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RADAR DATA FOR CHOOSING PASSES TO SATISFY THE APOLLO 7 (AS-205/CSM-101) RENDEZVOUS RADAR TEST OBJECTIVE

By Samuel L. Miller,
Orbital Mission Analysis Branch

(This revision supersedes MSC Internal Note No. 68-FM-152, dated June 25, 1968)

MISSION PLANNING AND ANALYSIS DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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PROJECT APOLLO

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HOUSTON, TEXAS

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RADAR DATA FOR CHOOSING PASSES TO SATISFY THE APOLLO 7 (AS-205/CSM-101) RENDEZVOUS RADAR TEST OBJECTIVE

By Samuel L. Miller

SUMMARY AND INTRODUCTION

One of the test objectives of the Apollo 7 (mission C or AS-205/CSM-101) is to simulate the CSM passing over the LM while the LM is on the lunar surface. The purpose of this objective (P6.8, ref. 1) is to determine if the rendezvous radar (RR) transponder transmission from the CSM and the reception link in the LM will operate in a manner consistent with the requirements of a mode II operation during a lunar-stay phase. This objective must be accomplished prior to the first lunar landing mission.

This document presents the tracking data required by the Instrumentation and Electronic Systems Division for choosing the CSM passes over the White Sands Missile Range (WSMR) tracking site during which this test objective may be satisfied. The WSRM tracking station will have the LM RR reception link.

This document supersedes reference 2 and reference 4.

DISCUSSION OF DATA

The Mission C operational trajectory, revision 1 (reference 3) was used as a basis for generating radar data for the WSMR tracking site.

Table I presents the ground elapsed times at which suitable conditions exist for conducting the LM RR test objective. The final criteria for selecting suitable revolutions for the LM RR test are given below (ref. 1).

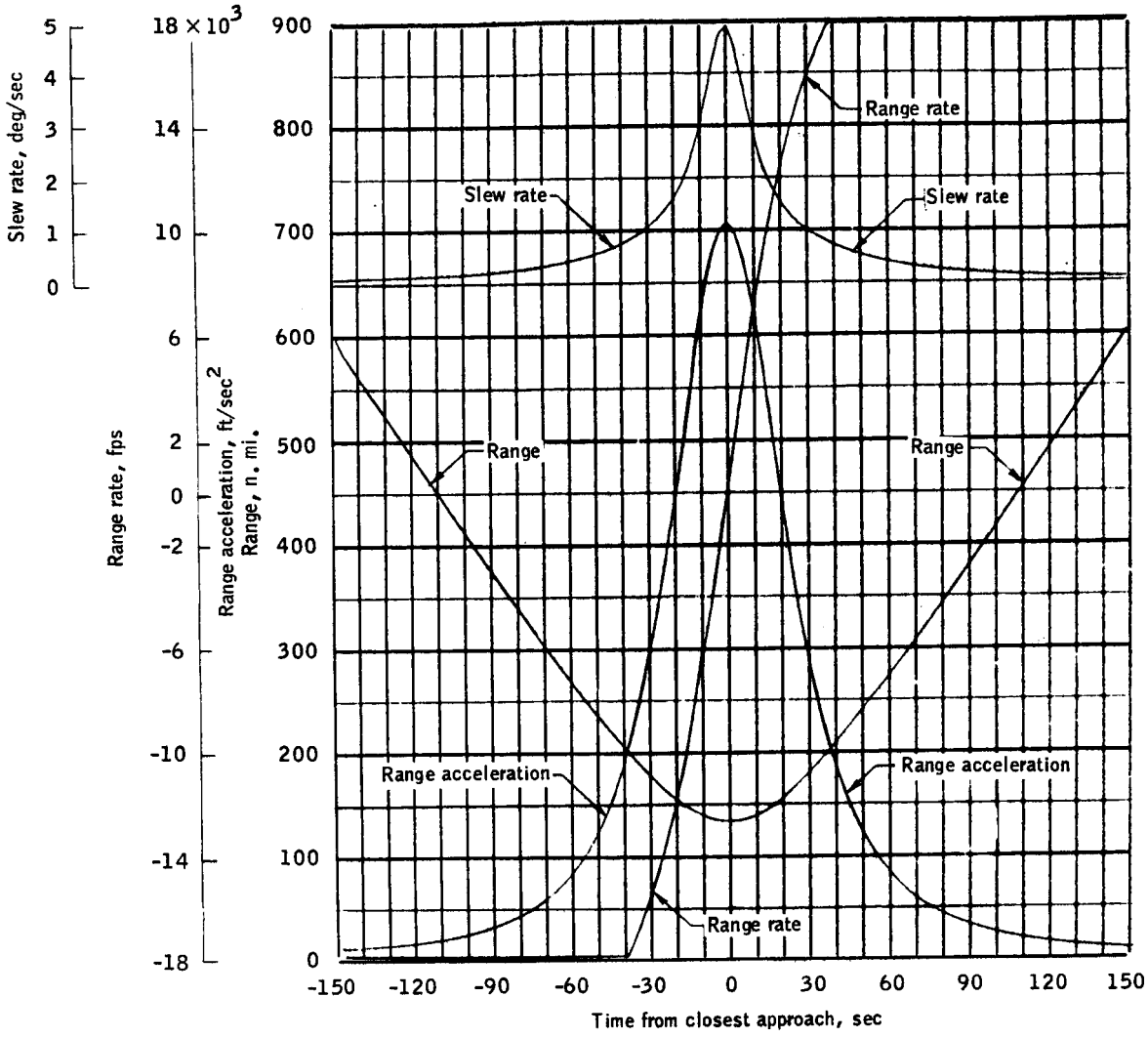
Maximum range, n. mi.	400
Range rate, fps	-5500 to 5500
Maximum range acceleration, ft/sec^2	300
Maximum slew rate, deg/sec	2.6
Minimum elevation angle, deg	8

Figure 1 presents plots of range, range-rate, range acceleration, and slew rate for each WSMR pass. These parameters are plotted as a function of dwell time over the station with time zero being the time of closest approach.

TABLE I.- TIME INTERVALS FOR VARIOUS REVOLUTIONS

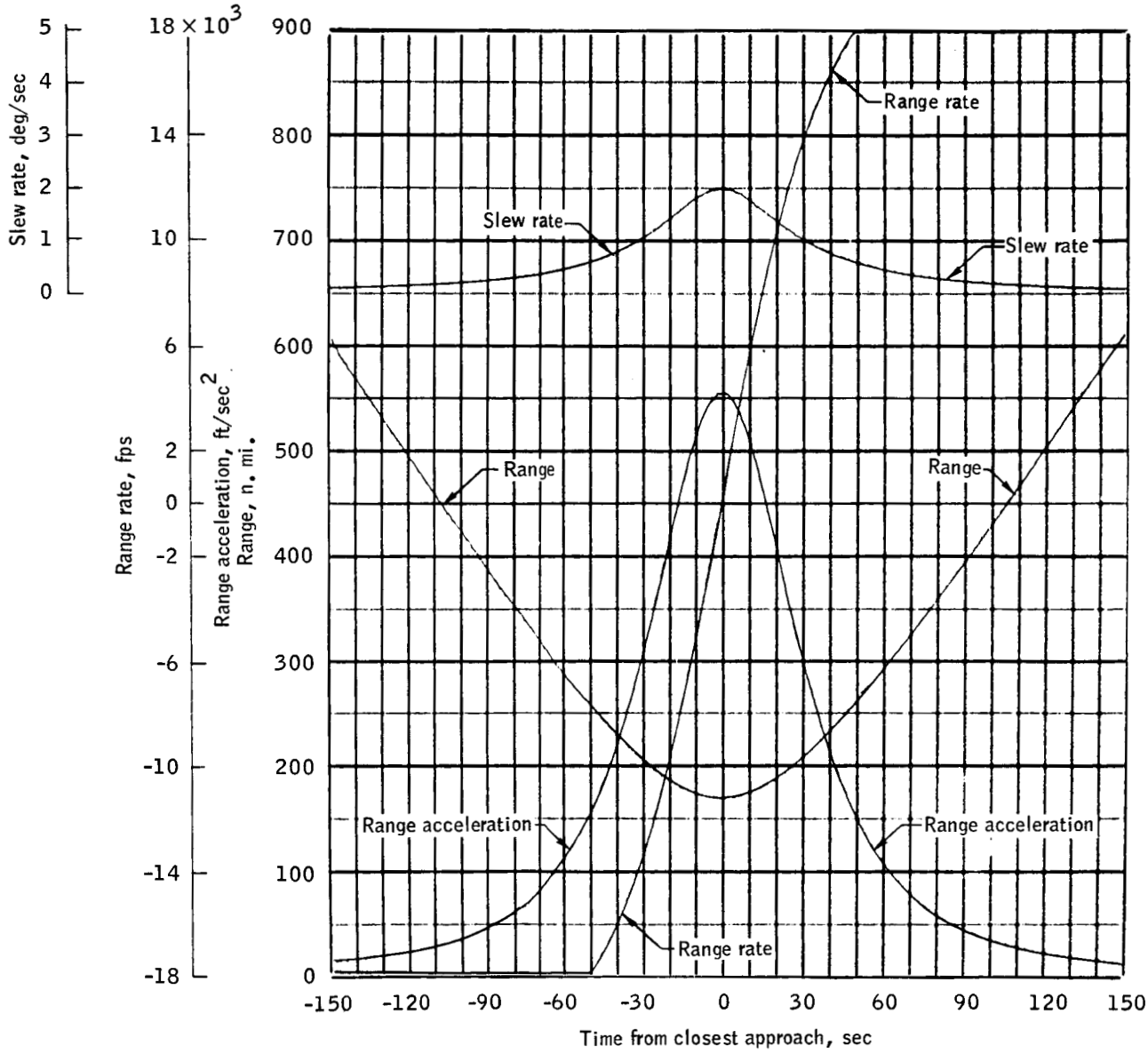
DURING WHICH LM RR CONSTRAINTS ARE SATISFIED

Revolution	Time Interval Satisfying LM RR Constraints, g.e.t.		Duration sec
	Beginning, day:hr:min:sec	End day:hr:min:sec	
45	02:23:41:07	02:23:41:46	39
48	03:04:24:08	03:04:24:53	45
107	07:01:47:43	07:01:48:26	43
136	09:00:29:20	09:00:29:57	37



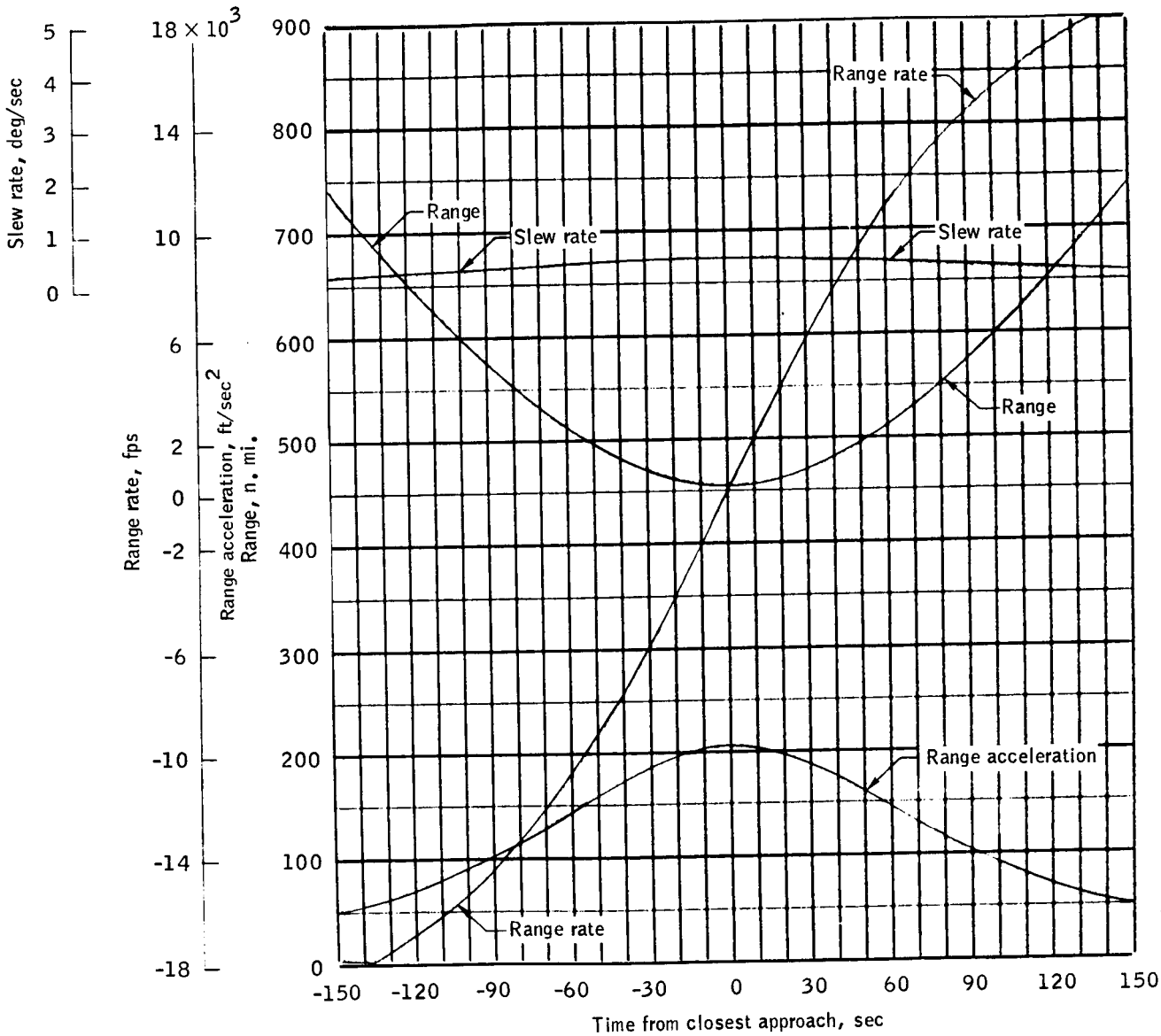
(a) Revolution 2.

Figure 1.- Radar data for White Sands missile range based on revision I of the Apollo 7 operational trajectory.



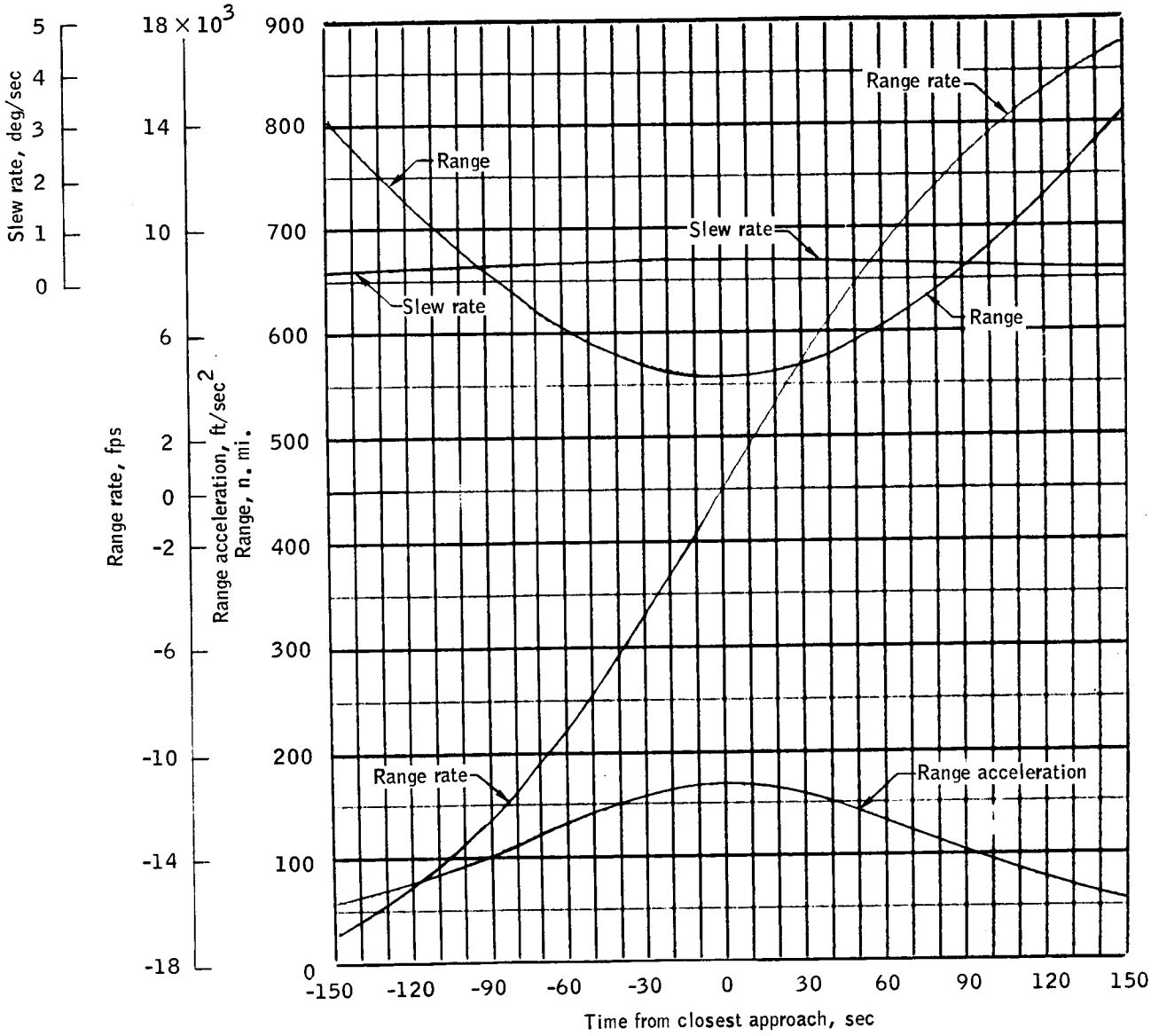
(b) Revolution 3.

Figure 1.- Continued.



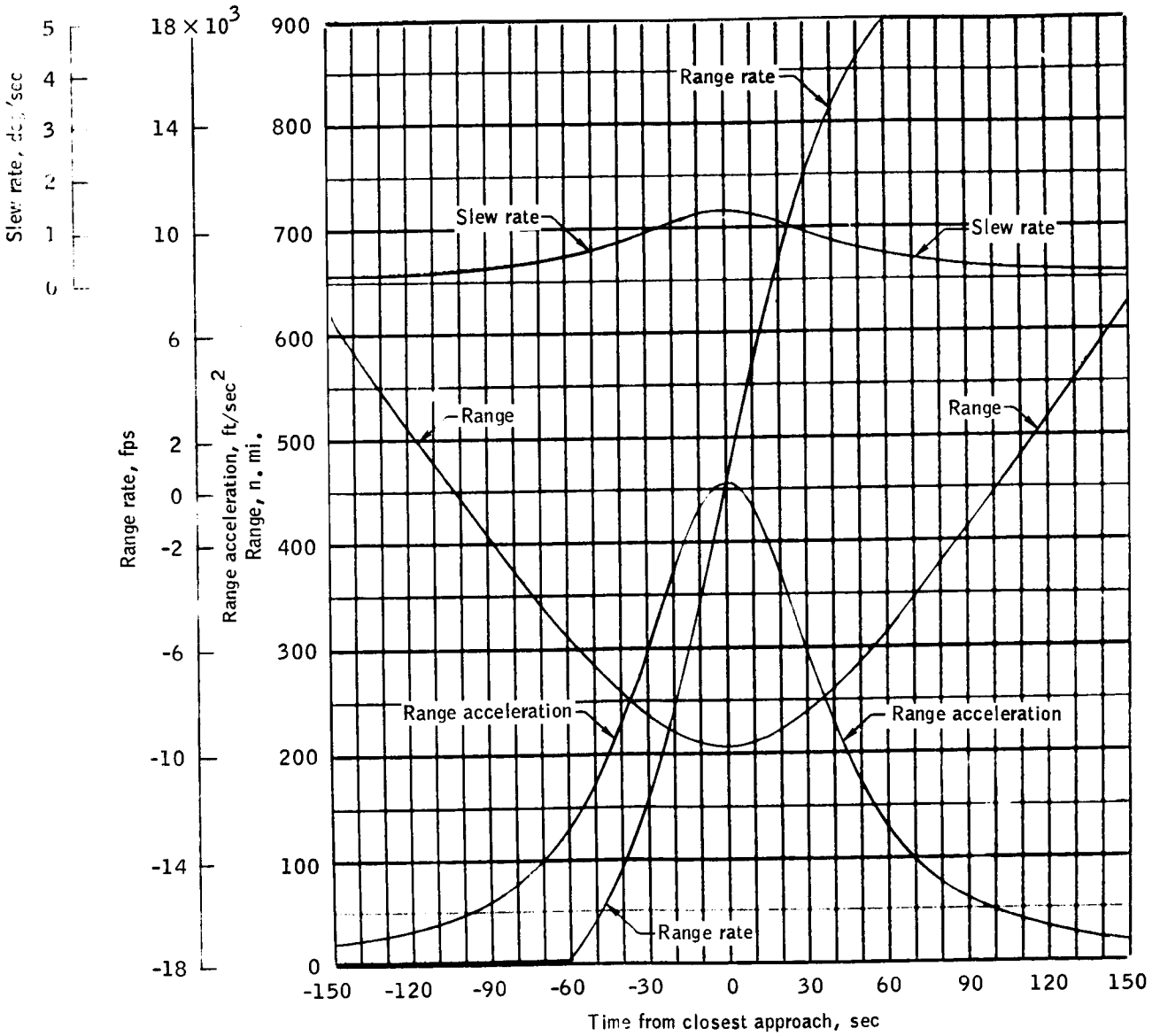
(c) Revolution 4.

Figure 1.- Continued.



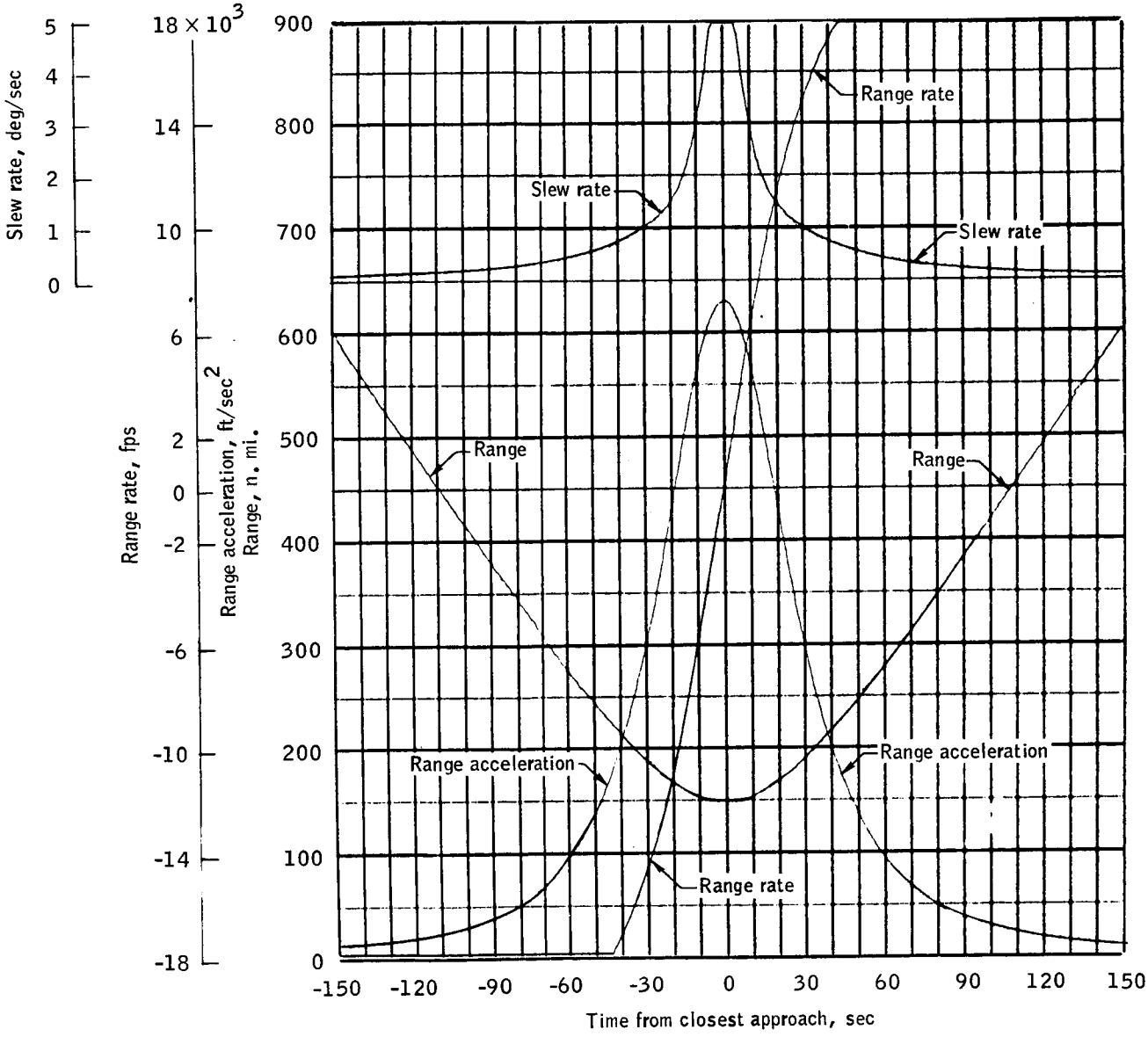
(d) Revolution 15.

