AIRCRAFT CHARACTERISTICS FOR AIRFIELD-HELIPORT DESIGN AND EVALUATION

AIRCRAFT ENGINE BLAST RELATIONSHIPS

E-l. This appendix presents engine blast relationships for US Army, US Air Force, and selected civil and comercial fixed-wing aircraft. Velocities and temperatures from engine exhausts are capable of causing bodily injury to personnel and damage to airfield equipment or facilities. These blast relationships should be beneficial to planners and civil engineers in the layout and design of airfield systems.

E-2. Blast relationships are arranged in figure format for various military, civil, and comercial fixed-wing aircraft (figs E-l to E-141). Velocity versus distance graphs (figs E-l to E-83) and temperature versus distance graphs (figs E-84 to E-141) present blast data at various thrust power settings. Some distances presented in the blast relationships are measured from the jet engine nozzle and other distances are measured from the rear of the aircraft. Blast data are based on information provided by Air Logistic Center managers and aircraft manufacturers.

E-3. Velocity versus distance relationships are grouped by military aircraft (figs E-l to E-43) and civil and commercial aircraft (figs E-44 to E-83). Military aircraft are further sub-grouped as follows:

a. Bomber Aircraft.

Figure	Aircraft
E-l	B-1B
E-2	B-52G
E-3	B-52H
E-4	FB-111A

b. Cargo/Transport Aircraft.

Figure	Aircraft
E-5	C-5A/B
E-6	C-9A
E-7	C-21A
E-8	C-22B
E-9	C-130B/E/H
E-10	C-135B
E-11	KC-135R
E-12	C-137B/C
E-13	C-140A/B
E-14	C-141A/B
E-15	KC-10A
E-16	VC-25A

c. Special-Duty Aircraft.

Figure	Aircraft
E-17	E-3A/B/C
E-18	E-4A/B
E-19	EC-18B
E-20	EC-130E/H, MC-130E/H and WC-130E/H
E-21	EC-135A/G/L
E-22	EC-135C/E/H/J/K/P/Y, RC-135S/U/V/W, and WC-135B
E-23	EF-111A
E-24	OA-37B
E-25	OV-1B/C/D
E-26	RF-4C

d. Tactical Aircraft.

Figure	Aircraft
E-27	A-7D/K
E-28	A-10A
E-29	A-37B
E-30	AC-130A/H/U
E-31	F-4C/D/E
E-32	F-5E/F
E-33	F-15A/B/C/D/E
E-34	F-16A/B
E-35	F-16C/D
E-36	F-100
E-37	F-101B
E-38	F-104G
E-39	F-105D/F/G
E-40	F-106A/B
E-41	F-111A/E
E-42	F-111D
E-43	F-111F

E-4. Velocity versus distance relationships for civil and commercial aircraft are as follows:

Figure	Aircraft
E-44	Lockheed L-382 (L-100-20 and L-100-30)
E-45	Gates Learjet 24/25
E-46	Gates Learjet 35/36
E-47	Gruman Gulfstreaa II
E-48	Lockheed 1329
E-49	Rockwell NA-265-40 and NA-265-60
E-50	Rockwell NA-265-75A
E-51	Avions Marcel Dassault Mystere 20
E-52	Hamburger- Flugzeubau HFB- 320
E-53	Israel Aircraft 1121
E-54	Boeing 707-120B/ -320B/-320C
E-55	Boeing 707-320/-420
E-56	Boeing 720
E-57	Boeing 720B
E-58	Boeing 727-100/-100C
E-59	Boeing 727-200

Figure	Aircraft
E-60	Boeing 737-100
E-61	Boeing 737-200
E-62	Boeing 737-300/-400
E-63	Boeing 747-1008/ -200B-Pass/-200C-Cargo/ -200C-Pass/-200F-Cargo/ -300-Pass
E-64	Boeing 747-400
E-65	Boeing 747SF
E-66	Boeing 757-200
E-67	Boeing 767-200/-200ER/ -300 with PW-JT9D-7R4E Engines
E-68	Boeing 767-200ER/-300 with GE-CF6-80A2
E-69	Boeing 767-300ER
E-70	General Dynamics/Convair 880
E-71	General Dynamics/Convair 990
E-72	Lockheed L-1011-1 and L-1011-100
E-73	Lockheed L-1011-200/-500/ -500 Ex. Wing

Figure	Aircraft
E-74	McDonnell Douglas DC-8-43/ -55/-55F/-61/-61F/-62/ -6 2F/ -63/-63 F
E-75	McDonnell Douglas DC-8-71/ -71F/-72/-72F/-73/-73F
E-76	McDonnell Douglas DC-9-15/ -15F/-21/-32/-33F/-41/-51
E-77	McDonnell Douglas MD-81/-82/ -83/-87/-88
E-78	McDonnell Douglas DC-10-10
E-79	McDonnell Douglas DC-10-30
E-80	McDonnell Douglas DC-10-40
E-81	B.A.C. One-Eleven Model 400
E-82	B.A.C. One-Eleven Model 500
E-83	B.A.C./SNIAS Concorde

E-5. Temperature versus distance relationships are grouped by military aircraft (figs E-84 to E-122) and civil and commercial aircraft (figs E-123 to E-141). Military aircraft are further subgrouped as follows:

a. Bomber Aircraft.

Figure	Aircraft
E-84	B-lB
E-85	B-52G
E-86	B-52H
E-87	FB-111A

b. Cargo/Transport Aircraft.

Figure	Aircraft
E-88	C-5A/B
E-89	C-9A
E-90	C-21A
E-91	C-22B
E-92	C-135B
E-93	KC-135R
E-94	C-137B/C
E-95	C-140A/B
E-96	C-141A/B
E-97	KC-10A

c. Special-Duty Aircraft.

Figure	Aircraft
E-98	E-3A/B/C
E-99	E-4A/B
E-100	EC-18B
E-101	EC-135A/G/L
E-102	EC-135C/E/H/J/K/P/Y, RC-135S/U/V/W, and WC -1351
E-103	EF-111A
E-104	OA-37B
E-105	OV-1B/C/D
E-106	RF-4C

d. Tactical Aircraft.

Figure	Aircraft
E-107	A-7D/K
E-108	A-10A
E-109	A-37B
E-110	F-4C/D/E
E-111	F-5E/F
E-112	F-15A/B/C/D/E
E-113	F-16A/B
E-114	F-16C/D
E-115	F-100
E-116	F-101B
E-117	F-104G
E-118	F-105D/F/G
E-119	F-106A/B
E-120	F-111A/E
E-121	F-111D
E-122	F-111F

E-6. Temperature versus distance relationships for civil and commercial aircraft are as follows:

Figure	Aircraft
E-123	Gates Learjet 35/36
E-124	Lockheed 1329
E-125	Rockwell NA-265-40 and NA-265-60
E-126	Rockwell NA-265-75A
E-127	Avions Marcel Dassault Mystere 20
E-128	Boeing 727-100/-100C
E-129	Boeing 727-200
E-130	Boeing 737-100
E-131	Boeing 737-200
E-132	Boeing 747-100B/-200B-Pass/ -200C-Cargo/-200C-Pass/ -200F-Cargo/-300-Pass
E-133	Boeing 747SF
E-134	General Dynamics/Convair 880
E-135	General Dynamics/Convair 990
E-136	Lockheed L-1011-l and L-1011-100
E-137	Lockheed L-1011-200/-500/ -500 Ex. Wing

Figure	Aircraft
E-138	McDonnell Douglas DC-9-15/ -15F/-21/-32/-33F/-41/-51
E-139	B.A.C. One-Eleven Model 400
E-140	B.A.C. One-Eleven Model 500
E-141	B.A.C./SNIAS Concord.

