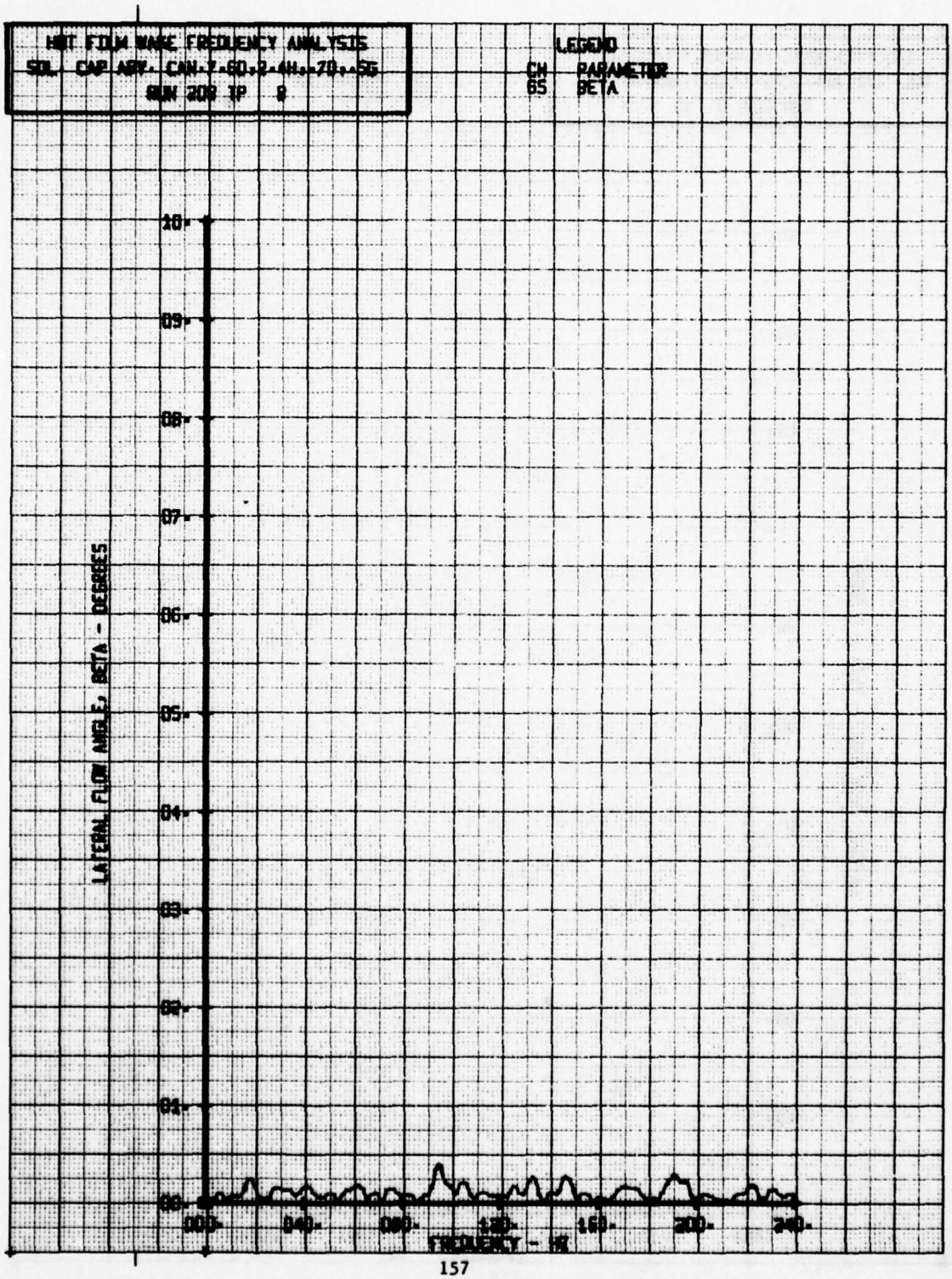
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SDL CAP ABV. CAN.7.60.2.4H.-70.-56
RUN 208 IP 8
LEGEND
CH PARAMETER
65 BETA
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LATERAL FLOW ANGLE, BETA - DEGREES
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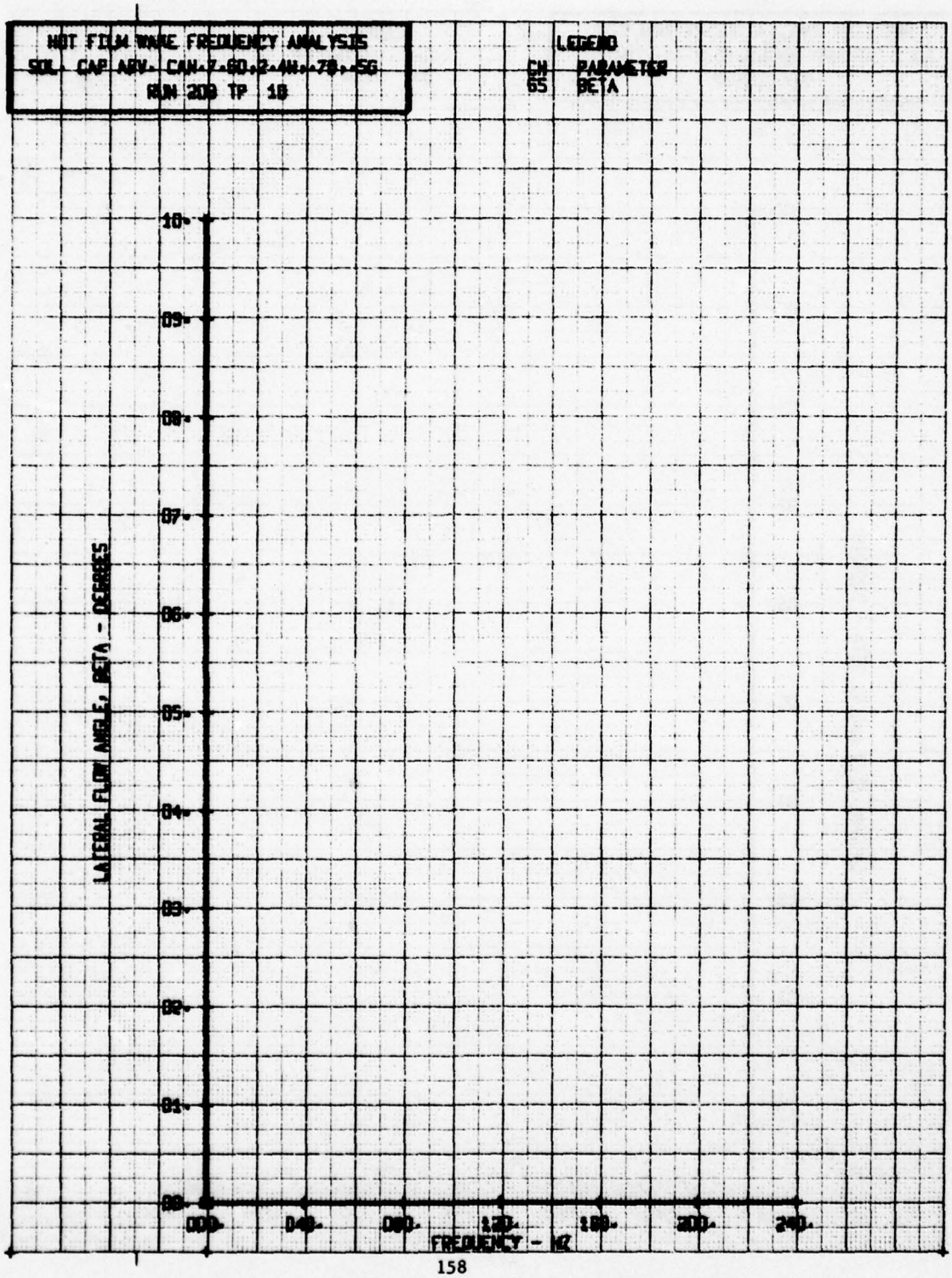
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARV. CAN.7.60.2.4N.-78.-5G
RUN 208 TP 18
LEGEND
CH PARAMETER
65 BETA
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LATERAL FLOW ANGLE, BETA - DEGREES
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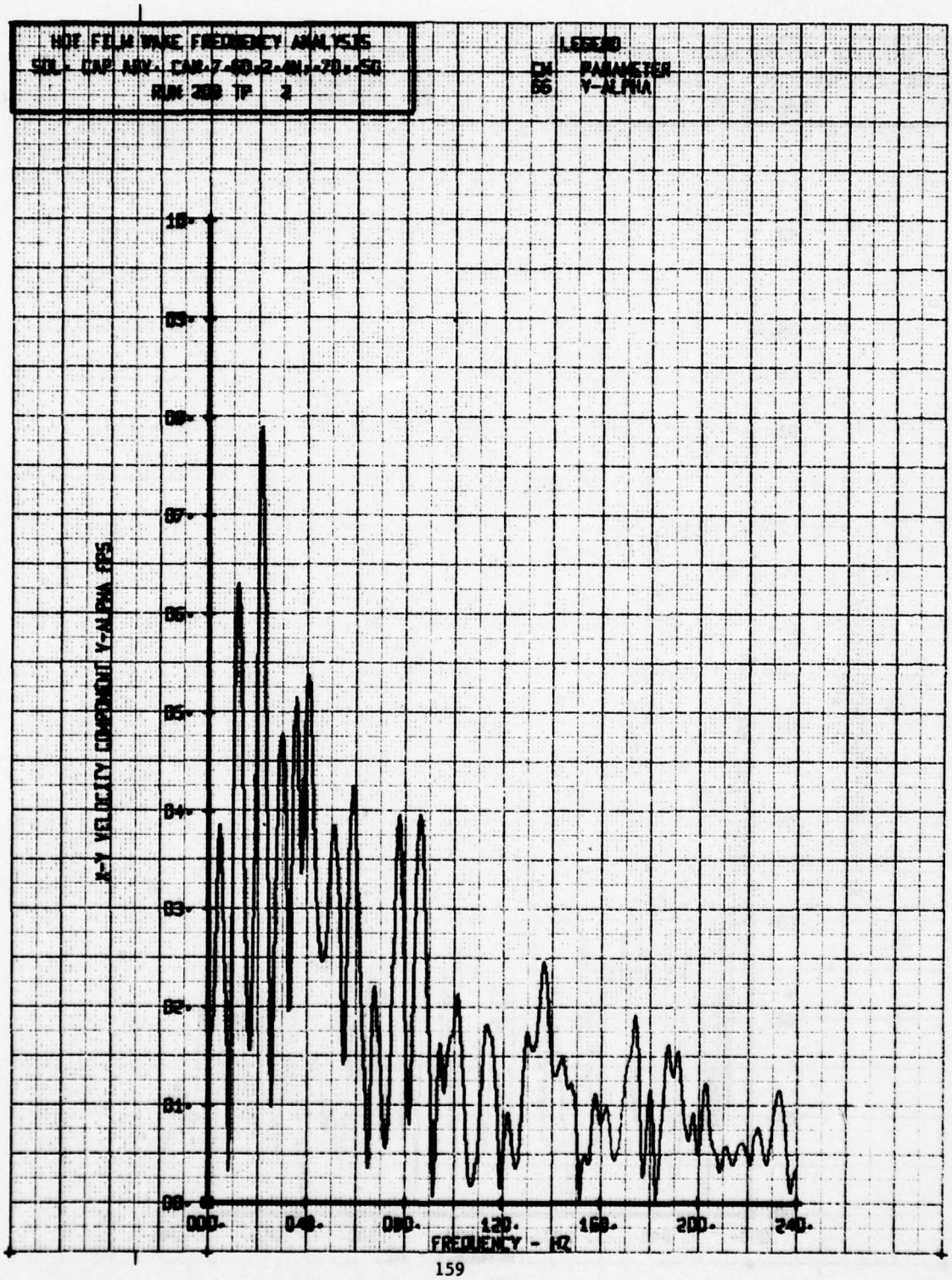
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARV. CAR.7.60.2.4N.-70.-SG
RUN 2E8 TP 2
LEGEND
CH PARAMETER
S6 Y-ALPHA
X-Y VELOCITY COMPONENT Y-ALPHA FPS
FREQUENCY - HZ
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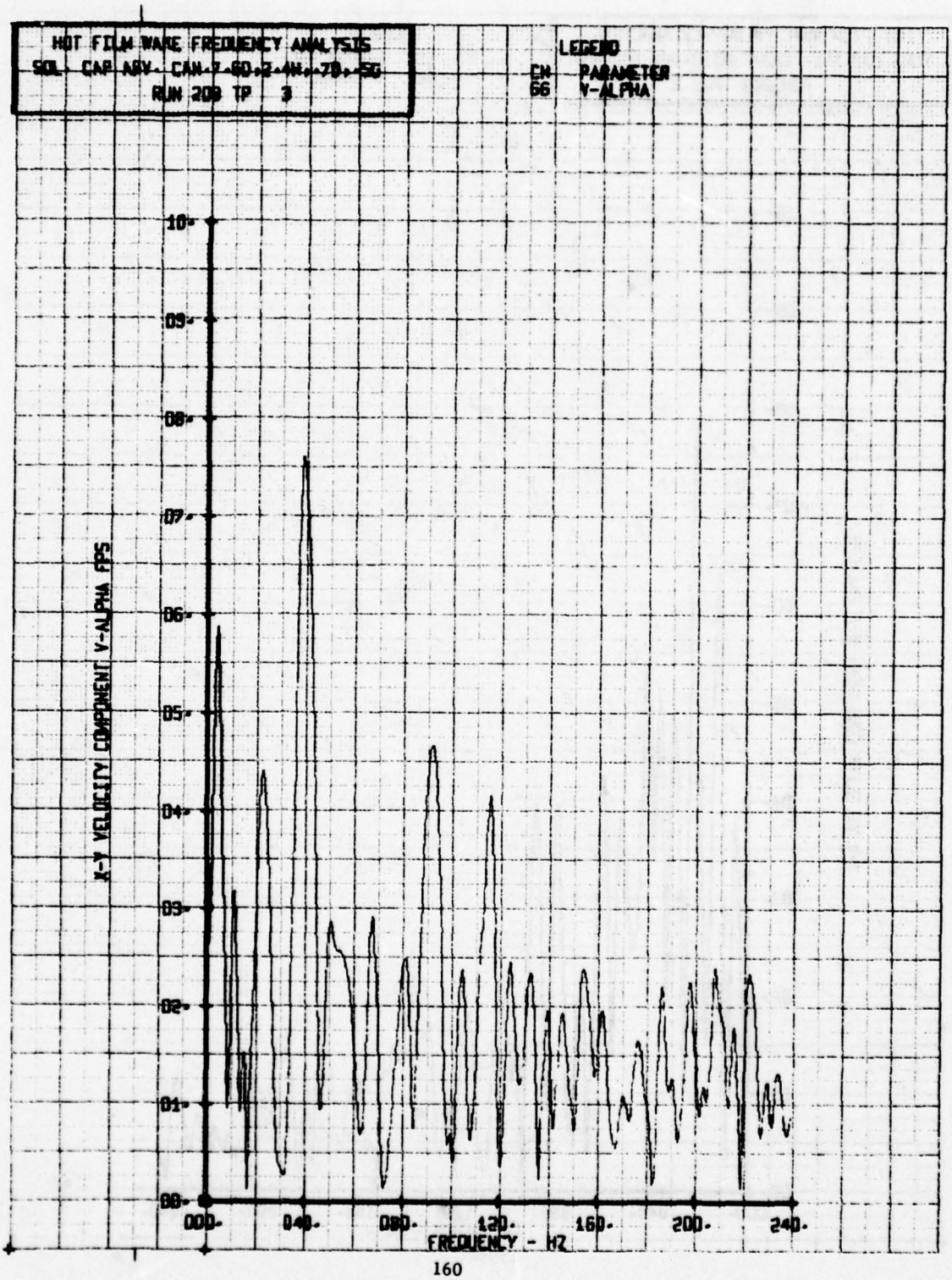
HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7.6D.2.4N.,7D,.5G
RUN 208 TP 3
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
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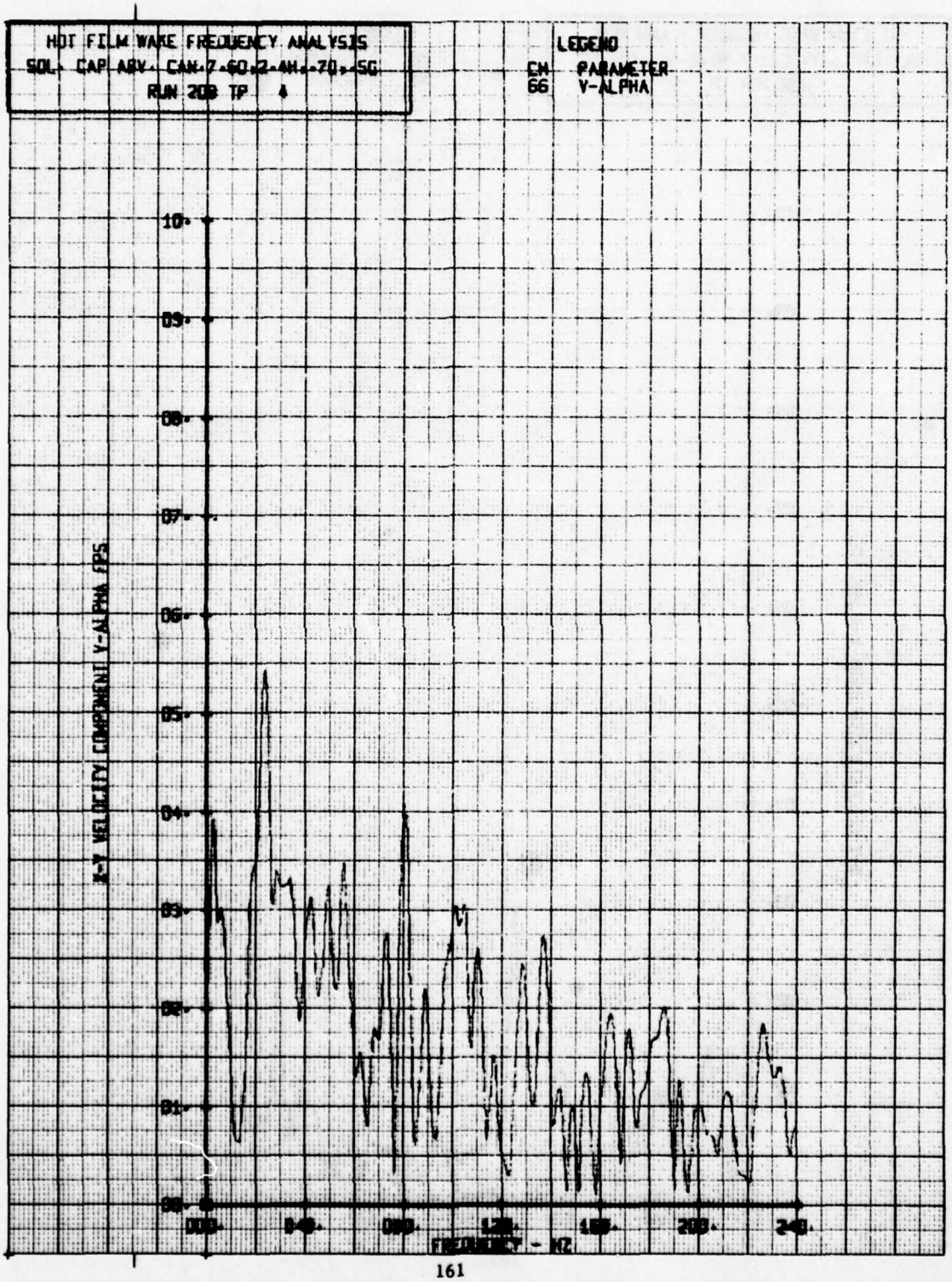
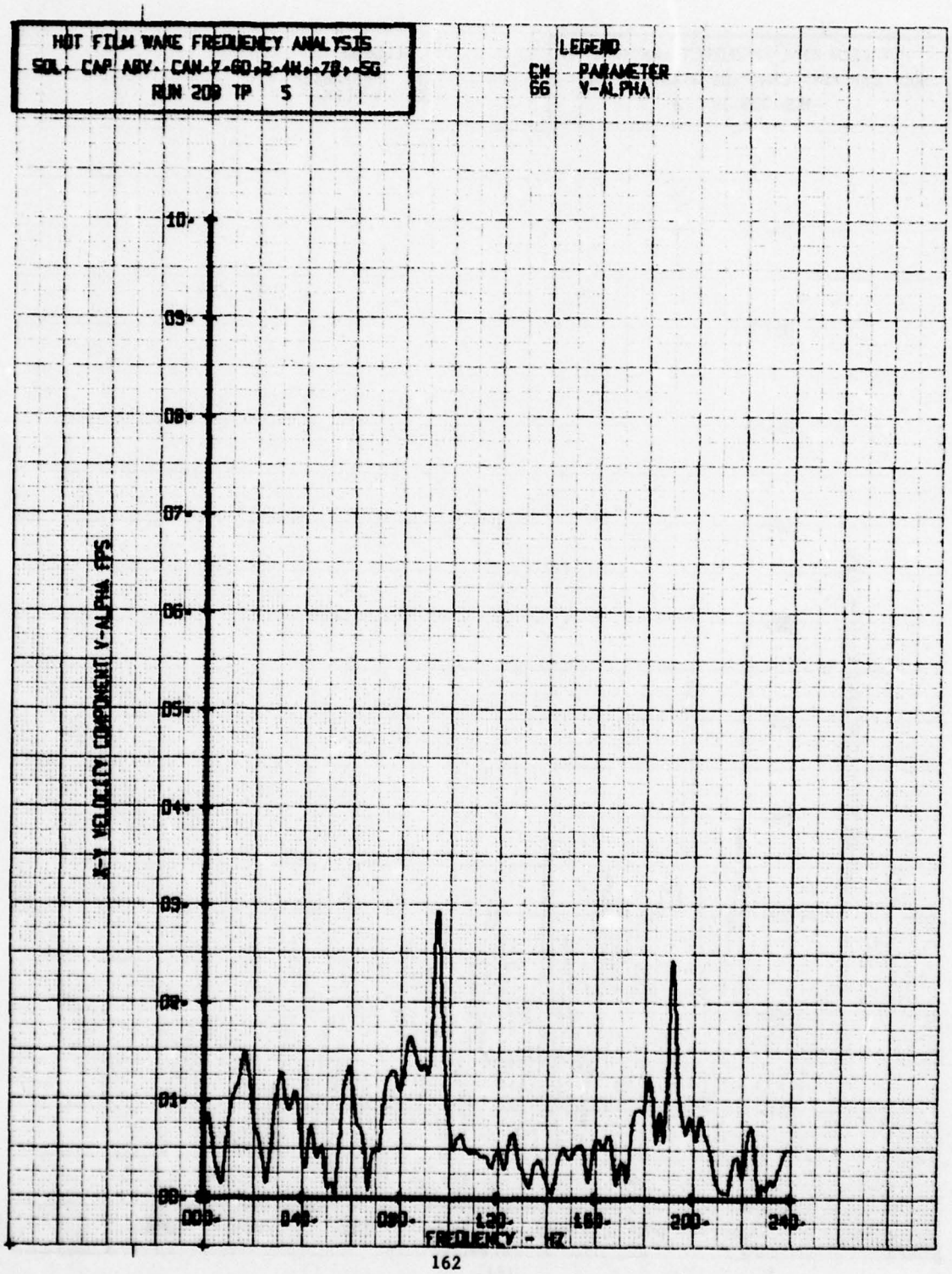
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARV. CAN.7.60.2.4H.-70.-5G
RUN 208 TP 4
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7-60.2-4H.-78.-SG
RUN 209 TP 5
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
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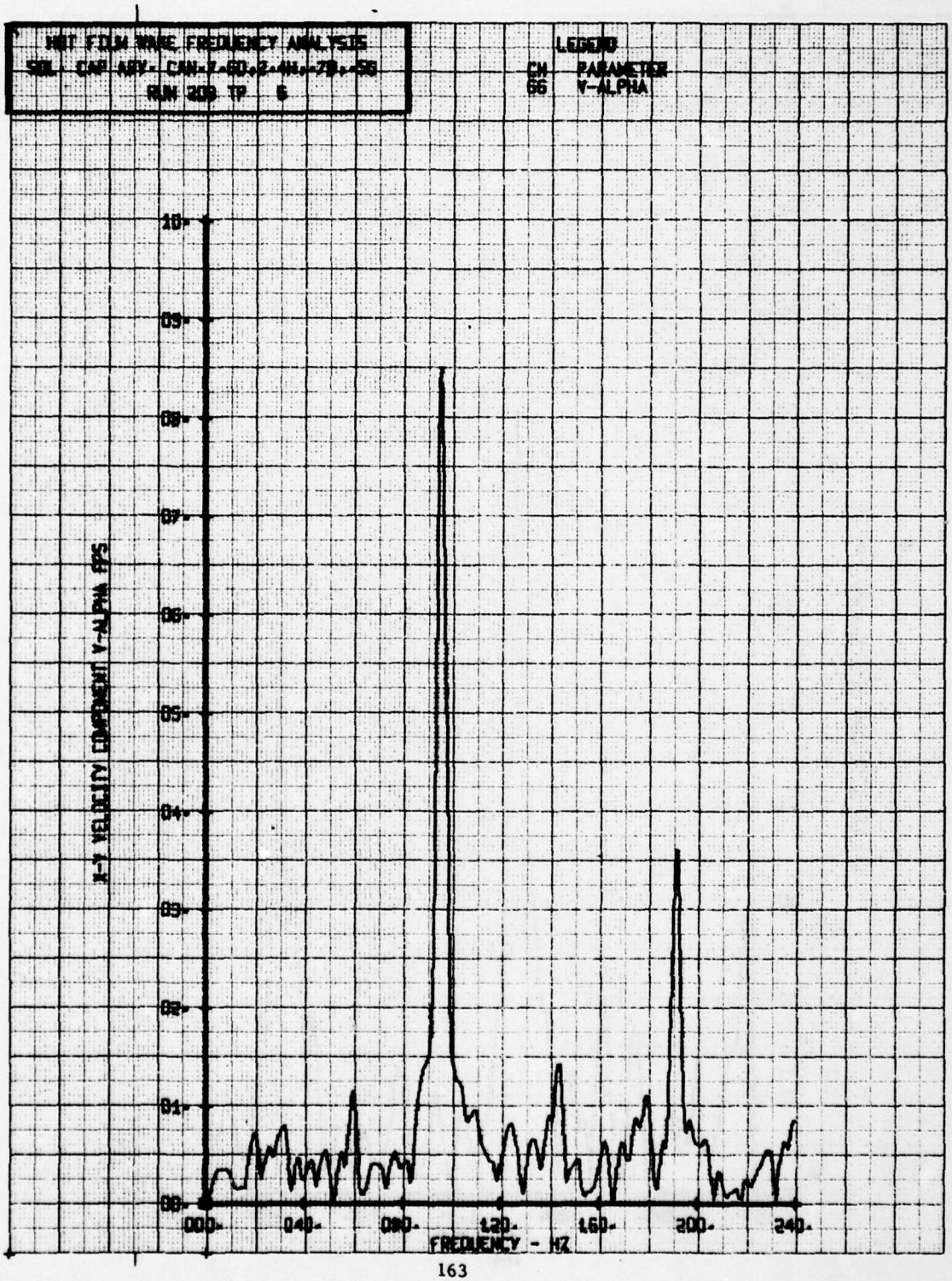
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL- CAP ADV- CAN-2.60,2.44,-78,-56
RUN 208 TP 6
LEGEND
CM PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
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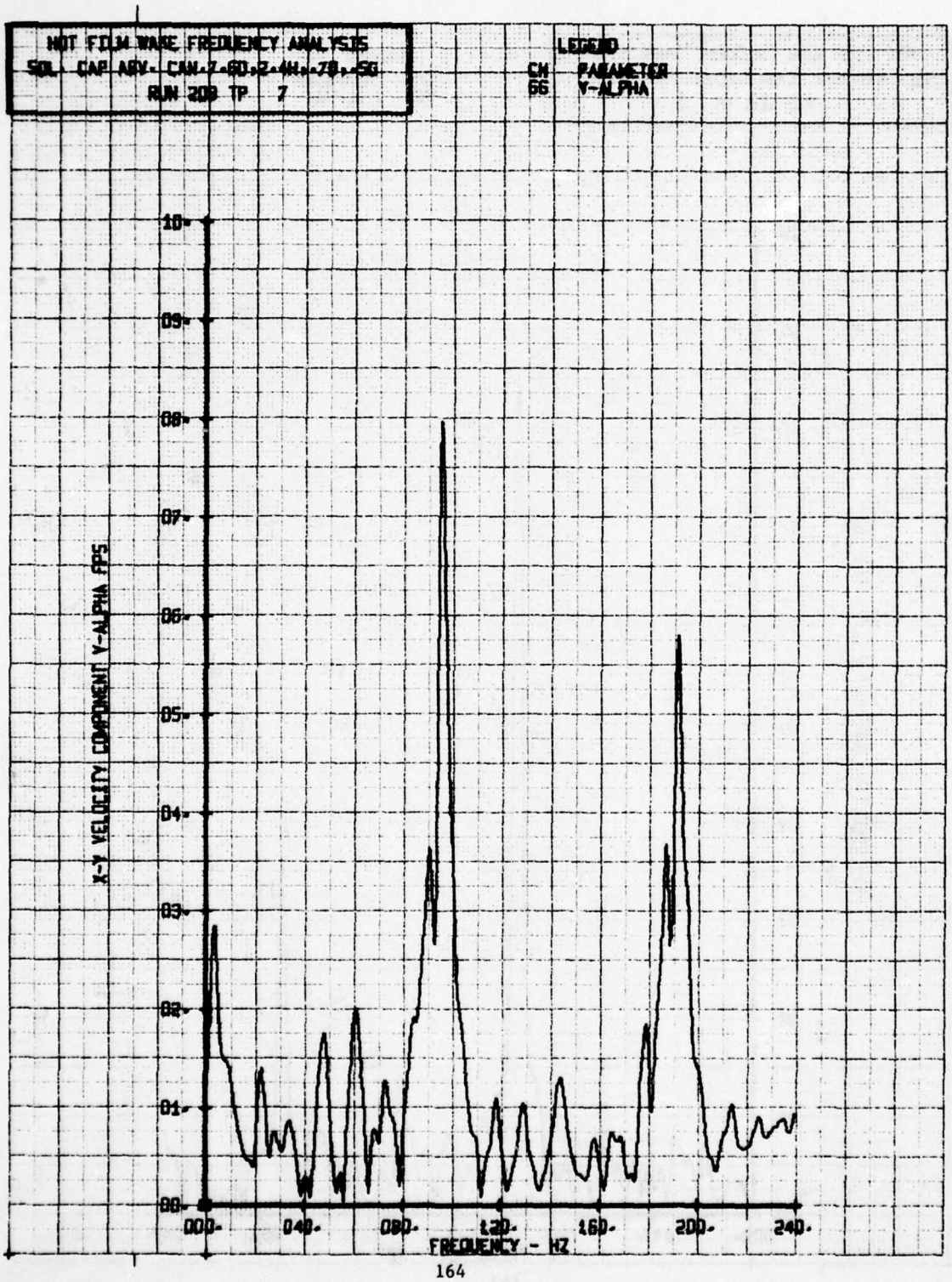
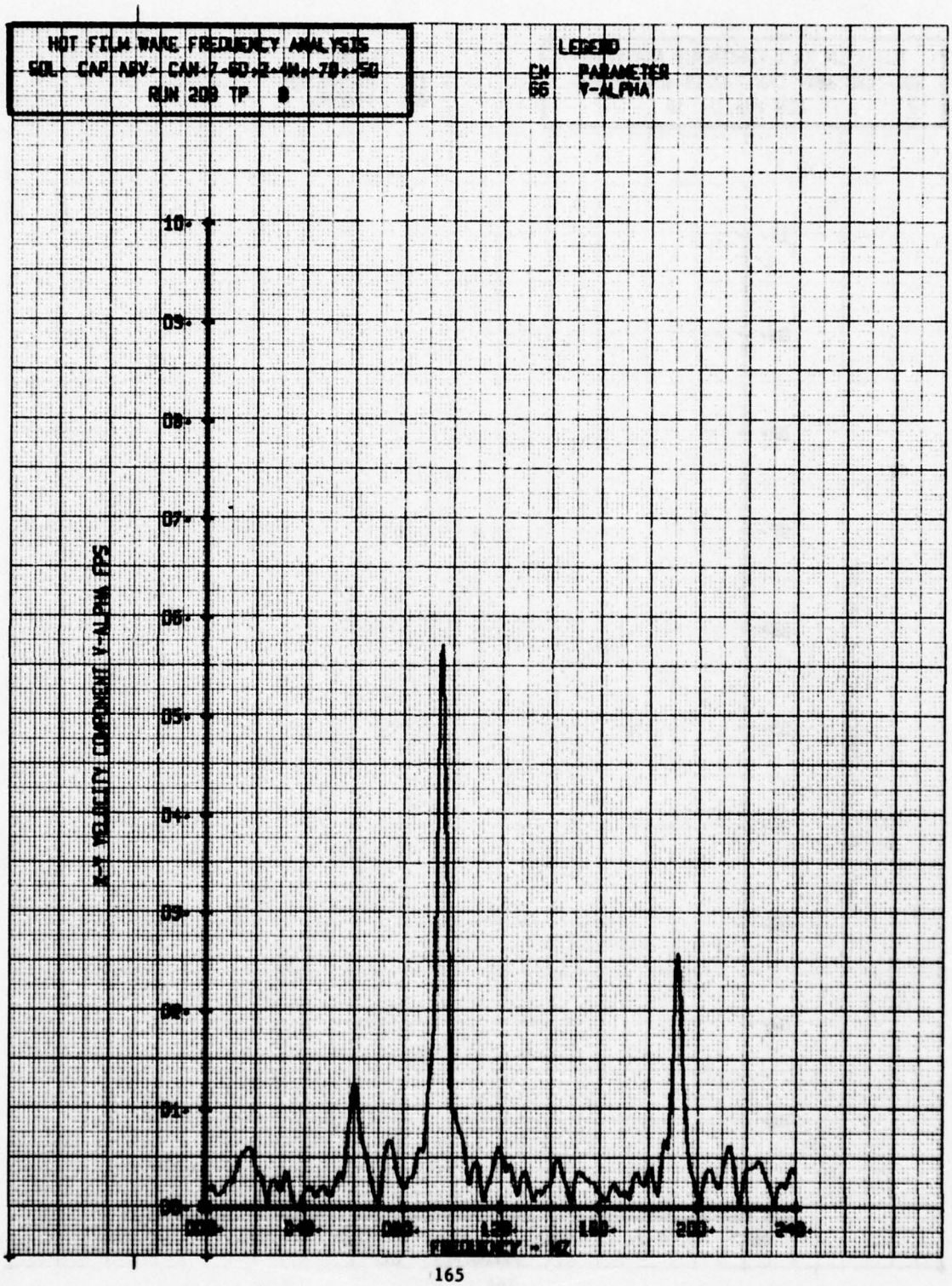
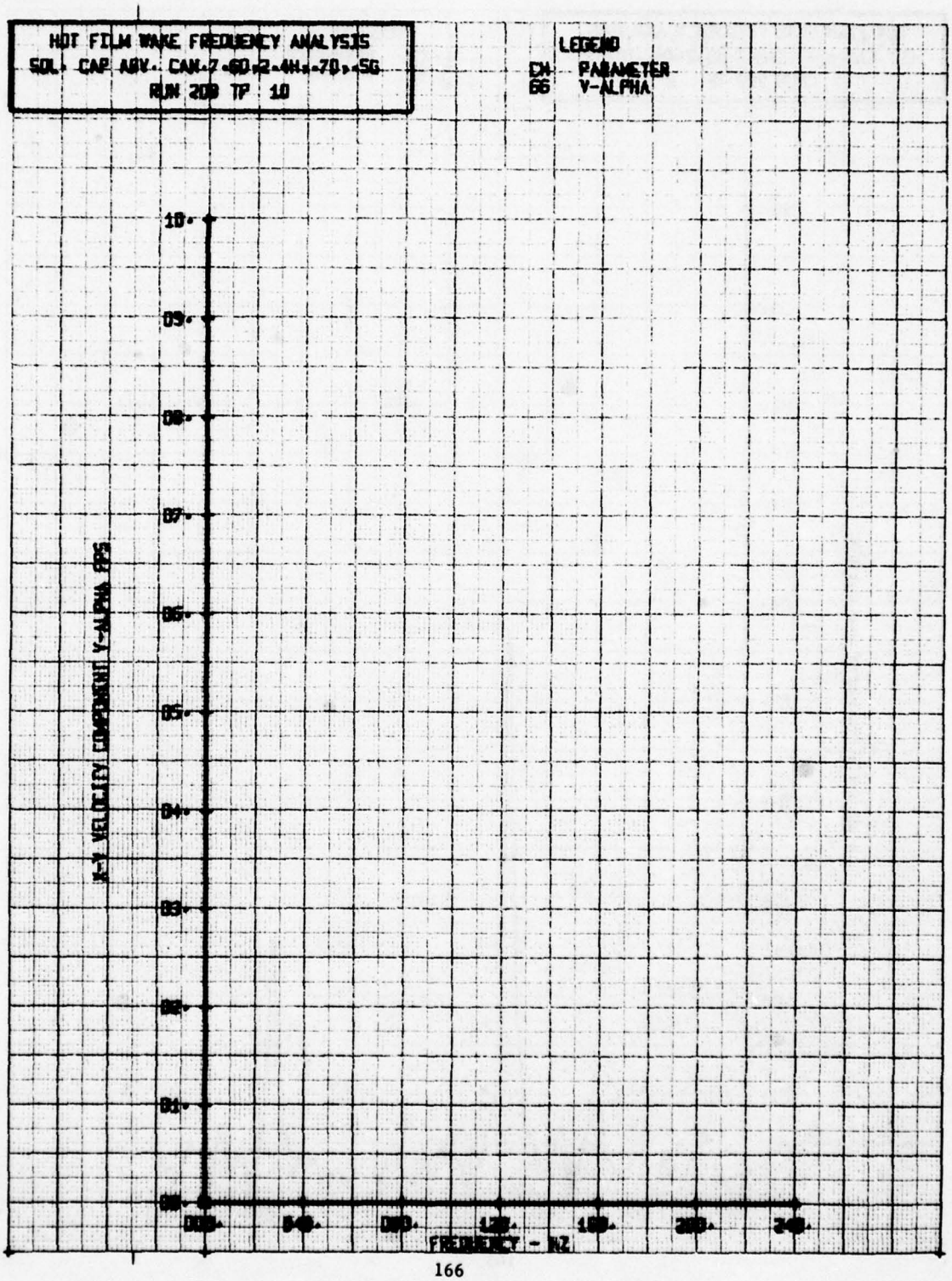
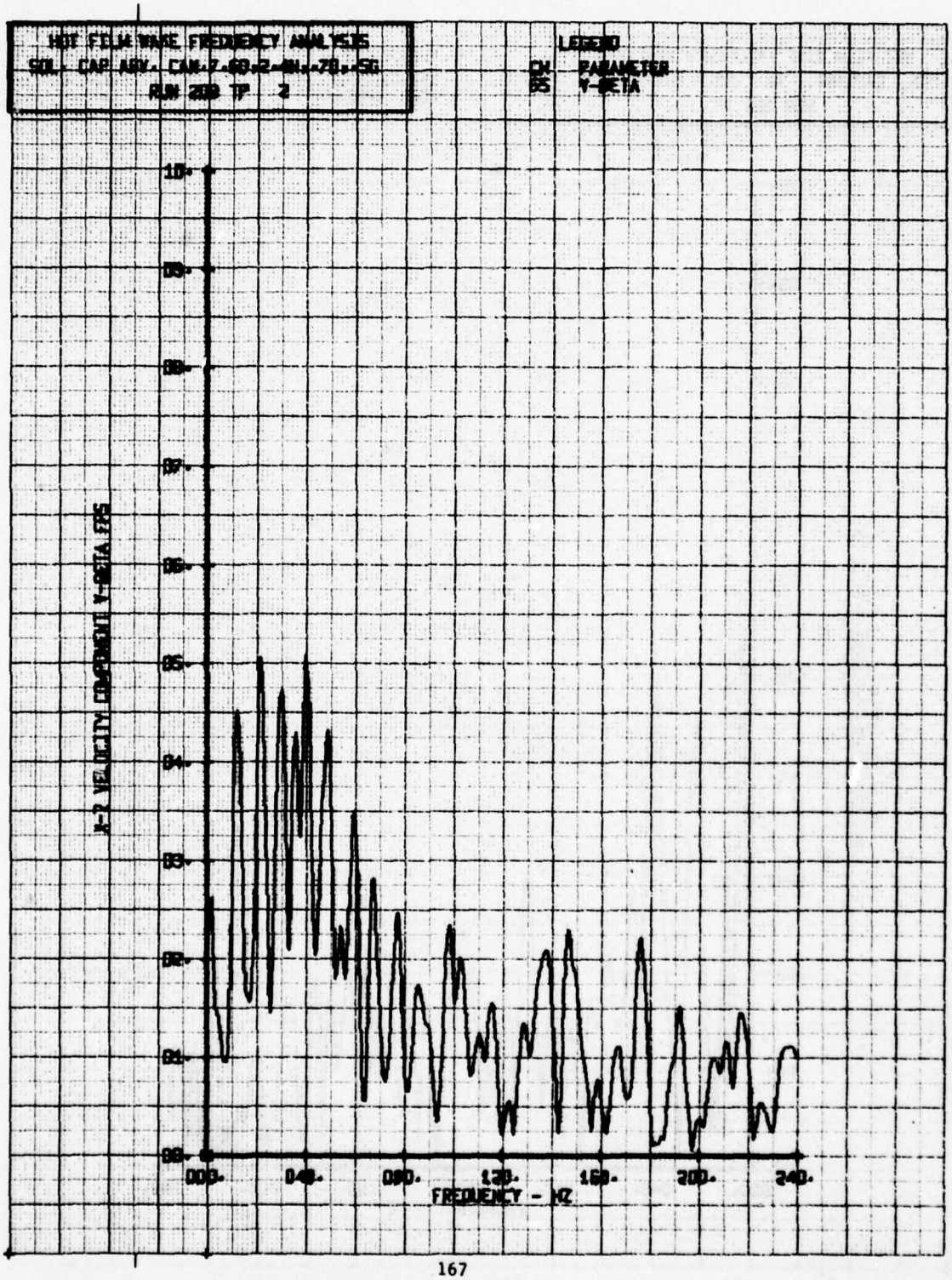
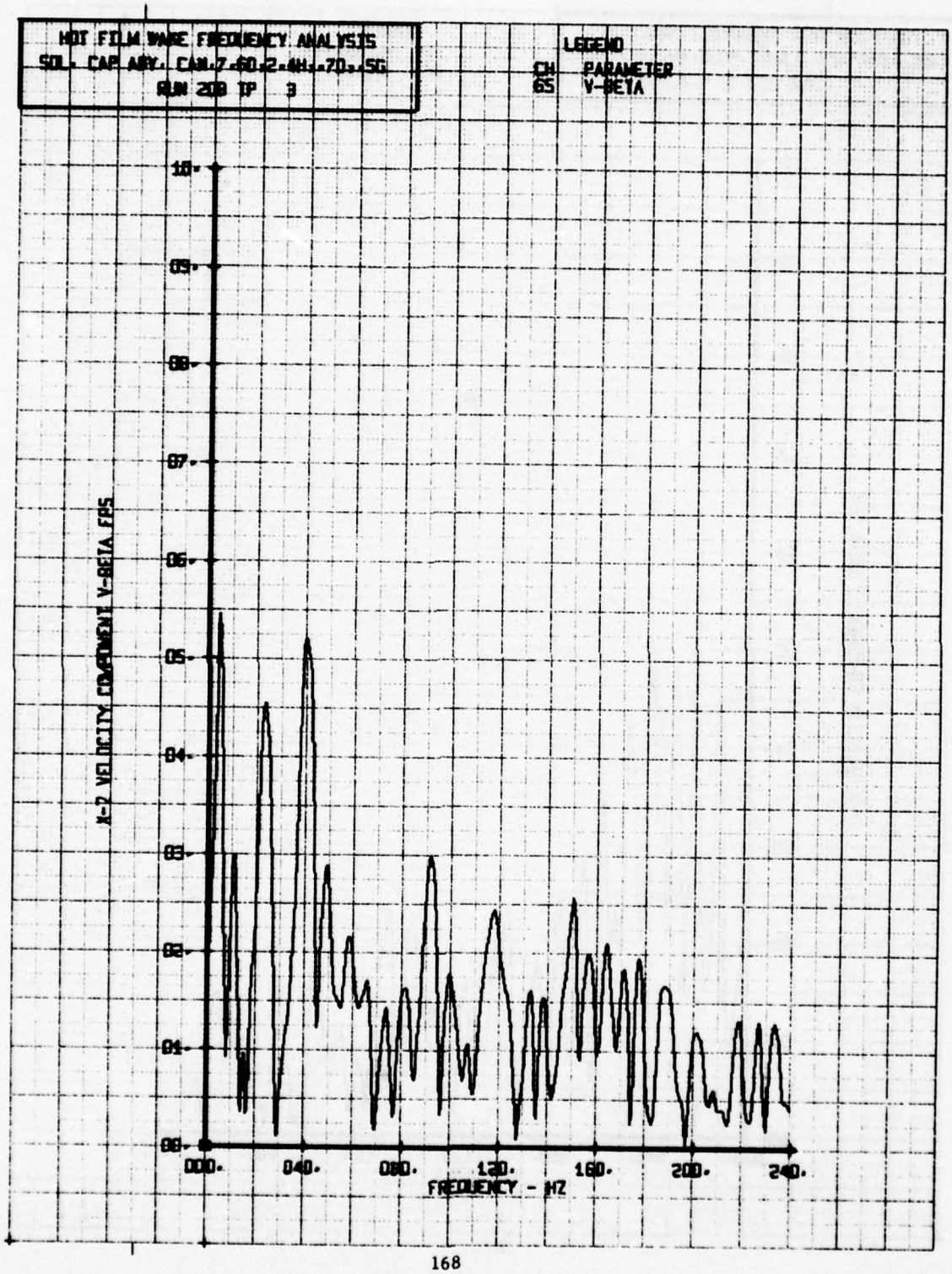
FREQUENCY - HZ

