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February 1967

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ABBREVIATIONS AND SYMBOLS FOR SOUNDING ROCKET DOCUMENTS

Abbreviations:

AFCRL	- Air Force Cambridge Research Laboratory, Bedford, Mass.
AIL	- Airborne Instruments Laboratory, Melville, Long Island, N.Y.
AS&E	- American Science and Engineering, Inc., Cambridge, Mass.
BRL	- Ballistic Research Laboratories, Aberdeen, Md.
BuStds	- National Bureau of Standards, Boulder, Colo.
CRPL	- Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo.
DRTE	- (Canadian) Defense Research Telecommunications Establishment, Ottawa, Canada
Ga. Tech.	- Georgia Institute of Technology, Atlanta, Ga.
GCA	- Geophysics Corporation of America, Bedford, Mass.
Harvard	- Harvard College, Cambridge, Mass.
JHU	- Johns Hopkins University, Baltimore, Md.
JPL	- Jet Propulsion Laboratory, Pasadena, Calif.
LaRC	- NASA, Langley Research Center, Hampton, Va.
LeRC	- NASA, Lewis Research Center, Cleveland, Ohio
Lockheed	- Lockheed Missiles and Space Division, Palo Alto, Calif.
NCAR	- National Center for Atmospheric Research, Boulder, Colo.
NRL	- Naval Research Laboratory, Washington, D. C.
NYU	- New York University, New York, N.Y.
Rice	- Rice University, Houston, Texas
SCAS	- Southwest Center for Advanced Studies, Dallas, Texas
Stanford	- Stanford Research Institute, Menlo Park, Calif.
U. Colo.	- University of Colorado, Boulder, Colo.
U. Ill.	- University of Illinois, Urbana, Ill.

U. Mich.	- University of Michigan, Ann Arbor, Mich.
U. Minn.	- University of Minnesota, Minneapolis, Minn.
UNH	- University of New Hampshire, Durham, N.H.
U. Wisc.	- University of Wisconsin, Madison, Wisc.
Varian	- Varian Associates, Palo Alto, Calif.

Firing Sites:

ARG	- Chamical, Argentina
ASC	- Ascension Island
AUS	- Woomera, Australia
BRZ	- Natal, Brazil
EGL	- Eglin Air Force Base, Florida
FC	- Fort Churchill, Canada
IND	- Thumba, India
Italy	- Sardinia, Italy
NOR	- Andoya, Norway
NZ	- Karikari, New Zealand
PB	- Point Barrow, Alaska
PMR	- Pacific Missile Range
PAK	- Karachi, Pakistan
SWE	- Kronogard, Sweden
SUR	- Coronie, Surinam
WI	- Wallops Island, Virginia
WIMR	- Wallops Island Mobile Range, W. I., Virginia
WS	- White Sands Missile Range, New Mexico

Numbering System:

NASA 1.—Aerobee 100
2.—Arcon
3.—Nike Asp
4.—Aerobee 150, 150 A
5.—Iris
6.—Aerobee 300
7.—Argo E-5
8.—Argo D-4
9.—Skylark
10.—Nike Cajun
11.—Argo D-8
12.—Special projects
14.—Nike Apache
15.—Arcas
16.—Astrobee 1500
17.—Aerobee 350
18.—Nike Tomahawk

Numbers following the decimal point indicate chronological order of assignment to Goddard missions.

Identifying Letters:

The letters which follow each rocket number identify —

(1) the instrumenting agency, and
(2) the experiment, according to the following list:

1. Agency

G - Goddard
N - Other NASA centers
U - College or university
D - Department of Defense
A - Other government agency
C - Industrial corporations
I - International

2. Experiment

A - Aeronomy
E - Energetic particles and fields
I - Ionospheric physics
S - Solar physics
G - Galactic astronomy
R - Radio astronomy
B - Biological
P - Special projects
T - Test and support
M - Meteorology

PAYLOAD AND TRAJECTORY DATA FOR GSFC NIKE APACHE FIRINGS JANUARY-JUNE 1965 TRACKED BY RADAR

Howard L. Galloway, Jr.
Sounding Rocket Branch
Spacecraft Integration and Sounding Rocket Division
and
Kathleen M. Maxen
Fairchild Hiller Corporation

The Nike Apache, a two-stage solid-propellant unguided sounding rocket, is stabilized by four fins (on each of the two stages) arranged in a cruciform configuration.

A conical transition section bolted to the first stage slip-fits into the nozzle of the second stage. At first-stage burnout, differential drag forces separate the stages as no mechanical restraint in the axial direction exists between the second stage and the transition assembly. Second-stage ignition is normally delayed for 16.5 seconds after first-stage burnout in order to reduce aerodynamic heating and drag in the low-altitude high-density region.

Of 65 Nike Apaches fired from January to June 1965 by Goddard Space Flight Center, 47 were tracked by radar. Table 1 lists payload and launch data for these rockets.

Figure 1 shows the four standard drag configurations of Nike Apaches used by GSFC. Many payloads, however, do not conform to these standards. Figures 2 through 325 consist of a photograph or sketch of the payload configuration of each rocket tracked by radar, followed by its radar plots. Neither photographs nor sketches are available for rockets 14.98 UA, 14.99 UA, and 14.100 UA, which were similar to rockets flown with a drag case 3 configuration.

Table 1

Nike Apache Rockets Fired January - June 1965 Tracked By Radar

ROCKET NUMBER		LAUNCH DATE	LAUNCH SITE	PAYLOAD WEIGHT (lb)	PAYLOAD LENGTH (in.)	PREDICTED ELEVATION (degrees)	LAUNCH ANGLE AZIMUTH (degrees)	RADAR	SCIENTIST	EXPERIMENT
GSFC	WI									
14.07 UE	KS2-1830	12 Mar 65	WIMR	65	80.25	85	270	MPS-19;Vacuum Inserted	UNH Opp	Magnetic fields
14.25 UA	GS2-1822	15 Apr 65	WIMR	62	74.2	85	210	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.26 UA	GS2-1823	6 Apr 65	WIMR	62	74.2	85	200	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.27 UA	GS2-1824	13 Apr 65	WIMR	62	74.2	85	180	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.61 UE	G2-2022	3 Feb 65	WI	80	79 7/8	80	105	FPS-16; FPQ-6	UNH Schardt	Energetic particles
14.62 UA	G2-1185	18 Mar 65	WI	63	65	80	100	MOD II with Film;FPQ-6	SCAS Horowitz	Composition
14.64 UA	GS2-1847	8 Mar 65	WIMR	62	74.2	85	270	MPS-19;Film Data;Vacuum Data	U. Mich. W. Smith	Atmosphere structure
14.65 UA	GS2-1848	9 Mar 65	WIMR	62	74.2	82.4	270	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.66 UA	GS2-1849	4 Apr 65	WIMR	62	74.2	85	270	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.67 UA	GS2-1850	13 Apr 65	WIMR	62	74.2	85	150	MPS-19;Vacuum Inserted	U. Mich. W. Smith	Atmosphere structure
14.71 CM	G2-2262	23 Jun 65	WI	66.5	59	80	140	FPS-16; FPQ-6	GCA W. Smith	Luminescent cloud
14.72 CM	G2-2263	23 Jun 65	WI	66.5	59	80	100	FPS-16; Spandar	GCA W. Smith	Luminescent cloud
14.73 CM	G2-2264	23 Jun 65	WI	75.5	62	80	140	FPS-16; FPQ-6	GCA W. Smith	Luminescent cloud
14.74 CM	G2-2265	23 Jun 65	WI	59.5	62 7/8	80	105	FPS-16	GCA W. Smith	Luminescent cloud
14.83 UE	KS2-1831	10 Mar 65	WIMR	65	80.25	85	270	MPS-19;Vacuum Inserted	UNH Opp	Magnetic fields
14.84 UE	KS2-1832	12 Mar 65	WIMR	65	80.25	85	270	MPS-19;Vacuum Inserted	UNH Opp	Magnetic fields
14.85 UE	KS2-1833	9 Mar 65	WIMR	65	80.25	85	270	MPS-19;Vacuum Inserted	UNH Opp	Magnetic fields
14.98 UA	KS2-1844	11 Mar 65	WIMR	70	71.25	85	270	MPS-19;Vacuum Inserted	U. Mich. Dubin	Composition
14.99 UA	KS2-1845	11 Mar 65	WIMR	70	71.25	85	310	MPS-19;Vacuum Inserted	U. Mich. Dubin	Composition
14.100 UA	KS2-1803	15 Apr 65	WIMR	70	71.25	85	210	MPS-19;Vacuum Inserted	U. Mich. Dubin	Composition
14.132 NA	G2-2194	1 Apr 65	WI	87	73.5	80	95	FPS-16; FPQ-6; Spandar	LeRC Potter	Airglow
14.142 NA	G2-1186	7 Jan 65	WI	87	73.5	80	95	FPS-16; FPQ-6; Spandar	LeRC Potter	Airglow
14.160 GE	GS2-1914	8 Mar 65	WIMR	60	80.25	85	270	MPS-19 Vacuum Inserted	T. N. Davis	Magnetic fields

Table 1 (Continued)

Nike Apache Rockets Fired January - June 1965 Tracked By Radar

14.171 GE	GS2-1806	16 Mar 65	WIMR	60	80.25	85	285	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.172 GE	GS2-1807	18 Mar 65	WIMR	60	80.25	85	270	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.173 GE	GS2-1808	26 Mar 65	WIMR	60	80.25	85	260	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.174 GE	GS2-1809	24 Mar 65	WIMR	60	80.25	85	265	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.175 GE	GS2-1810	27 Mar 65	WIMR	60	80.25	85	300	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.176 GE	GS2-1805	18 Mar 65	WIMR	60	80.25	85	270	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.177 GI	GS2-1812	16 Mar 65	WIMR	55	71.75	85	285	MPS-19; Vacuum Inserted	Aikin, Blumle	Ionospheres
14.178 GI	GS2-1813	18 Mar 65	WIMR	55	71.75	85	270	MPS-19; Film Data	Aikin, Blumle	Ionospheres
14.179 GI	GS2-1814	18 Mar 65	WIMR	55	71.75	85	270	MPS-19; Vacuum Inserted	Aikin, Blumle	Ionospheres
14.180 GI	GS2-1815	24 Mar 65	WIMR	55	71.75	85	265	MPS-19; Vacuum Inserted	Aikin, Blumle	Ionospheres
14.181 GI	GS2-1816	26 Mar 65	WIMR	55	71.75	85	260	MPS-19; Vacuum Inserted	Aikin, Blumle	Ionospheres
14.182 GI	GS2-1811	27 Mar 65	WIMR	55	71.75	85	300	MPS-19; Vacuum Inserted	Aikin, Blumle	Ionospheres
14.184 UE	KS2-1835	5 Apr 65	WIMR	65	80.25	85	210	MPS-19	UNH Schardt	Energetic particles
14.185 UE	KS2-1836	2 Apr 65	WIMR	65	80.25	85	210	MPS-19; Vacuum Inserted	UNH Schardt	Energetic particles
14.186 UE	KS2-1837	13 Apr 65	WIMR	65	80.3	85	360	MPS-19; Vacuum Inserted	UNH Schardt	Energetic particles
14.201 CA	G2-2306	23 Jun 65	WI	69.5	73	79.8	96.1	FPS-16; FPQ-6	GCA W. Smith	Ionospheres; Luminescent Clouds
14.215 AI	G2-2261	18 Jun 65	WI	42.5	78.25	77.3	105	FPQ-6	BuStds Schmerling	Ionospheres
14.228 UI	KS2-1817	20 Mar 65	WIMR	55	67	83	280	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.229 UI	KS2-1818	23 Mar 65	WIMR	60	76.50	83	280	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.230 UI	KS2-1819	5 Apr 65	WIMR	55	67	83	278	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.231 UI	KS2-1820	9 Apr 65	WIMR	55	67	84	0	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.232 UI	KS2-1821	12 Apr 65	WIMR	55	67	84	180	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.245 UI	G2-2259	14 Jun 65	WI	50	65 7/8	80	100	FPS-16; FPQ-6	U. Ill. Schmerling	Ionospheres
14.246 UI	G2-2260	17 Jun 65	WI	50	65 7/8	80	100	FPS-16; FPQ-6	U. Ill. Schmerling	Ionospheres