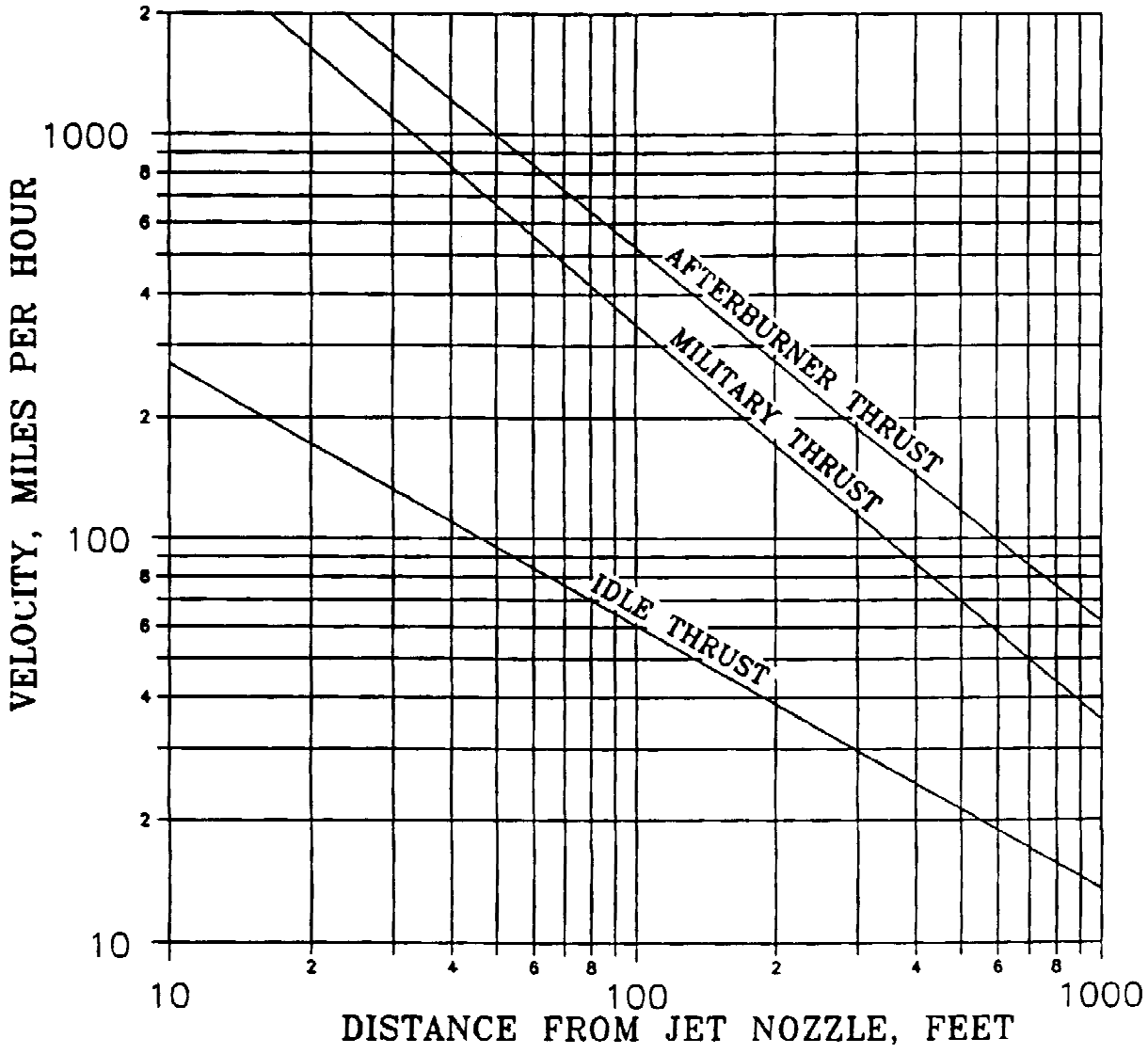

Figure E-1. B-1B, Velocity - Distance Curves

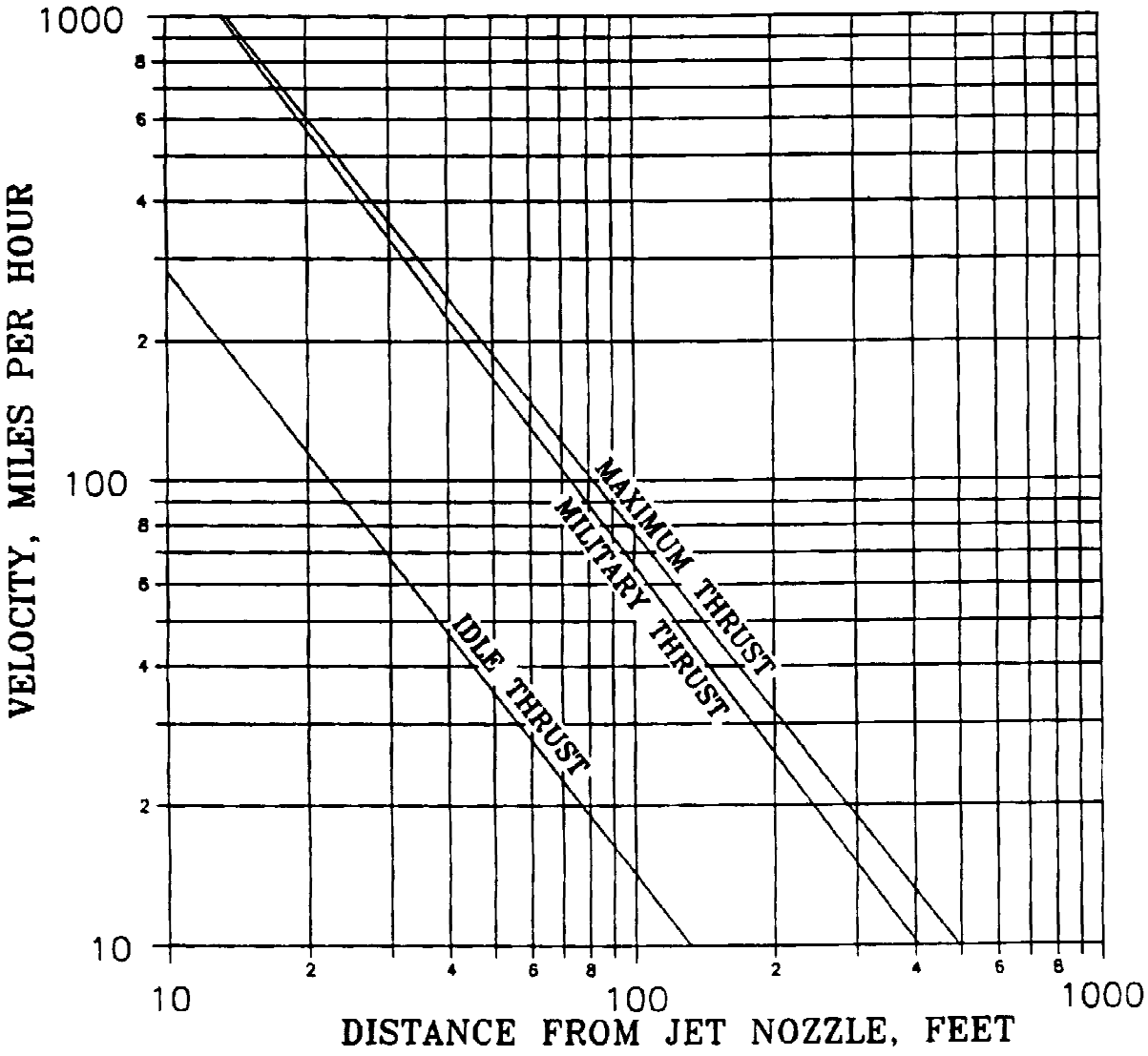

Figure E-2. B-52G, Velocity - Distance Curves

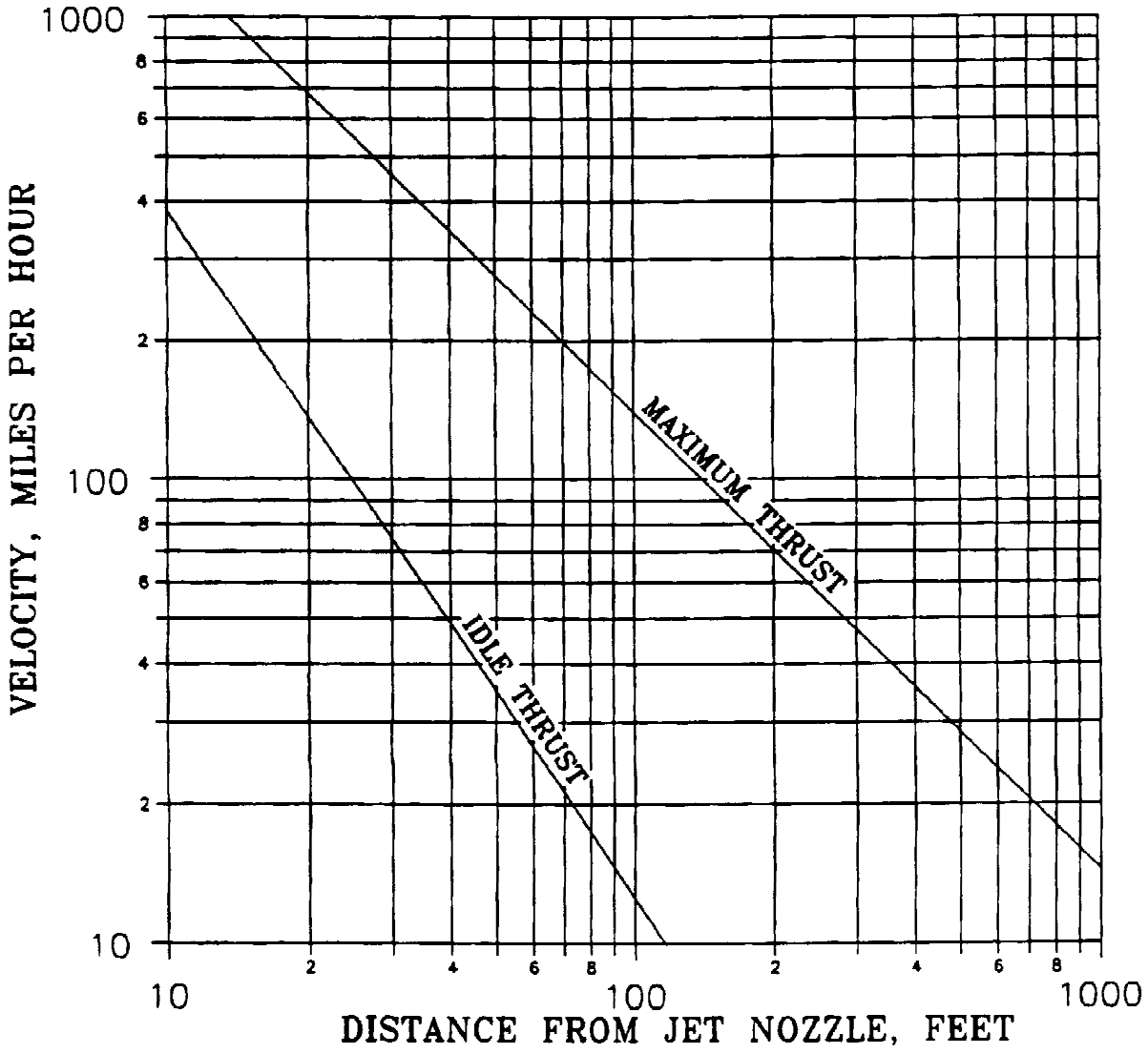