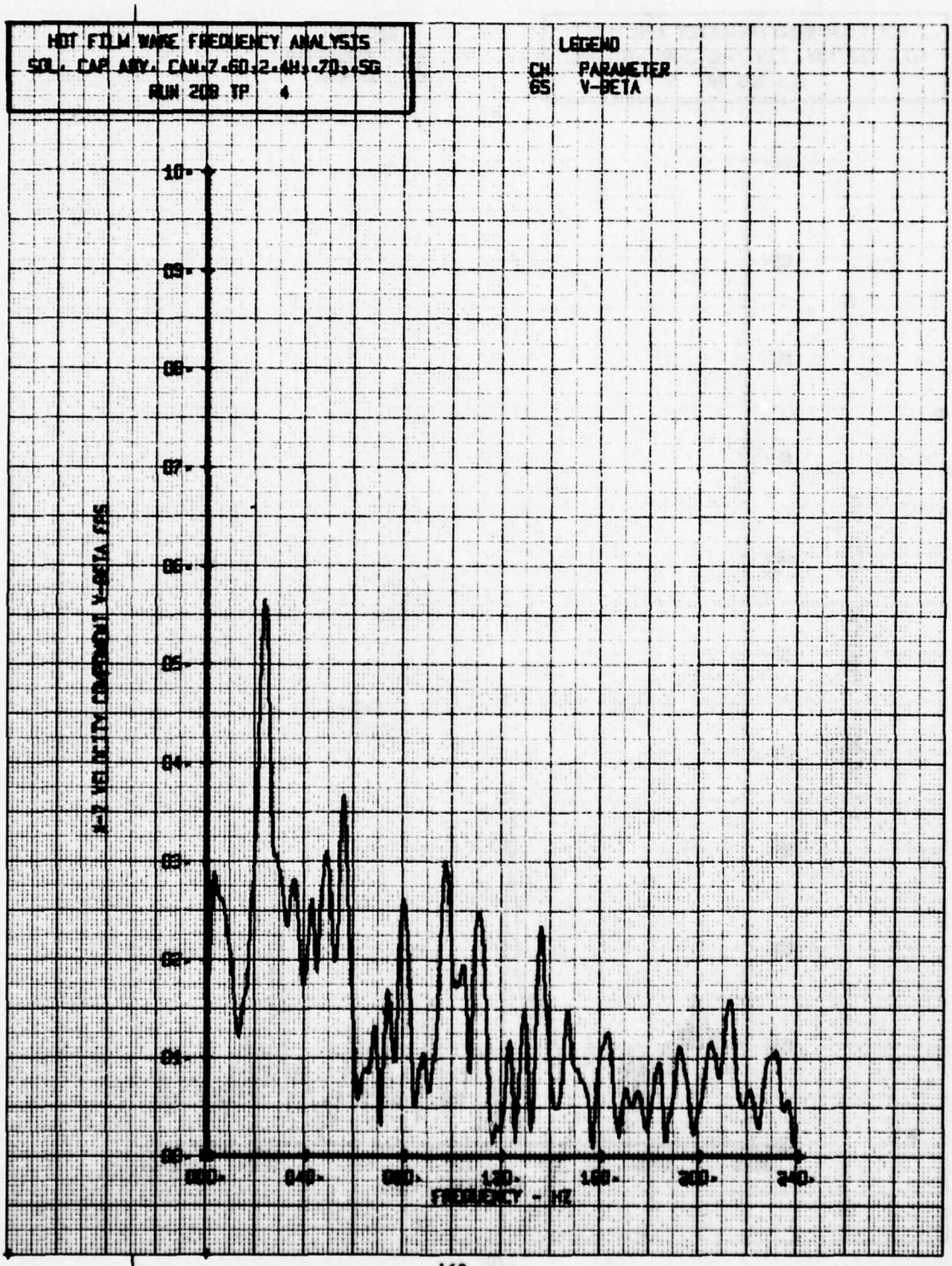

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7.60,2.4H,.78,.5G
RUN 208 TP 7
LEGEND
CH PARAMETER
66 Y-ALPHA
X-Y VELOCITY COMPONENT Y-ALPHA FPS
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

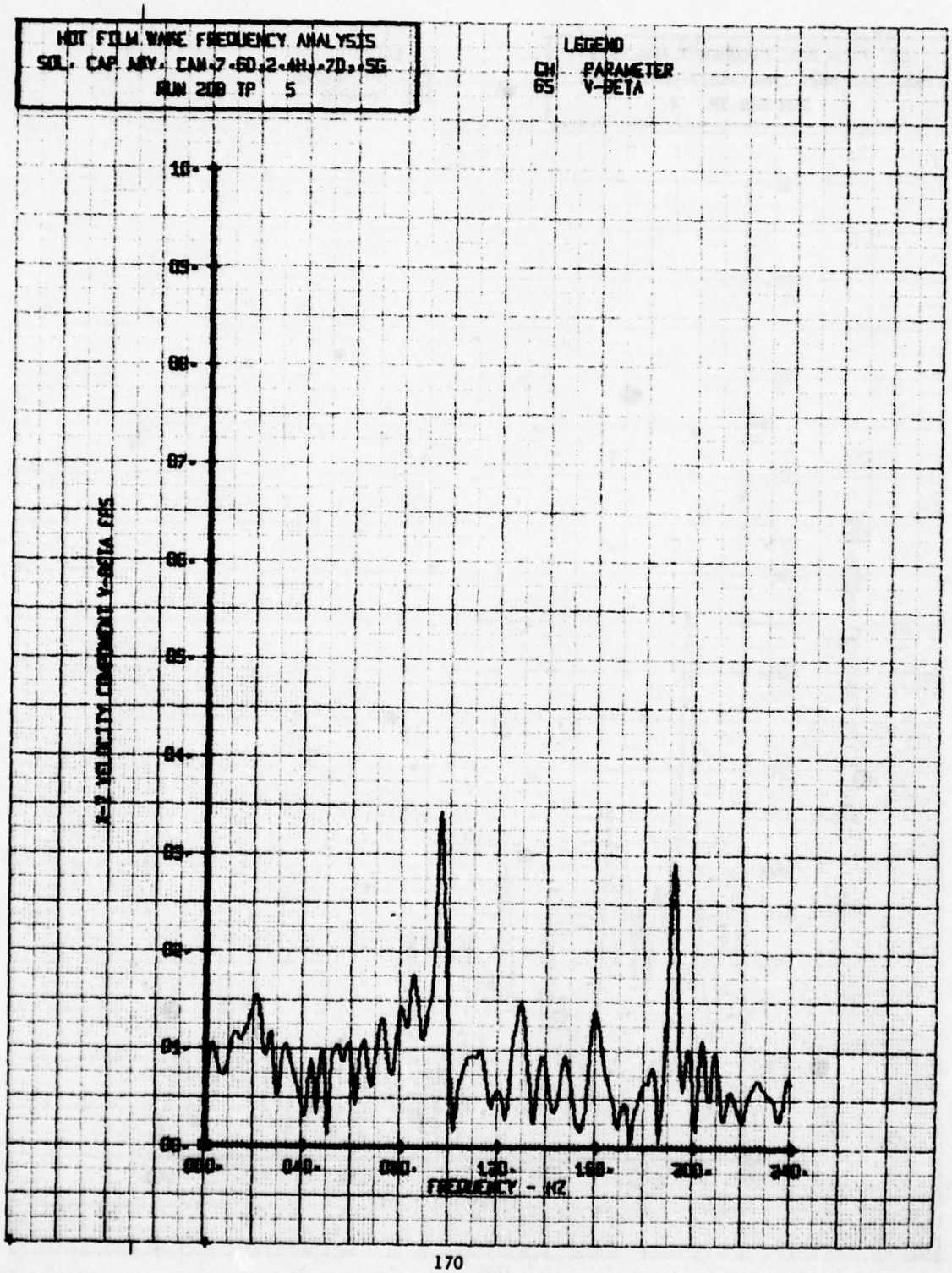

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7.60.2.4N.-70.-50
RUN 208 TP 0
LEGEND
CM PARAMETER
56 V-ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
X-F VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ

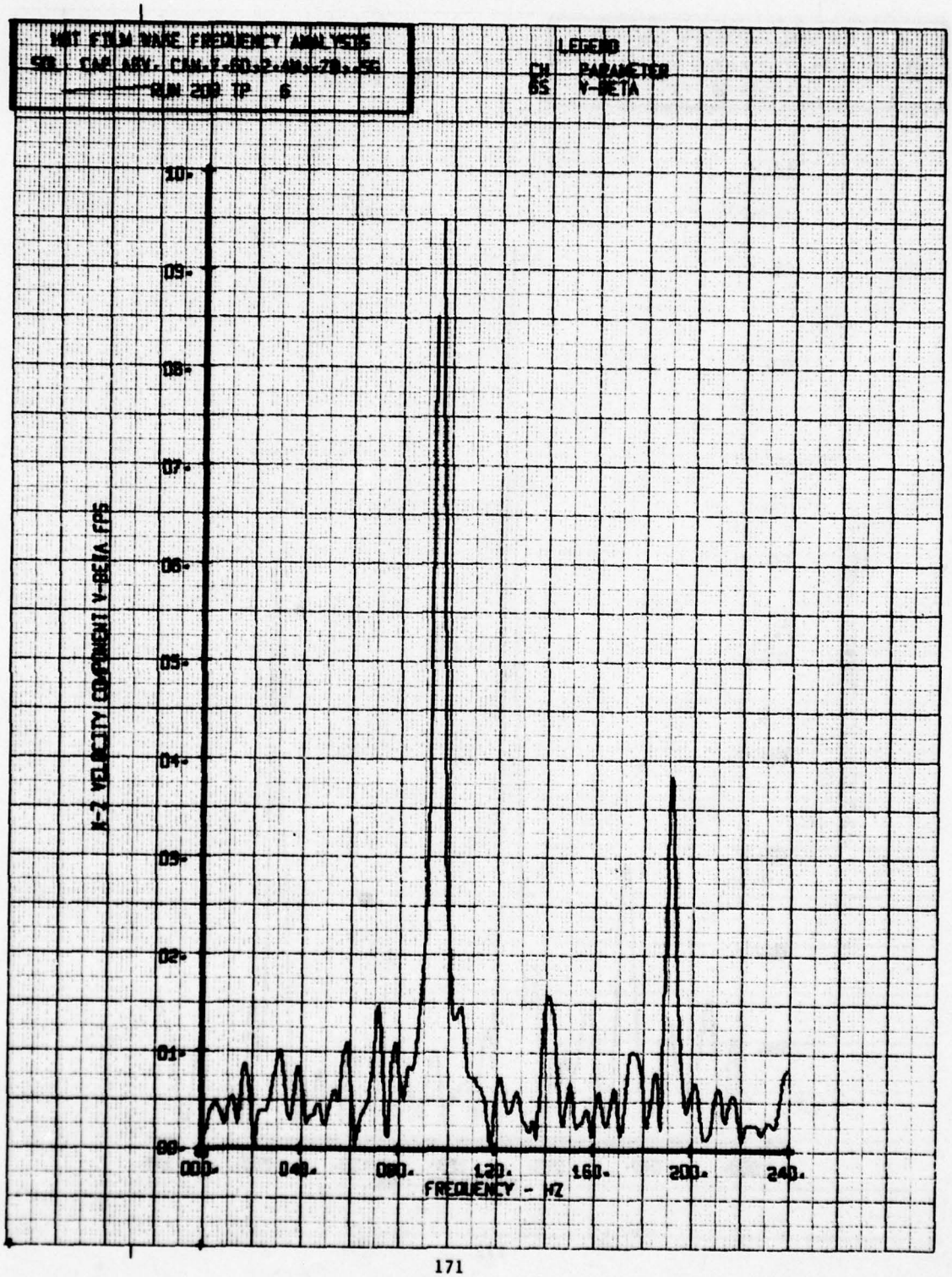

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7.60,2.4H,.70,.5G
RUN 209 TP 10
LEGEND
CH PARAMETER
66 V-ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
X-Y VELOCITY COMPONENT V-ALPHA FPS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

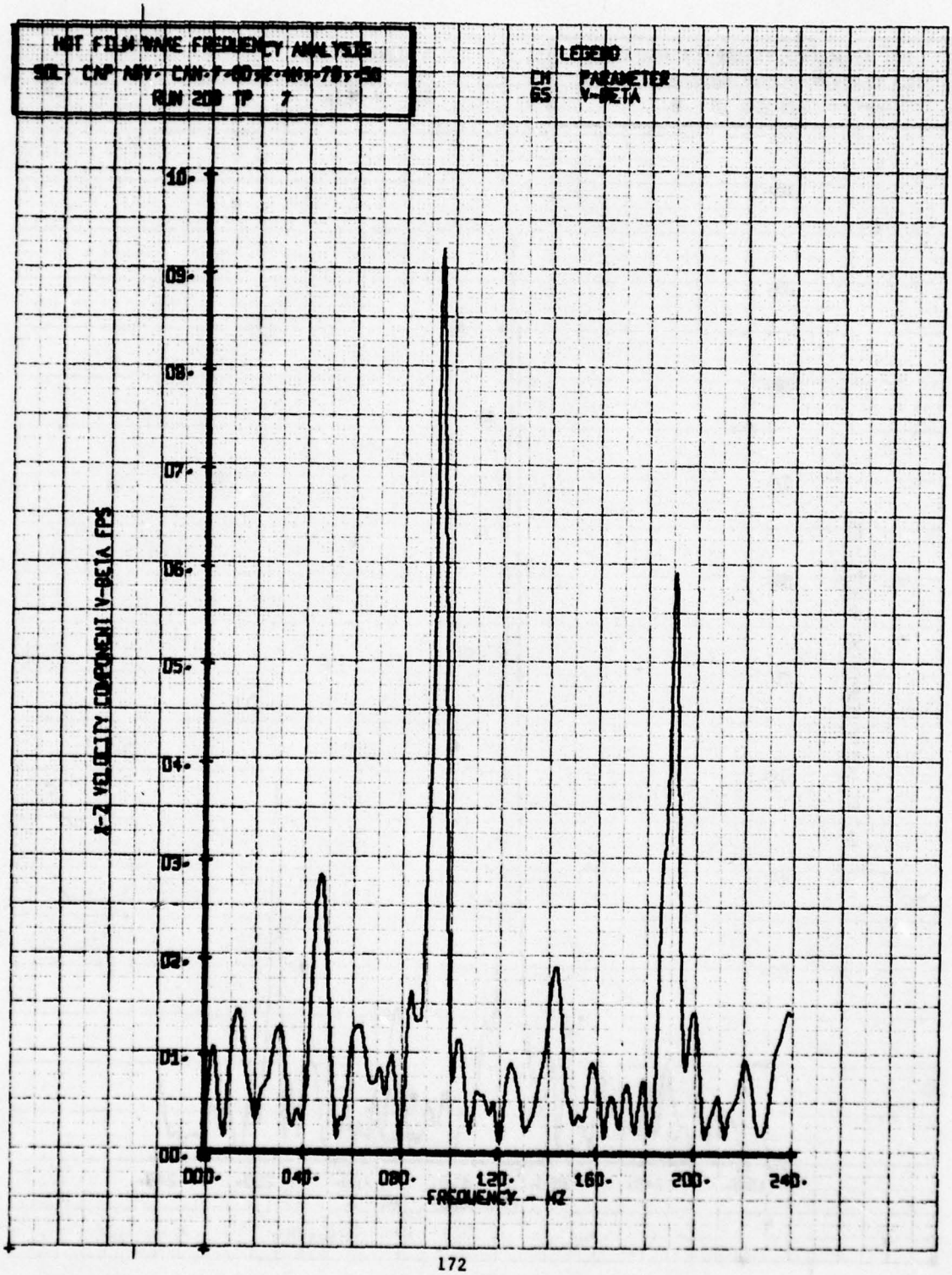

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ABV. CAN.7.60.2-BL.-70.-SG
RUN 208 TP 2
LEGEND
CH. PARAMETER
05 Y-BETA
X-2 VELOCITY COMPONENT Y-BETA FPS
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

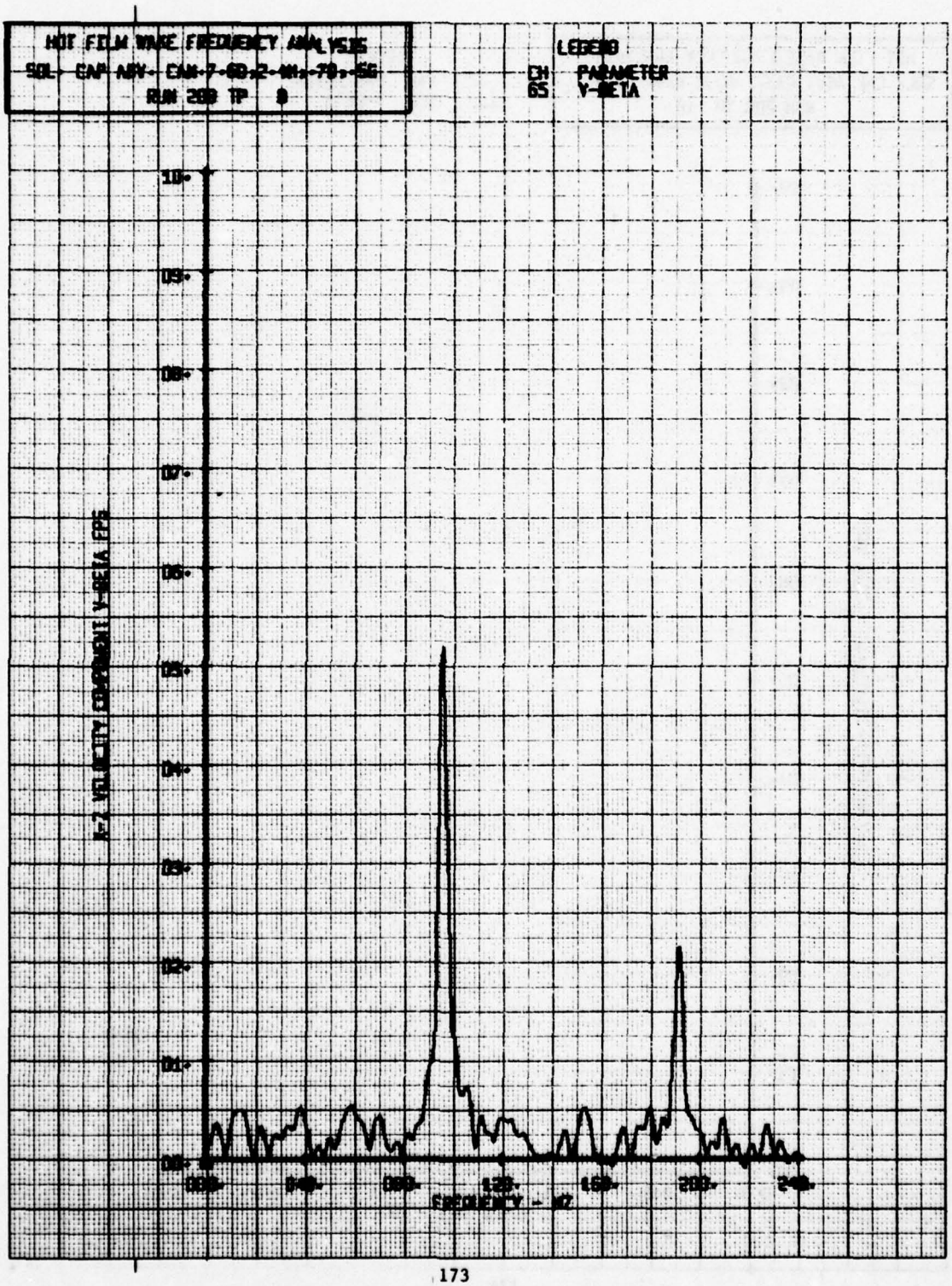

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARY. CAN.7.60.2.4H.70.5G
RUN 208 TP 3
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

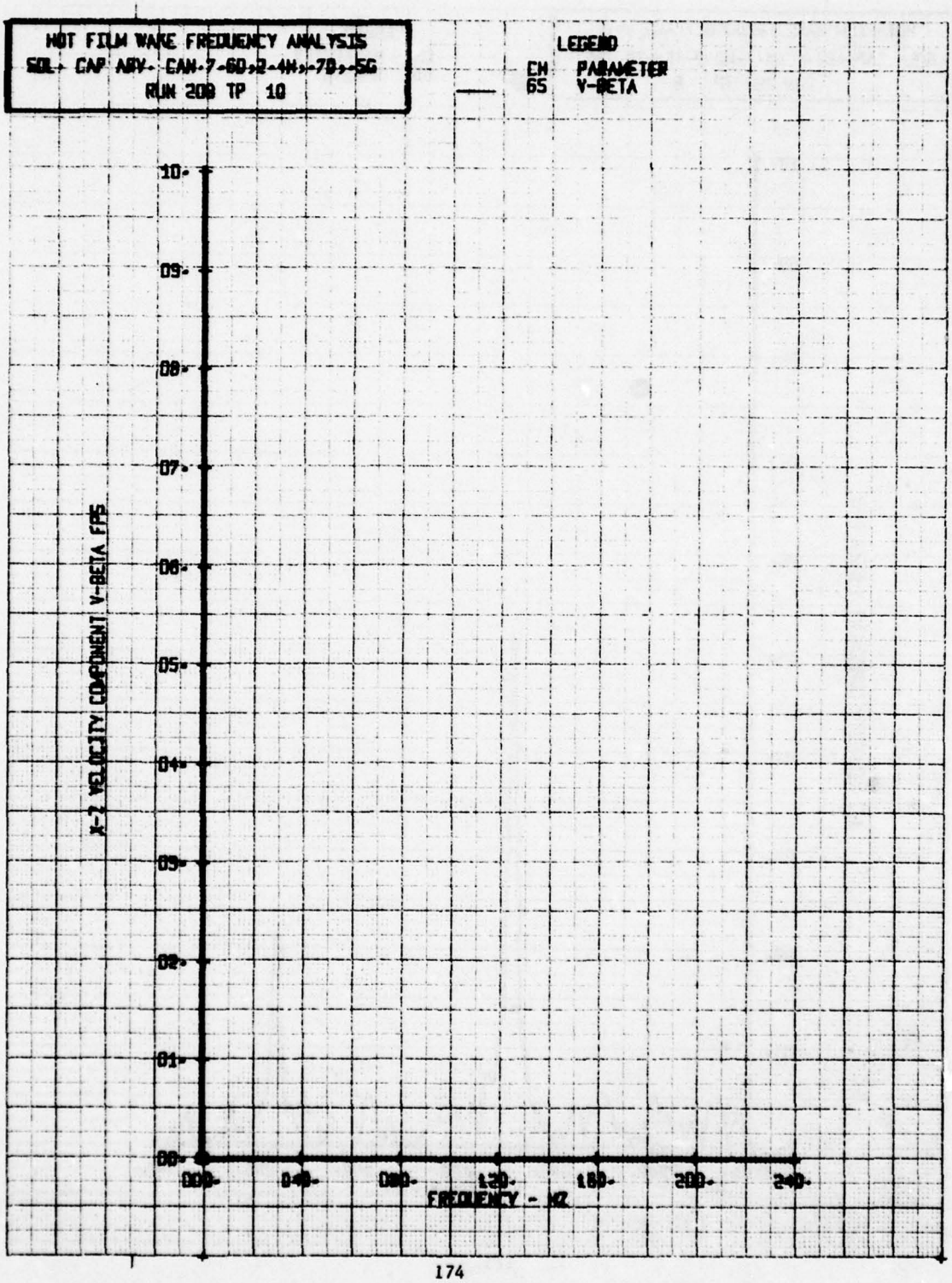

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP ARY. CAN.7.60.2.4H.70.SG
RUN 208 TP 4
LEGEND
CH. PARAMETER
65 V-BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
00.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

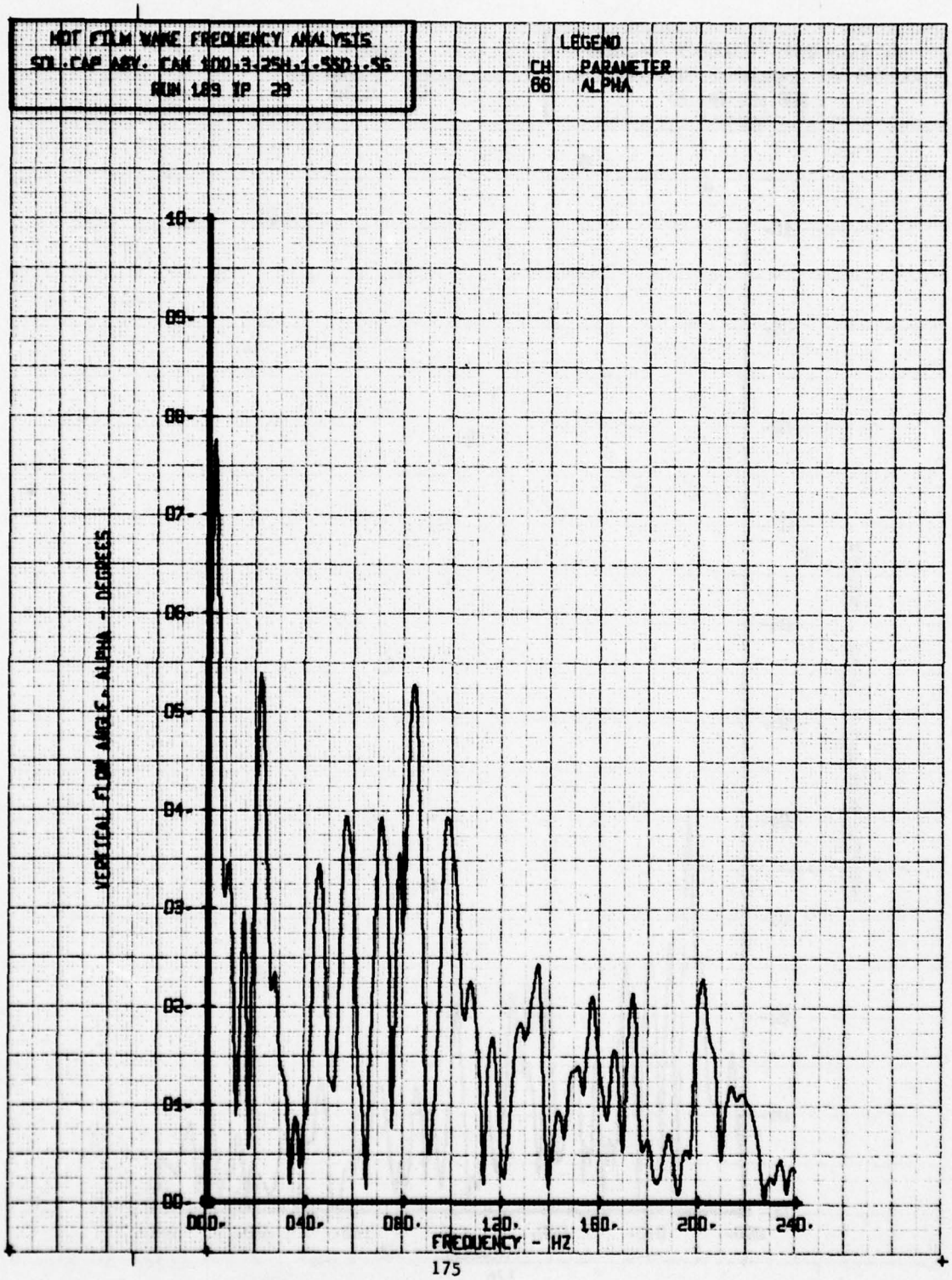

HOT FILM WAKE FREQUENCY ANALYSIS
SOL. CAP. ARY. CAN.7.6D.2.4H.,.7D.,.5G
RUN 208 TP 5
LEGEND
CH PARAMETER
65 V-BETA
FREQUENCY - HZ

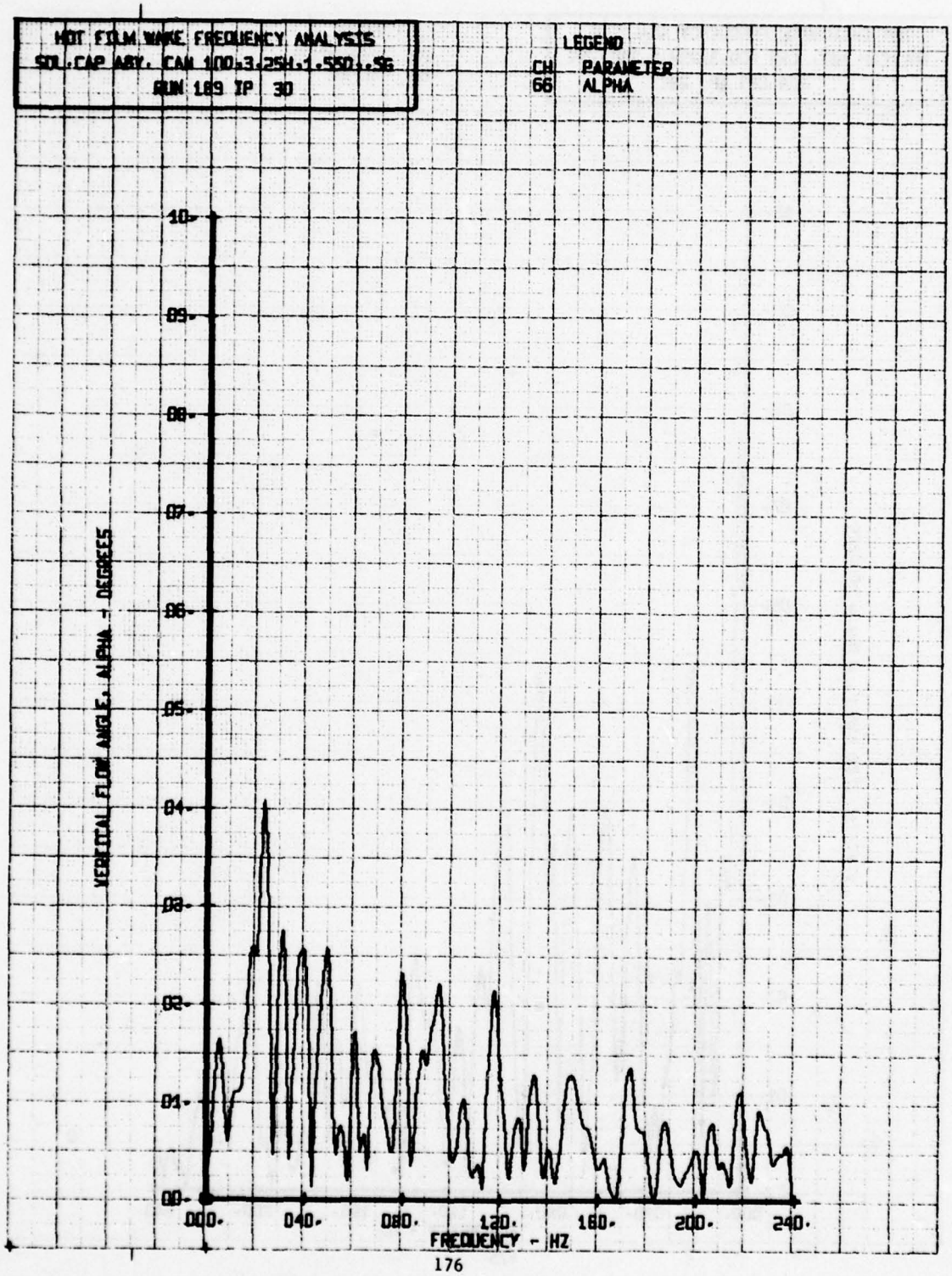

HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
05 V-BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
X-Z VELOCITY COMPONENT V-BETA FPS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

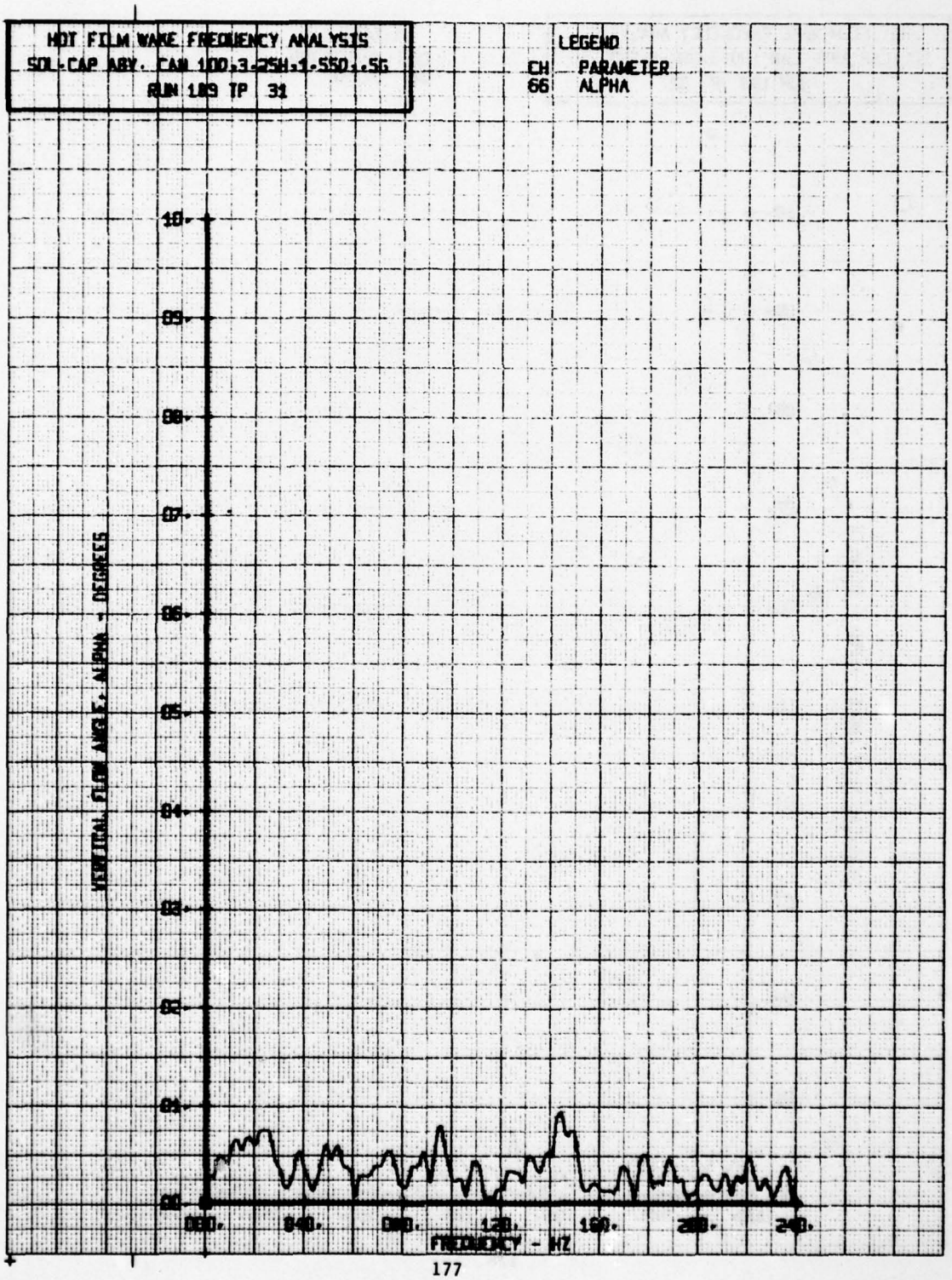

HOT FILM WAKE FREQUENCY ANALYSIS
RUN 208 TP 7
LEGEND
CM PARAMETER
65 V-BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
K-2 VELOCITY COMPONENT V-BETA FPS
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

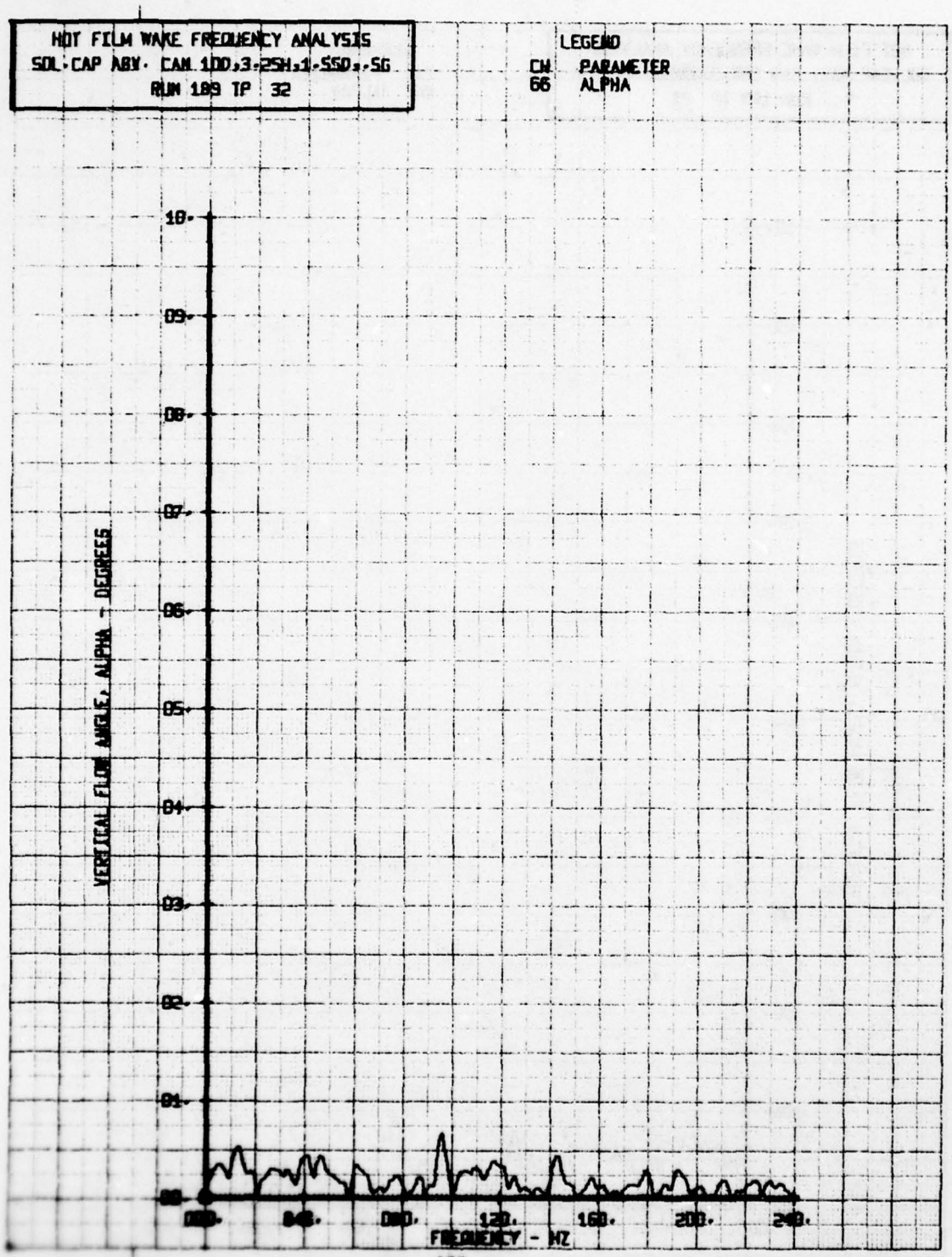

HOT FILM WAKE FREQUENCY ANALYSIS
RUN 200 TP 8
LEGEND
CH PARAMETER
65 Y-BETA
X-Z VELOCITY COMPONENT Y-BETA FPS
FREQUENCY - HZ

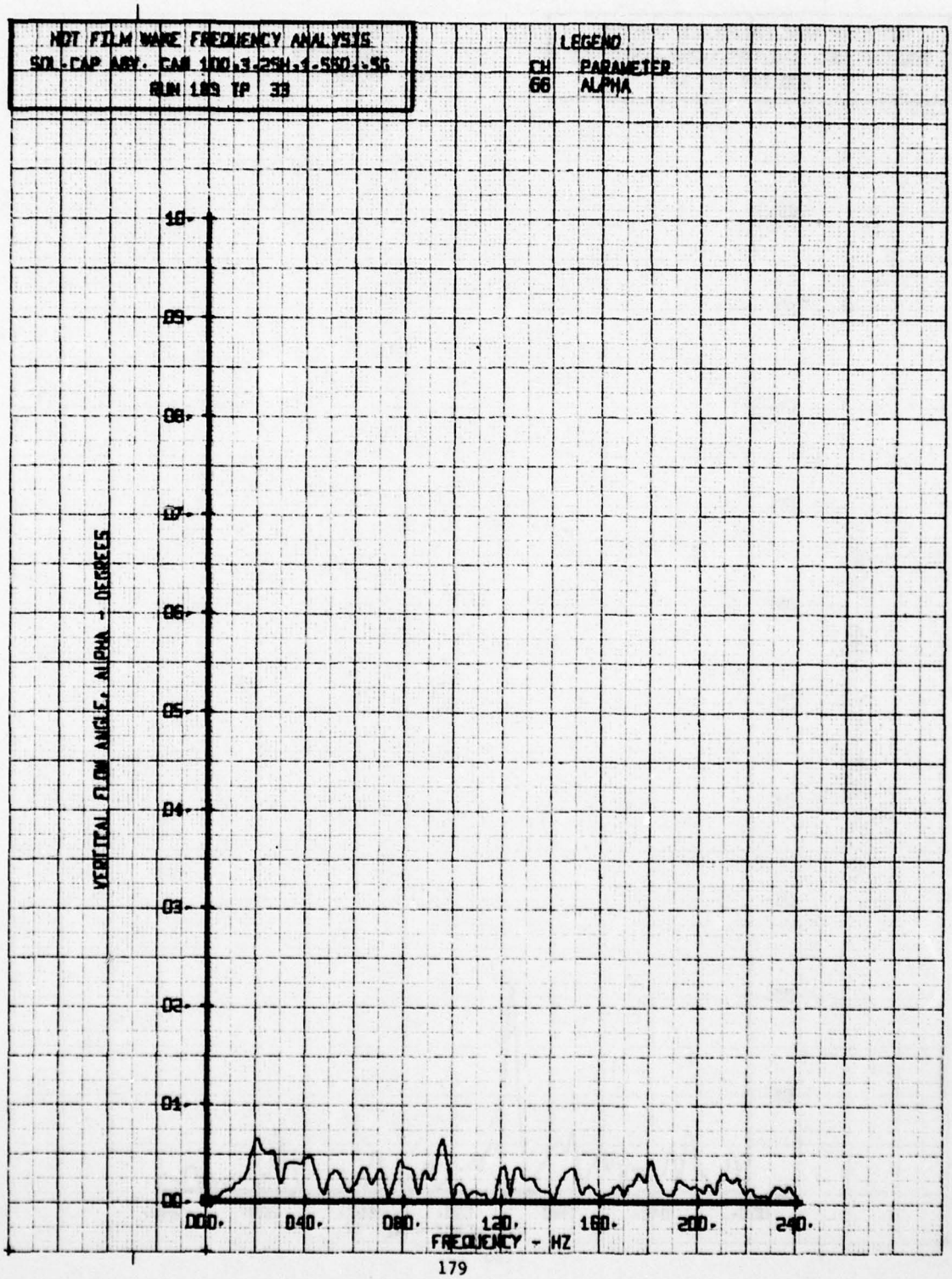

HOT FILM WAKE FREQUENCY ANALYSIS
SOL- CAP ABV- CAN-7-6D,2-4H,-7D,-5G
RUN 209 TP 10
LEGEND
CH PARAMETER
65 V-BETA
10-
09-
08-
07-
06-
05-
04-
03-
02-
01-
00-
X-2 VELOCITY COMPONENT V-BETA FPS
000-
040-
080-
120-
160-
200-
240-
FREQUENCY - HZ

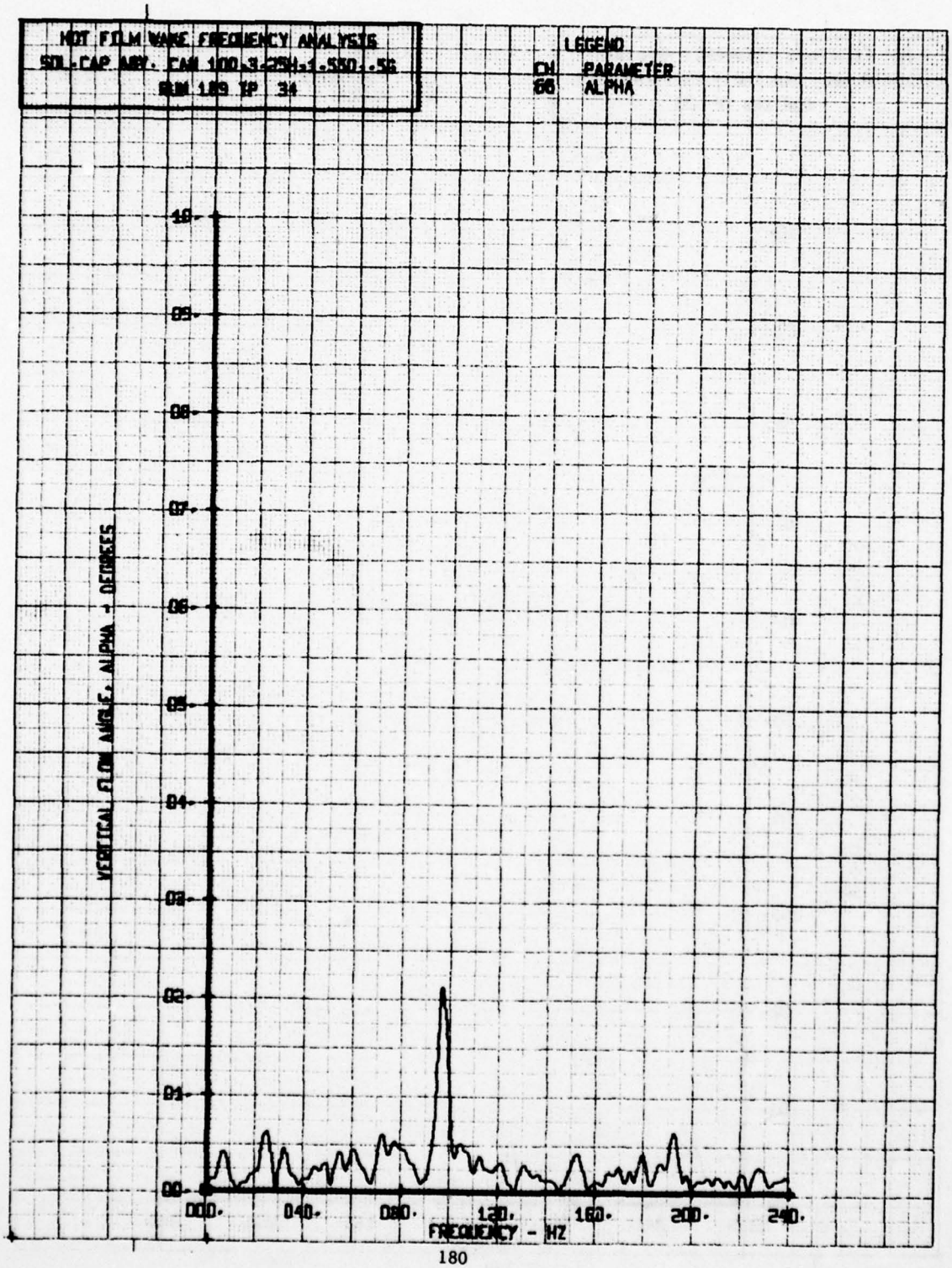

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.3.25H.1.SSD.SG
RUN 189 IP 23
LEGEND
CH PARAMETER
66 ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
VERTICAL FLOW ANGLE, ALPHA - DEGREES
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