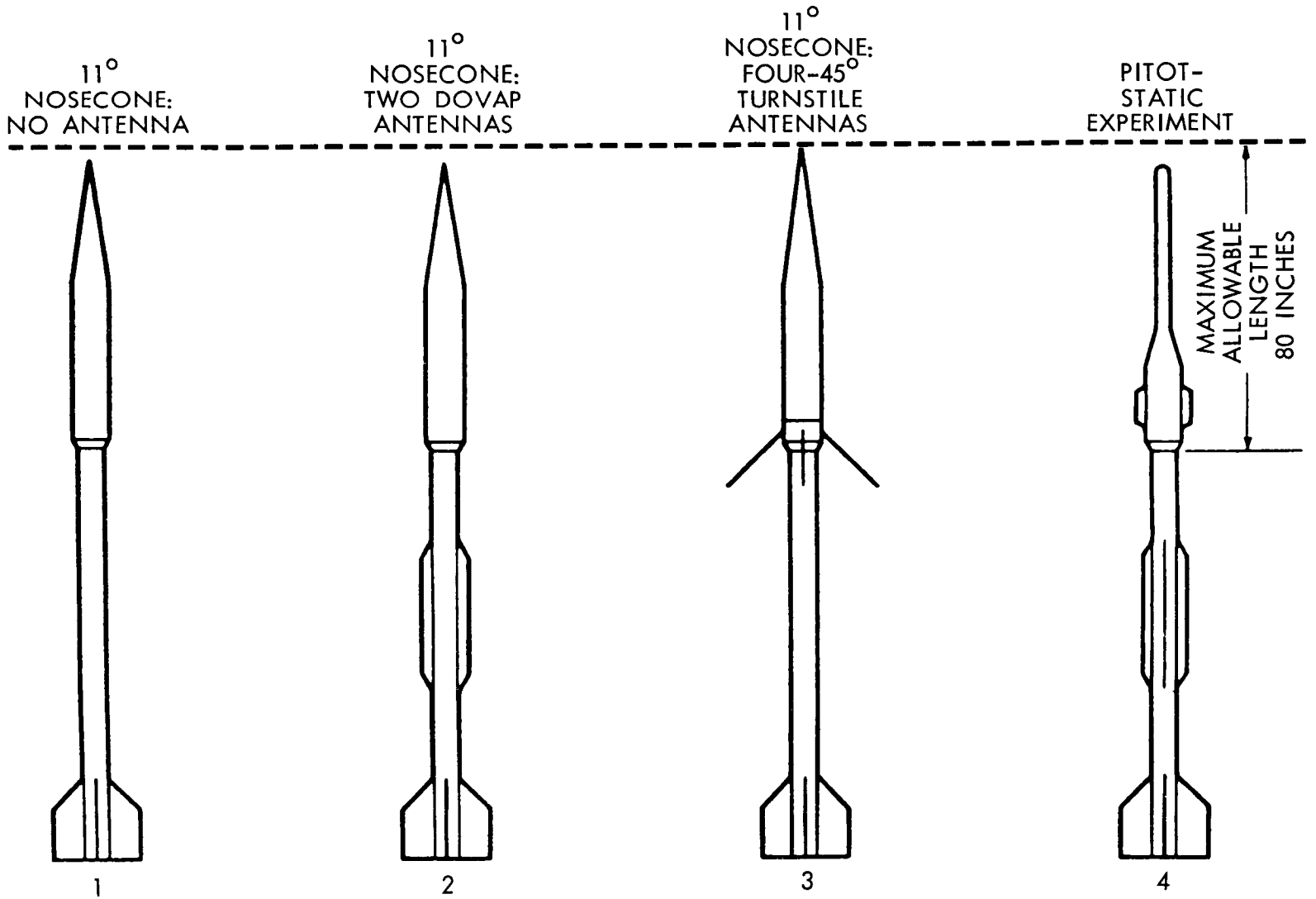

Figure 1. Standard Drag Cases

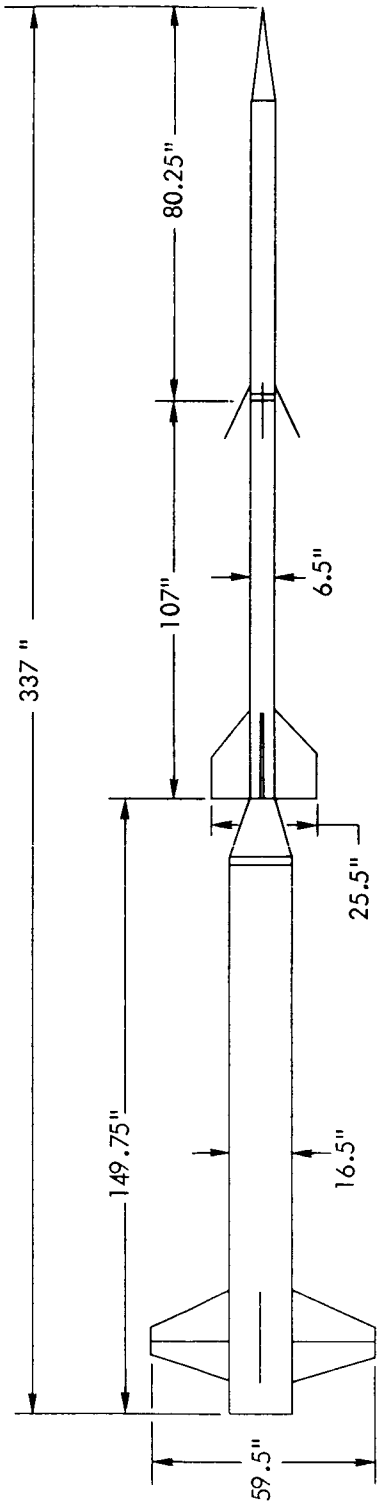

Figure 2. 14.07 UE Sketch

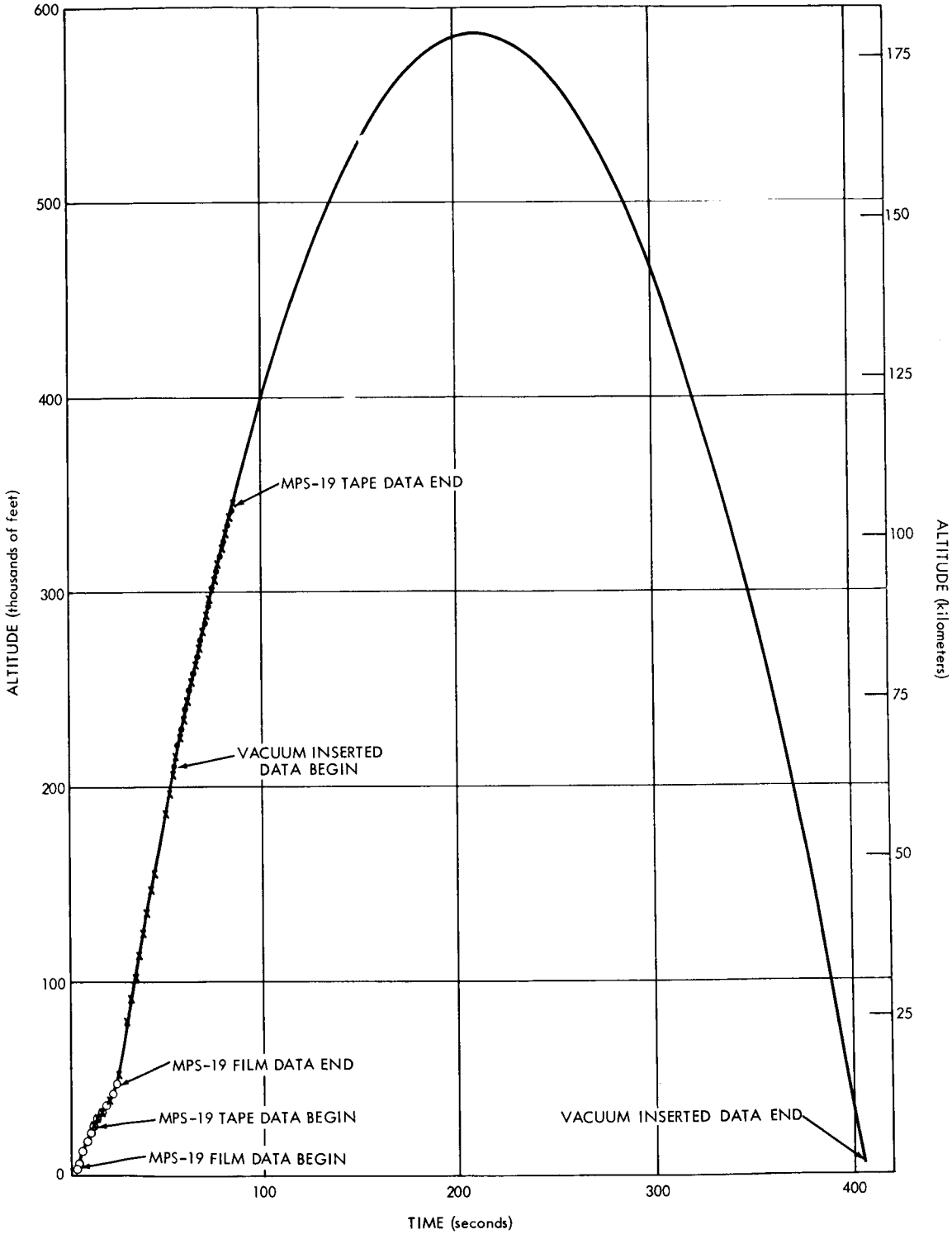

Figure 3. 14.07 UE Radar Plot, Altitude vs Time

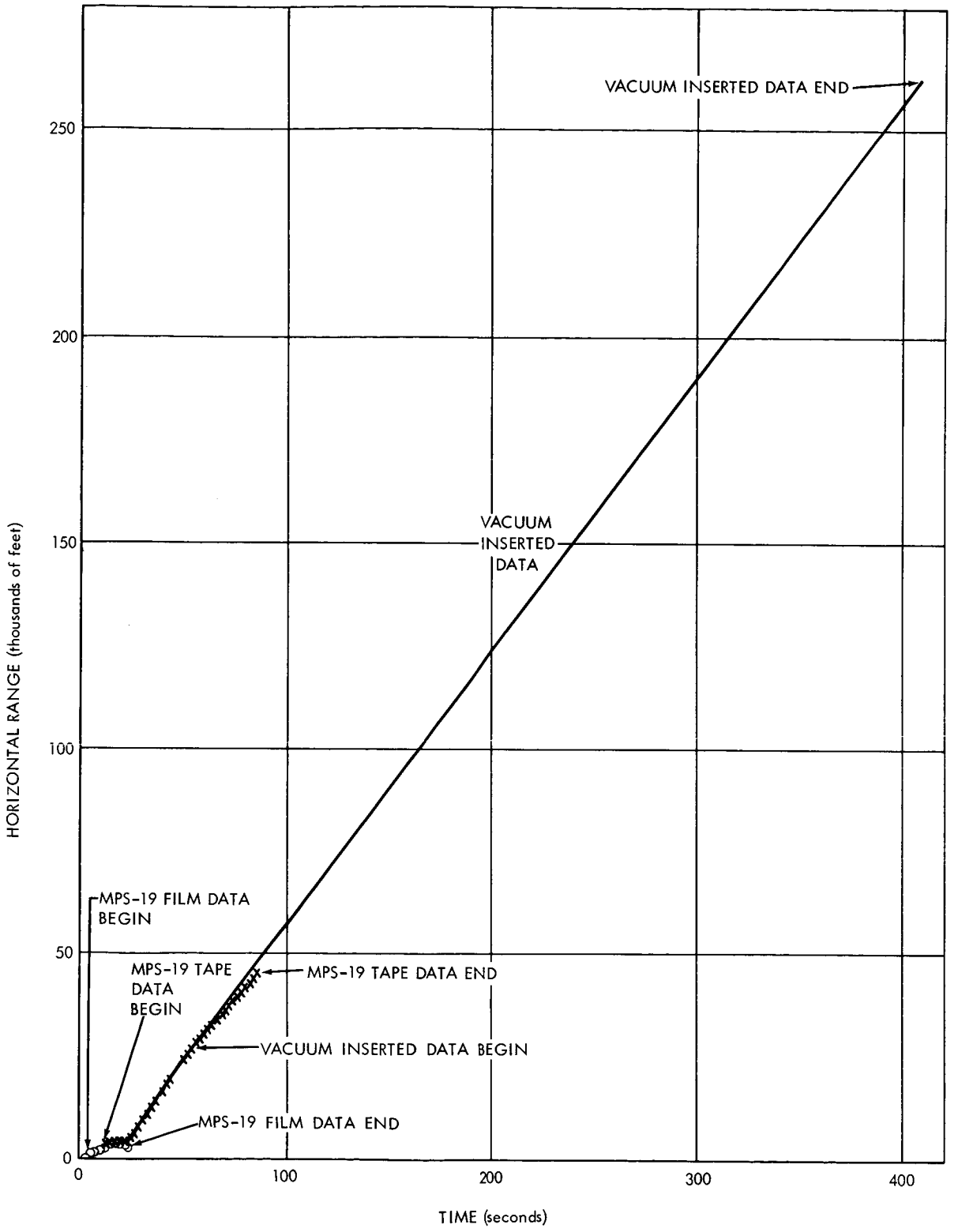

Figure 4. 14.07 UE Radar Plot, Horizontal Range vs Time

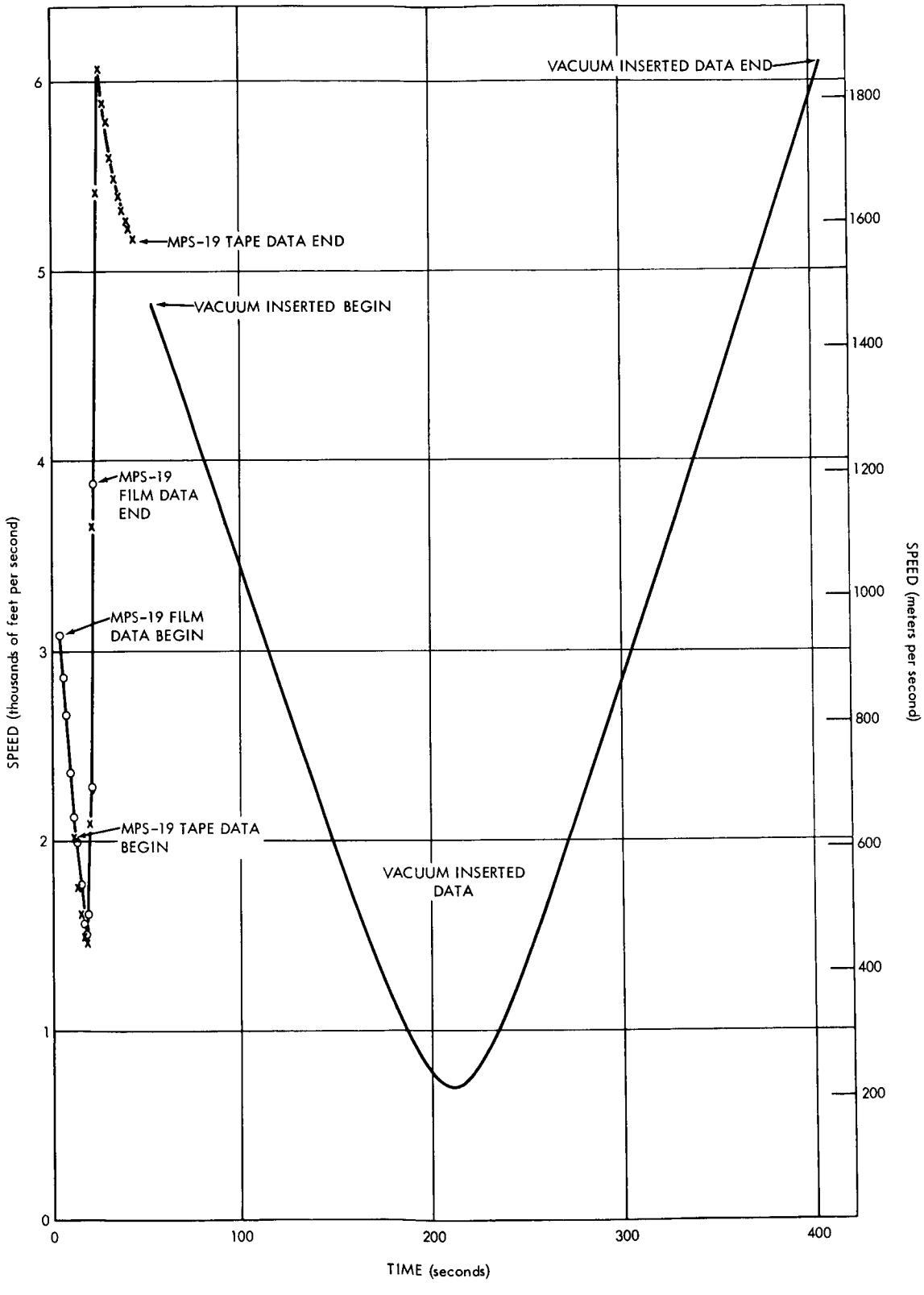

Figure 5. 14.07 UE Radar Plot, Speed vs Time

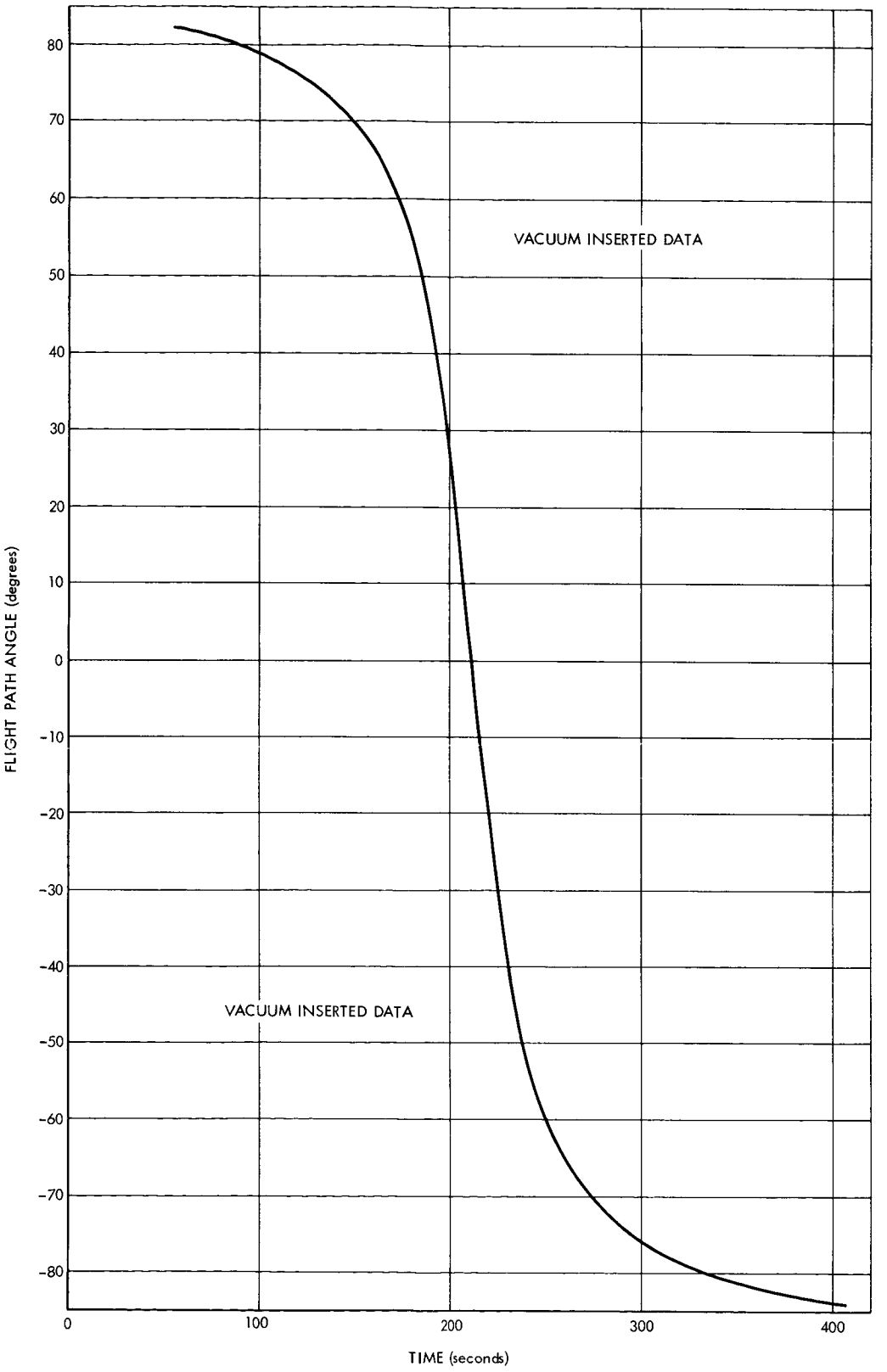

Figure 6. 14.07 UE Radar Plot, Flight Path Angle vs Time

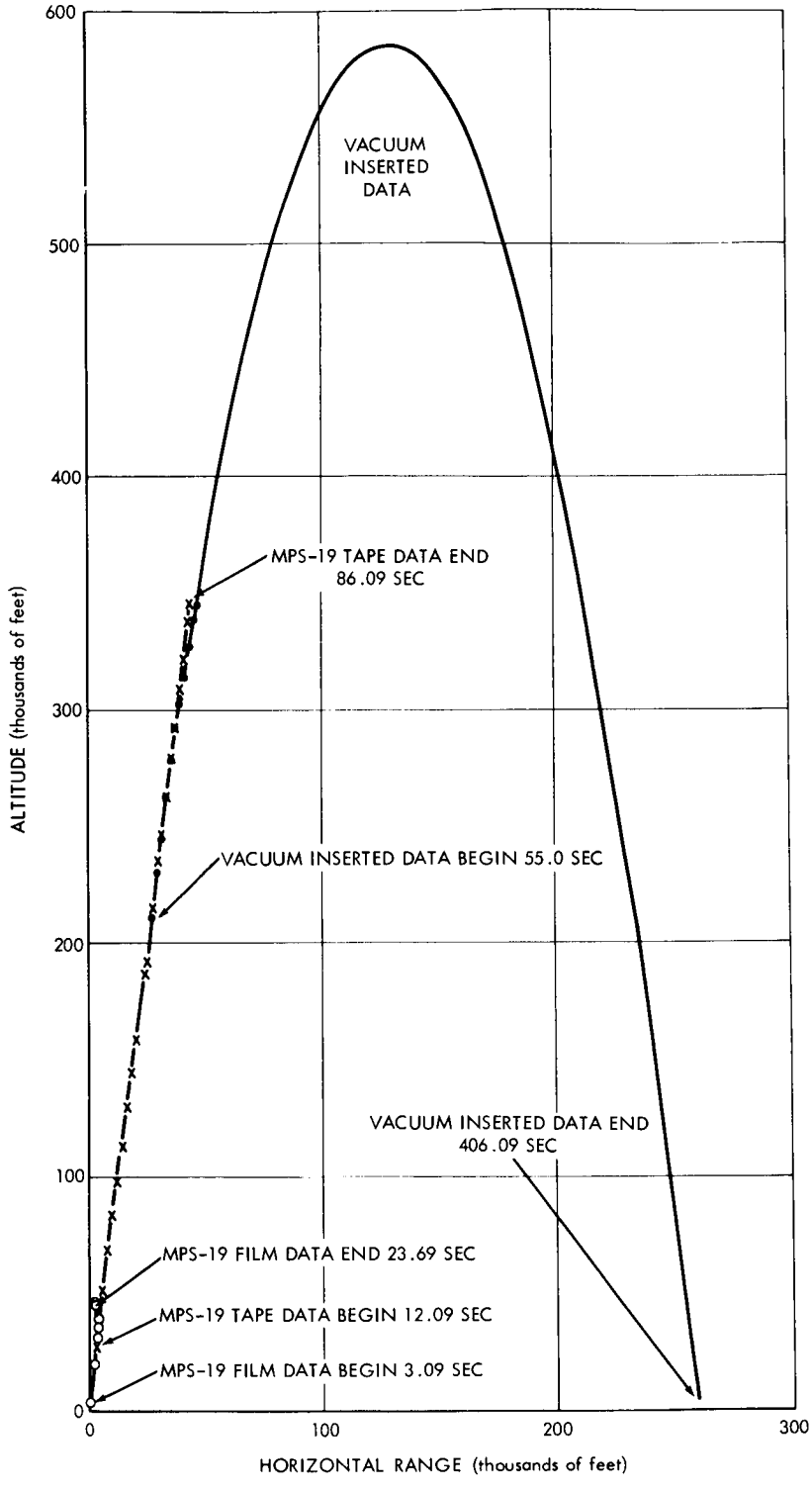

Figure 7. 14.07 UE Radar Plot, Altitude vs Horizontal Range

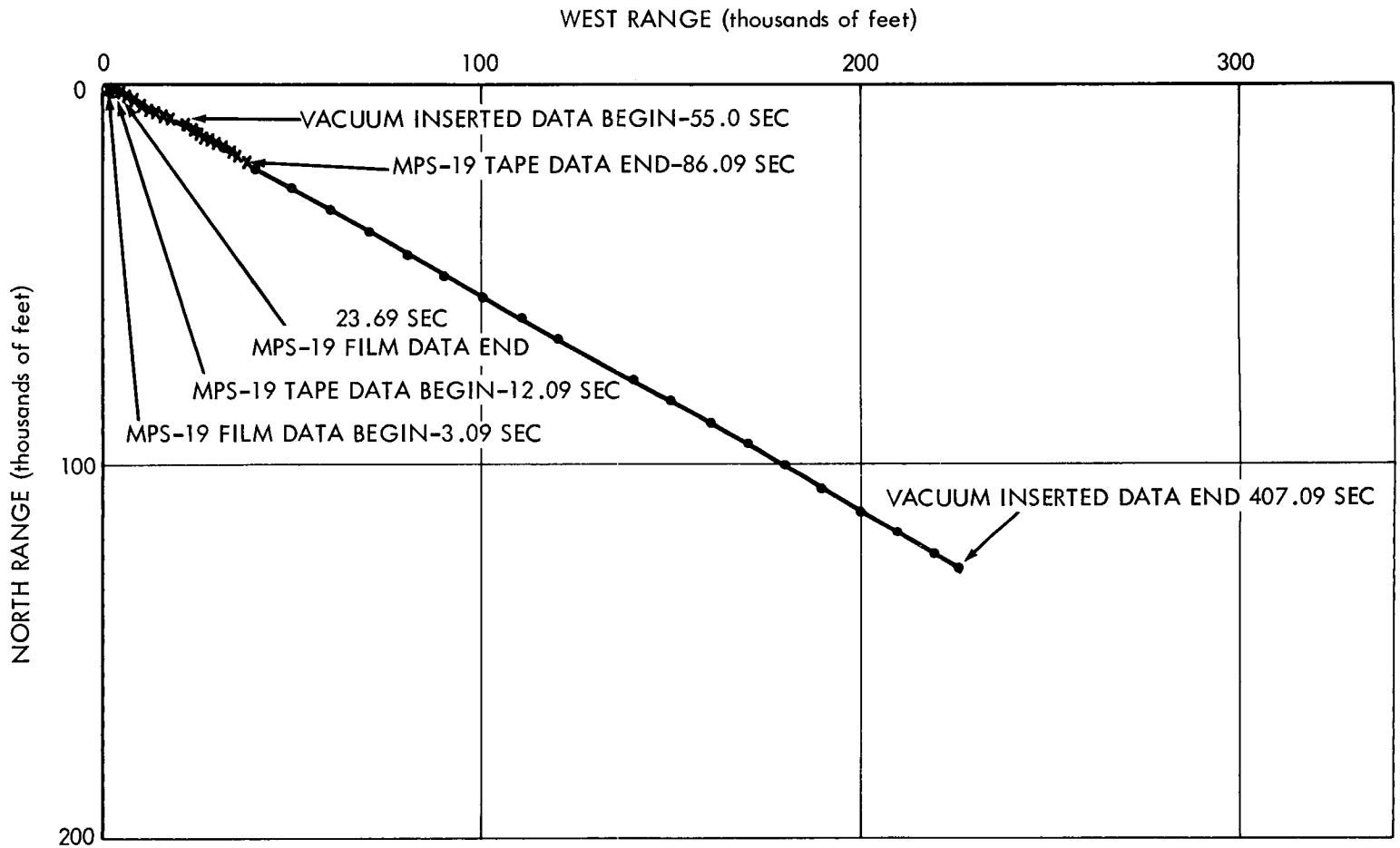

Figure 8. 14.07 UE Radar Plot, North Range vs West Range

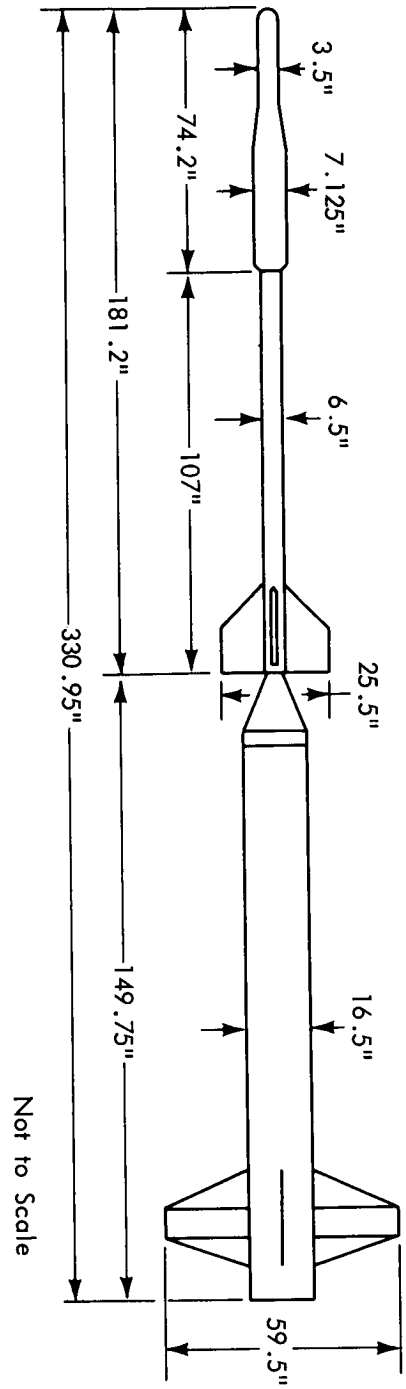

Figure 9. 14.25 UA Sketch

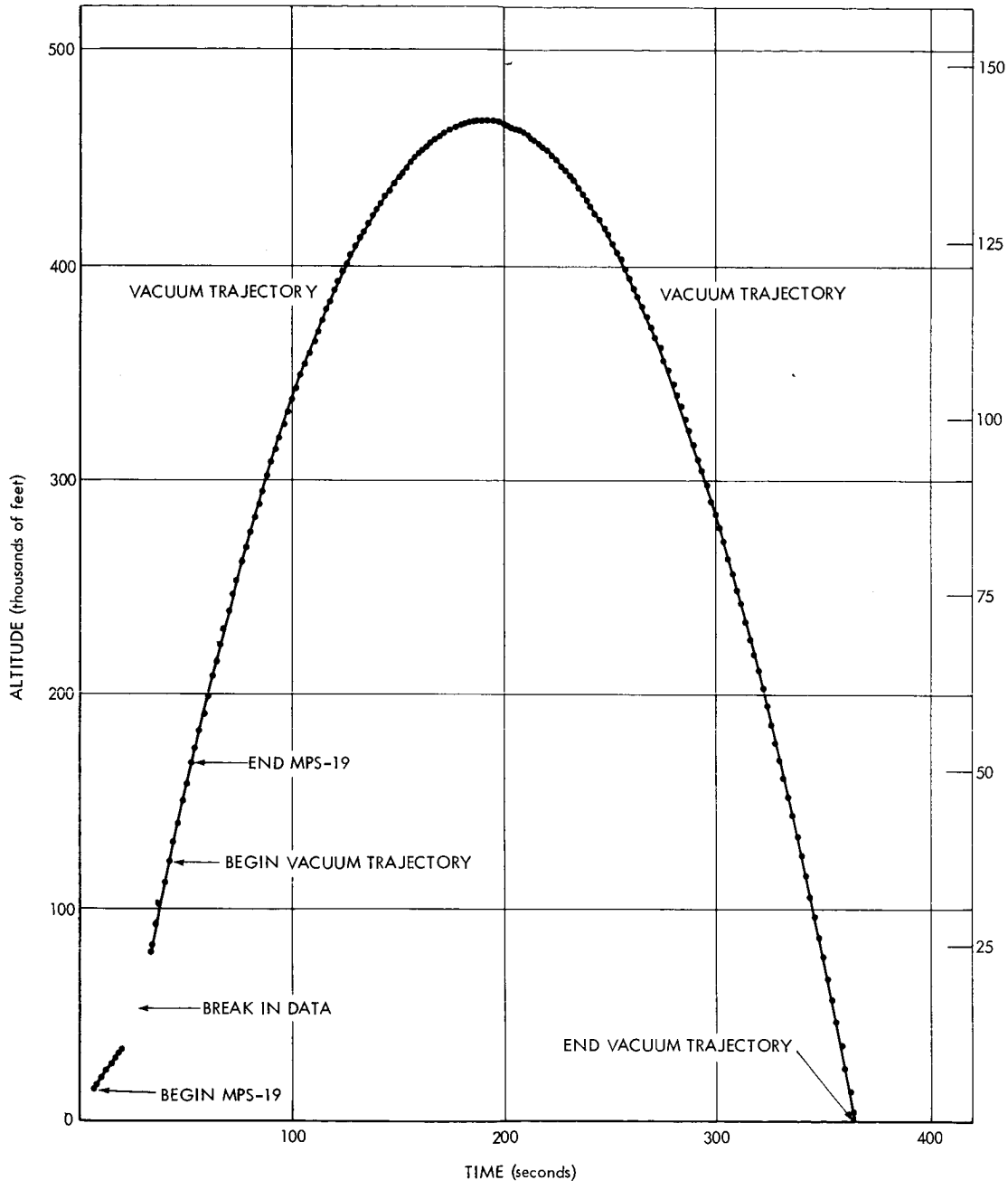

Figure 10. 14.25 UA Radar Plot, Altitude vs Time

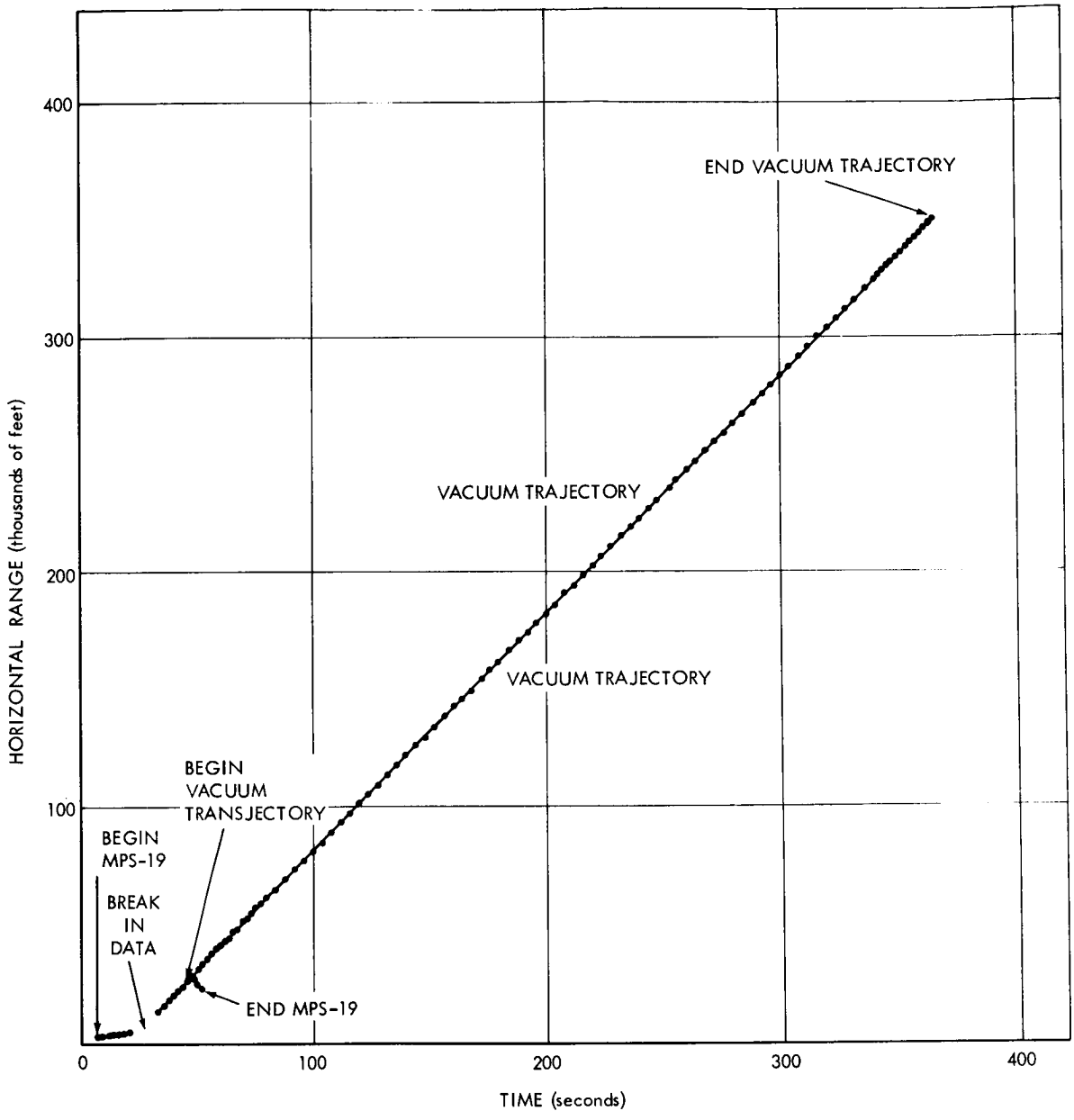

Figure 11. 14.25 UA Radar Plot, Horizontal Range vs Time

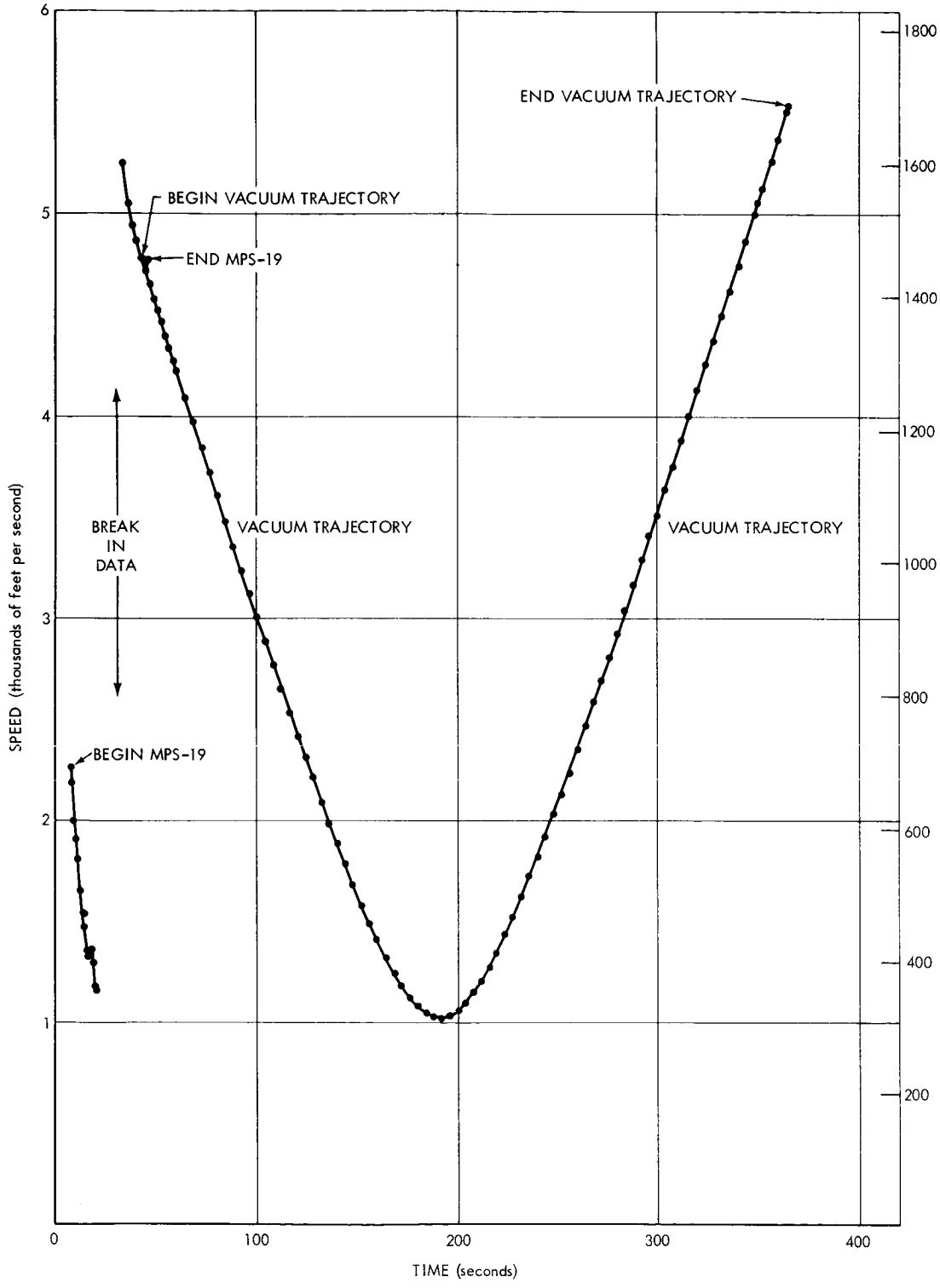

Figure 12. 14.25 UA Radar Plot, Speed vs Time

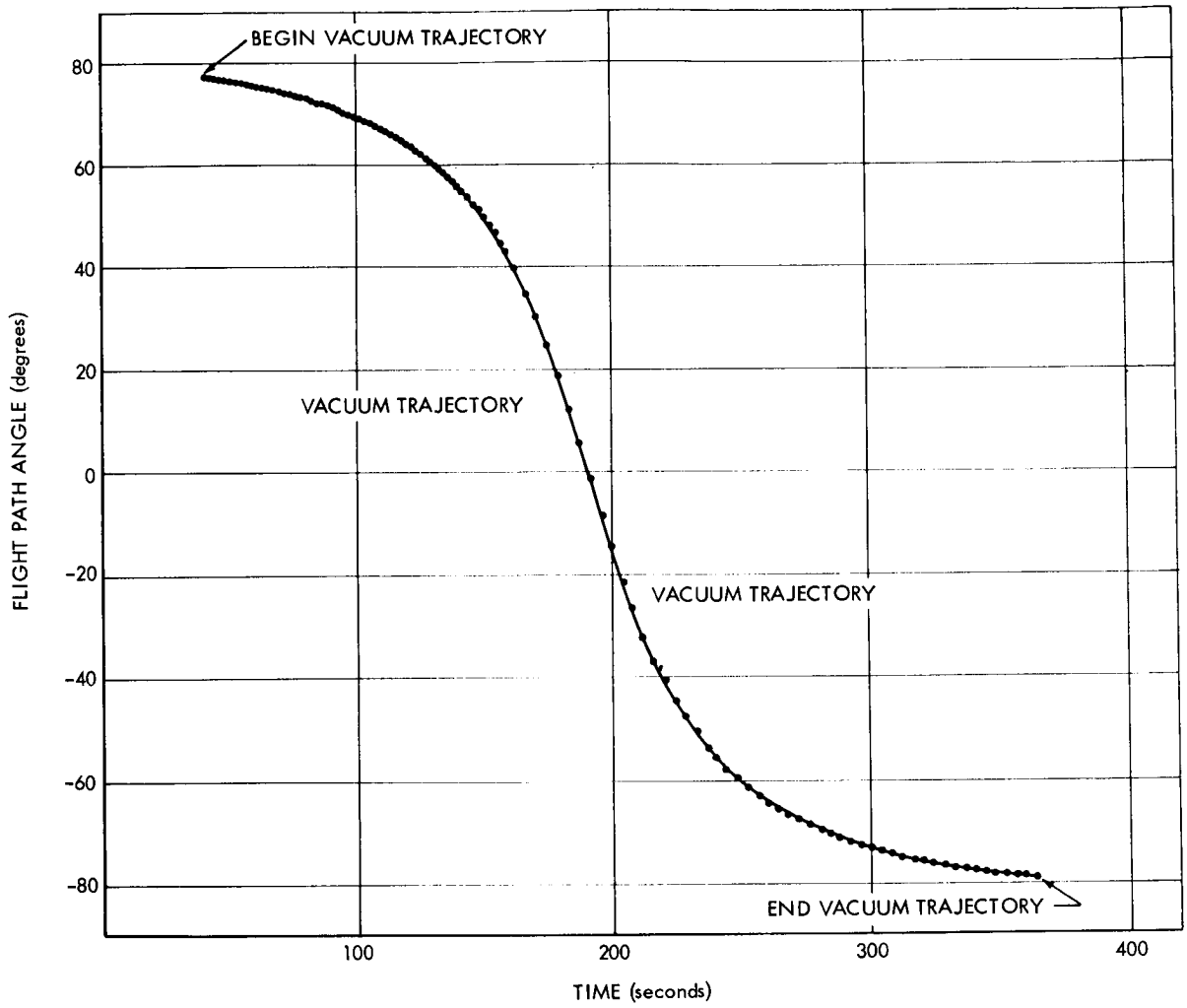

Figure 13. 14.25 UA Radar Plot, Flight Path Angle vs Time

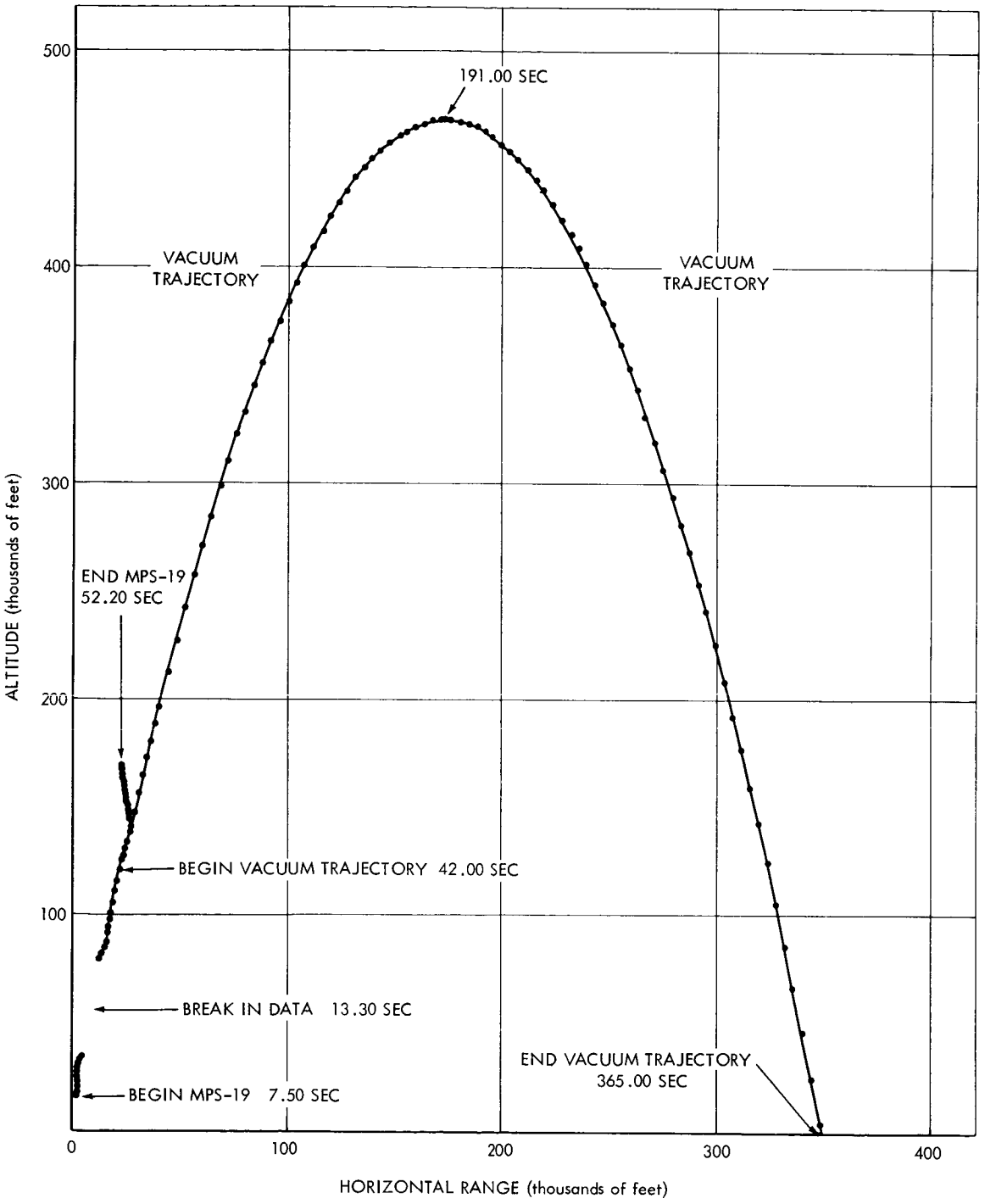

Figure 14. 14.25 UA Radar Plot, Altitude vs Horizontal Range

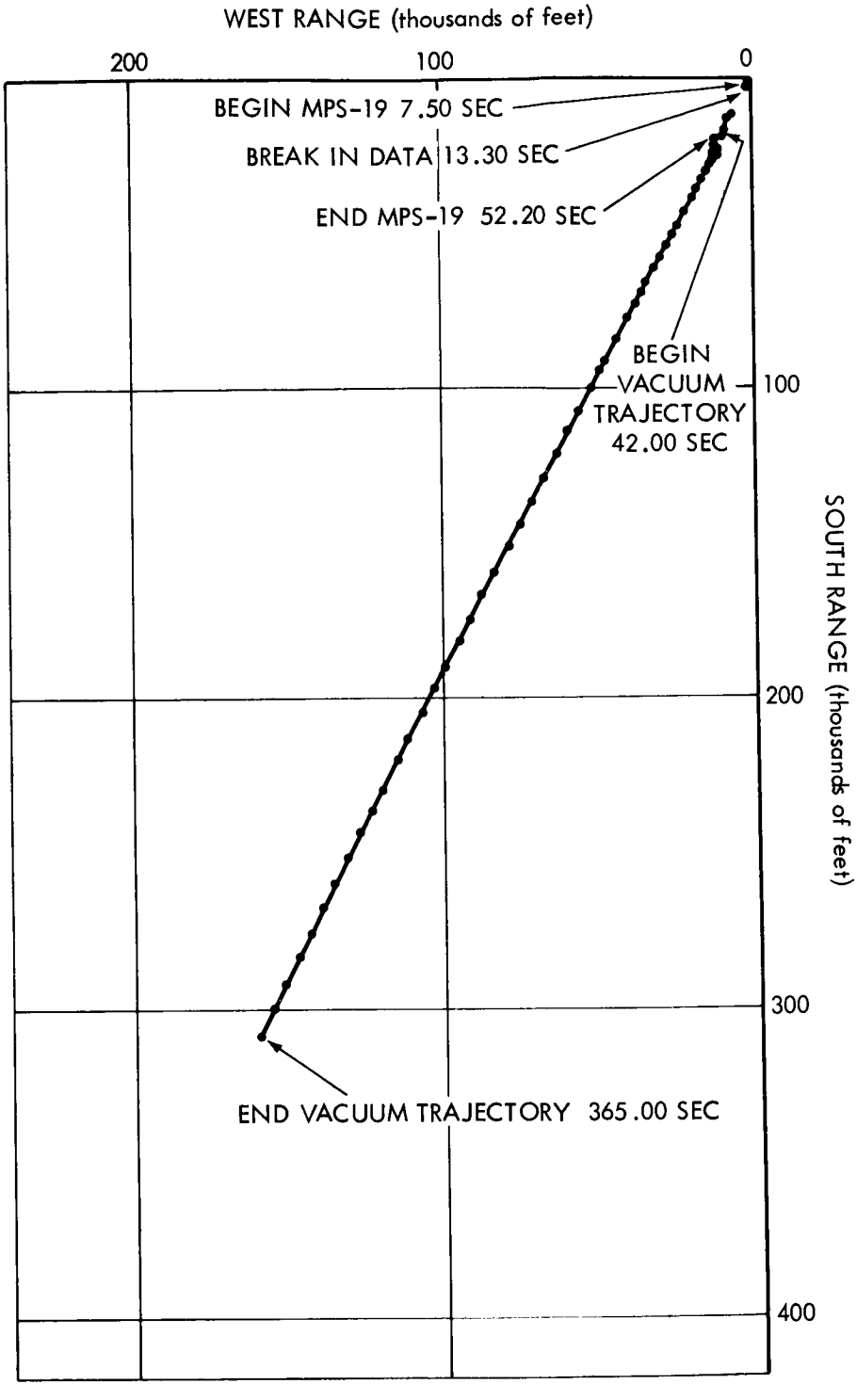

Figure 15. 14.25 UA Radar Plot, South Range vs West Range

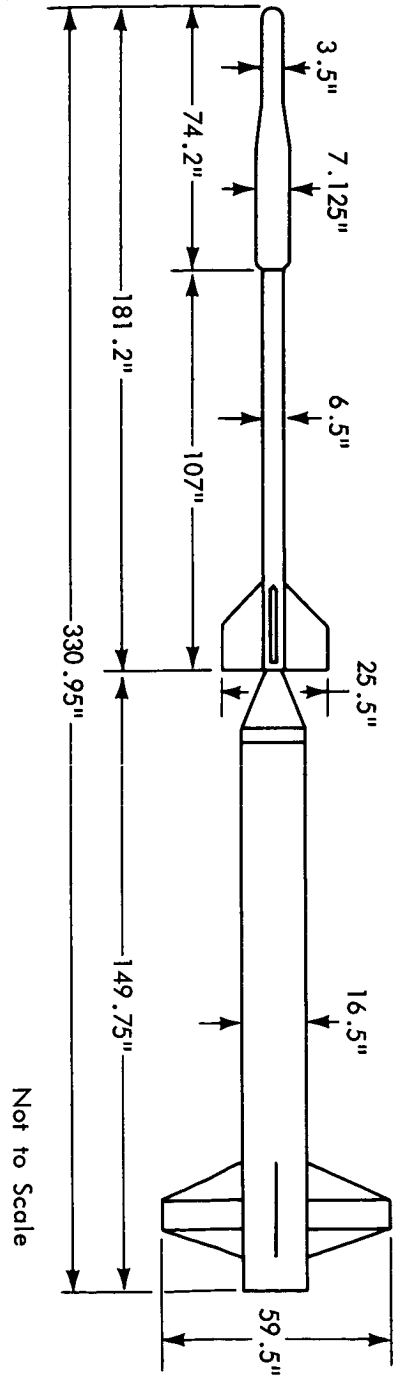

Figure 16. 14.26 UA Sketch

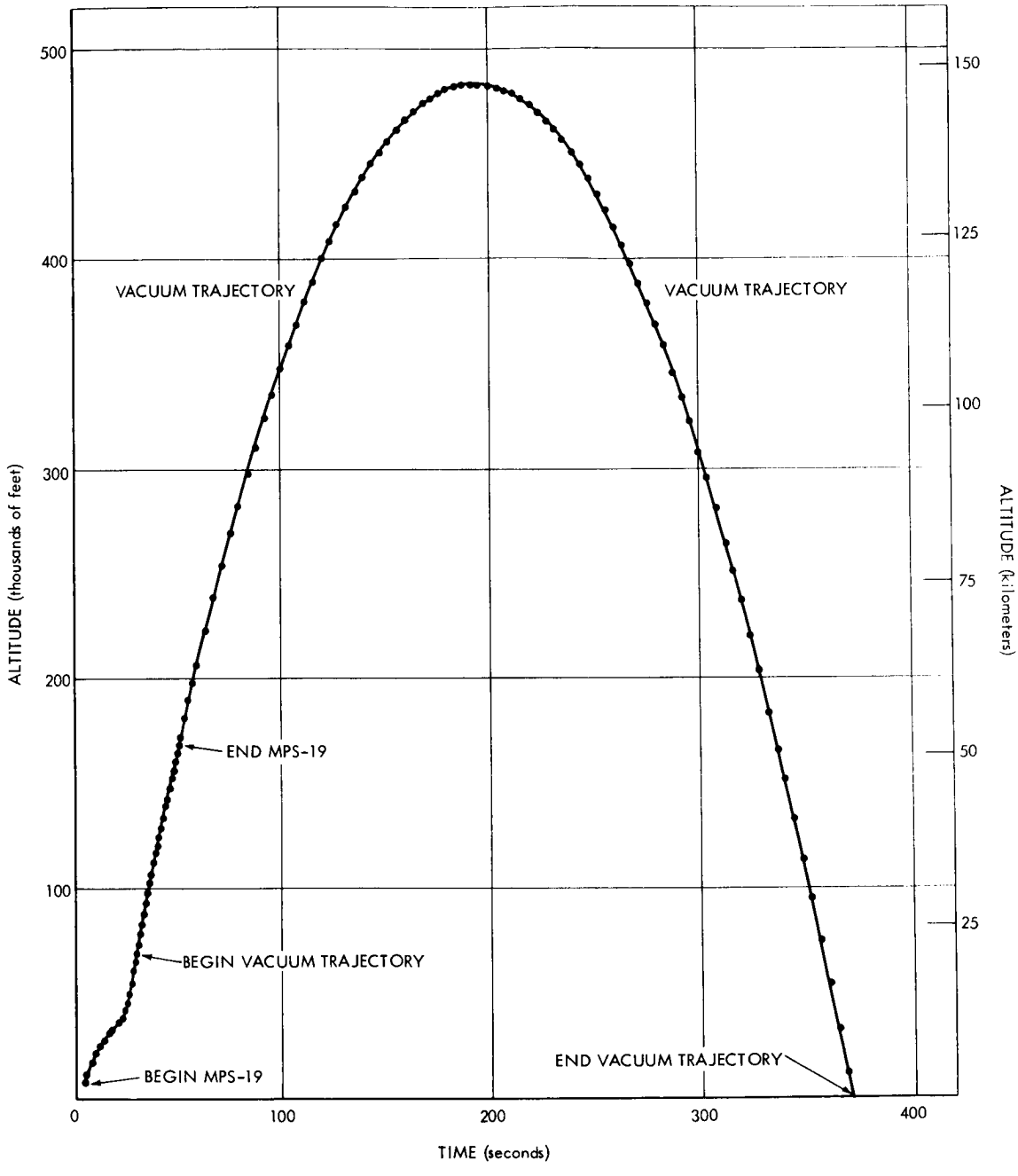

Figure 17. 14.26 UA Radar Plot, Altitude vs Time

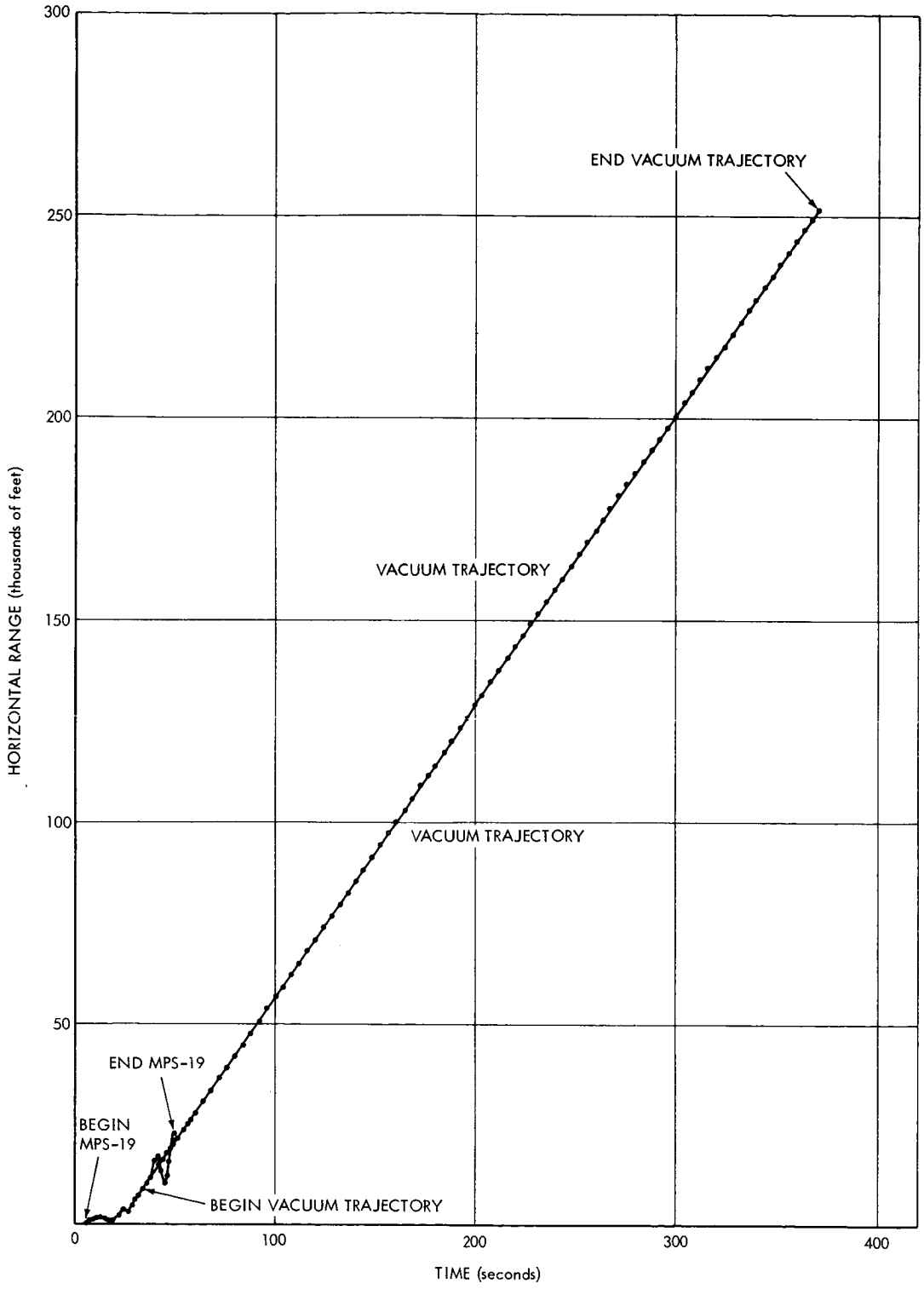

Figure 18. 14.26 UA Radar Plot, Horizontal Range vs Time

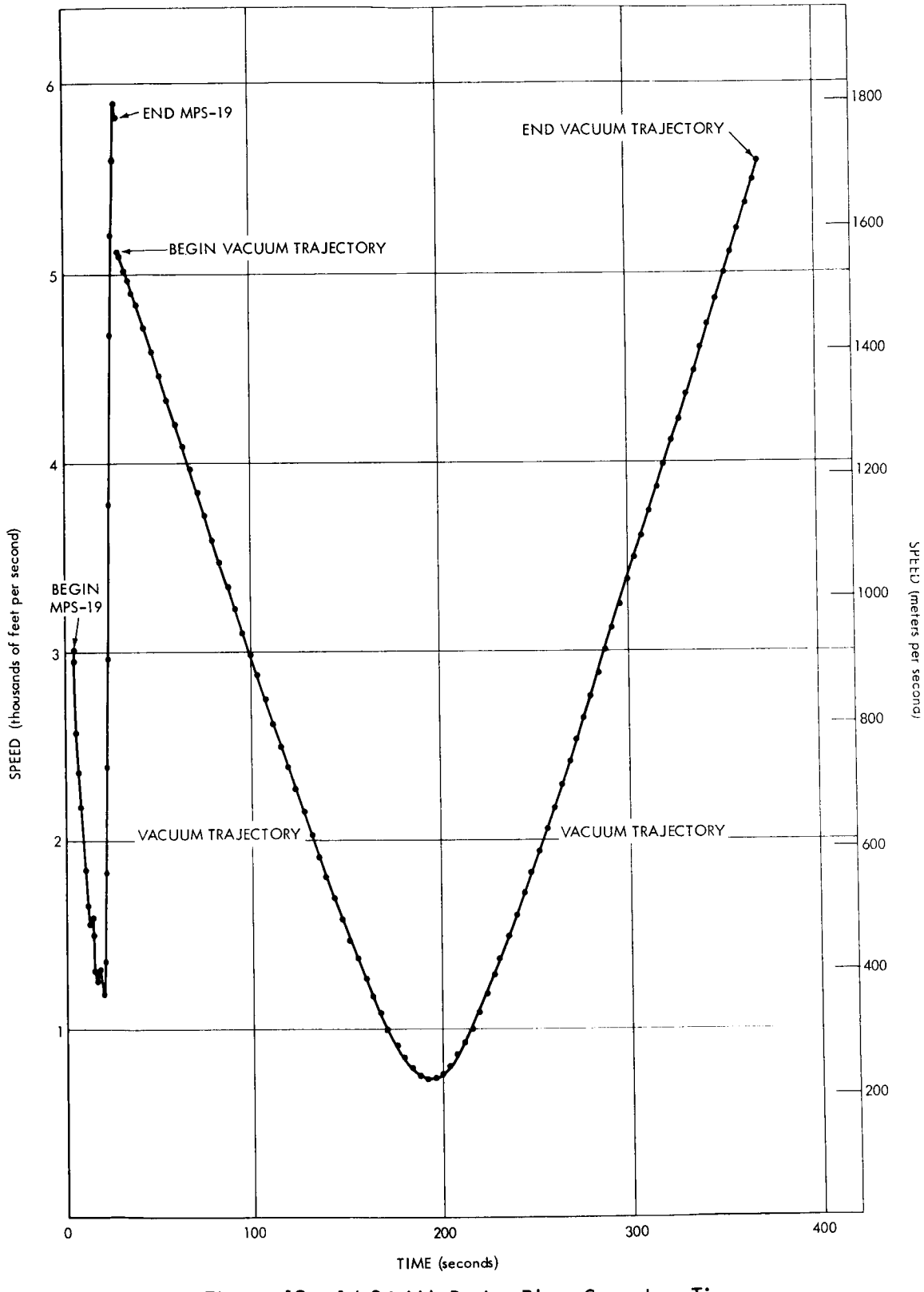

Figure 19. 14.26 UA Radar Plot, Speed vs Time

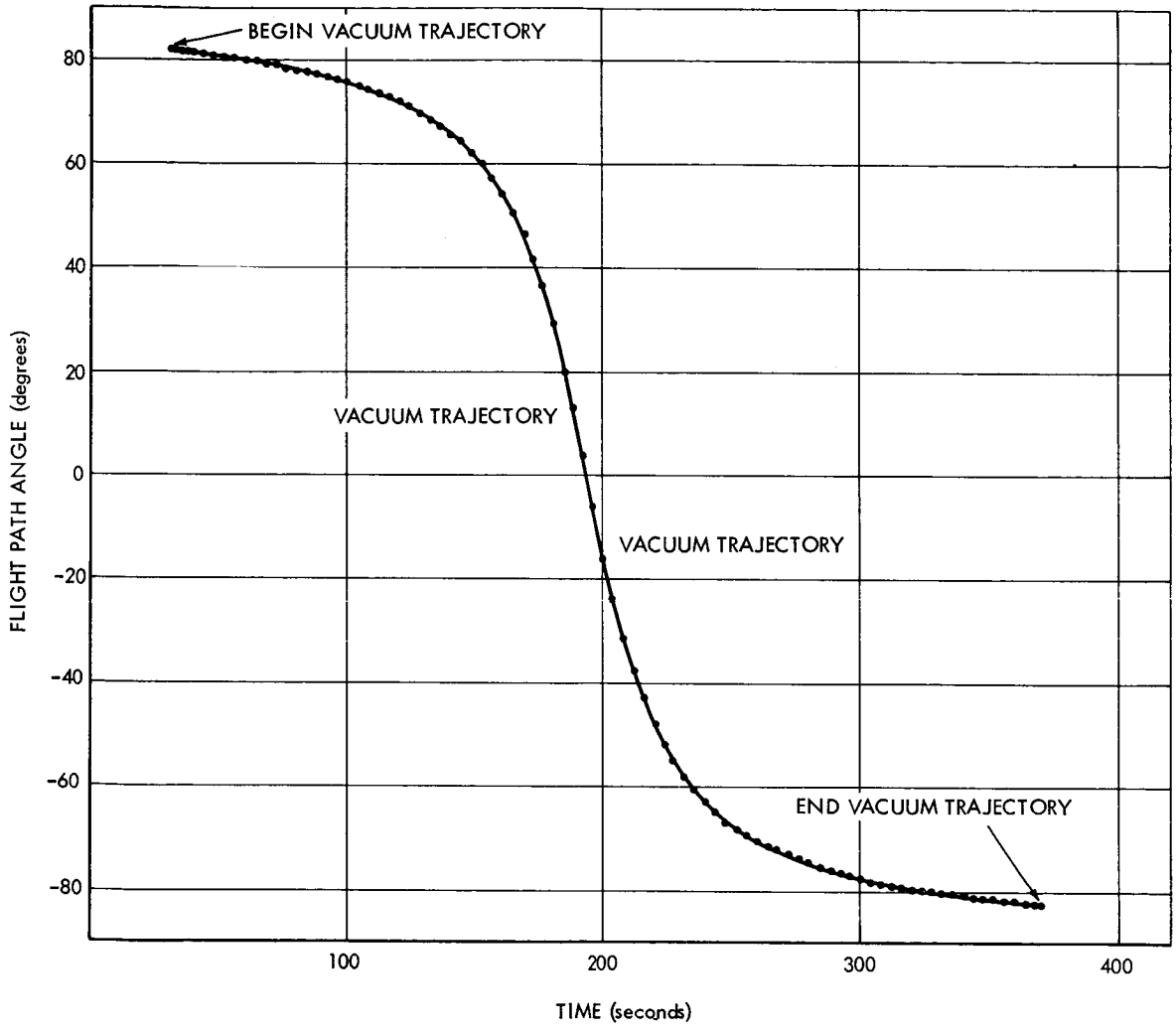

Figure 20. 14.26 UA Radar Plot, Flight Path Angle vs Time

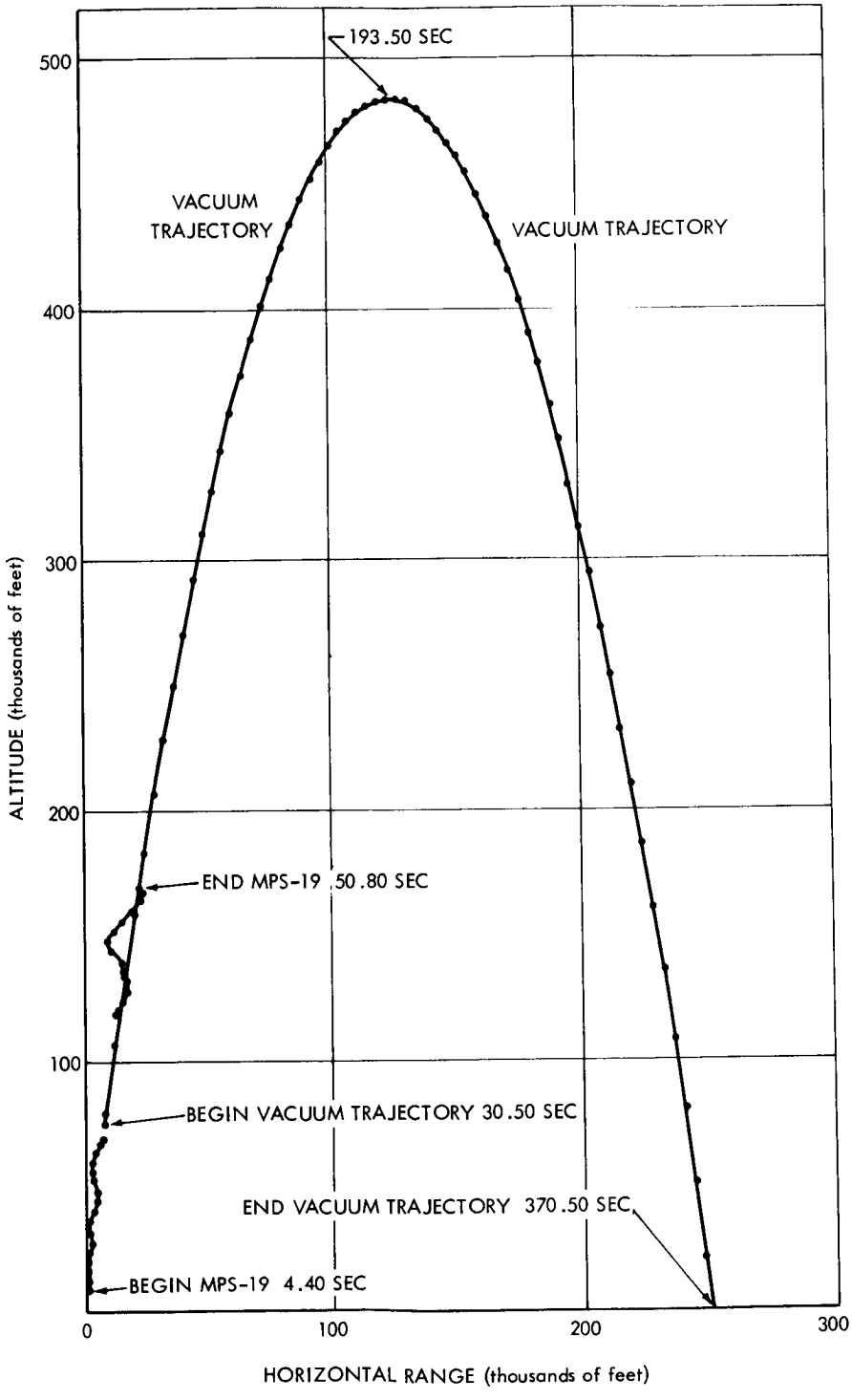

Figure 21. 14.26 UA Radar Plot, Altitude vs Horizontal Range

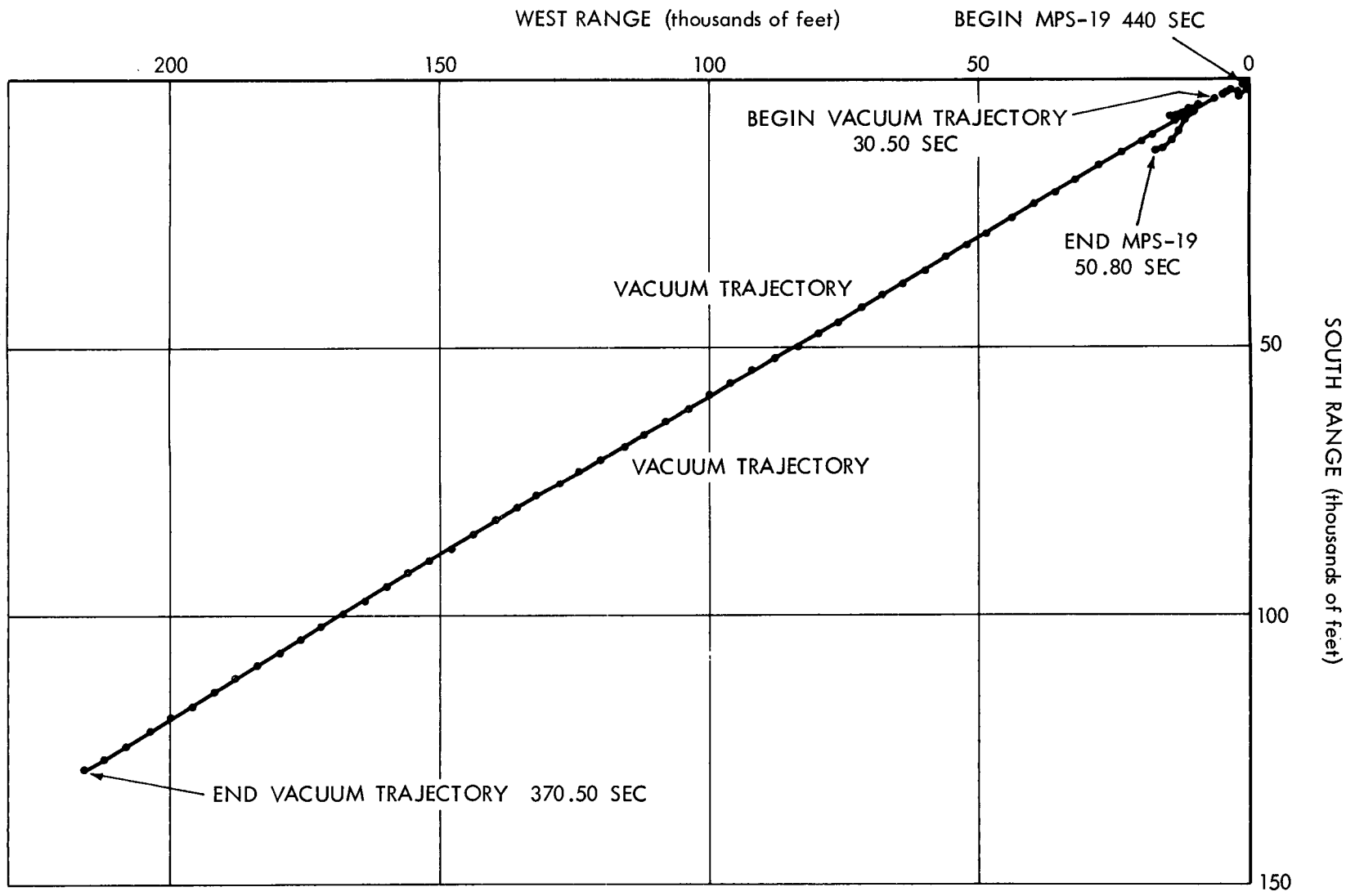

Figure 22. 14.26 UA Radar Plot, South Range vs West Range

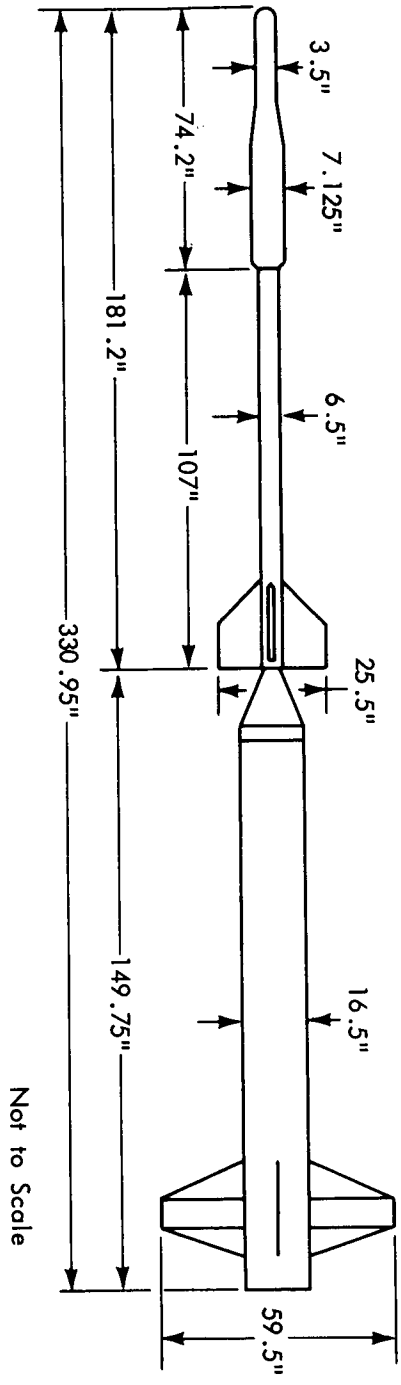

Figure 23. 14.27 UA Sketch

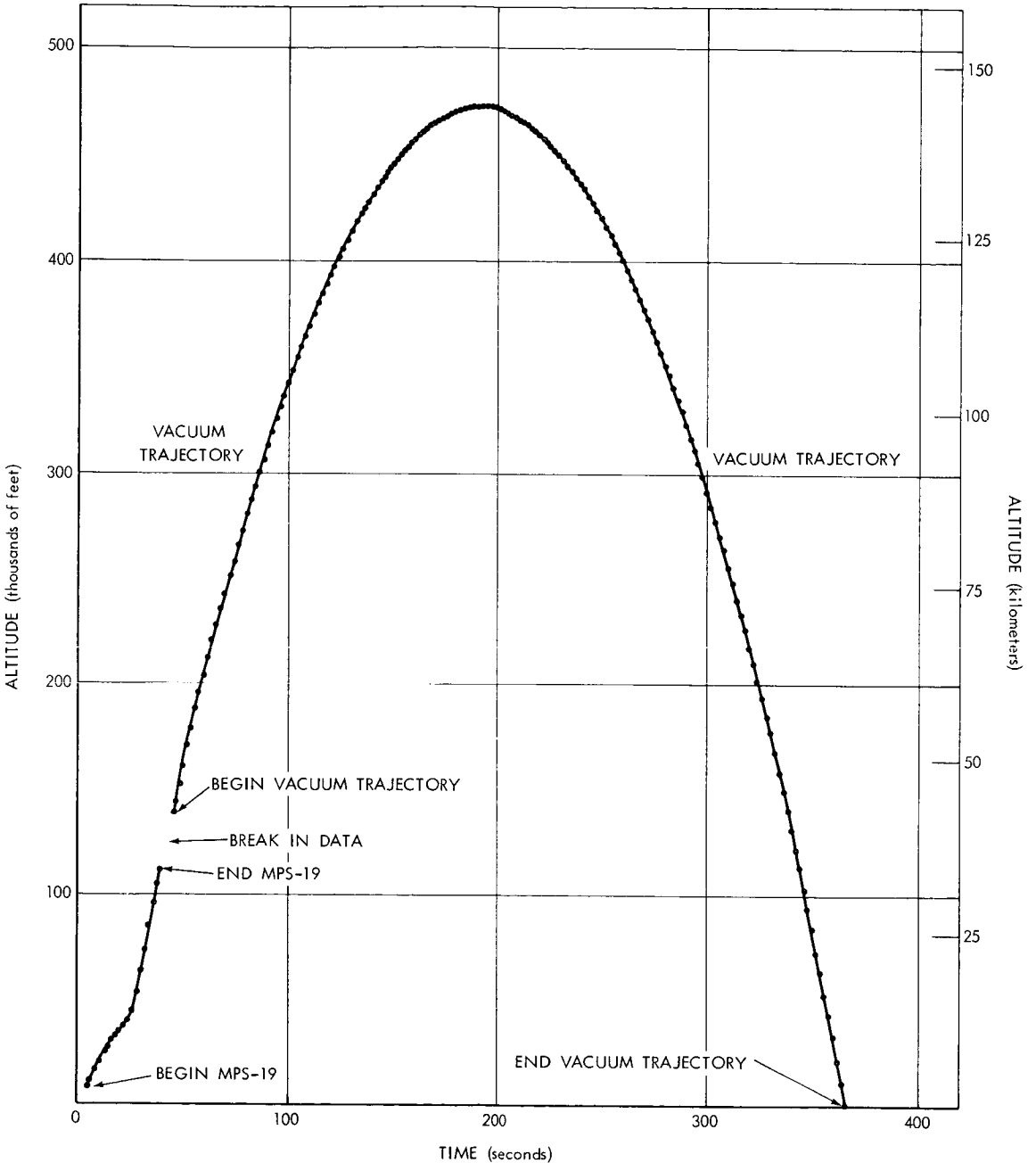

Figure 24. 14.27 UA Radar Plot, Altitude vs Time

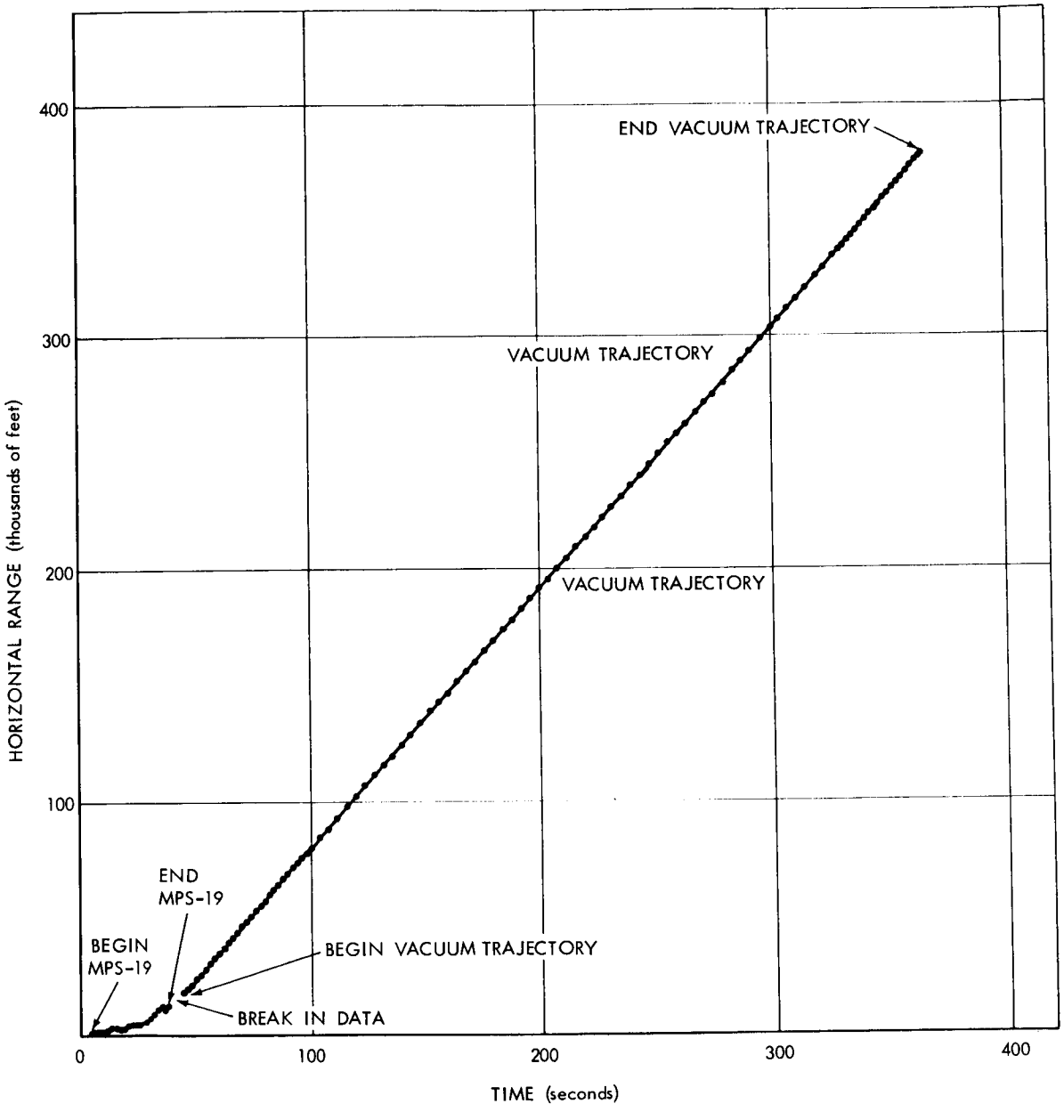

Figure 25. 14.27 UA Radar Plot, Horizontal Range vs Time

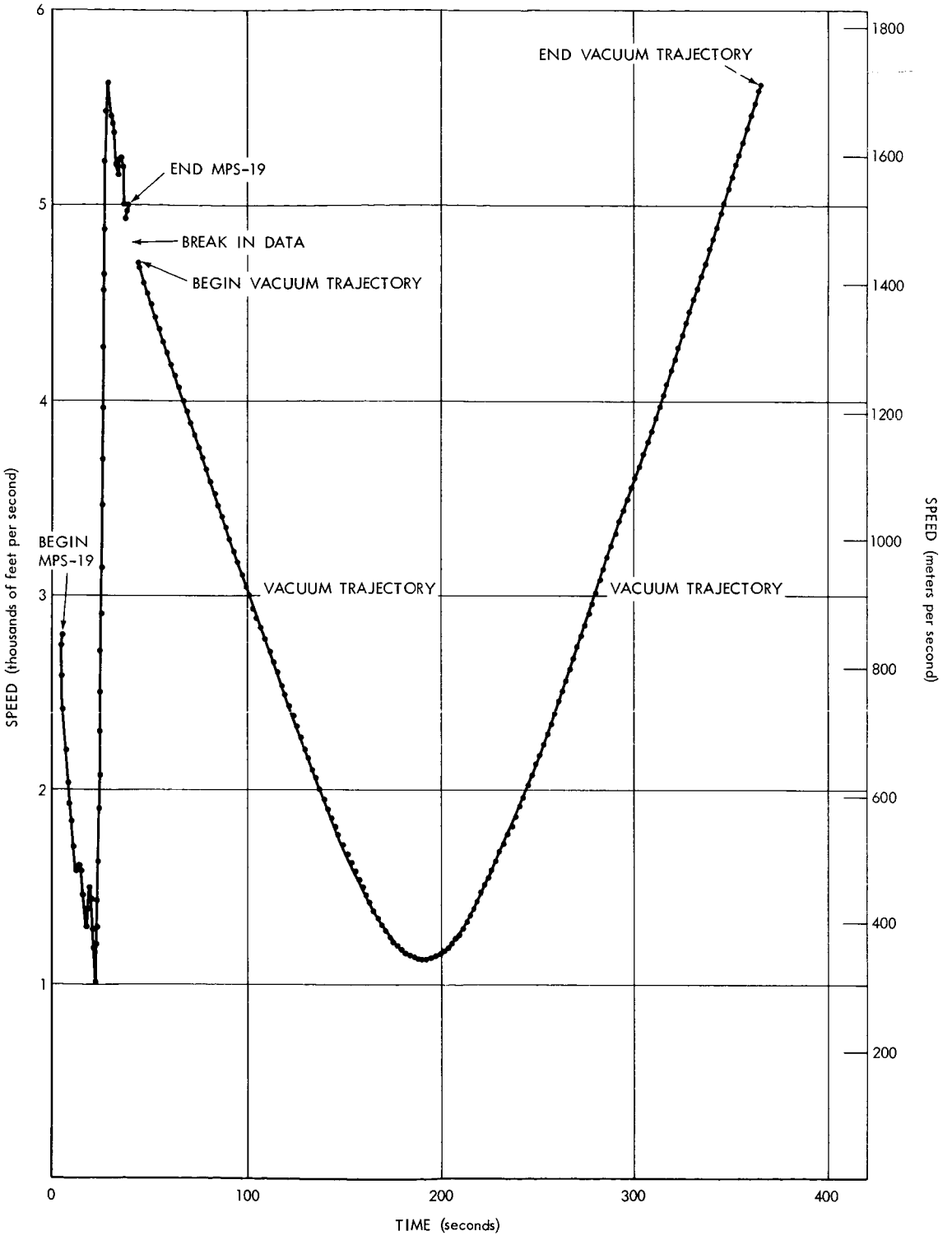

Figure 26. 14.27 UA Radar Plot, Speed vs Time

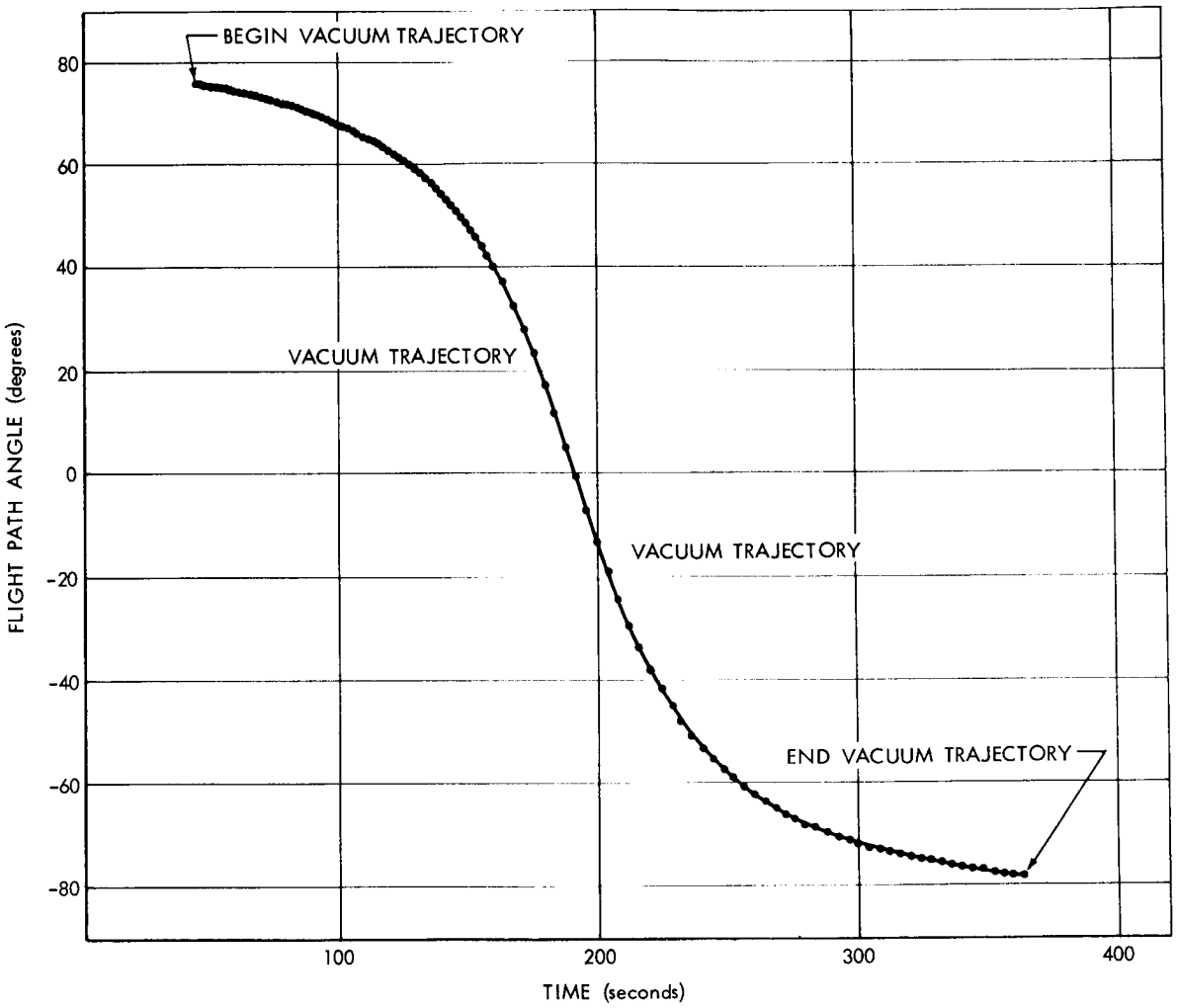

Figure 27. 14.27 UA Radar Plot, Flight Path Angle vs Time

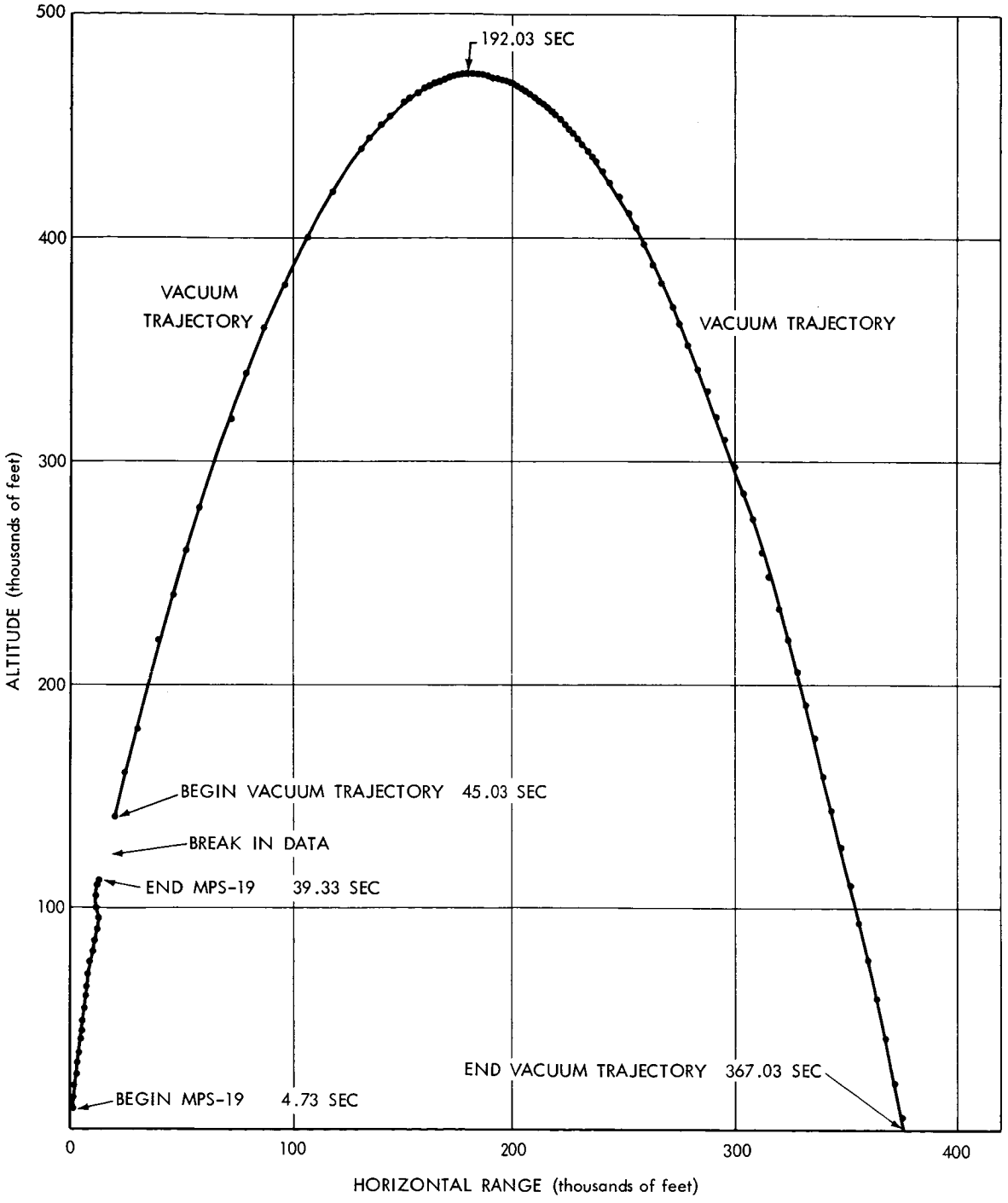

Figure 28. 14.27 UA Radar Plot, Altitude vs Horizontal Range

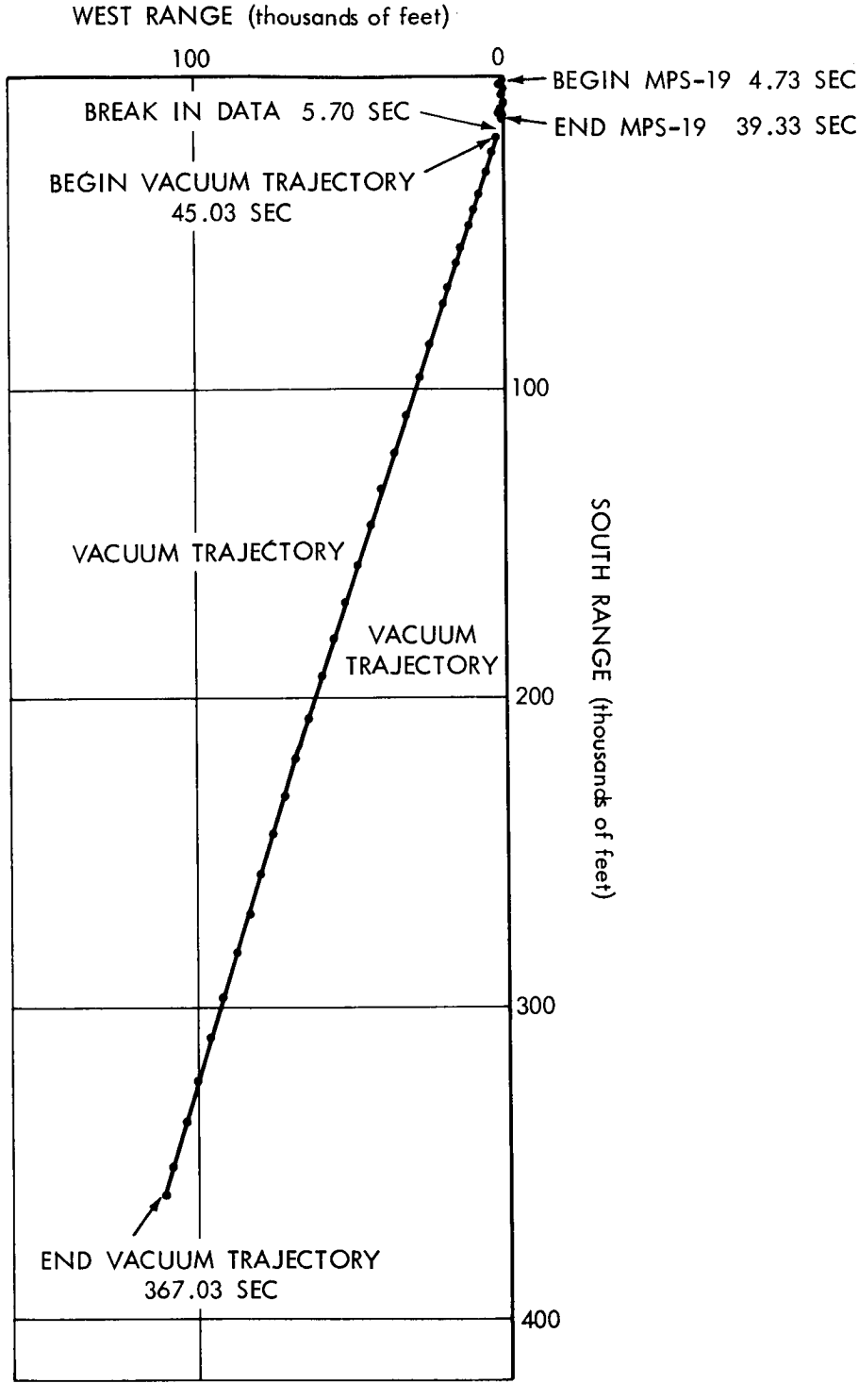

Figure 29. 14.27 UA Radar Plot, South Range vs West Range

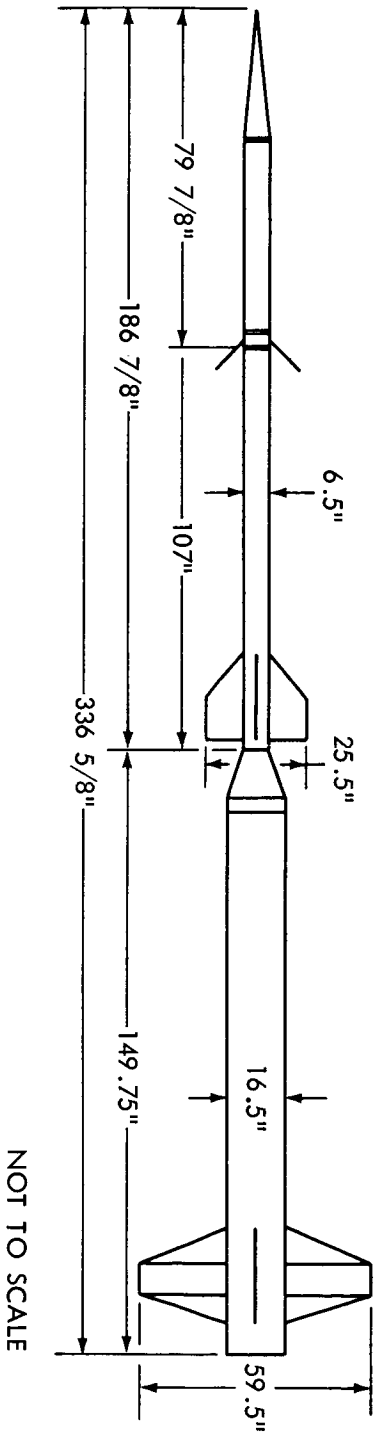

Figure 30. 14.61 UE Sketch

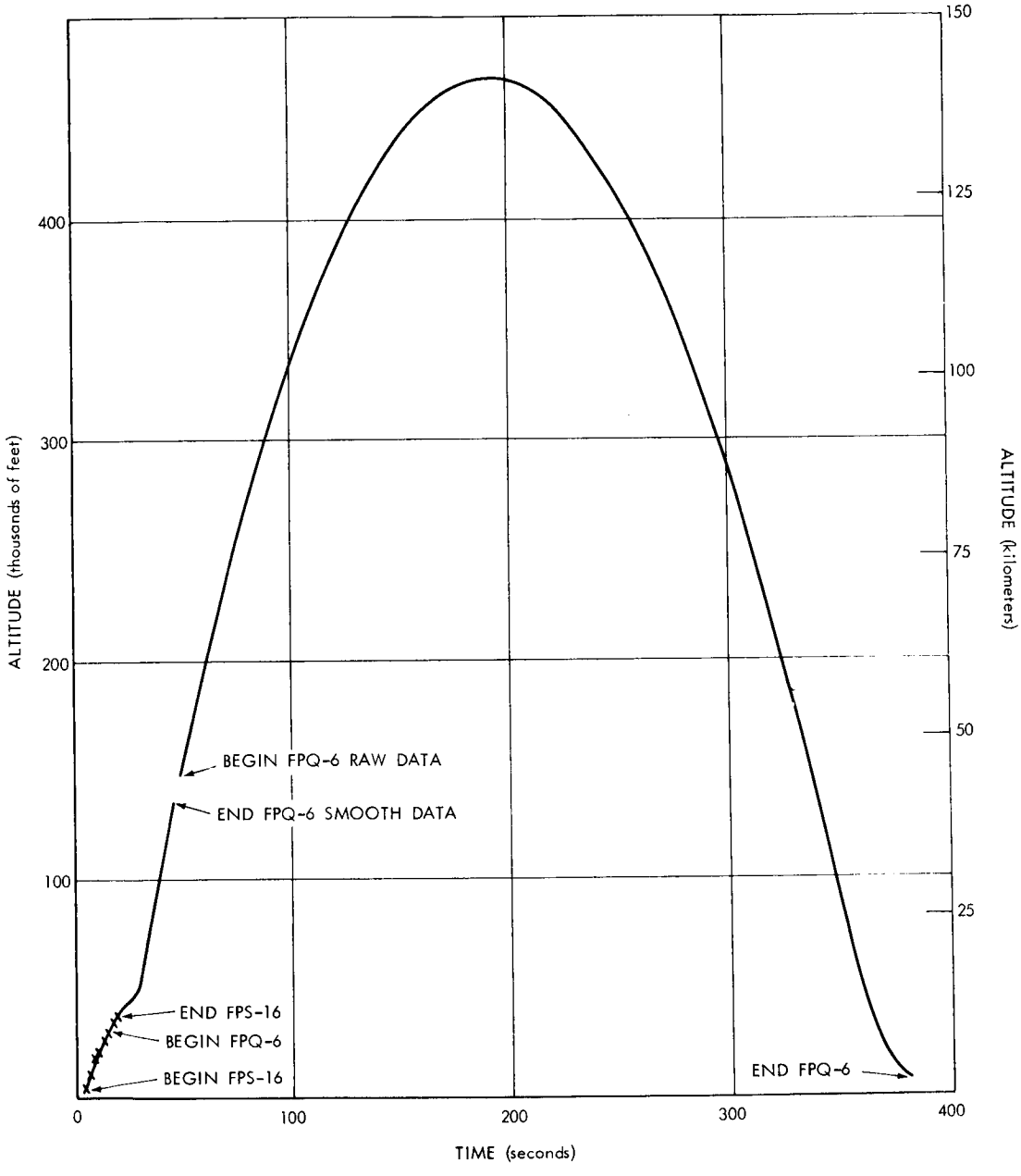

Figure 31. 14.61 UE Radar Plot, Altitude vs Time

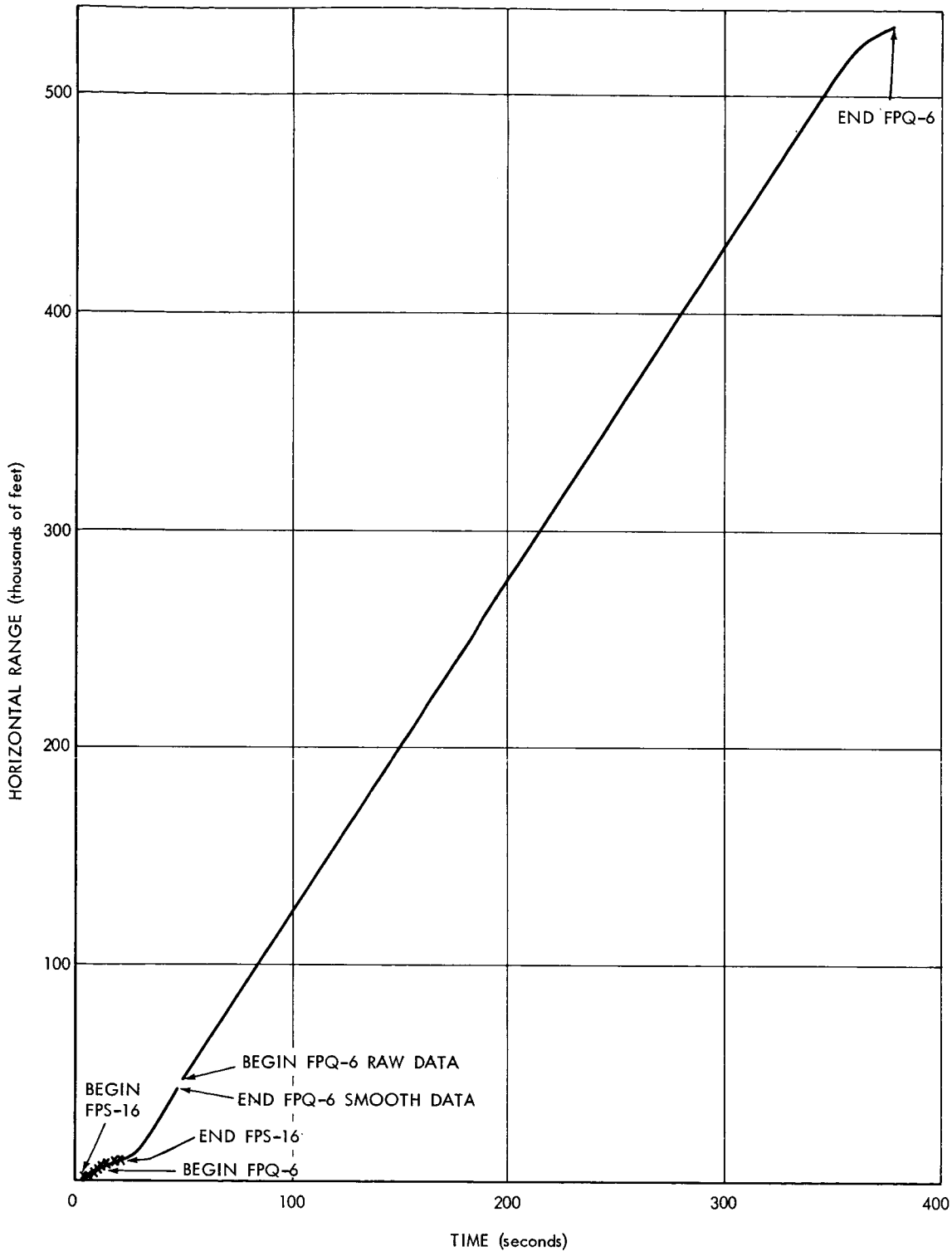

Figure 32. 14.61 UE Radar Plot, Horizontal Range vs Time

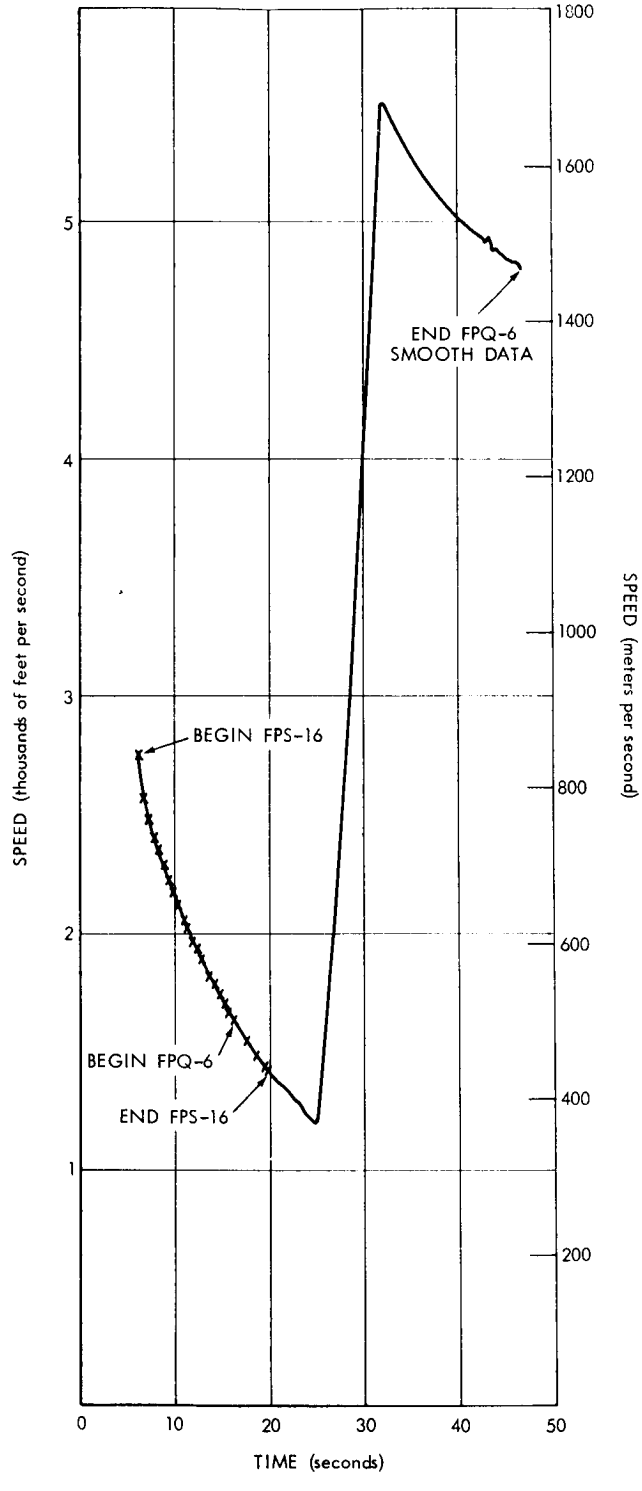

Figure 33. 14.61 UE Radar Plot, Speed vs Time

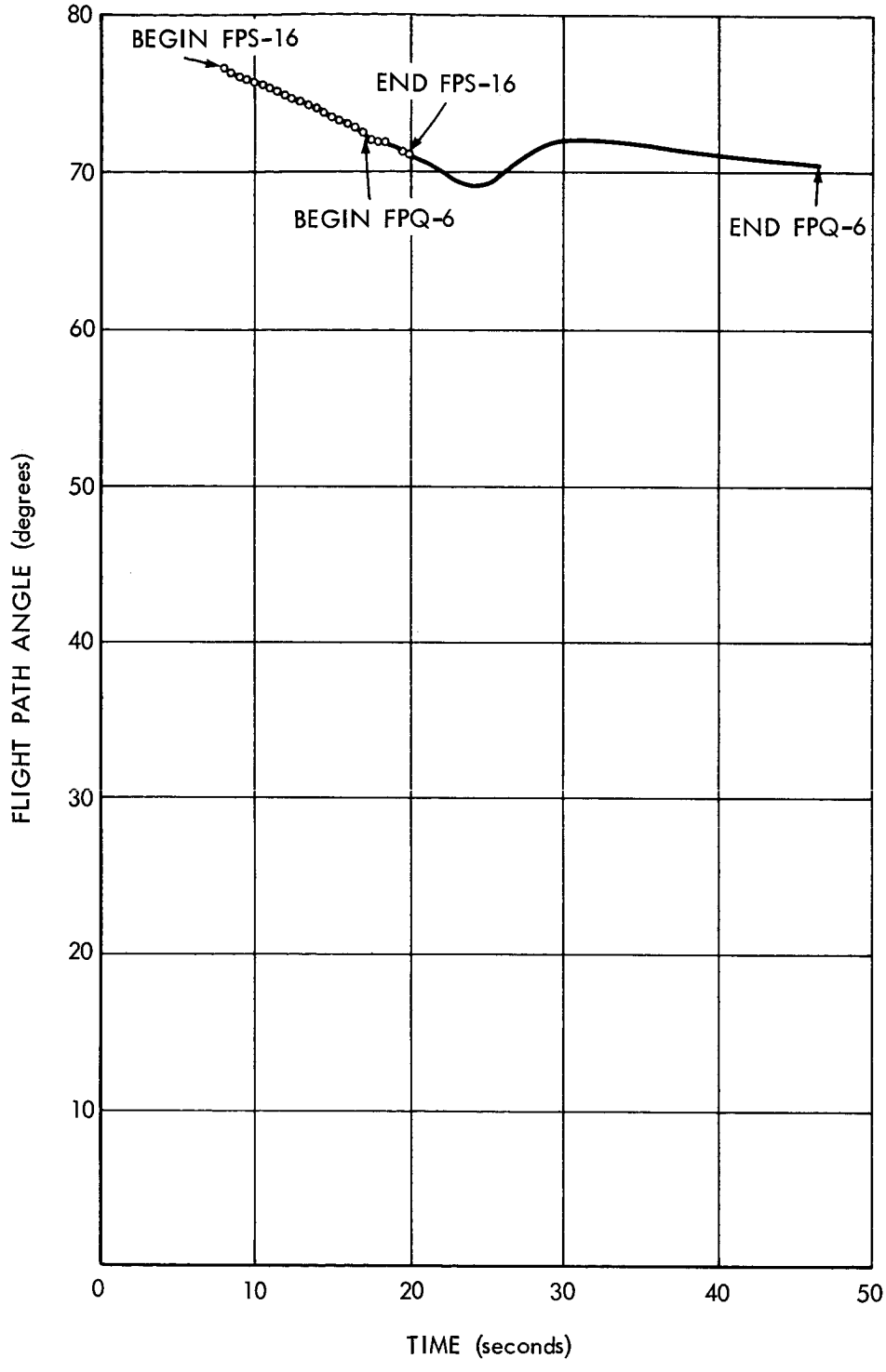

Figure 34. 14.61 UE Radar Plot, Flight Path Angle vs Time

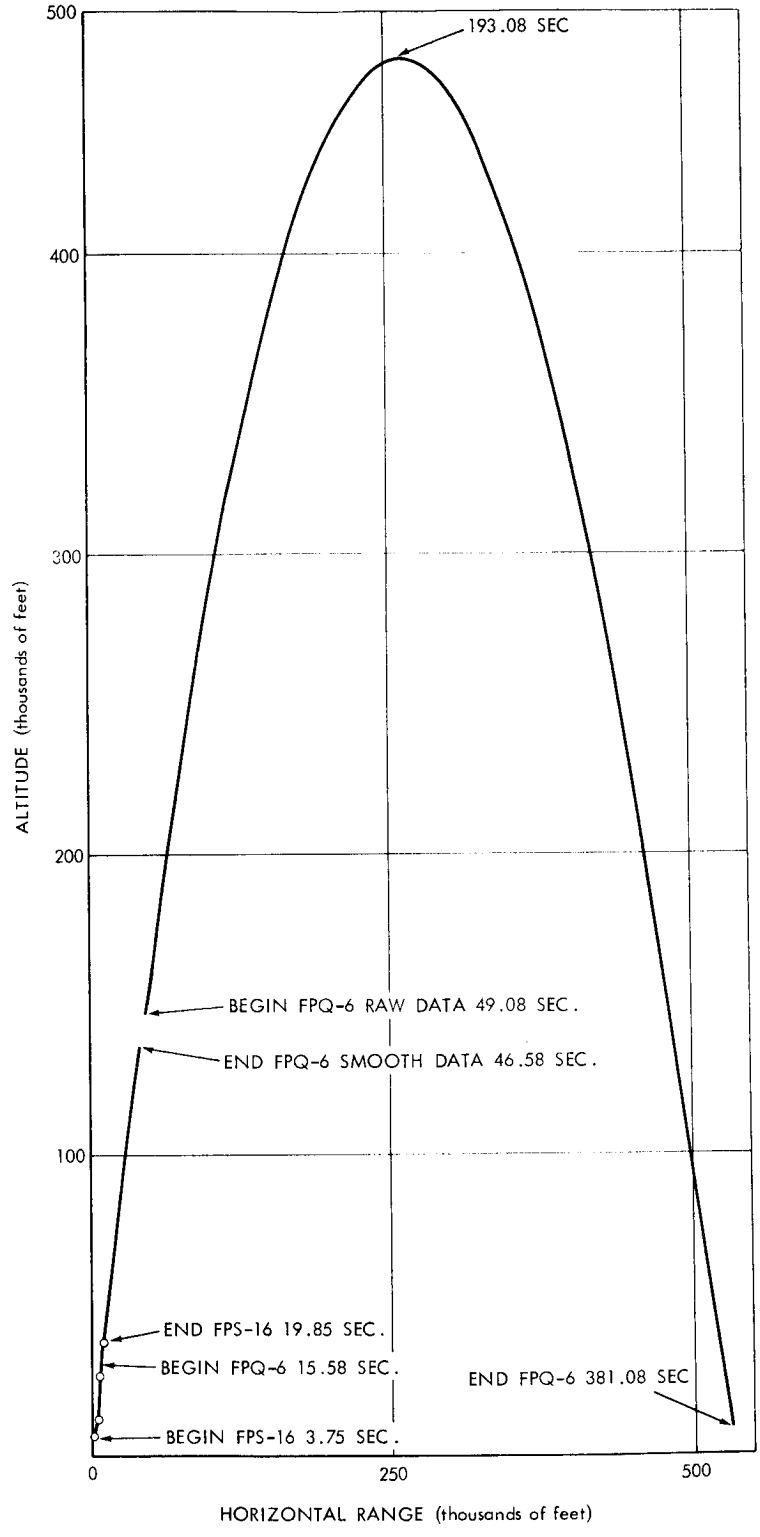

Figure 35. 14.61 UE Radar Plot, Altitude vs Horizontal Range

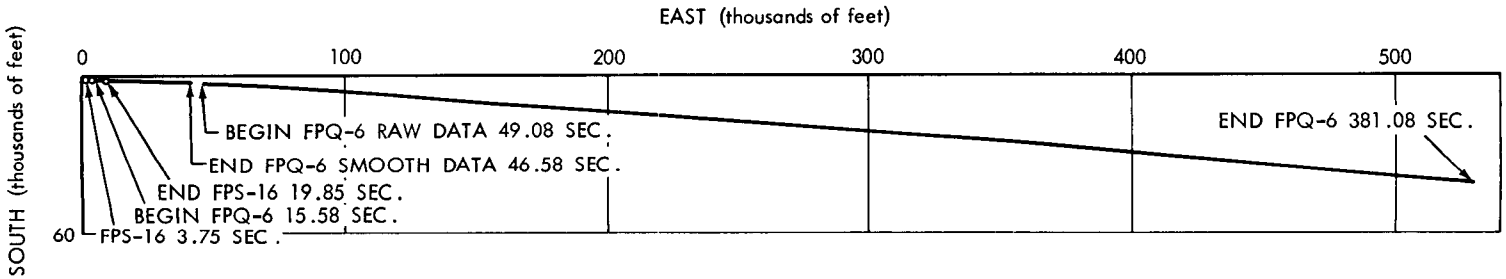

Figure 36. 14.61 UE Radar Plot, South Range vs East Range

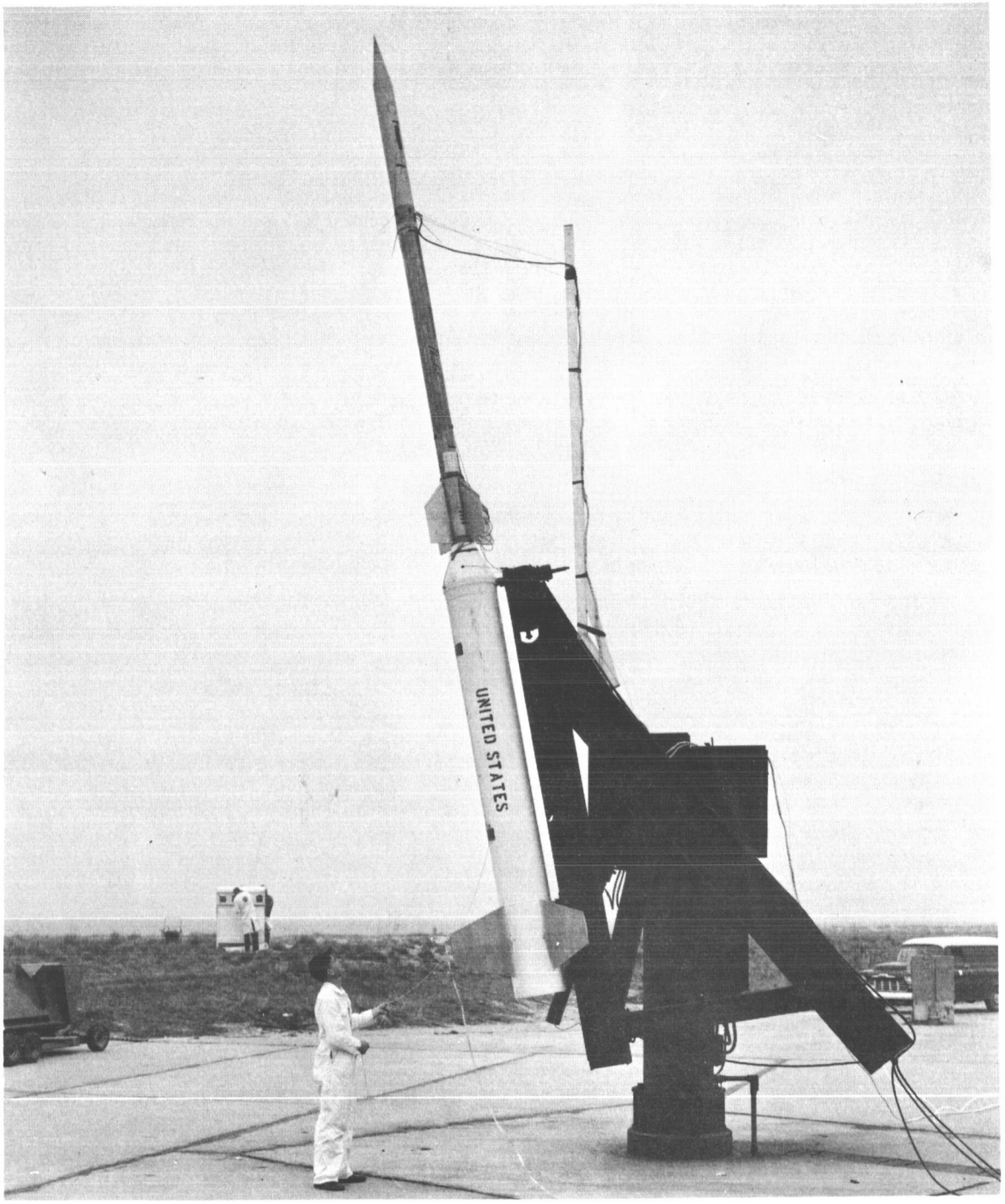

Figure 37. 14.62 UA Photograph

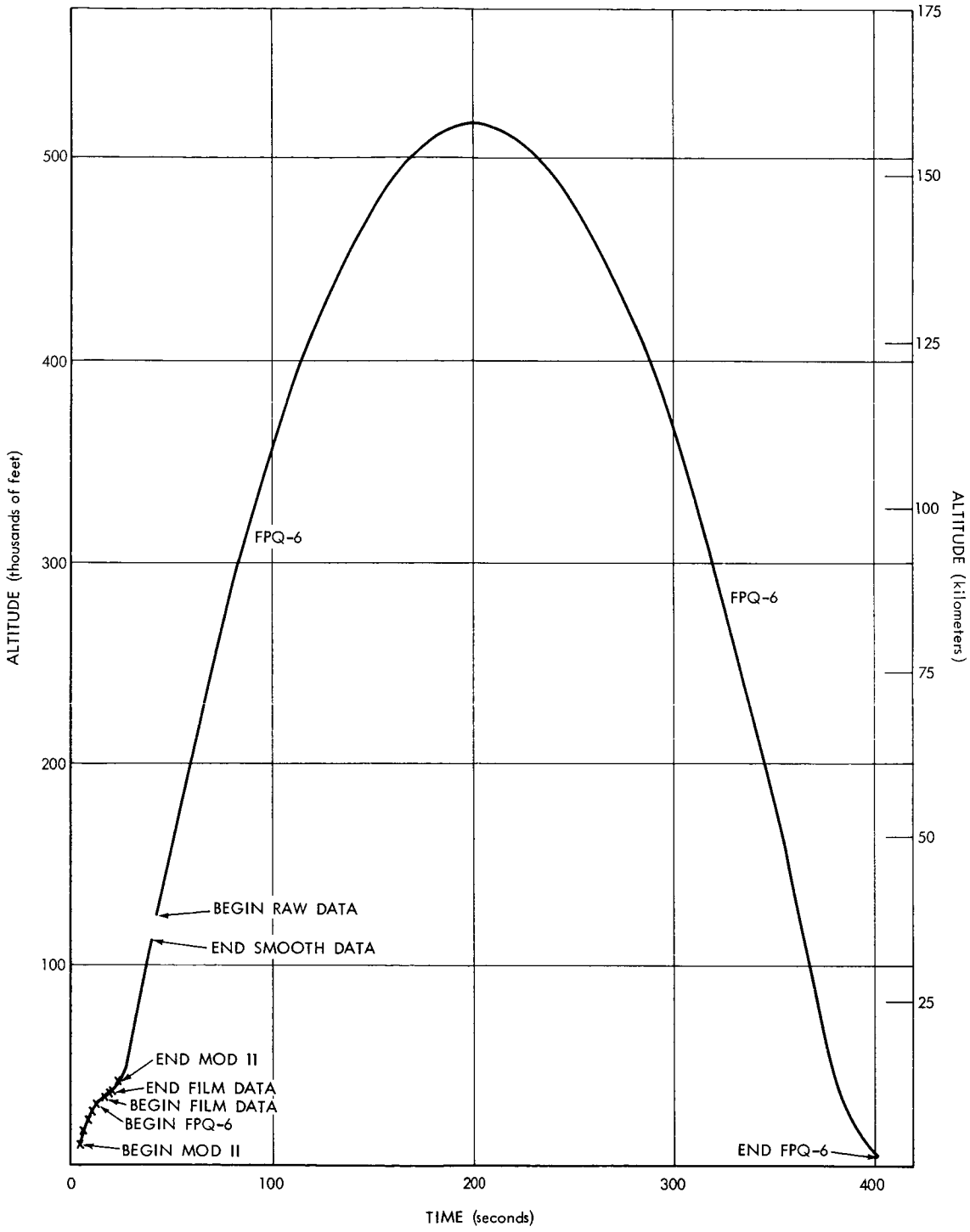

Figure 38. 14.62 UA Radar Plot, Altitude vs Time

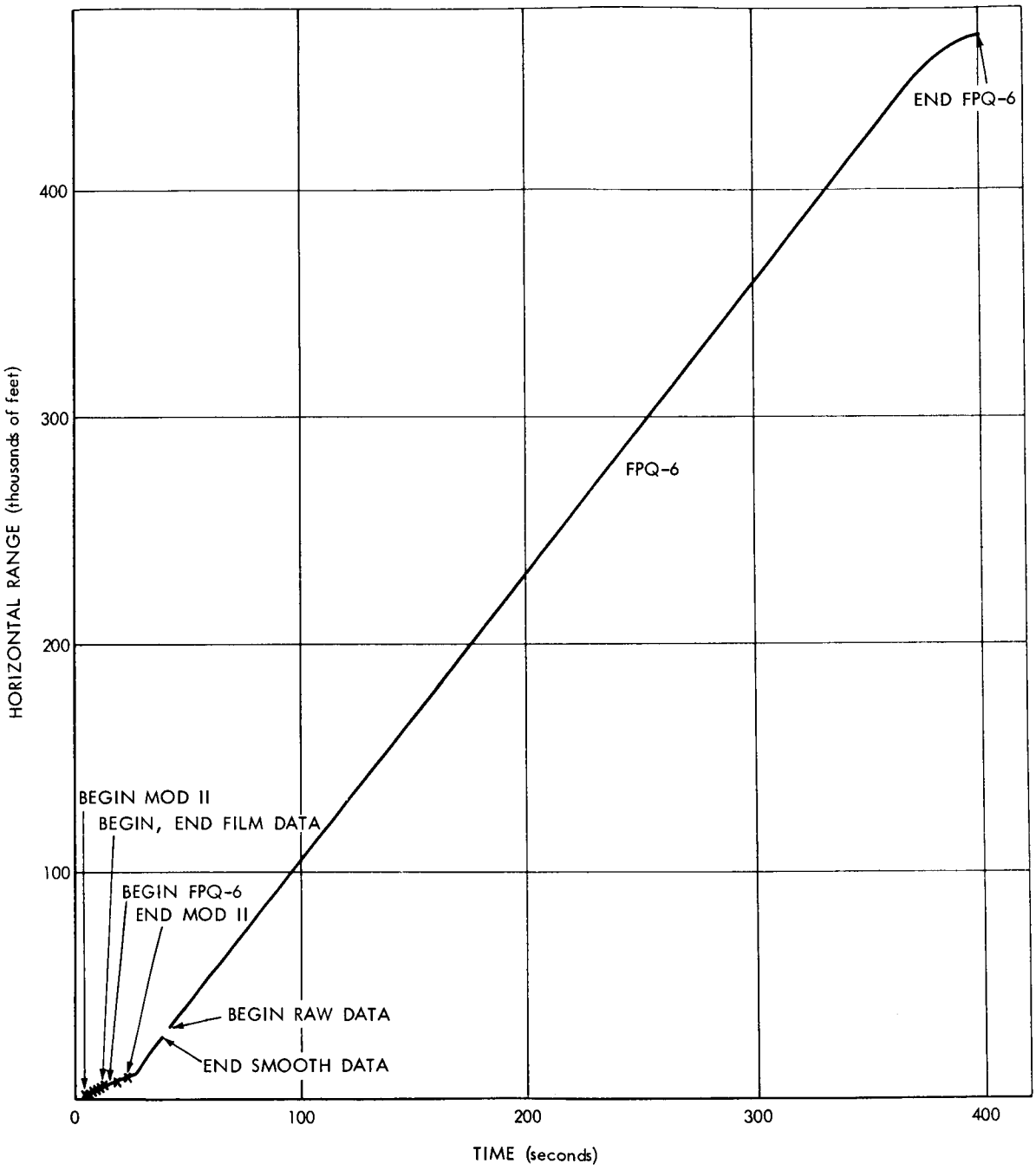

Figure 39. 14.62 UA Radar Plot, Horizontal Range vs Time

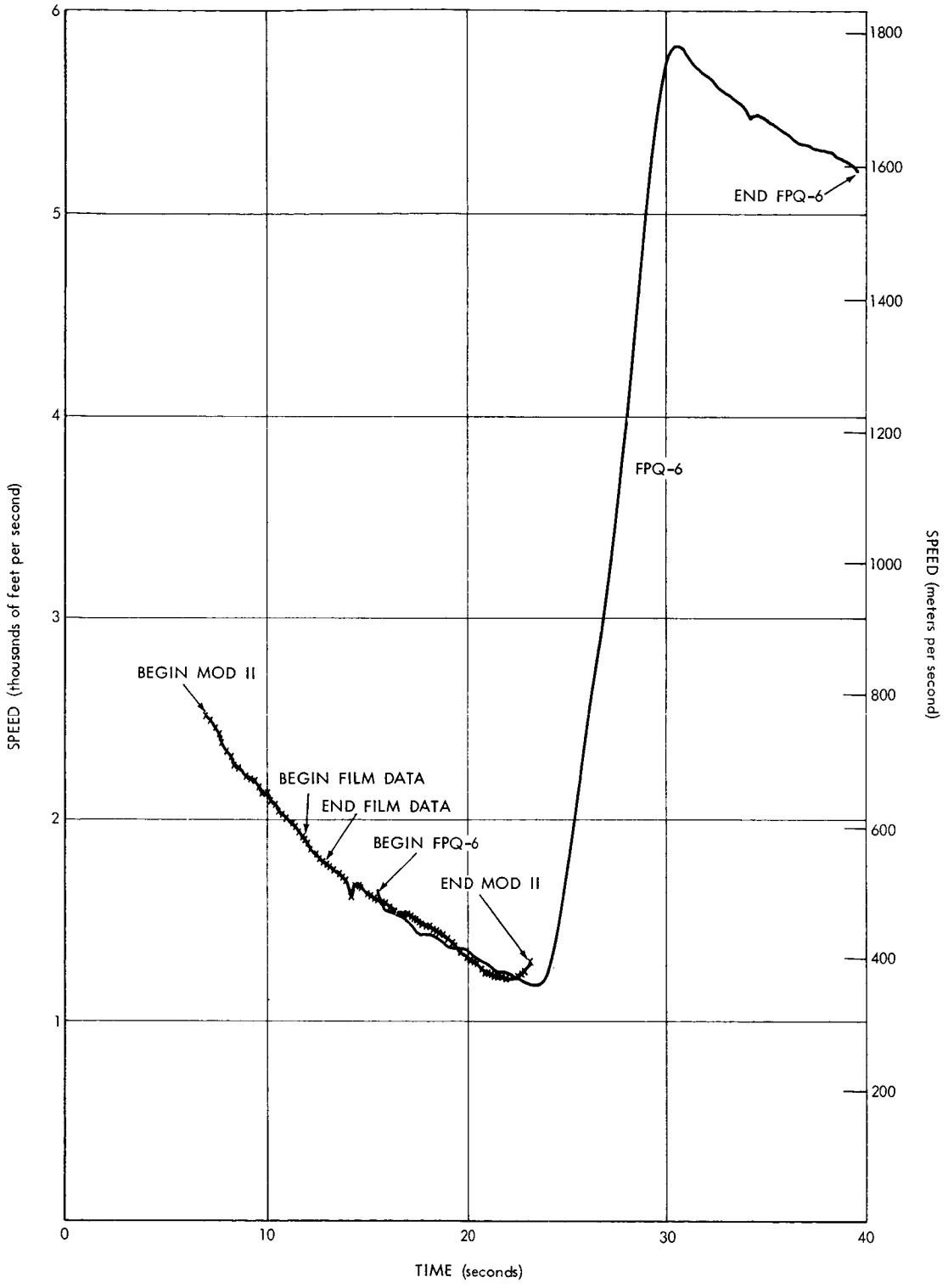

Figure 40. 14.62 UA Radar Plot, Speed vs Time

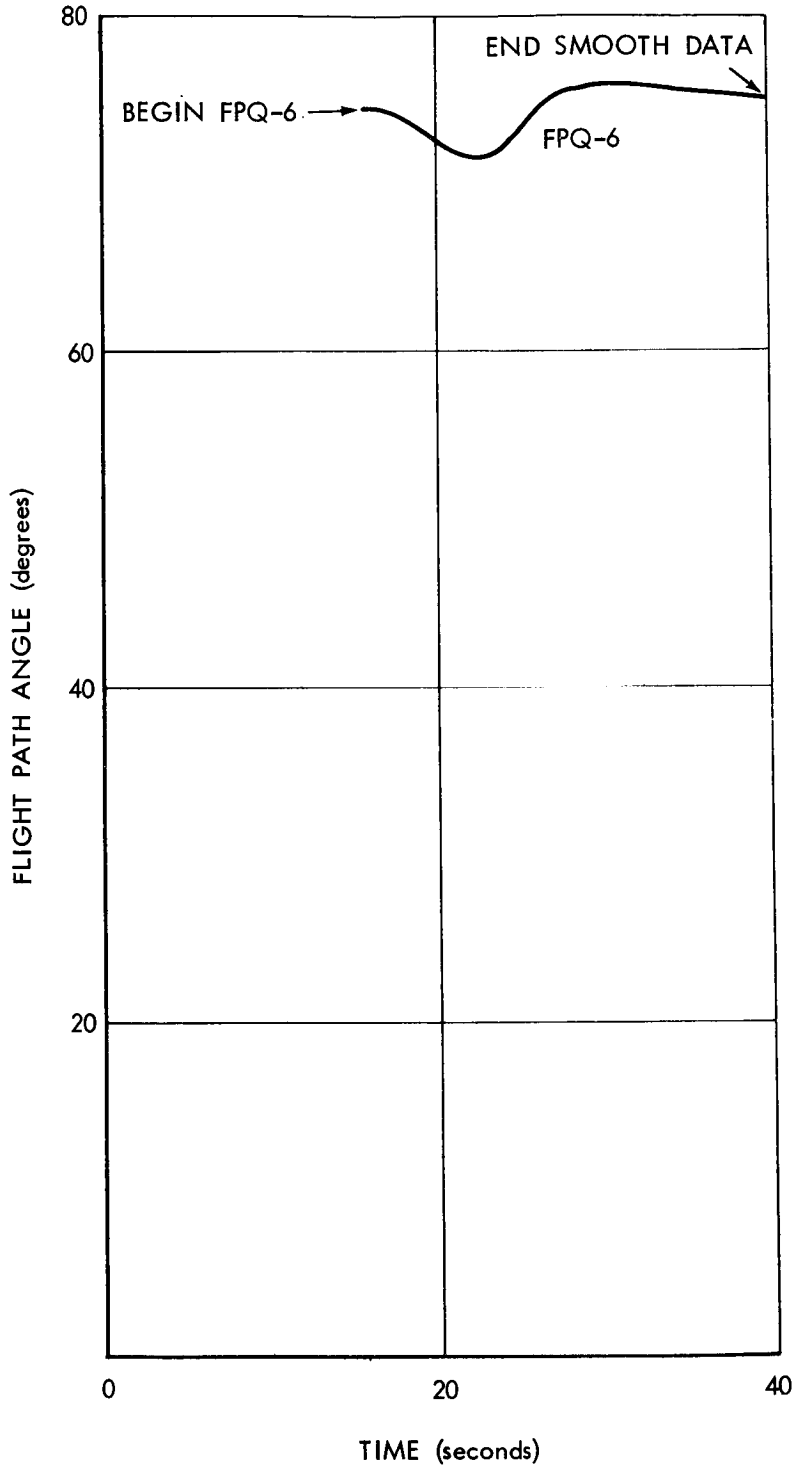

Figure 41. 14.62 UA Radar Plot, Flight Path Angle vs Time

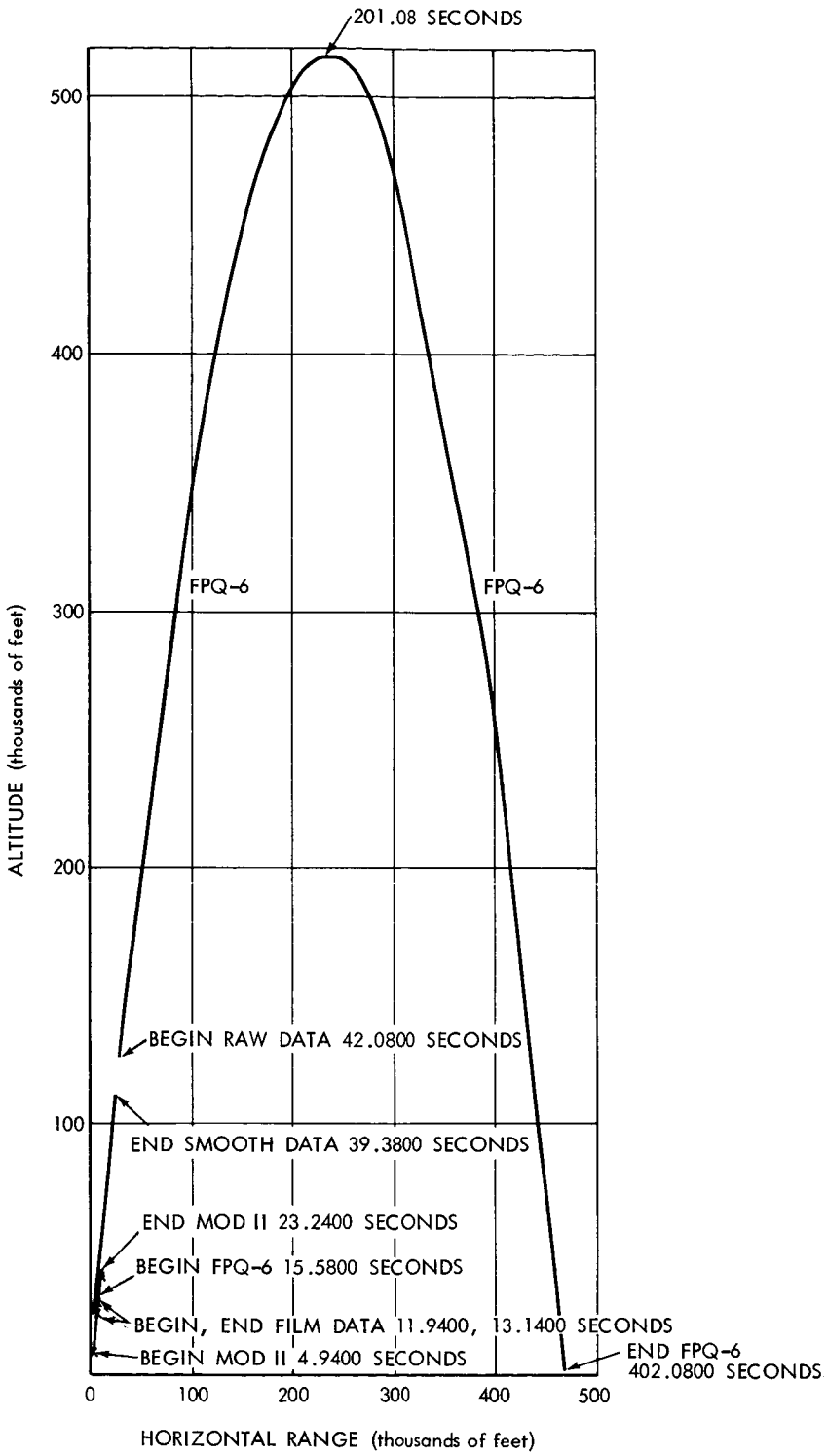

Figure 42. 14.62 UA Radar Plot, Altitude vs Horizontal Range

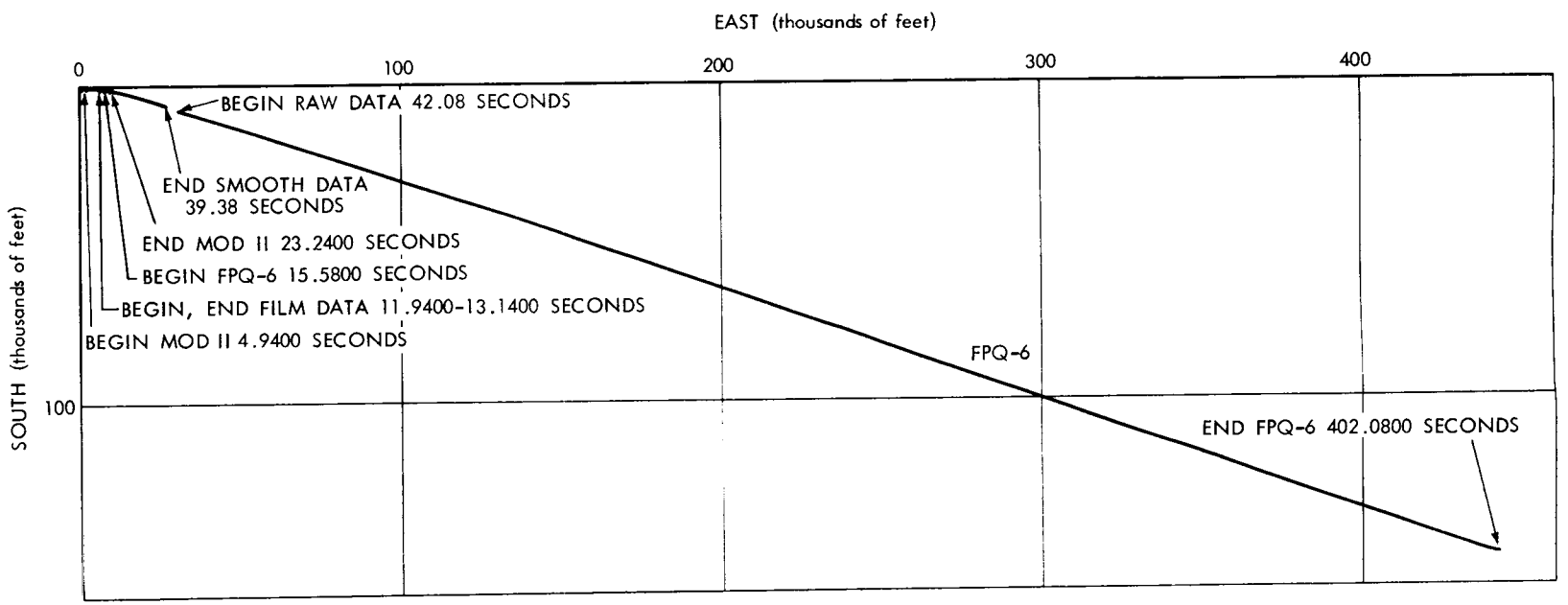

Figure 43. 14.62 UA Radar Plot, South Range vs East Range

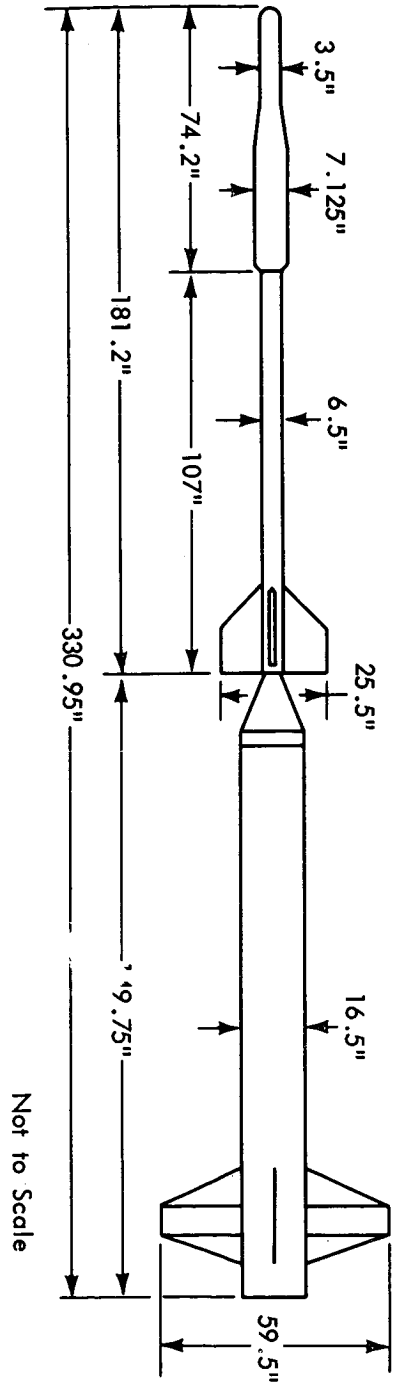

Figure 44. 14.64 UA Sketch

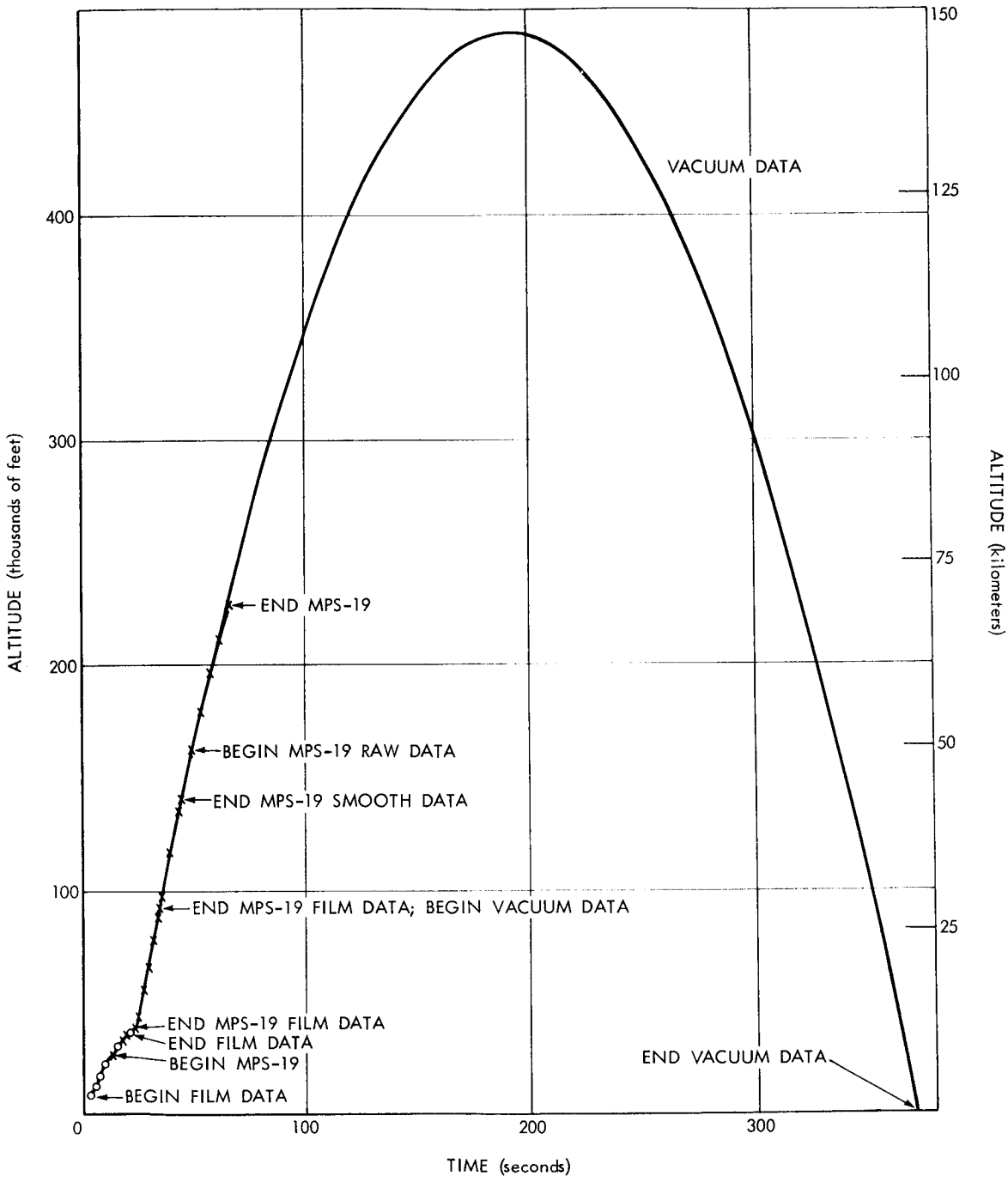

Figure 45. 14.64 UA Radar Plot, Altitude vs Time

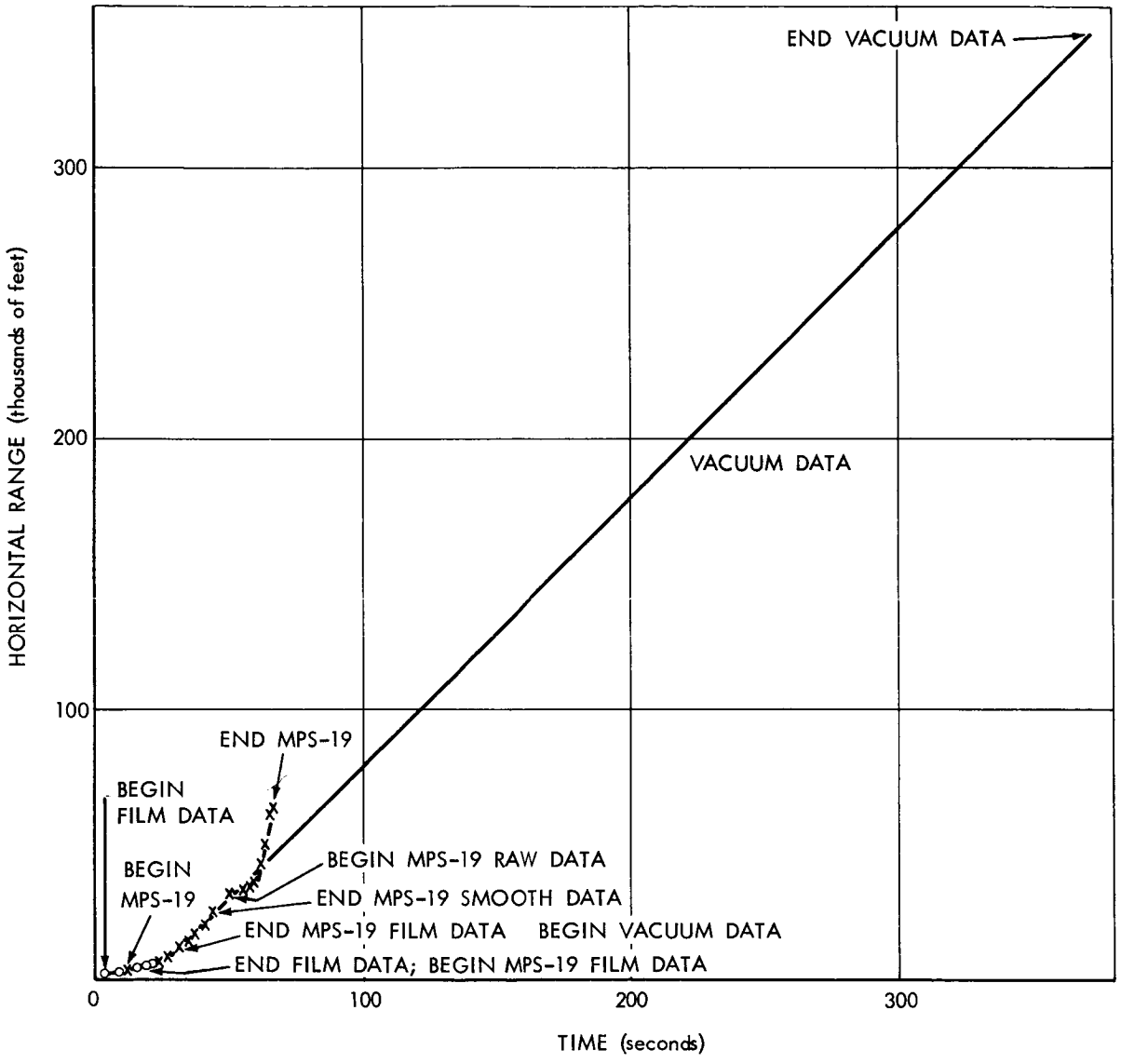

Figure 46. 14.64 UA Radar Plot, Horizontal Range vs Time

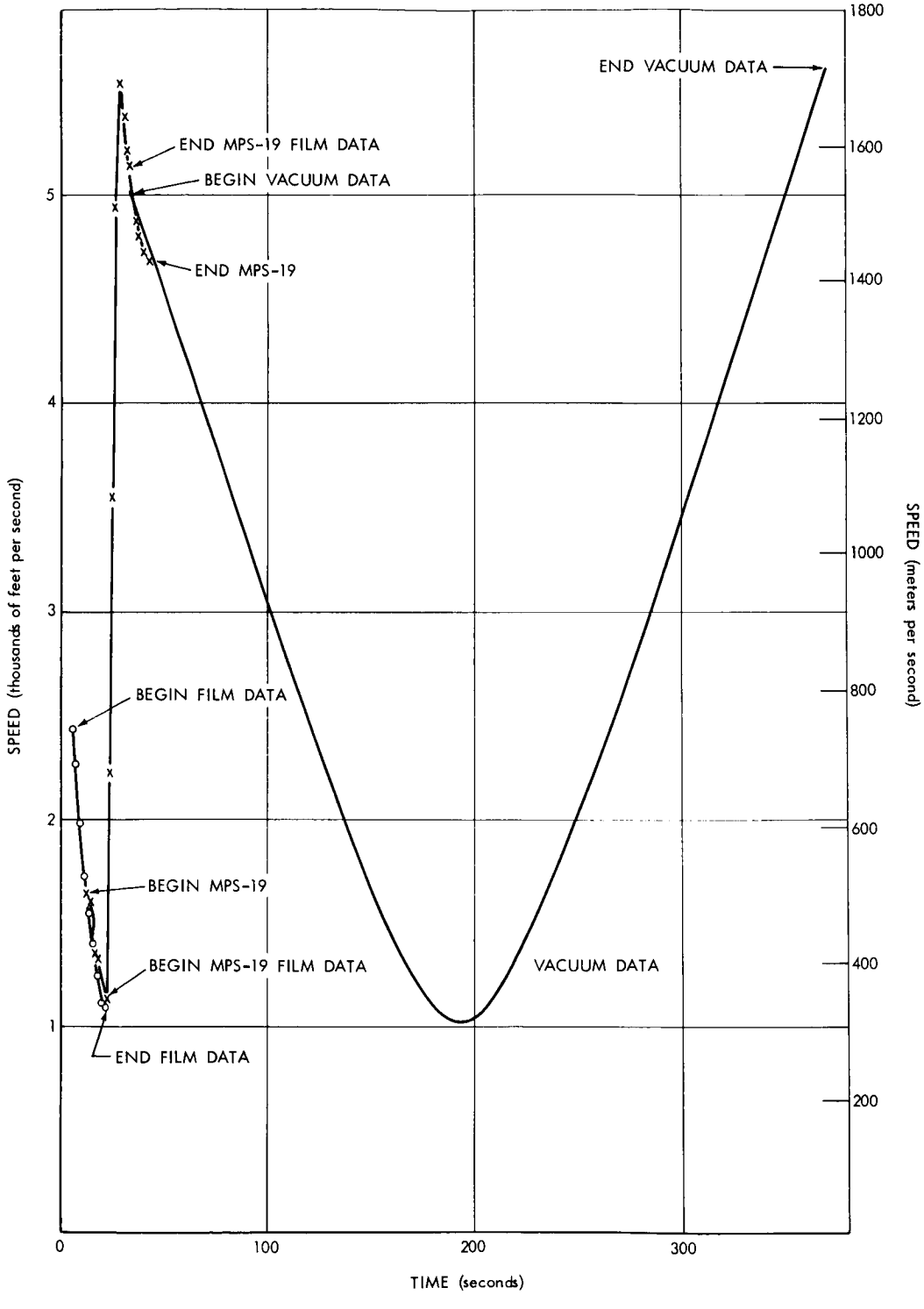

Figure 47. 14.64 UA Radar Plot, Speed vs Time

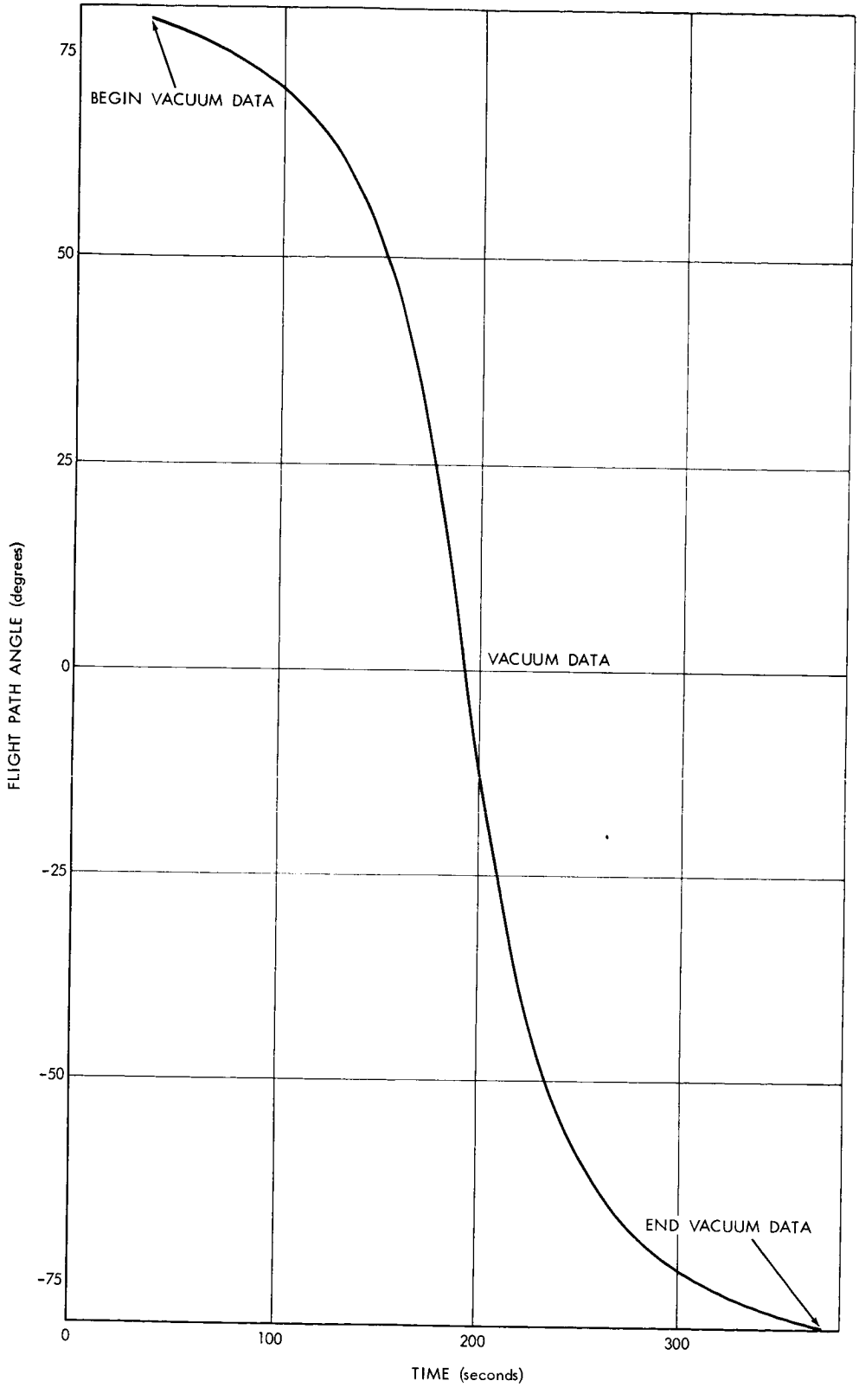