Figure E-3. B-52H, Velocity - Distance Curves

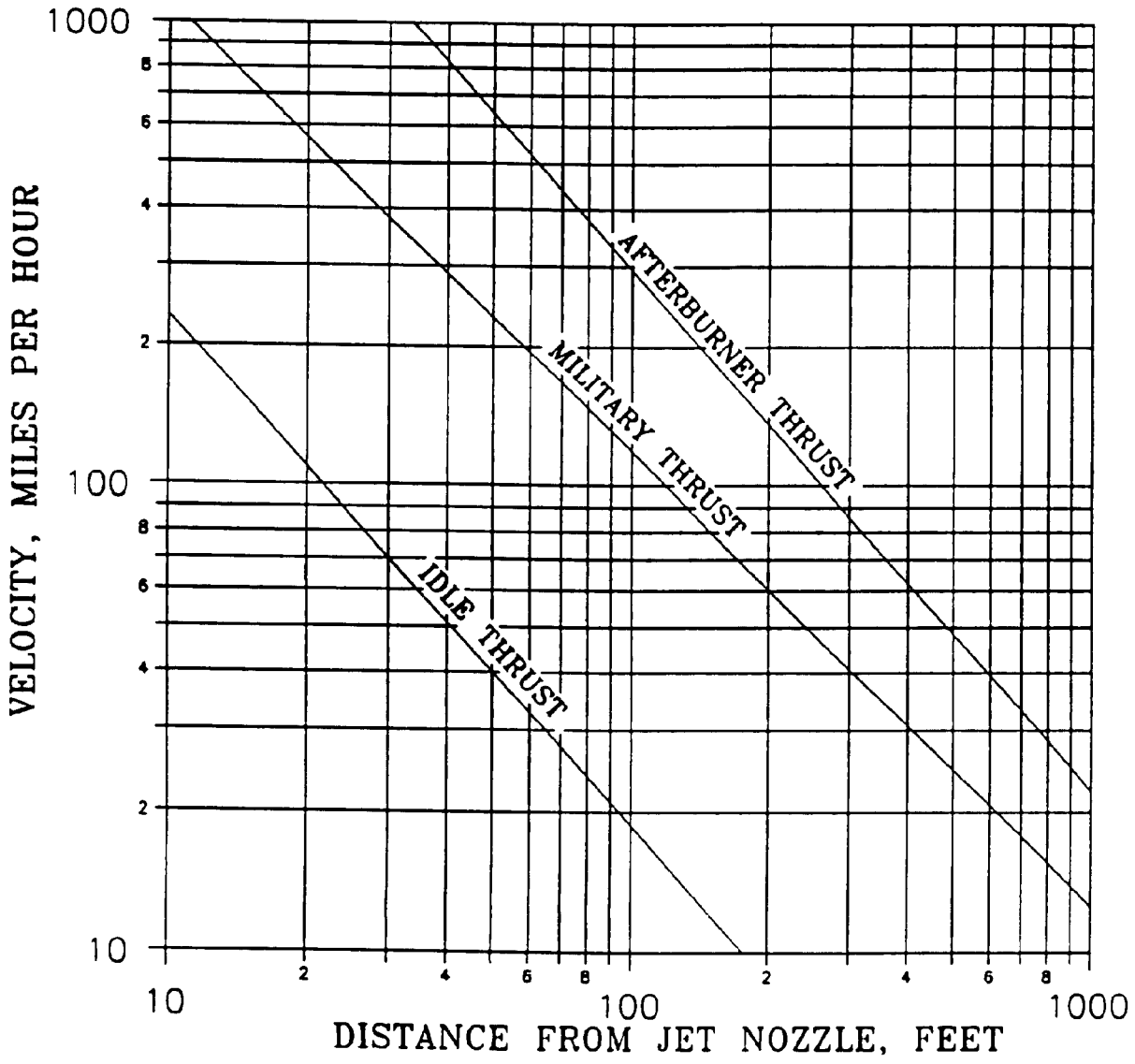

Figure E-4. FB-111A, Velocity - Distance Curves

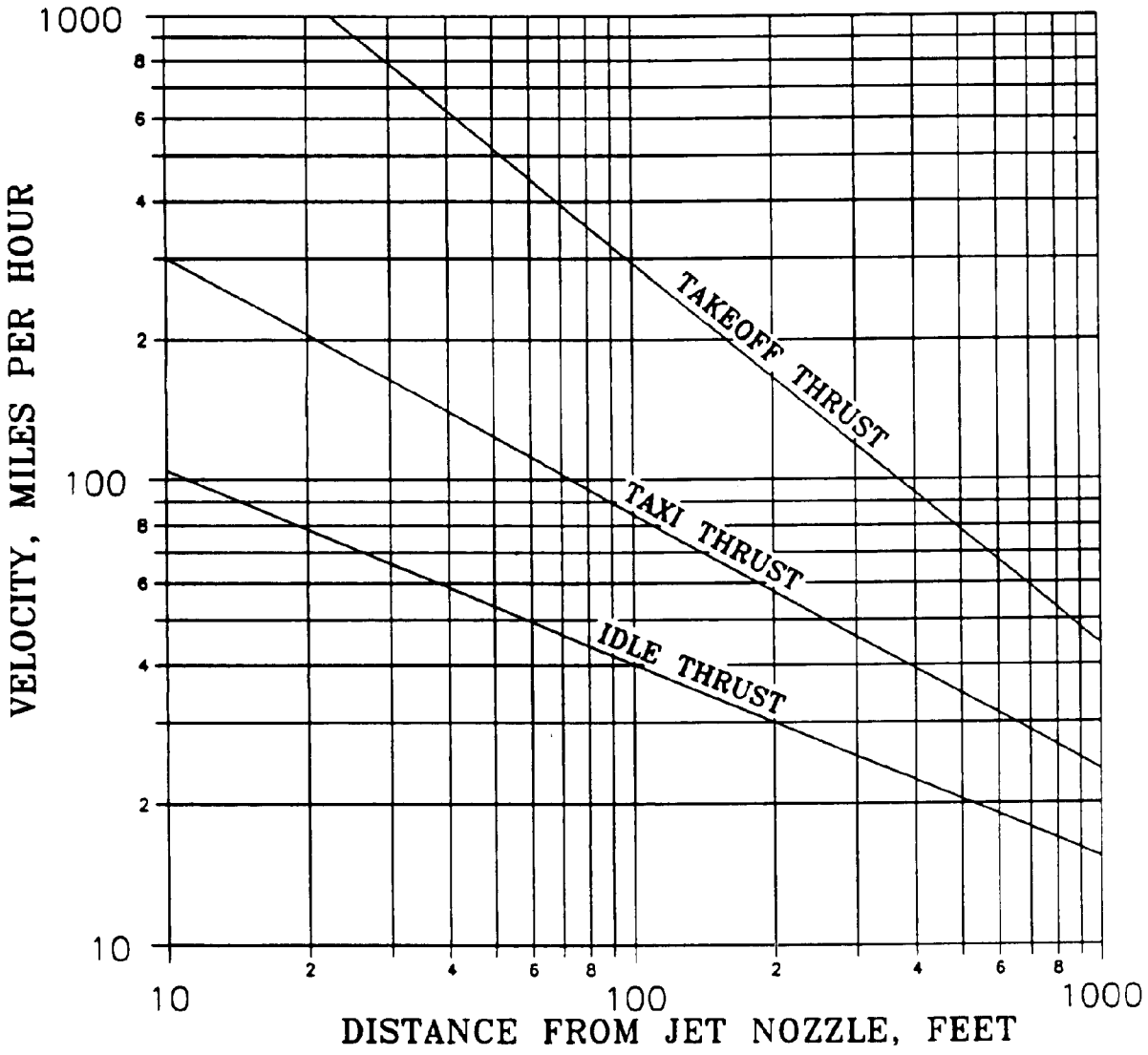

Figure E-5. C-5A/B, Velocity - Distance Curves

