REPORT NO. F378 24 FEBRUARY 1967

F-4M(FVS) (U)

MCDONNELL

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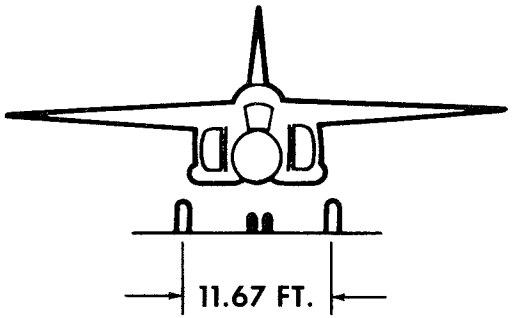
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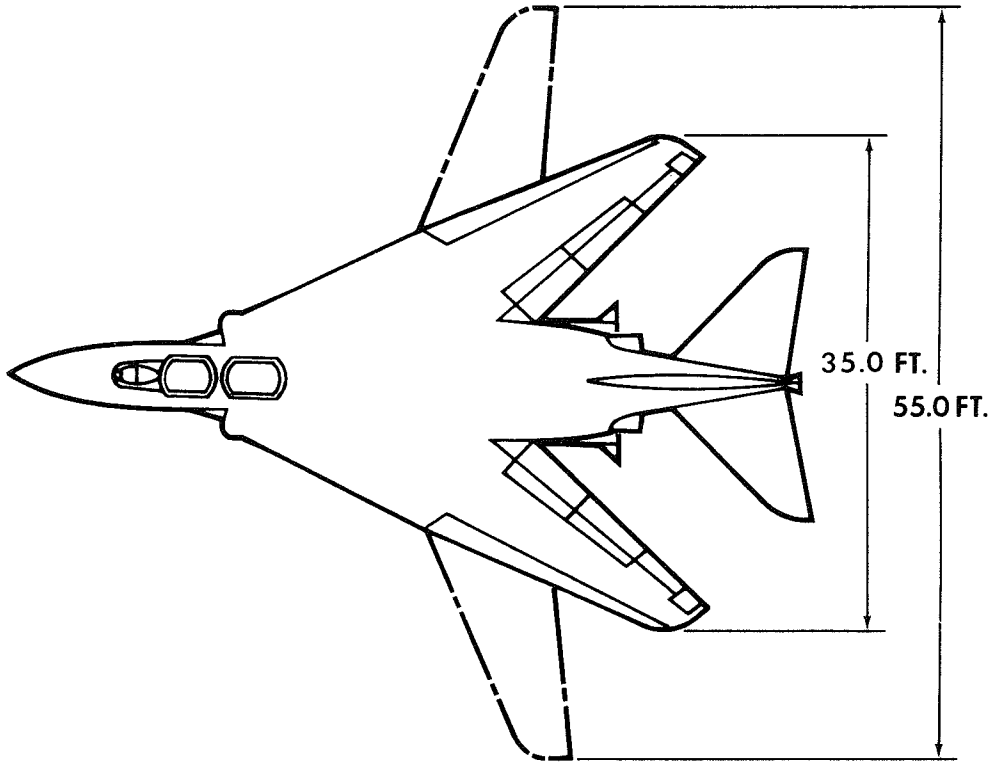
GROUP 3
DOWNGRADED AT 12 YEAR INTERVALS;
NOT AUTOMATICALLY DECLASSIFIED.
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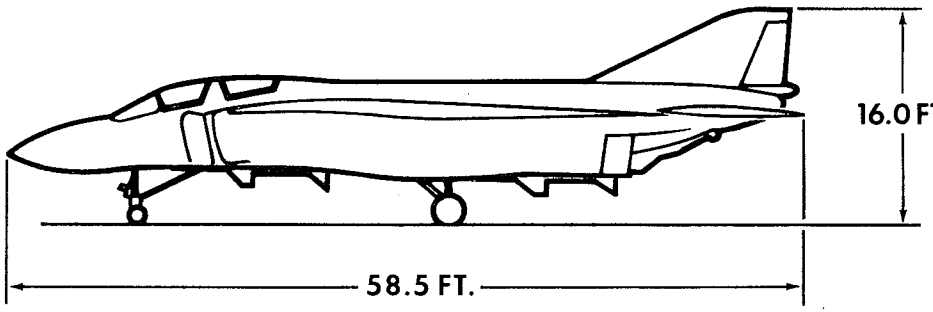
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F-4M(FVS)