Figure 48. 14.64 UA Radar Plot, Flight Path Angle vs Time

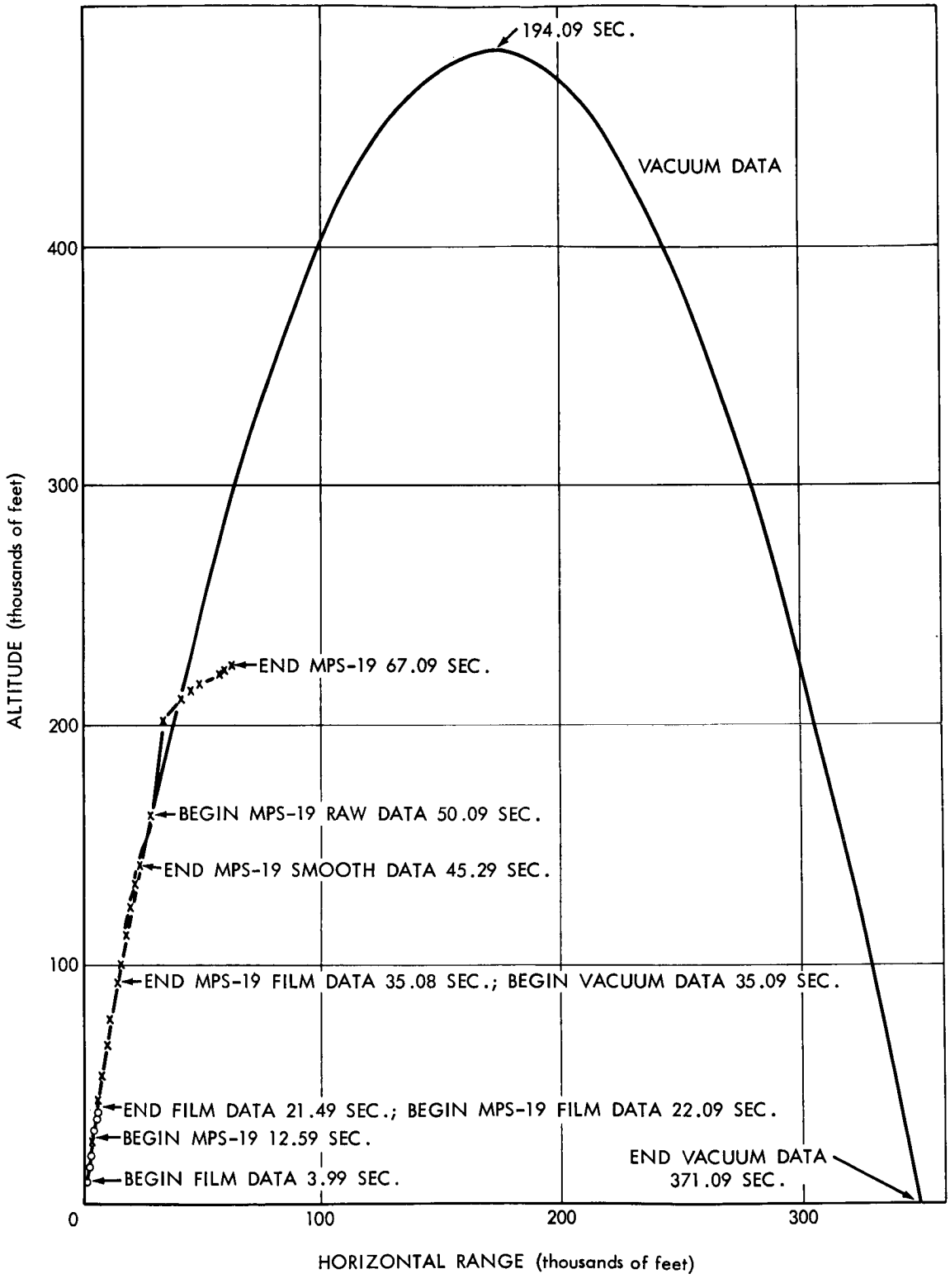

Figure 49. 14.64 UA Radar Plot, Altitude vs Horizontal Range

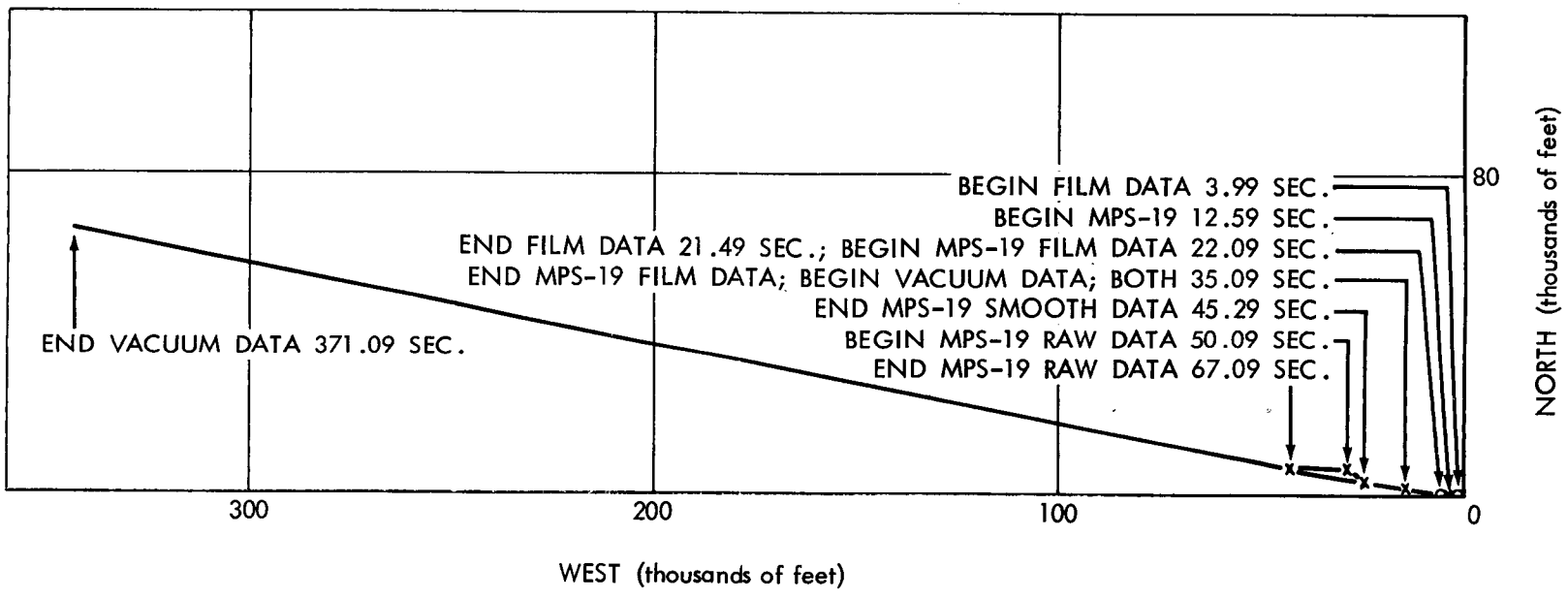

Figure 50. 14.64 UA Radar Plot, North Range vs West Range

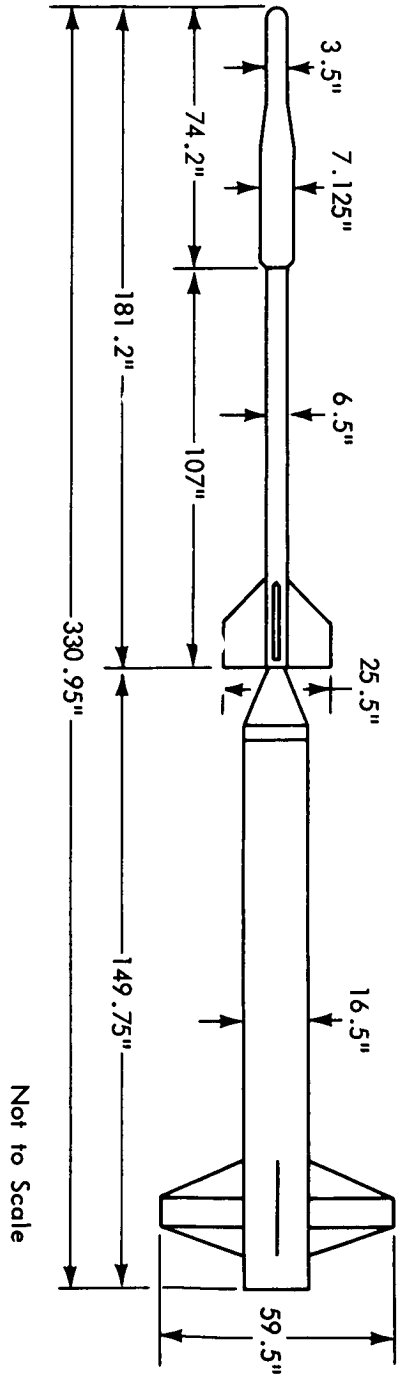

Figure 51. 14.65 UA Sketch

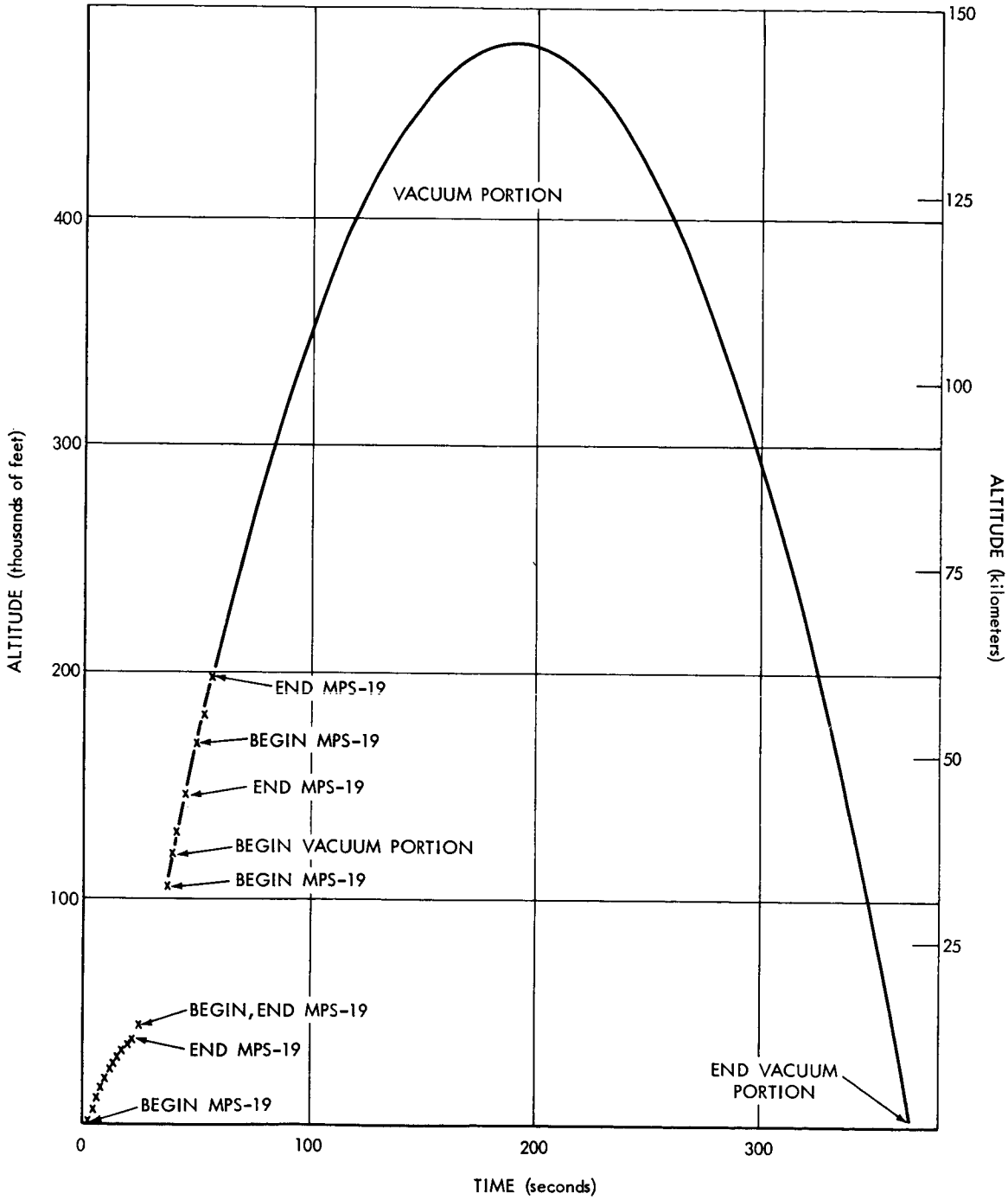

Figure 52. 14.65 UA Radar Plot, Altitude vs Time

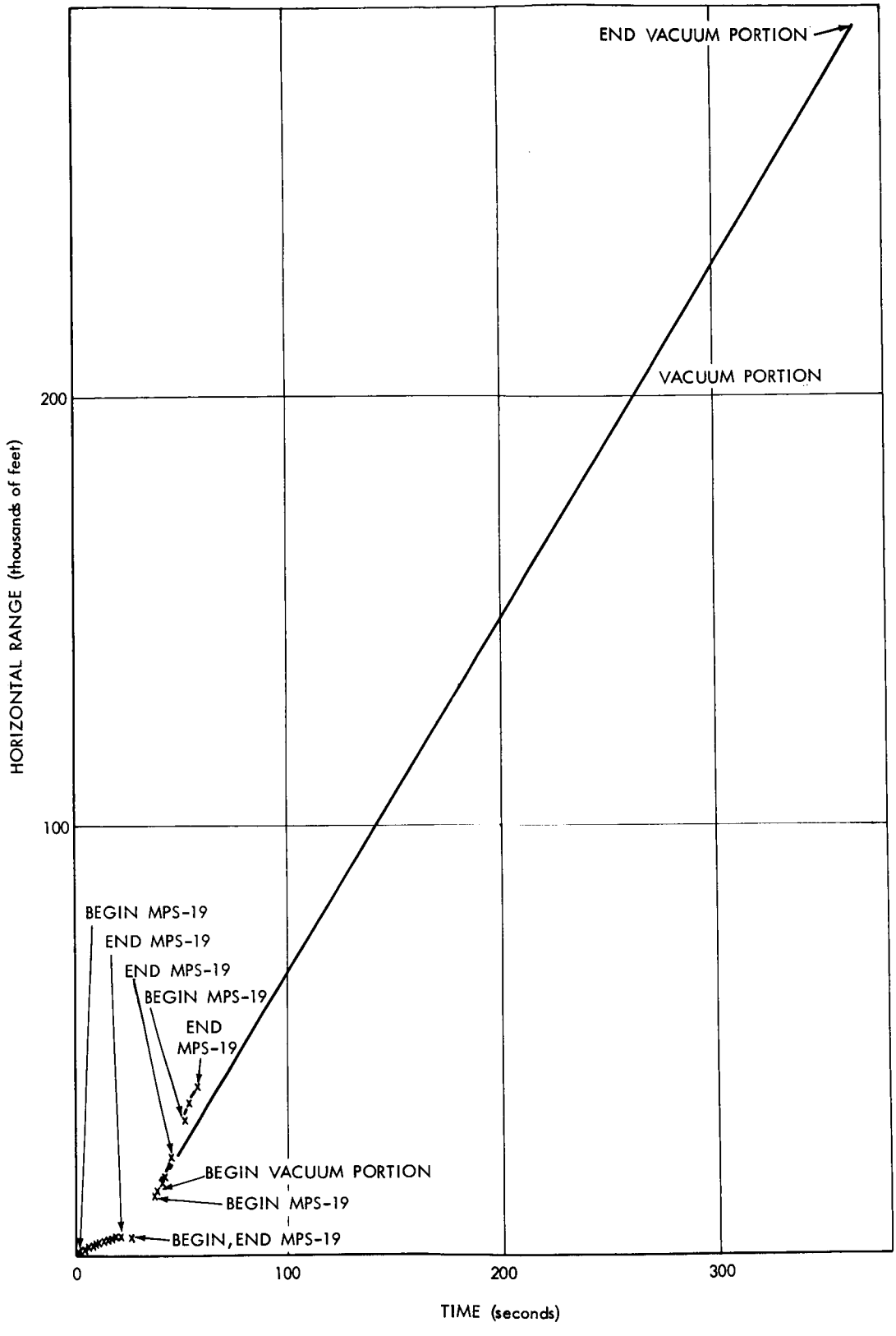

Figure 53. 14.65 UA Radar Plot, Horizontal Range vs Time

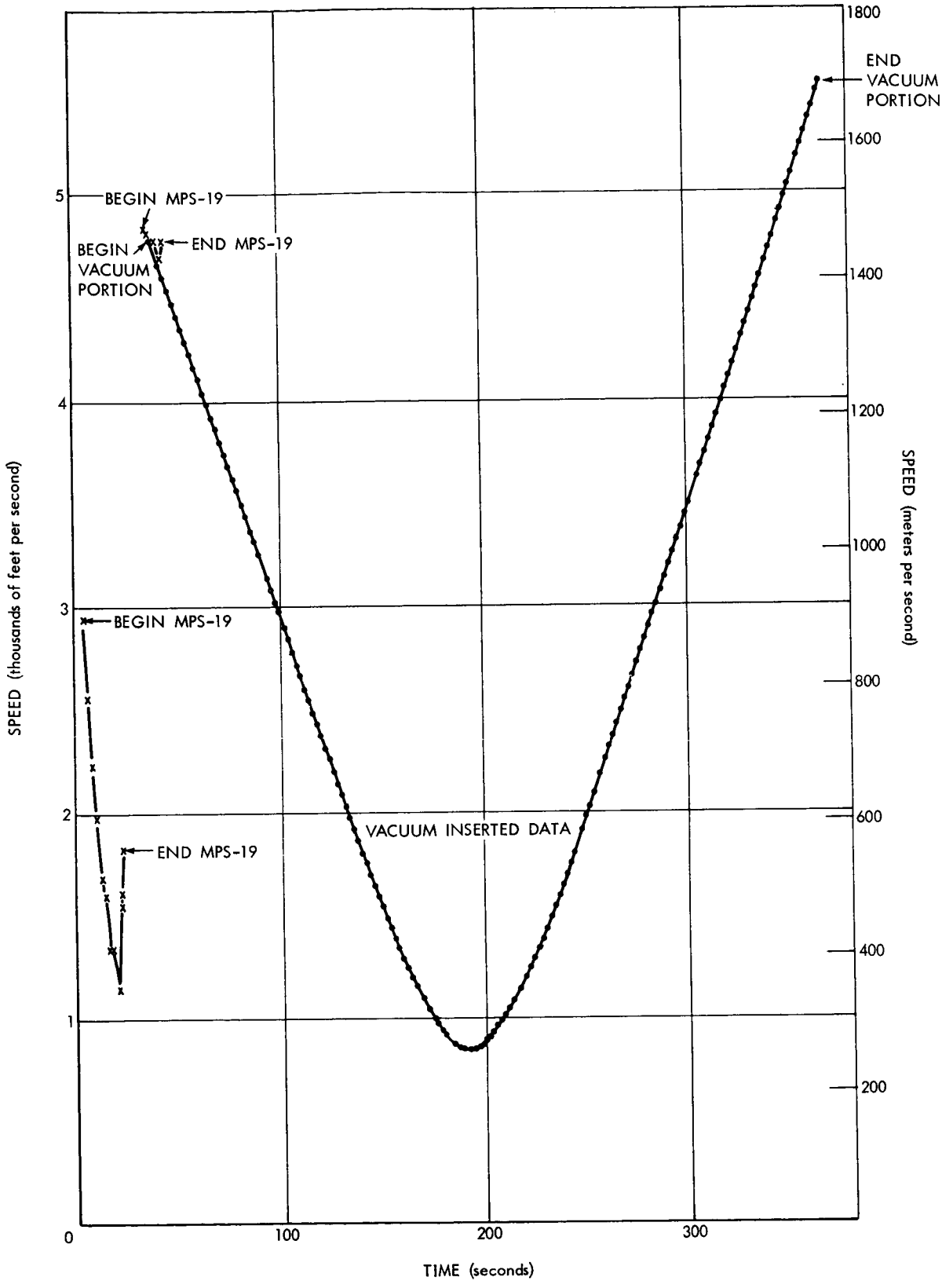

Figure 54. 14.65 UA Radar Plot, Speed vs Time

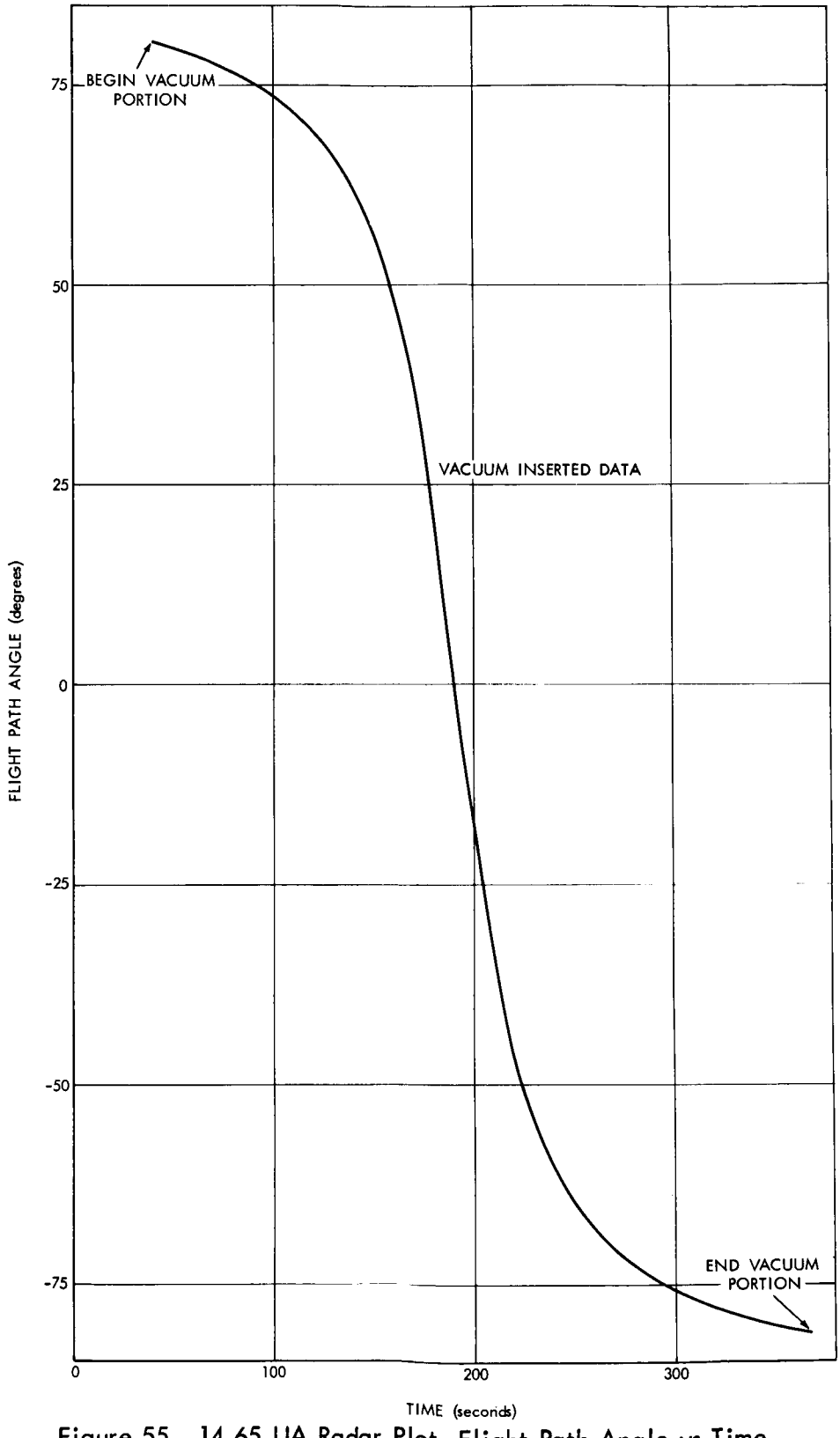

Figure 55. 14.65 UA Radar Plot, Flight Path Angle vs Time

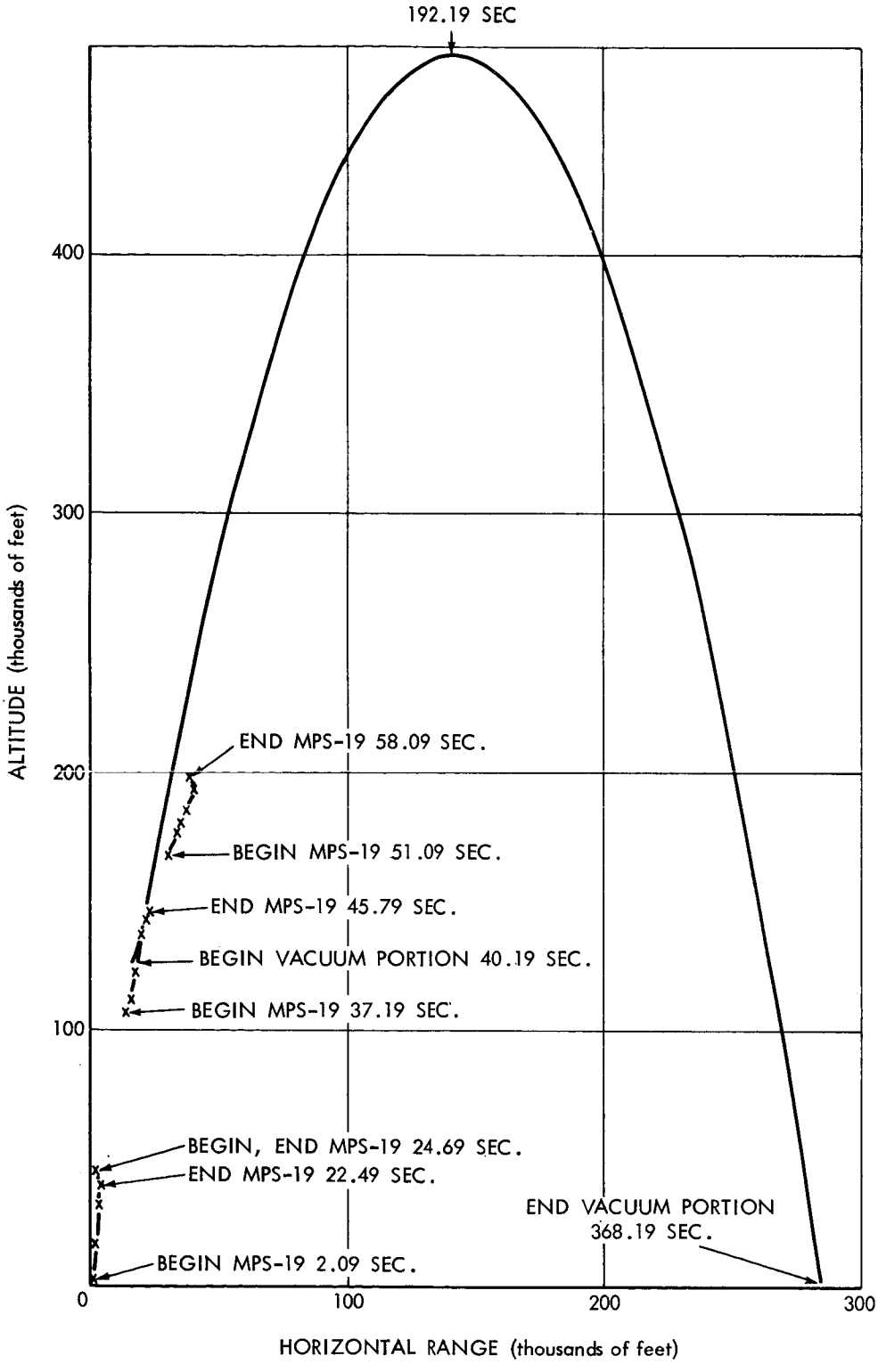

Figure 56. 14.65 UA Radar Plot, Altitude vs Horizontal Range

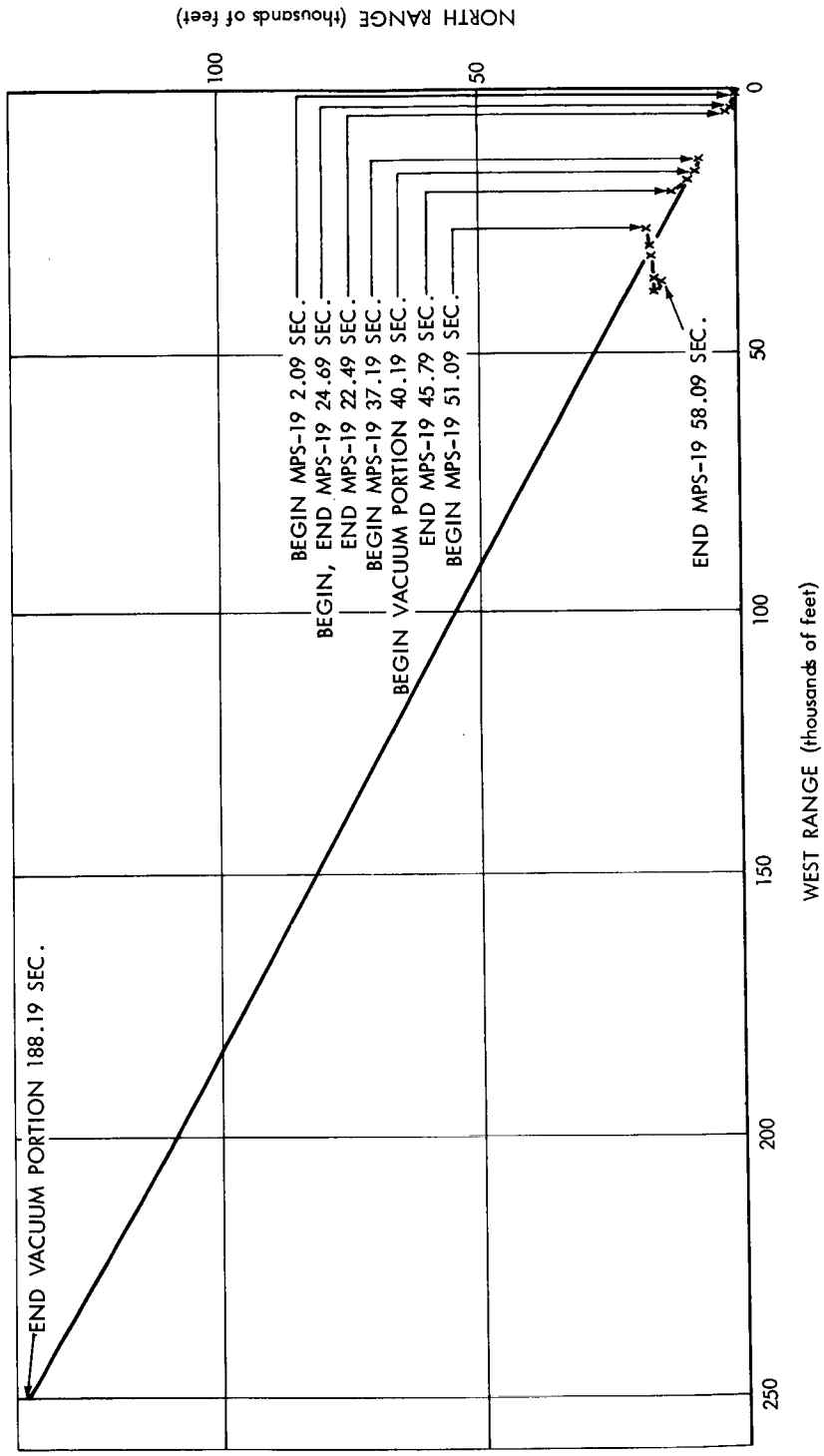

Figure 57. 14.65 UA Radar Plot, North Range vs West Range

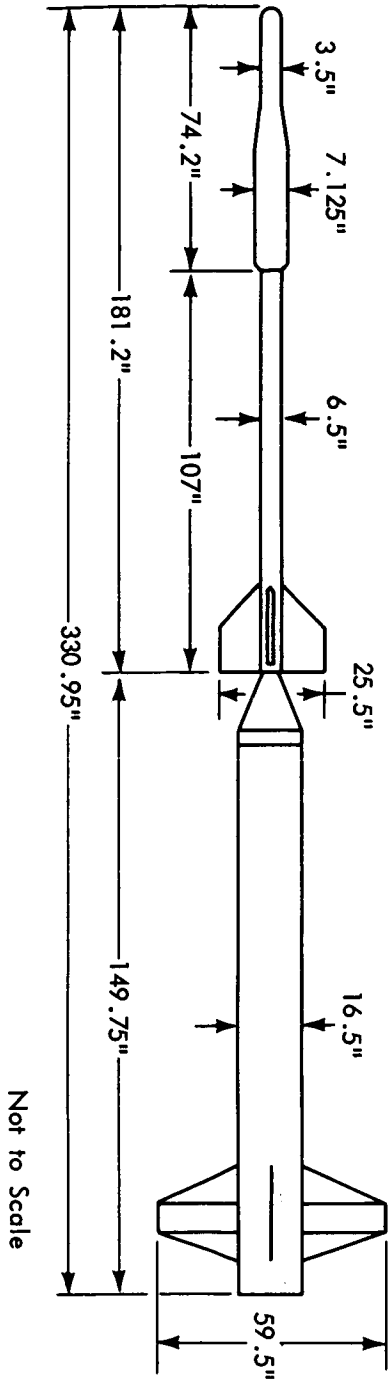

Figure 58. 14.66 UA Sketch

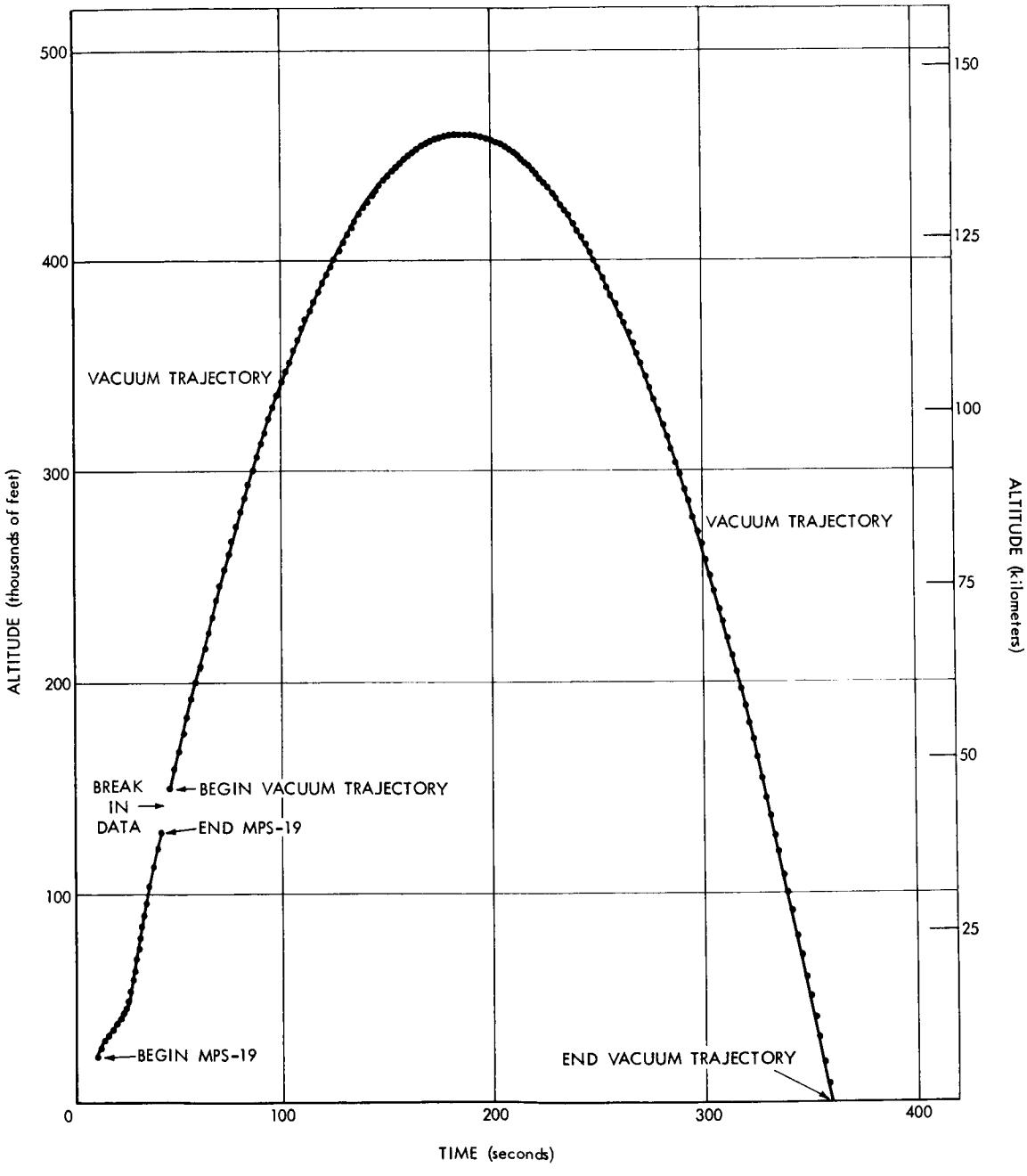

Figure 59. 14.66 UA Radar Plot, Altitude vs Time

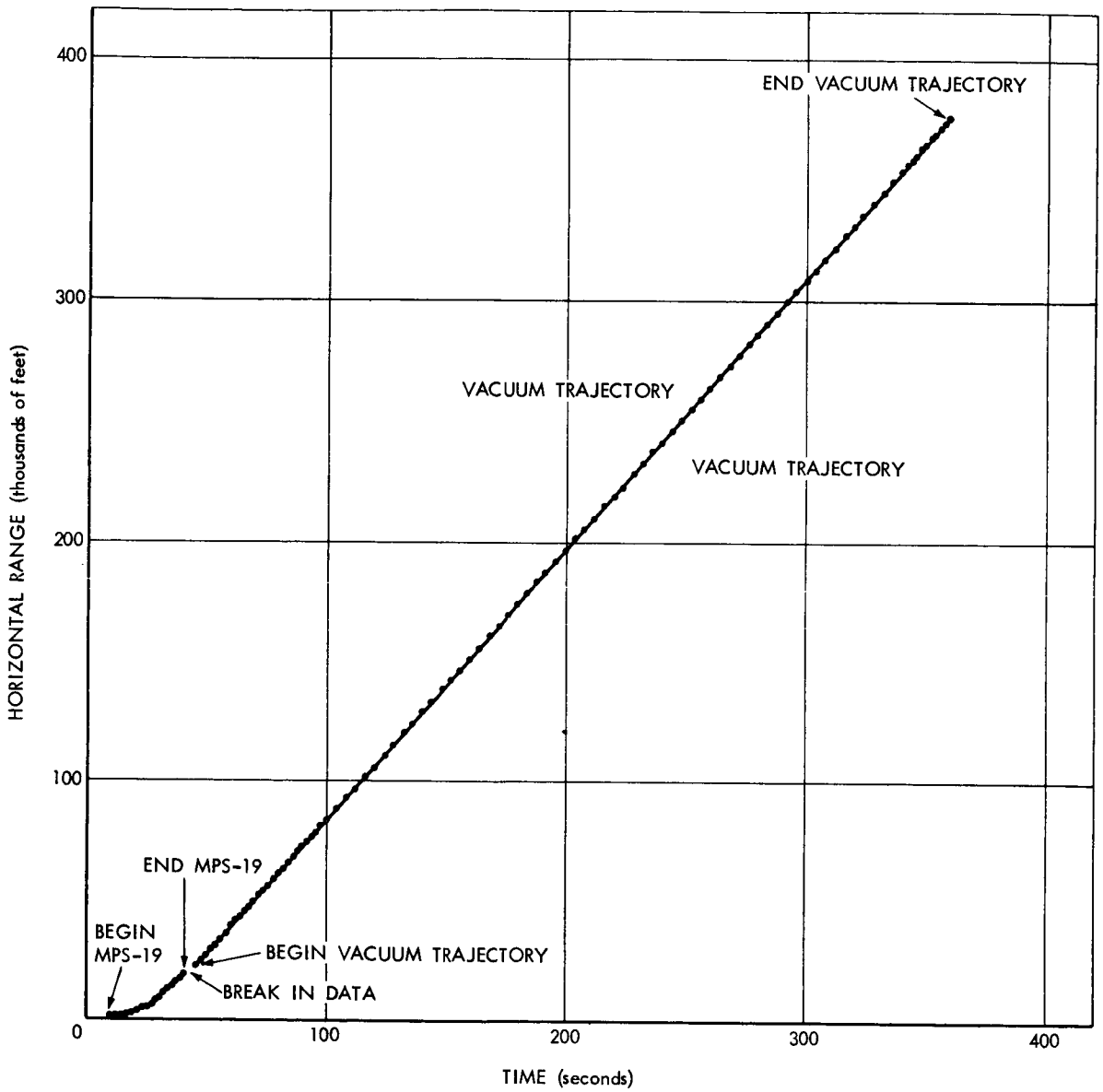

Figure 60. 14.66 UA Radar Plot, Horizontal Range vs Time

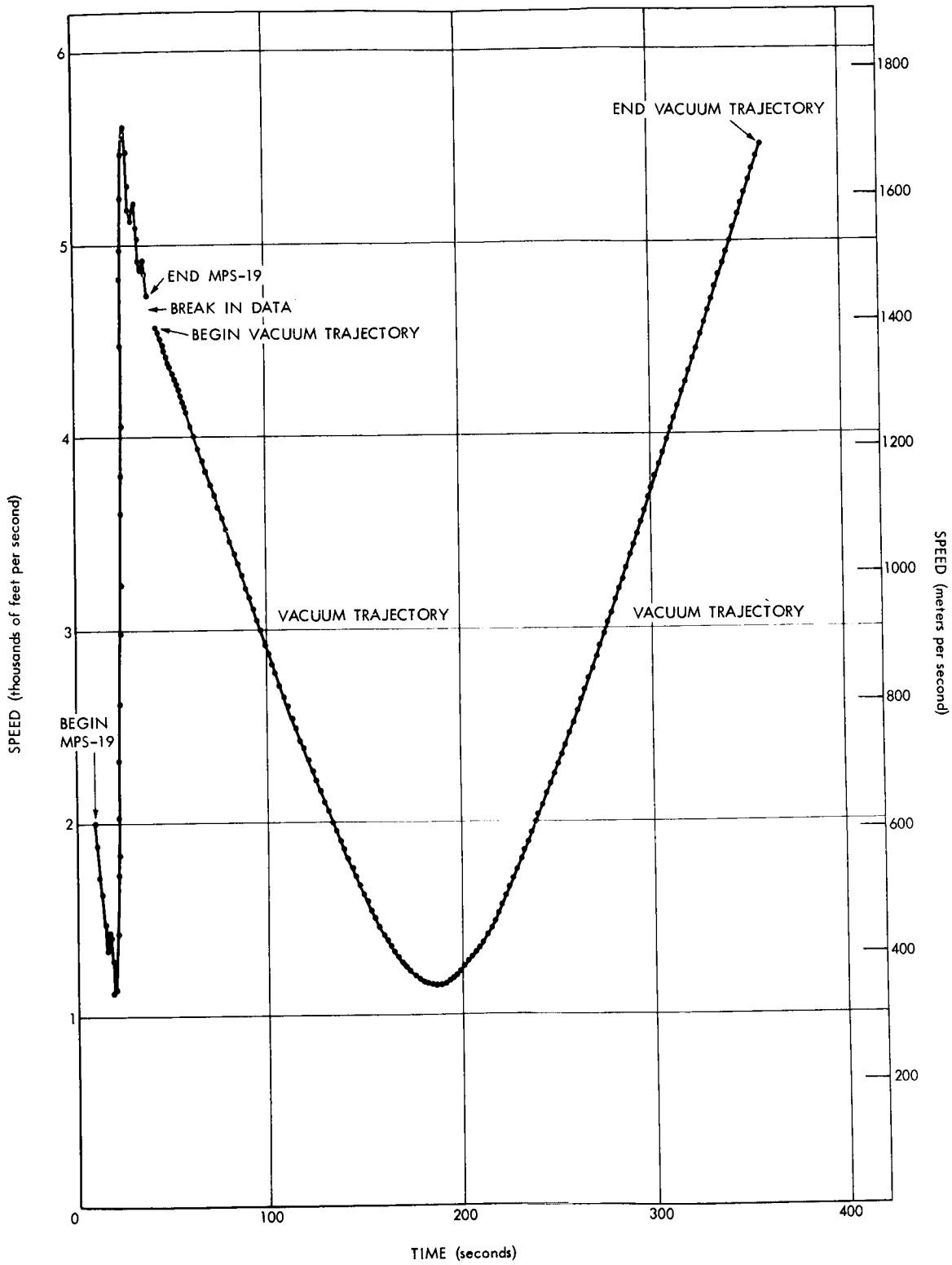

Figure 61. 14.66 UA Radar Plot, Speed vs Time

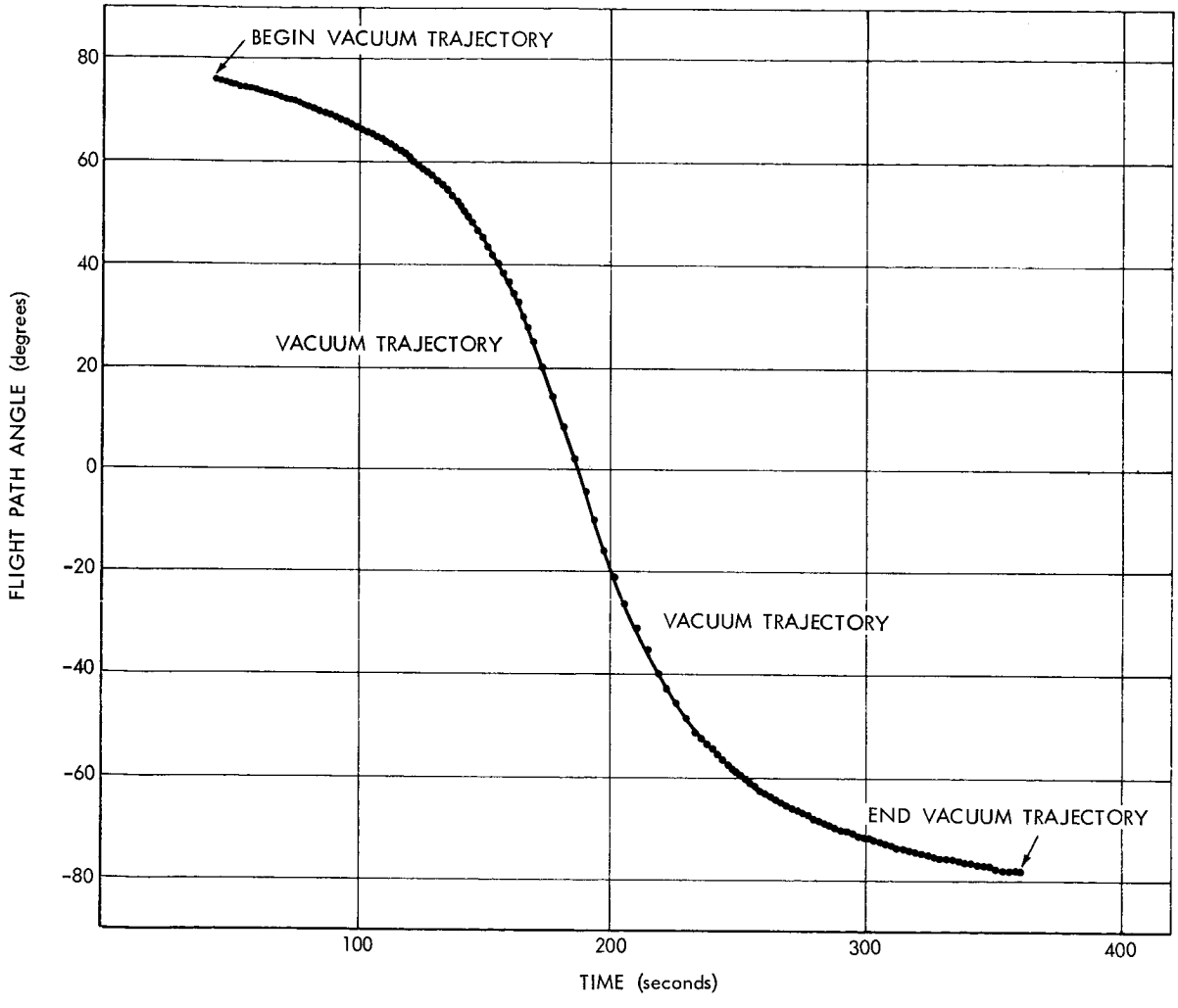

Figure 62. 14.66 UA Radar Plot, Flight Path Angle vs Time

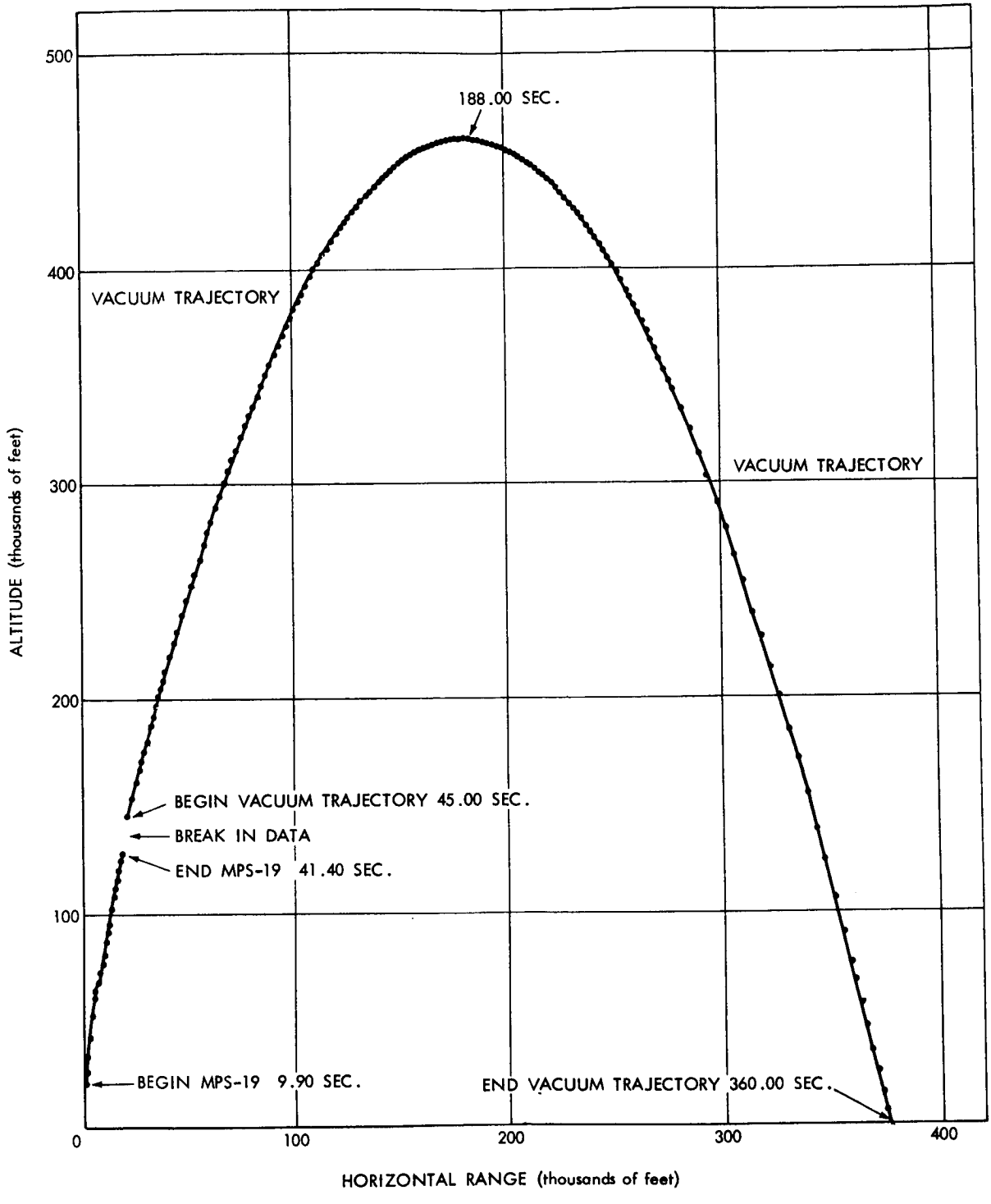

Figure 63. 14.66 UA Radar Plot, Altitude vs Horizontal Range

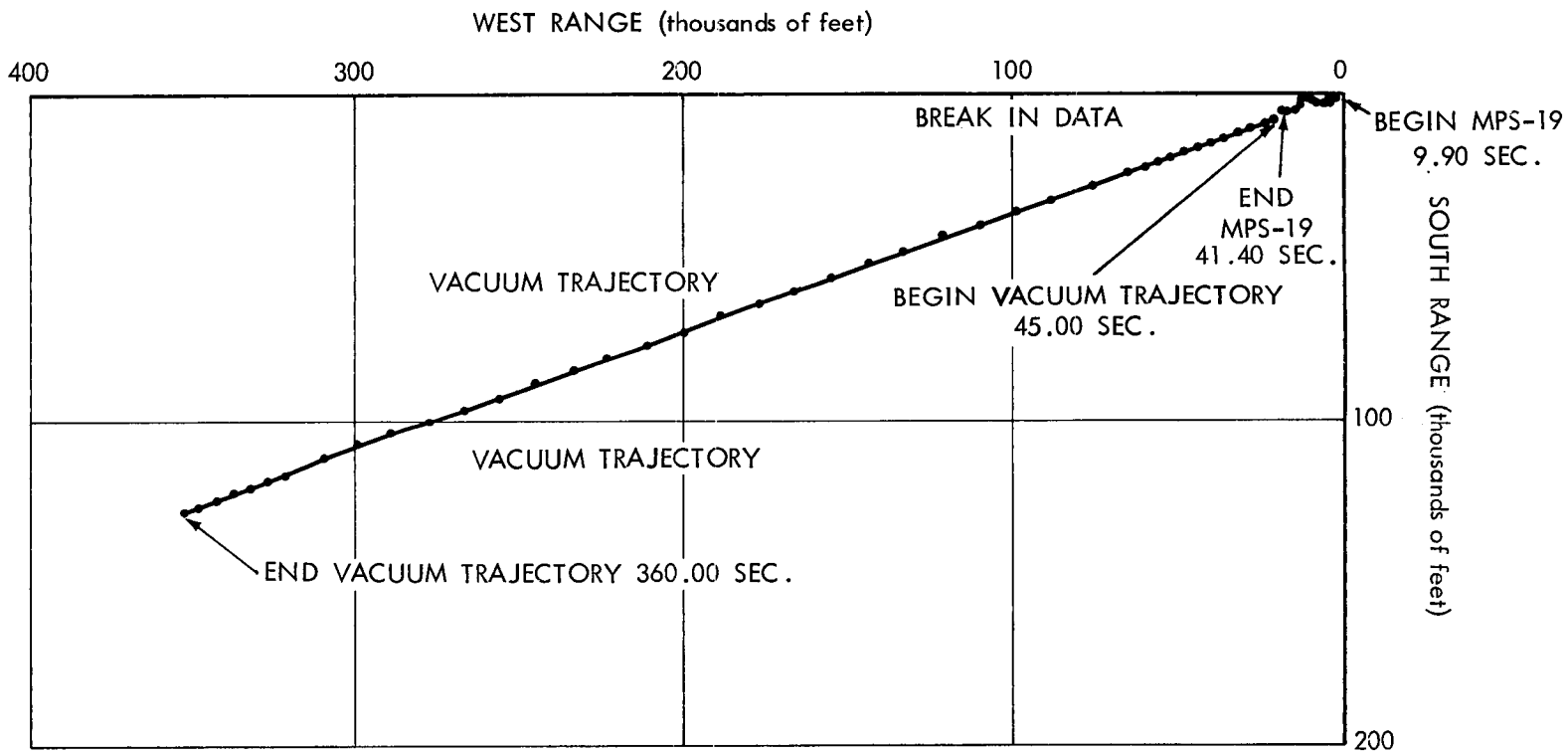

Figure 64. 14.66 UA Radar Plot, South Range vs West Range

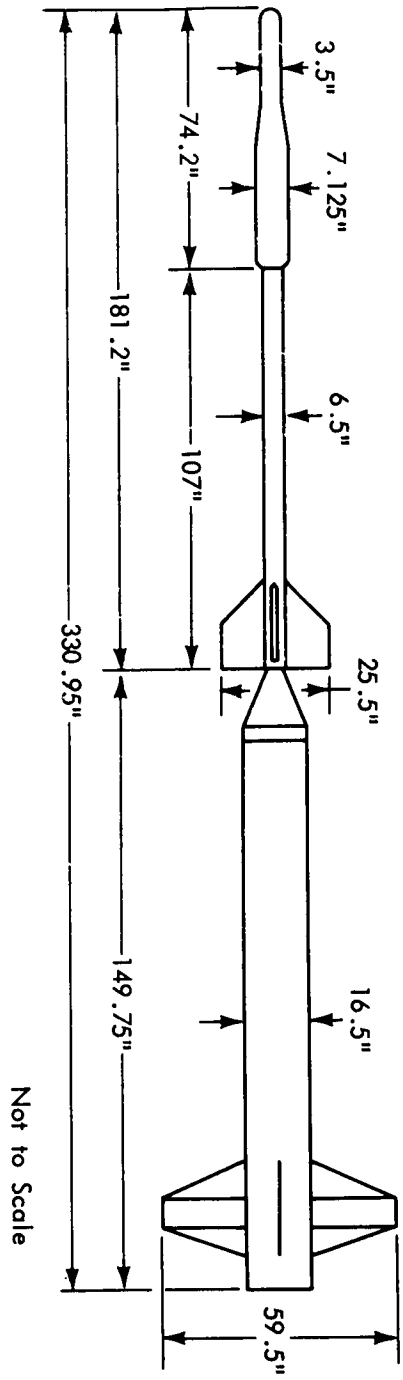

Figure 65. 14.67 Sketch

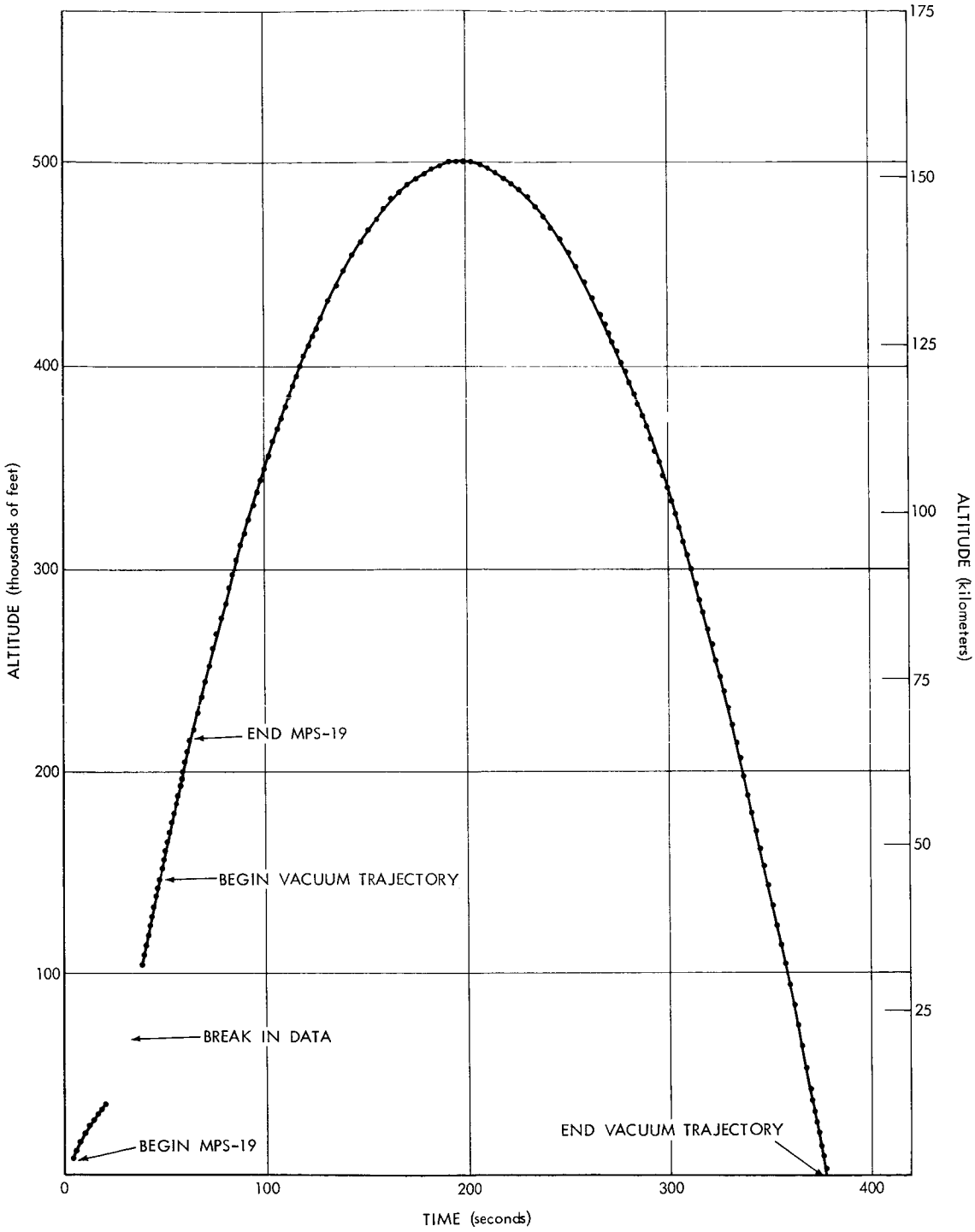

Figure 66. 14.67 UA Radar Plot, Altitude vs Time

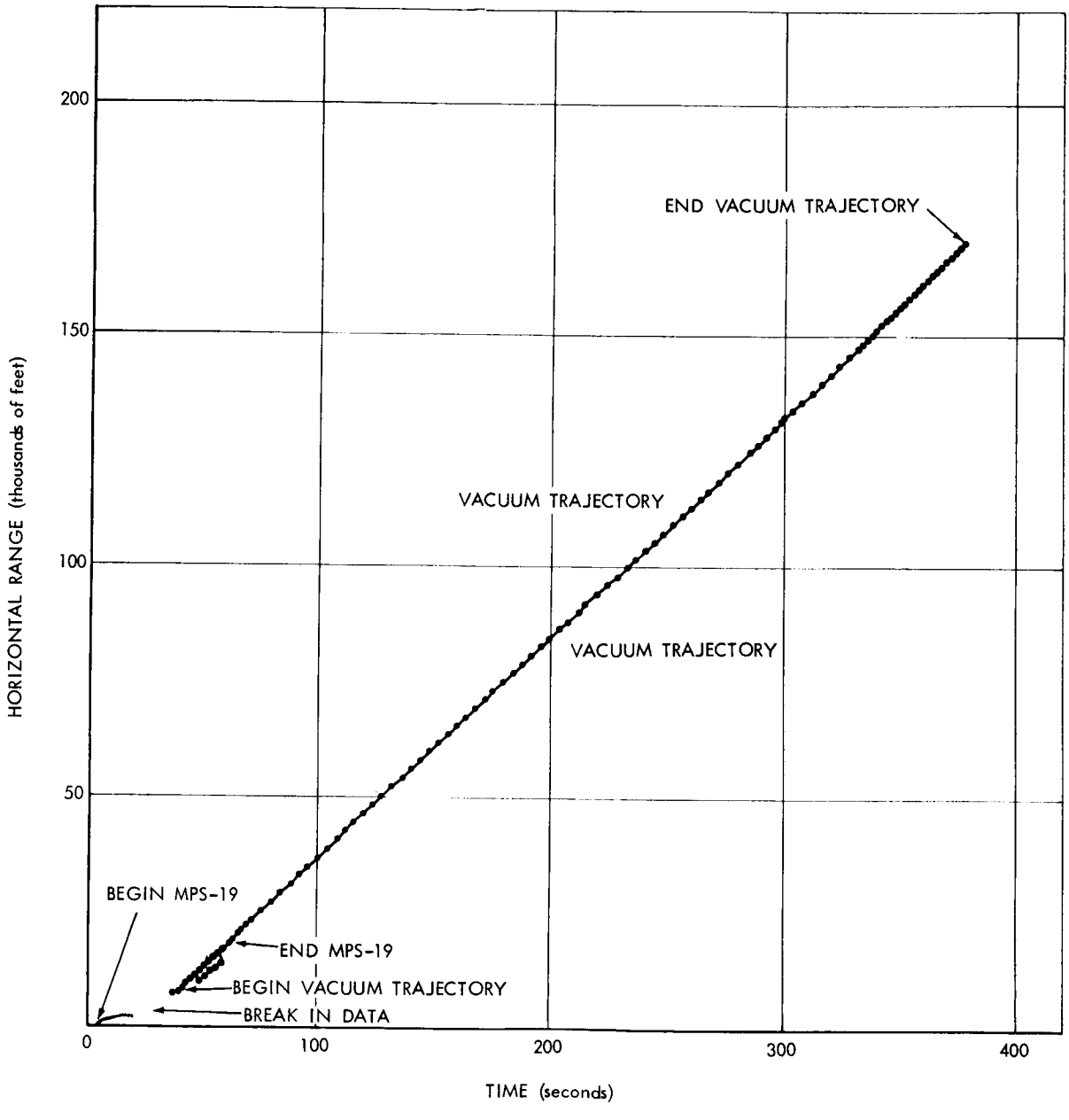

Figure 67. 14.67 UA Radar Plot, Horizontal Range vs Time

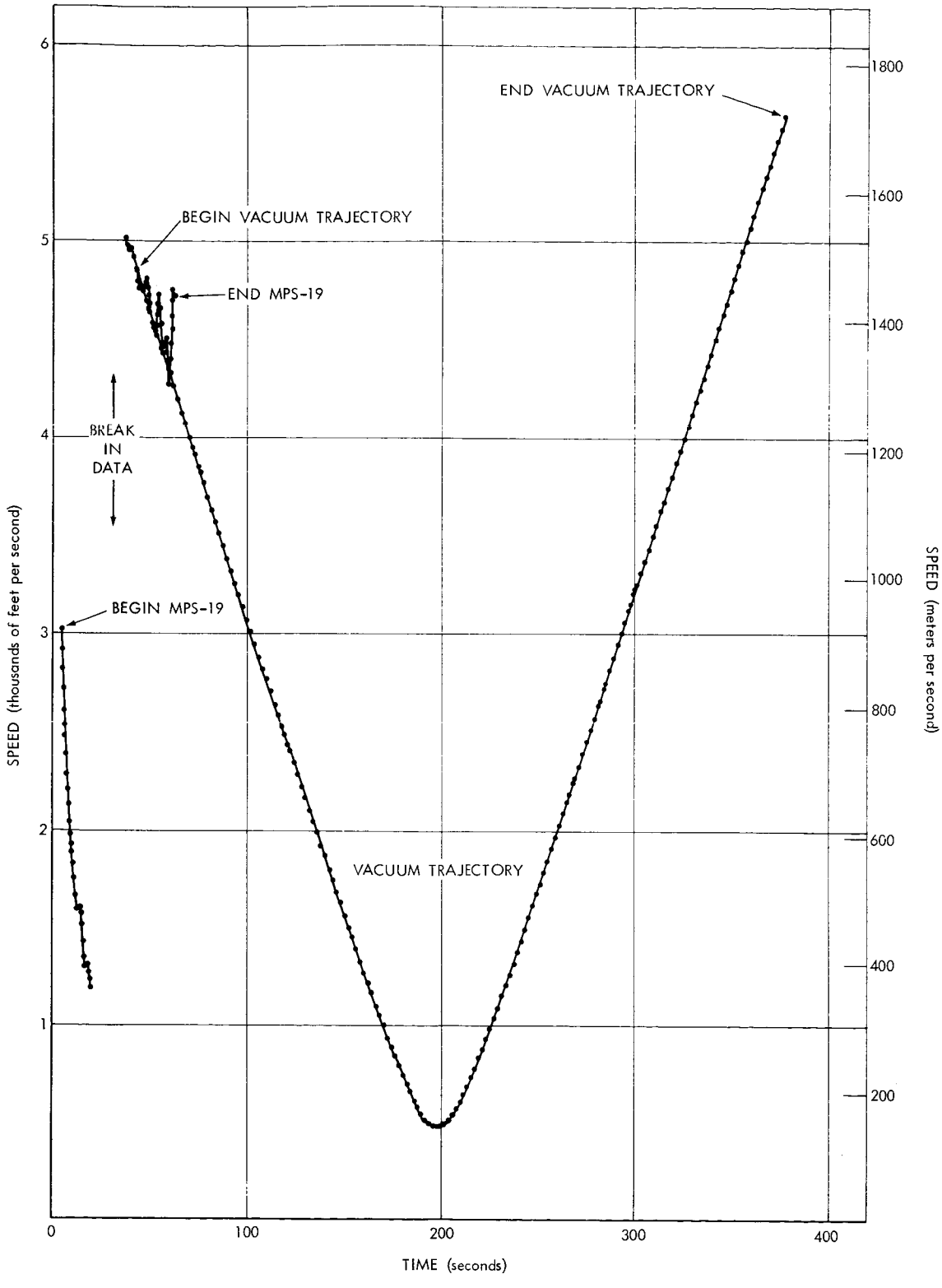

Figure 68. 14.67 UA Radar Plot, Speed vs Time

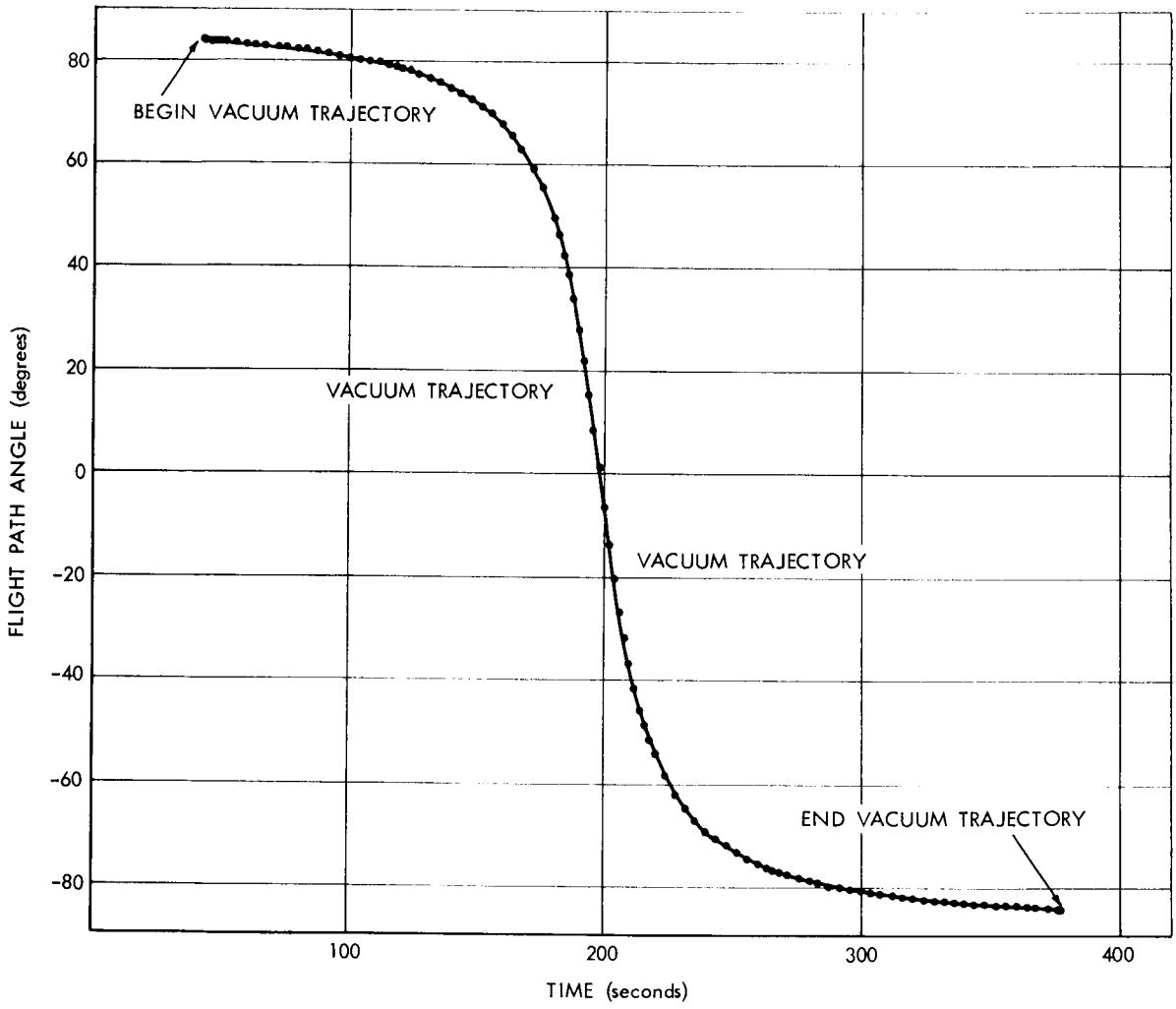

Figure 69. 14.67 UA Radar Plot, Flight Path Angle vs Time

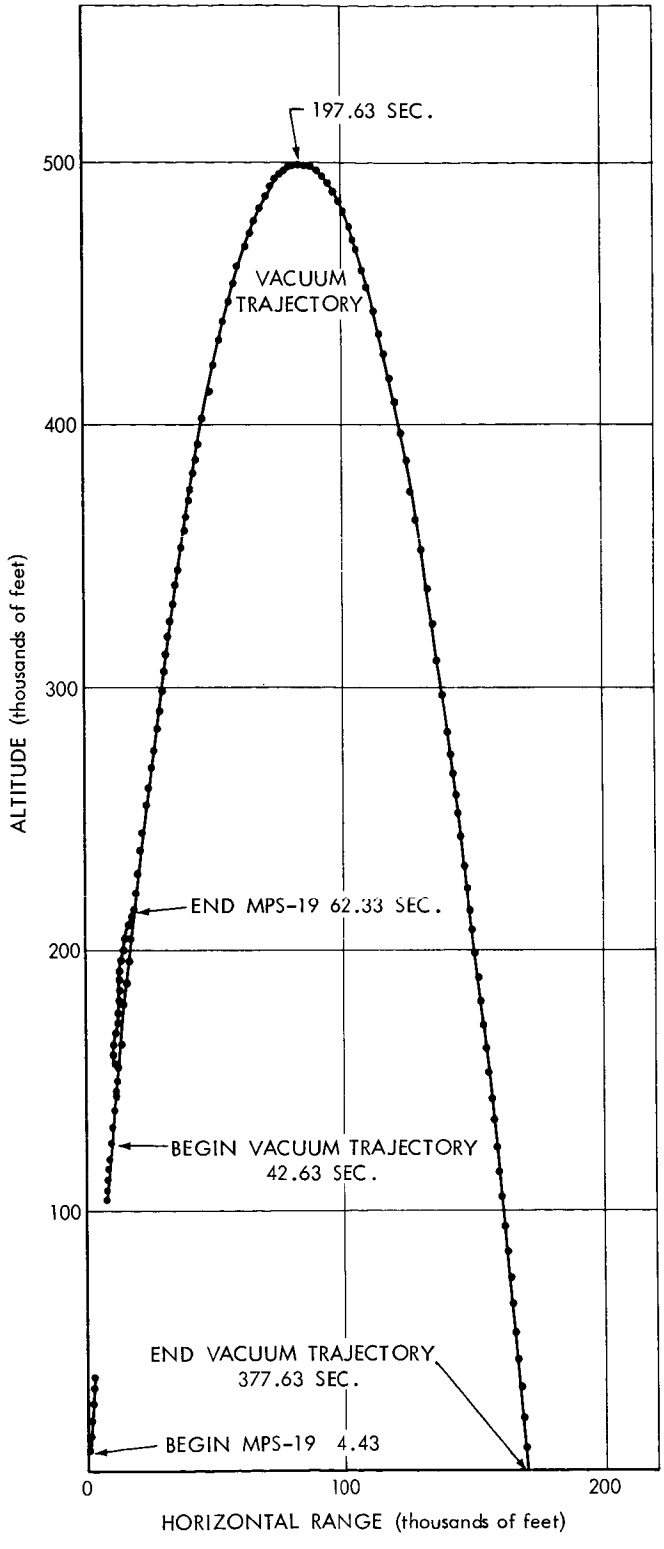

Figure 70. 14.67 UA Radar Plot, Altitude vs Horizontal Range

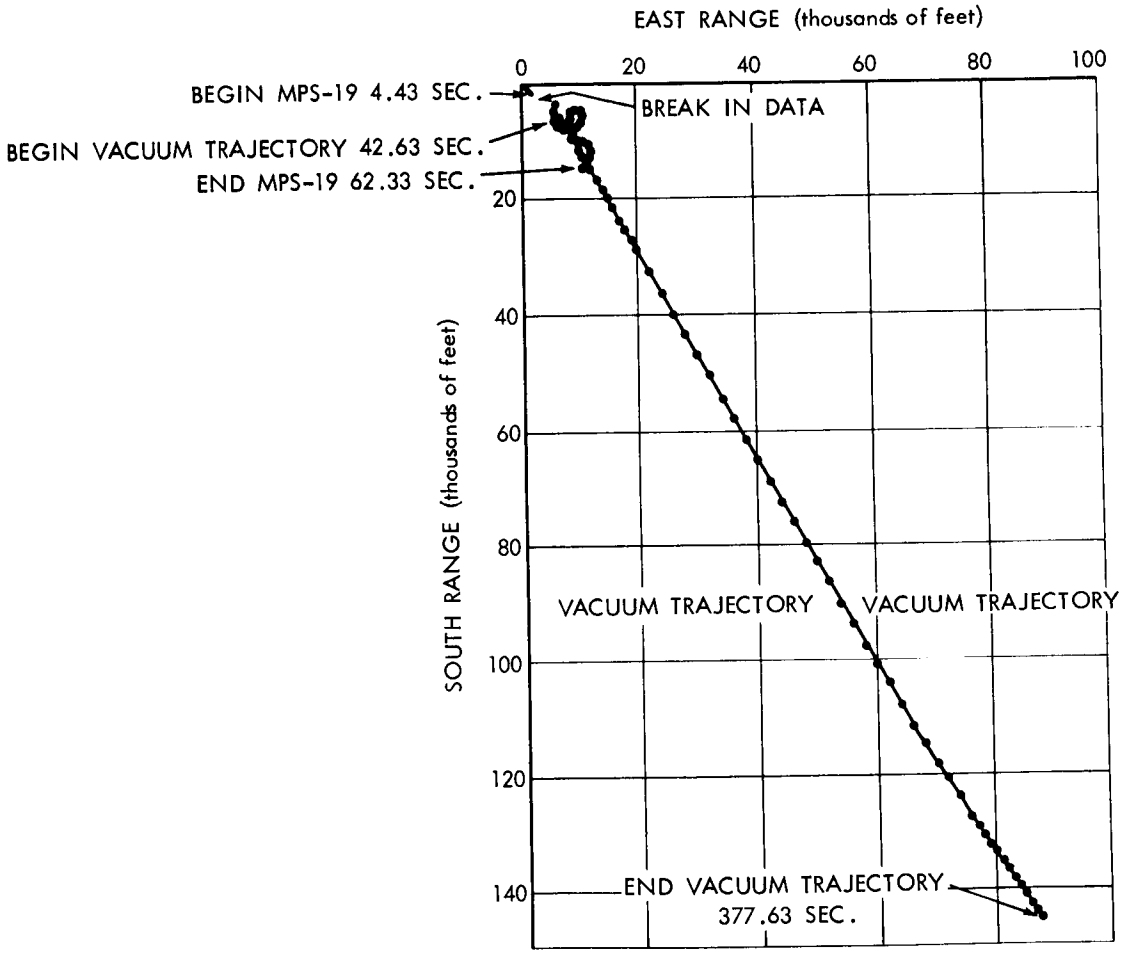

Figure 71. 14.67 UA Radar Plot, South Range vs East Range

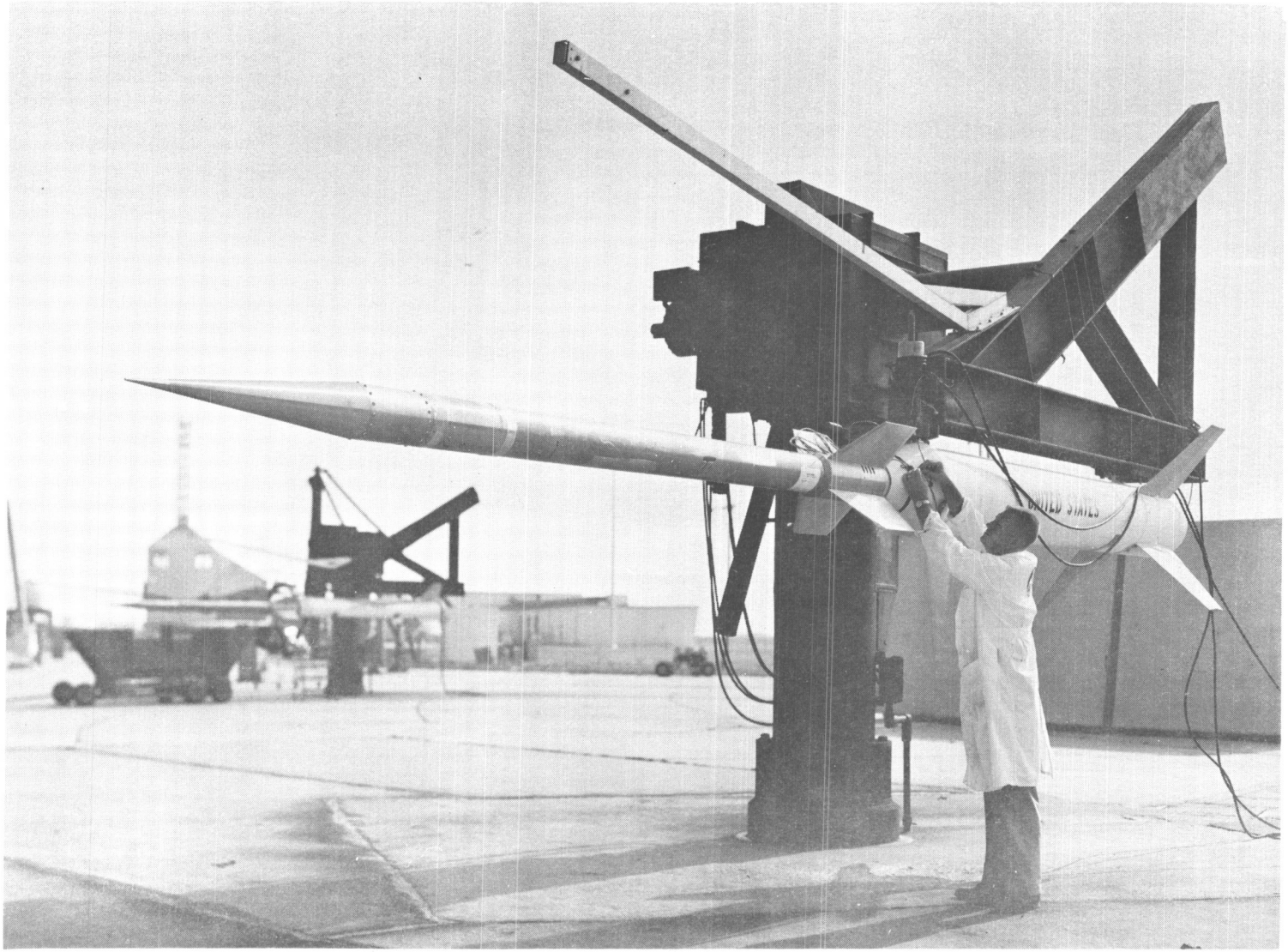

Figure 72. 14.71 CM Photograph

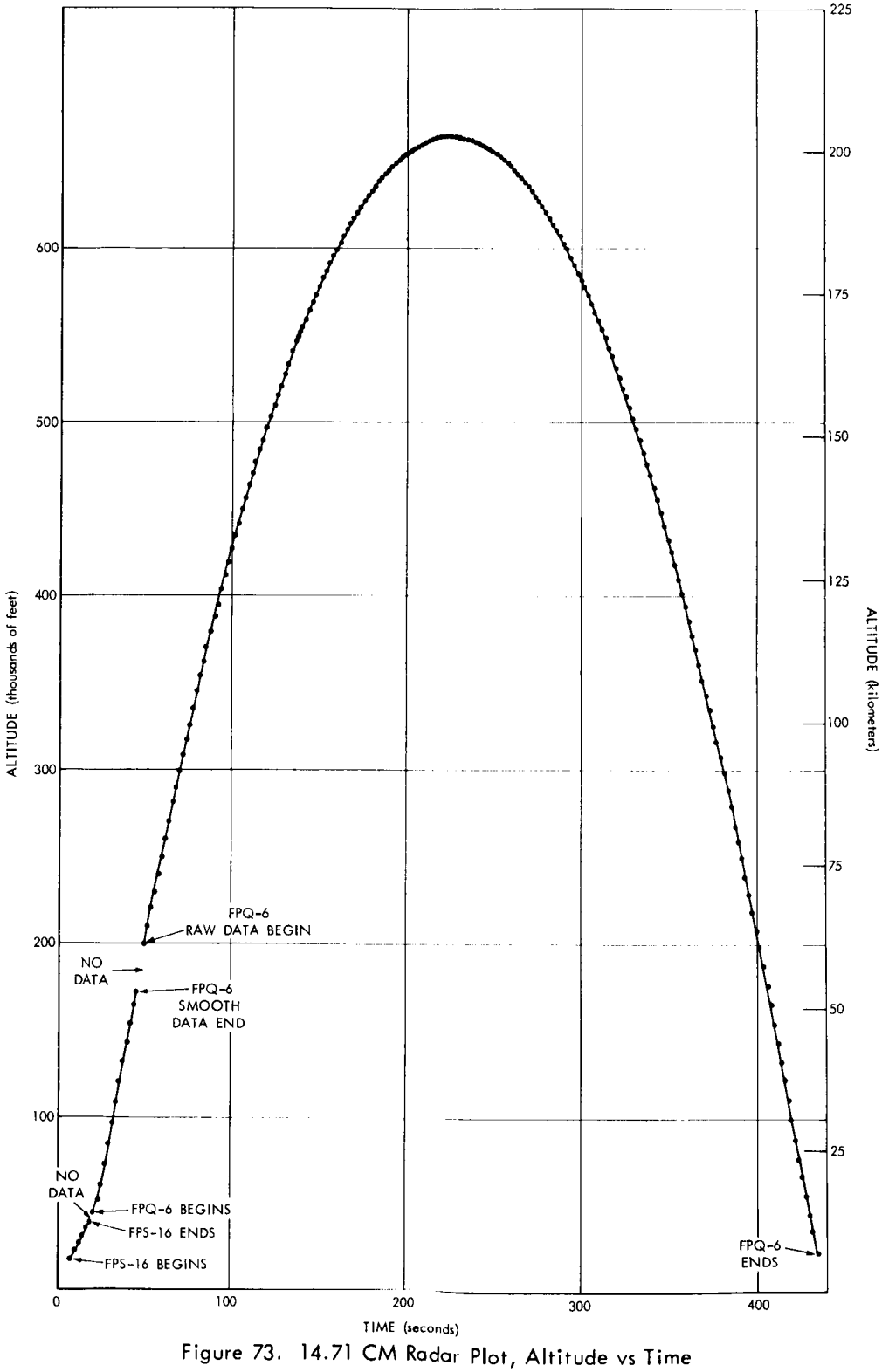

Figure 73. 14.71 CM Radar Plot, Altitude vs Time

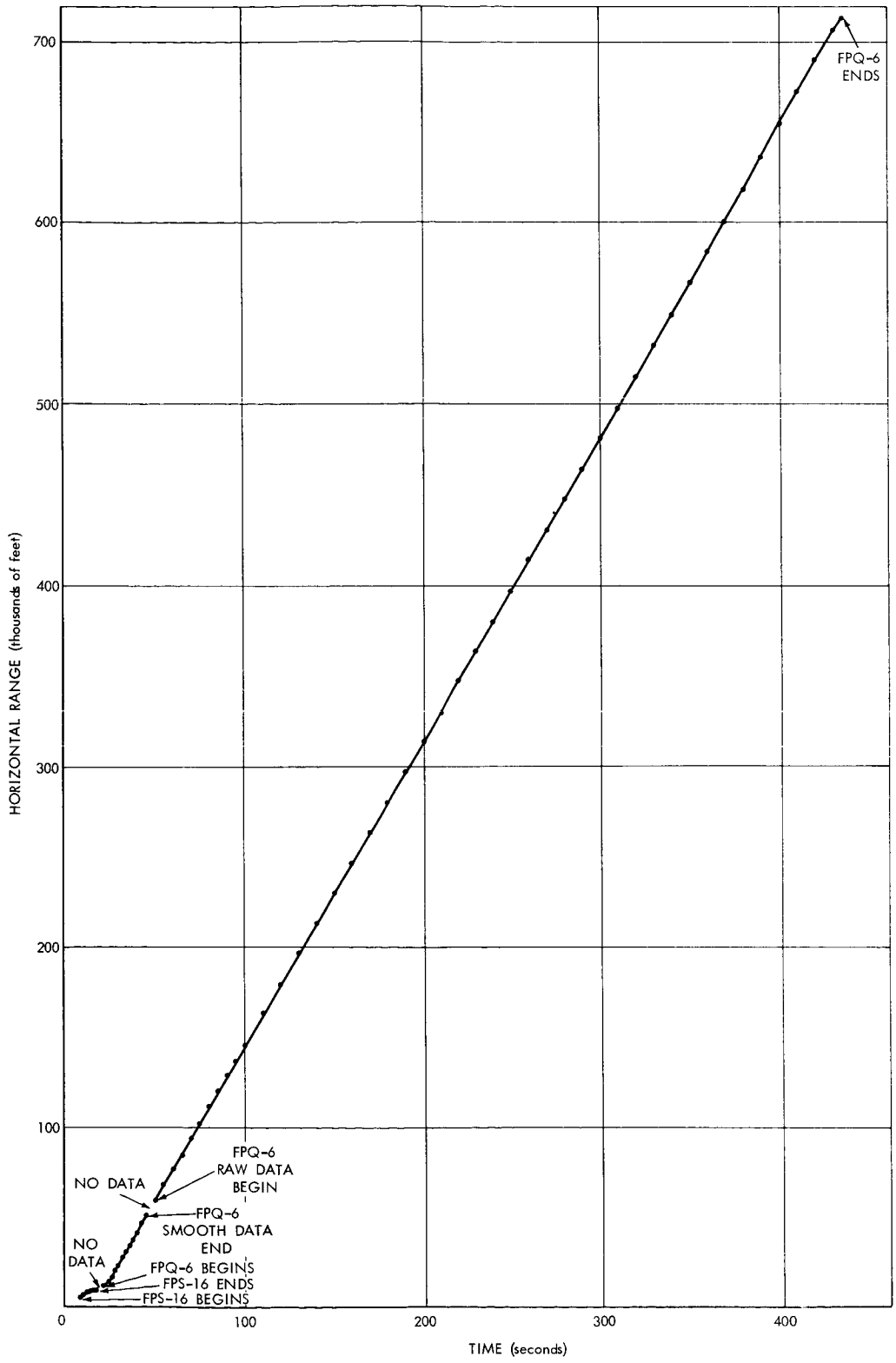

Figure 74. 14.71 CM Radar Plot, Horizontal Range vs Time

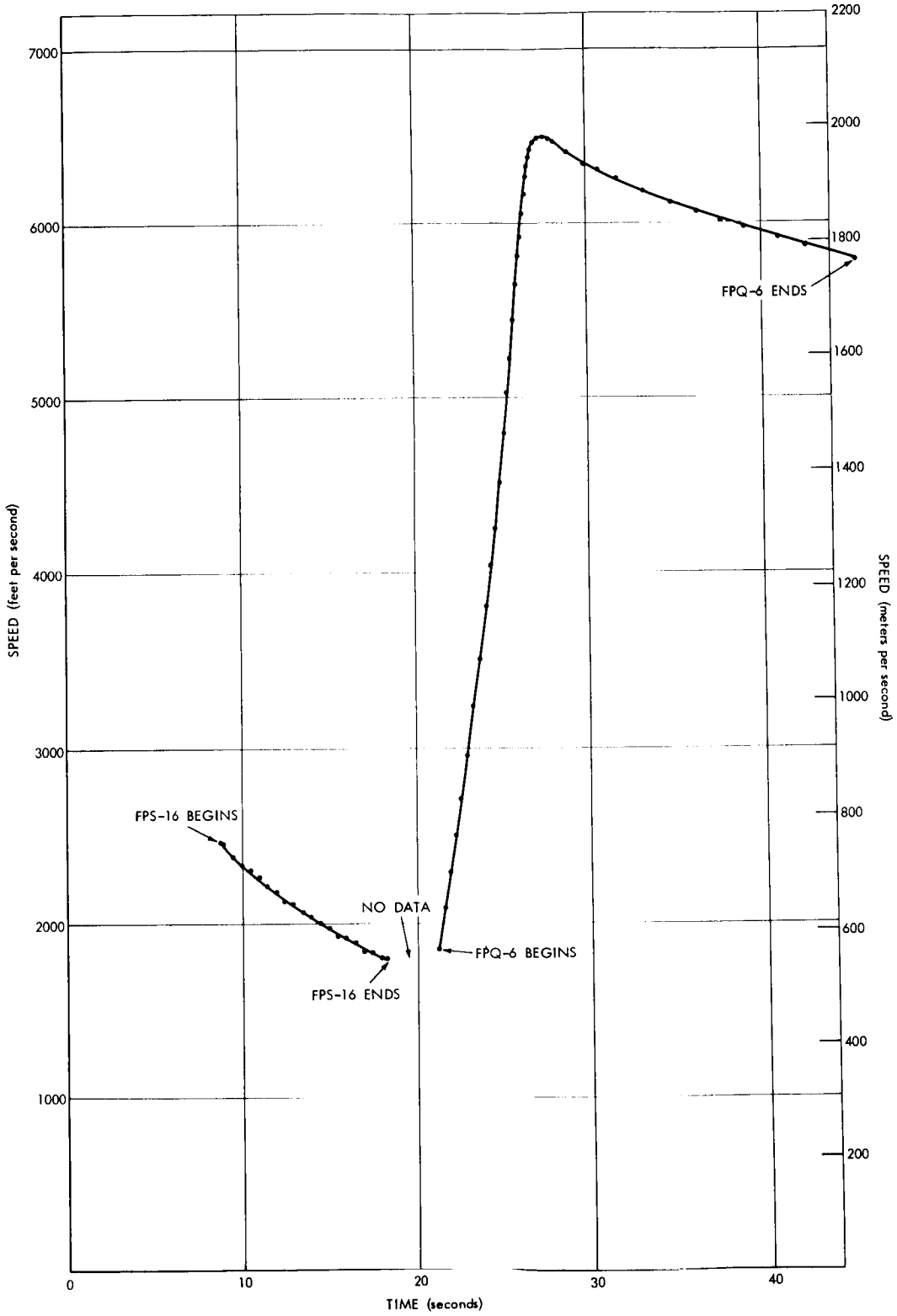

Figure 75. 14.71 CM Radar Plot, Speed vs Time

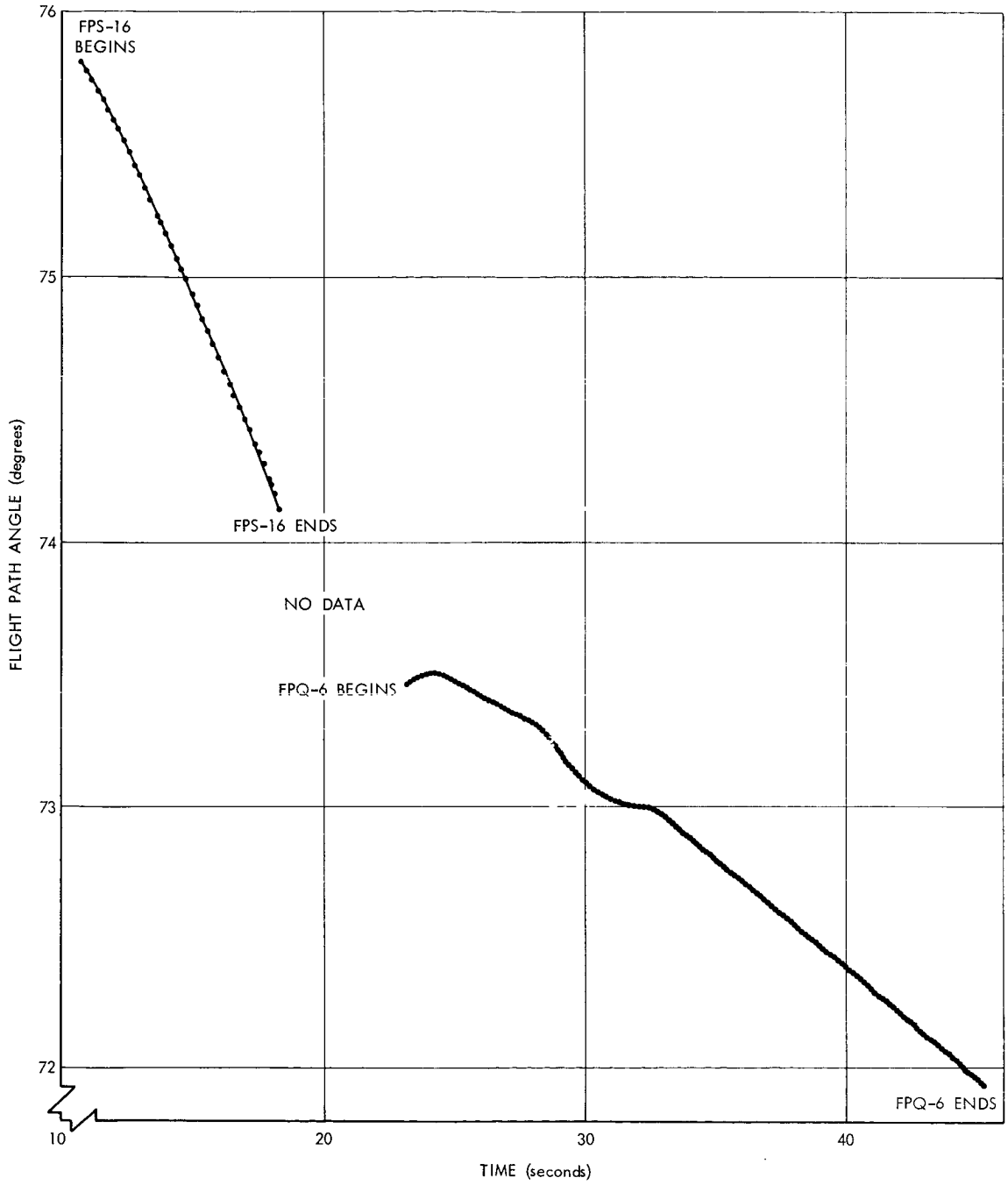

Figure 76. 14.71 CM Radar Plot, Flight Path Angle vs Time

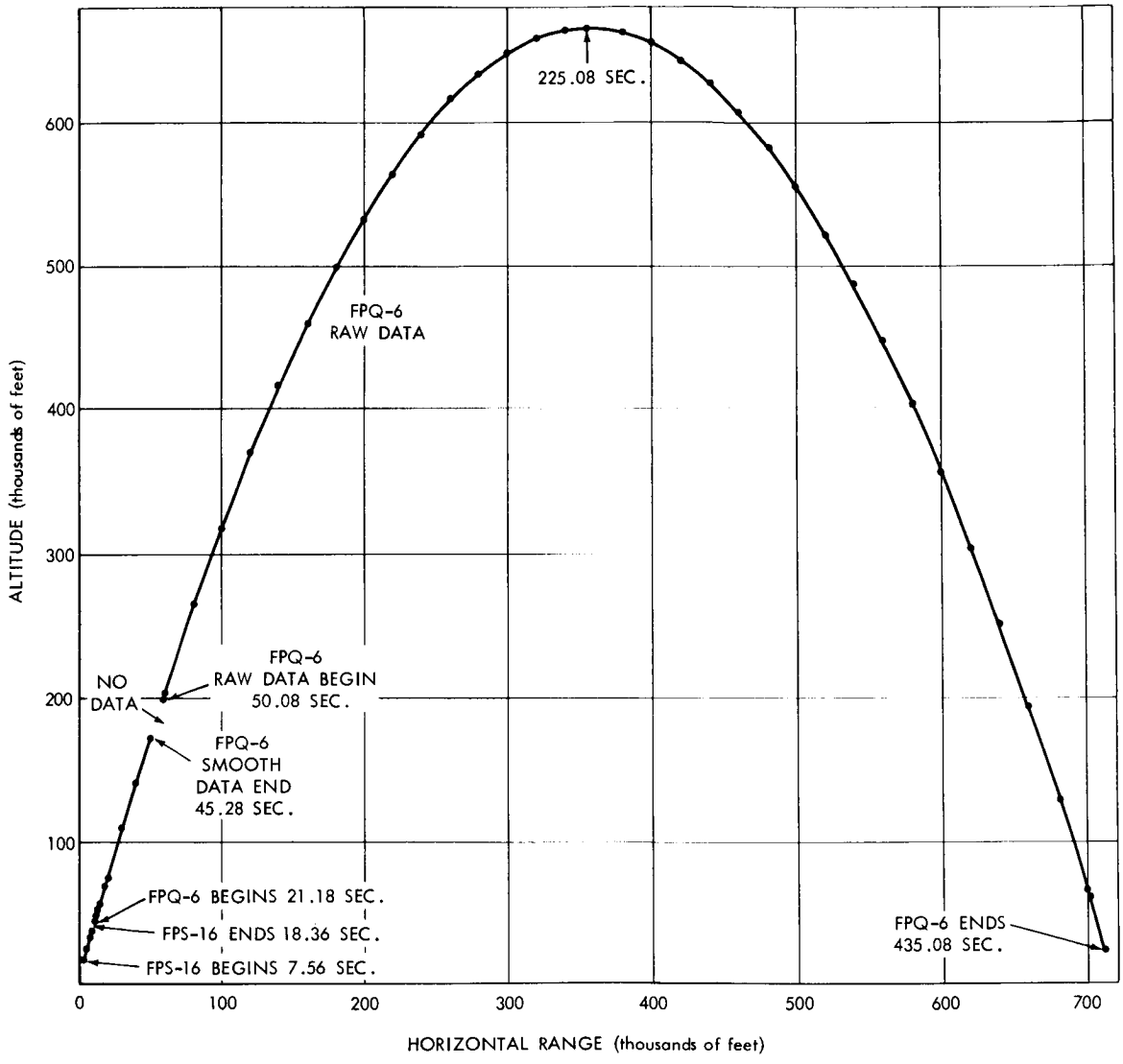

Figure 77. 14.71 CM Radar Plot, Altitude vs Horizontal Range

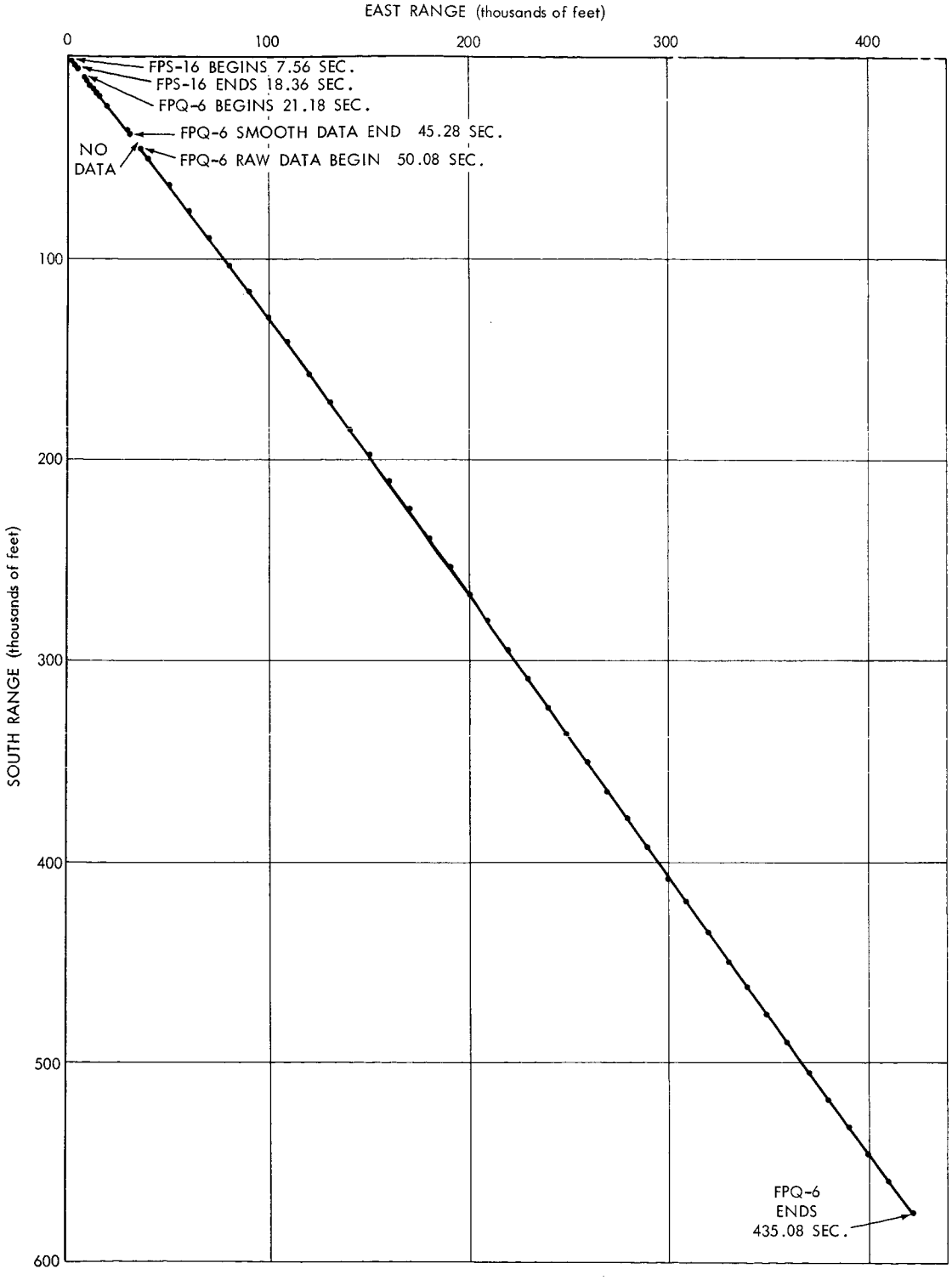

Figure 78. 14.71 CM Radar Plot, South Range vs East Range

Figure 79. 14.72 CM Photograph

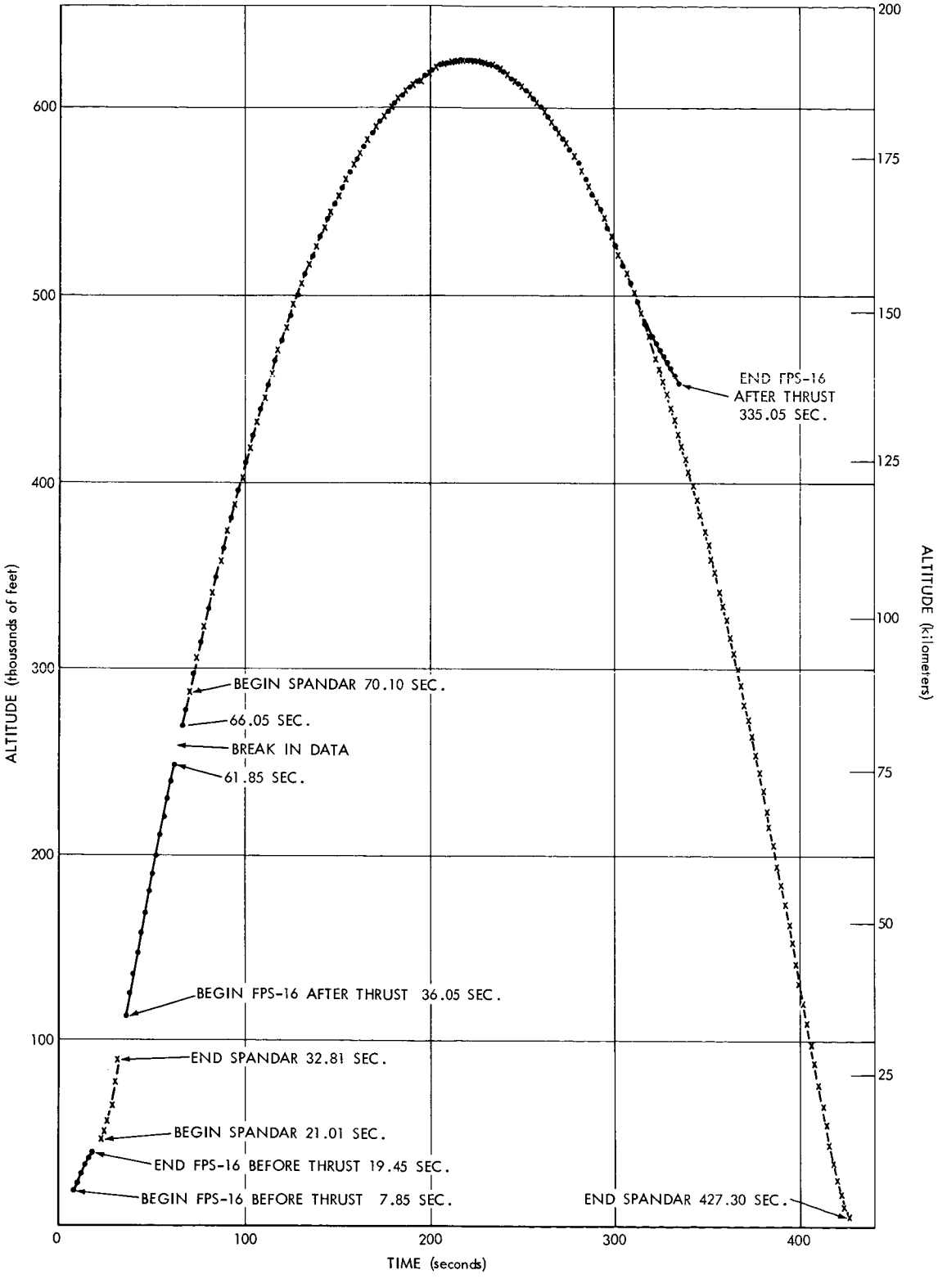

Figure 80. 14.72 CM Radar Plot, Altitude vs Time

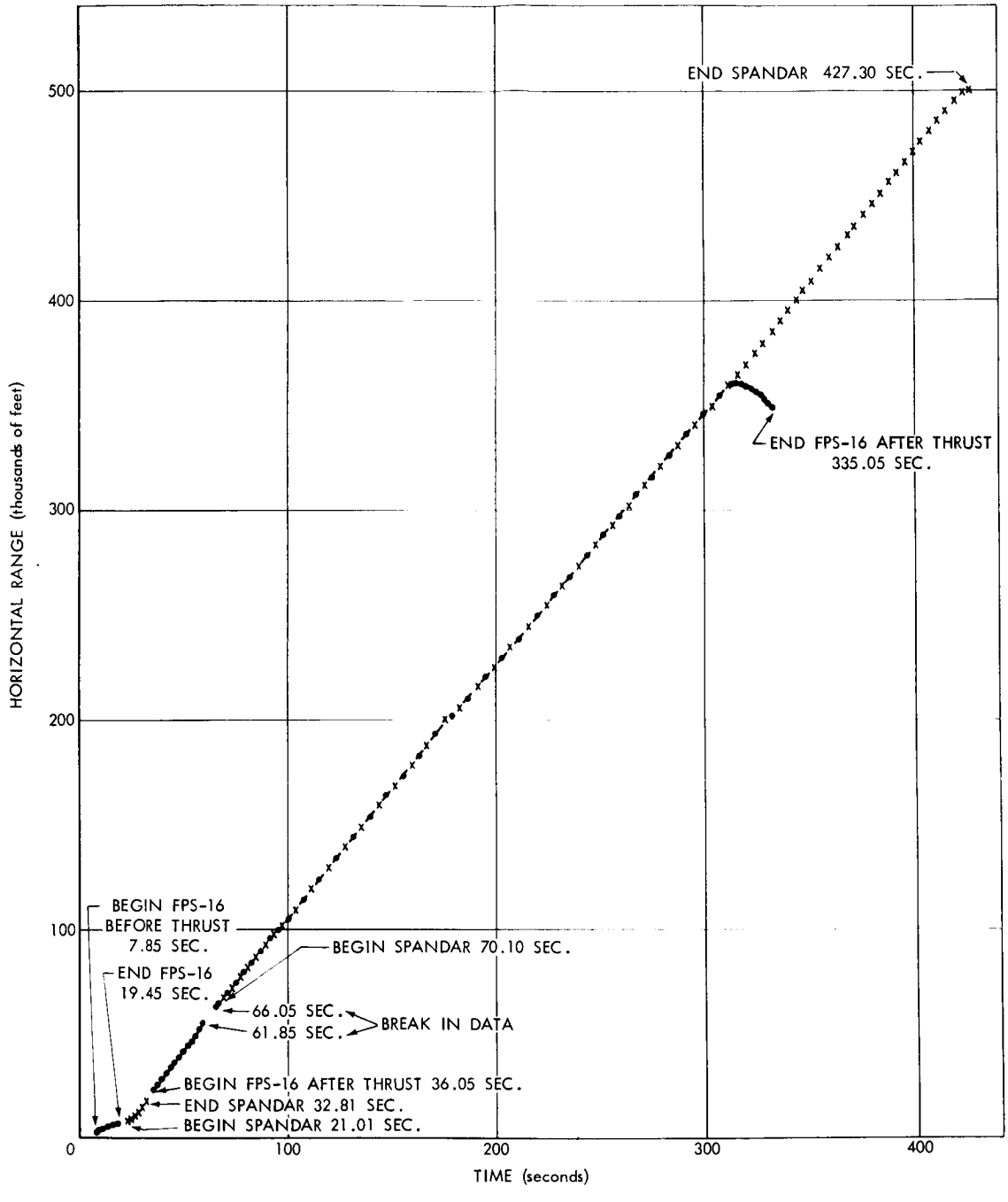

Figure 81. 14.72 CM Radar Plot, Horizontal Range vs Time

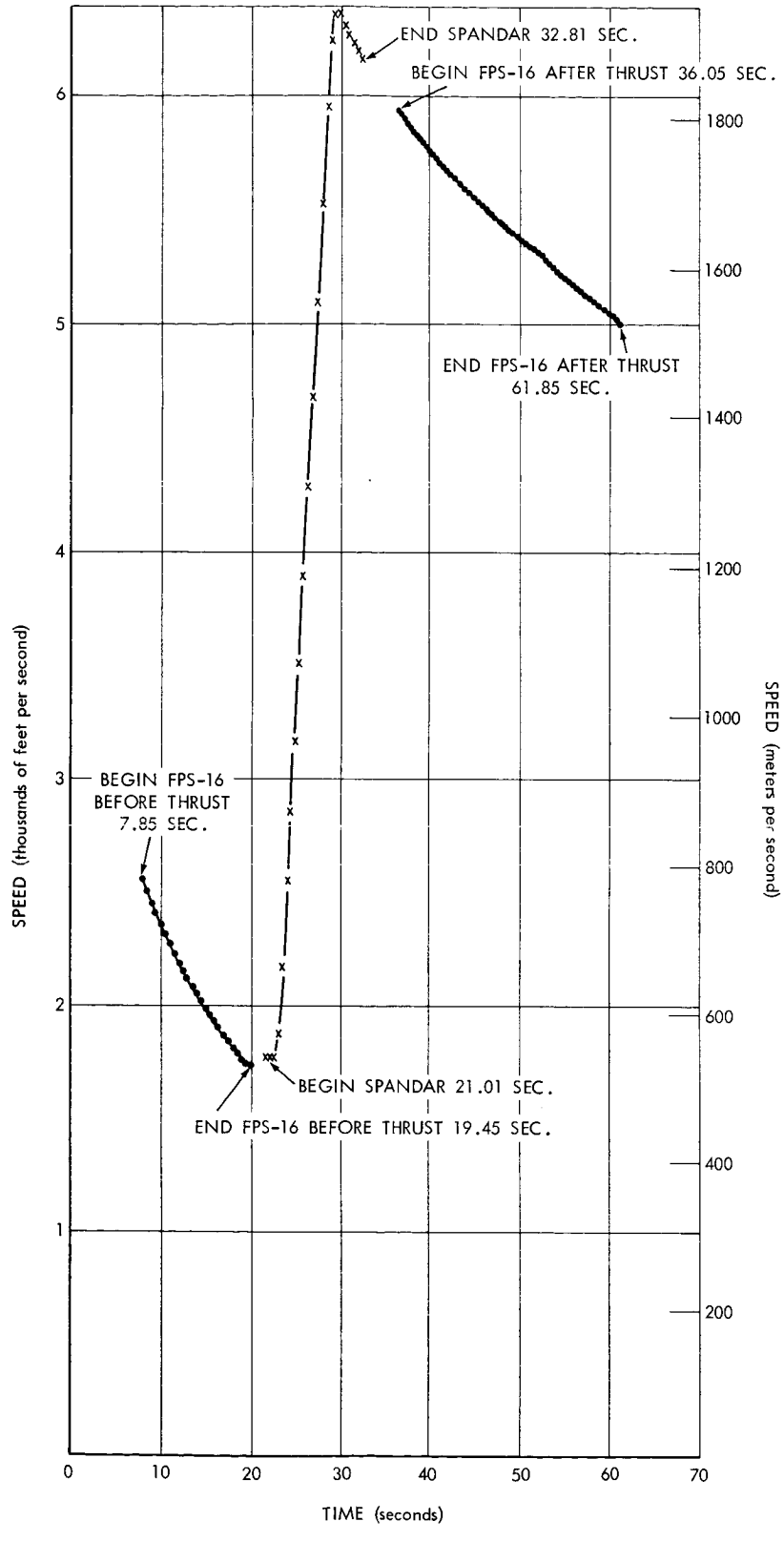

Figure 82. 14.72 CM Radar Plot, Speed vs Time

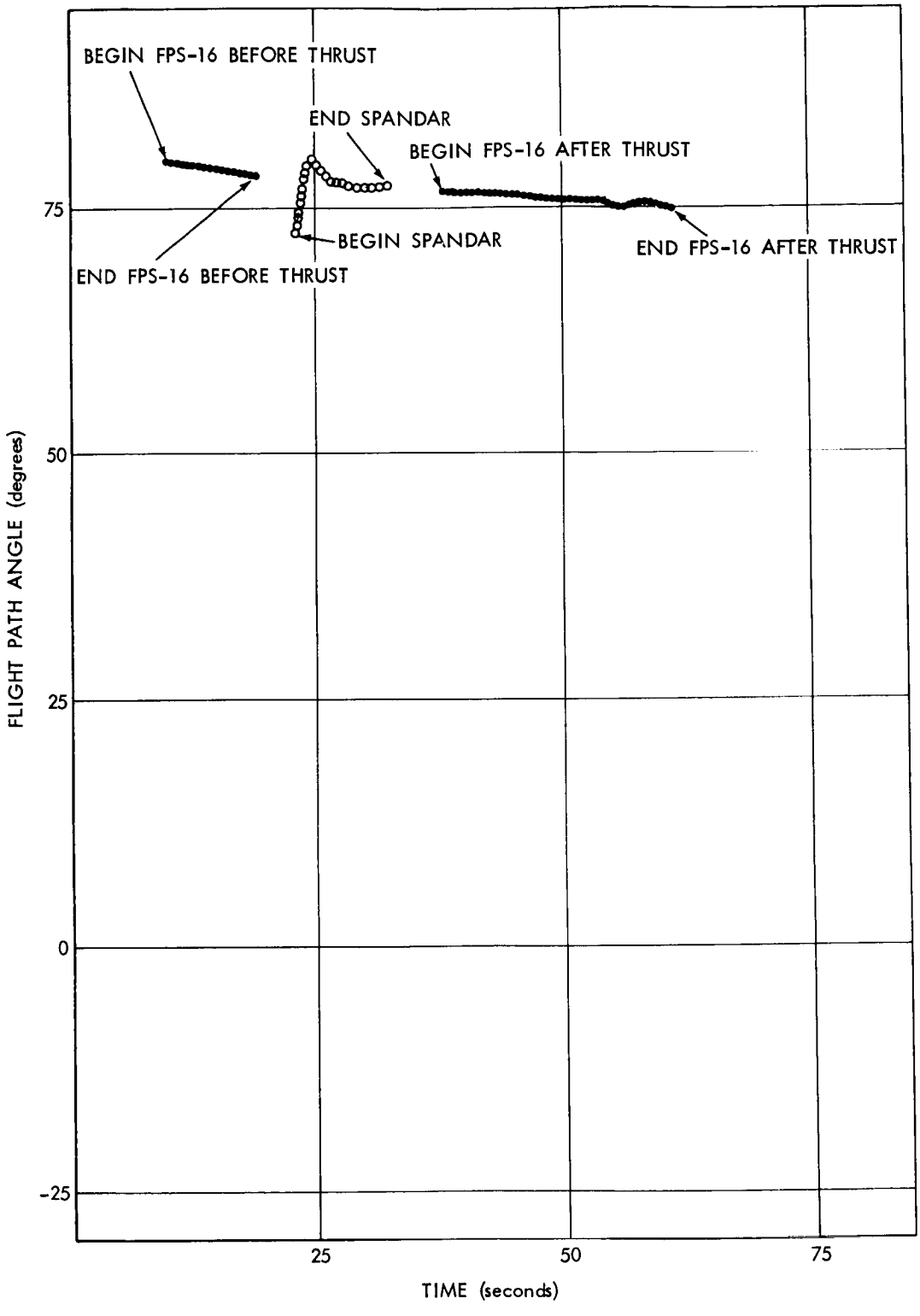

Figure 83. 14.72 CM Radar Plot, Flight Path Angle vs Time

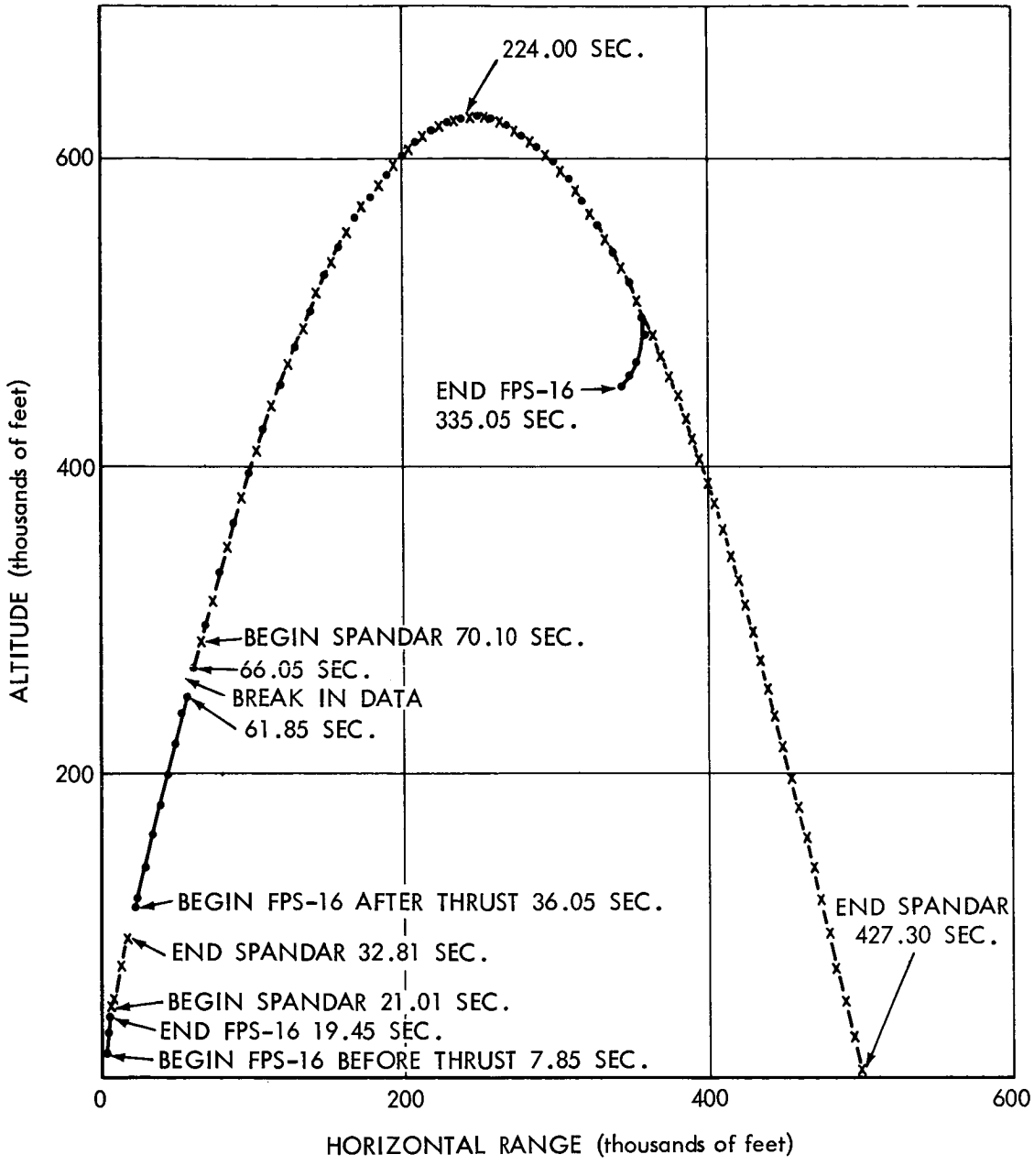

Figure 84. 14.72 CM Radar Plot, Altitude vs Horizontal Range

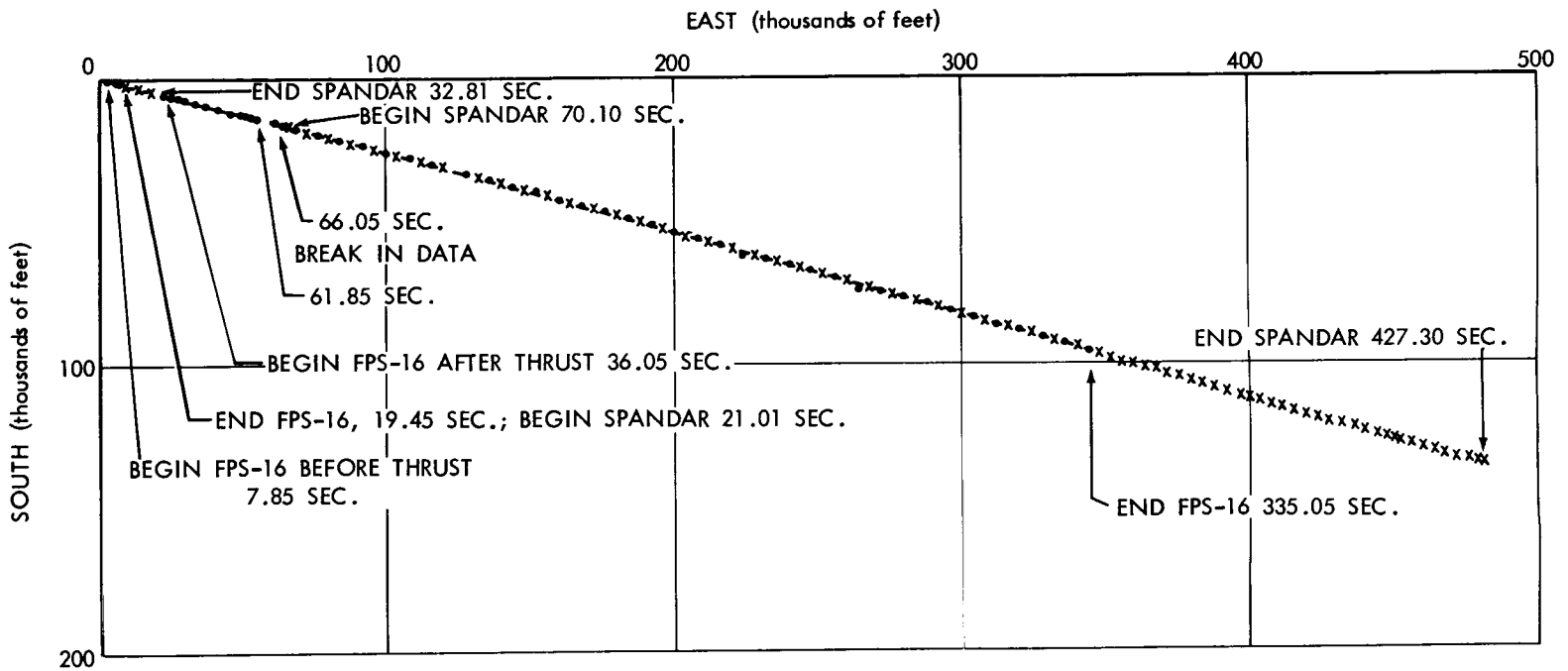

Figure 85. 14.72 CM Radar Plot, South Range vs East Range

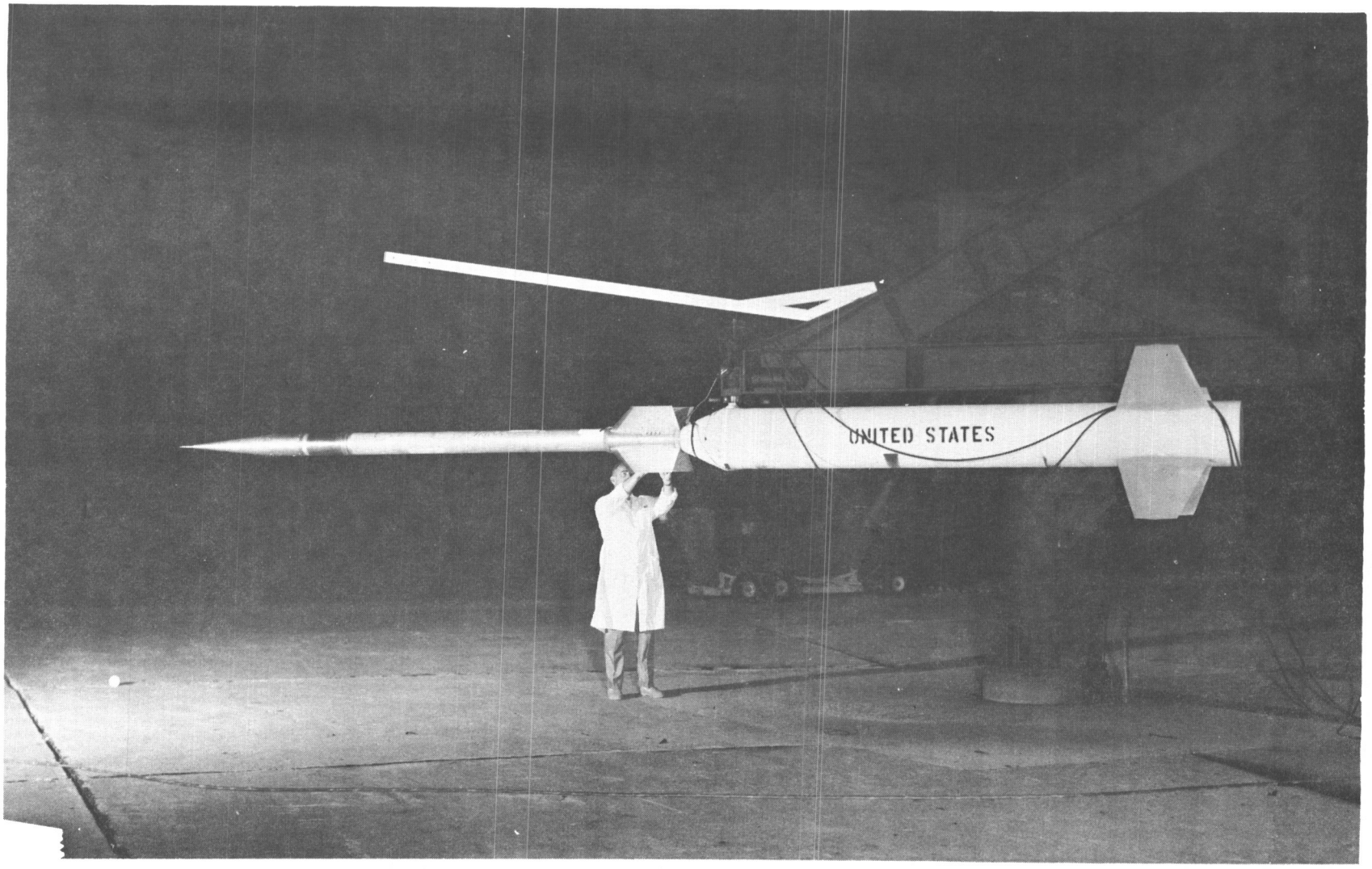

Figure 86. 14.73 CM Photograph

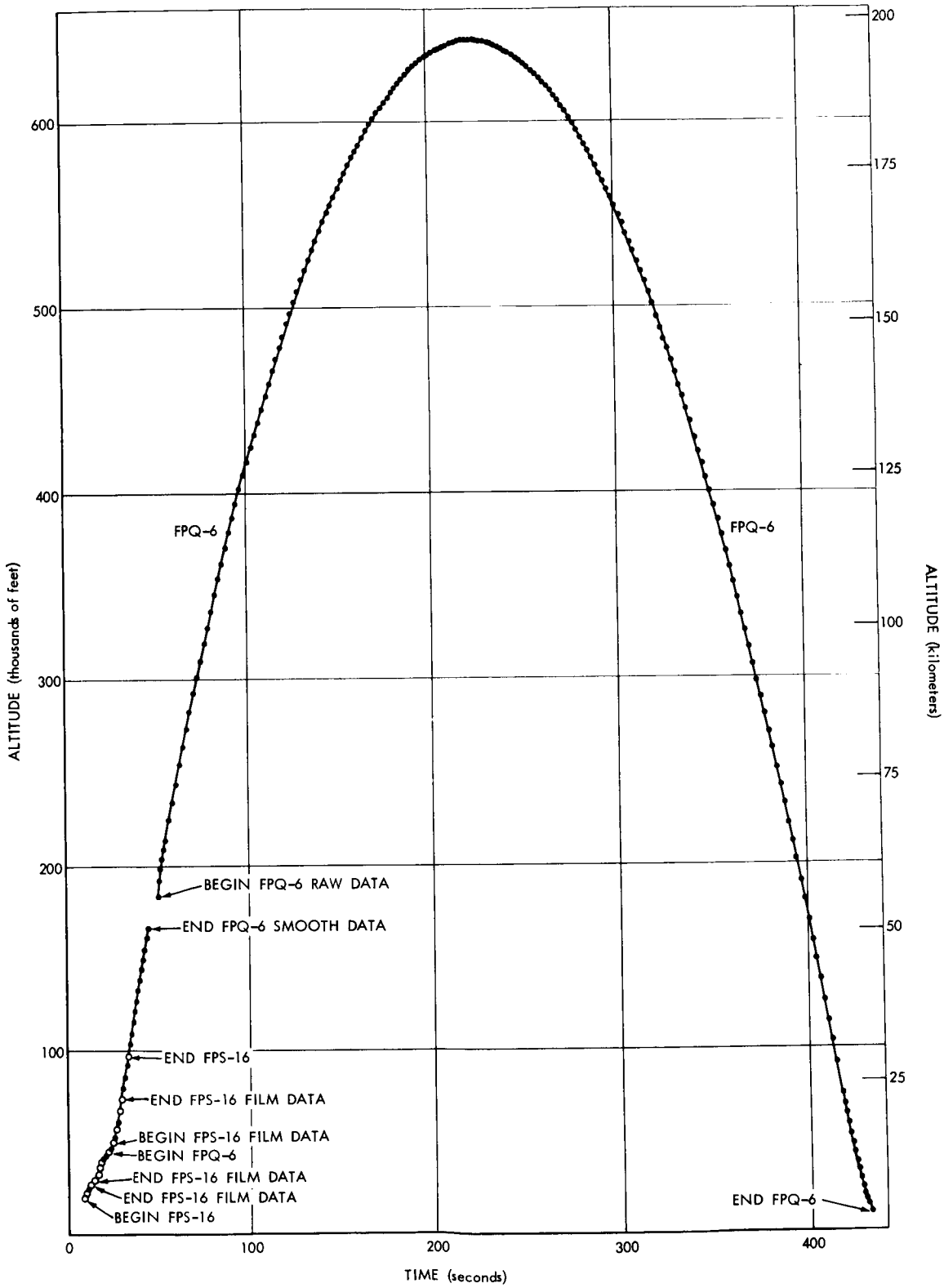

Figure 87. 14.73 CM Radar Plot, Altitude vs Time

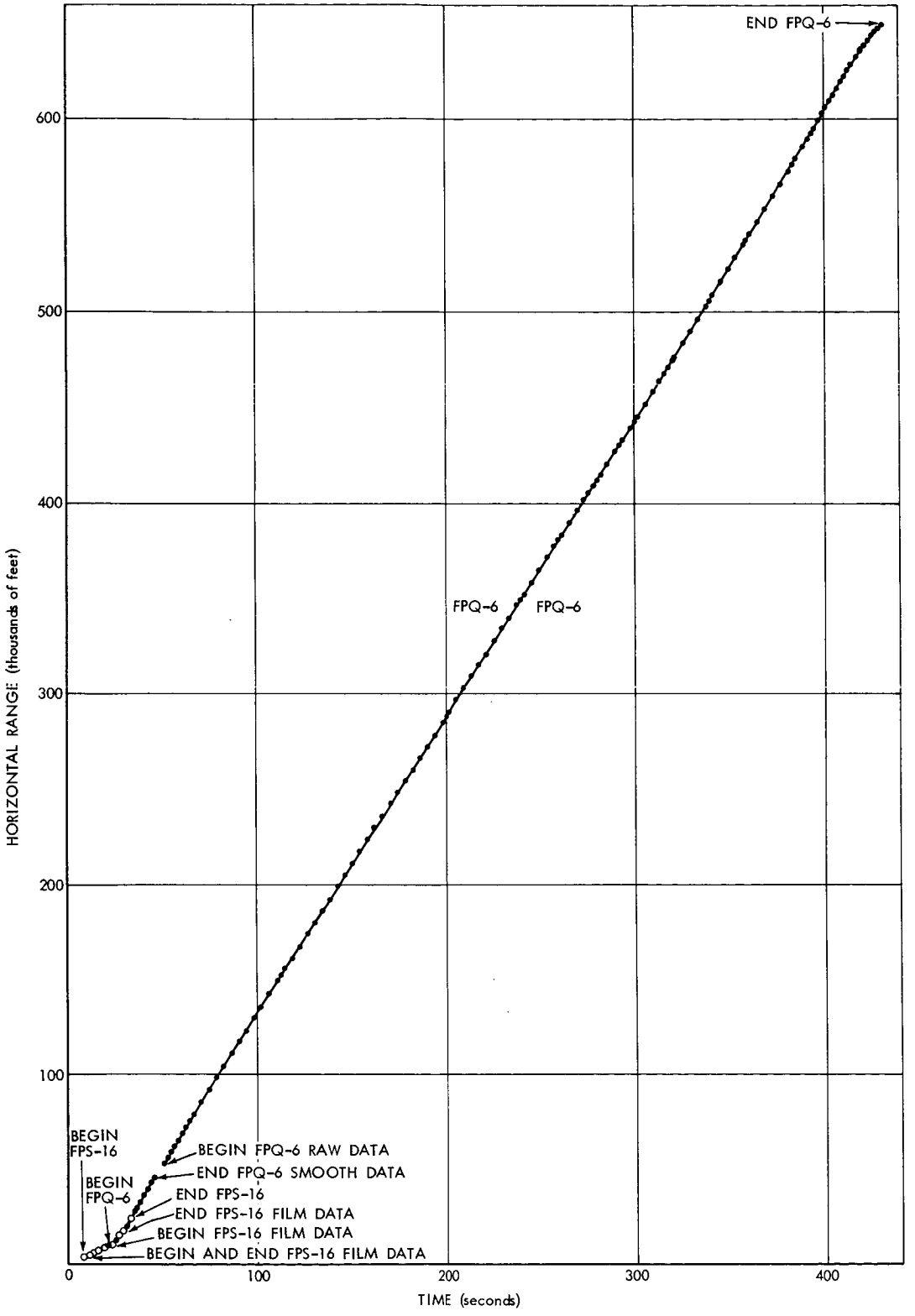

Figure 88. 14.73 CM Radar Plot, Horizontal Range vs Time

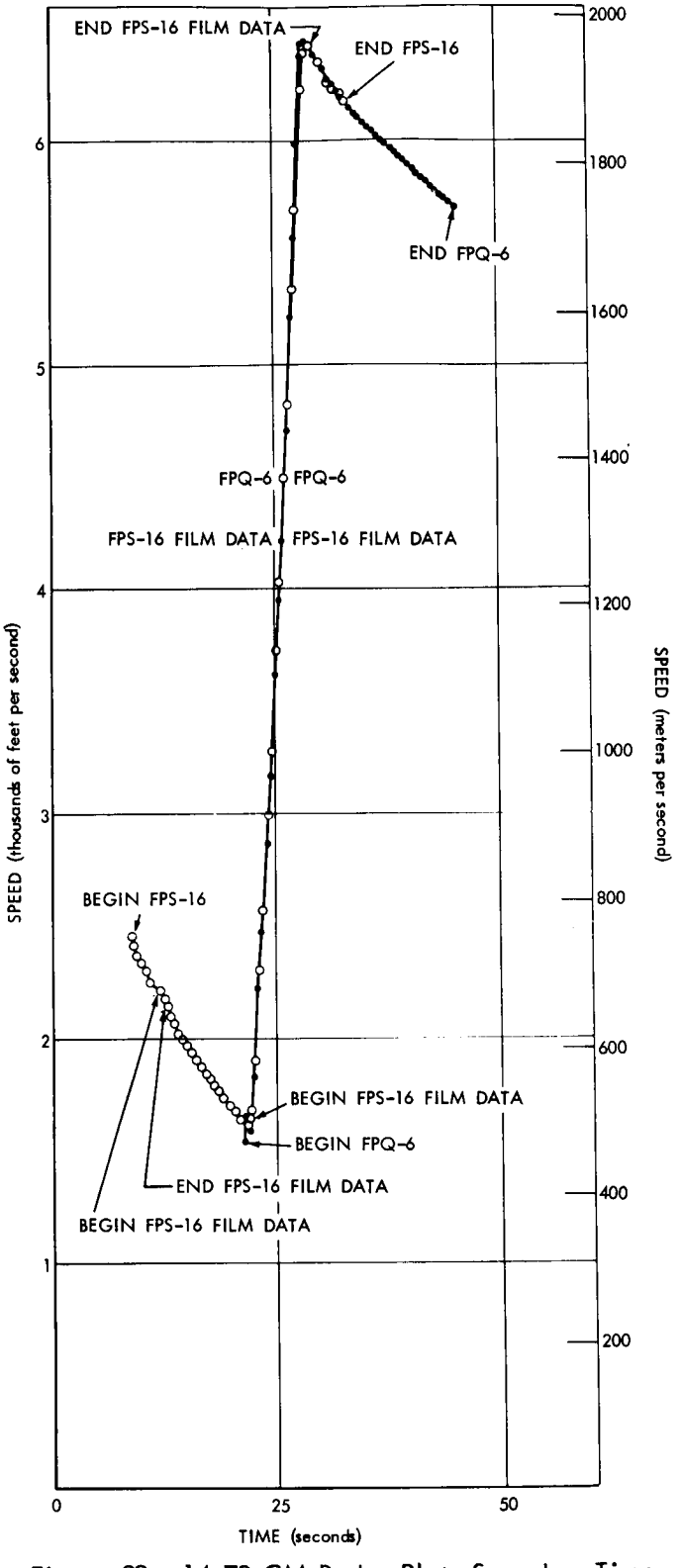

Figure 89. 14.73 CM Radar Plot, Speed vs Time

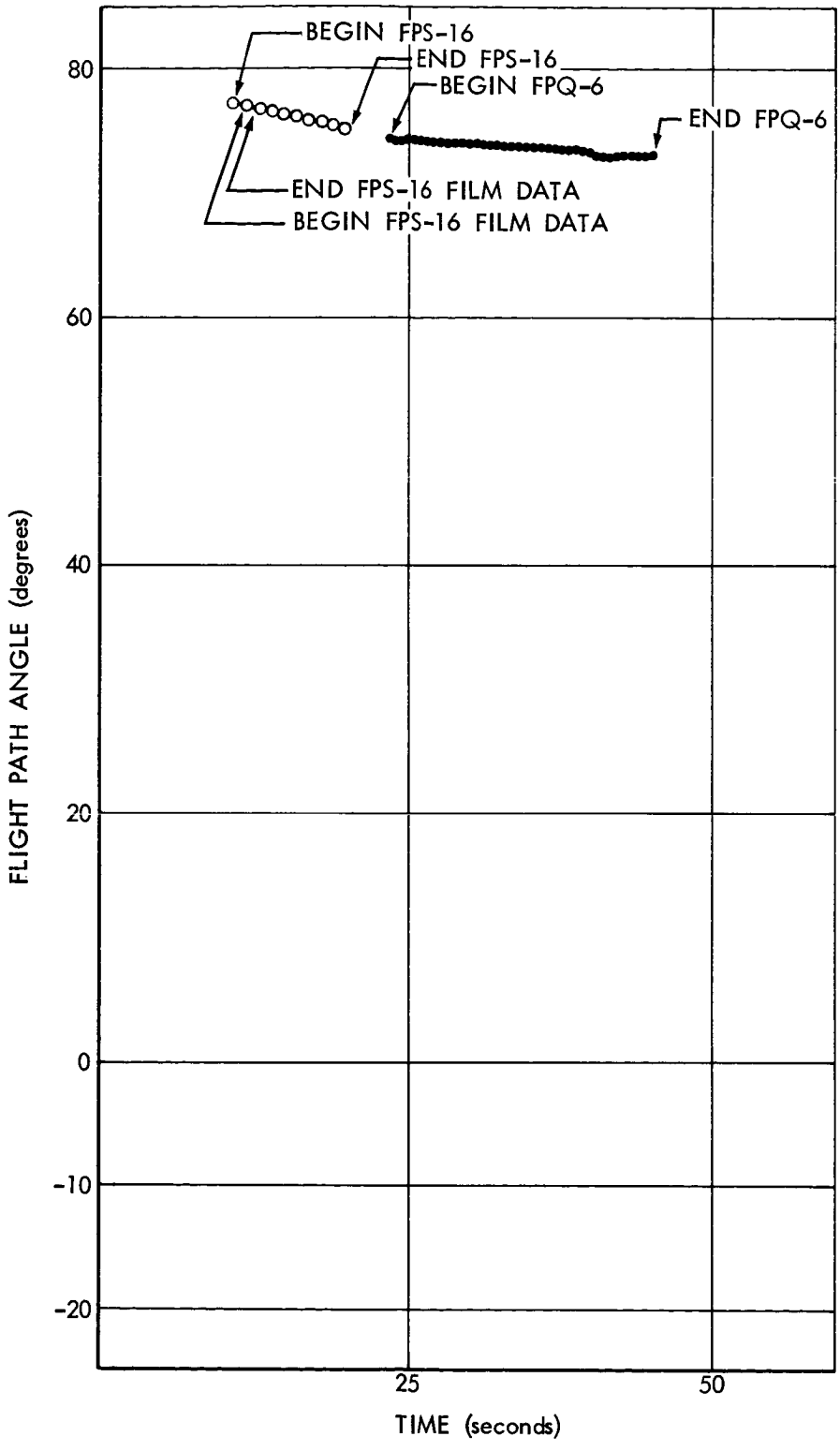

Figure 90. 14.73 CM Radar Plot, Flight Path Angle vs Time

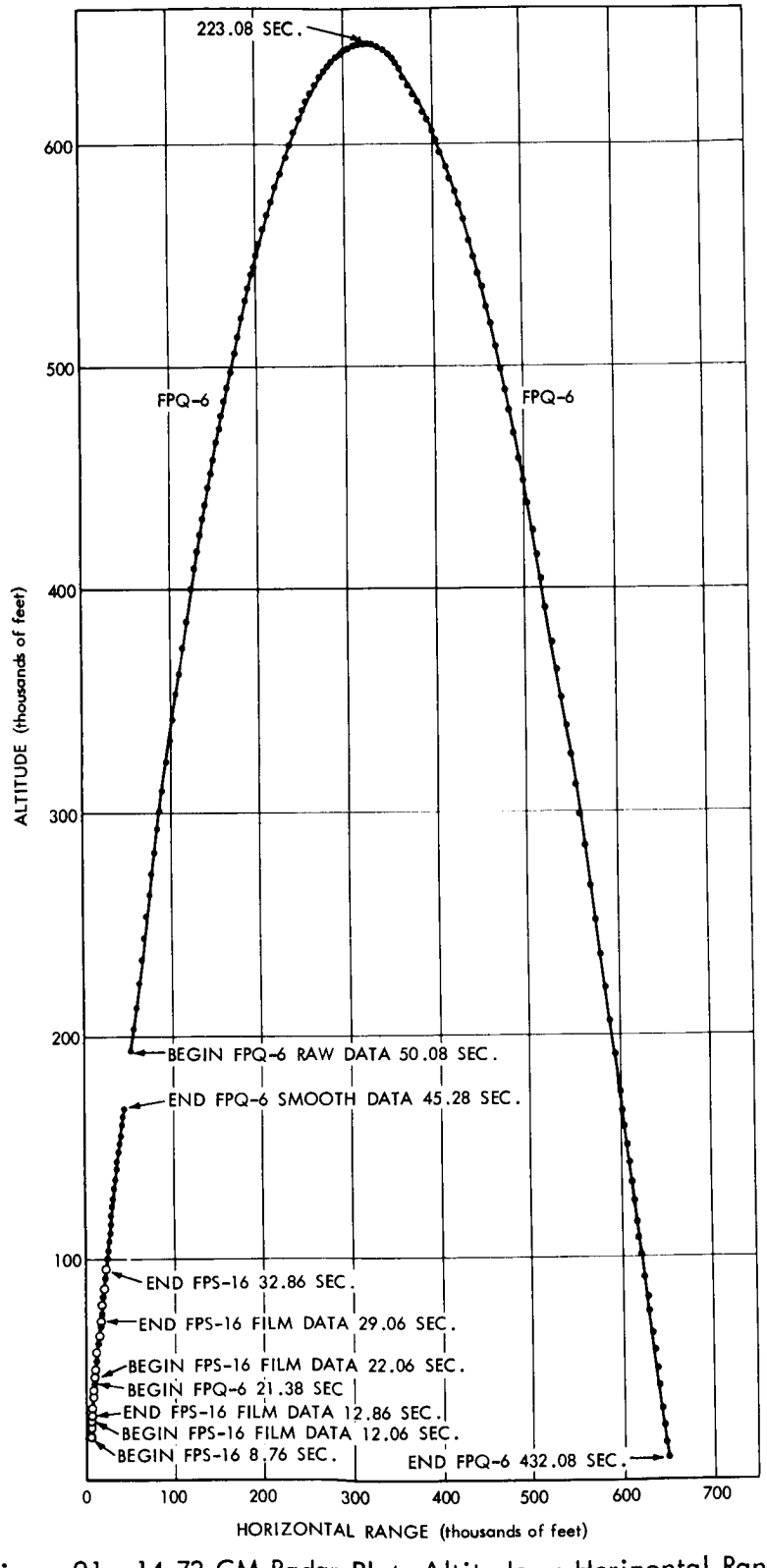

Figure 91. 14.73 CM Radar Plot, Altitude vs Horizontal Range

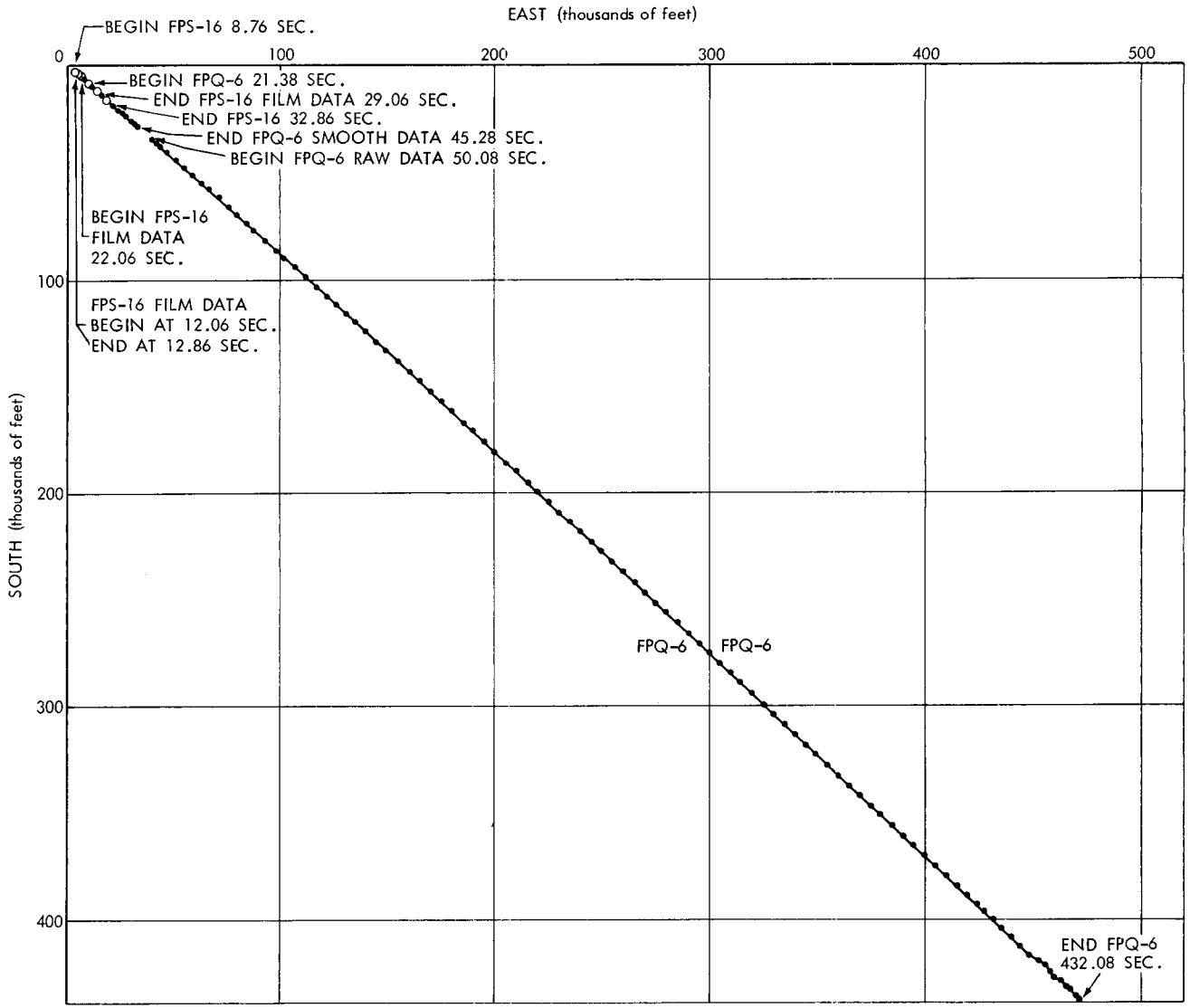

Figure 92. 14.73 CM Radar Plot, South Range vs East Range

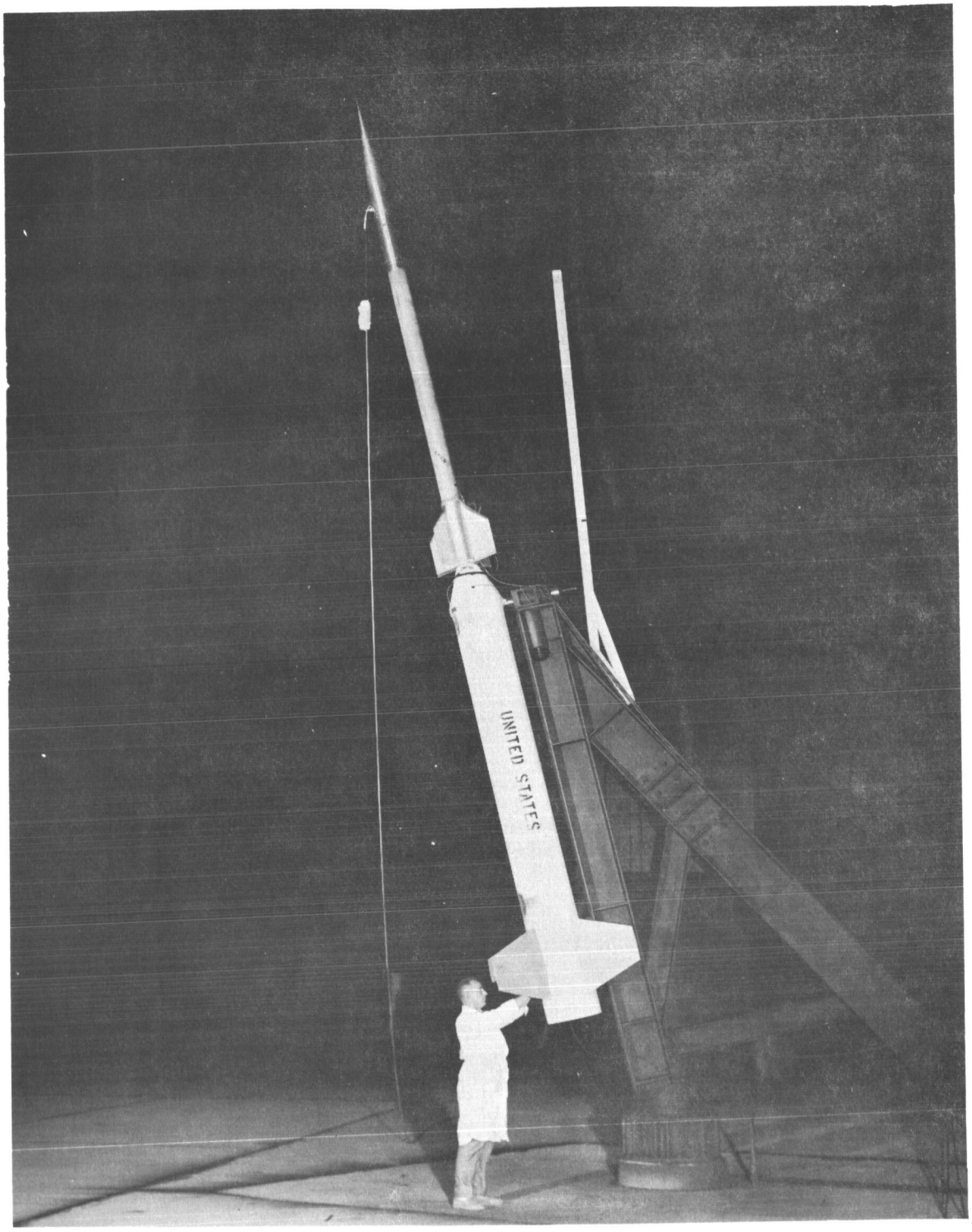

Figure 93. 14.74 CM Photograph

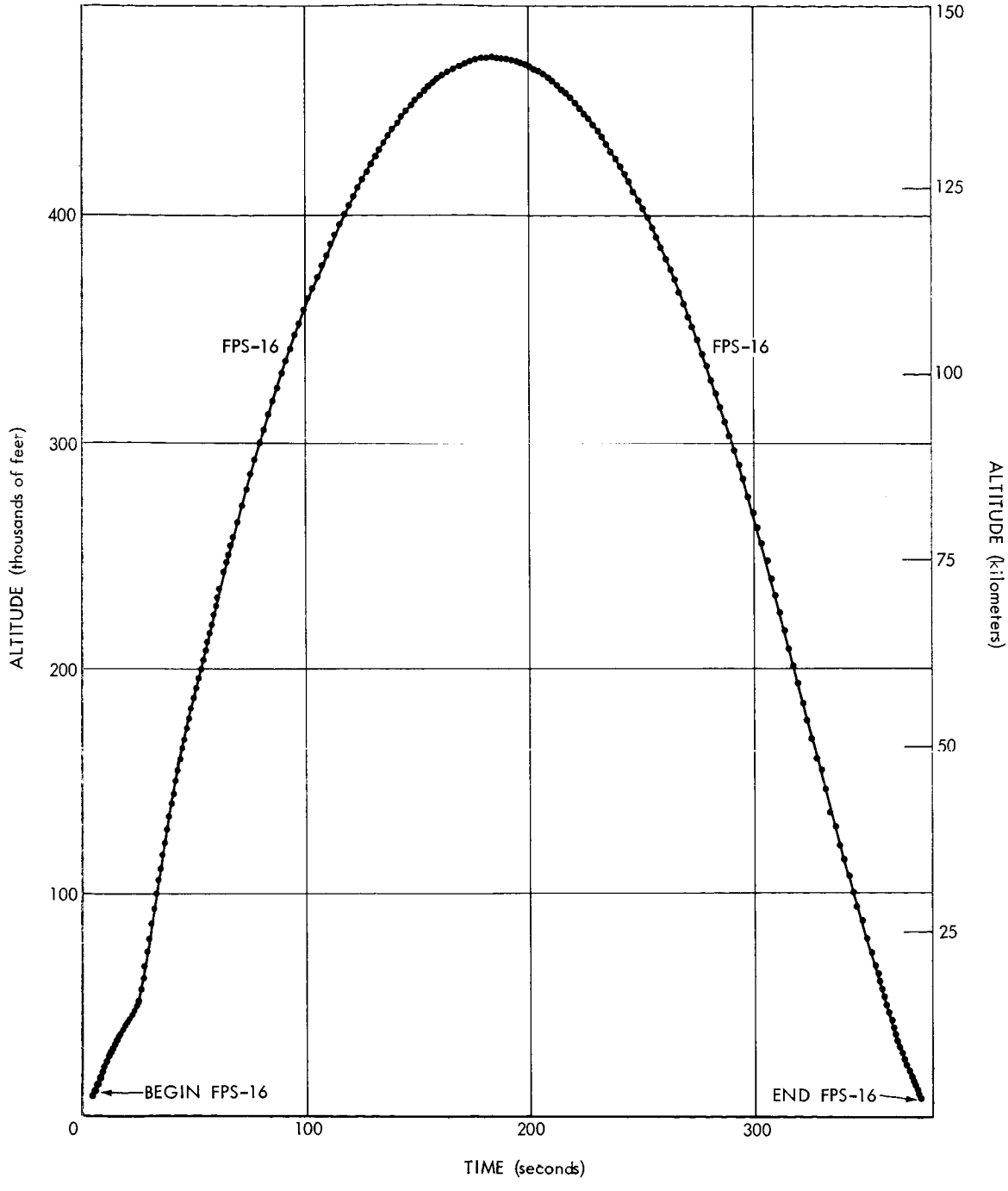

Figure 94. 14.74 CM Radar Plot, Altitude vs Time

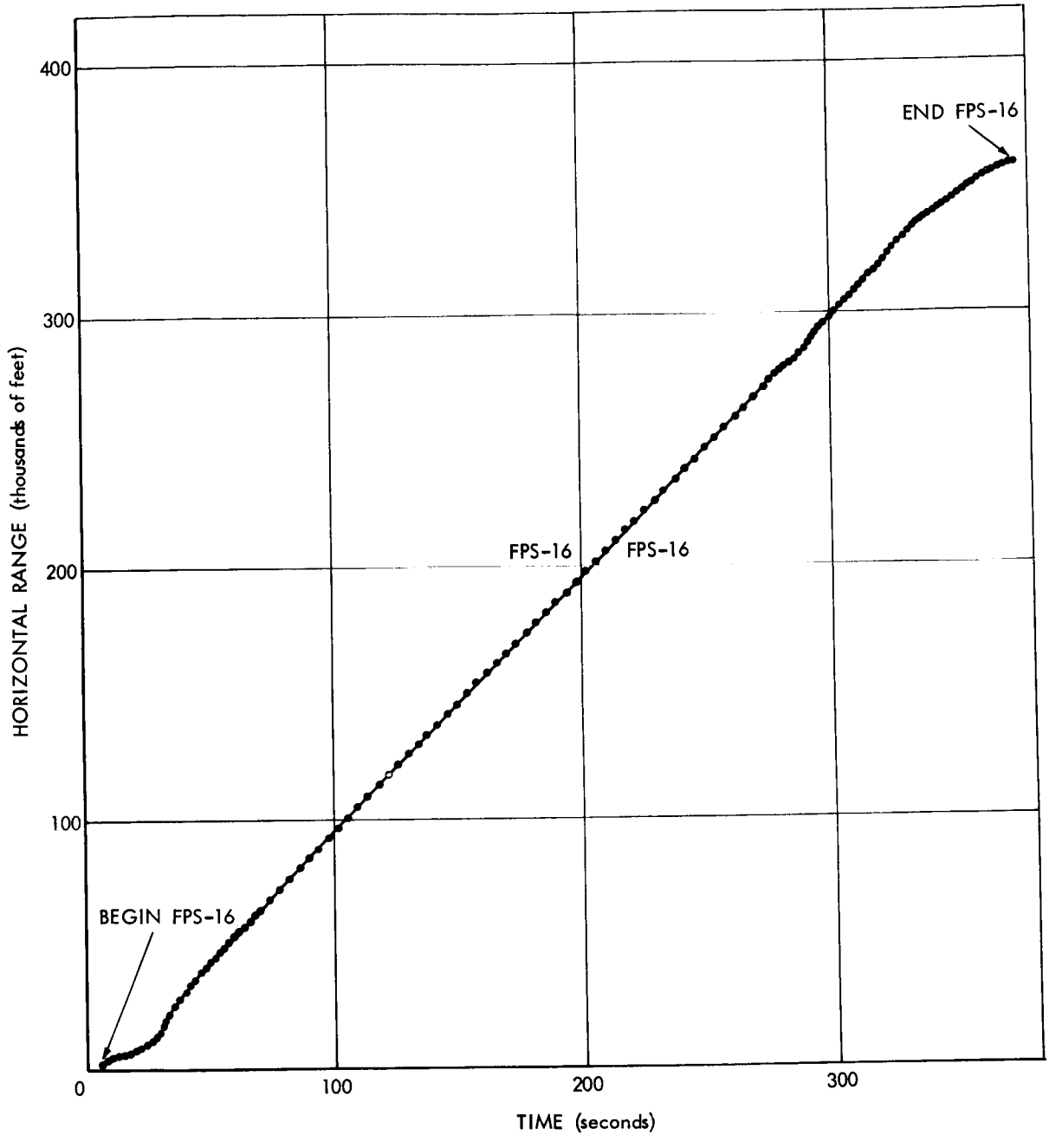

Figure 95. 14.74 CM Radar Plot, Horizontal Range vs Time