Figure 1.- Continued.



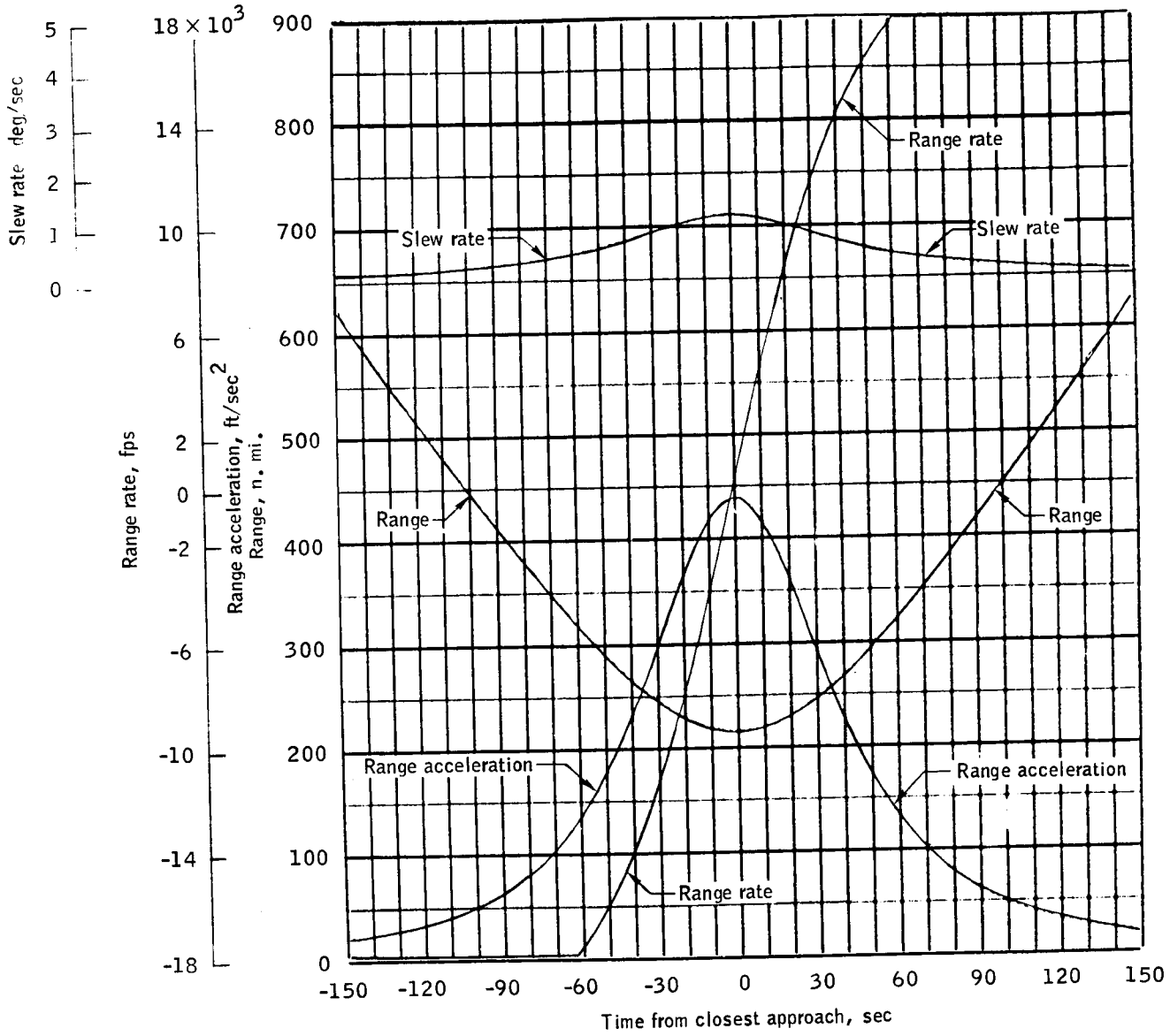
(e) Revolution 16.

Figure 1.- Continued.



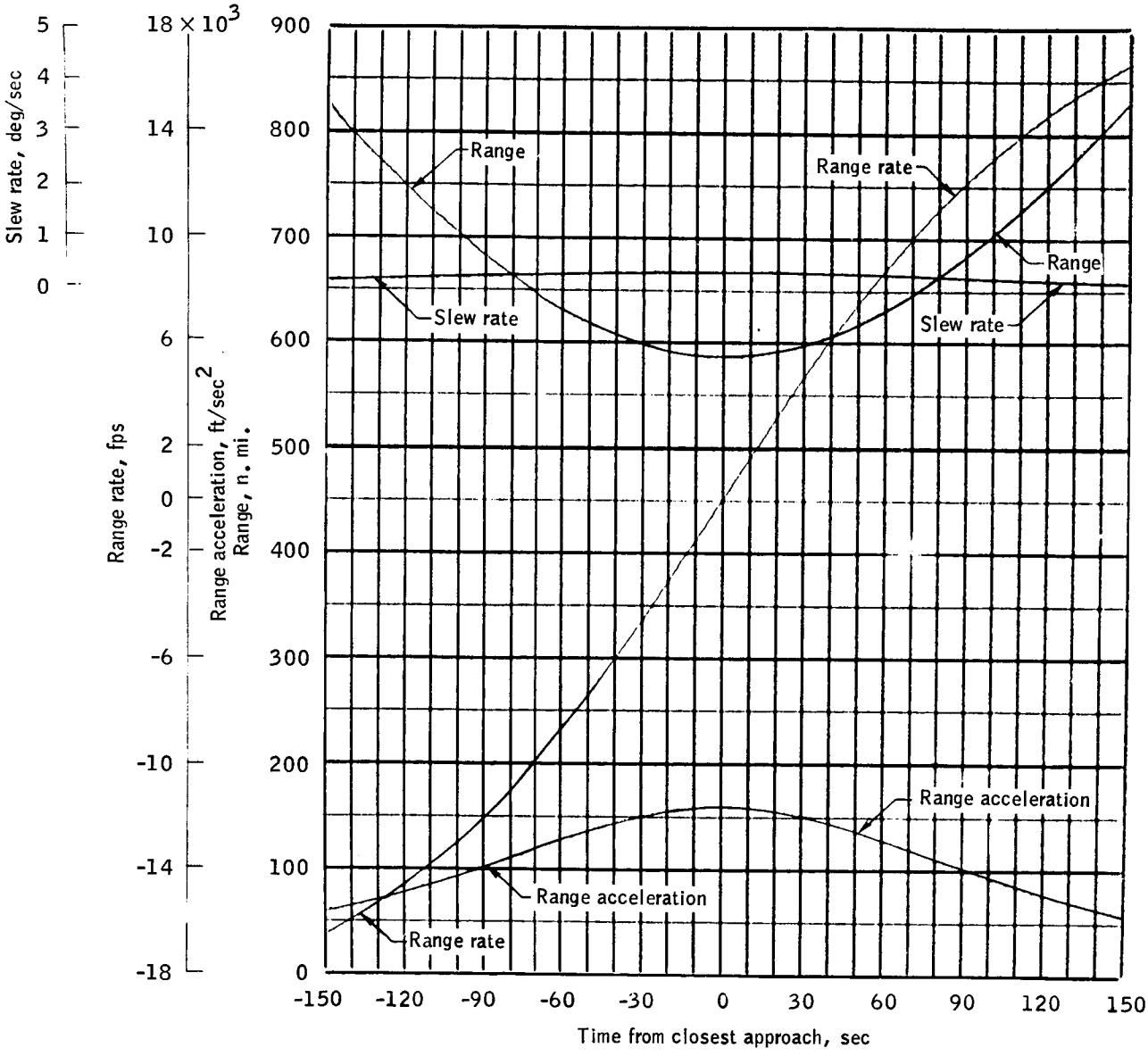
(f) Revolution 17.

Figure 1.- Continued.



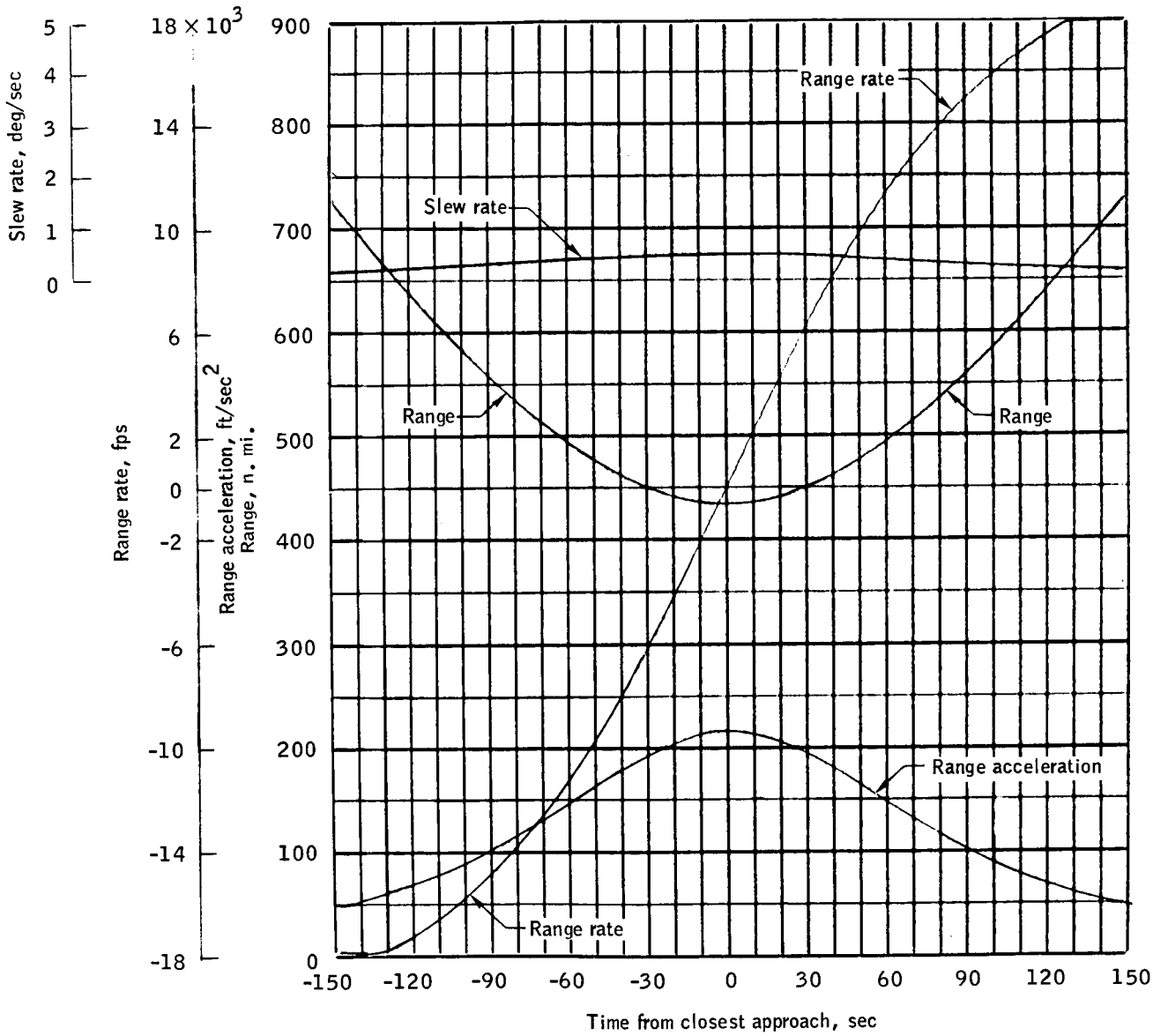
(g) Revolution 18.

Figure 1.- Continued.



(h) Revolution 19.

Figure 1.- Continued.



(i) Revolution 30.

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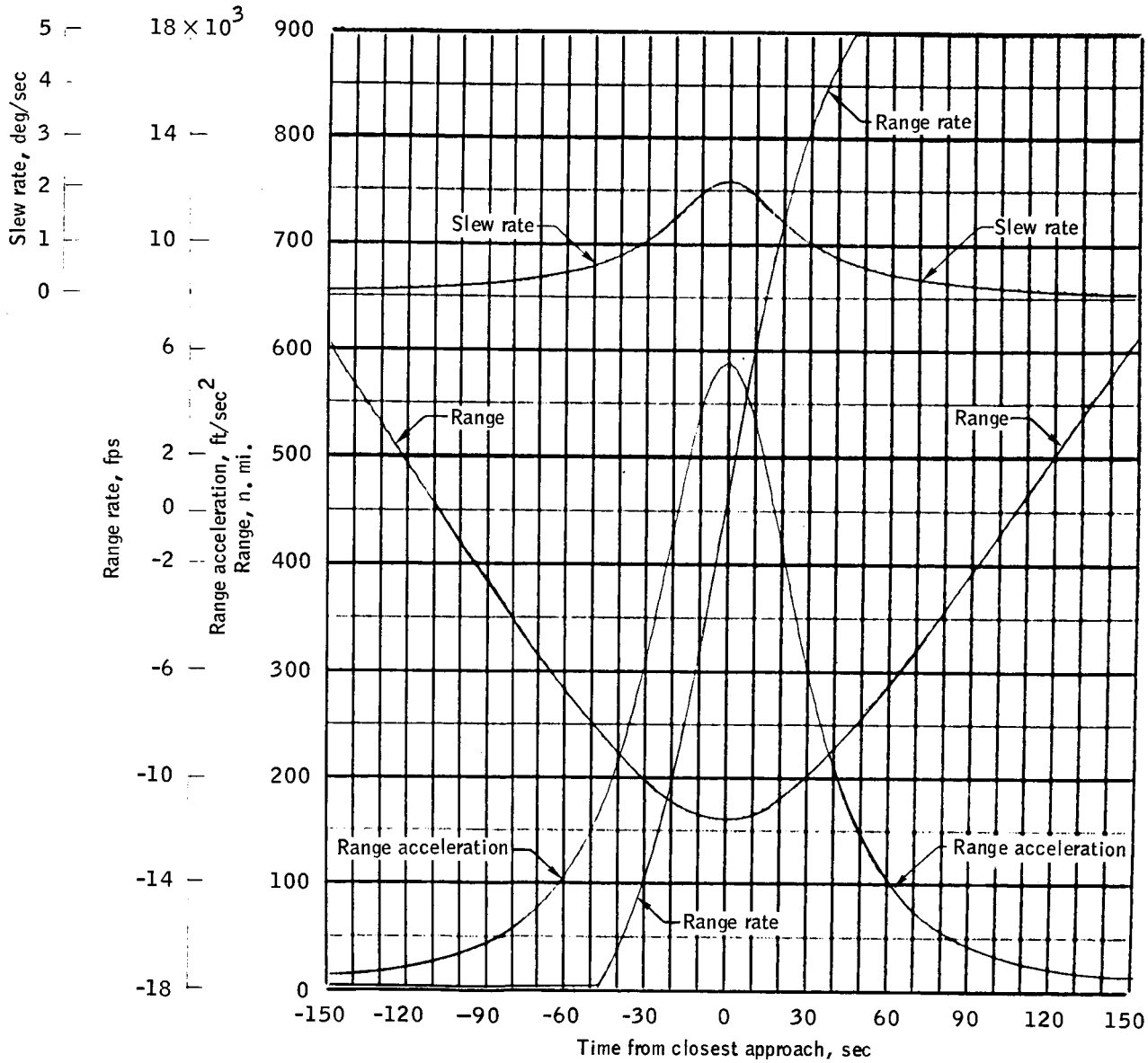
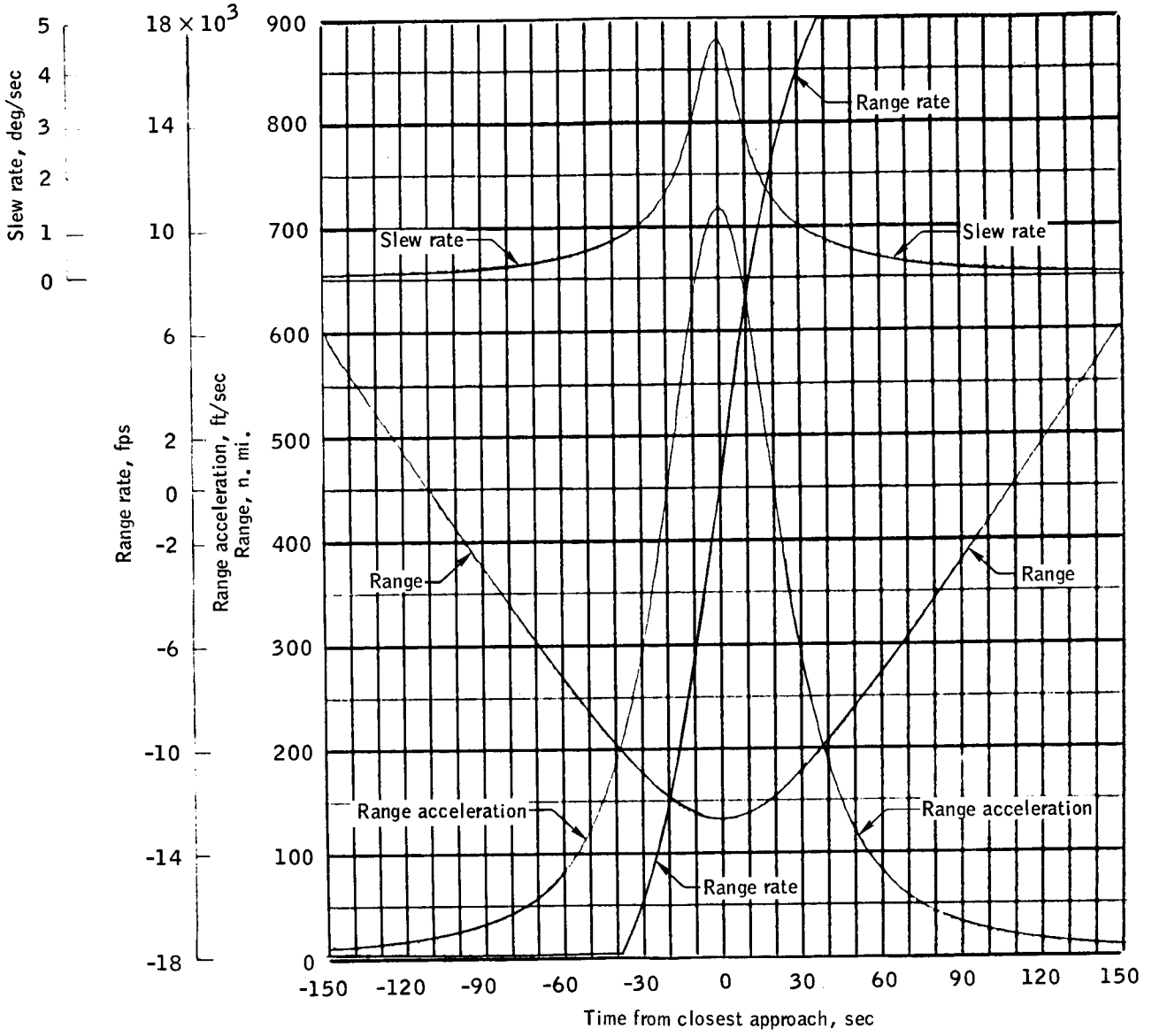


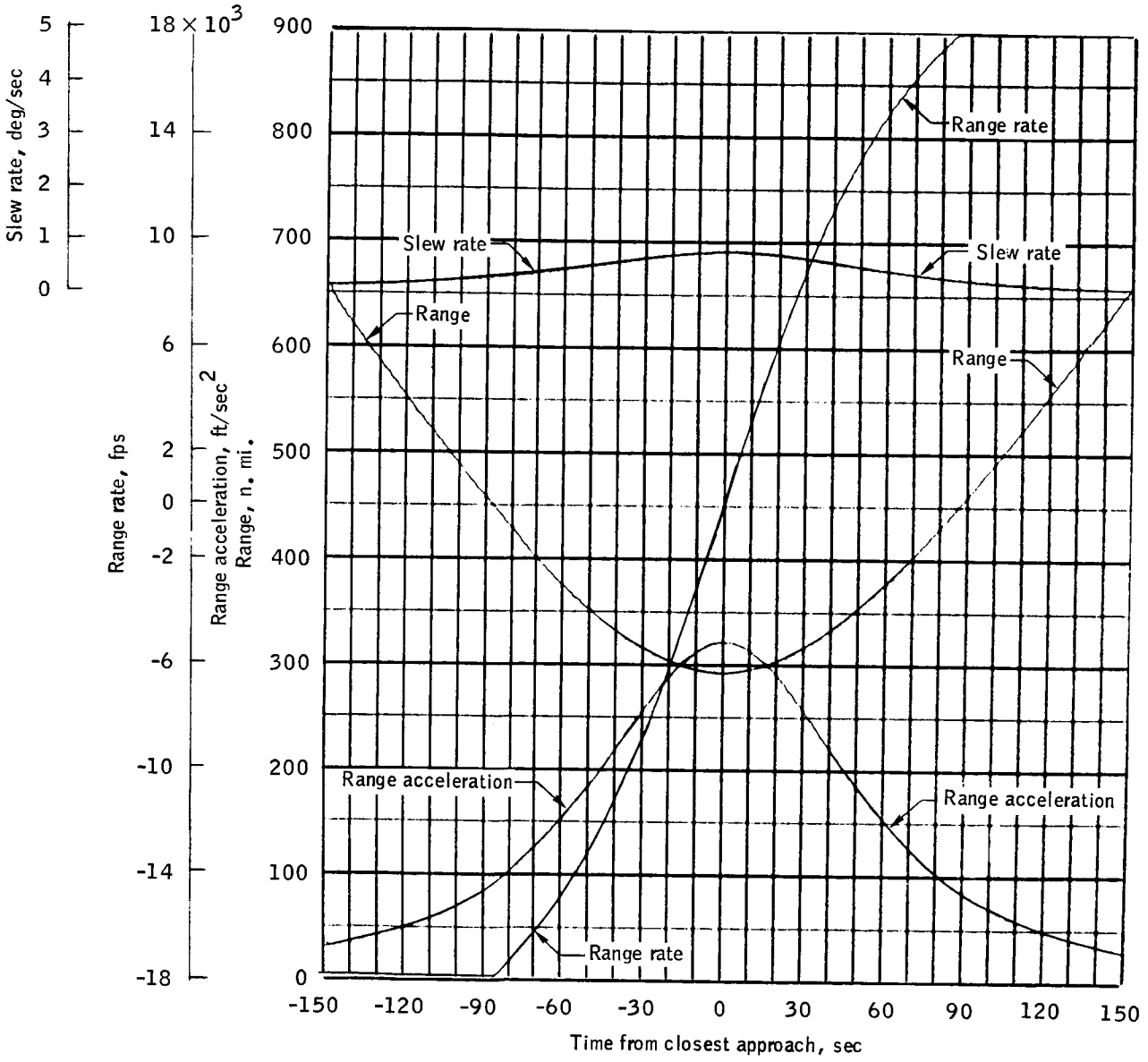
(j) Revolution 31.

Figure 1.- Continued.



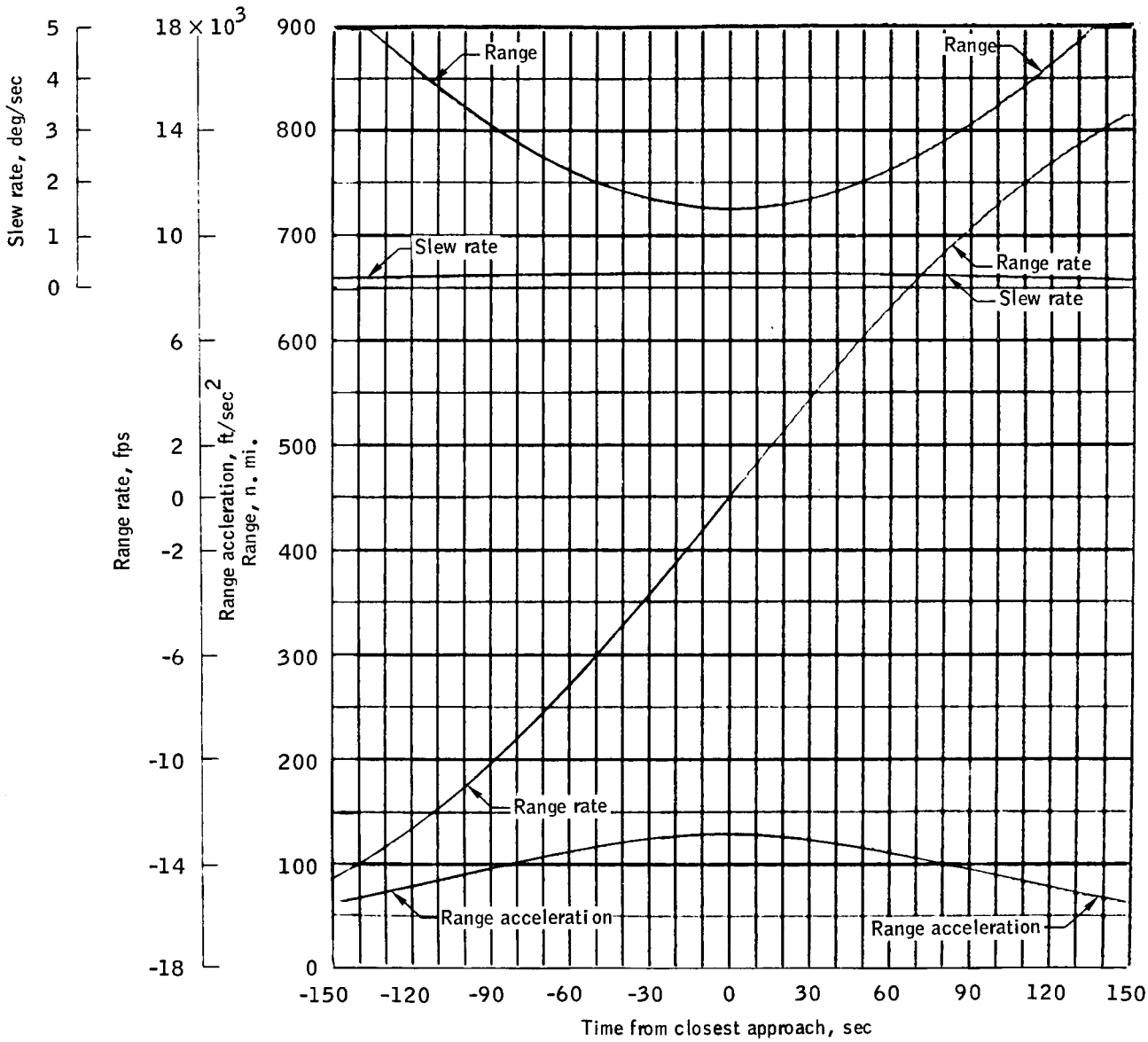
(k) Revolution 32.