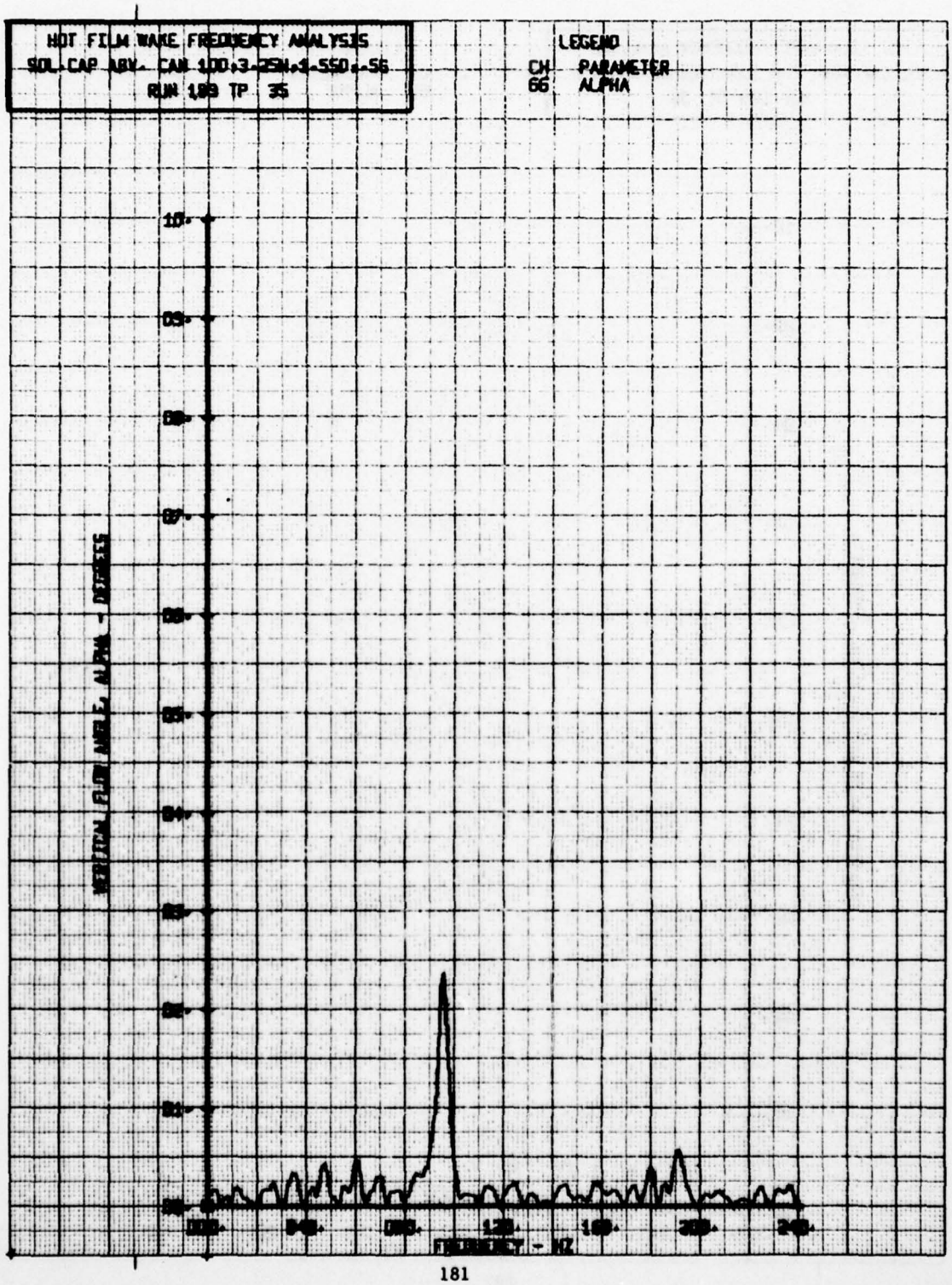

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.3.25H.1.550..5G
RUN 189 TP 30
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

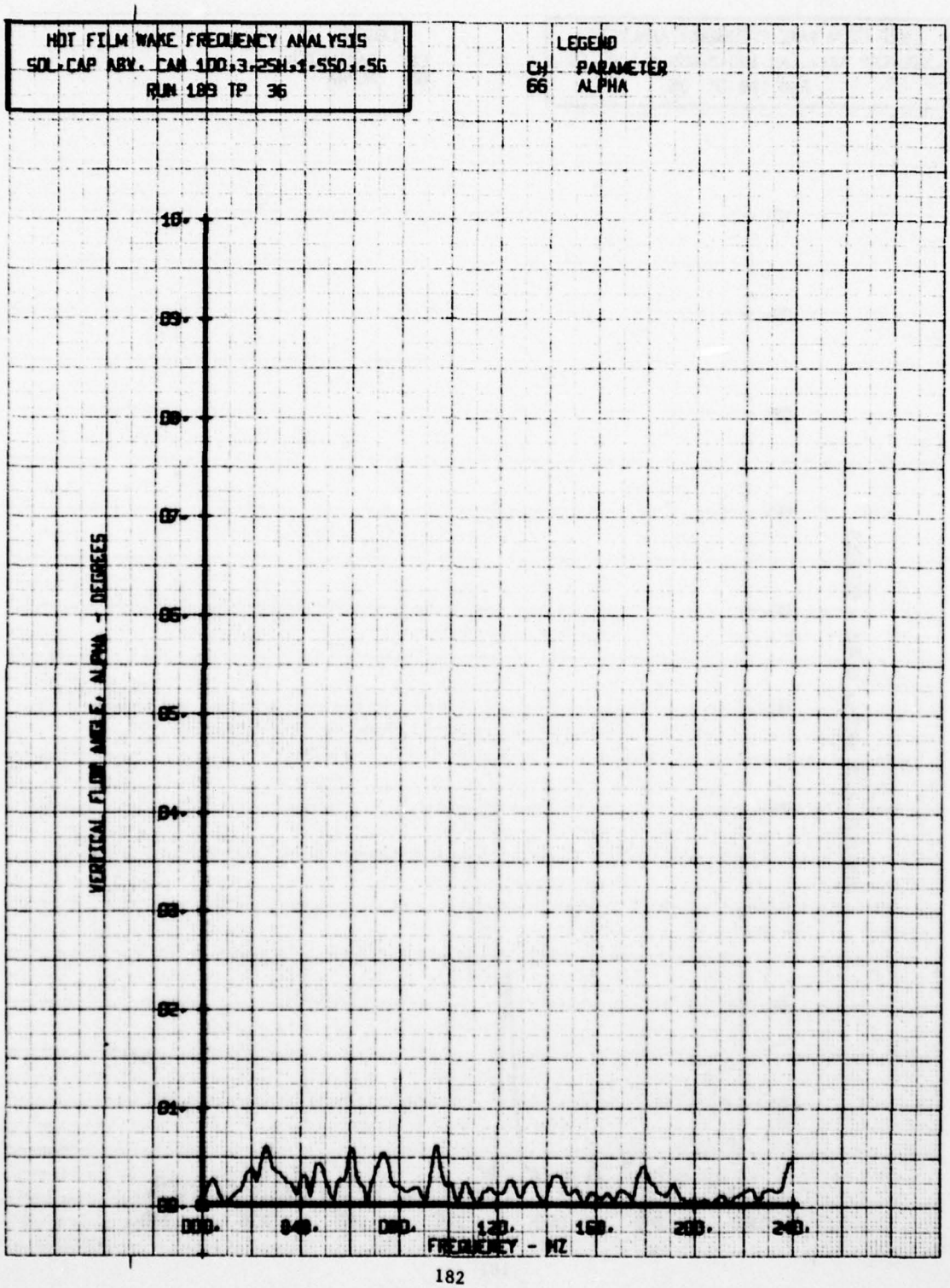

HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY. CAN 100,3.25H,1.550,.5G
RUN 189 TP 31
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ

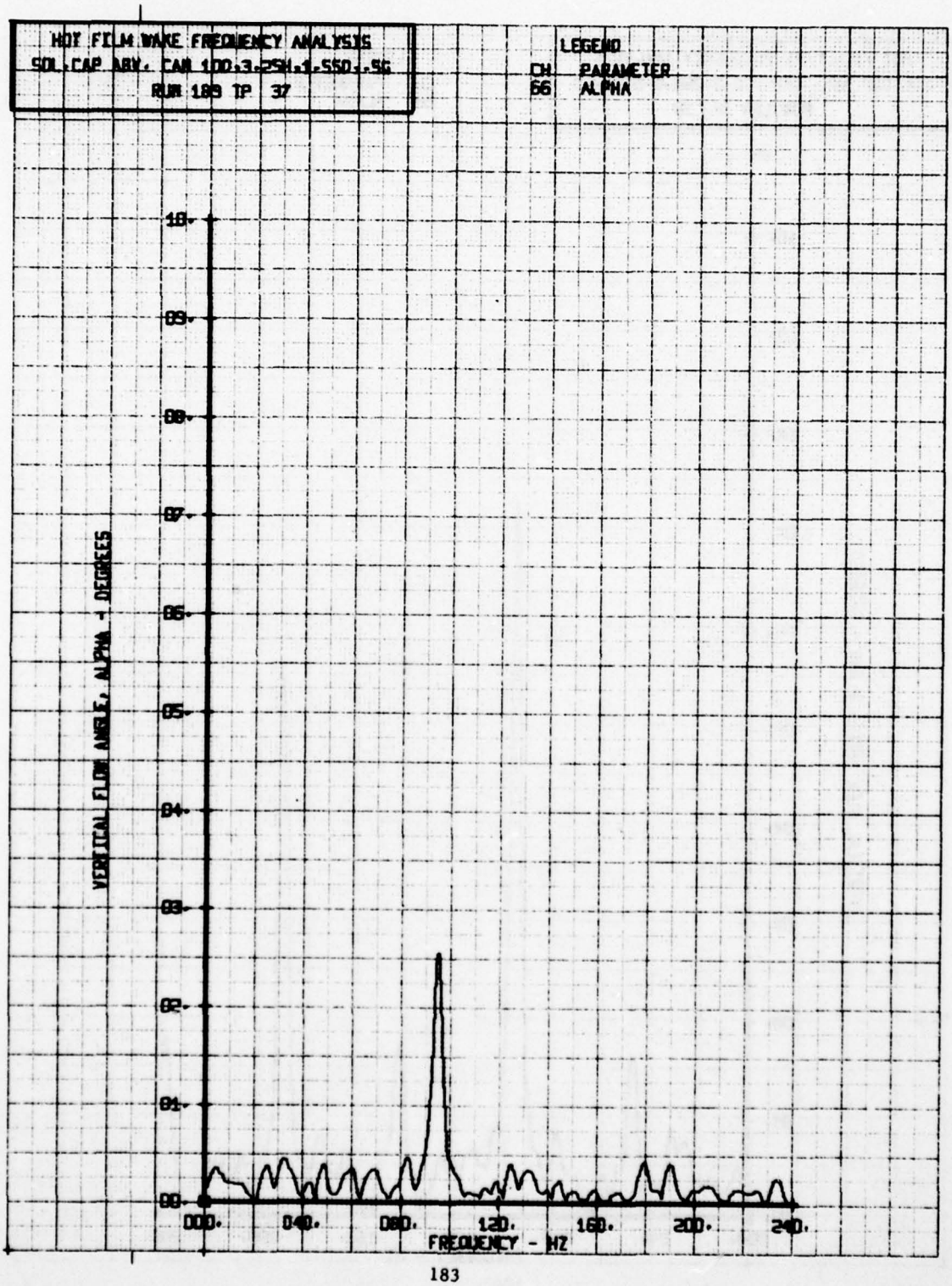

HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY- CAM 100,3-25H,1-SSD,-SG
RUN 189 TP 32
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

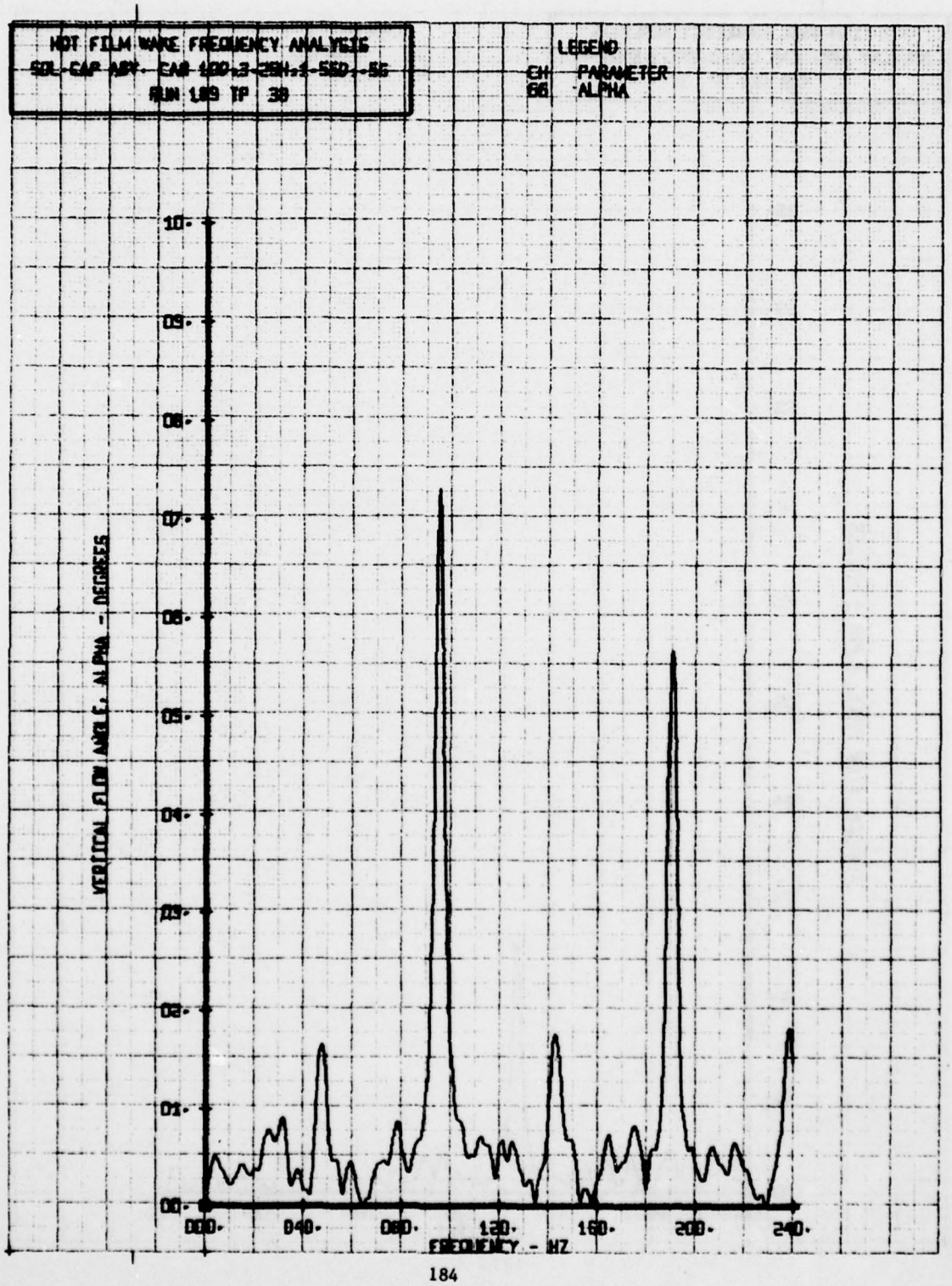

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAM 100,3.25H,1.550,.56
RUN 189 TP 33
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

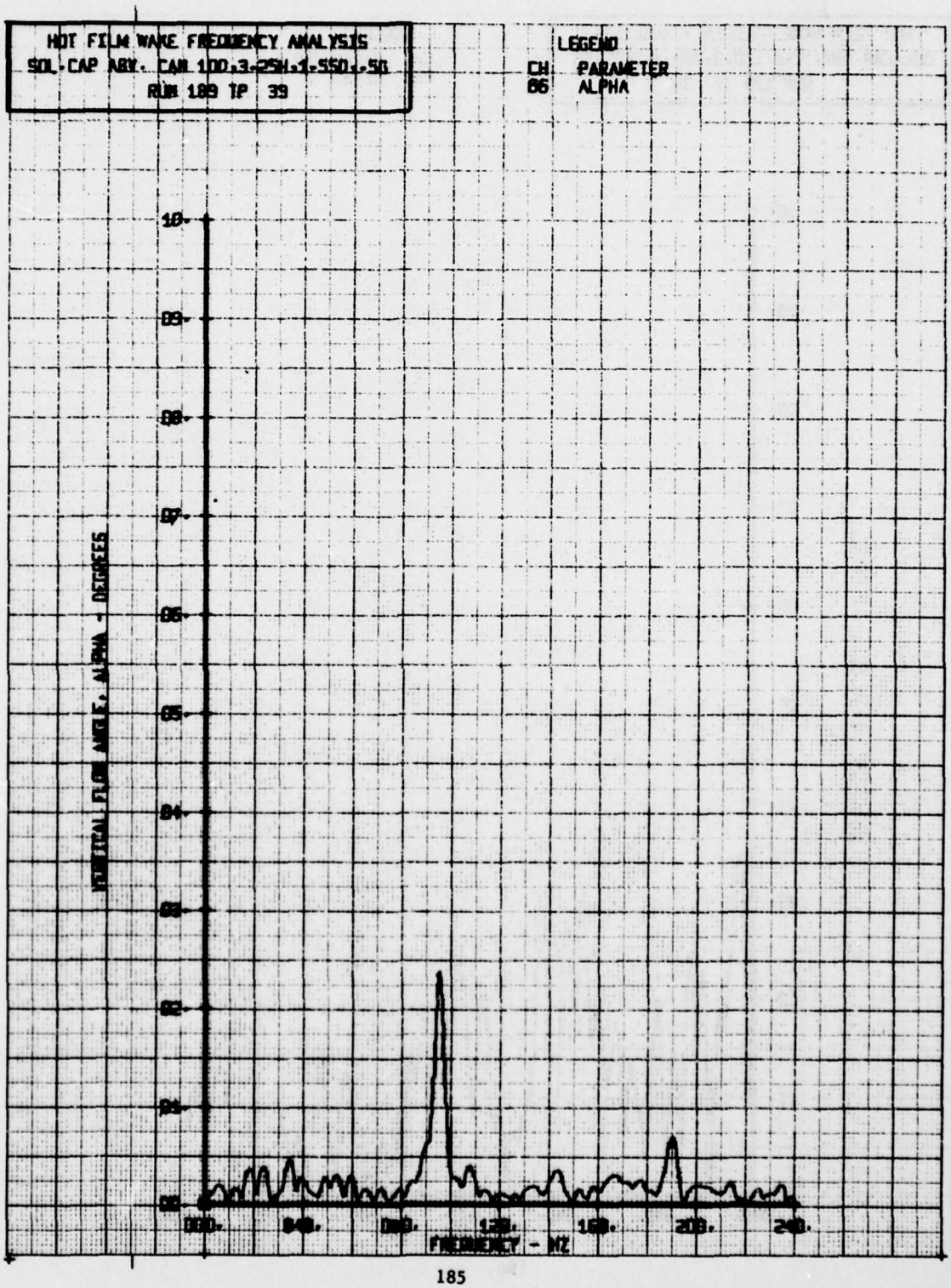

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARY. FAN 100.3.25H.1.550.1.56
RUN 189 TP 34
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV- CAN 100.3-25N.1-550.-56
RUN 189 TP 35
LEGEND
CH PARAMETER
66 ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
VERTICAL FLOW ANGLE, ALPHA - DEGREES
100.
140.
180.
220.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100,3.25H,1.550,.5G
RUN 183 TP 36
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAM 100.3.25H.1.550..5G
RUN 189 TP 37
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SQL-CAP ABY- CAB 100,3-25N,1-SSD,-SG
RUN 189 TP 38
LEGEND
CH PARAMETER
66 ALPHA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
VERTICAL FLOW ANGLE, ALPHA - DEGREES
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV. CAM 100,3-25H,1-550,-50
RUN 189 TP 39
LEGEND
CH PARAMETER
06 ALPHA
10.
09.
08.
07.
06.
05.
04.
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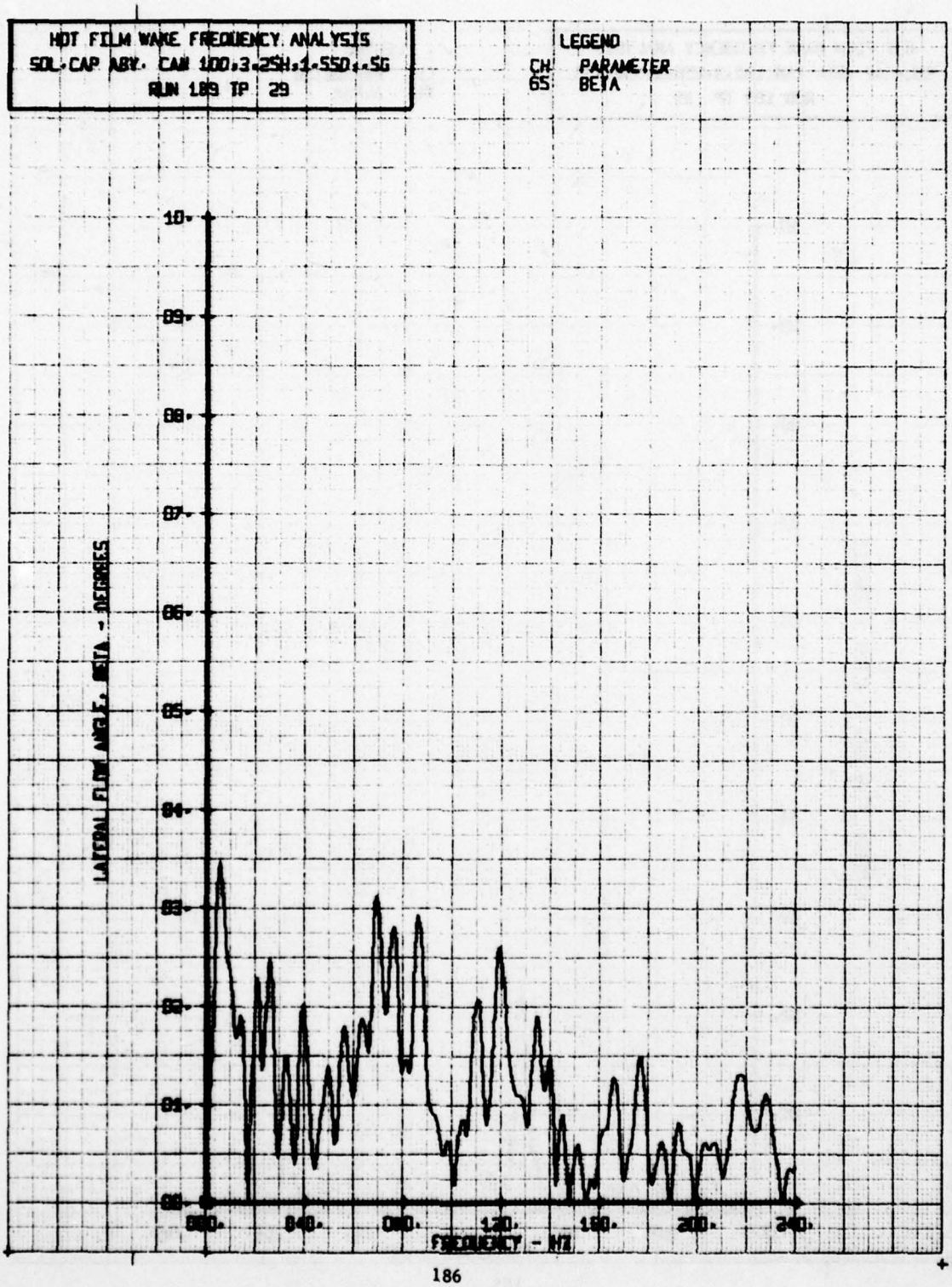
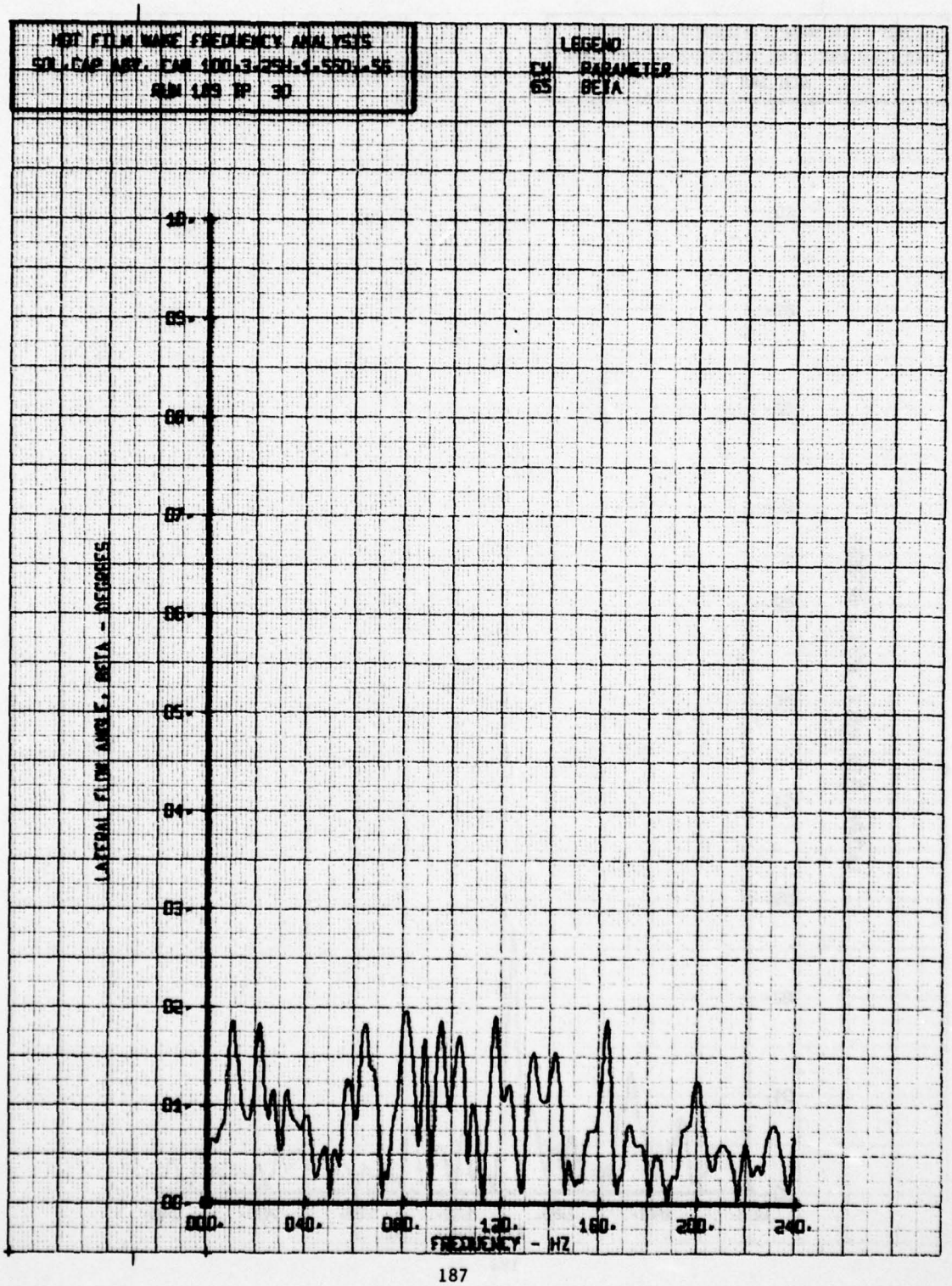
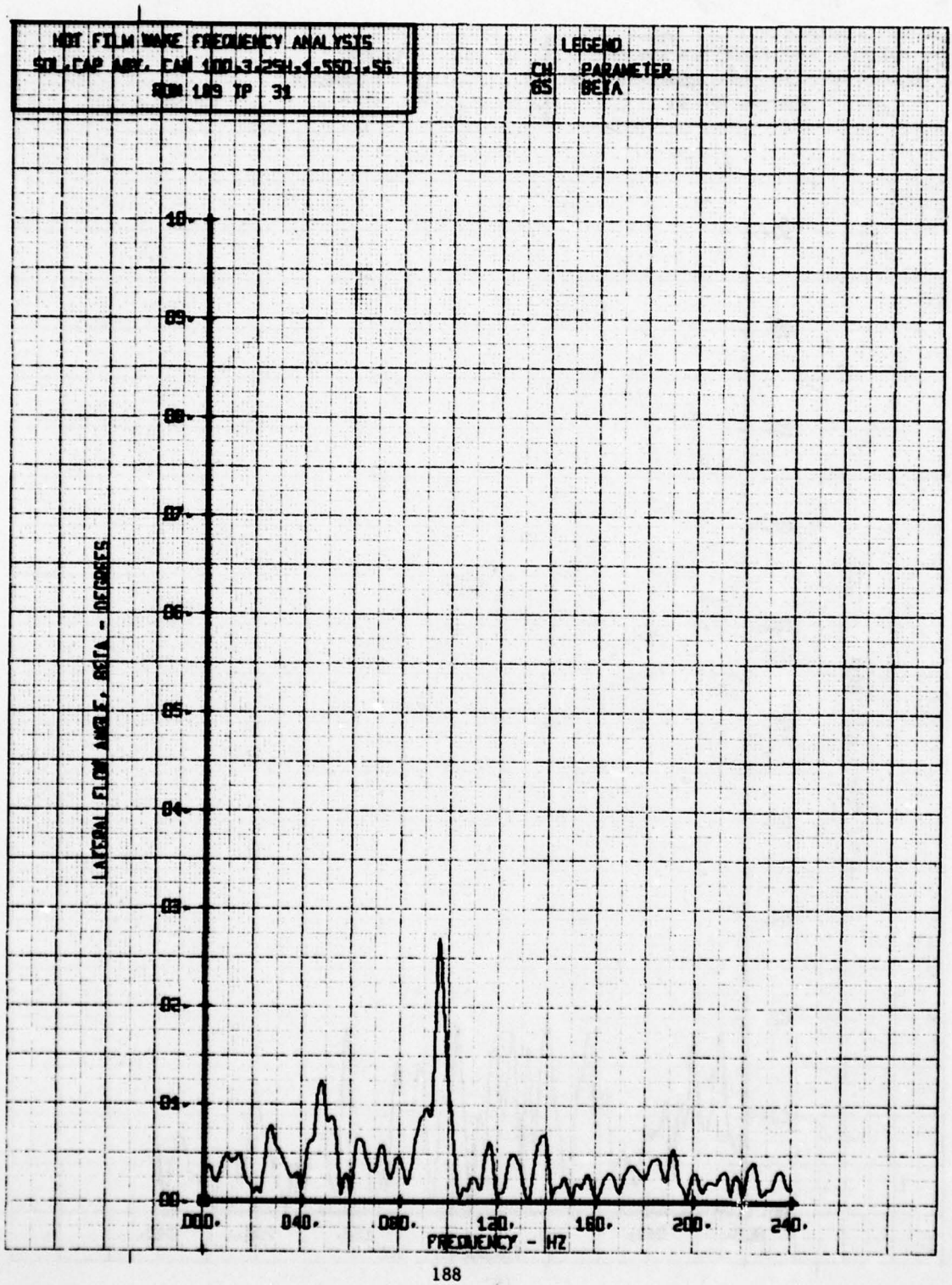
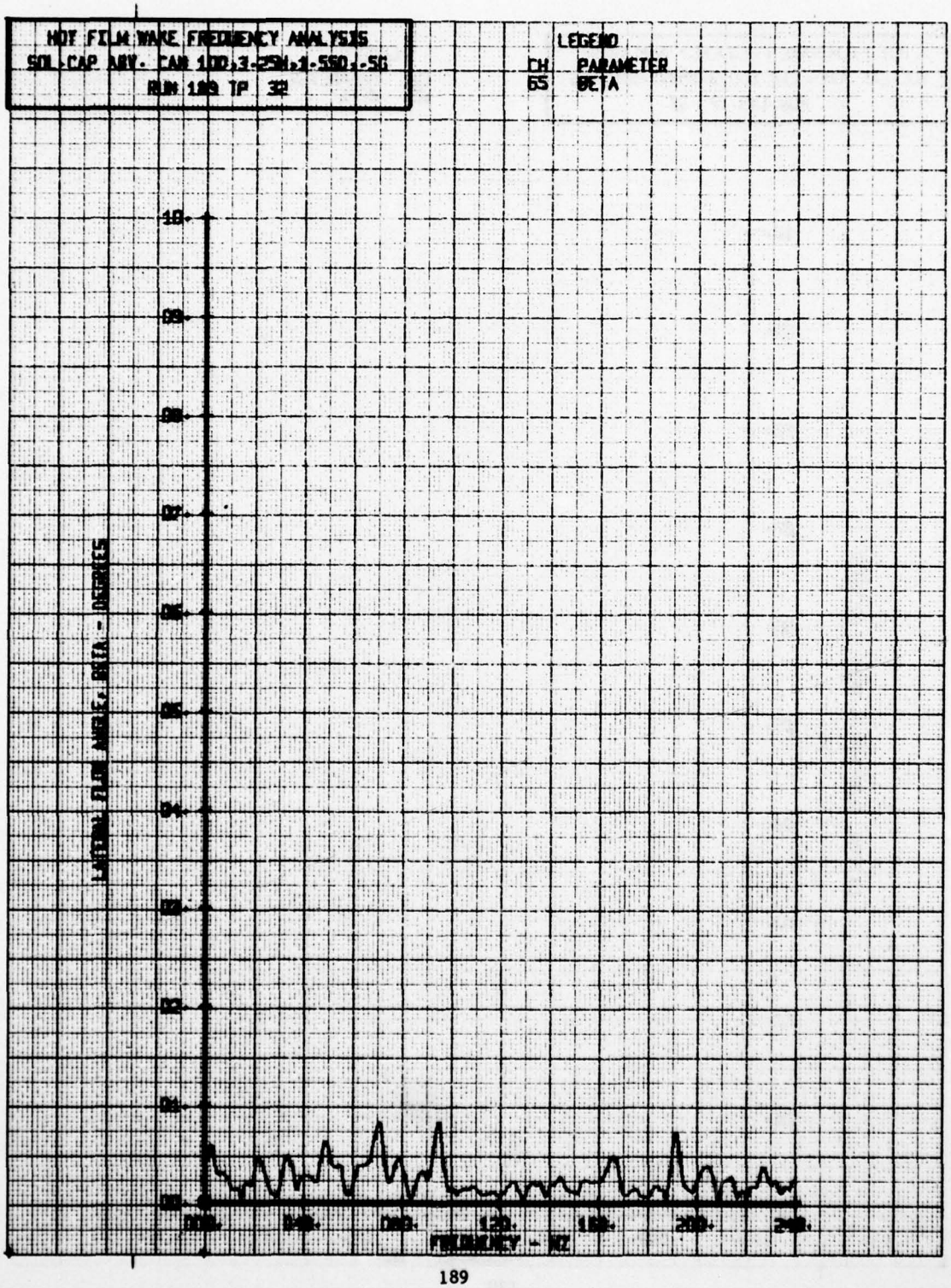
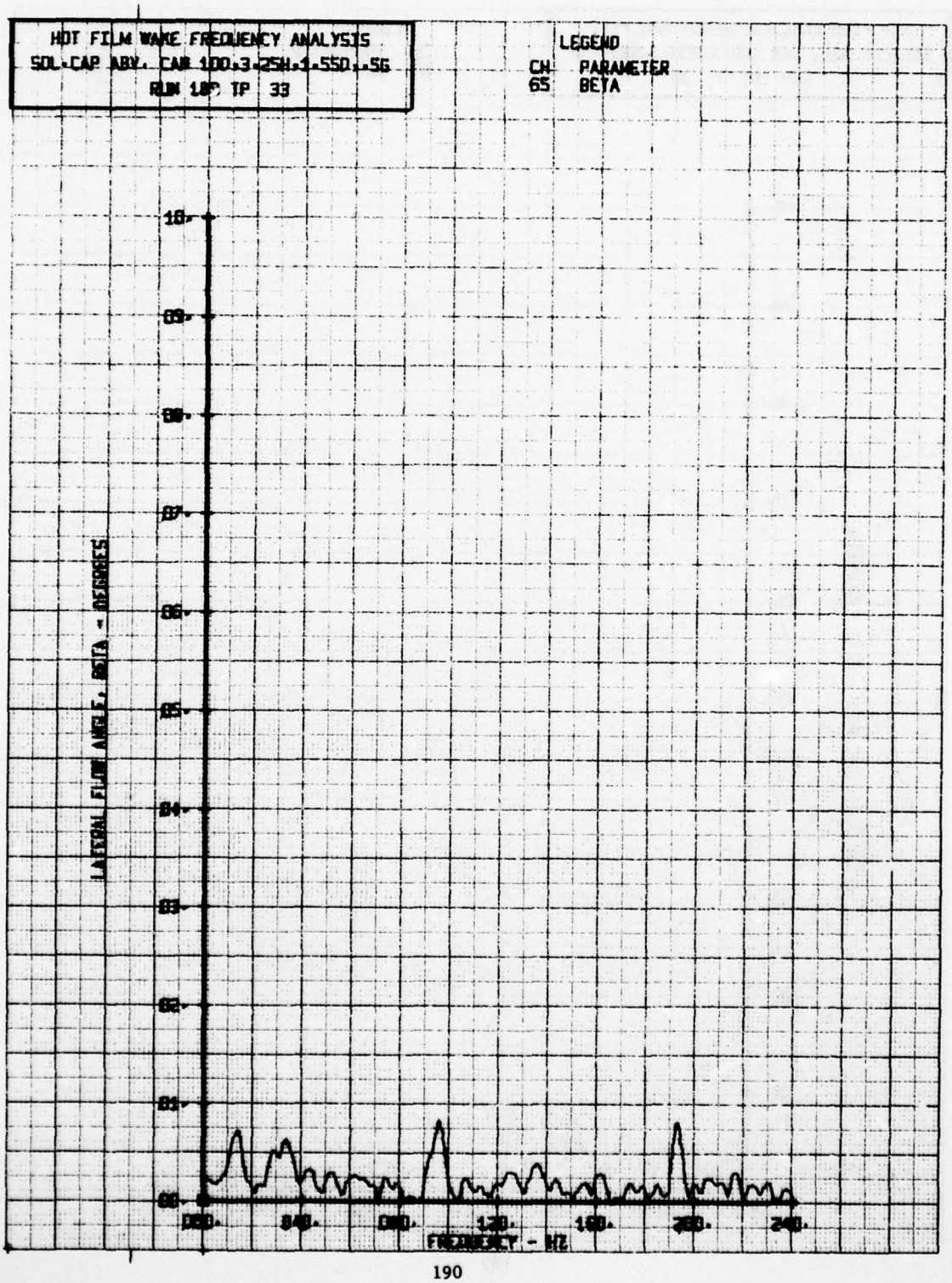
02.
01.
00.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

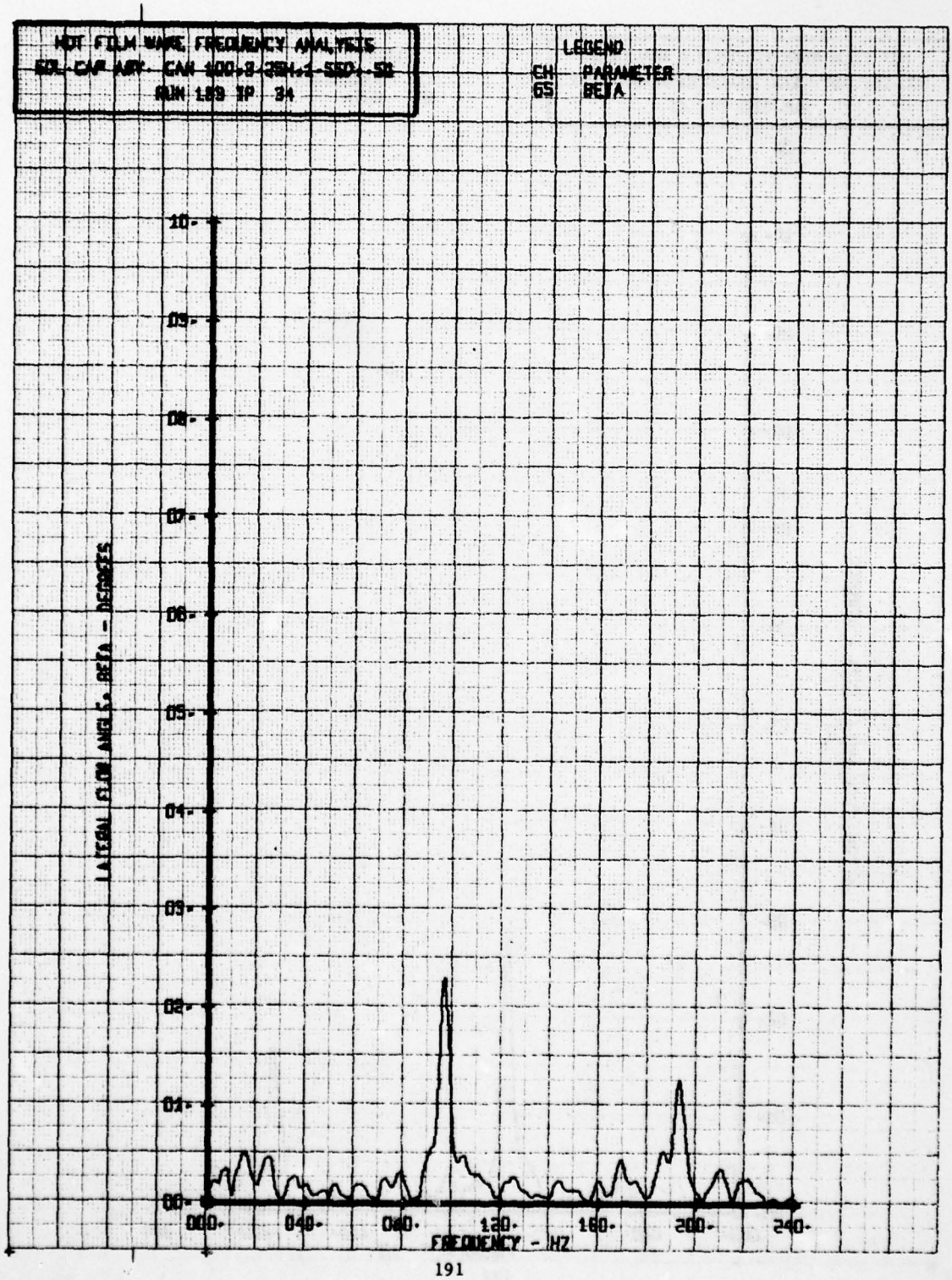

HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY. CAM 100,3.25H,1.550,.5G
RUN 189 TP 29
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARR. CAP 100.3.254.1.550.-56
RUN 189 TP 30
LEGEND
CH PARAMETER
65 BETA
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
LATERAL FLOW ANGLE, BETA - DEGREES
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3.25H.1.550..5G
RUN 189 TP 31
LEGEND
CH PARAMETER
85 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARV. CAR 100,3.25M,1.550,.5G
RUN 189 TP 32
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAP 100.3.25H.1.550..5G
RUN 18P TP 33
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 189 TP 34
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
10.
09.
08.
07.
06.
05.
04.
03.
02.
01.
00.
000.
040.
080.
120.
160.
200.
240.
FREQUENCY - HZ

AD-A062 640 BOEING VERTOL CO PHILADELPHIA PA F/G 1/3
INTERACTIONAL AERODYNAMICS OF THE SINGLE ROTOR HELICOPTER CONFI--ETC(U)
SEP 78 P F SHERIDAN DAAJ02-77-C-0020
UNCLASSIFIED USARTL-TR-78-23G-V-7C NL