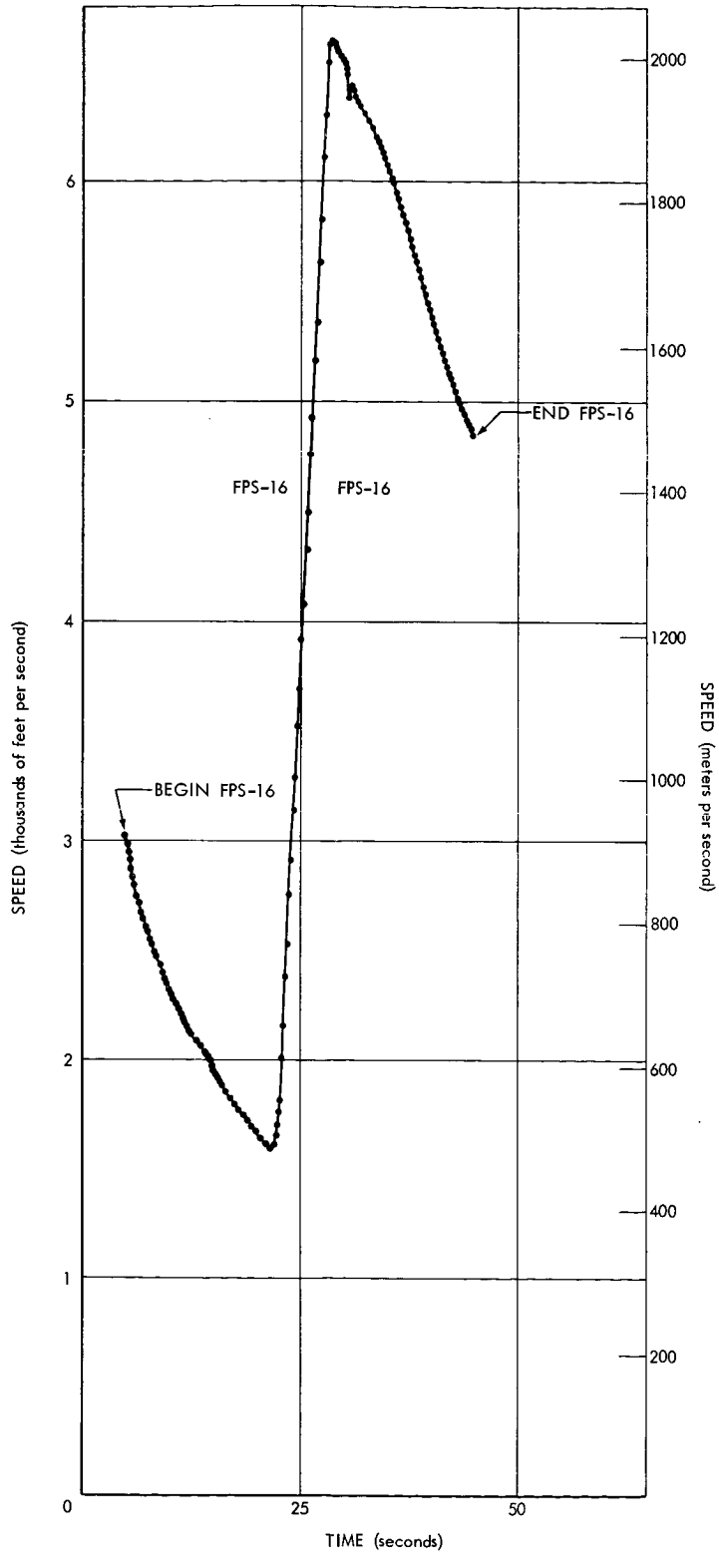

Figure 96. 14.74 CM Radar Plot, Speed vs Time

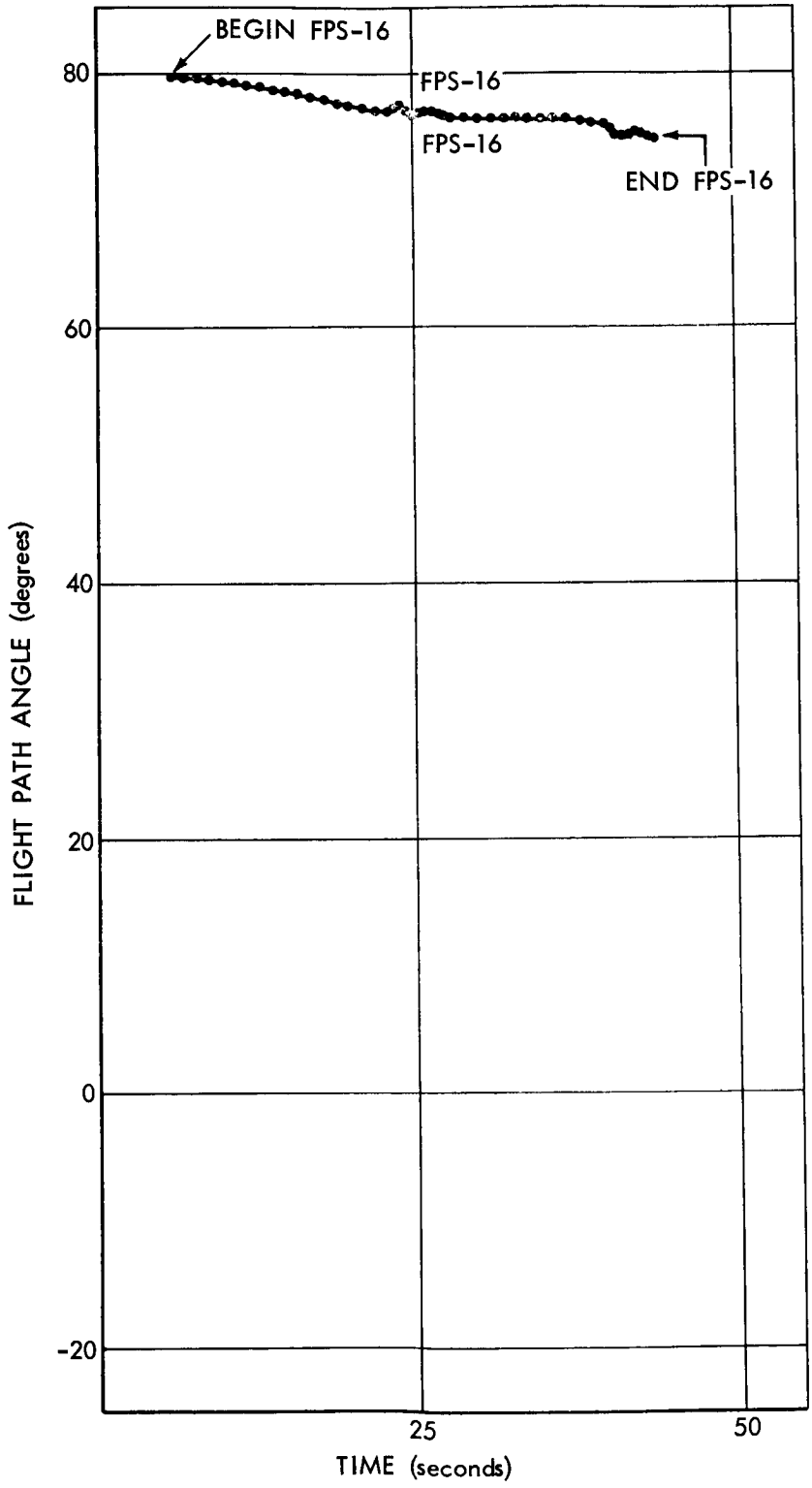

Figure 97. 14.74 CM Radar Plot, Flight Path Angle vs Time

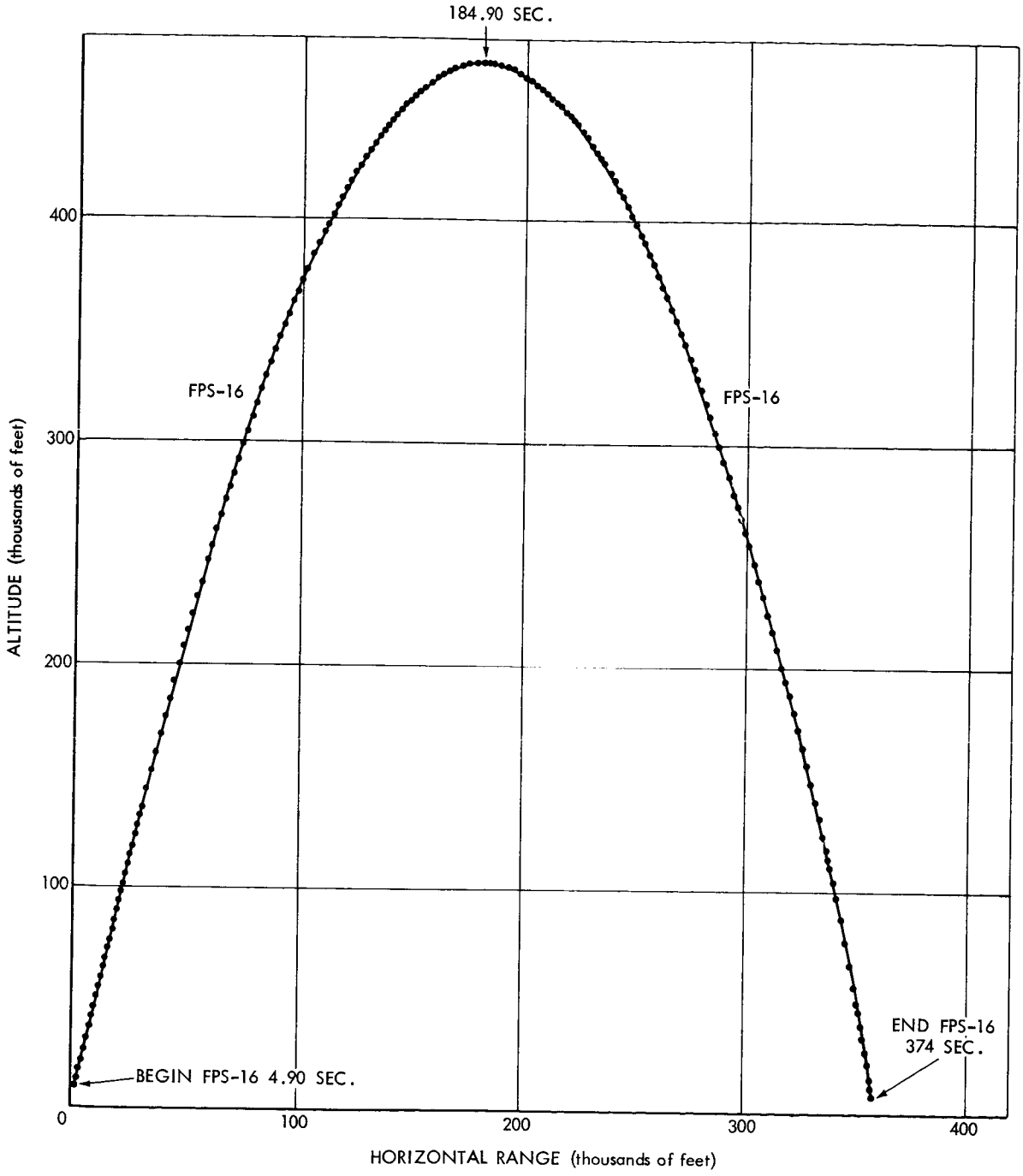

Figure 98. 14.74 CM Radar Plot, Altitude vs Horizontal Range

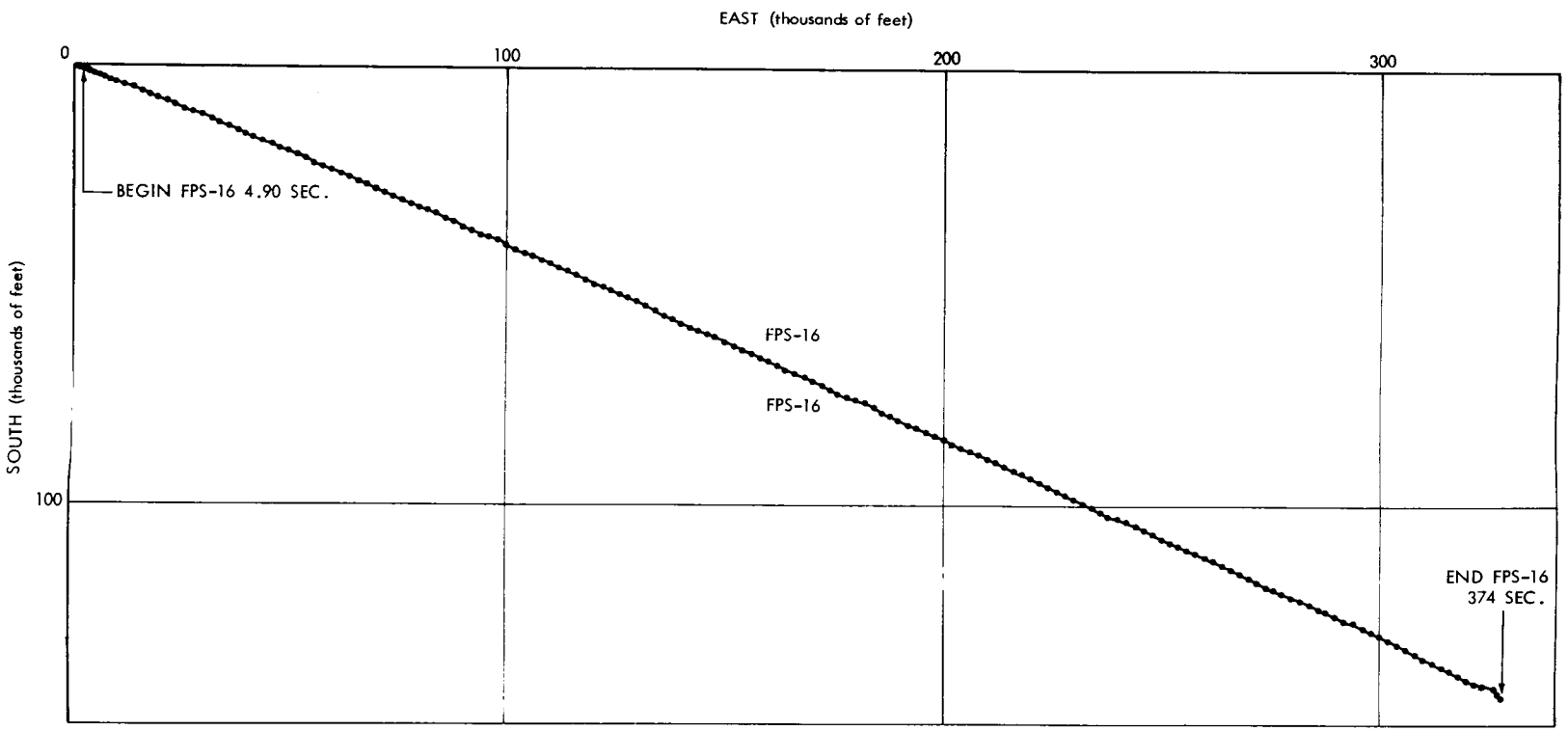

Figure 99. 14.74 CM Radar Plot, South Range vs East Range

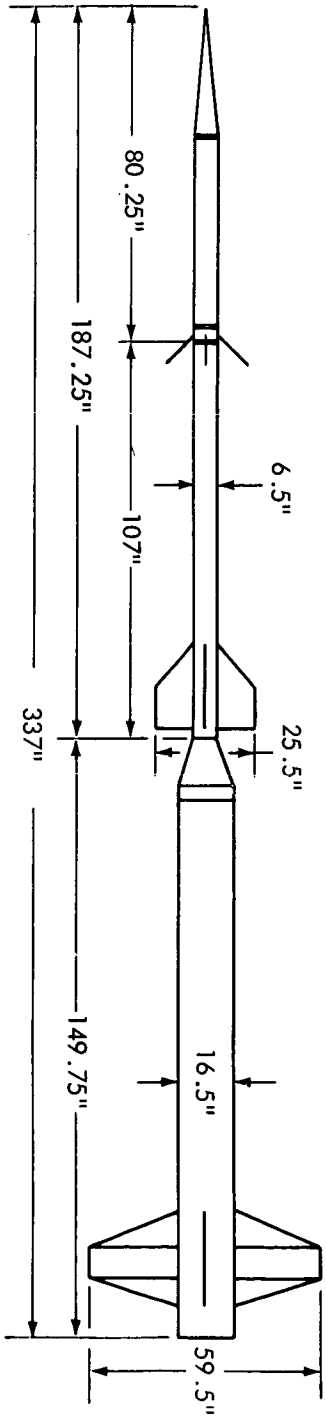

Figure 100. 14:83 UE Sketch

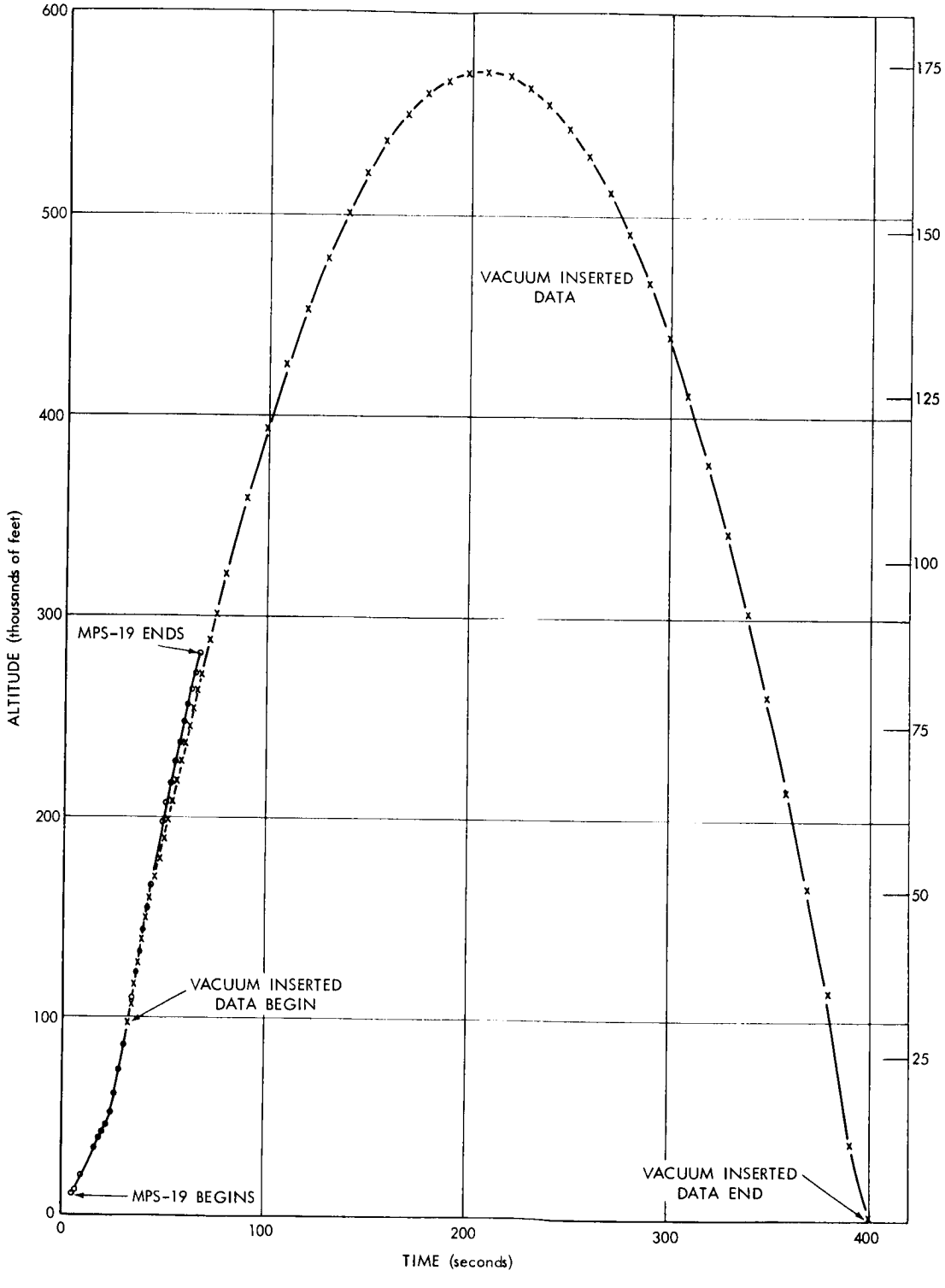

Figure 101. 14.83 UE Radar Plot, Altitude vs Time

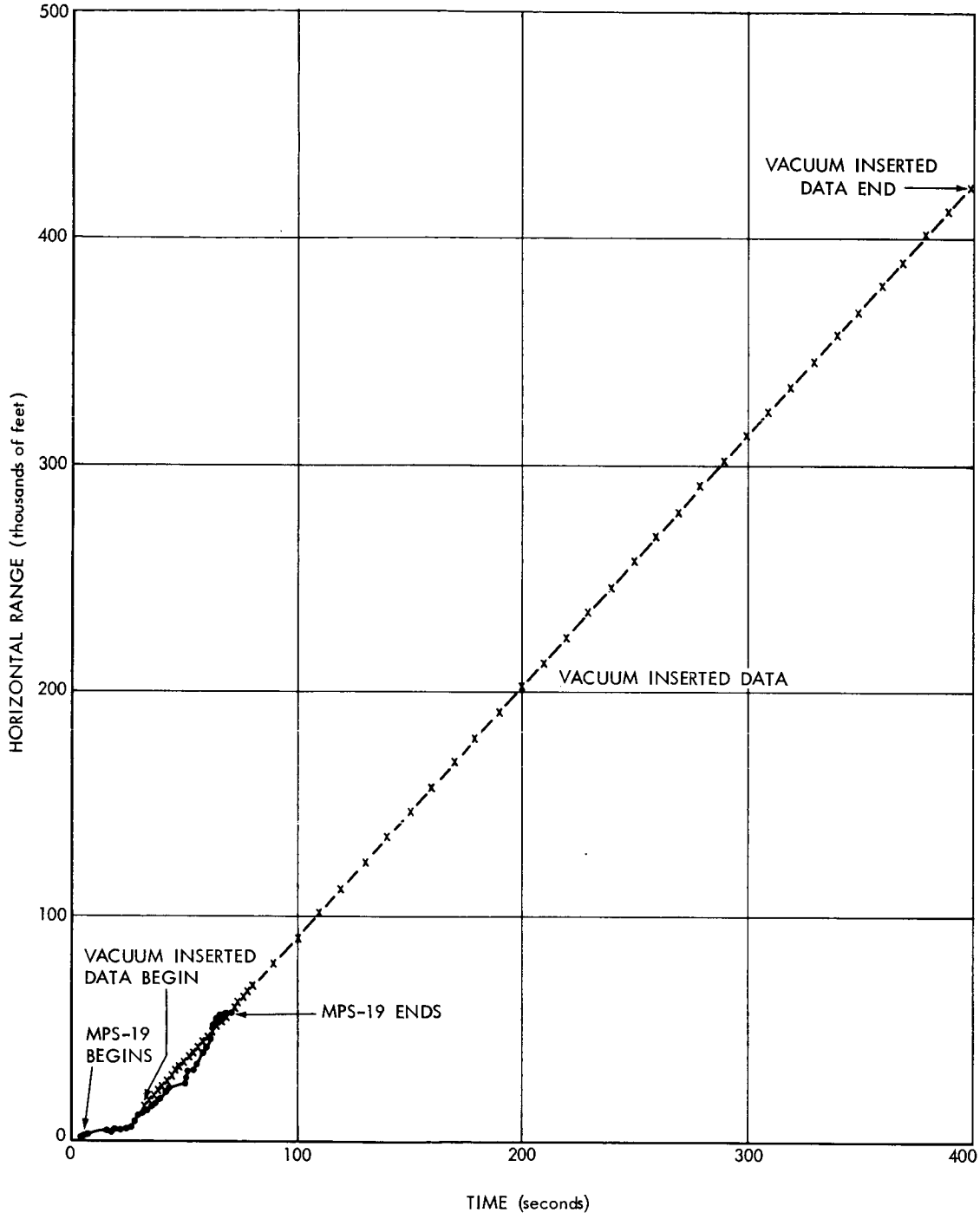

Figure 102. 14.83 UE Radar Plot, Horizontal Range vs Time

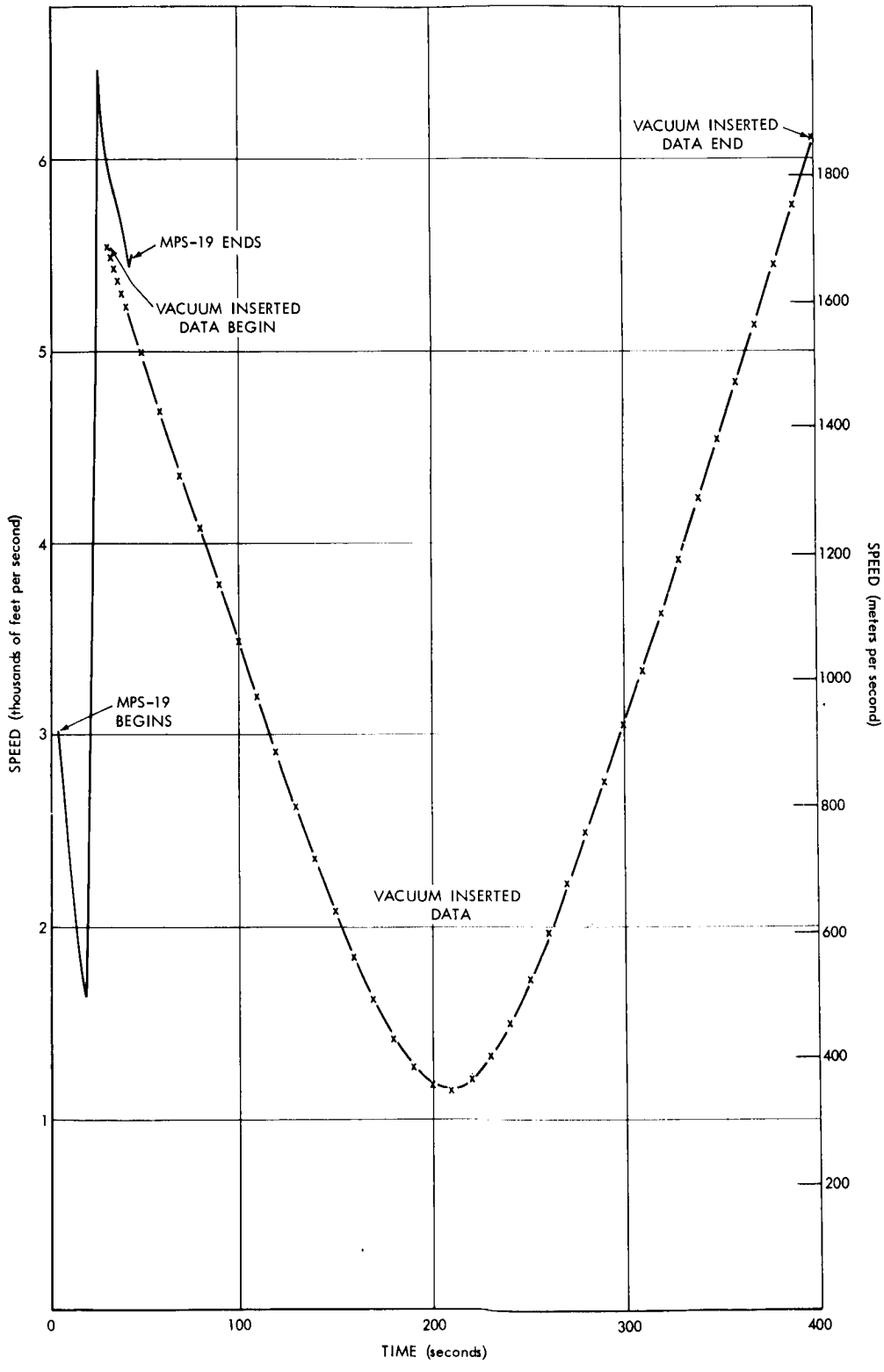

Figure 103. 14.83 UE Radar Plot, Speed vs Time

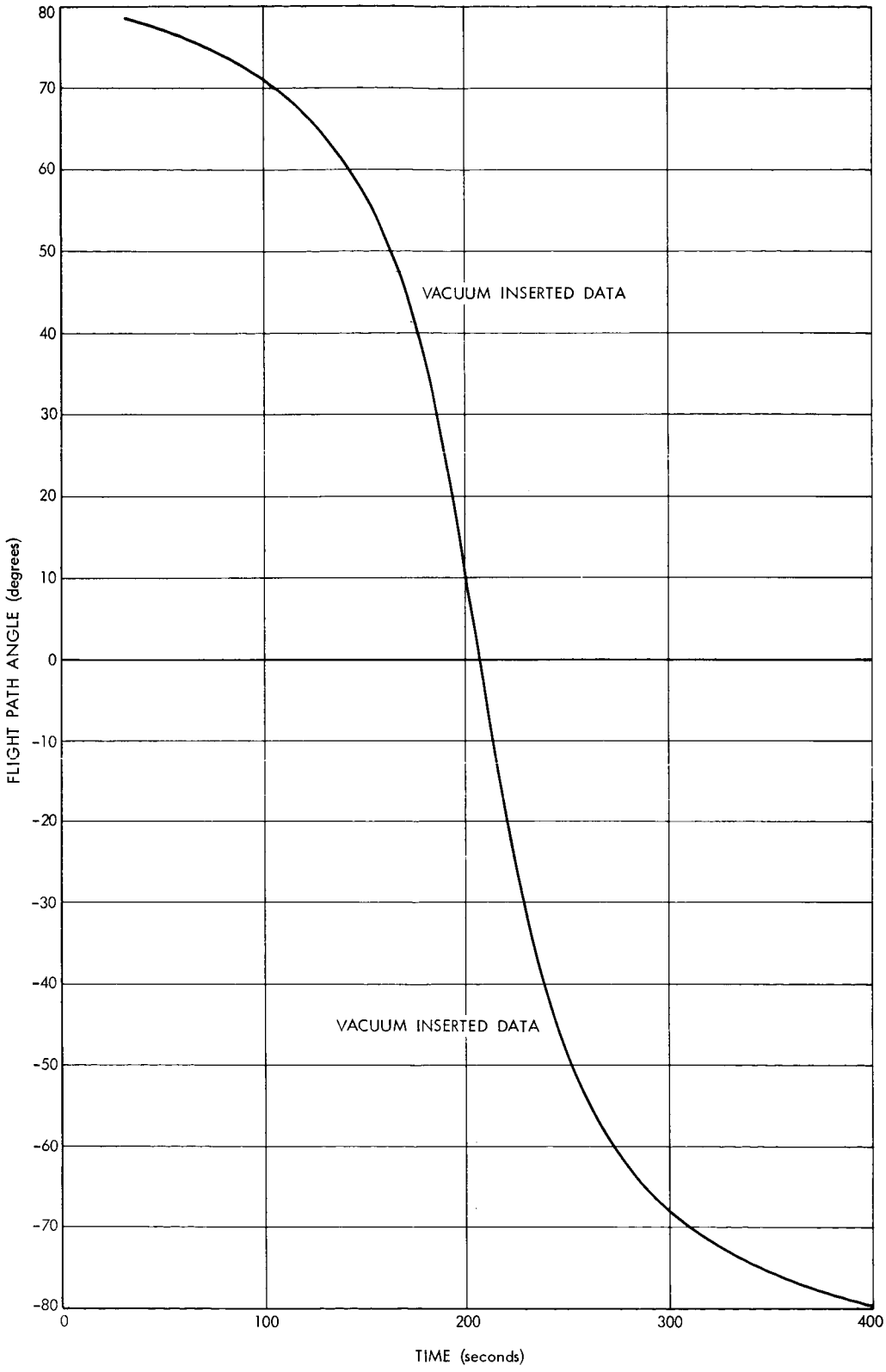

Figure 104. 14.83 UE Radar Plot, Flight Path Angle vs Time

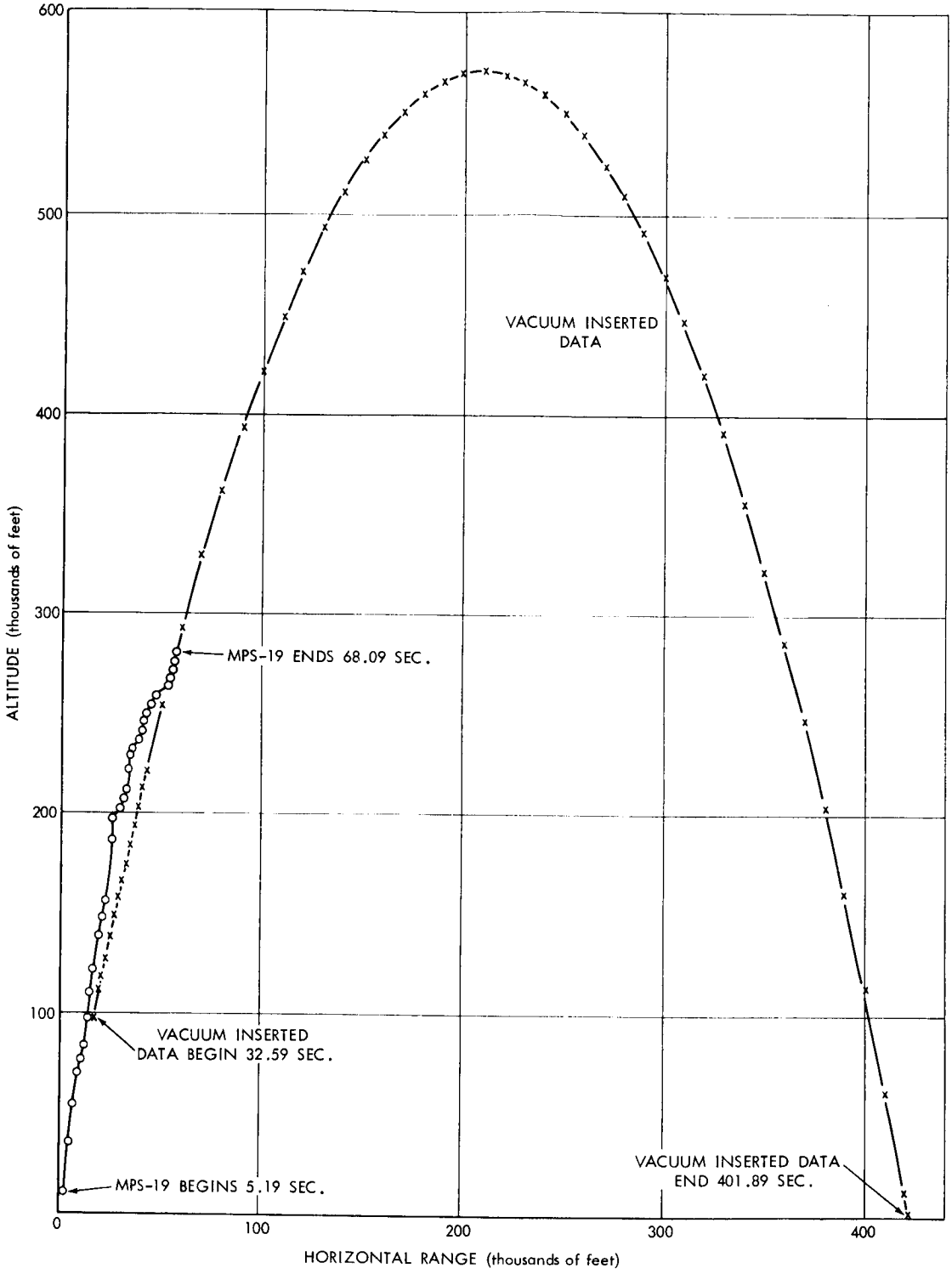

Figure 105. 14.83 UE Radar Plot, Altitude vs Horizontal Range

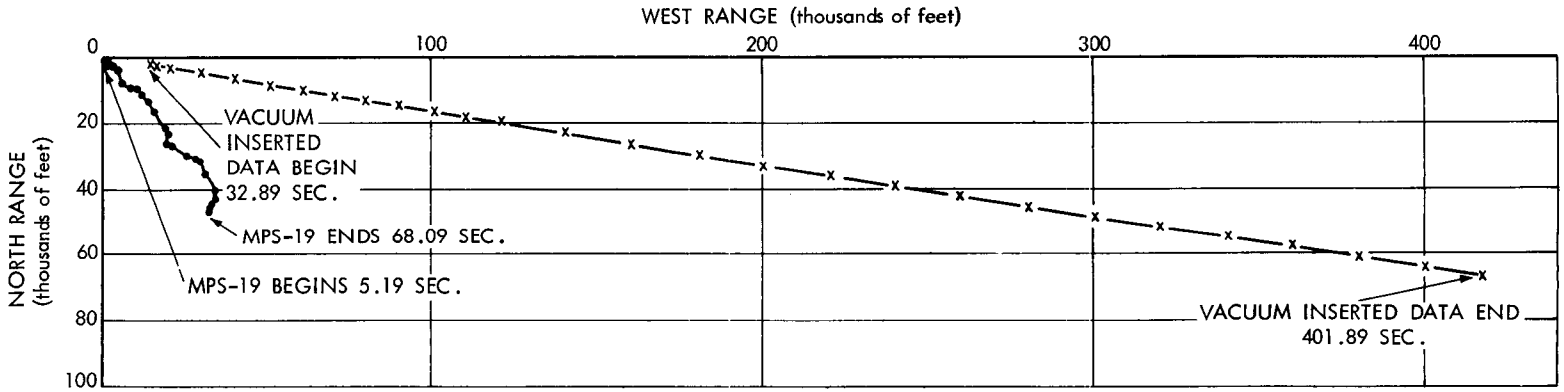

Figure 106. 14.83 UE Radar Plot, North Range vs West Range

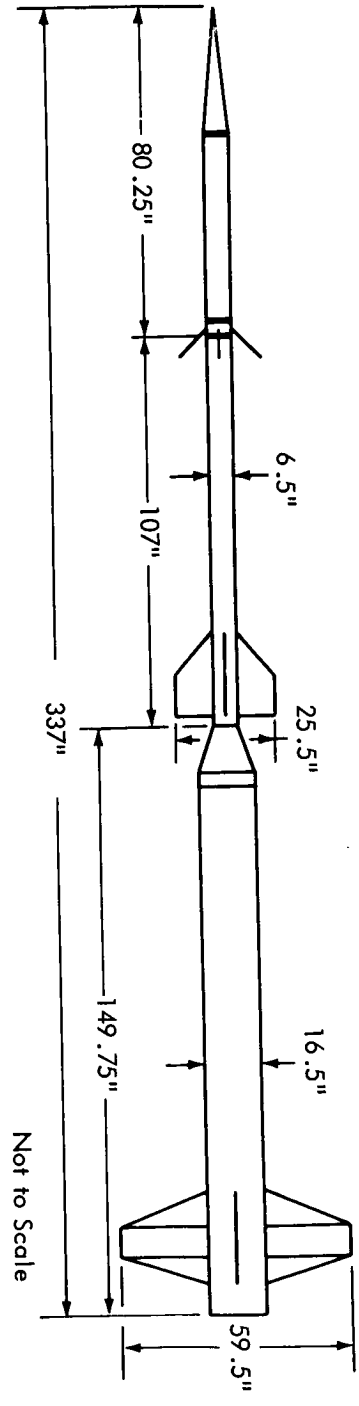

Figure 107. 14.84 UE Sketch

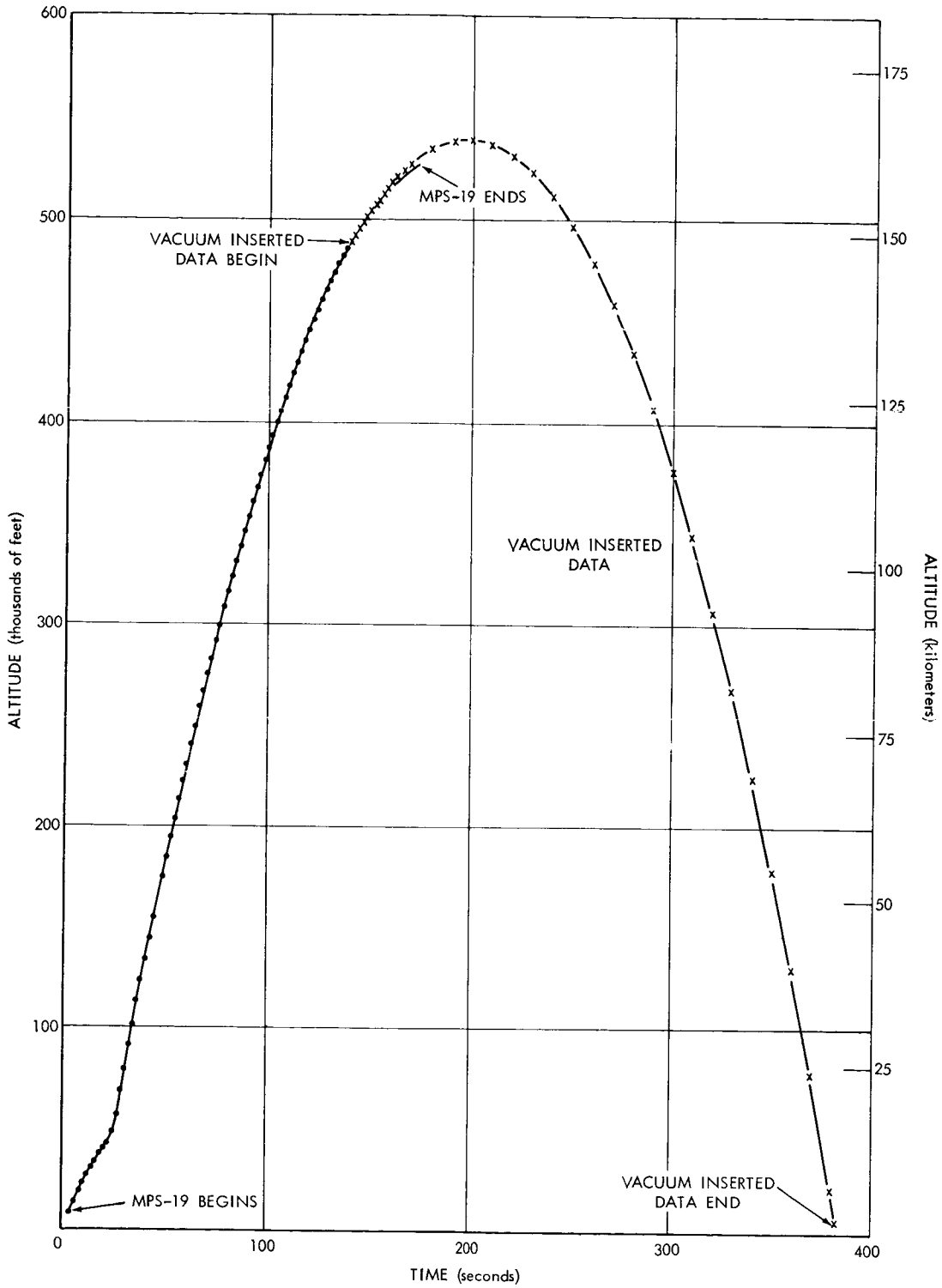

Figure 108. 14.84 UE Radar Plot, Altitude vs Time

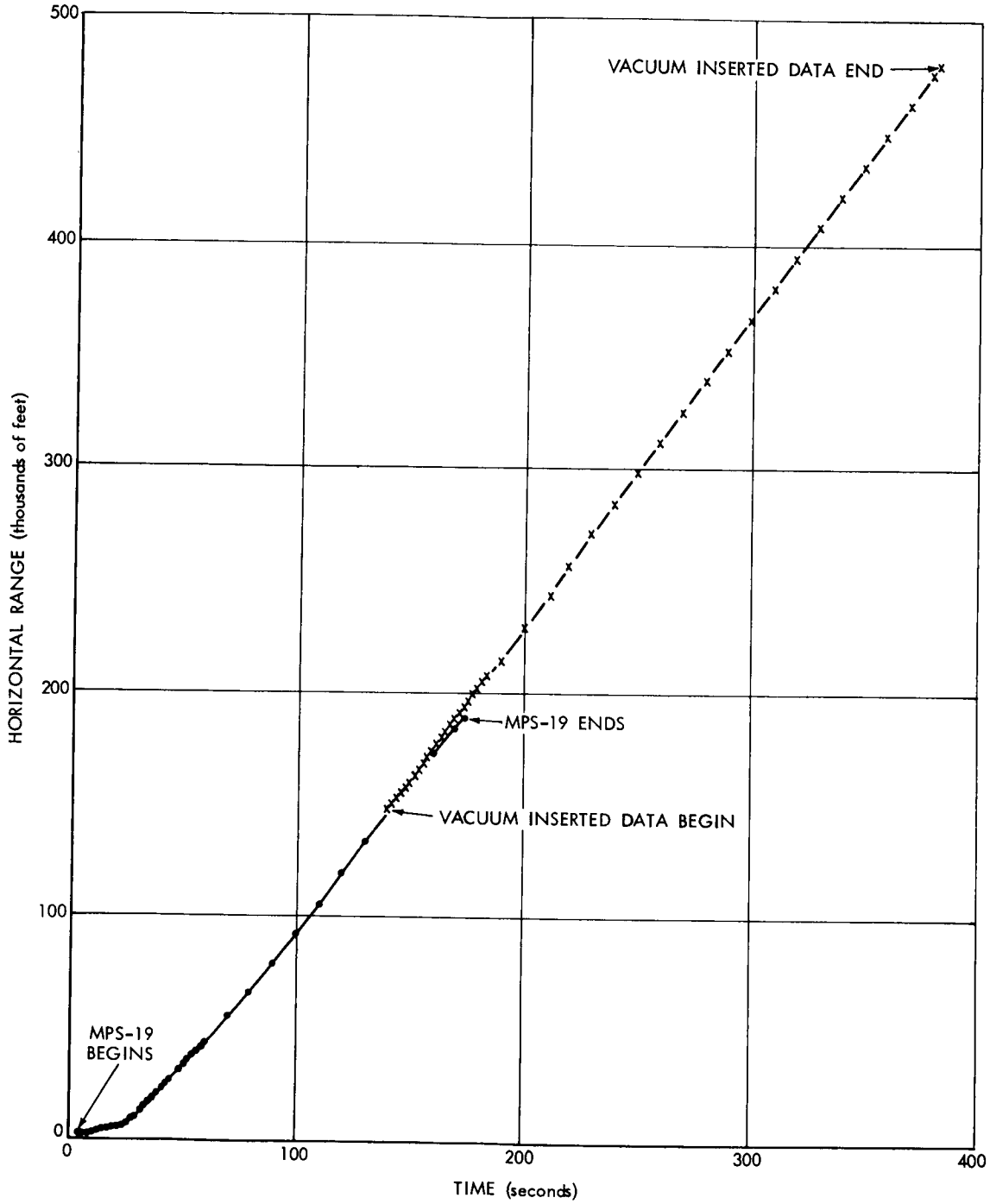

Figure 109. 14.84 UE Radar Plot, Horizontal Range vs Time

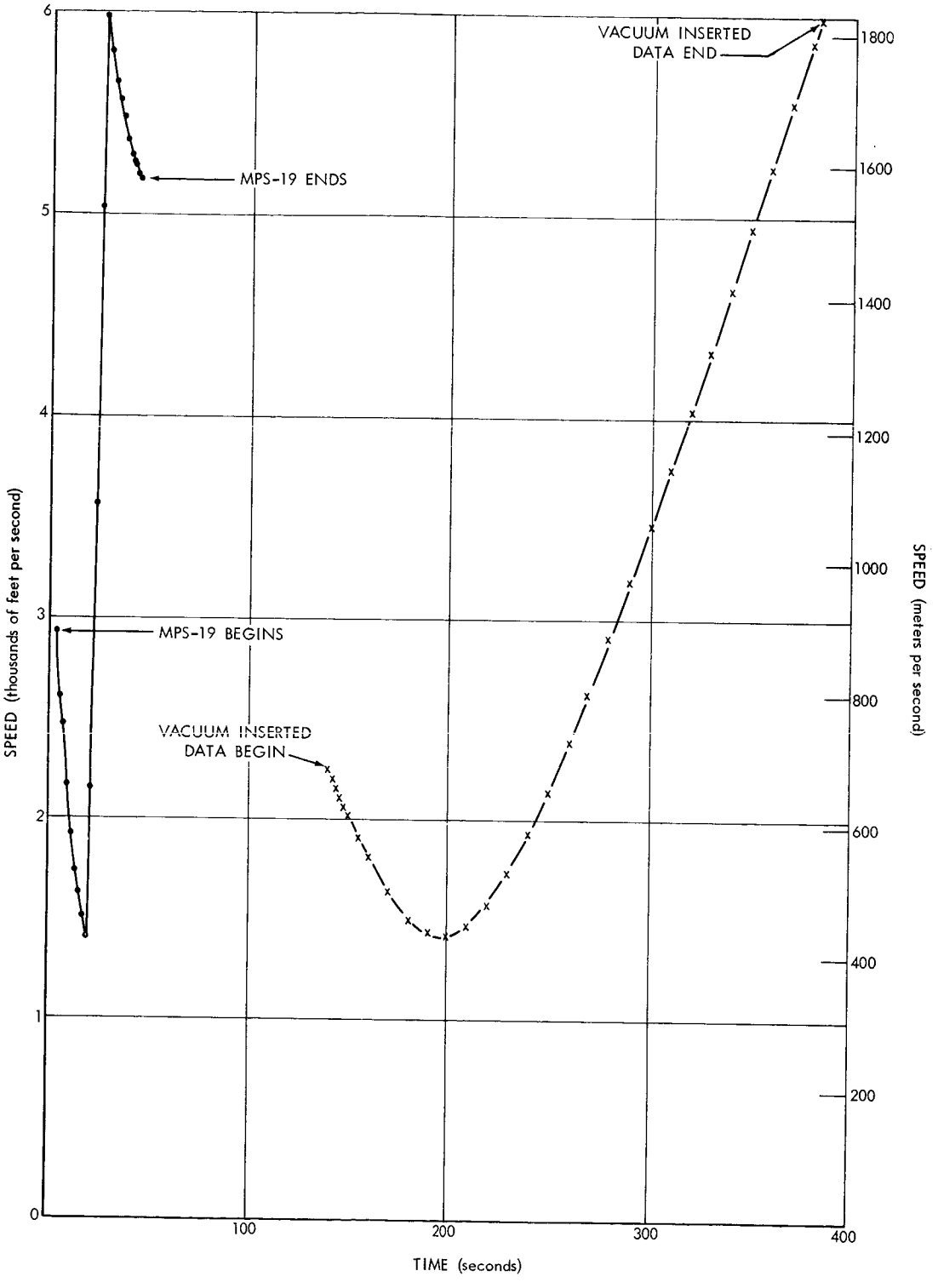

Figure 110. 14.84 UE Radar Plot, Speed vs Time

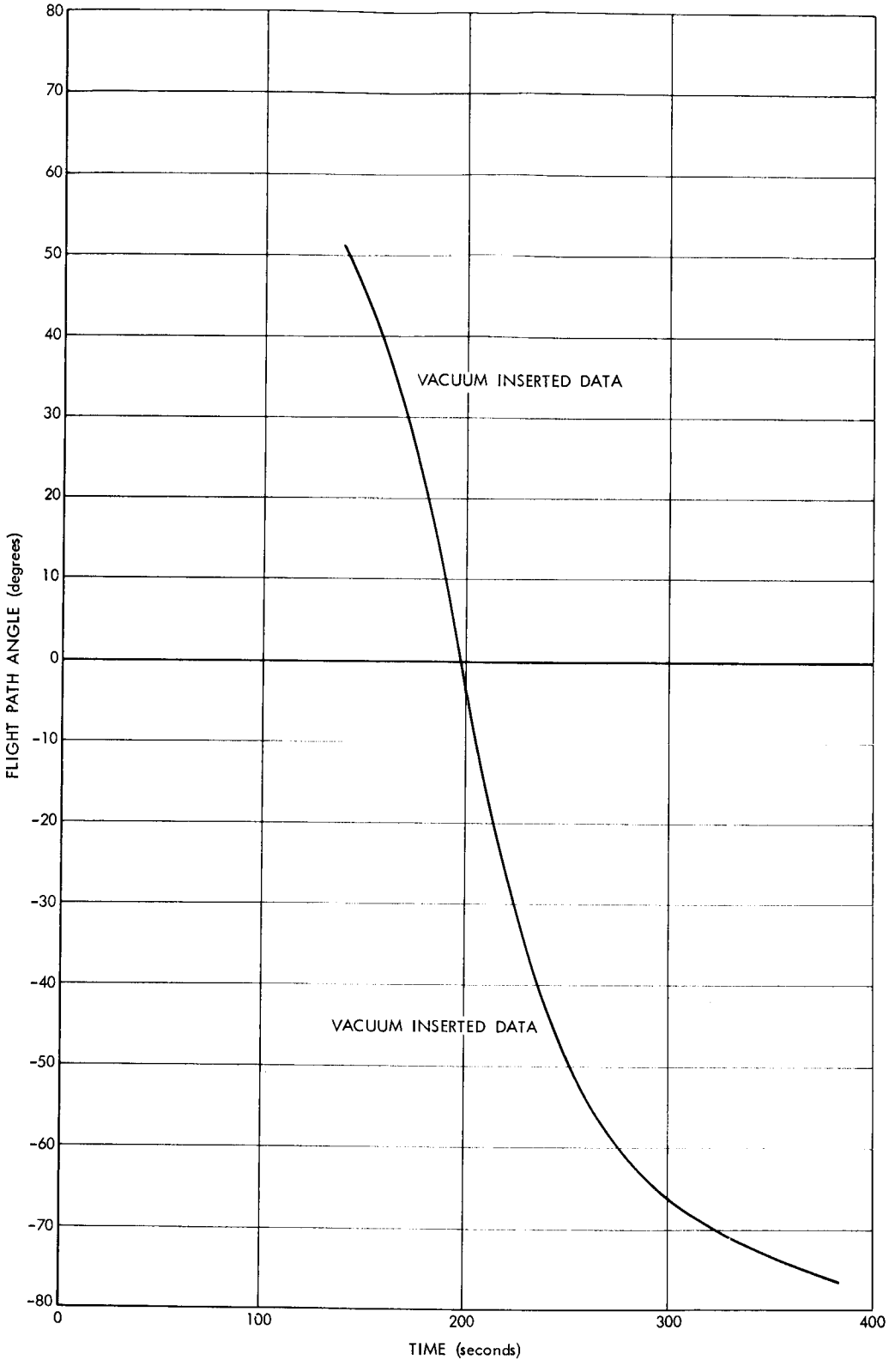

Figure 111. 14.84 UE Radar Plot, Flight Path Angle vs Time

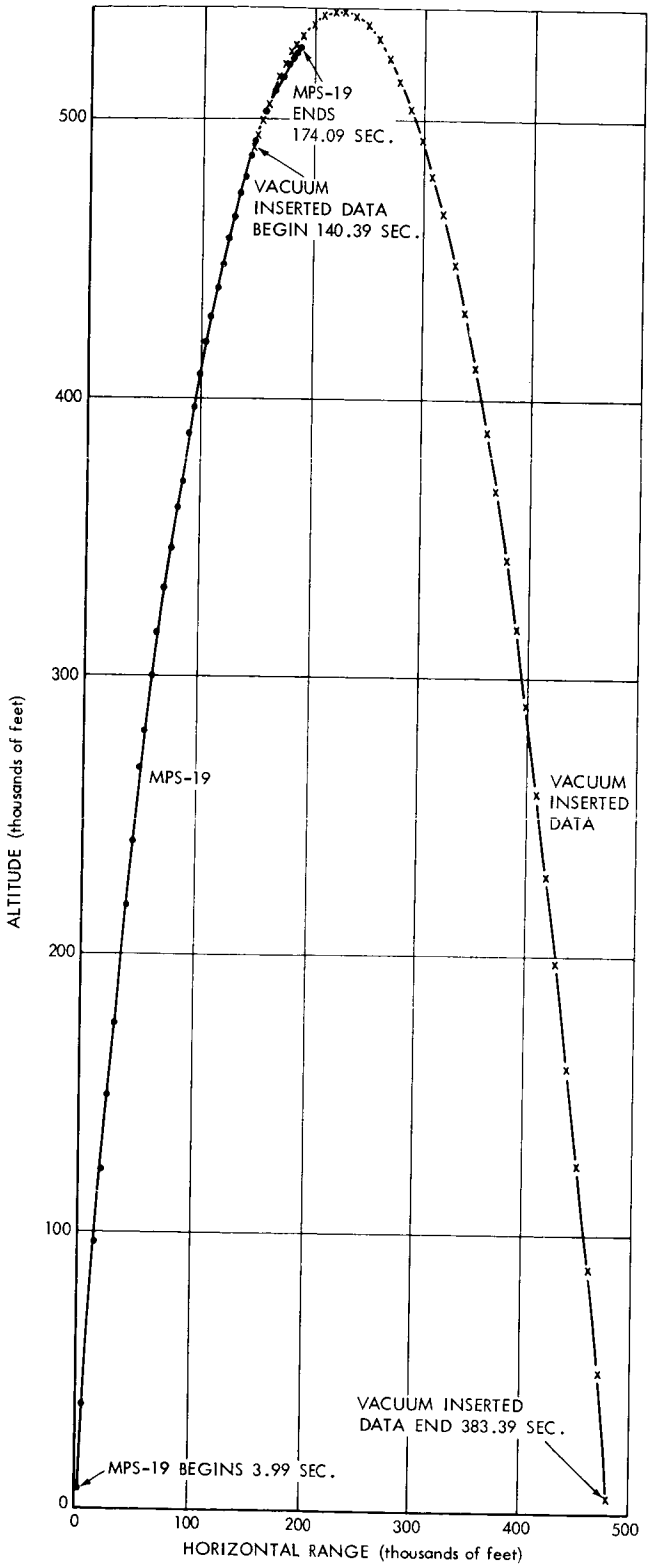

Figure 112. 14.84 UE Radar Plot, Altitude vs Horizontal Range

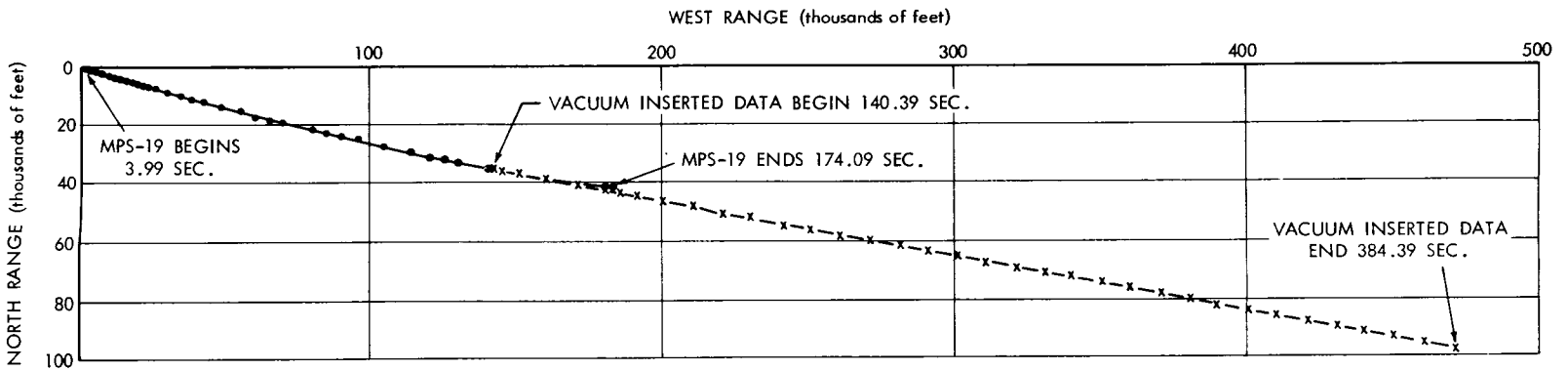

Figure 113. 14.84 UE Radar Plot, North Range vs West Range

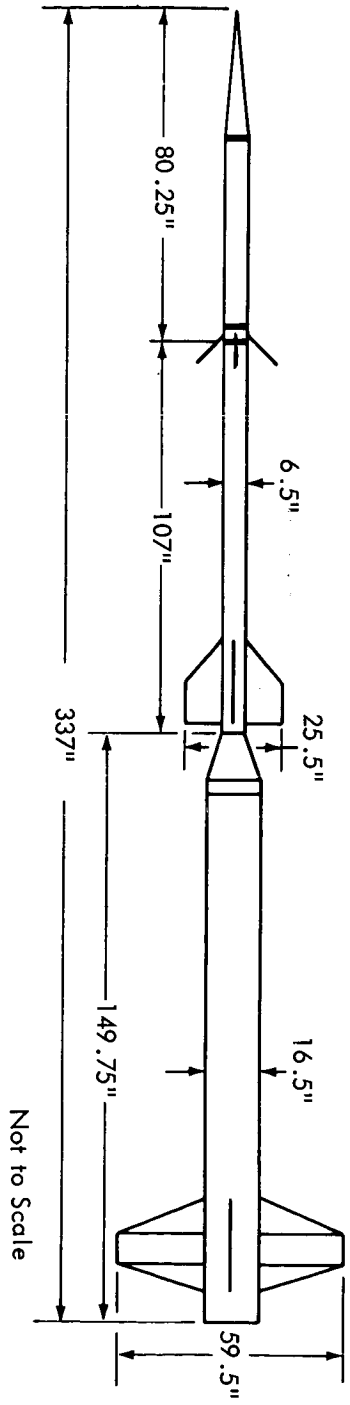

Figure 114. 14.85 UE Sketch

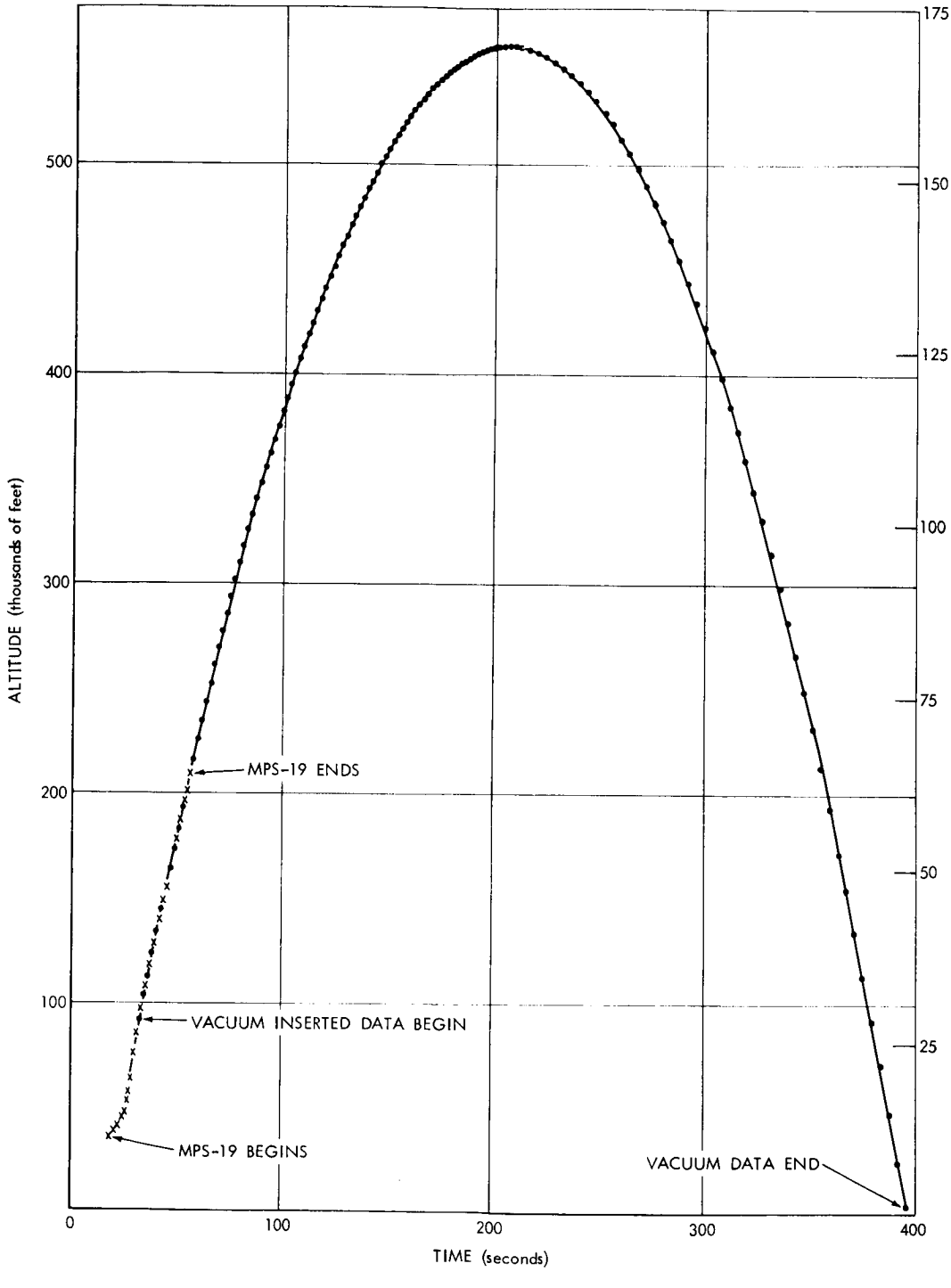

Figure 115. 14.85 UE Radar Plot, Altitude vs Time

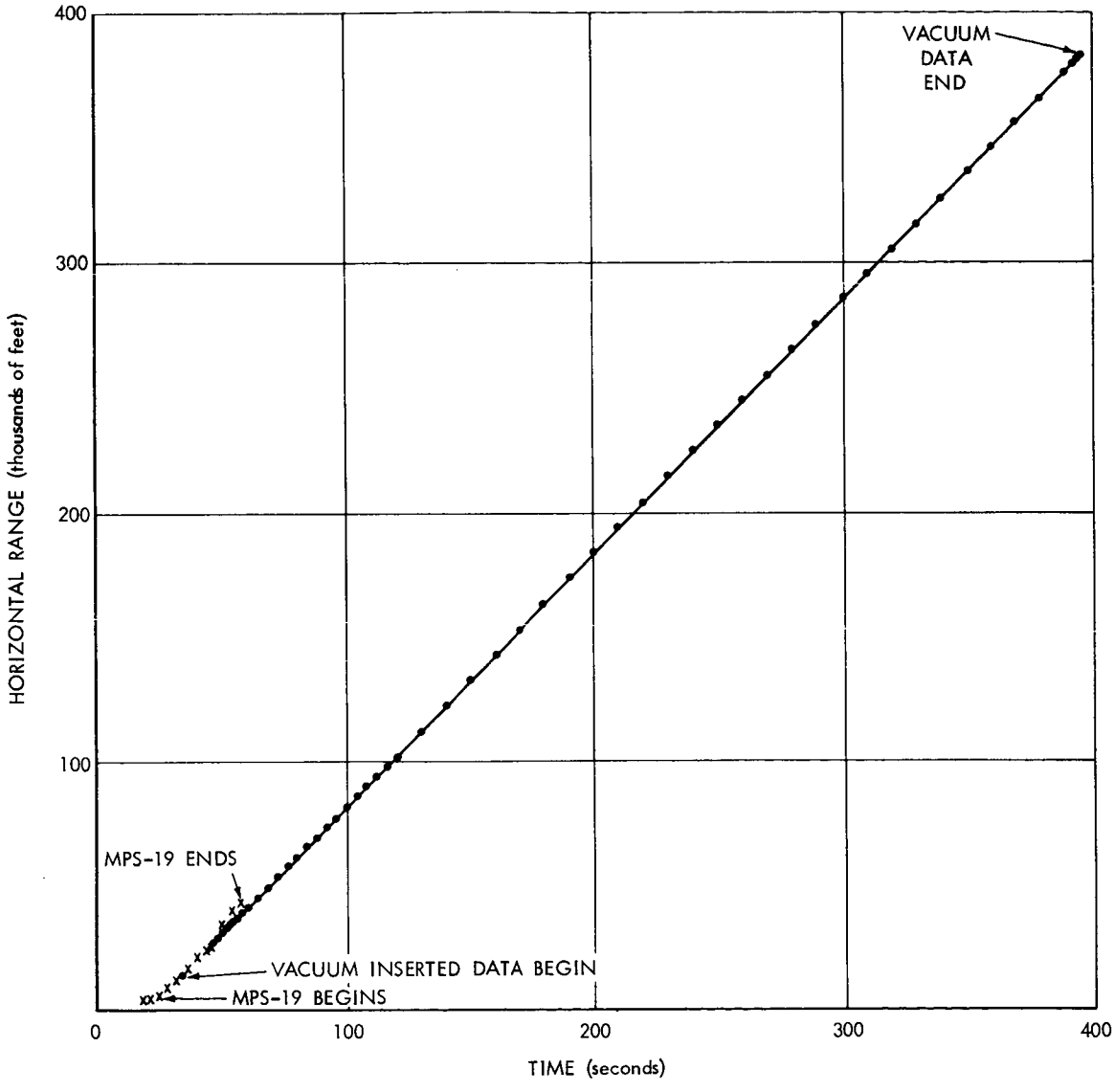

Figure 116. 14.85 UE Radar Plot, Horizontal Range vs Time

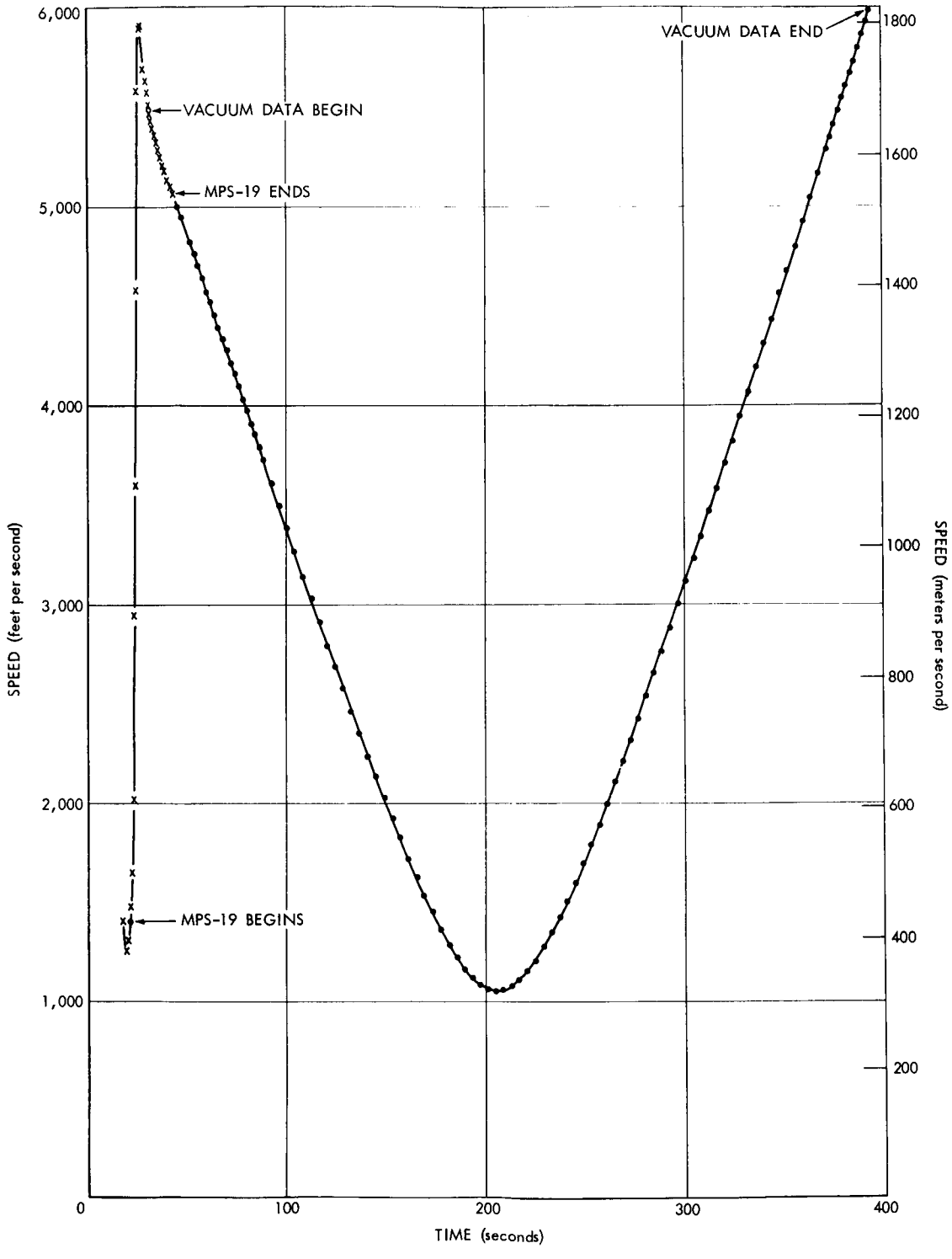

Figure 117. 14.85 UE Radar Plot, Speed vs Time

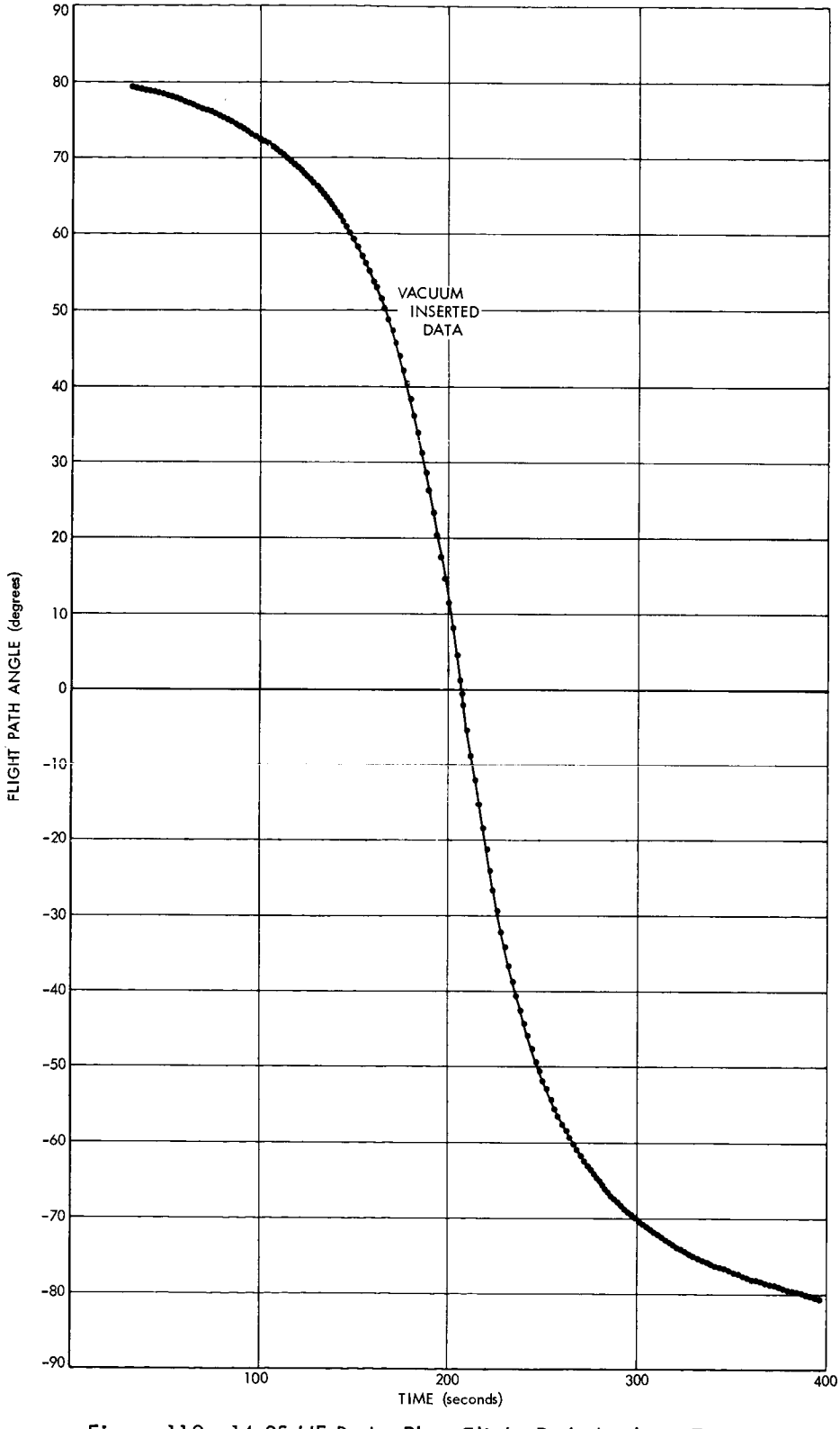

Figure 118. 14.85 UE Radar Plot, Flight Path Angle vs Time

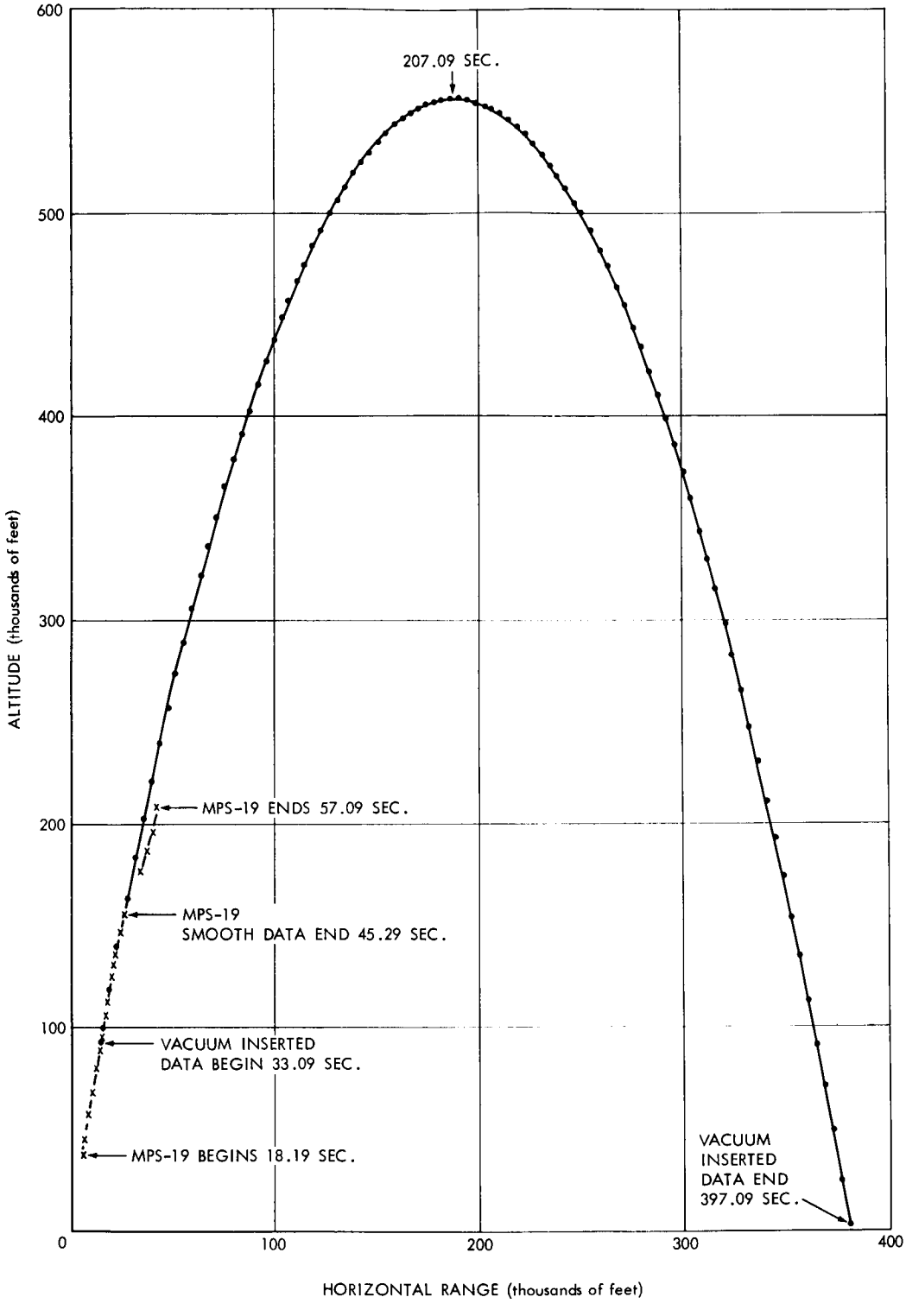

Figure 119. 14.85 UE Radar Plot, Altitude vs Horizontal Range

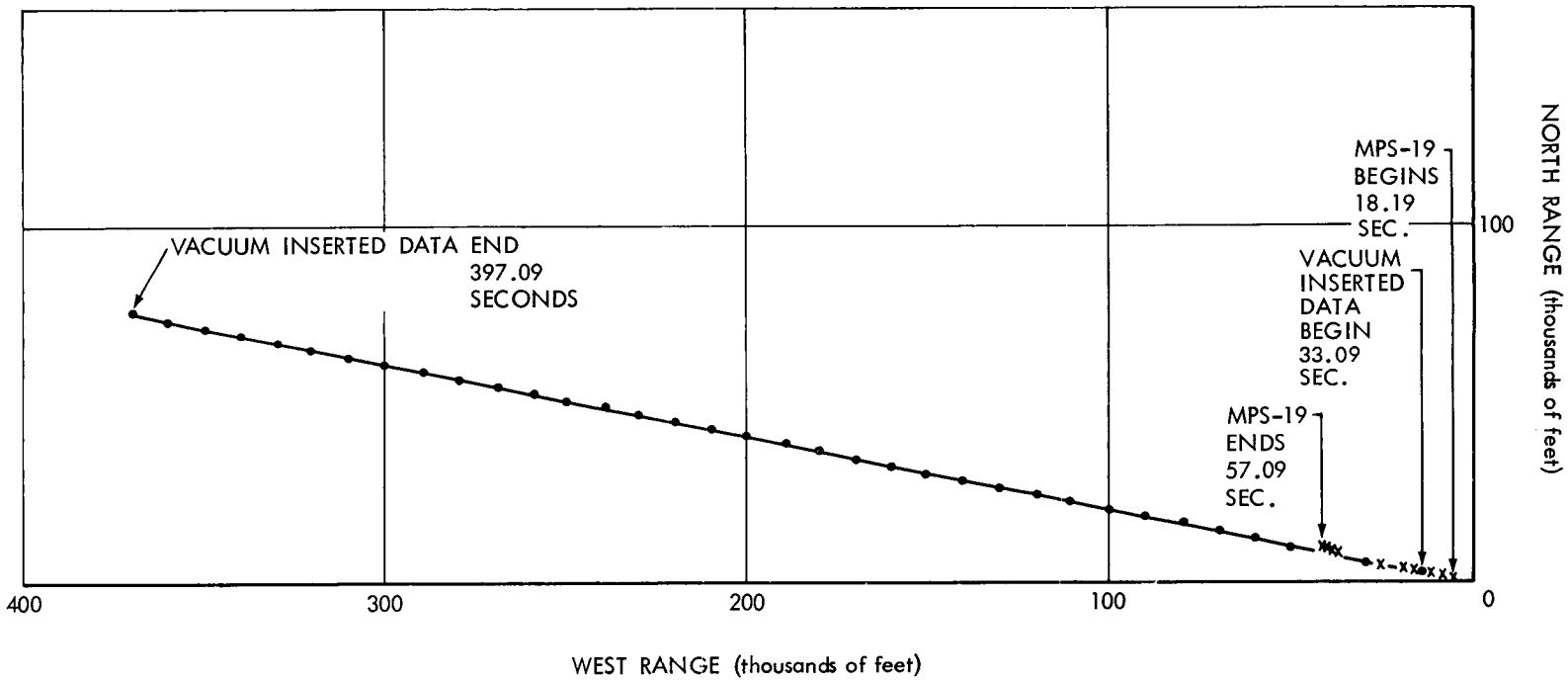

Figure 120. 14.85 UE Radar Plot, North Range vs West Range

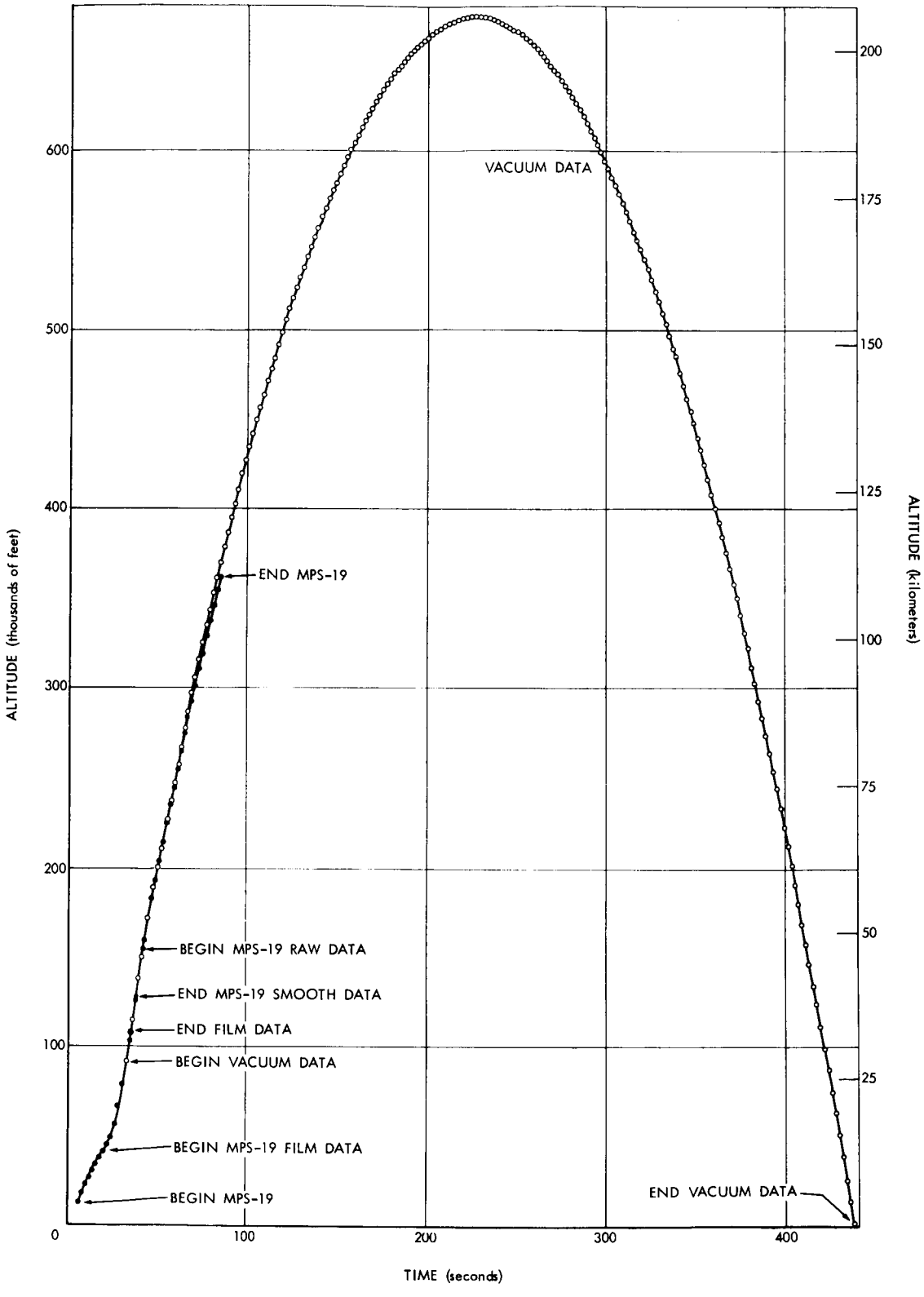

Figure 121. 14.98 UA Radar Plot, Altitude vs Time

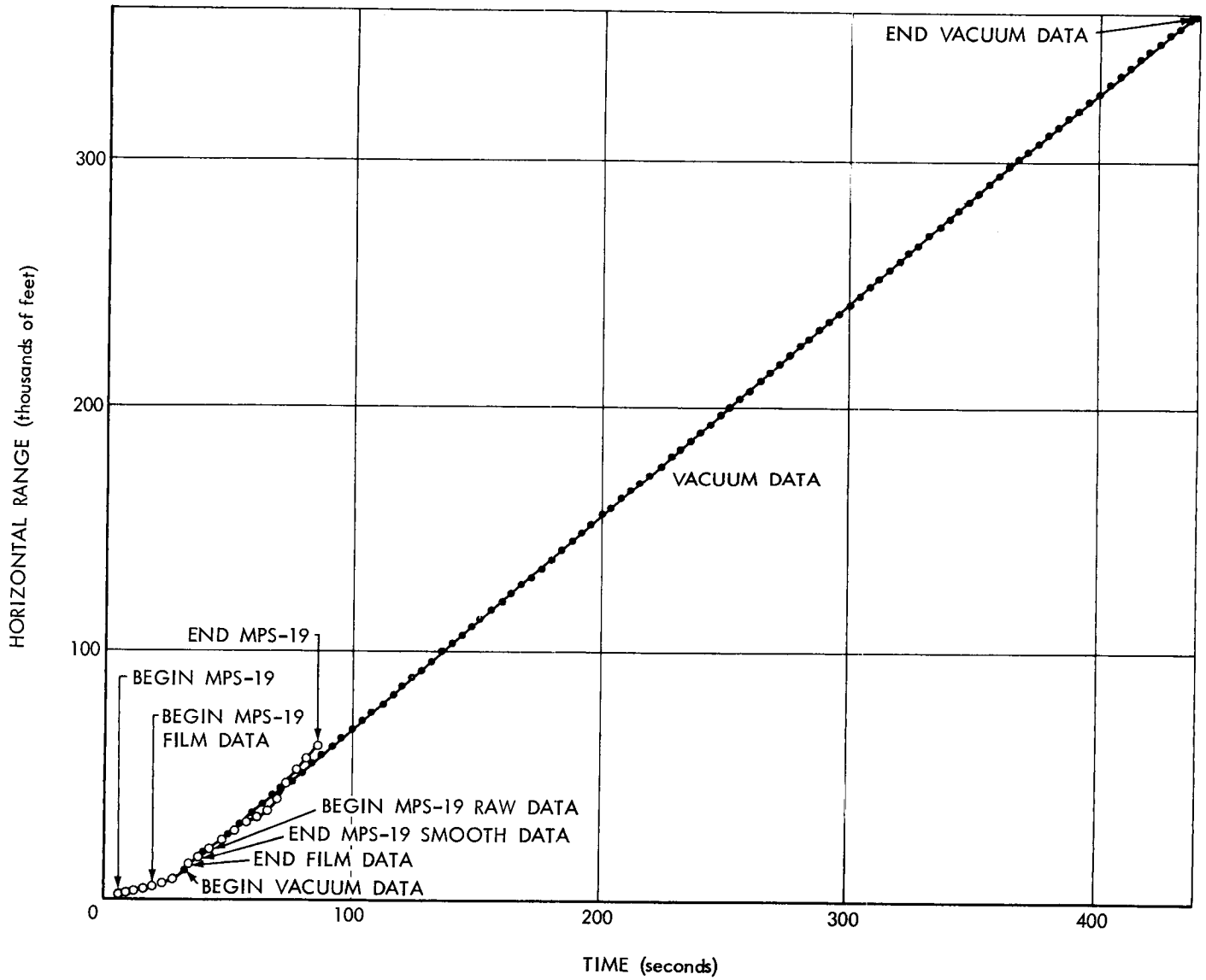

Figure 122. 14.98 UA Radar Plot, Horizontal Range vs Time

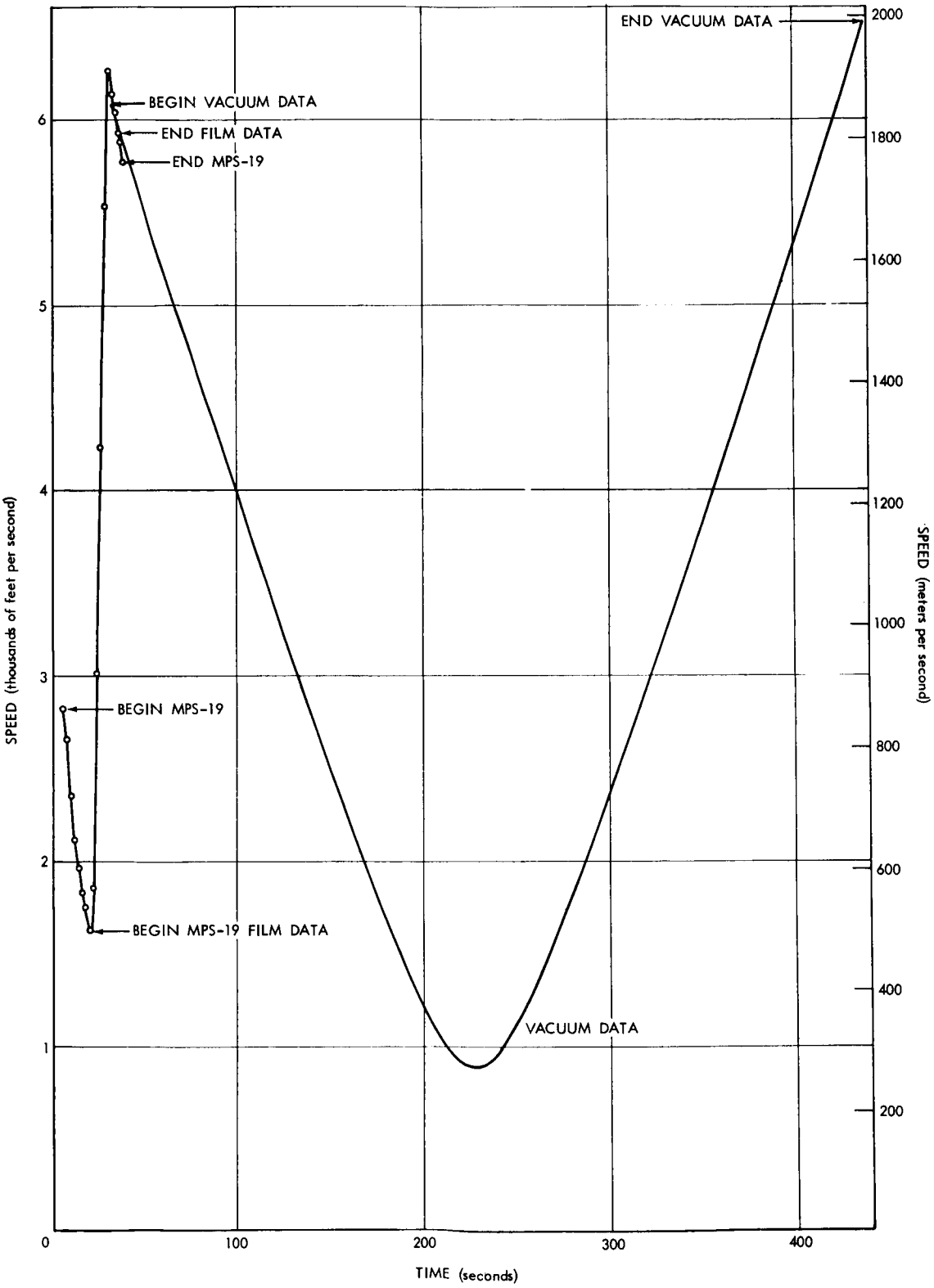

Figure 123. 14.98 UA Radar Plot, Speed vs Time

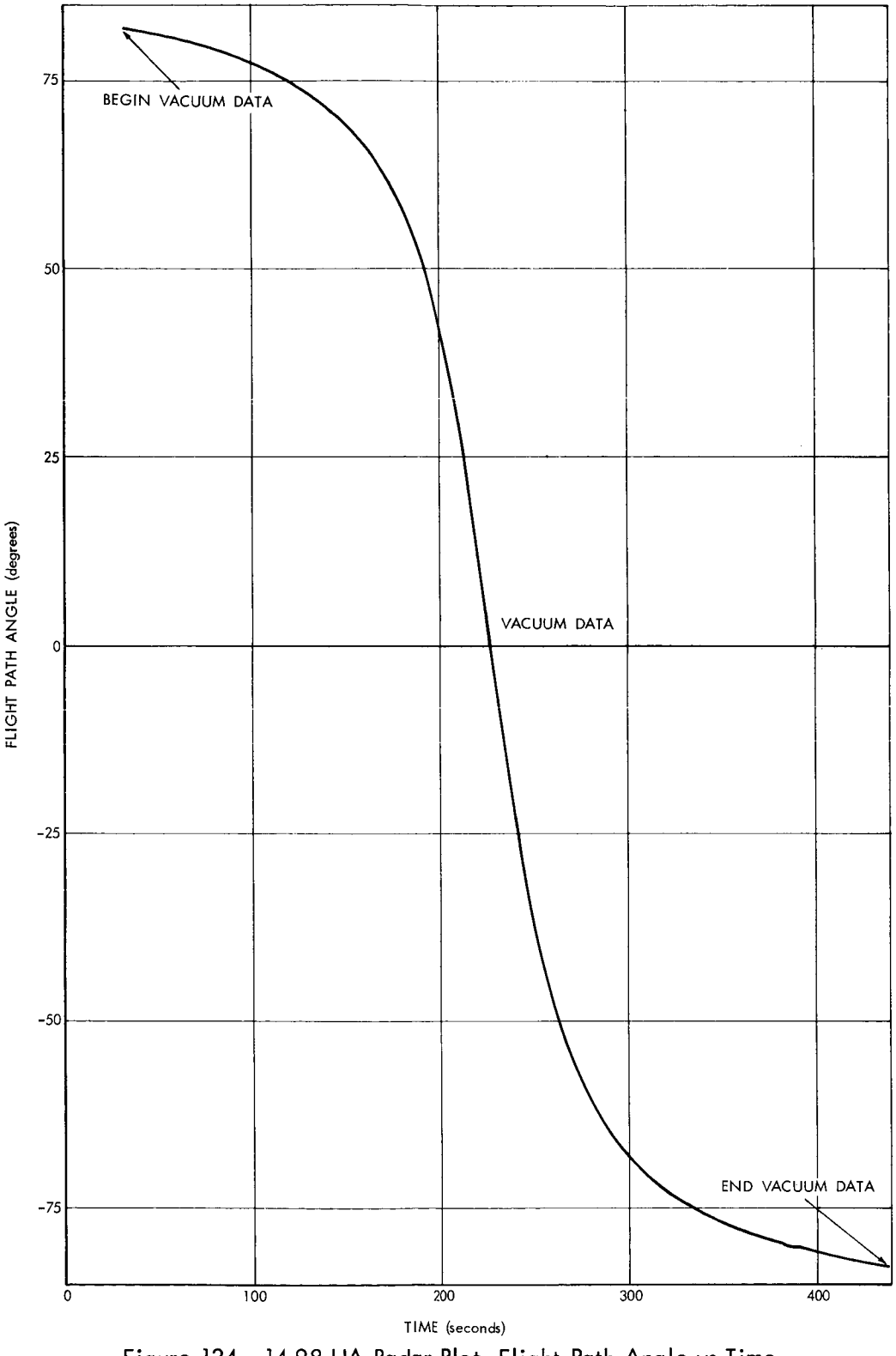

Figure 124. 14.98 UA Radar Plot, Flight Path Angle vs Time

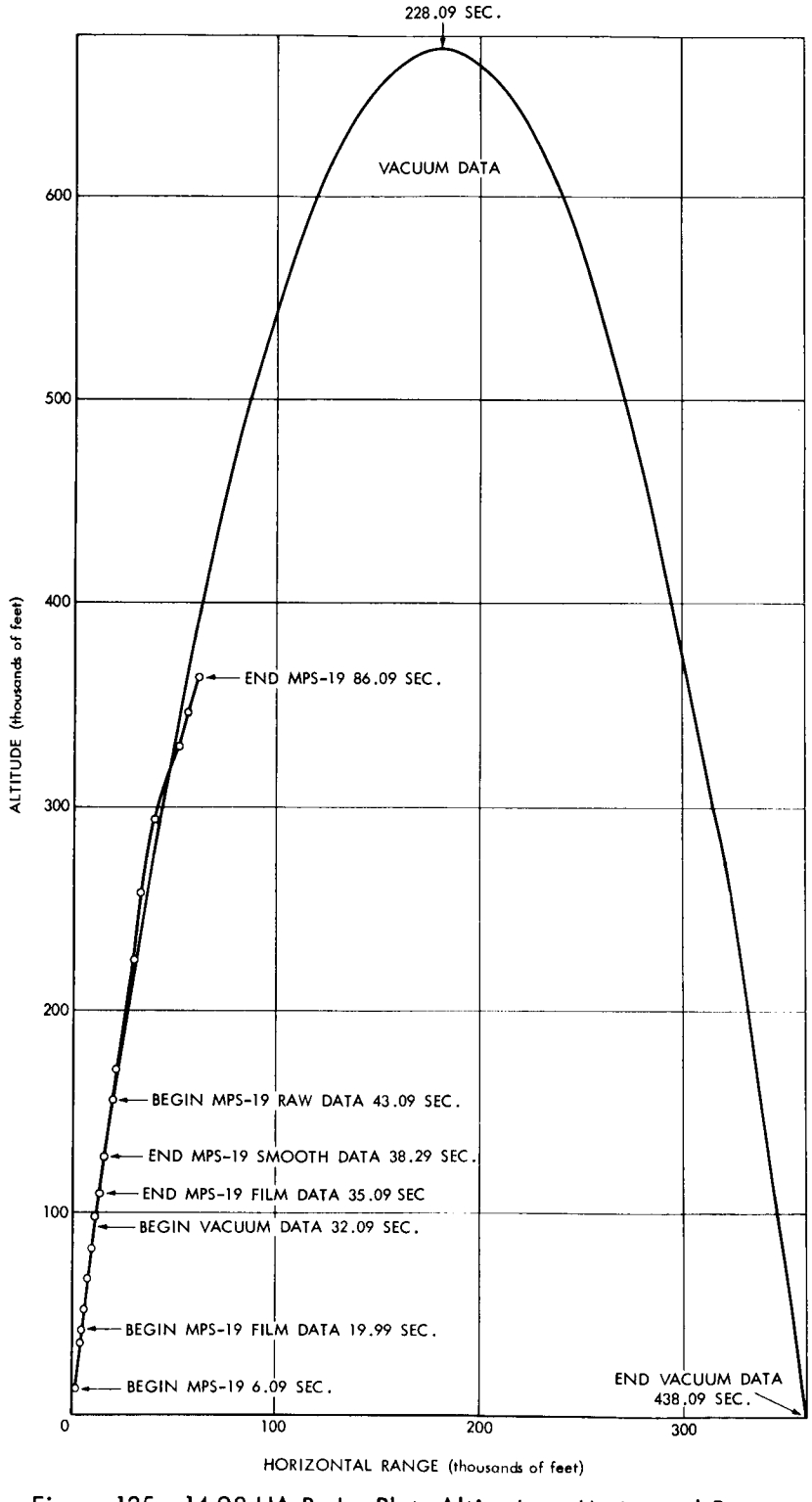

Figure 125. 14.98 UA Radar Plot, Altitude vs Horizontal Range

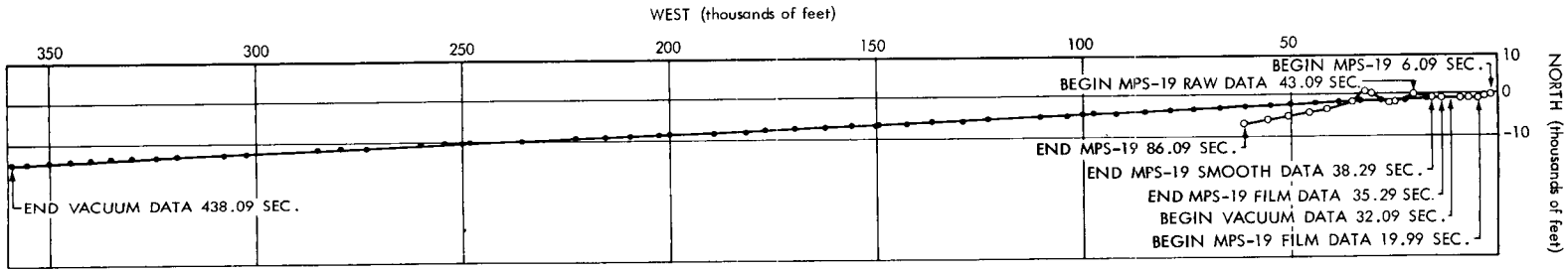

Figure 126. 14.98 UA Radar Plot, North Range vs West Range

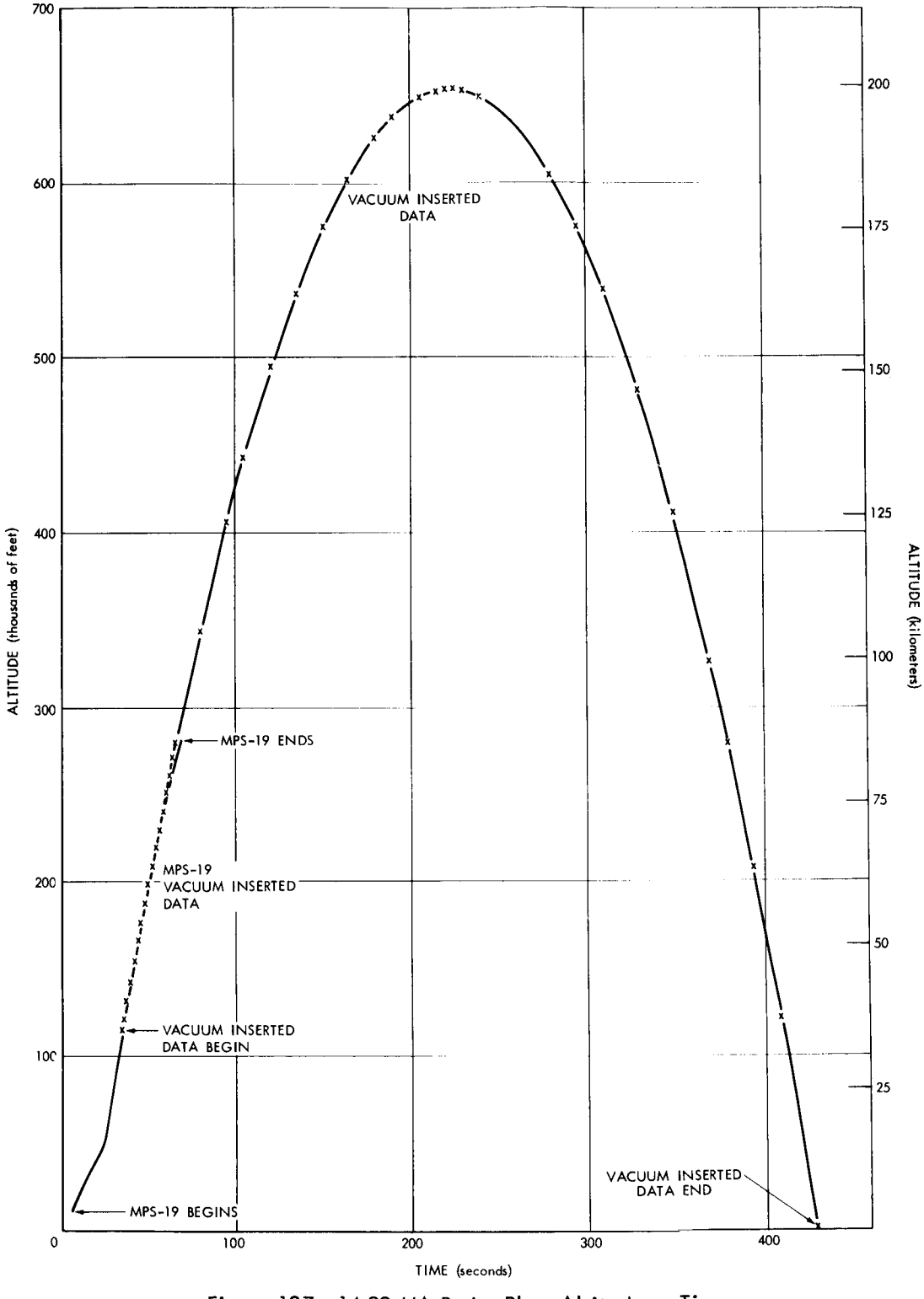

Figure 127. 14.99 UA Radar Plot, Altitude vs Time

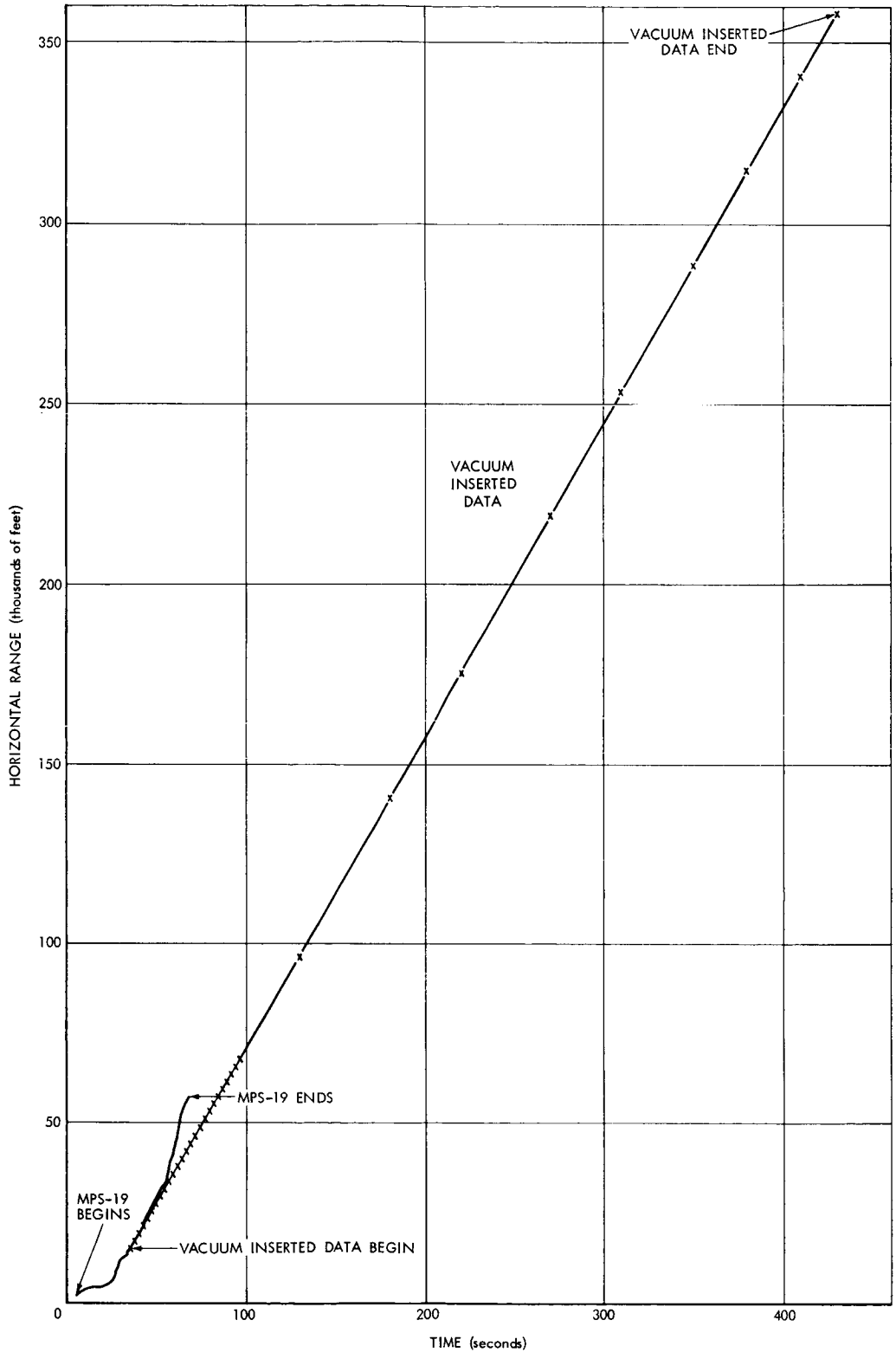

Figure 128. 14.99 UA Radar Plot, Horizontal Range vs Time

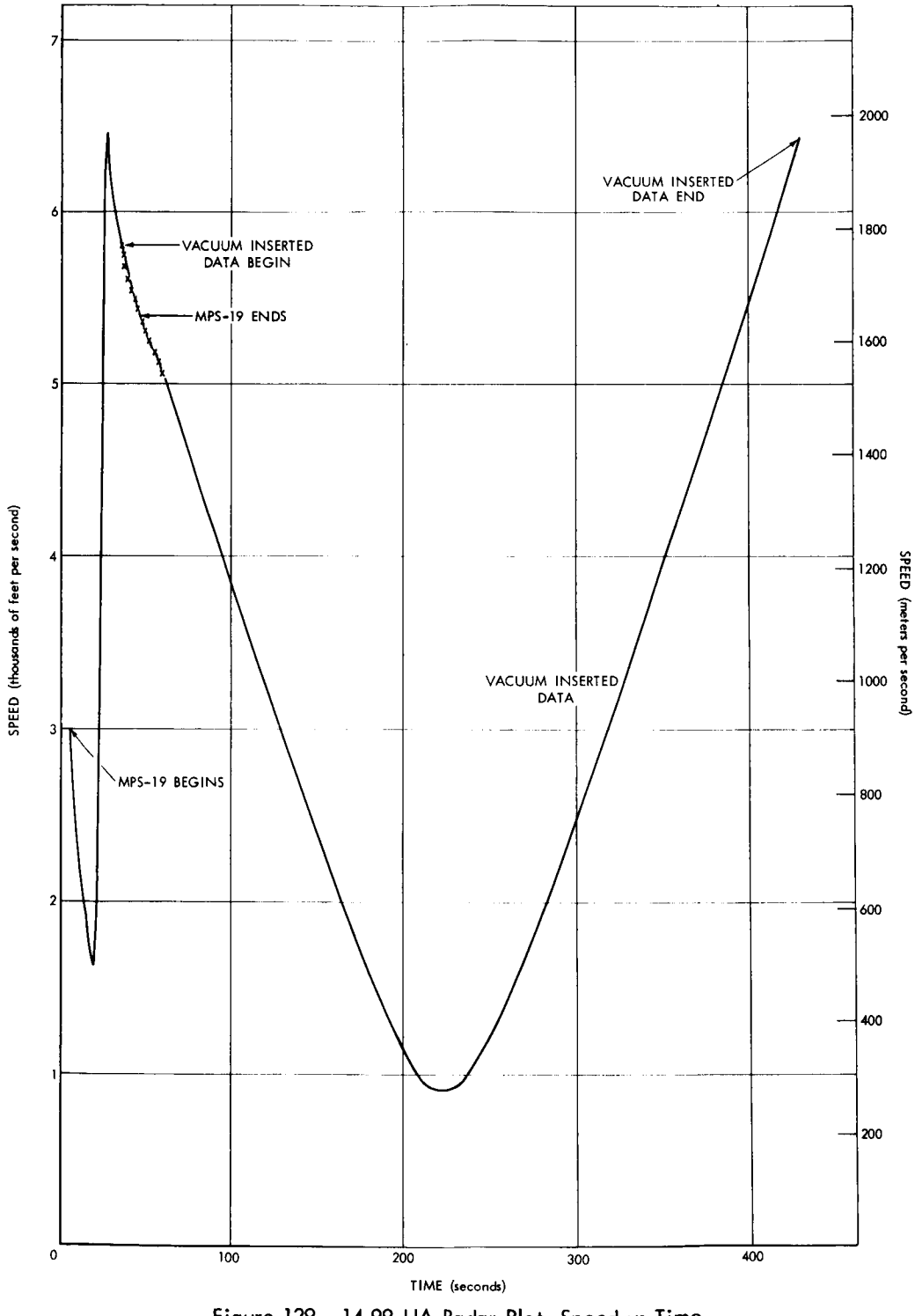

Figure 129. 14.99 UA Radar Plot, Speed vs Time

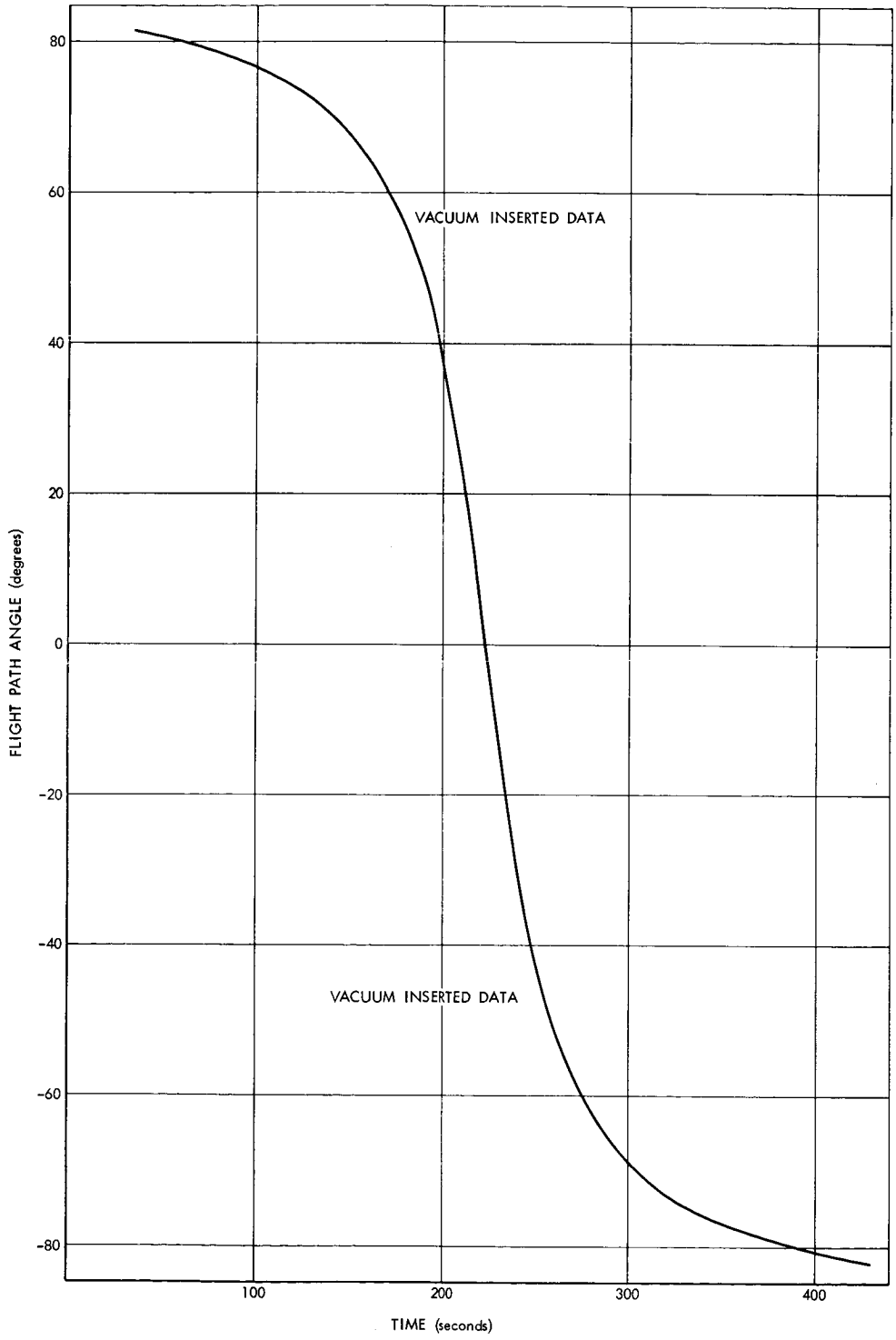

Figure 130. 14.99 UA Radar Plot, Flight Path Angle vs Time

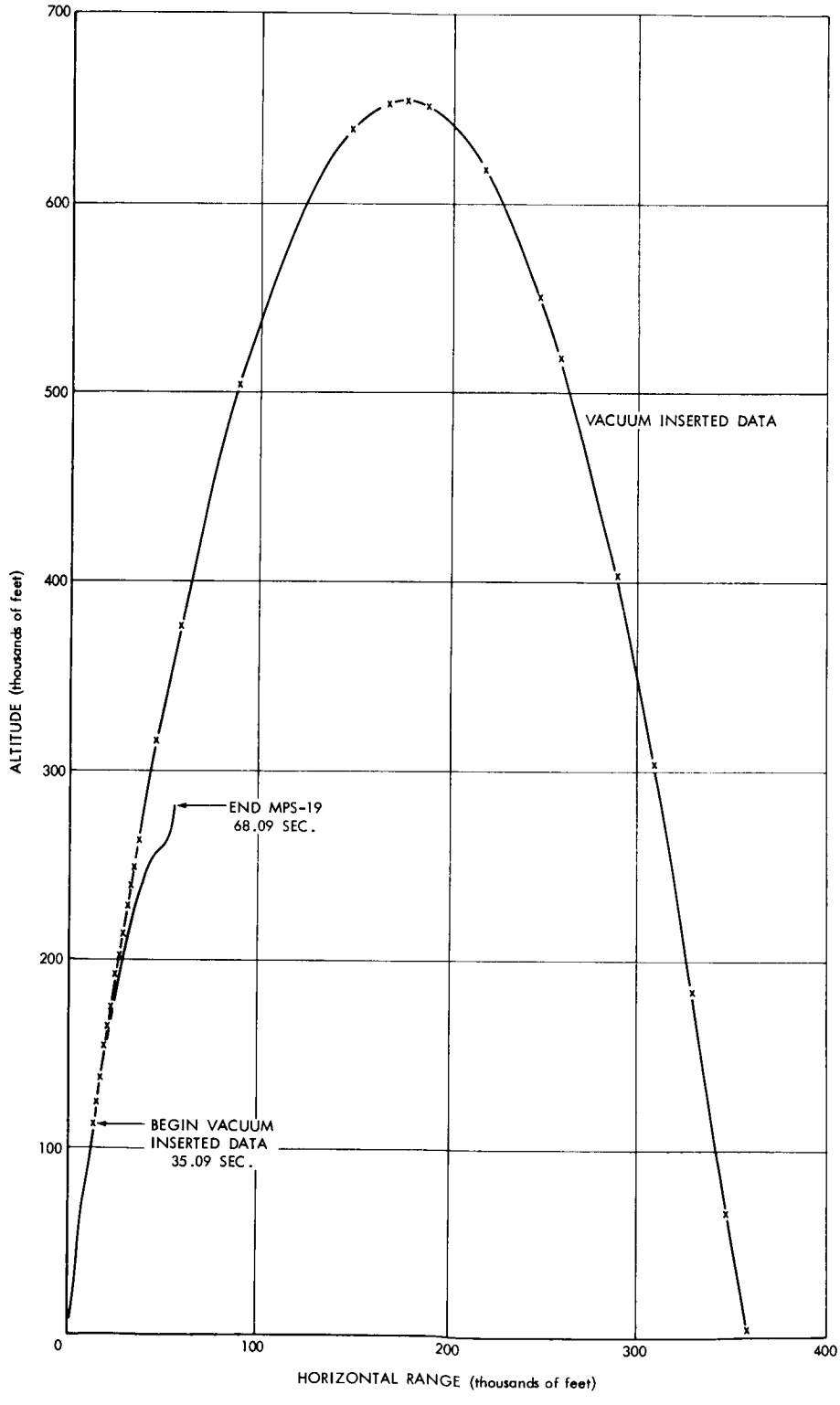

Figure 131. 14.99 UA Radar Plot, Altitude vs Horizontal Range

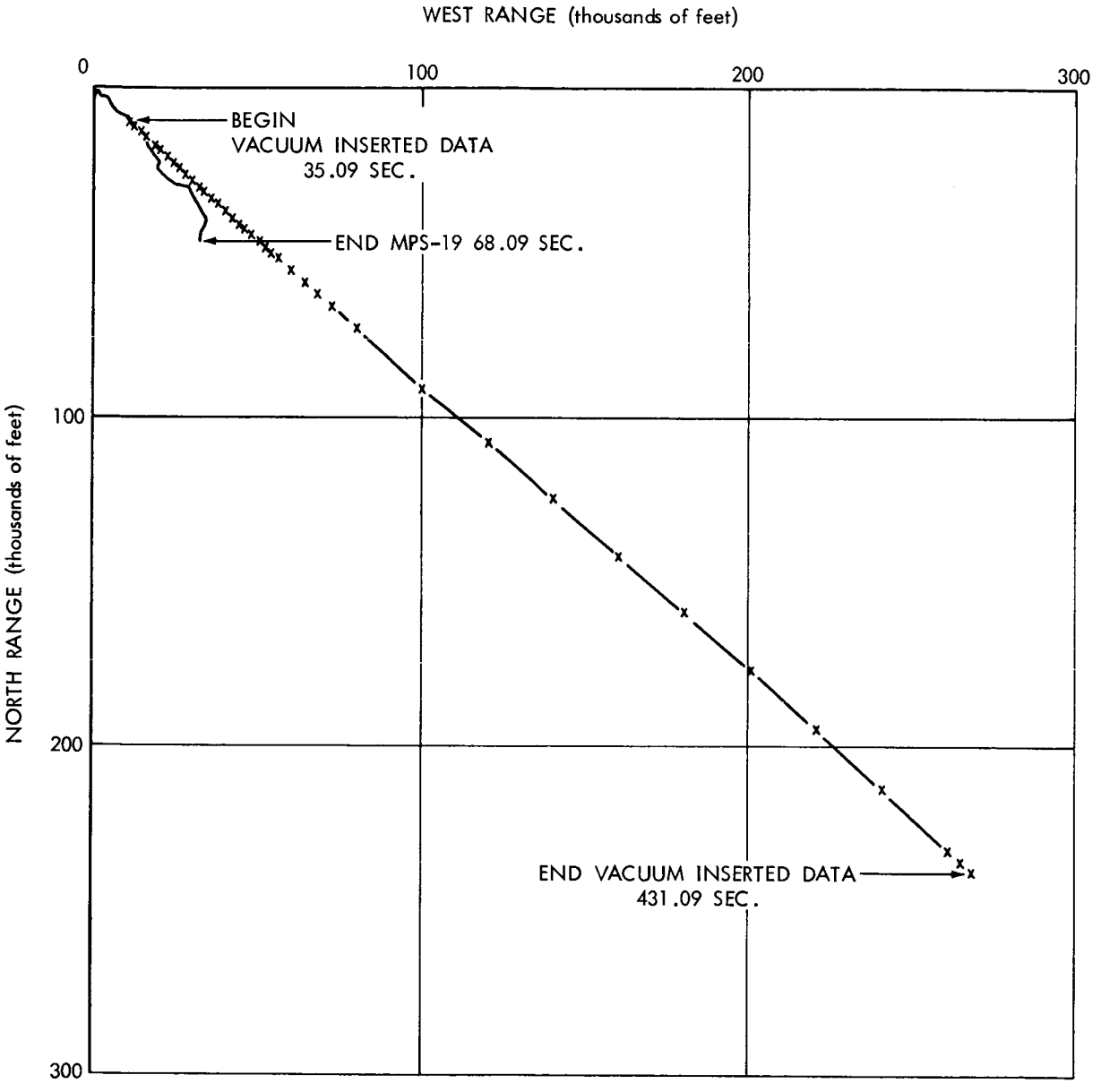

Figure 132. 14.99 UA Radar Plot, North Range vs West Range

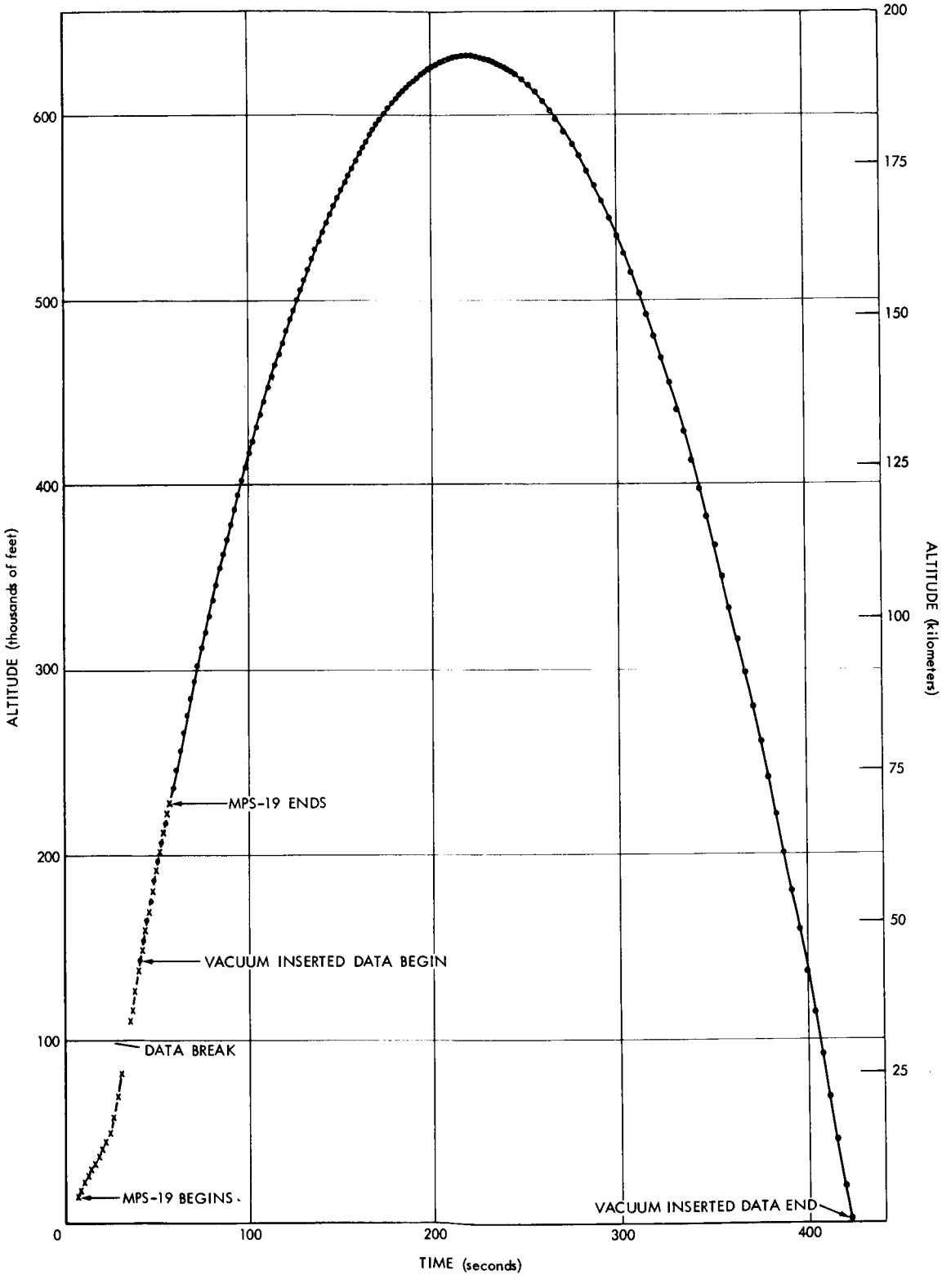

Figure 133. 14.100 UA Radar Plot, Altitude vs Time

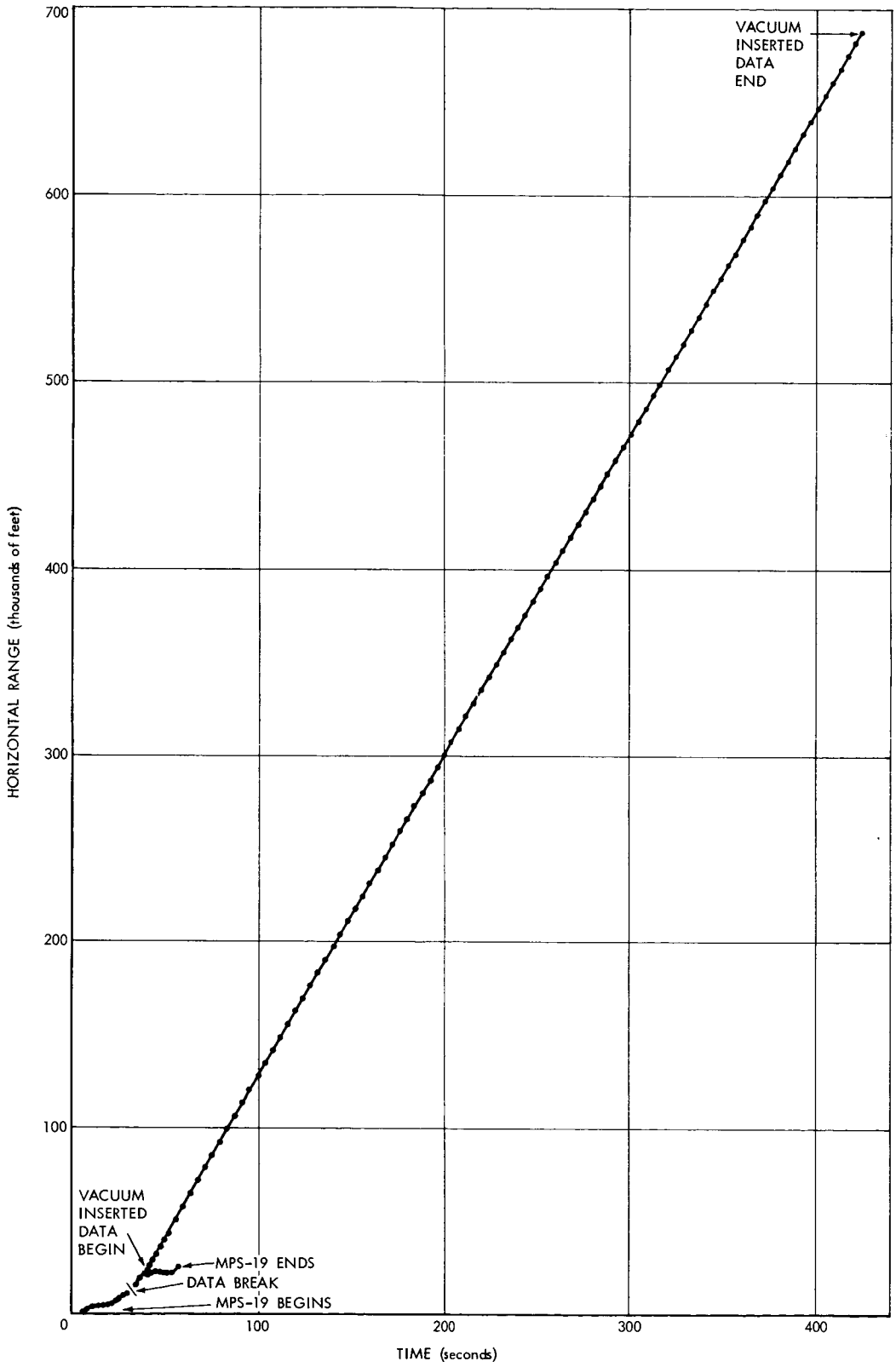

Figure 134. 14.100 UA Radar Plot, Horizontal Range vs Time

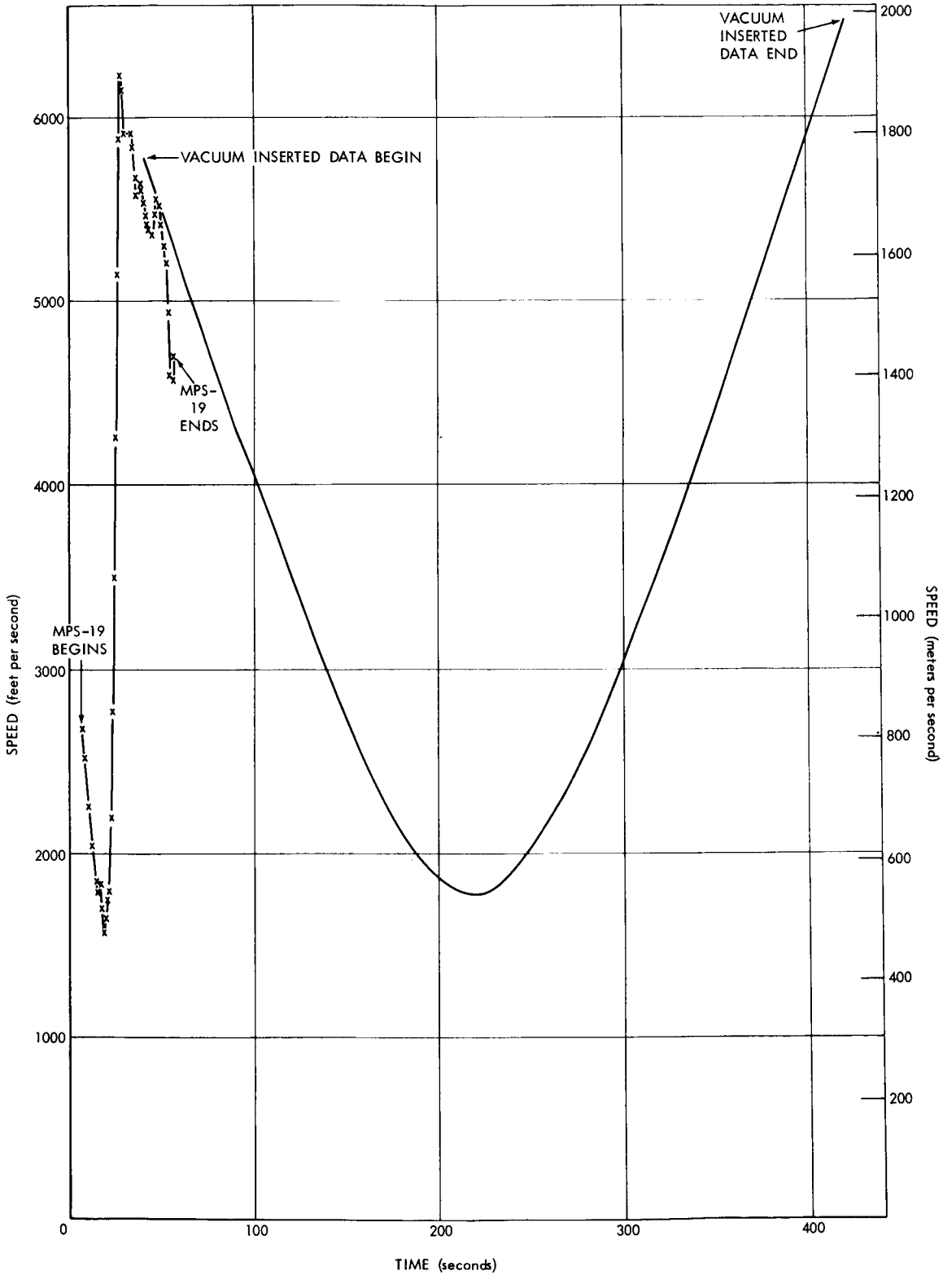

Figure 135. 14.100 UA Radar Plot, Speed vs Time

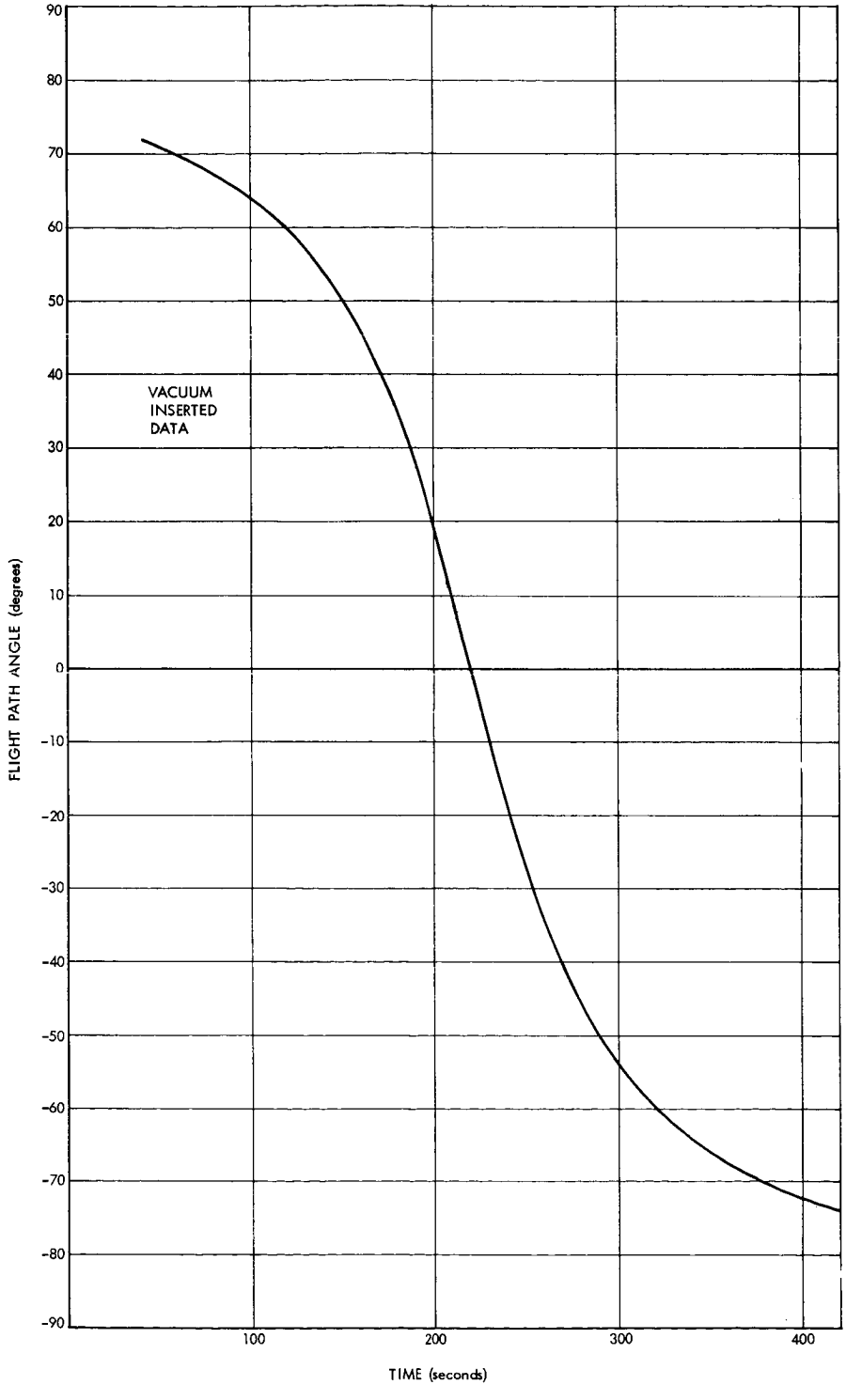

Figure 136. 14.100 UA Radar Plot, Flight Path Angle vs Time

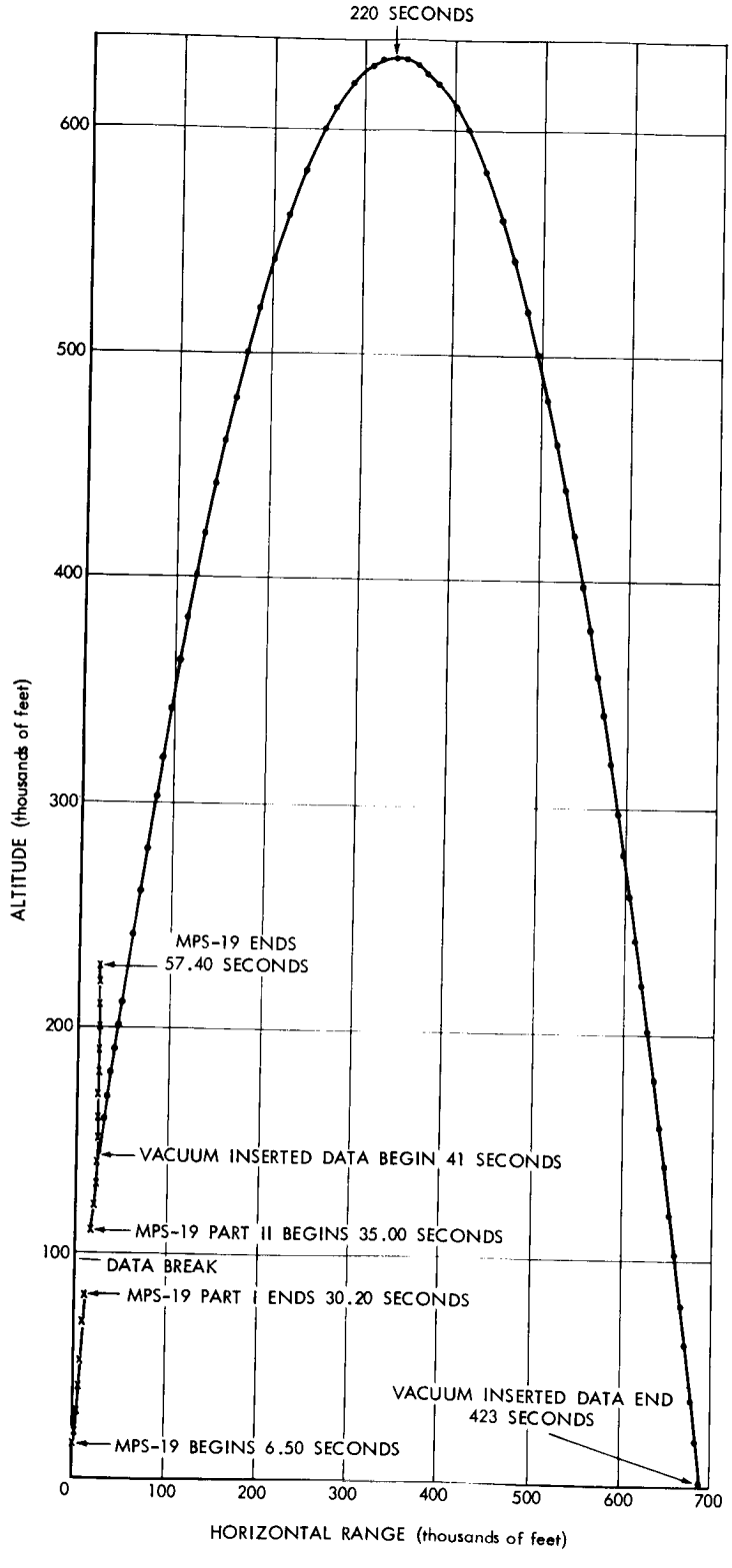

Figure 137. 14.100 UA Radar Plot, Altitude vs Horizontal Range

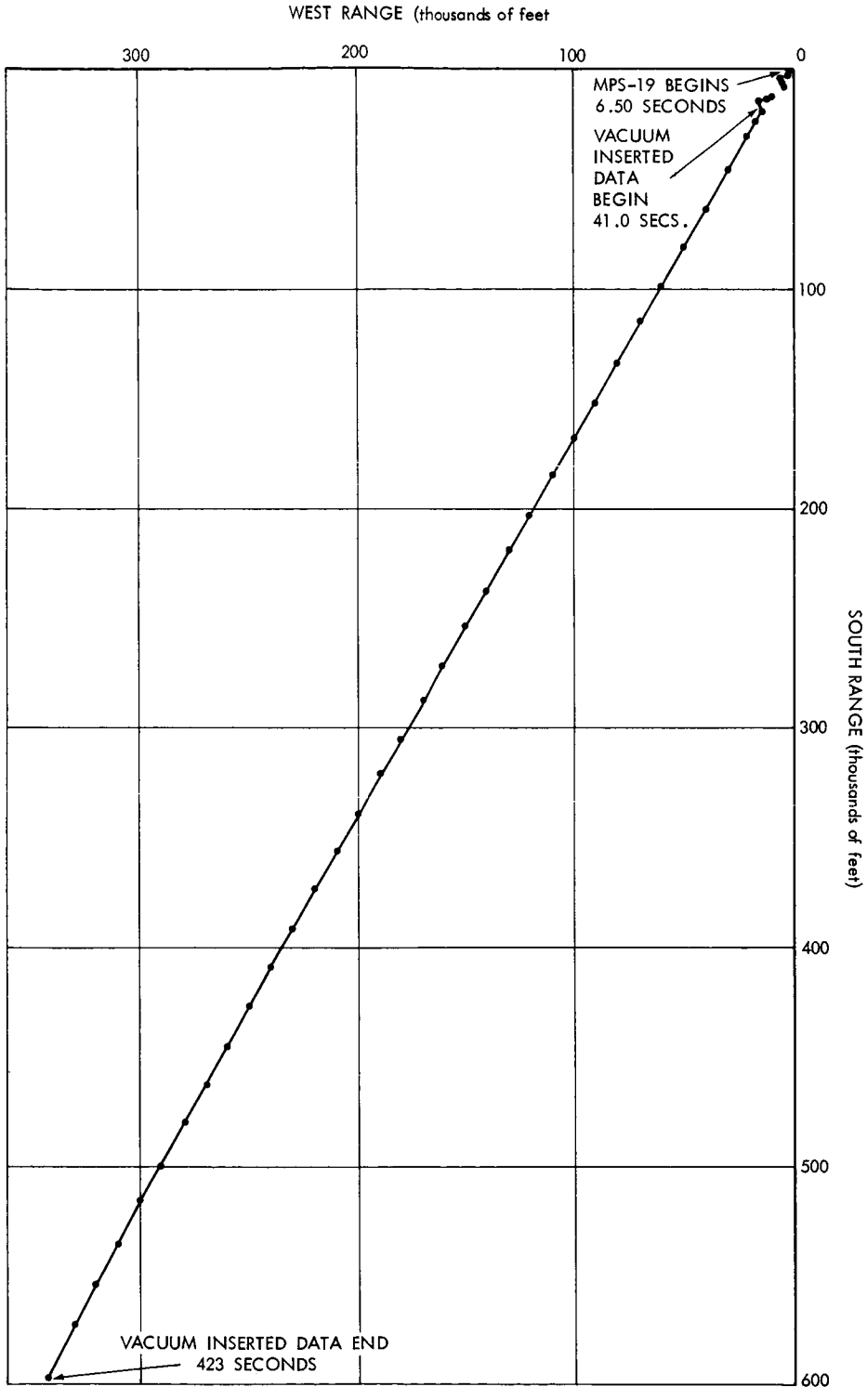

Figure 138. 14.100 UA Radar Plot, South Range vs West Range

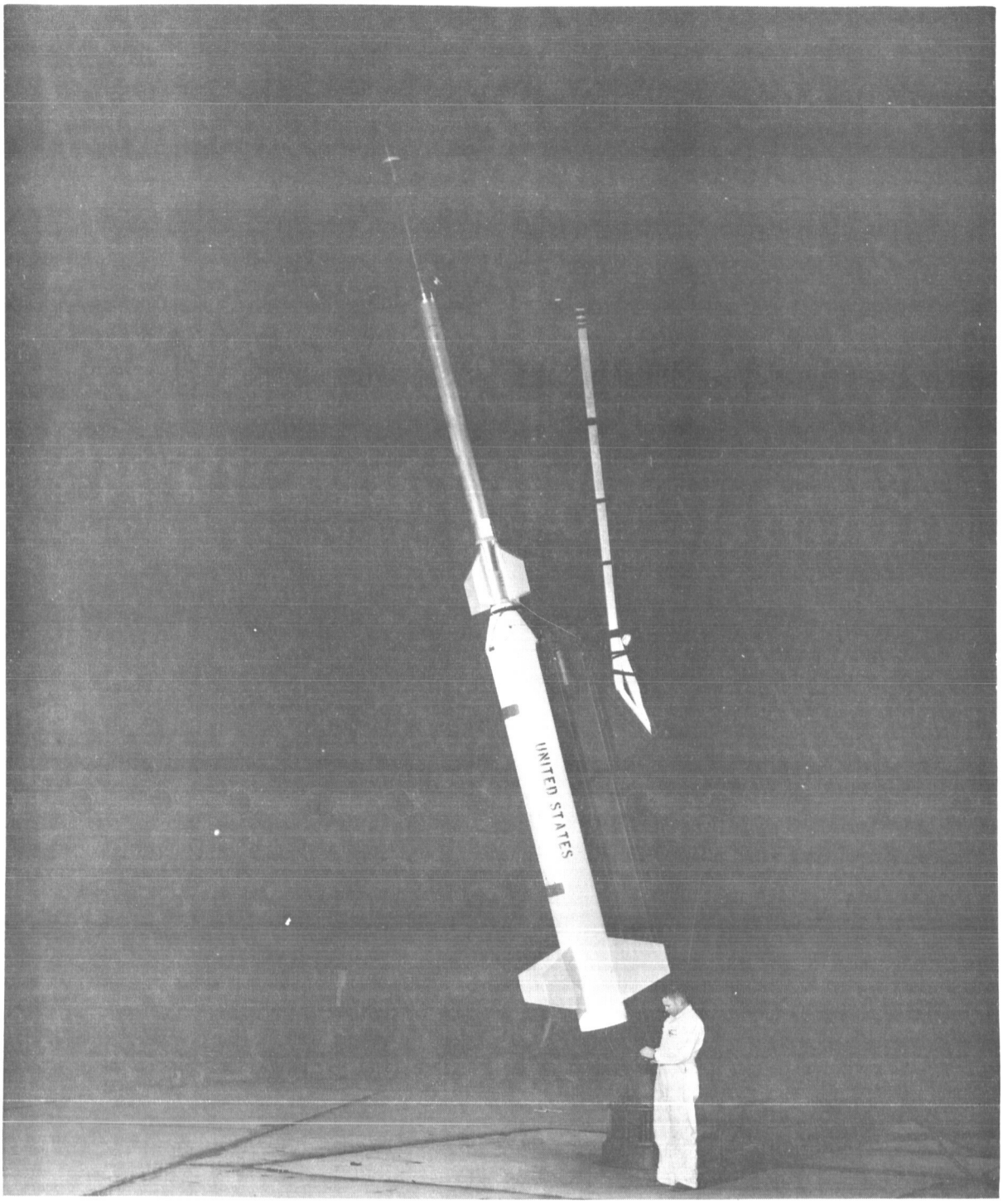

Figure 139. 14.132 NA Photograph

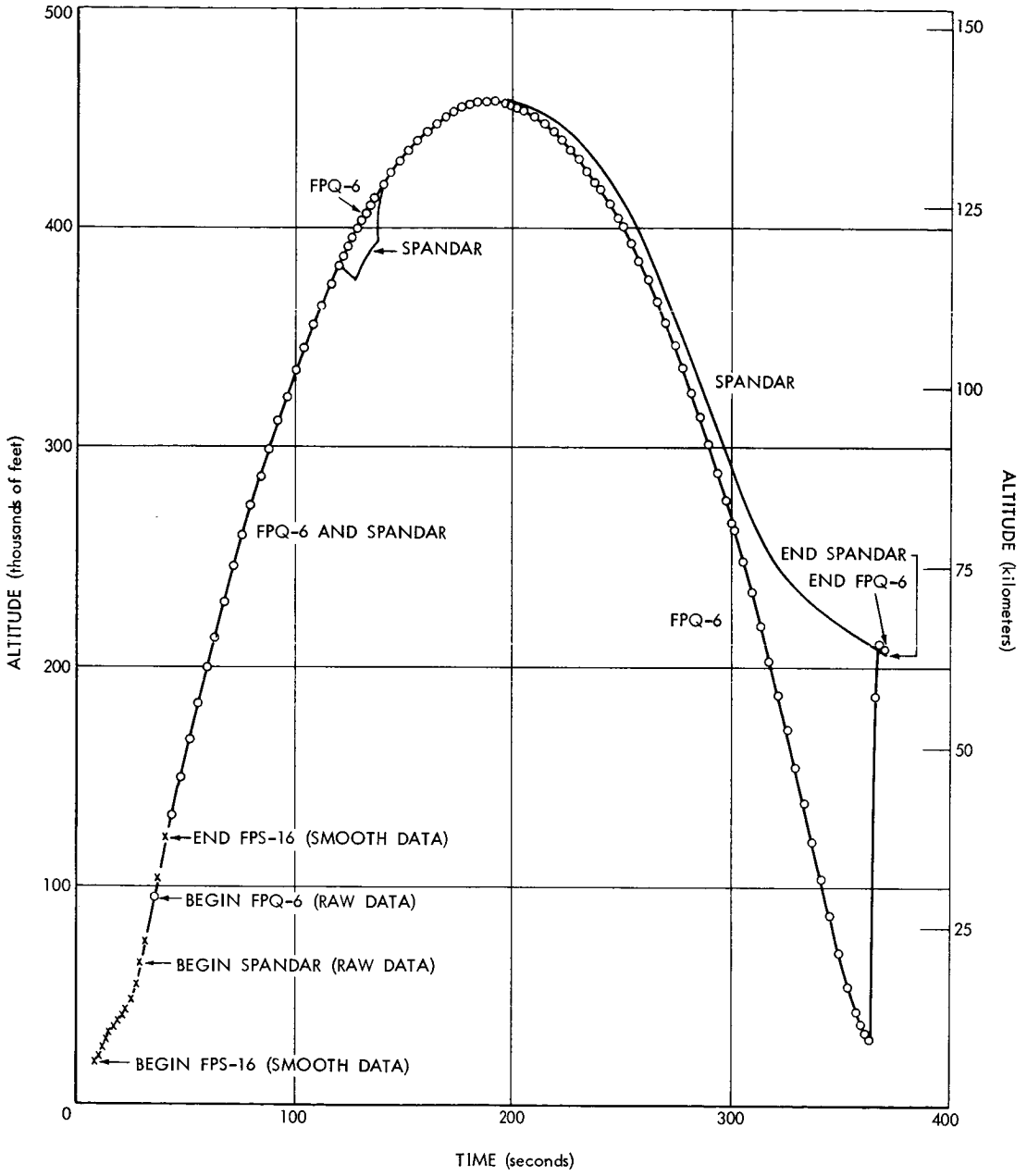

Figure 140. 14.132 NA Radar Plot, Altitude vs Time

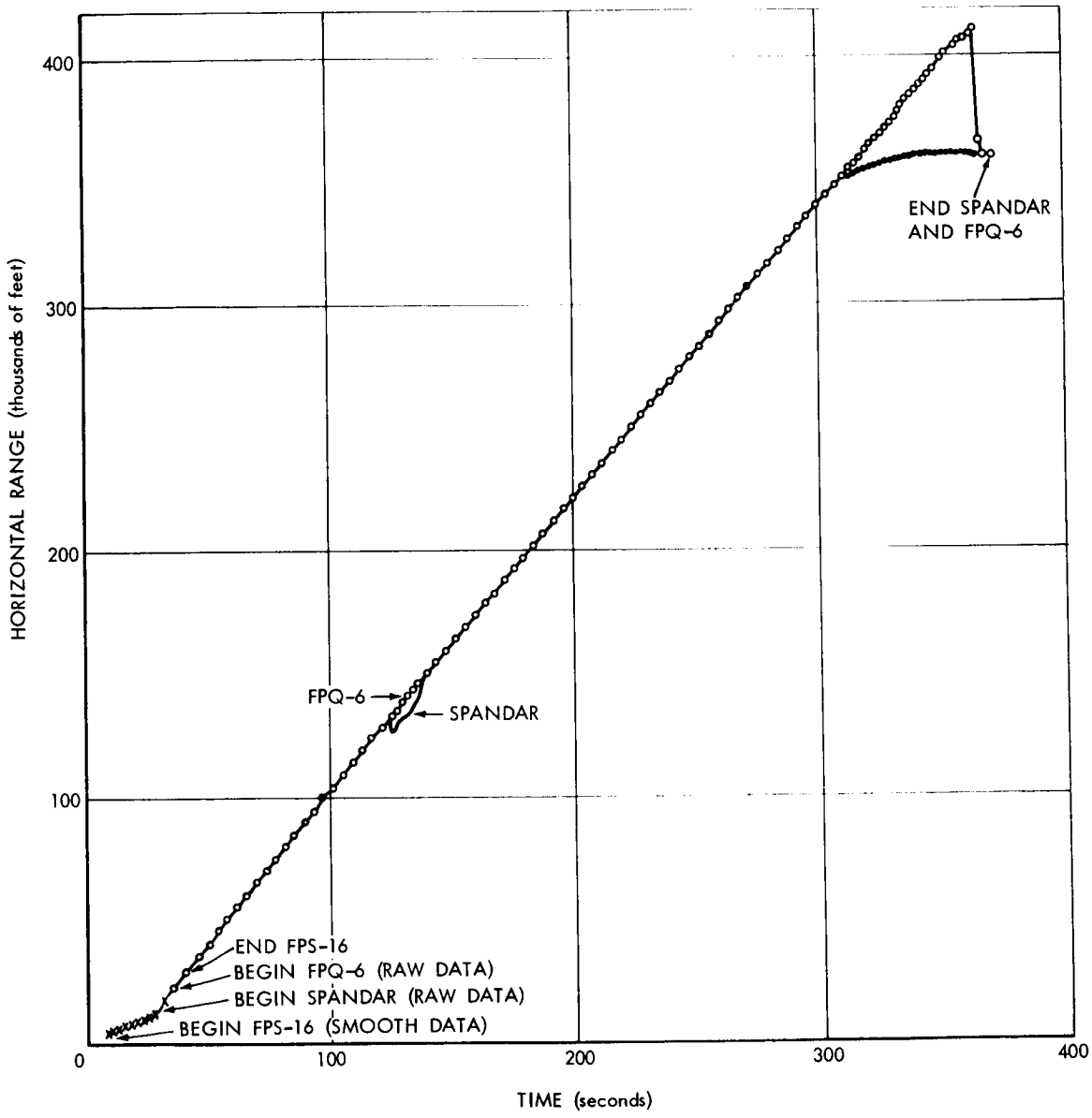

Figure 141. 14.132 NA Radar Plot, Horizontal Range vs Time