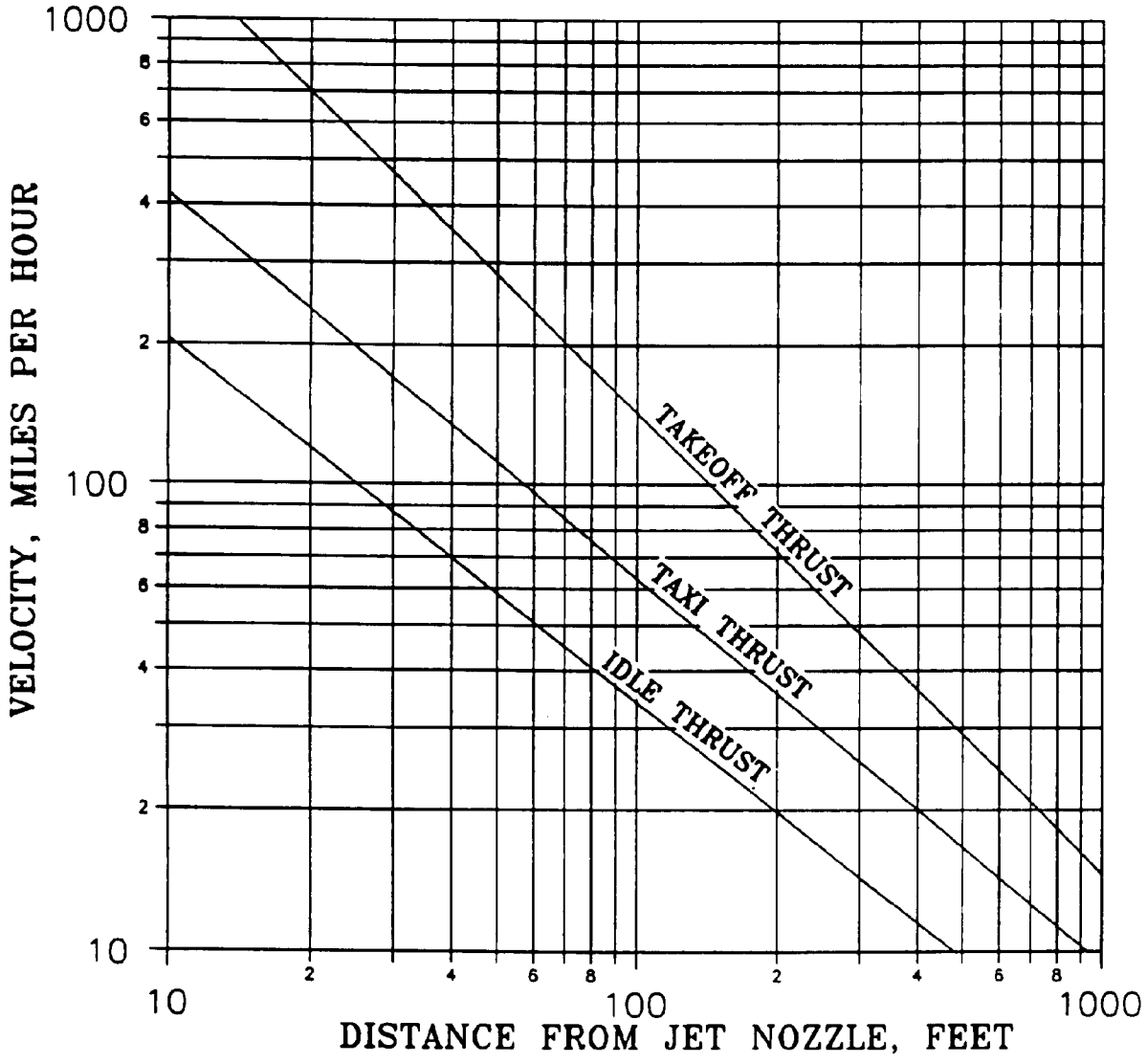

Figure E-6. C-9A, Velocity - Distance Curves

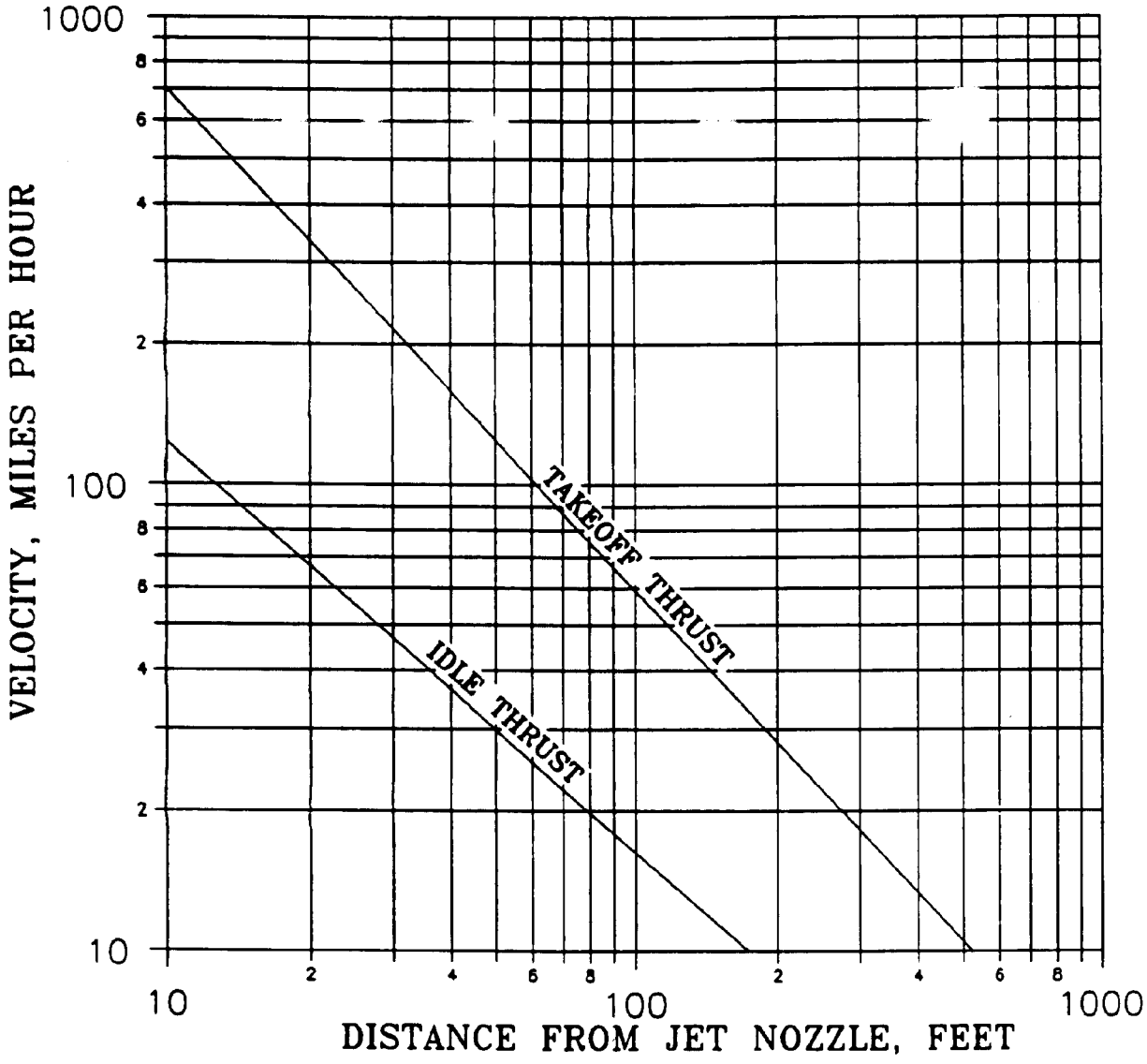

Figure E-7. C-21A, Velocity - Distance Curves

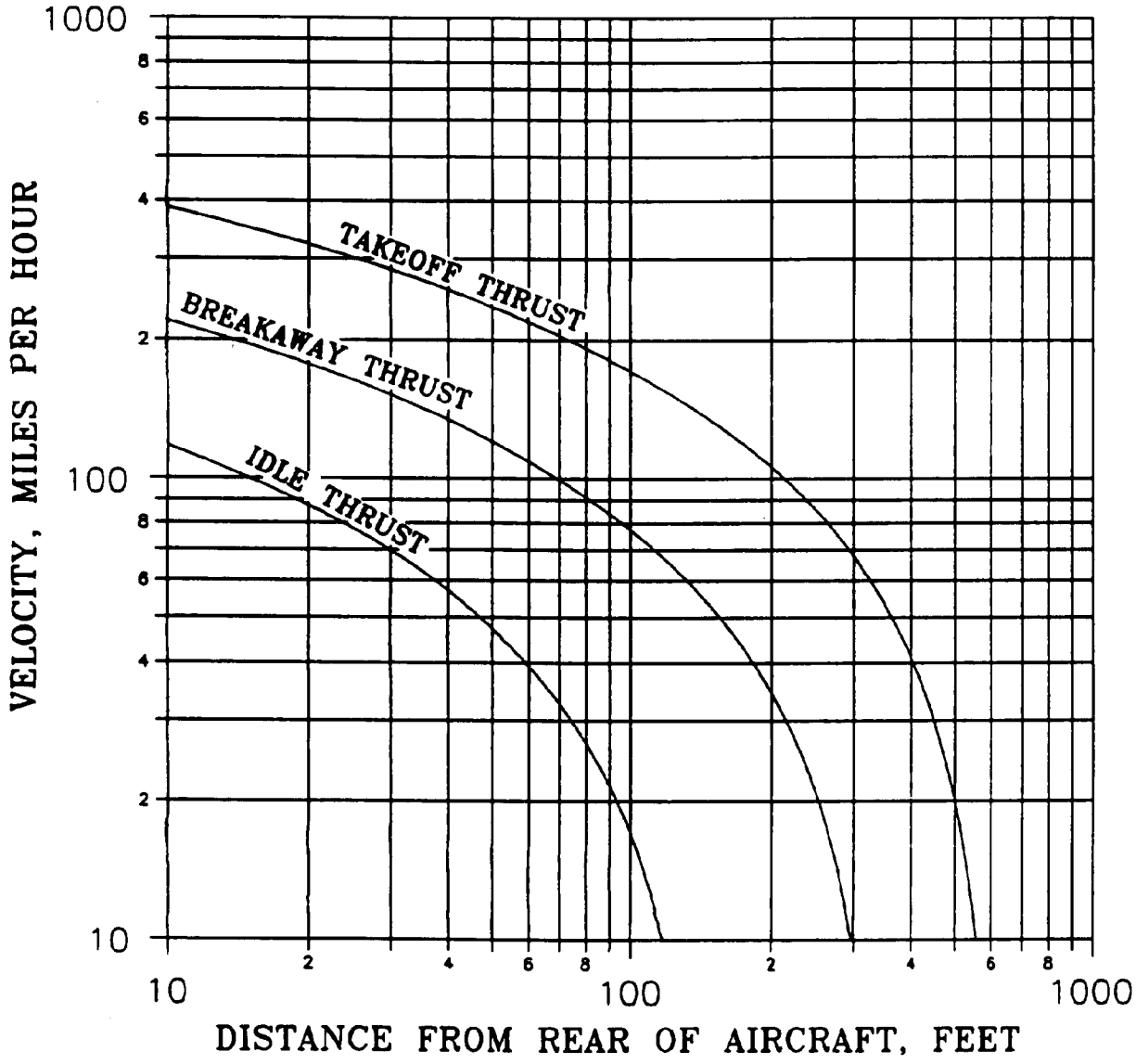

Figure E-8. C-22B, Velocity - Distance Curves