Figure 1.- Continued.



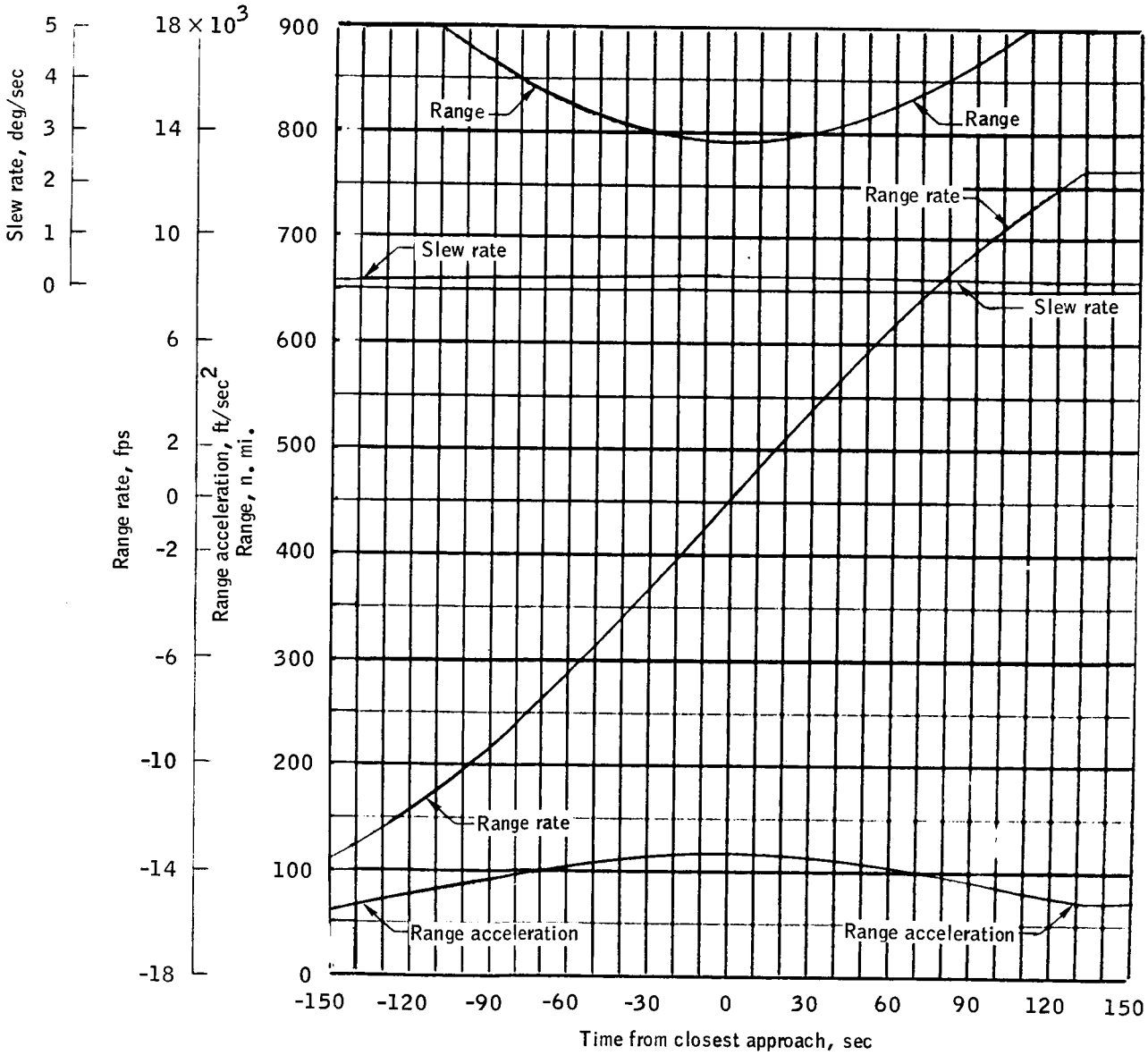
(l) Revolution 33.

Figure 1.- Continued.



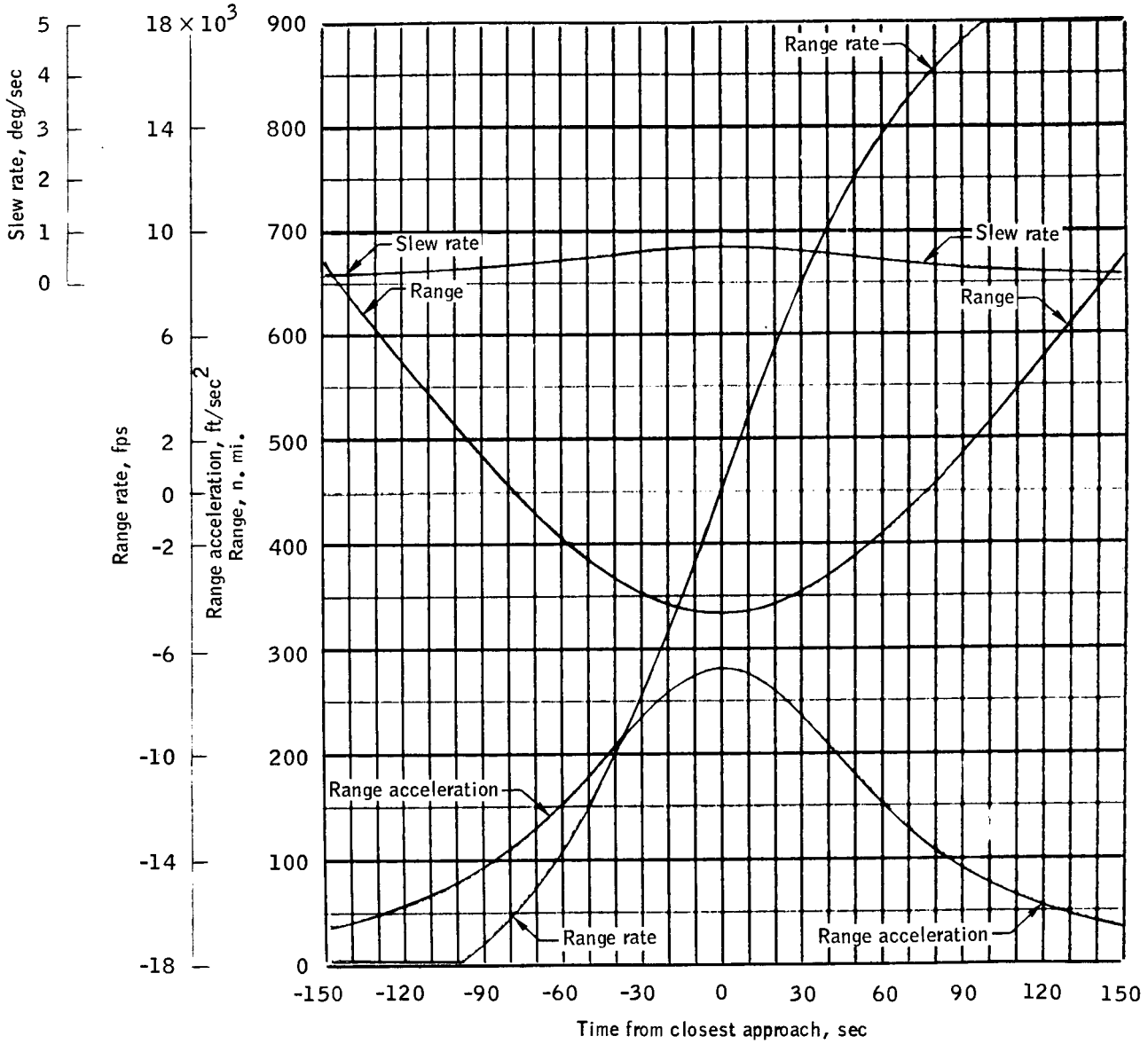
(m) Revolution 34.

Figure 1.- Continued.



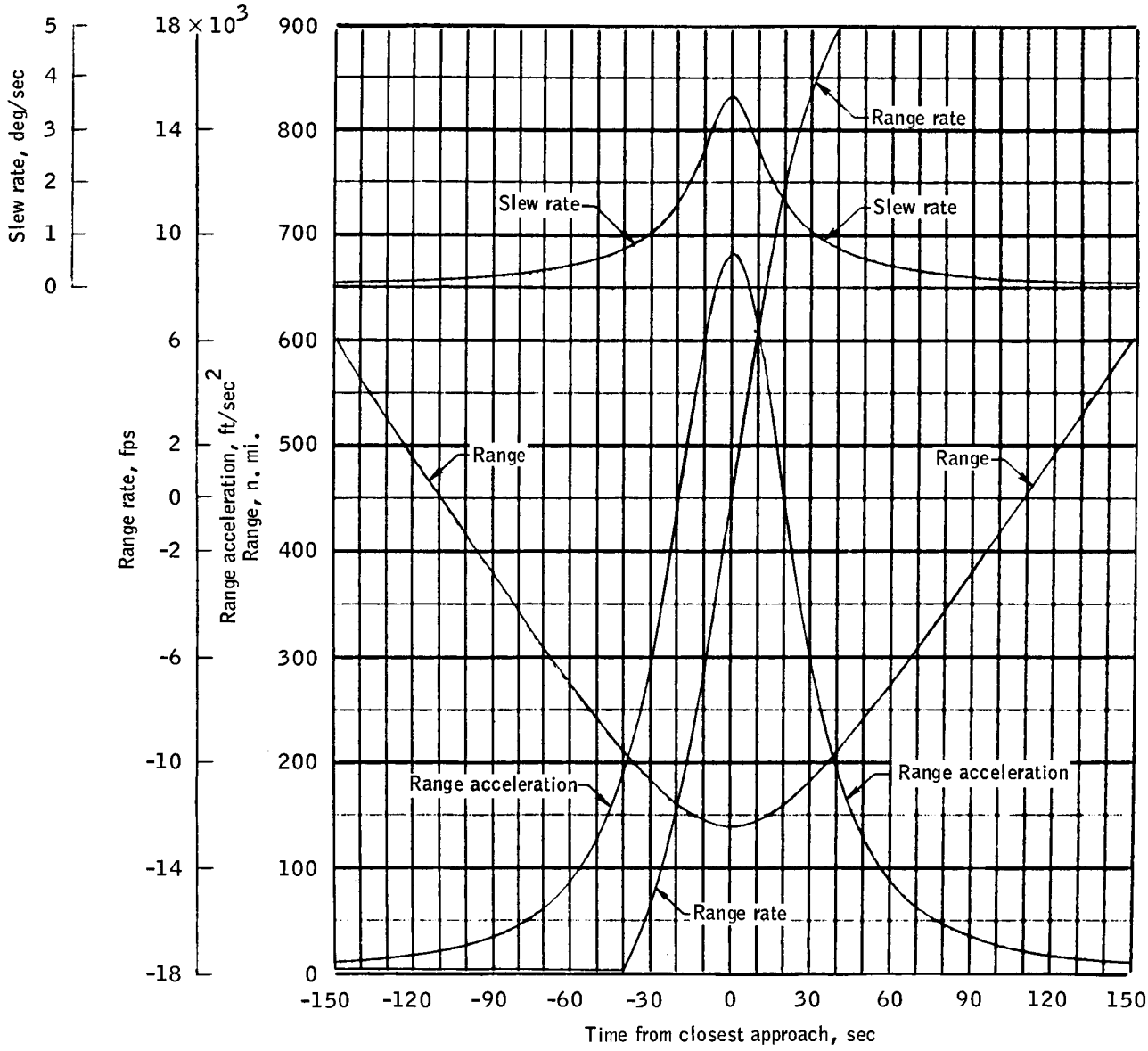
(n) Revolution 44.

Figure 1.- Continued.



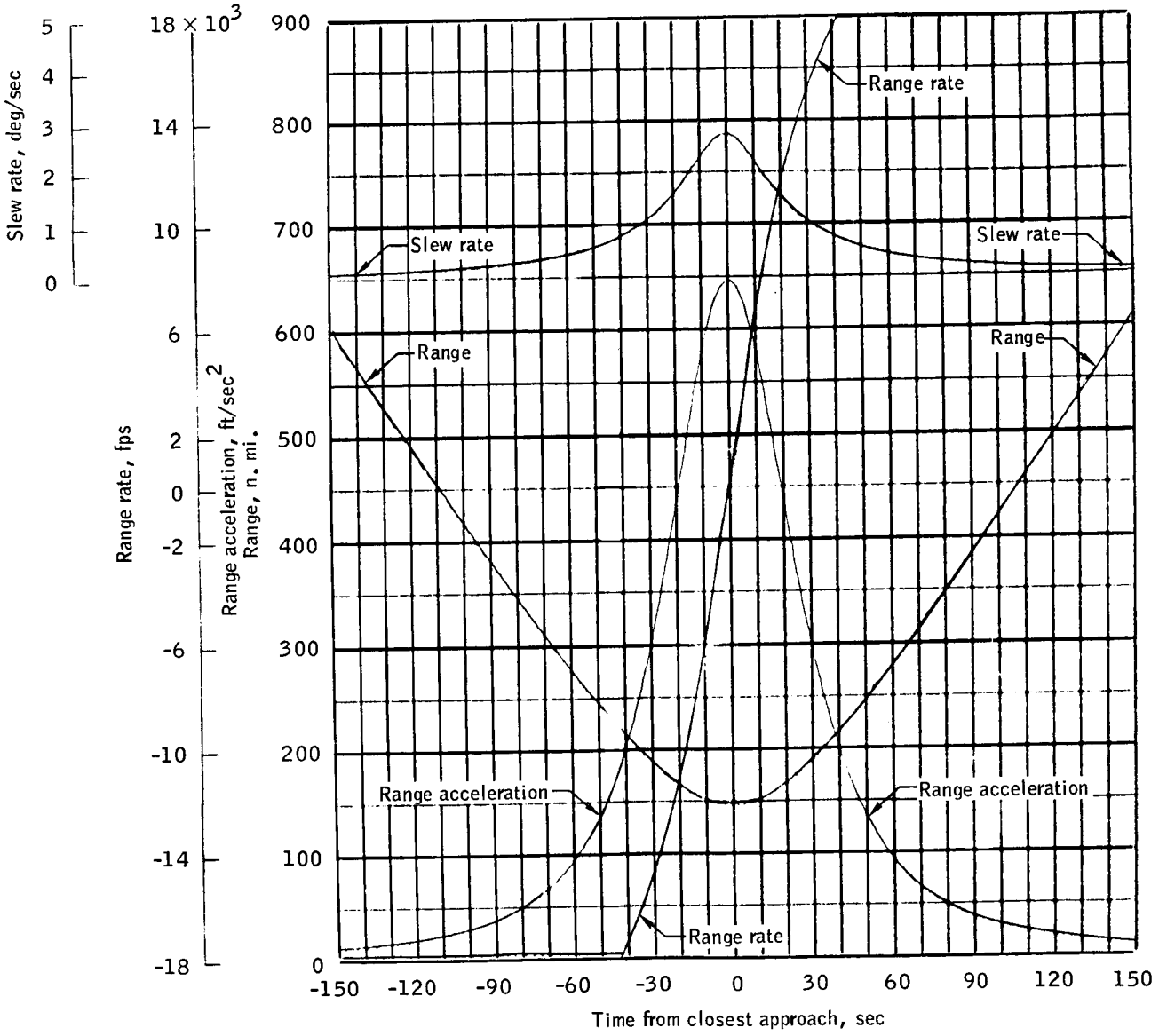
(o) Revolution 45.

Figure 1.- Continued.



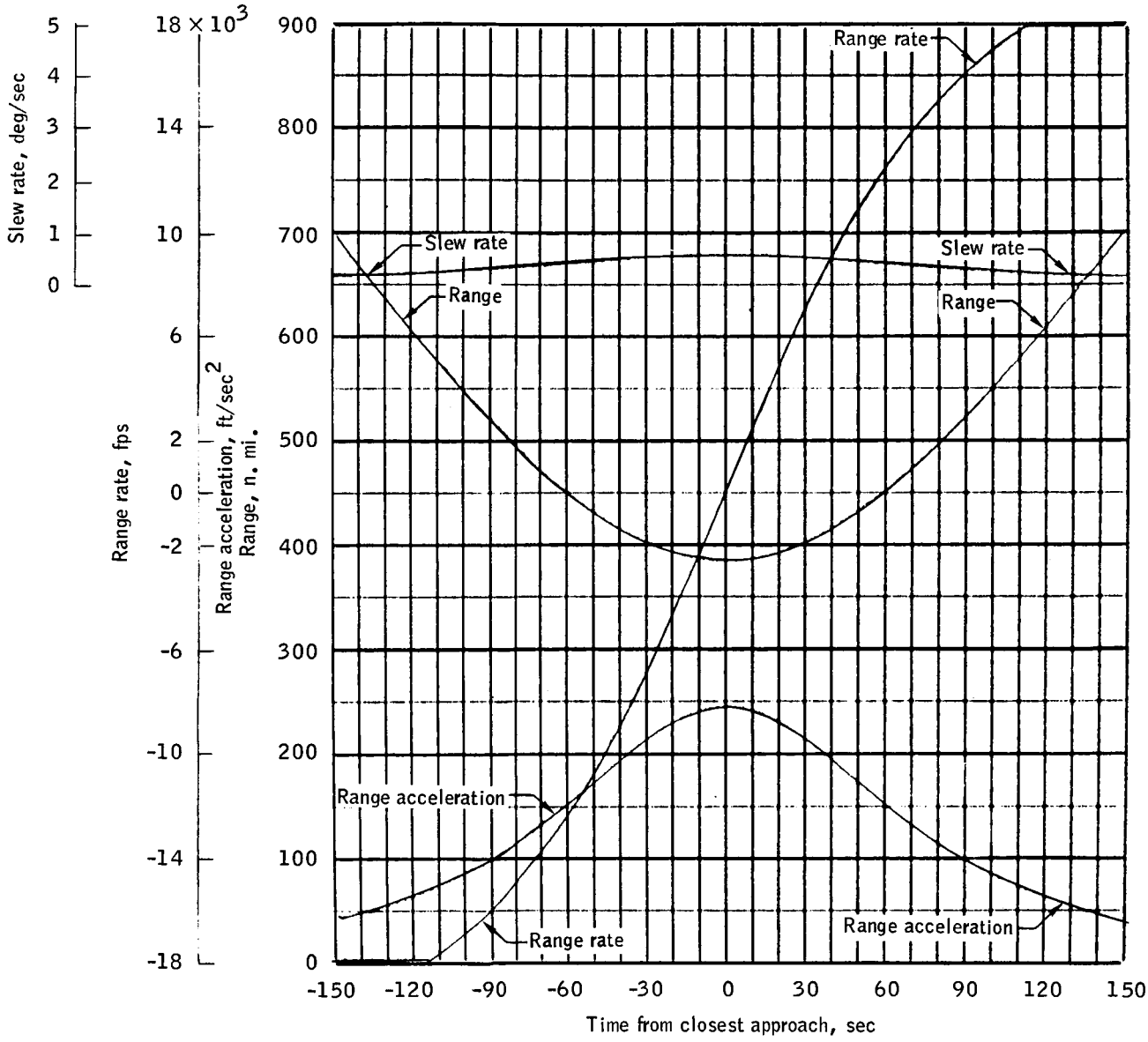
(p) Revolution 46.

Figure 1.- Continued.



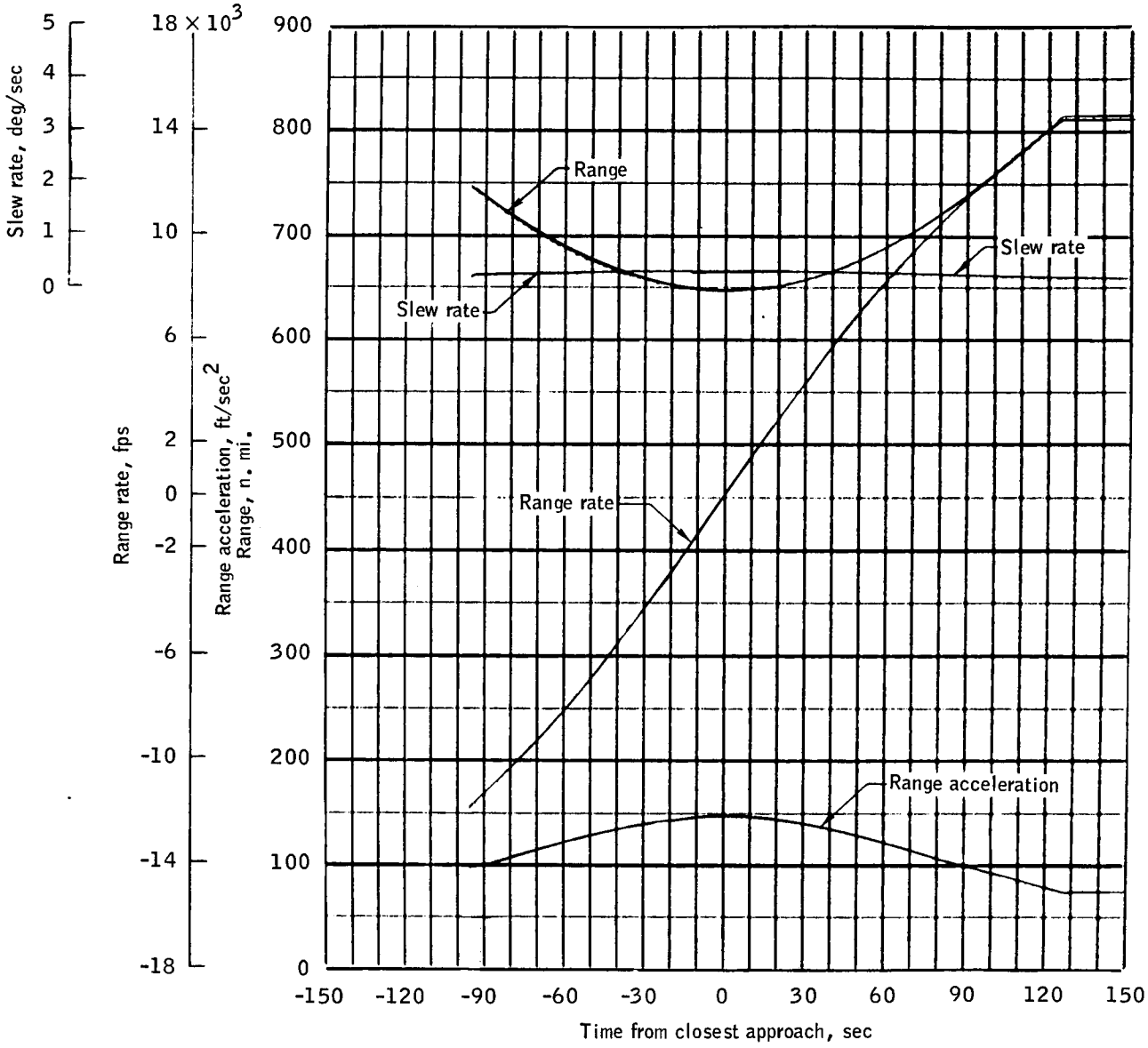
(q) Revolution 47.

Figure 1.- Continued.