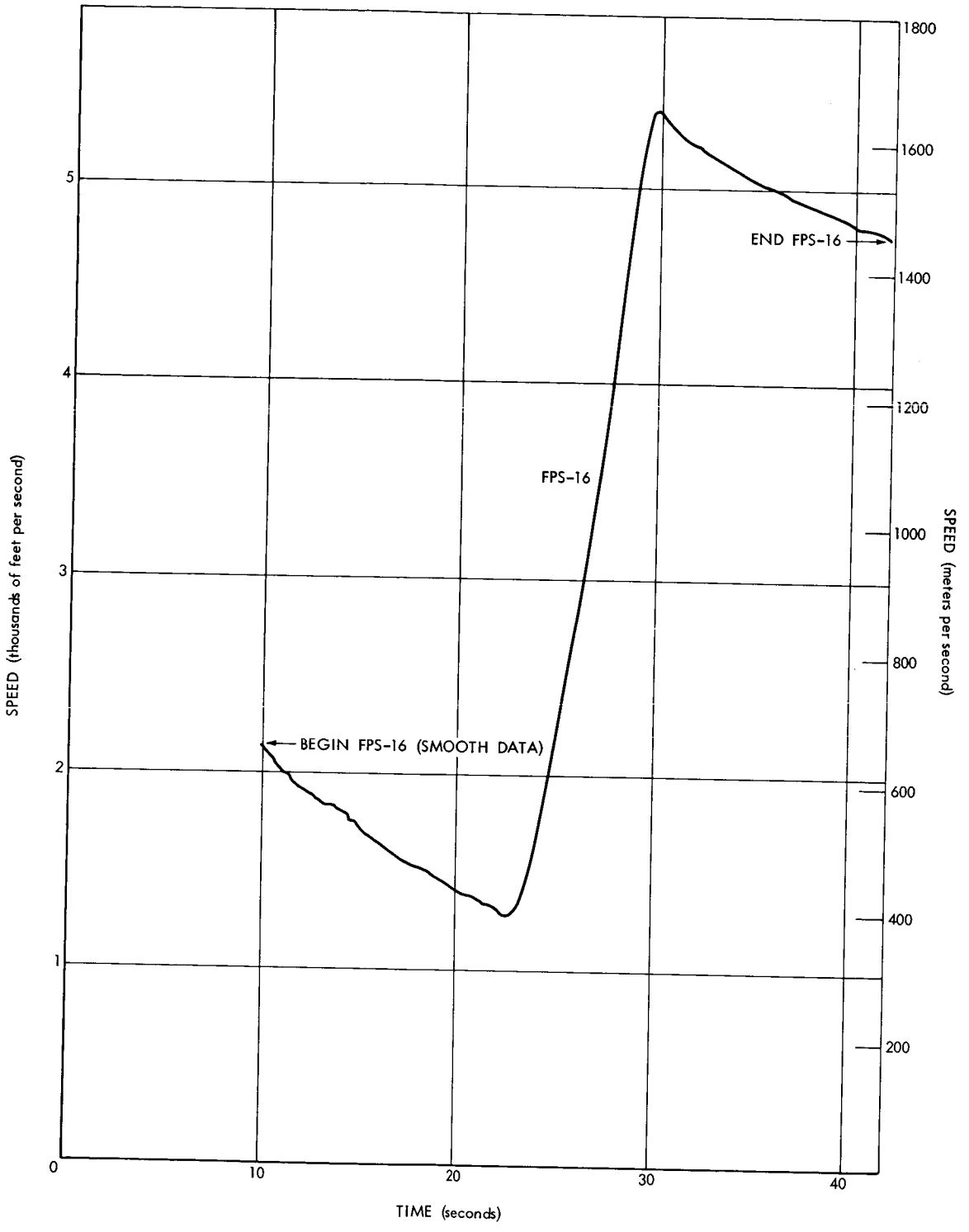

Figure 142. 14.132 NA Radar Plot, Speed vs Time

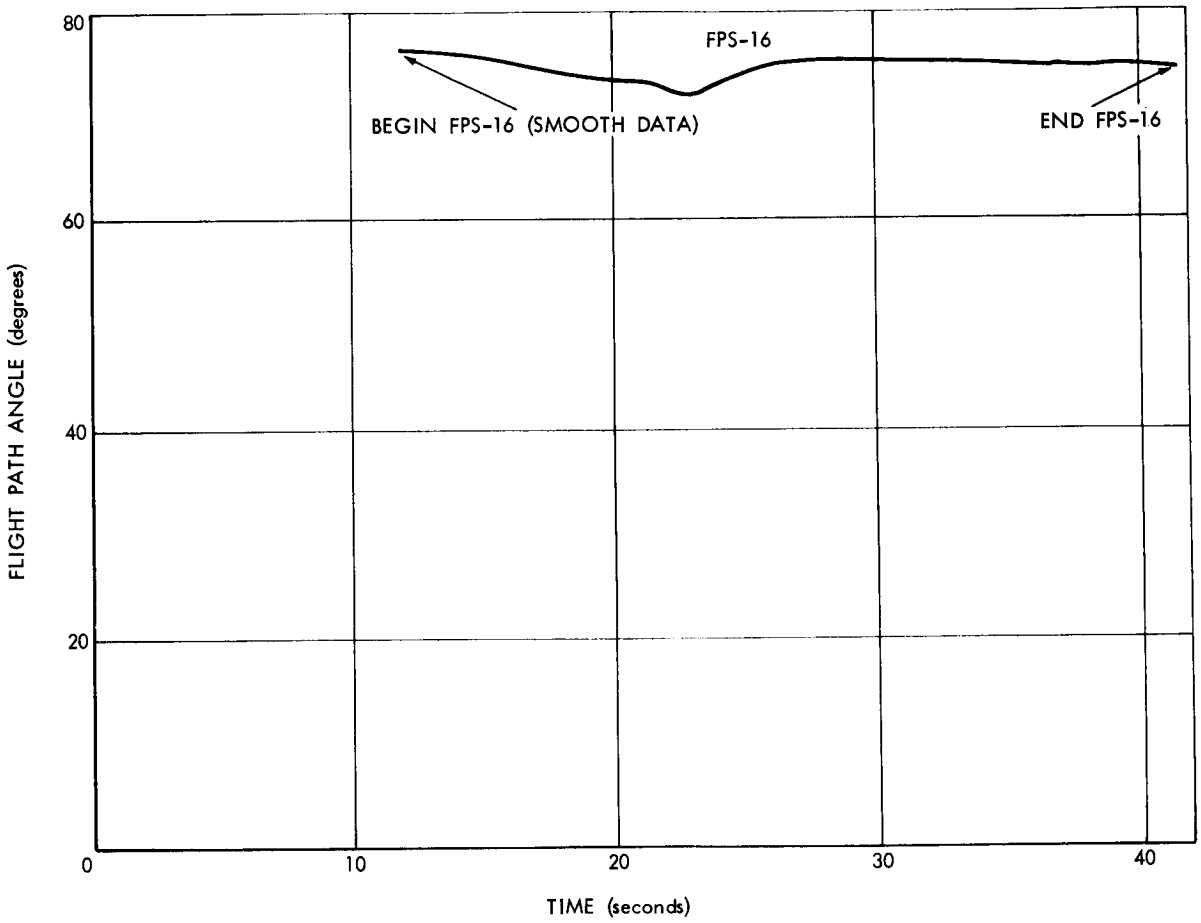

Figure 143. 14.132 NA Radar Plot, Flight Path Angle vs Time

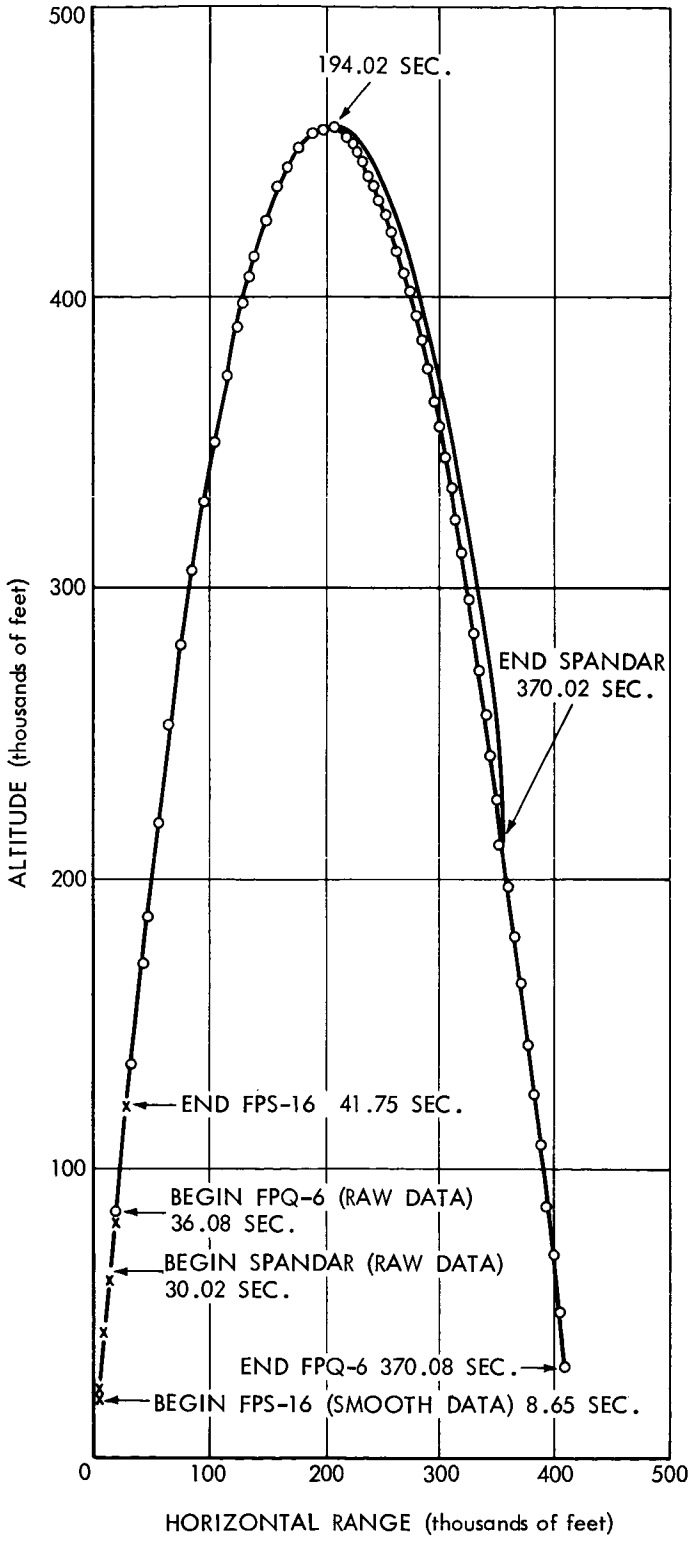

Figure 144. 14.132 NA Radar Plot, Altitude vs Horizontal Range

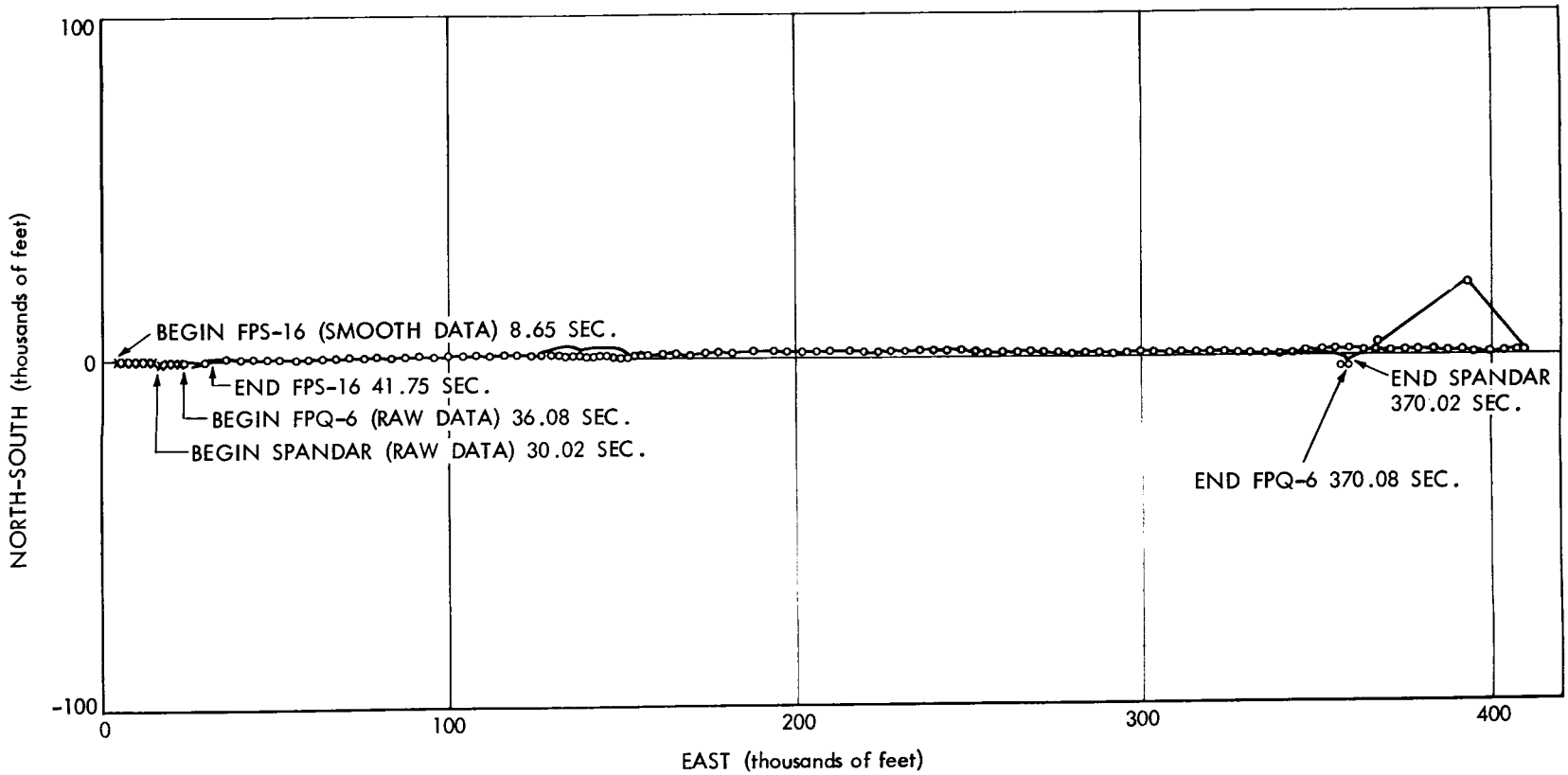

Figure 145. 14.132 NA Radar Plot, North-South Range vs East Range

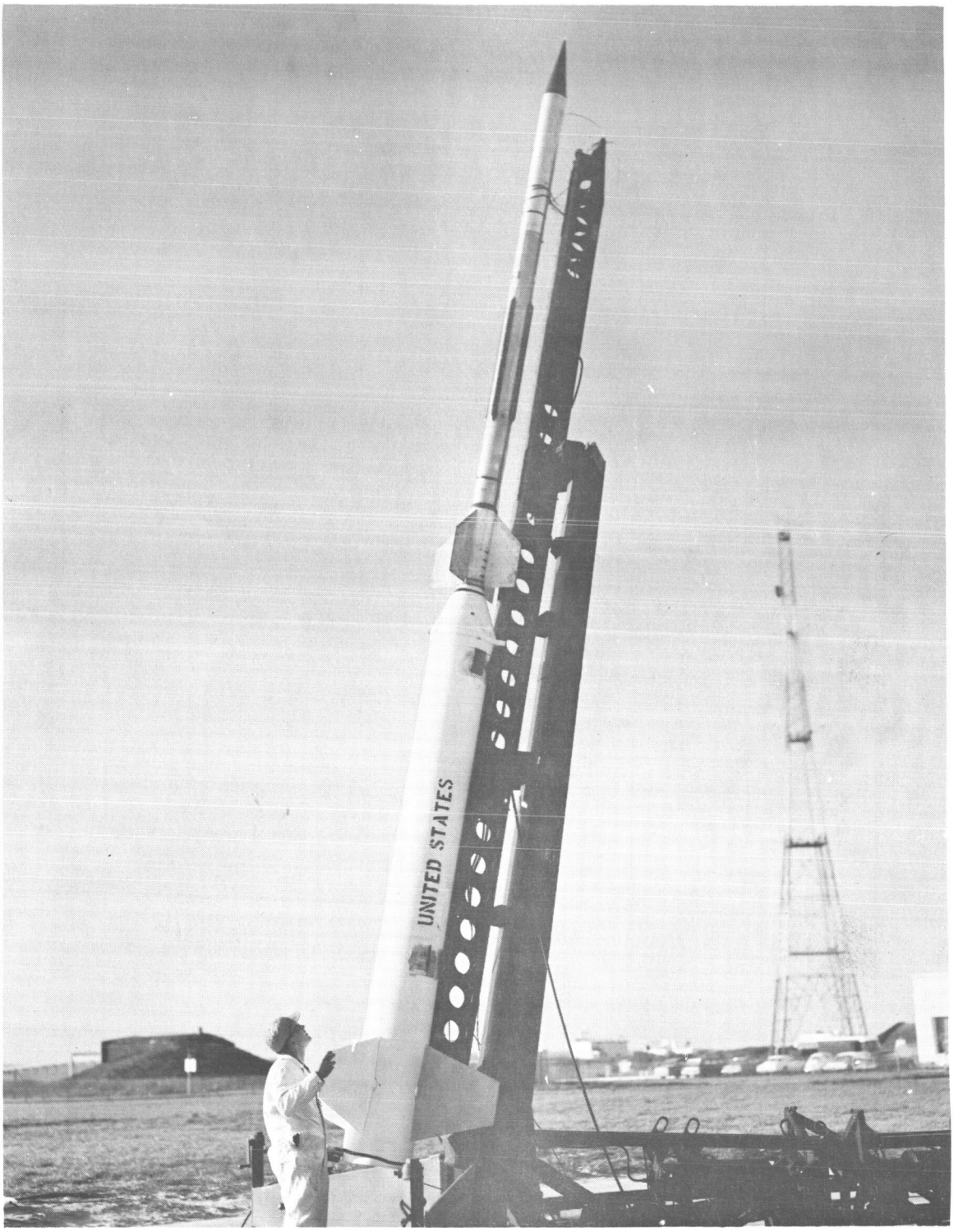

Figure 146. 14.142 NA Photograph

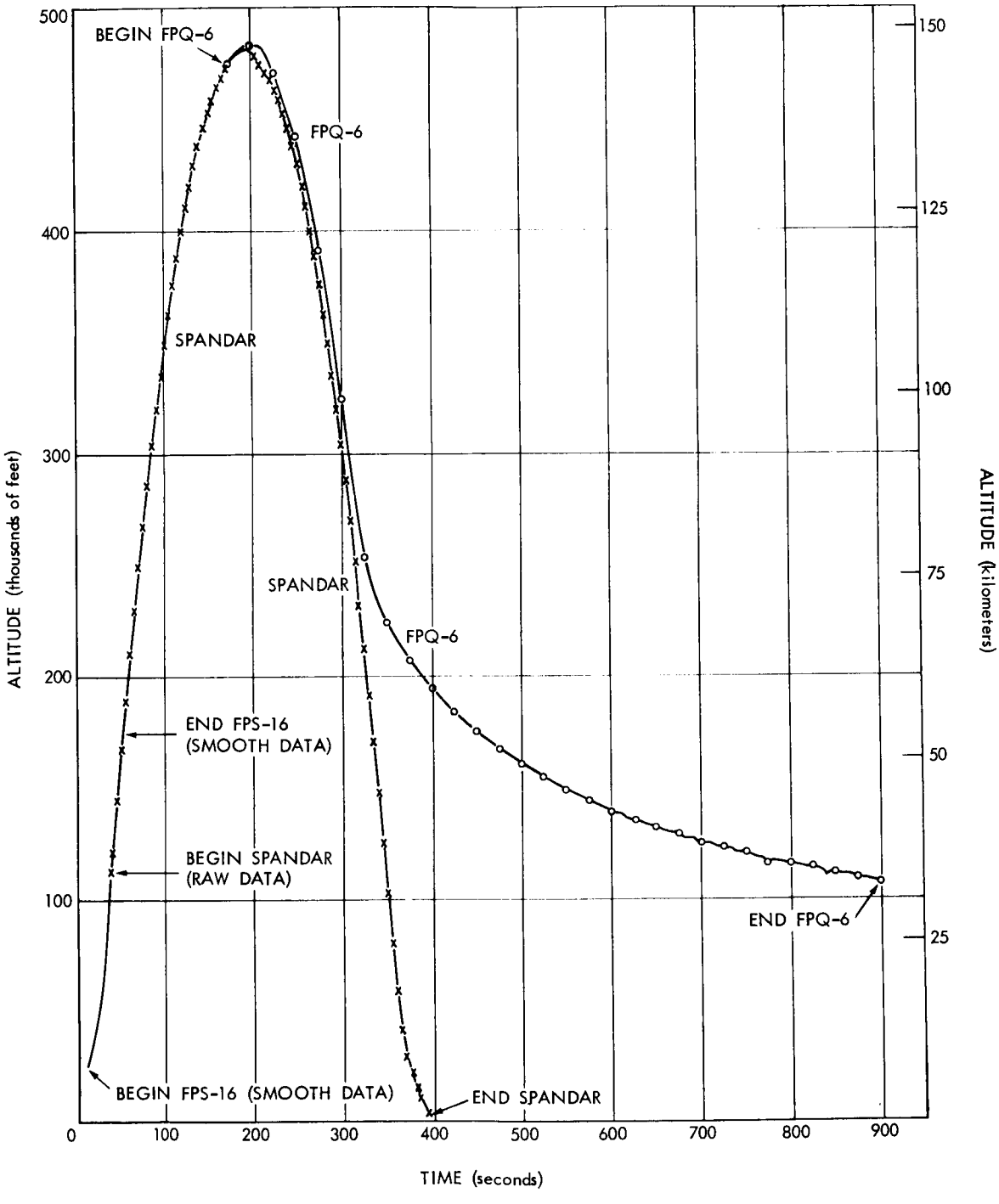

Figure 147. 14.142 NA Radar Plot, Altitude vs Time

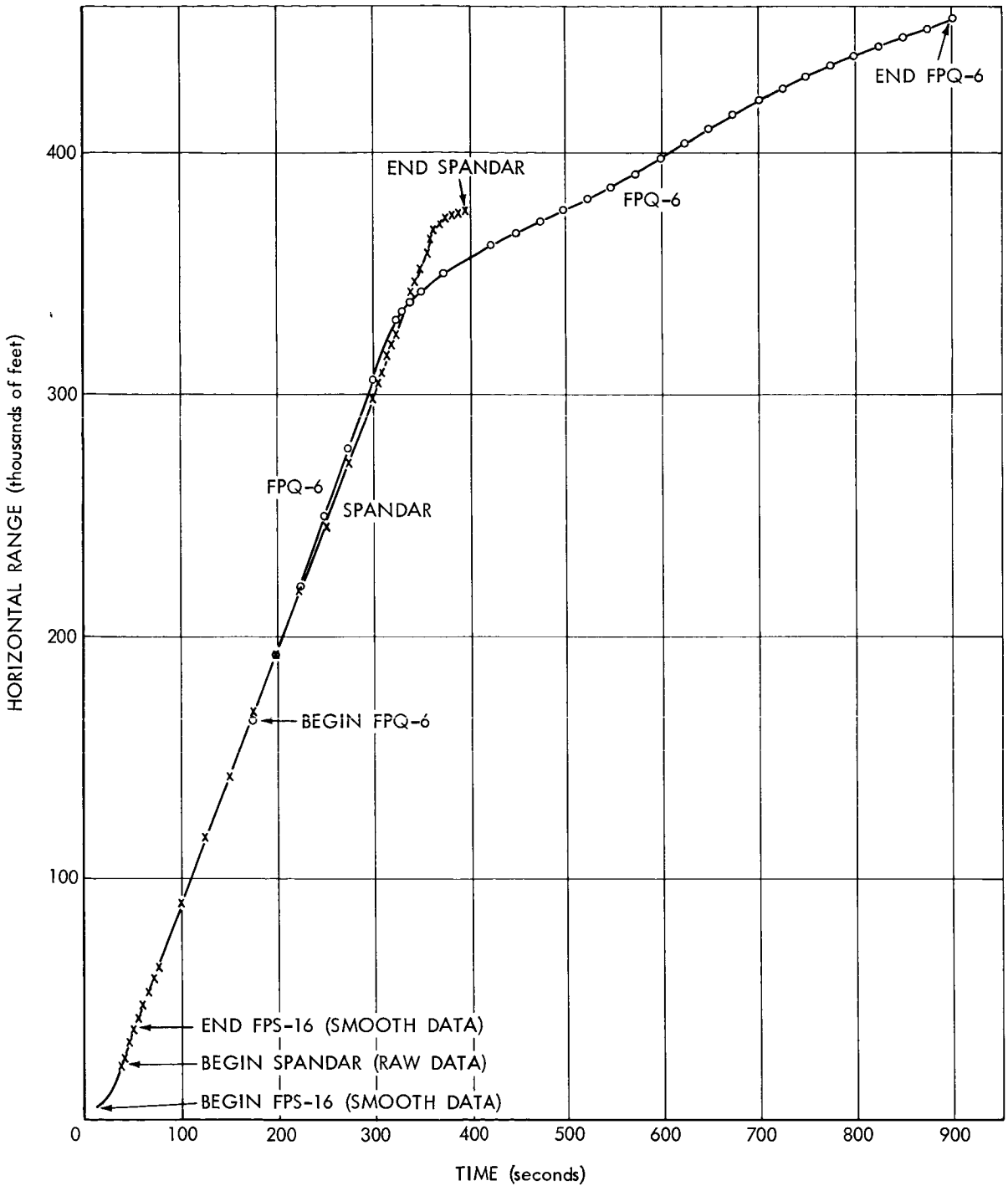

Figure 148. 14.142 NA Radar Plot, Horizontal Range vs Time

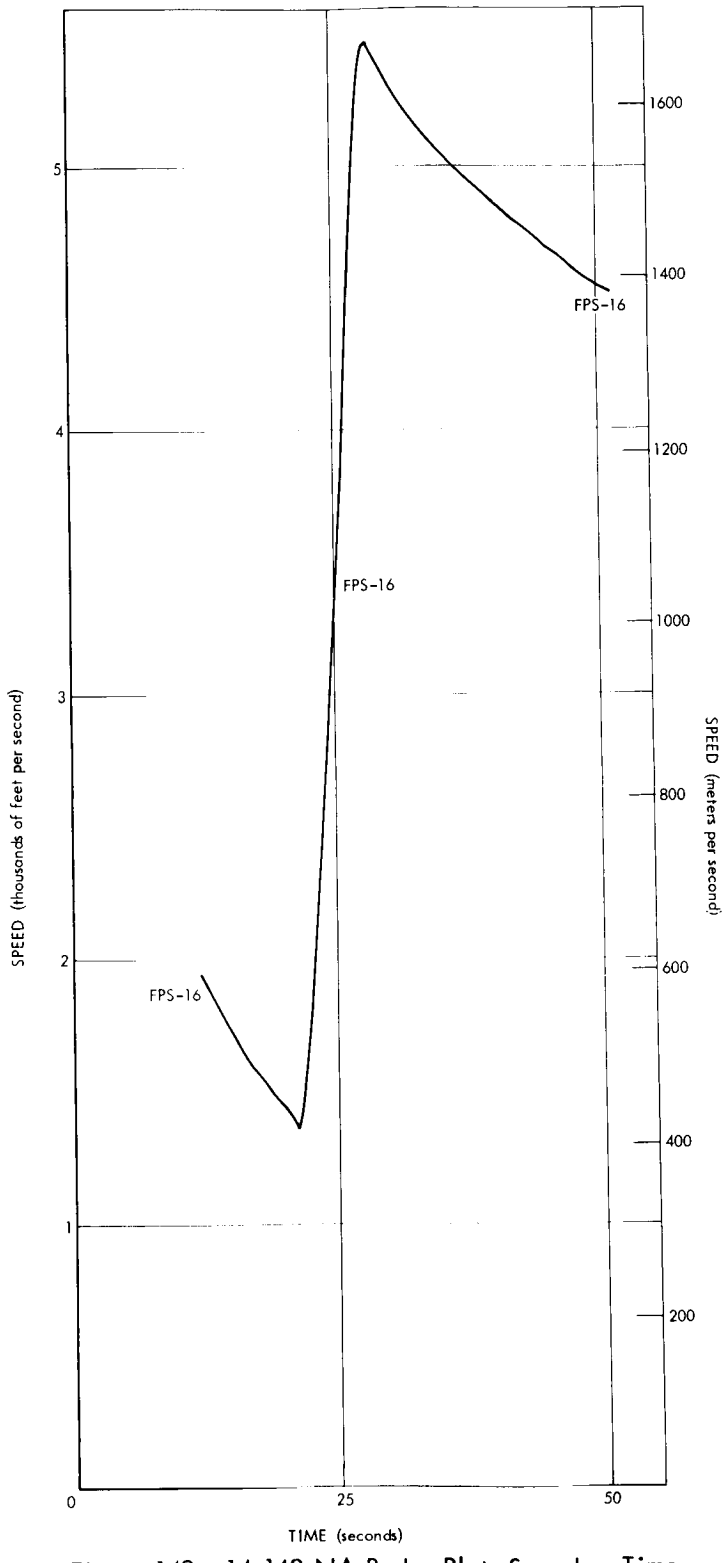

Figure 149. 14.142 NA Radar Plot, Speed vs Time

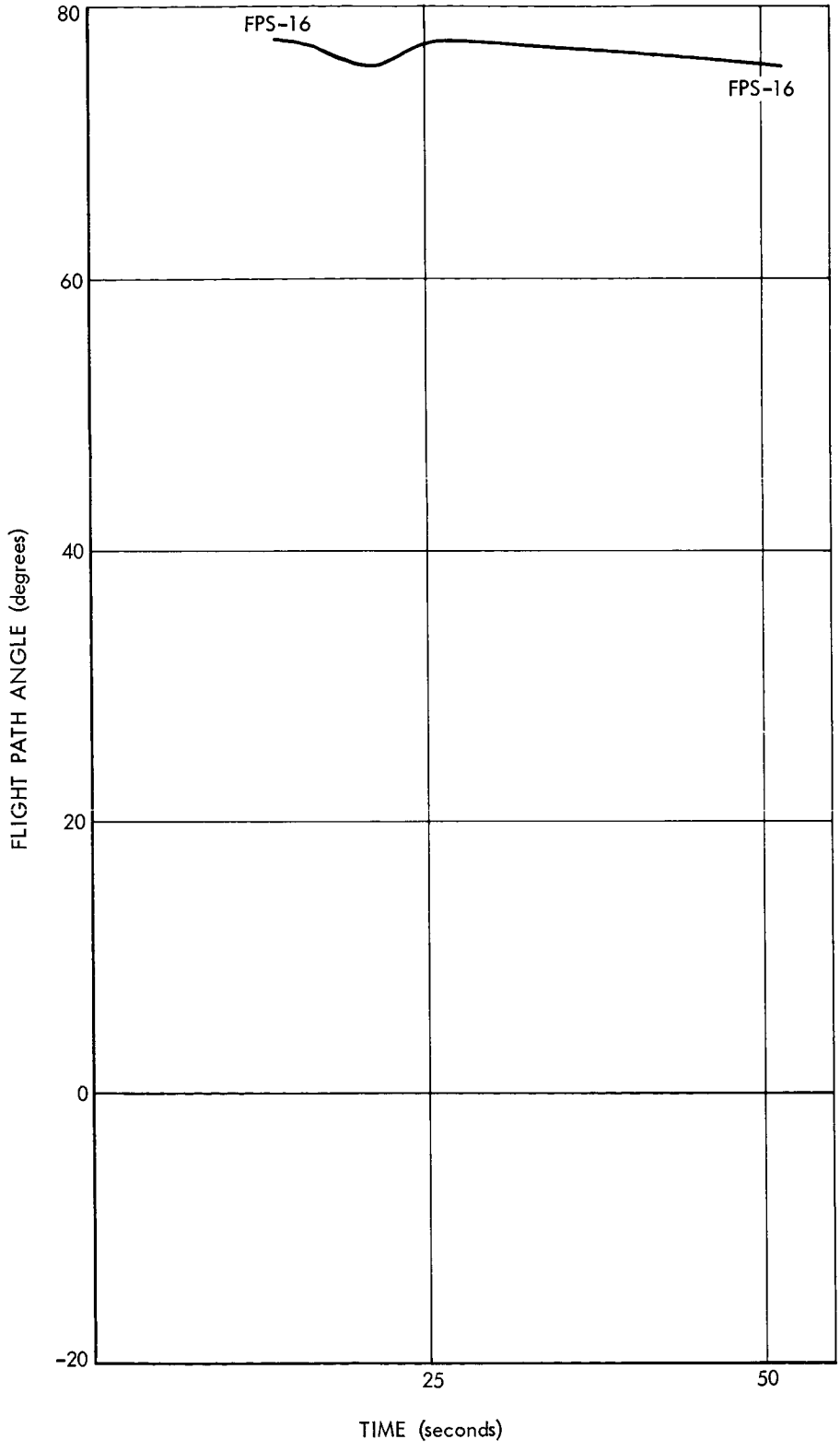

Figure 150. 14.142 NA Radar Plot, Flight Path Angle vs Time

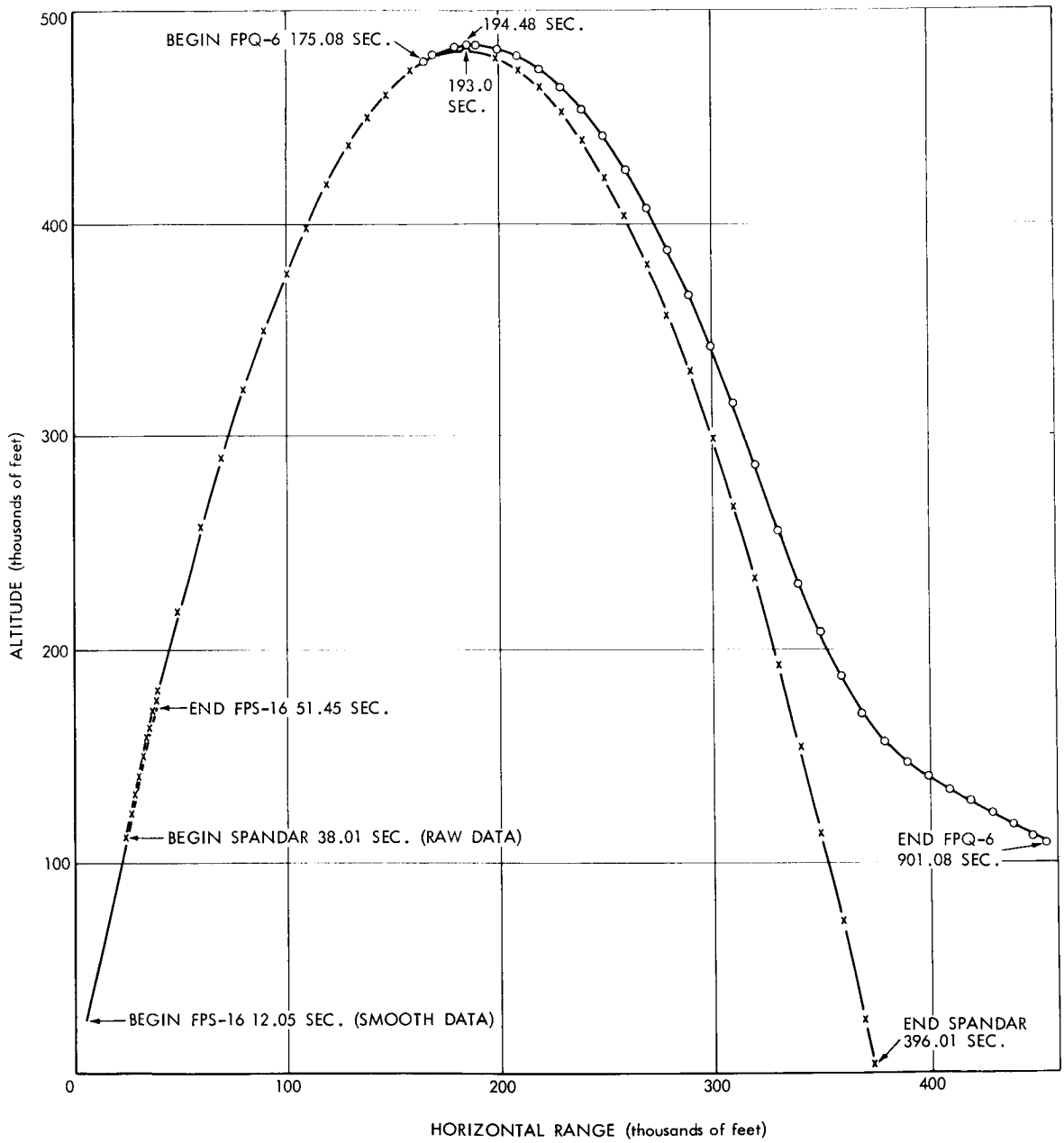

Figure 151. 14.142 NA Radar Plot, Altitude vs Horizontal Range

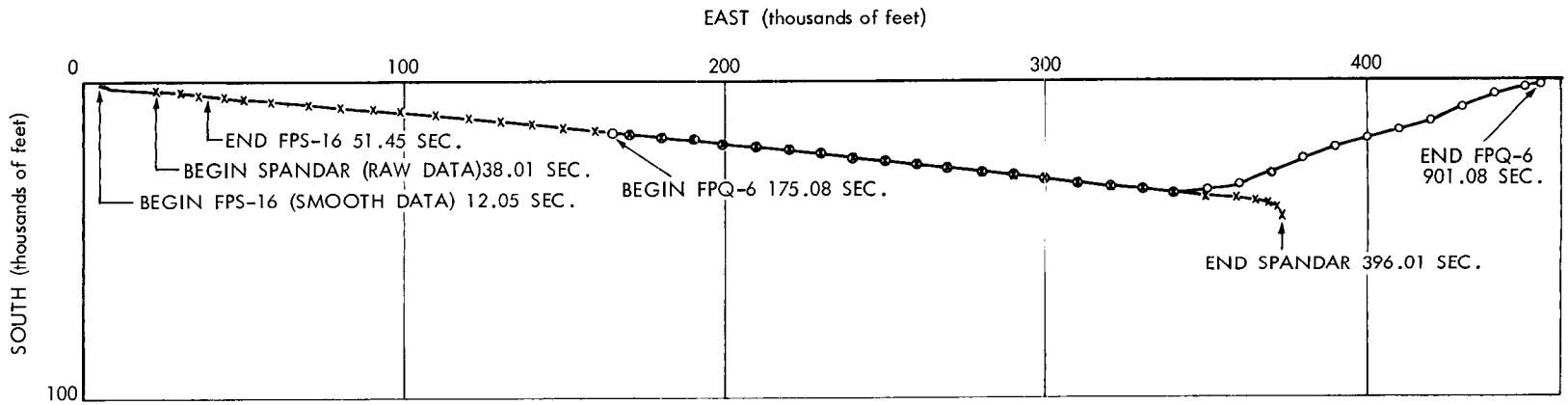

Figure 152. 14.142 NA Radar Plot, South Range vs East Range

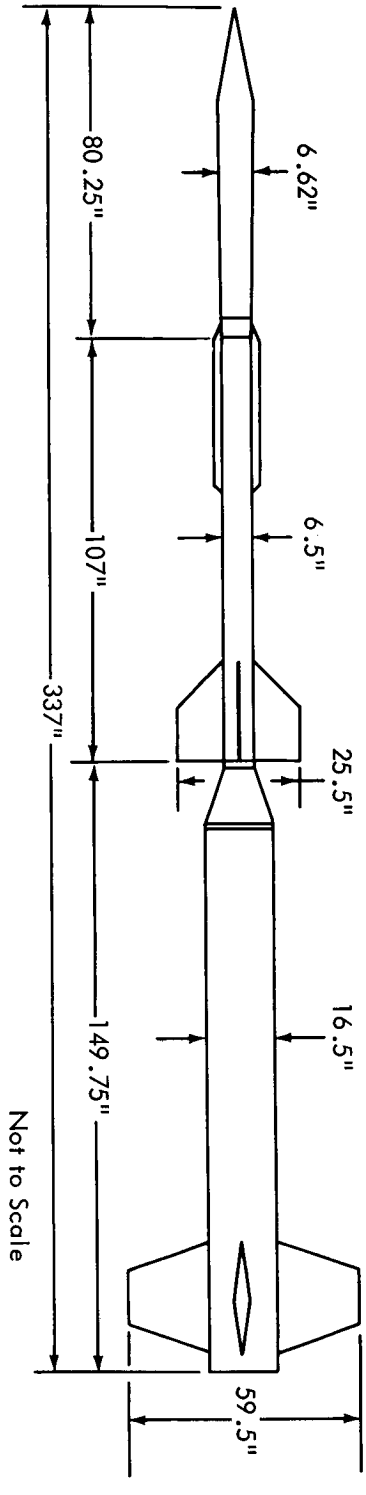

Figure 153. 14.160 GE Sketch

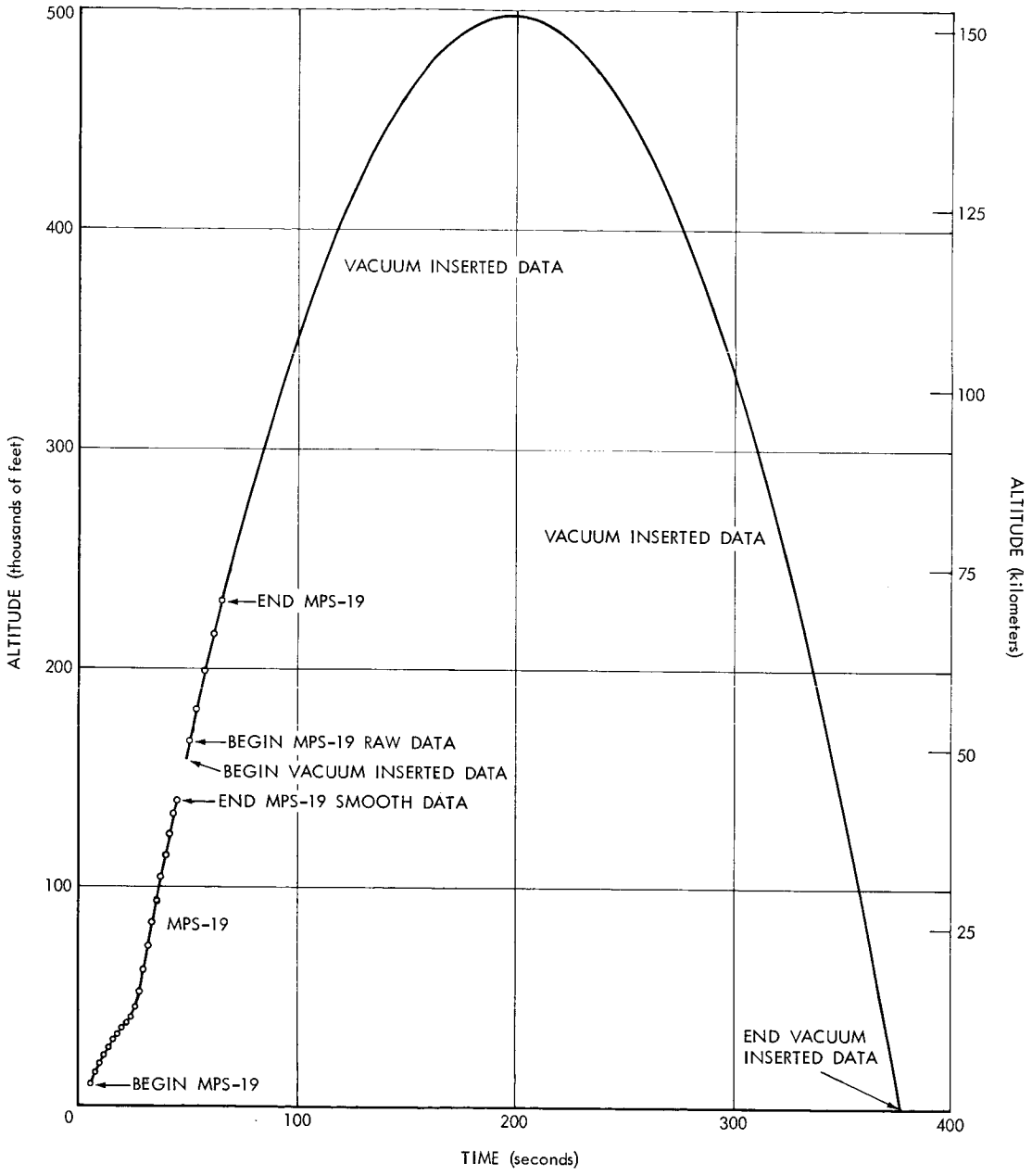

Figure 154. 14.160 GE Radar Plot, Altitude vs Time

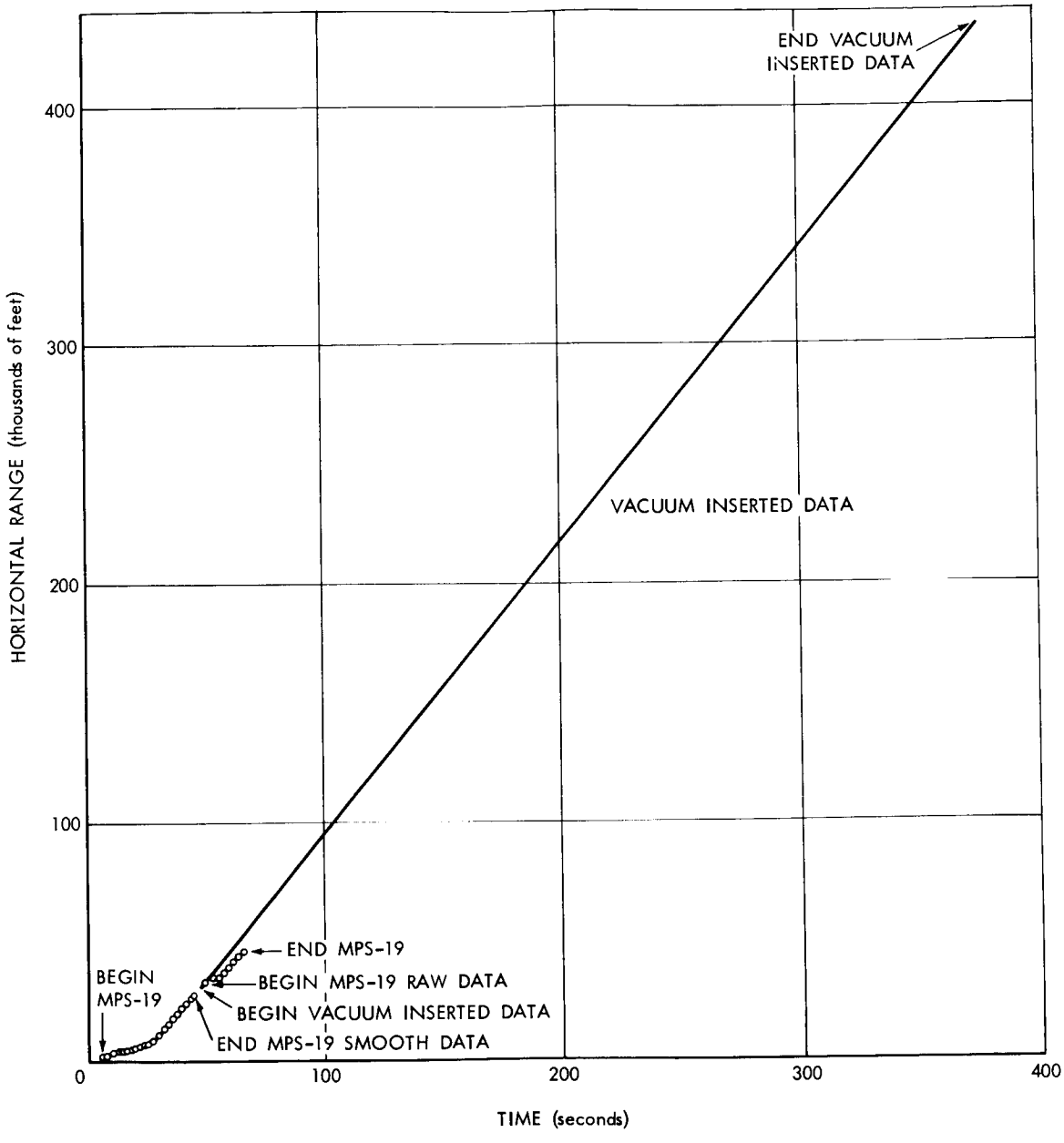

Figure 155. 14.160 GE Radar Plot, Horizontal Range vs Time

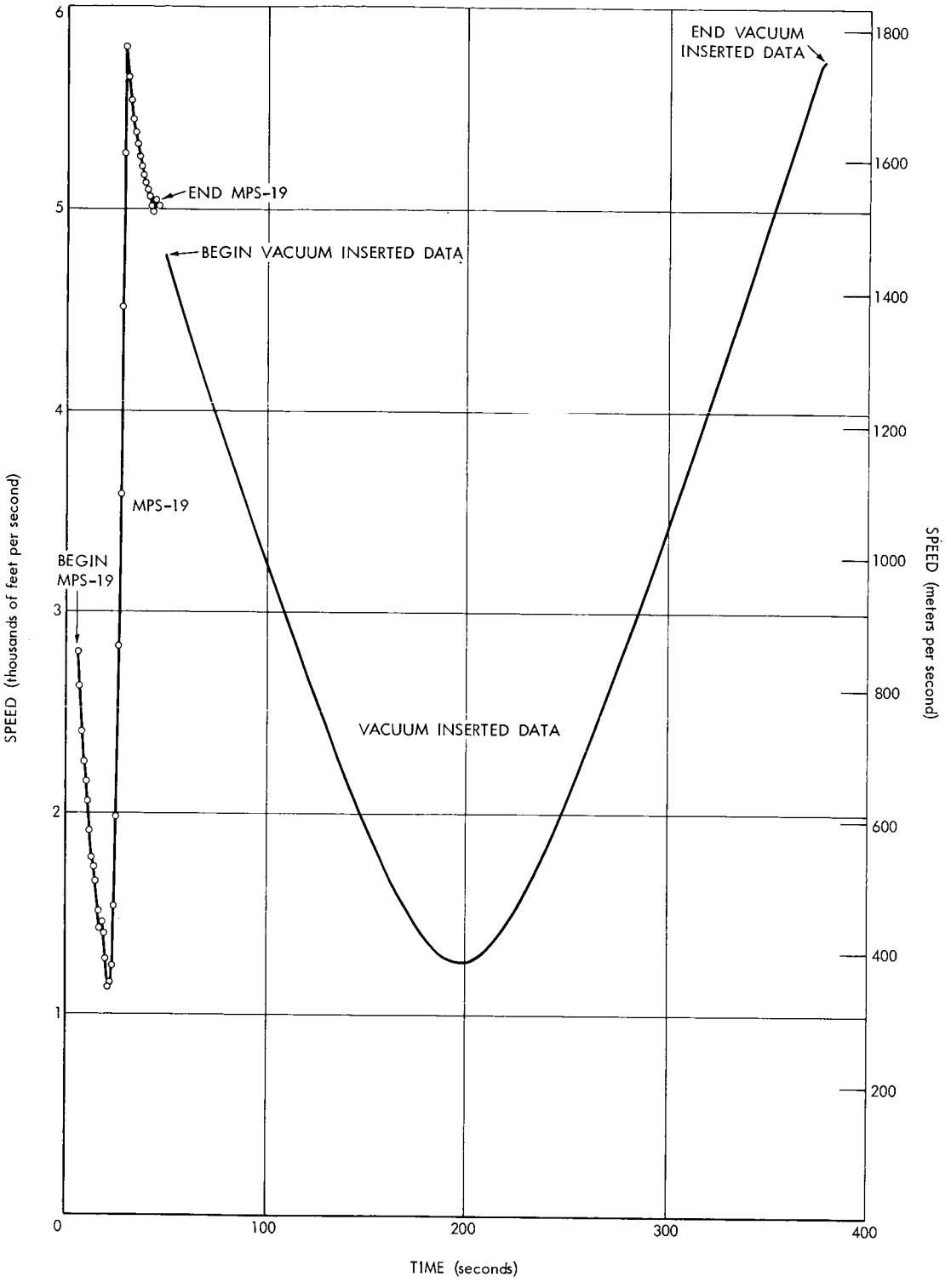

Figure 156. 14.160 GE Radar Plot, Speed vs Time

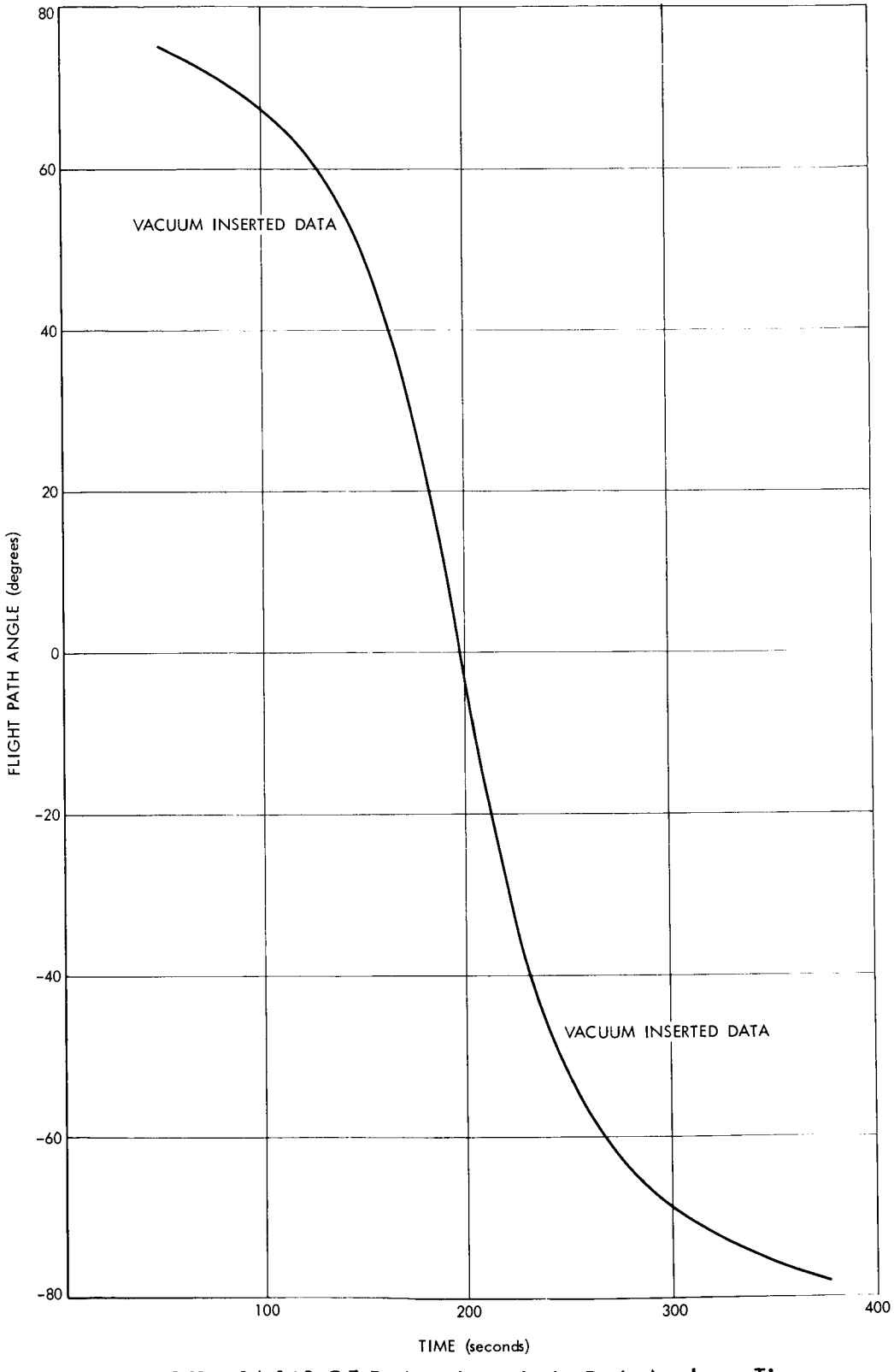

Figure 157. 14.160 GE Radar Plot, Flight Path Angle vs Time

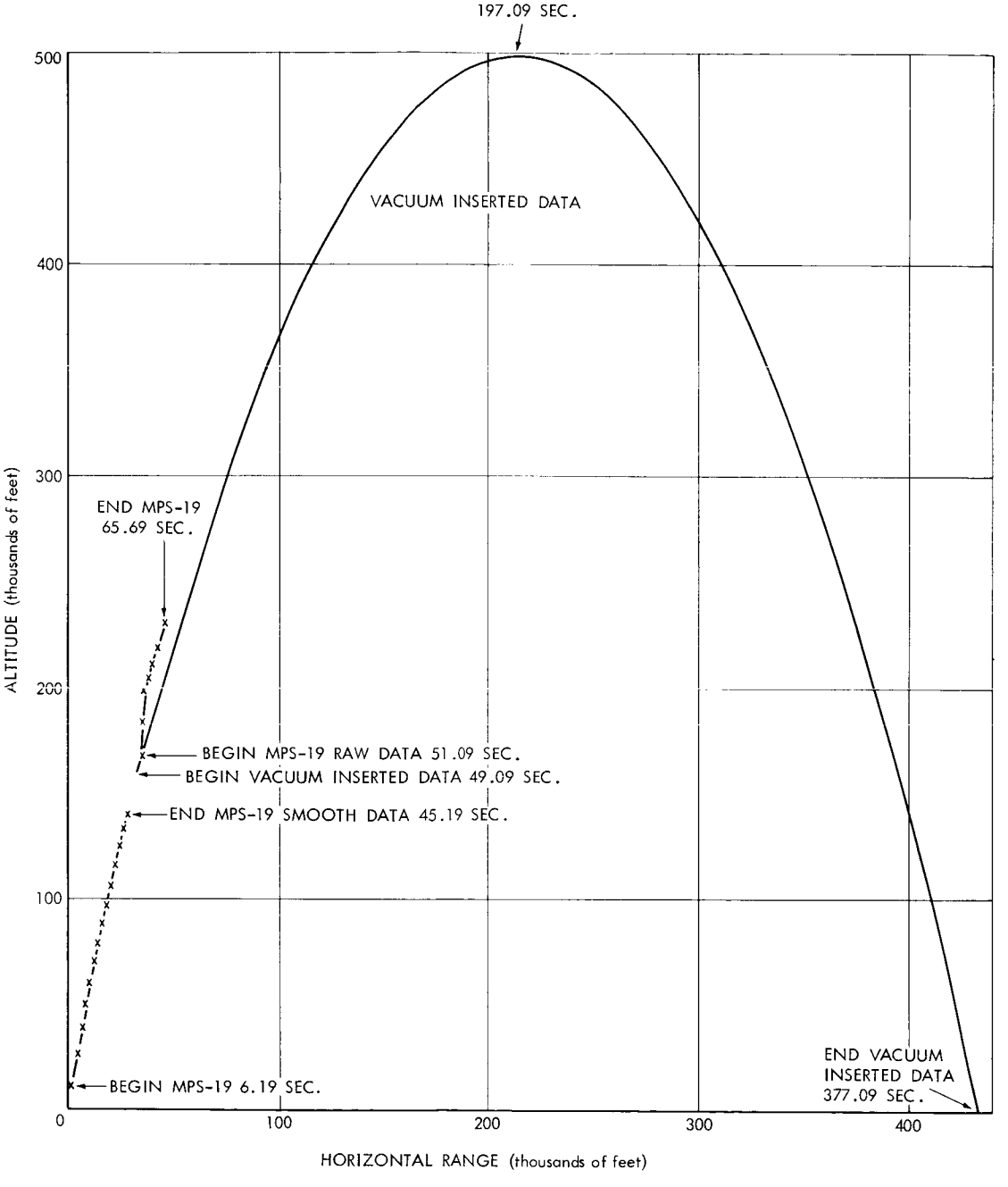

Figure 158. 14.160 GE Radar Plot, Altitude vs Horizontal Range

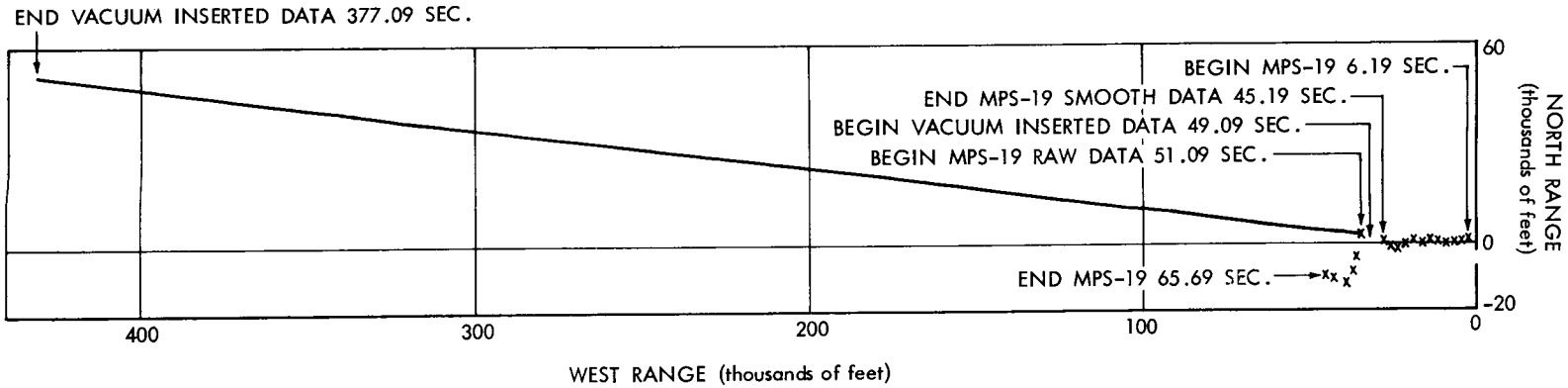

Figure 159. 14.160 GE Radar Plot, North Range vs West Range

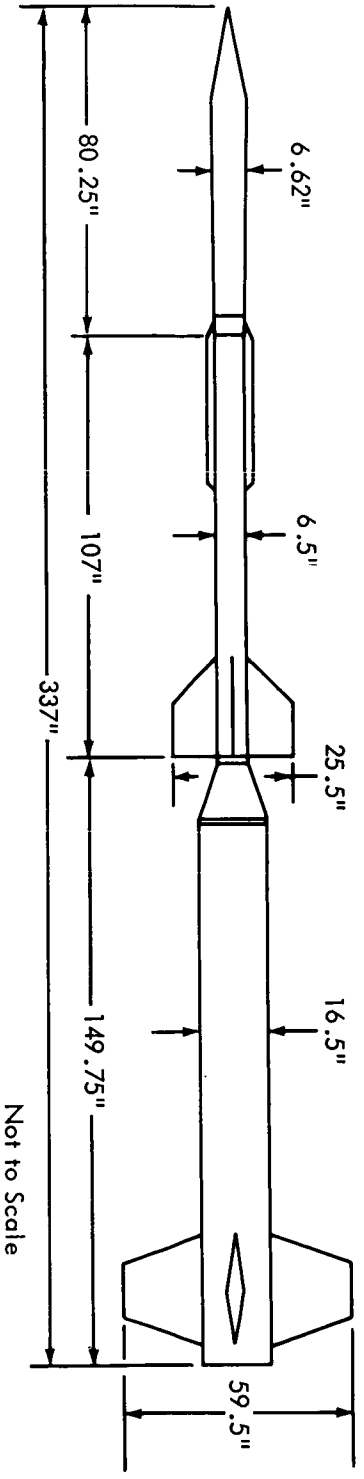

Figure 160. 14.171 GE Sketch

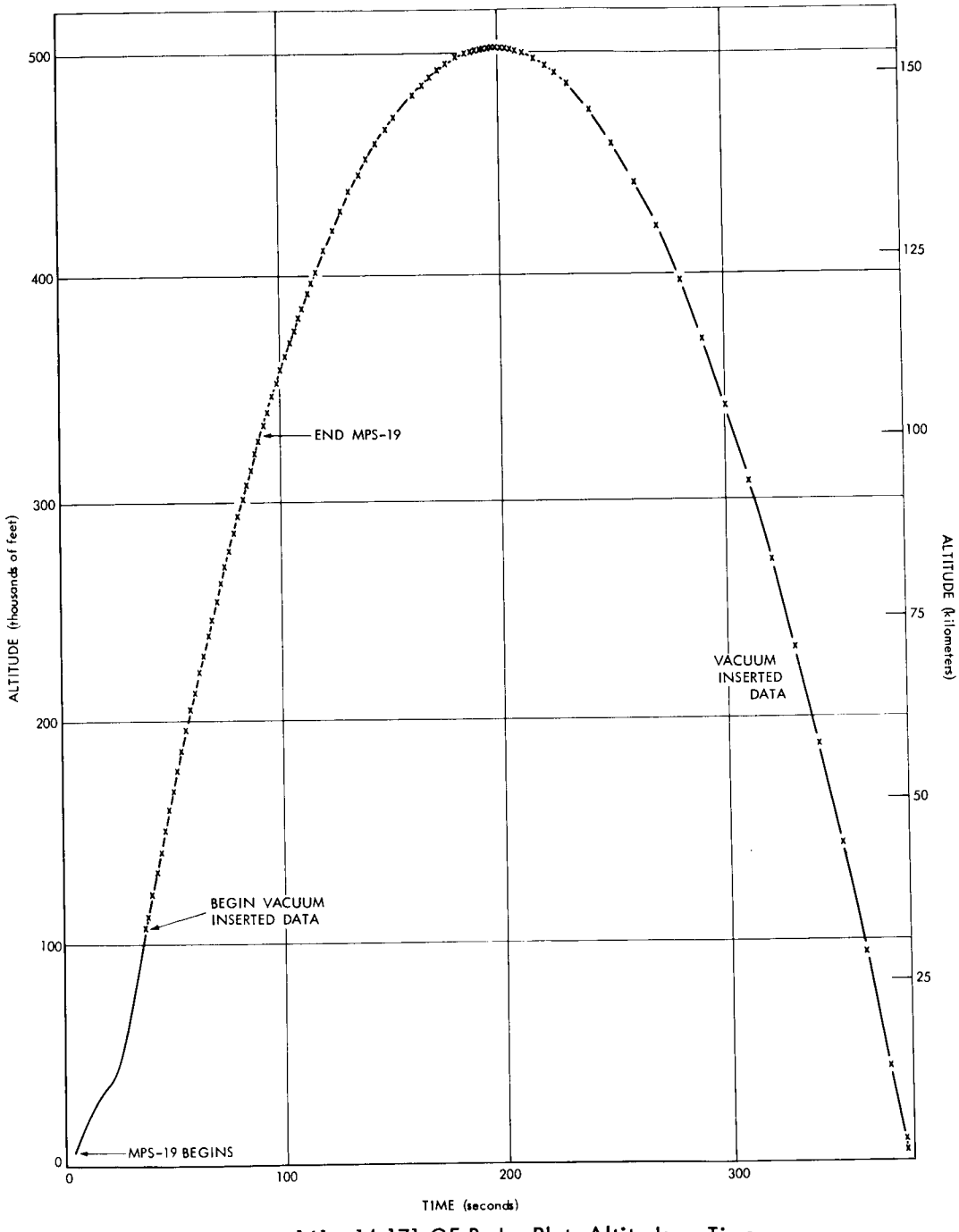

Figure 161. 14.171 GE Radar Plot, Altitude vs Time

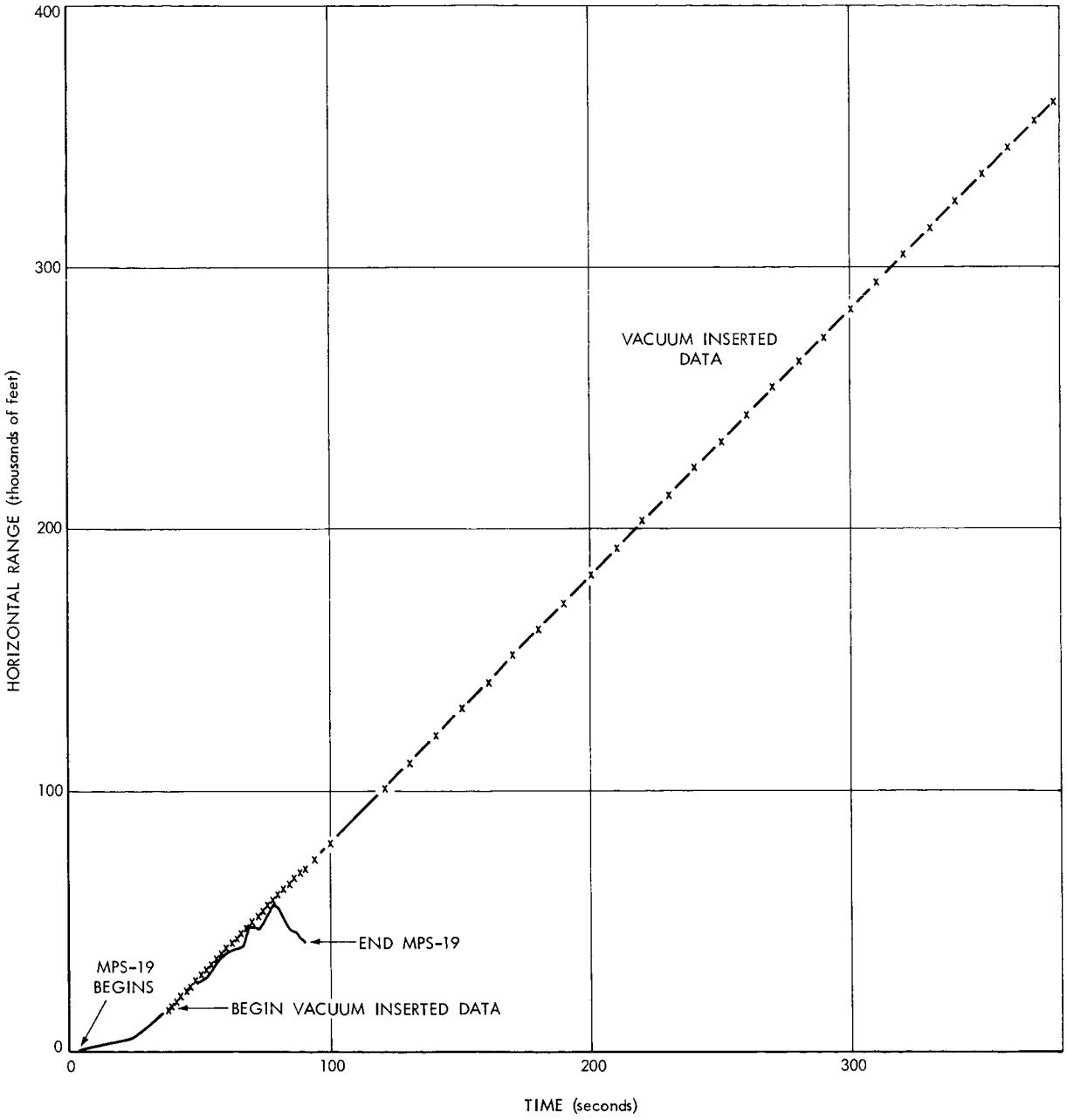

Figure 162. 14.171 GE Radar Plot, Horizontal Range vs Time

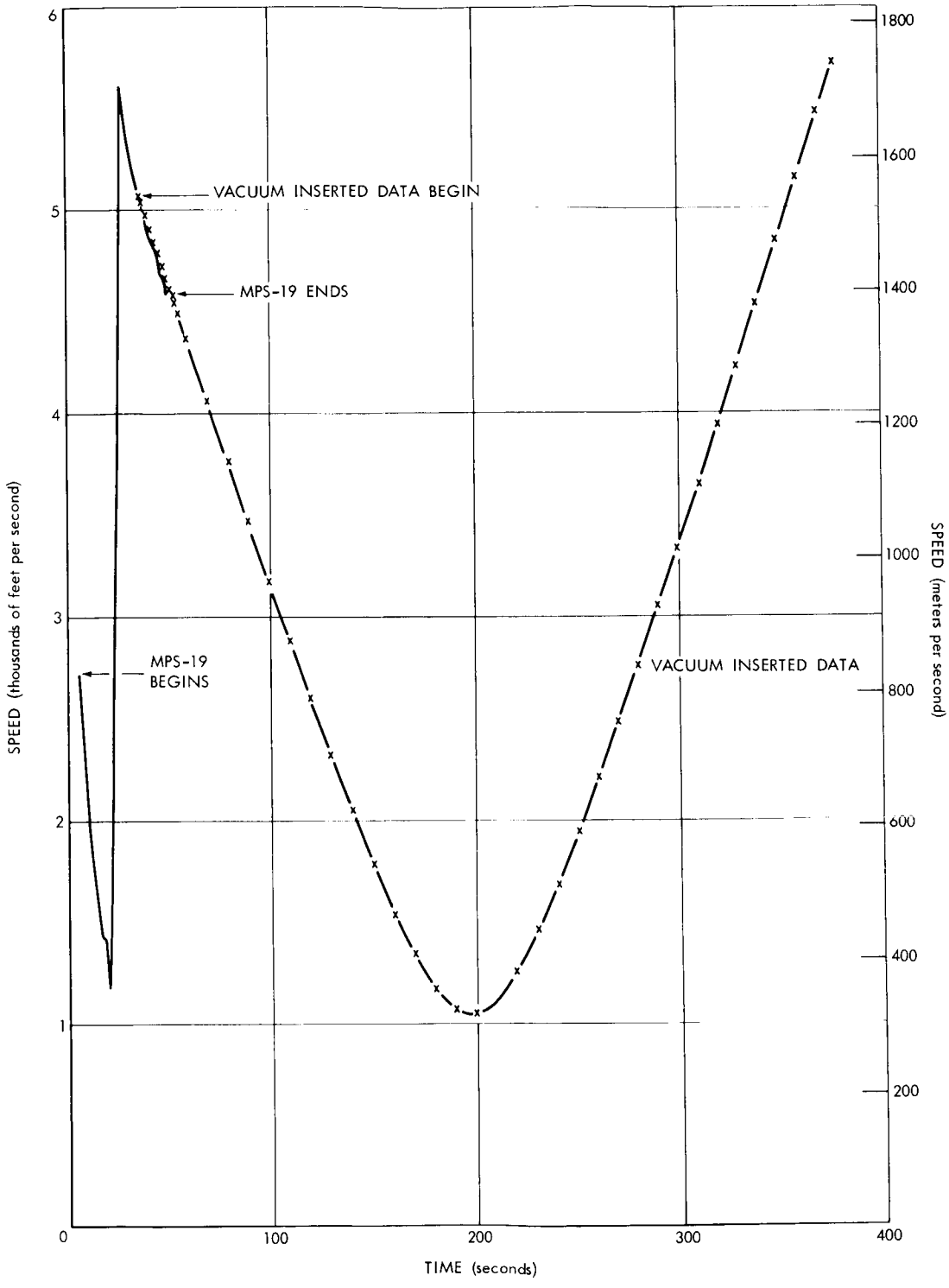

Figure 163. 14.171 GE Radar Plot, Speed vs Time

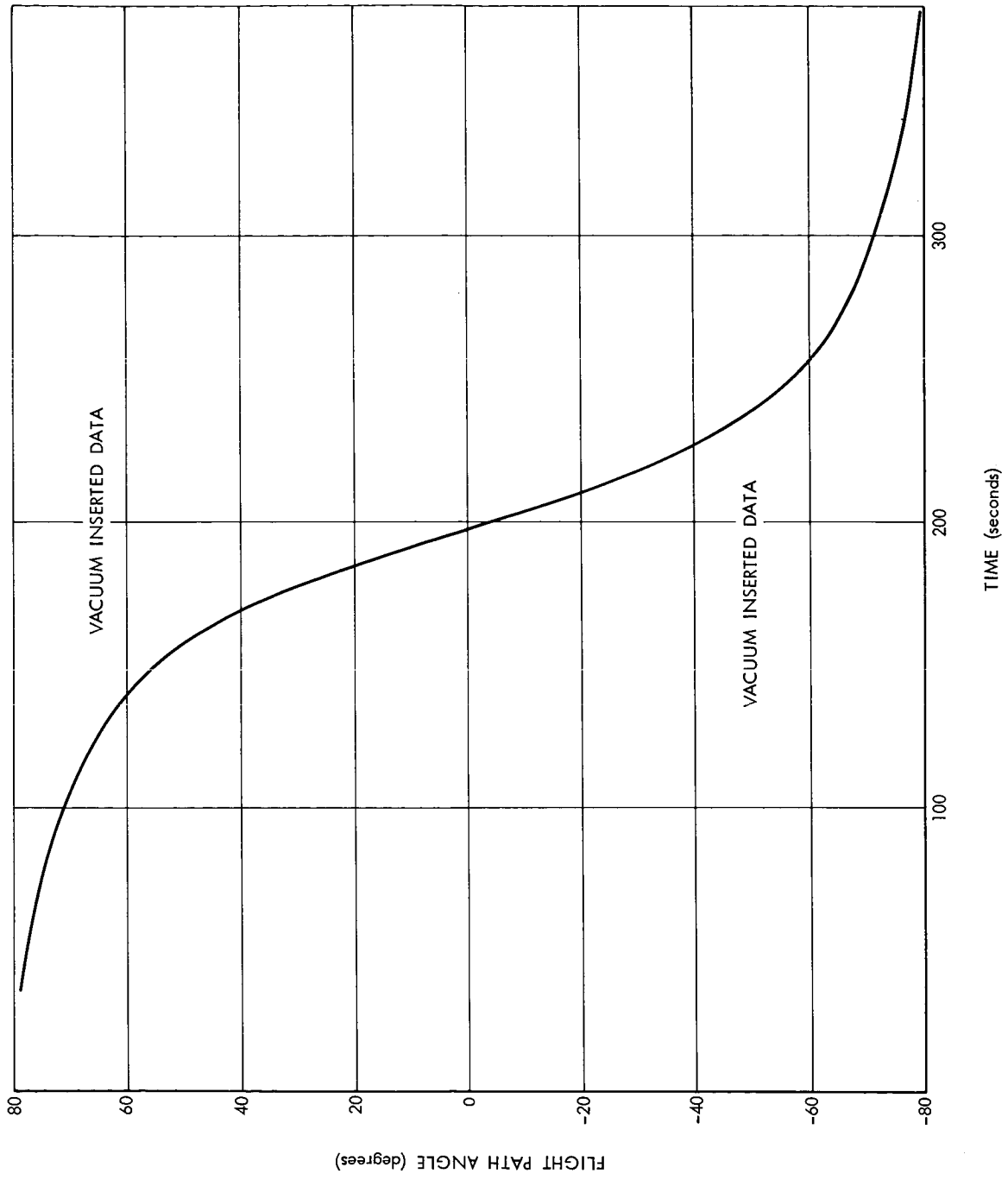

Figure 164. 14.171 GE Radar Plot, Flight Path Angle vs Time

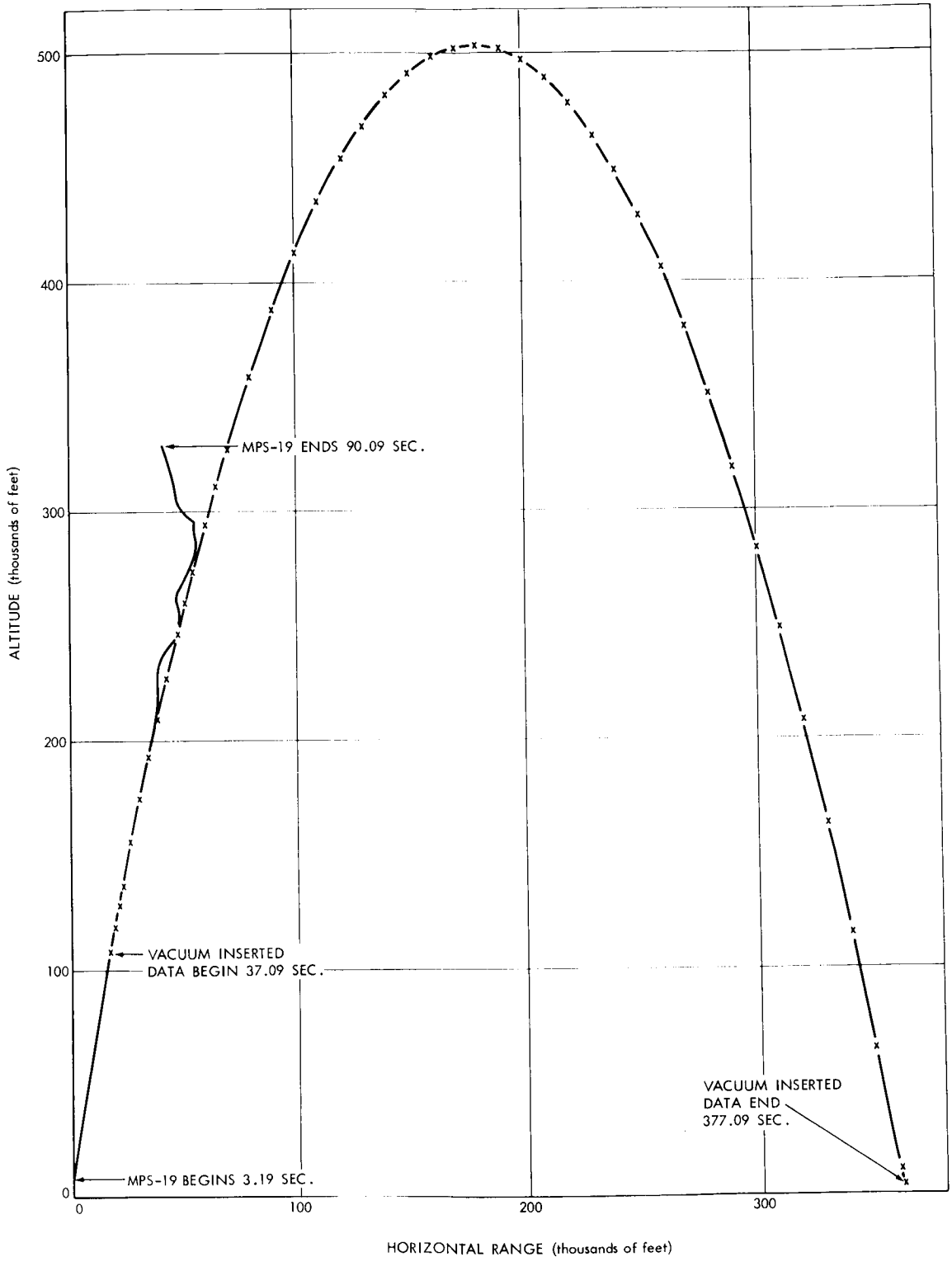

Figure 165. 14.171 GE Radar Plot, Altitude vs Horizontal Range

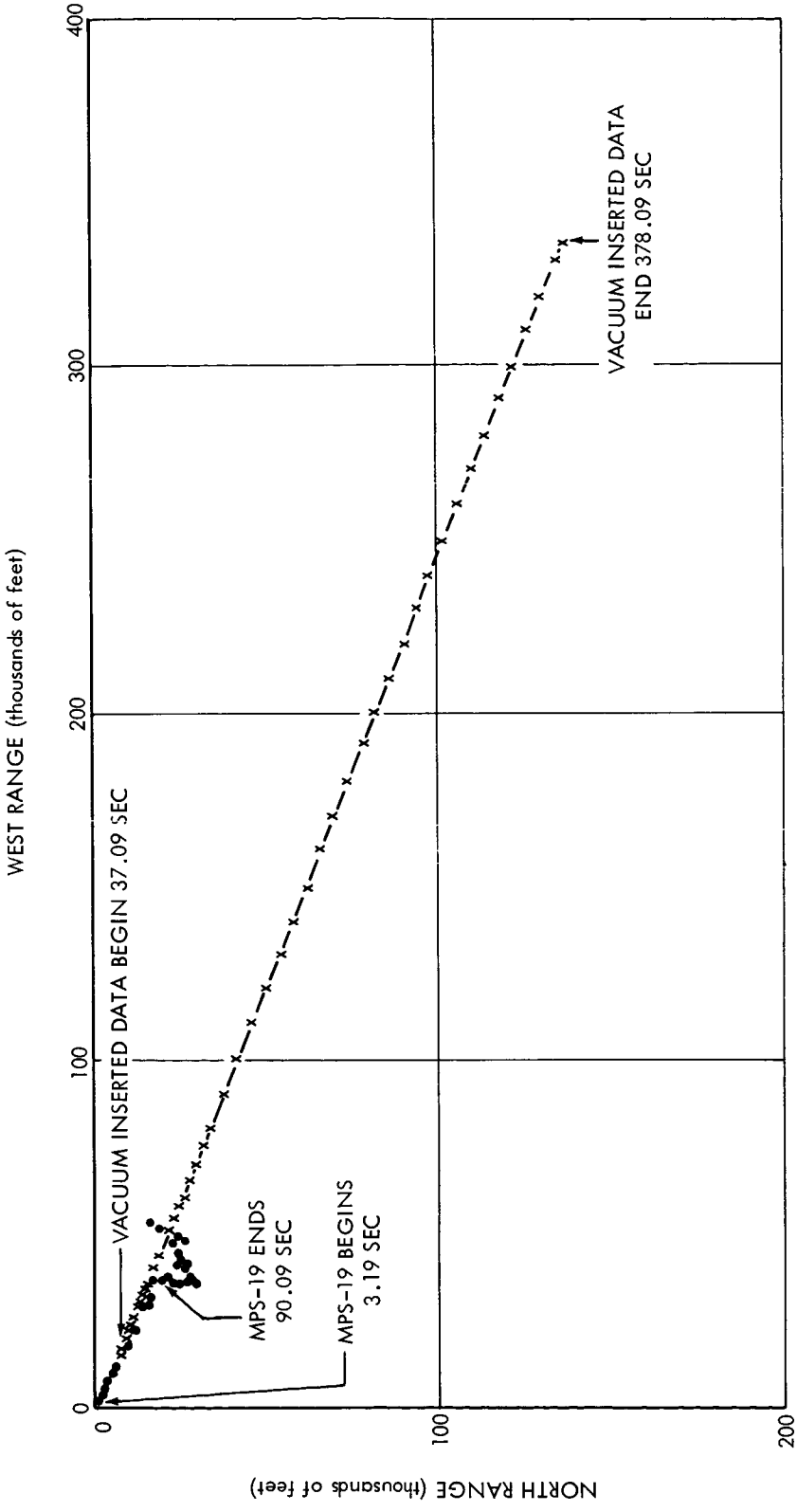

Figure 166. 14.171 GE Radar Plot, North Range vs West Range

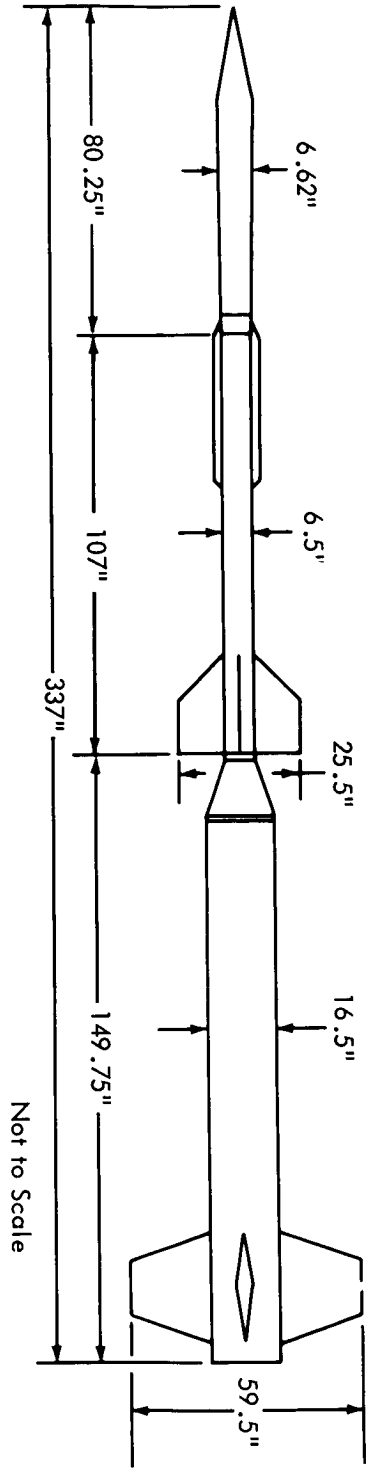

Figure 167. 14.172 GE Sketch

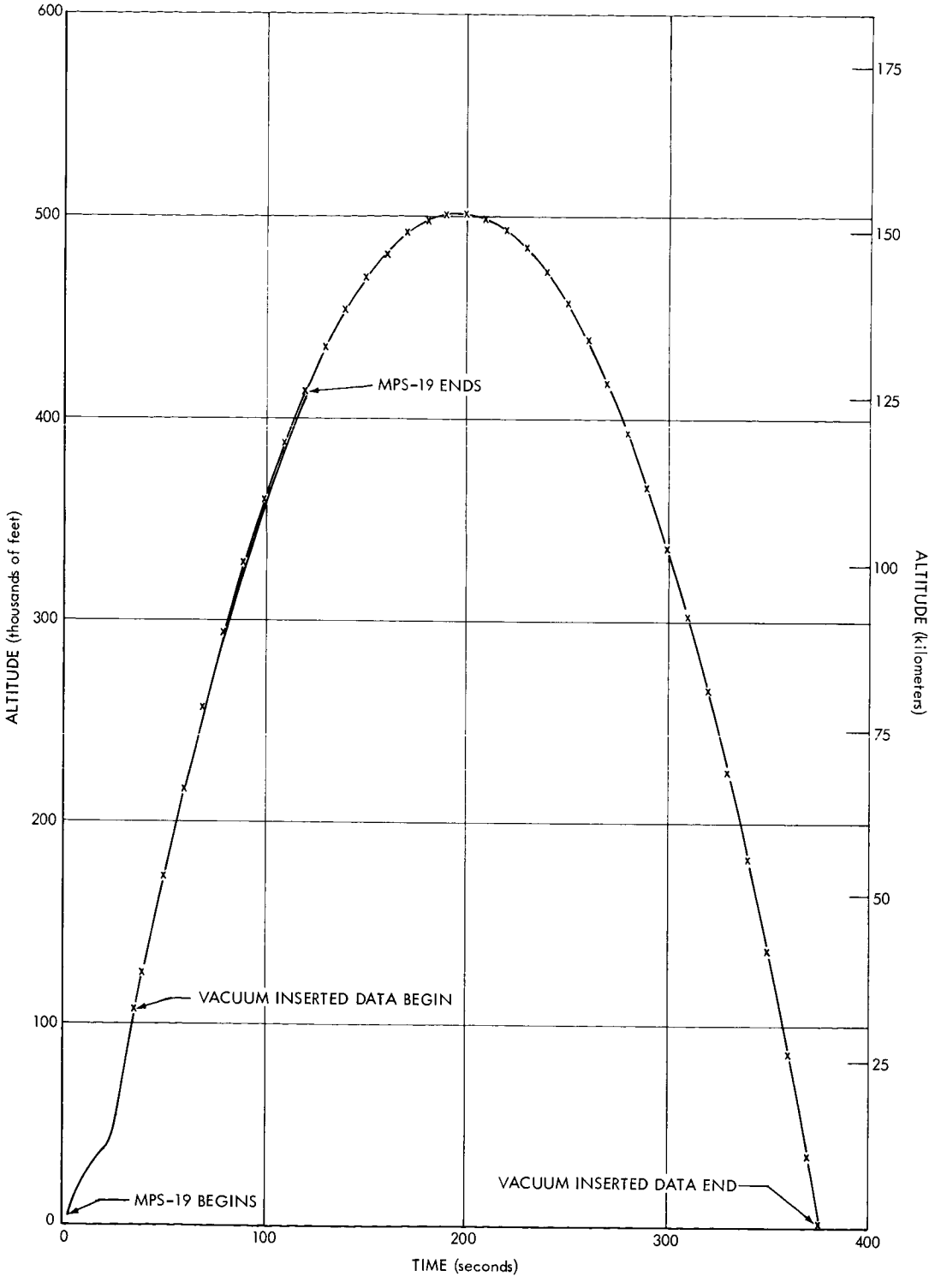

Figure 168. 14.172 GE Radar Plot, Altitude vs Time

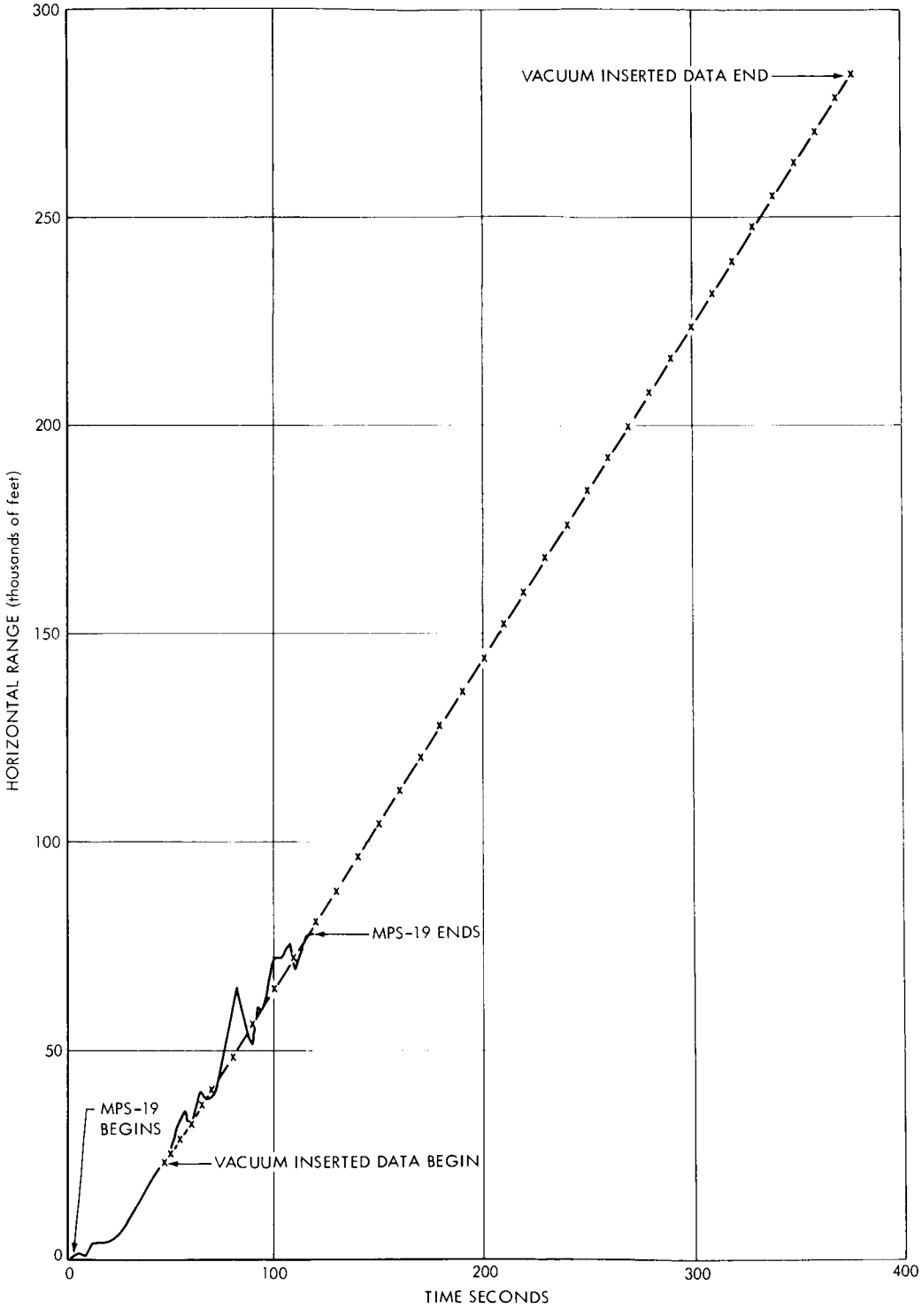

Figure 169. 14.172 GE Radar Plot, Horizontal Range vs Time

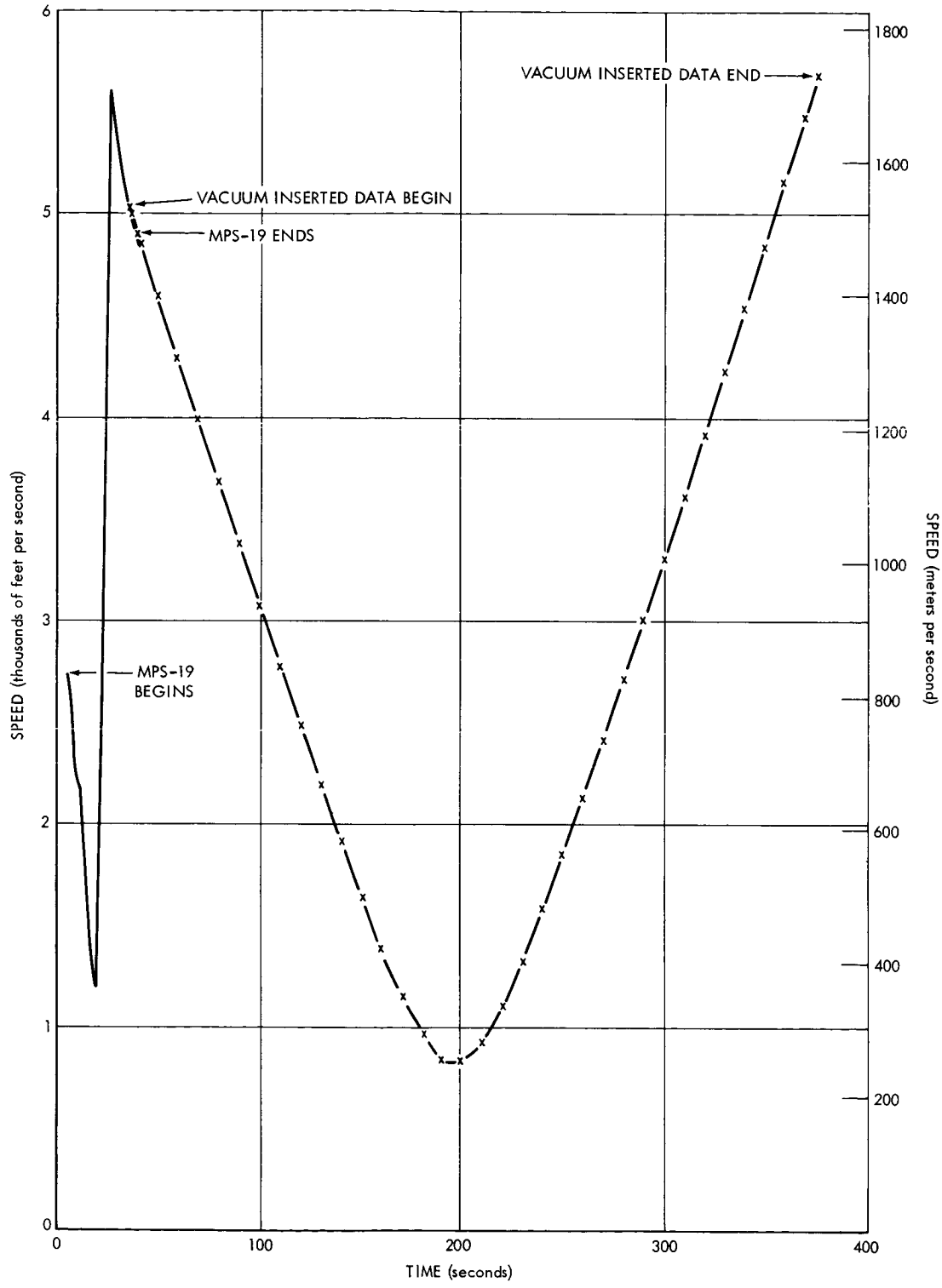

Figure 170. 14.172 GE Radar Plot, Speed vs Time

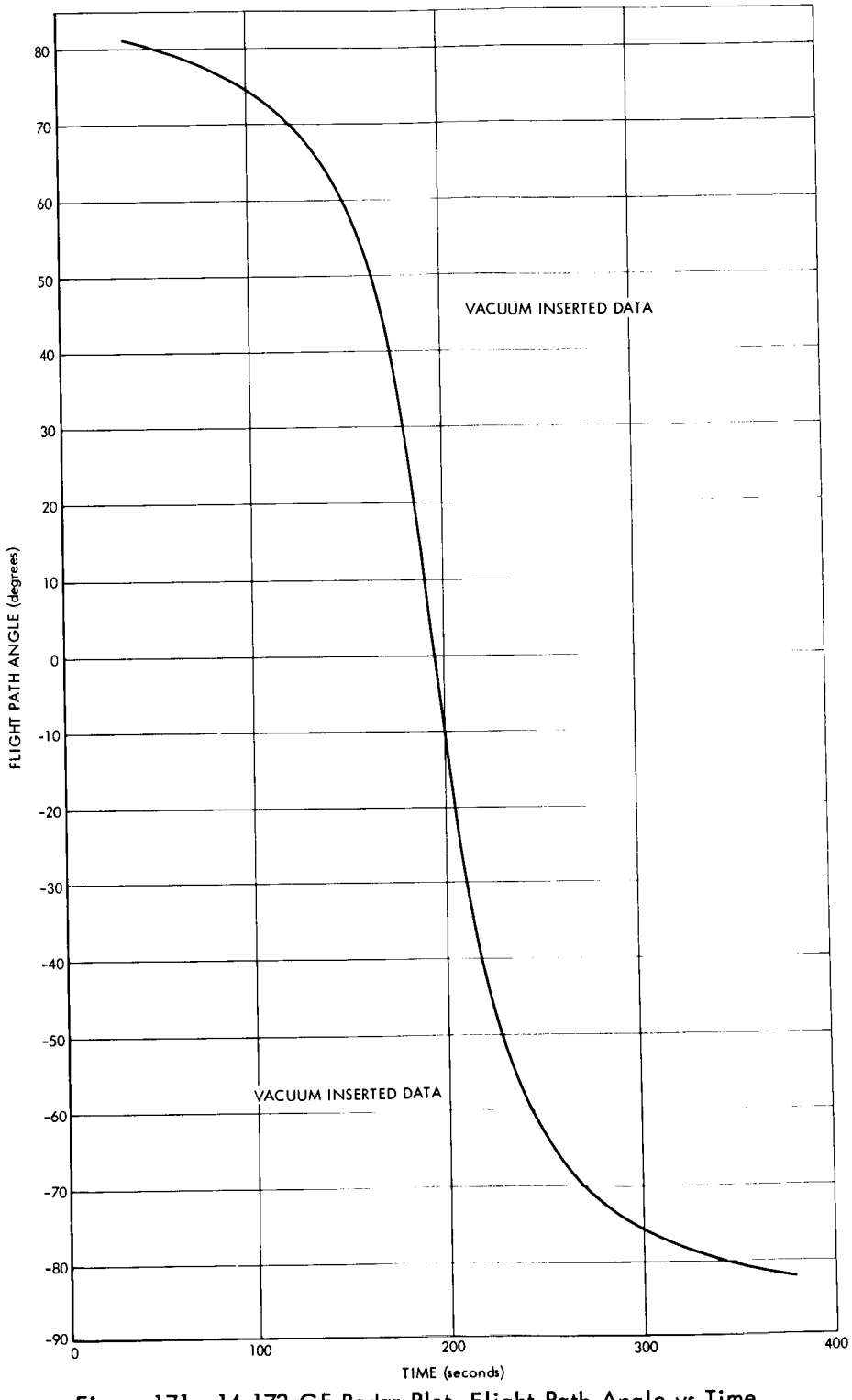

Figure 171. 14.172 GE Radar Plot, Flight Path Angle vs Time

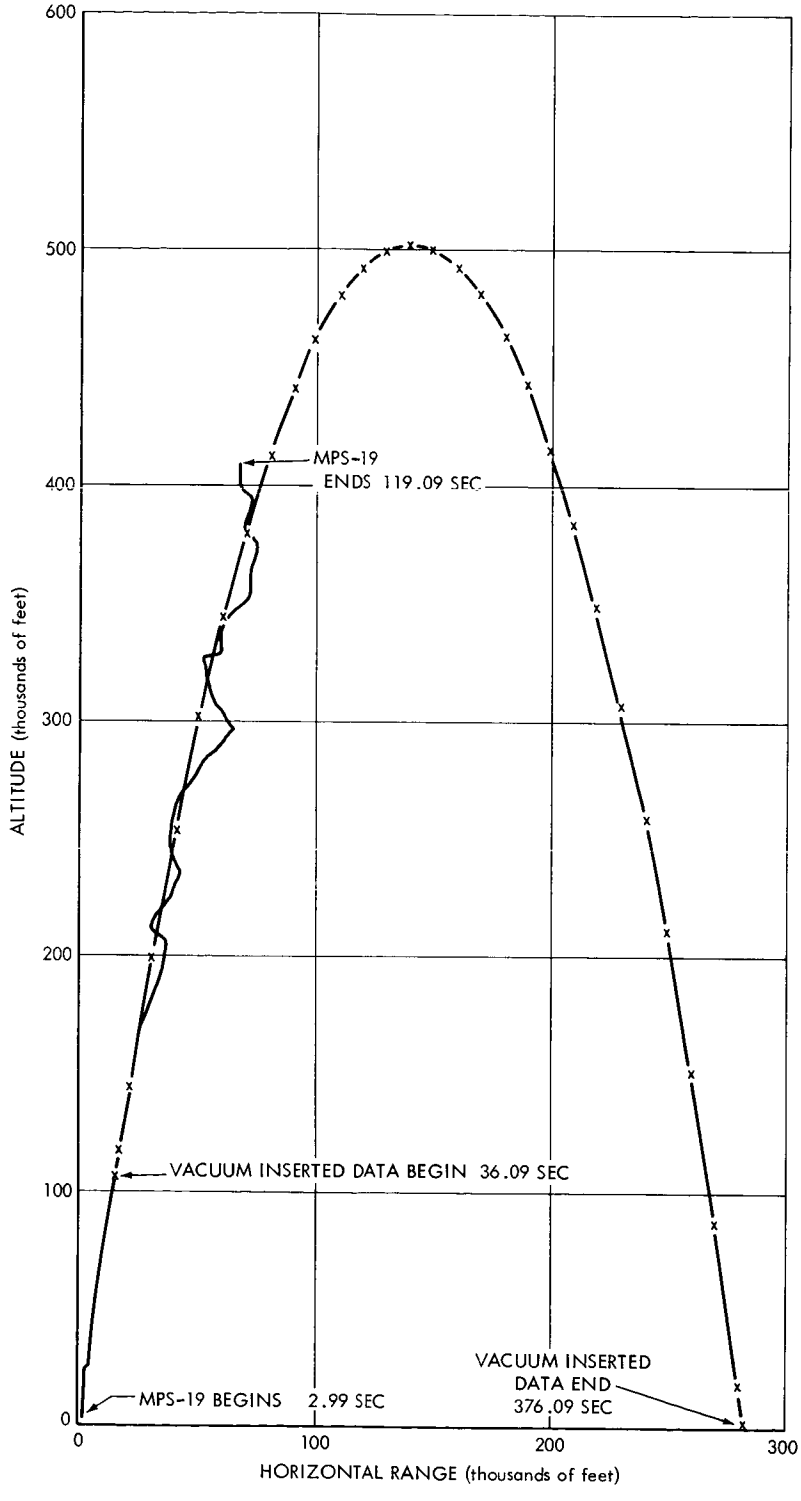

Figure 172. 14.172 GE Radar Plot, Altitude vs Horizontal Range

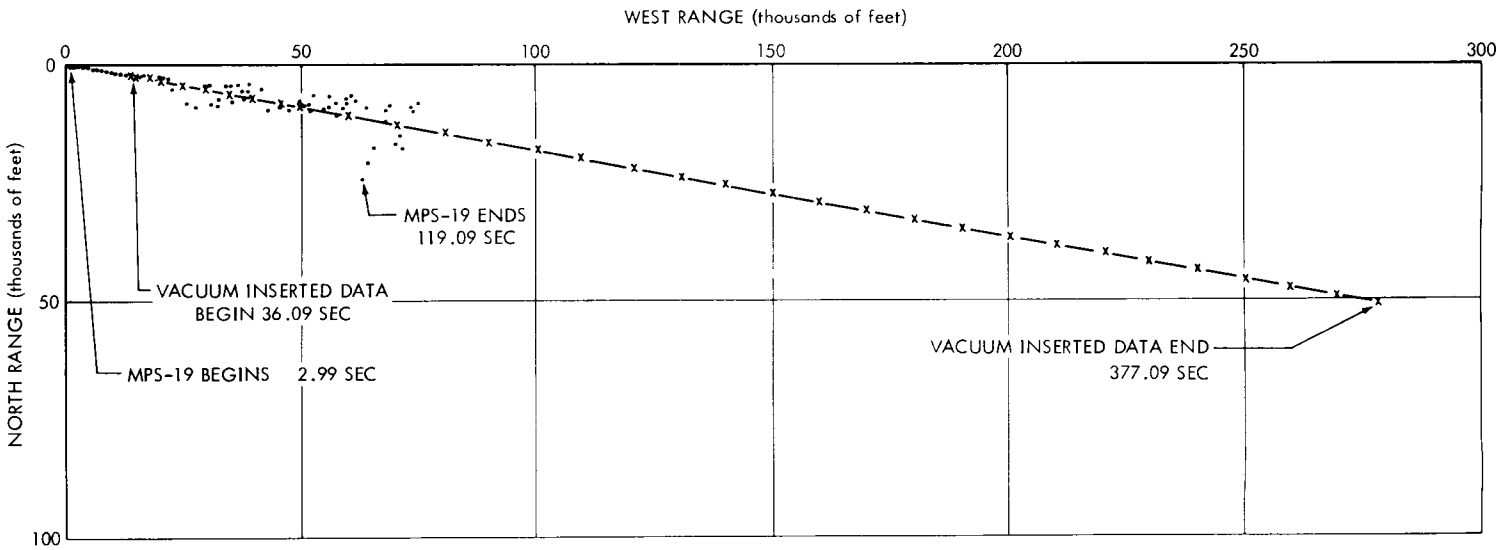

Figure 173. 14.172 GE Radar Plot, North Range vs West Range

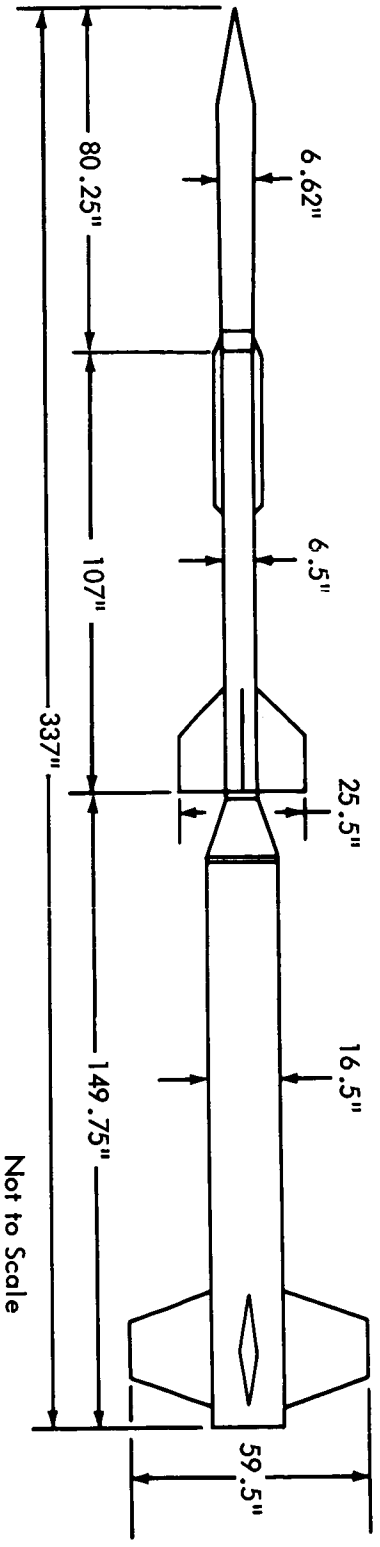

Figure 174. 14.173 GE Sketch

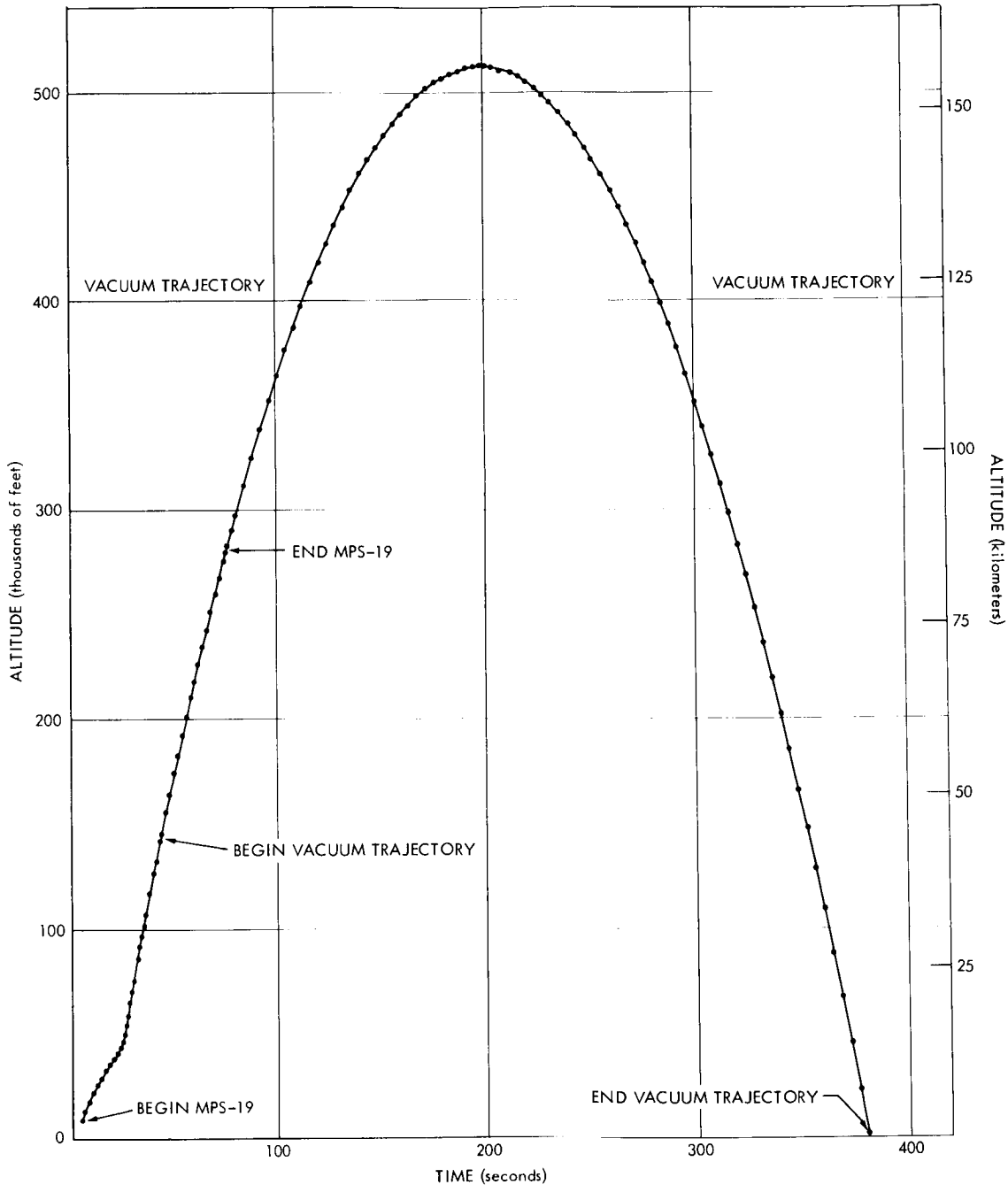

Figure 175. 14.173 GE Radar Plot, Altitude vs Time

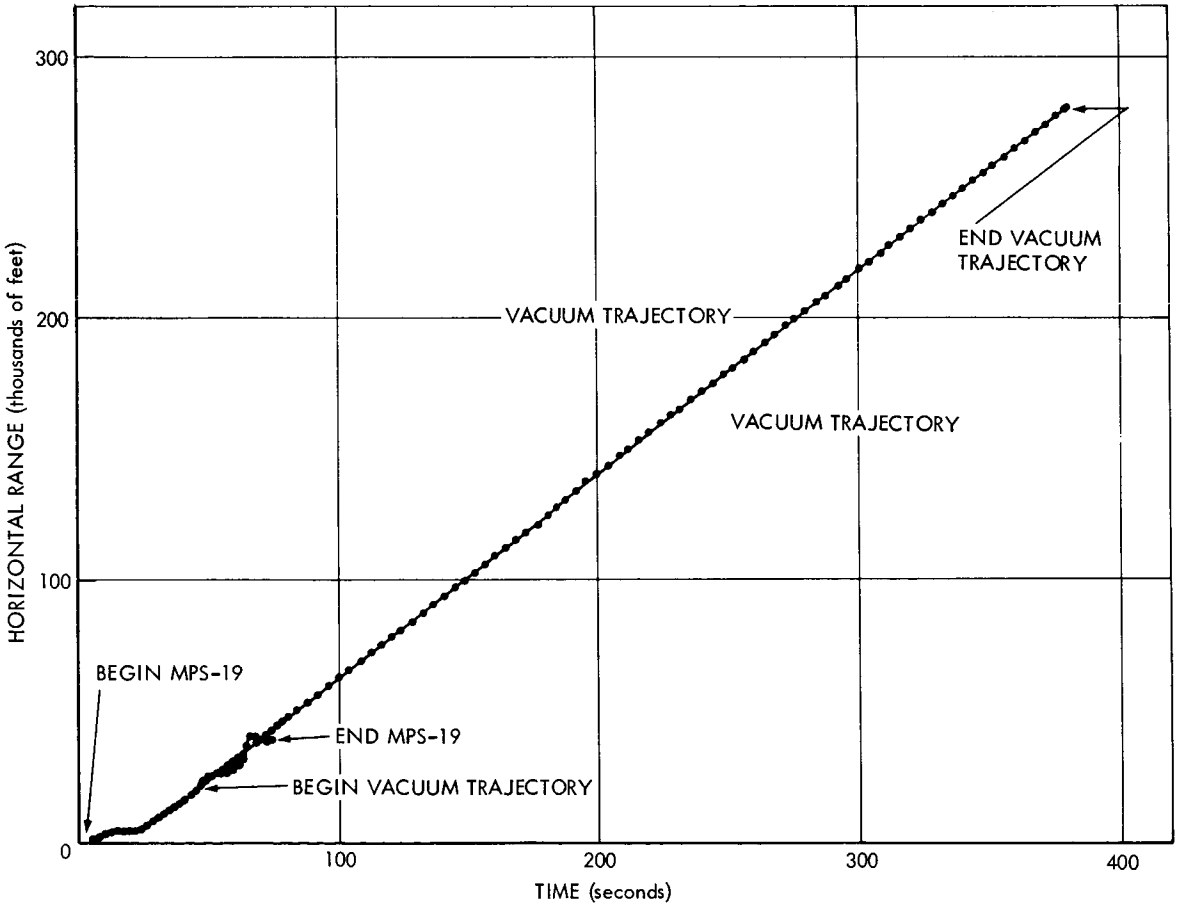

Figure 176. 14.173 GE Radar Plot, Horizontal Range vs Time

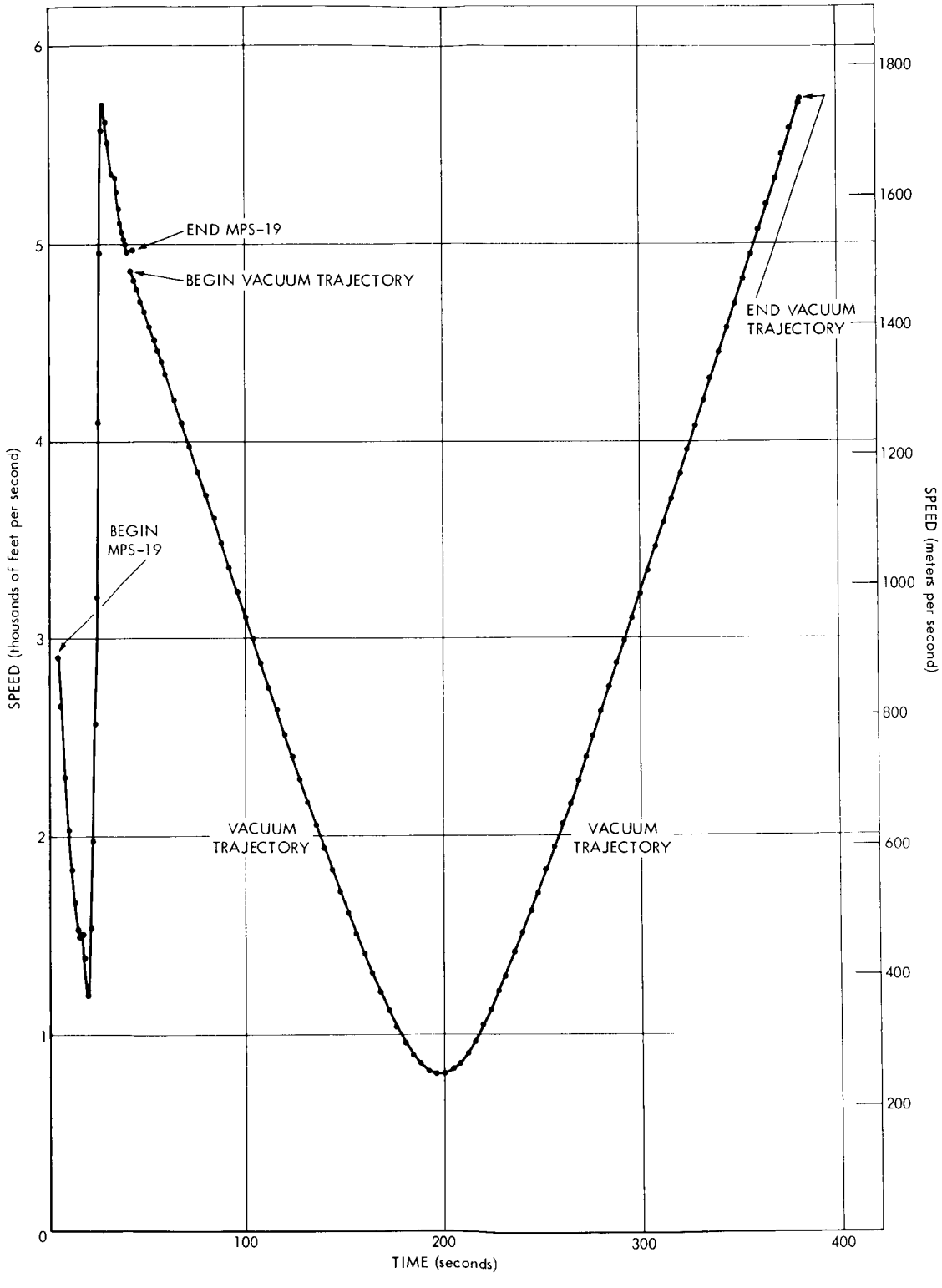

Figure 177. 14.173 GE Radar Plot, Speed vs Time

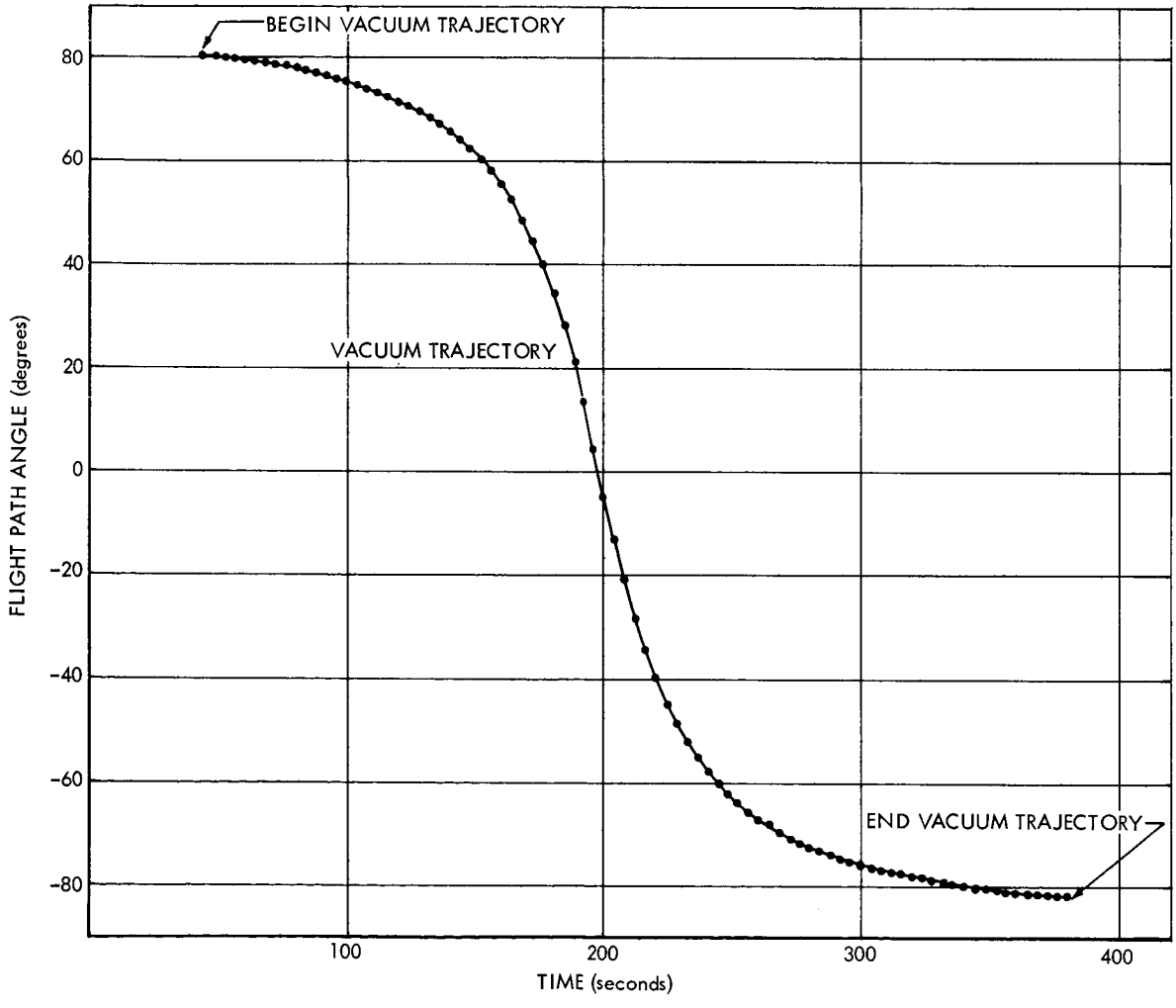

Figure 178. 14.173 GE Radar Plot, Flight Path Angle vs Time

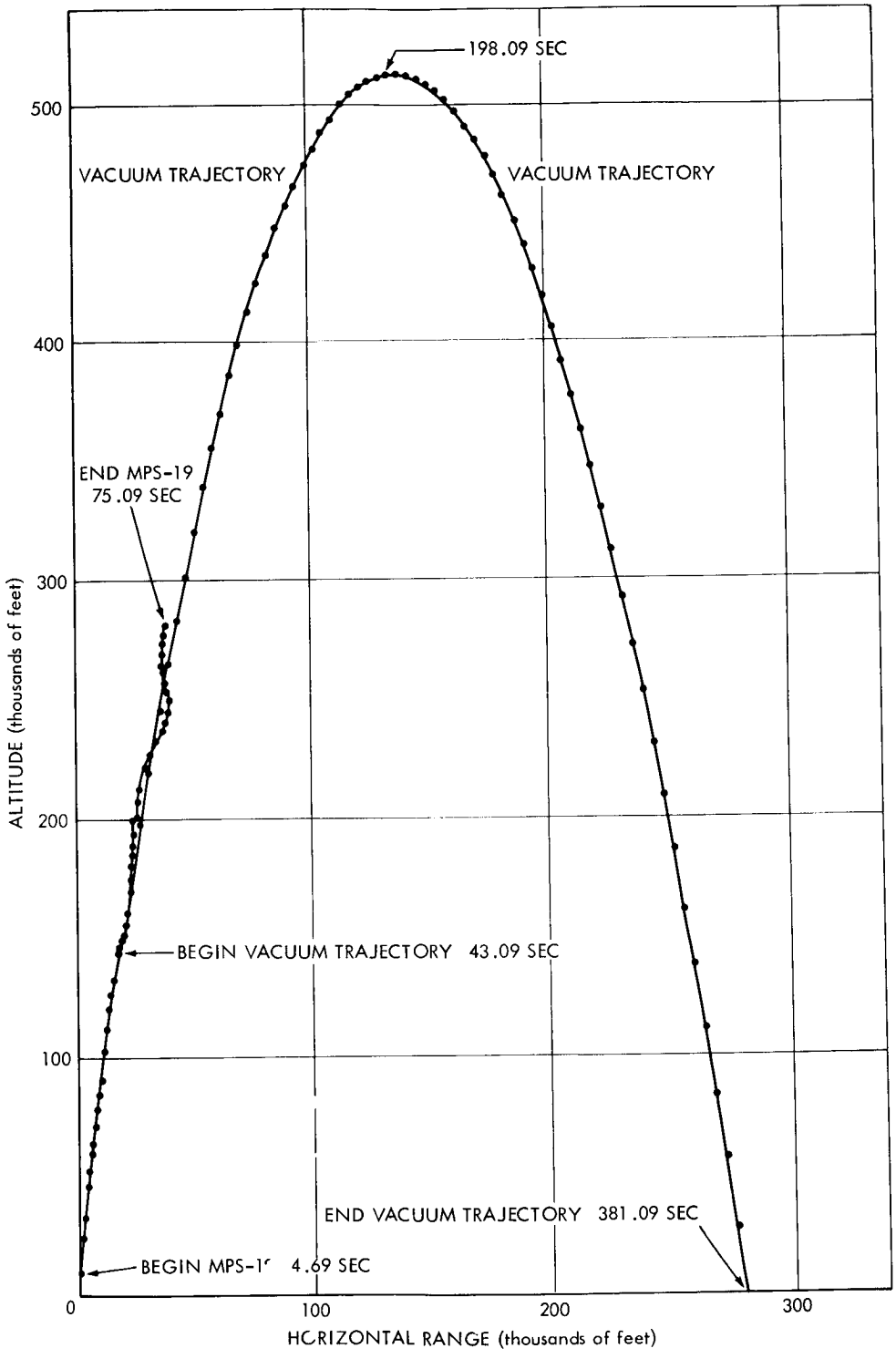

Figure 179. 14.173 GE Radar Plot, Altitude vs Horizontal Range

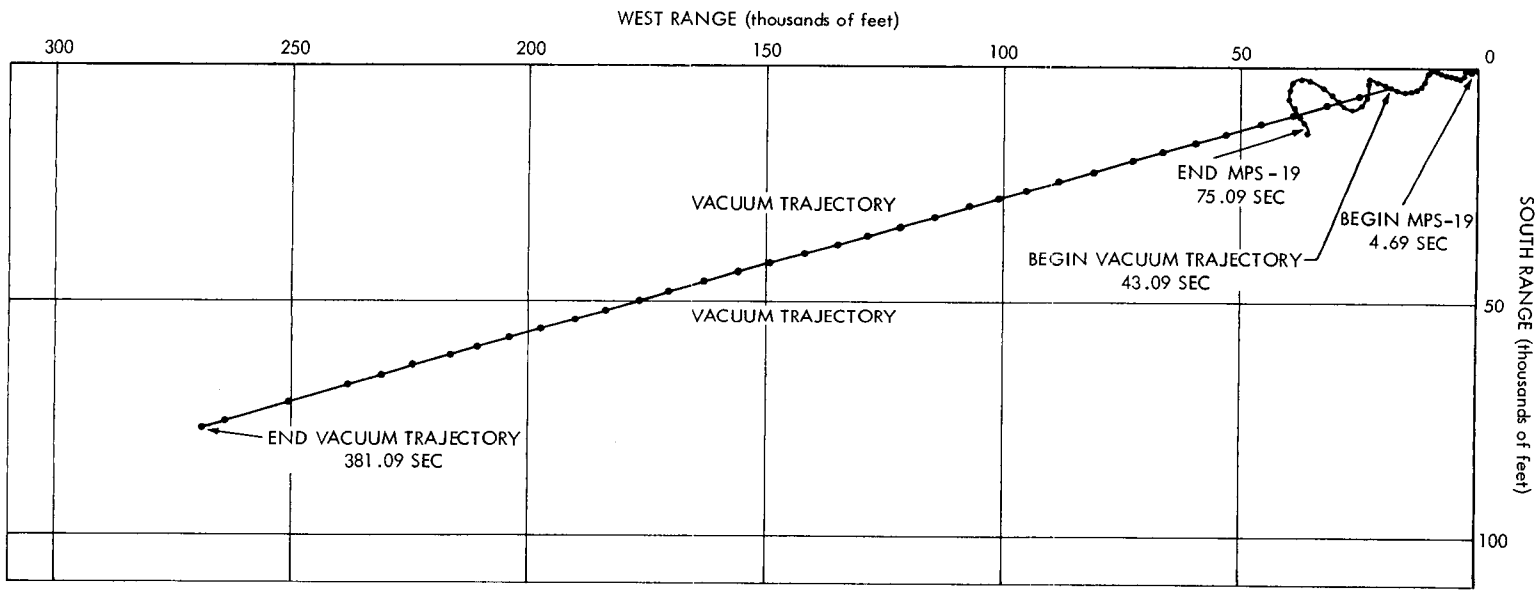

Figure 180. 14.173 GE Radar Plot, South Range vs West Range

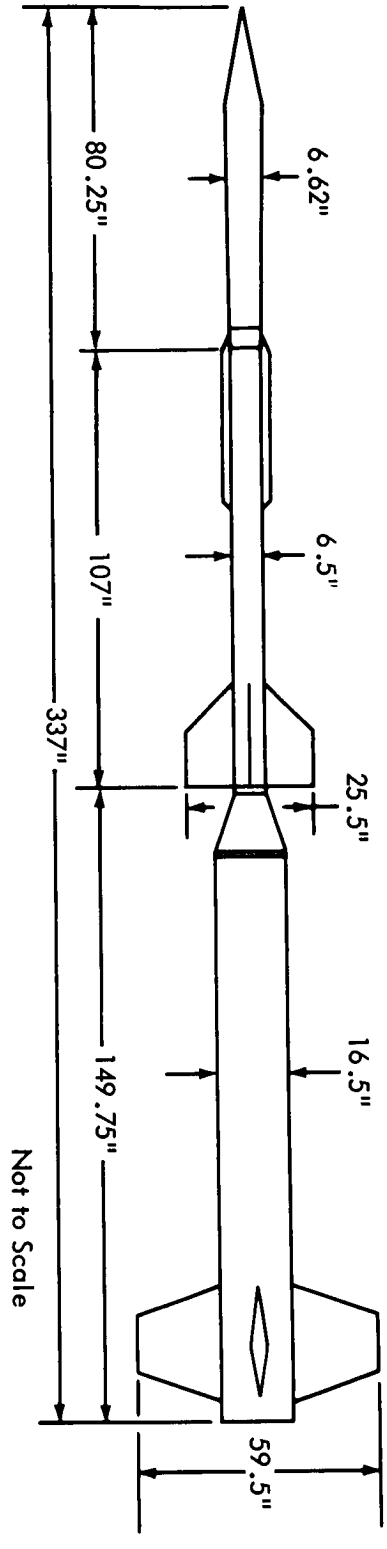

Figure 181. 14.174 GE Sketch

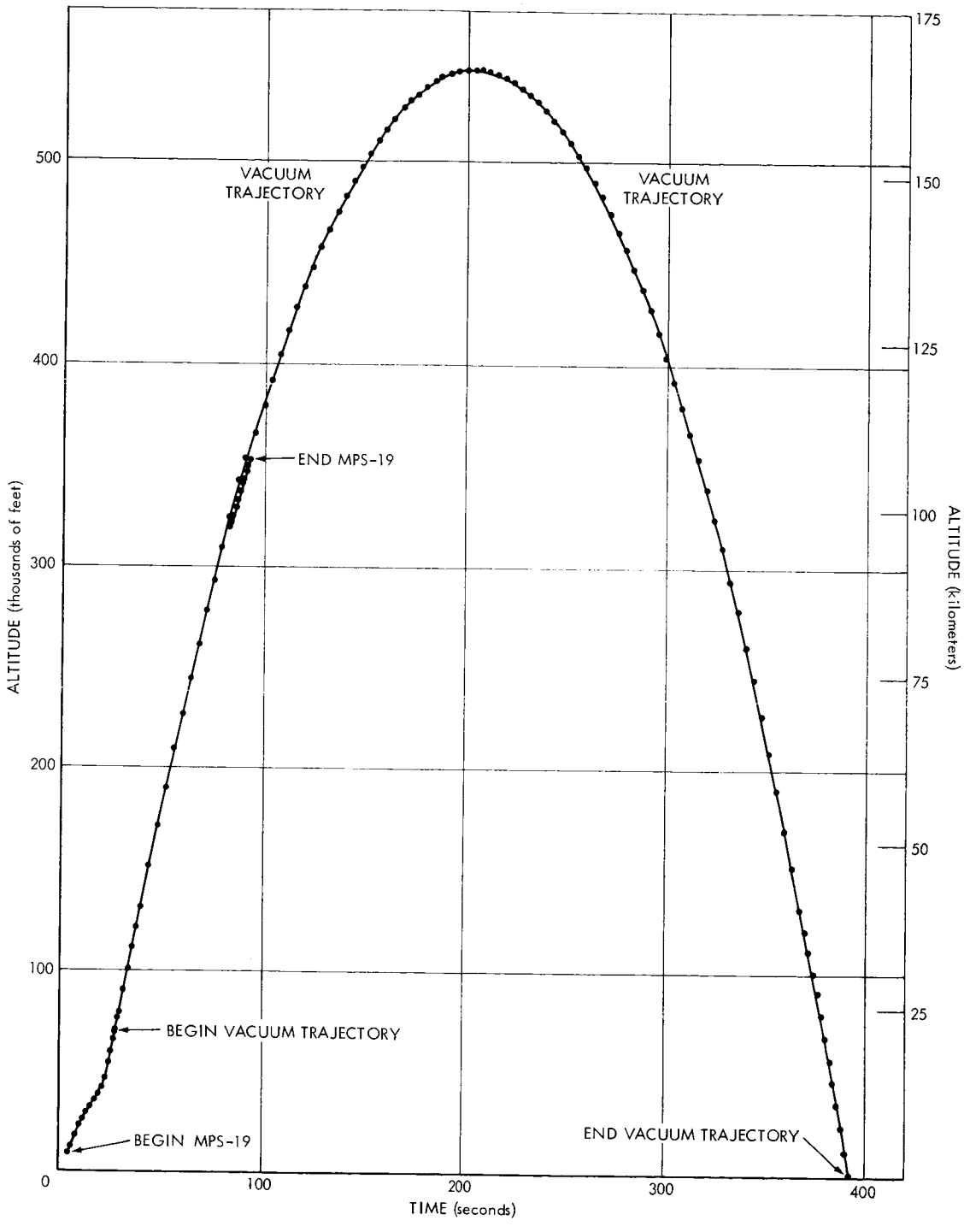

Figure 182. 14.174 GE Radar Plot, Altitude vs Time

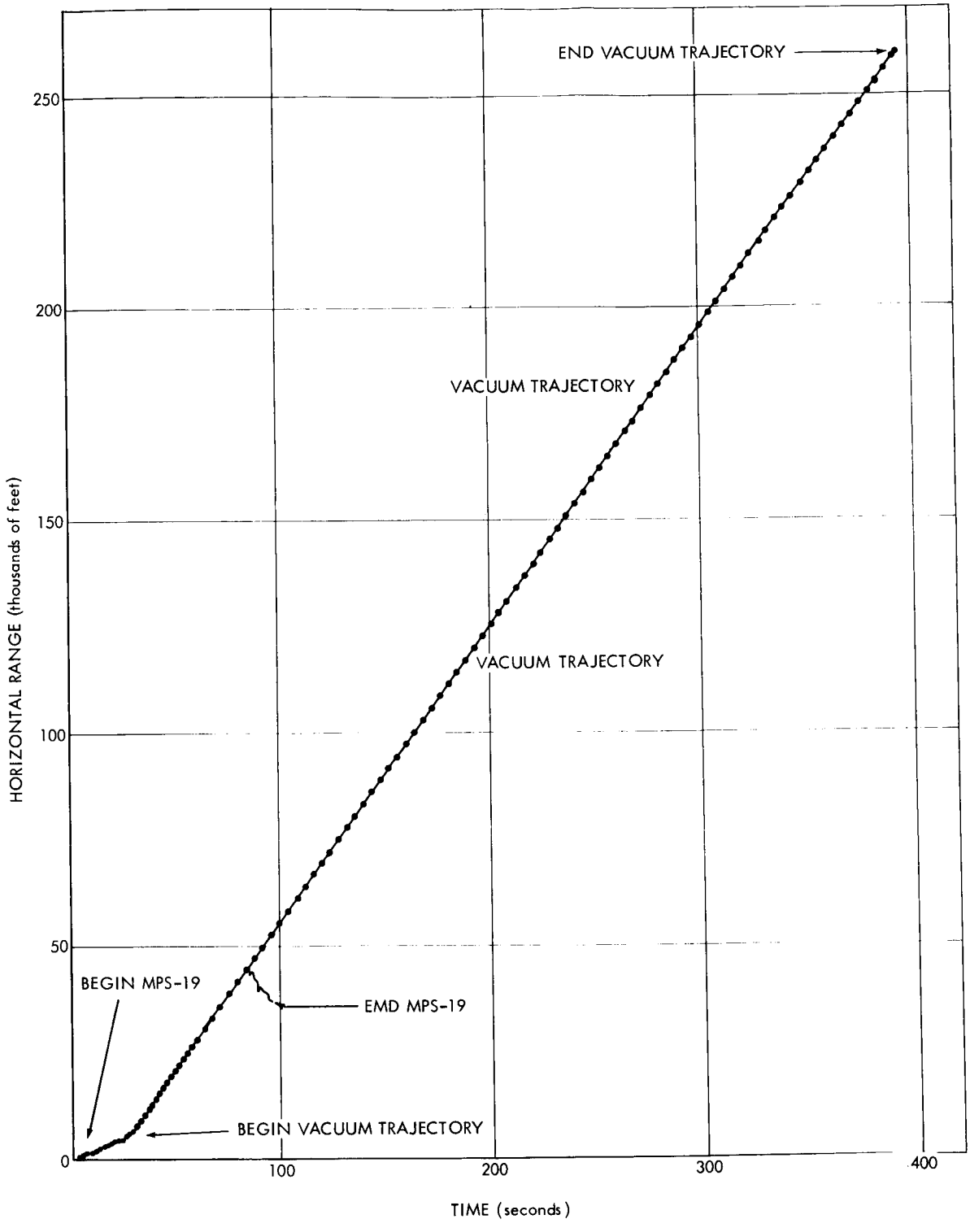

Figure 183. 14.174 GE Radar Plot, Horizontal Range vs Time

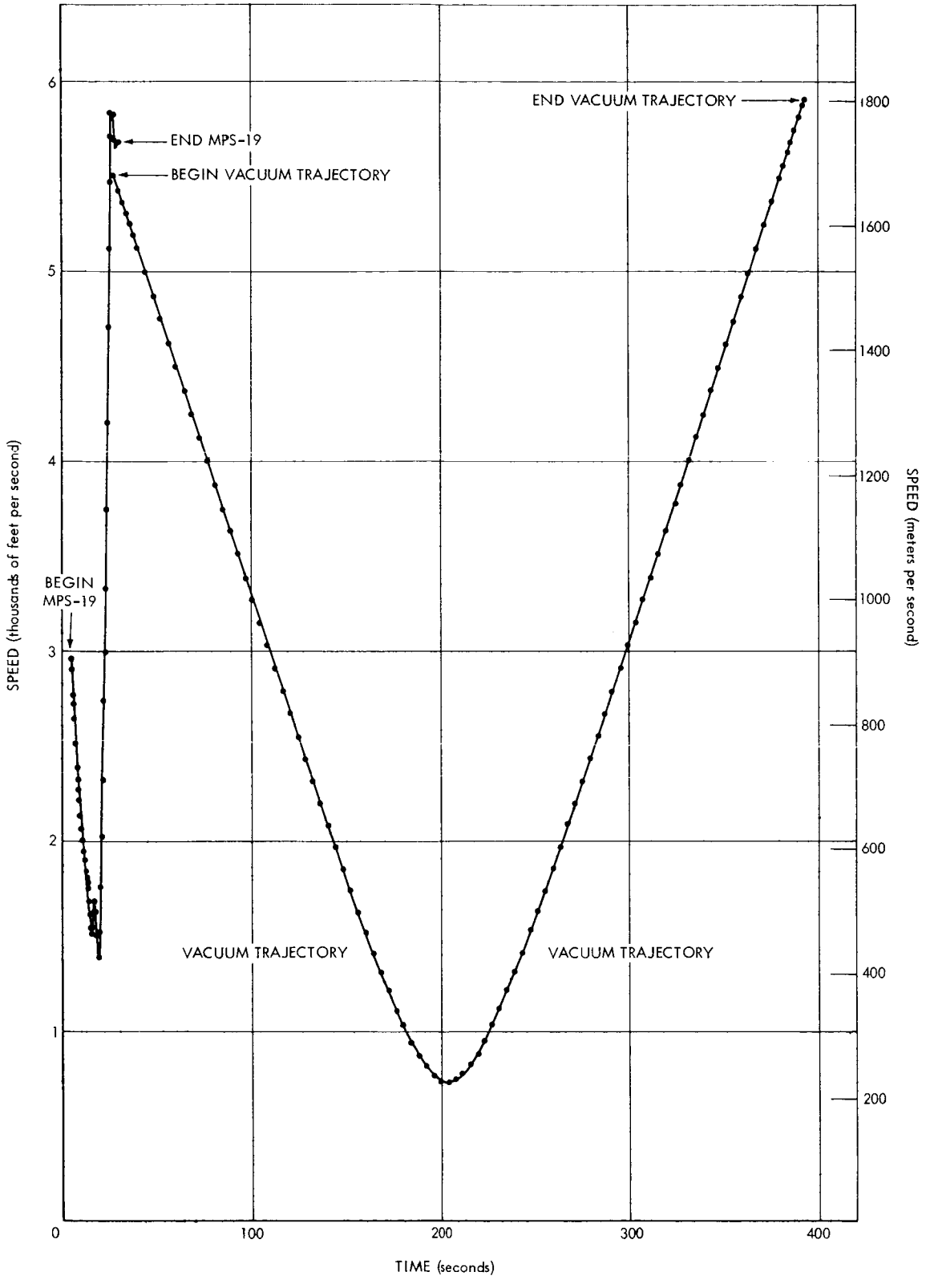

Figure 184. 14.174 GE Radar Plot, Speed vs Time

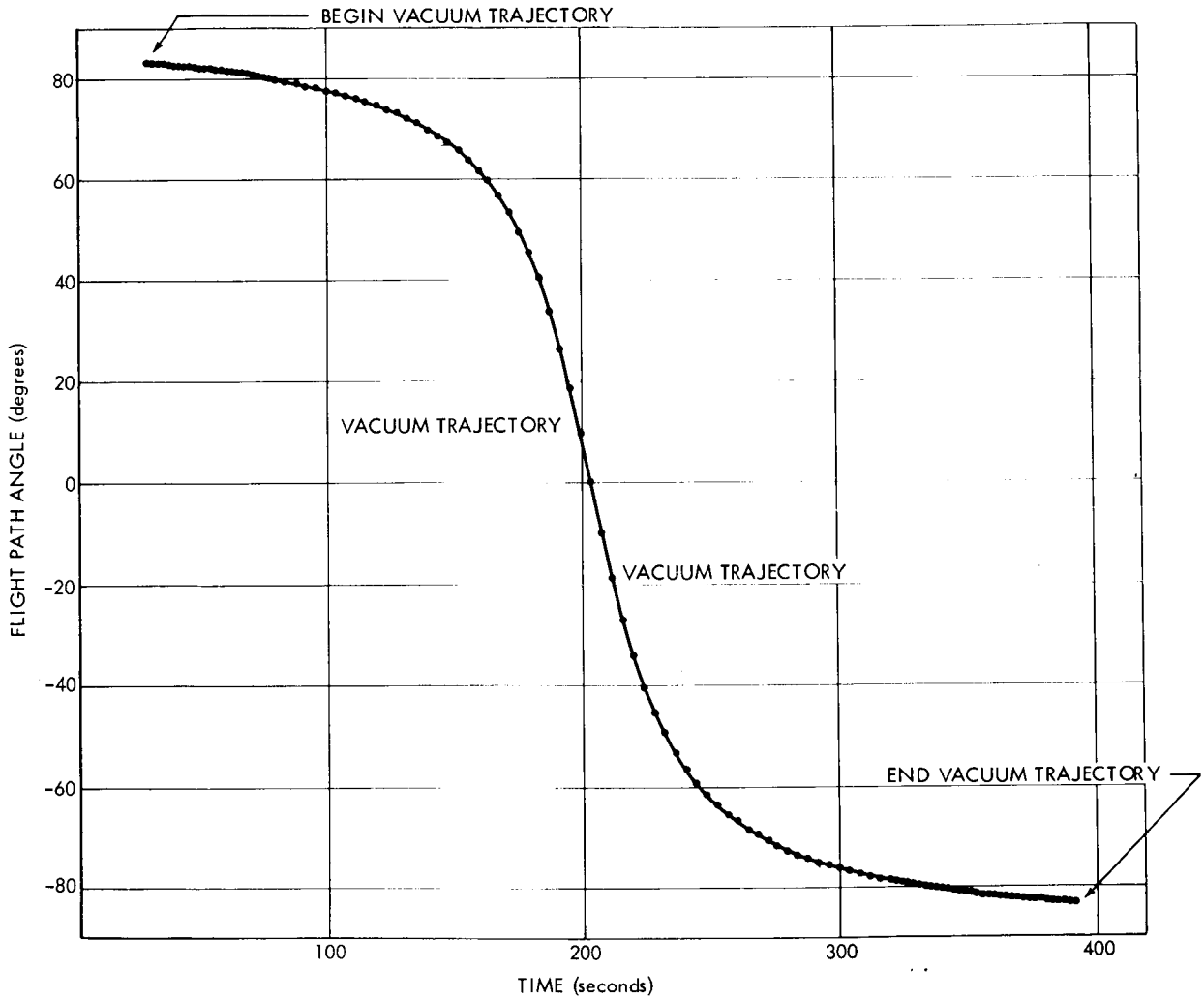

Figure 185. 14.174 GE Radar Plot, Flight Path Angle vs Time

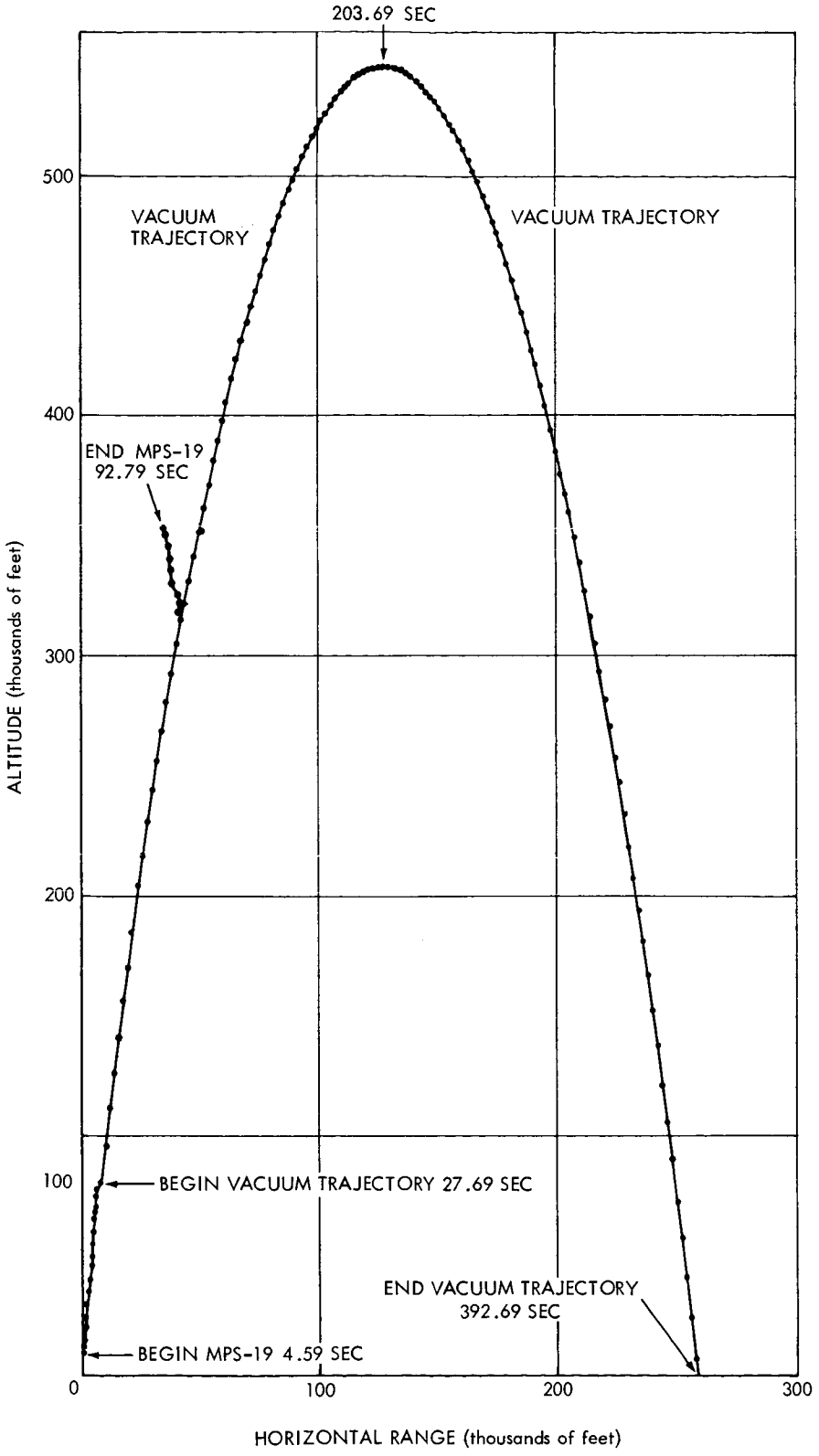

Figure 186. 14.174 GE Radar Plot, Altitude vs Horizontal Range

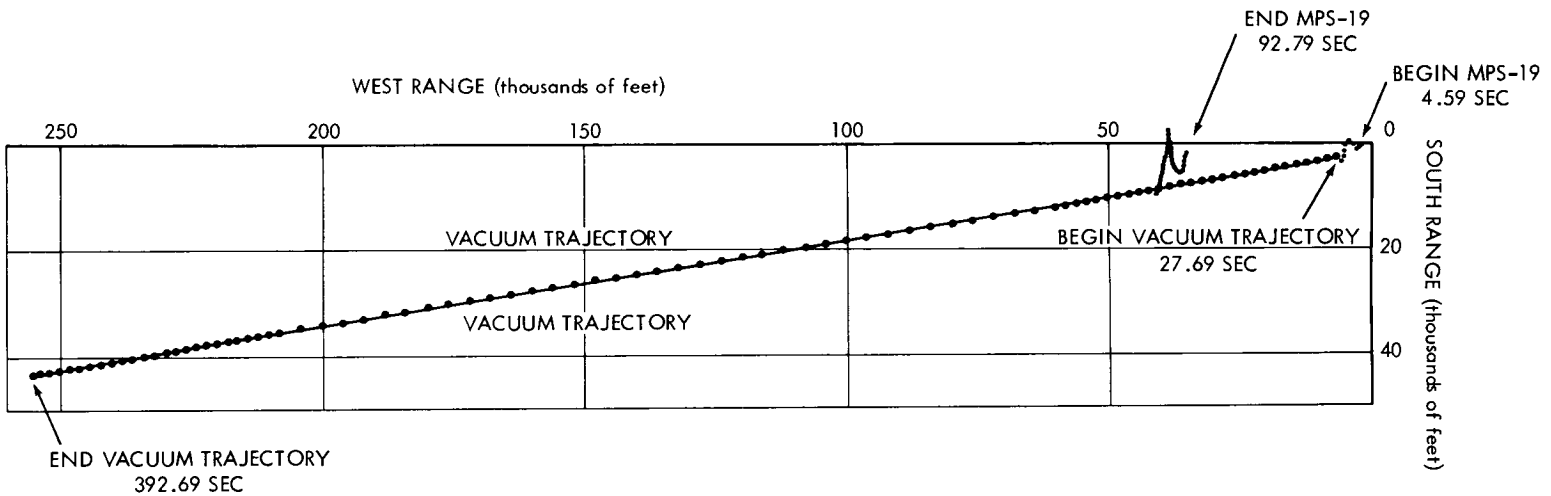