3 OF 3
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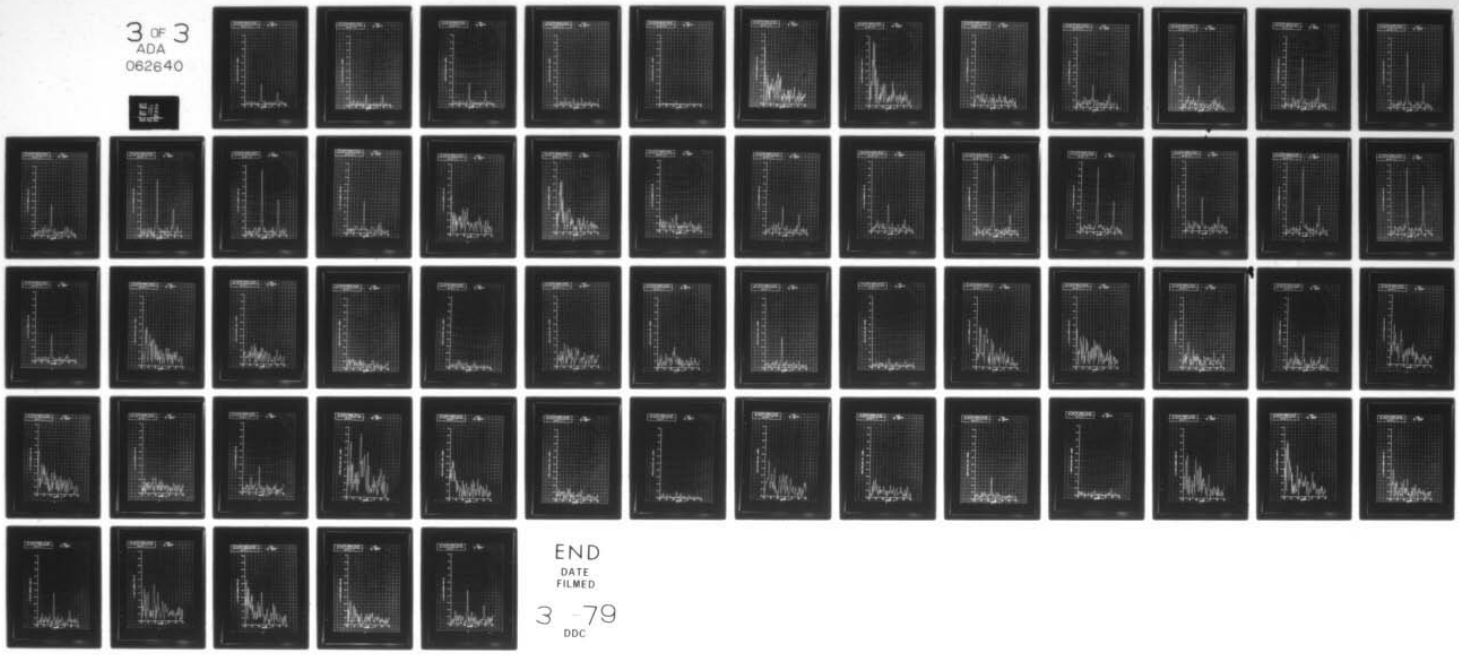

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DATE
FILMED
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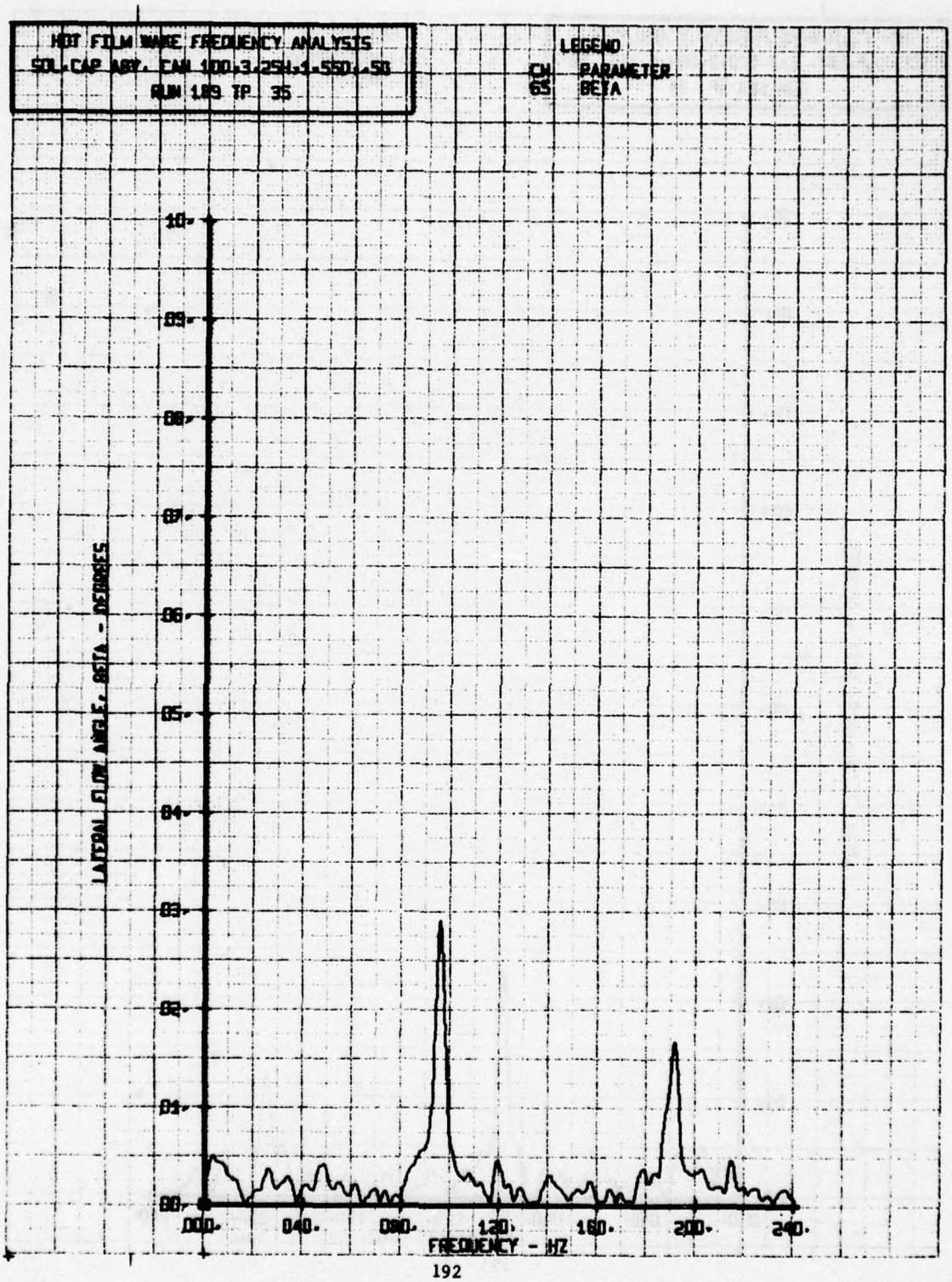
HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100,3.25H,1.55D,.5B
RUN 189 TP 35
LEGEND
CM PARAMETER
65 BETA
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LATERAL FLOW ANGLE, BETA - DEGREES
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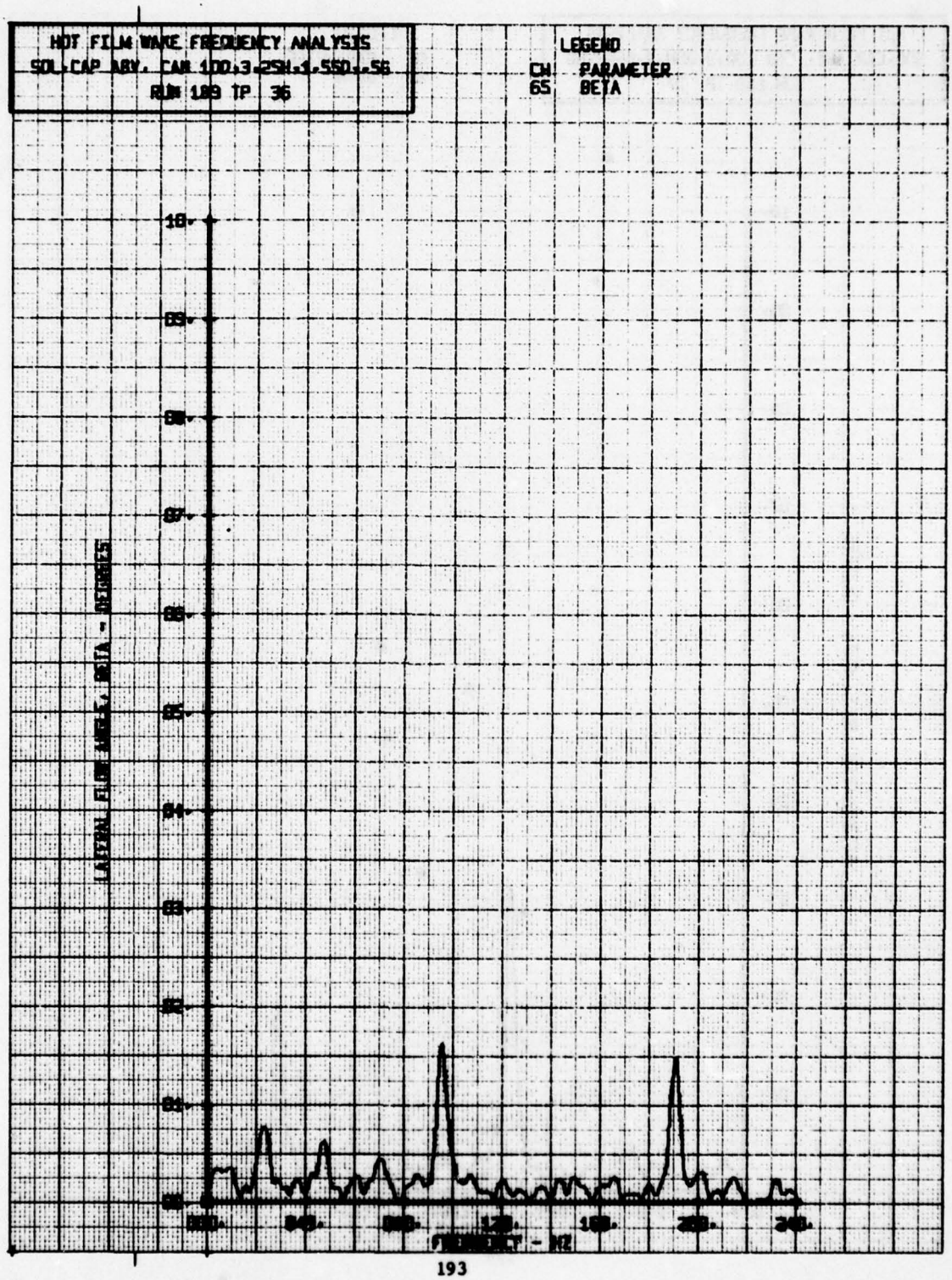
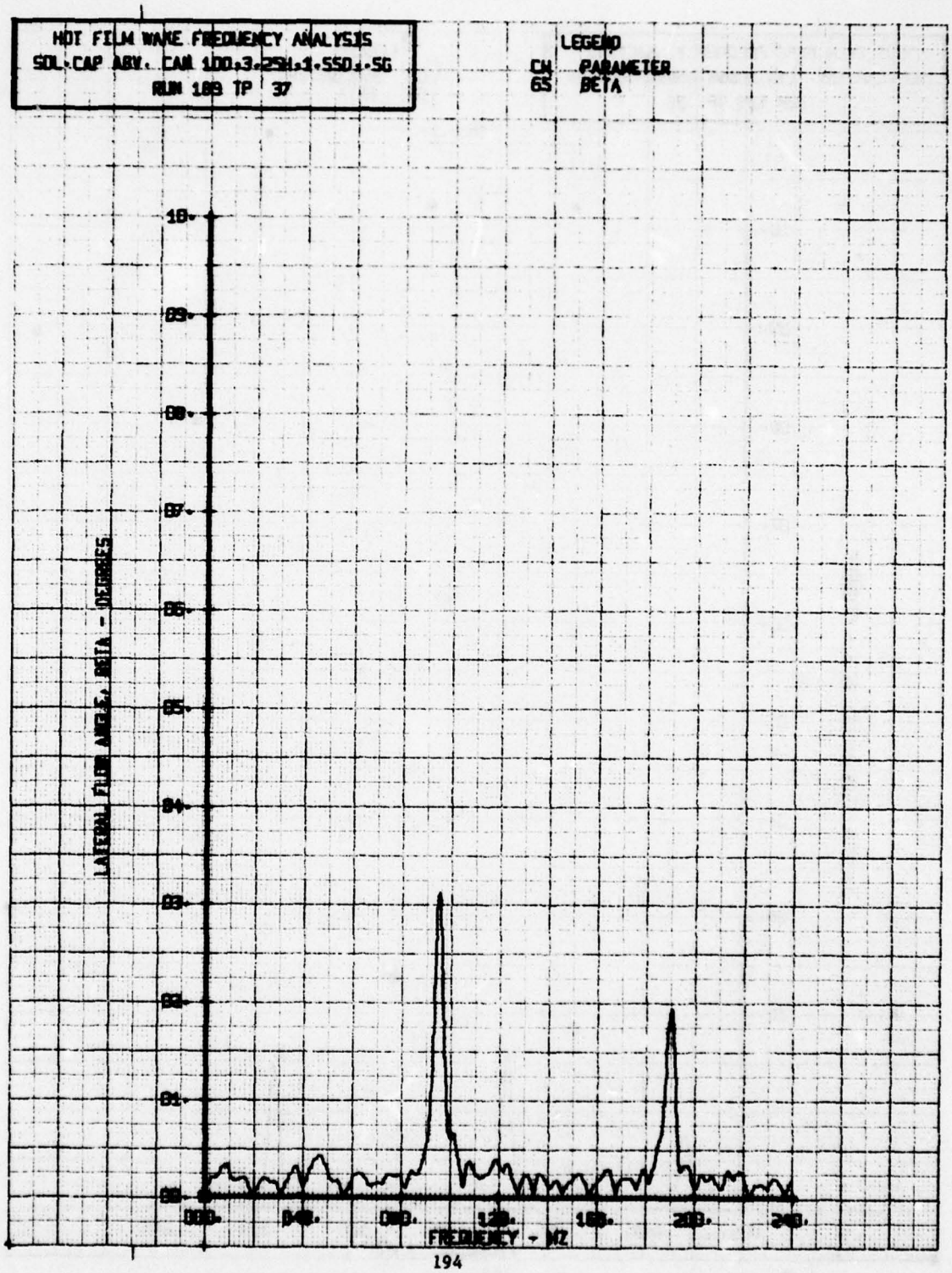
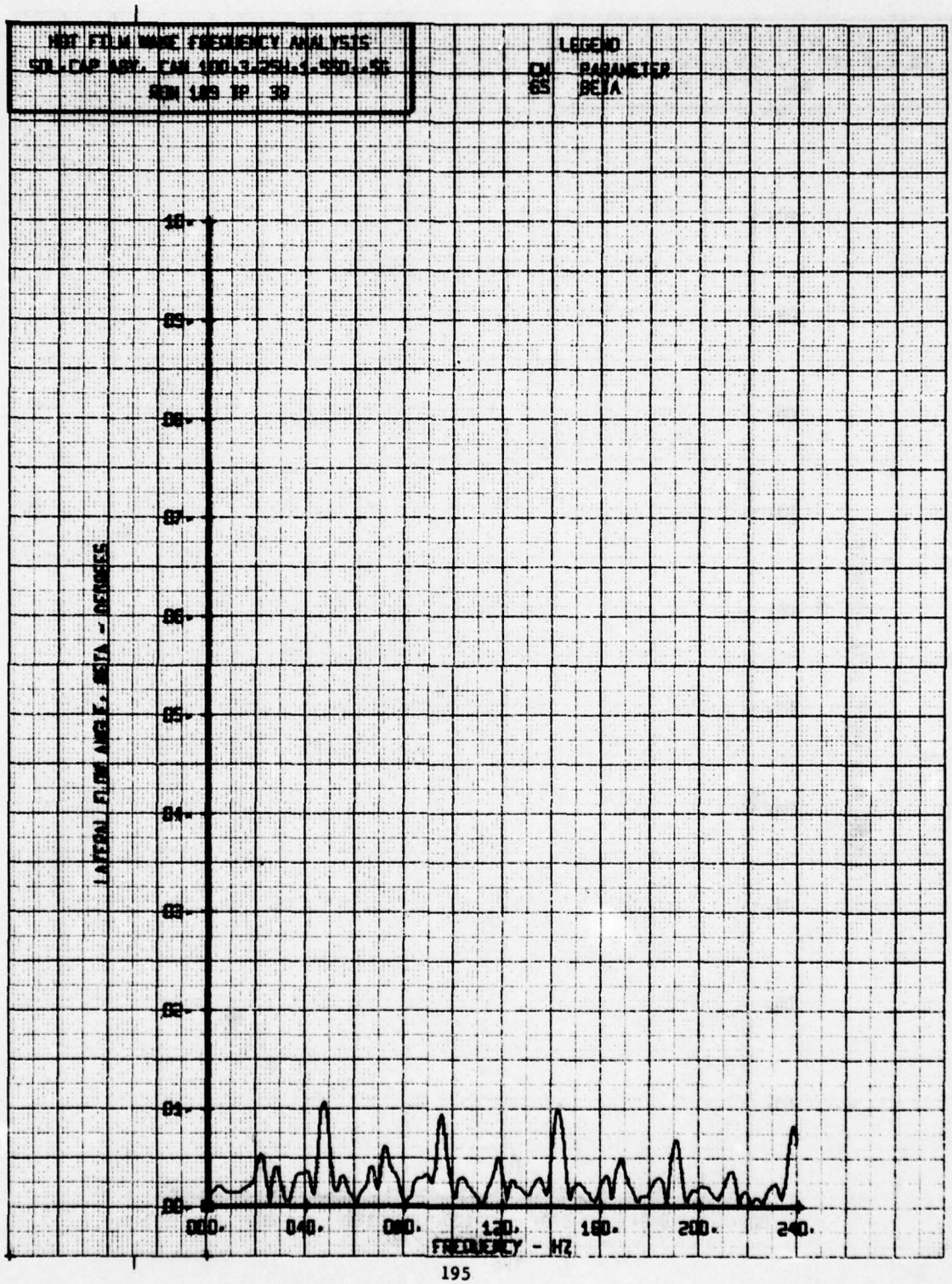
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3.25H.1.55D..56
RUN 189 TP 36
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAM 100.3.25H.1.550.-5G
RUN 189 TP 37
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ADV. FAN 100.3-250.1-500..5%
RUN 189 TP 39
LEGEND
CM PARAMETER
BS BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ
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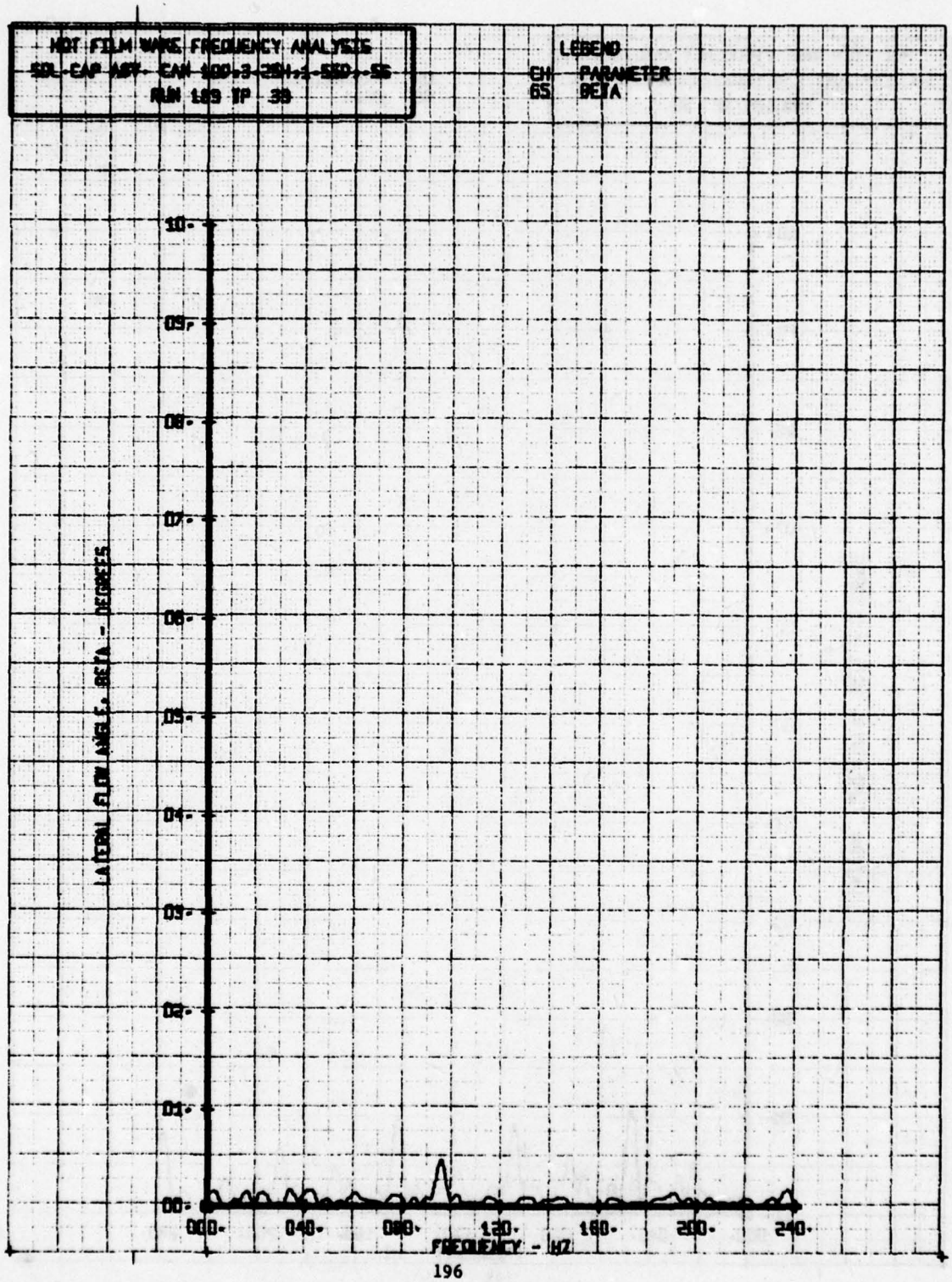
HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ASY- CAN 100,3-2SH,1-SSD,-SG
RUN 189 TP 38
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
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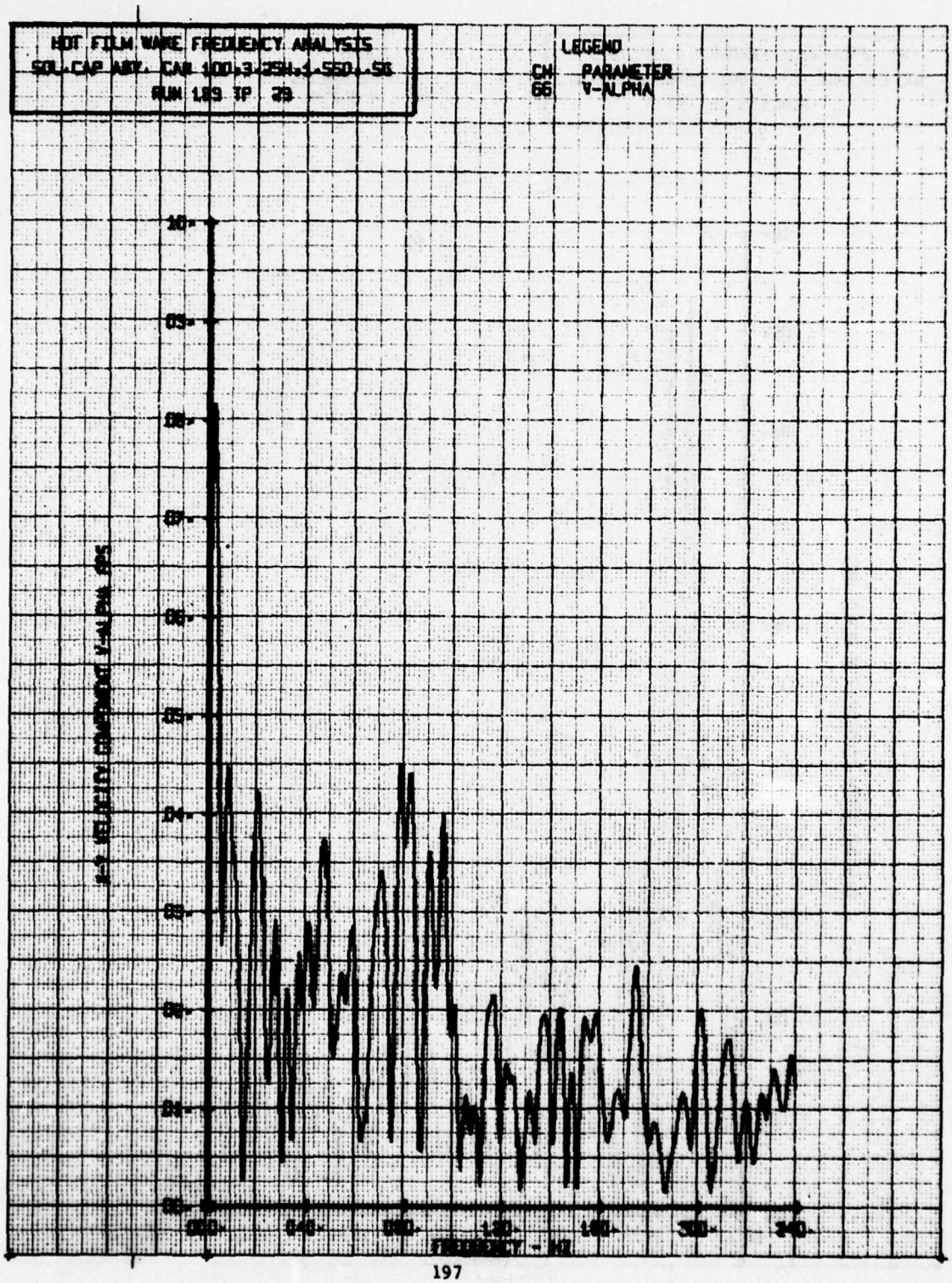
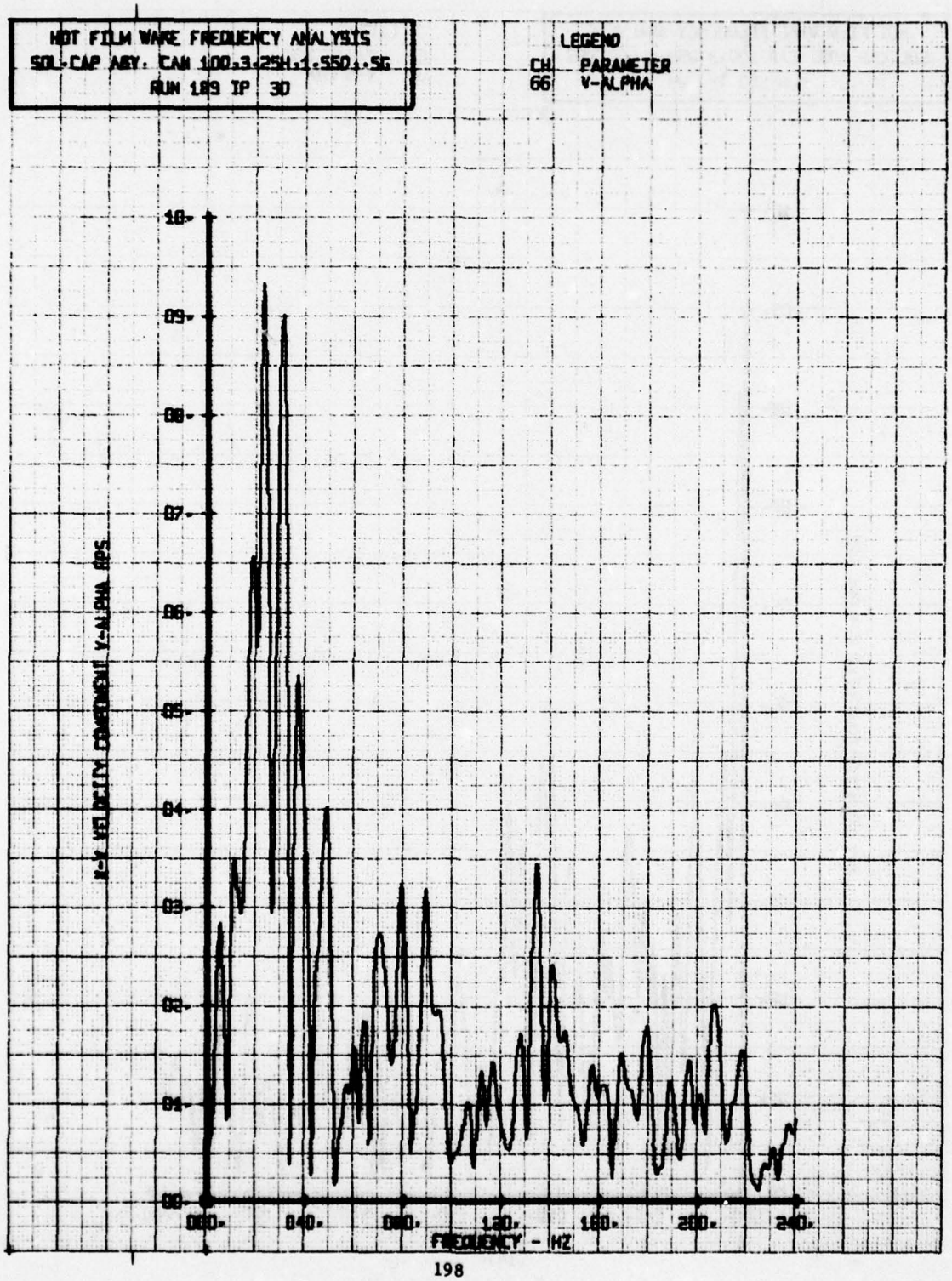
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAB 100.3.254.1.550.56
RUN 183 TP 29
LEGEND
CH PARAMETER
66 V-ALPHA
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY: CAN 100,3.25H,1.550,.5G
RUN 189 IP 30
LEGEND
CH PARAMETER
66 V-ALPHA
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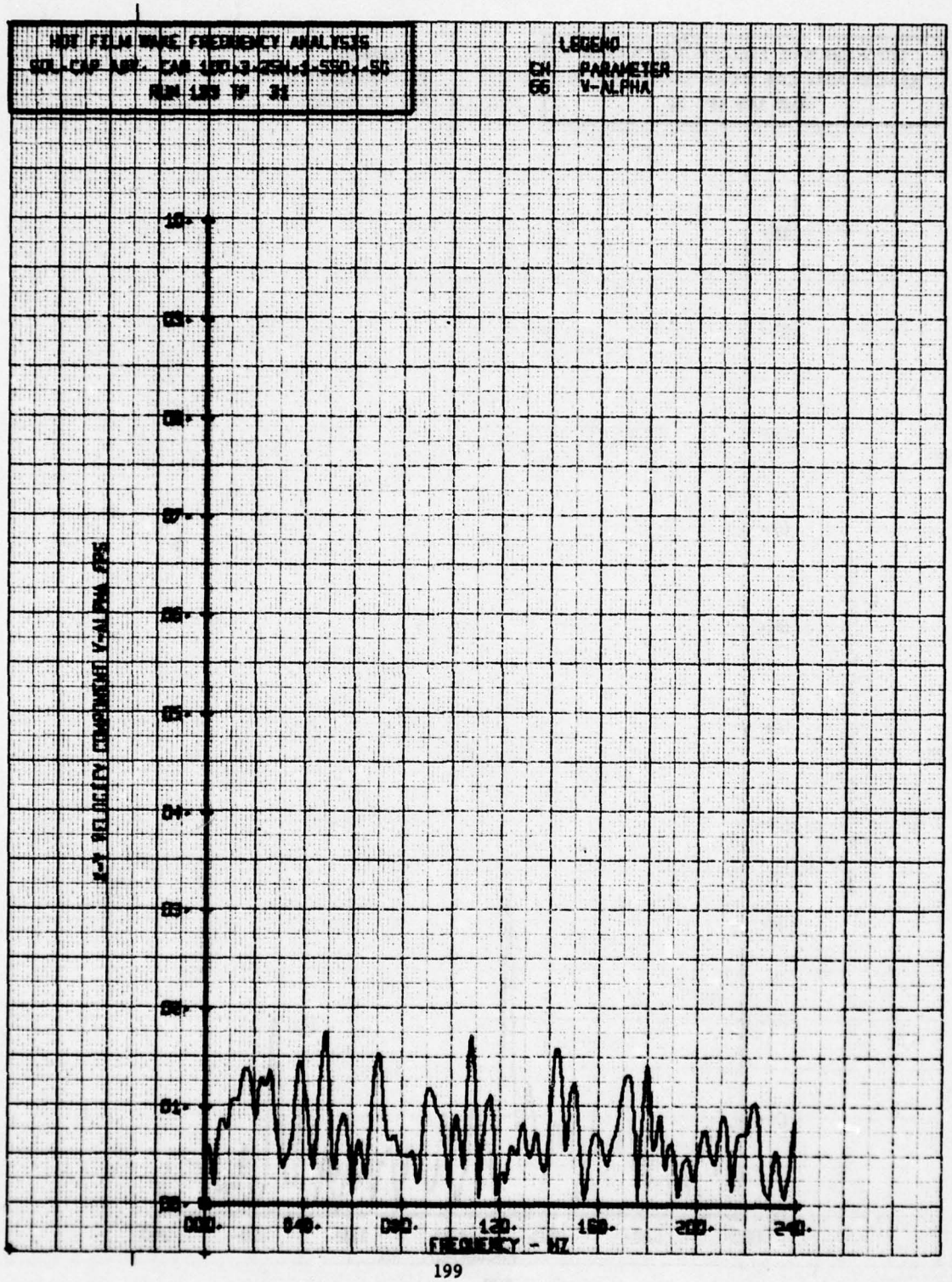
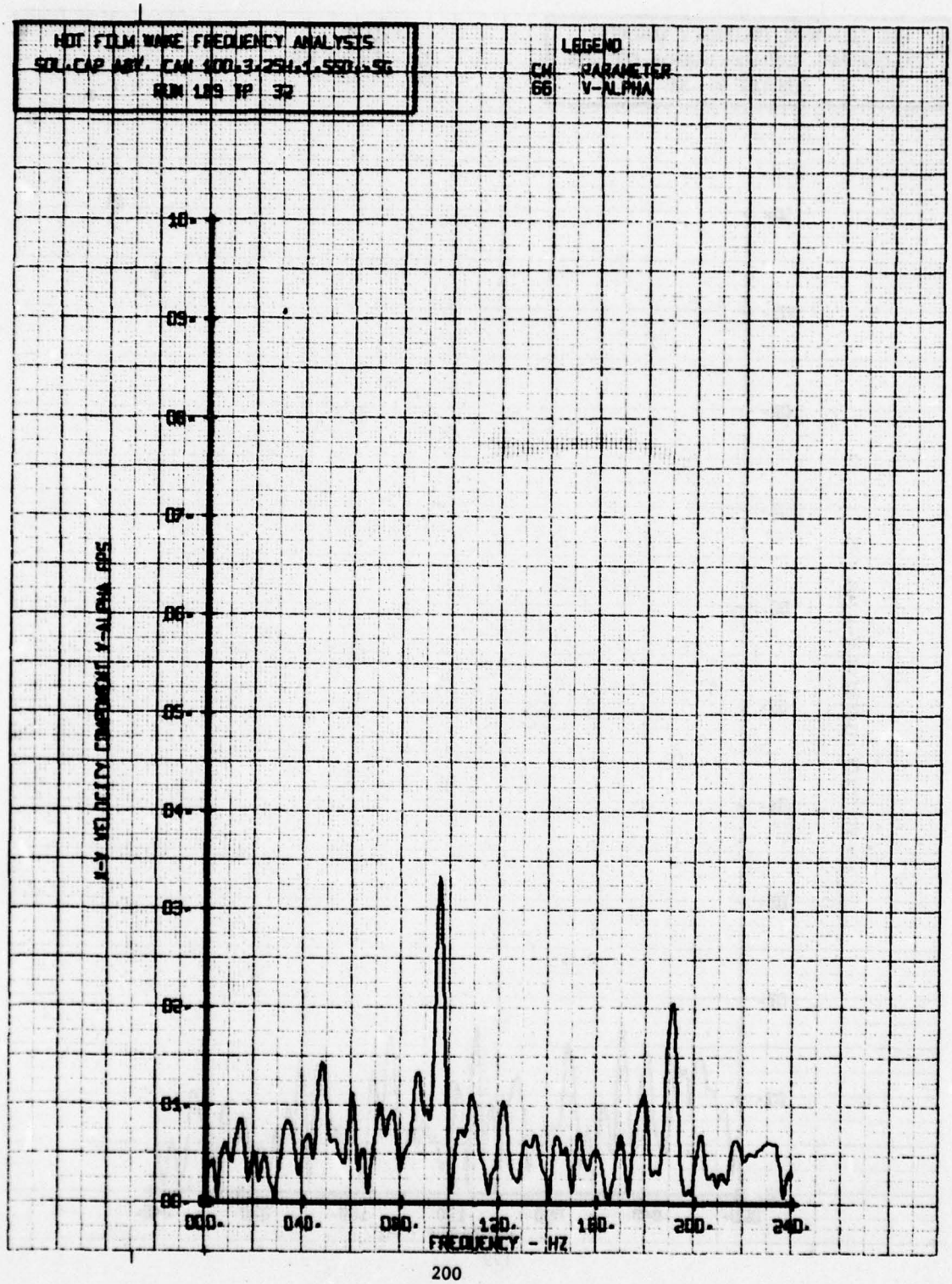
FREQUENCY - HZ


HOT FILM WAVE FREQUENCY ANALYSIS
SOL-CAP ADV. CAP 180.3-254.1-550.-50
RUN 123 TP 31
LEGEND
CH PARAMETER
66 V-ALPHA
X-F VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP AGV. CAN 100.3.25H.1.550.-5G
RUN 189 IP 32
LEGEND
CH PARAMETER
66 V-ALPHA
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X-Y VELOCITY COMPONENT Y-ALPHA FPS
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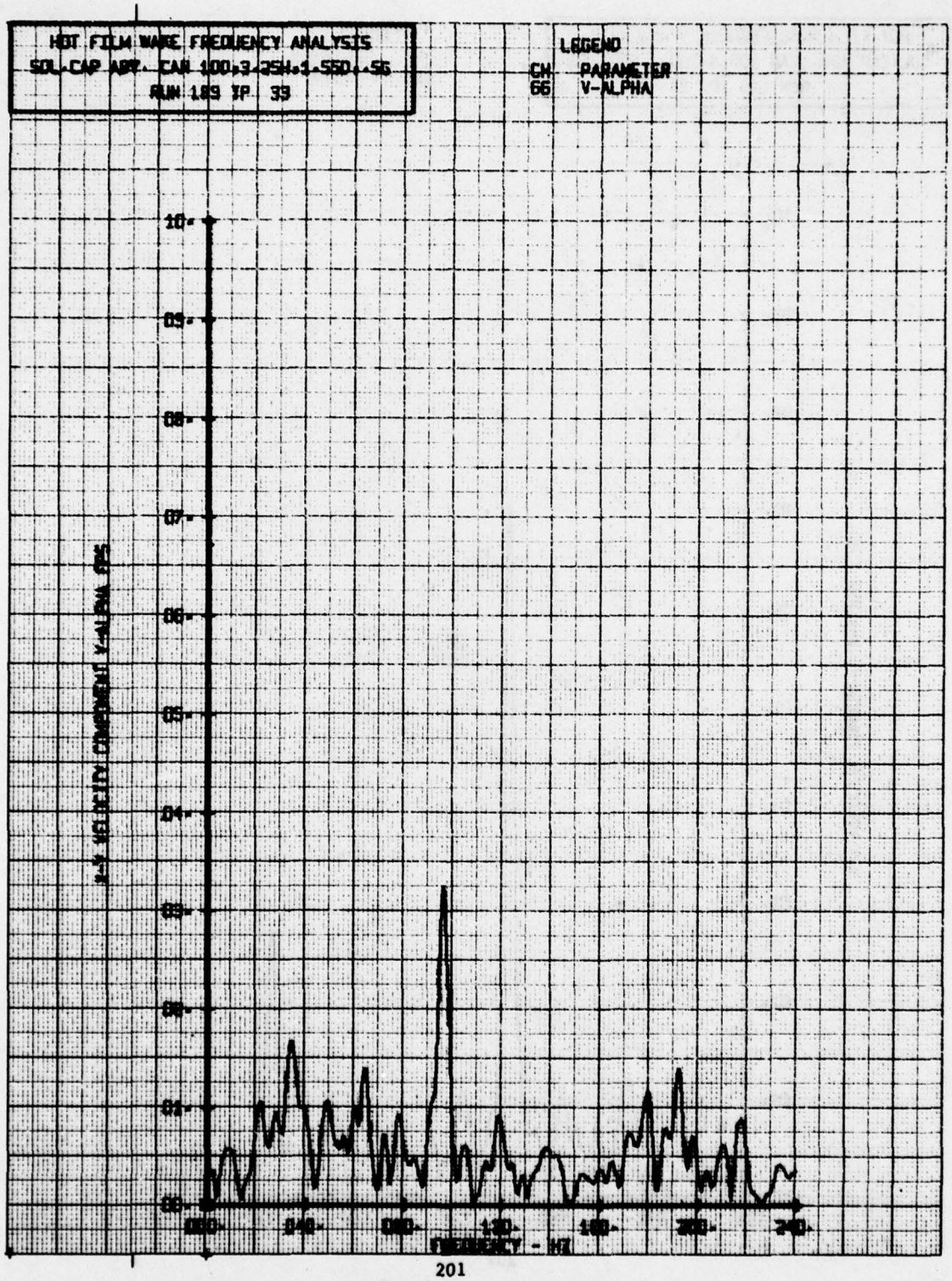
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY. CAN 100,3.25H,1.550,.56
RUN 189 TP 33
LEGEND
CH PARAMETER
66 V-ALPHA
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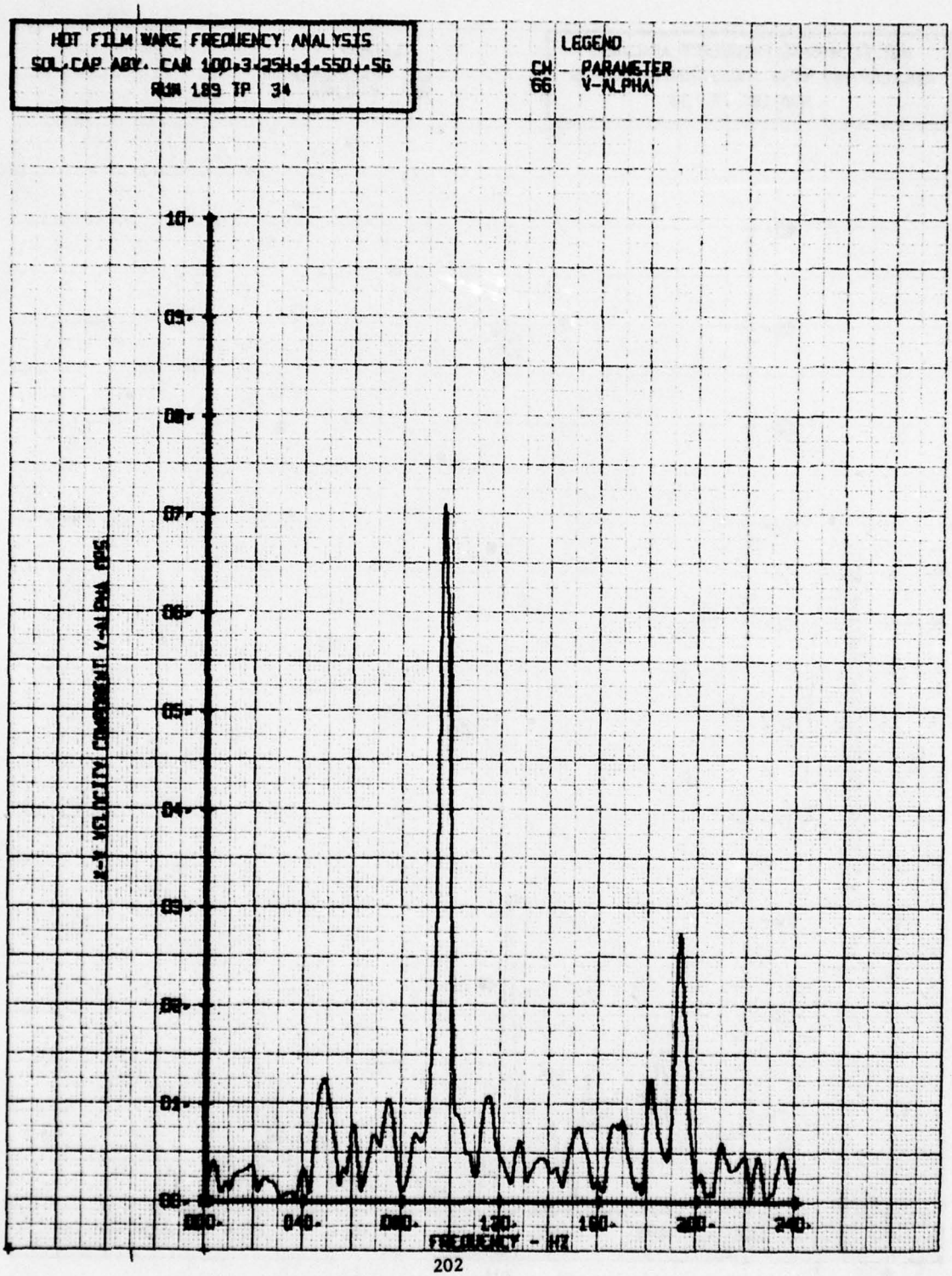
FREQUENCY - HZ
X-Y VELOCITY COMPONENT Y-ALPHA FPS