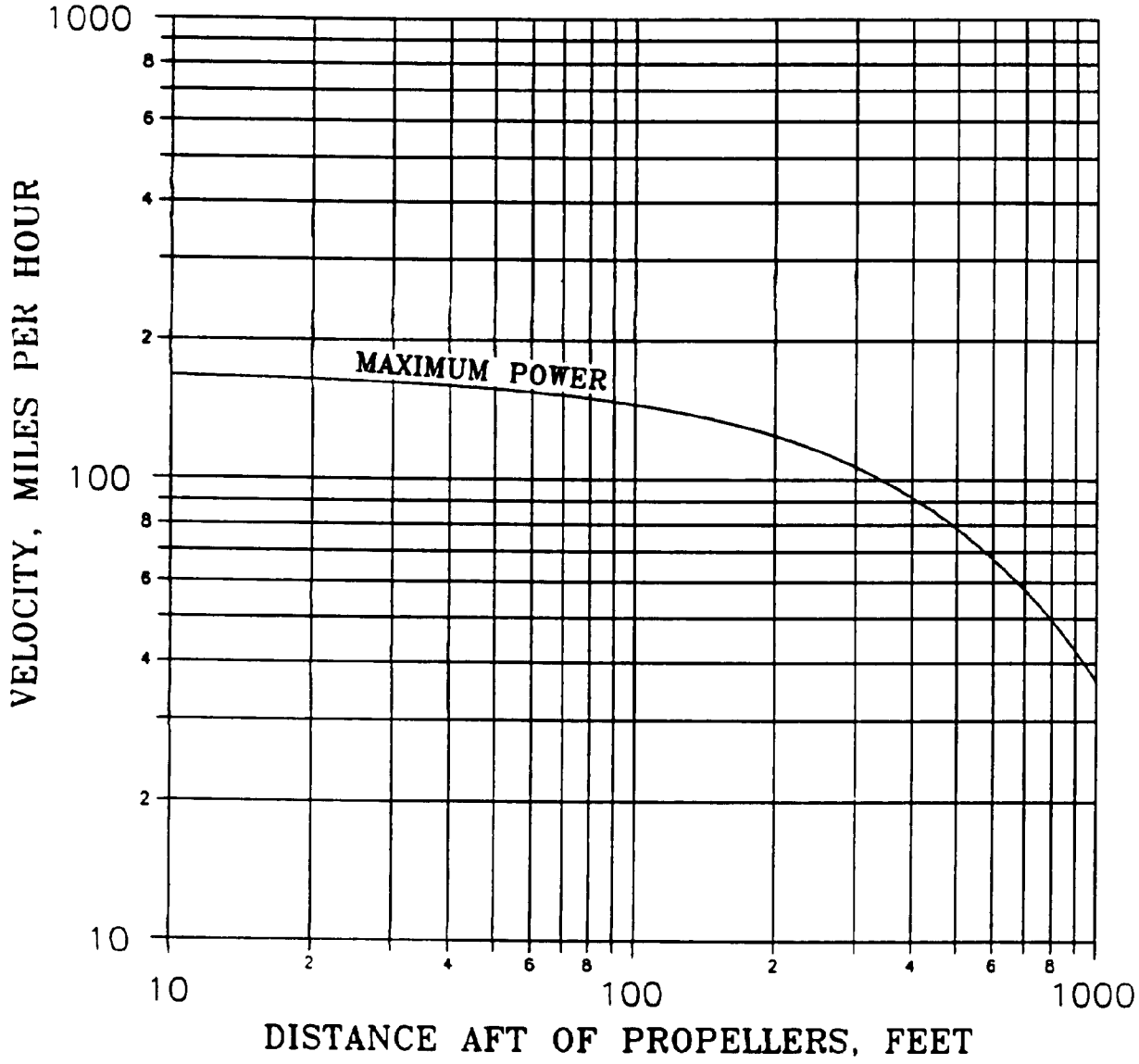

Figure E-9. C-130B/E/H, Velocity - Distance Curve

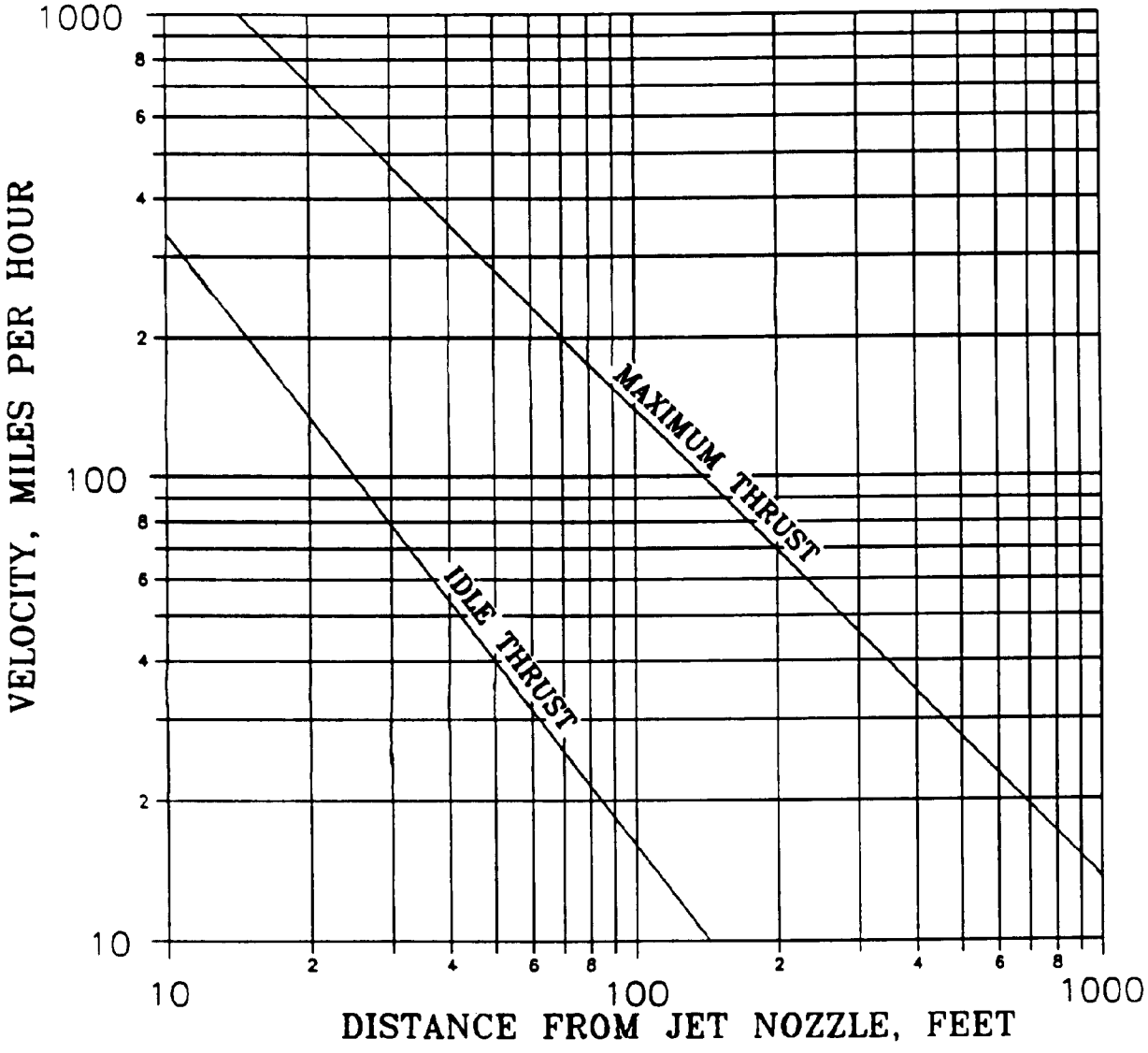

Figure E-10. C-135B, Velocity - Distance Curves

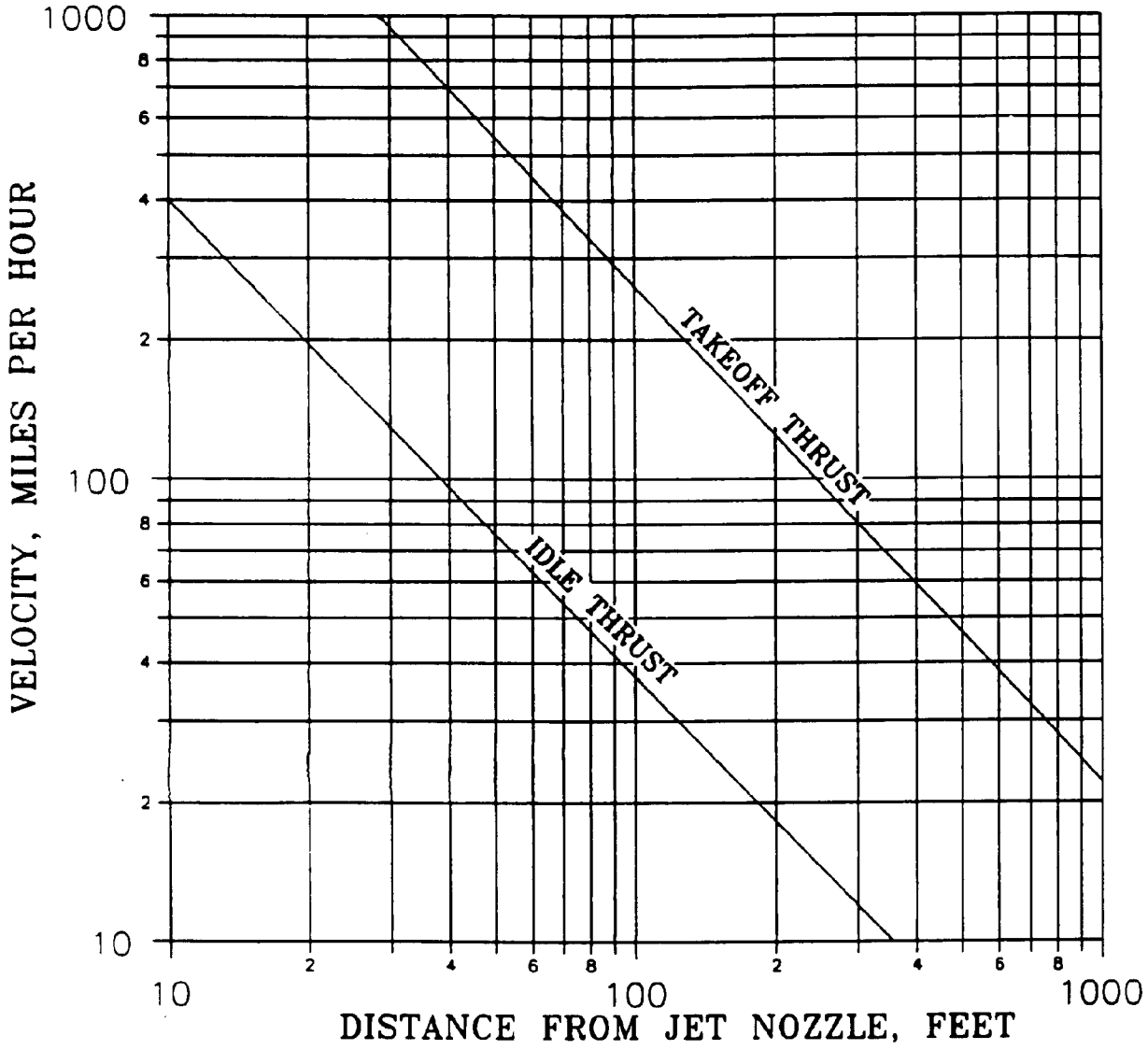