Figure 187. 14.174 GE Radar Plot, South Range vs West Range

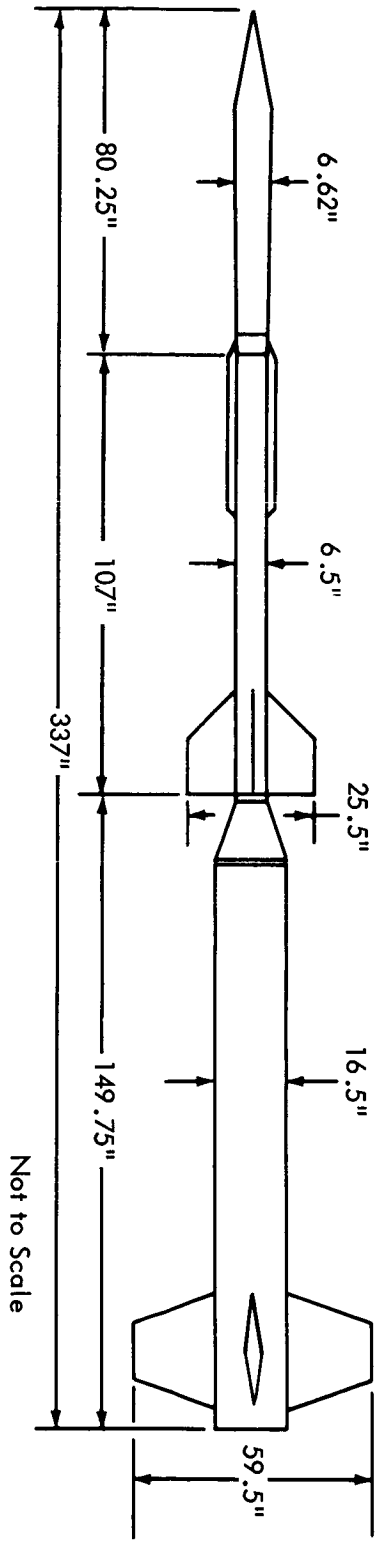

Figure 188. 14.175 GE Sketch

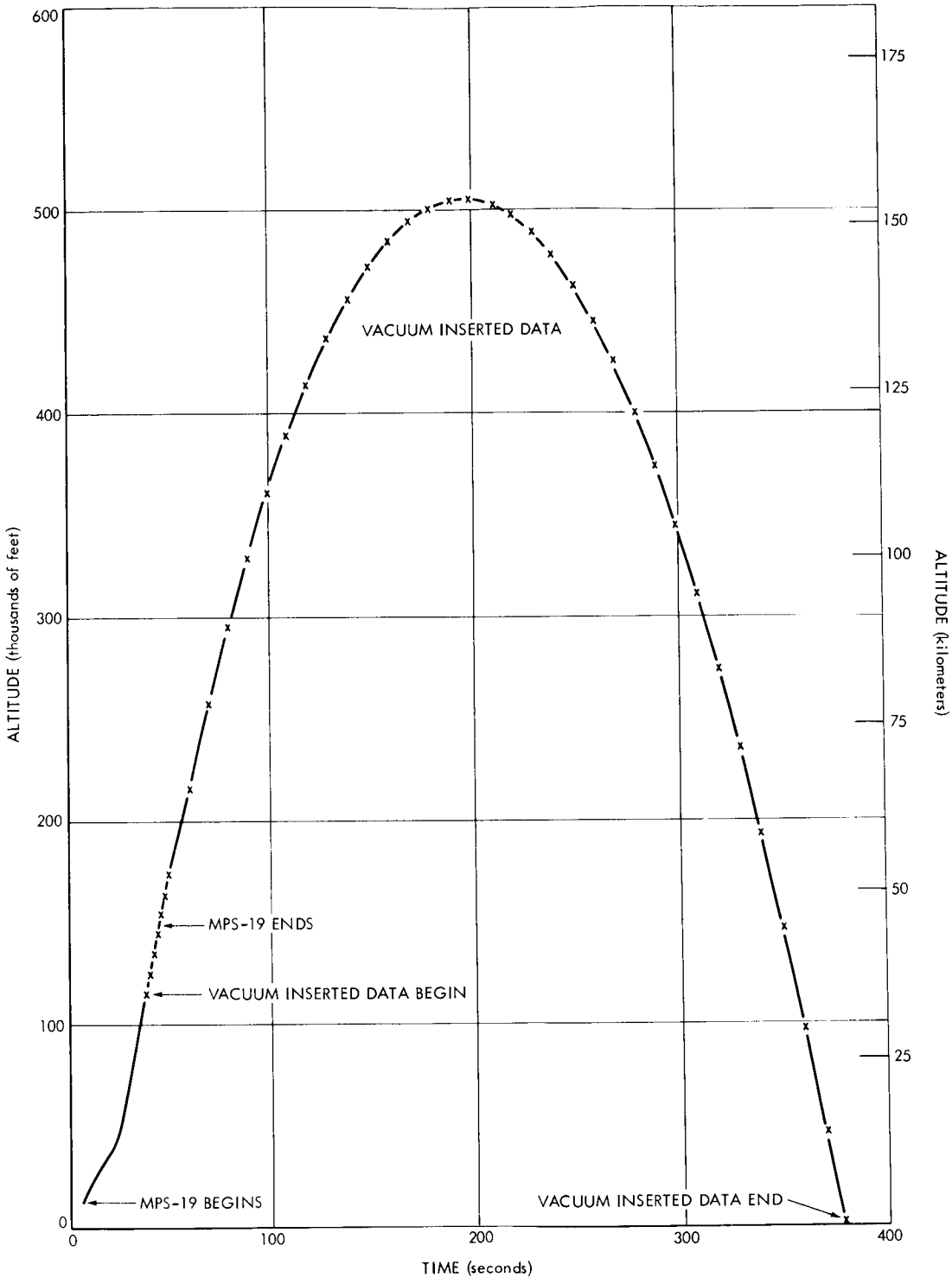

Figure 189. 14.175 GE Radar Plot, Altitude vs Time

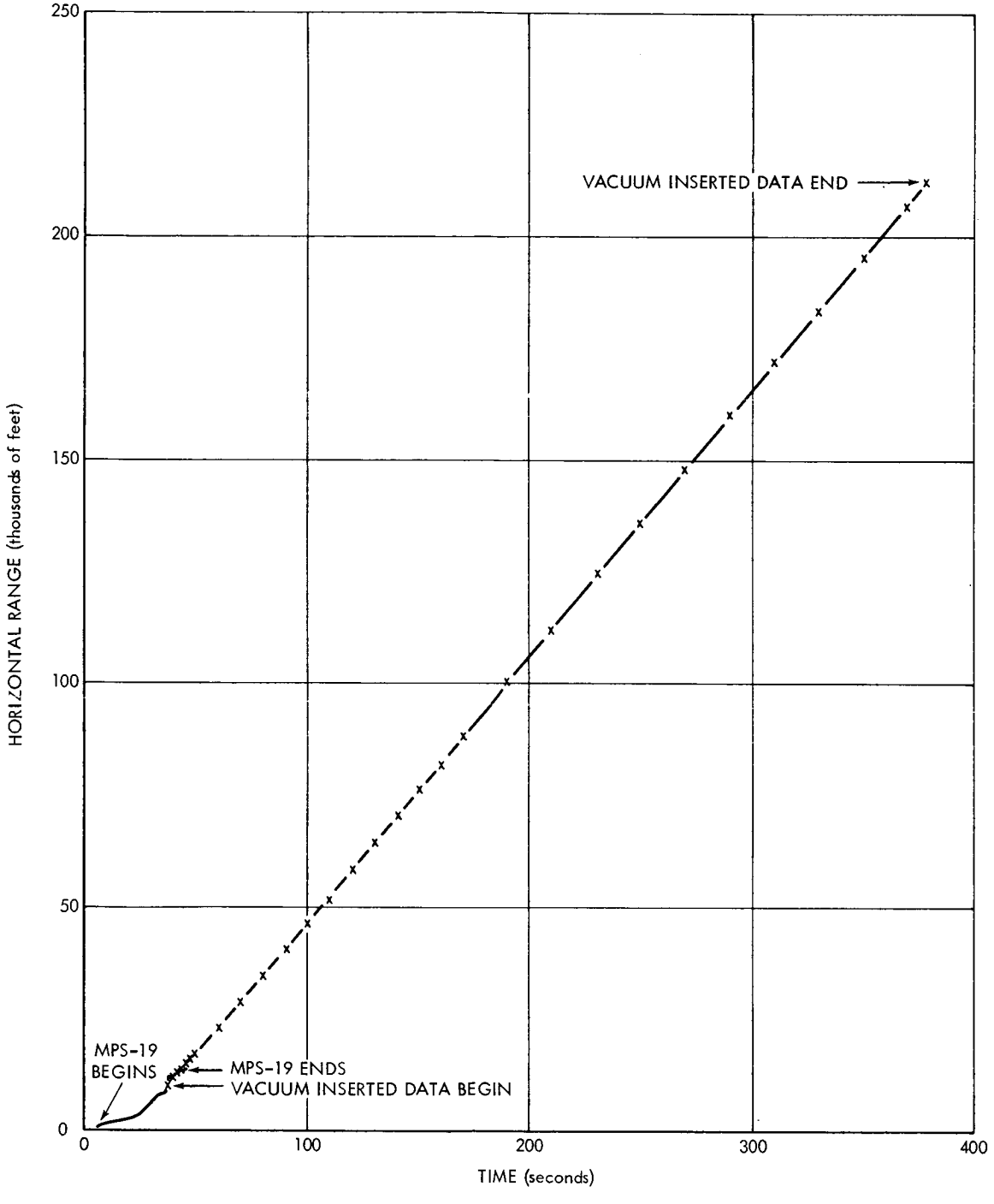

Figure 190. 14.175 GE Radar Plot, Horizontal Range vs Time

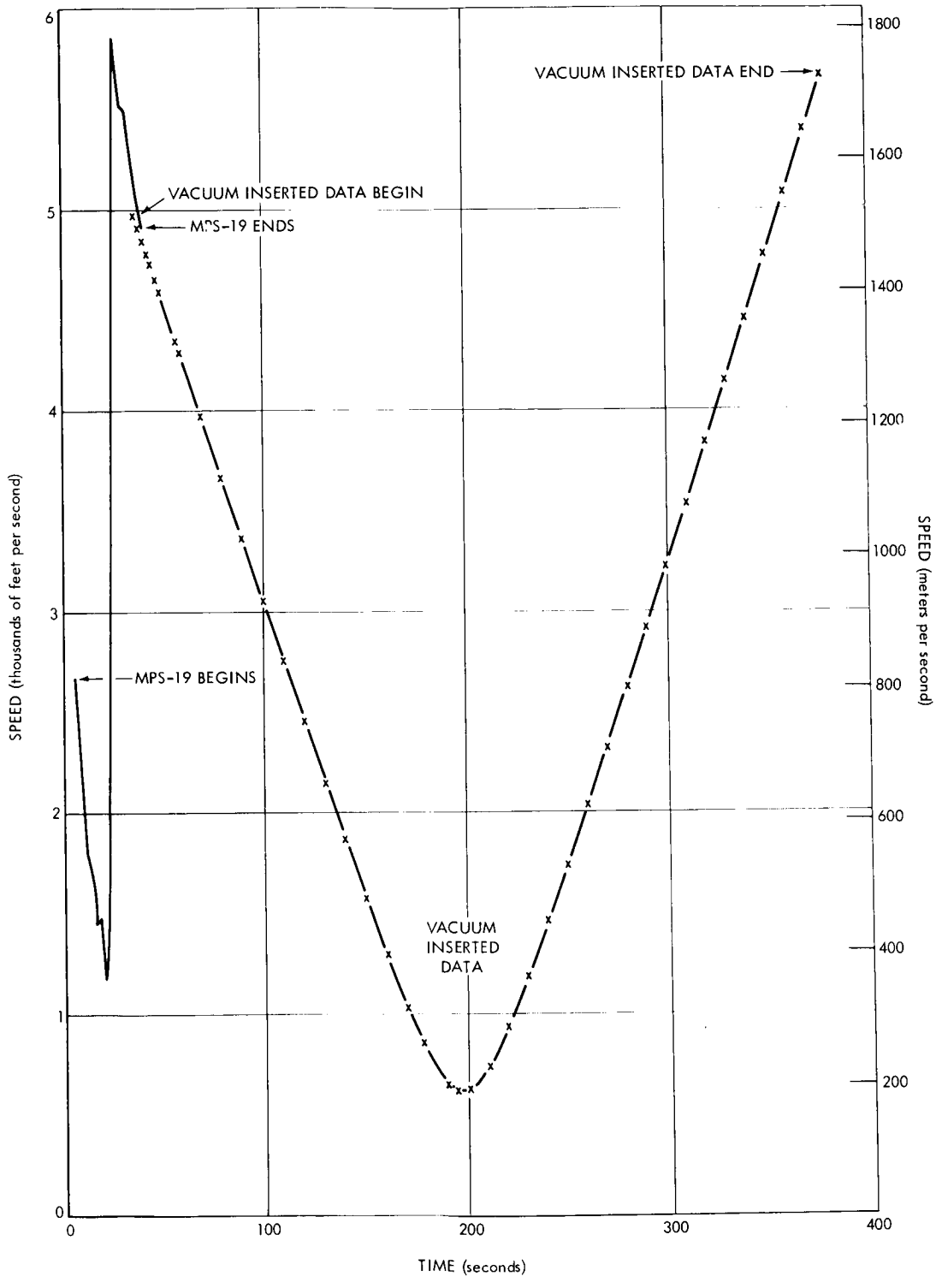

Figure 191. 14.175 GE Radar Plot, Speed vs Time

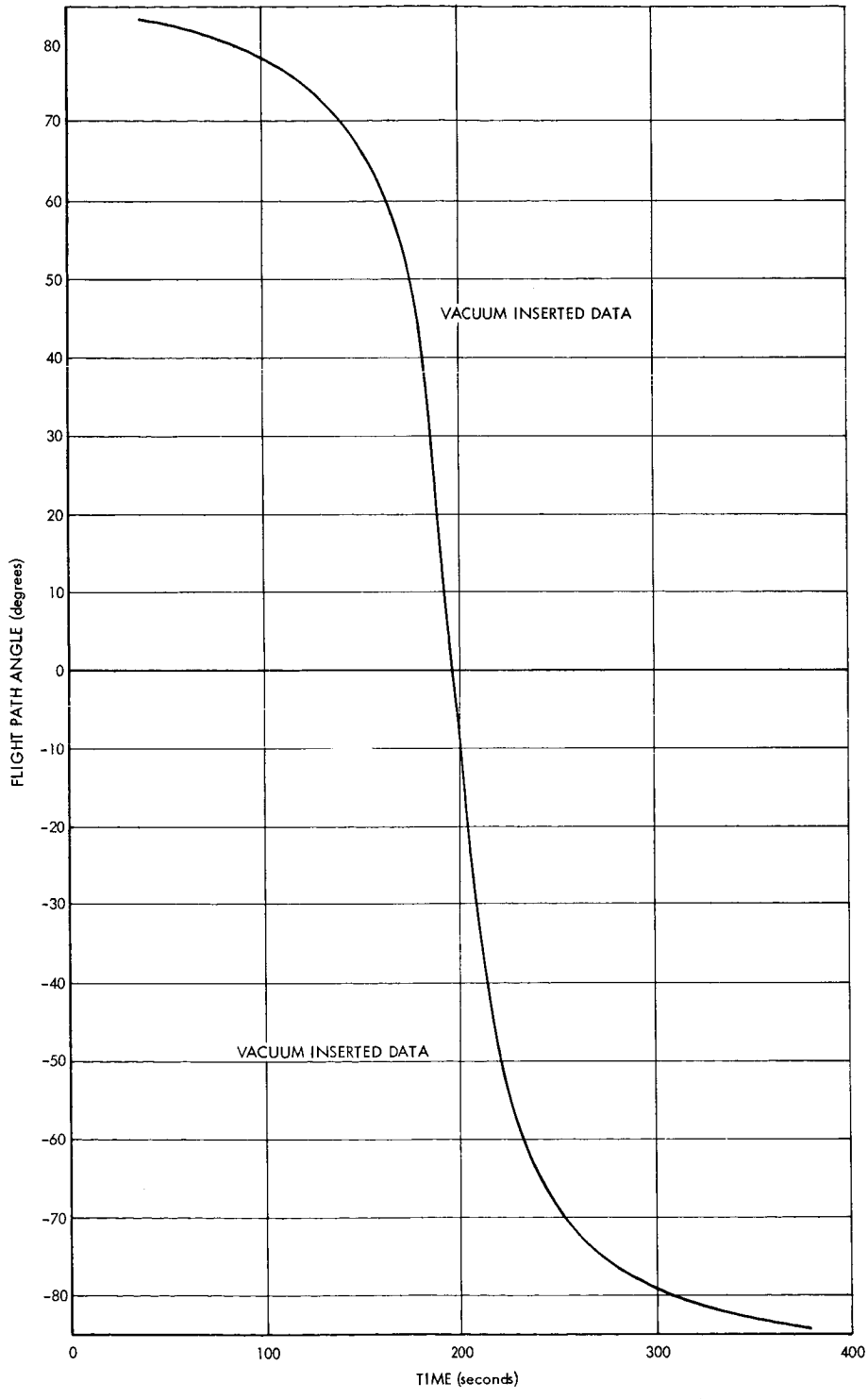

Figure 192. 14.175 GE Radar Plot, Flight Path Angle vs Time

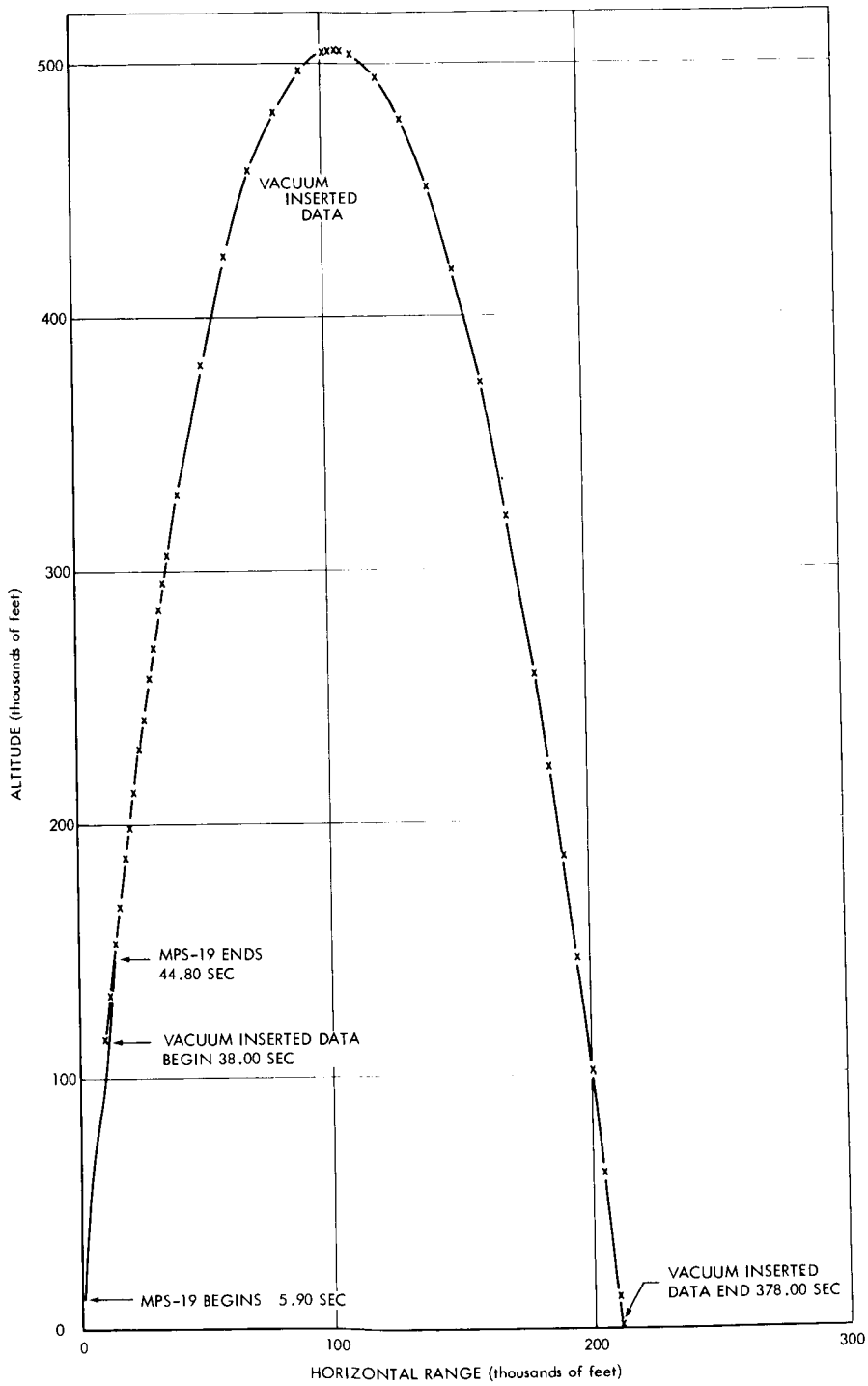

Figure 193. 14.175 GE Radar Plot, Altitude vs Horizontal Range

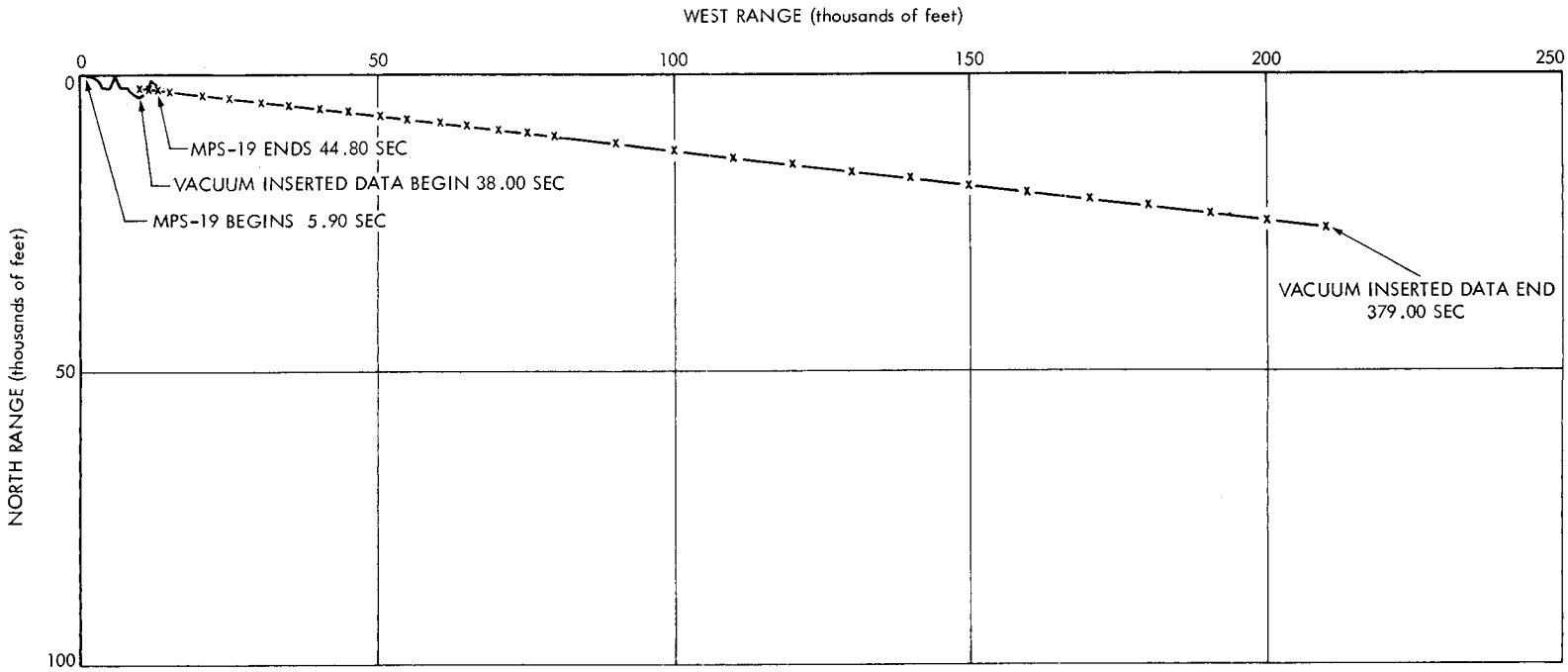

Figure 194. 14.175 GE Radar Plot, North Range vs West Range

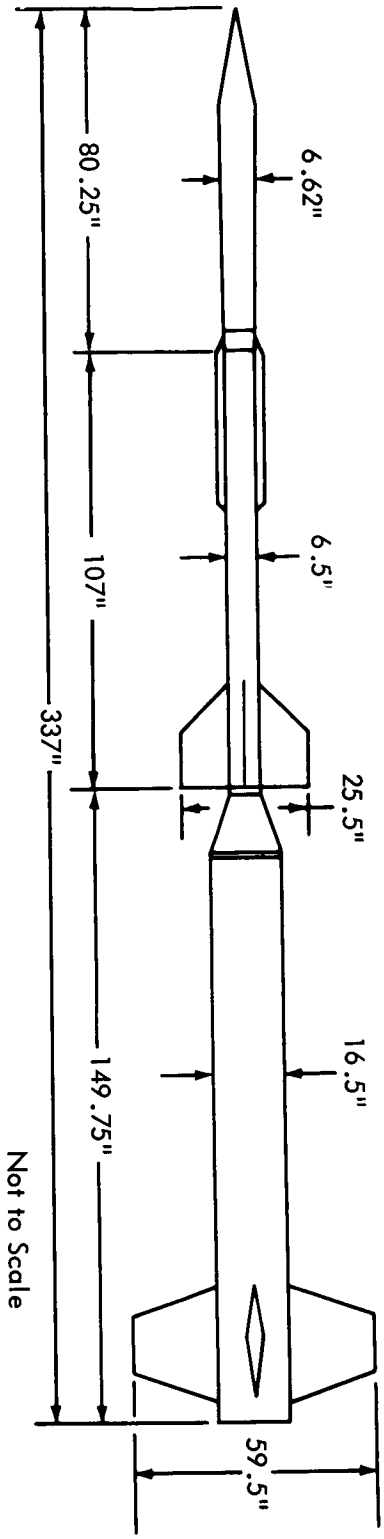

Figure 195. 14.176 GE Sketch

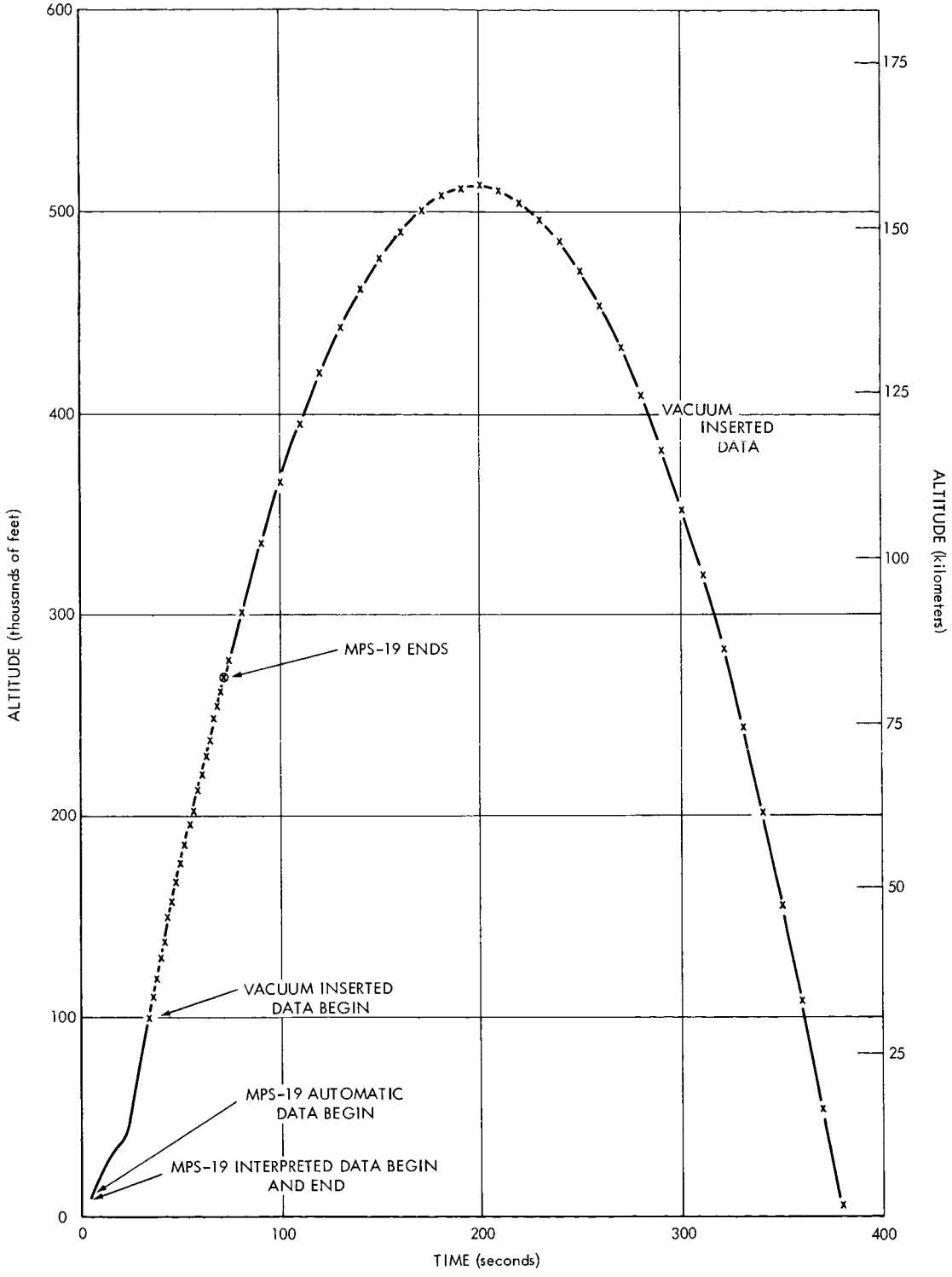

Figure 196. 14.176 GE Radar Plot, Altitude vs Time

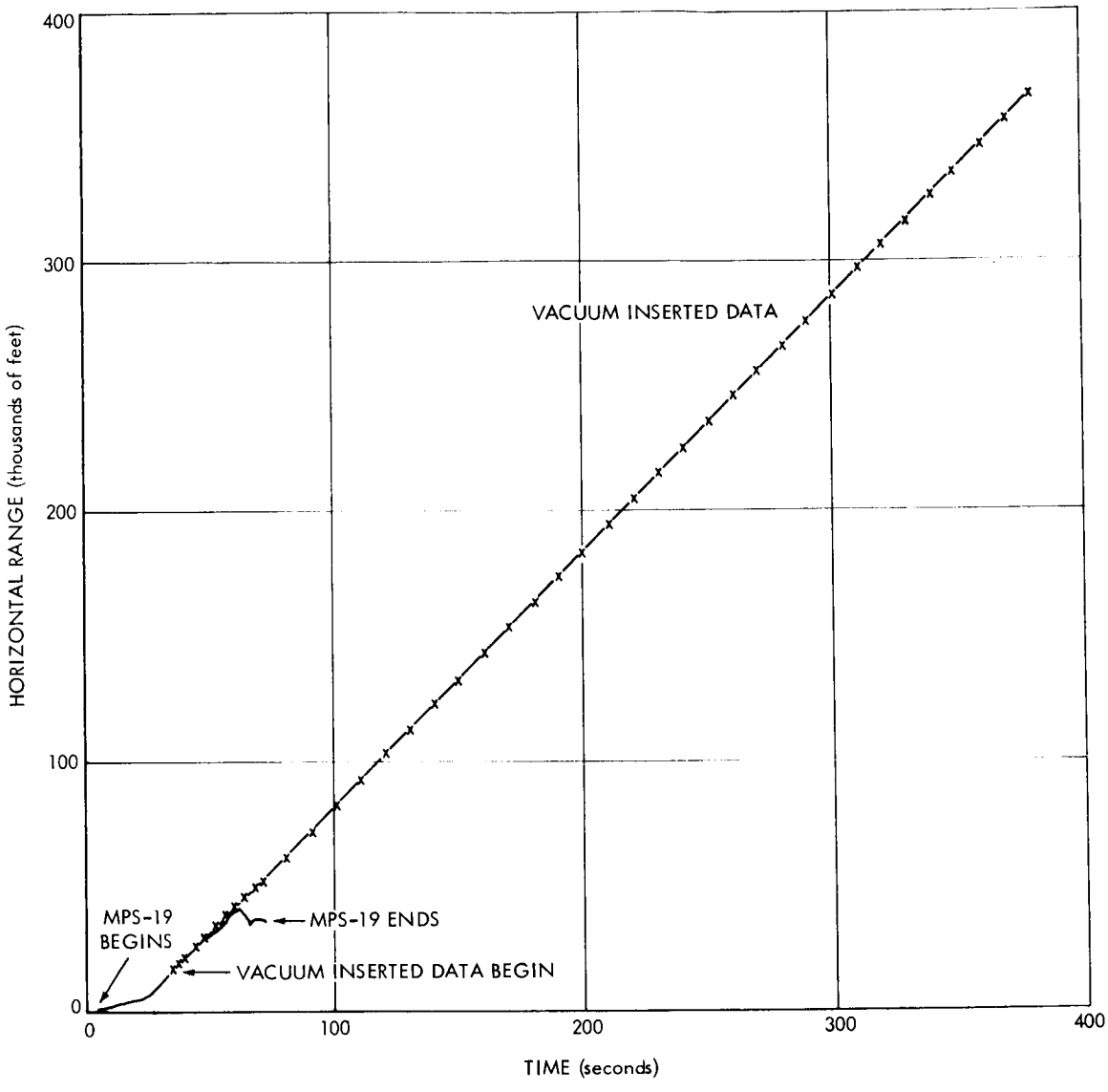

Figure 197. 14.176 GE Radar Plot, Horizontal Range vs Time

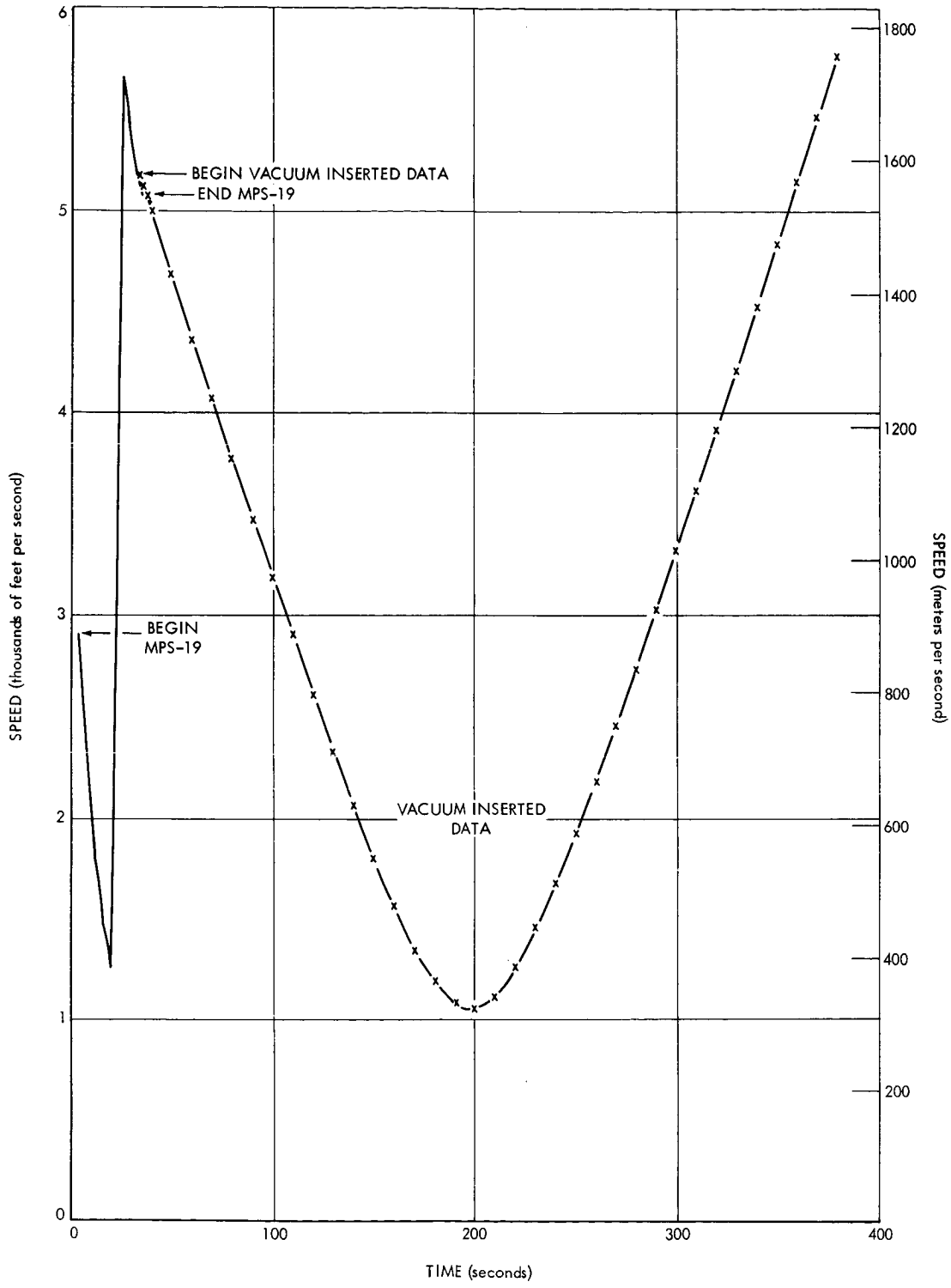

Figure 198. 14.176 GE Radar Plot, Speed vs Time

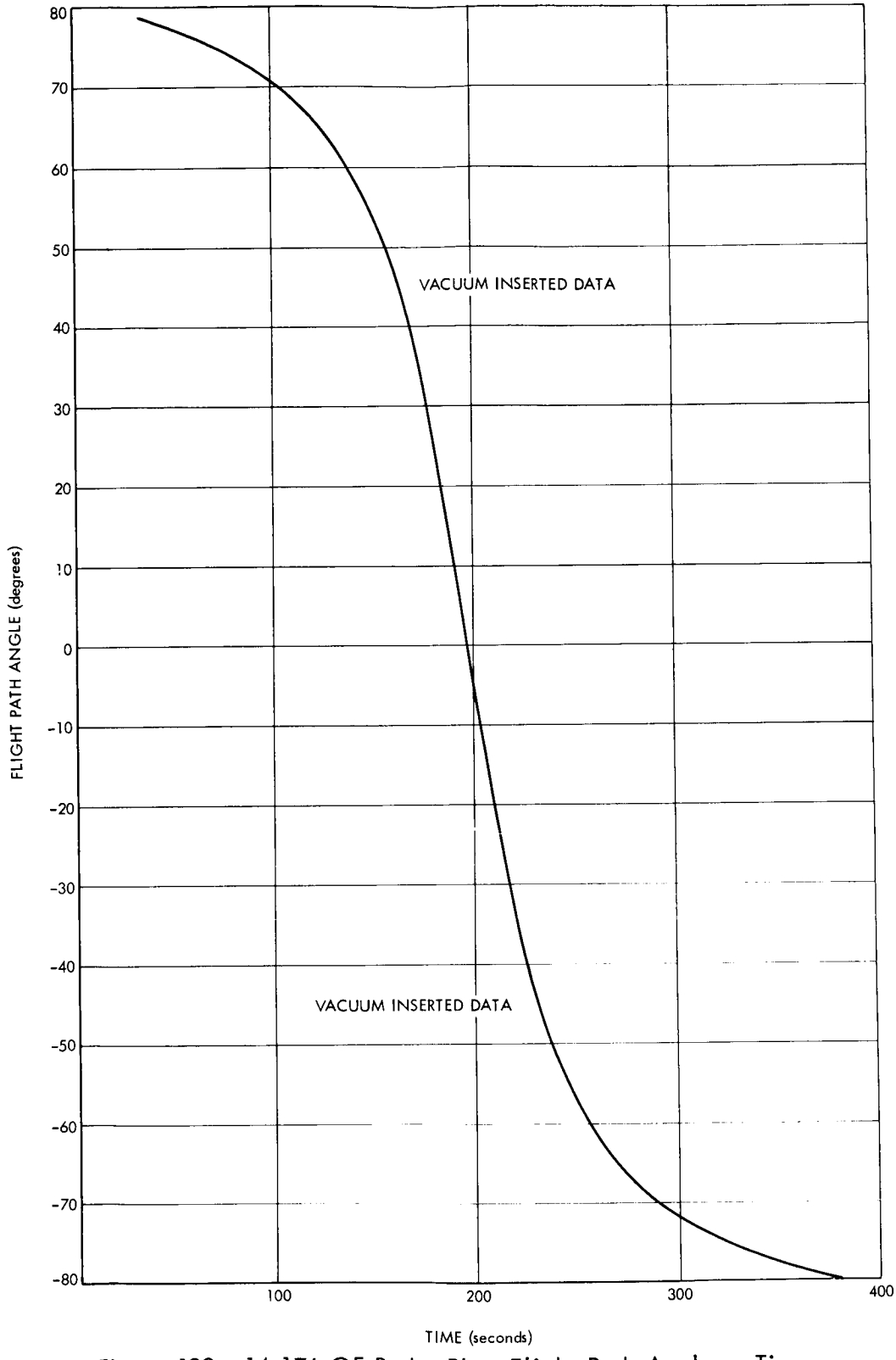

Figure 199. 14.176 GE Radar Plot, Flight Path Angle vs Time

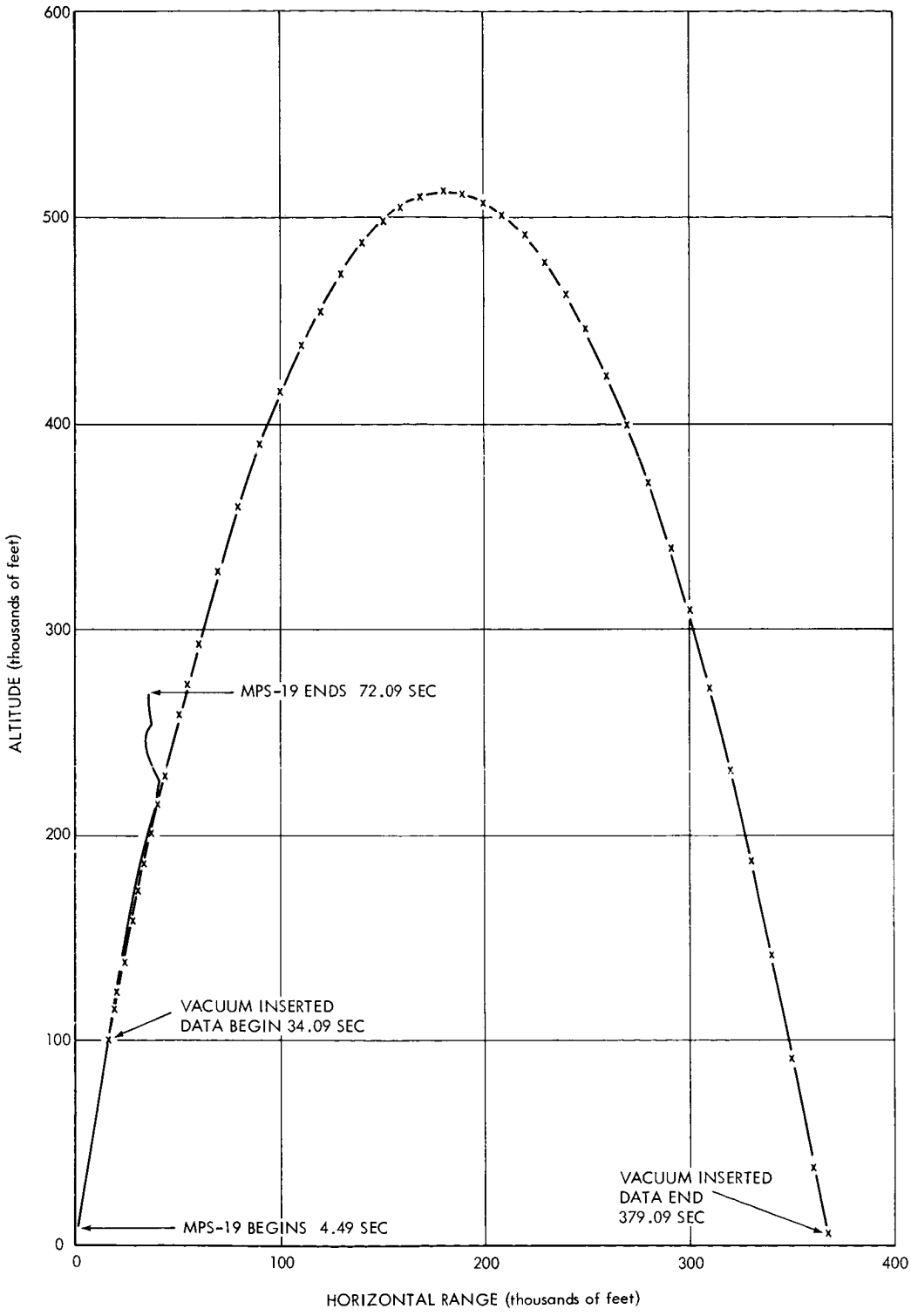

Figure 200. 14.176 GE Radar Plot, Altitude vs Horizontal Range

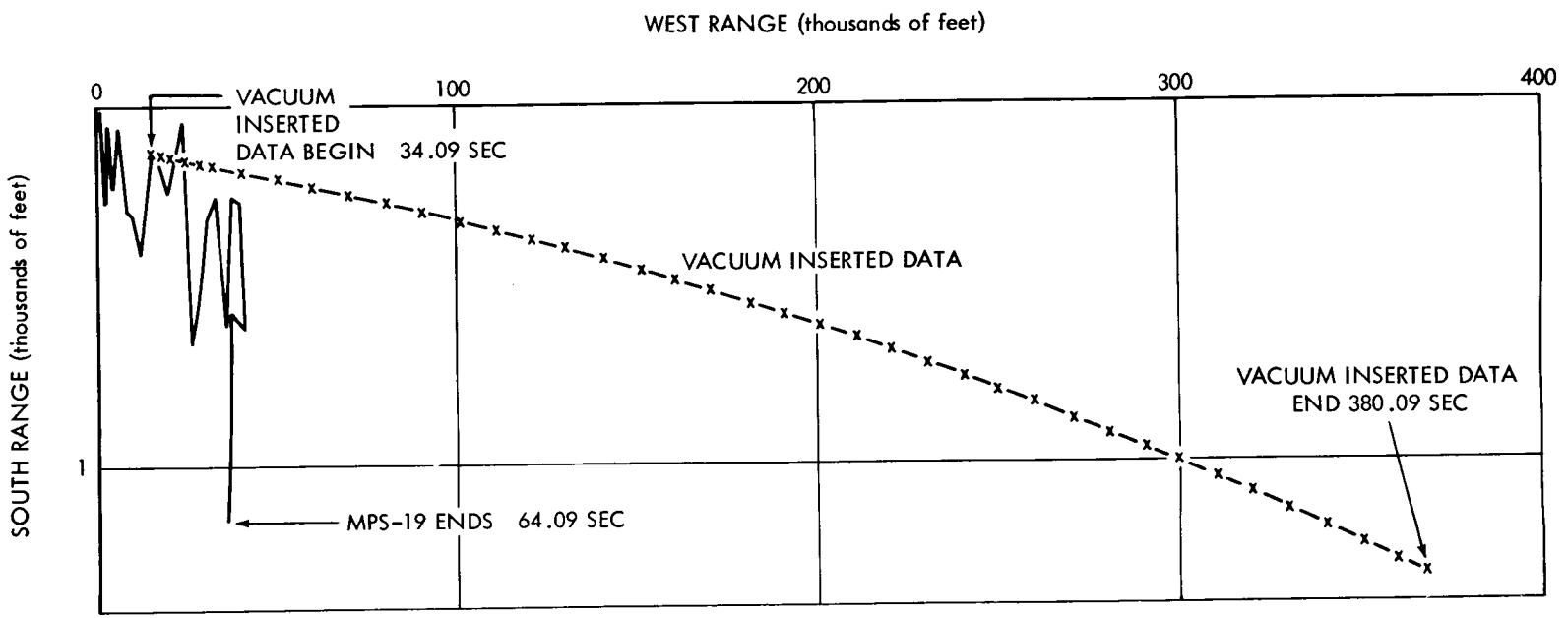

Figure 201. 14.176 GE Radar Plot, South Range vs West Range

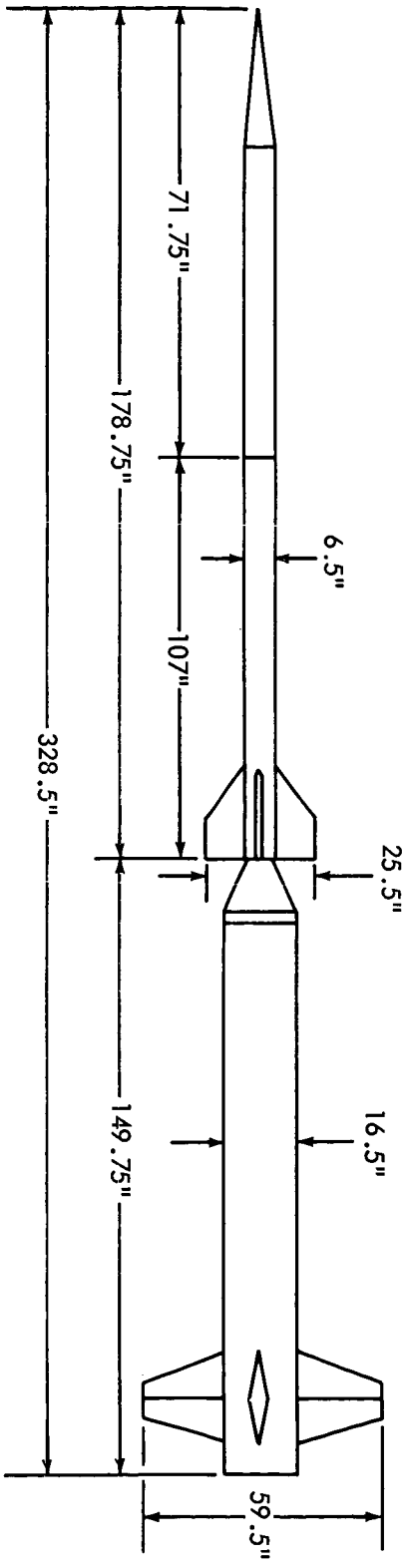

Figure 202. 14.177 GI Sketch

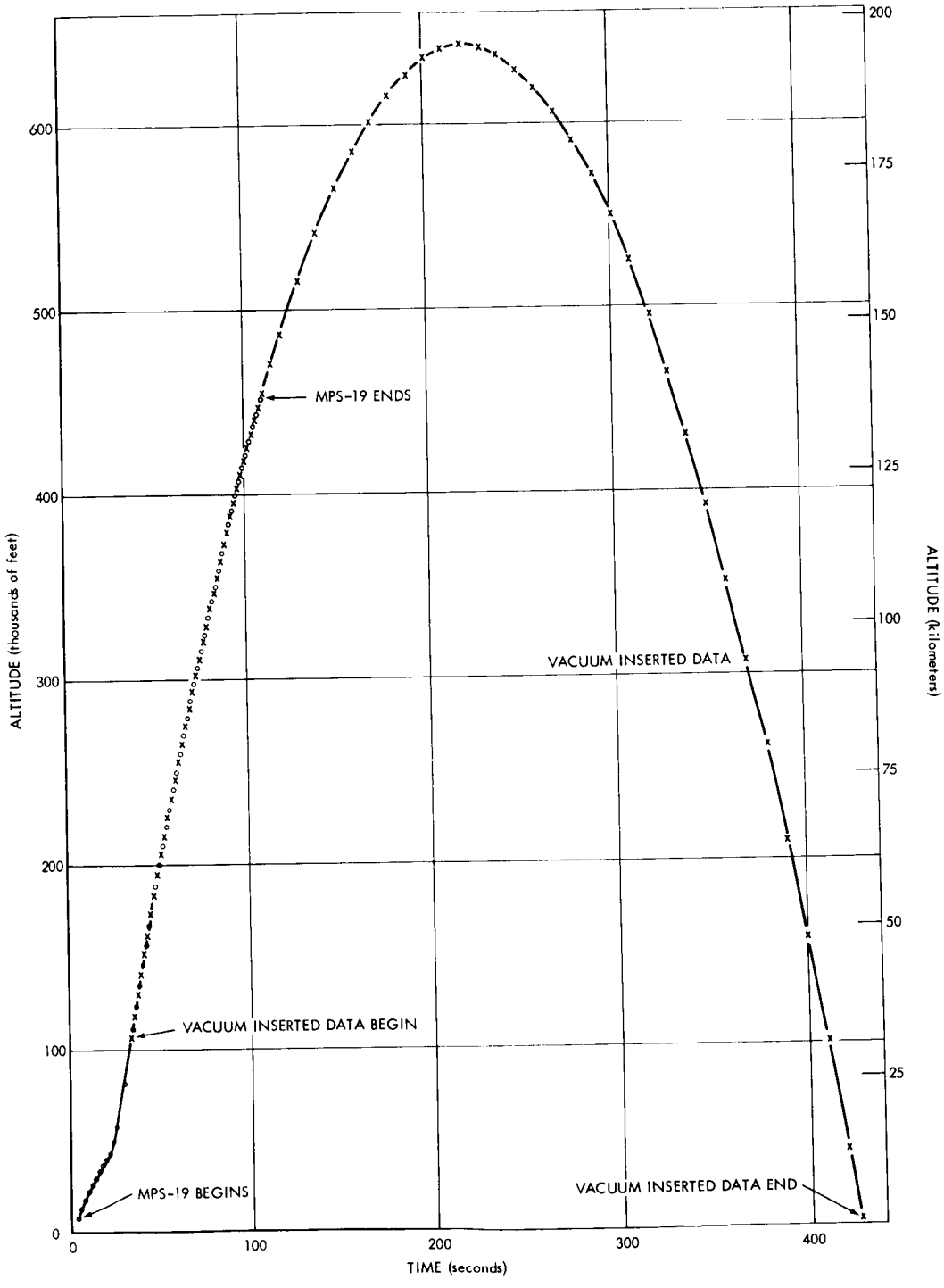

Figure 203. 14.177 GI Radar Plot, Altitude vs Time

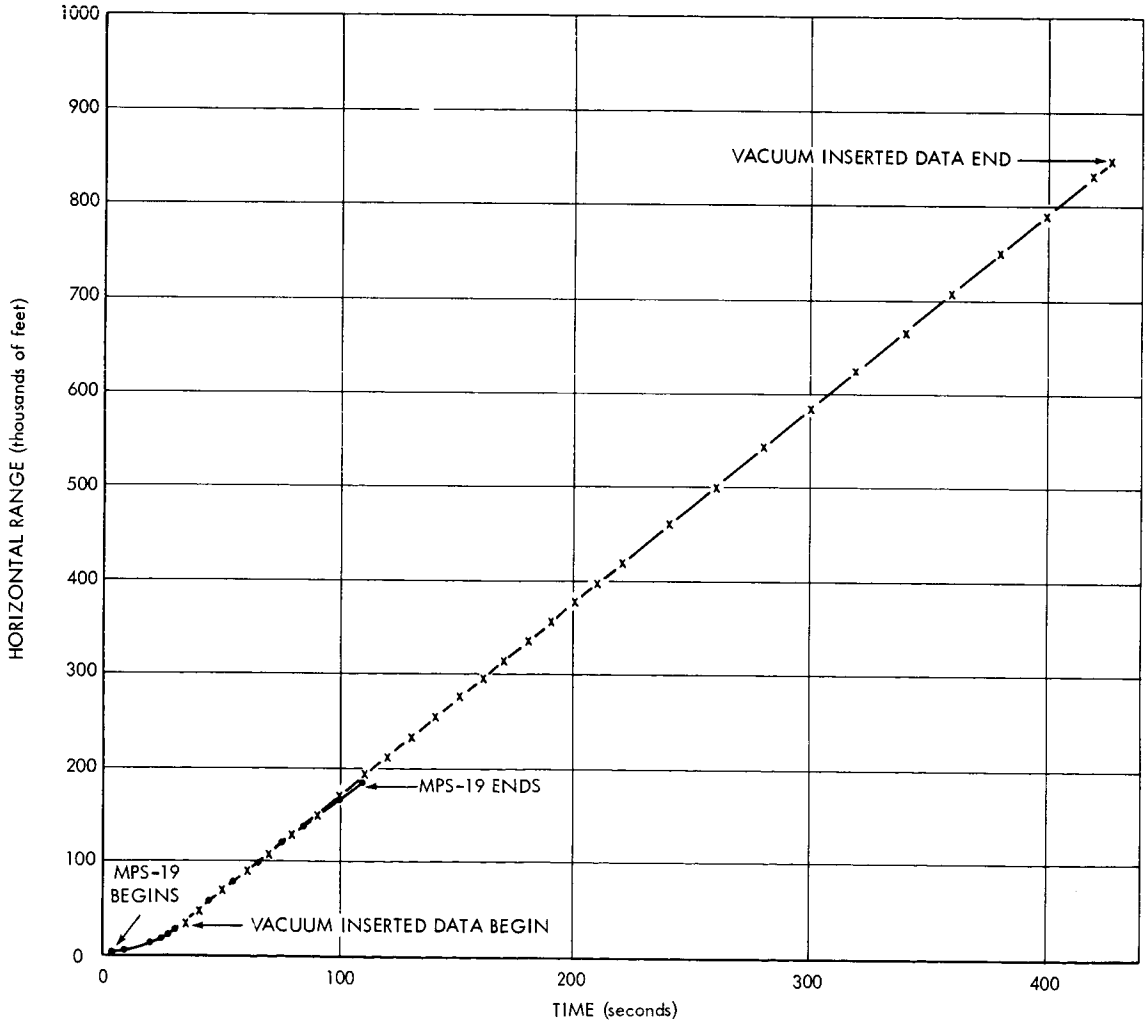

Figure 204. 14.177 GI Radar Plot, Horizontal Range vs Time

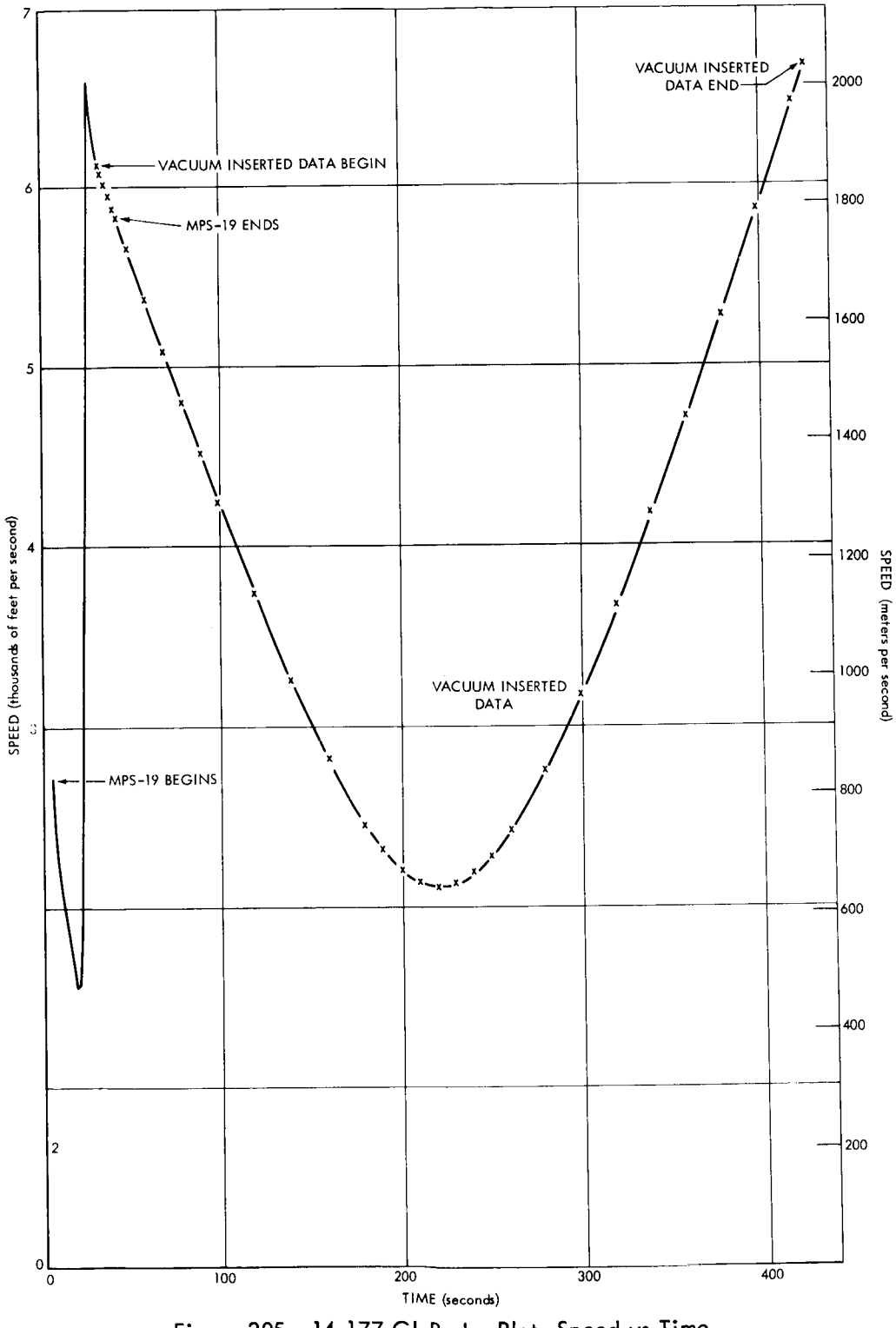

Figure 205. 14.177 GI Radar Plot, Speed vs Time

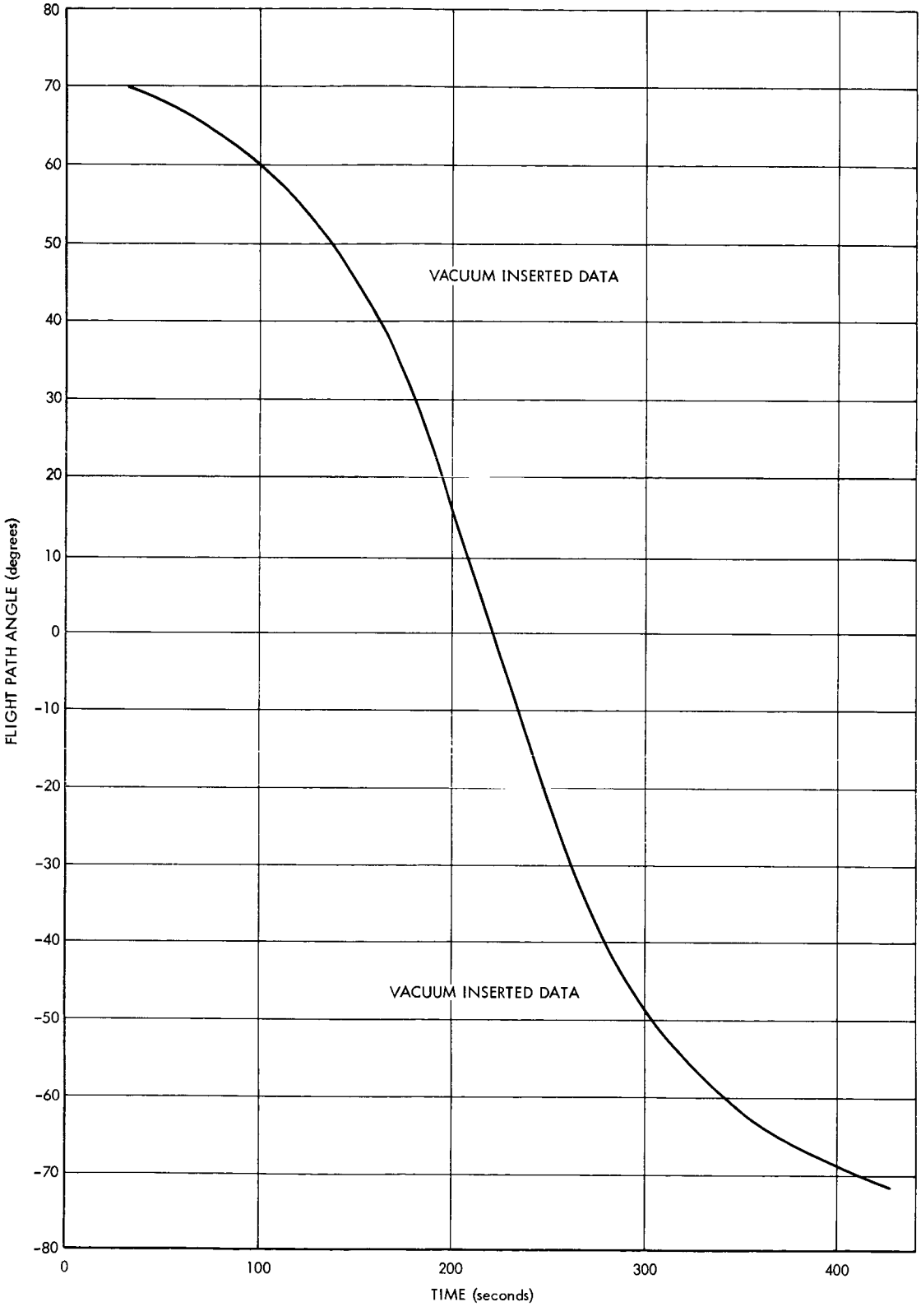

Figure 206. 14.177 GI Radar Plot, Flight Path Angle vs Time

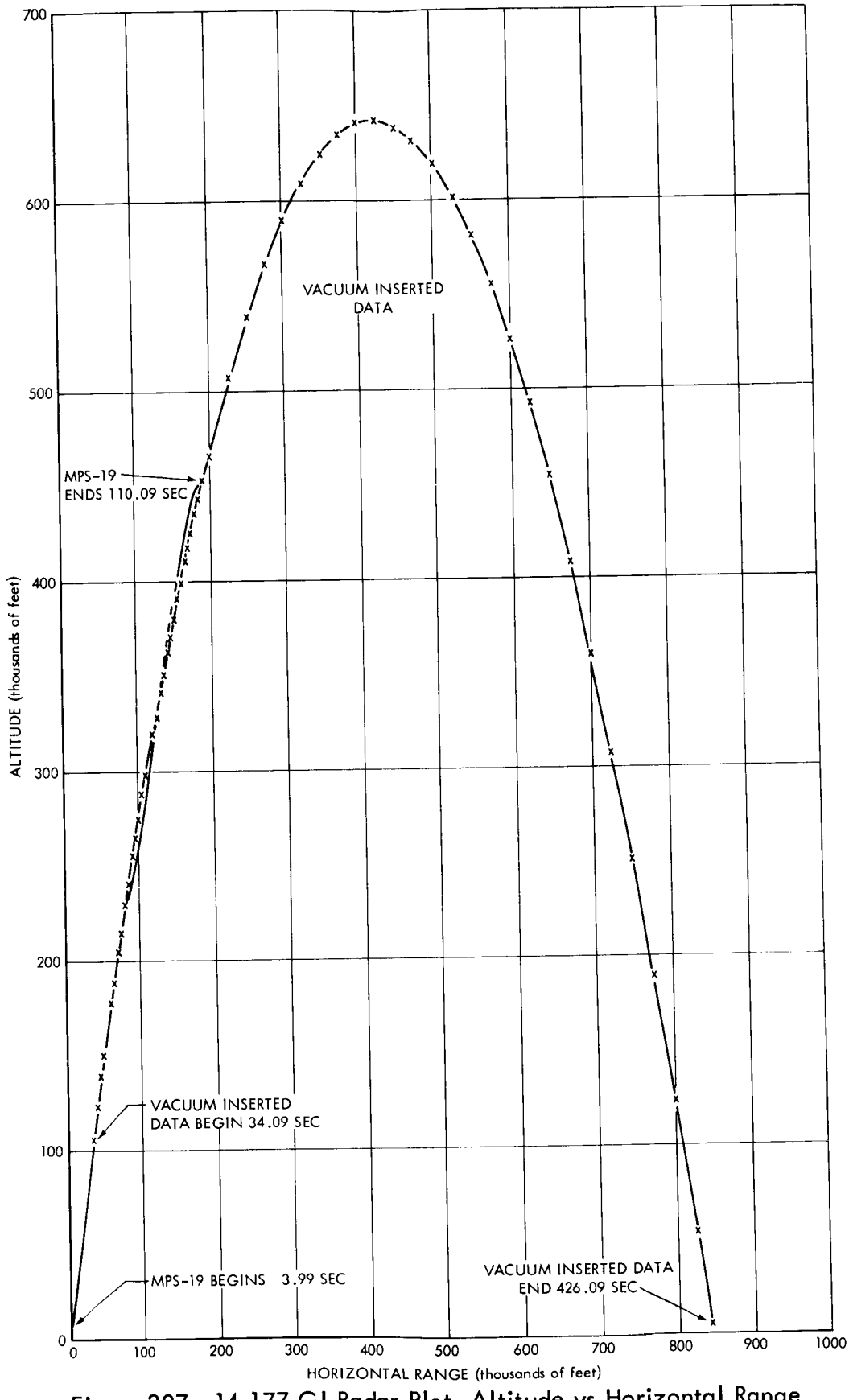

Figure 207. 14.177 GI Radar Plot, Altitude vs Horizontal Range

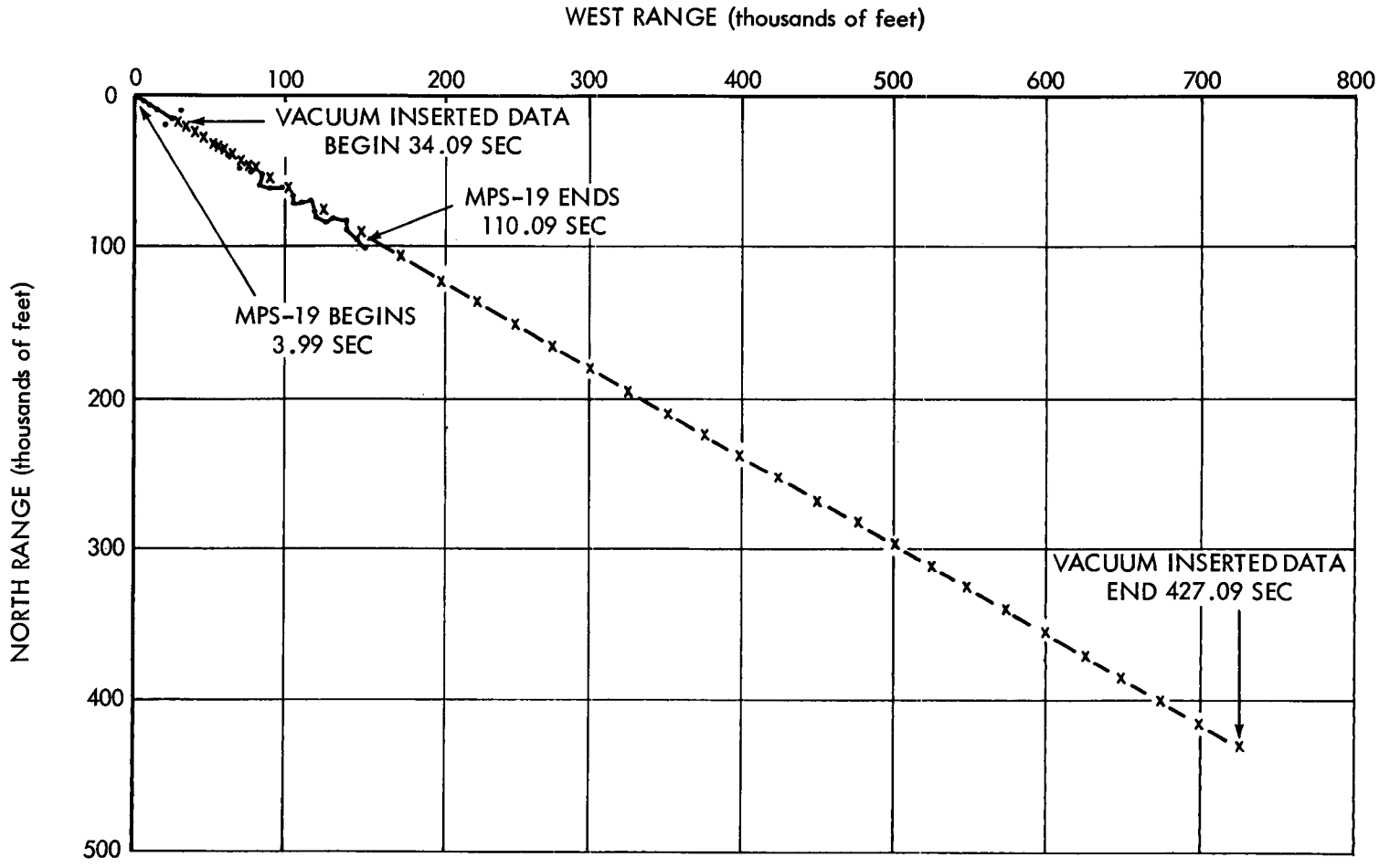

Figure 208. 14.177 GI Radar Plot, North Range vs West Range

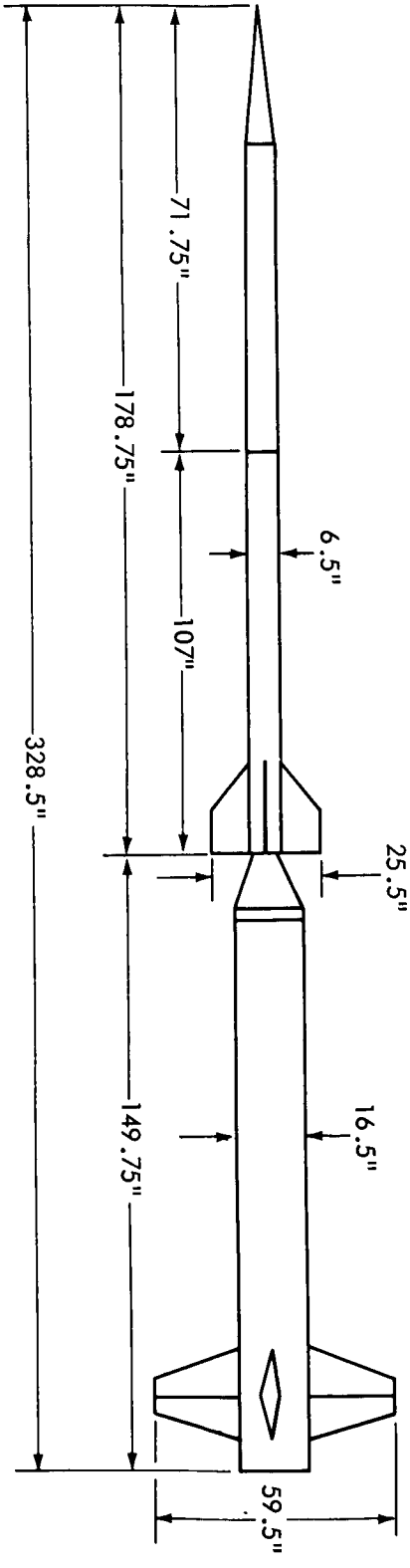

Figure 209. 14.178 GI Sketch

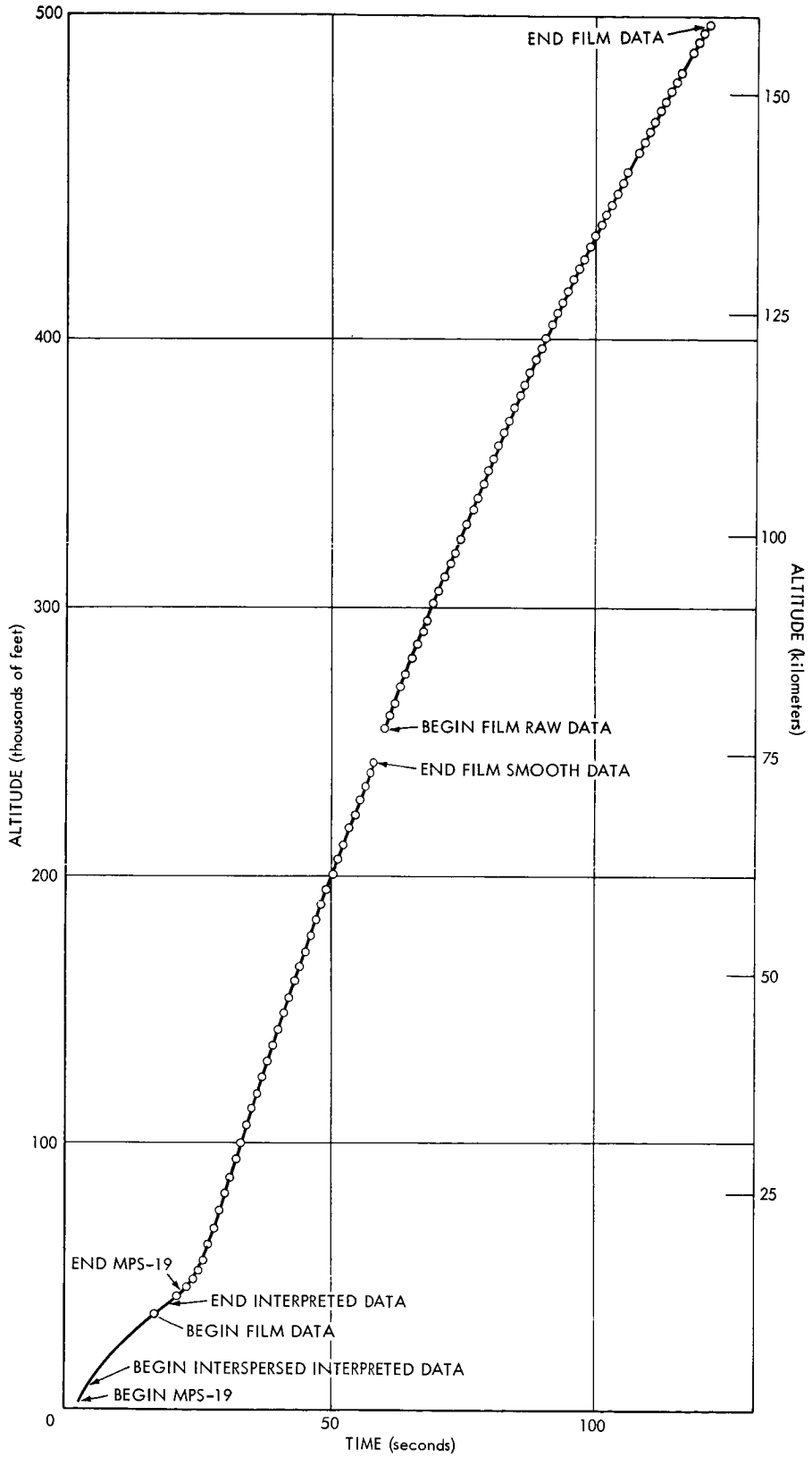

Figure 210. 14.178 GI Radar Plot, Altitude vs Time

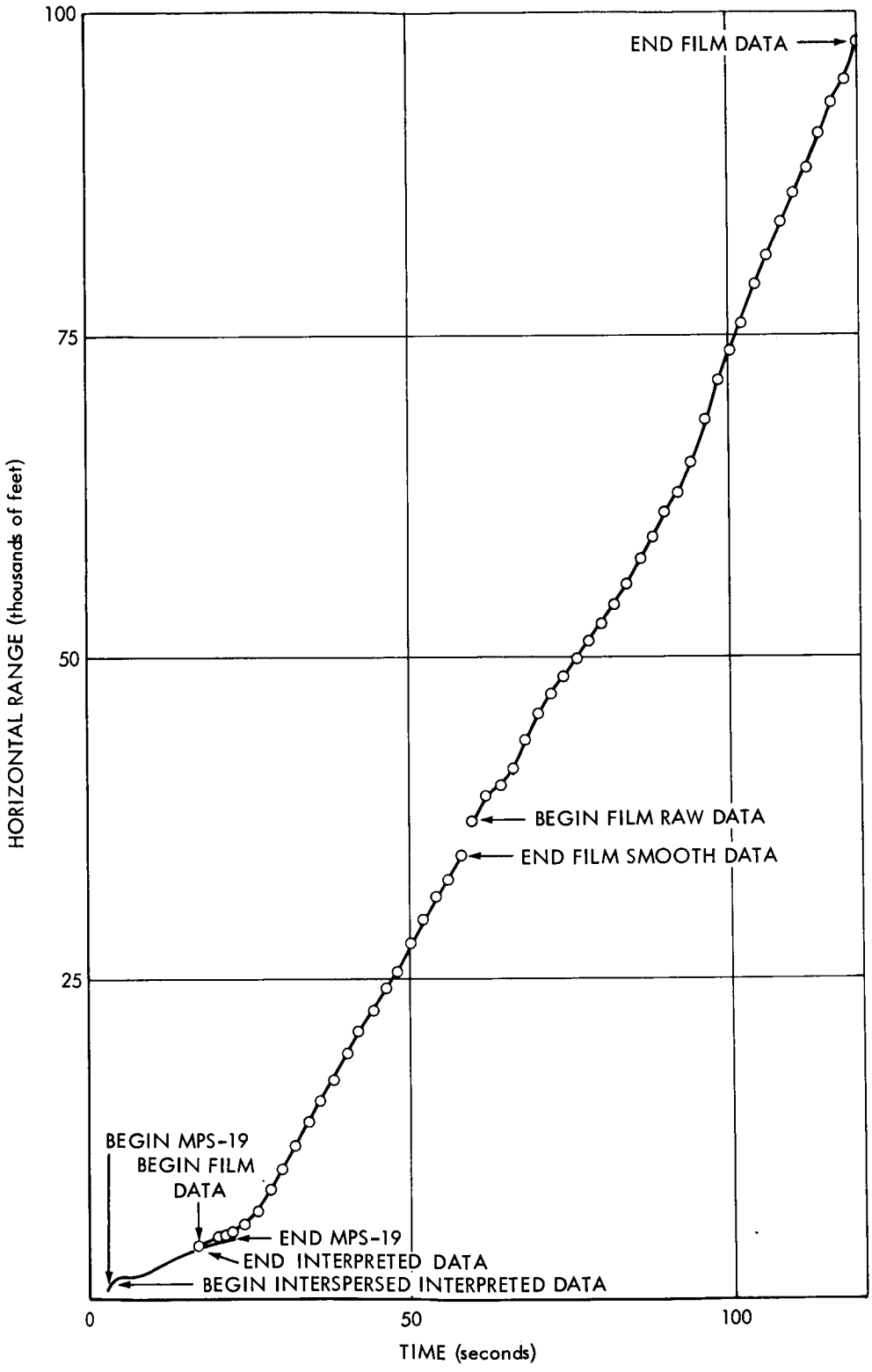

Figure 211. 14.178 GI Radar Plot, Horizontal Range vs Time

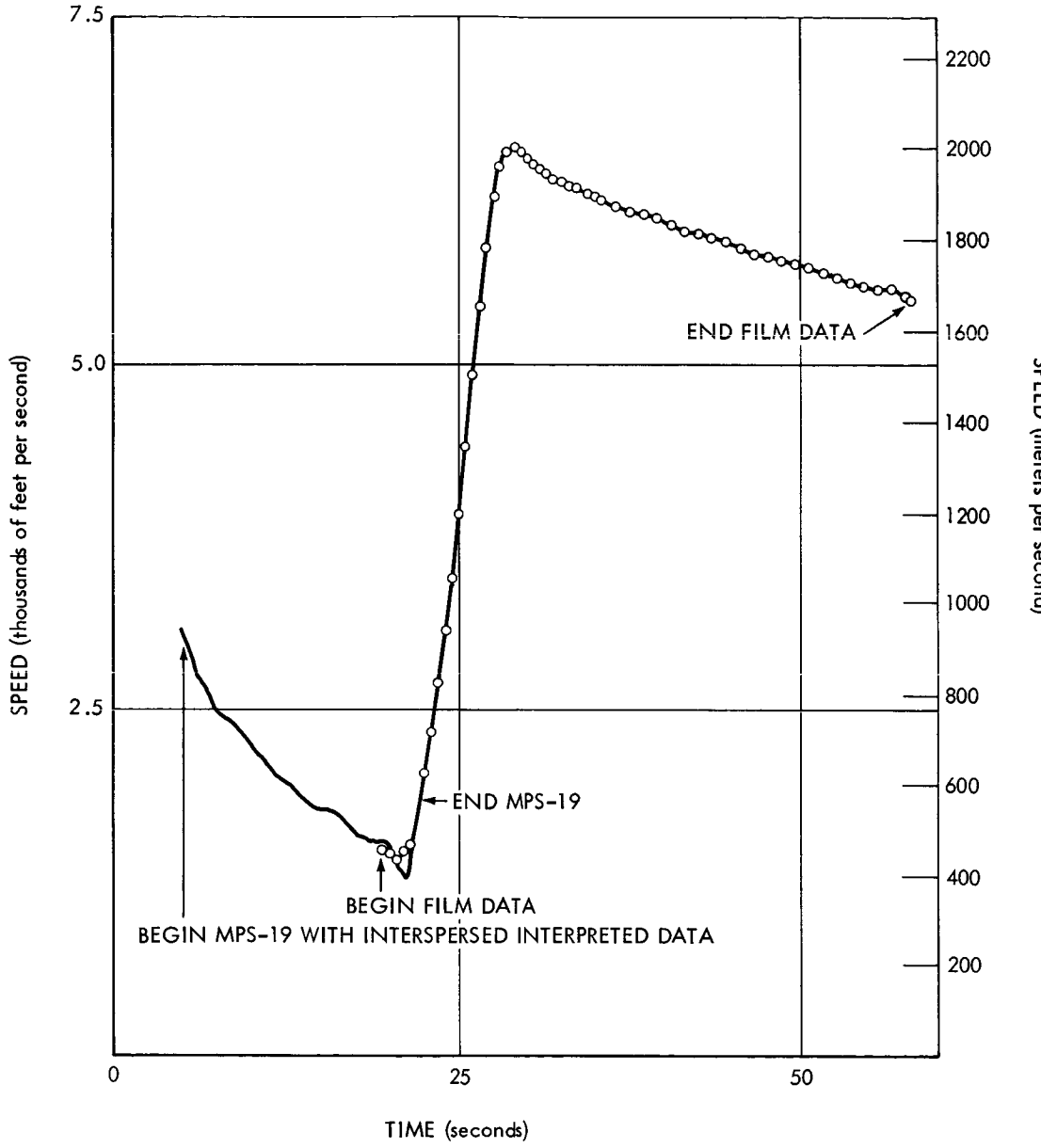

Figure 212. 14.178 GI Radar Plot, Speed vs Time

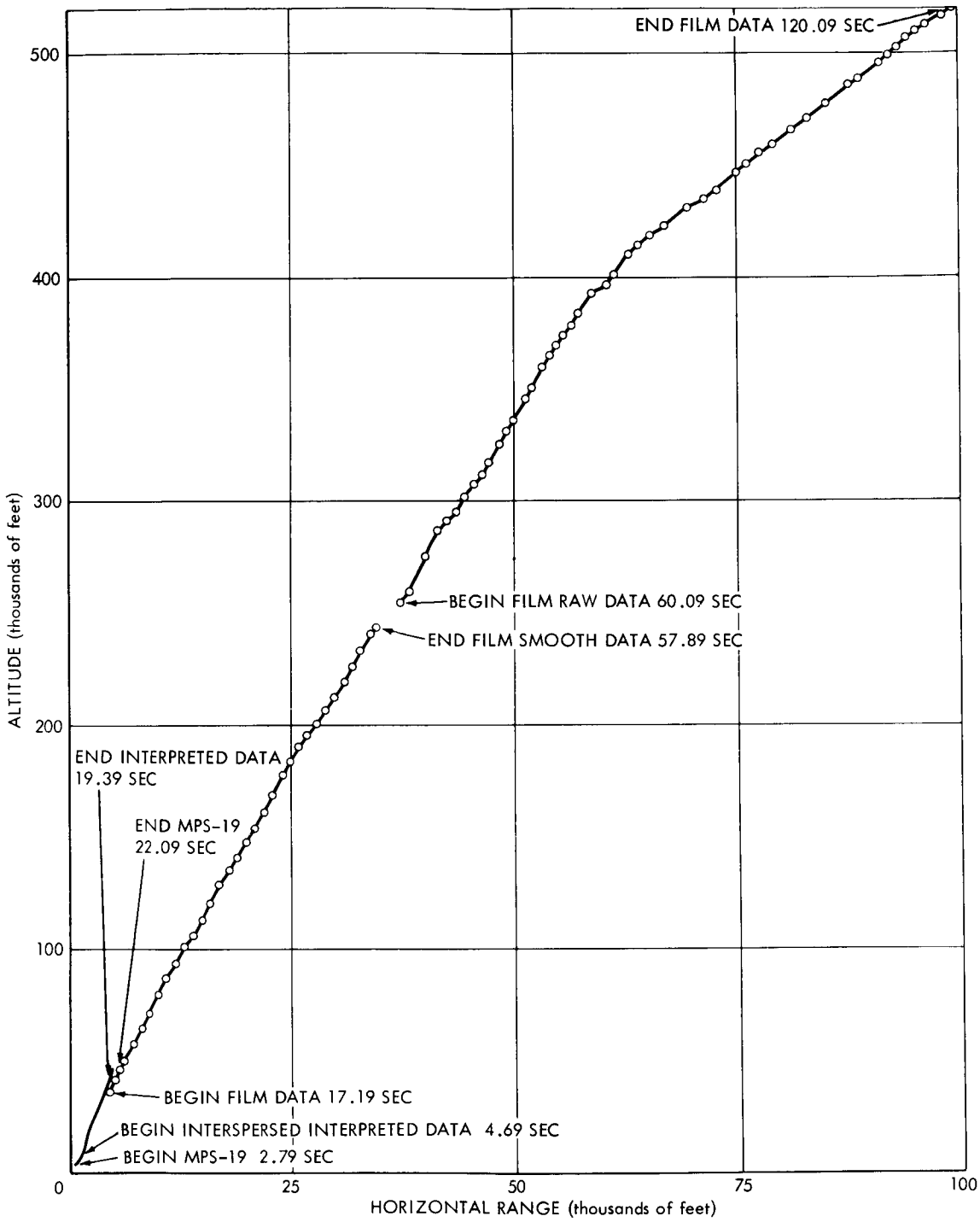

Figure 213. 14.178 GI Radar Plot, Altitude vs Horizontal Range

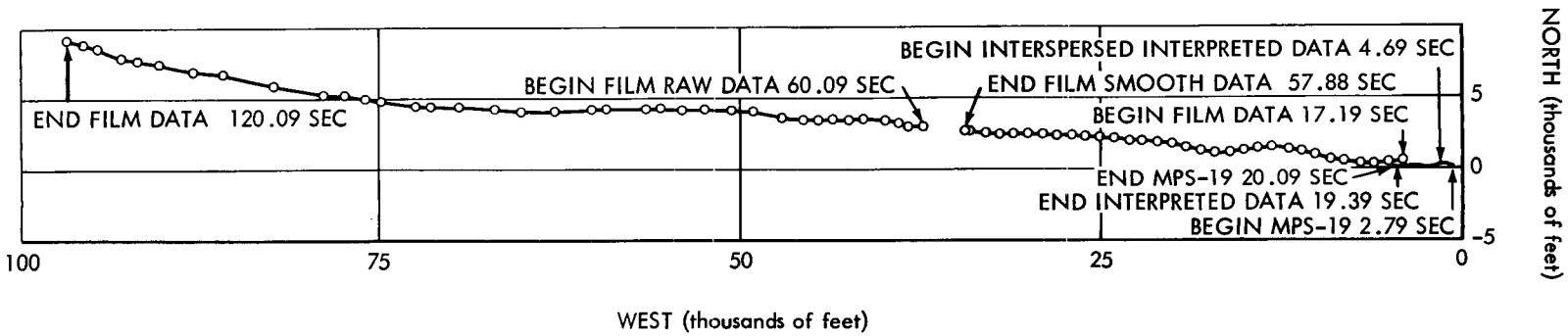

Figure 214. 14.178 GI Radar Plot, North Range vs West Range

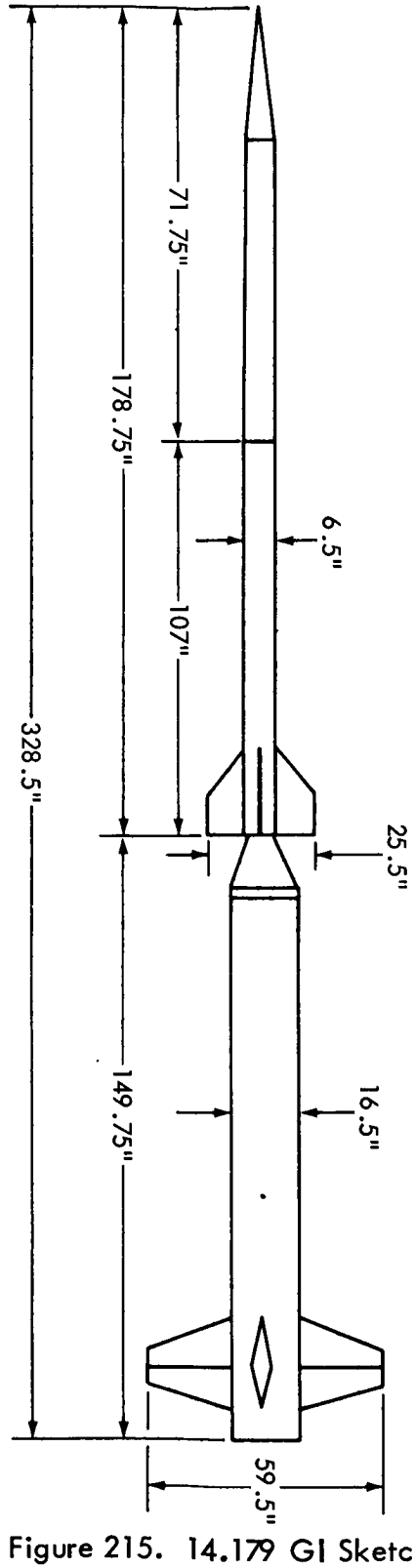

Figure 215. 14.179 GI Sketch

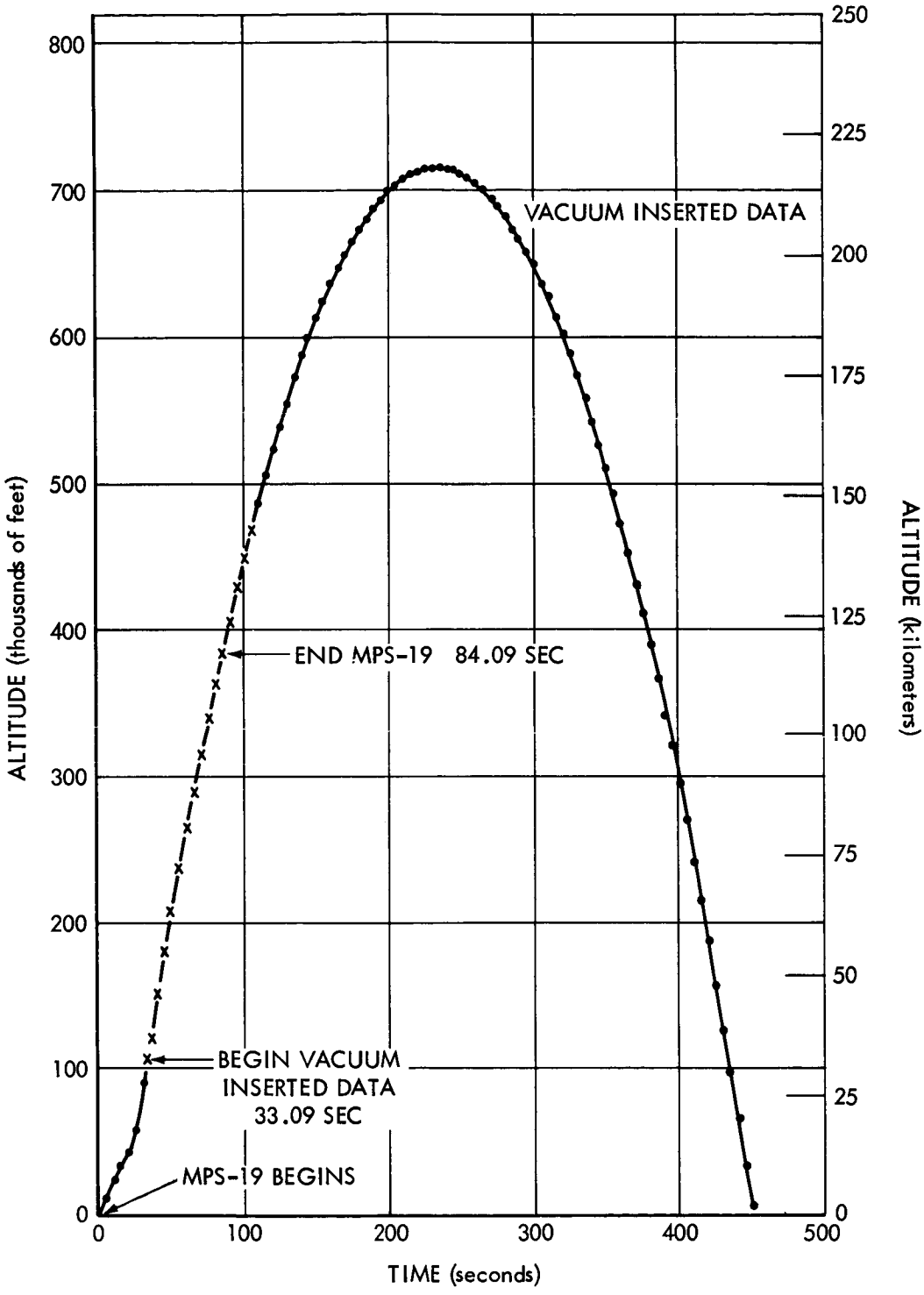

Figure 216. 14.179 GI Radar Plot, Altitude vs Time

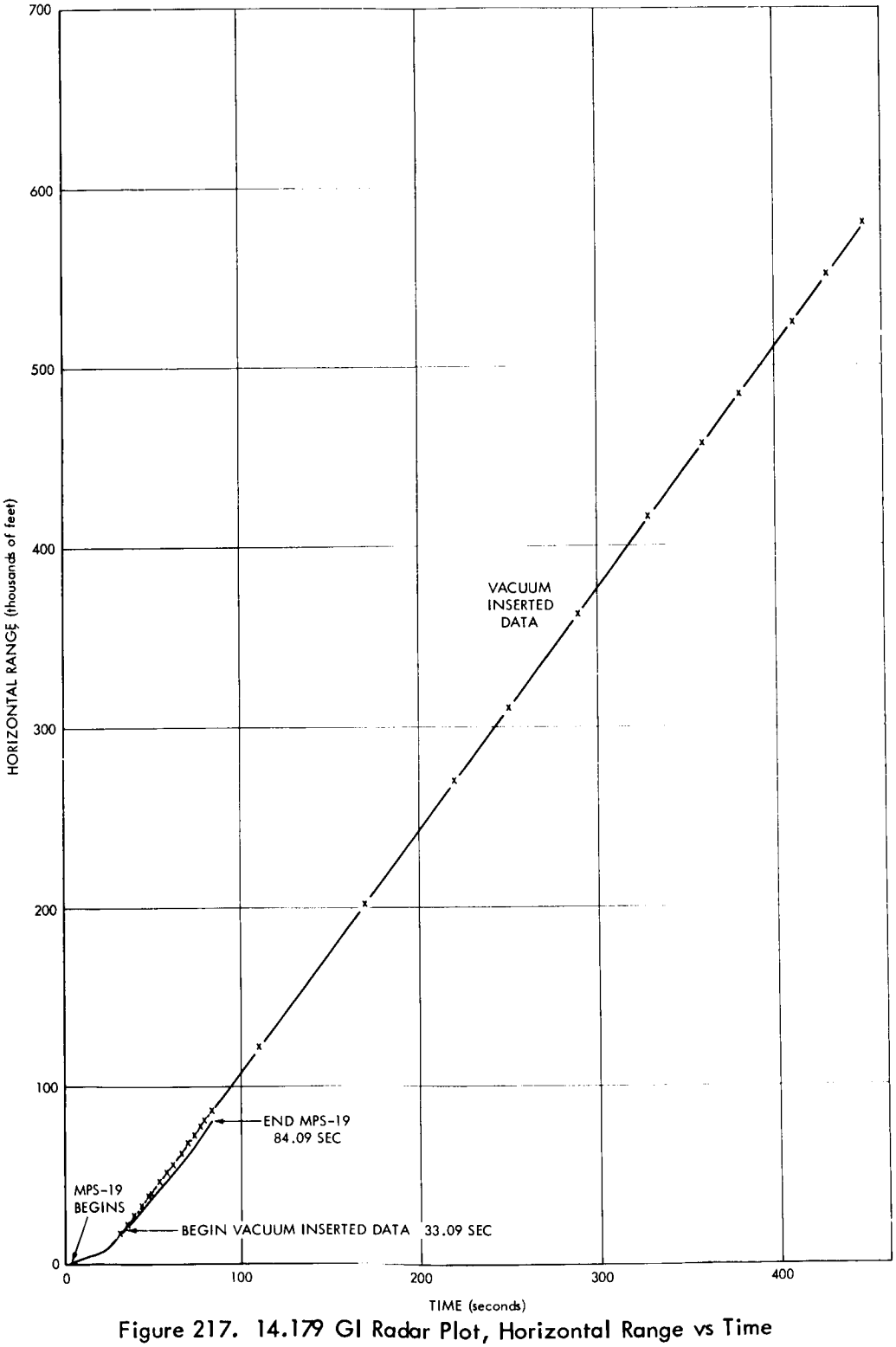

Figure 217. 14.179 GI Radar Plot, Horizontal Range vs Time

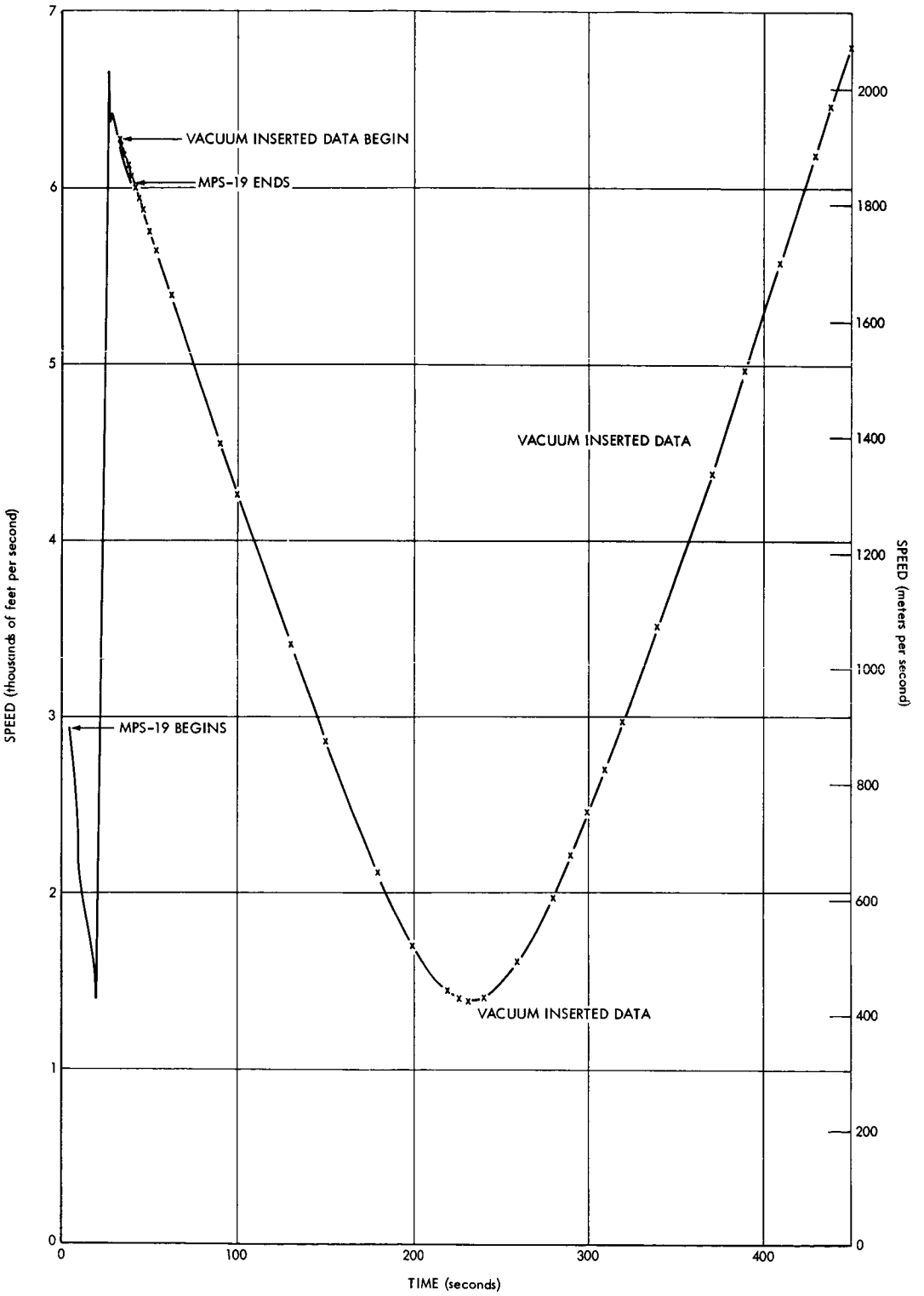

Figure 218. 14.179 GI Radar Plot, Speed vs Time

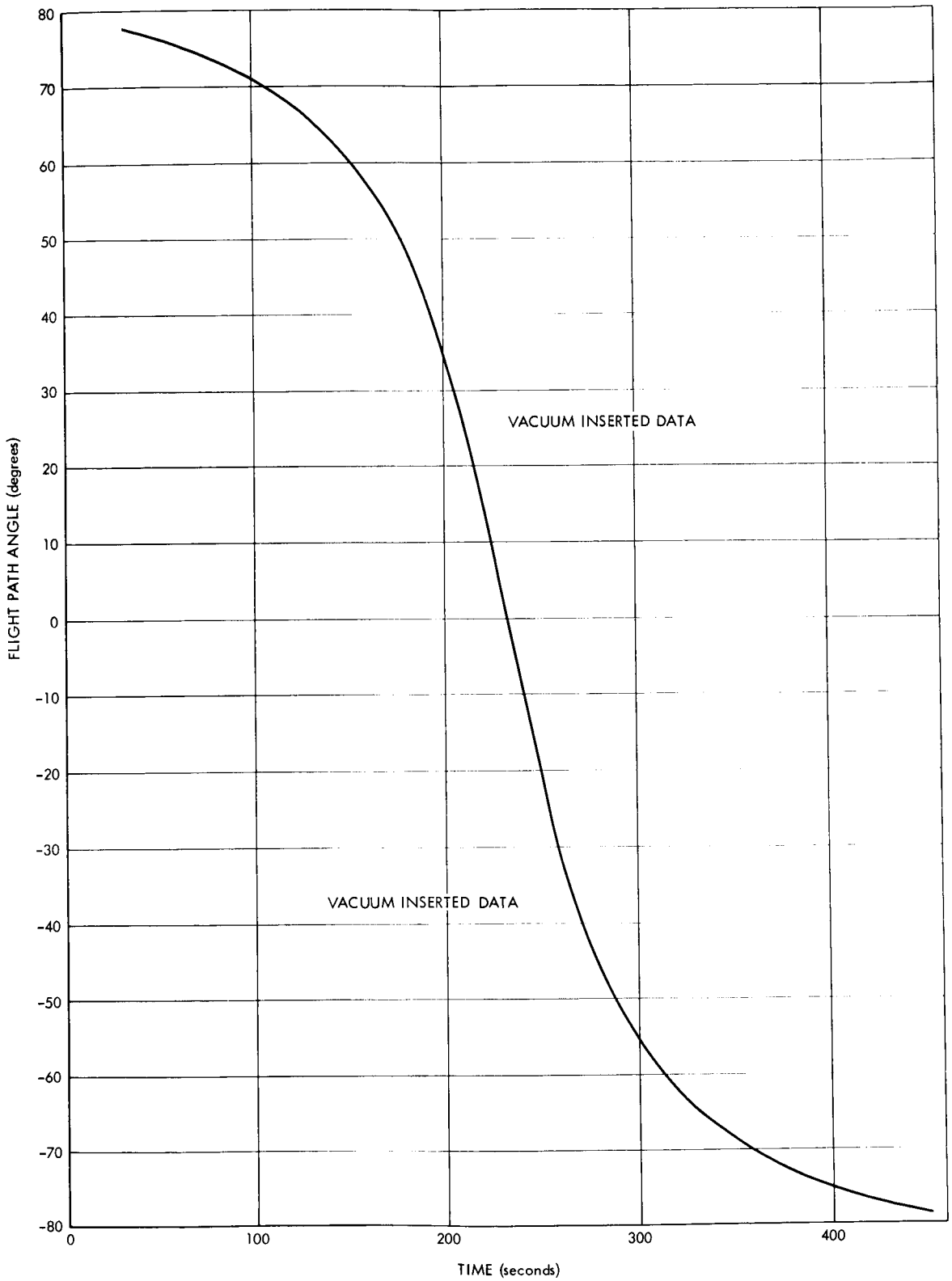

Figure 219. 14.179 GI Radar Plot, Flight Path Angle vs Time

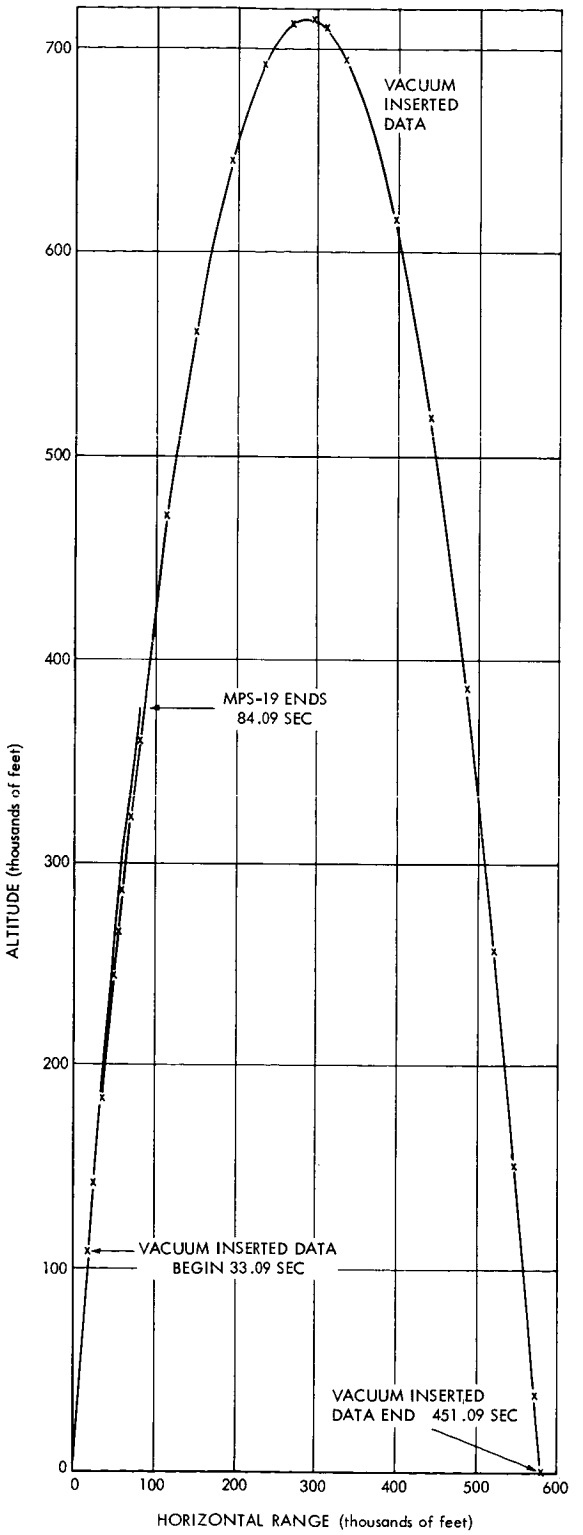

Figure 220. 14.179 GI Radar Plot, Altitude vs Horizontal Range

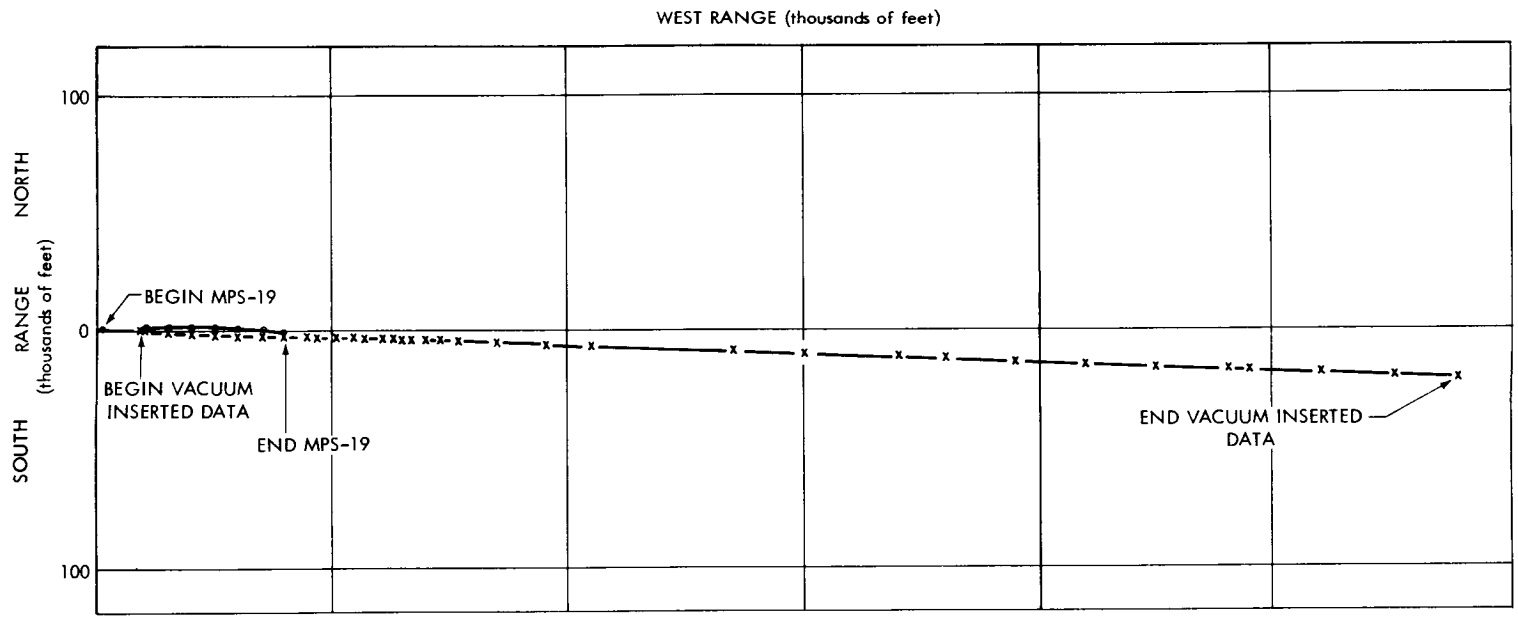

Figure 221. 14.179 GI Radar Plot, North-South Range vs West Range

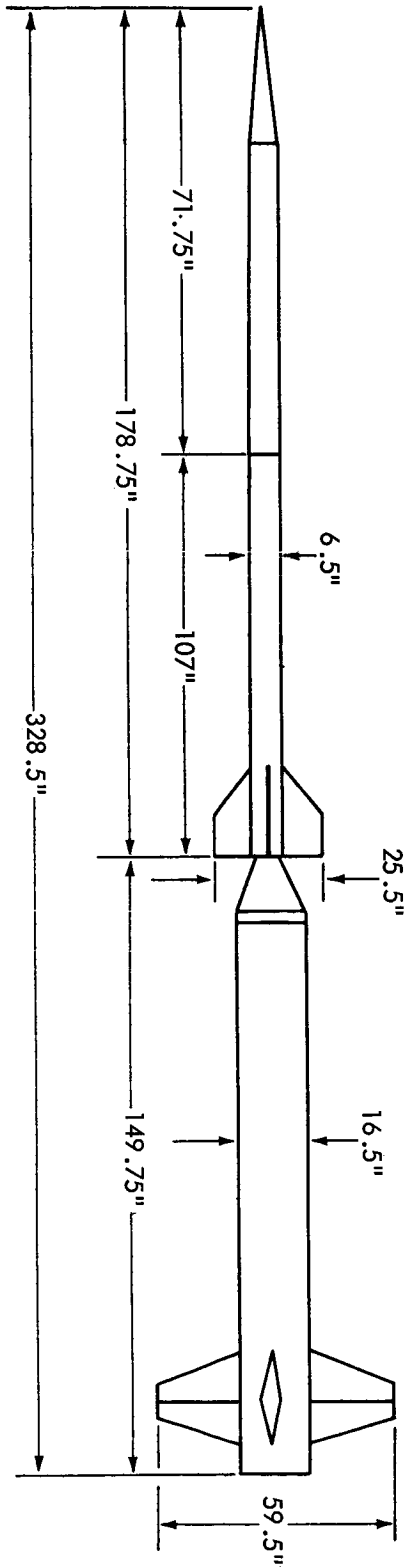

Figure 222. 14.180 GI Sketch

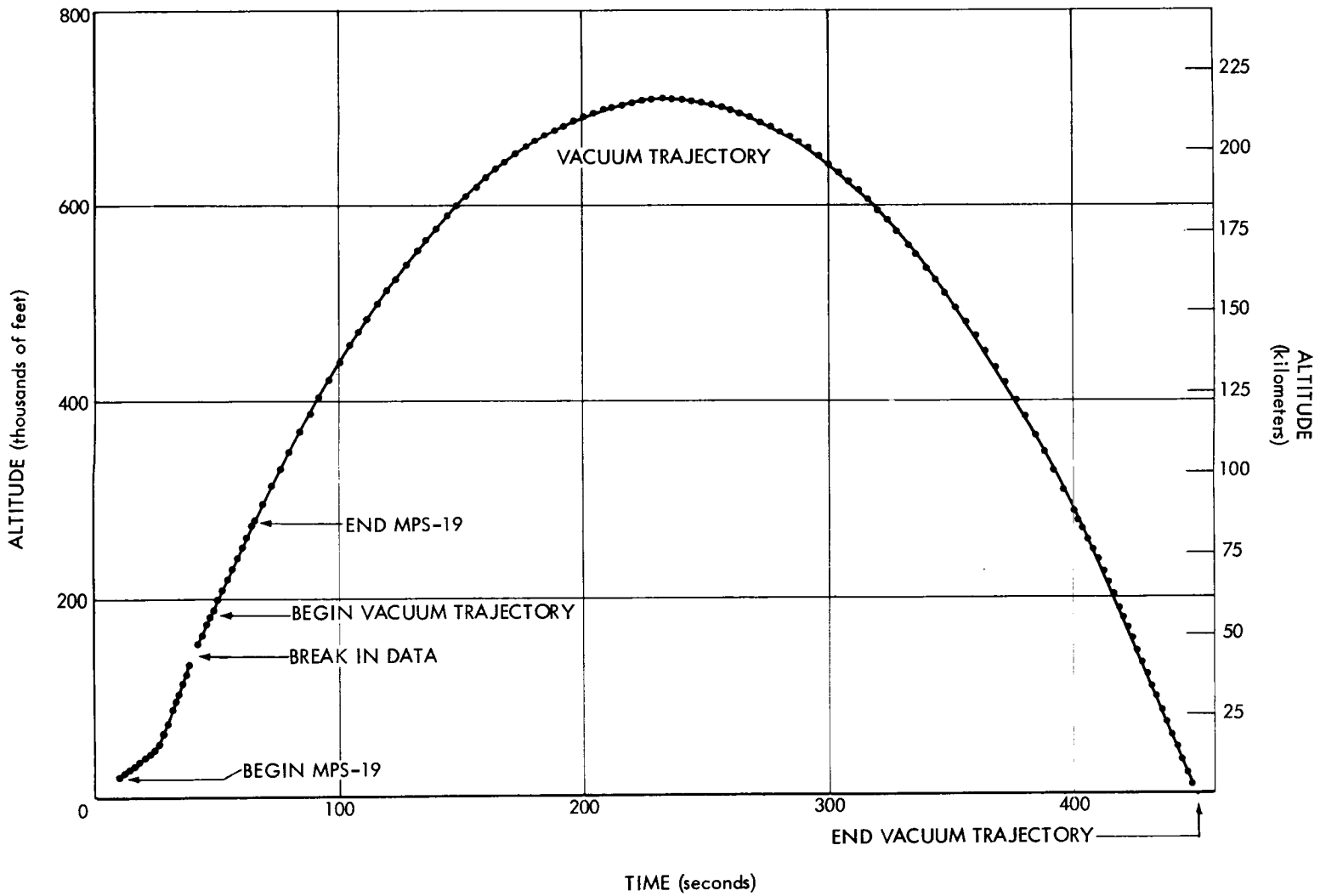

Figure 223. 14.180 GI Radar Plot, Altitude vs Time

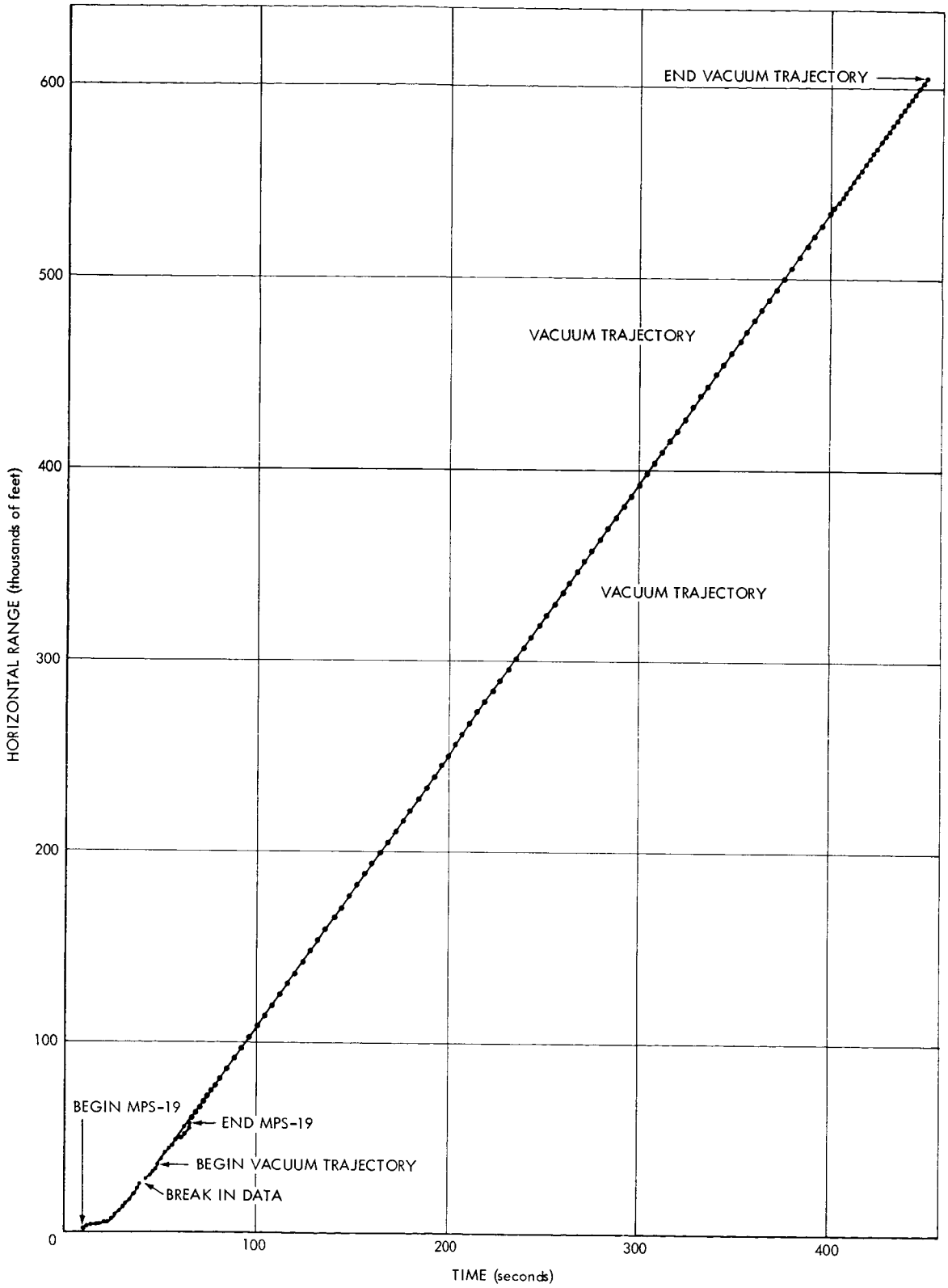

Figure 224. 14.180 GI Radar Plot, Horizontal Range vs Time

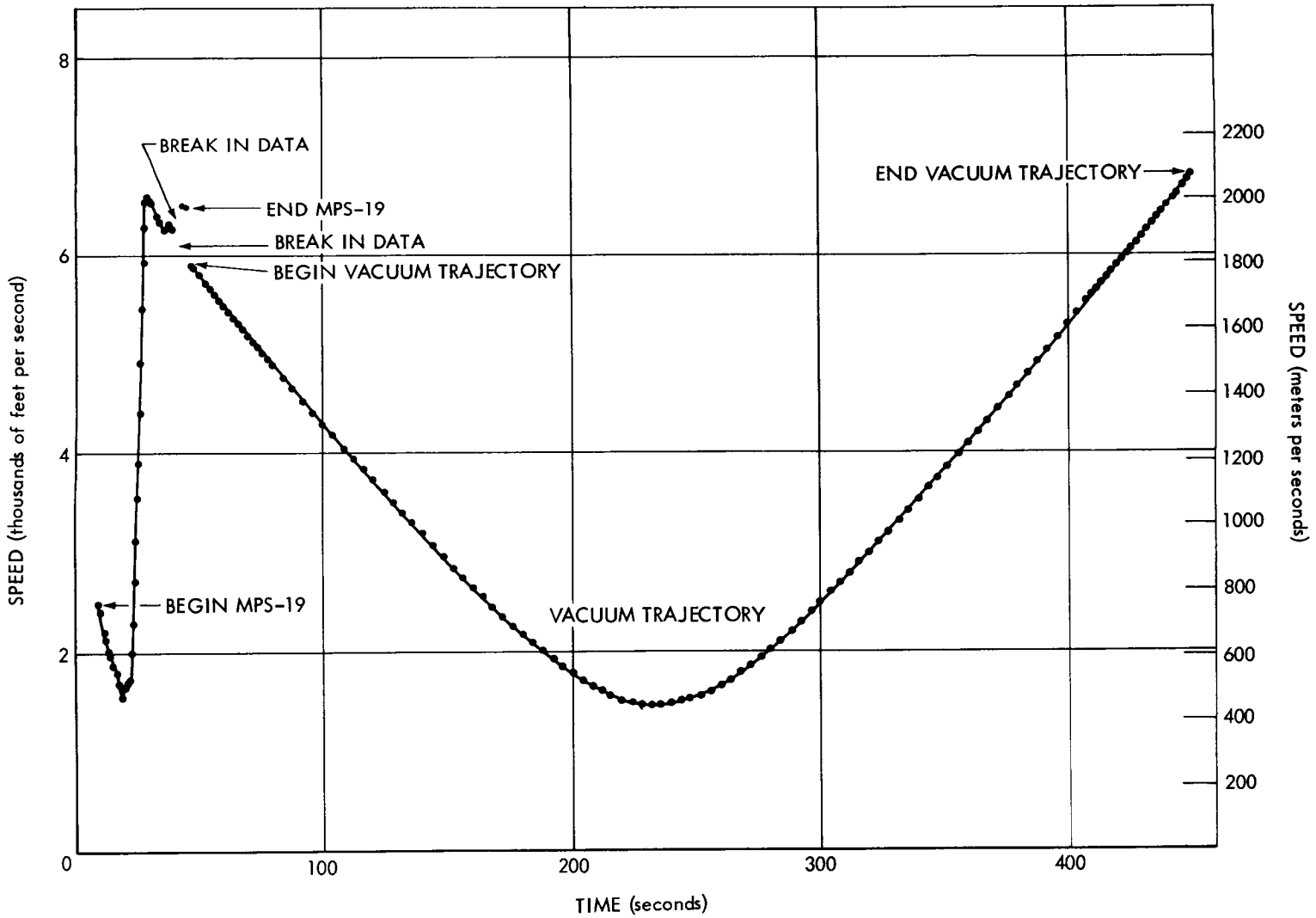

Figure 225. 14.180 GI Radar Plot, Speed vs Time

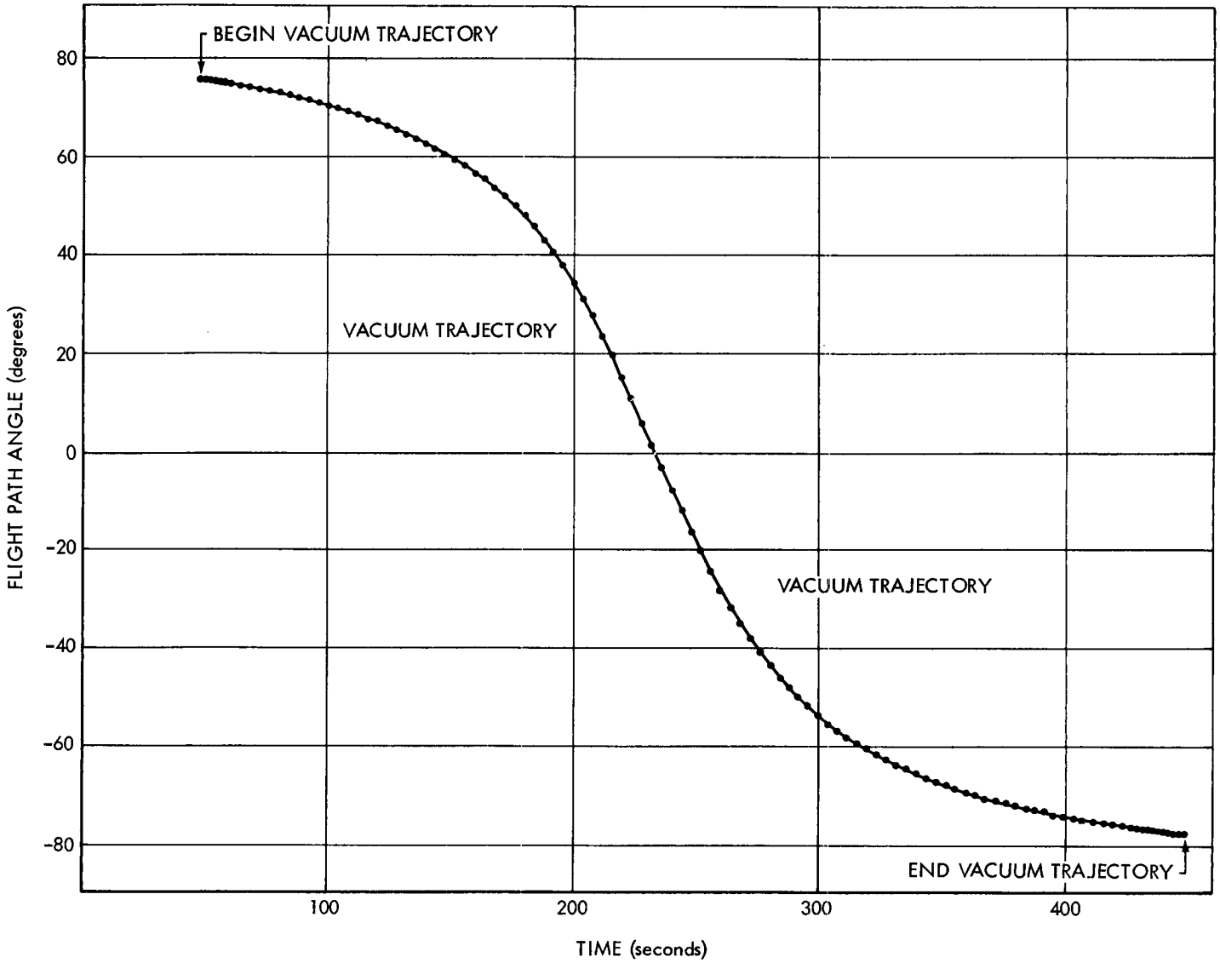

Figure 226. 14.180 GI Radar Plot, Flight Path Angle vs Time

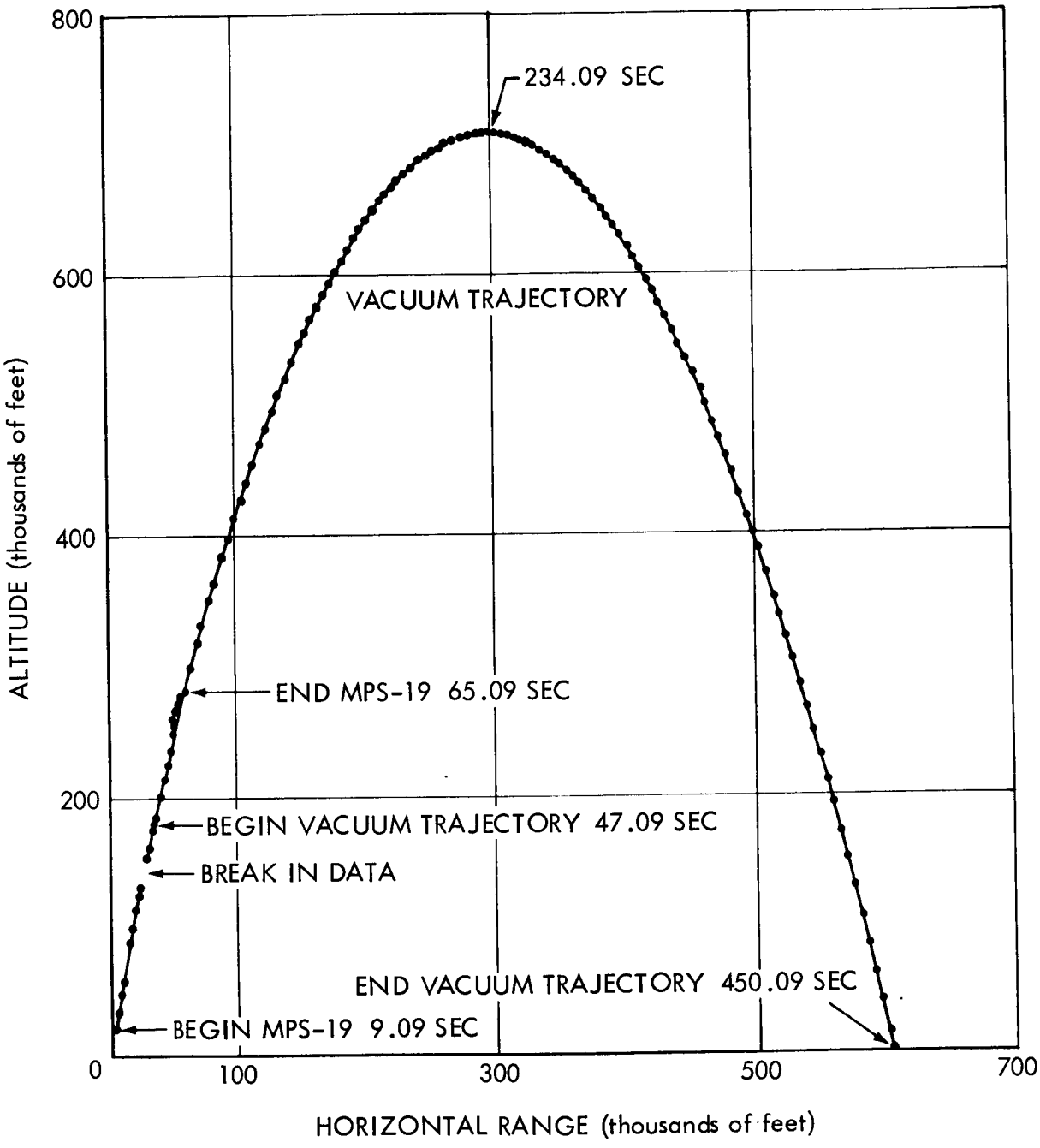

Figure 227. 14.180 GI Radar Plot, Altitude vs Horizontal Range

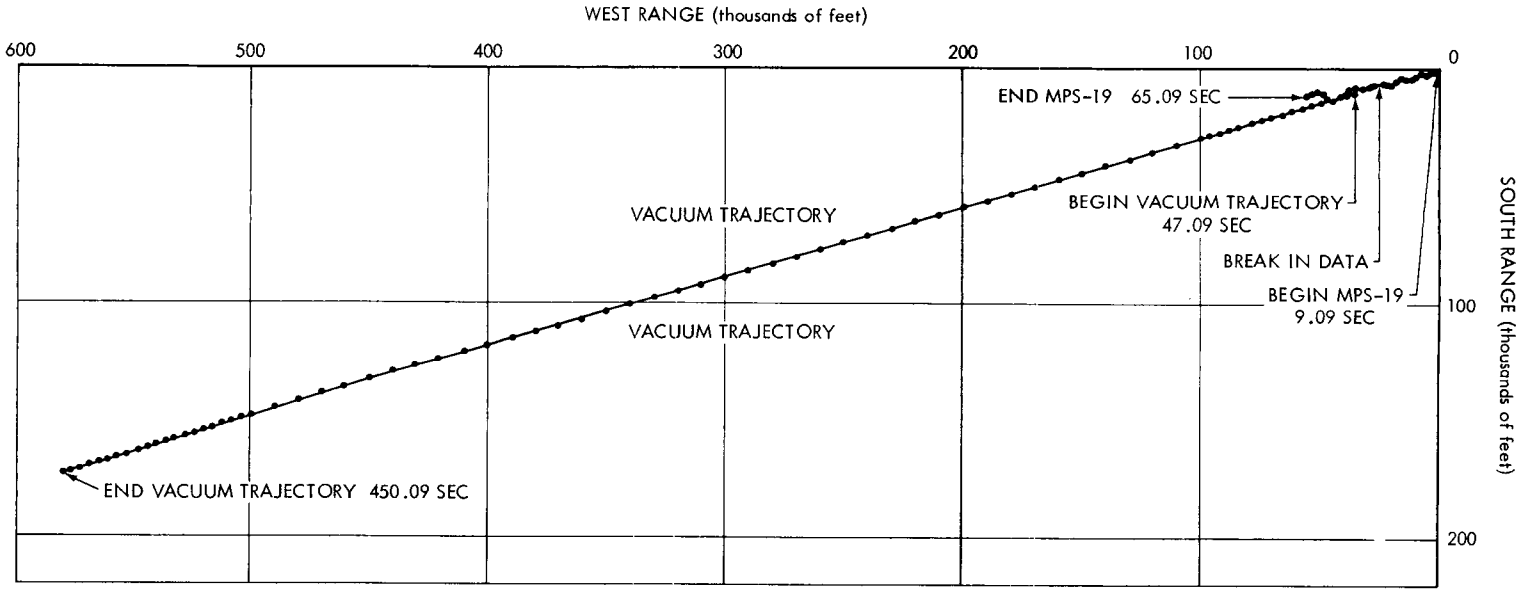

Figure 228. 14.180 GI Radar Plot, South Range vs West Range

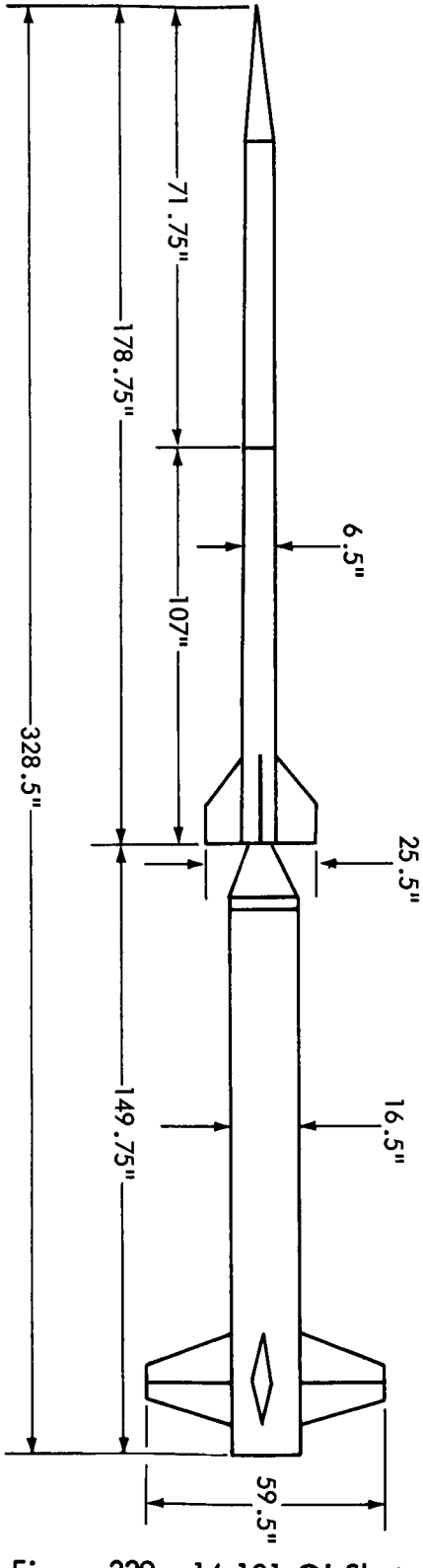

Figure 229. 14.181 GI Sketch

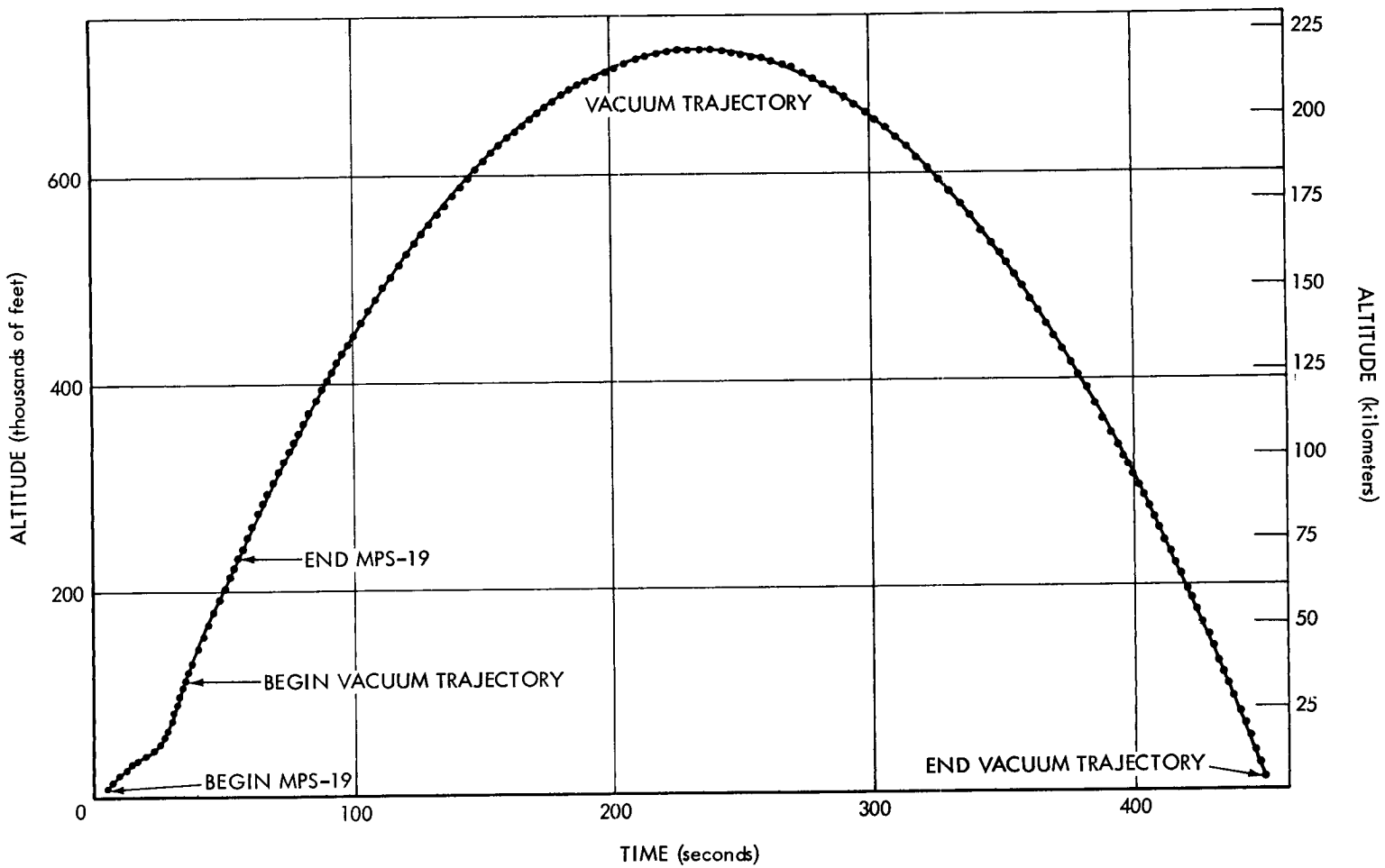

Figure 230. 14.181 GI Radar Plot, Altitude vs Time

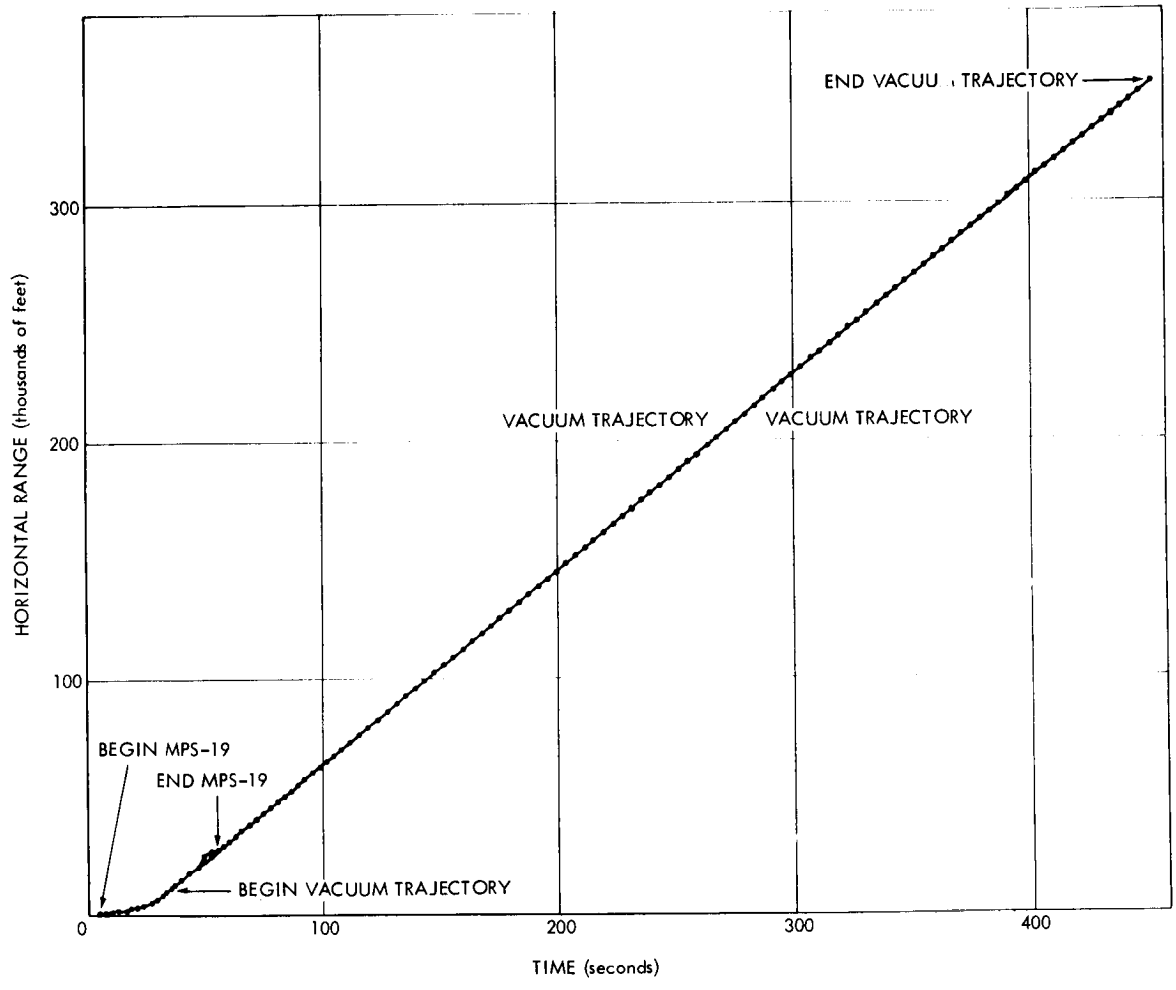

Figure 231. 14.181 GI Radar Plot, Horizontal Range vs Time

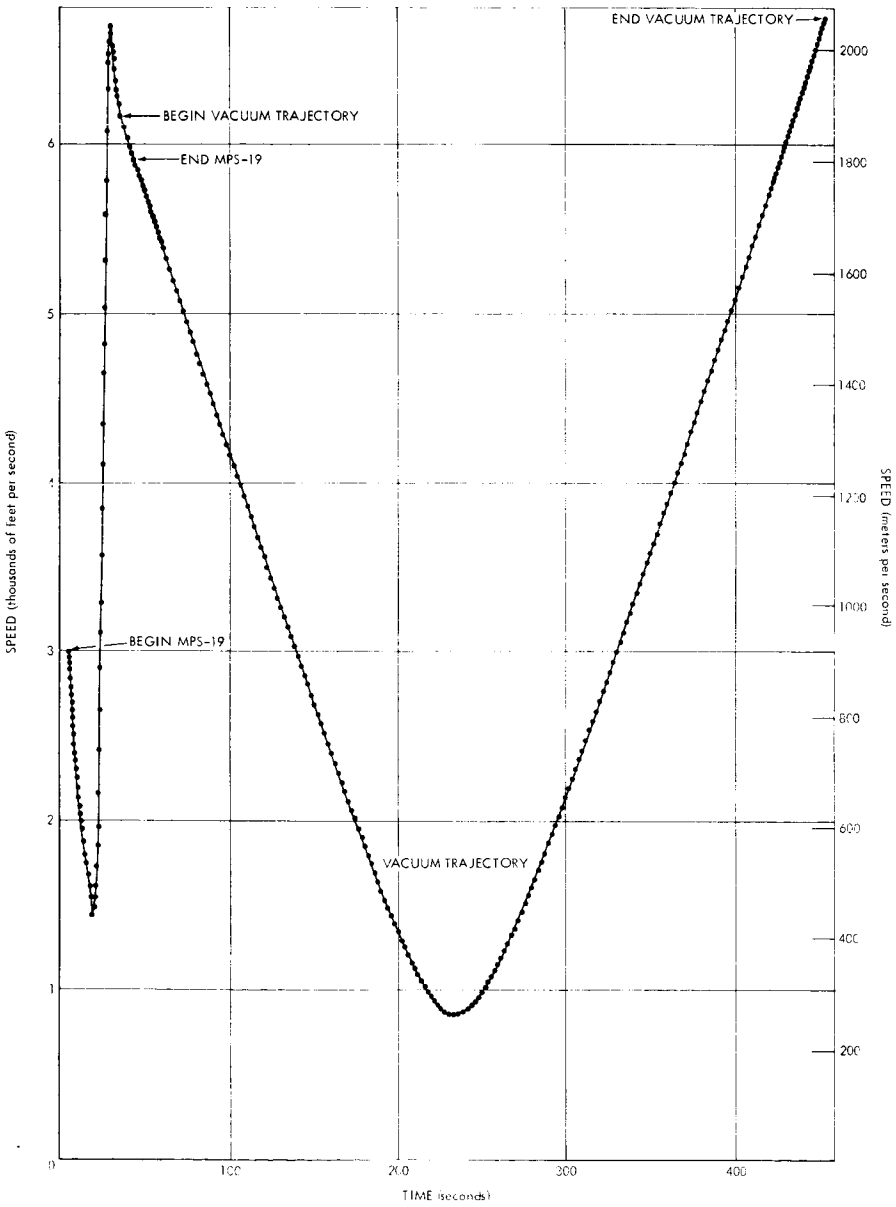

Figure 232. 14.181 GI Radar Plot, Speed vs Time

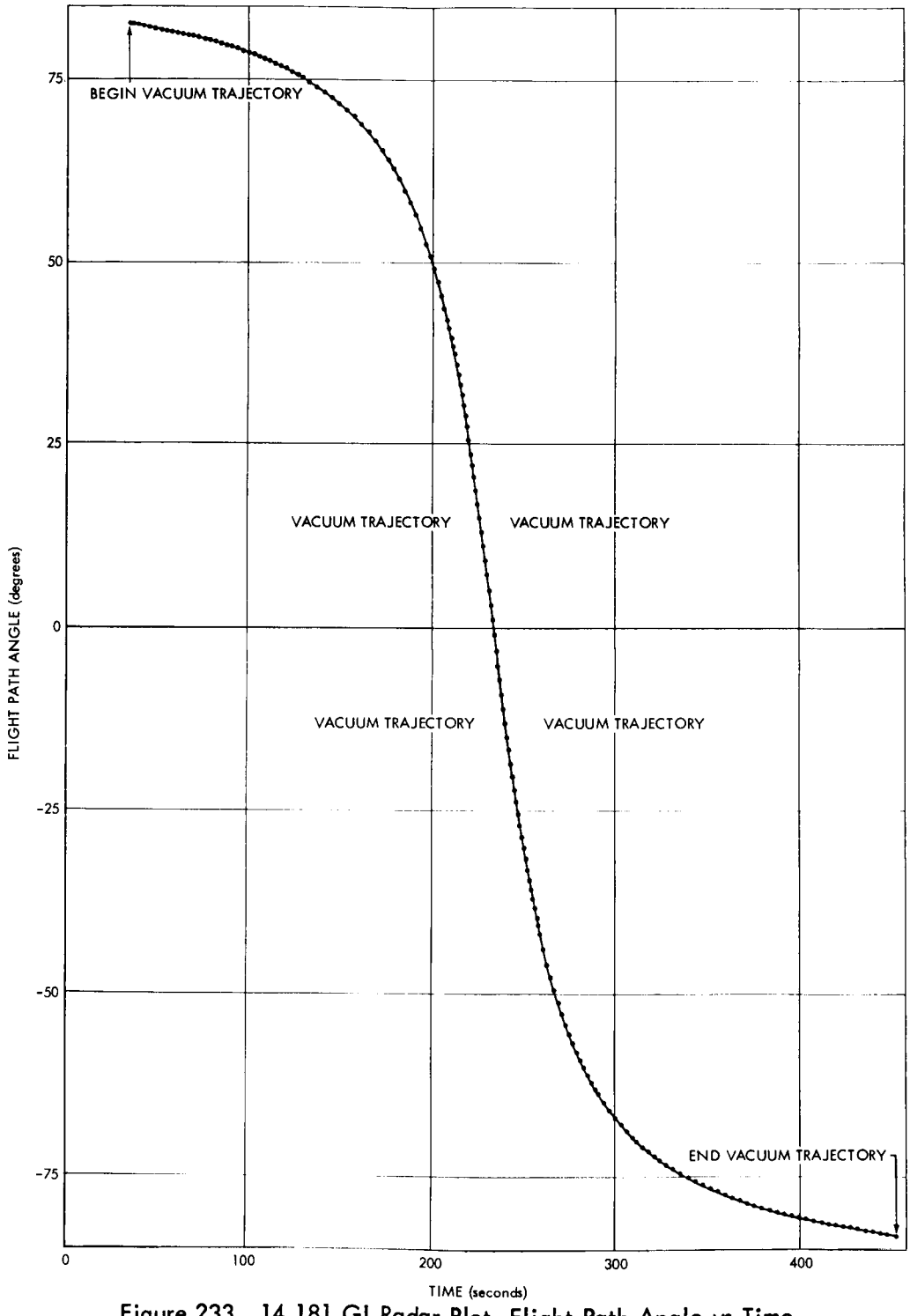

Figure 233. 14.181 GI Radar Plot, Flight Path Angle vs Time