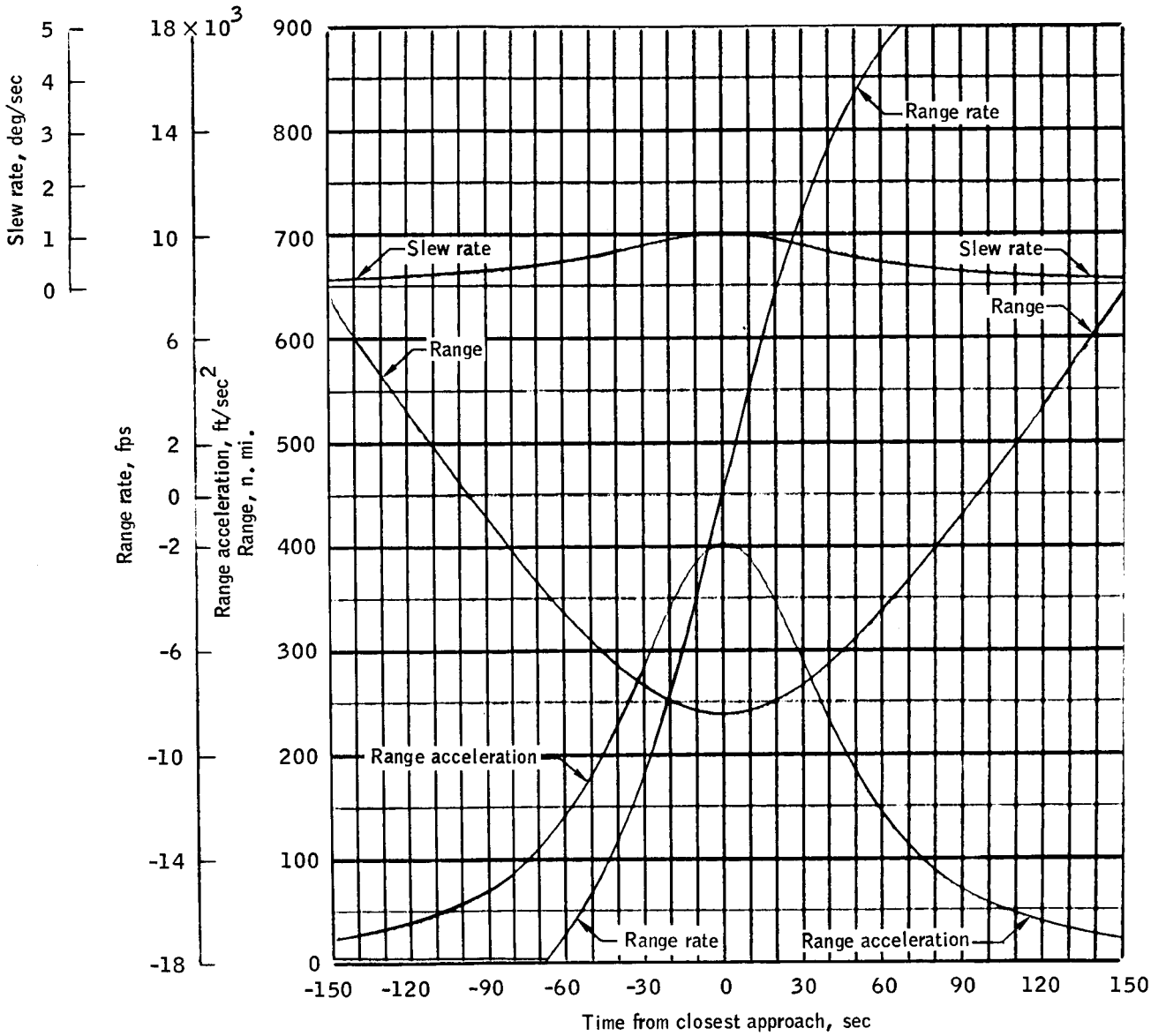
(r) Revolution 48.

Figure 1.- Continued.



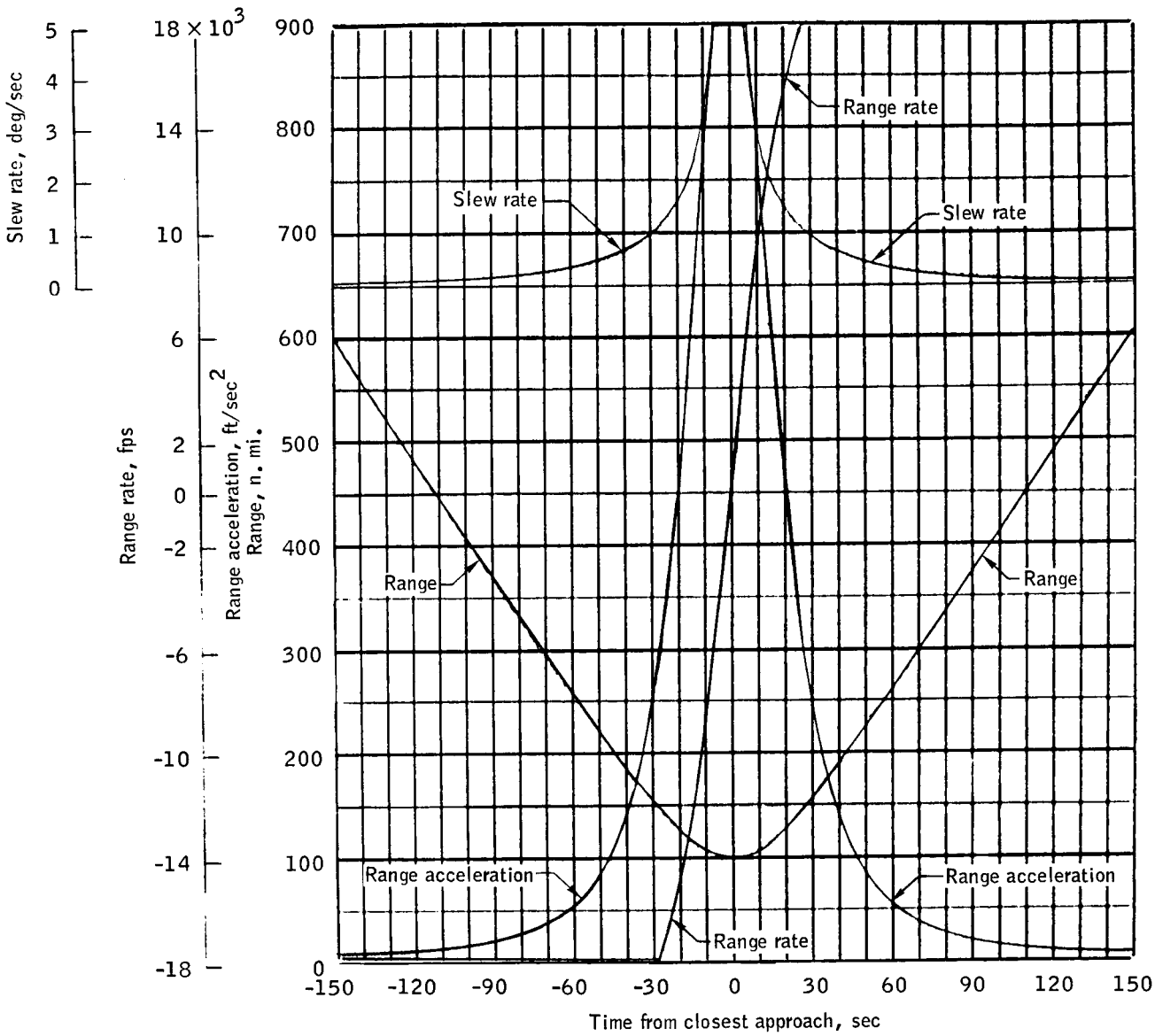
(s) Revolution 59.

Figure 1.- Continued.



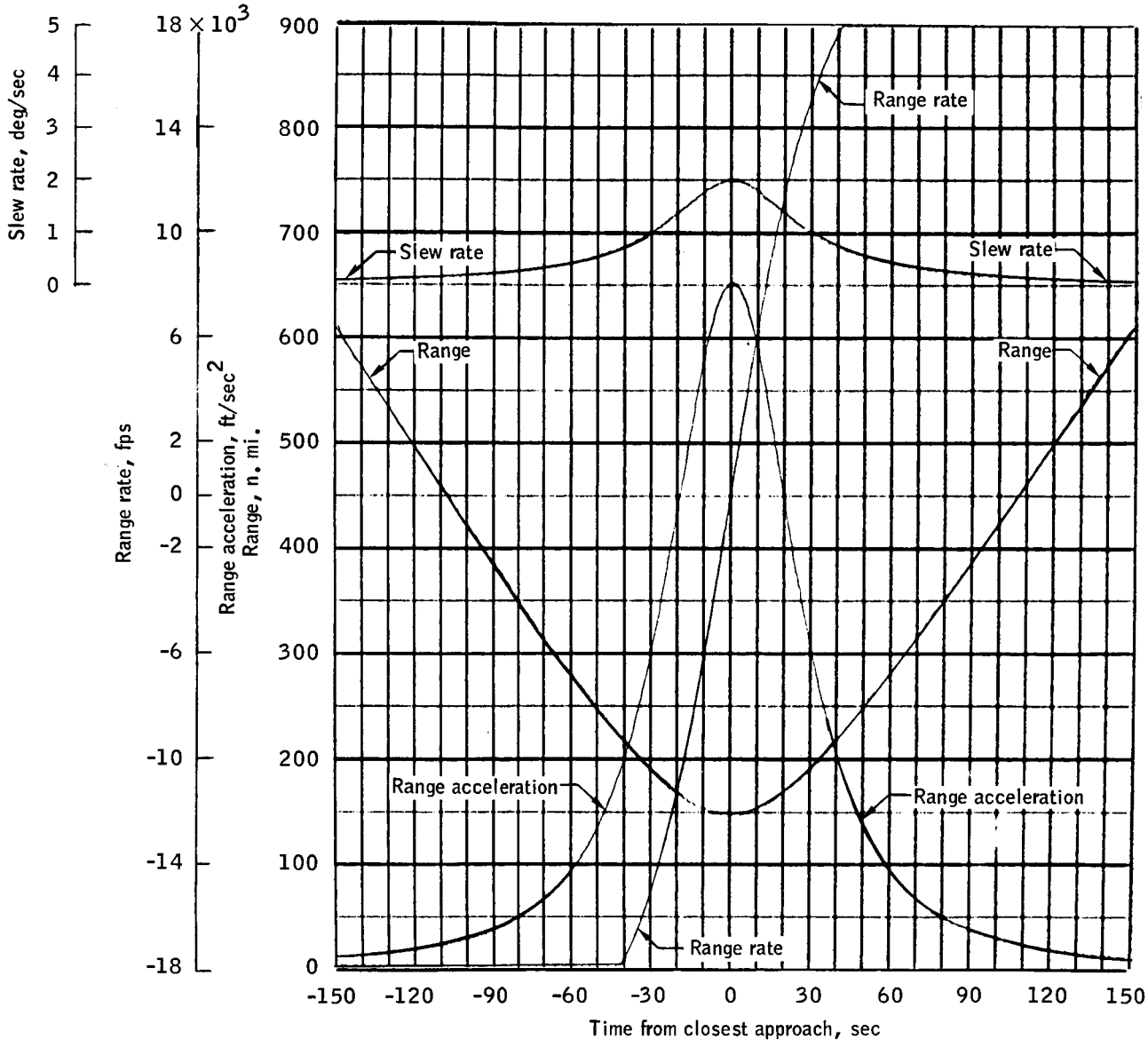
(t) Revolution 60.

Figure 1.- Continued.



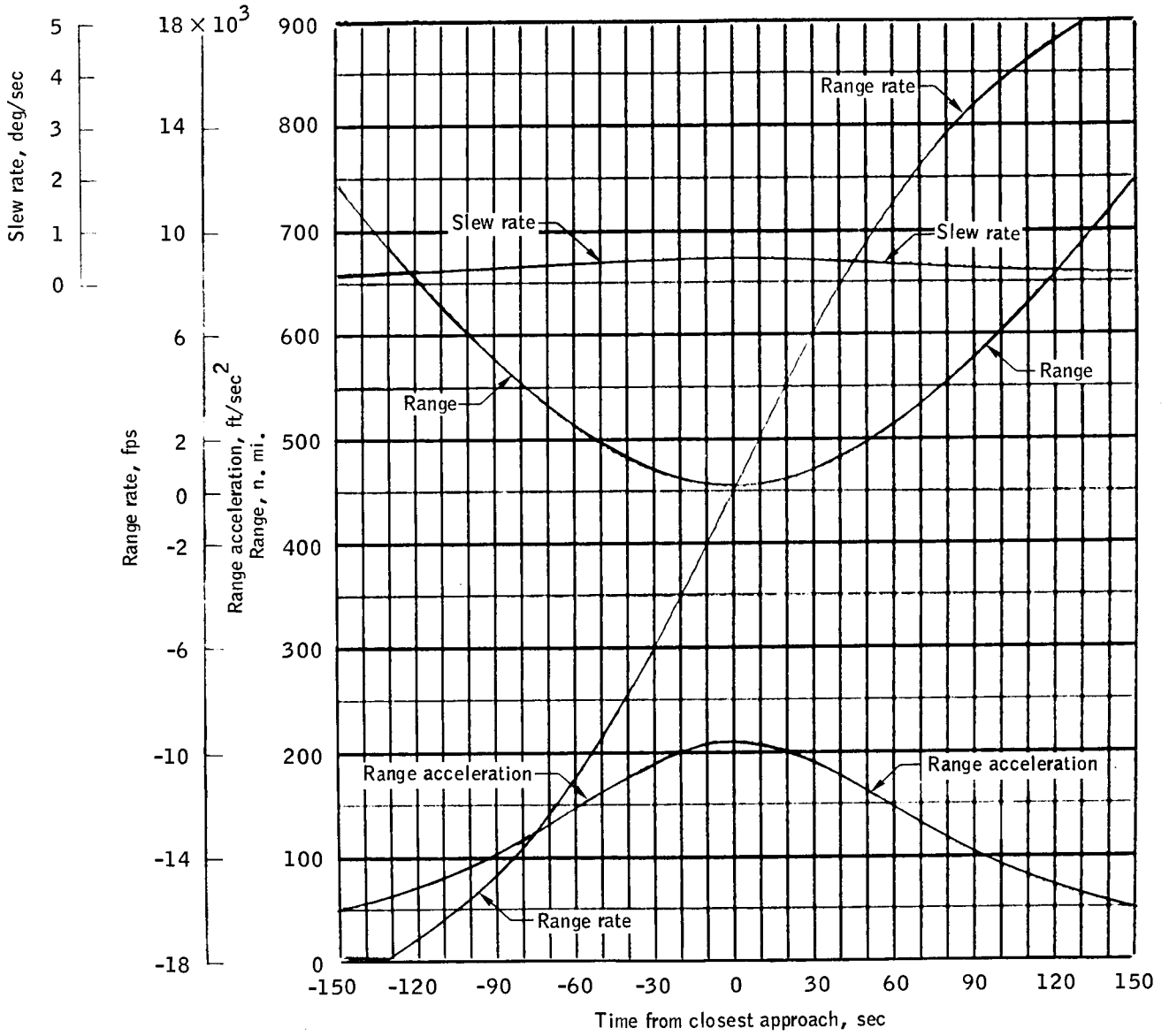
(u) Revolution 61.

Figure 1.- Continued.



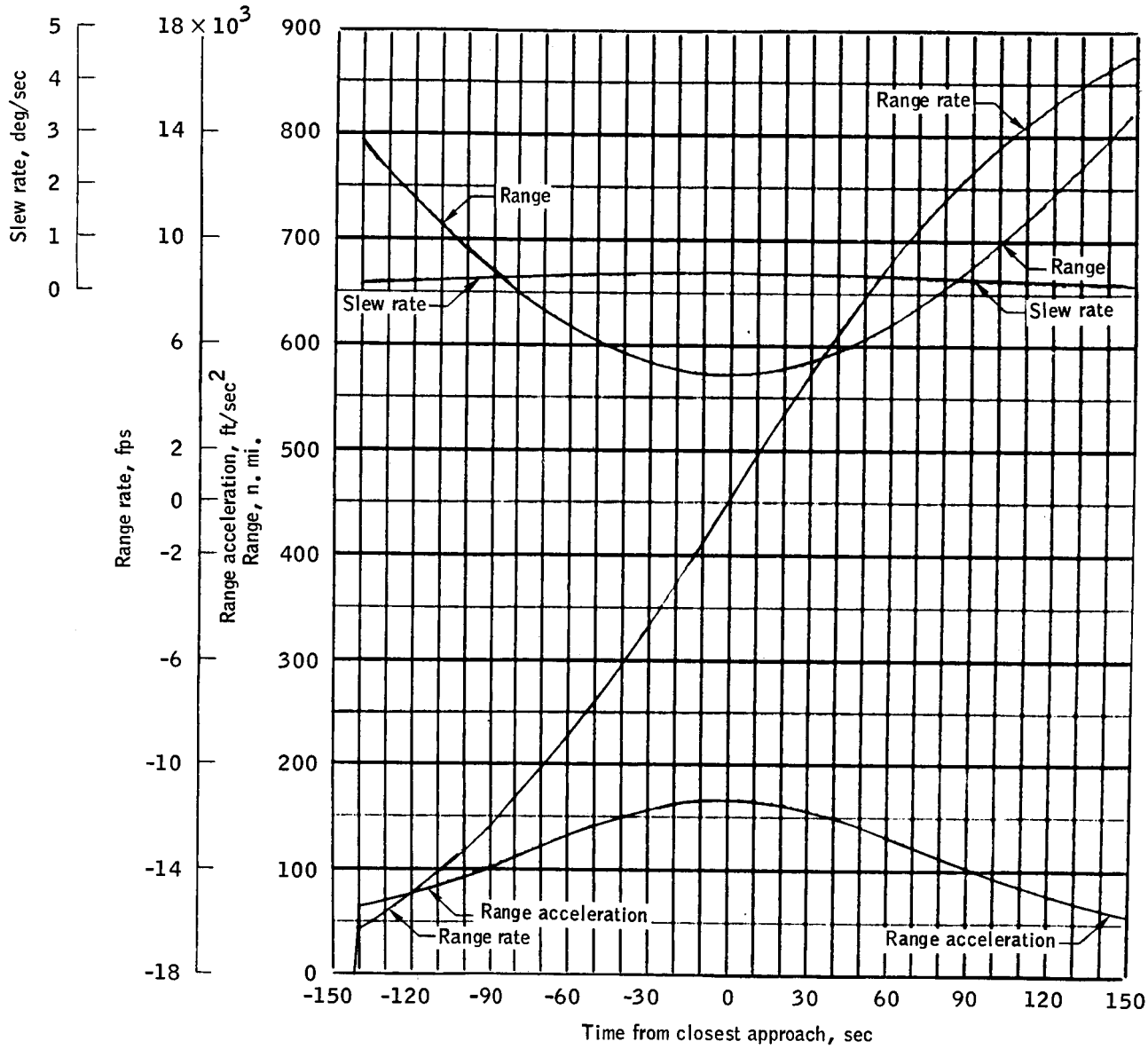
(v) Revolution 62.

Figure 1.- Continued.



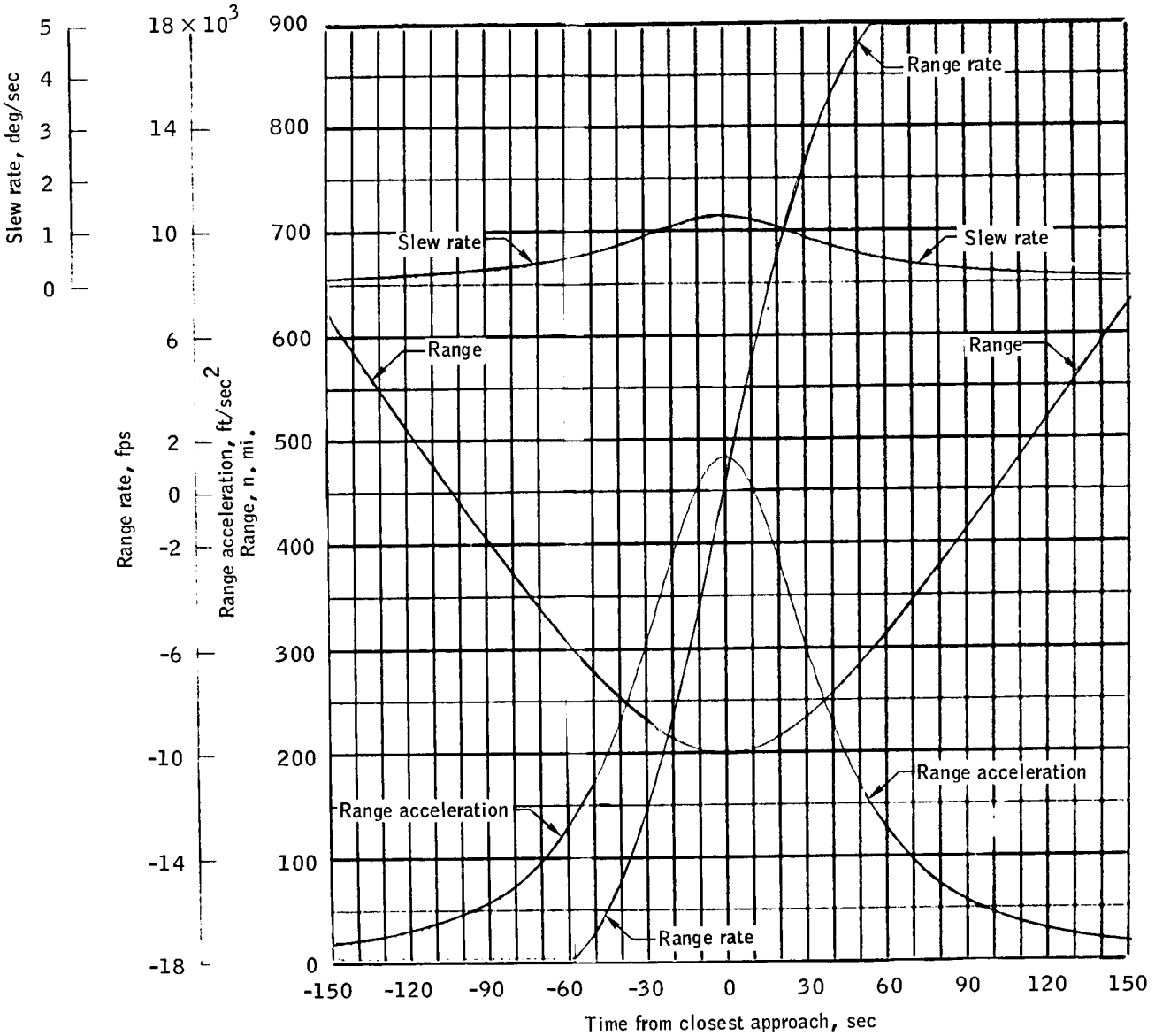
(w) Revolution 63.

Figure 1.- Continued.



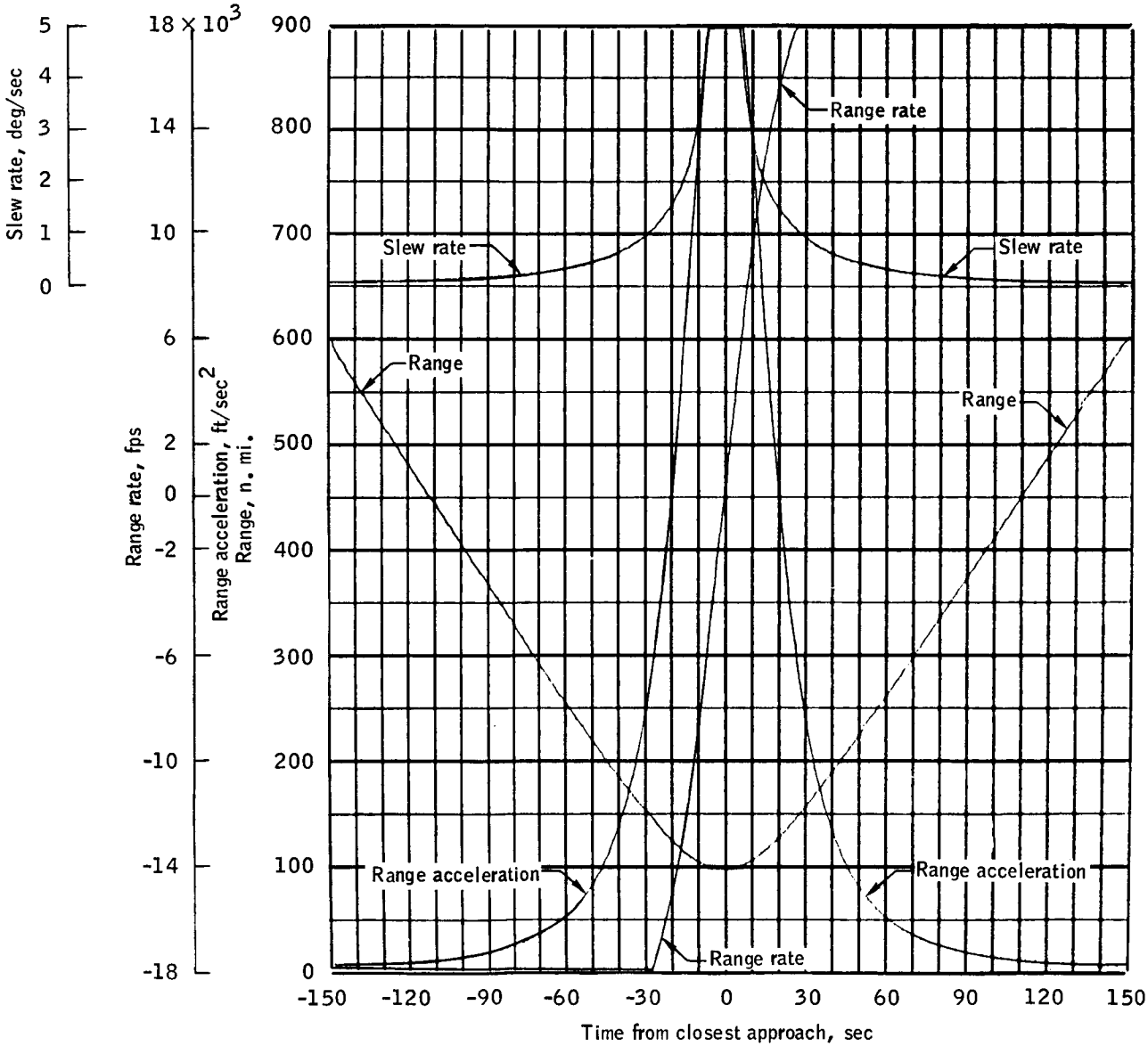
(x) Revolution 74.