Figure E-11. KC-135R, Velocity - Distance Curves

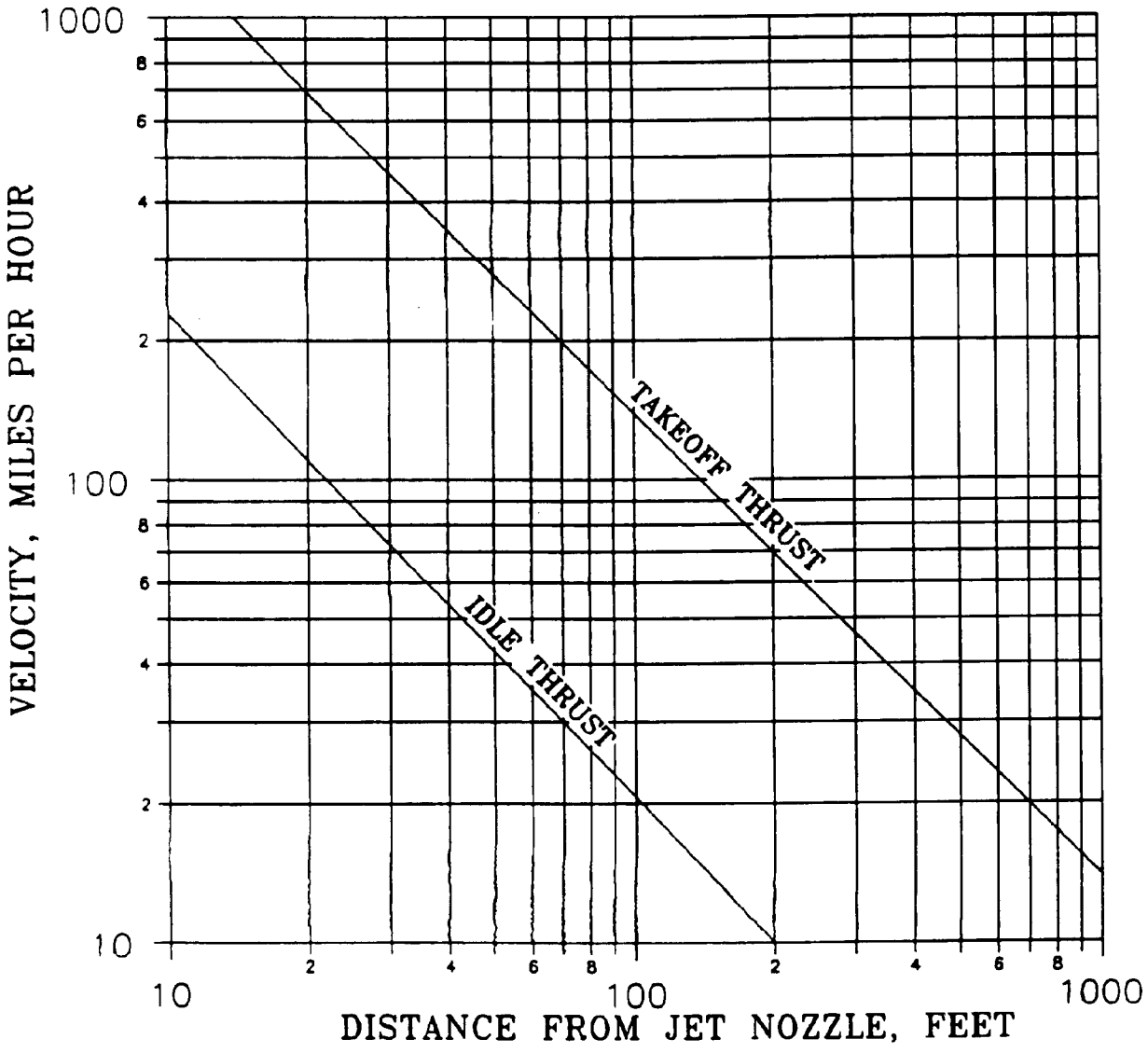

Figure E-12. C-137B/C, Velocity - Distance Curves

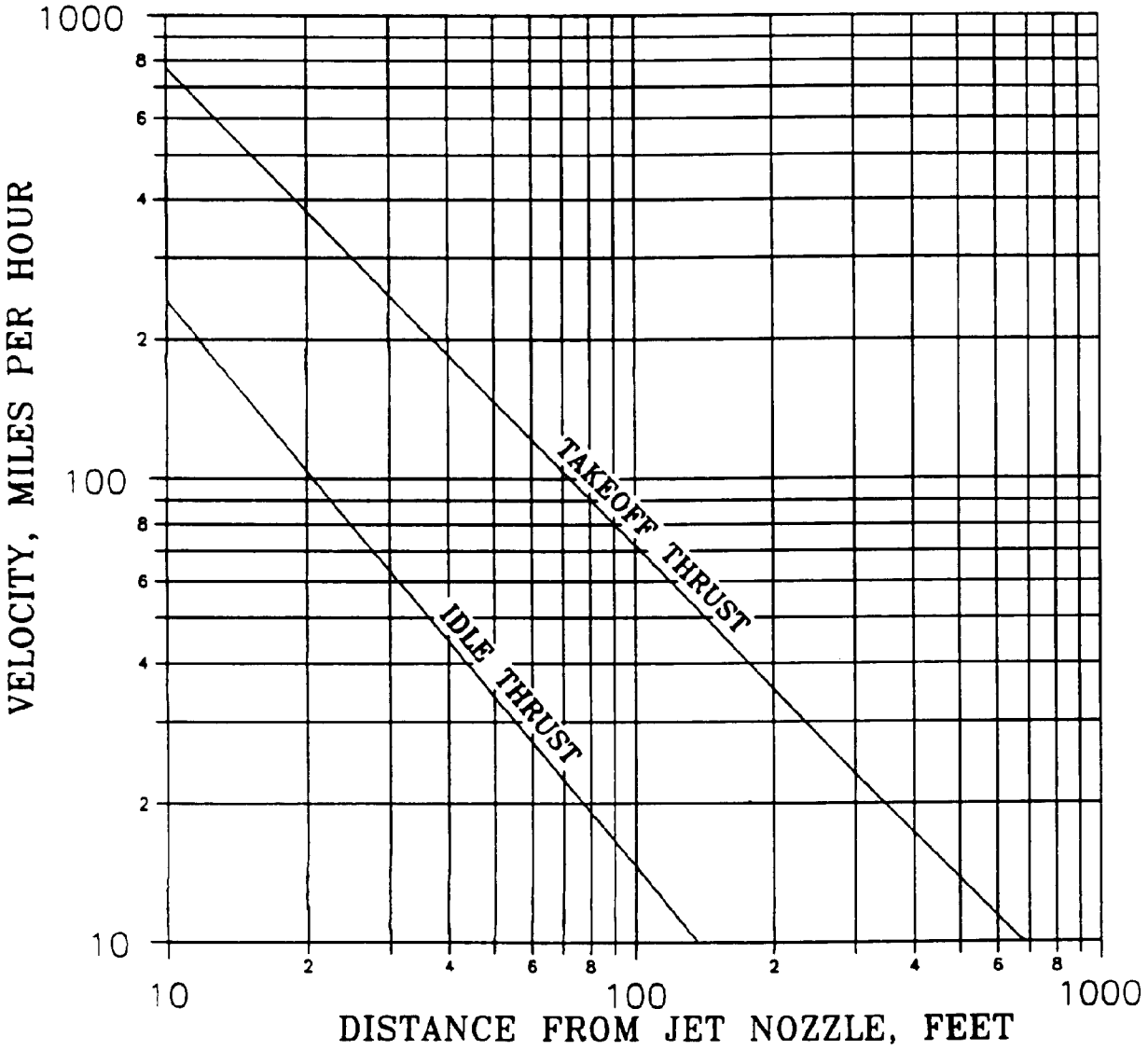

Figure E-13. C-140A/B, Velocity - Distance Curves