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAR 100.3.25H.1.550.1.5G
RUN 189 TP 34
LEGEND
CH PARAMETER
66 V-ALPHA
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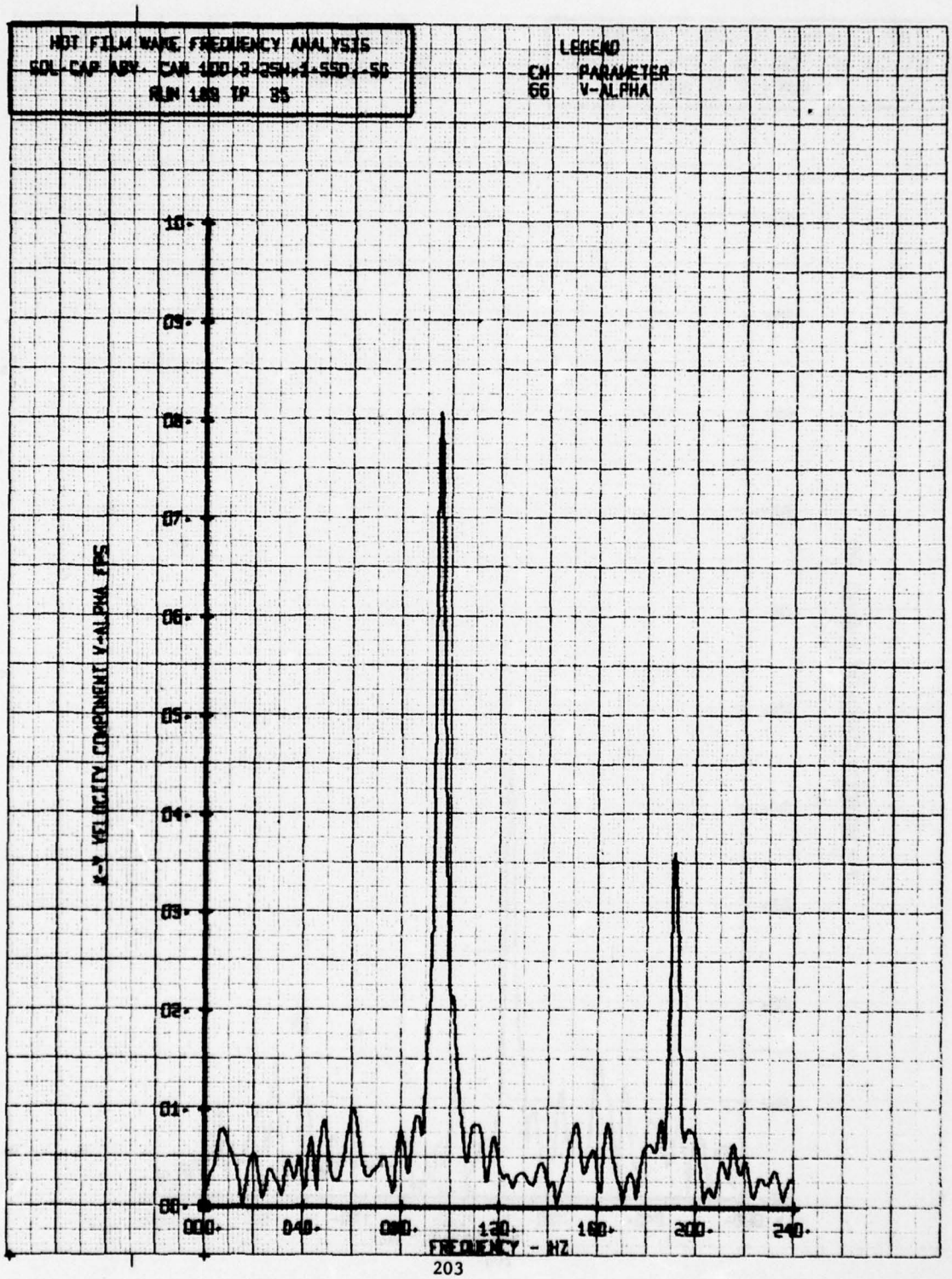
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV- CAR 100.3-25H.1-550.-SG
RUN 189 TP 35
LEGEND
CH PARAMETER
66 V-ALPHA
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X-Y VELOCITY COMPONENT V-ALPHA FPS
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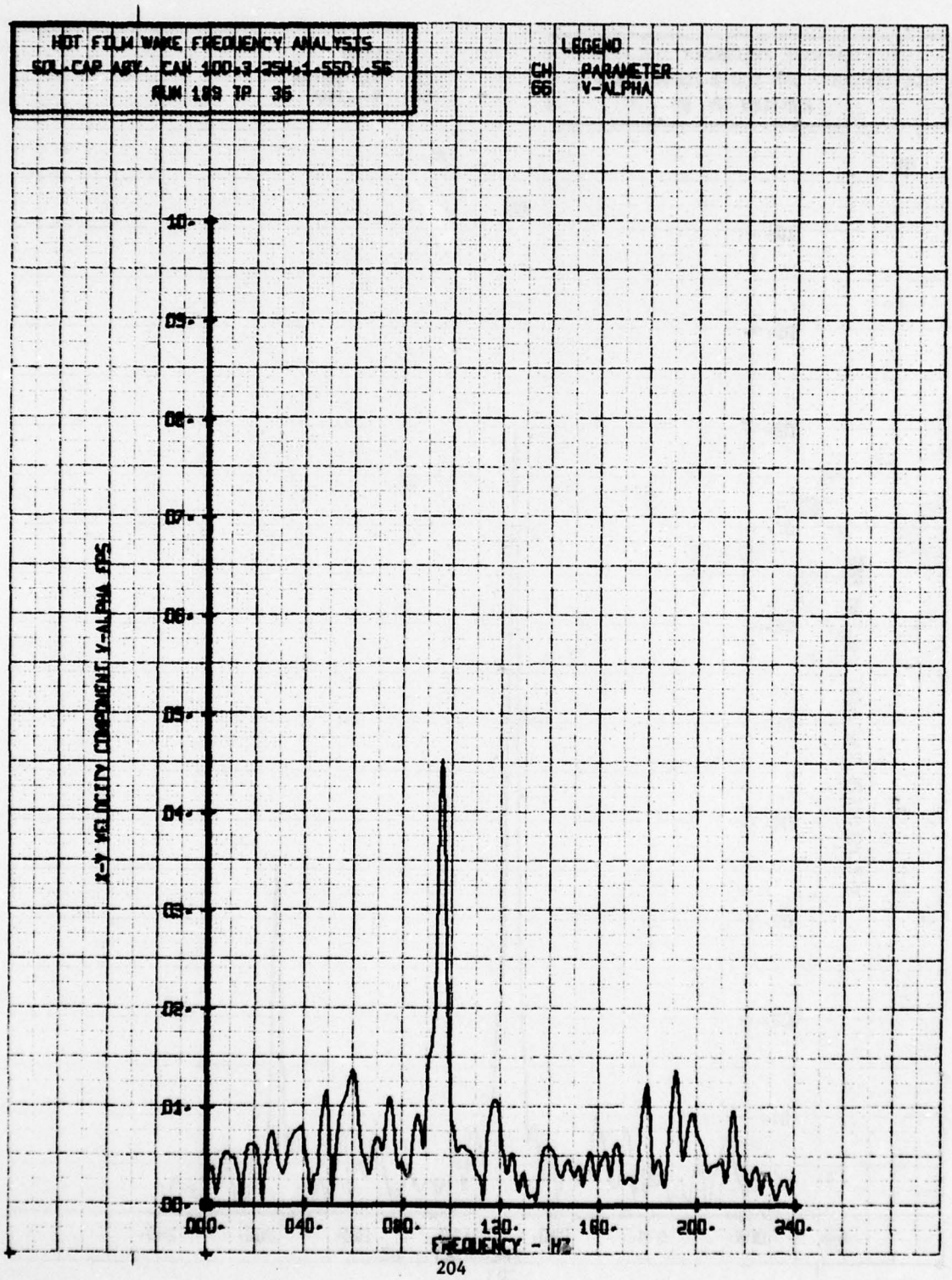
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.-CAP ABV. CAN 100.3-25H.1-550.-56
RUN 189 TP 36
LEGEND
CH PARAMETER
66 V-ALPHA
X-V VELOCITY COMPONENT V-ALPHA FPS
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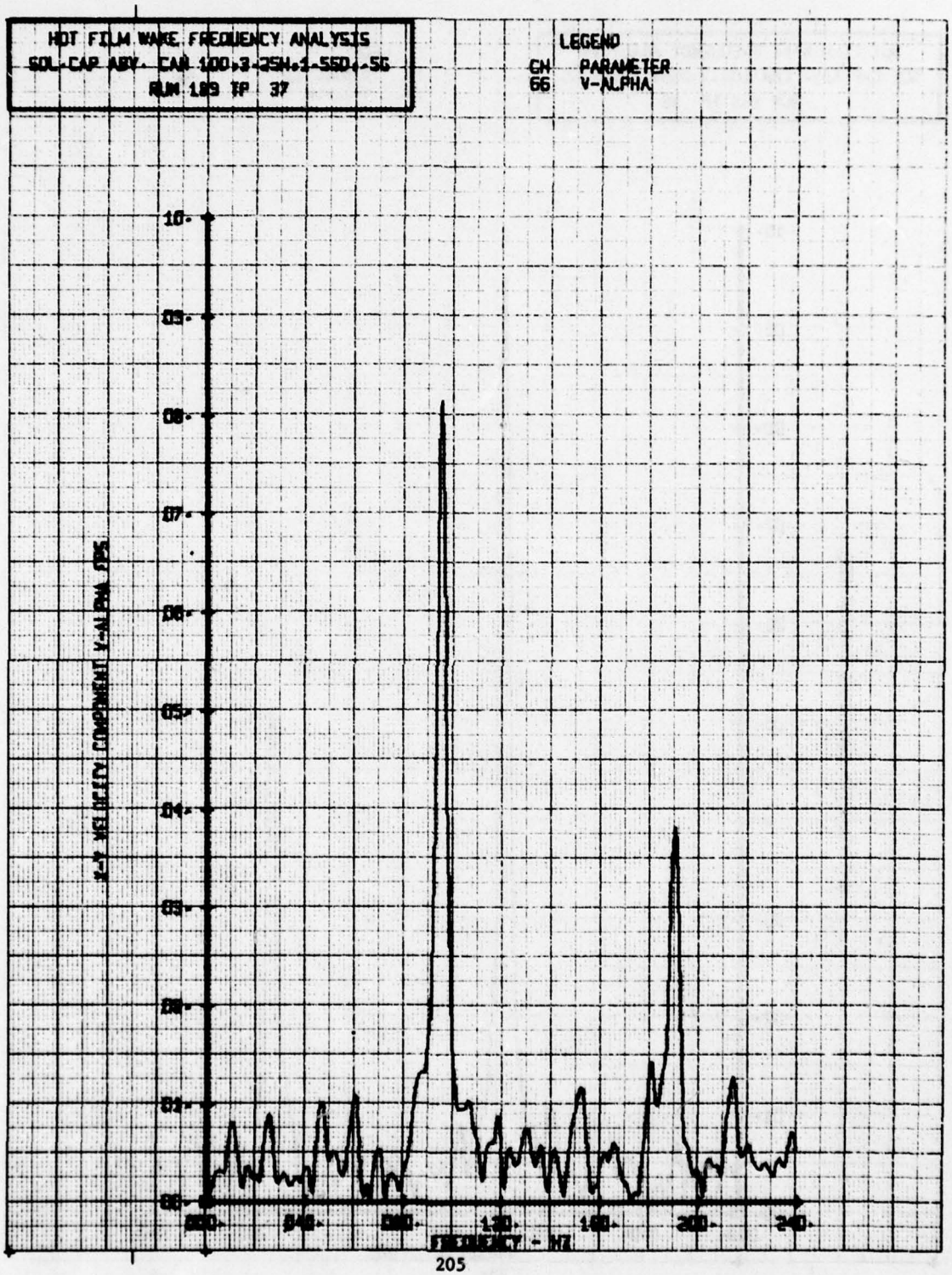
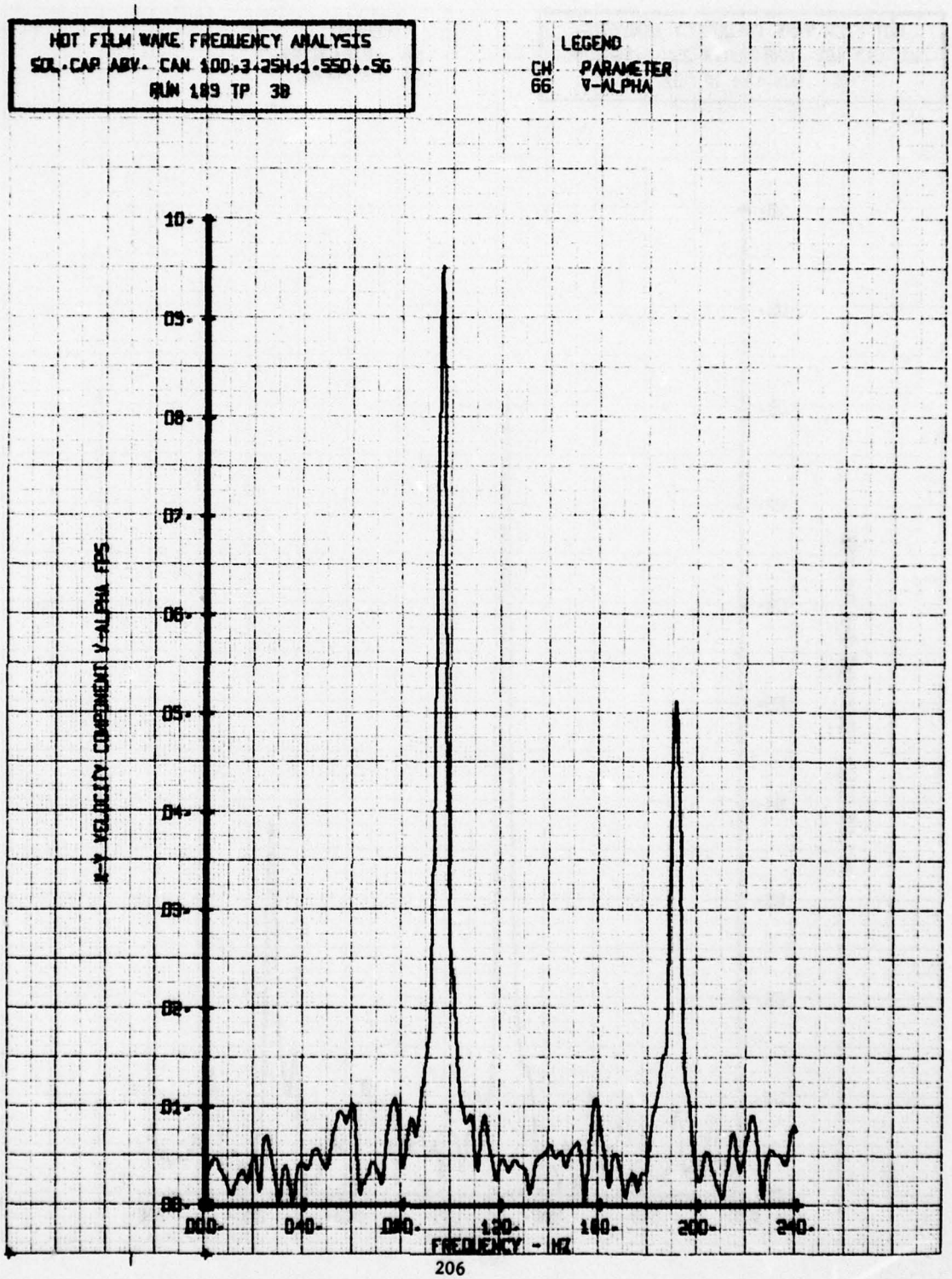
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV- CAR 100,3-25N,1-55D,-5G
RUN 189 TP 37
LEGEND
CN PARAMETER
66 V-ALPHA
X-P VELOCITY COMPONENT V-ALPHA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3.25N.1.550.-5G
RUN 189 TP 38
LEGEND
CH PARAMETER
66 V-ALPHA
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U-V VELOCITY COMPONENT V-ALPHA FPS
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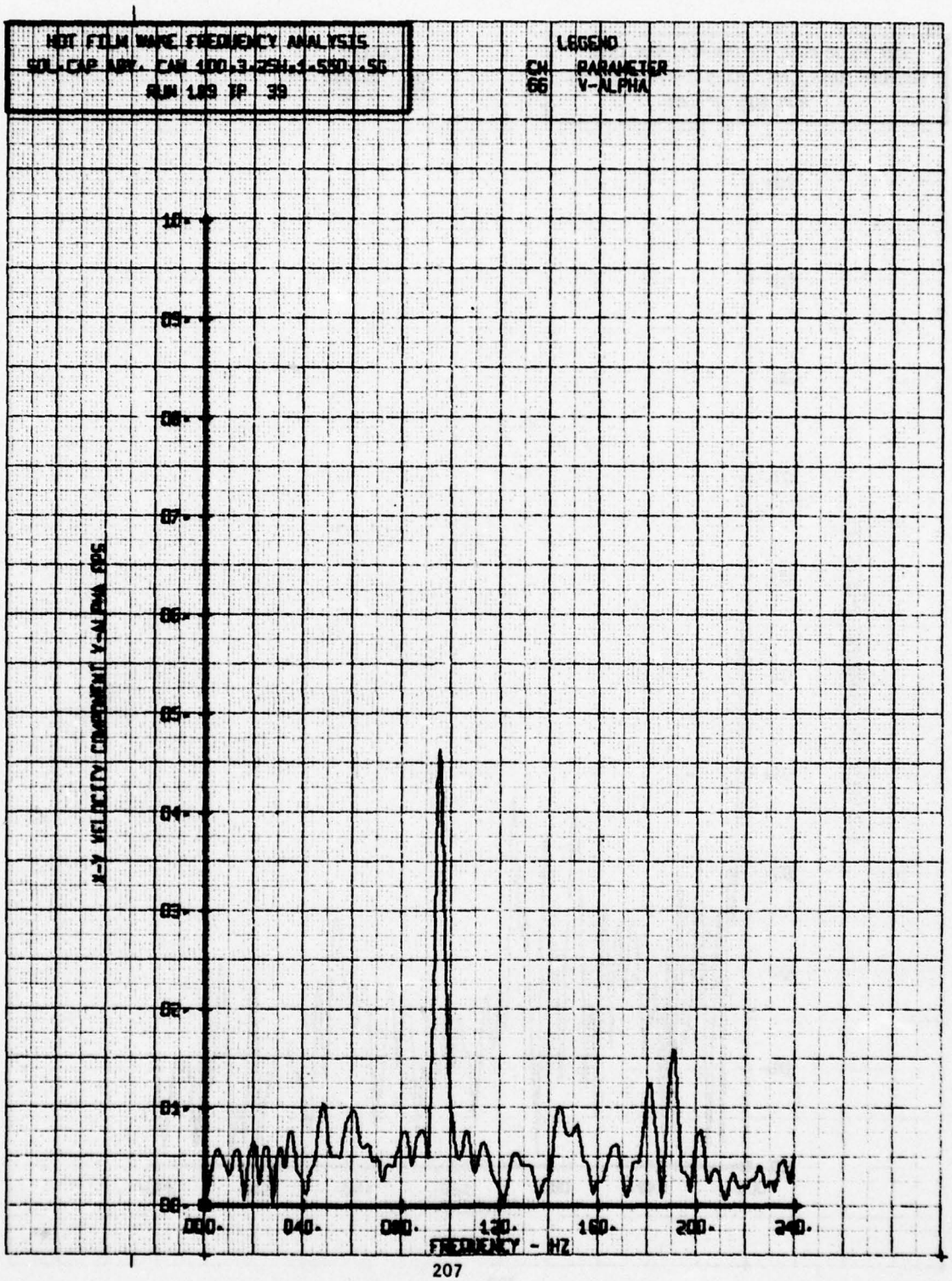
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ADV. CAN 100.3.254.1.550..SG
RUN 189 TP 39
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA .995
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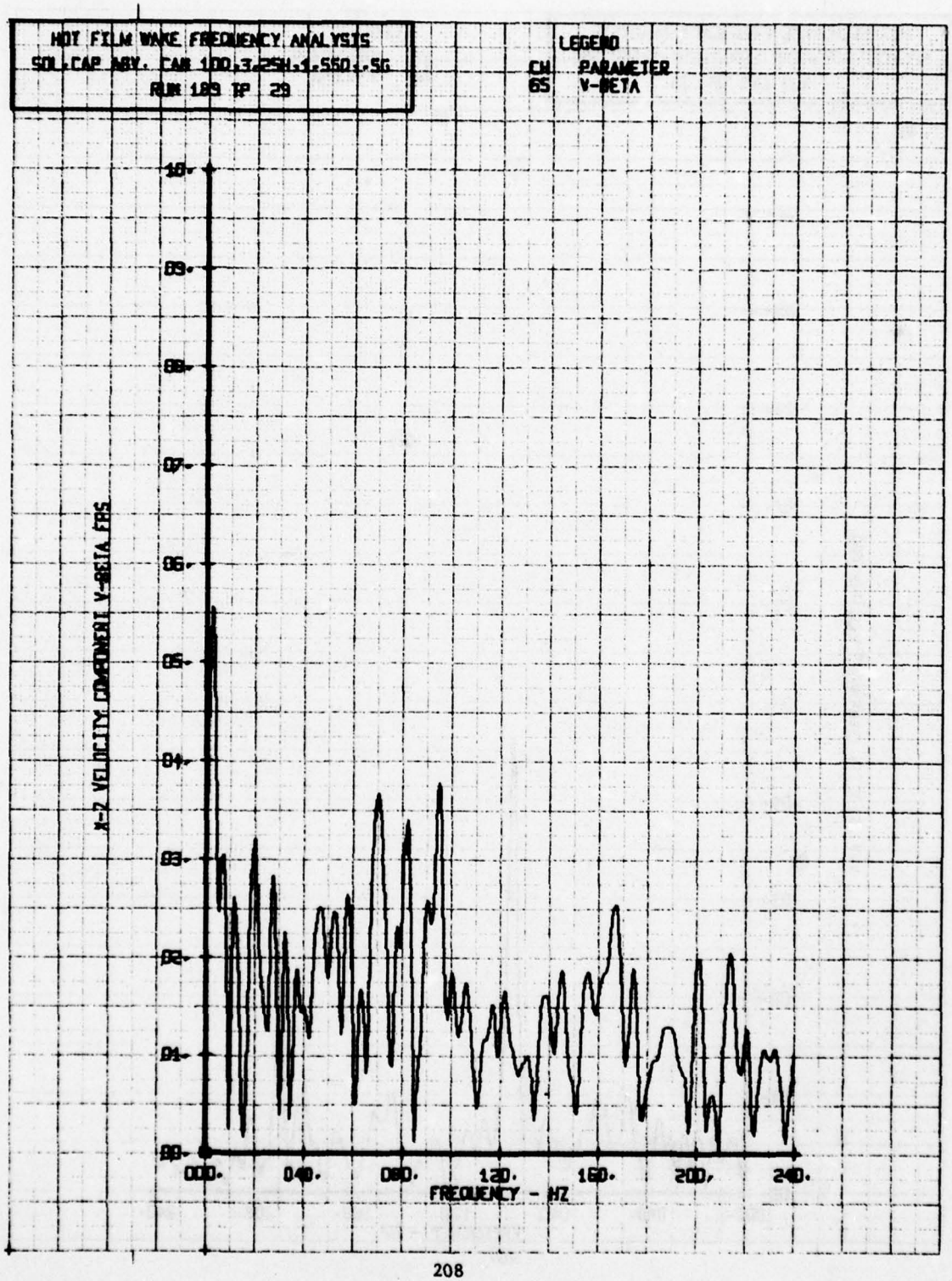
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAB 100,3.25H,1.550,.5G
RUN 189 TP 29
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FRS
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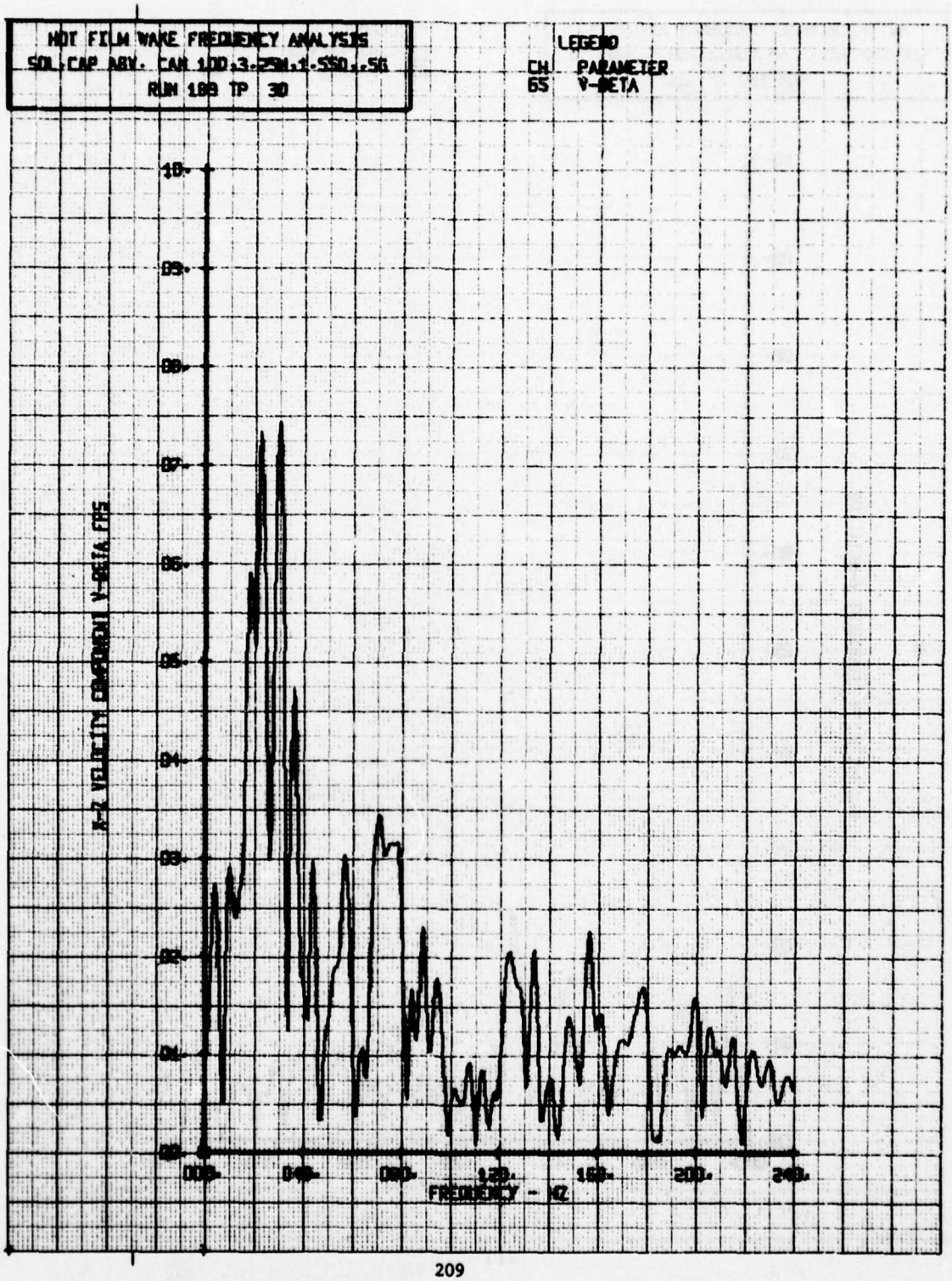
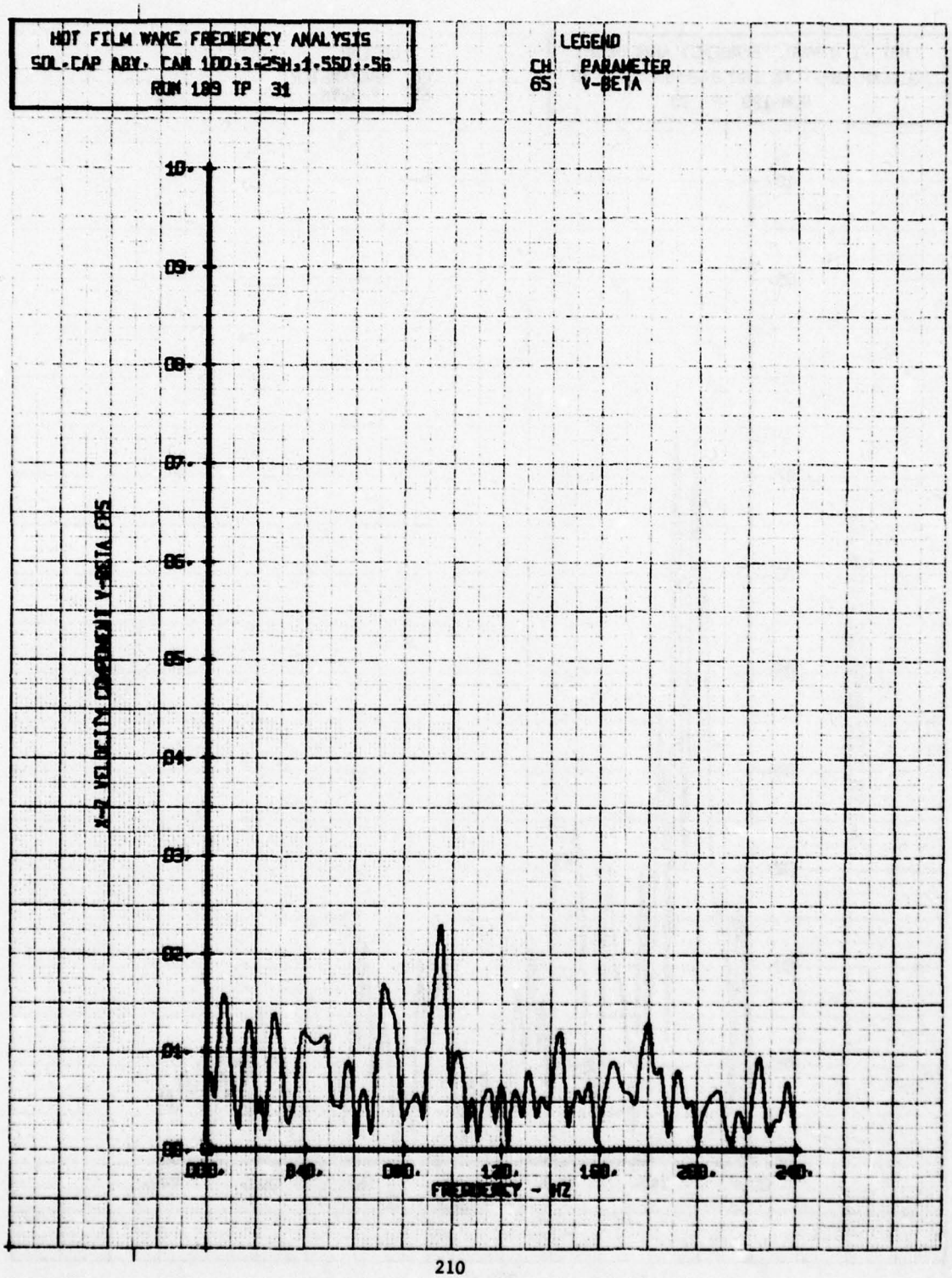
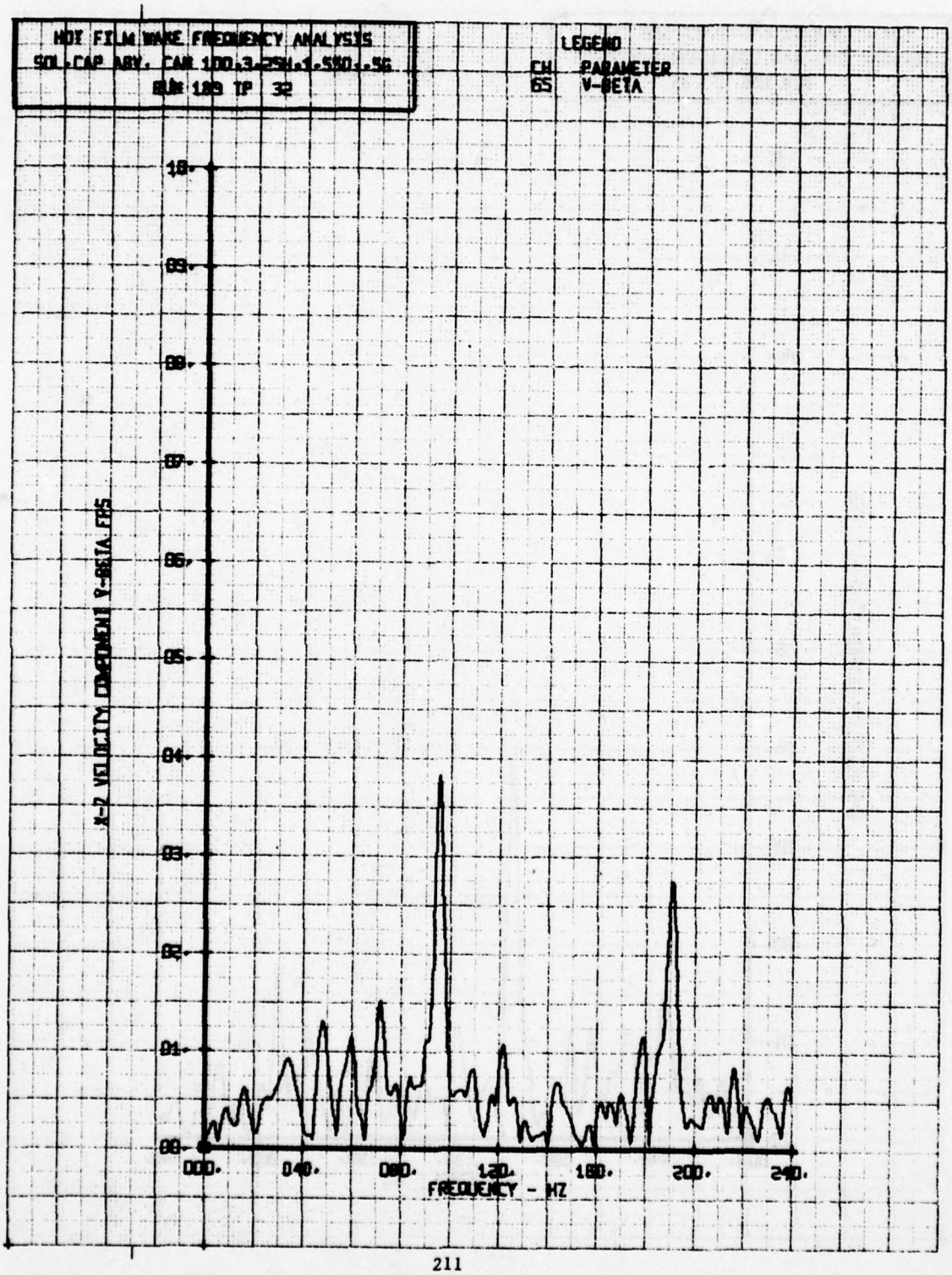
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3-250.1-550..5G
RUN 189 TP 30
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA,FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABY. CAN 100,3.25H,1.55D,.56
RUN 189 TP 31
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAR 100.3-25H.1-590..56
RUN 189 TP 32
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FRS
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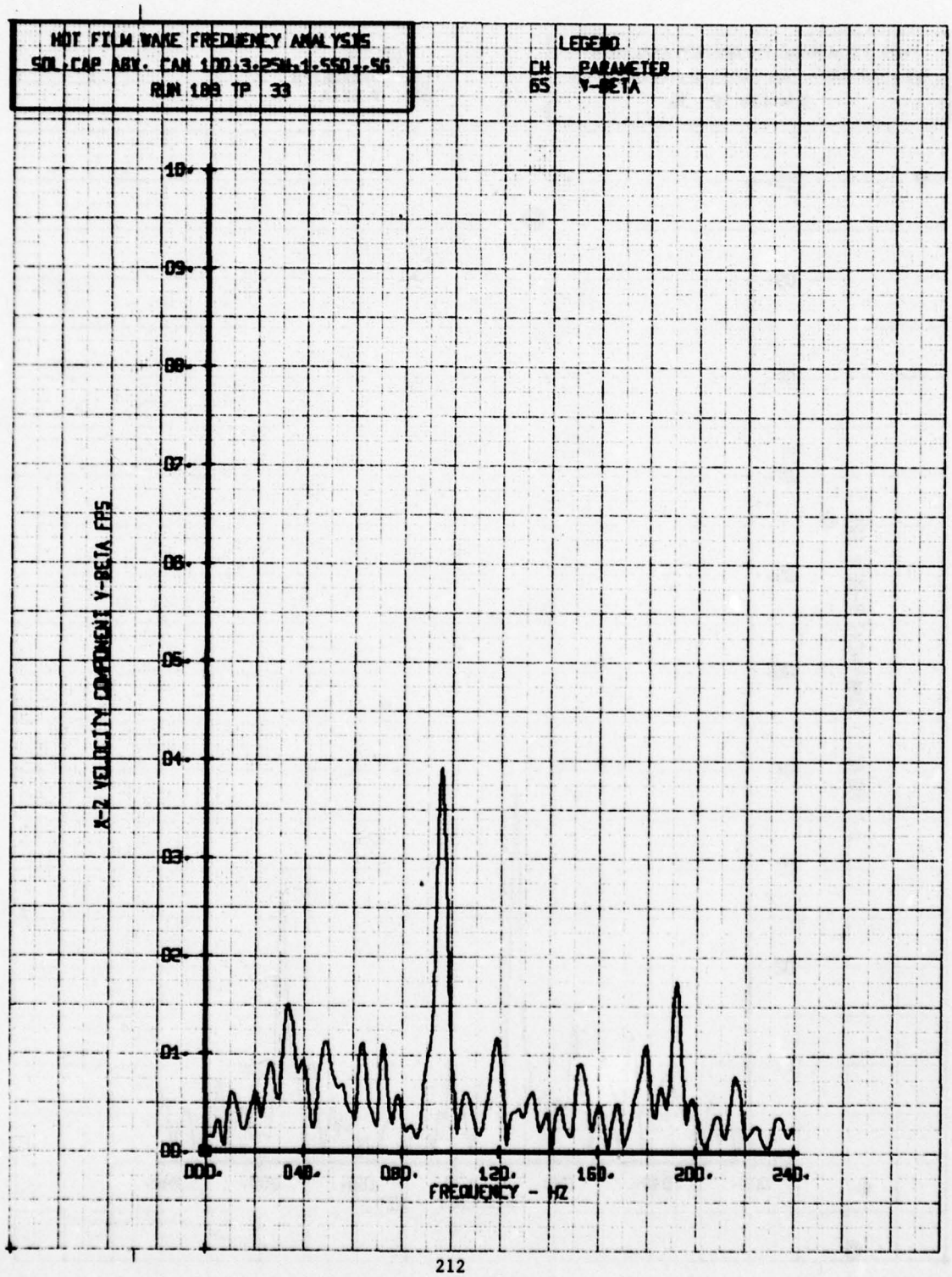
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.3.25W.1.550.,SG
RUN 188 TP 33
LEGEND
CH PARAMETER
65 Y-BETA
X-2 VELOCITY COMPONENT Y-BETA FPS
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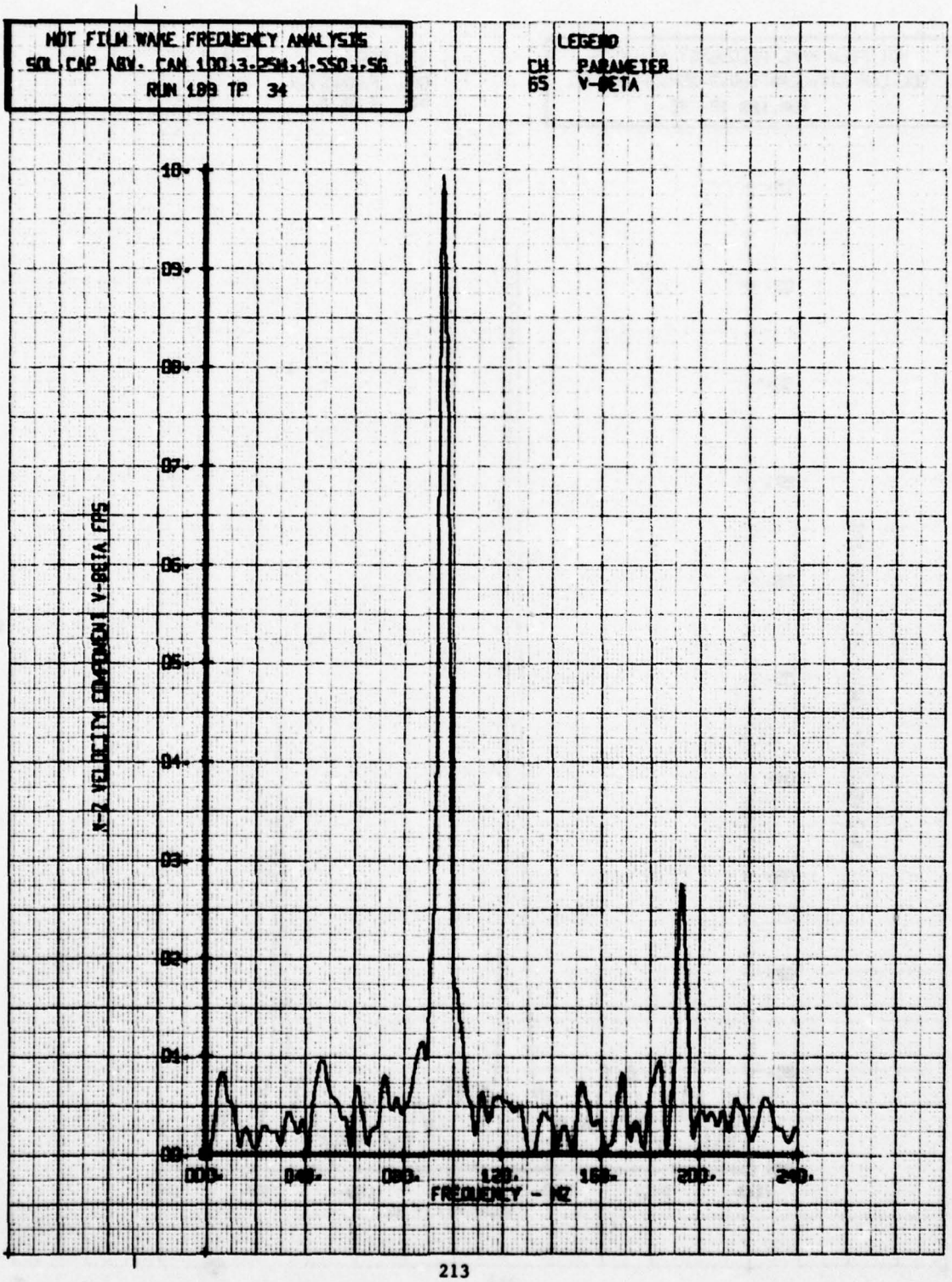
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL CAP ABV. CAN 100.3.25H.1.550.,SG
RUN 189 TP 34
LEGEND
CH PARAMETER
65 V-BETA
N-2 VELOCITY COMPONENT V-BETA FPS
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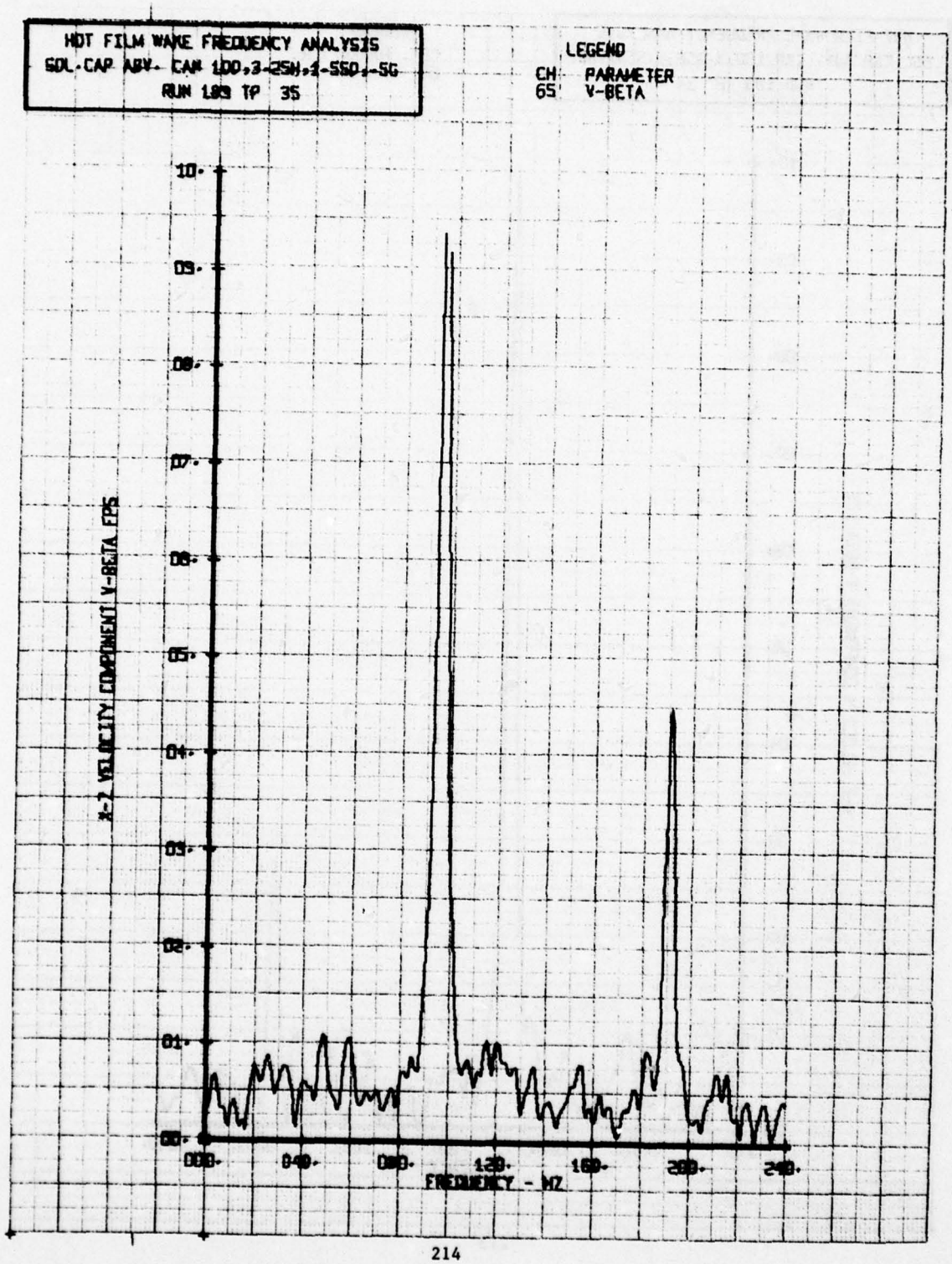
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100,3-25H,1-550,-5G
RUN 189 TP 35
LEGEND
CH PARAMETER
65 V-BETA
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X-2 VELOCITY COMPONENT V-BETA FPS
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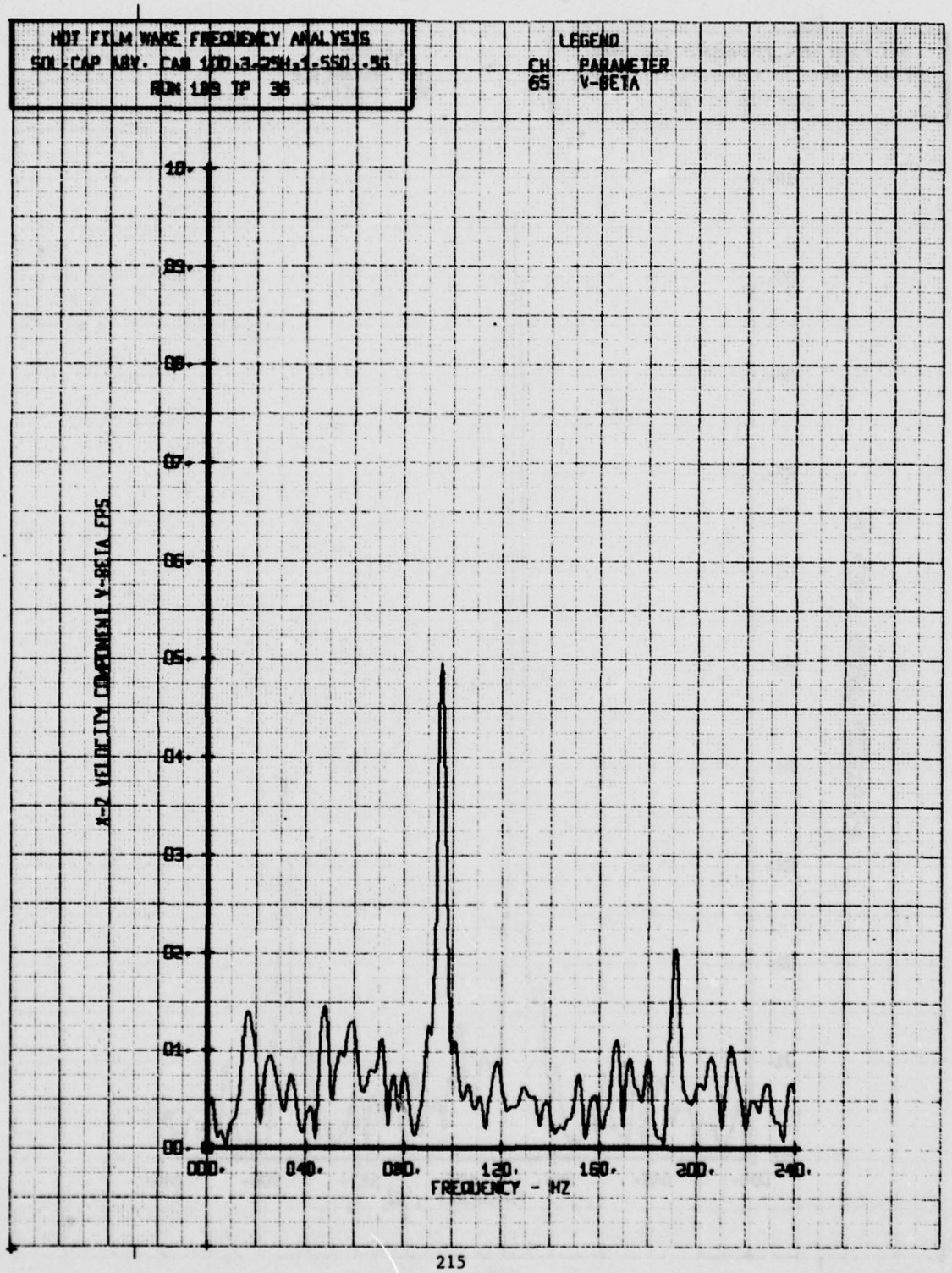
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV. CAB 100,3.25H,1.55D,.5G
RUN 183 TP 36
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ
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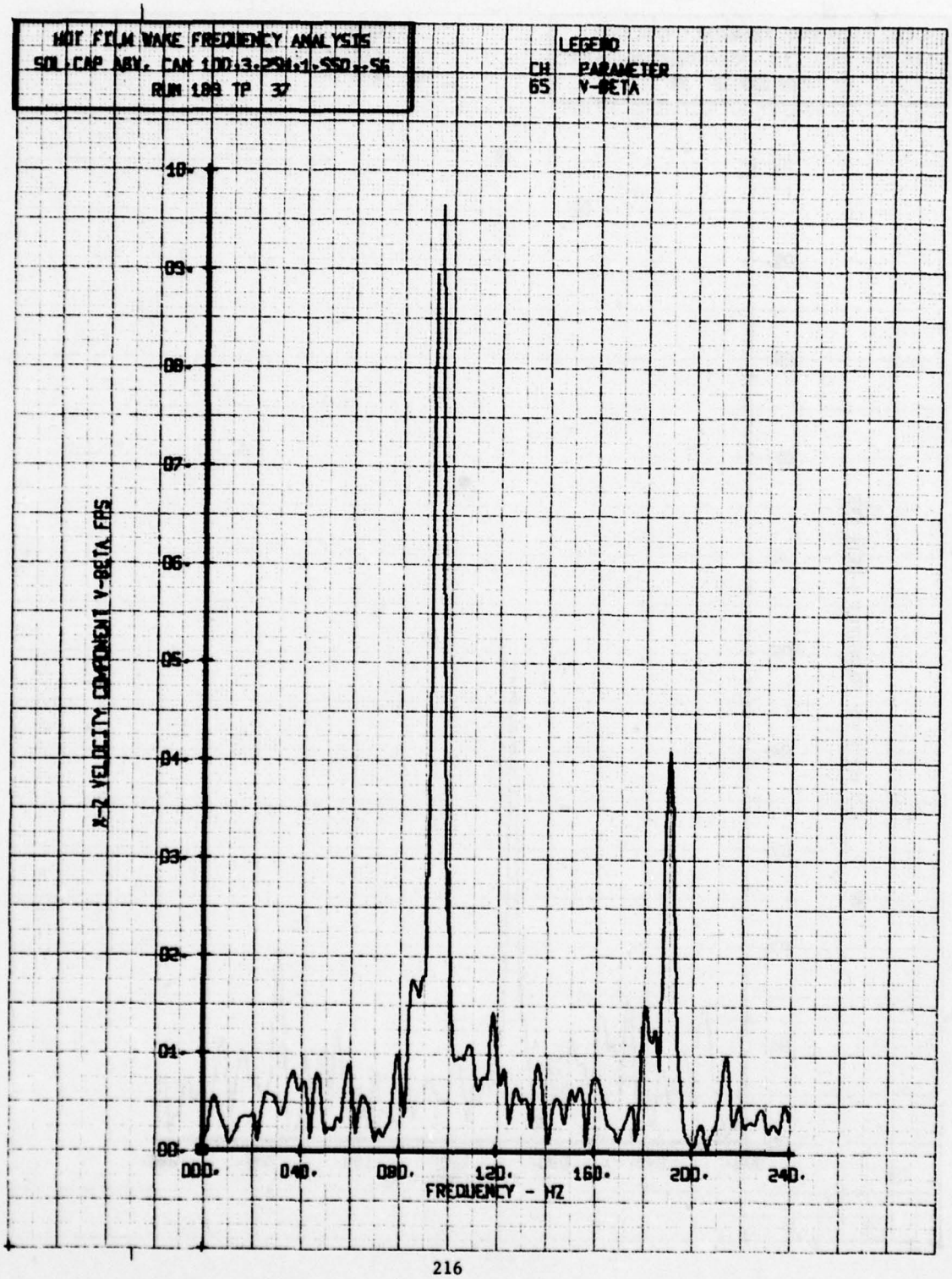
HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV. CAN 100.3.294.1.550..56
RUN 189 TP 37
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
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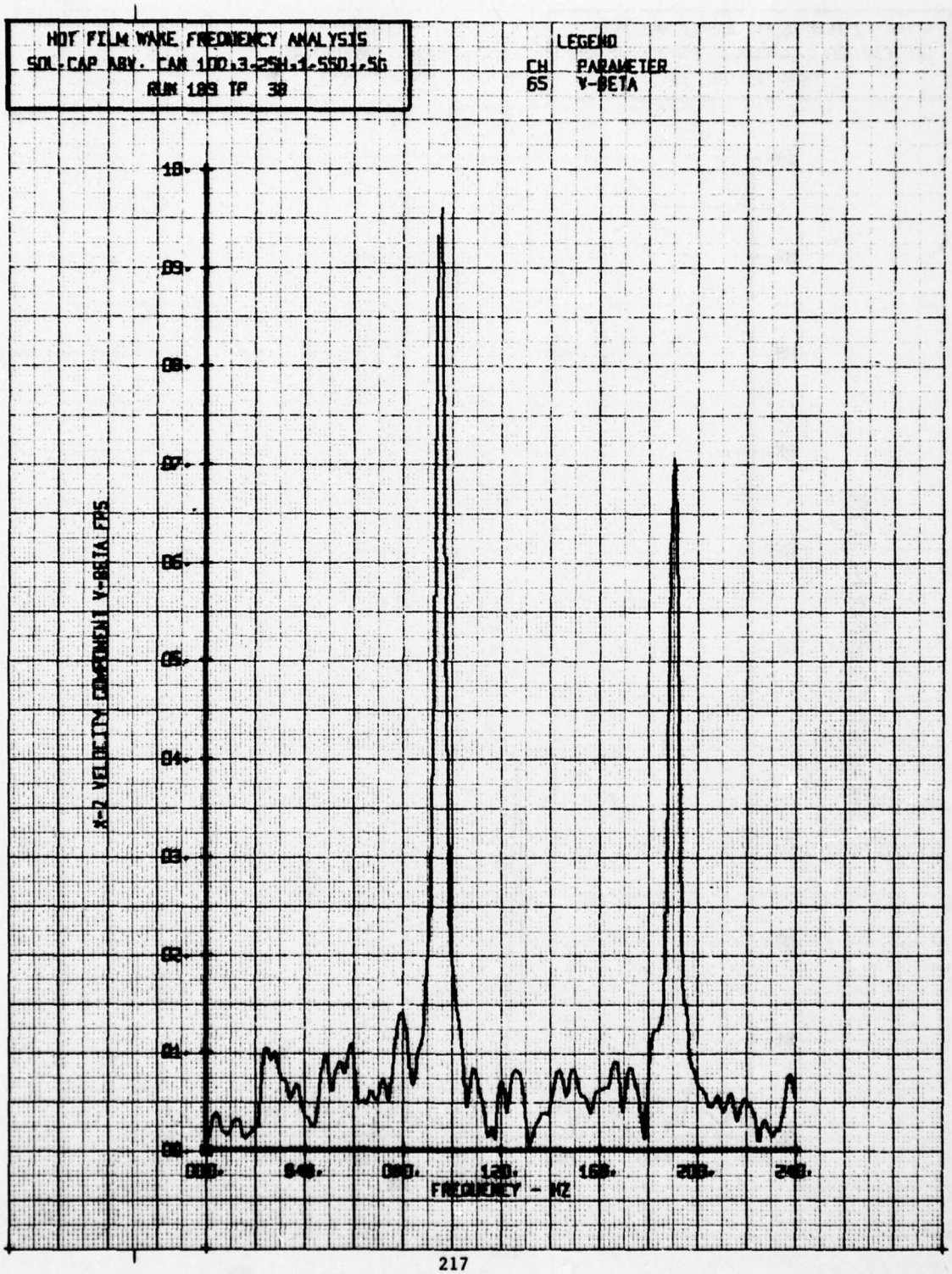
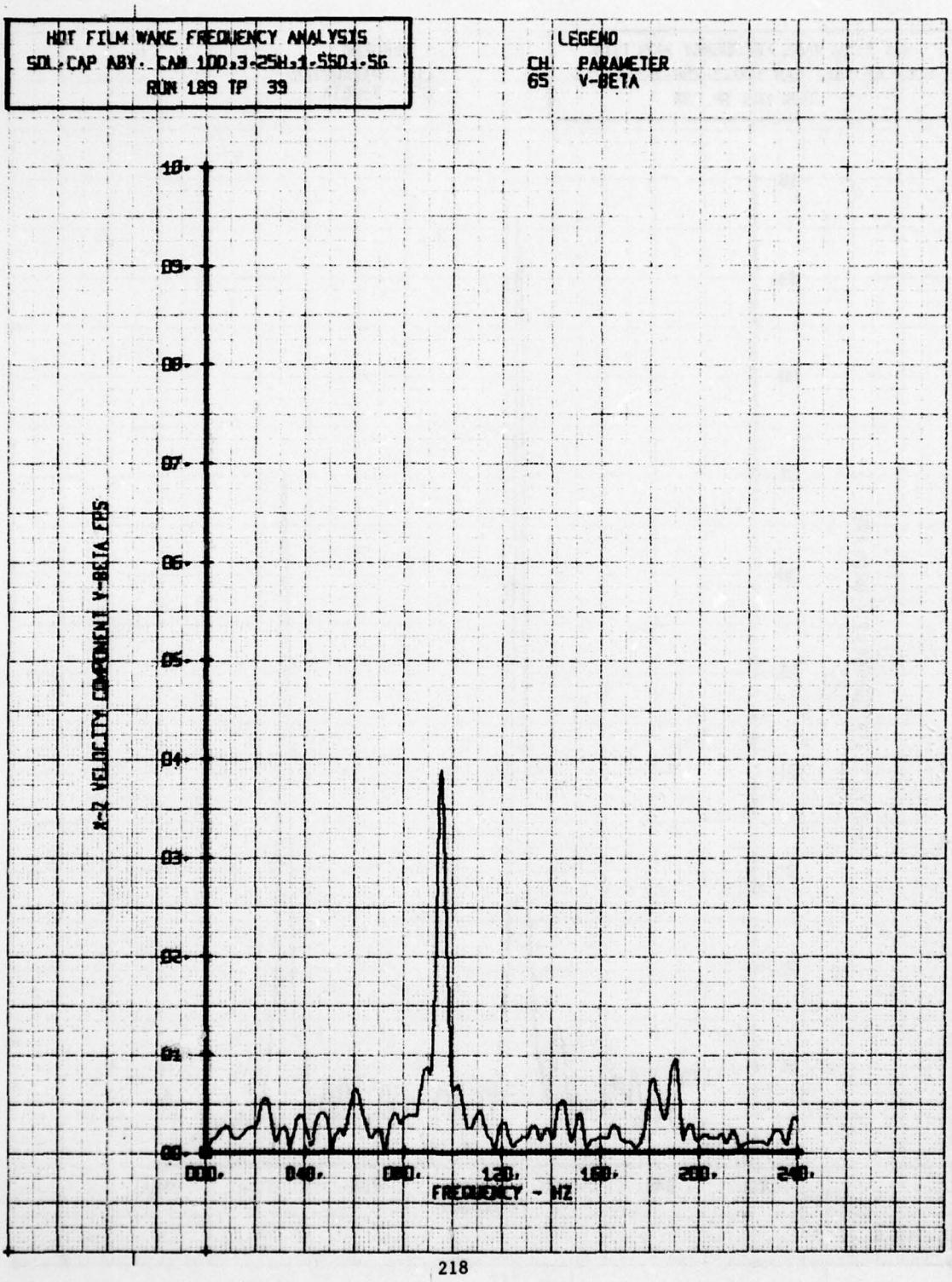
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100,3.25H,1.550,.5G
RUN 189 TP 38
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100,3-25H,1-550,-5G
RUN 189 TP 39
LEGEND
CH PARAMETER
65 V-BETA
X-Z VELOCITY COMPONENT V-BETA FBS
FREQUENCY - HZ
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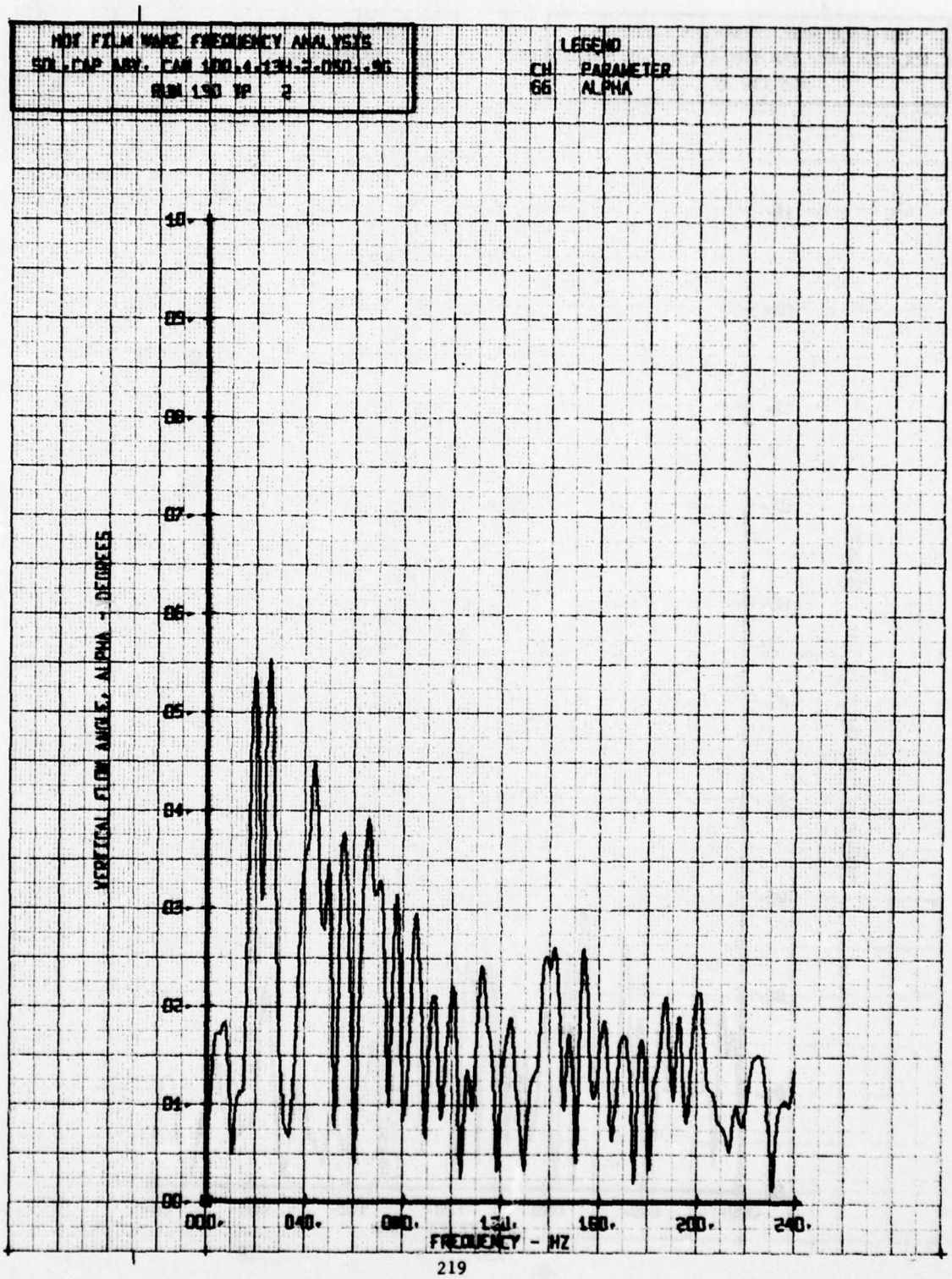
HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
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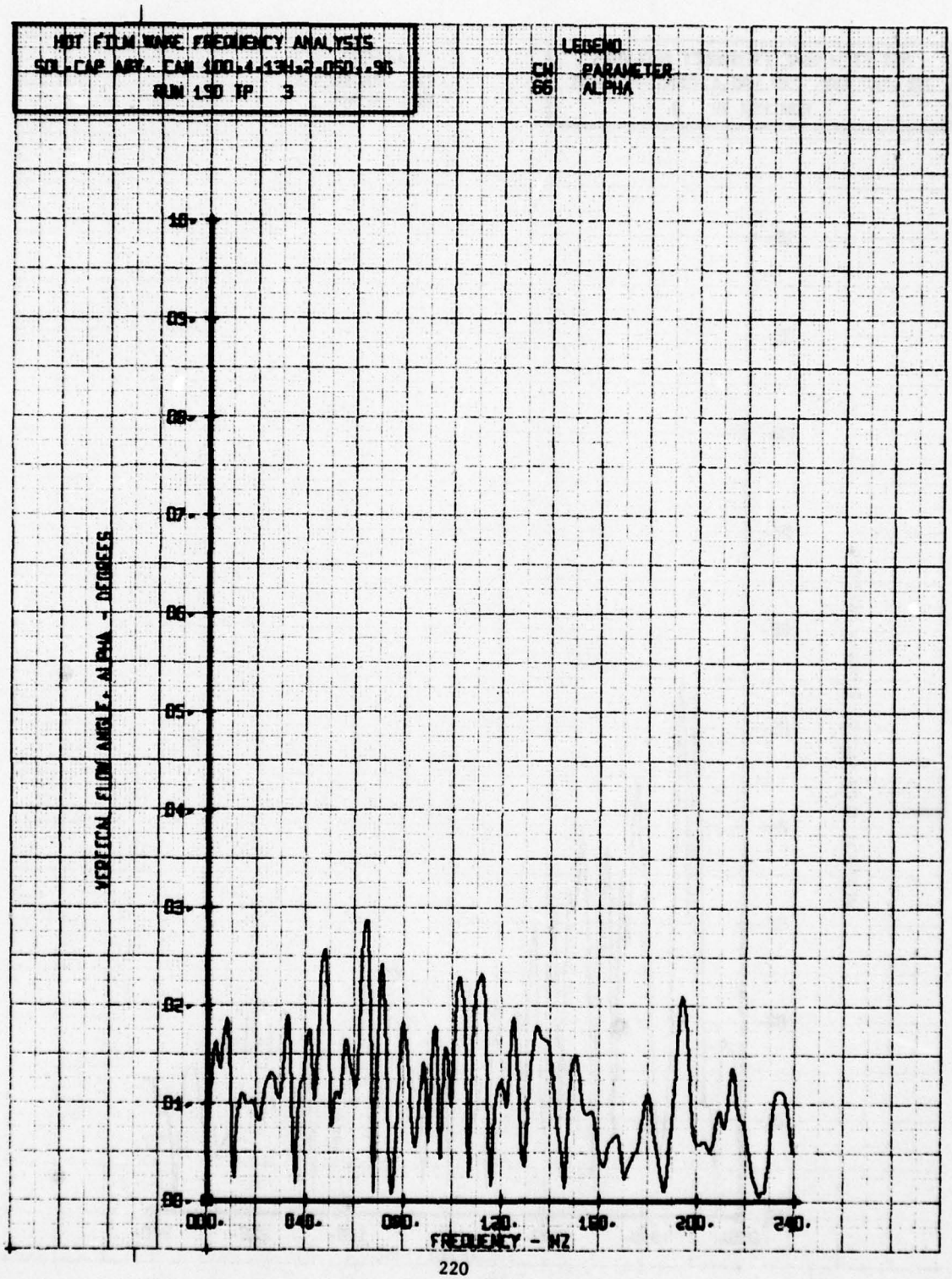
HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARR. CAN 100.4-13H.2.050..96
RUN 150 TP 3
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ
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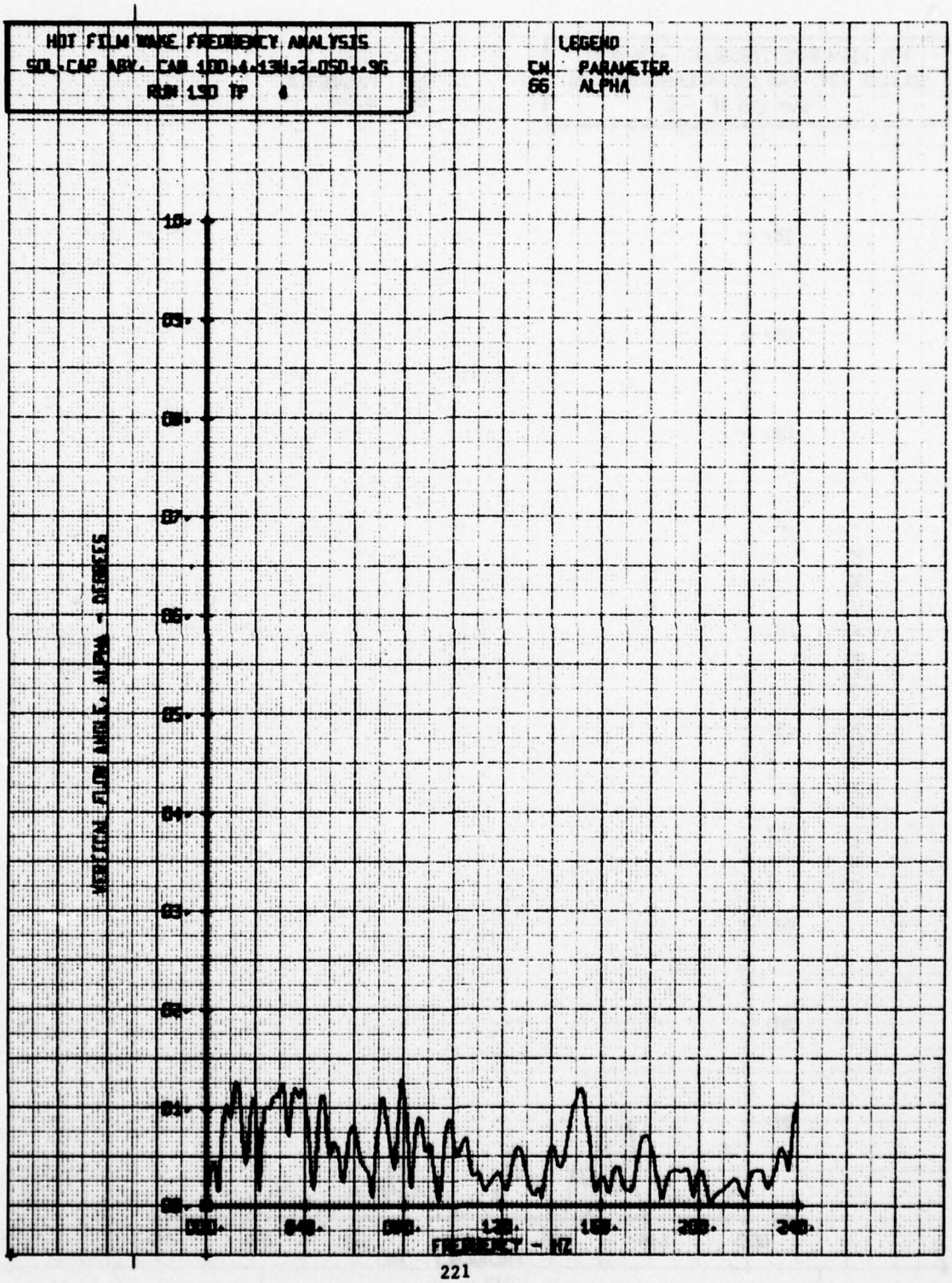
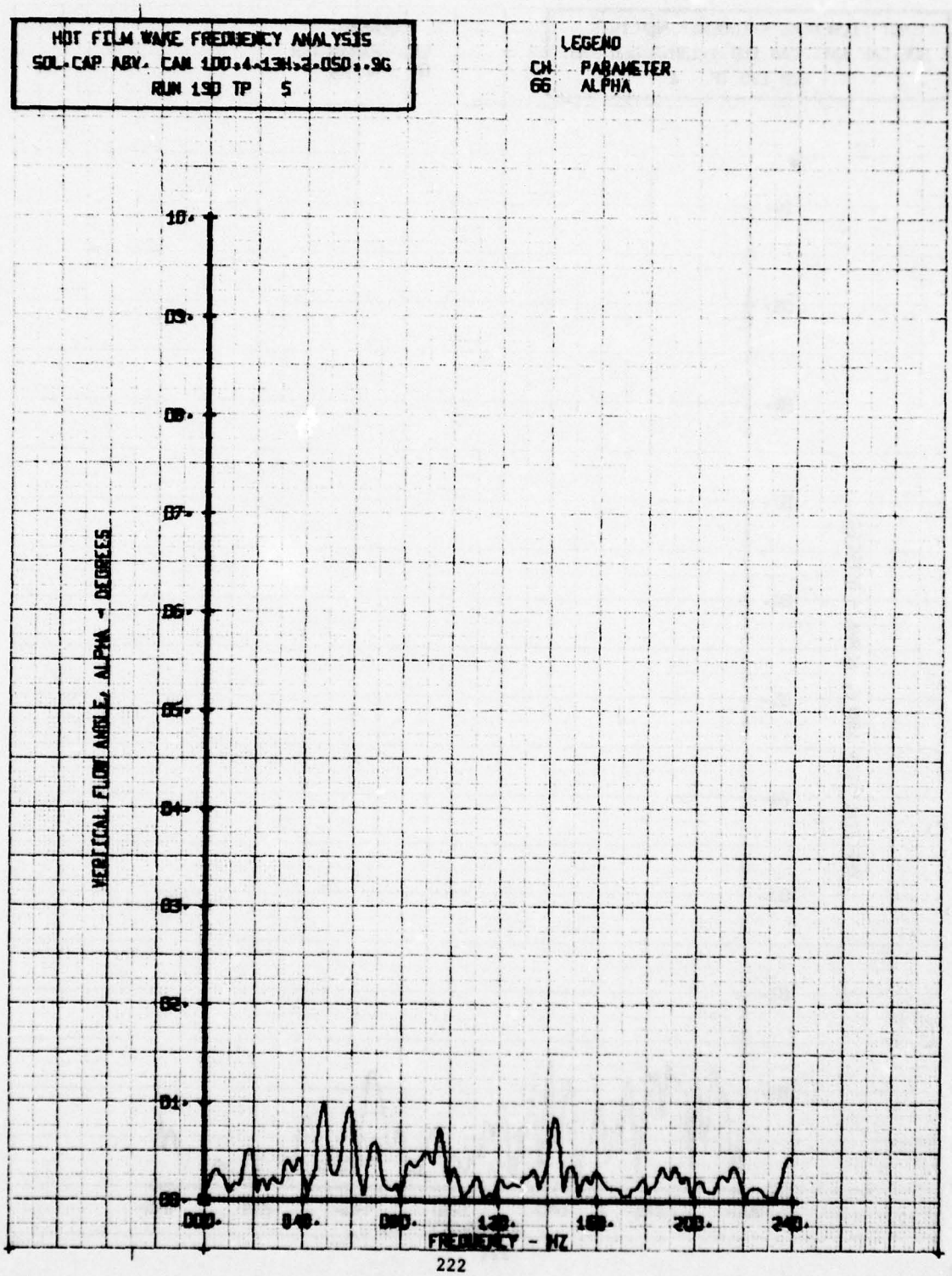
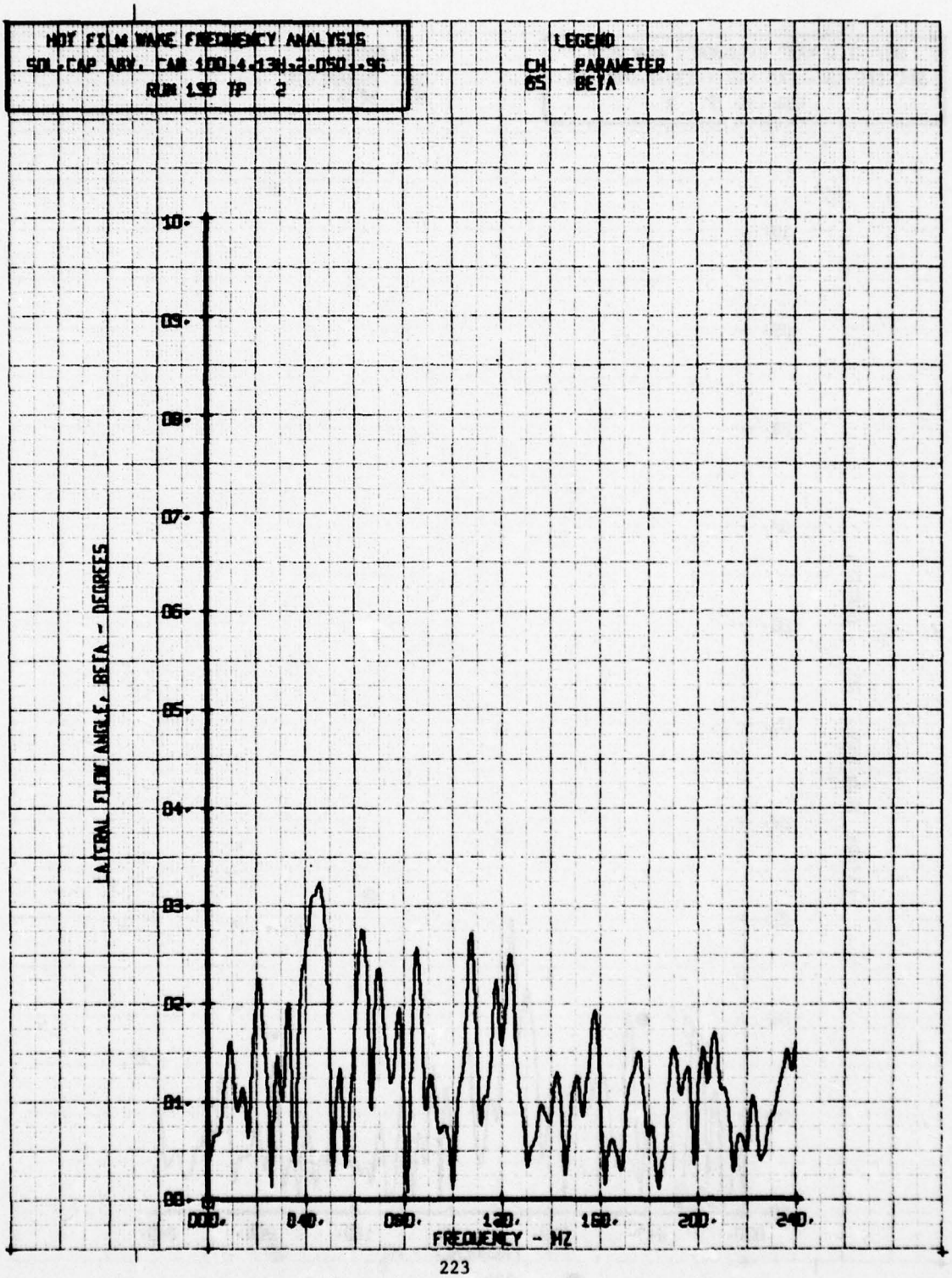