Figure 1.- Continued.



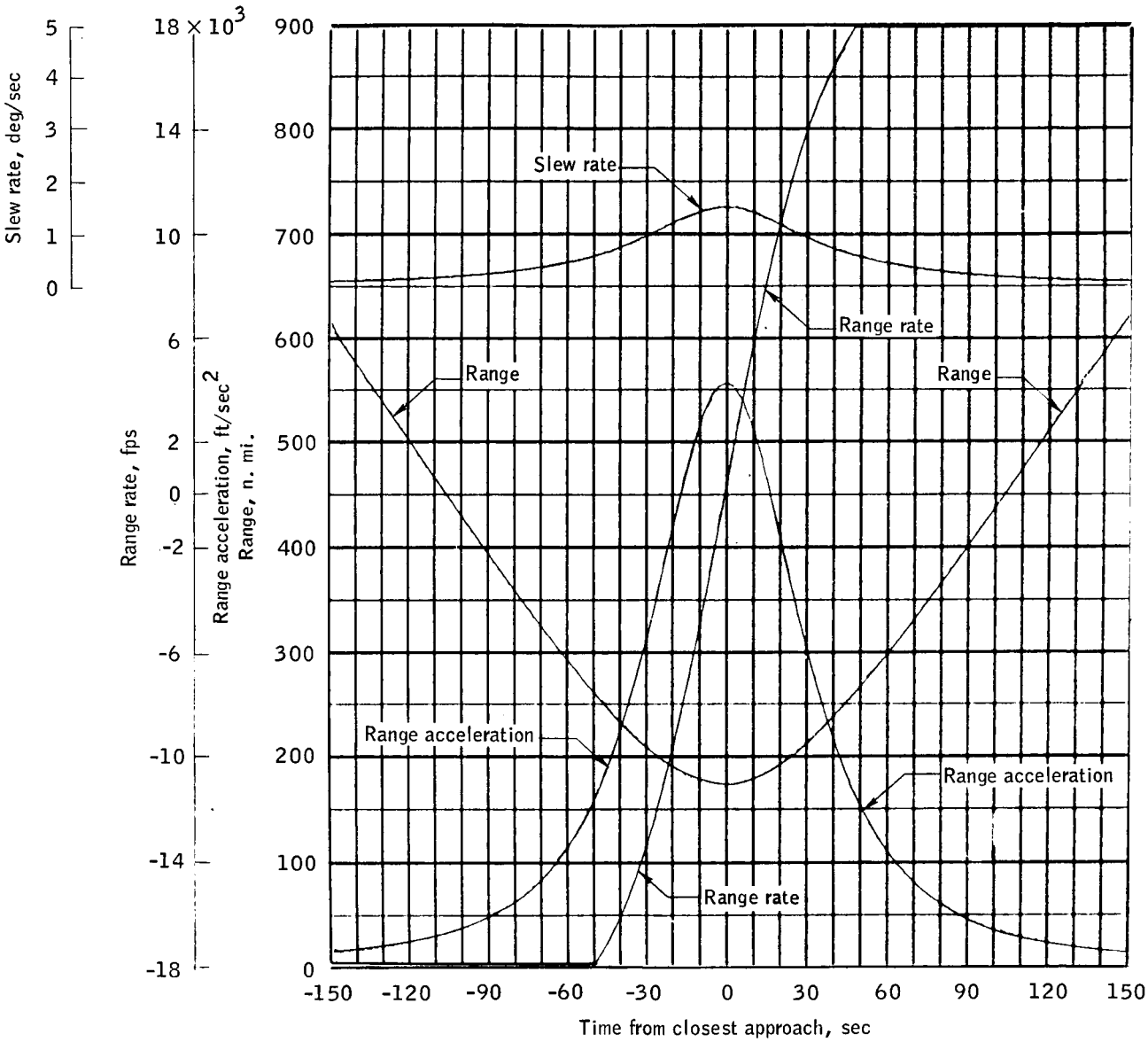
(y) Revolution 75.

Figure 1.- Continued.



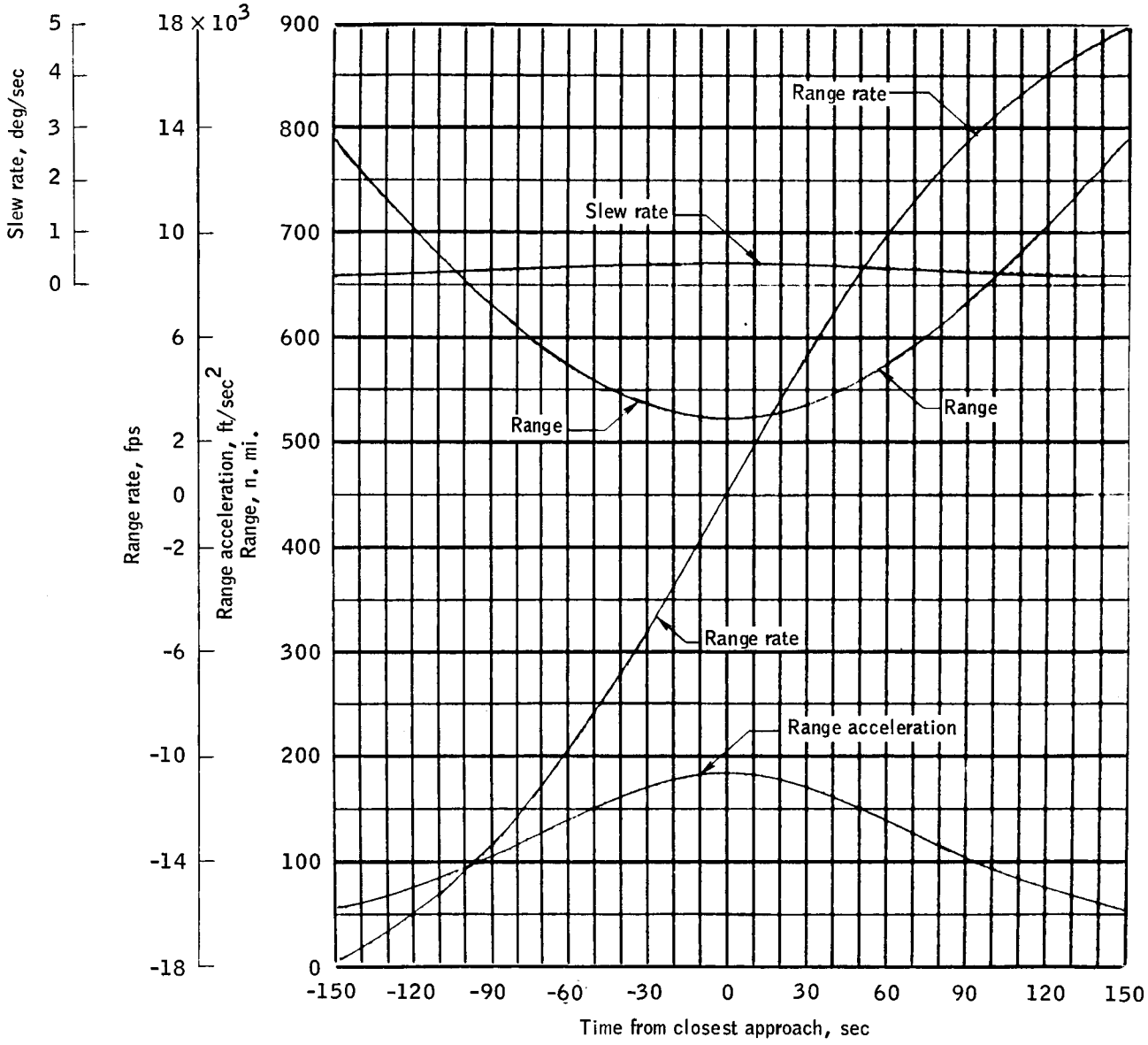
(z) Revolution 76.

Figure 1.- Continued.



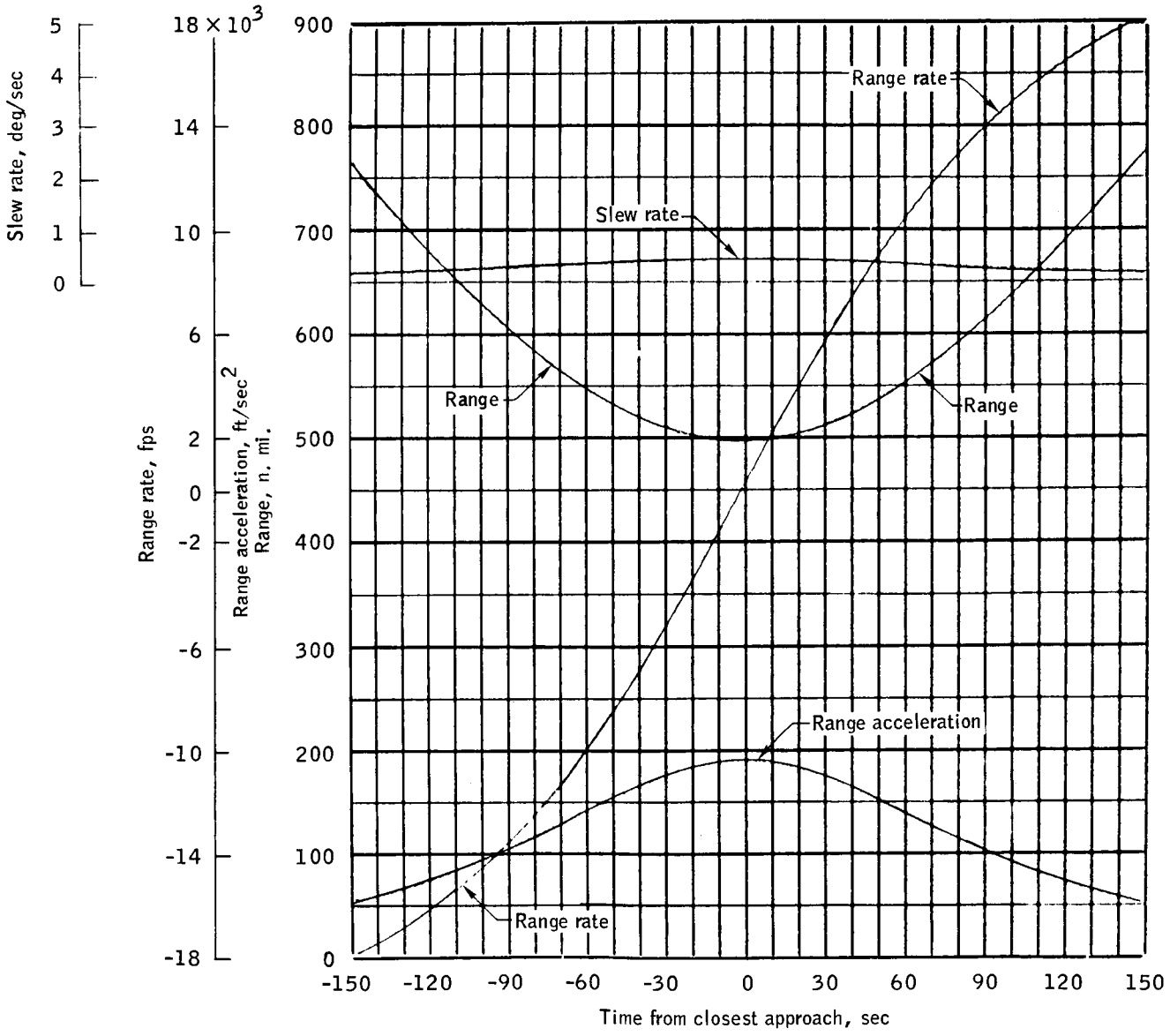
(aa) Revolution 77.

Figure 1.- Continued.



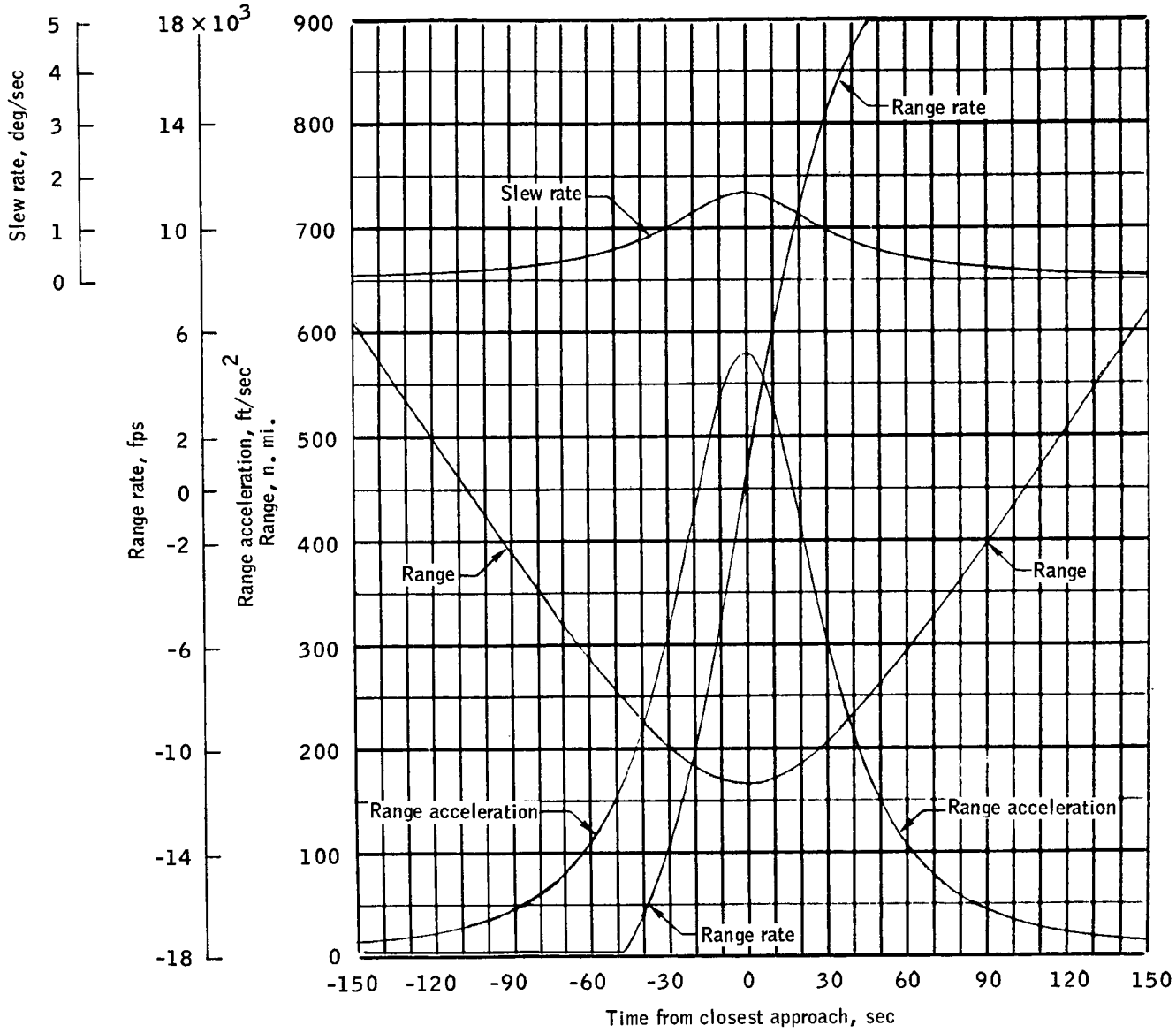
(bb) Revolution 78.

Figure 1.- Continued.



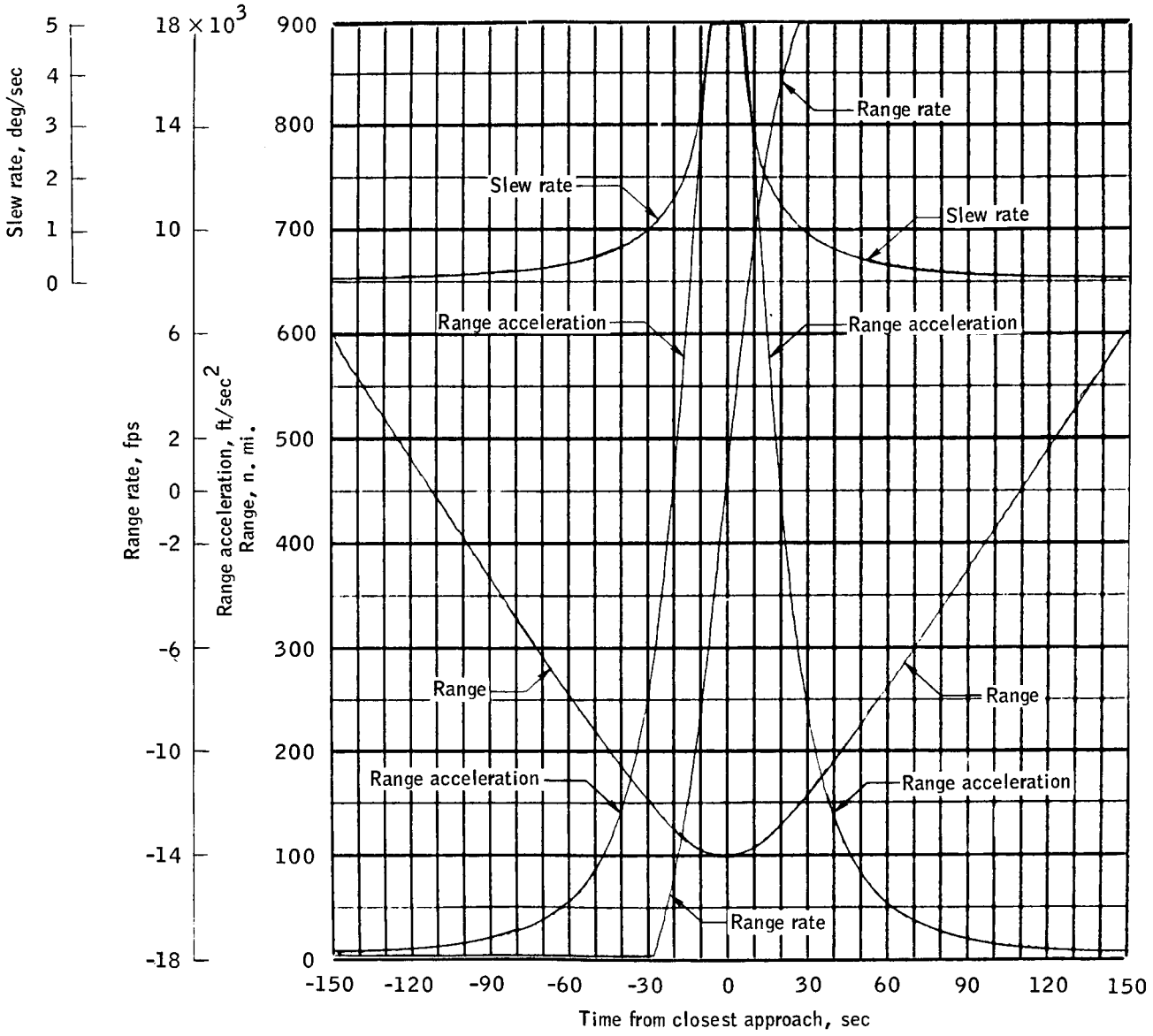
(cc) Revolution 89.

Figure 1.- Continued.



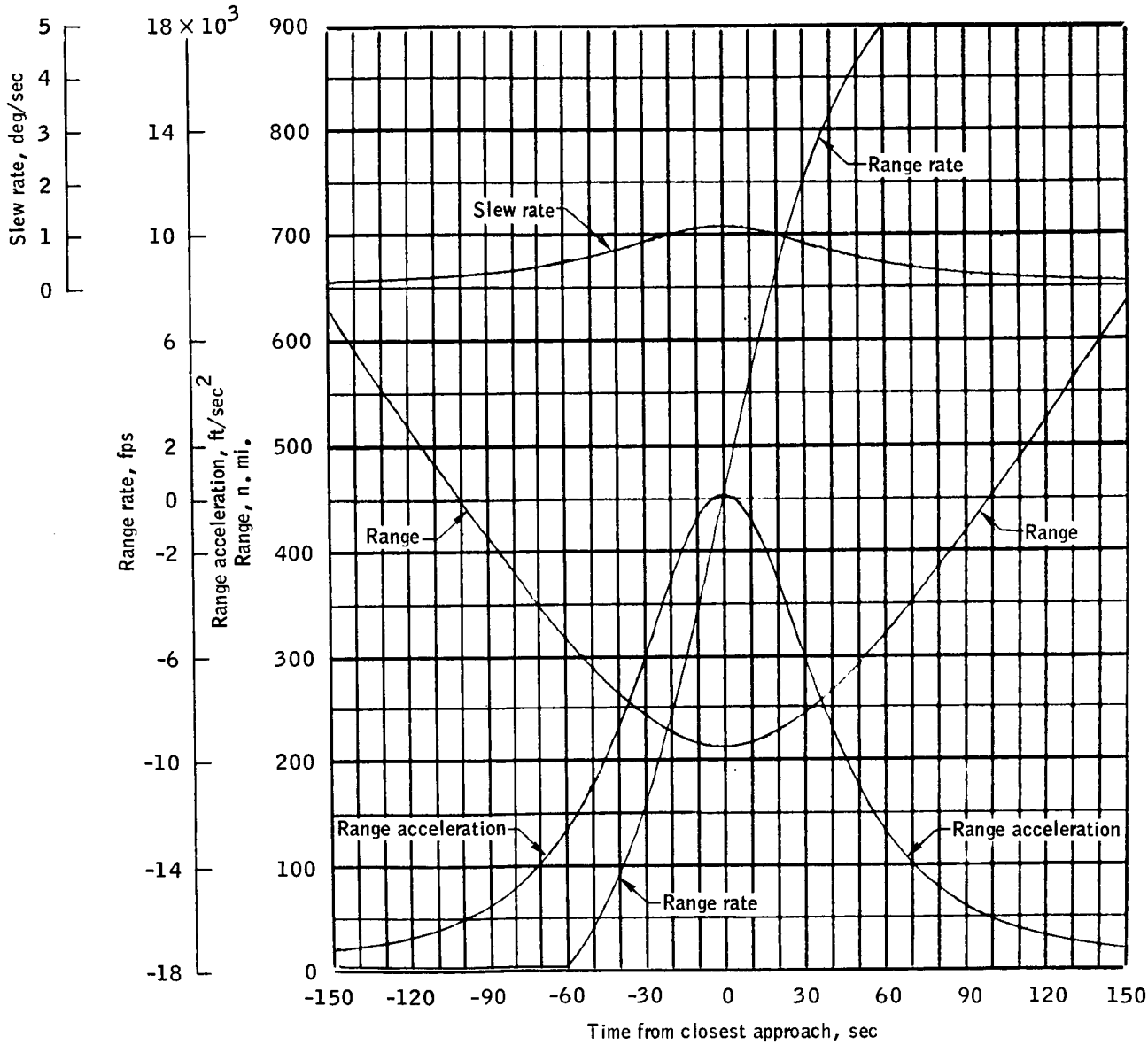
(dd) Revolution 90.

Figure 1.- Continued.