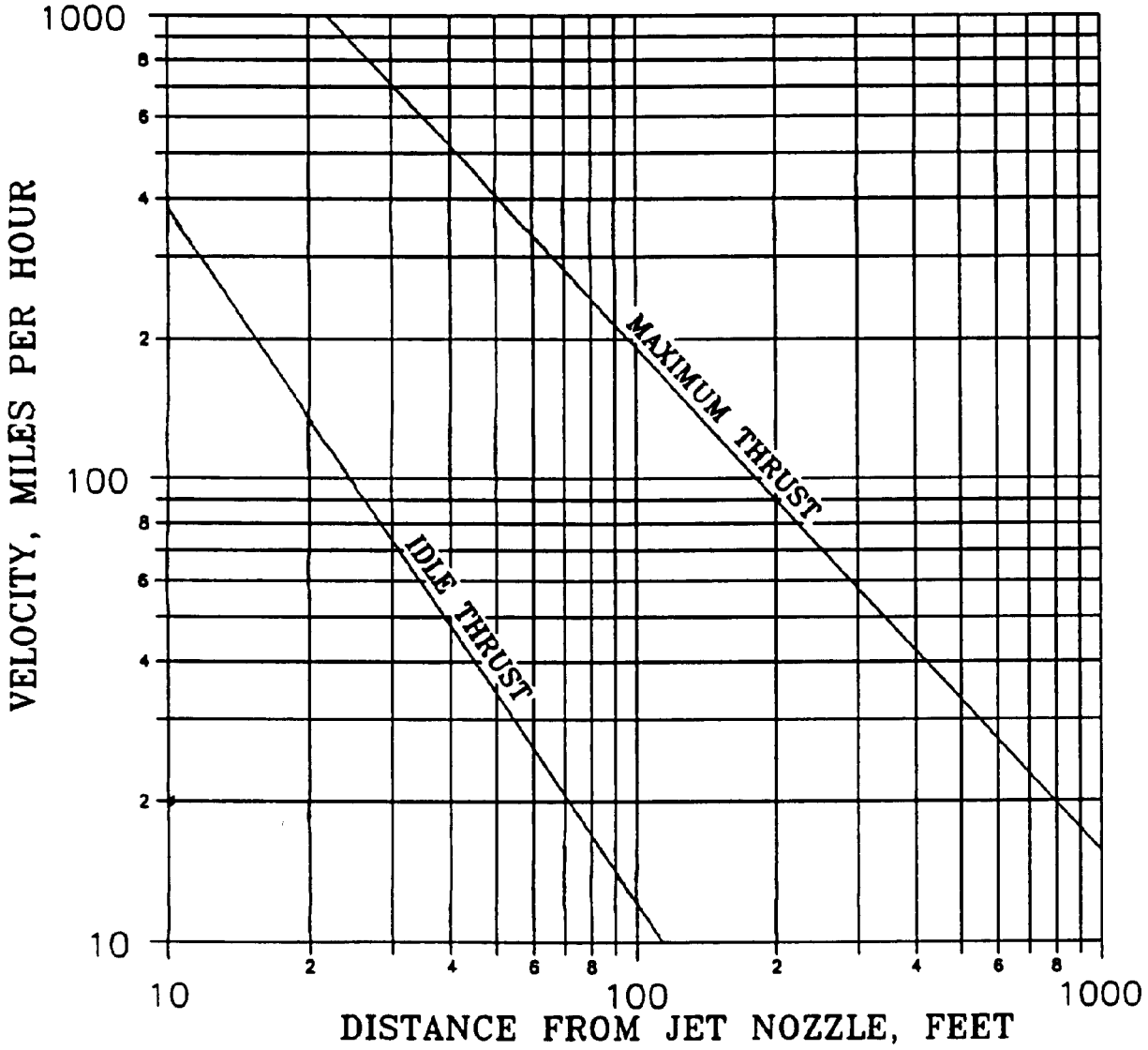

Figure E-14. C-141A/B, Velocity - Distance Curves

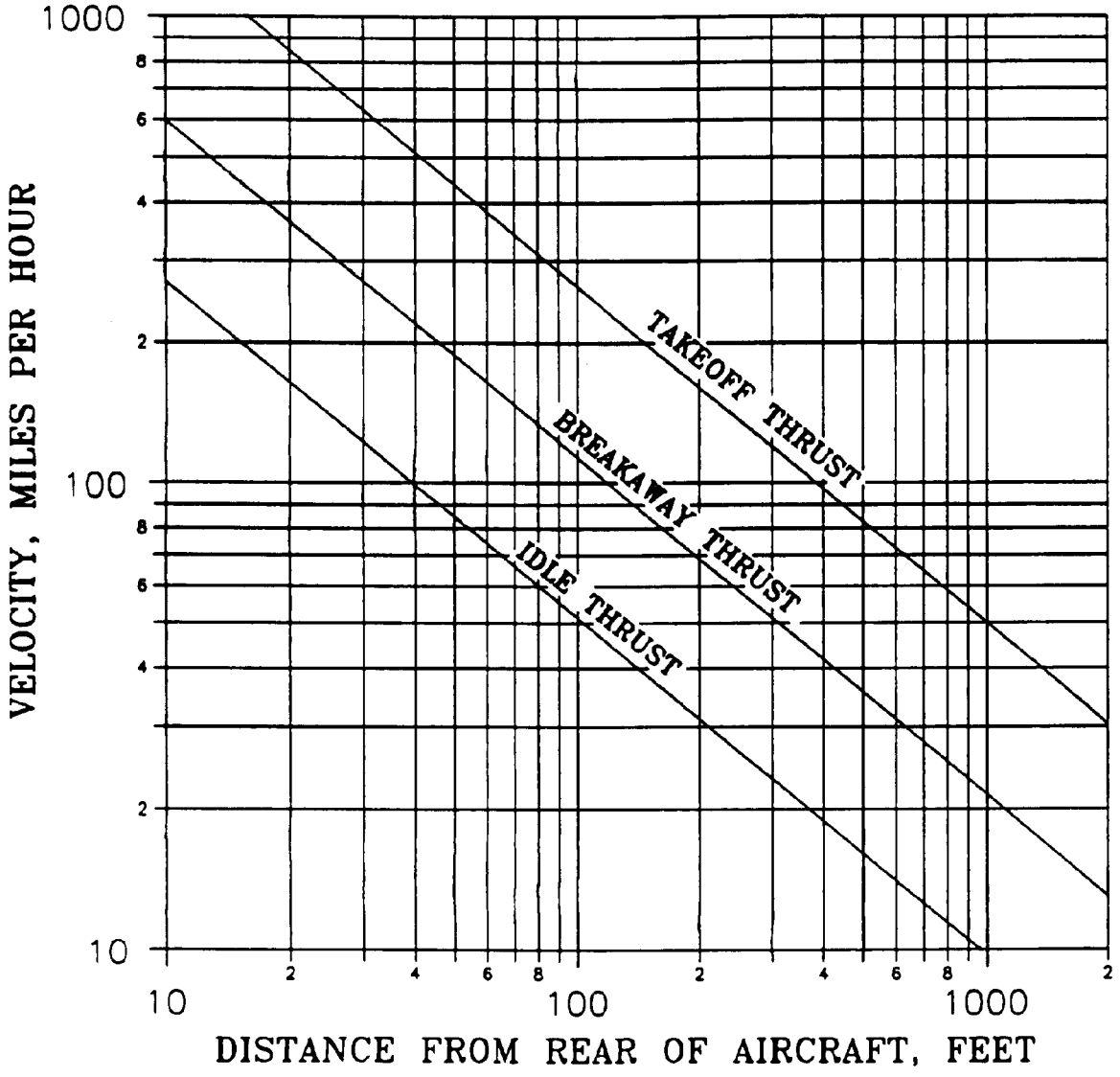

Figure E-15. KC-10A, Velocity - Distance Curves

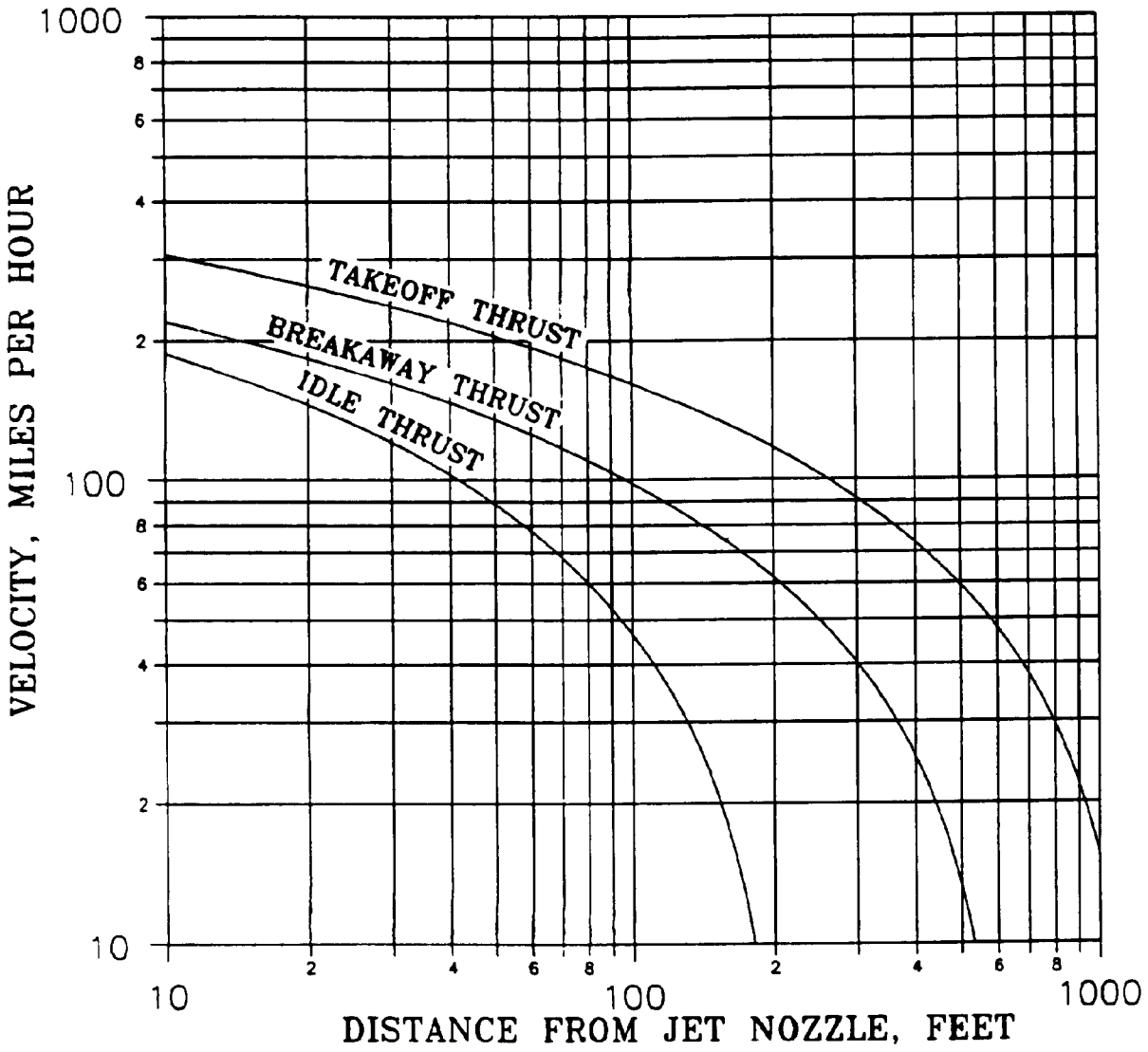