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAB 100.4.13N.2.050.-9G
RUN 150 TP 4
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.-CAP ABV. CAM 100.4-13H.2-050.-9G
RUN 190 TP 5
LEGEND
CH PARAMETER
66 ALPHA
VERTICAL FLOW ANGLE, ALPHA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARV. CAR 100.4.13H.2.050.,96
RUN 150 TP 2
LEGEND
CH PARAMETER
65 BETA
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LATERAL FLOW ANGLE, BETA - DEGREES
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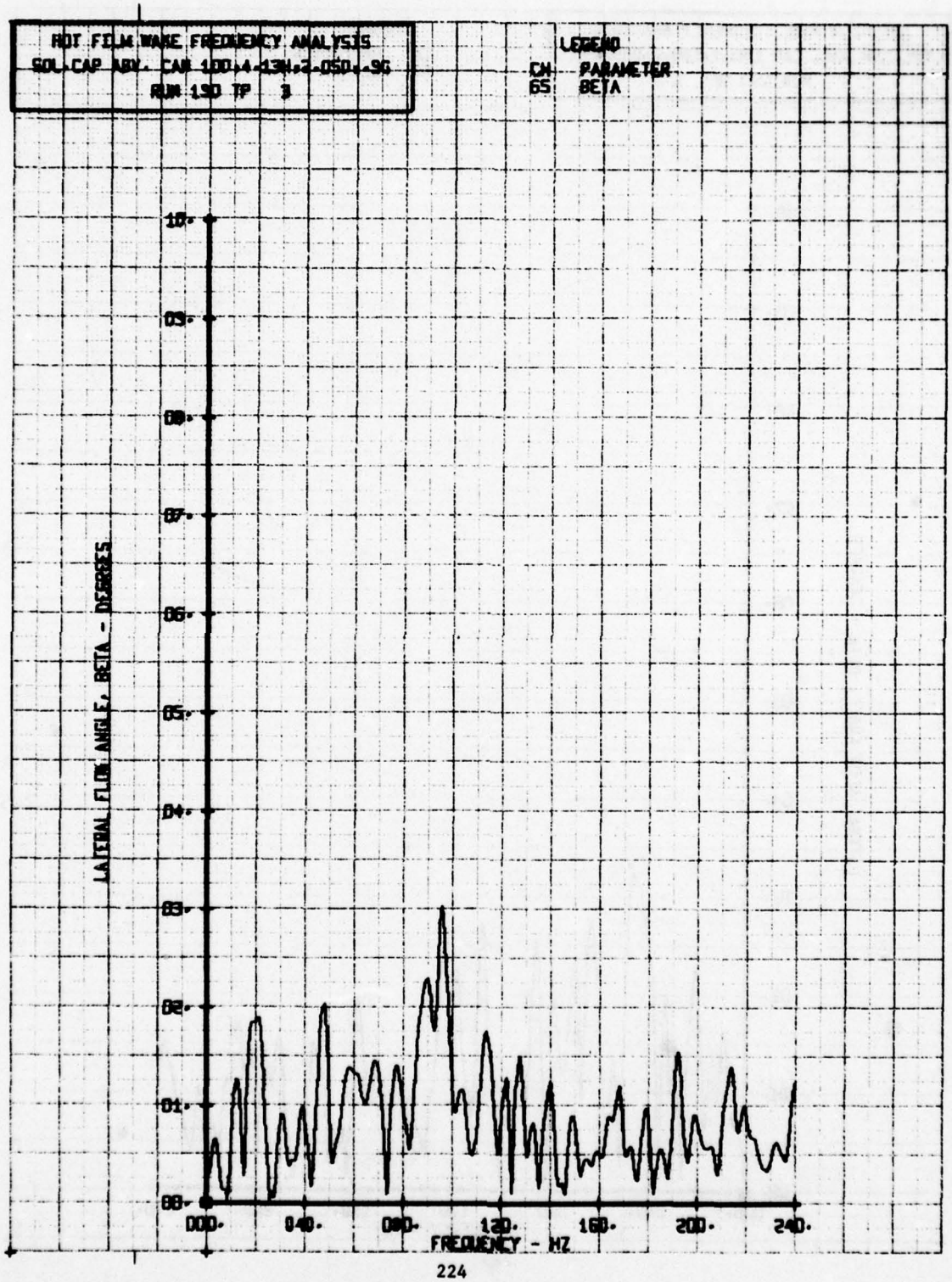
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAR 100.4-134.2-050.-96
RUN 190 TP 3
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
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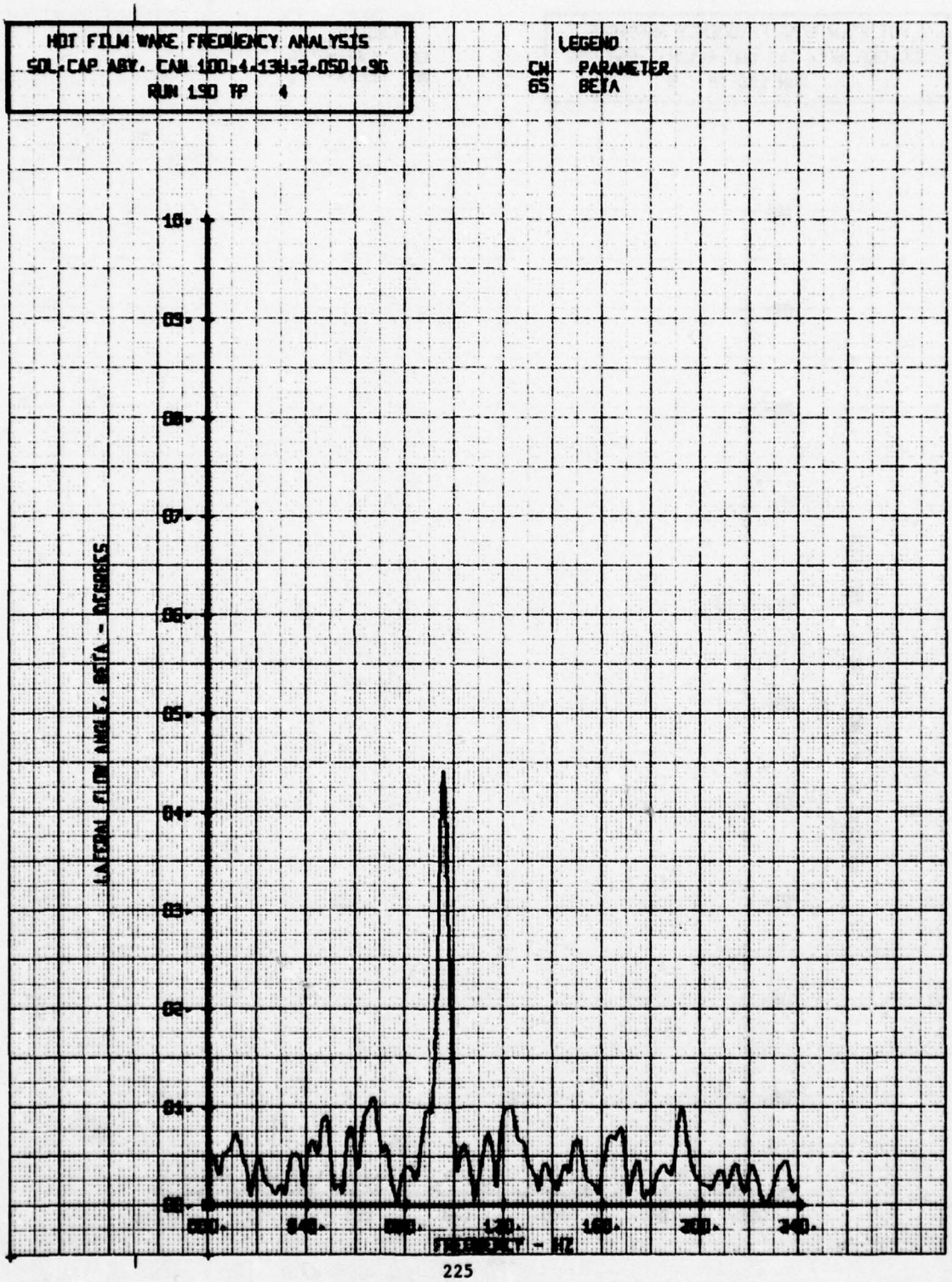
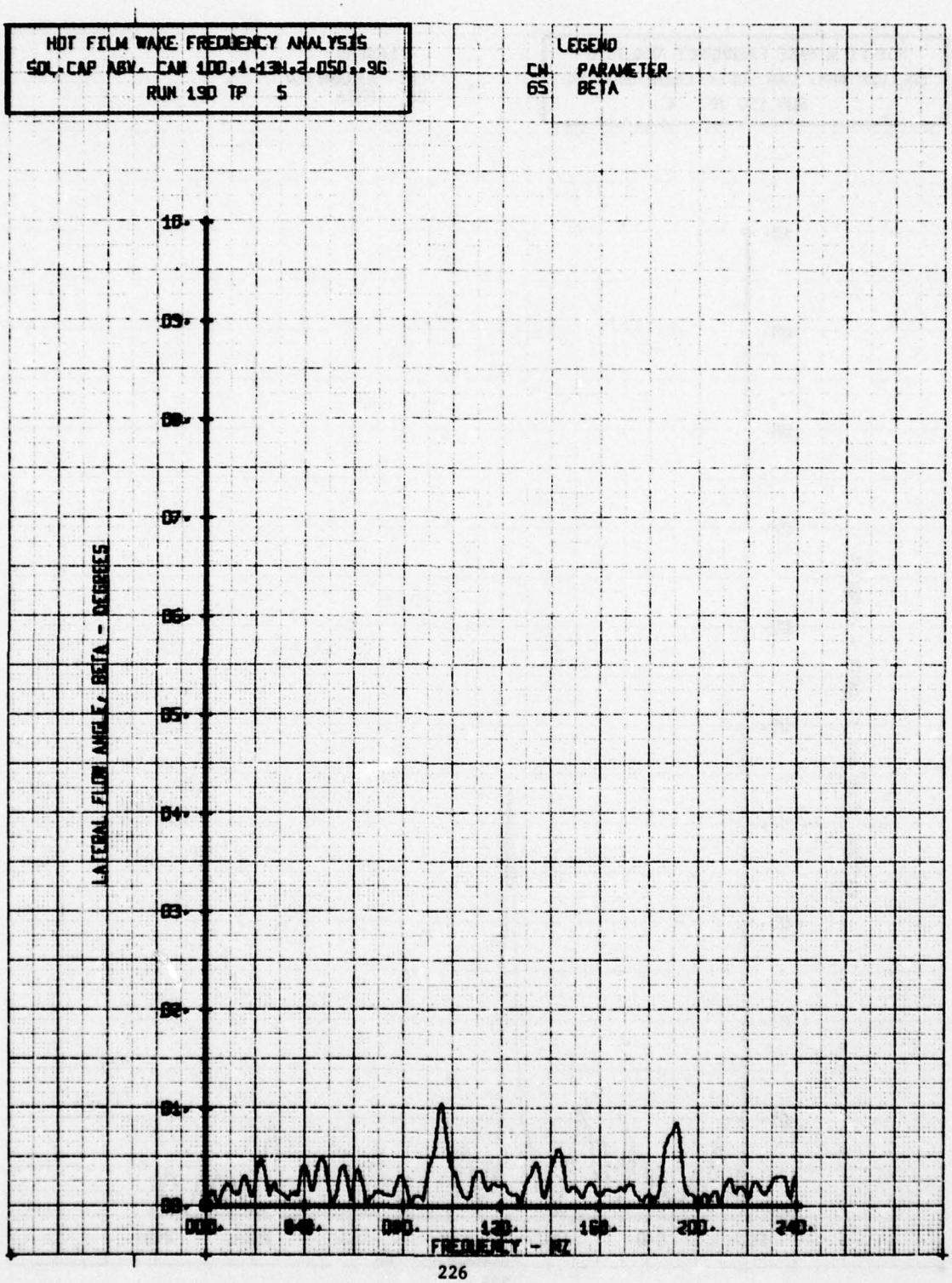
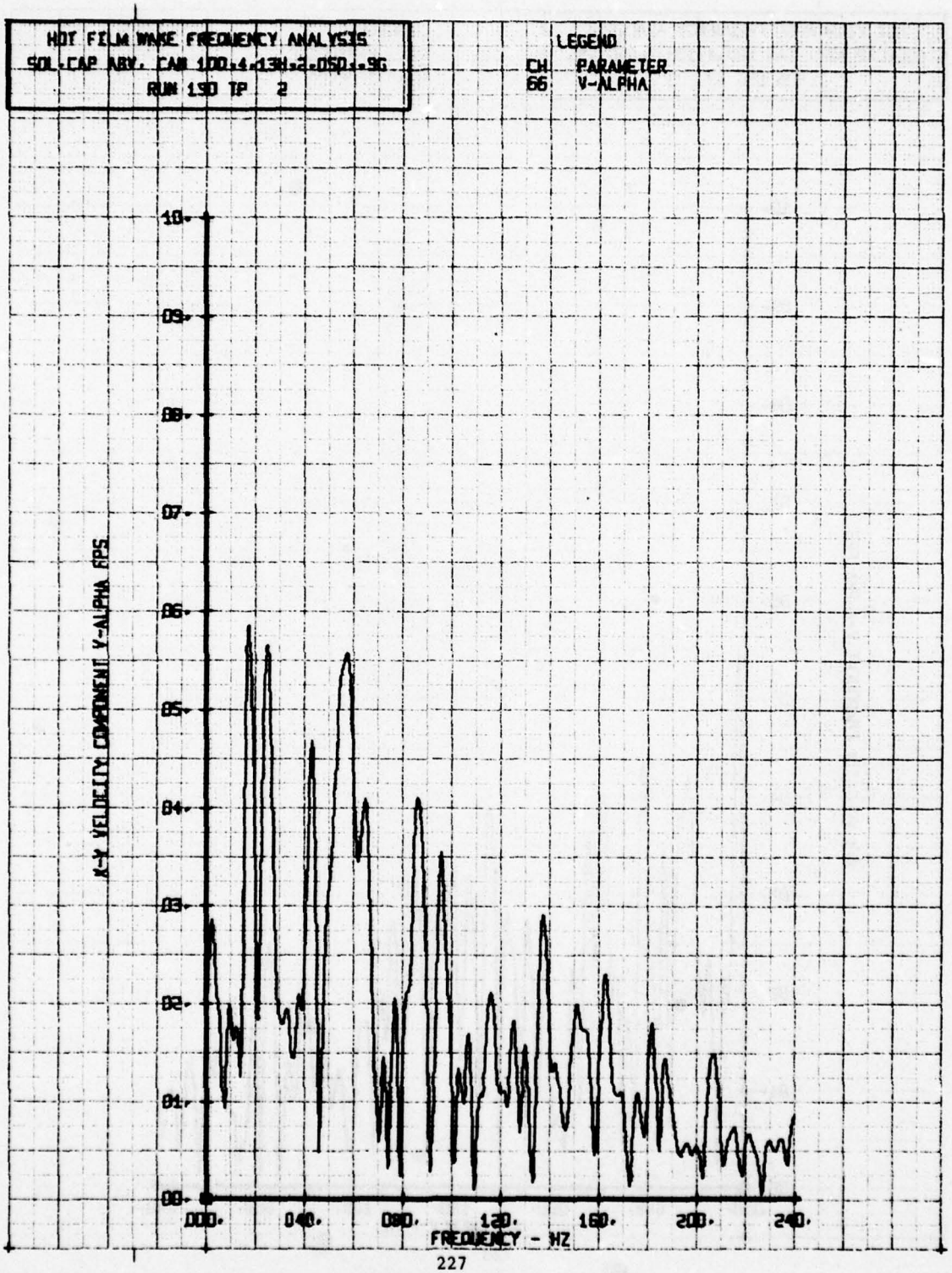
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.4.13H.2.050.0.90
RUN 190 TP 4
LEGEND
CH PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAM 100.4.13N.2.050.-9G
RUN 190 TP 5
LEGEND
CH. PARAMETER
65 BETA
LATERAL FLOW ANGLE, BETA - DEGREES
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARY. CAM 100.4.13H.2.050.9G
RUN 190 TP 2
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
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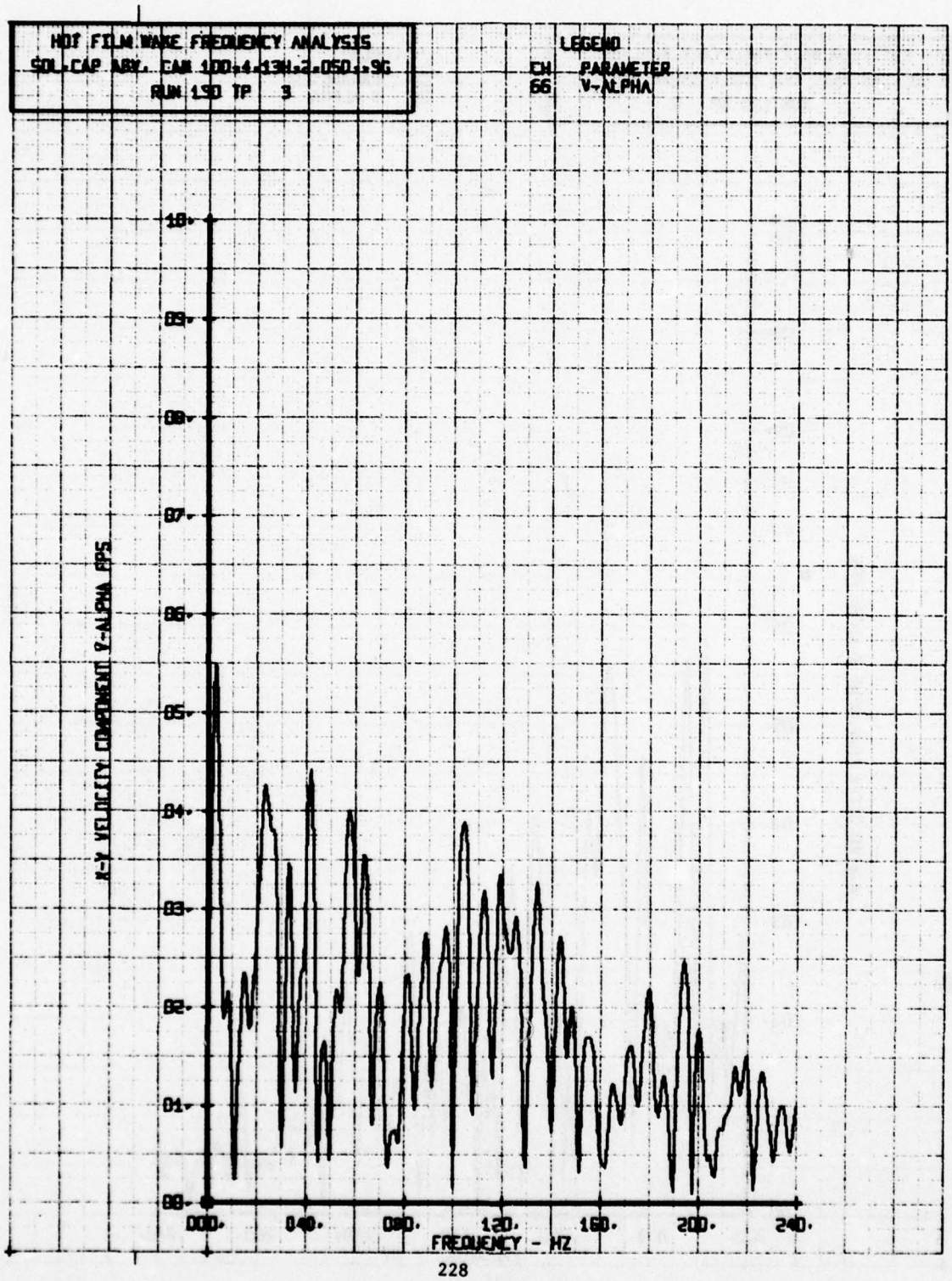
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV. CAM 100.4.13H.2.050..9G
RUN 150 TP 3
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA FPS
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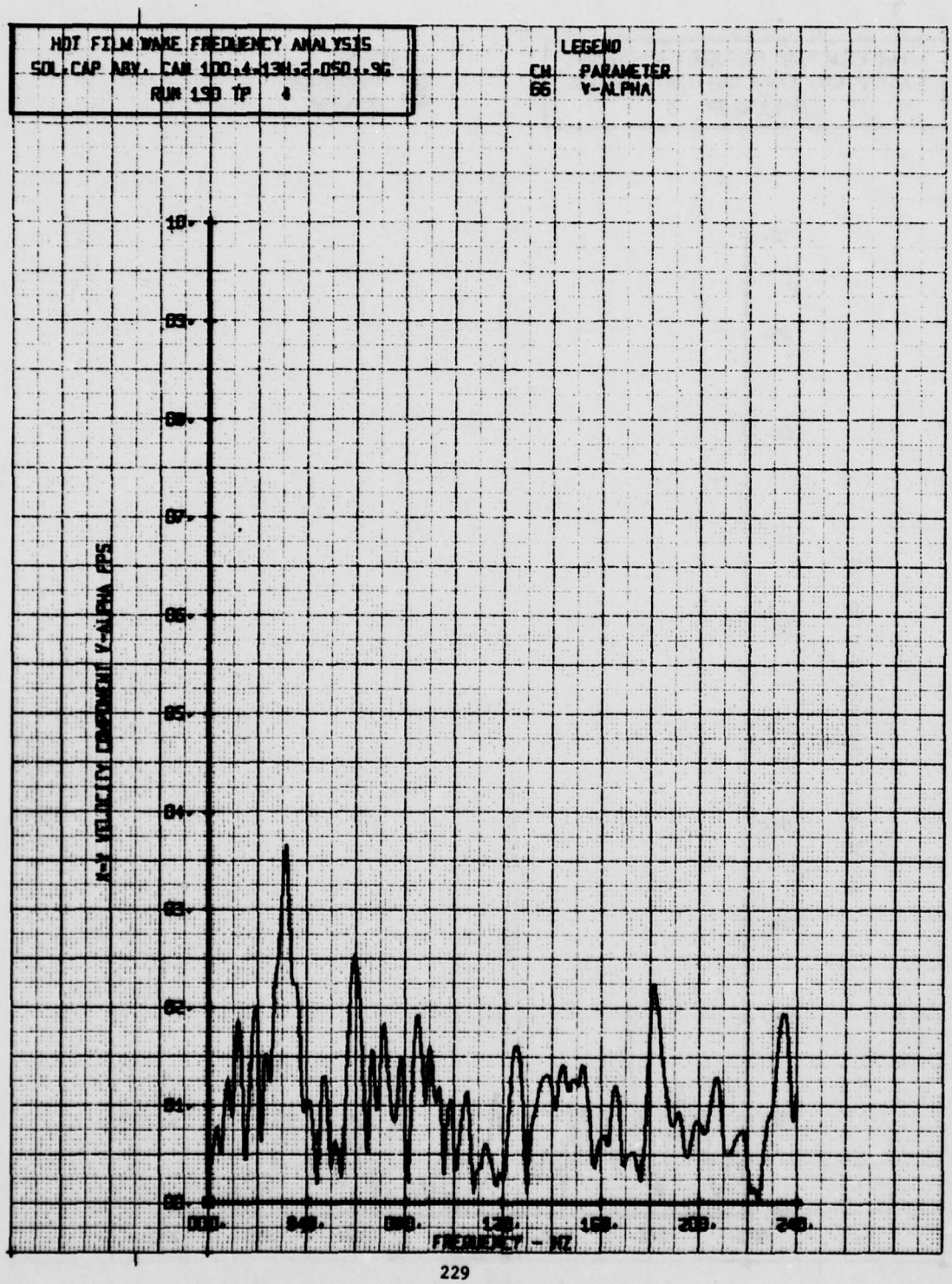
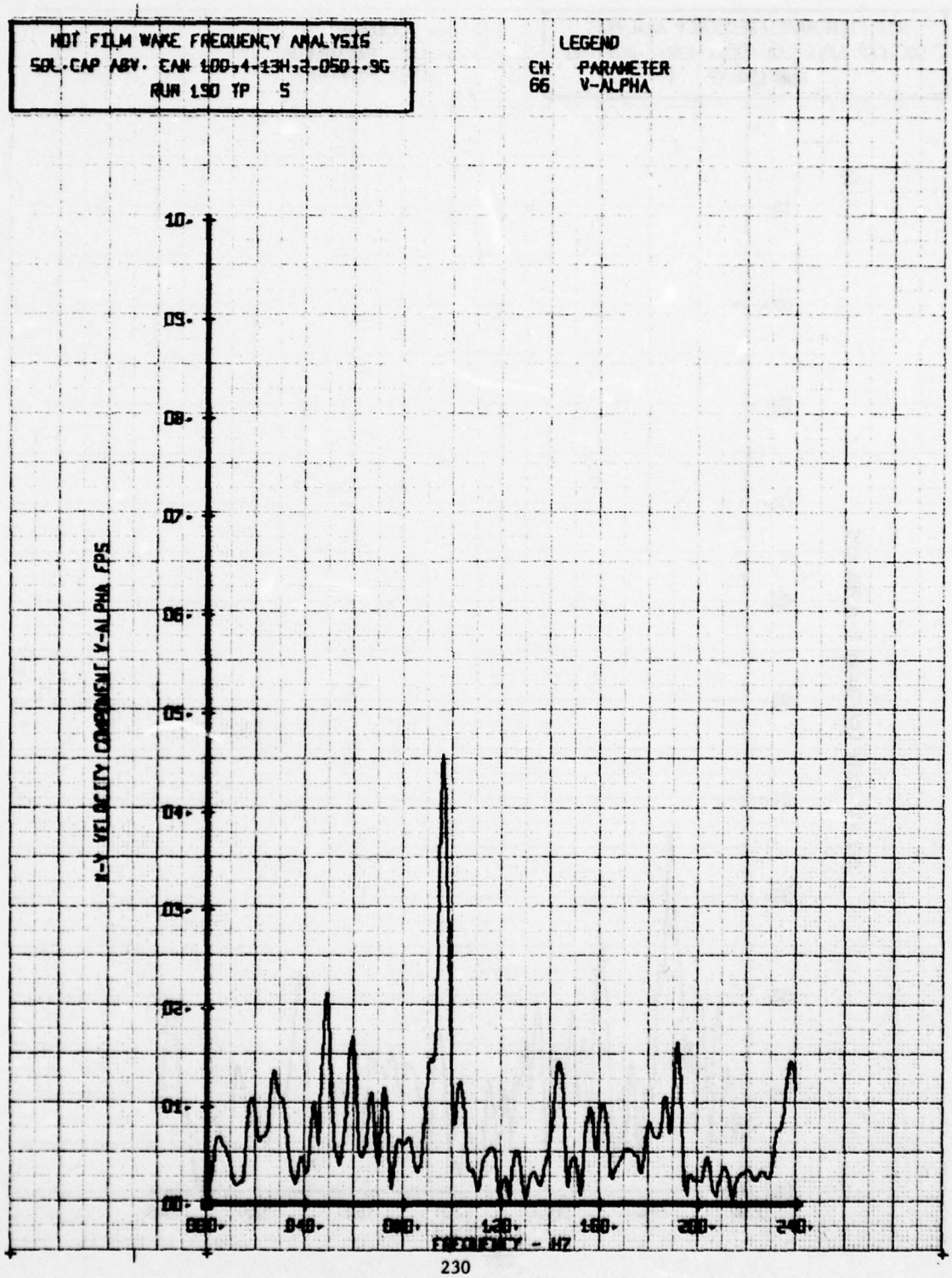
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.4-13H.2.050..9G
RUN 150 TP 4
LEGEND
CH PARAMETER
66 V-ALPHA
X-Y VELOCITY COMPONENT V-ALPHA PPS
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV. CAN 100,4-13H,2-050,-9G
RUN 190 TP 5
LEGEND
CH PARAMETER
66 V-ALPHA
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N-V VELOCITY COMPONENT V-ALPHA FPS
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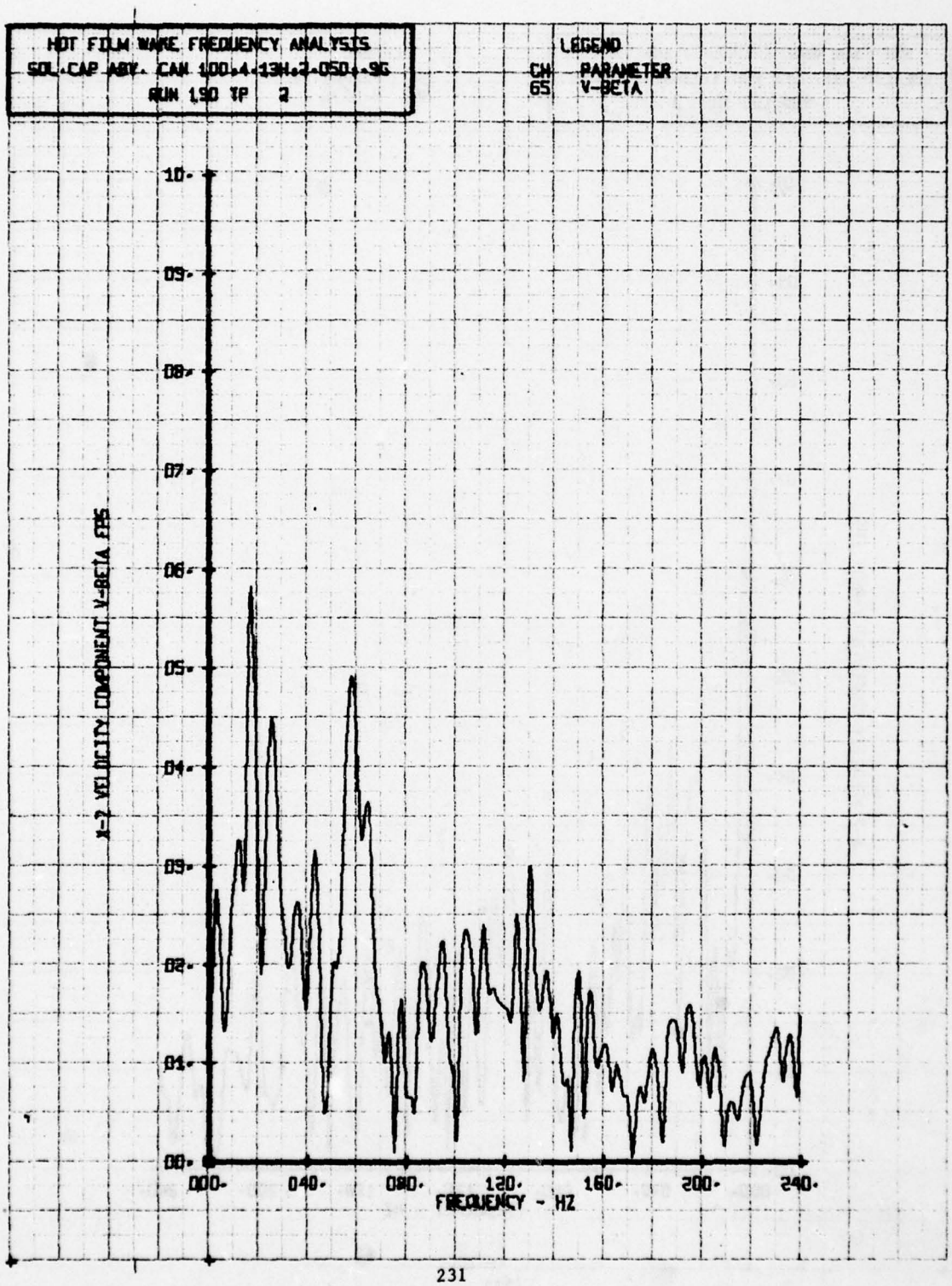
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.4.13H.2.050.-.9G
RUN 190 TP 2
LEGEND
CH PARAMETER
65 V-BETA
X-2 VELOCITY COMPONENT V-BETA FPS
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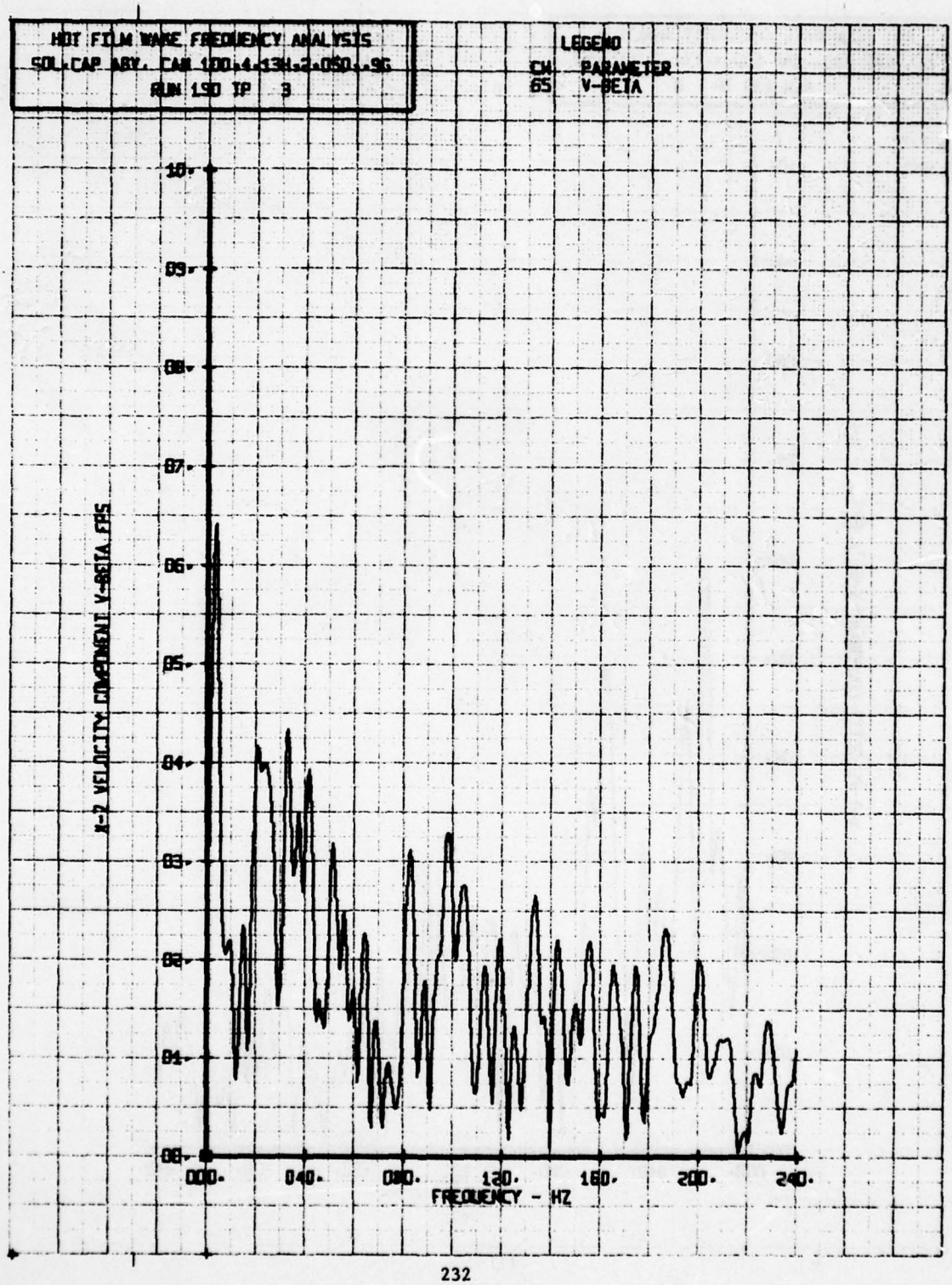
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAM 100,4.13H,2.050,.9G
RUN 150 IP 3
LEGEND
CH PARAMETER
65 V-BETA
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X-2 VELOCITY COMPONENT V-BETA FPS
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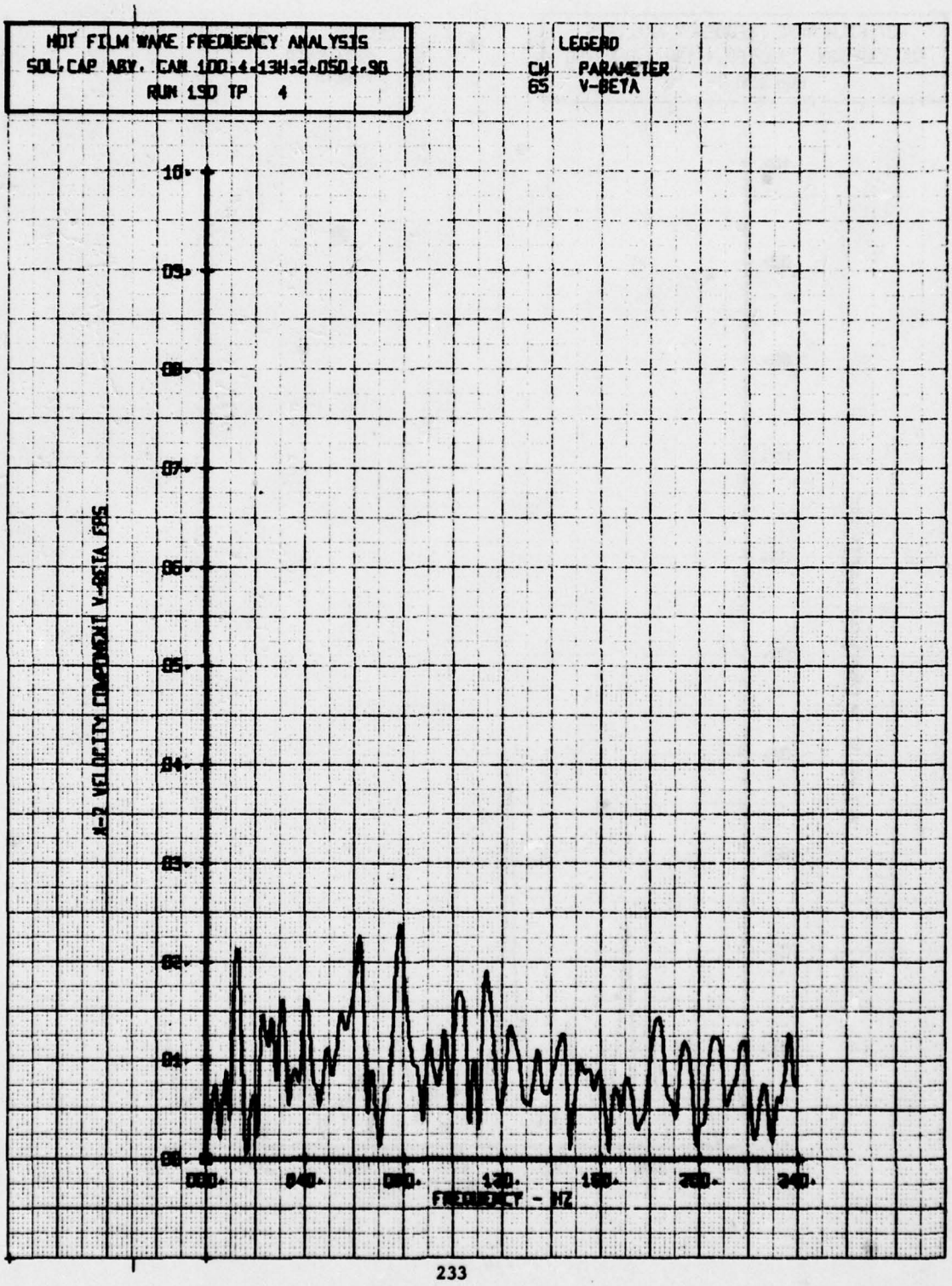
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABY. CAN 100.4.13H.2.050.-.90
RUN 130 TP 4
LEGEND
CH PARAMETER
65 V-BETA
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X-2 VELOCITY COMPONENT V-BETA FPS
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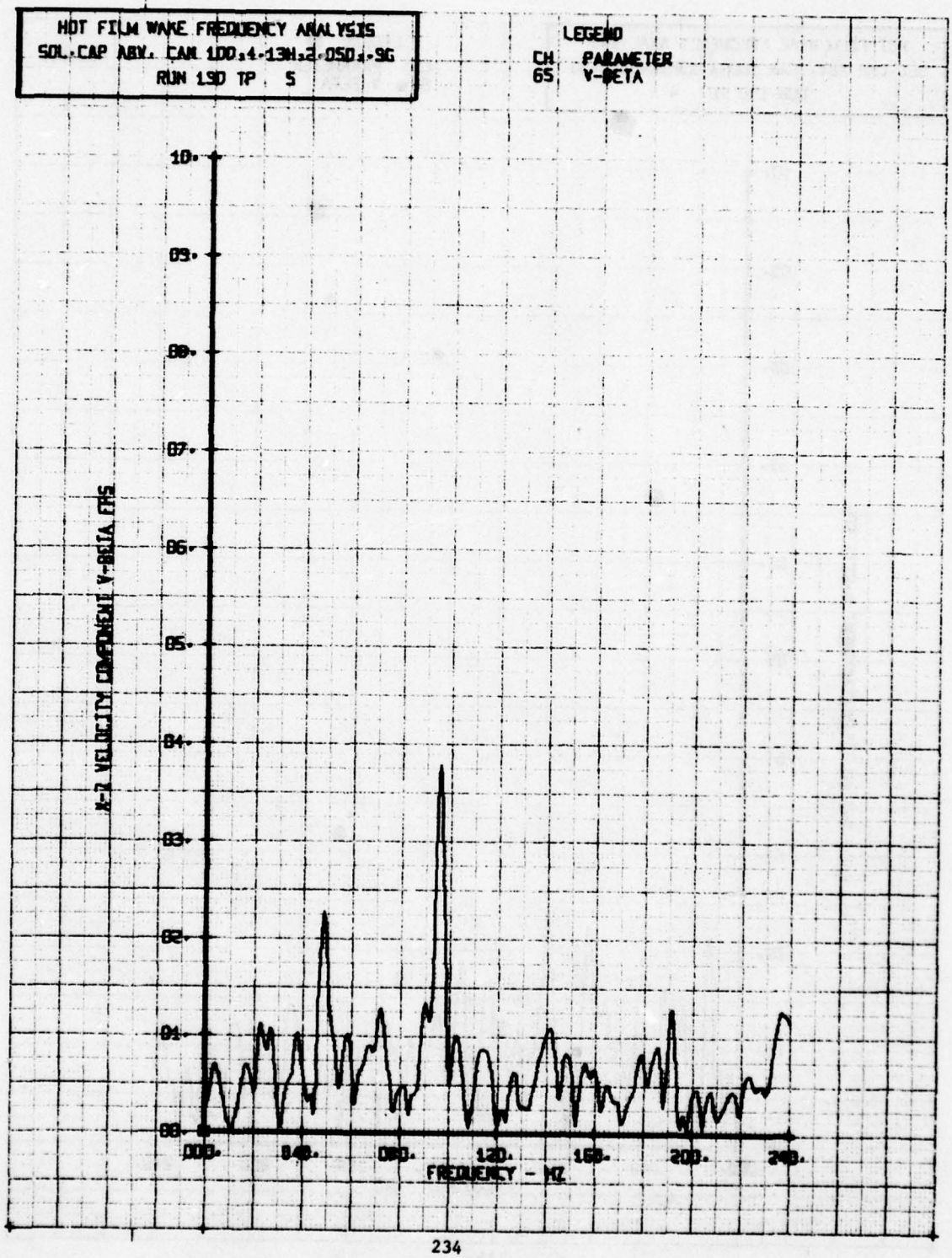
120.
160.
200.
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.4-13H.2-050.-9G
RUN 190 TP 5
LEGEND
CH PARAMETER
65 V-BETA
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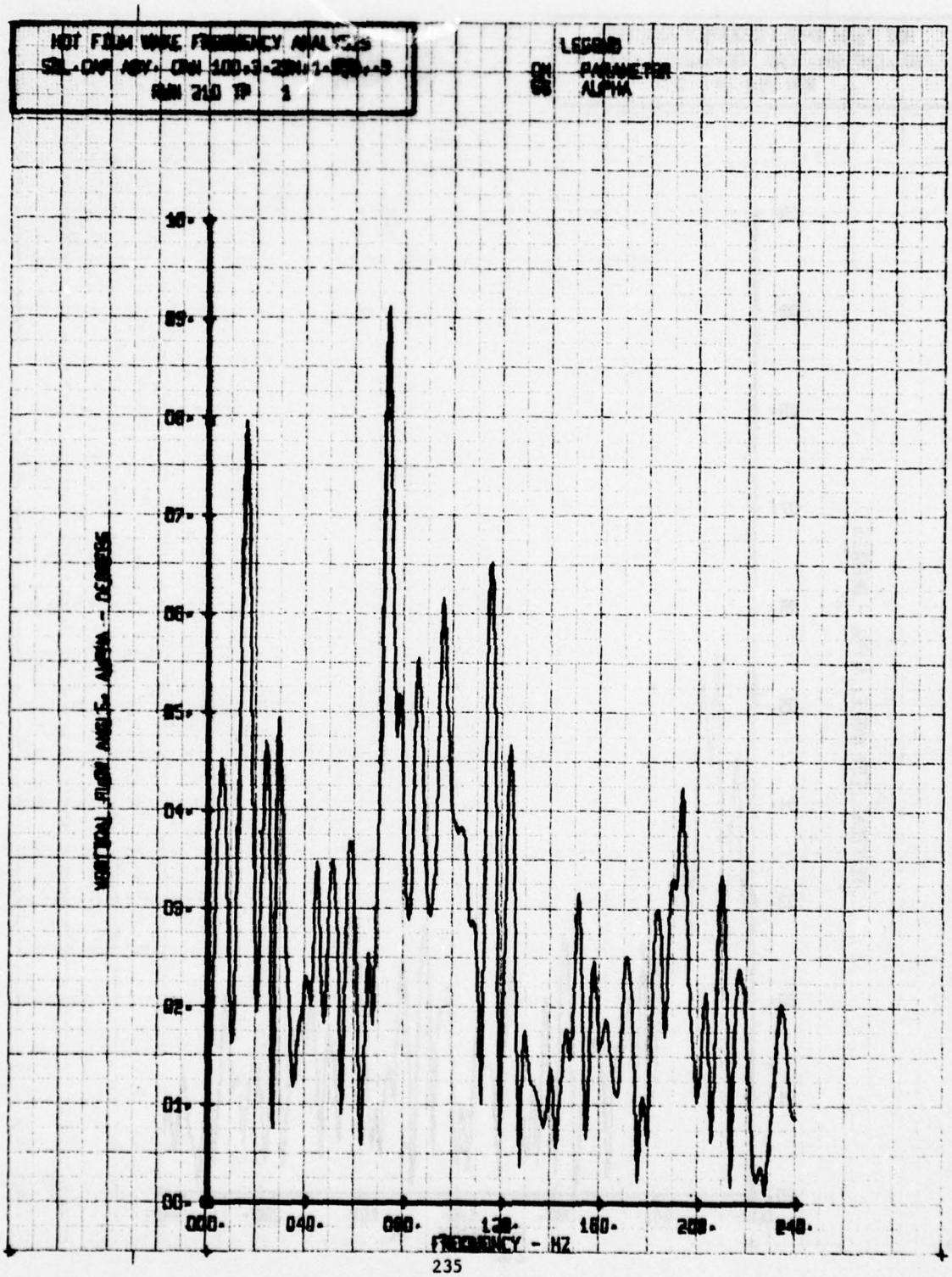
240.
FREQUENCY - HZ
X-Z VELOCITY COMPONENT V-BETA FRS