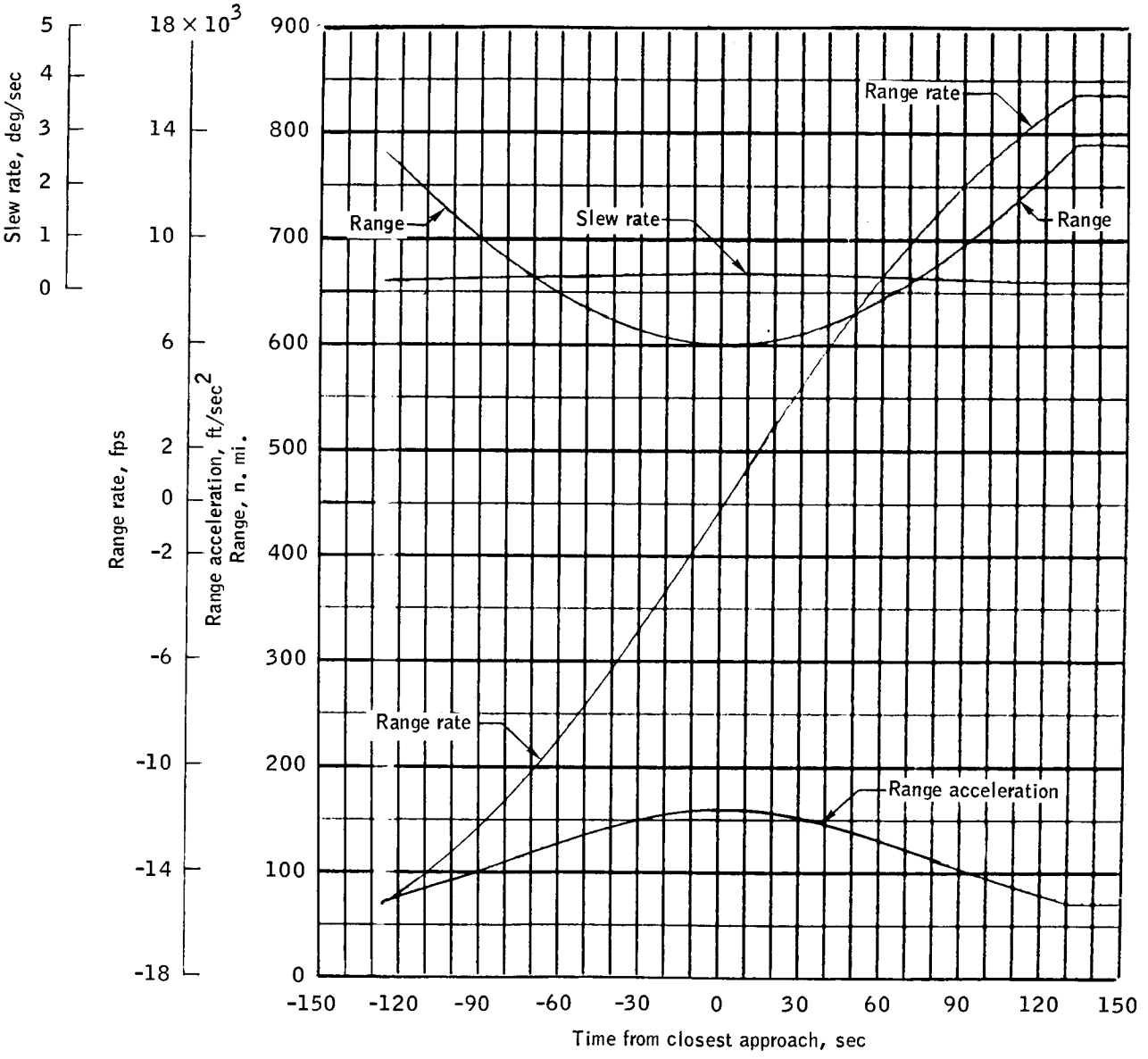
(ee) Revolution 91.

Figure 1.- Continued.



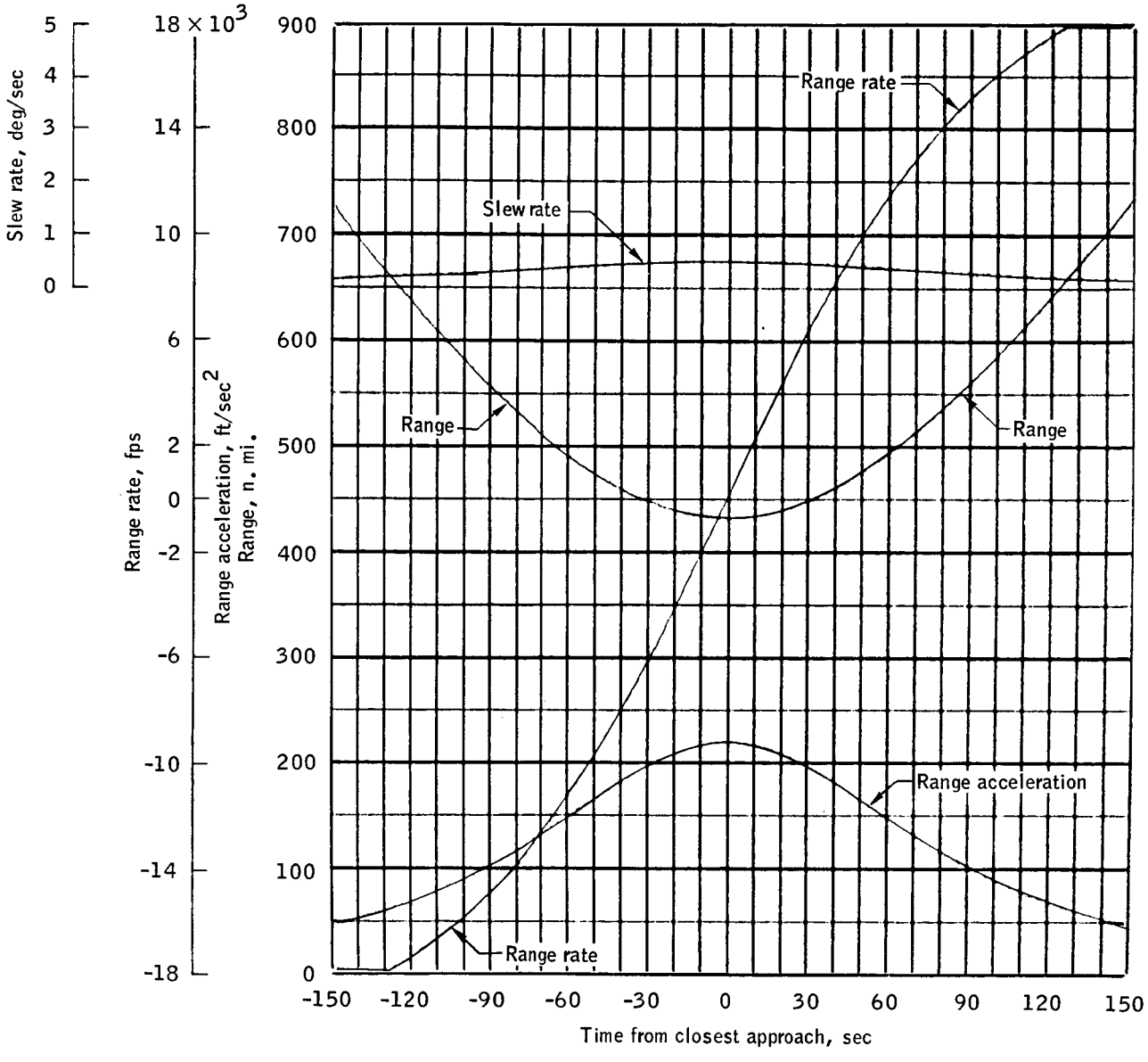
(ff) Revolution 92.

Figure 1.- Continued.



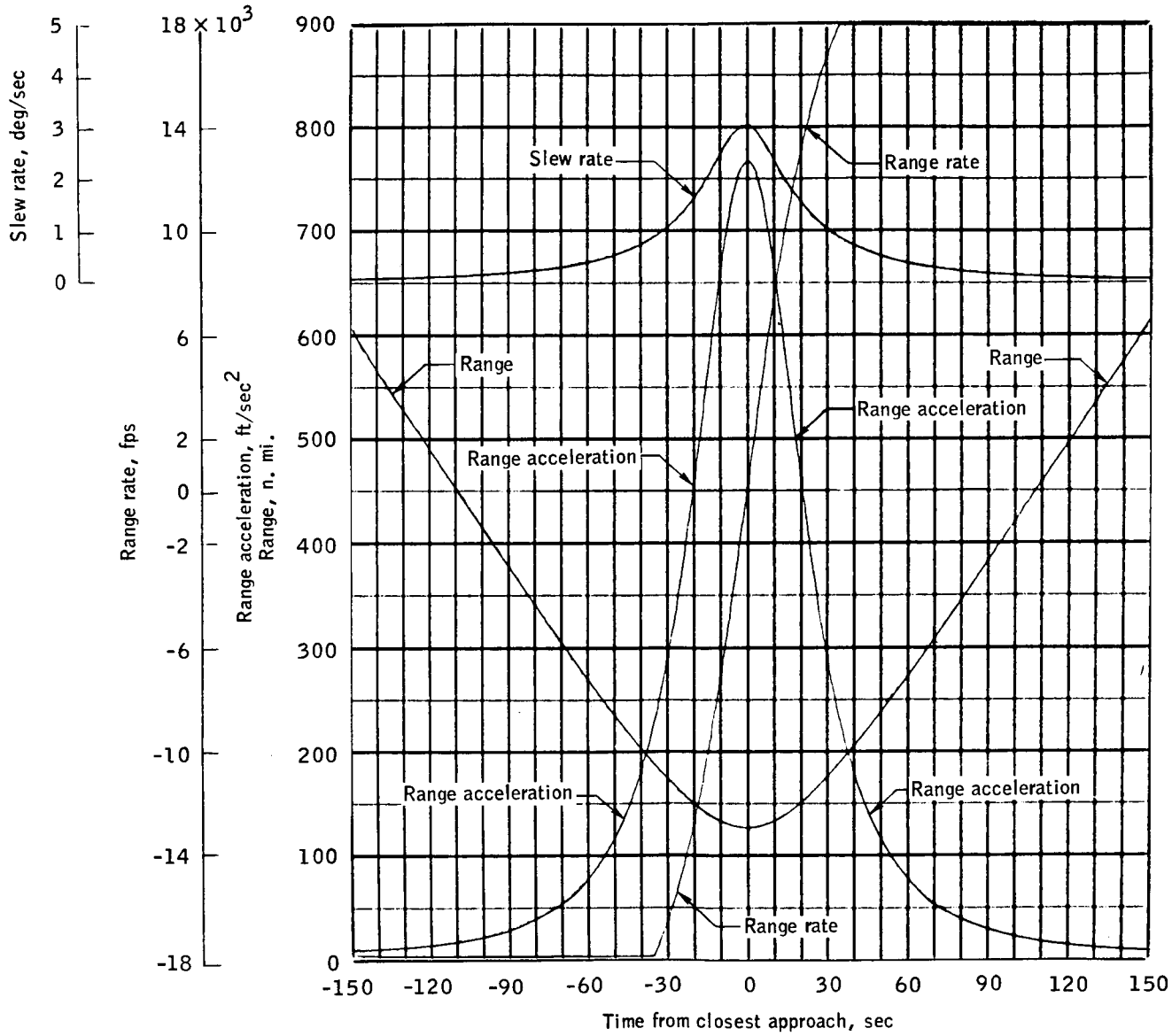
(gg) Revolution 93.

Figure 1.- Continued.



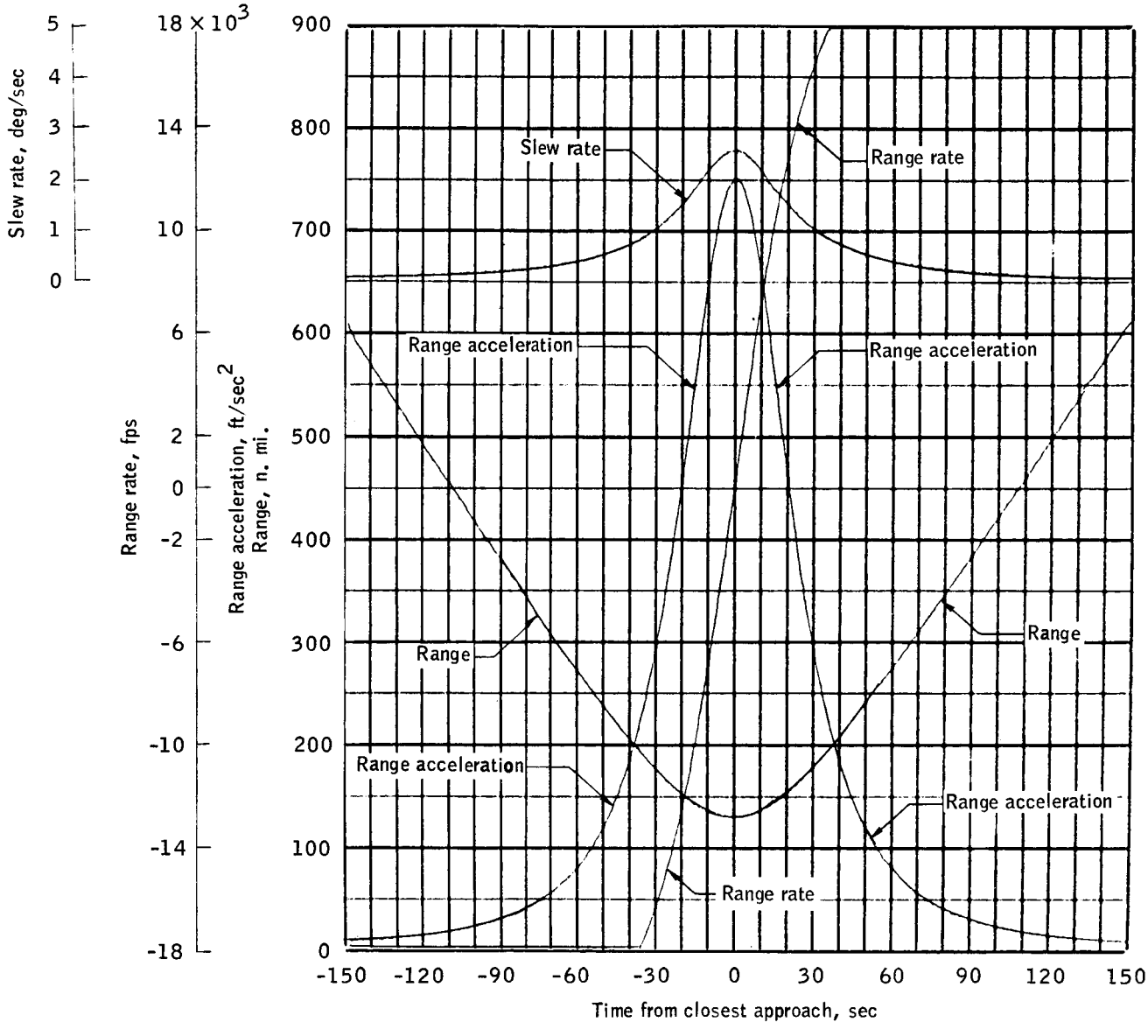
(hh) Revolution 104.

Figure 1.- Continued.



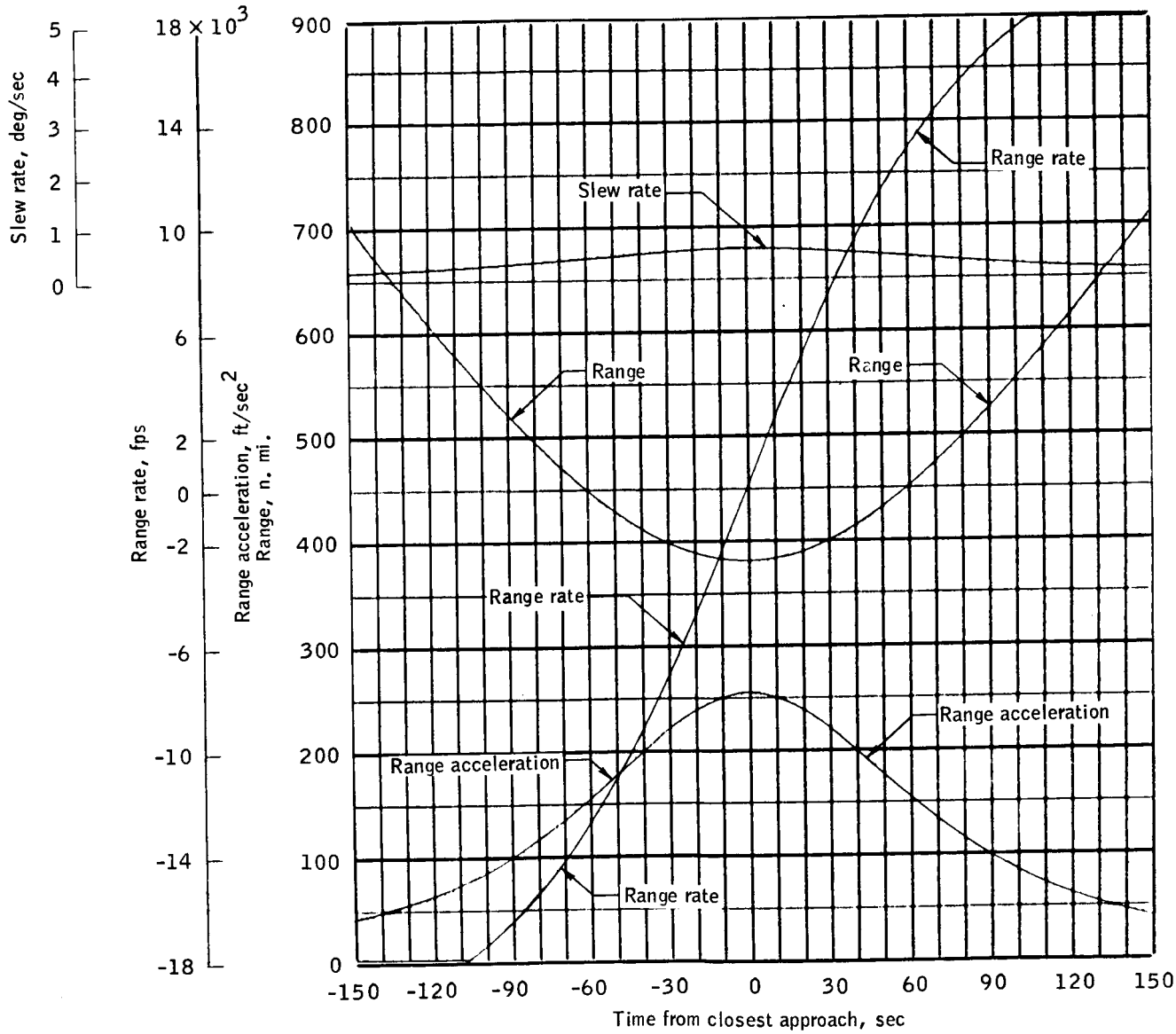
(ii) Revolution 105.

Figure 1.- Continued.



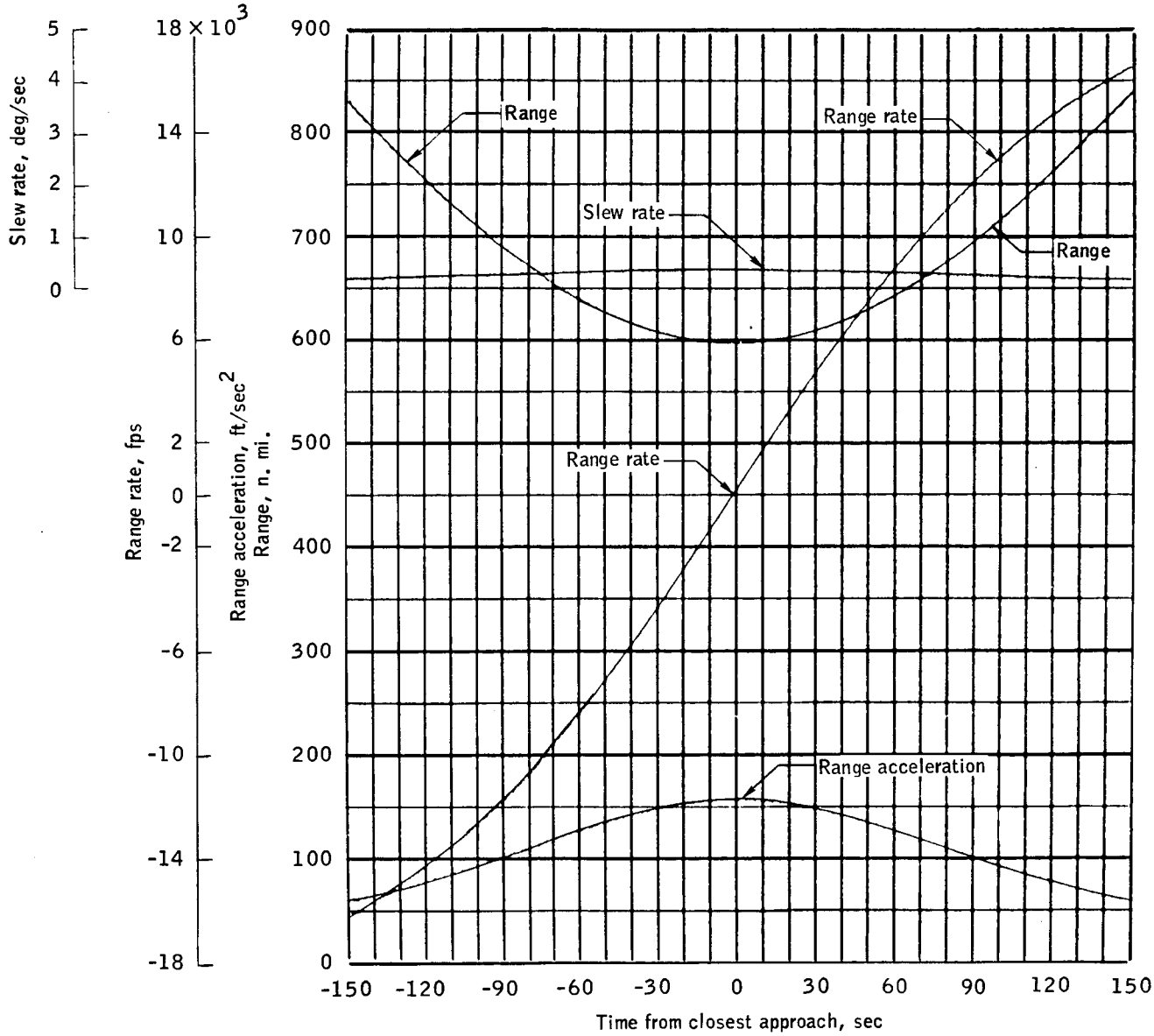
(jj) Revolution 106.

Figure 1.- Continued.



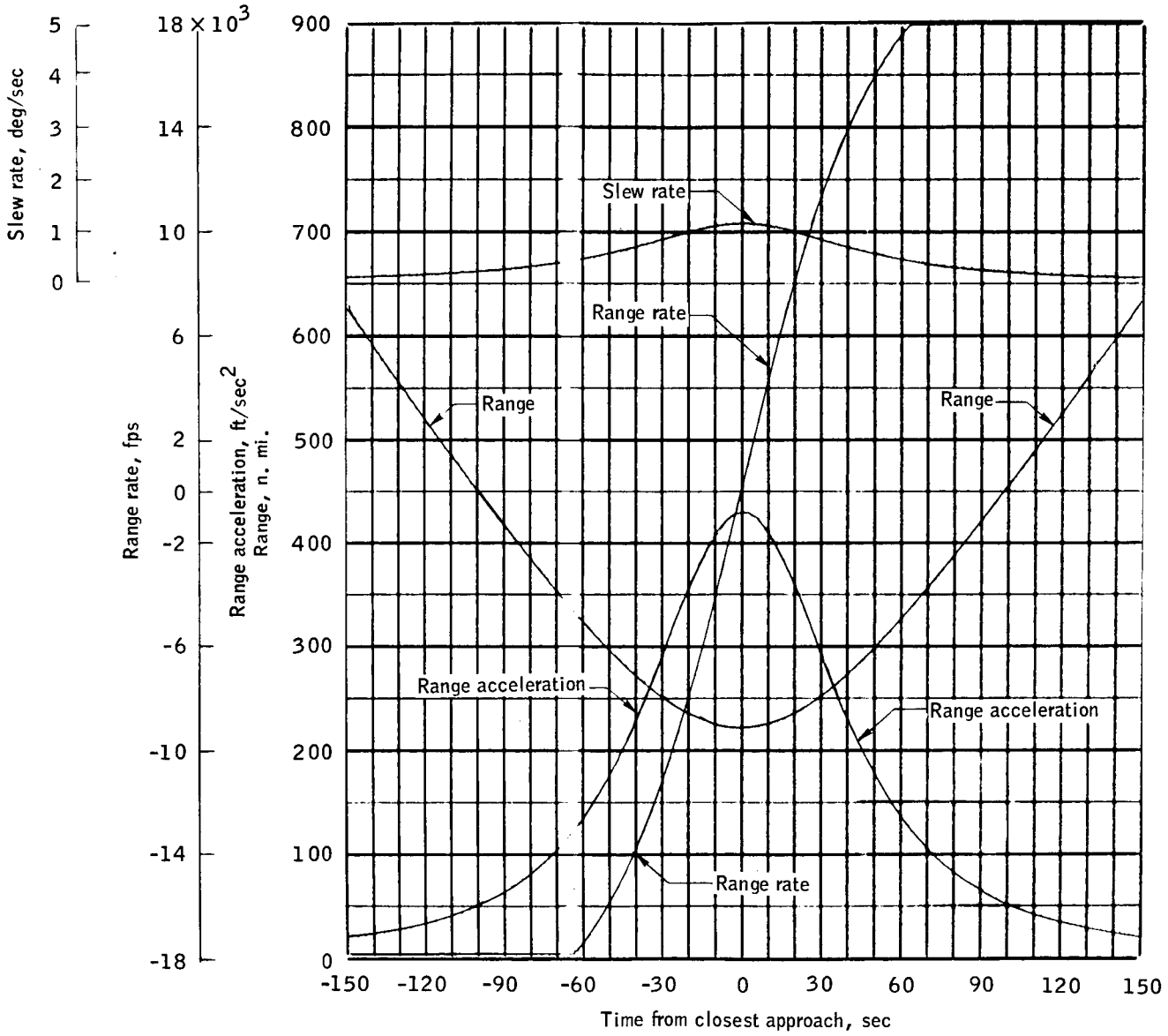
(kk) Revolution 107.