Figure E-16. VC-25A, Velocity - Distance Curves

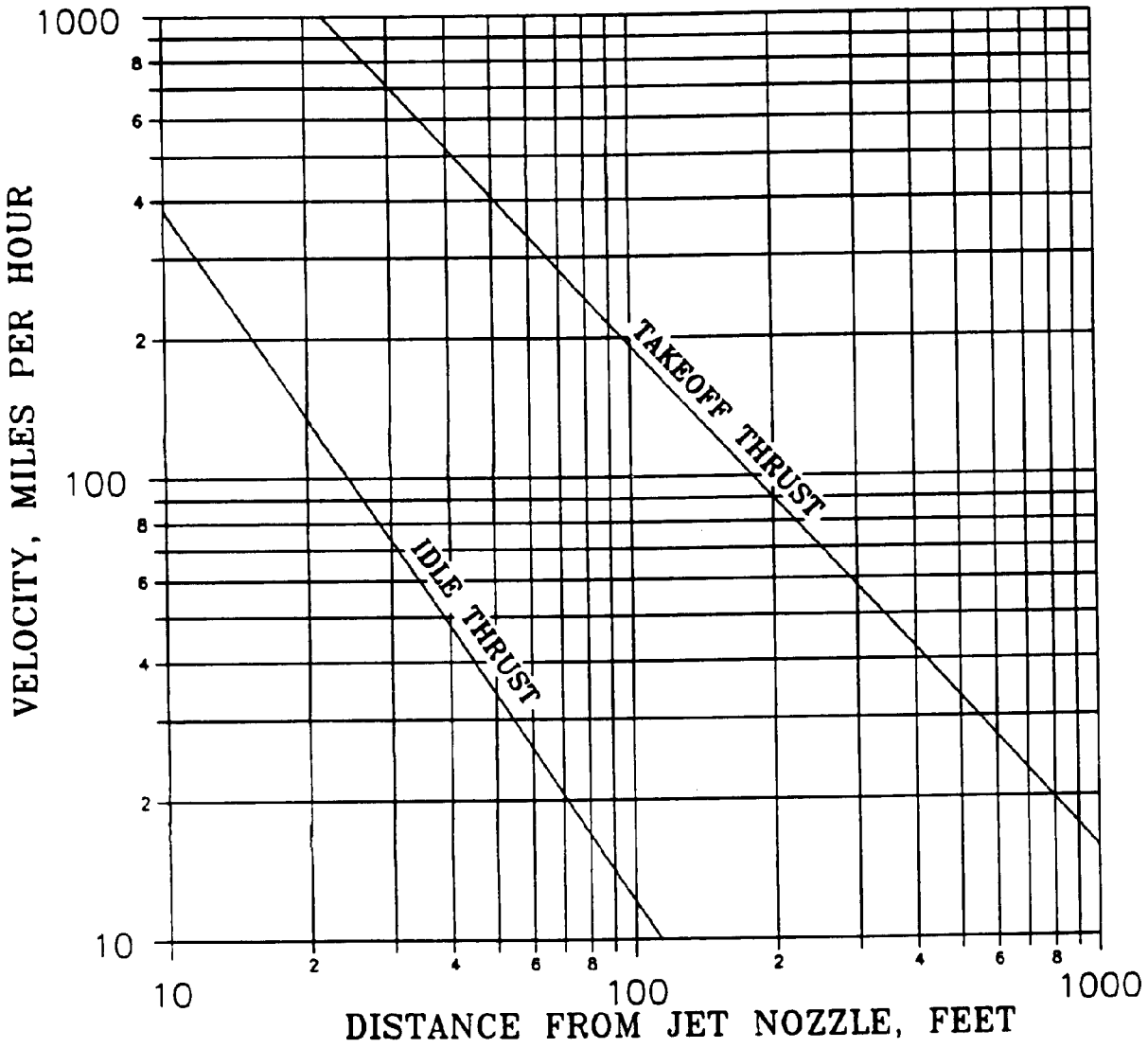

Figure E-17. E-3A/B/C, Velocity - Distance Curves

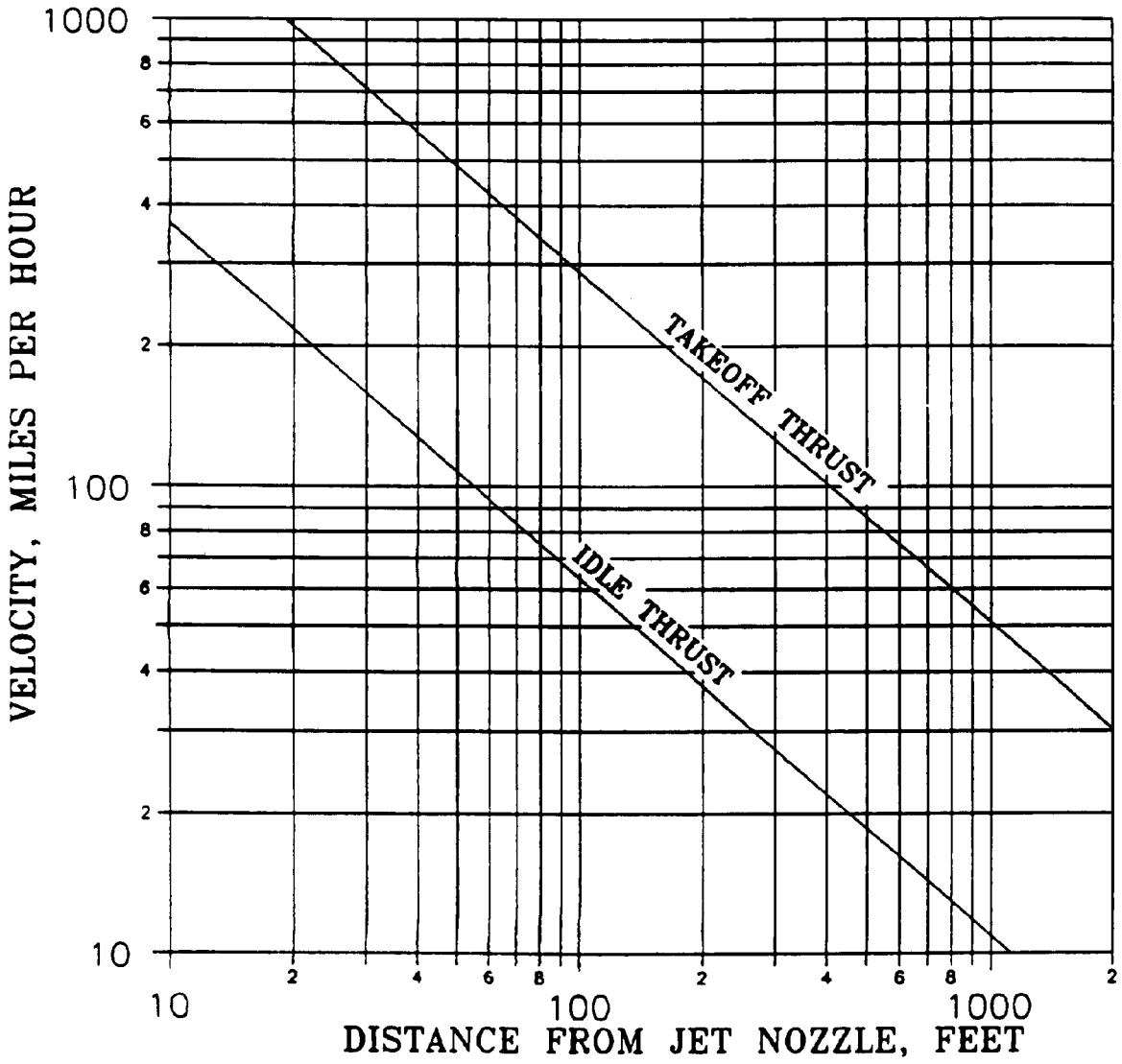

Figure E-18. E-4A/B, Velocity - Distance Curves