HOT FILM WAKE FREQUENCY ANALYSIS
RUN 210 TP 1
LEGEND
ON PARAMETER
ALPHA
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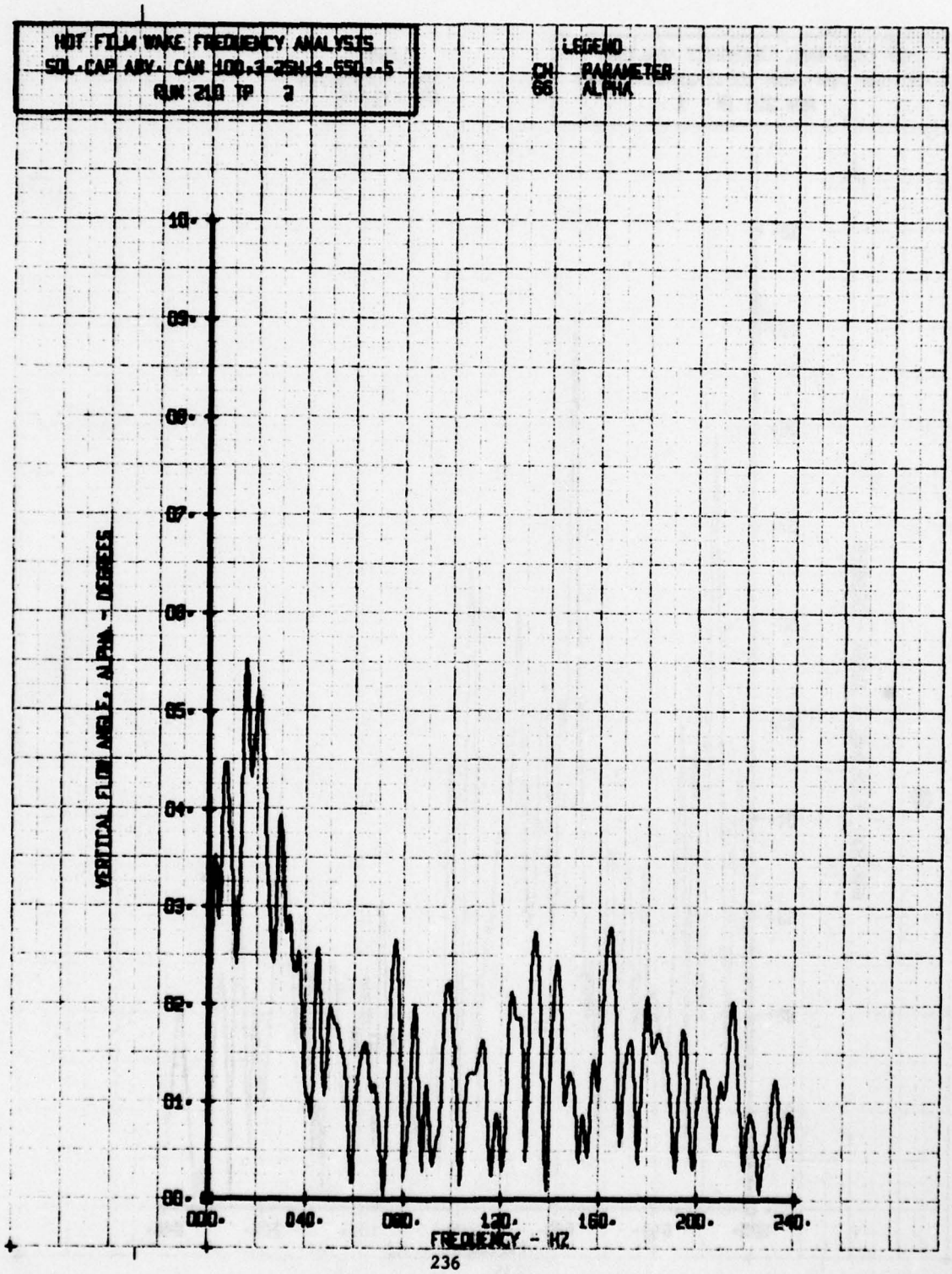
240.
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3-2SN.1-550..5
RUN 210 TP 2
LEGEND
CH PARAMETER
66 ALPHA
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VERTICAL FLOW ANGLE, ALPHA - DEGREES
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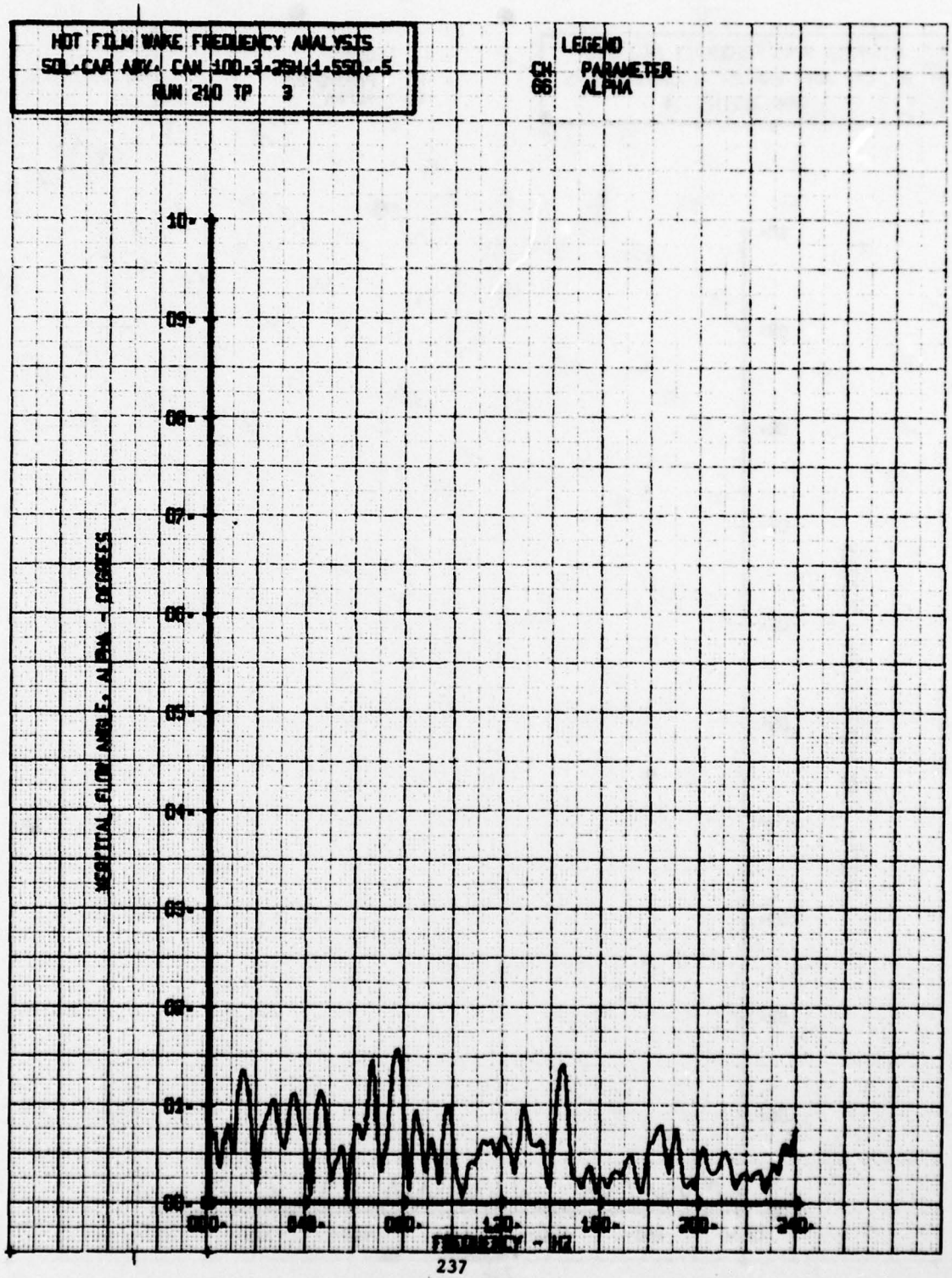
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ARV. CAN 100.3.25H.1.550..5
RUN 210 TP 3
LEGEND
CH PARAMETER
66 ALPHA
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VERTICAL FLOW ANGLE, ALPHA - DEGREES
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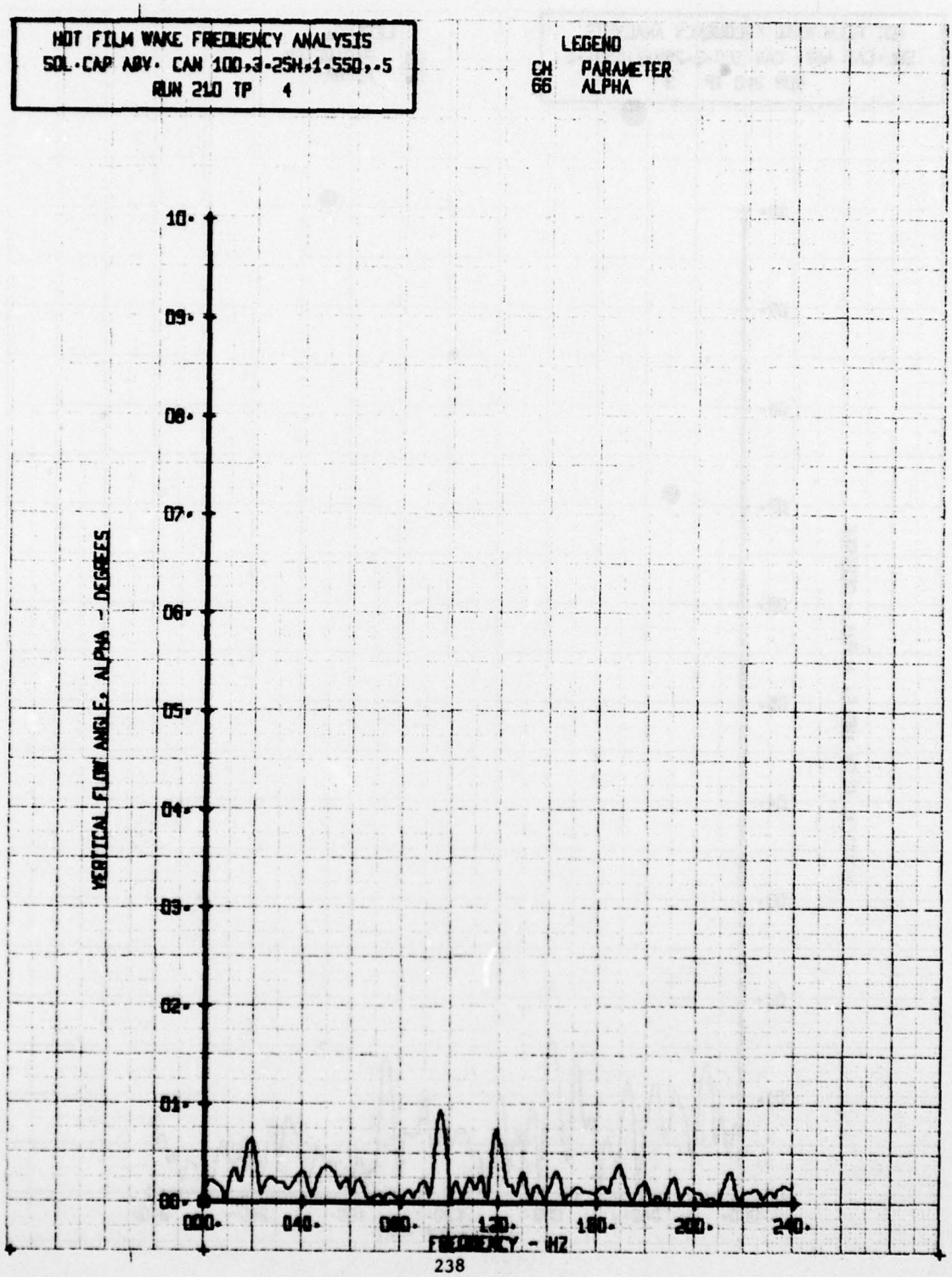
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100,3.25H,1.550,.5
RUN 210 TP 4
LEGEND
CH PARAMETER
66 ALPHA
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VERTICAL FLOW ANGLE, ALPHA - DEGREES
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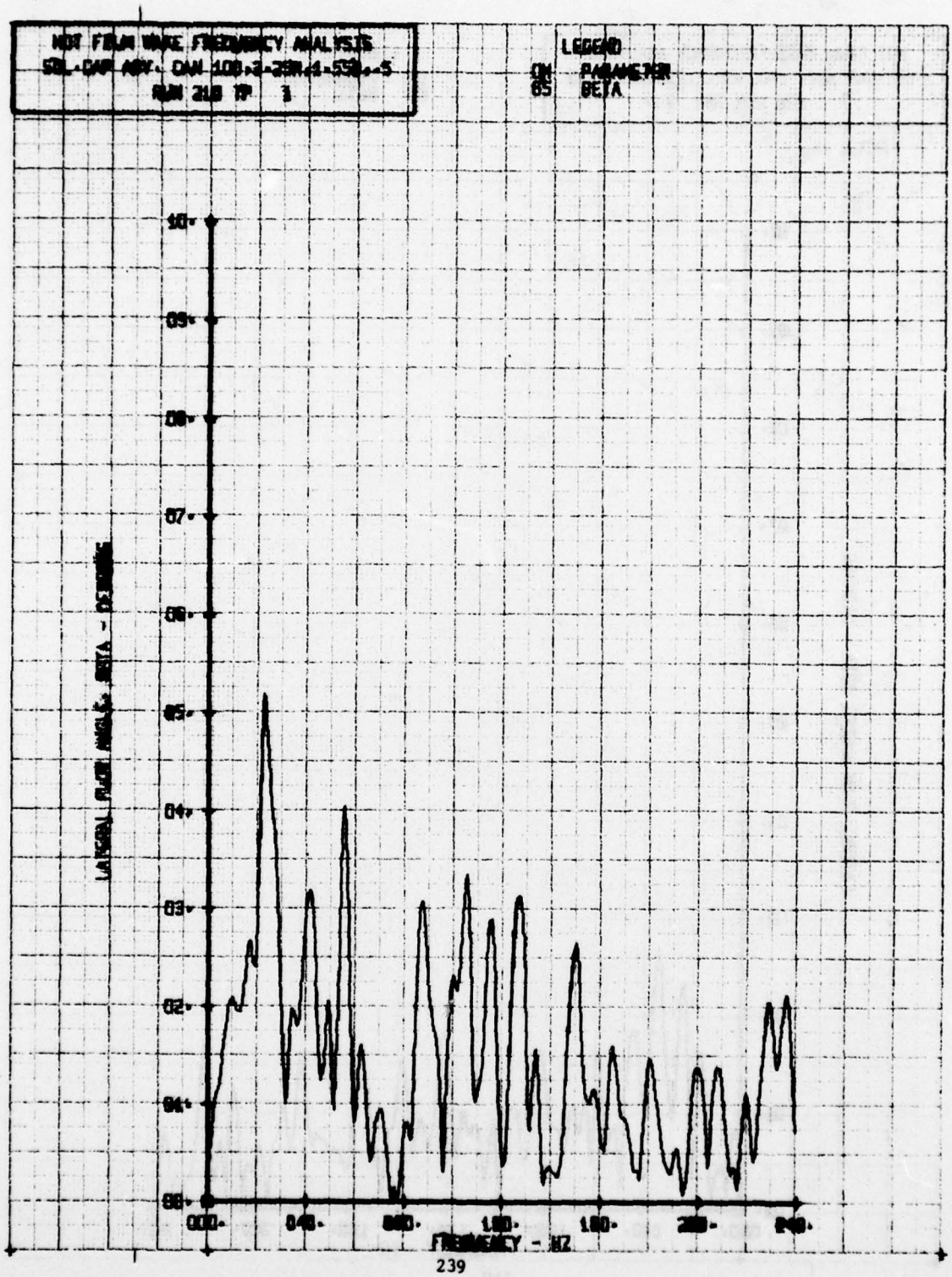
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
LEGEND
CH PARAMETER
85 BETA
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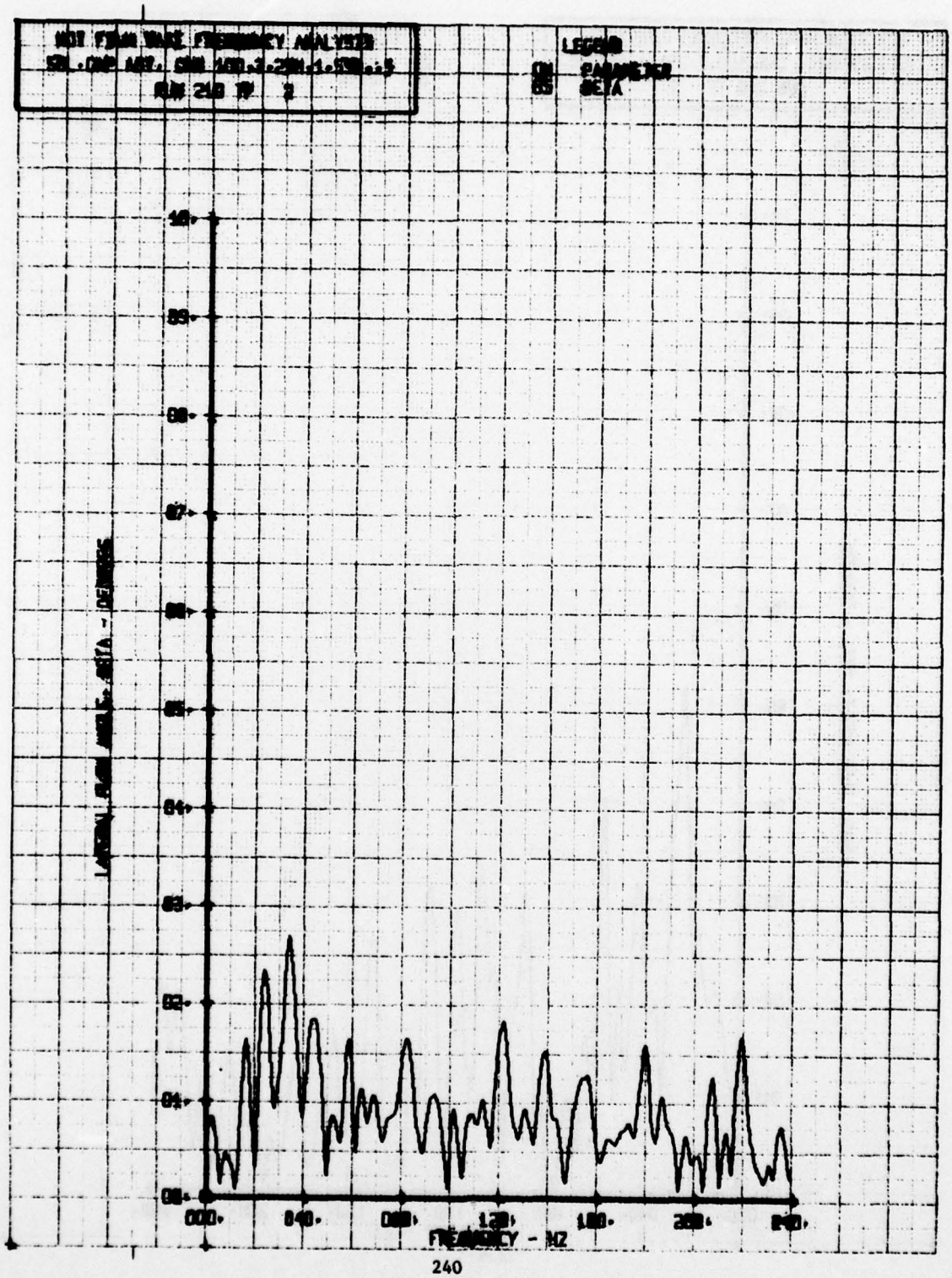
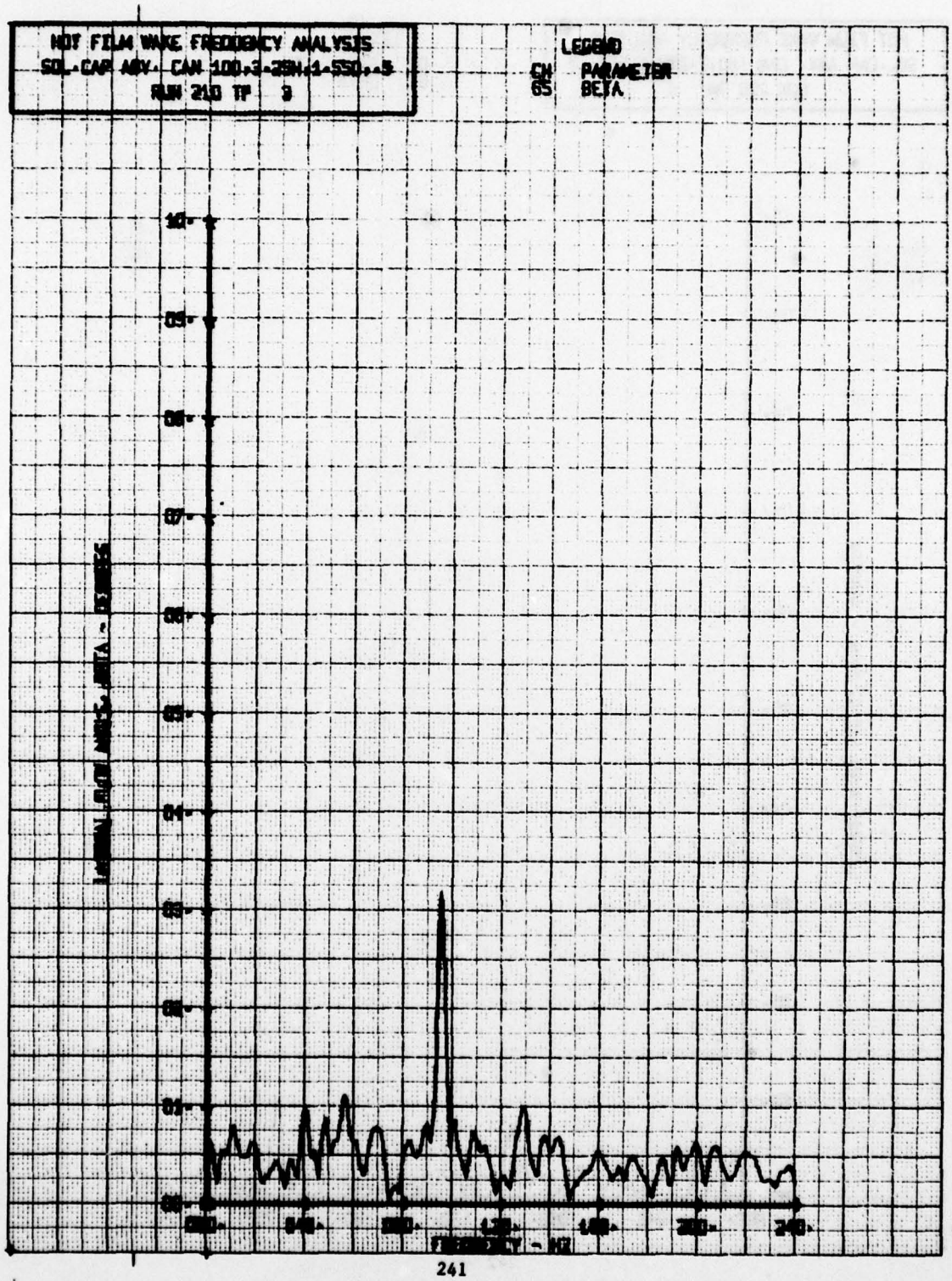
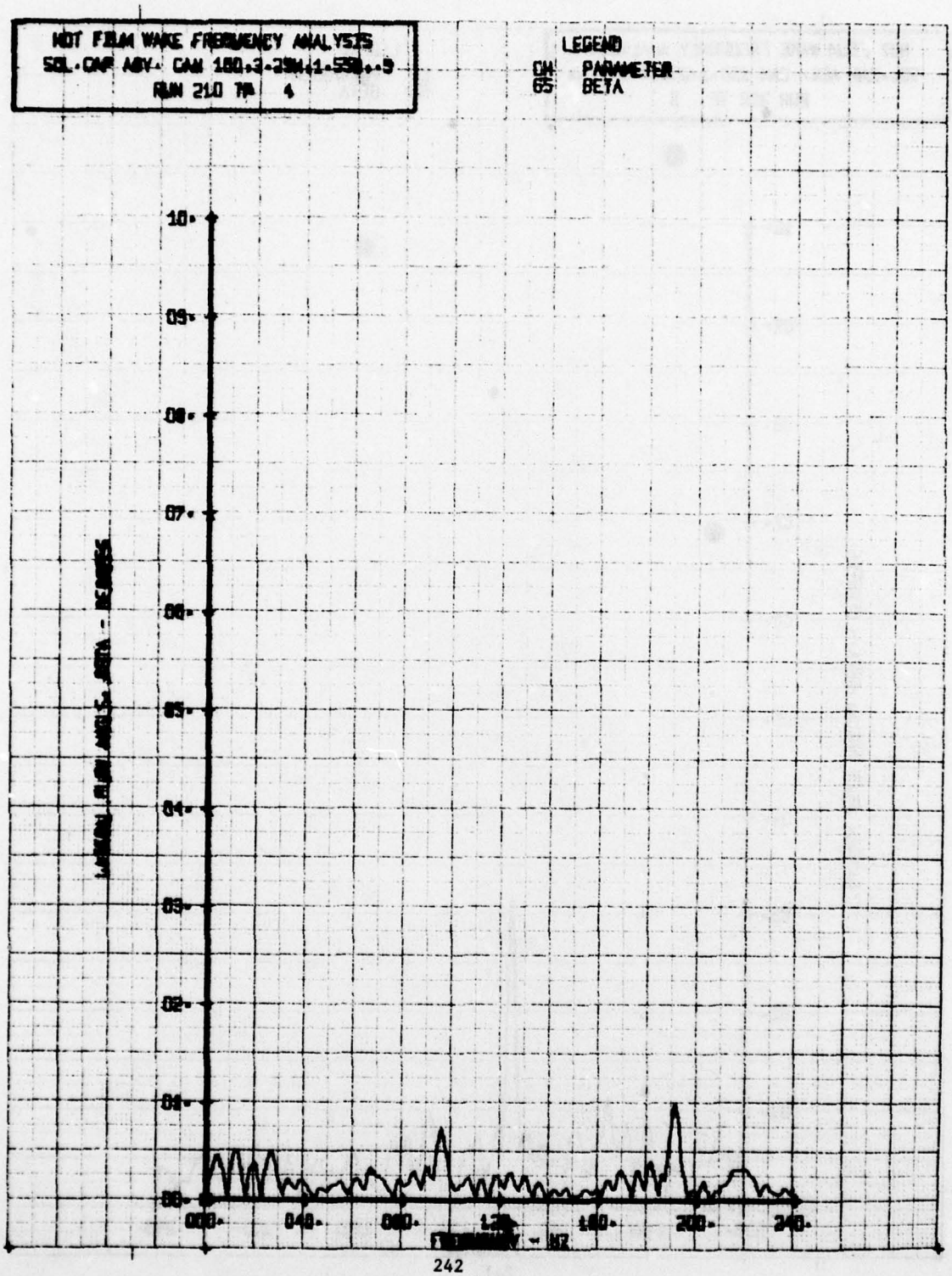
FREQUENCY - HZ