Figure 1.- Continued.



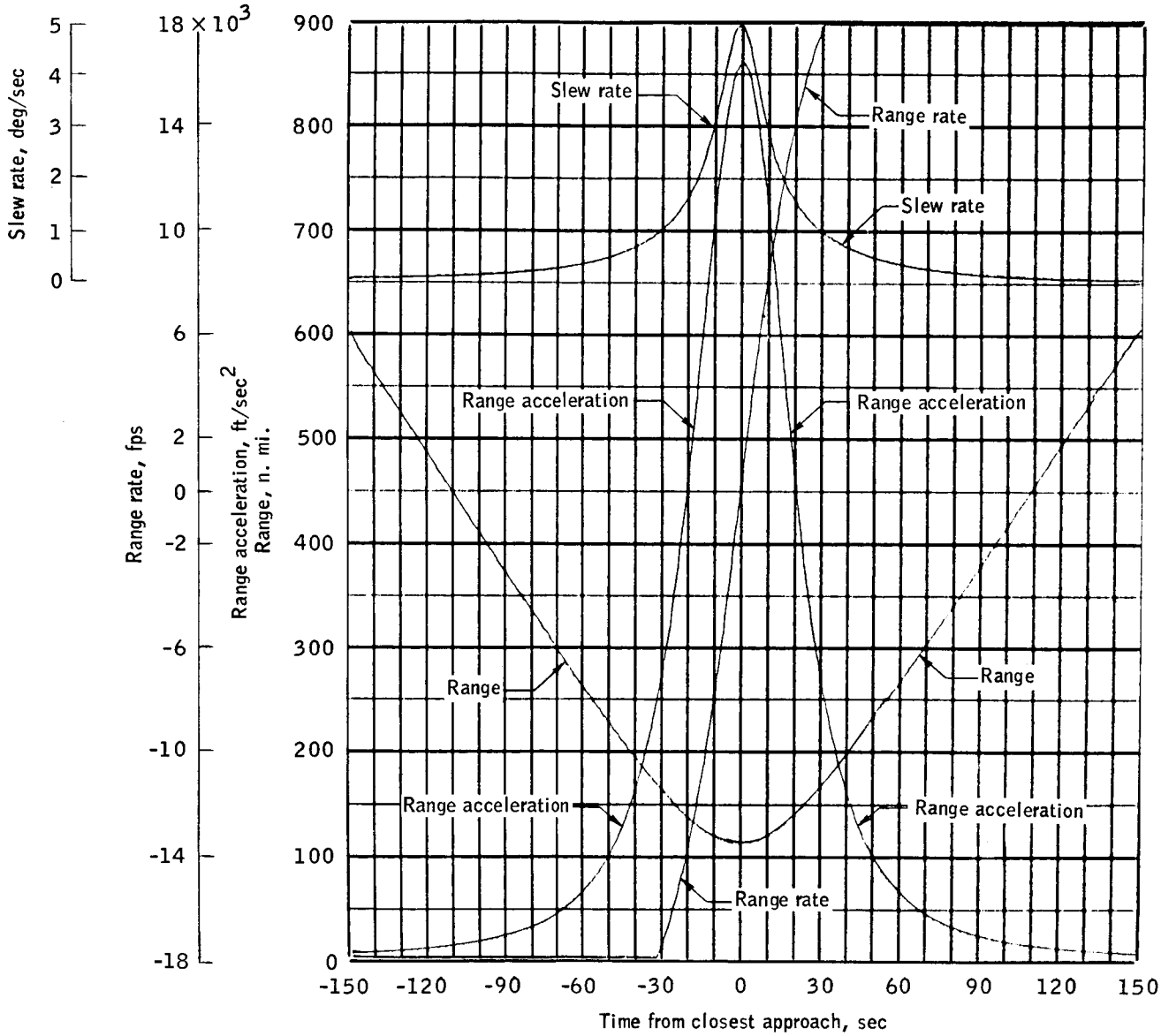
(II) Revolution 118.

Figure 1.- Continued.



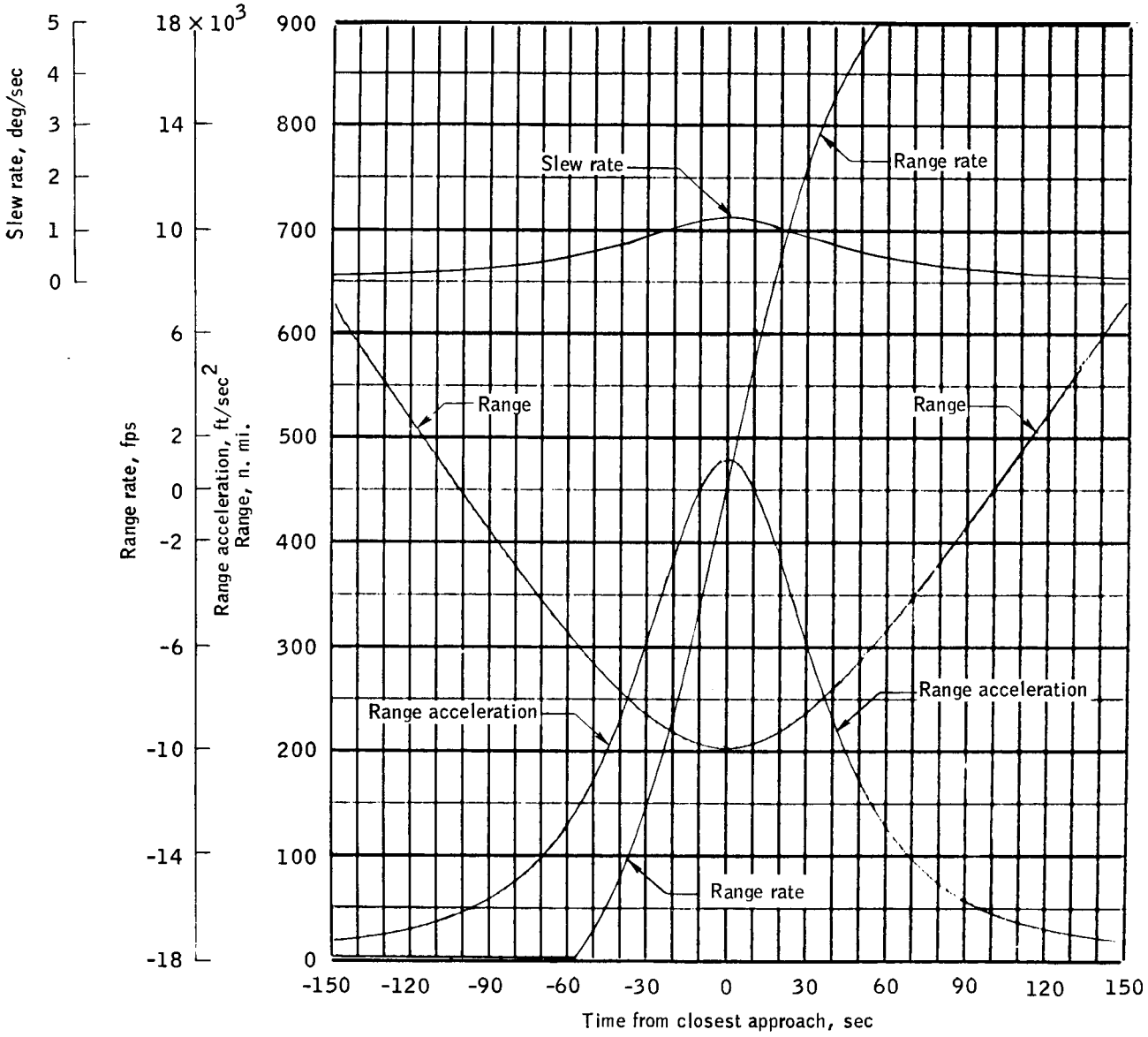
(mm) Revolution 119.

Figure 1.- Continued.



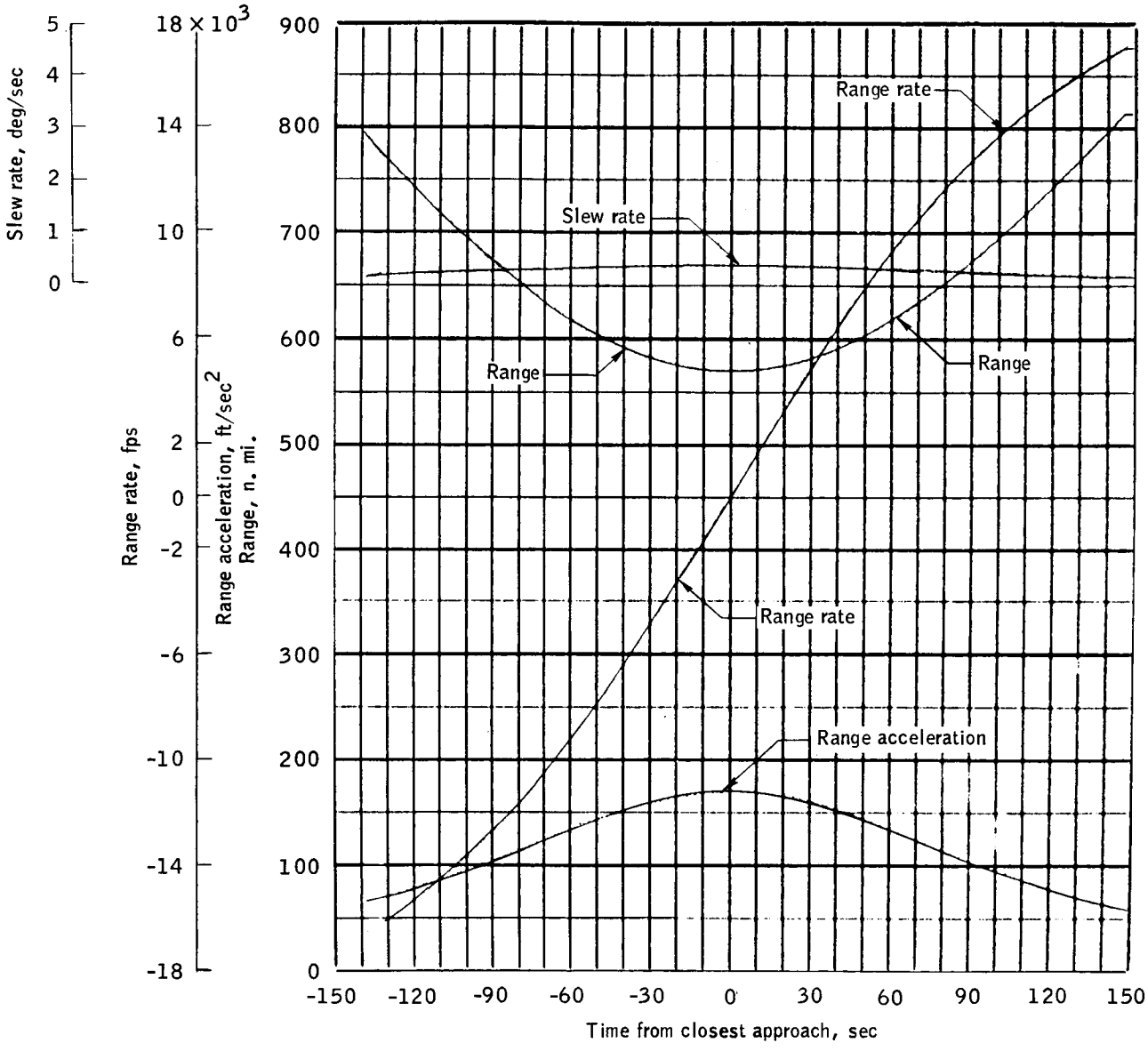
(nn) Revolution 120.

Figure 1.- Continued.



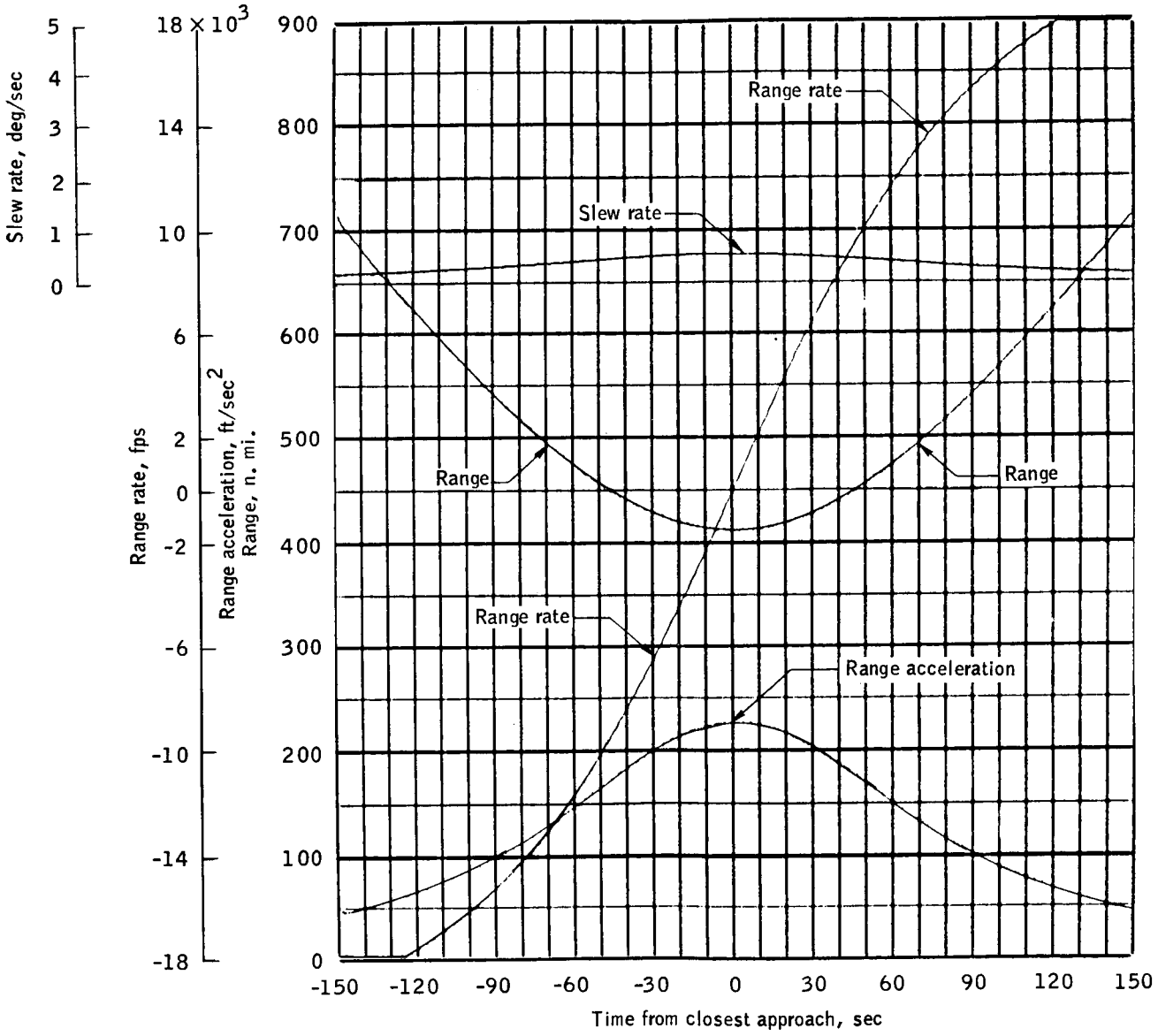
(oo) Revolution 121.

Figure 1.- Continued.



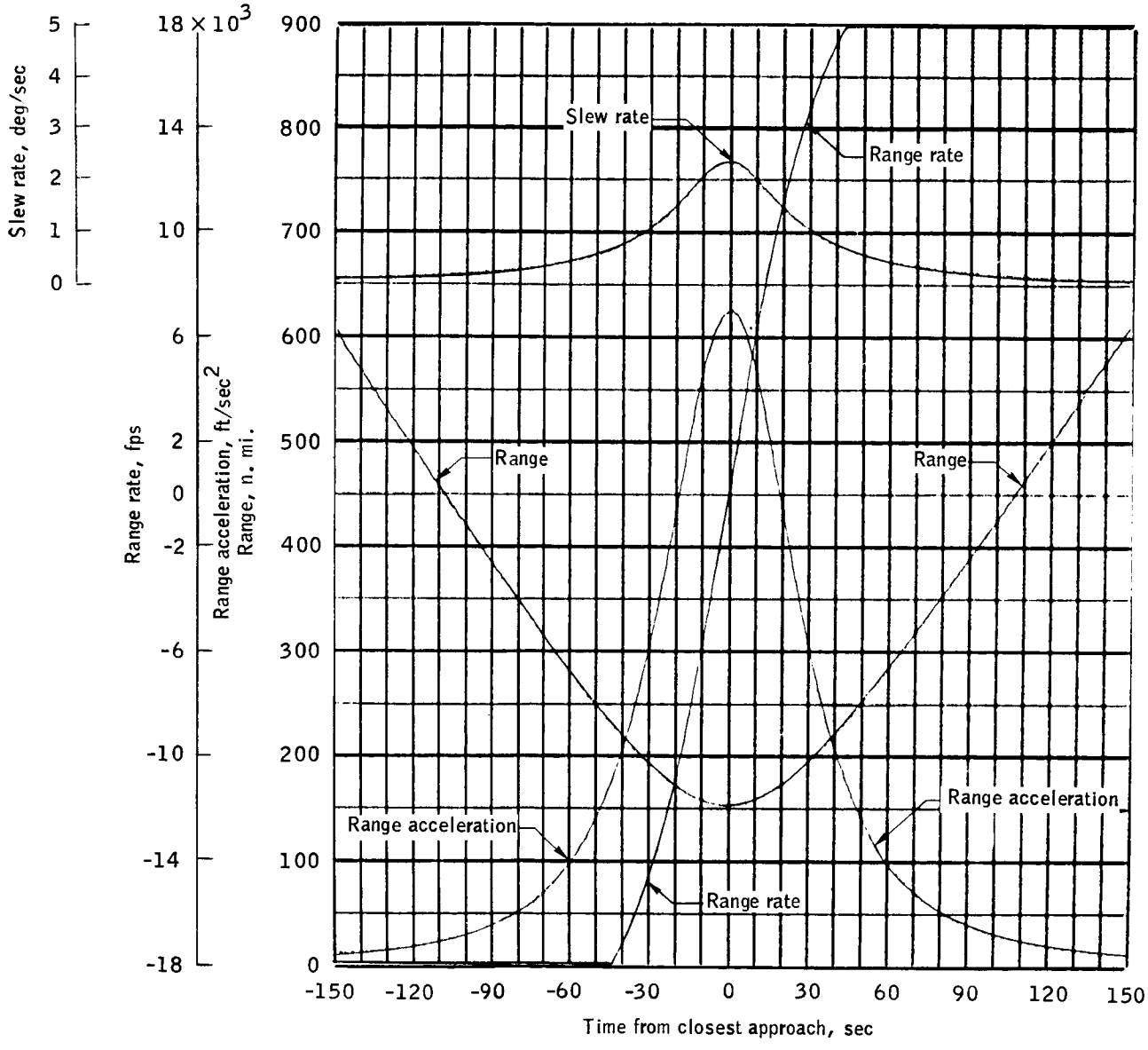
(pp) Revolution 122.

Figure 1.- Continued.



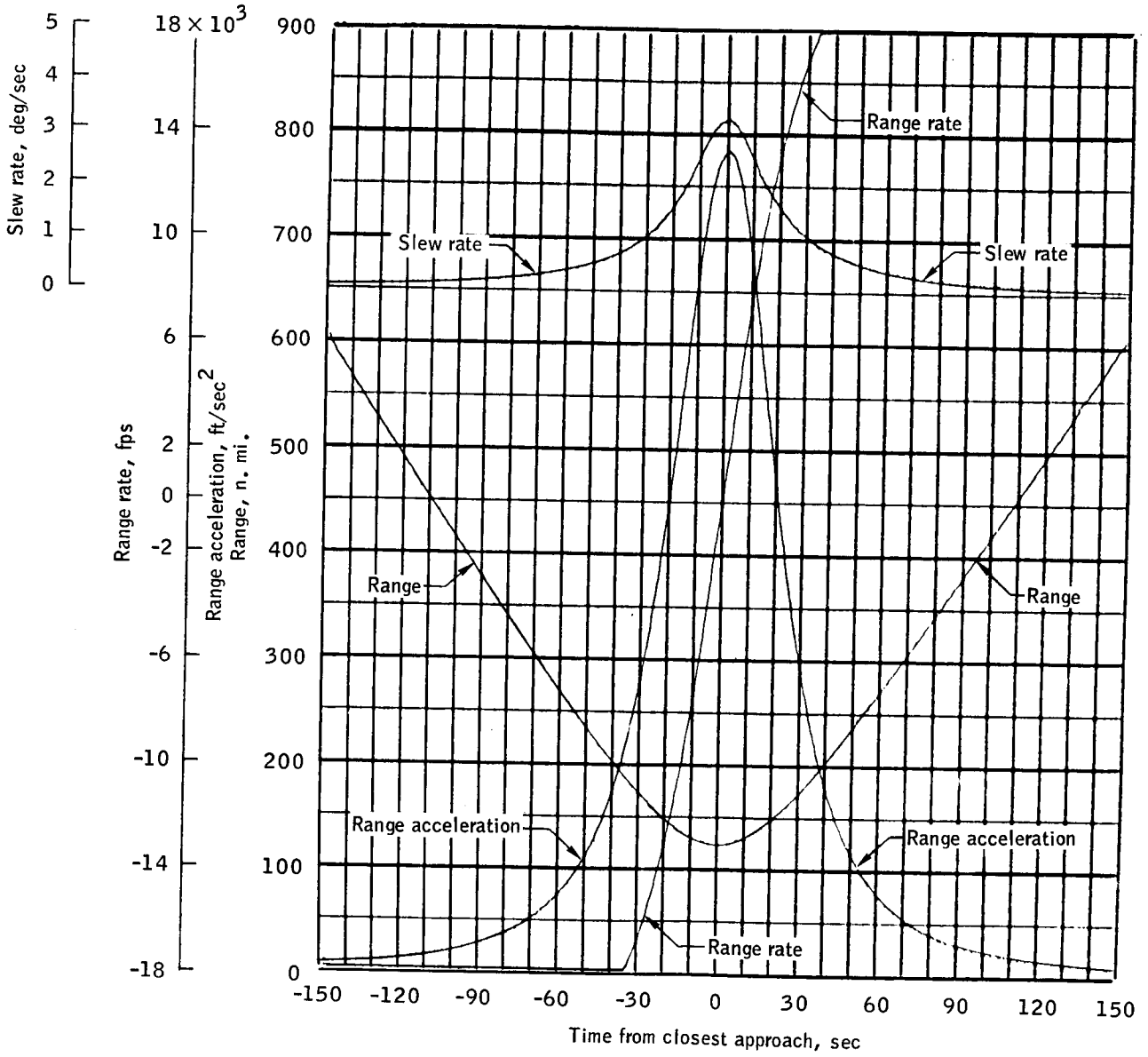
(qq) Revolution 133.

Figure 1.- Continued.