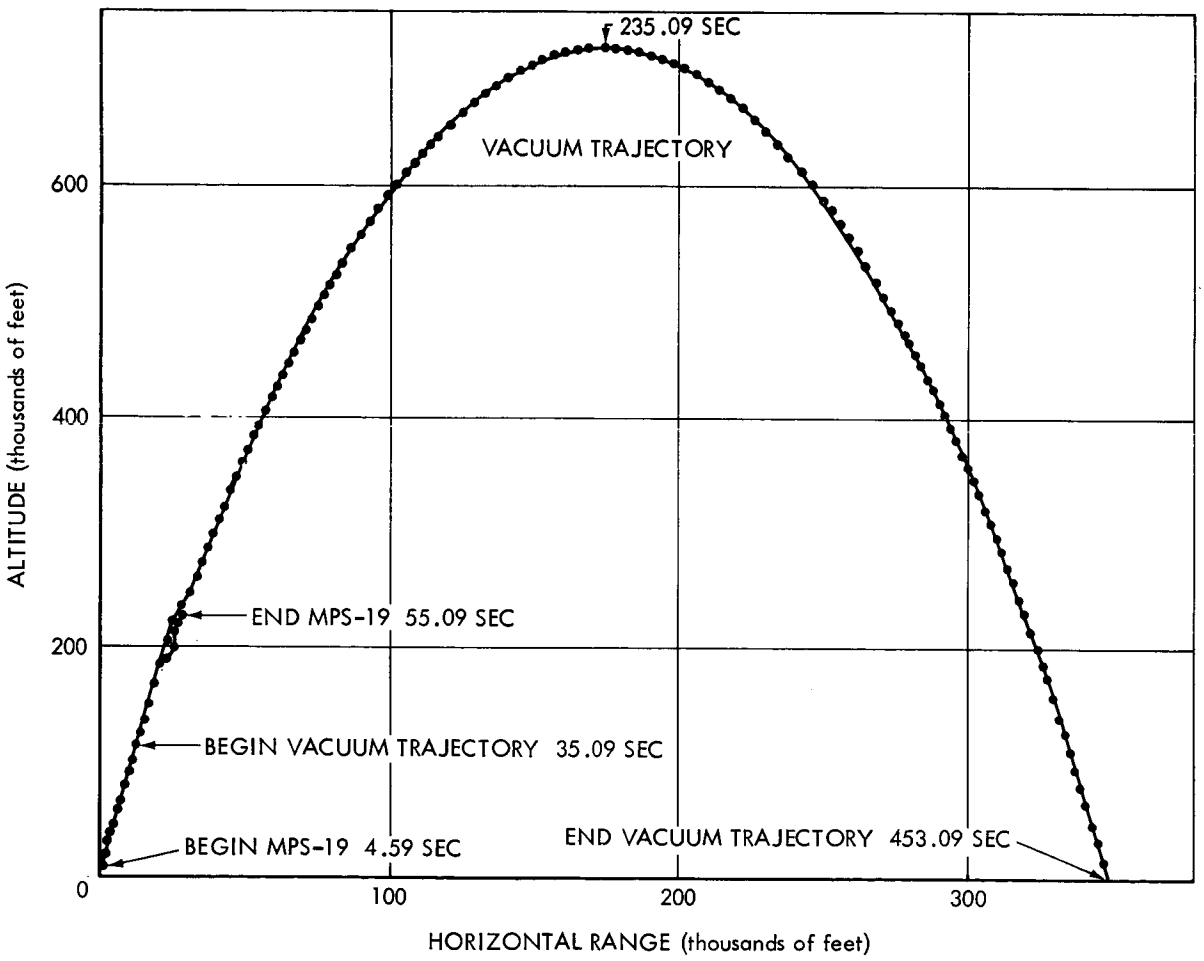

Figure 234. 14.181 GI Radar Plot, Altitude vs Horizontal Range

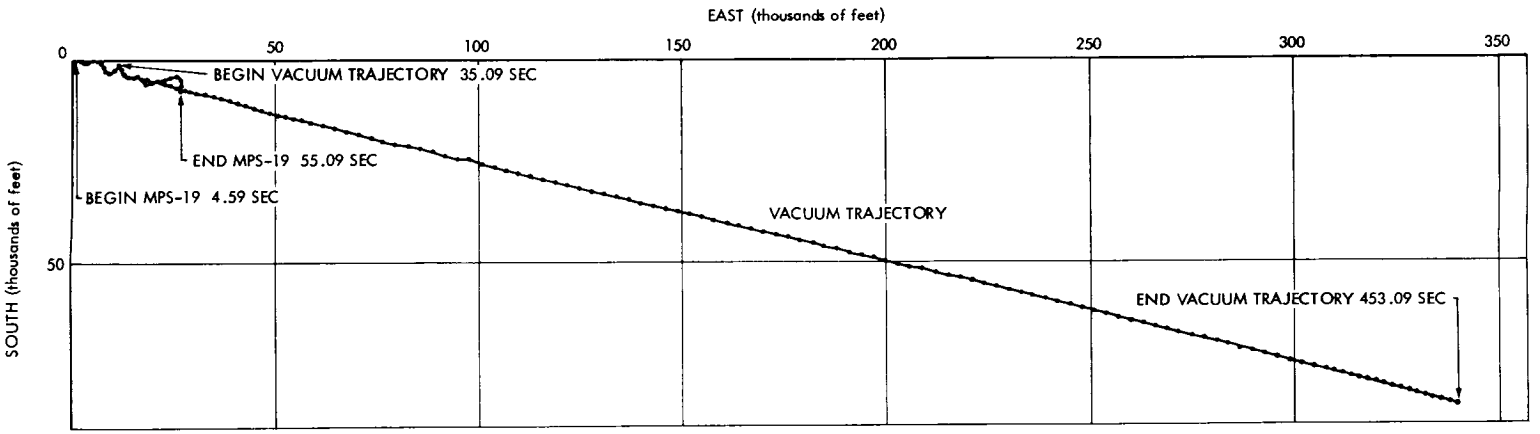

Figure 235. 14.181 GI Radar Plot, South Range vs East Range

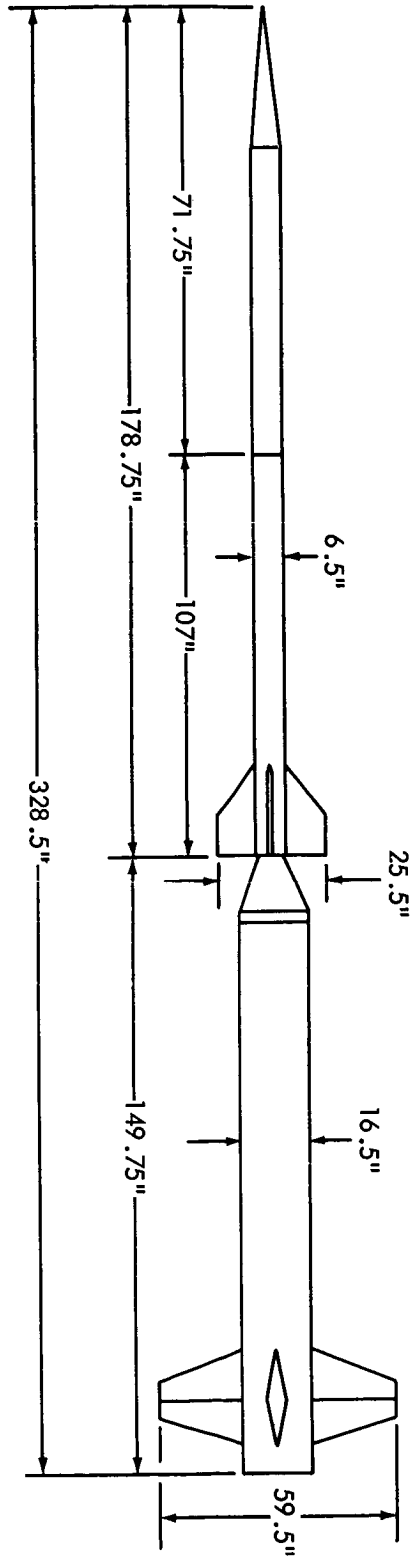

Figure 236. 14.182 GI Sketch

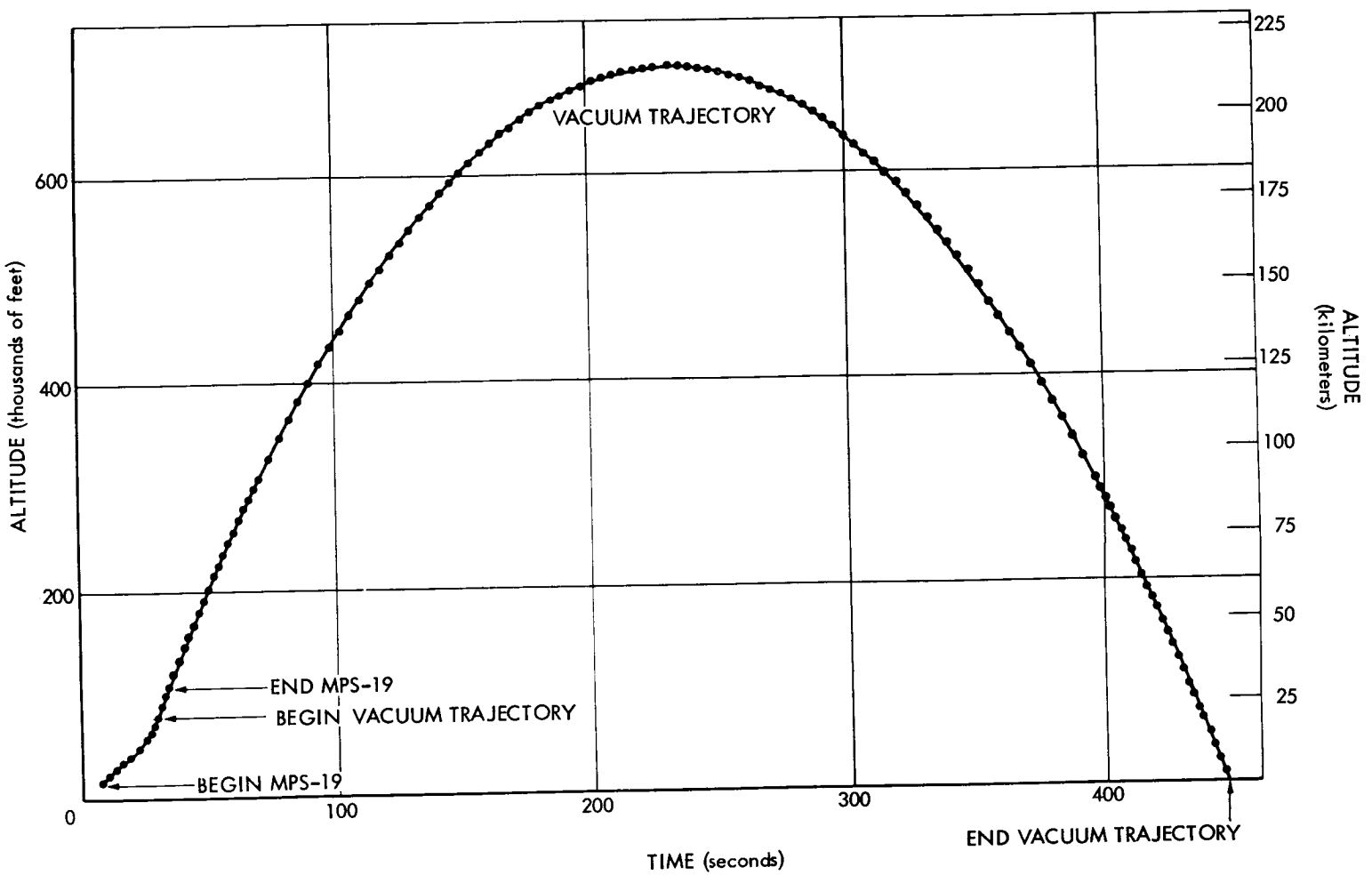

Figure 237. 14.182 GI Radar Plot, Altitude vs Time

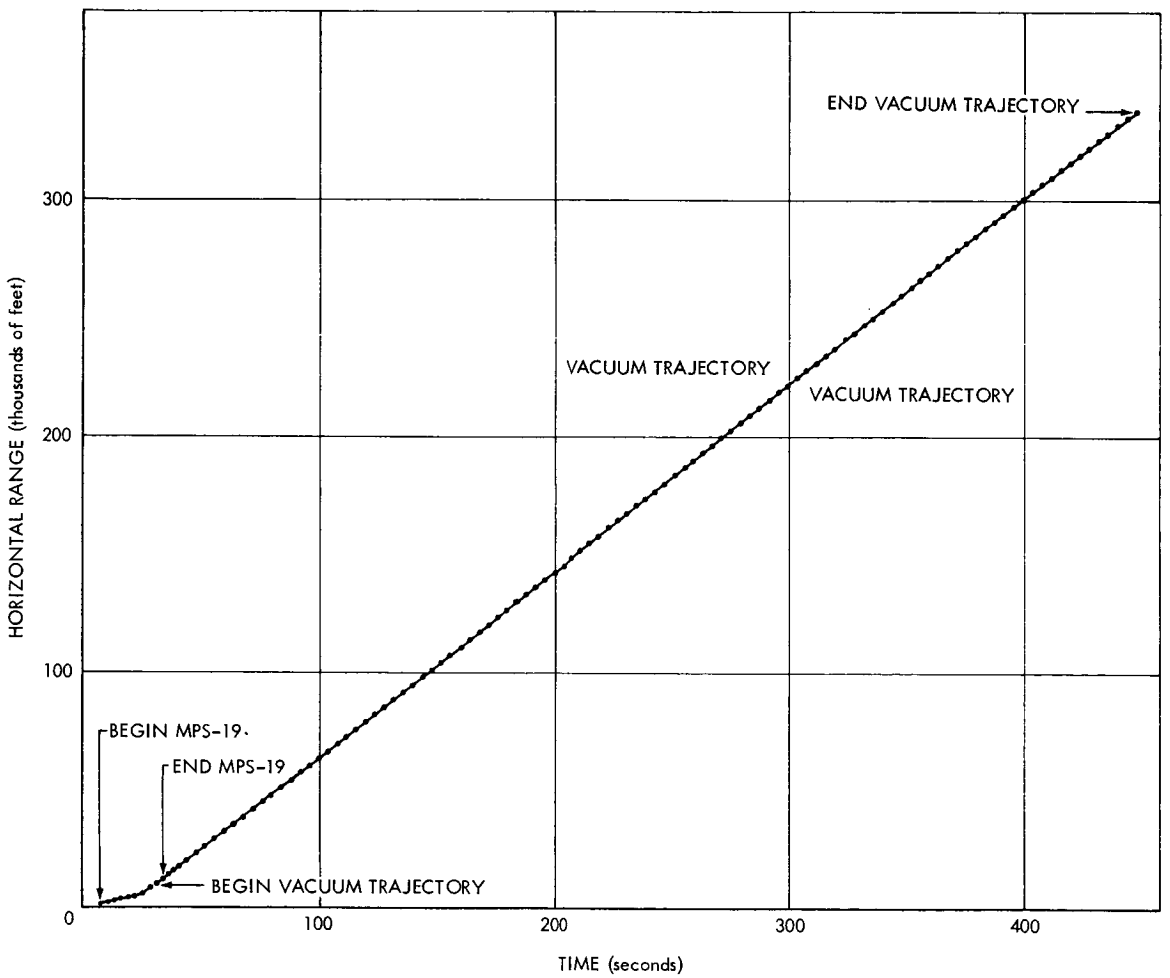

Figure 238. 14.182 GI Radar Plot, Horizontal Range vs Time

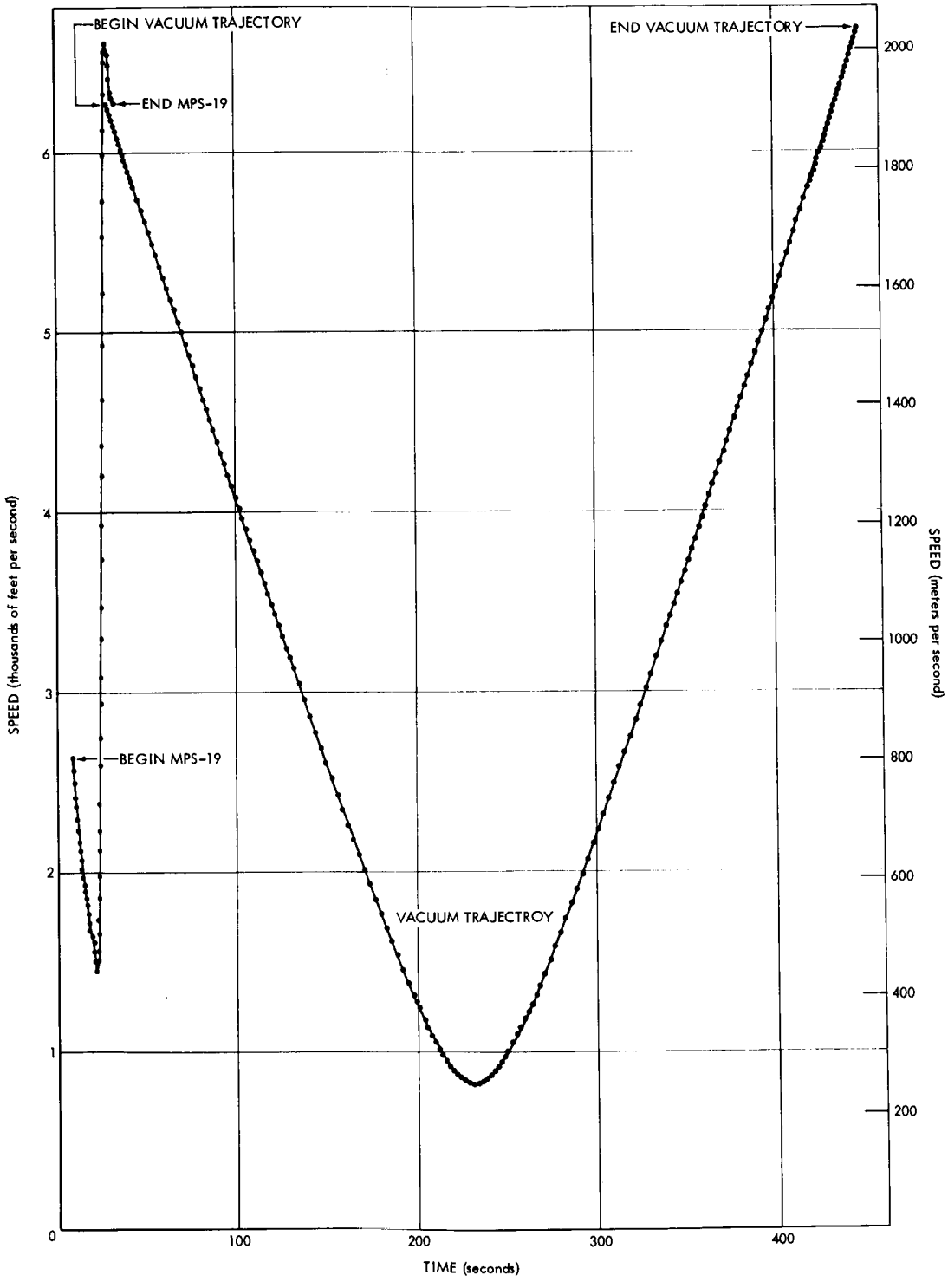

Figure 239. 14.182 GI Radar Plot, Speed vs Time

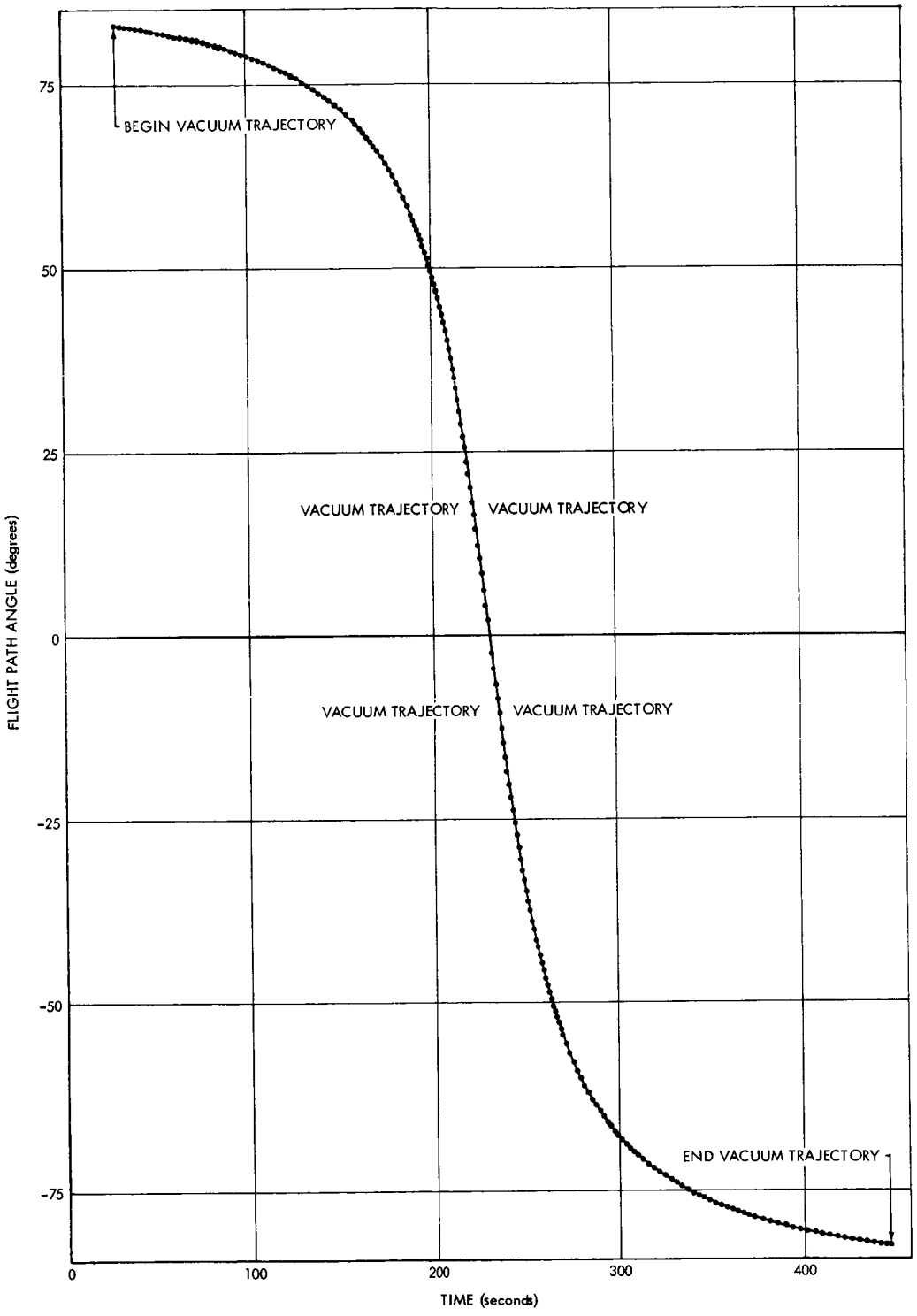

Figure 240. 14.182 GI Radar Plot, Flight Path Angle vs Time

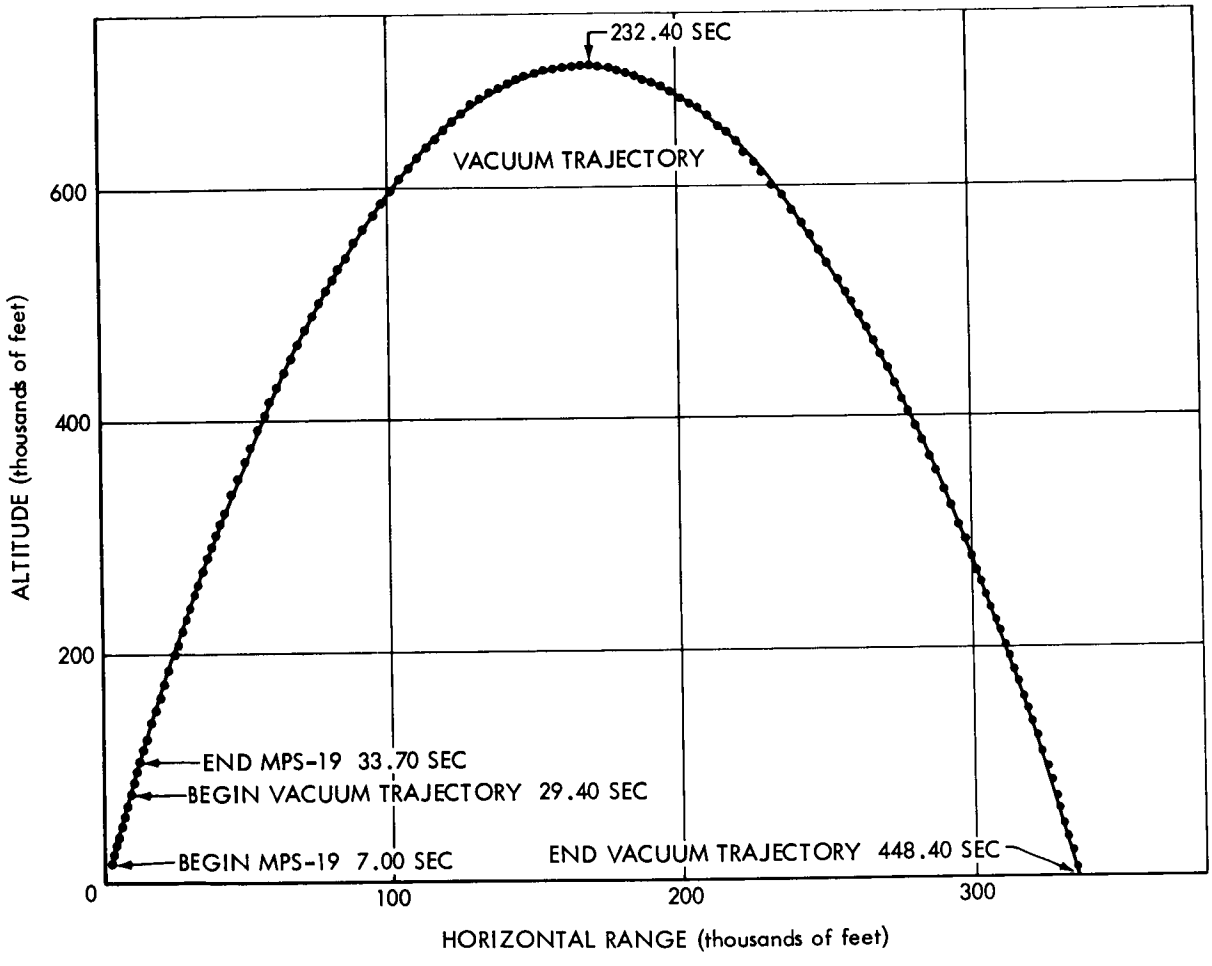

Figure 241. 14.182 GI Radar Plot, Altitude vs Horizontal Range

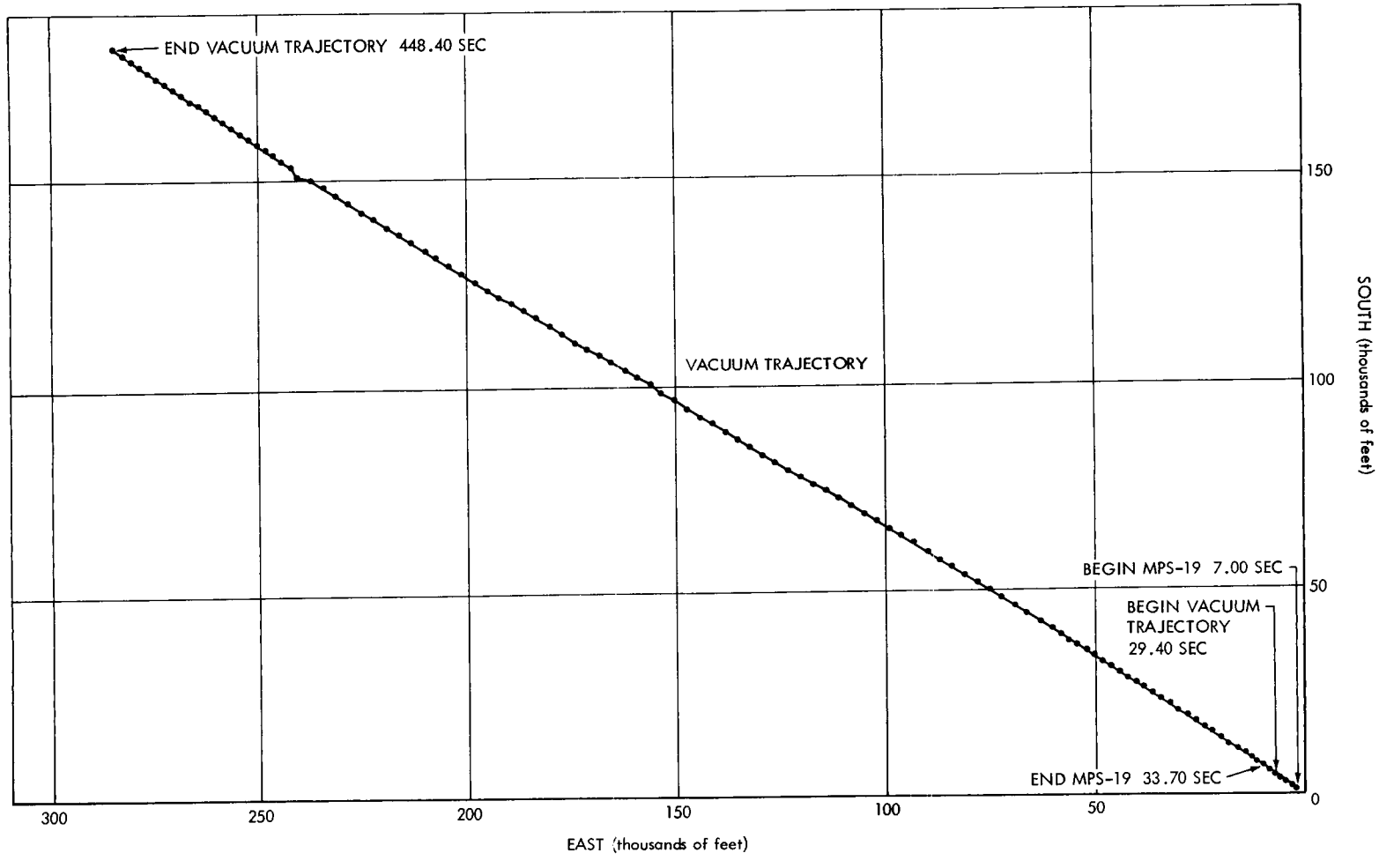

Figure 242. 14.182 GI Radar Plot, South Range vs East Range

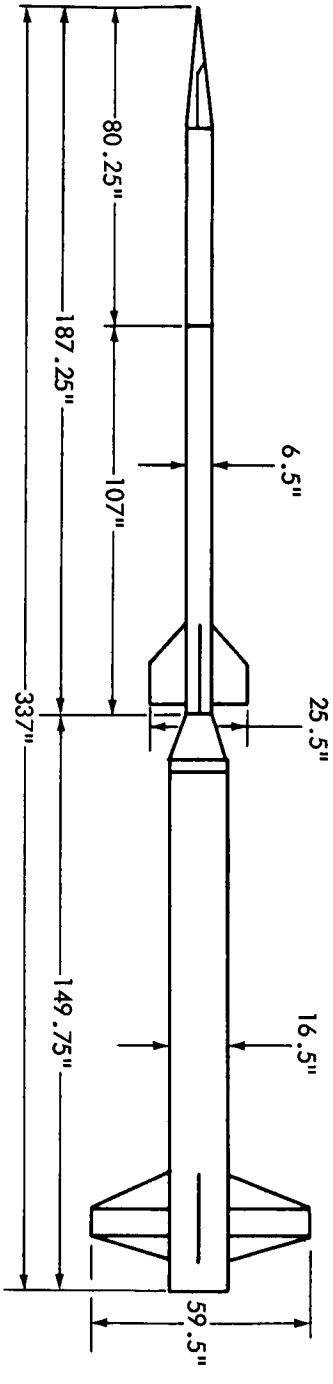

Figure 243. 14.184 UE Sketch

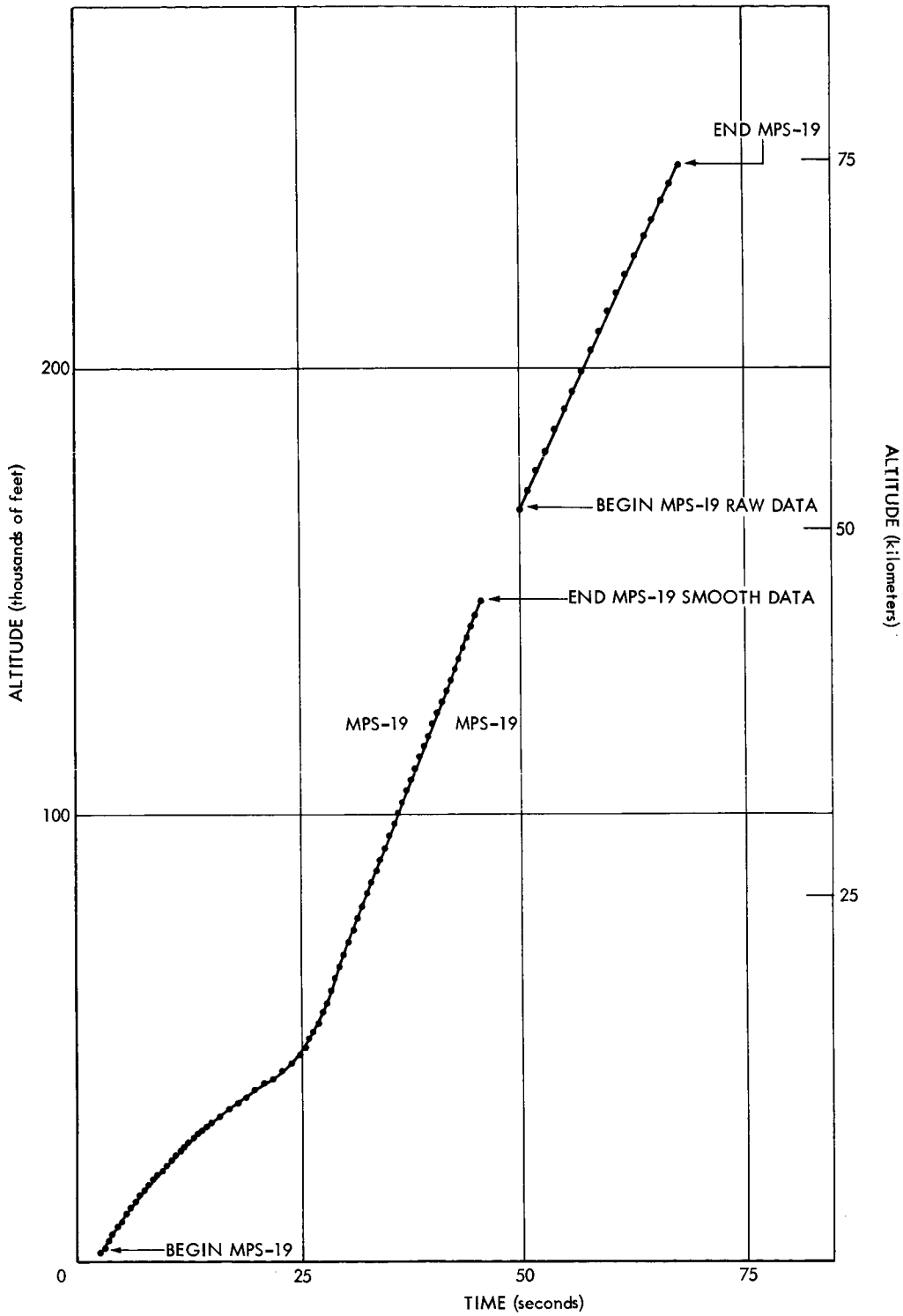

Figure 244. 14.184 UE Radar Plot, Altitude vs Time

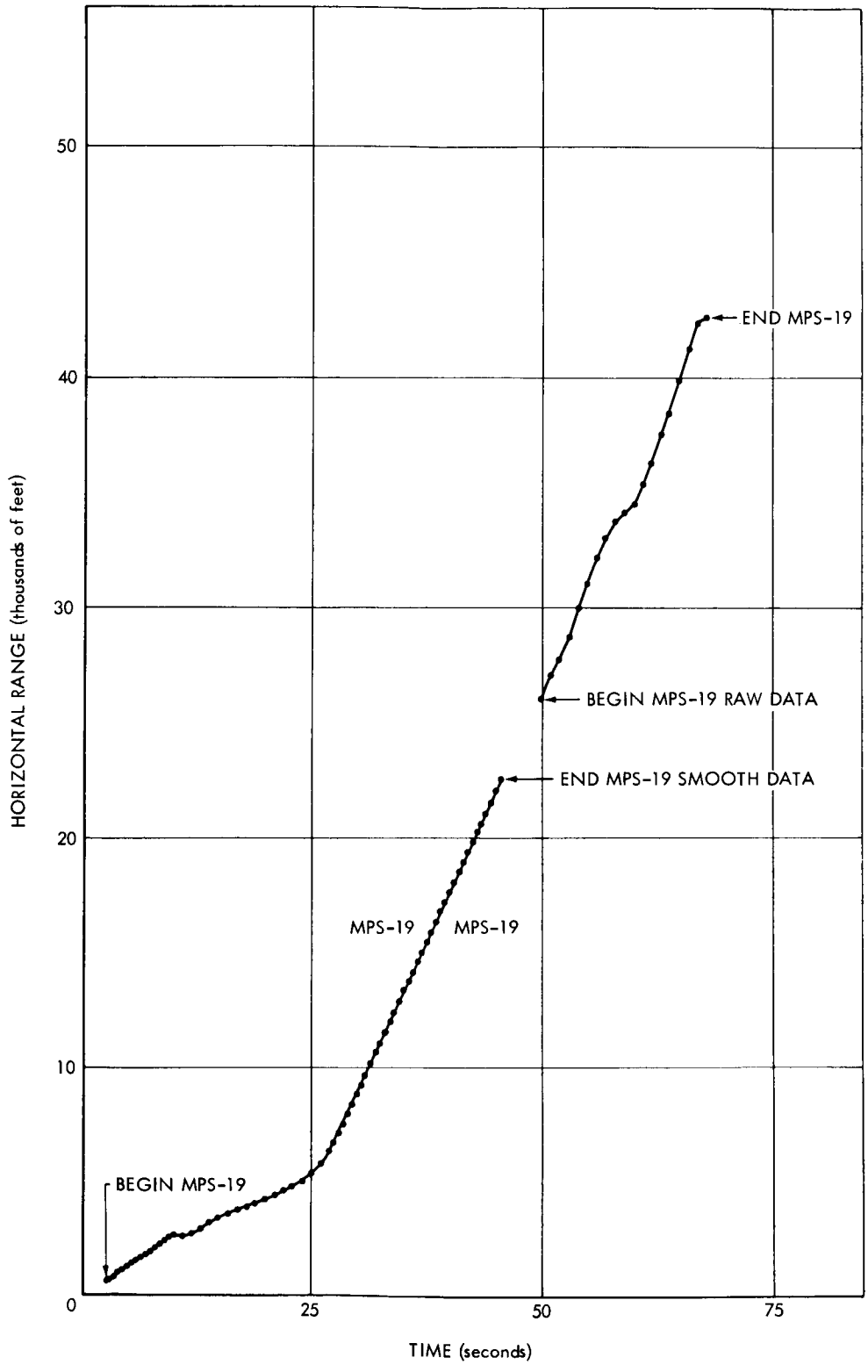

Figure 245. 14.184 UE Radar Plot, Horizontal Range vs Time

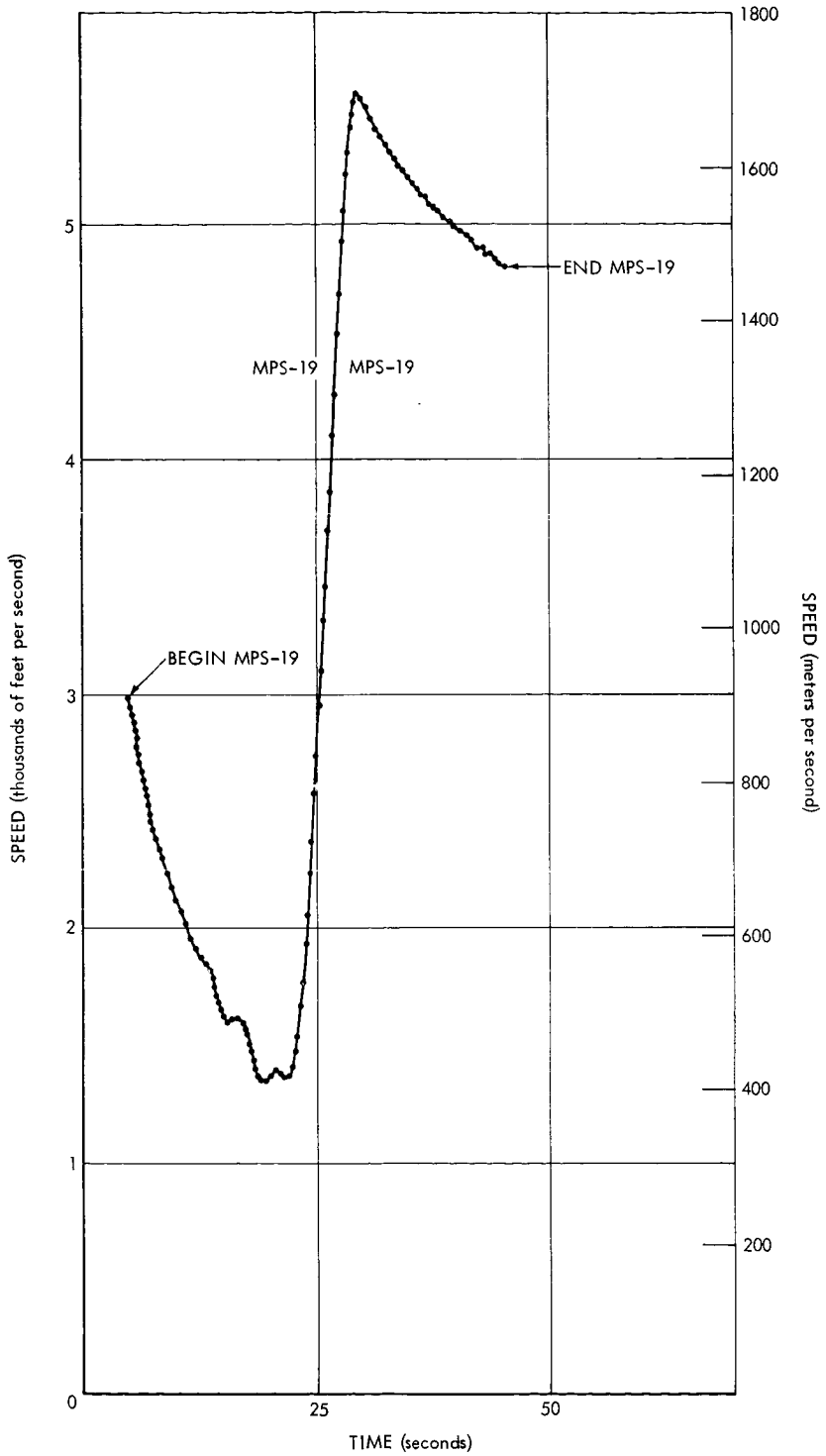

Figure 246. 14.184 UE Radar Plot, Speed vs Time

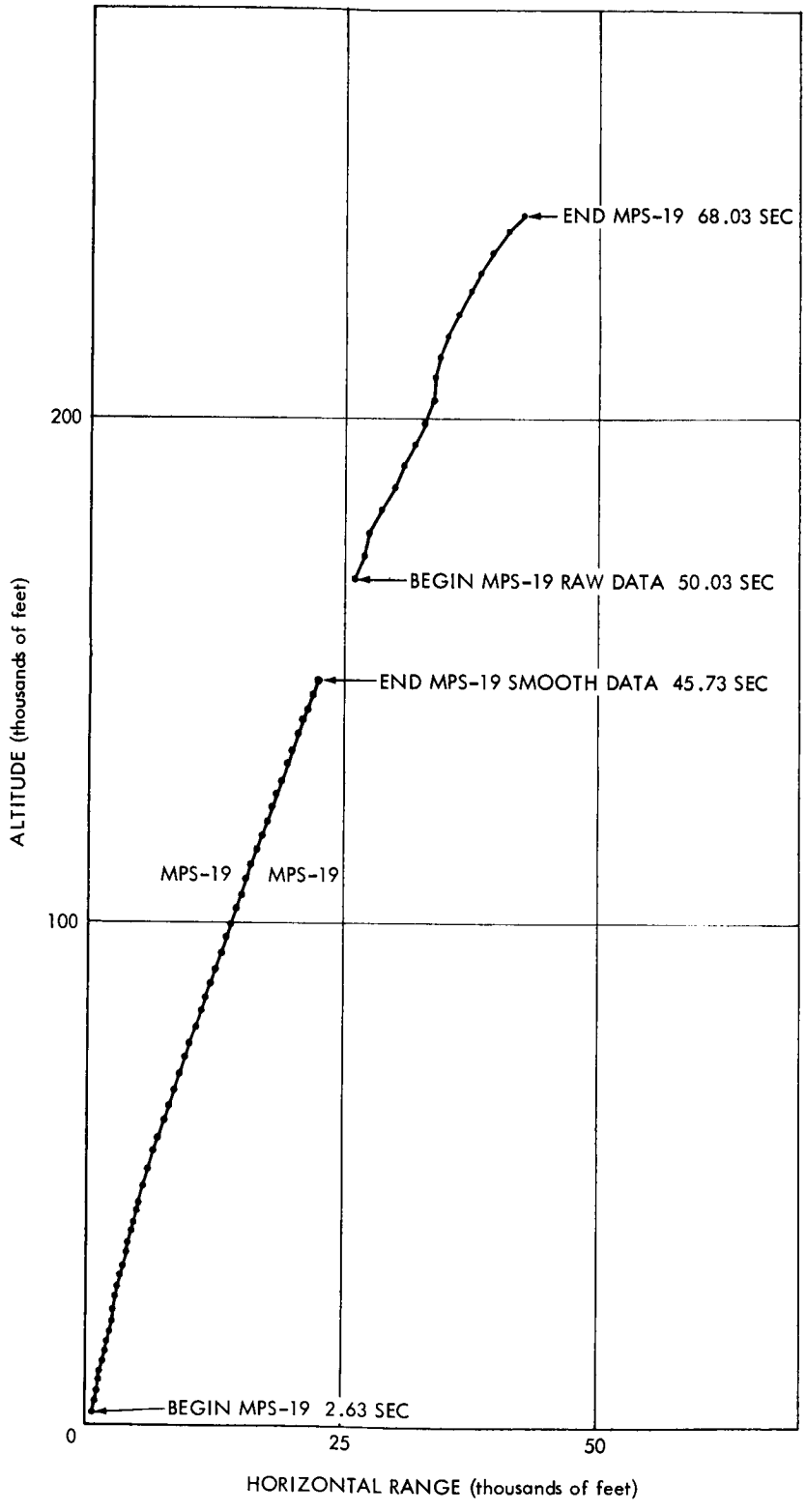

Figure 247. 14.184 UE Radar Plot, Altitude vs Horizontal Range

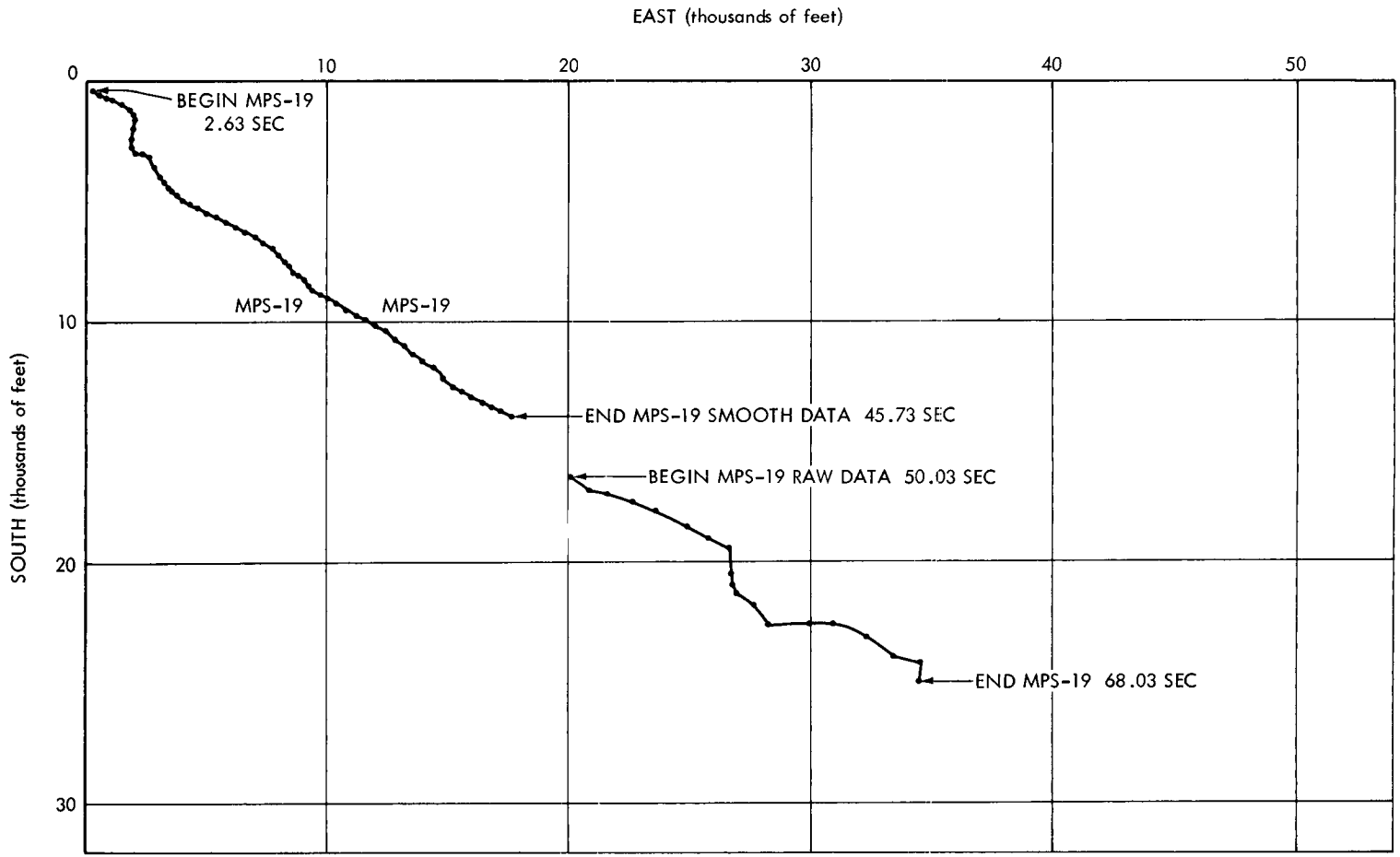

Figure 248. 14.184 UE Radar Plot, South Range vs East Range

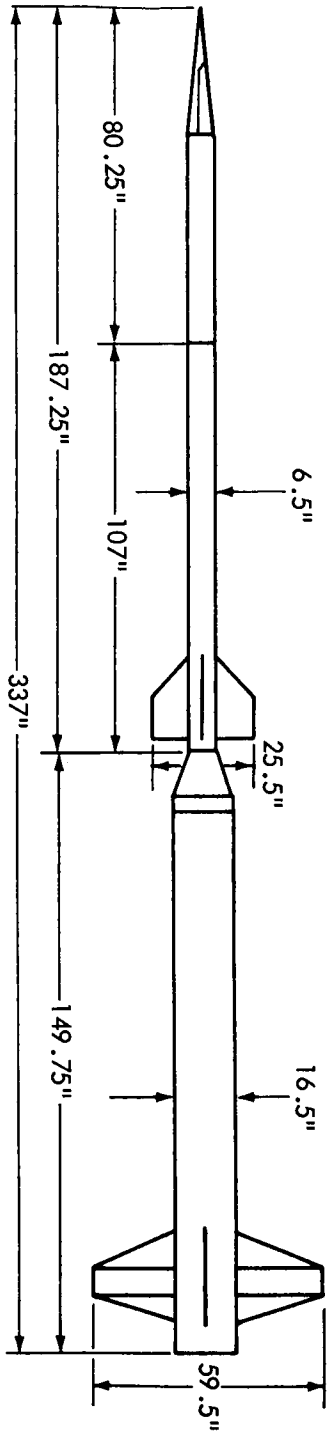

Figure 249. 14.185 UE Sketch

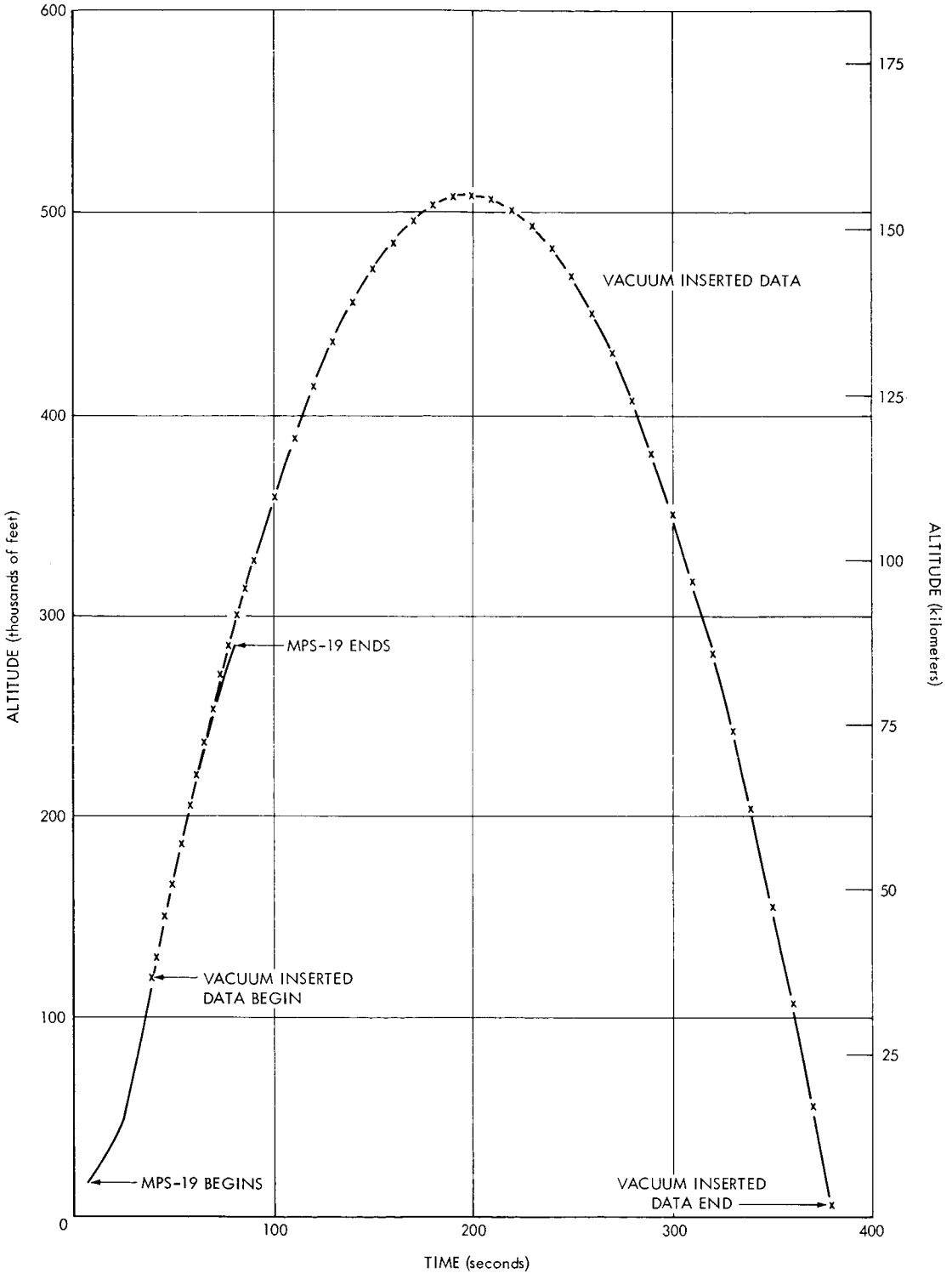

Figure 250. 14.185 UE Radar Plot, Altitude vs Time

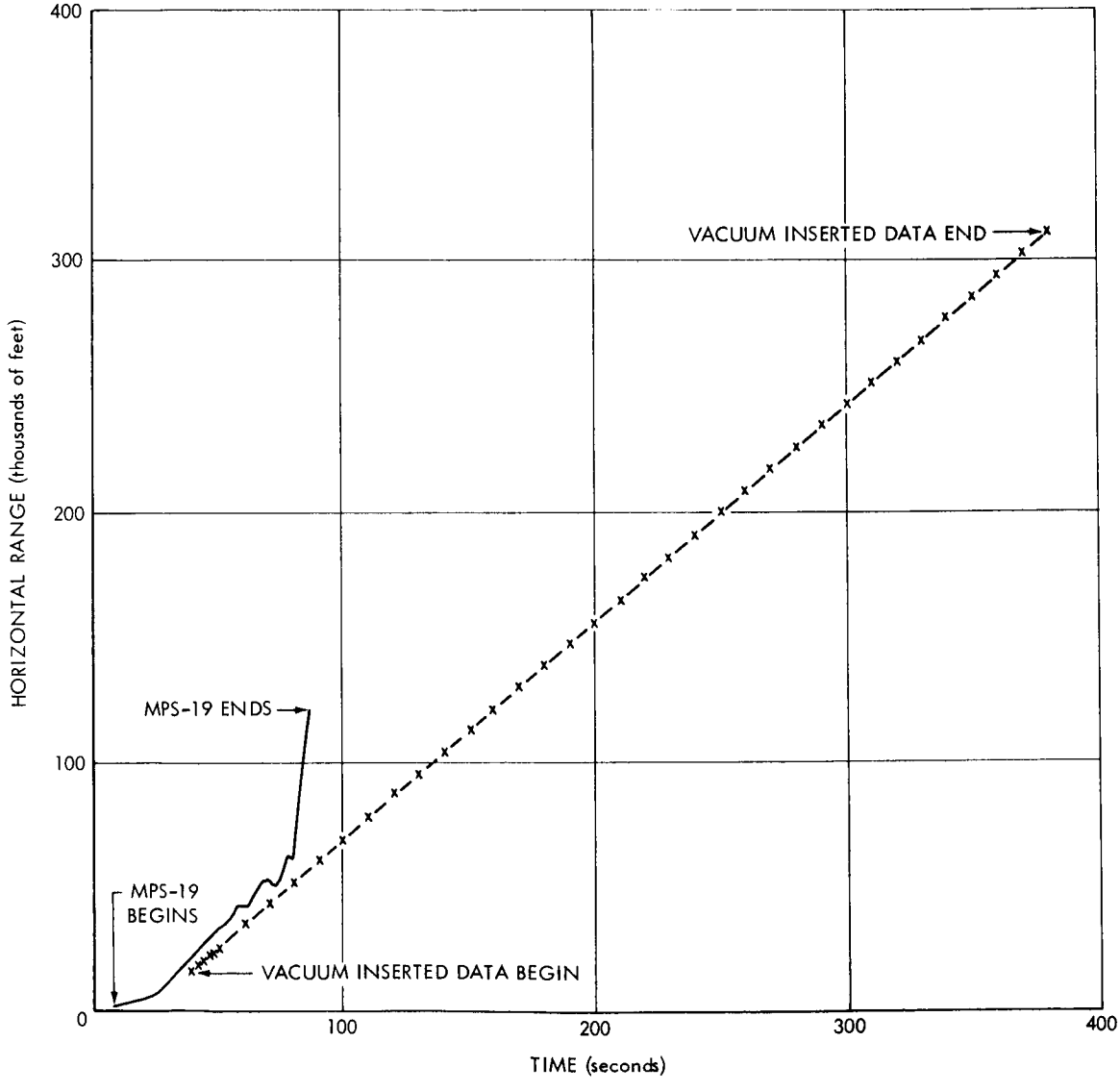

Figure 251. 14.185 UE Radar Plot, Horizontal Range vs Time

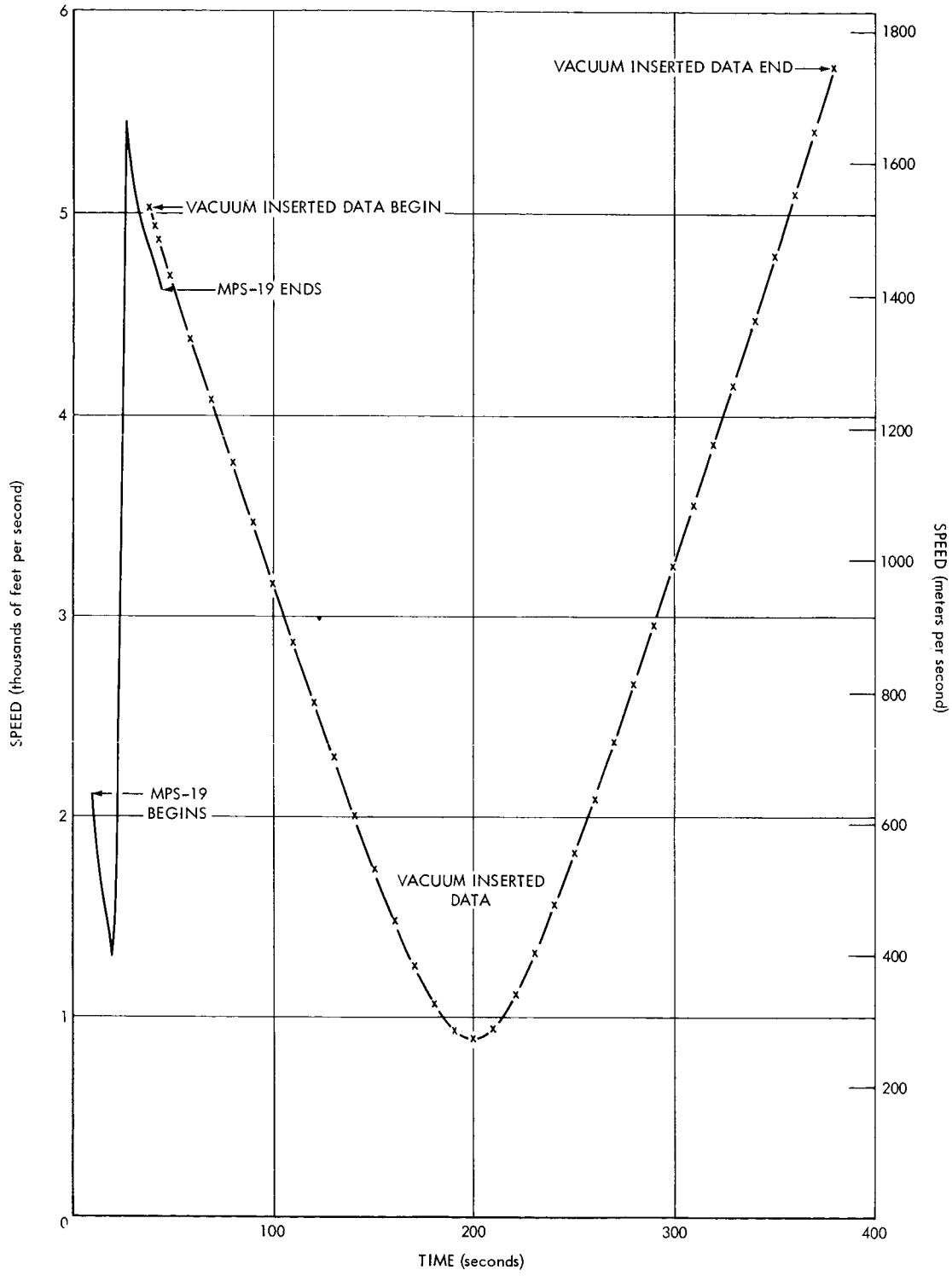

Figure 252. 14.185 UE Radar Plot, Speed vs Time

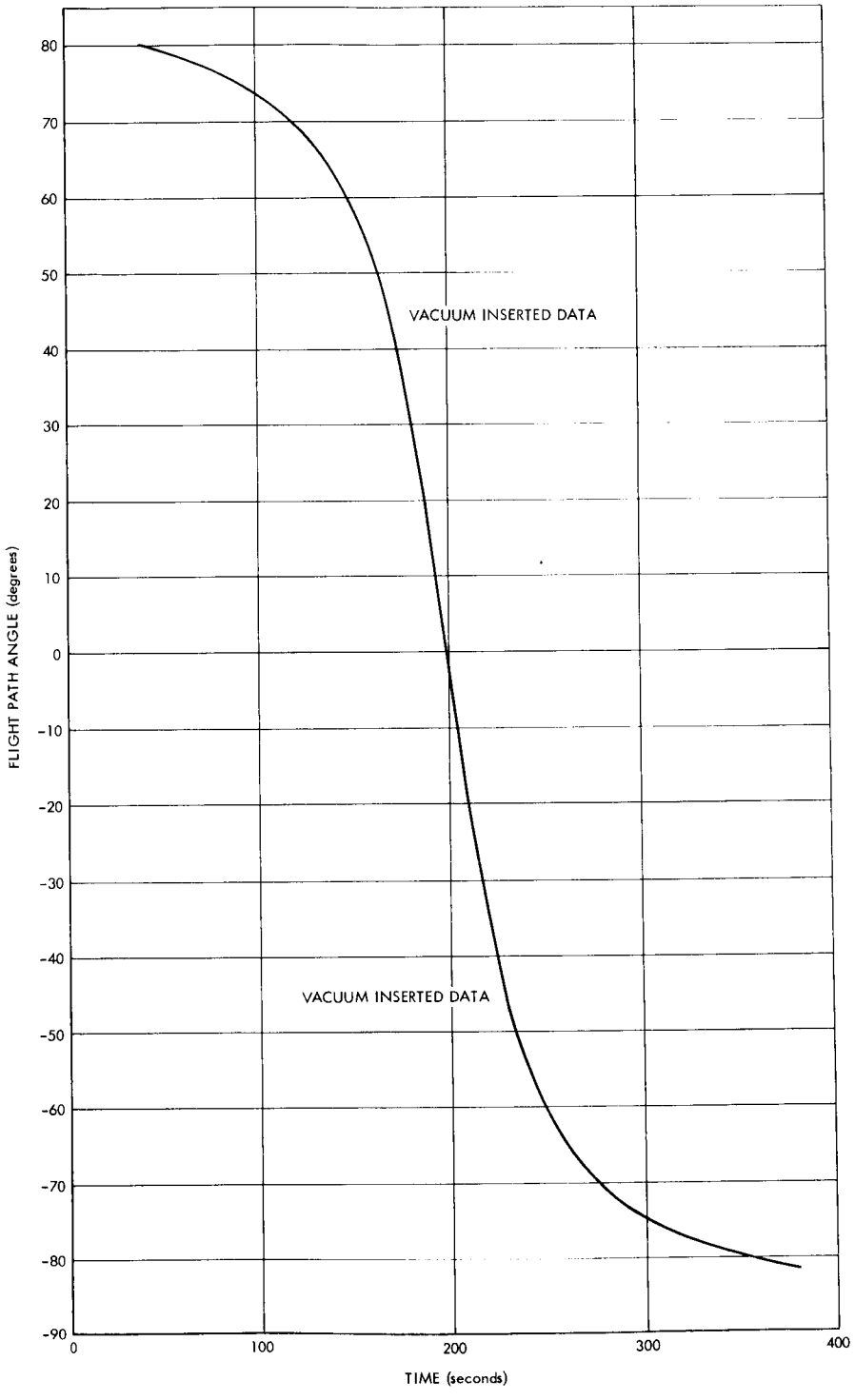

Figure 253. 14.185 UE Radar Plot, Flight Path Angle vs Time

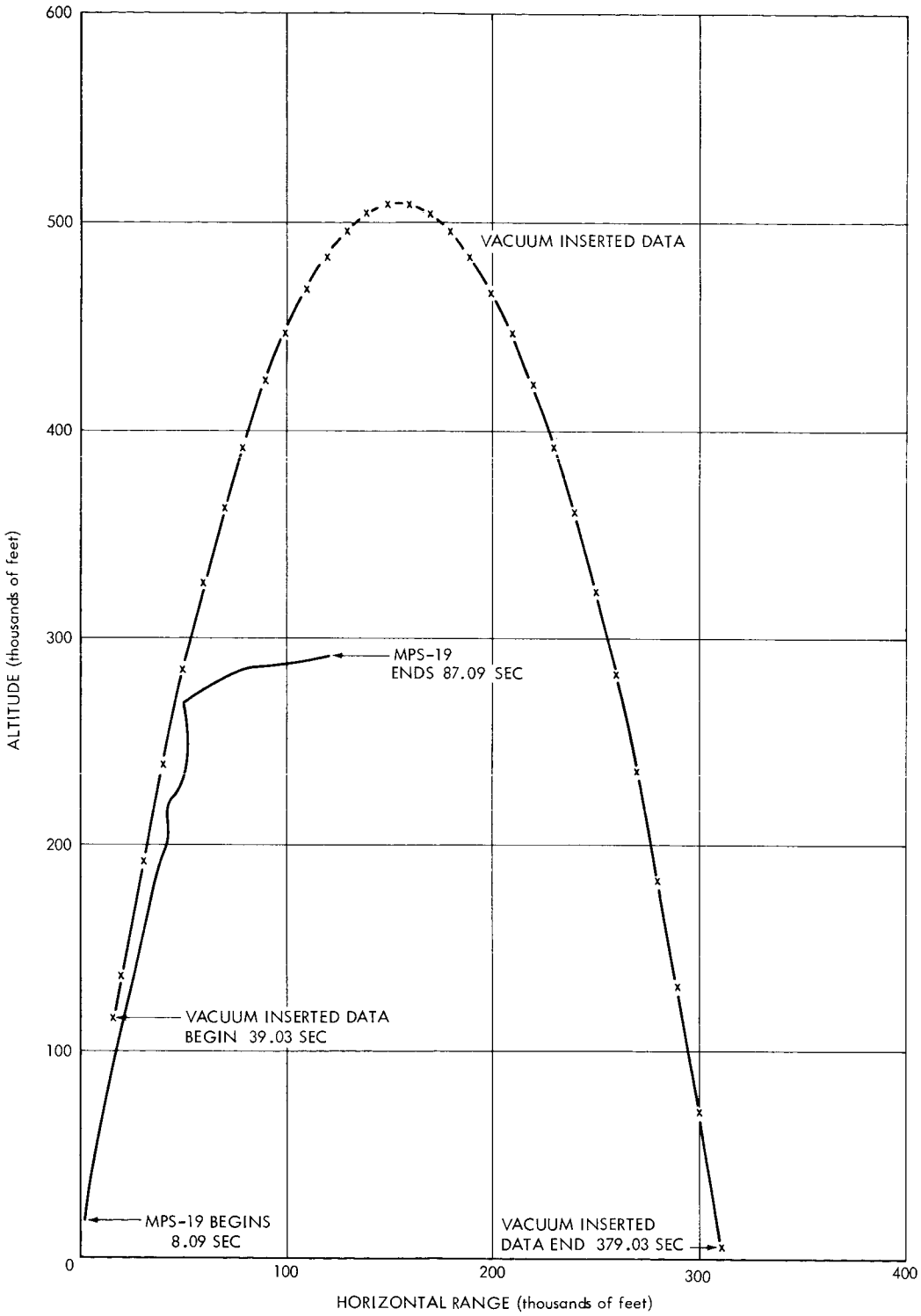

Figure 254. 14.185 UE Radar Plot, Altitude vs Horizontal Range

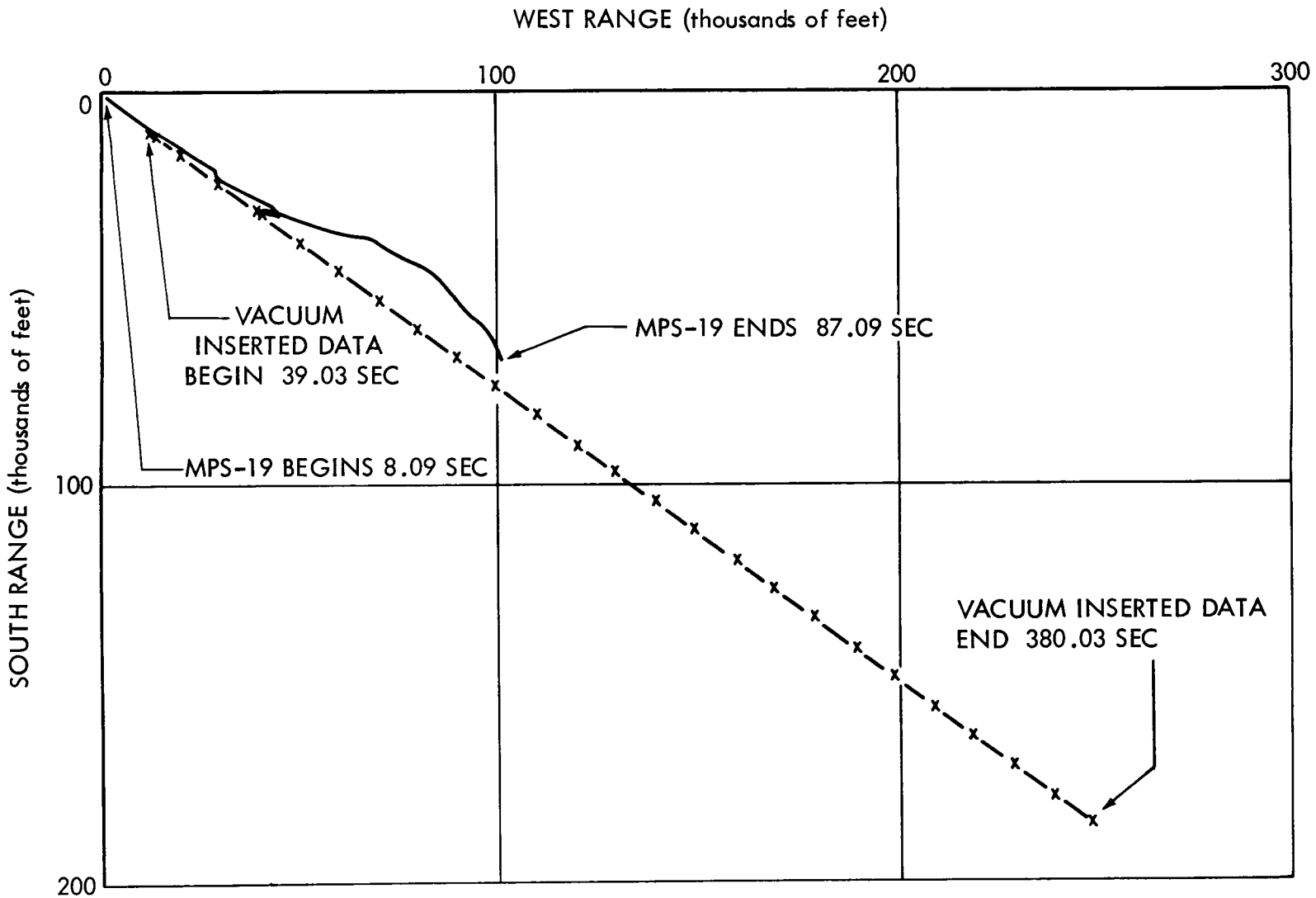

Figure 255. 14.185 UE Radar Plot, South Range vs West Range

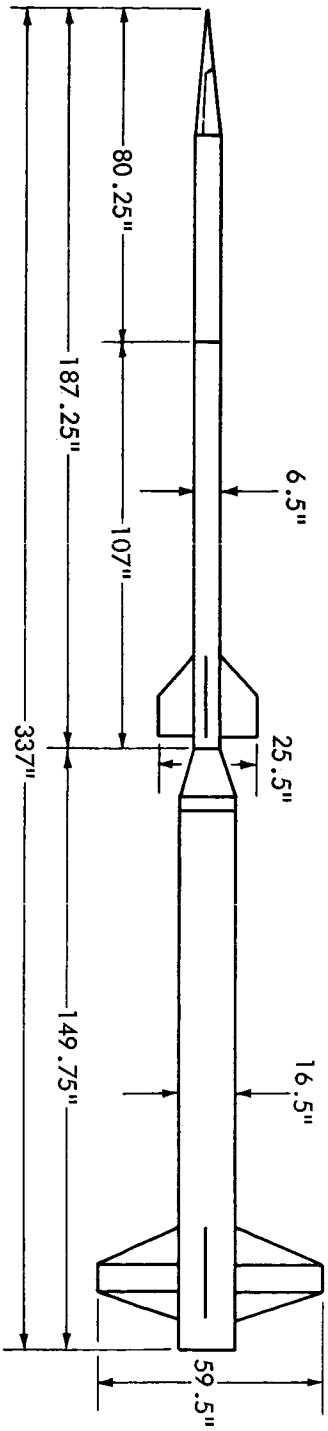

Figure 256. 14.186 UE Sketch

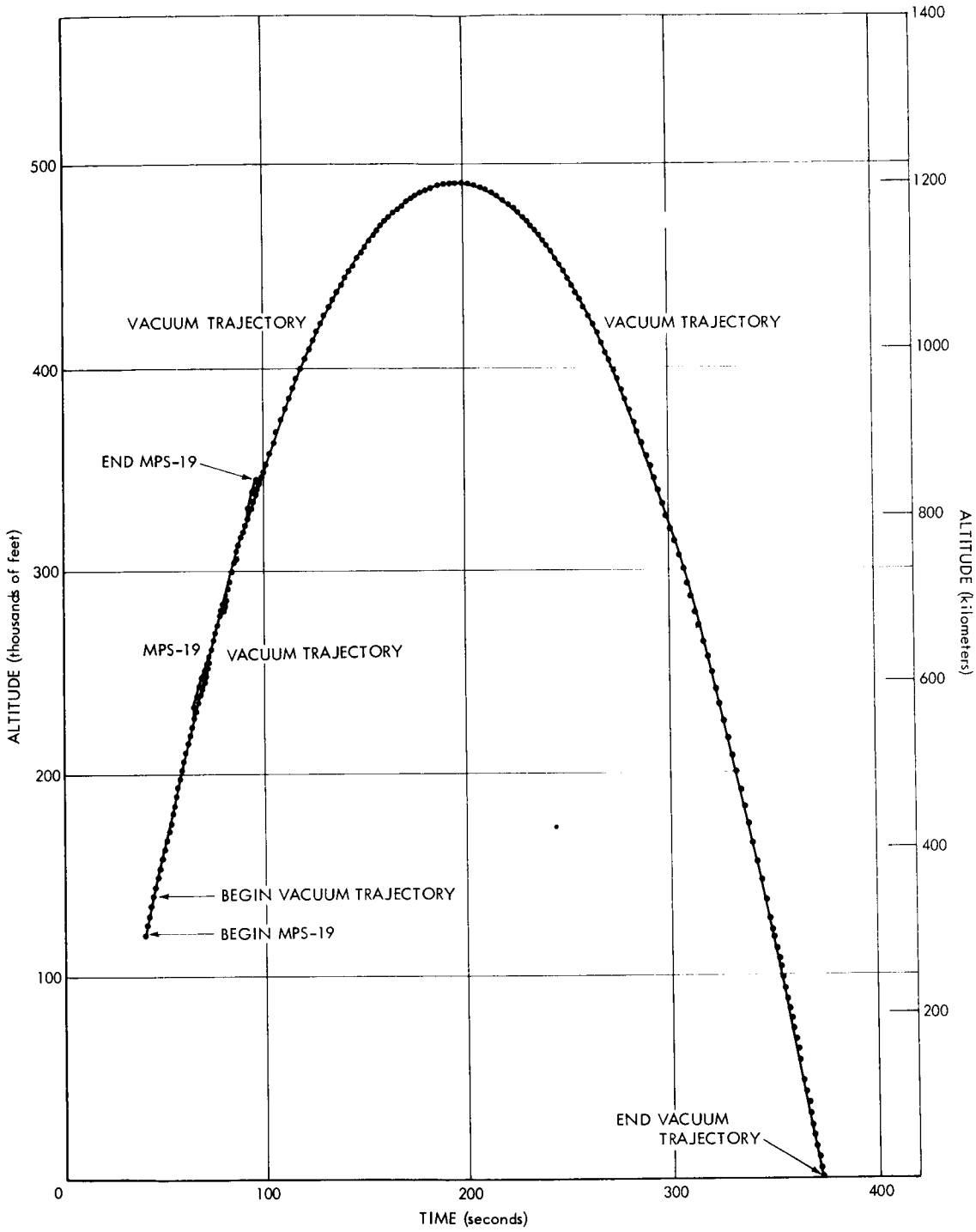

Figure 257. 14.186 UE Radar Plot, Altitude vs Time

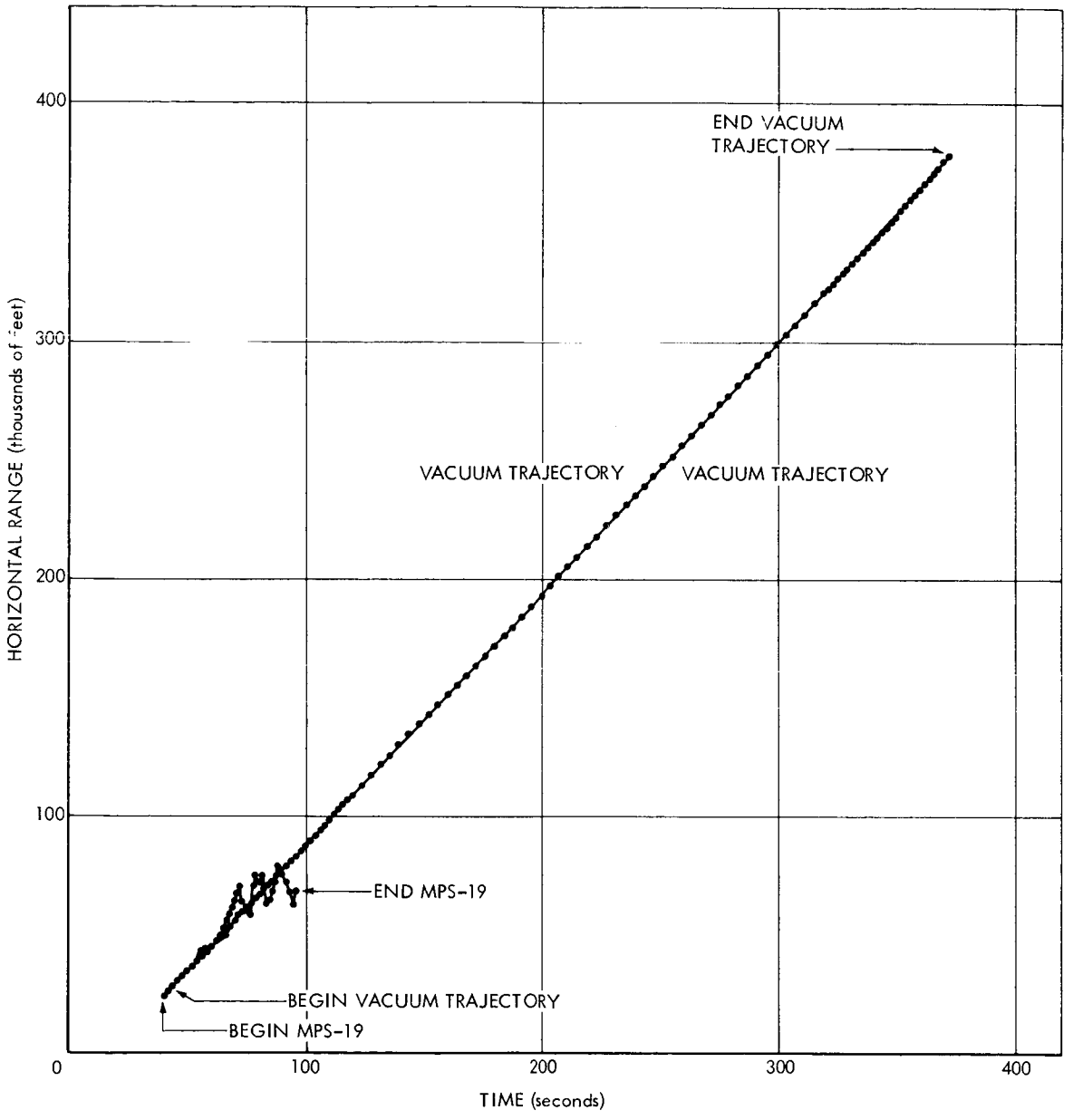

Figure 258. 14.186 UE Radar Plot, Horizontal Range vs Time

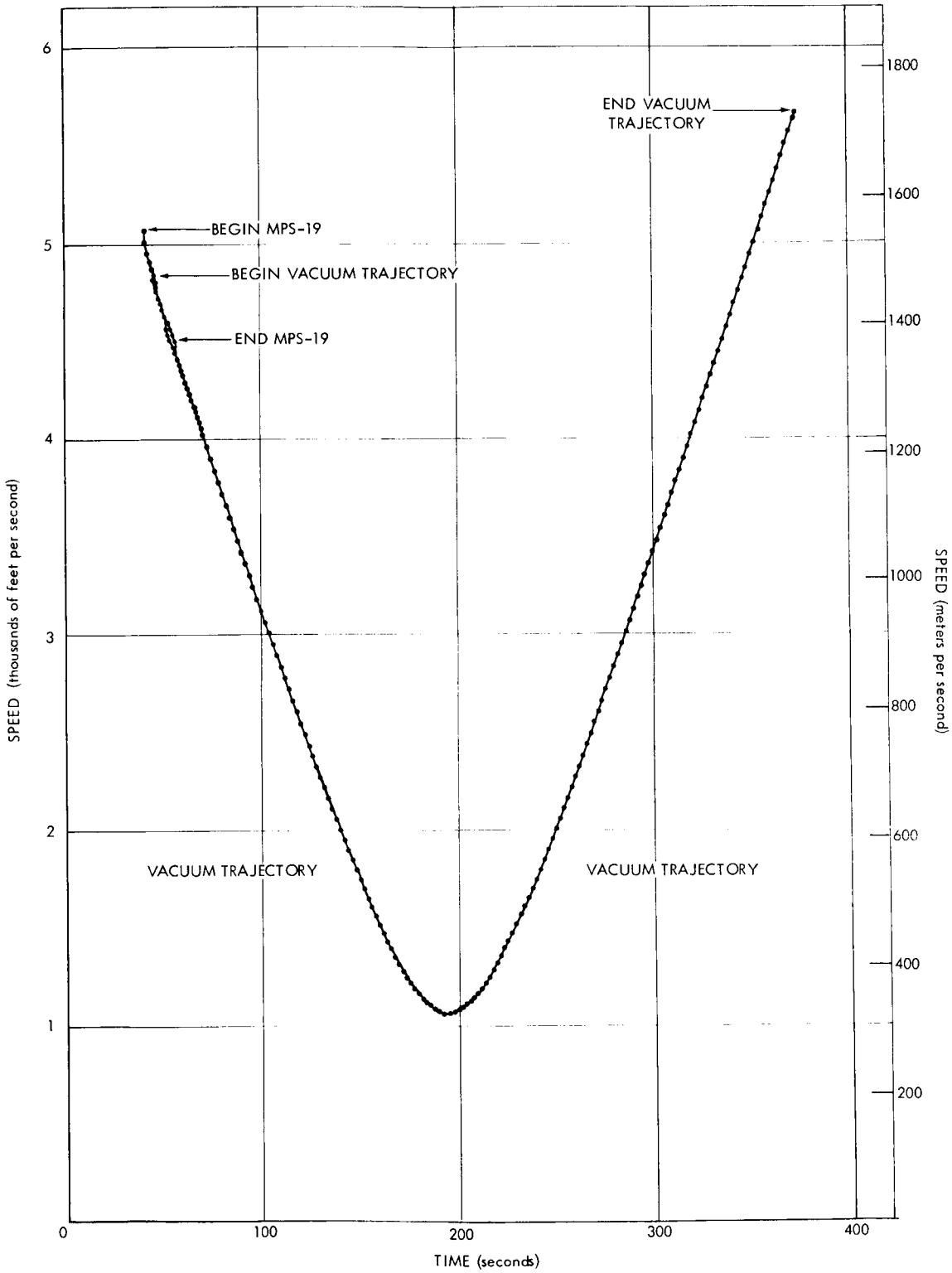

Figure 259. 14.186 UE Radar Plot, Speed vs Time

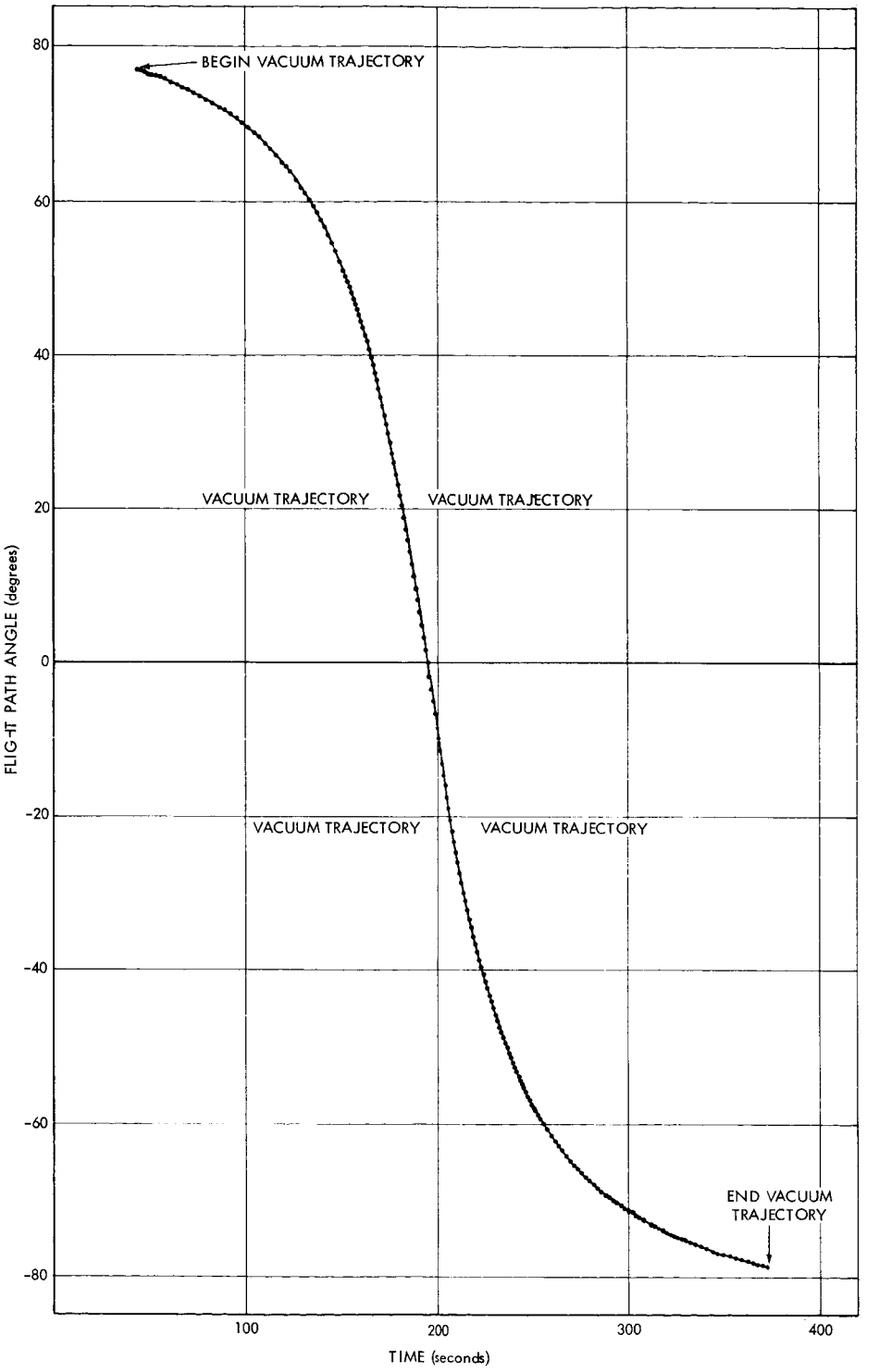

Figure 260. 14.186 UE Radar Plot, Flight Path Angle vs Time

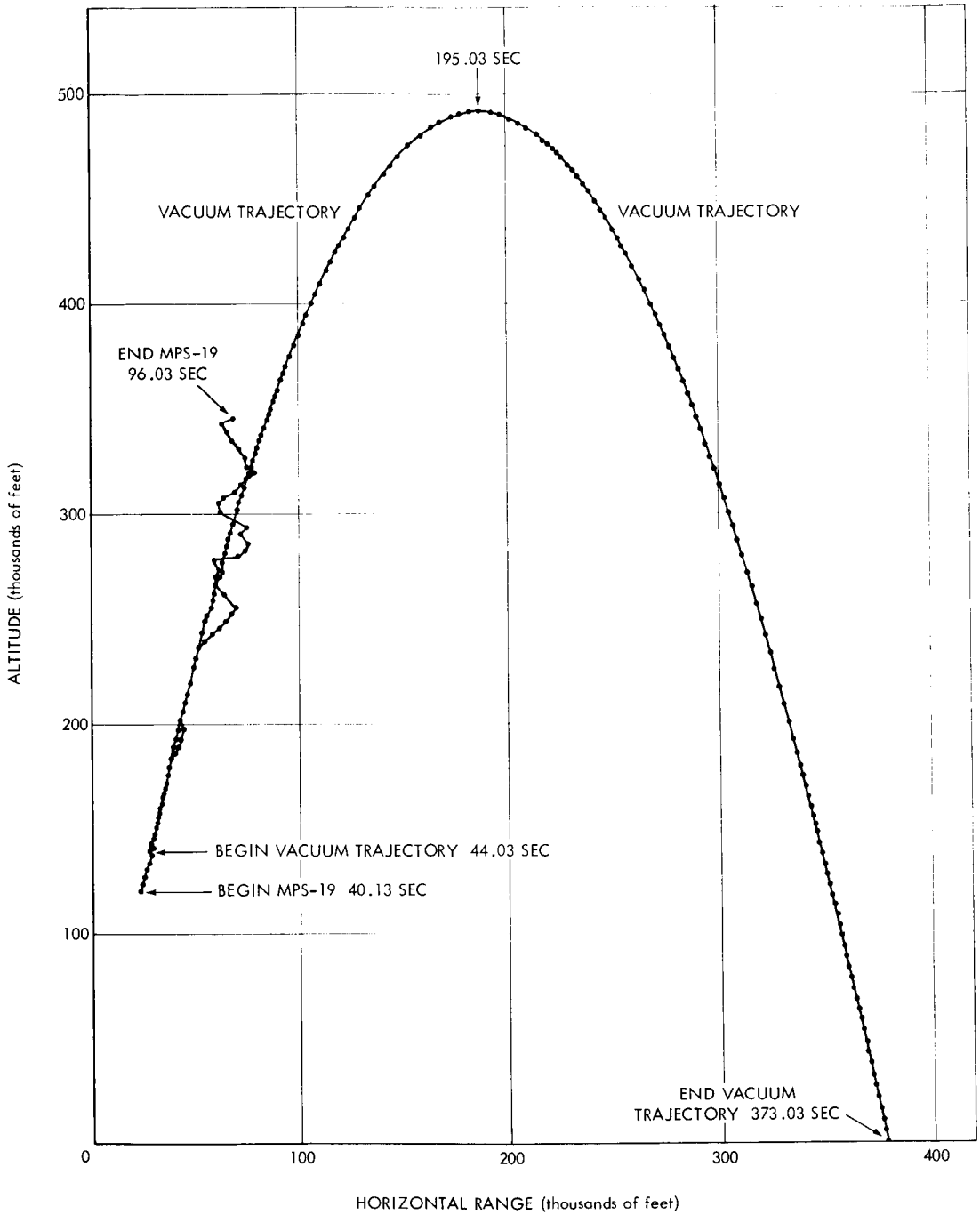

Figure 261. 14.186 UE Radar Plot, Altitude vs Horizontal Range

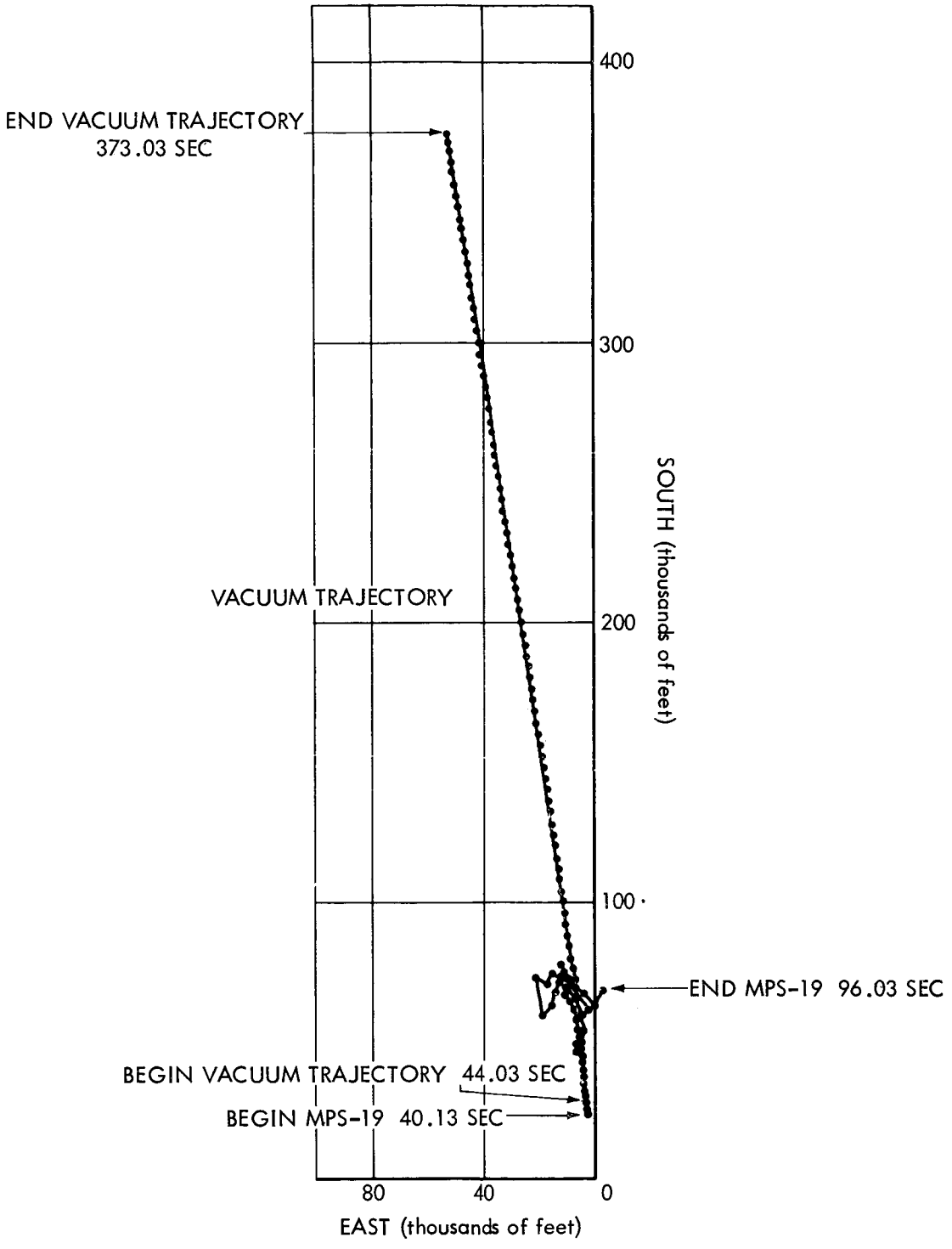

Figure 262. 14.186 UE Radar Plot, South Range vs East Range

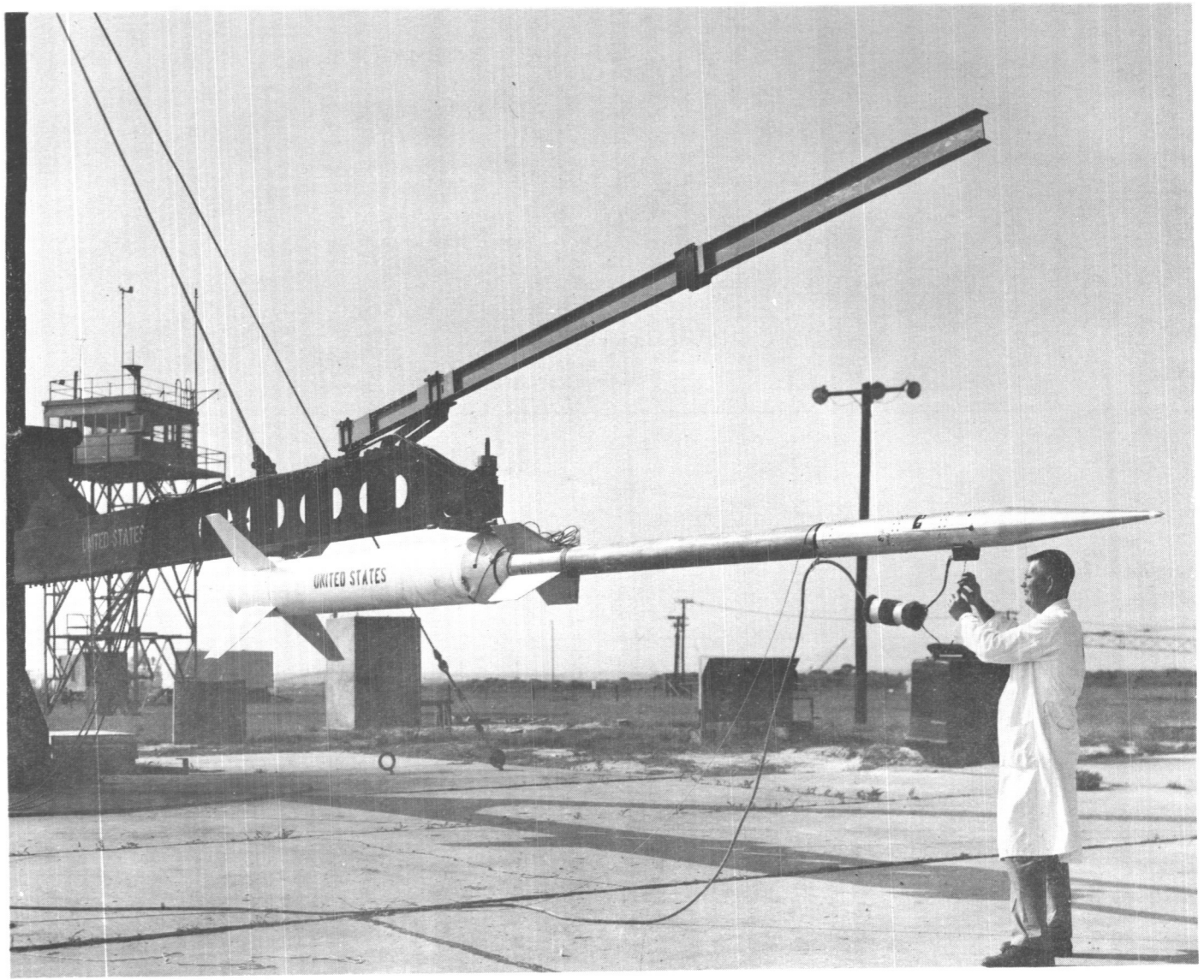

Figure 263. 14.201 CA Photograph

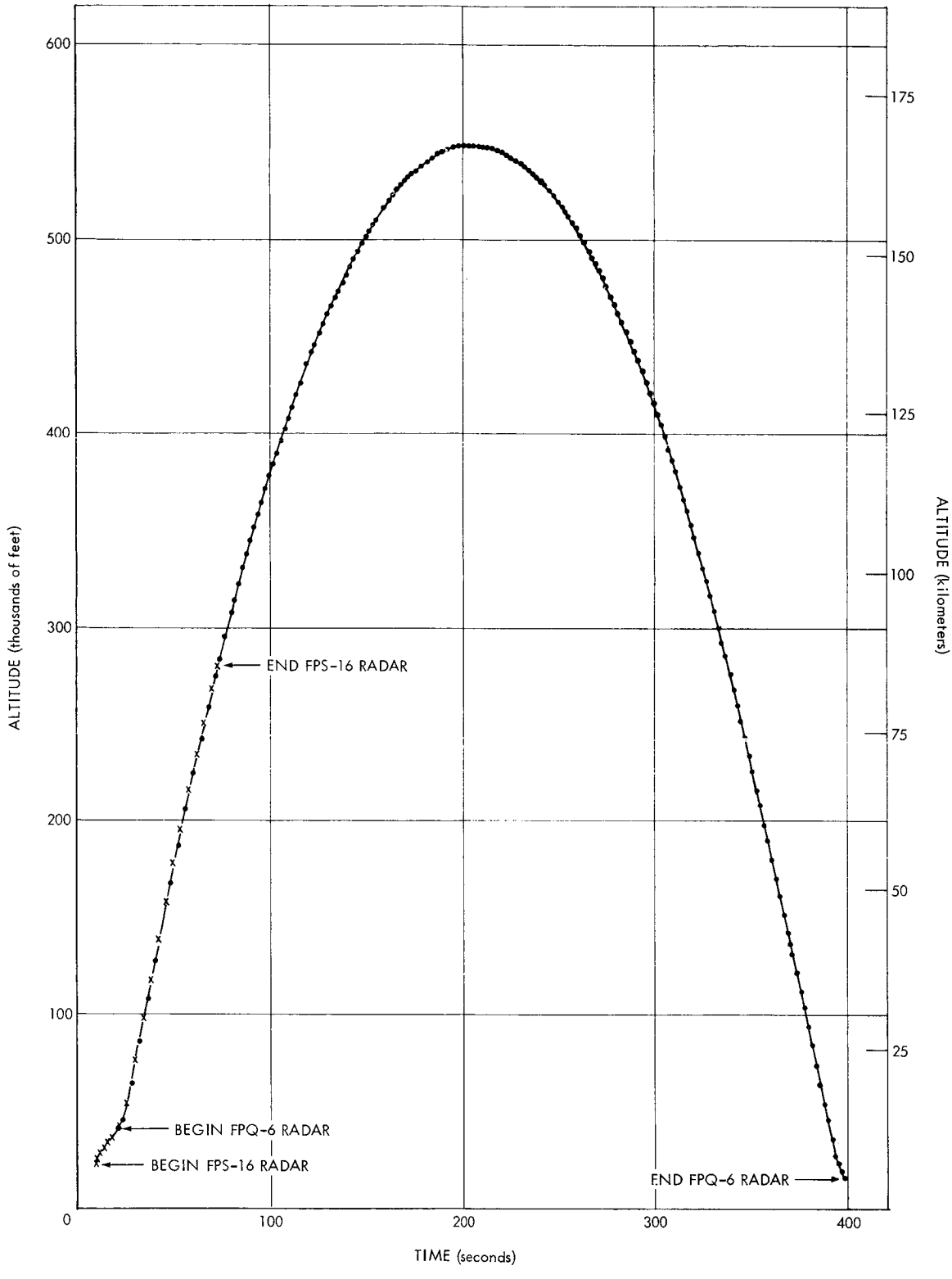

Figure 264. 14.201 CA Radar Plot, Altitude vs Time

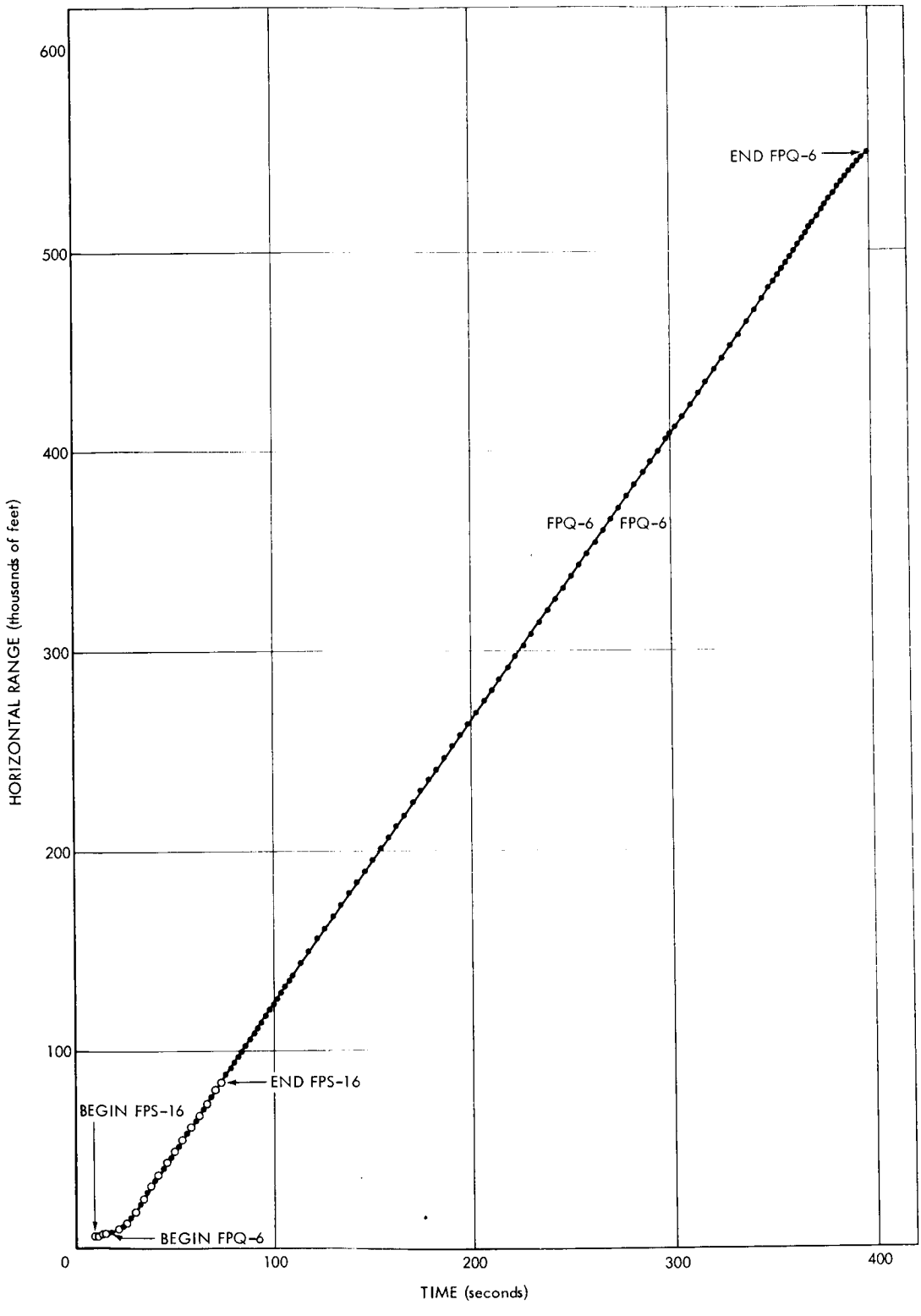

Figure 265. 14.201 CA Radar Plot, Horizontal Range vs Time

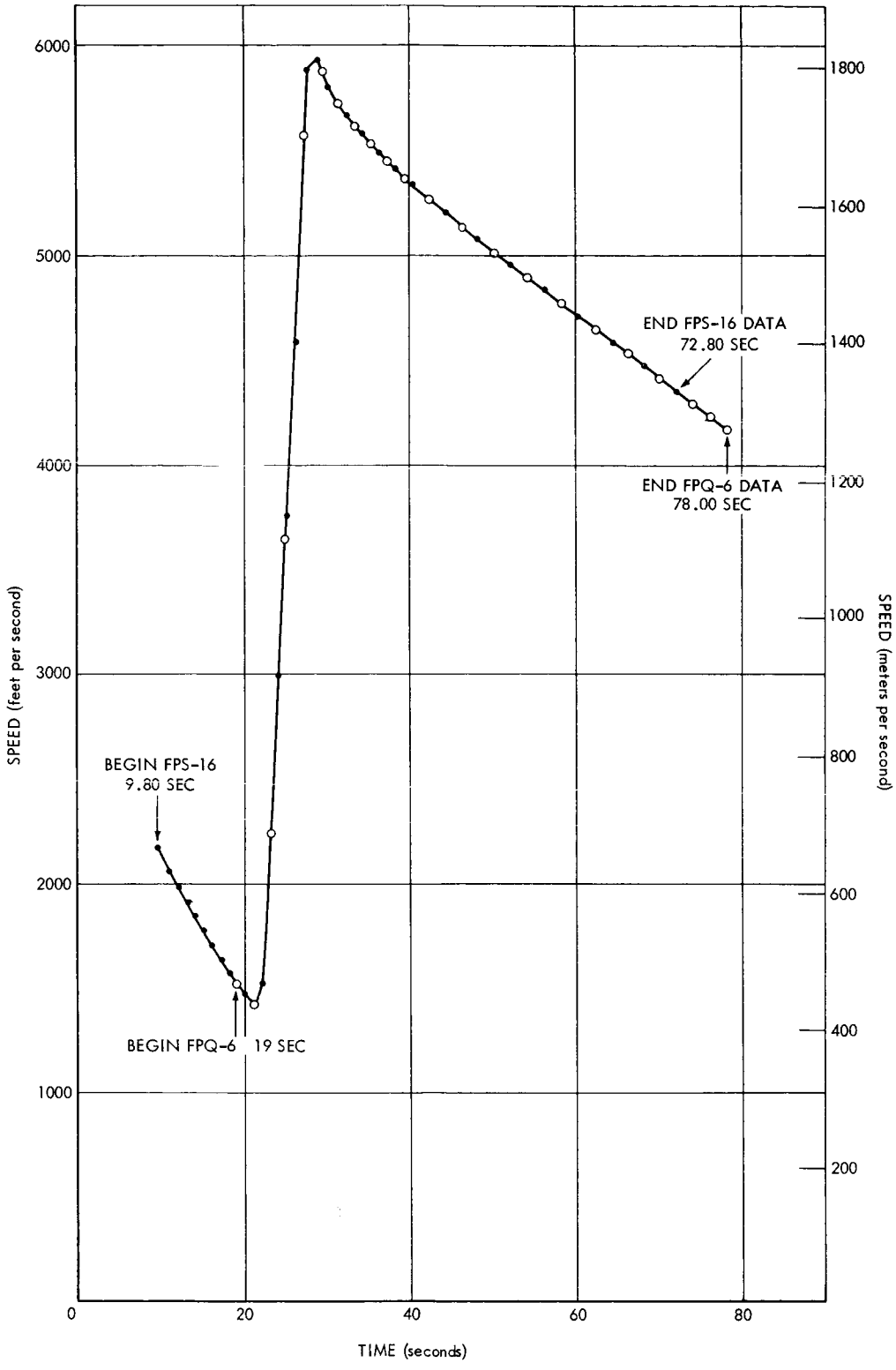

Figure 266. 14.201 CA Radar Plot, Speed vs Time

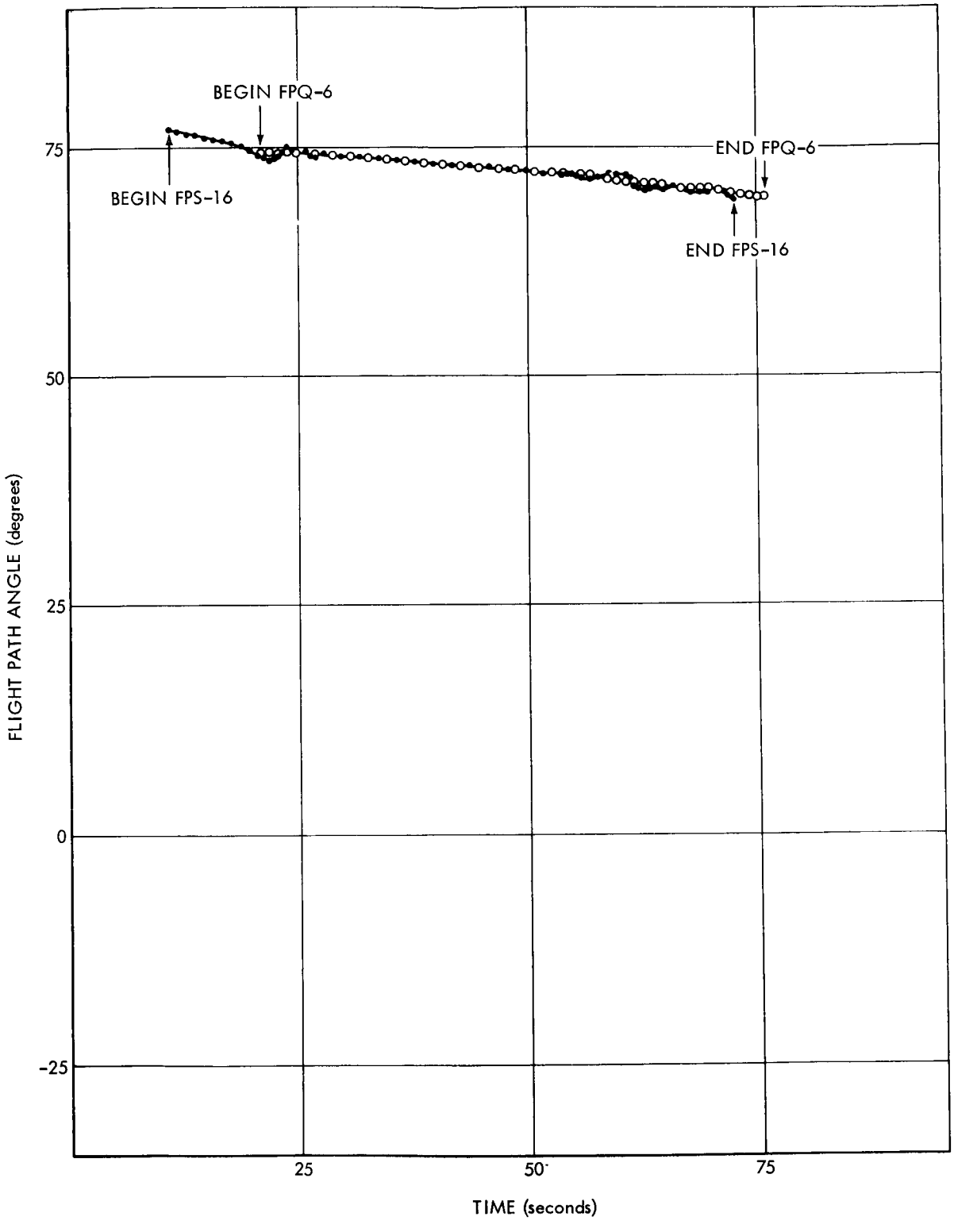

Figure 267. 14.201 CA Radar Plot, Flight Path Angle vs Time

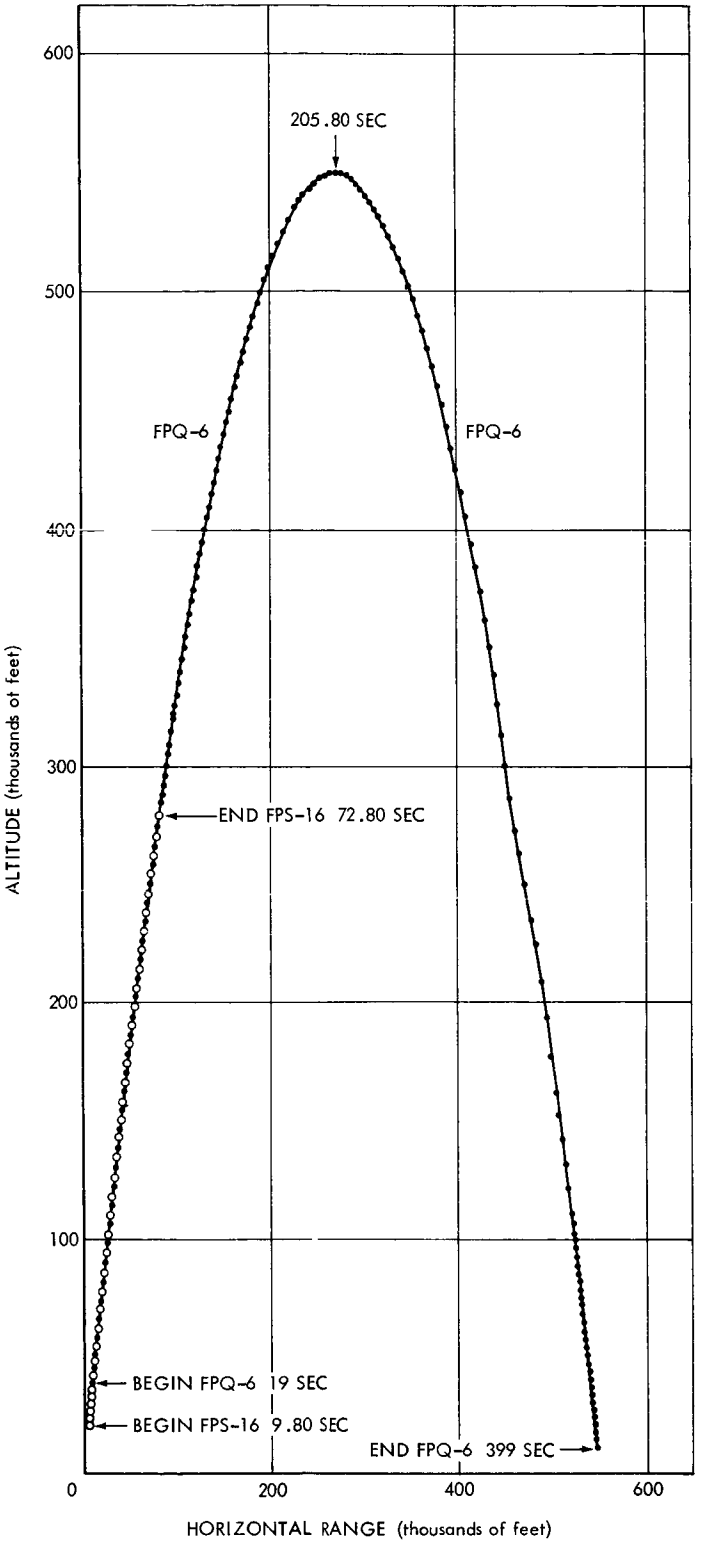

Figure 268. 14.201 CA Radar Plot, Altitude vs Horizontal Range

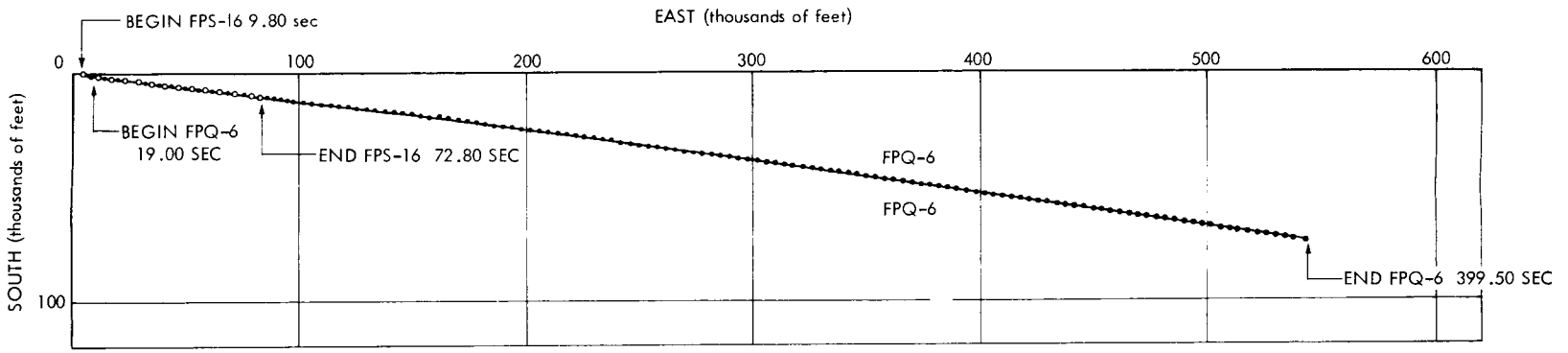

Figure 269. 14.201 CA Radar Plot, South Range vs East Range

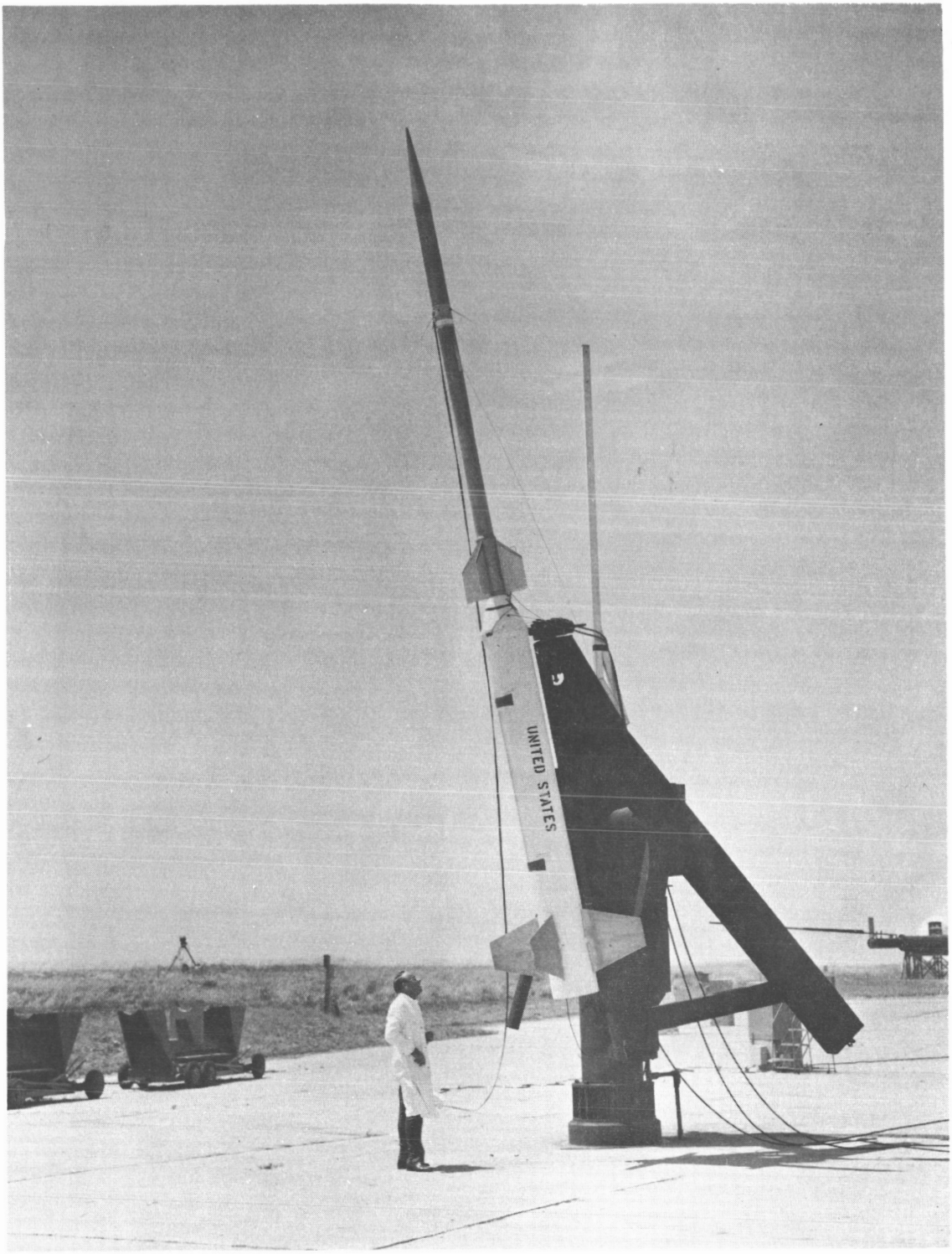

Figure 270. 14.215 AI Photograph

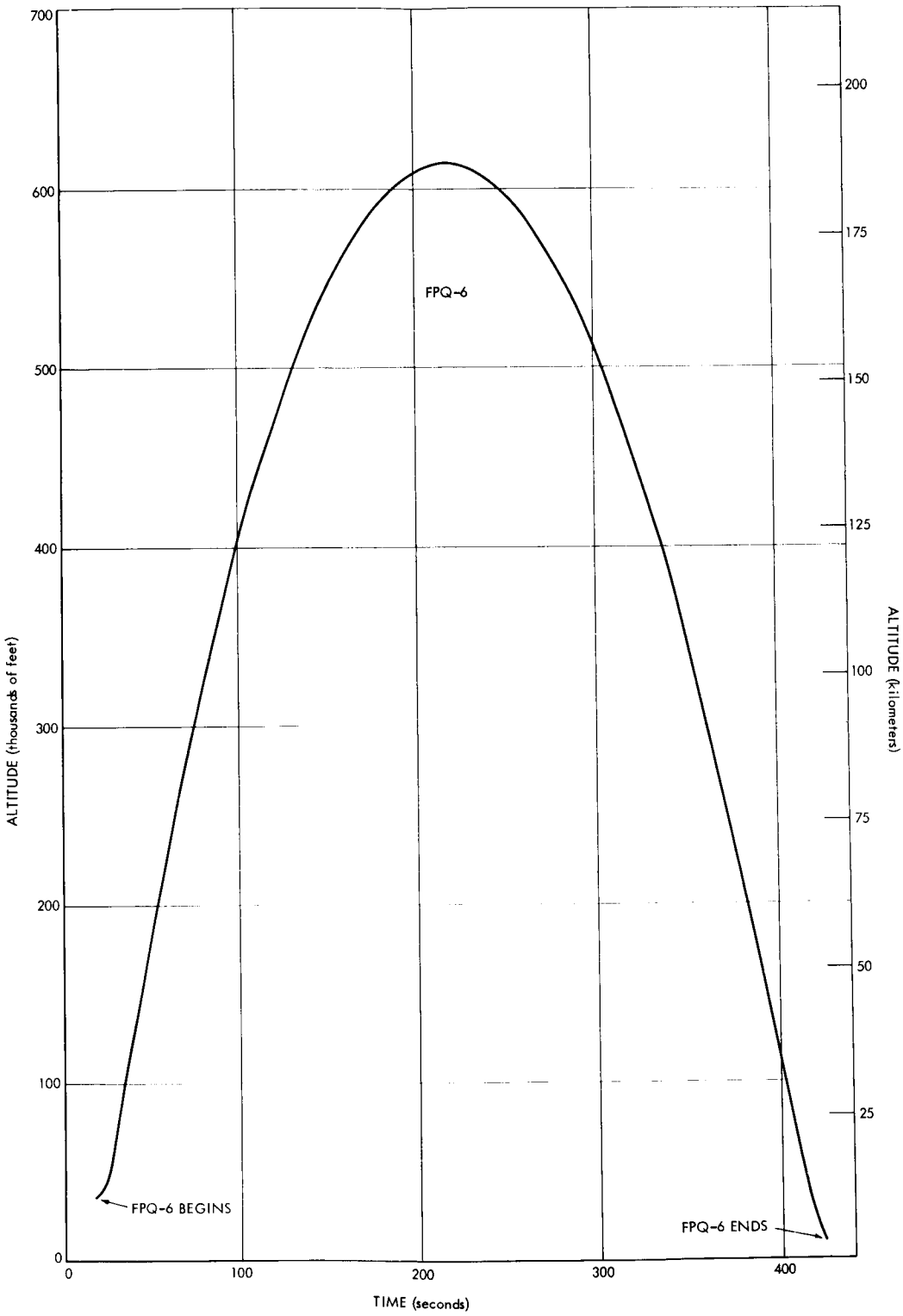

Figure 271. 14.215 AI Radar Plot, Altitude vs Time

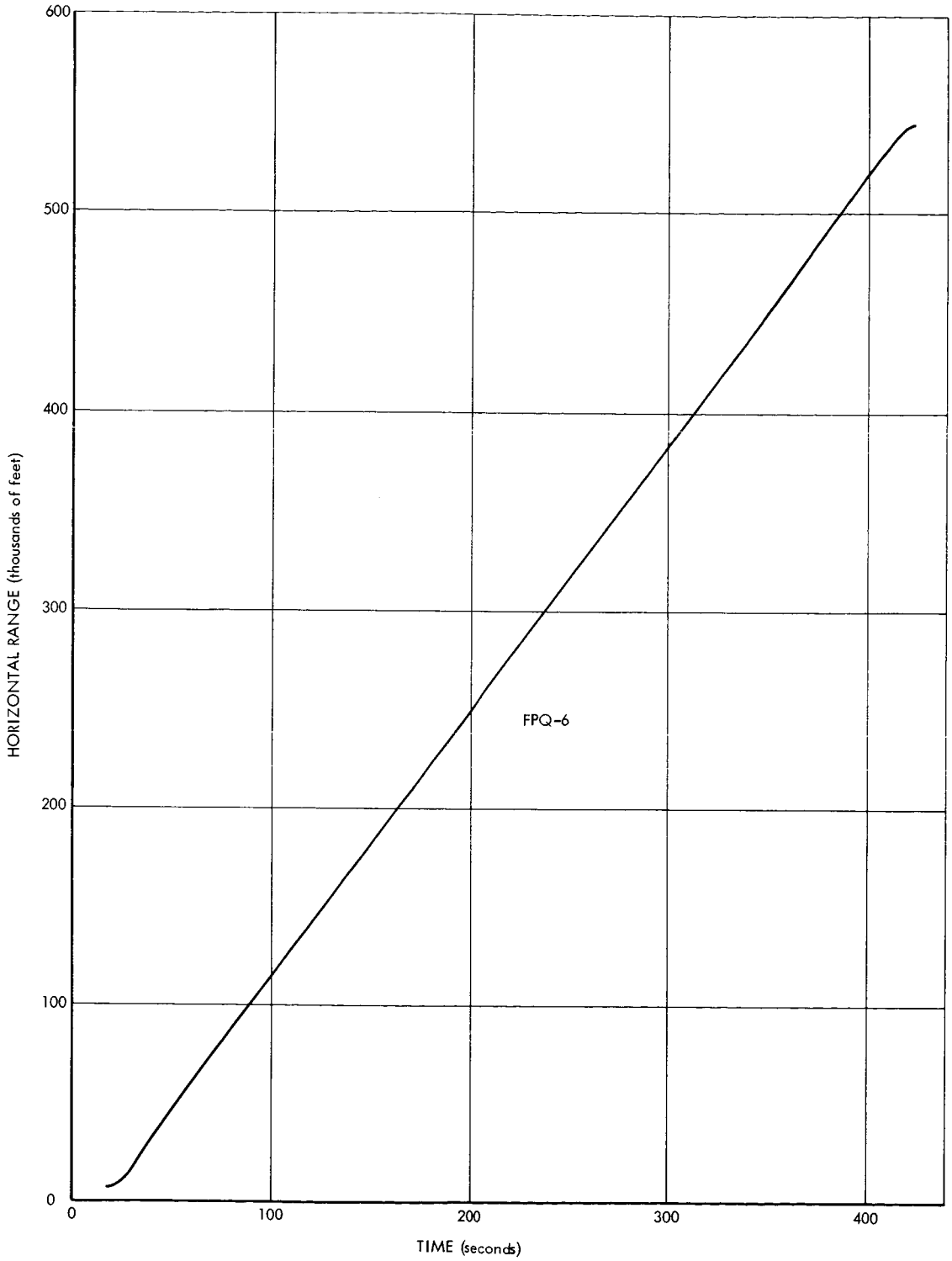

Figure 272. 14.215 AI Radar Plot, Horizontal Range vs Time

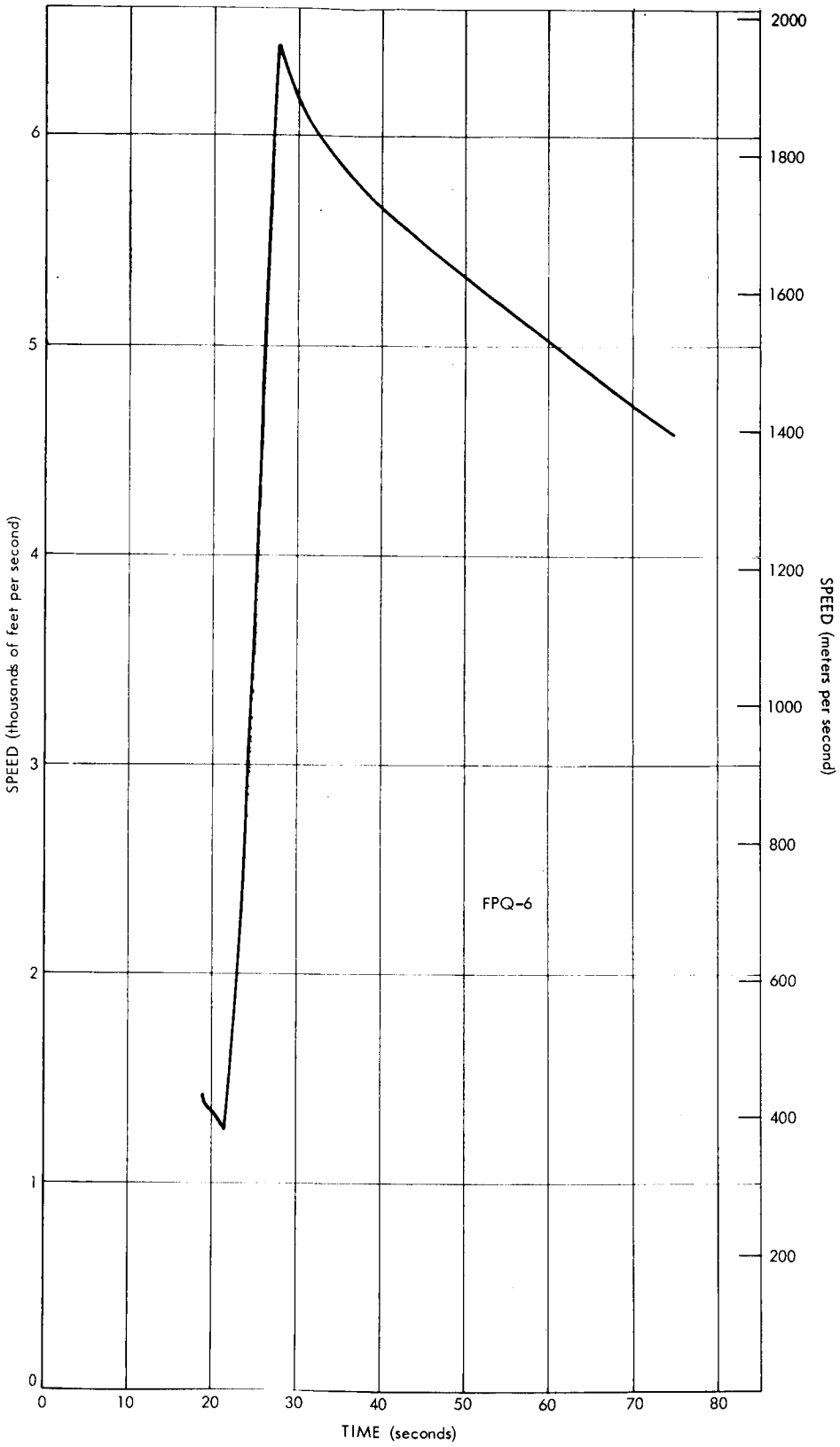

Figure 273. 14.215 AI Radar Plot, Speed vs Time

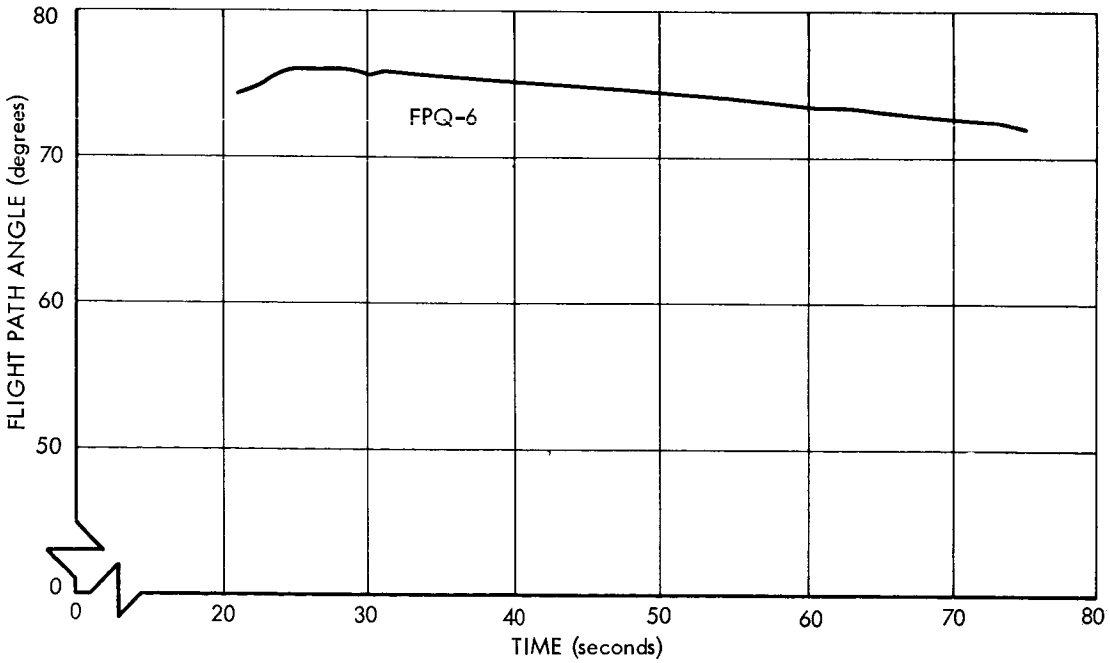

Figure 274. 14.215 AI Radar Plot, Flight Path Angle vs Time

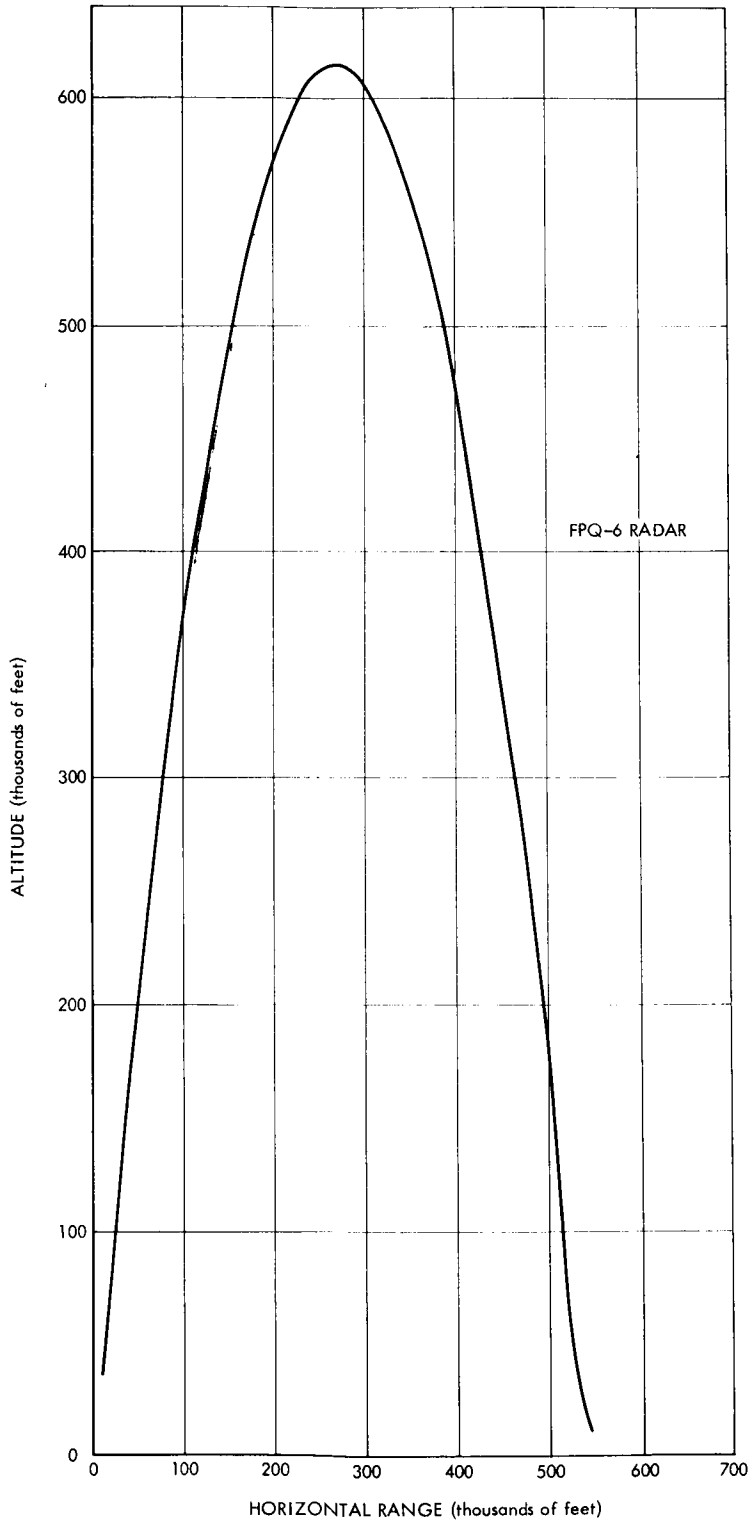

Figure 275. 14.215 Al Radar Plot, Altitude vs Horizontal Range

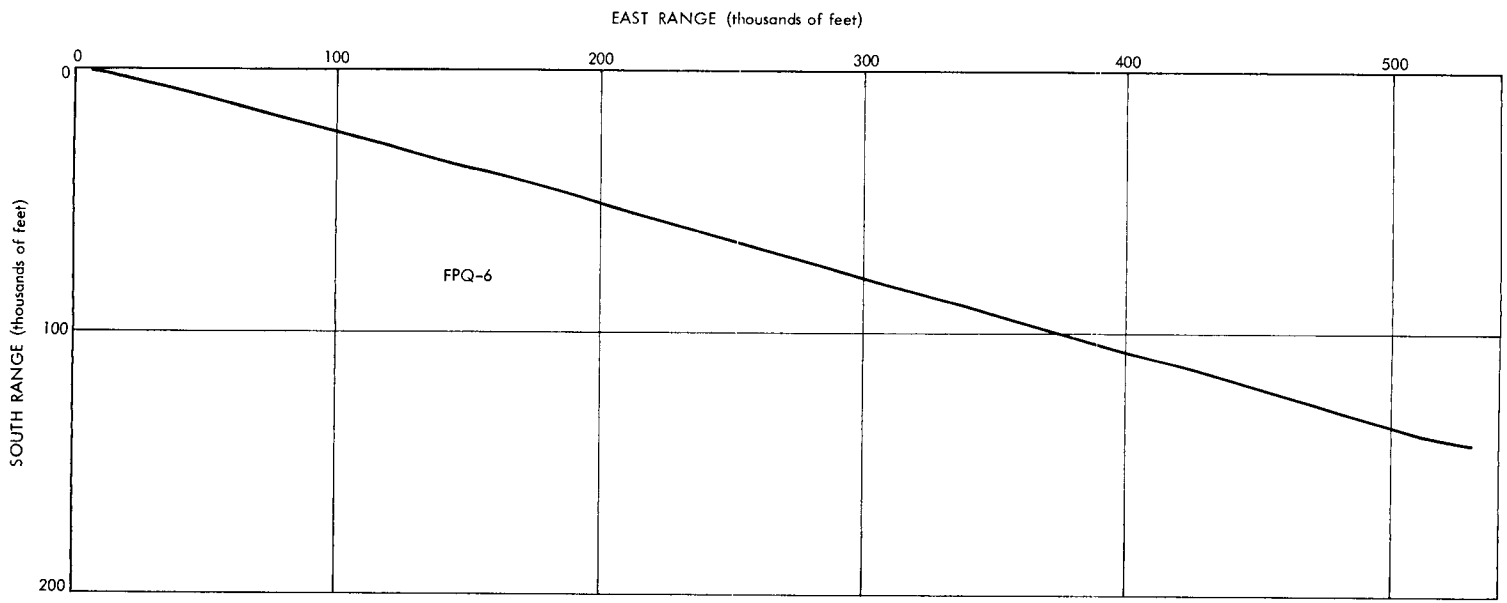

Figure 276. 14.215 AI Radar Plot, South Range vs East Range

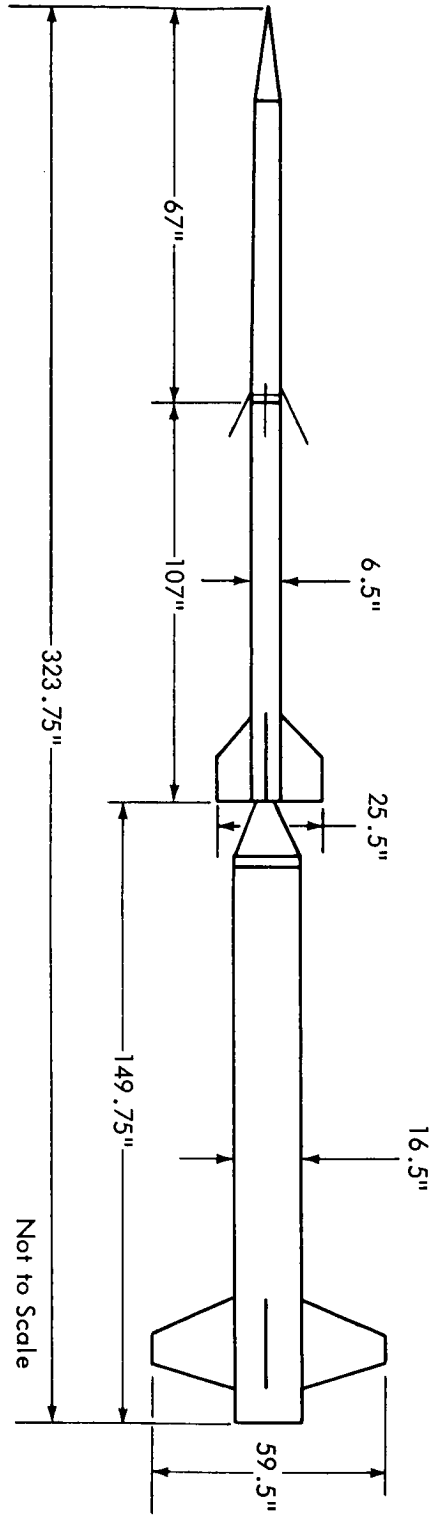

Figure 277. 14.228 UI Sketch

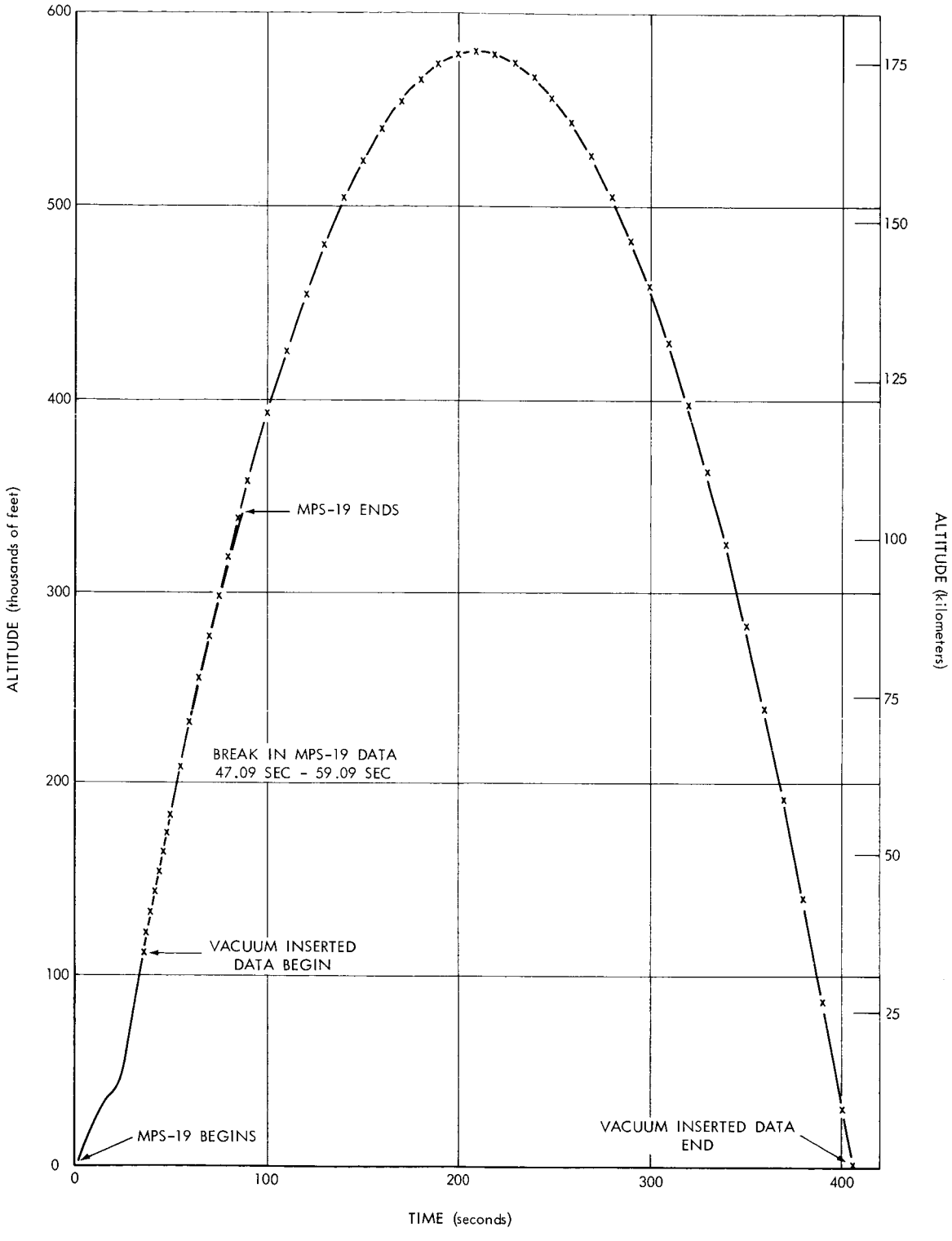

Figure 278. 14.228 UI Radar Plot, Altitude vs Time

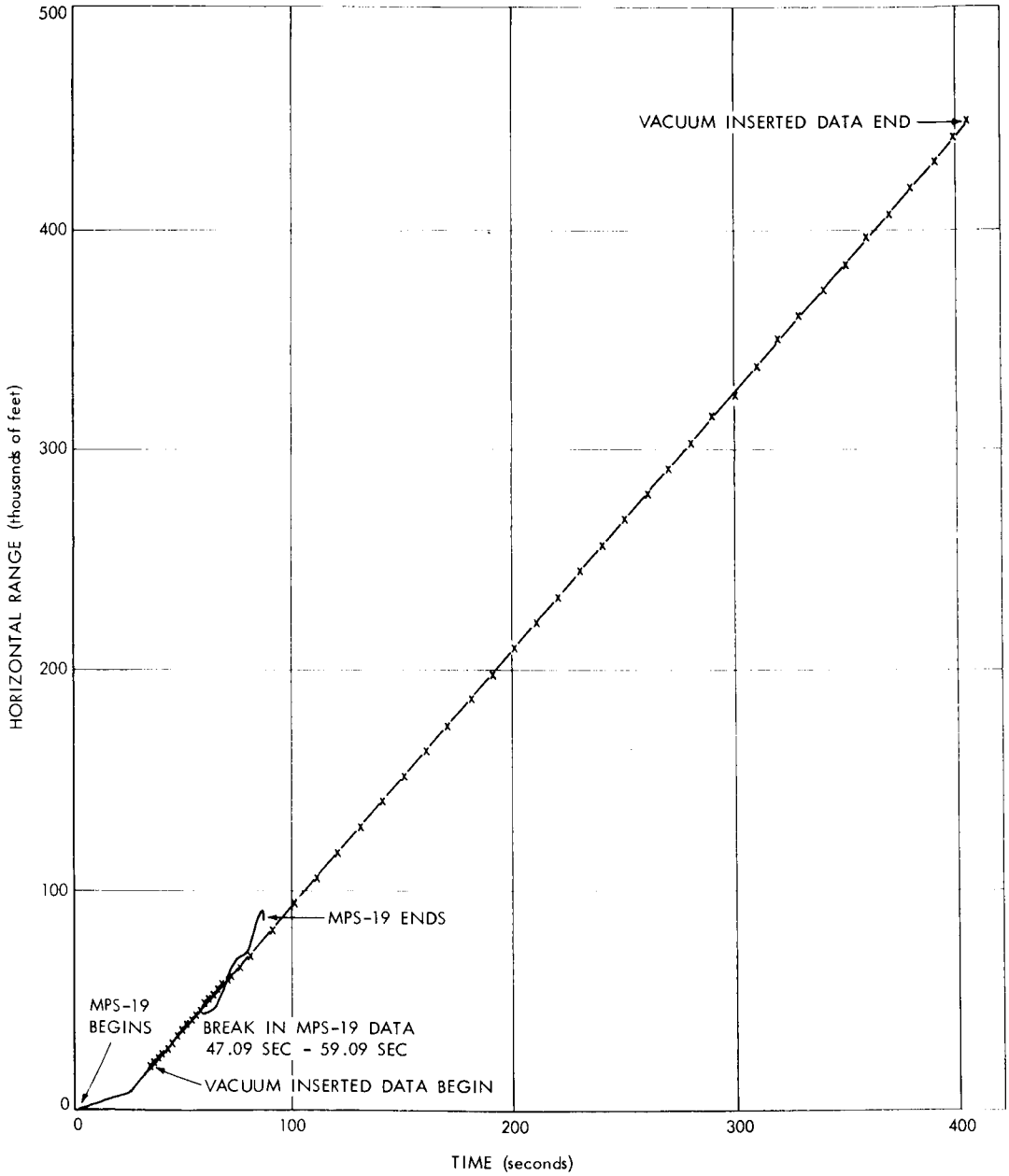

Figure 279. 14.228 UI Radar Plot, Horizontal Range vs Time