LEGEND
CH PARAMETER
05 BETA
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.-CAP ADV. CAN 100.3-2SH.1-550.-5
RUN 210 TP 3
LEGEND
CH PARAMETER
05 BETA


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CMP ABY. CAN 180.2.2SM.1.550.-9
RUN 210 TP 4
LEGEND
CH PARAMETER
65 BETA
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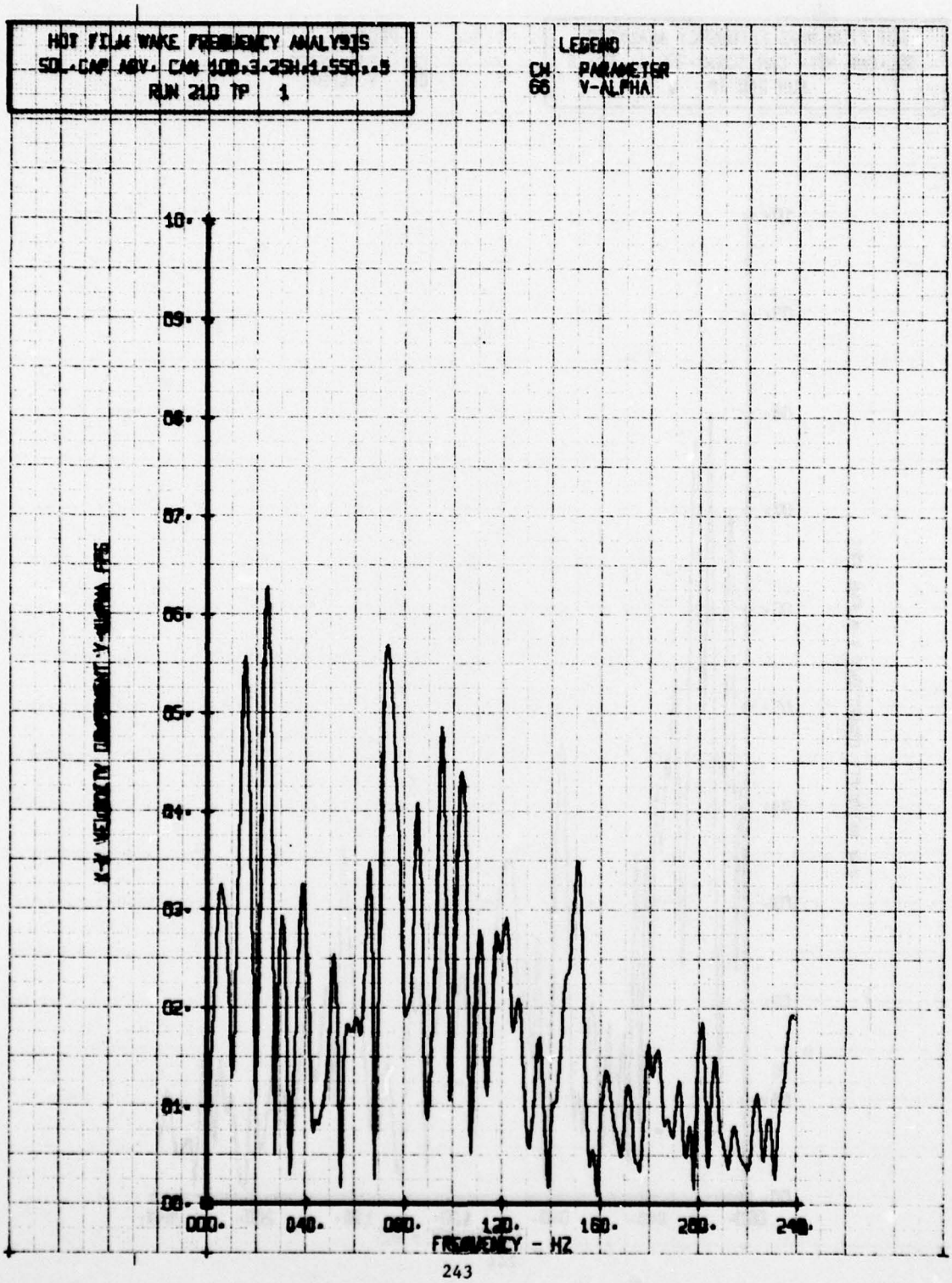
HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP AGV. CAN 100.3.25H.1.550.5
RUN 210 TP 1
LEGEND
CH PARAMETER
66 V-ALPHA
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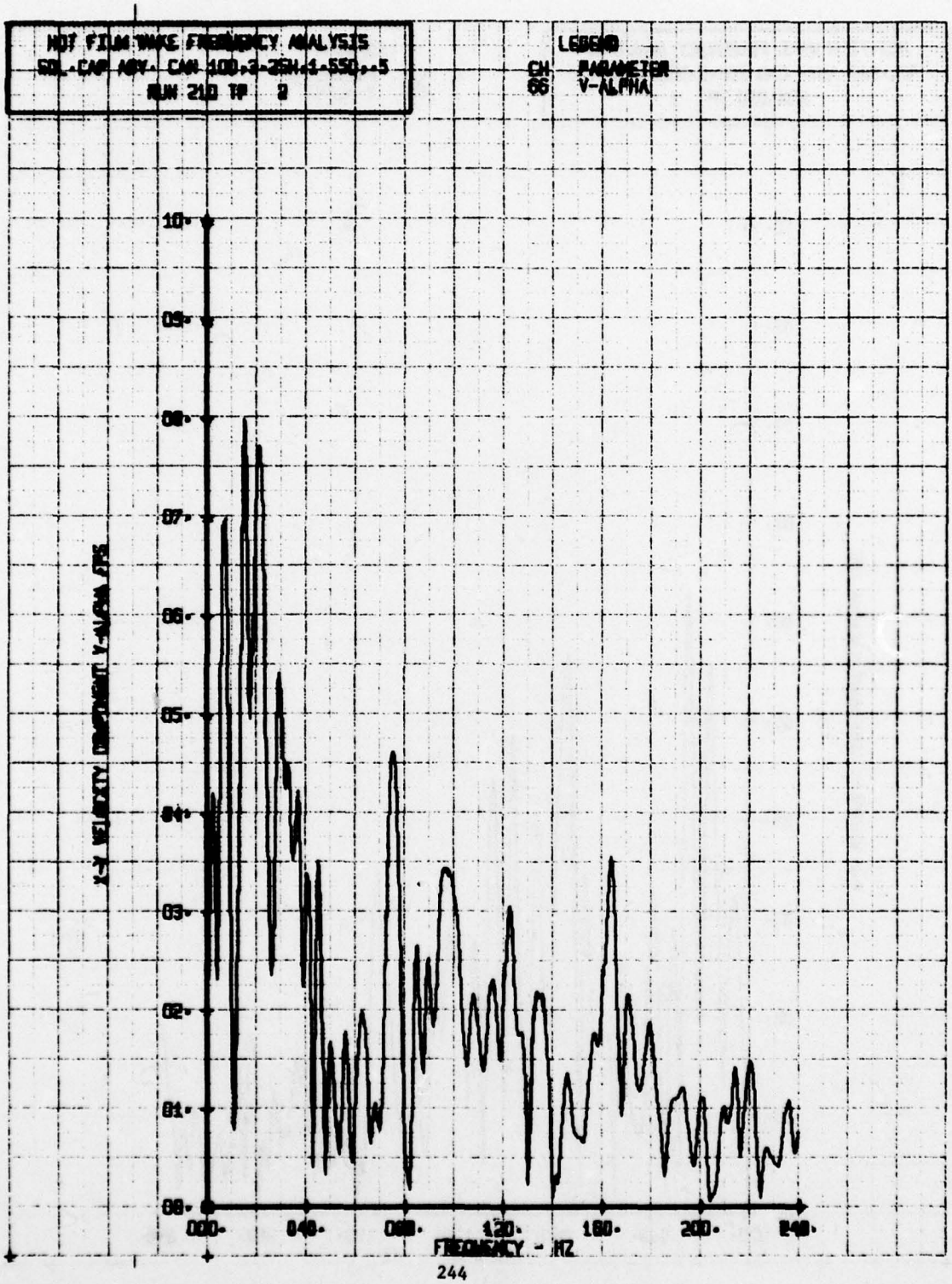
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ADV. CAN 100.2-25H.1-550.-5
RUN 210 TP 2
LEGEND
CH PARAMETER
66 V-ALPHA
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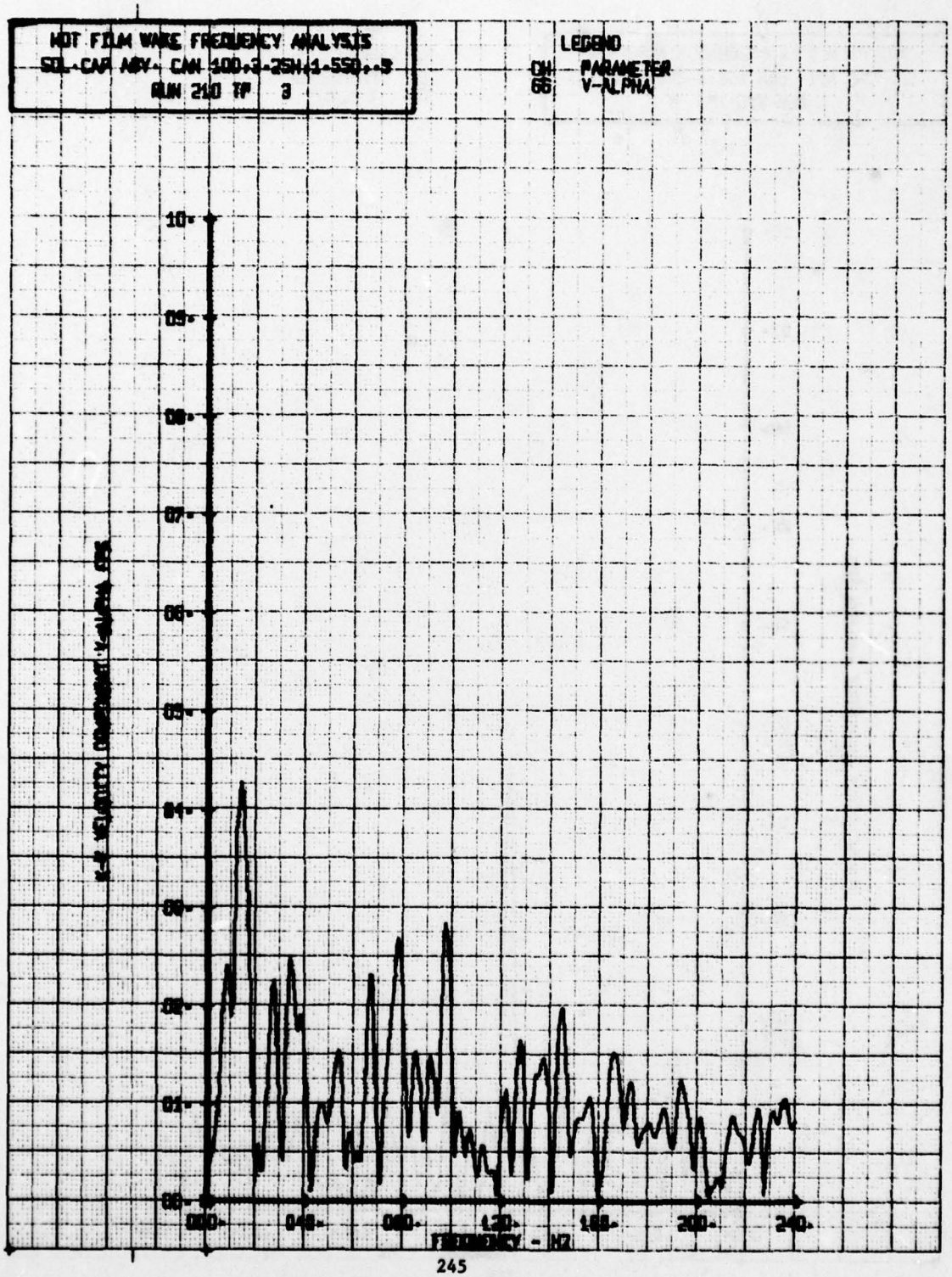
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV- CAN 100.3-25H.1-550.-3
RUN 210 TP 3
LEGEND
CH PARAMETER
66 V-ALPHA
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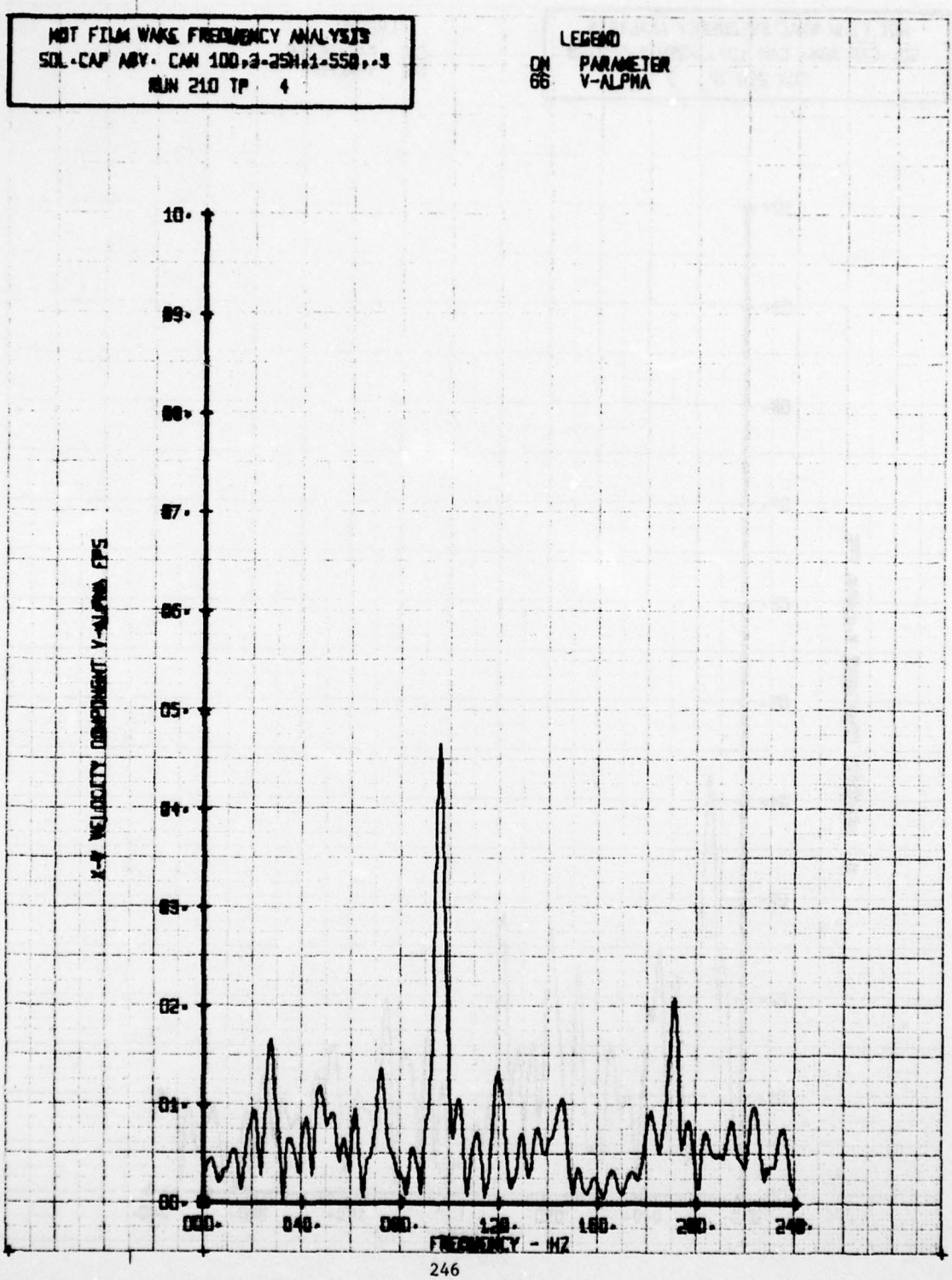
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100,3-25H,1-550,.3
RUN 210 TP 4
LEGEND
ON PARAMETER
66 V-ALPHA
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X-V VELOCITY COMPONENT V-ALPHA FPS
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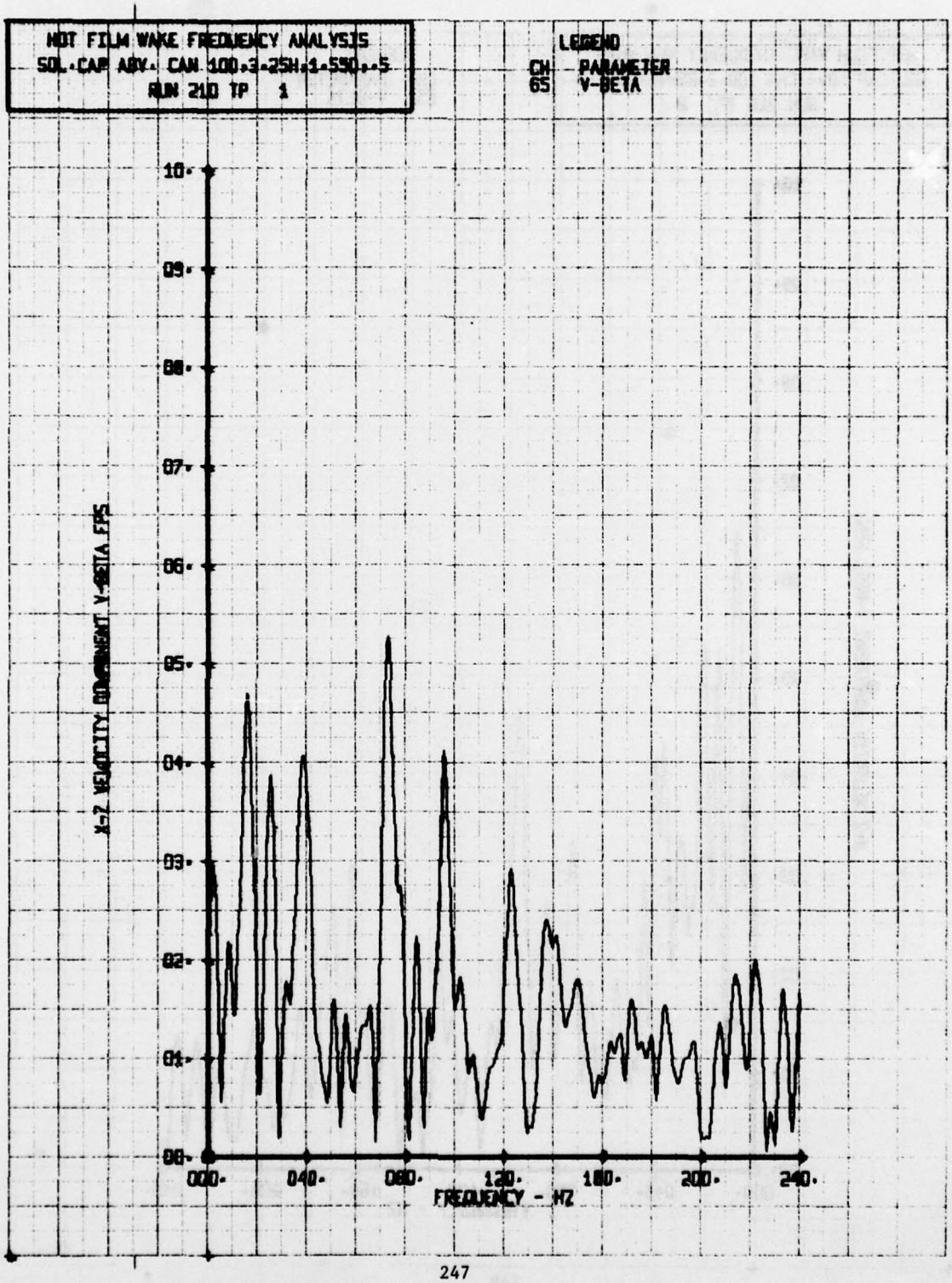
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3.25H.1.550.5
RUN 210 TP 1
LEGEND
CH PARAMETER
65 V-BETA
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X-Z VELOCITY COMPONENT V-BETA FPS
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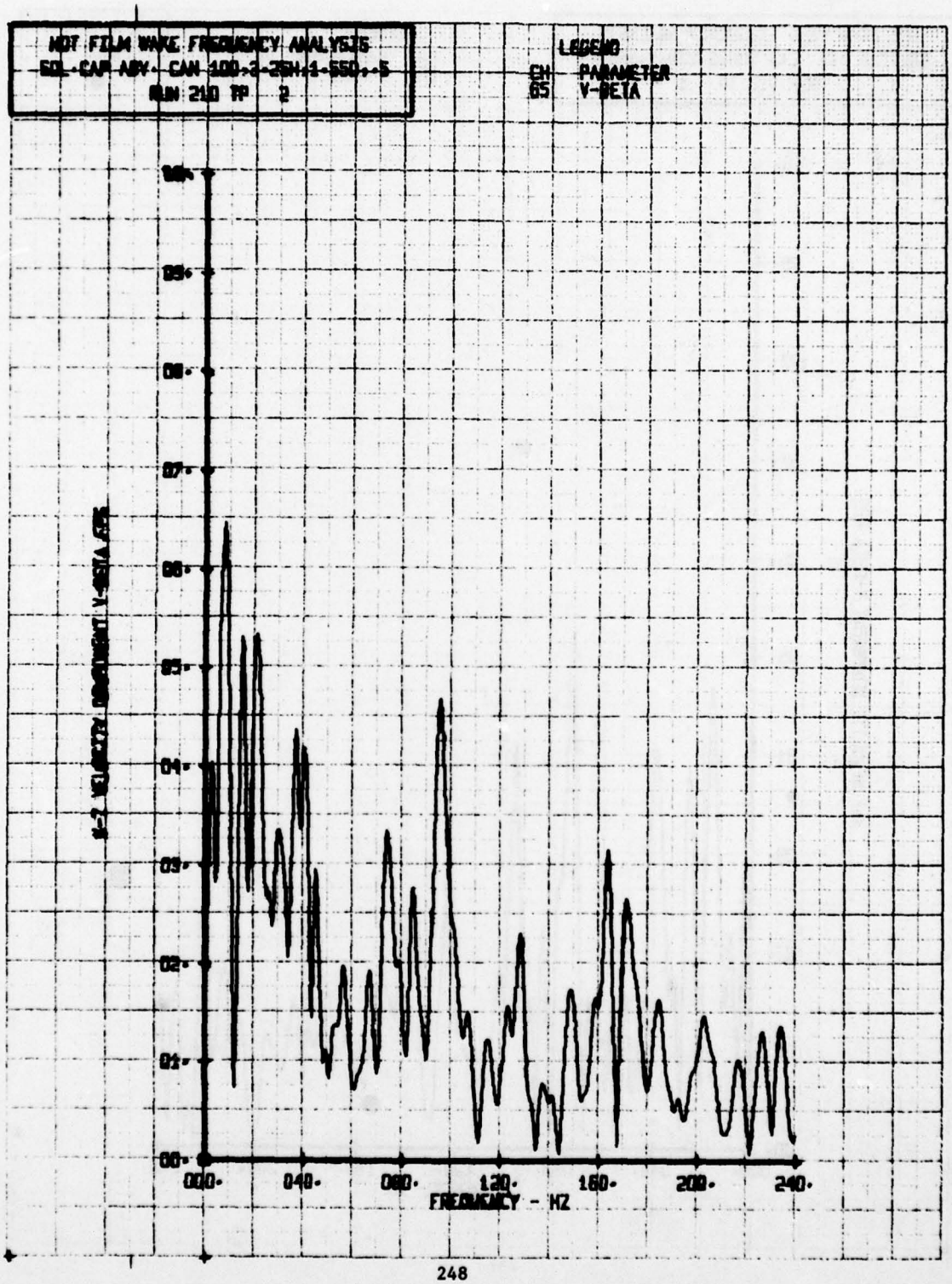
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL-CAP ABV- CAN 100-2-25H-1-550--5
RUN 210 TP 2
LEGEND
CH PARAMETER
85 V-BETA
FREQUENCY - HZ
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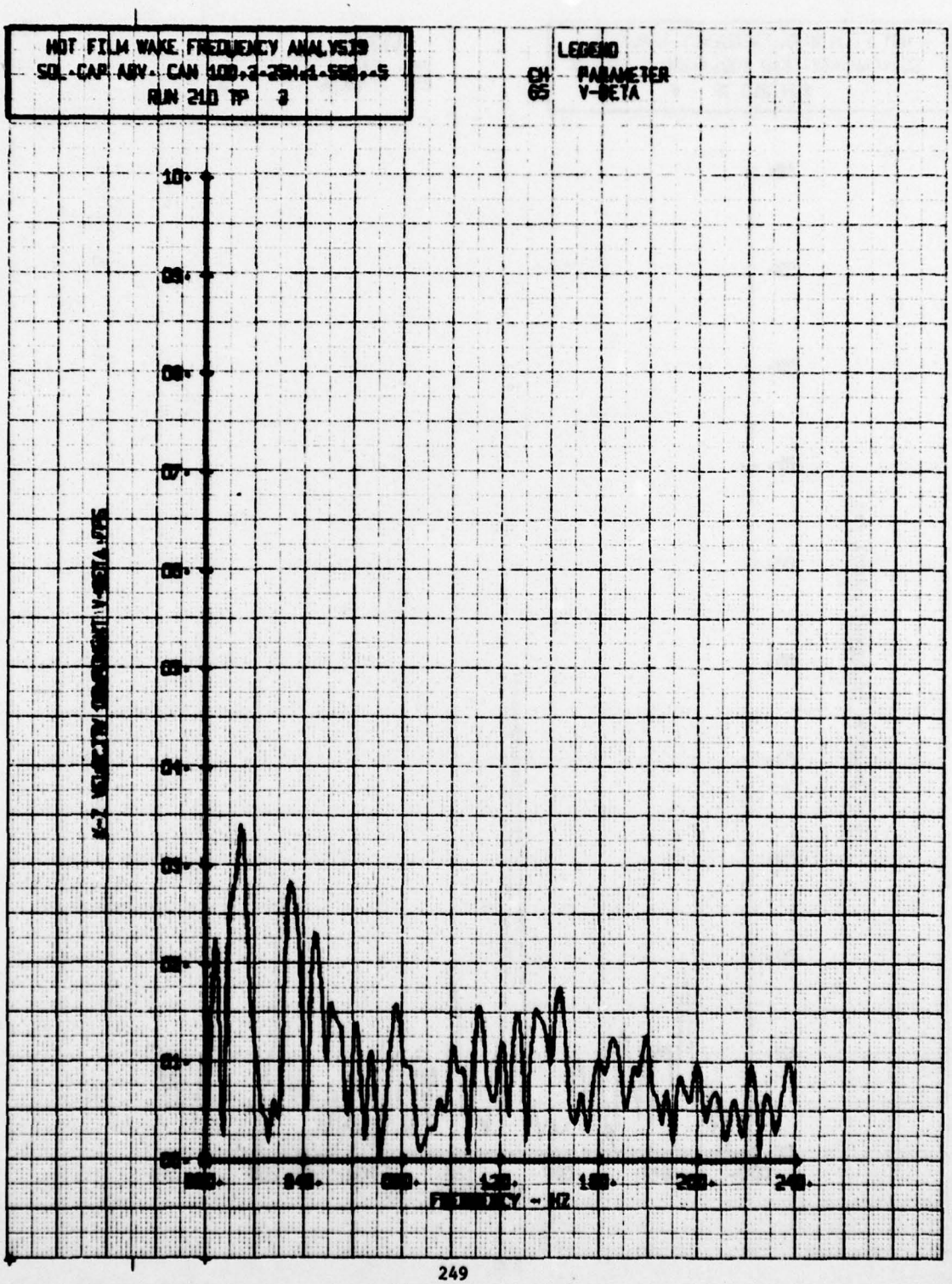
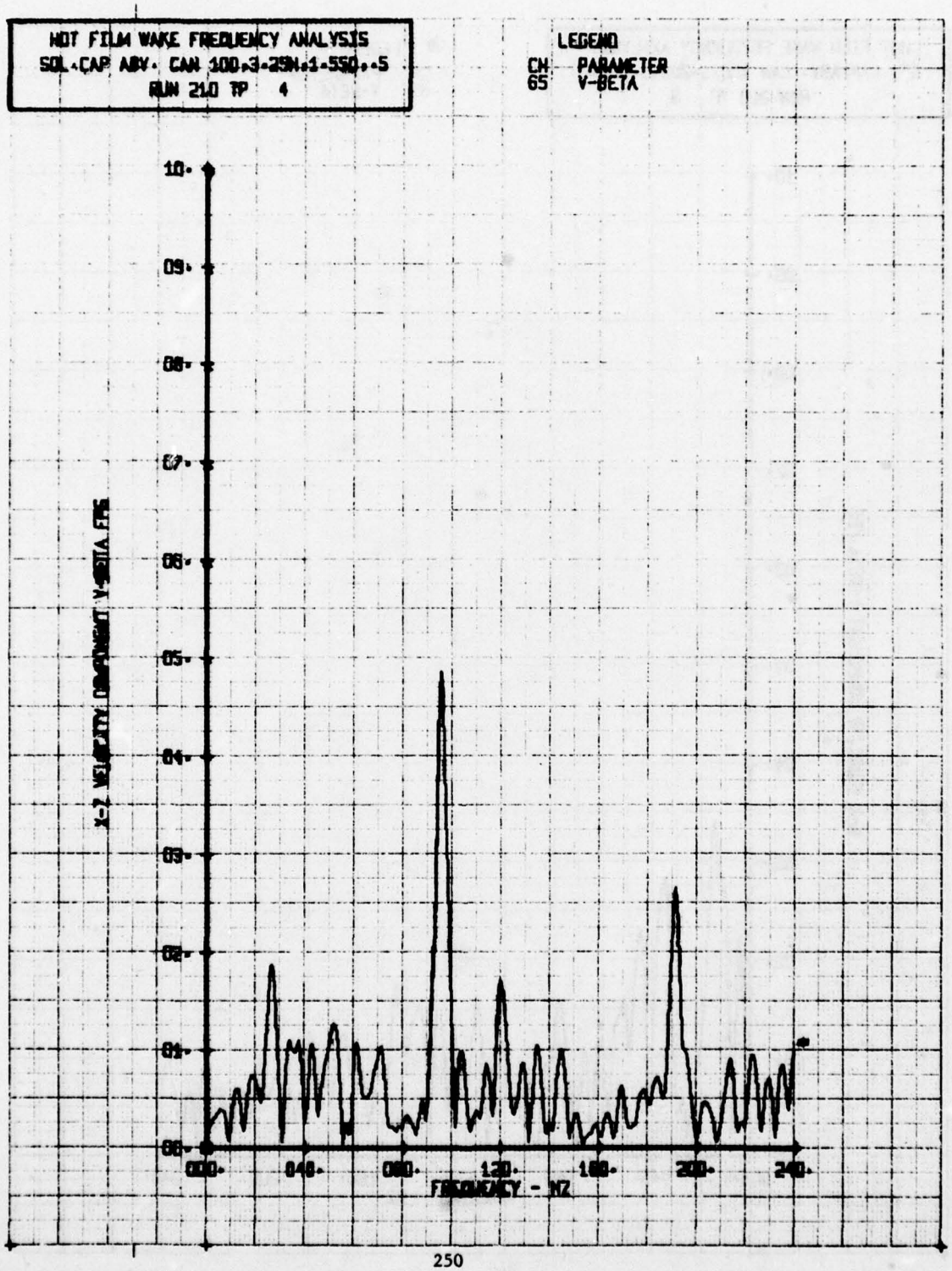

HOT FILM WAKE FREQUENCY ANALYSIS
SOL.-CAP ABV. CAN 100.2-25M.1-500.-5
RUN 210 TP 3
LEGEND
CH PARAMETER
65 V-BETA
FREQUENCY - HZ


HOT FILM WAKE FREQUENCY ANALYSIS
SOL.CAP ABV. CAN 100.3-25N.1-550.-5
RUN 210 TP 4
LEGEND
CH PARAMETER
65 V-BETA
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FREQUENCY - HZ

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