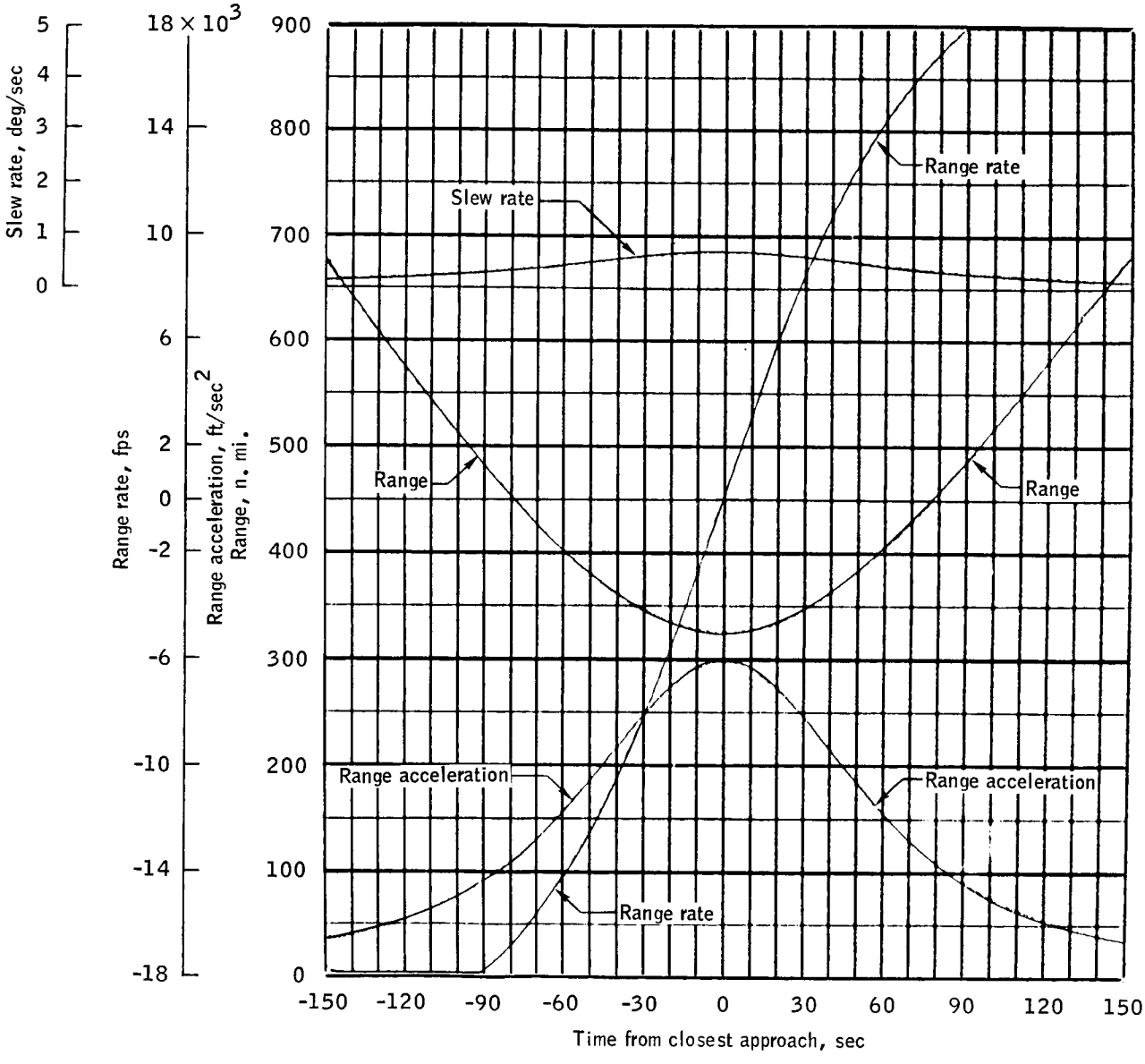
(rr) Revolution 134.

Figure 1.- Continued.



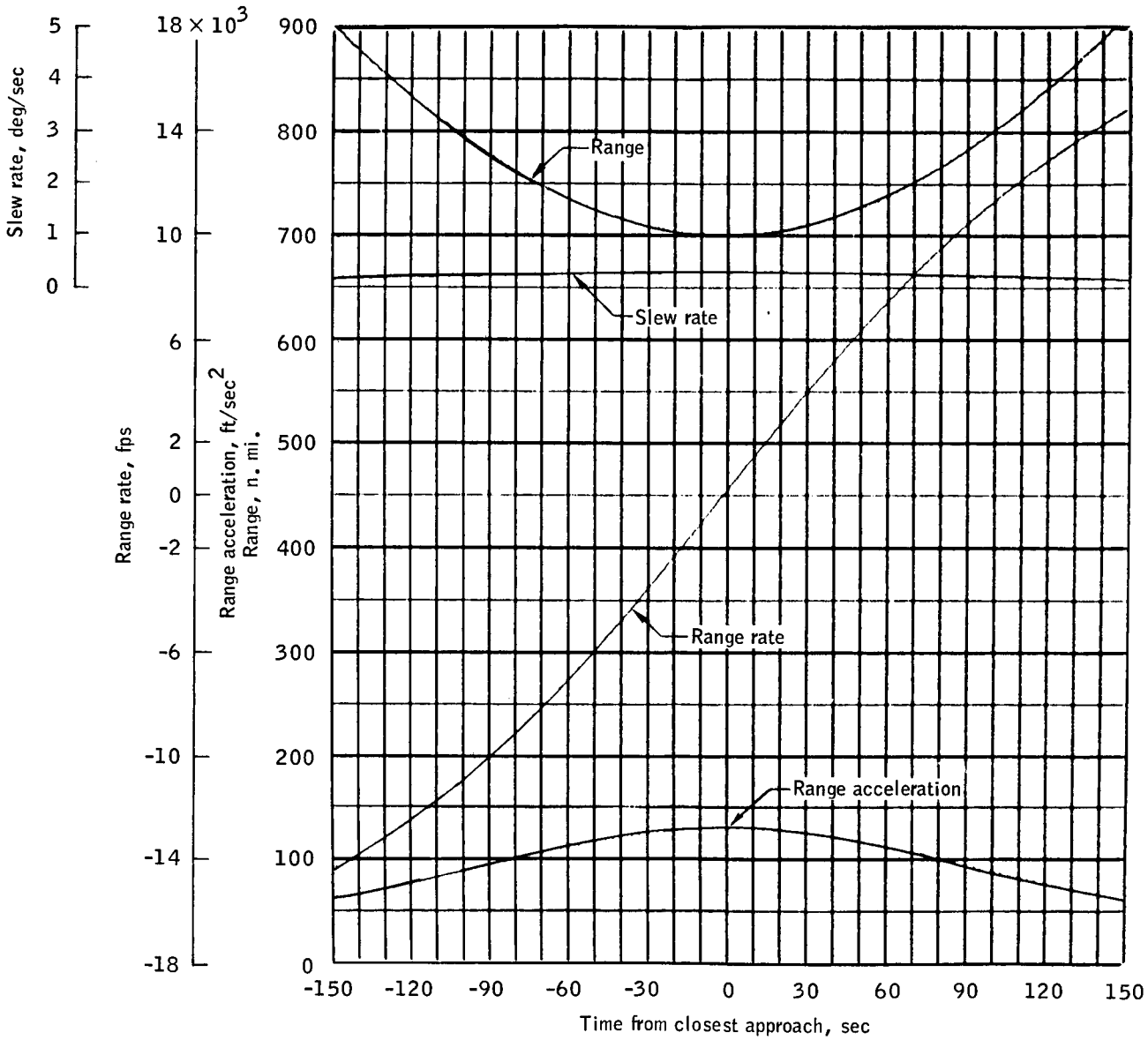
(ss) Revolution 135.

Figure 1.- Continued.



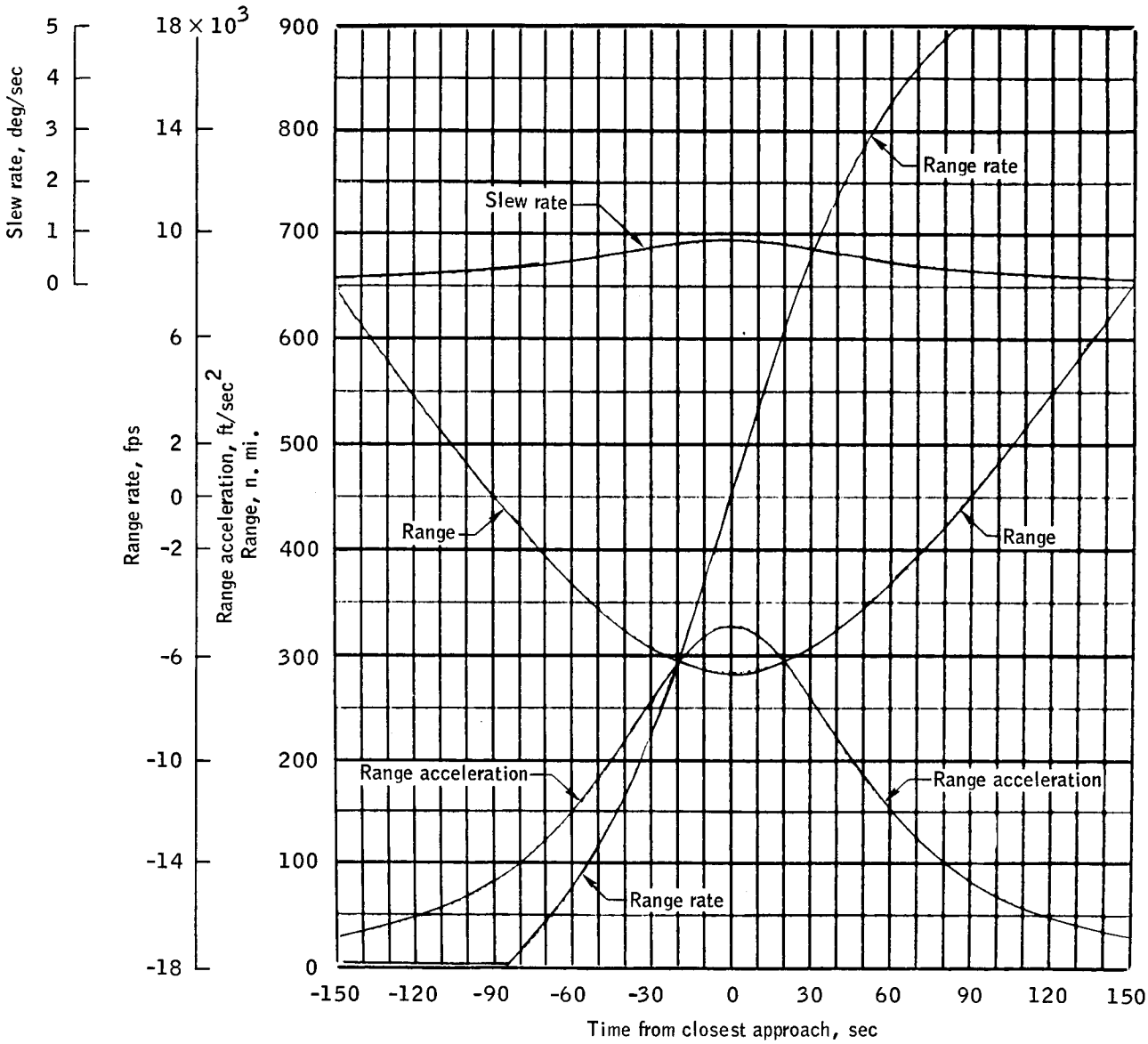
(tt) Revolution 136.

Figure 1.- Continued.



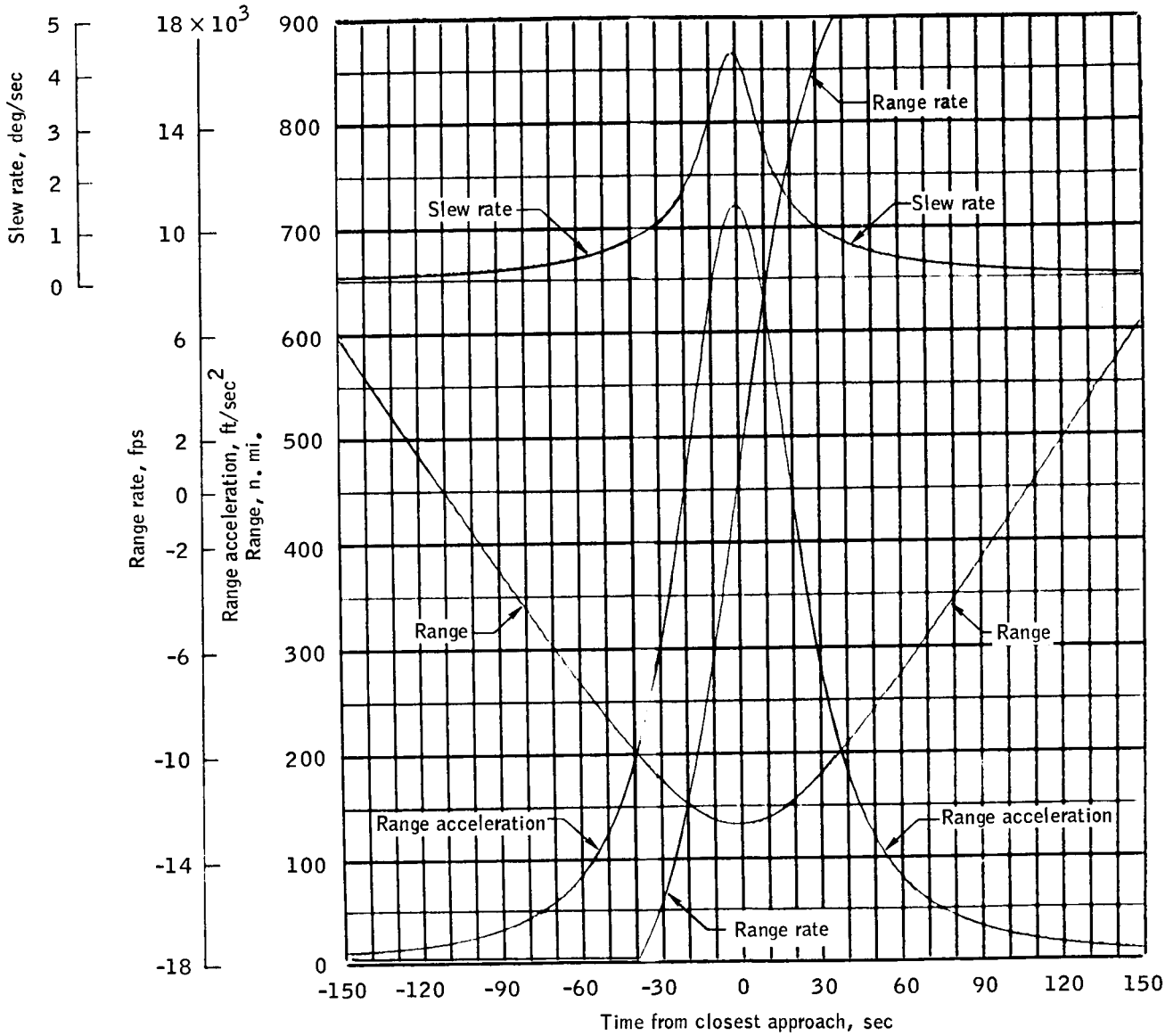
(uu) Revolution 147.

Figure 1.- Continued.



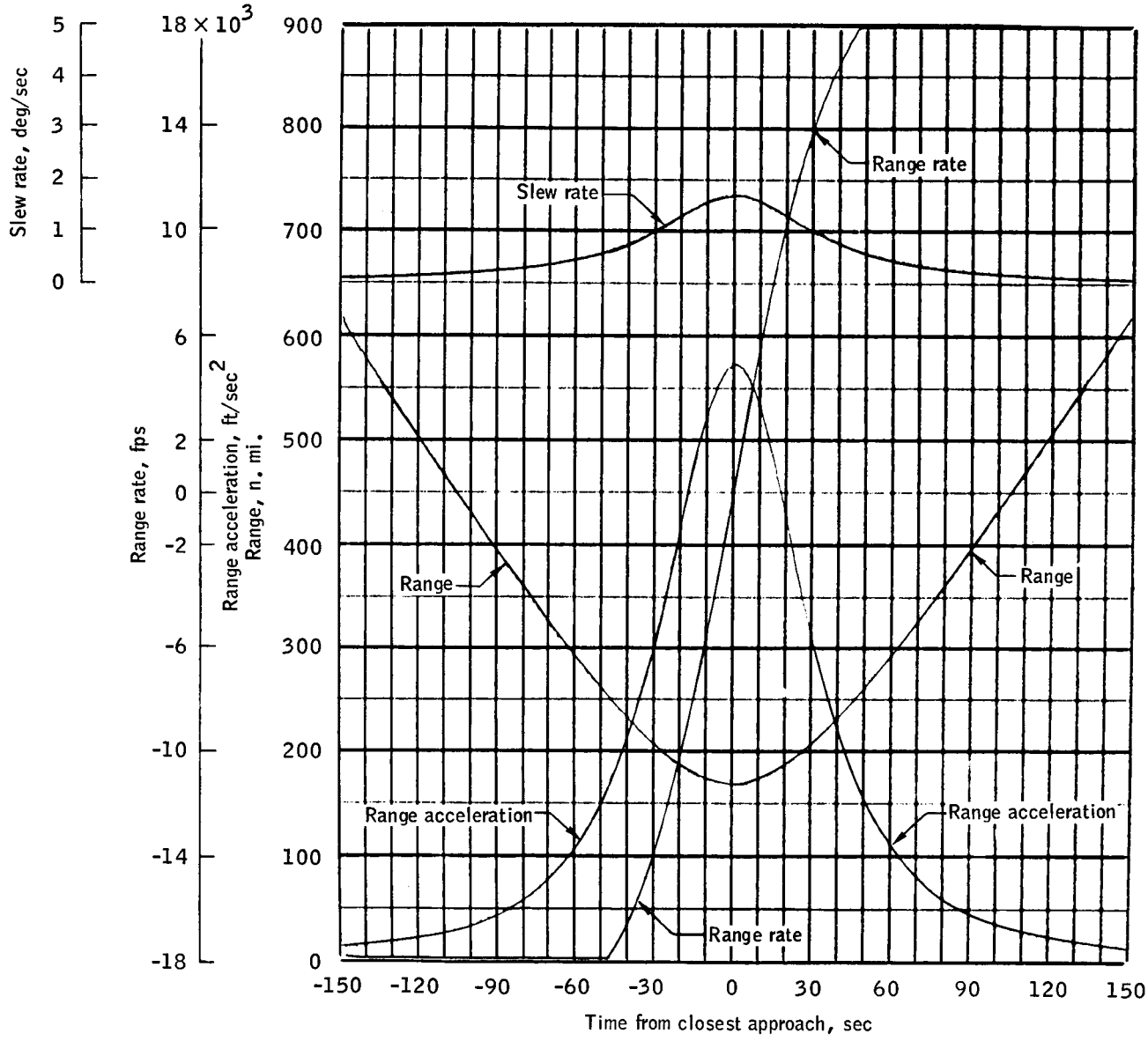
(vv) Revolution 148.

Figure 1.- Continued.



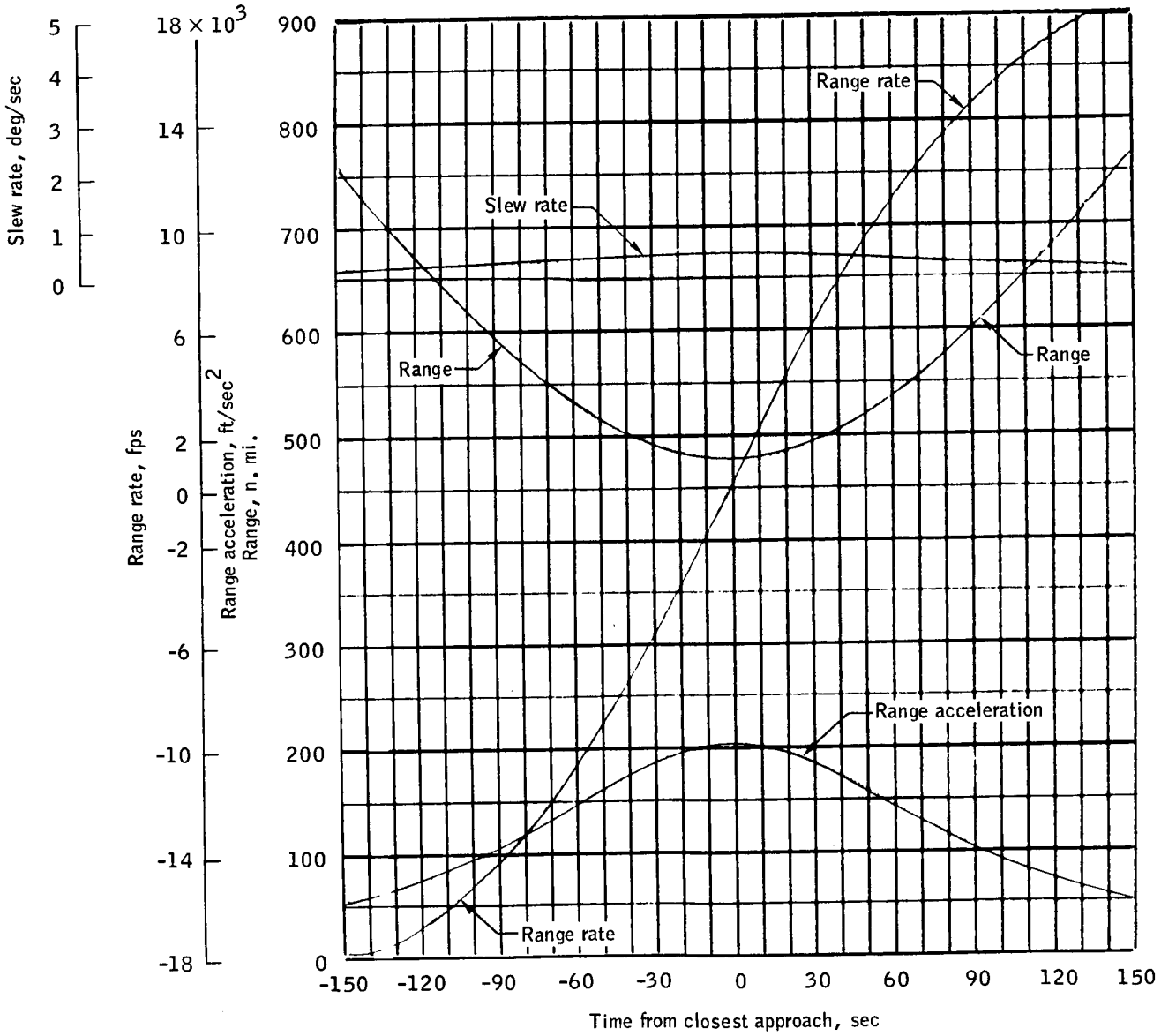
(ww) Revolution 149.

Figure 1.- Continued.



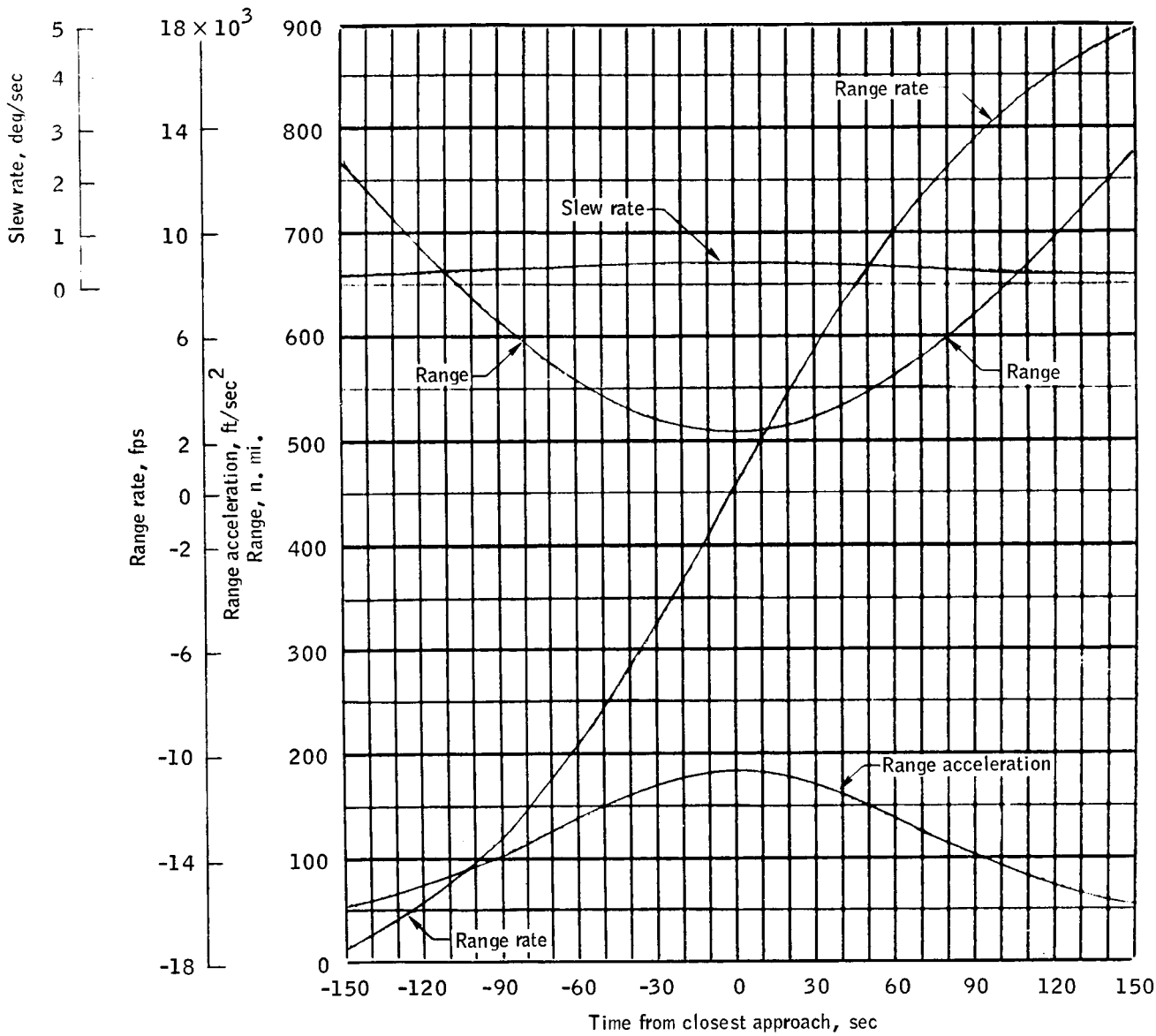
(xx) Revolution 150.

Figure 1.- Continued.



(yy) Revolution 151.

Figure 1.- Continued.



(zz) Revolution 162.

Figure 1.- Concluded.

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