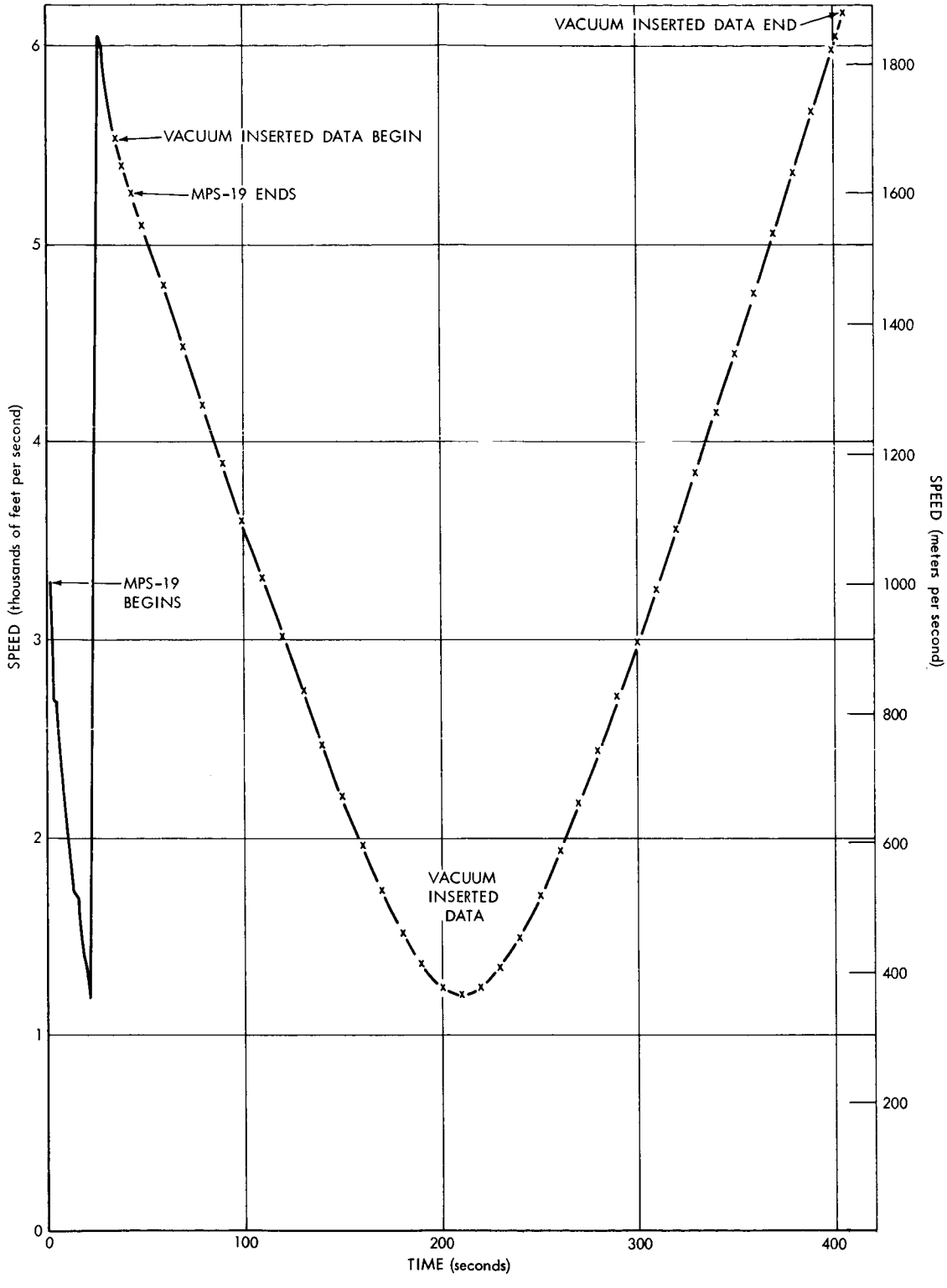

Figure 280. 14.228 UI Radar Plot, Speed vs Time

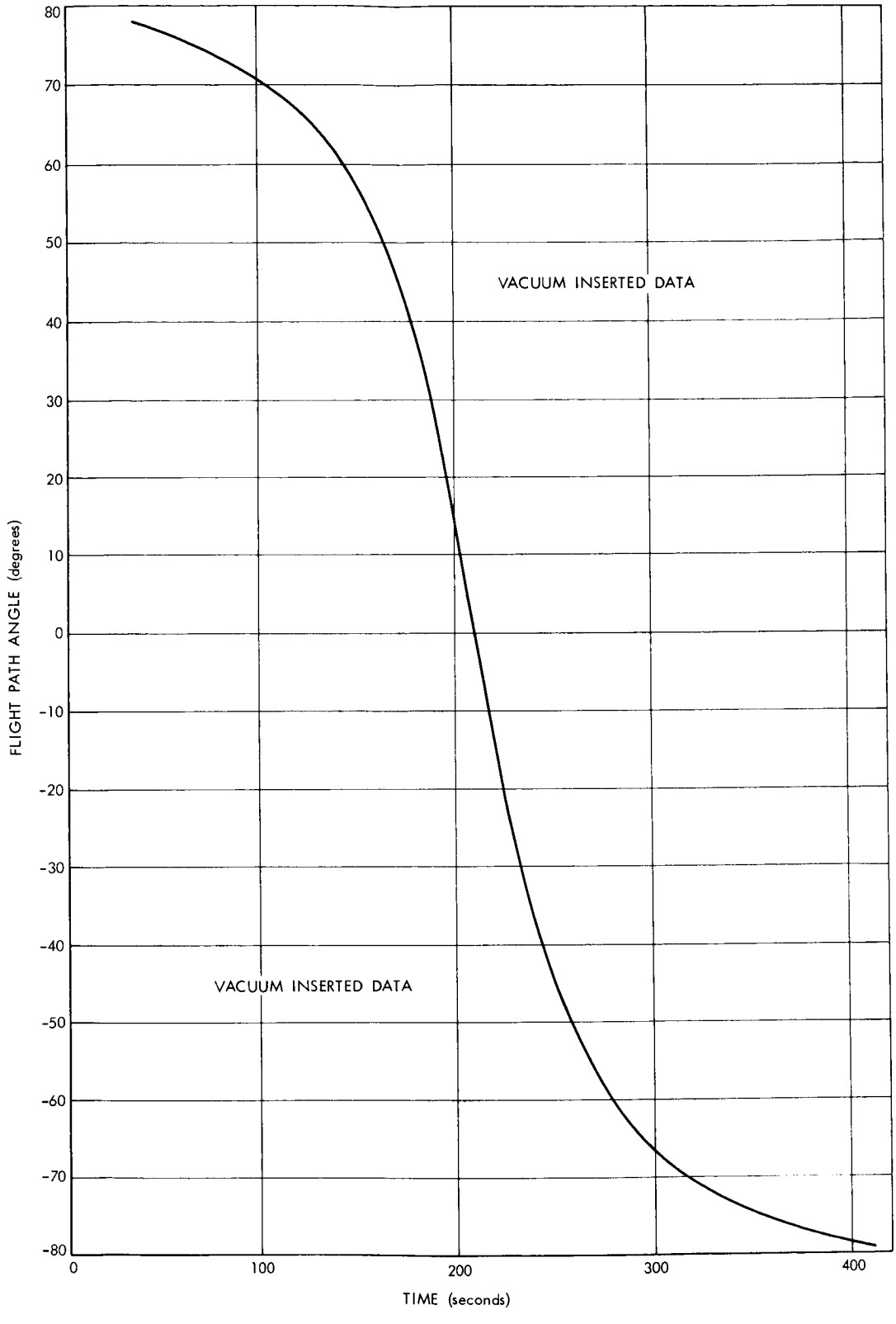

Figure 281. 14.228 UI Radar Plot, Flight Path Angle vs Time

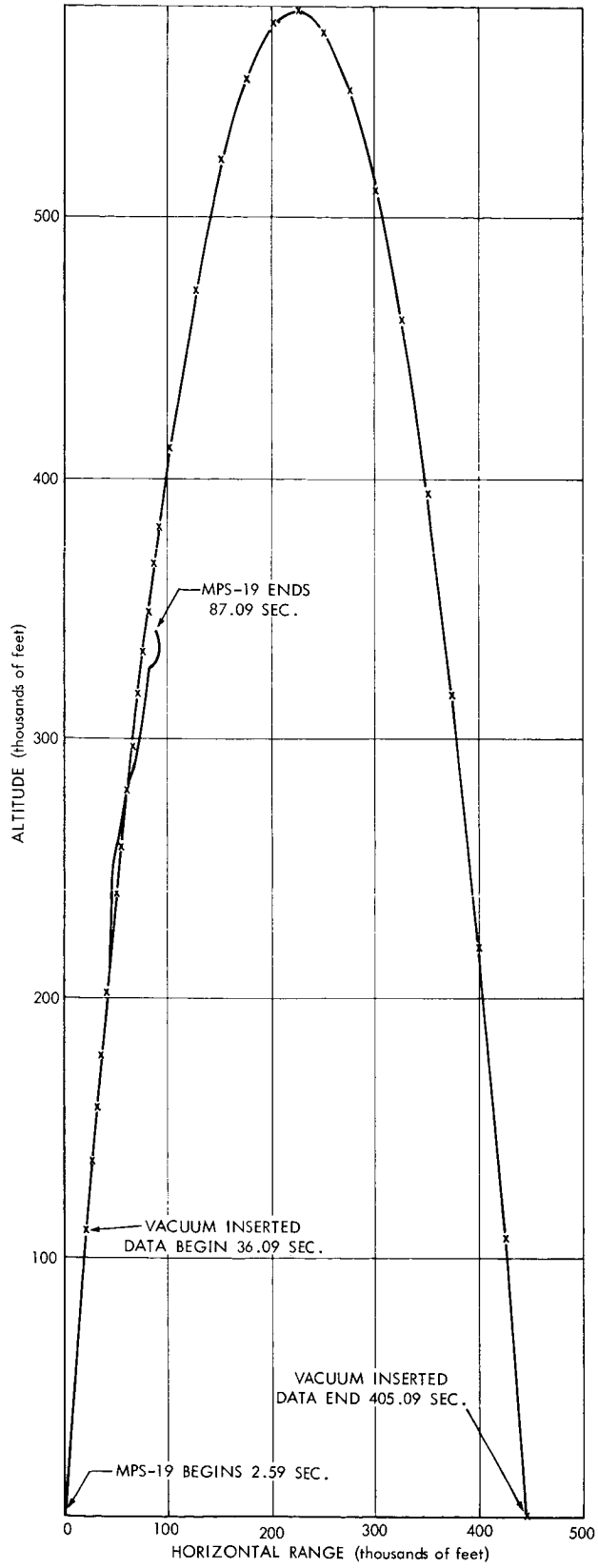

Figure 282. 14.228 UI Radar Plot, Altitude vs Horizontal Range

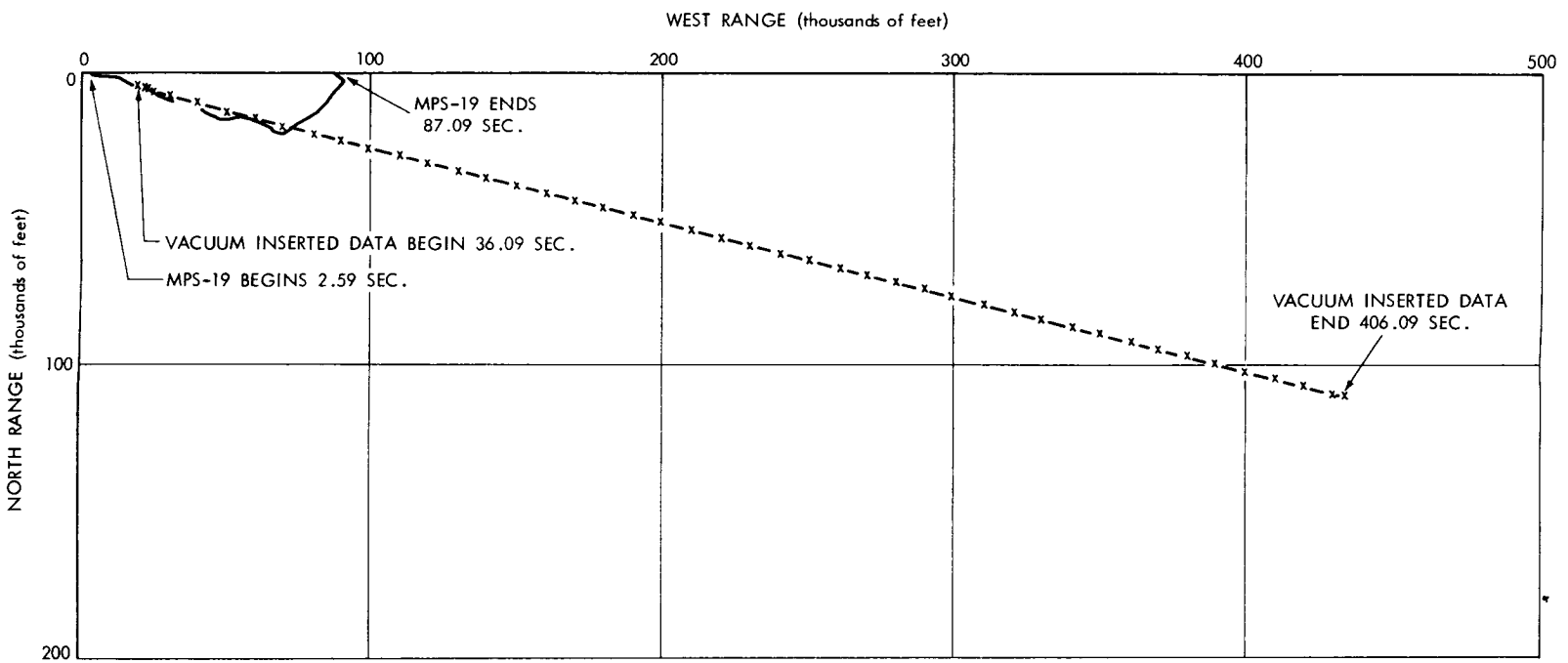

Figure 283. 14.228 UI Radar Plot, North Range vs West Range

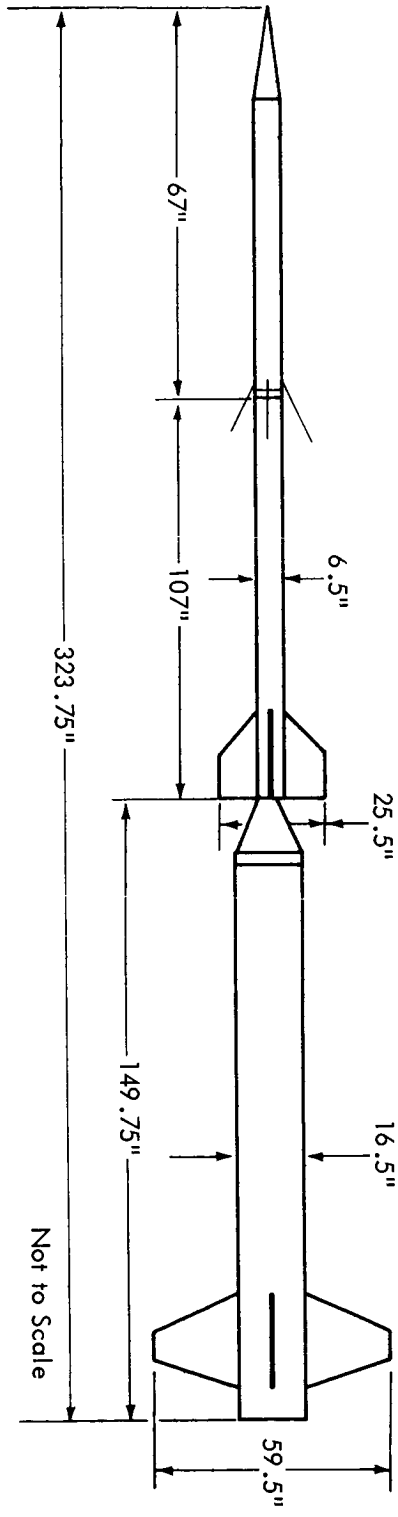

Figure 284. 14.229 UI Sketch

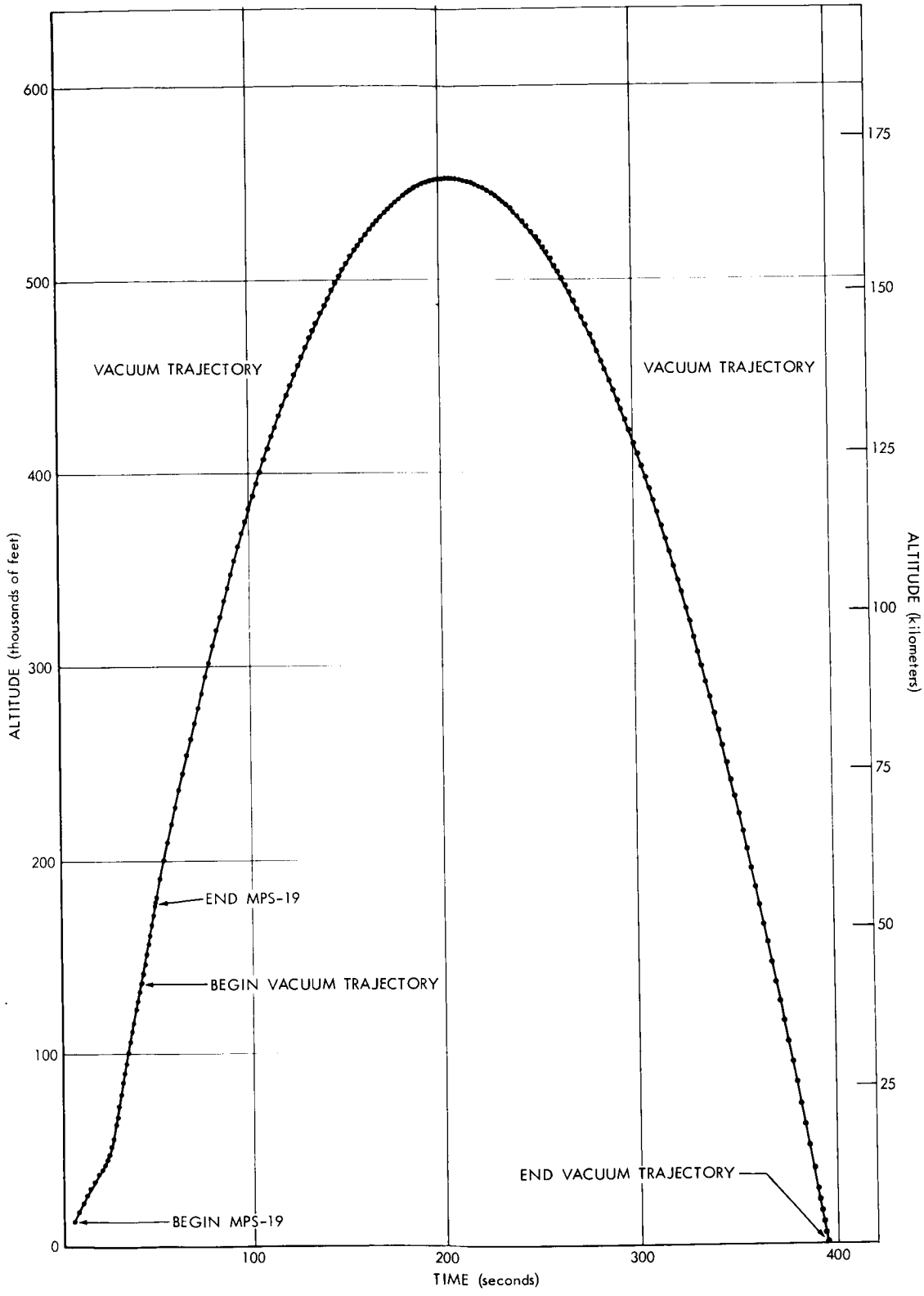

Figure 285. 14.229 UI Radar Plot, Altitude vs Time

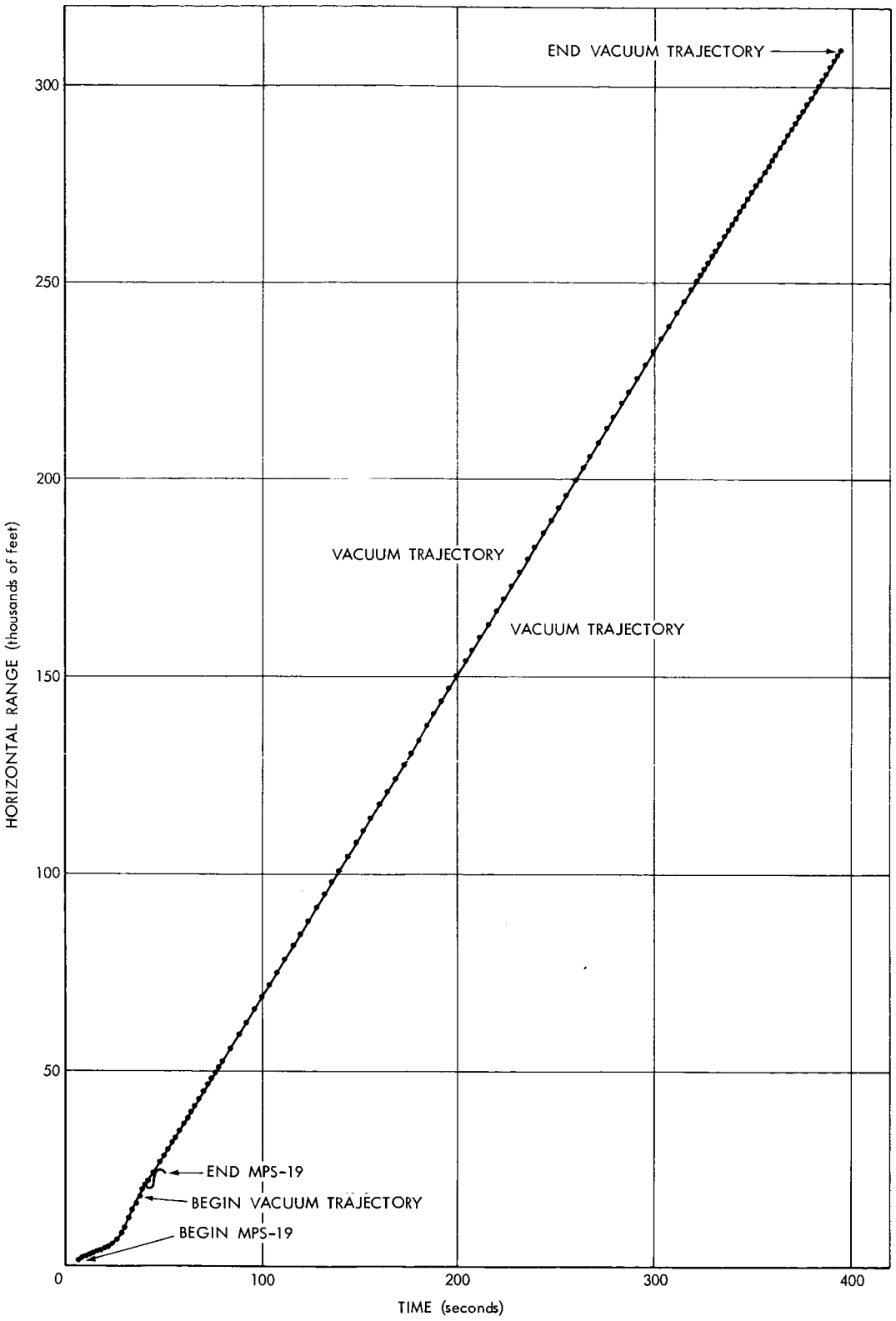

Figure 286. 14.229 UI Radar Plot, Horizontal Range vs Time

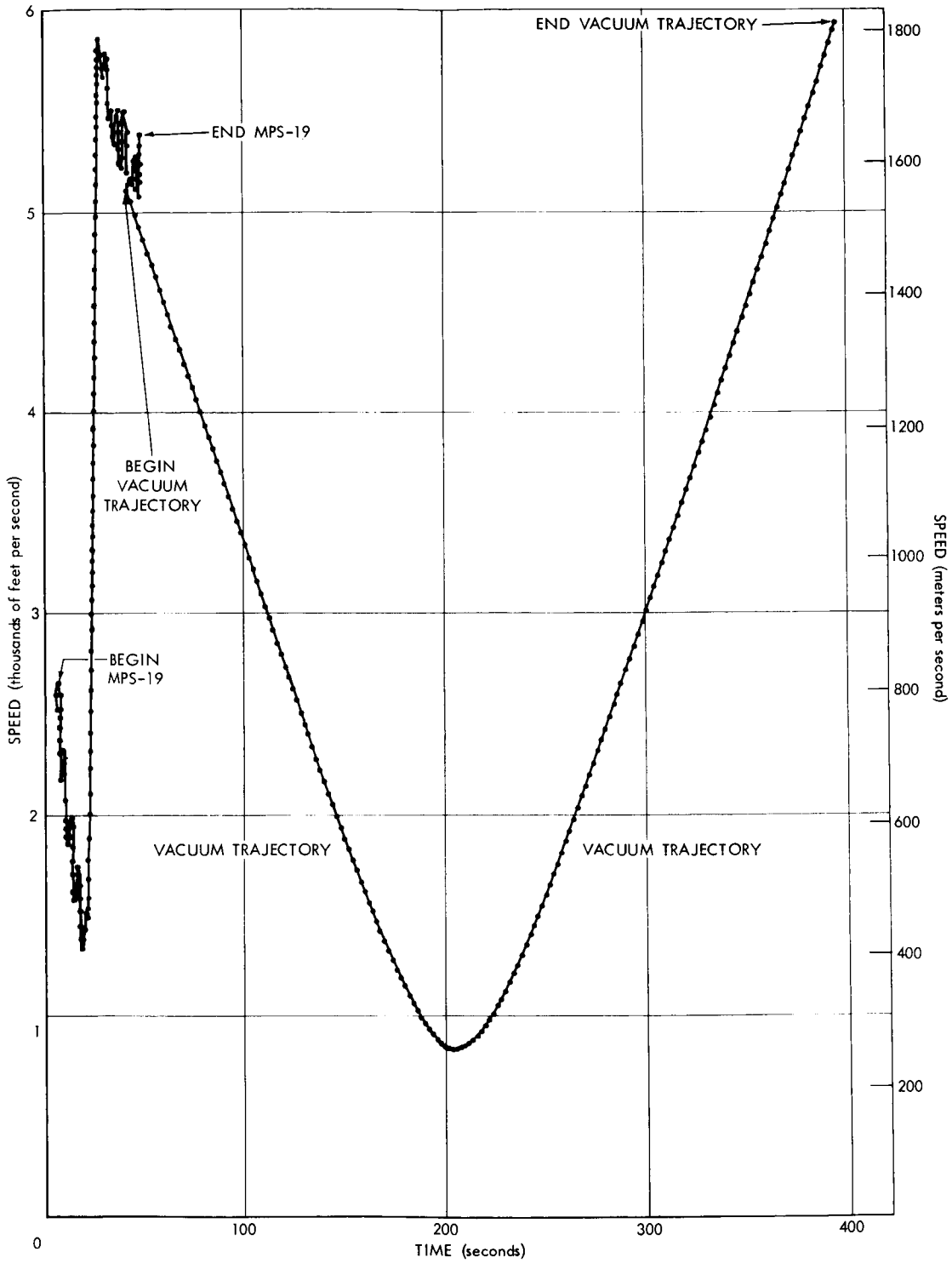

Figure 287. 14.229 UI Radar Plot, Speed vs Time

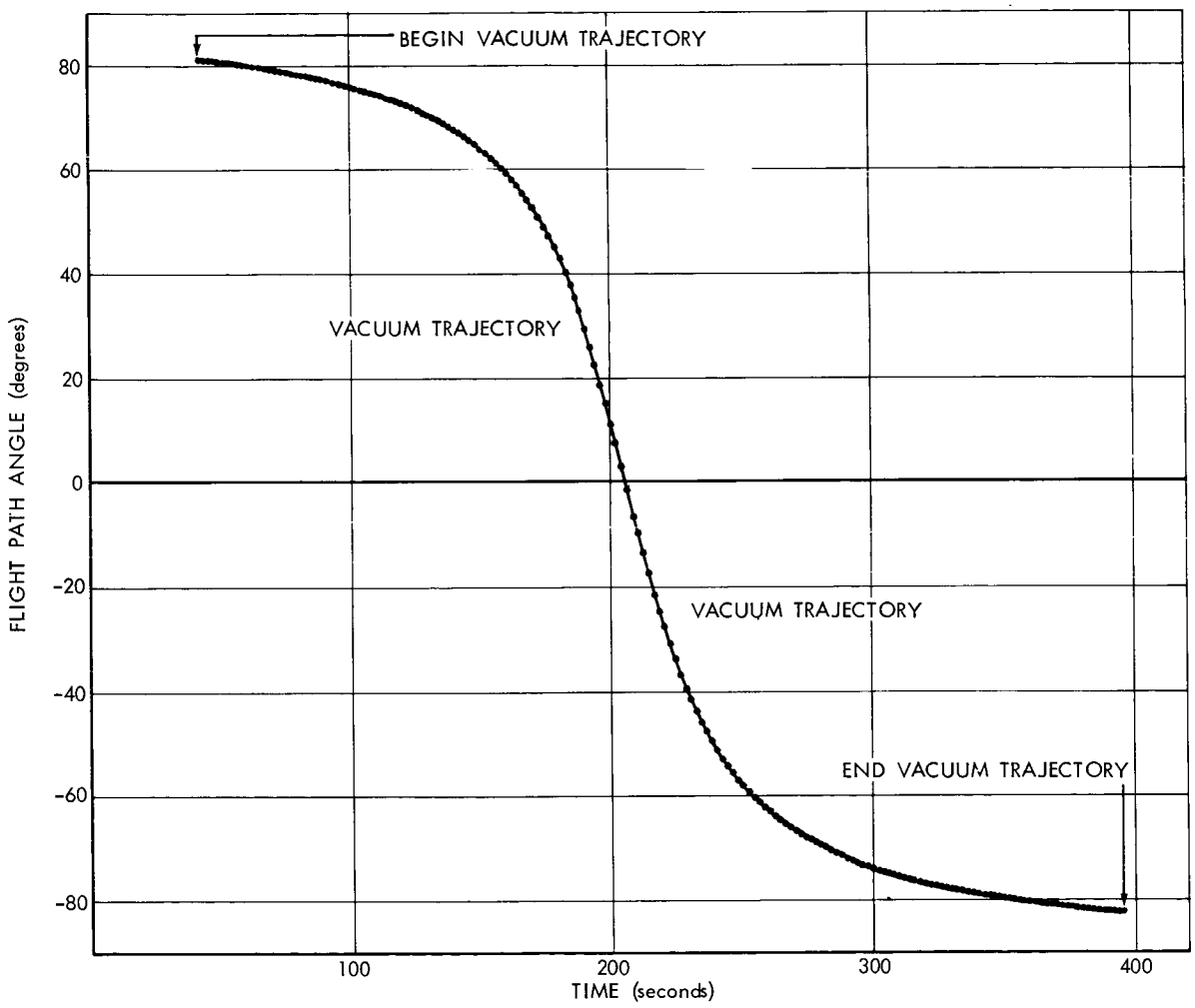

Figure 288. 14.229 UI Radar Plot, Flight Path Angle vs Time

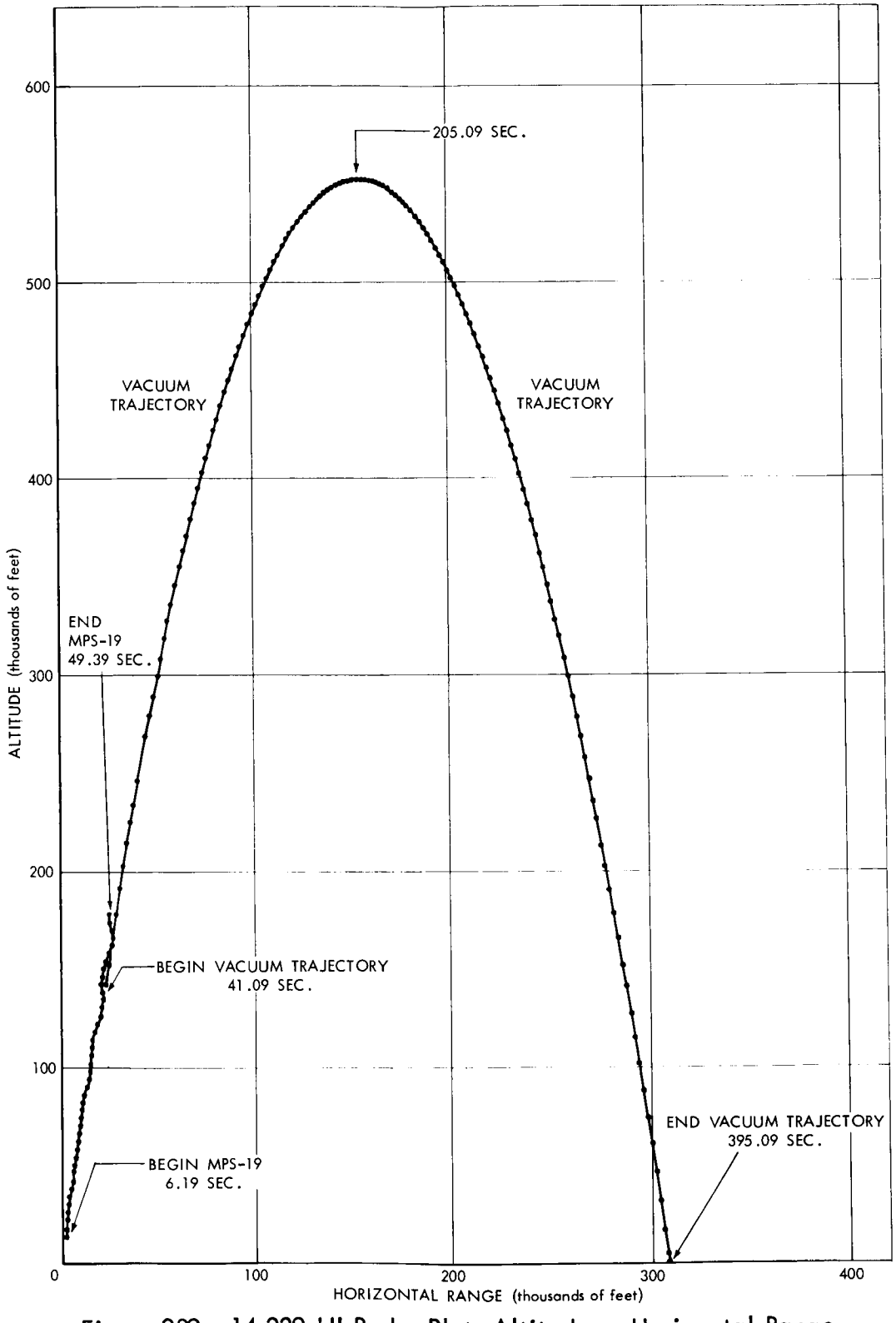

Figure 289. 14.229 UI Radar Plot, Altitude vs Horizontal Range

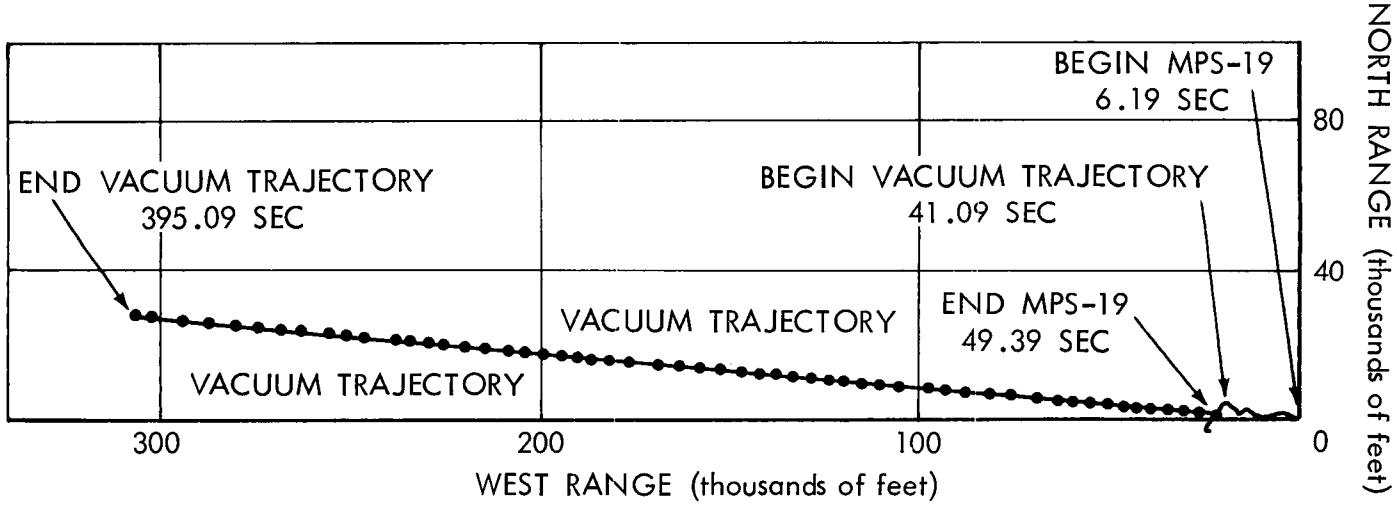

Figure 290. 14.229 UI Radar Plot, North Range vs West Range

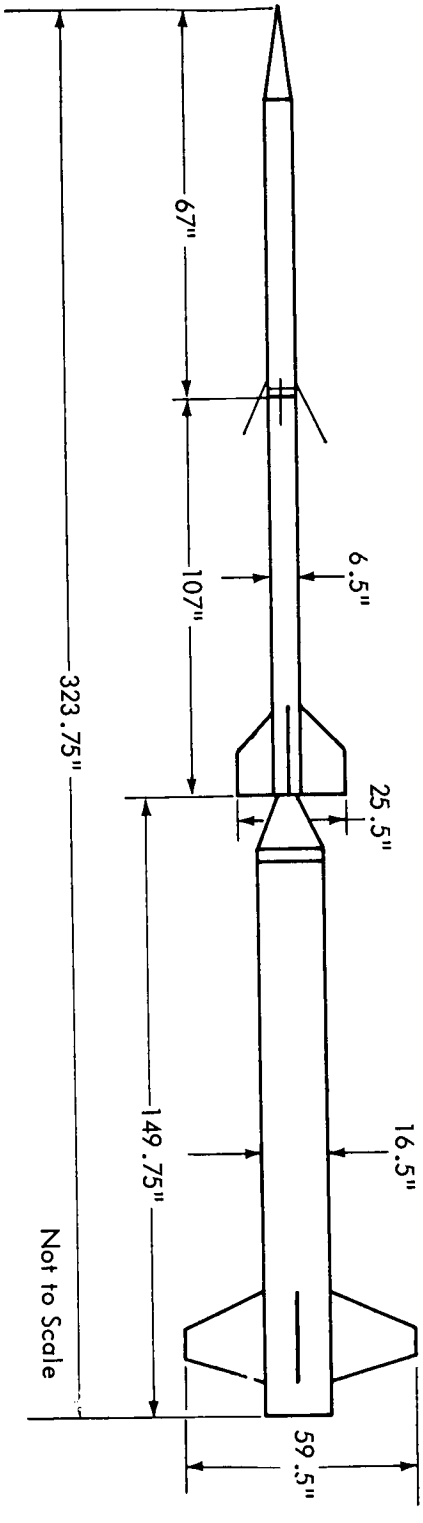

Figure 291. 14.230 UI Sketch

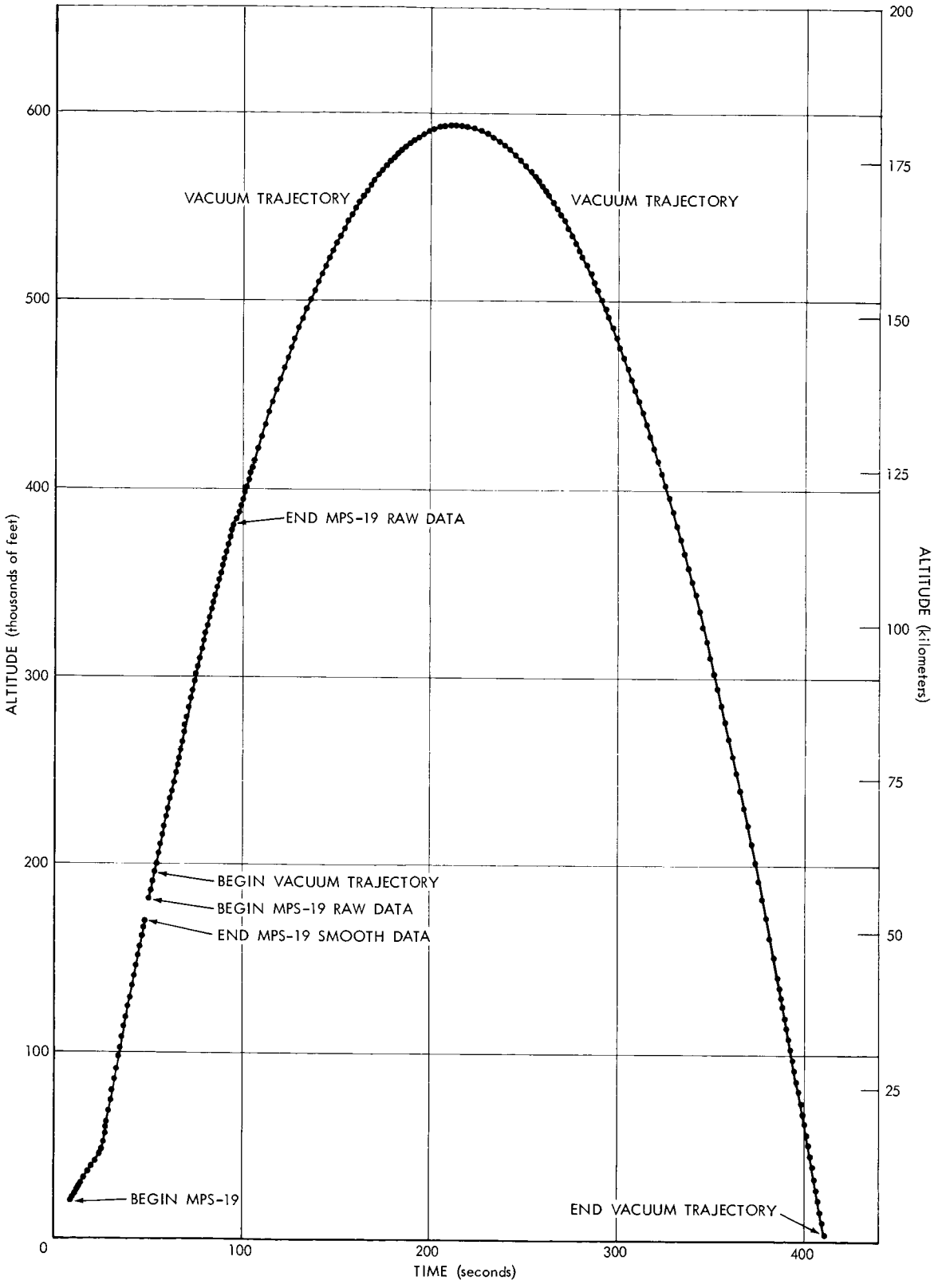

Figure 292. 14.230 UI Radar Plot, Altitude vs Time

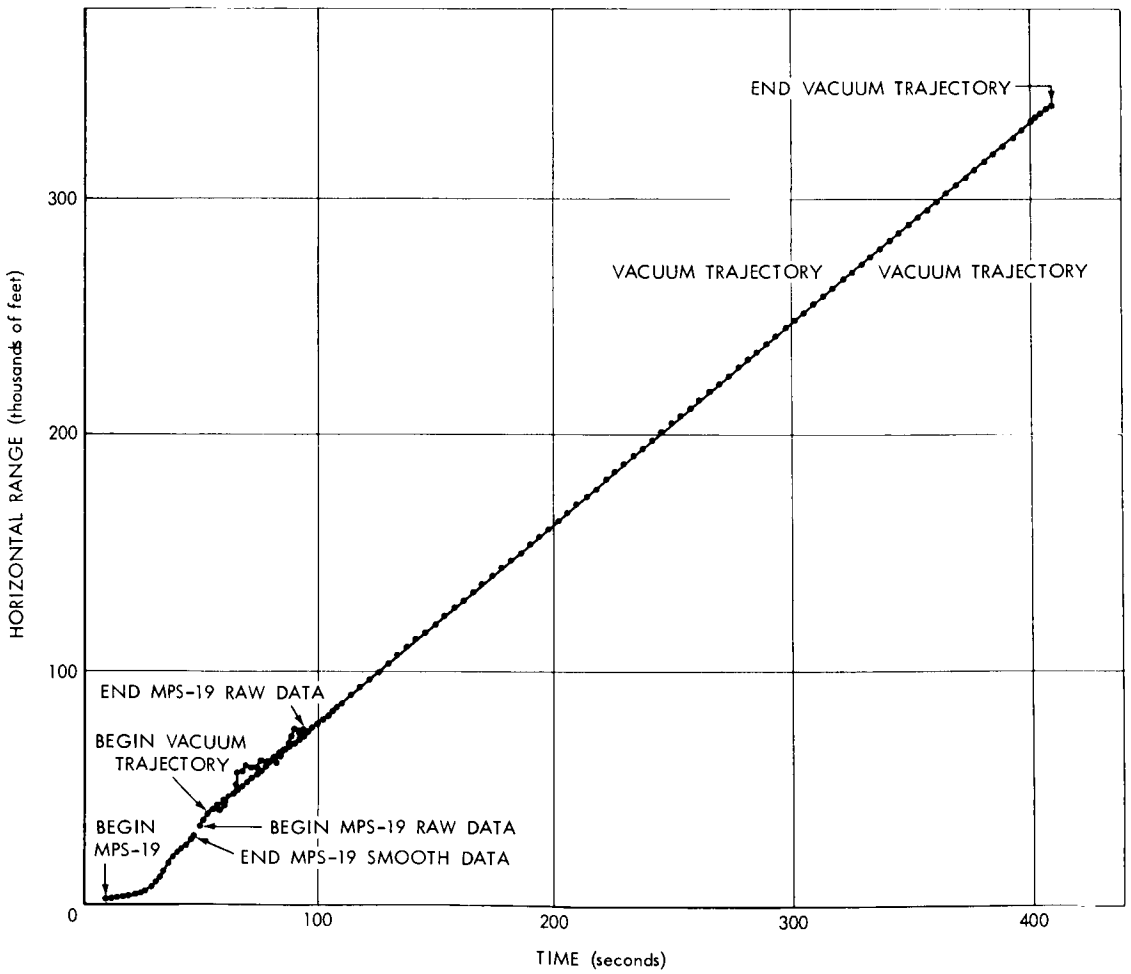

Figure 293. 14.230 UI Radar Plot, Horizontal Range vs Time

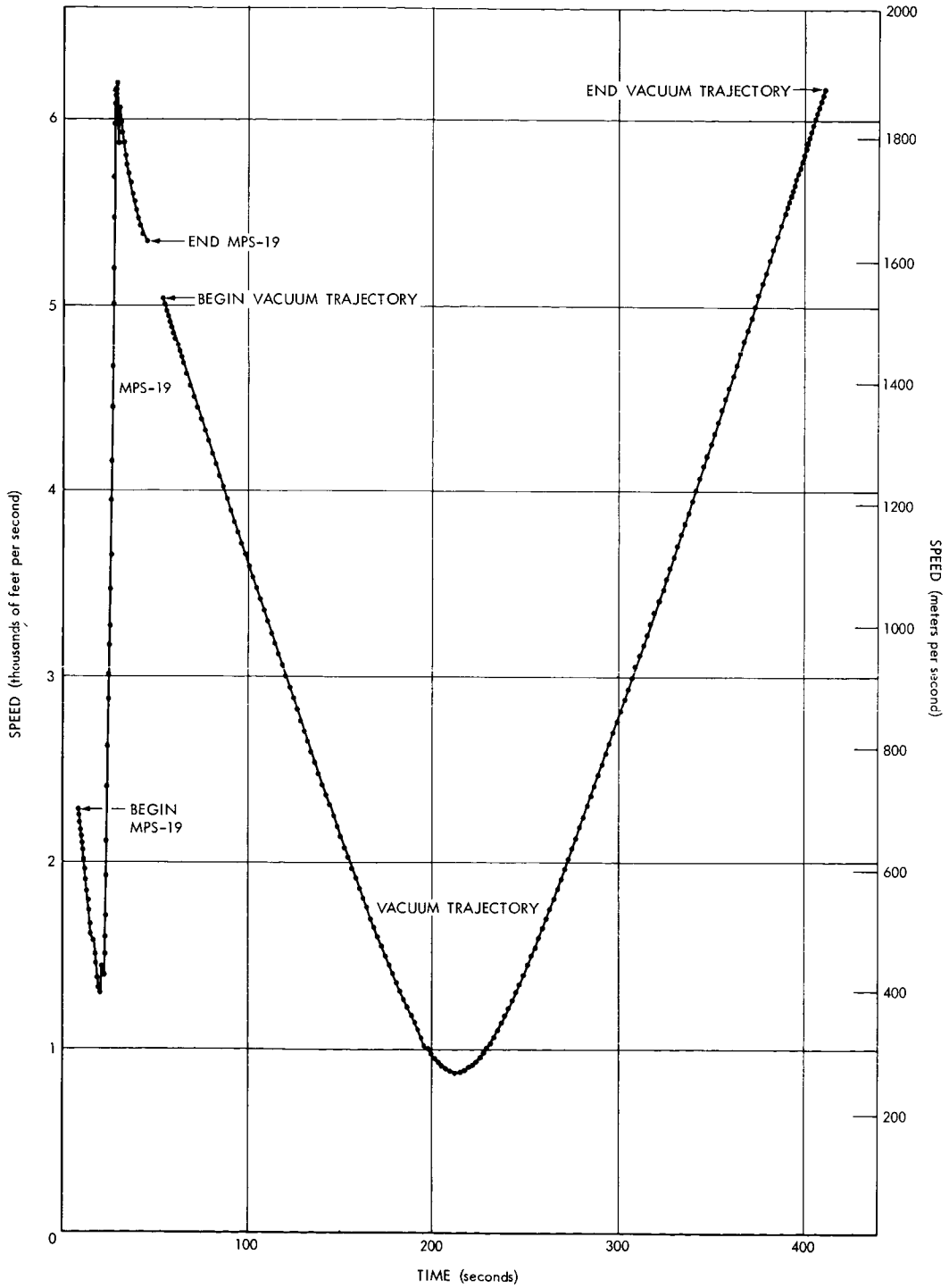

Figure 294. 14.230 UI Radar Plot, Speed vs Time

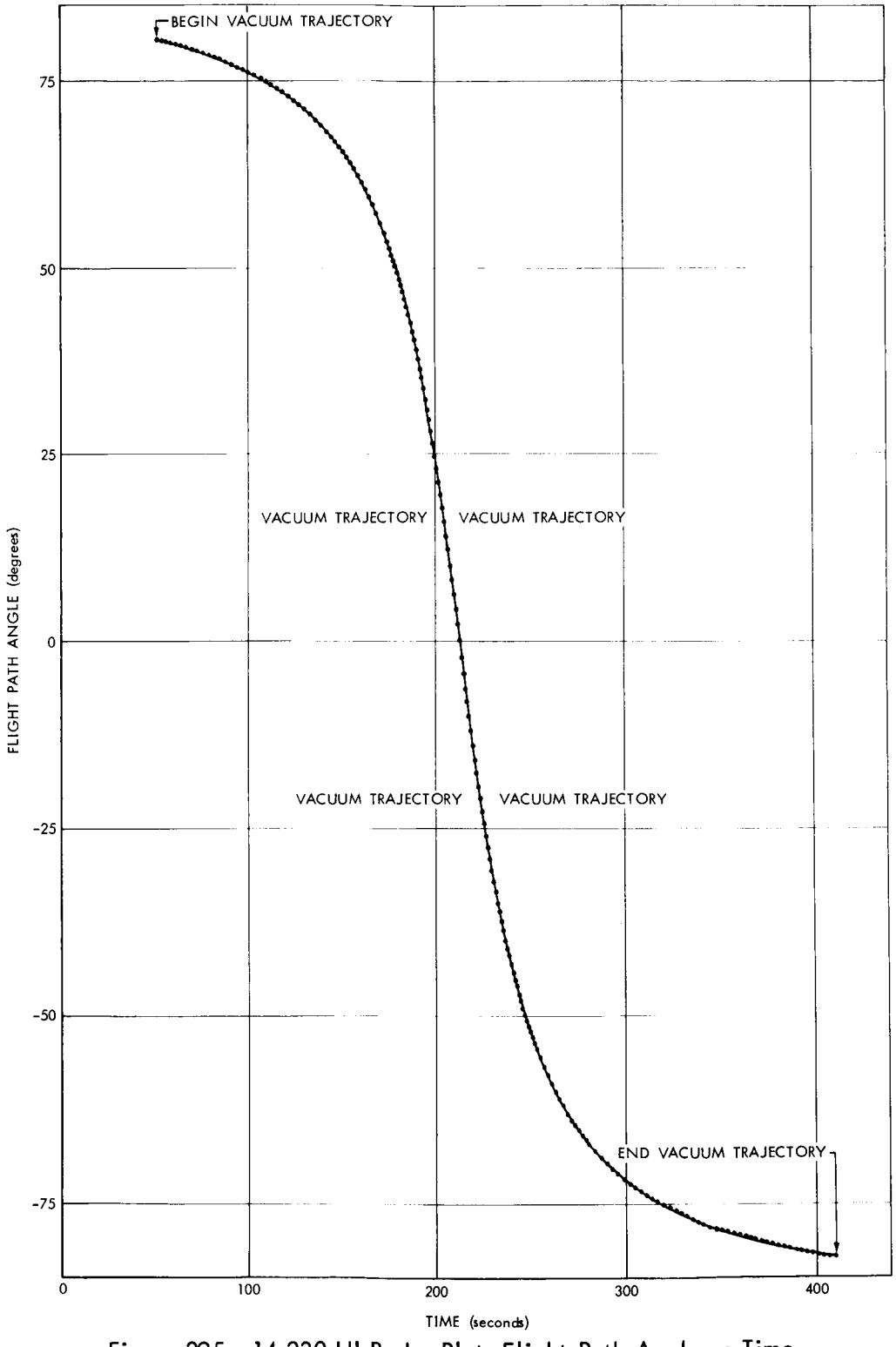

Figure 295. 14.230 UI Radar Plot, Flight Path Angle vs Time

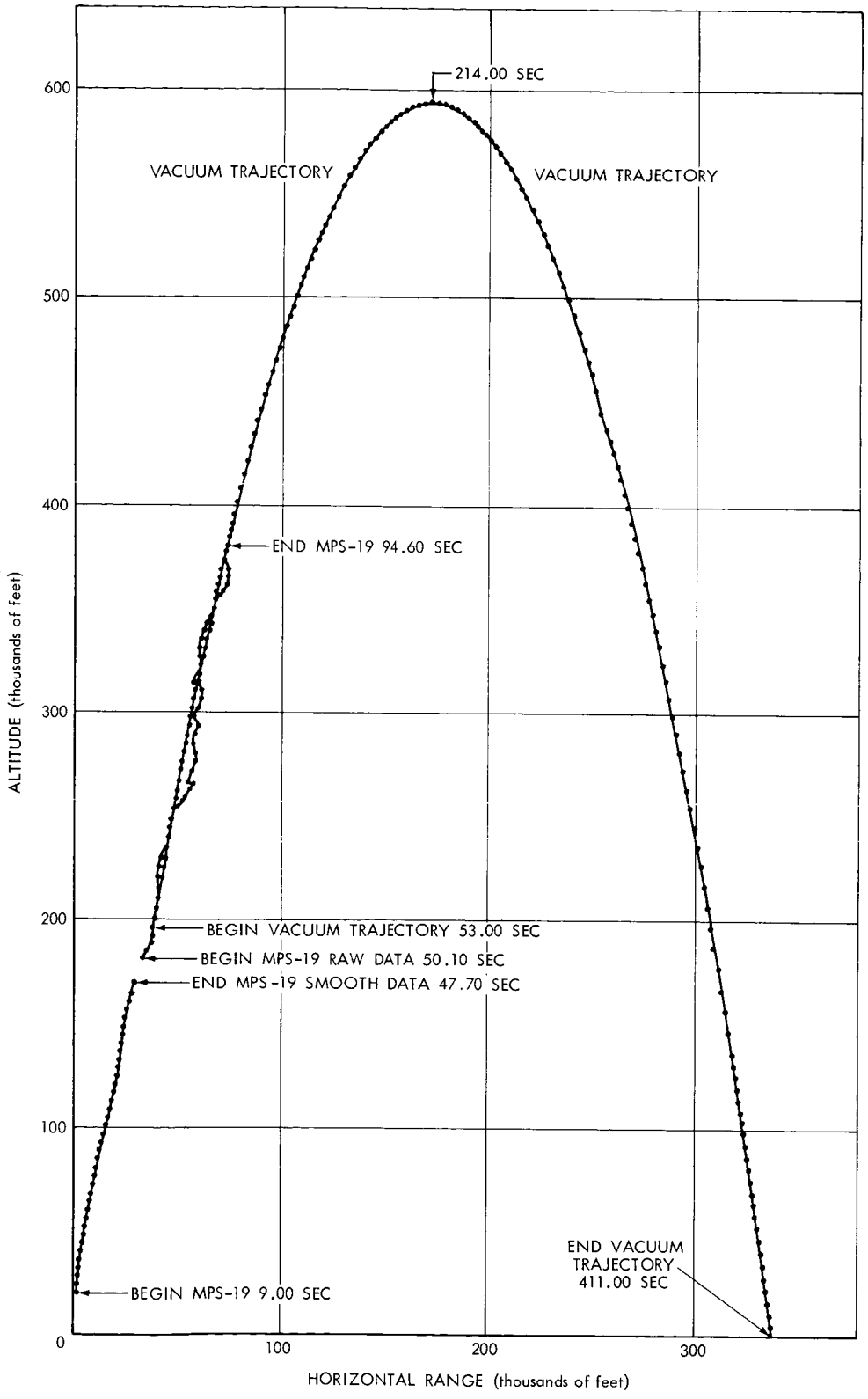

Figure 296. 14.230 UI Radar Plot, Altitude vs Horizontal Range

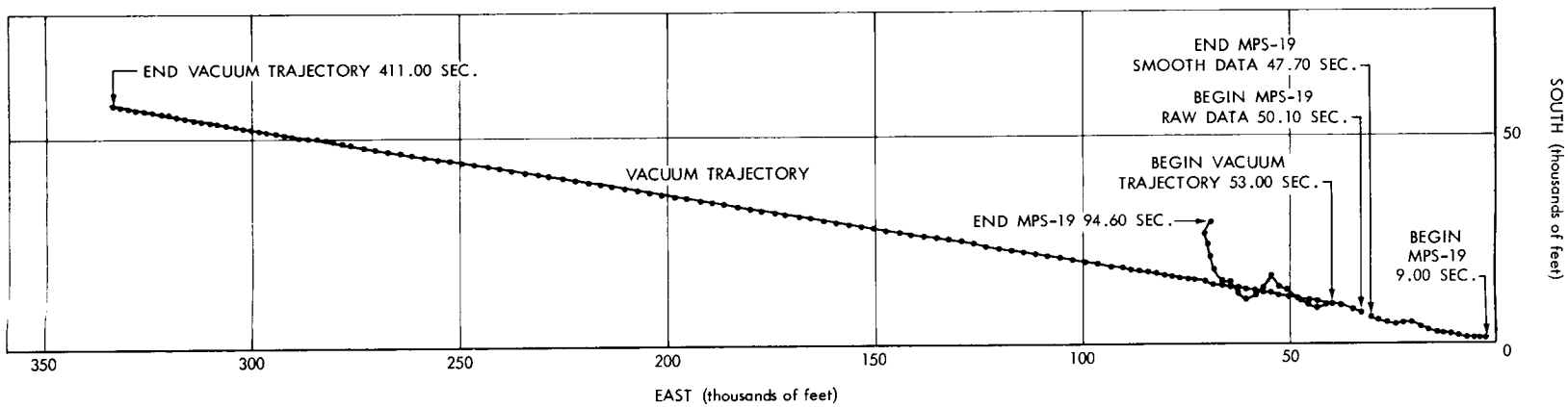

Figure 297. 14.230 UI Radar Plot, South Range vs East Range

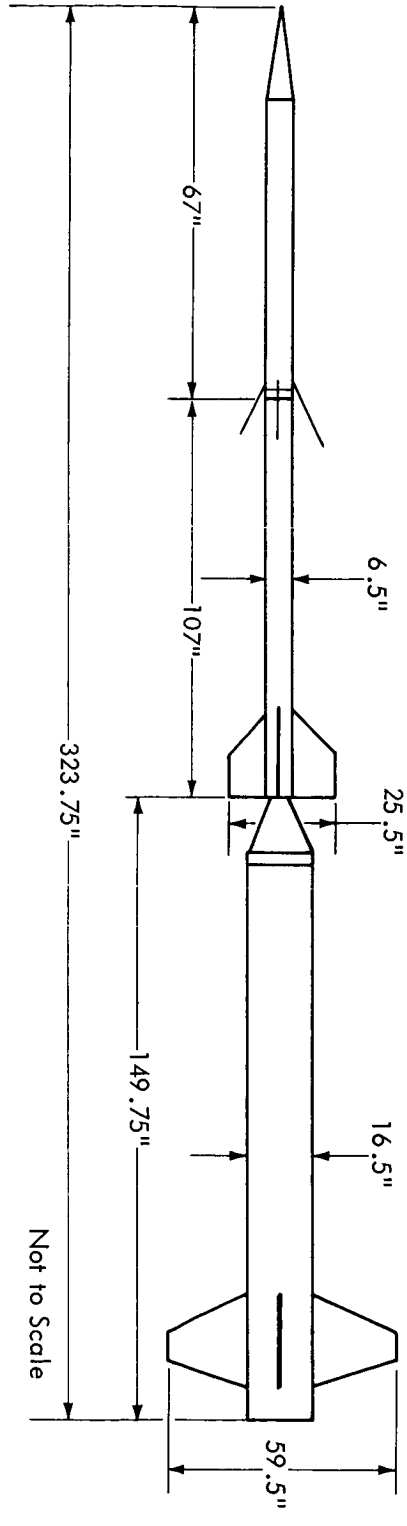

Figure 298. 14.231 UI Sketch

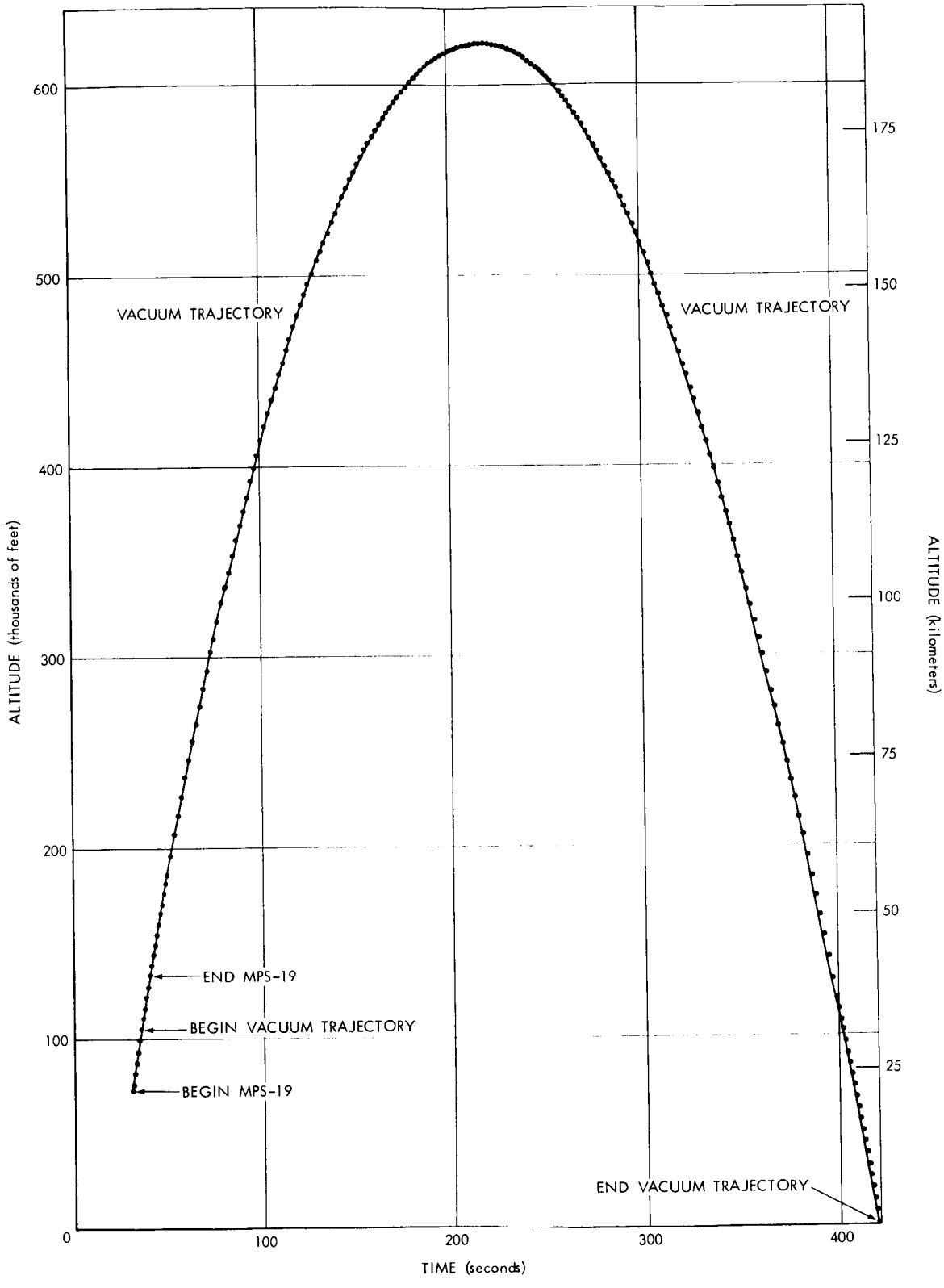

Figure 299. 14.231 UI Radar Plot, Altitude vs Time

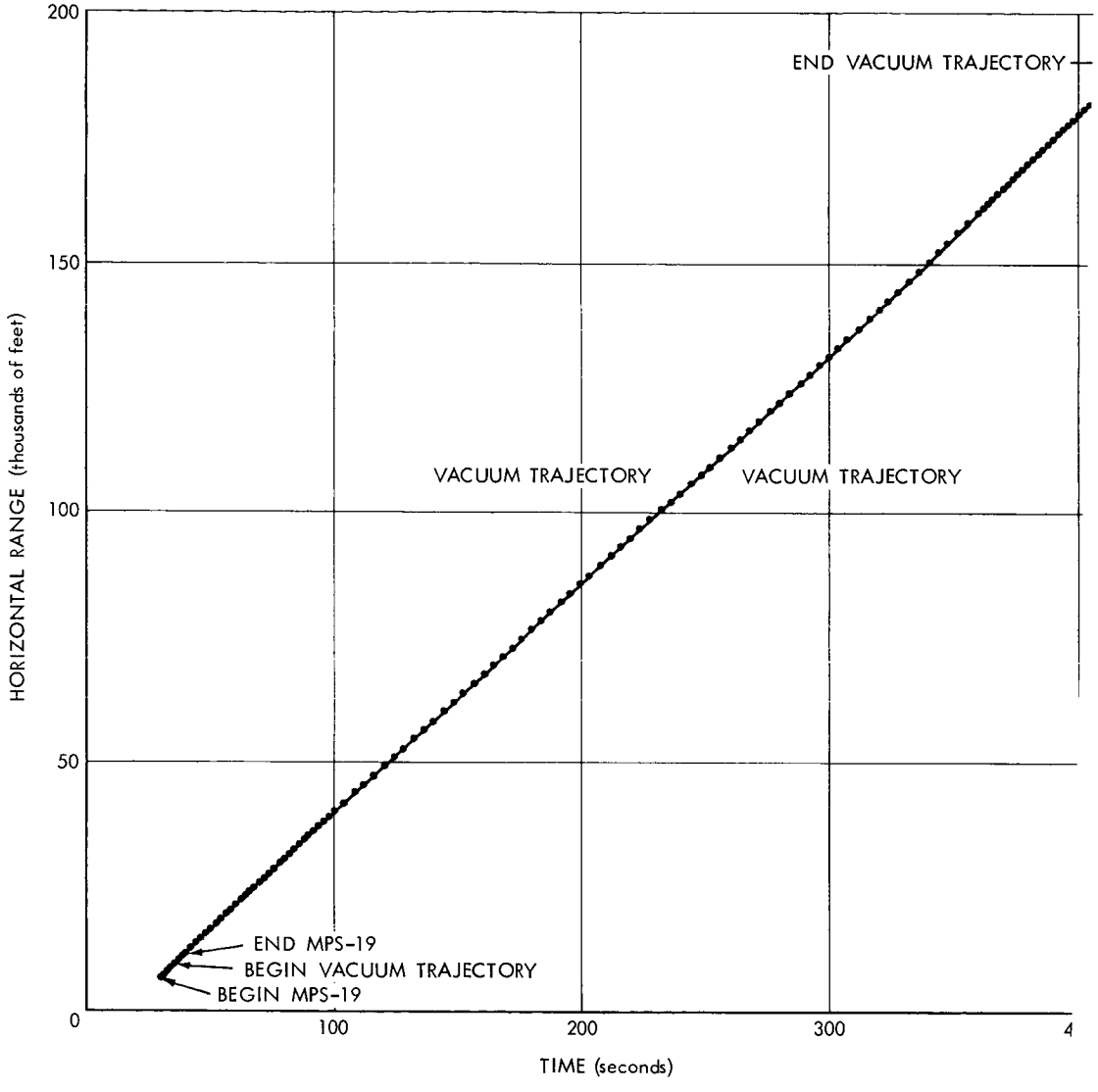

Figure 300. 14.231 UI Radar Plot, Horizontal Range vs Time

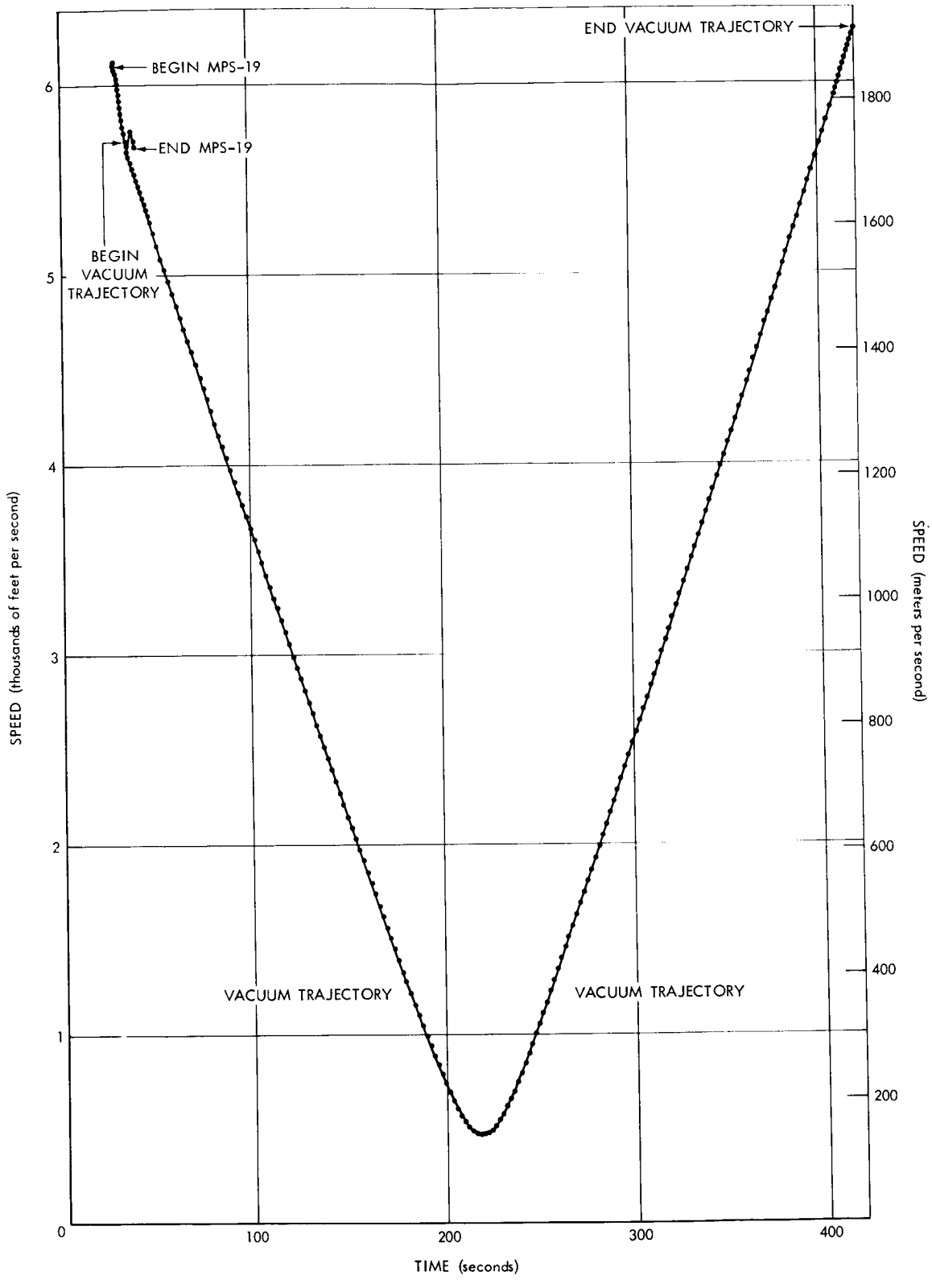

Figure 301. 14.231 UI Radar Plot, Speed vs Time

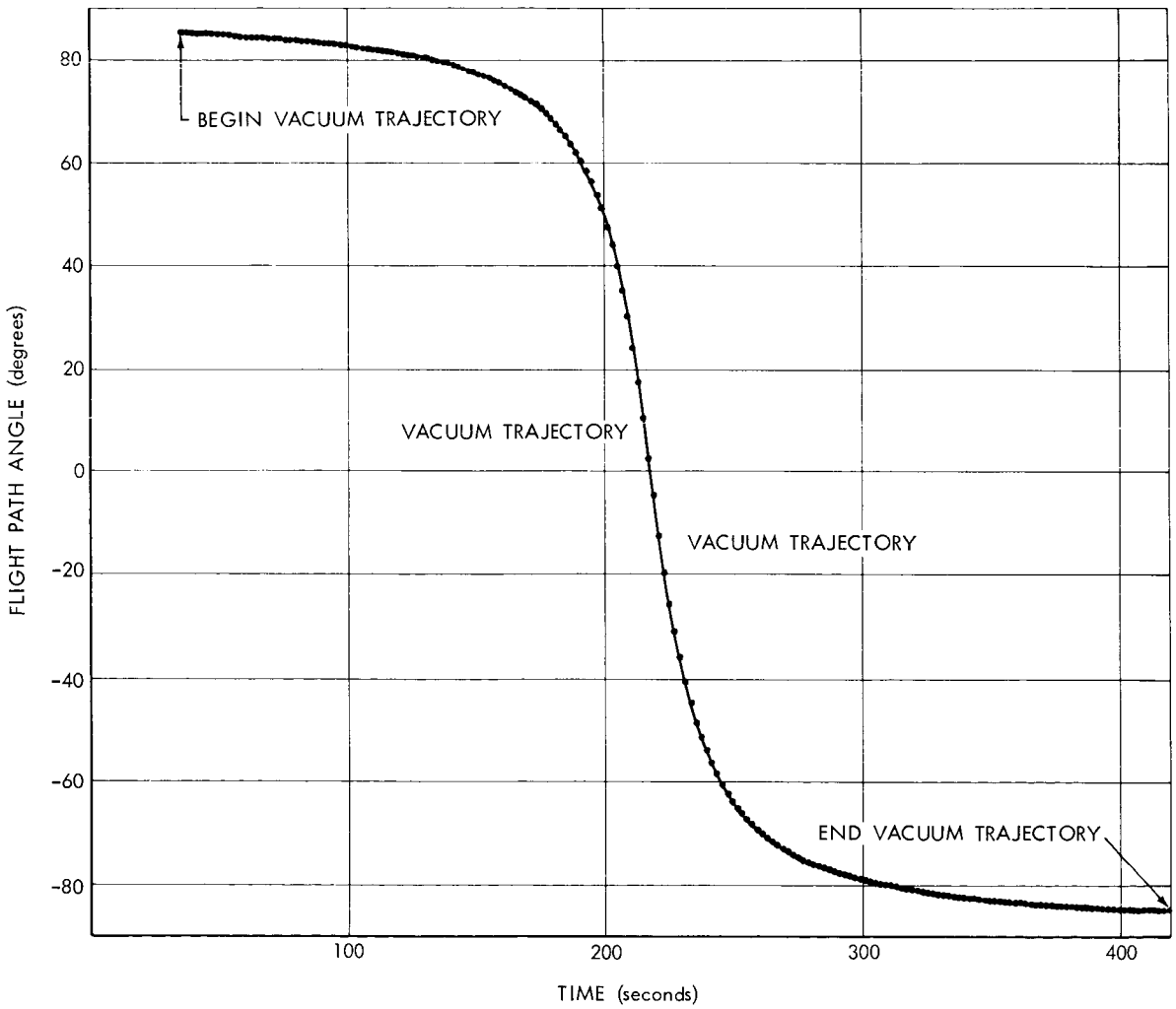

Figure 302. 14.231 UI Radar Plot, Flight Path Angle vs Time

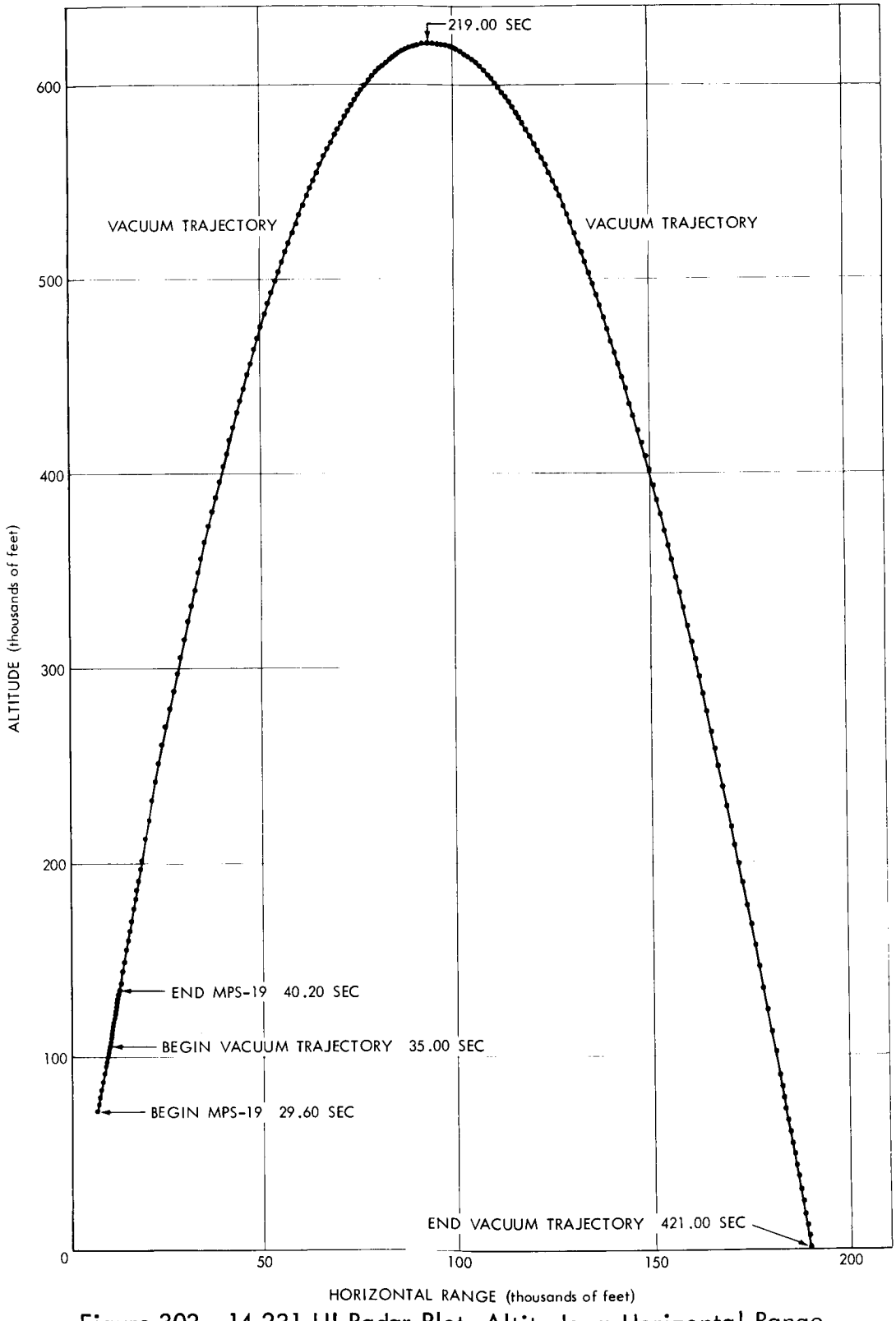

Figure 303. 14.231 UI Radar Plot, Altitude vs Horizontal Range

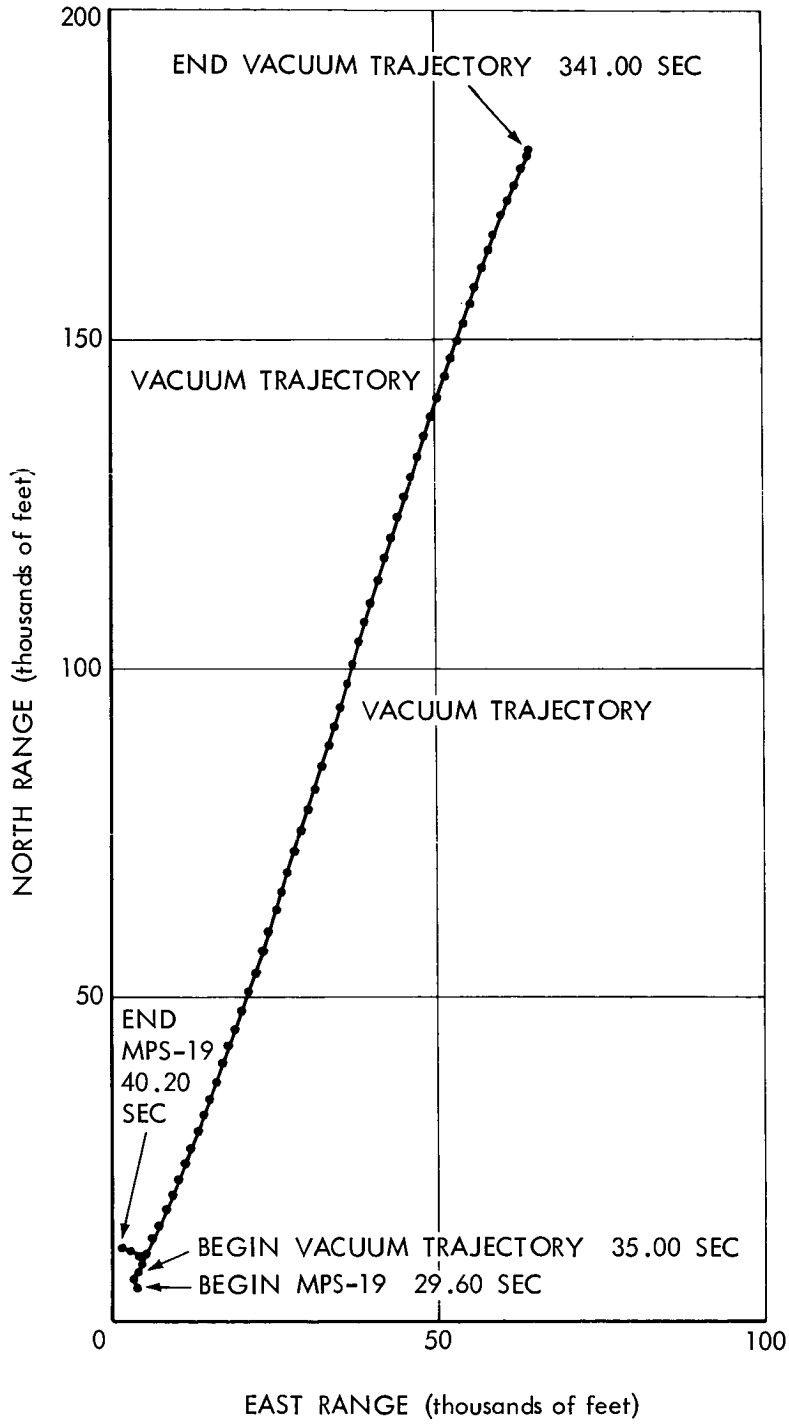

Figure 304. 14.231 UI Radar Plot, North Range vs East Range

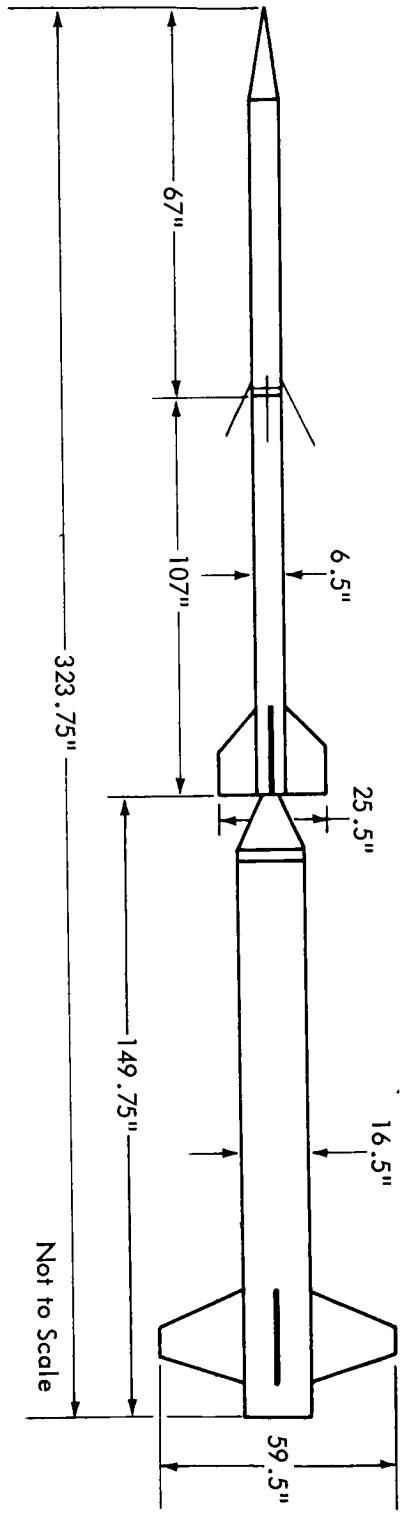

Figure 305. 14.232 UI Sketch

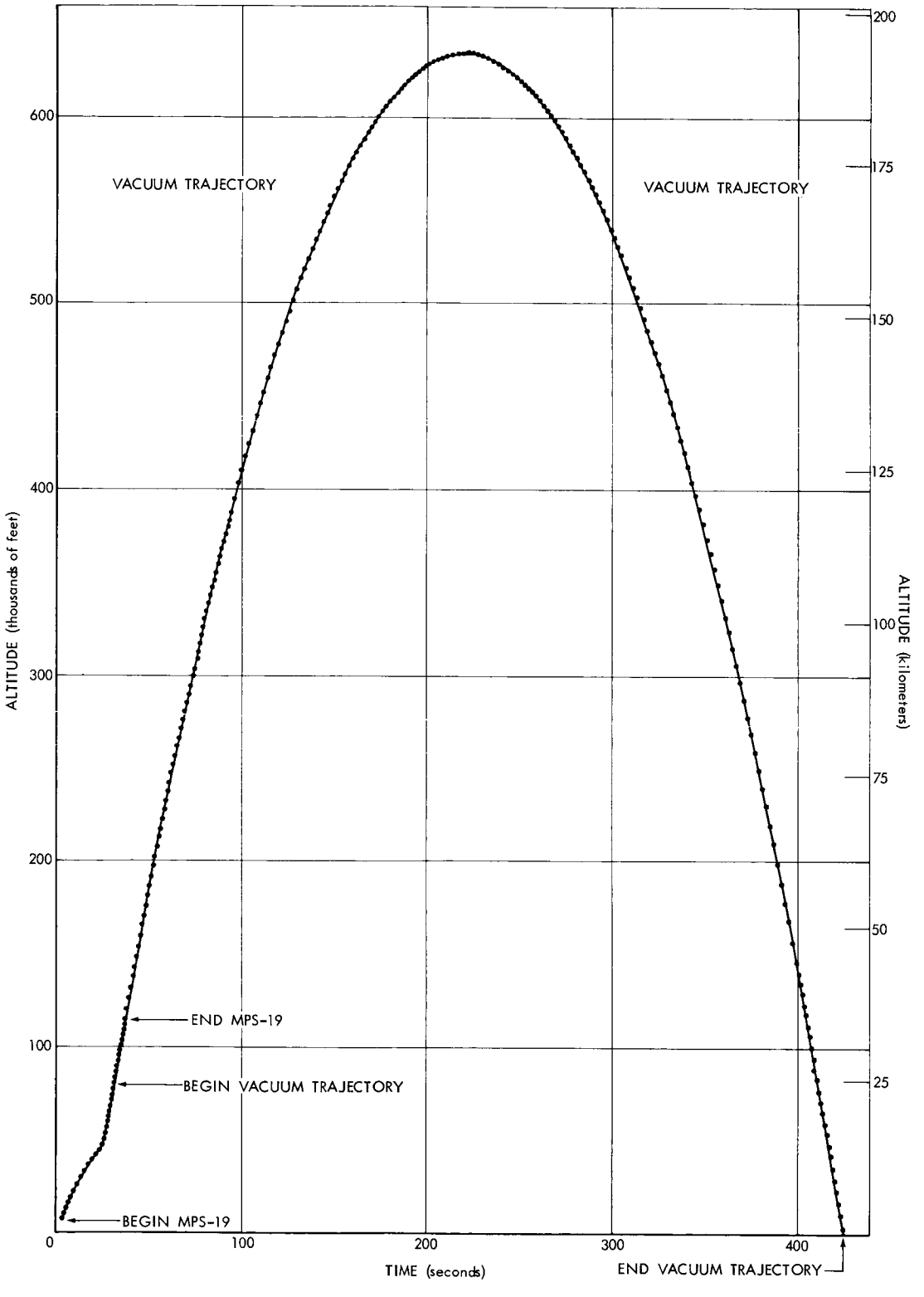

Figure 306. 14.232 UI Radar Plot, Altitude vs Time

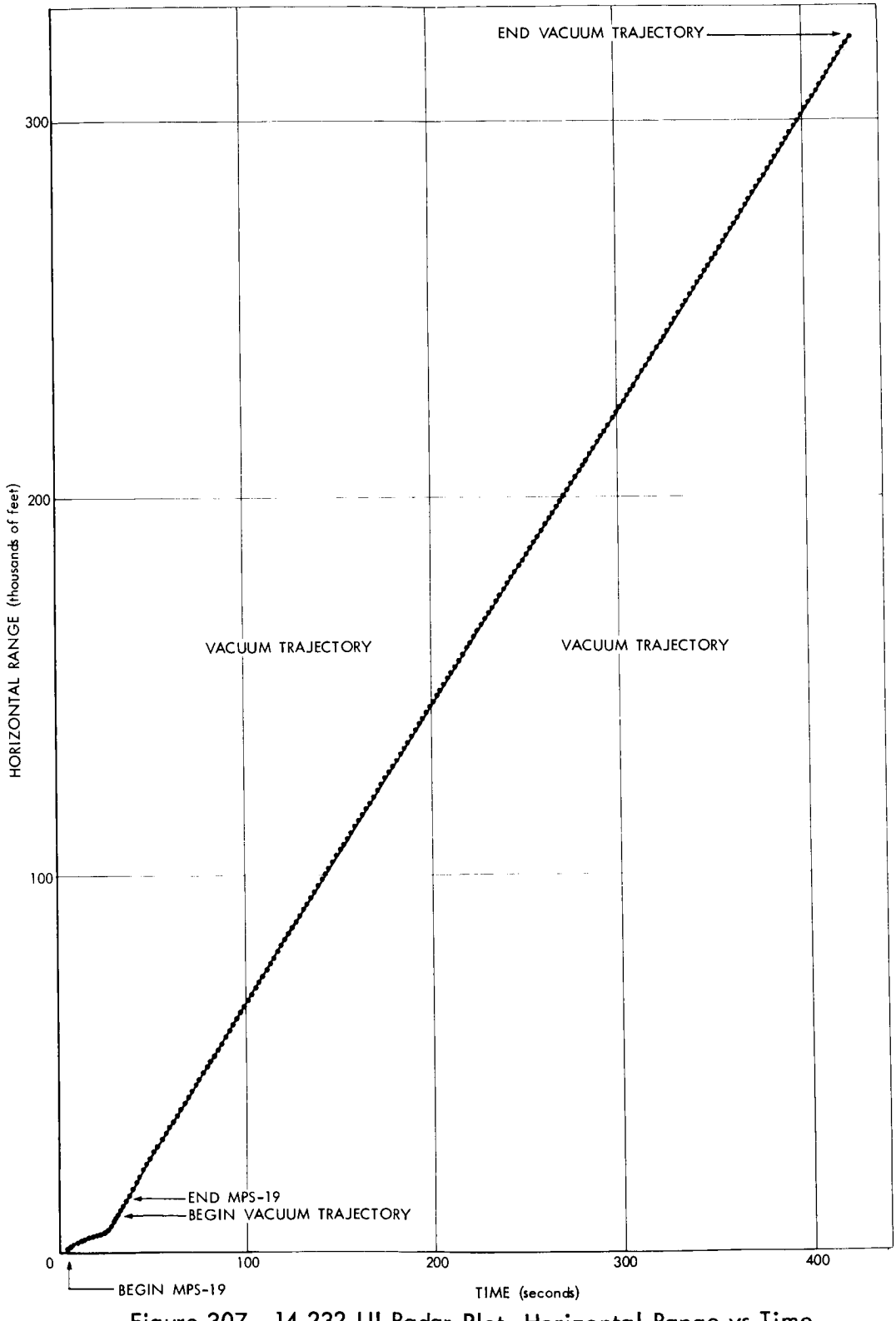

Figure 307. 14.232 UI Radar Plot, Horizontal Range vs Time

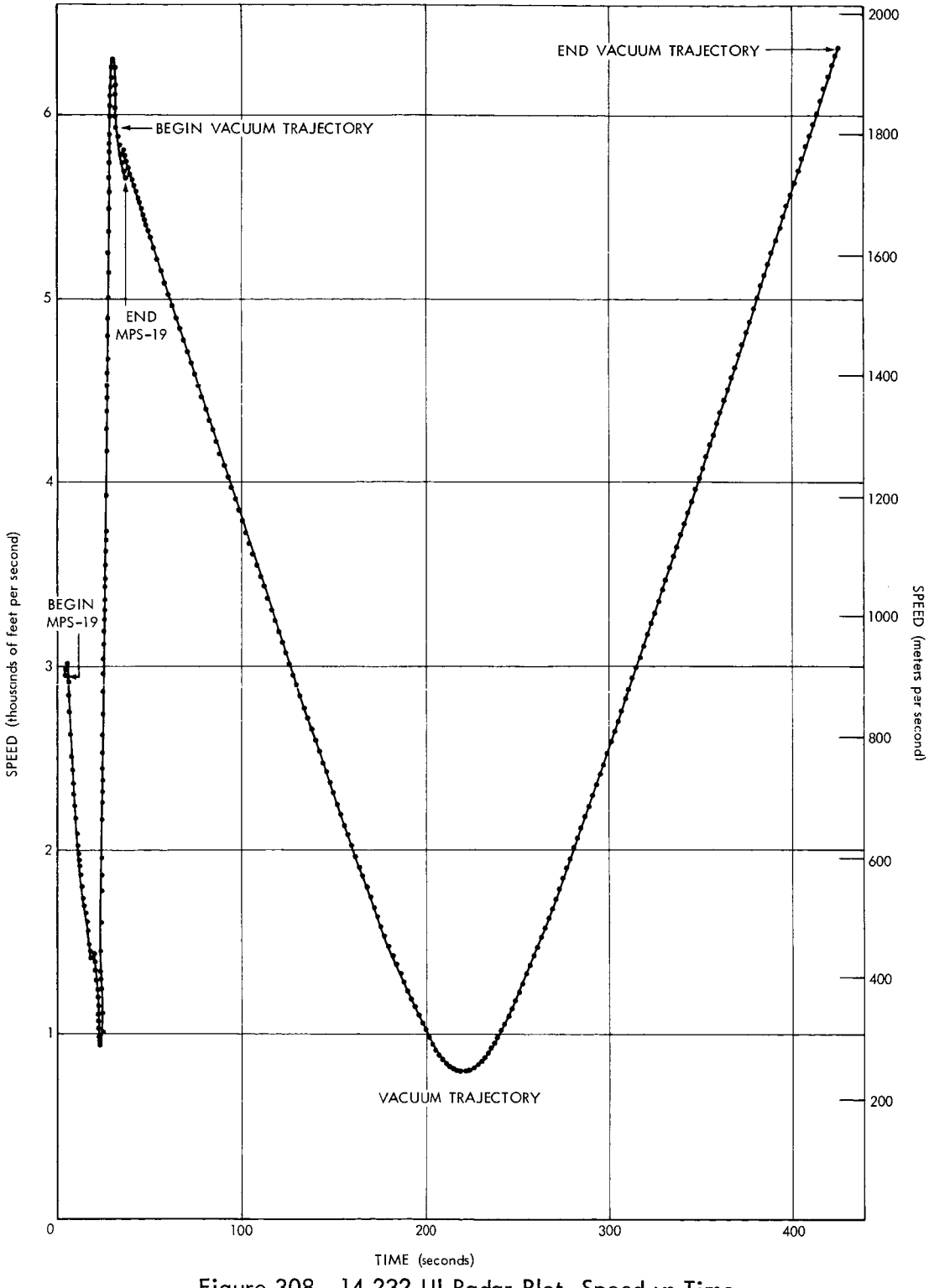

Figure 308. 14.232 UI Radar Plot, Speed vs Time

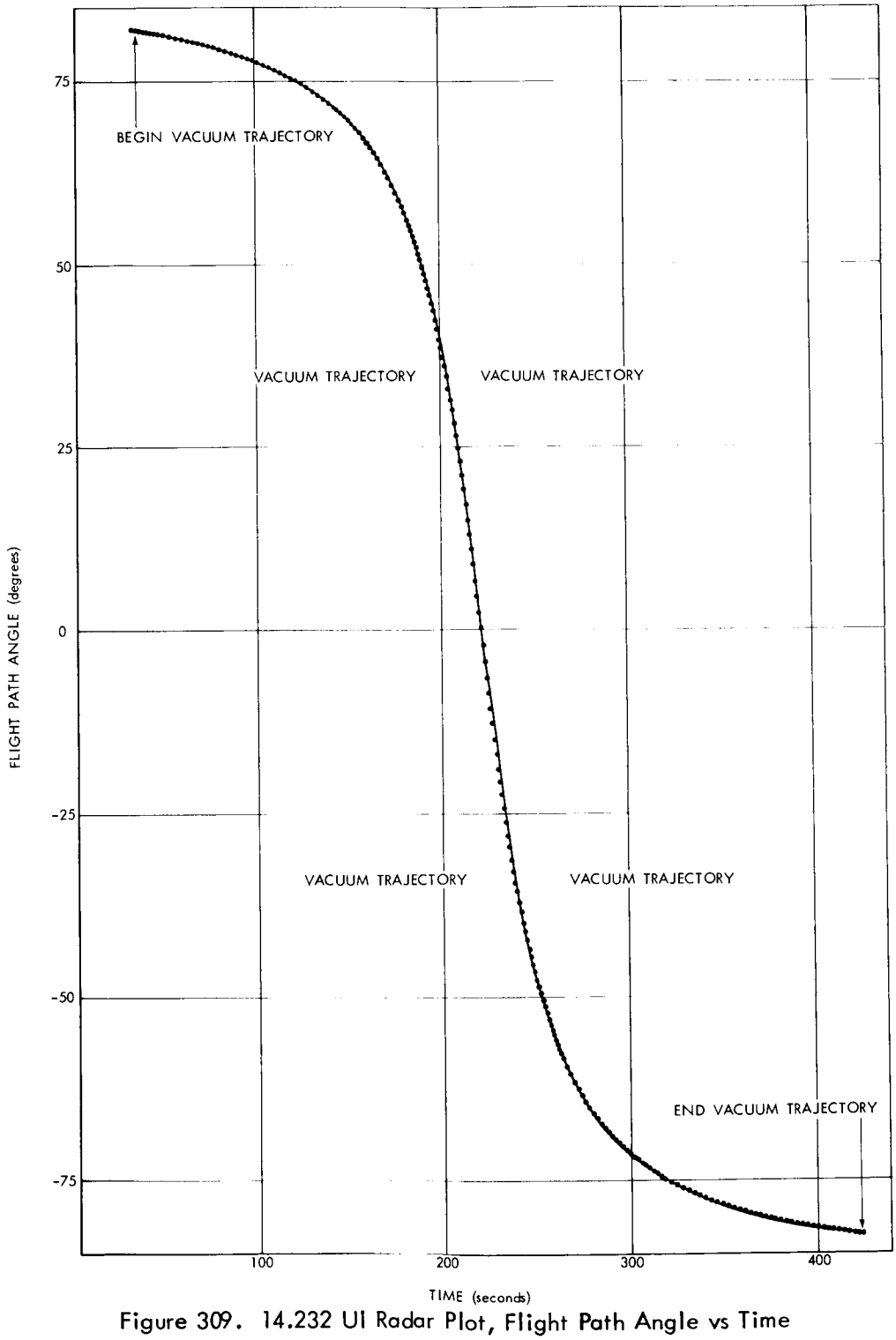

Figure 309. 14.232 UI Radar Plot, Flight Path Angle vs Time

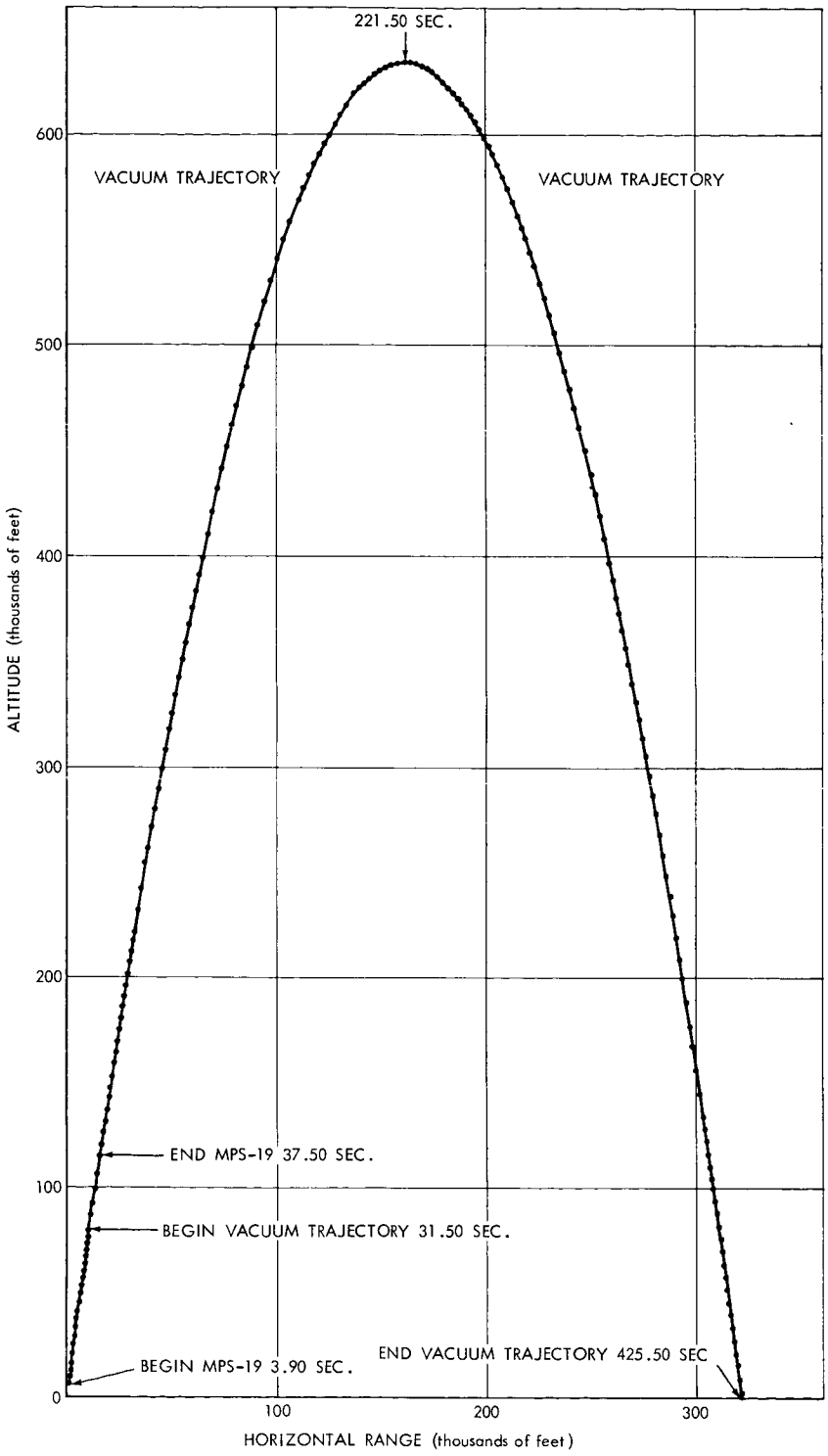

Figure 310. 14.232 UI Radar Plot, Altitude vs Horizontal Range

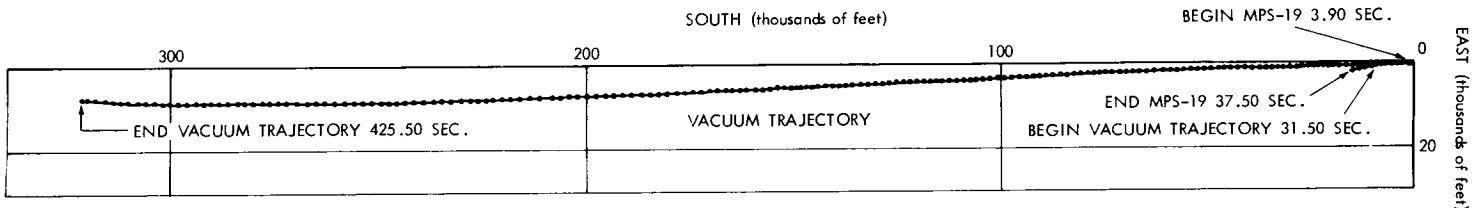

Figure 311. 14.232 UI Radar Plot, South Range vs East Range

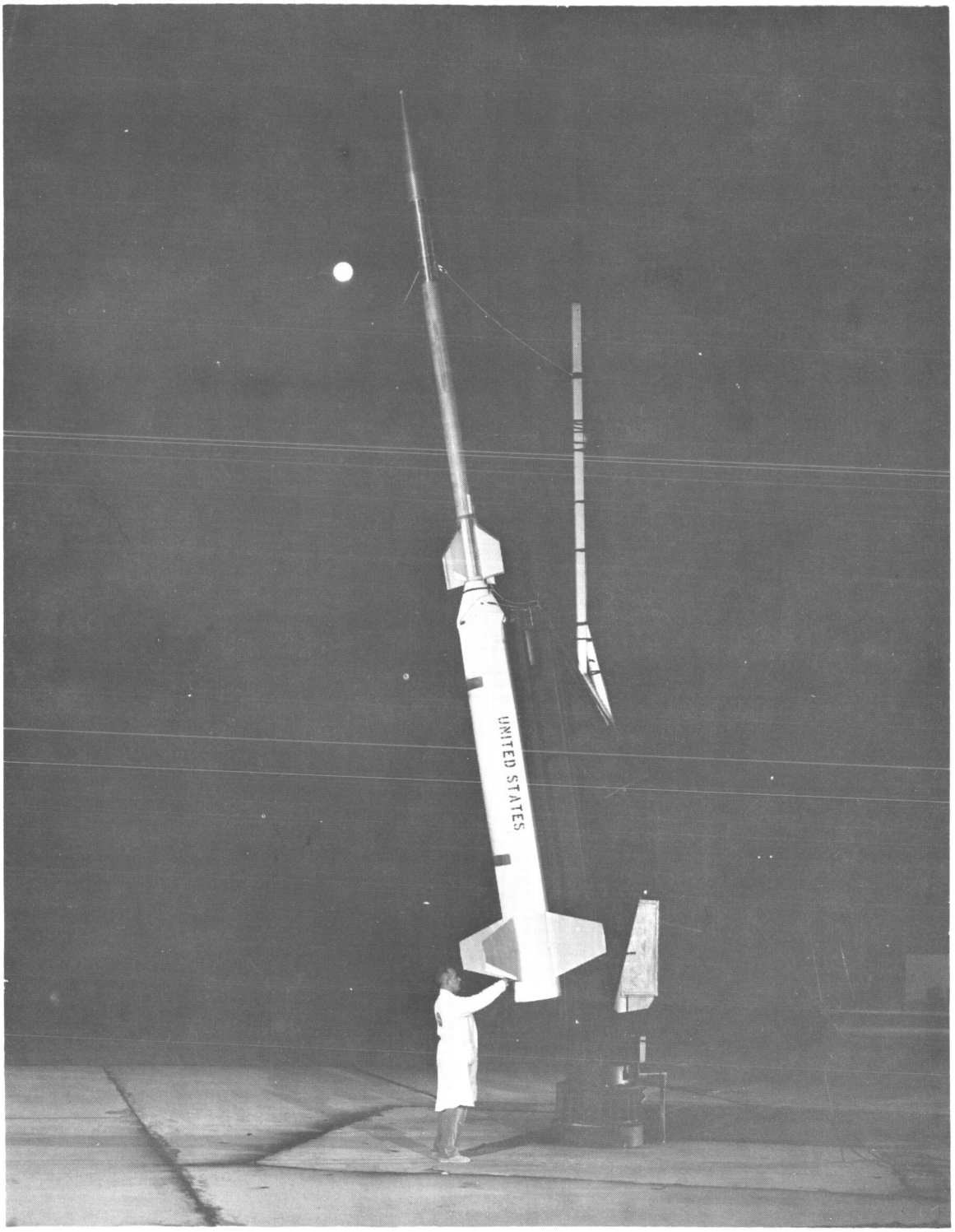

Figure 312. 14.245 UI Photograph

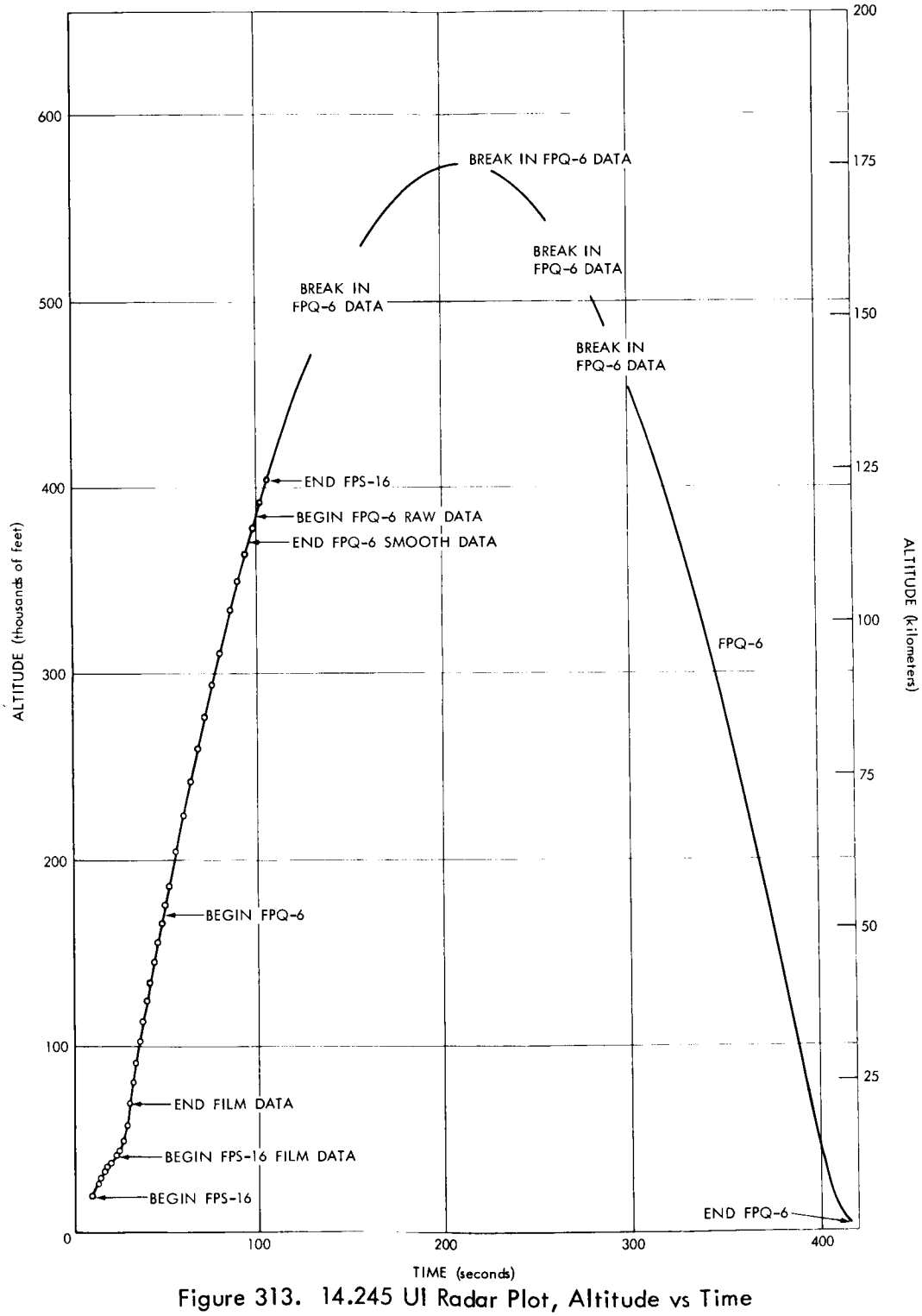

Figure 313. 14.245 UI Radar Plot, Altitude vs Time

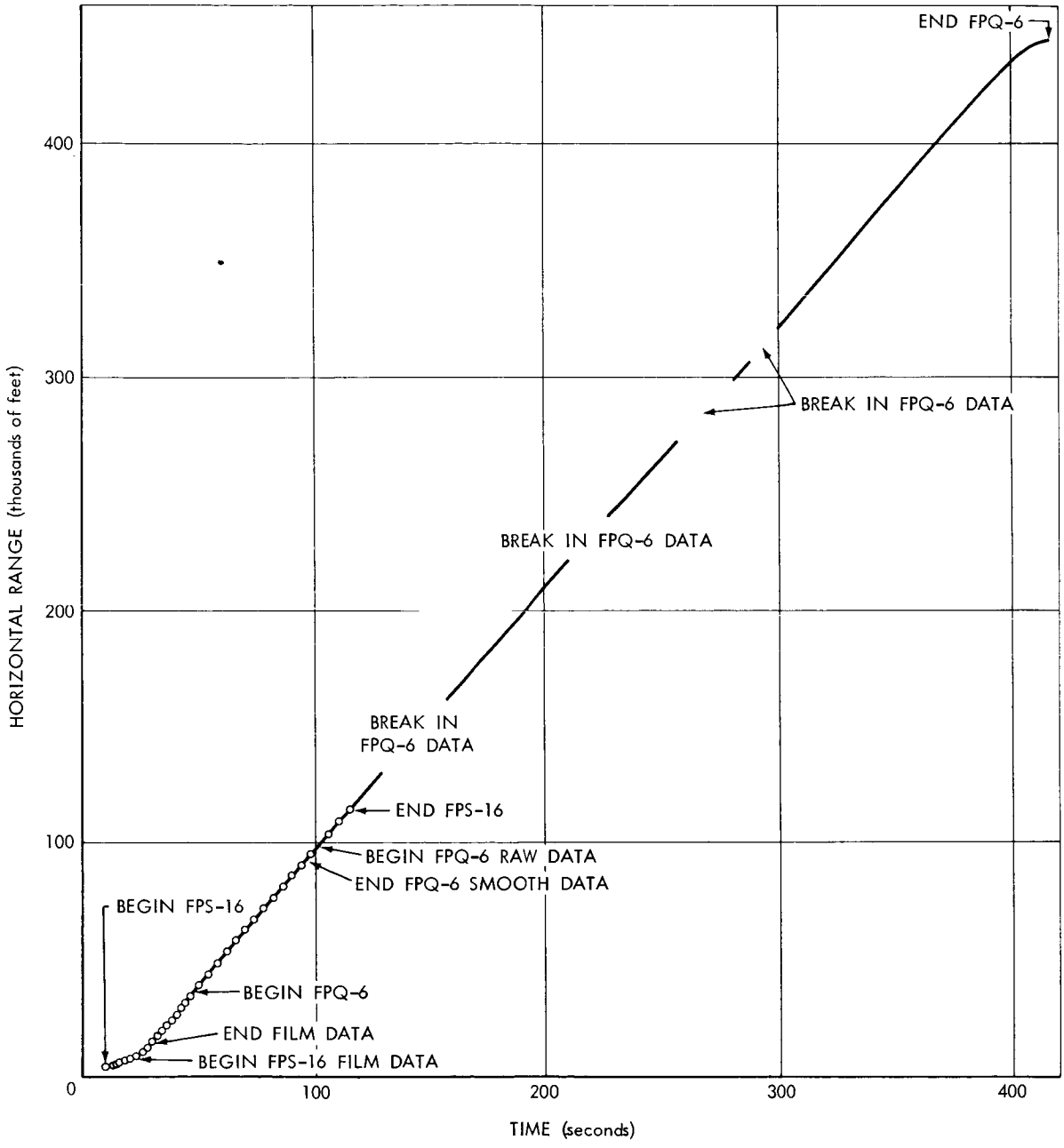

Figure 314. 14.245 UI Radar Plot, Horizontal Range vs Time

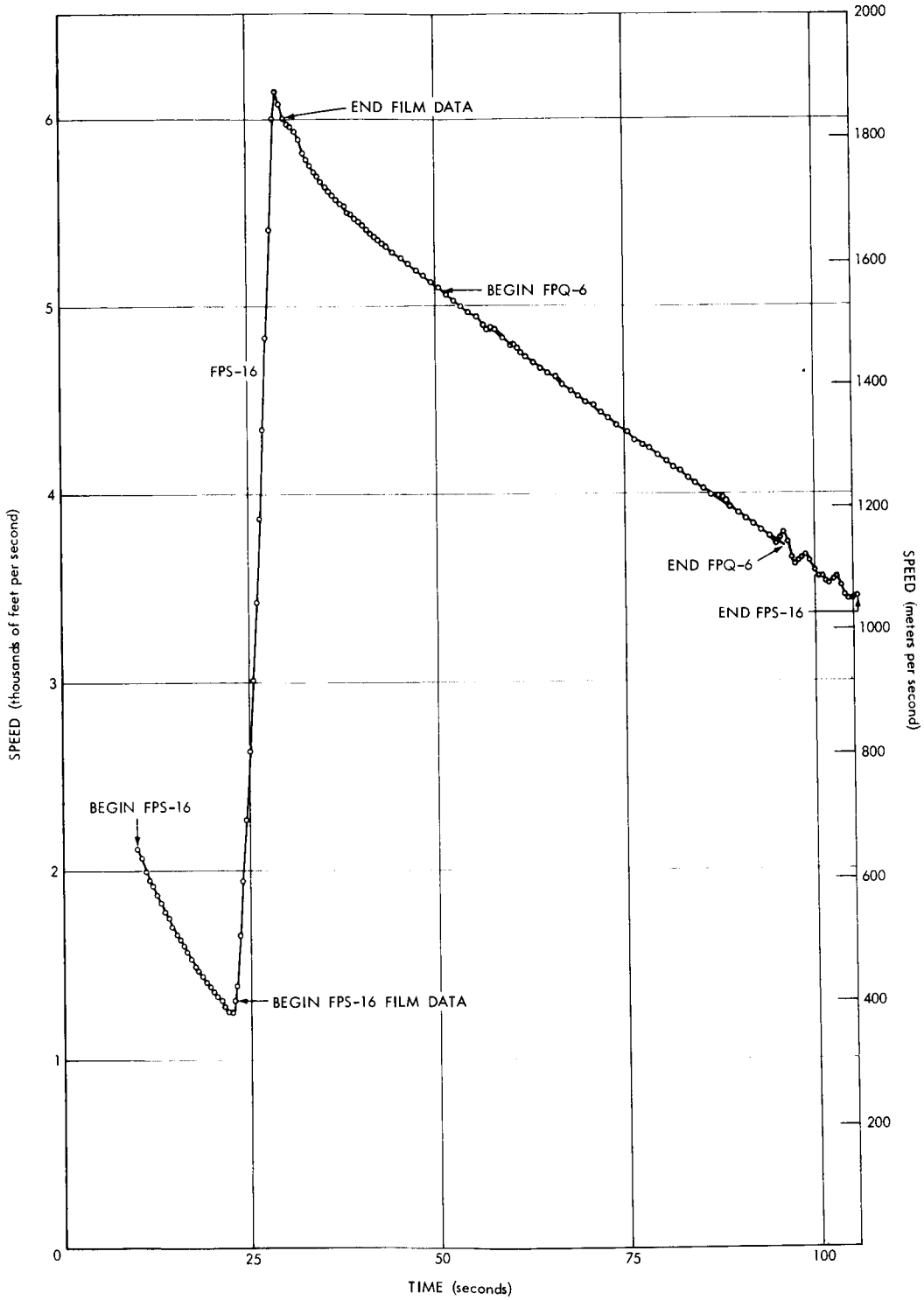

Figure 315. 14.245 UI Radar Plot, Speed vs Time

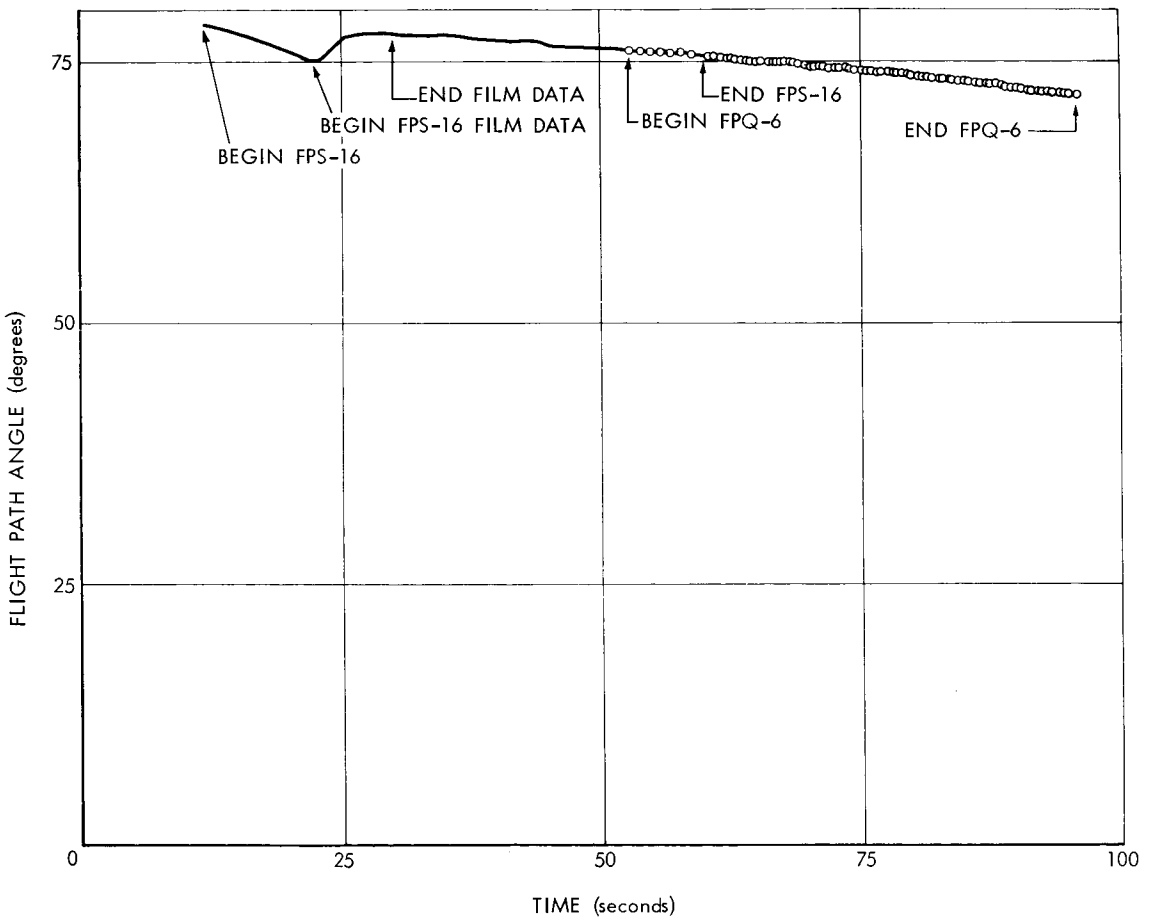

Figure 316. 14.245 UI Radar Plot, Flight Path Angle vs Time

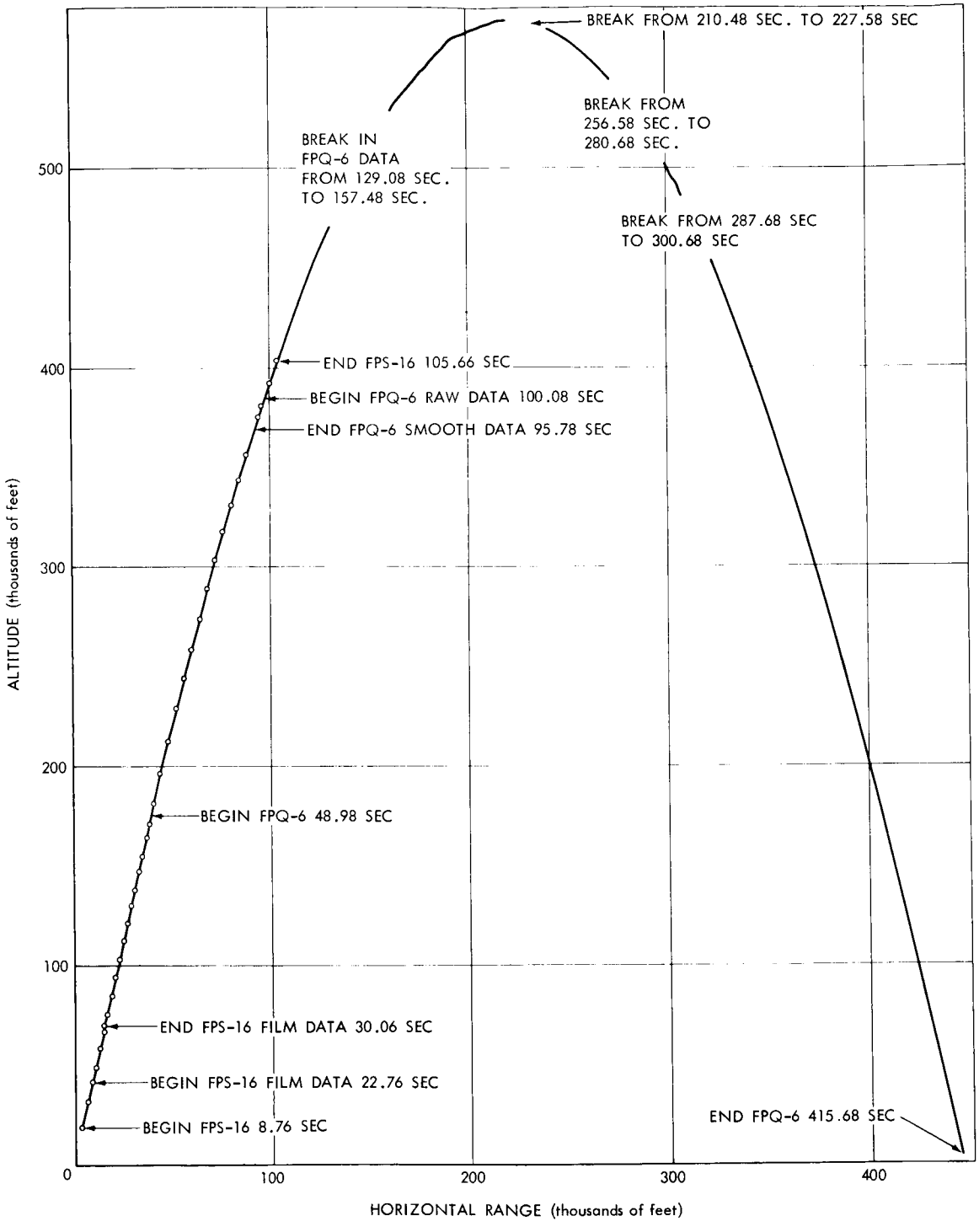

Figure 317. 14.245 UI Radar Plot, Altitude vs Horizontal Range

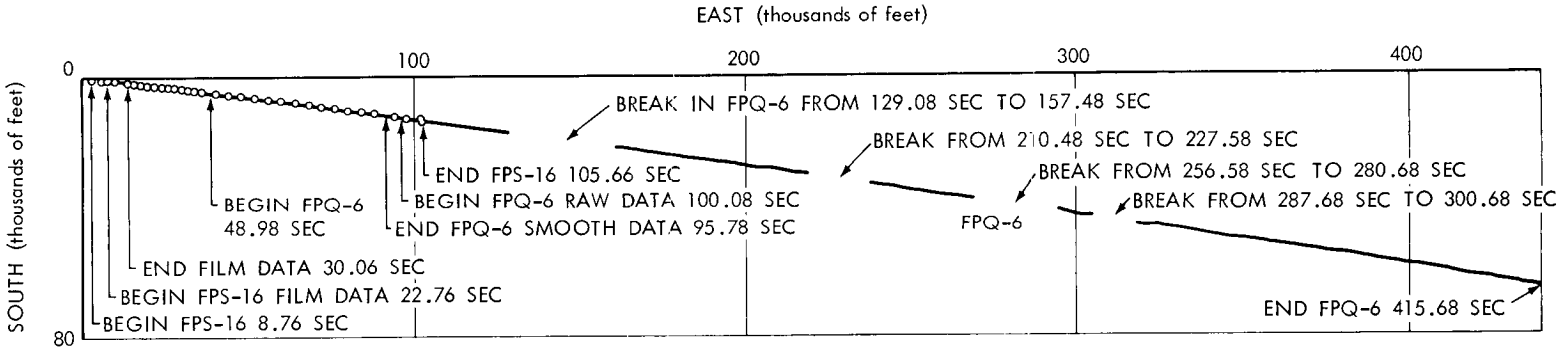

Figure 318. 14.245 UI Radar Plot, South Range vs East Range

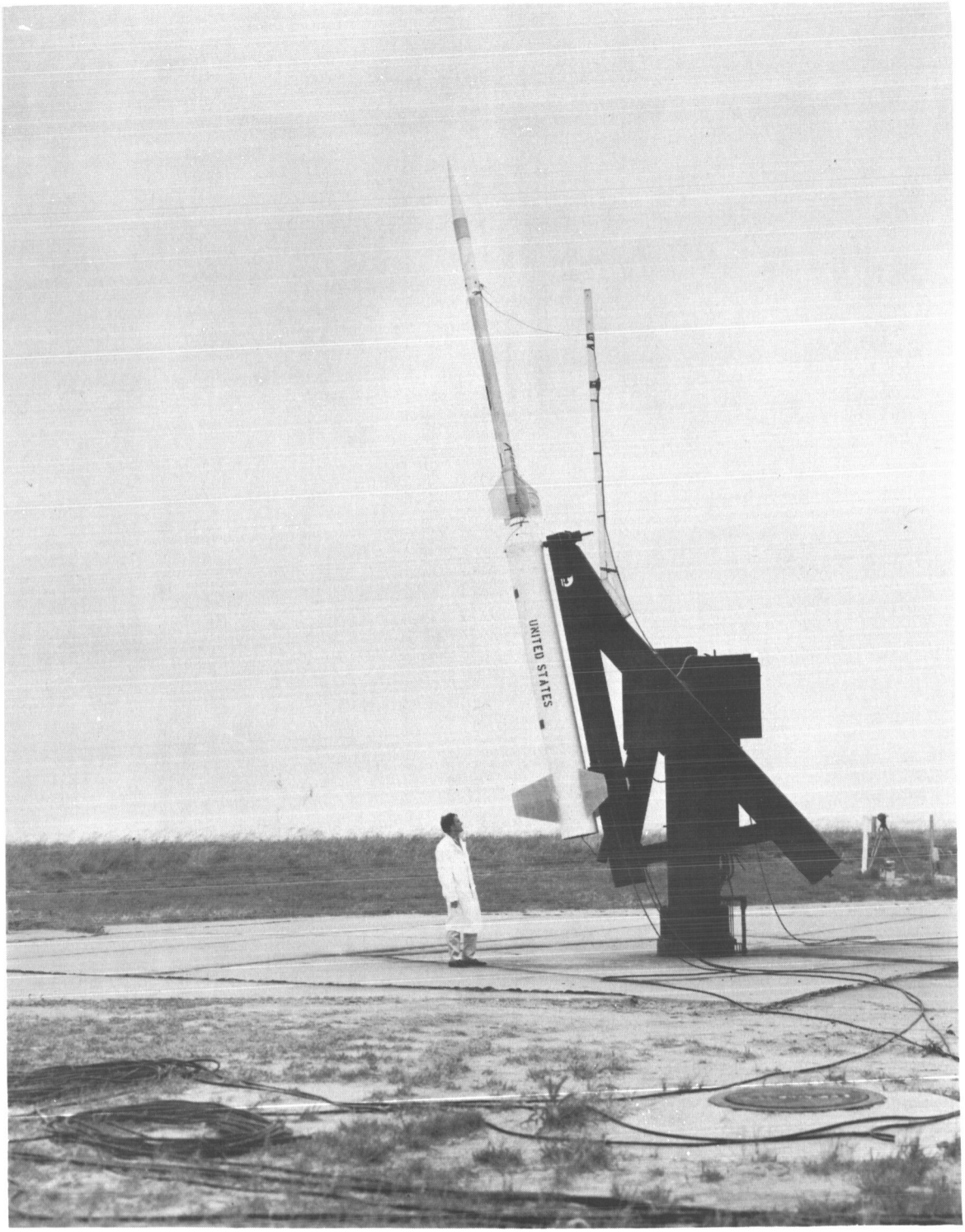

Figure 319. 14.246 UI Photograph

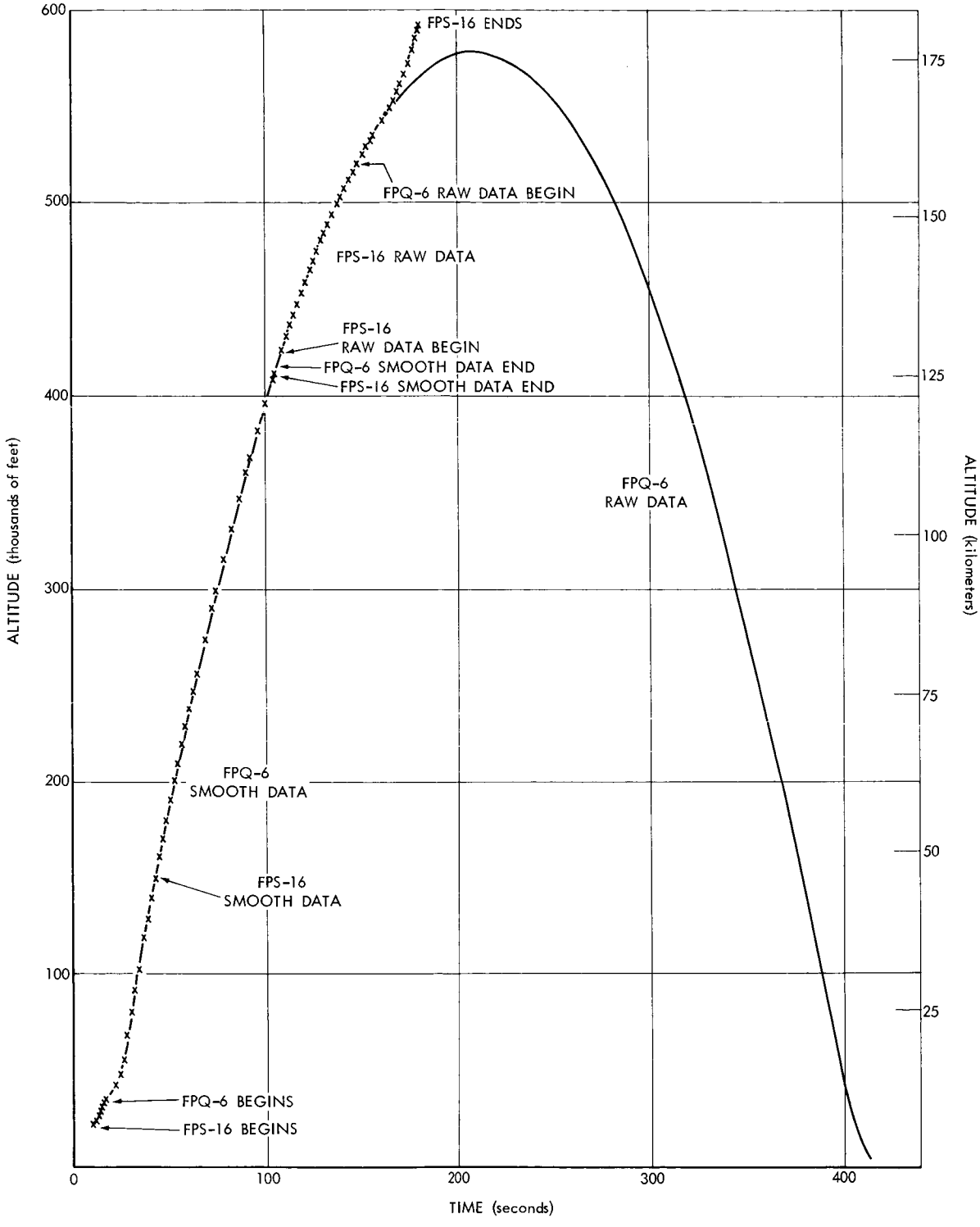

Figure 320. 14.246 UI Radar Plot, Altitude vs Time

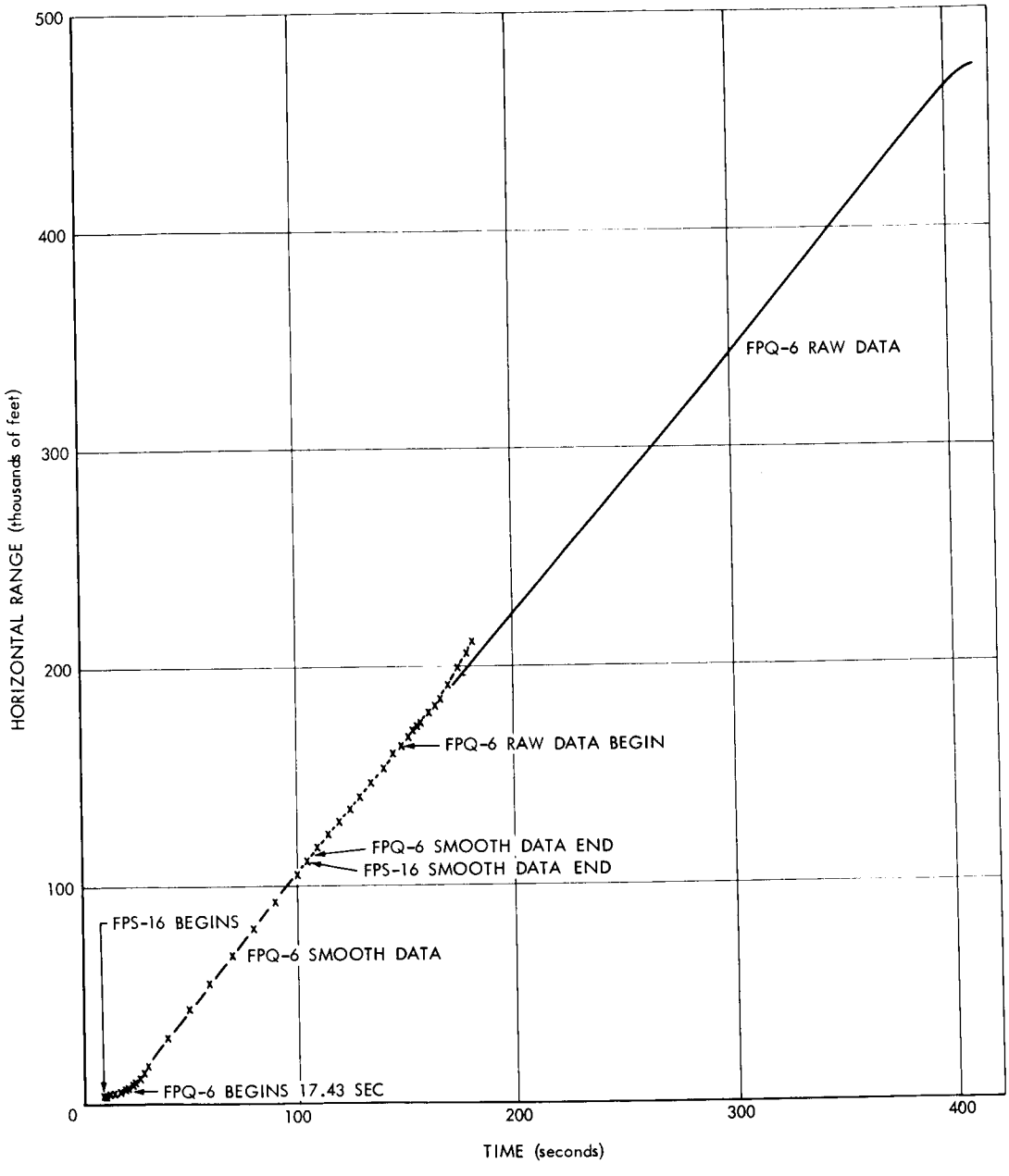

Figure 321. 14.246 UI Radar Plot, Horizontal Range vs Time

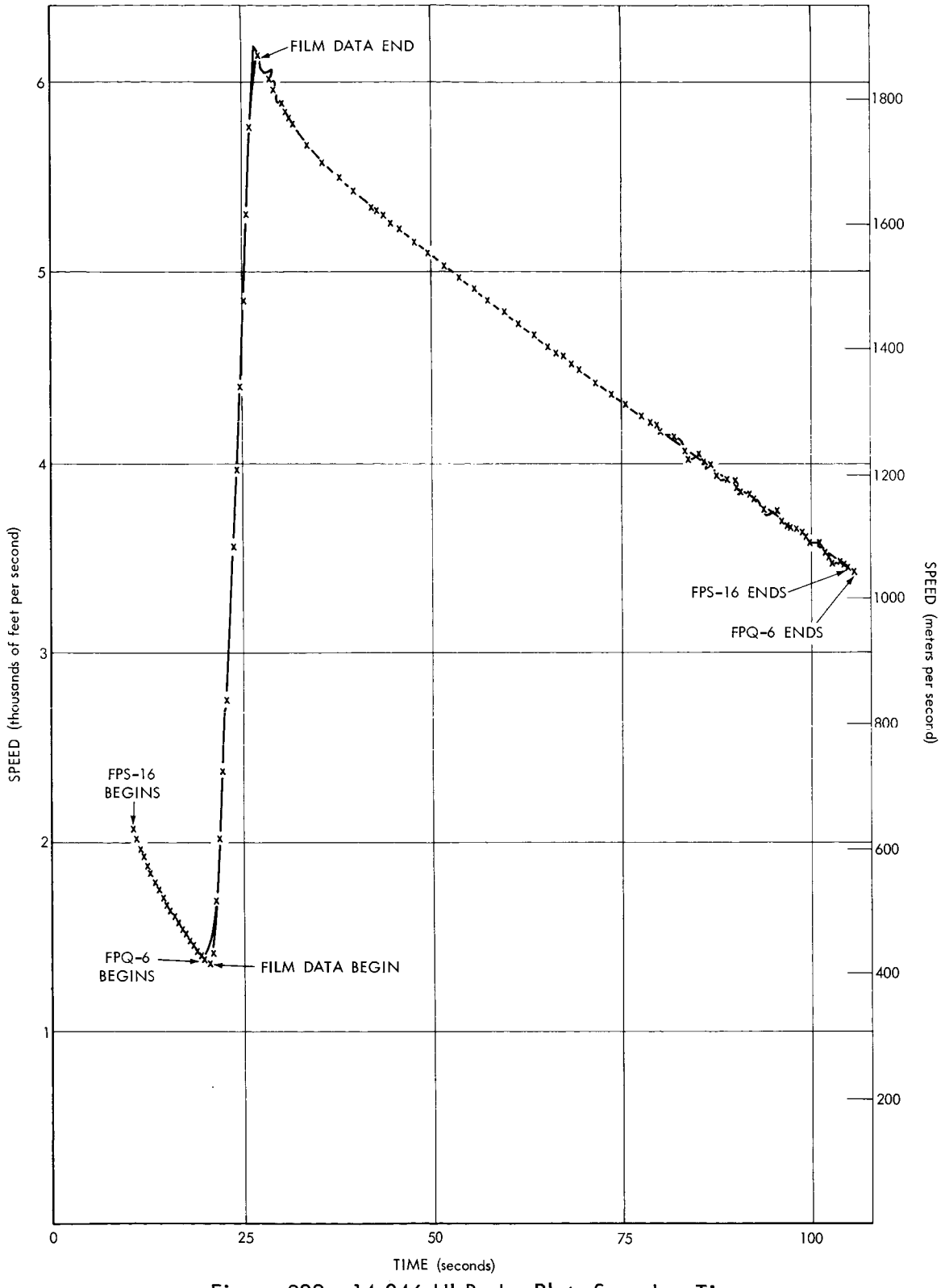

Figure 322. 14.246 UI Radar Plot, Speed vs Time

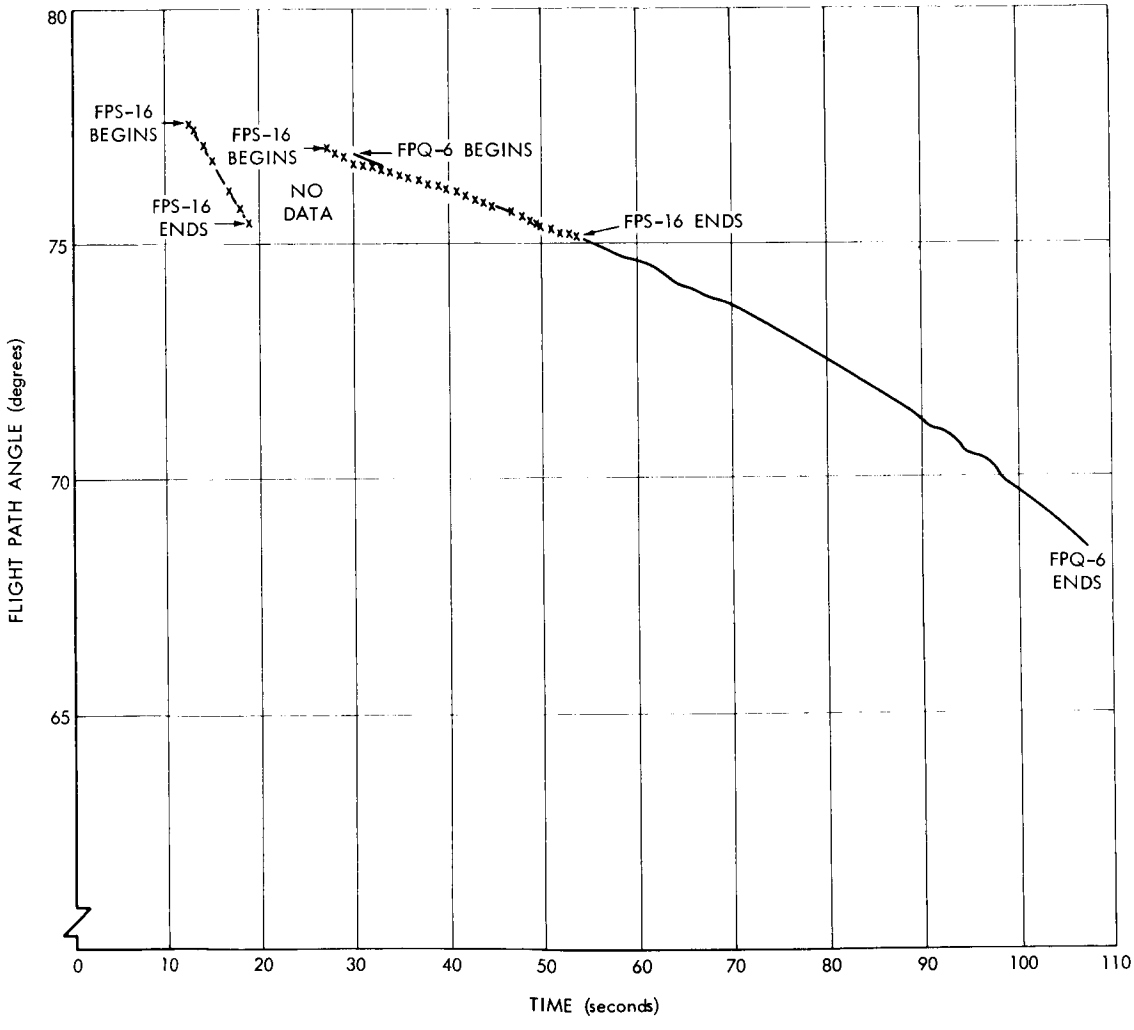

Figure 323. 14.246 UI Radar Plot, Flight Path Angle vs Time

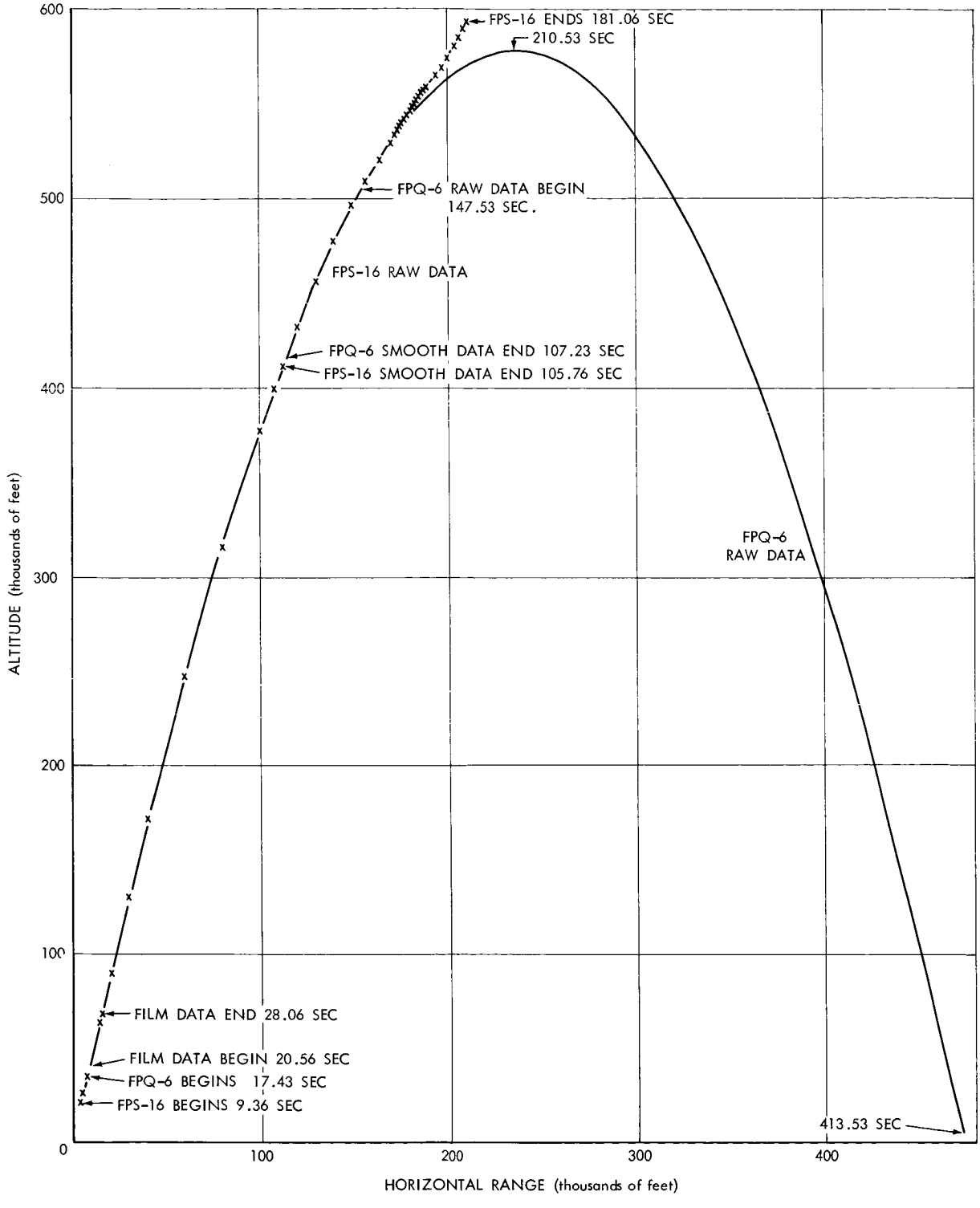

Figure 324. 14.246 UI Radar Plot, Altitude vs Horizontal Range

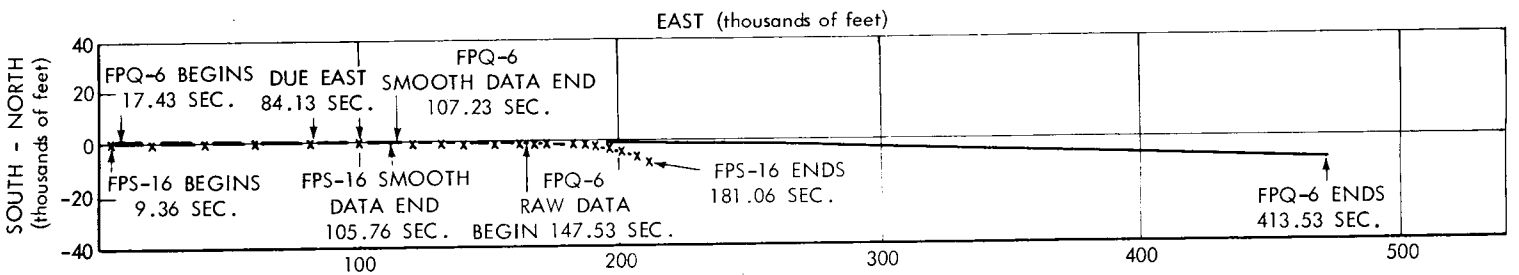

Figure 325. 14.246 UI Radar Plot, North-South Range vs East Range