GENERAL ARRANGEMENT







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GA67-00430

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AIRPLANE COMPARISON

		F-4M	F-4M(FVS)
DESIGN CHARACTERISTICS			
WING CONFIGURATION		LOW FIXED	HIGH VARIABLE SWEEP
REFERENCE WING AREA	$ft.^2$	530	420
ENGINES		(2) RB168-25R	(2) RB168-27R
INTERNAL AVTUR/50 FUEL	gal.	1991	2562
BASIC TAKEOFF GROSS WEIGHT	lb.	46,785	53,420
OPERATING WEIGHT EMPTY	lb.	33,545	36,383
COMBAT PERFORMANCE			
COMBAT GROSS WEIGHT (60% INT. FUEL)	lb.	41,489	46,605
MAXIMUM LEVEL FLIGHT SPEED (MAX. PWR.)	M	2.20	2.41
SUPERSONIC COMBAT CEILING (500 FT./MIN. R/C, MAX. PWR.)	ft.	54,400	57,600
ACCELERATION - .9M TO 2.0M @ 36,089 FT. MAX. PWR.	min.	3.17	2.58

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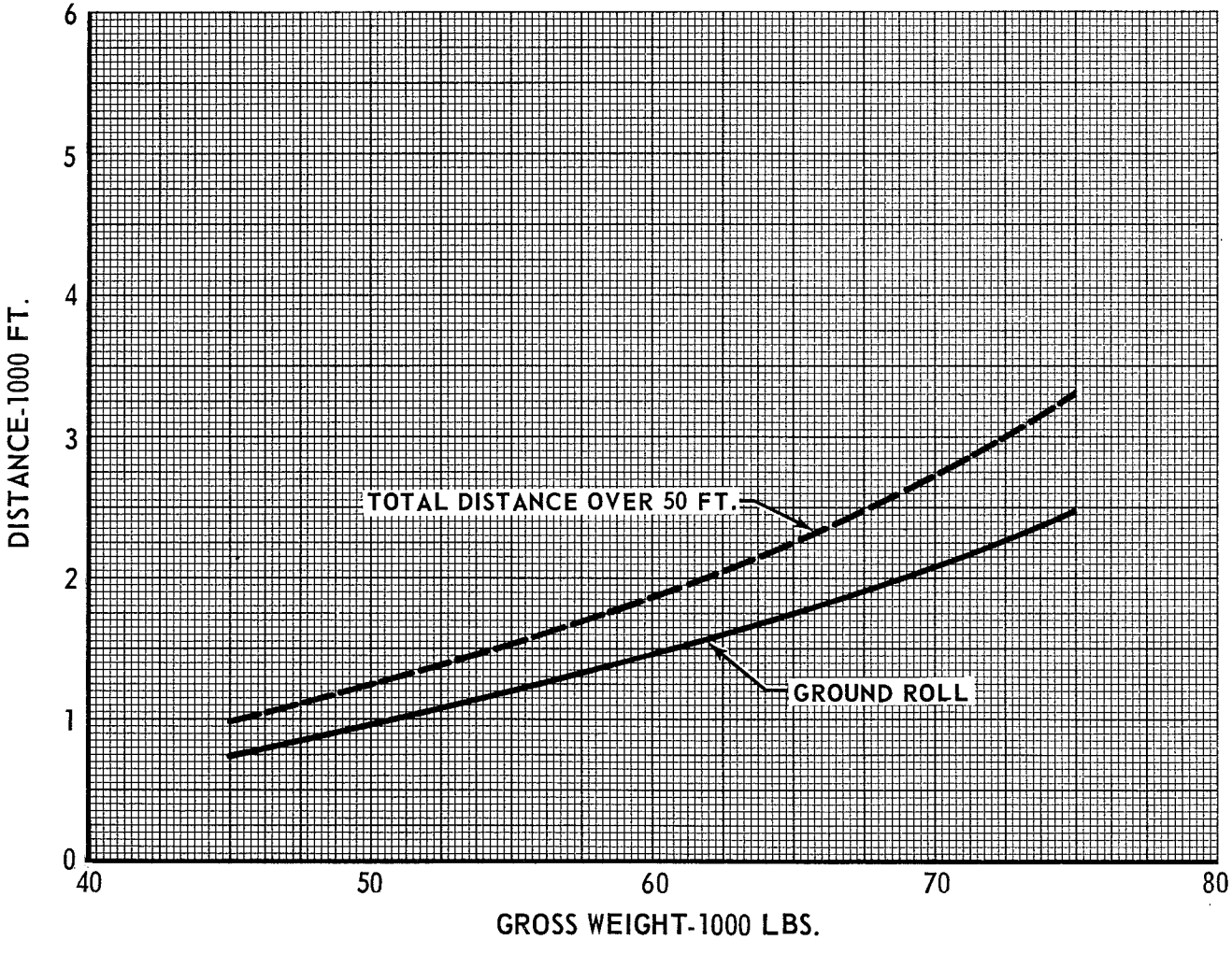
GA67-00429

F-4M(FVS)

TAKE-OFF PERFORMANCE

STANDARD DAY-59°F | **MAXIMUM POWER**

SEA LEVEL | **FULL FLAPS**



GA67-00422

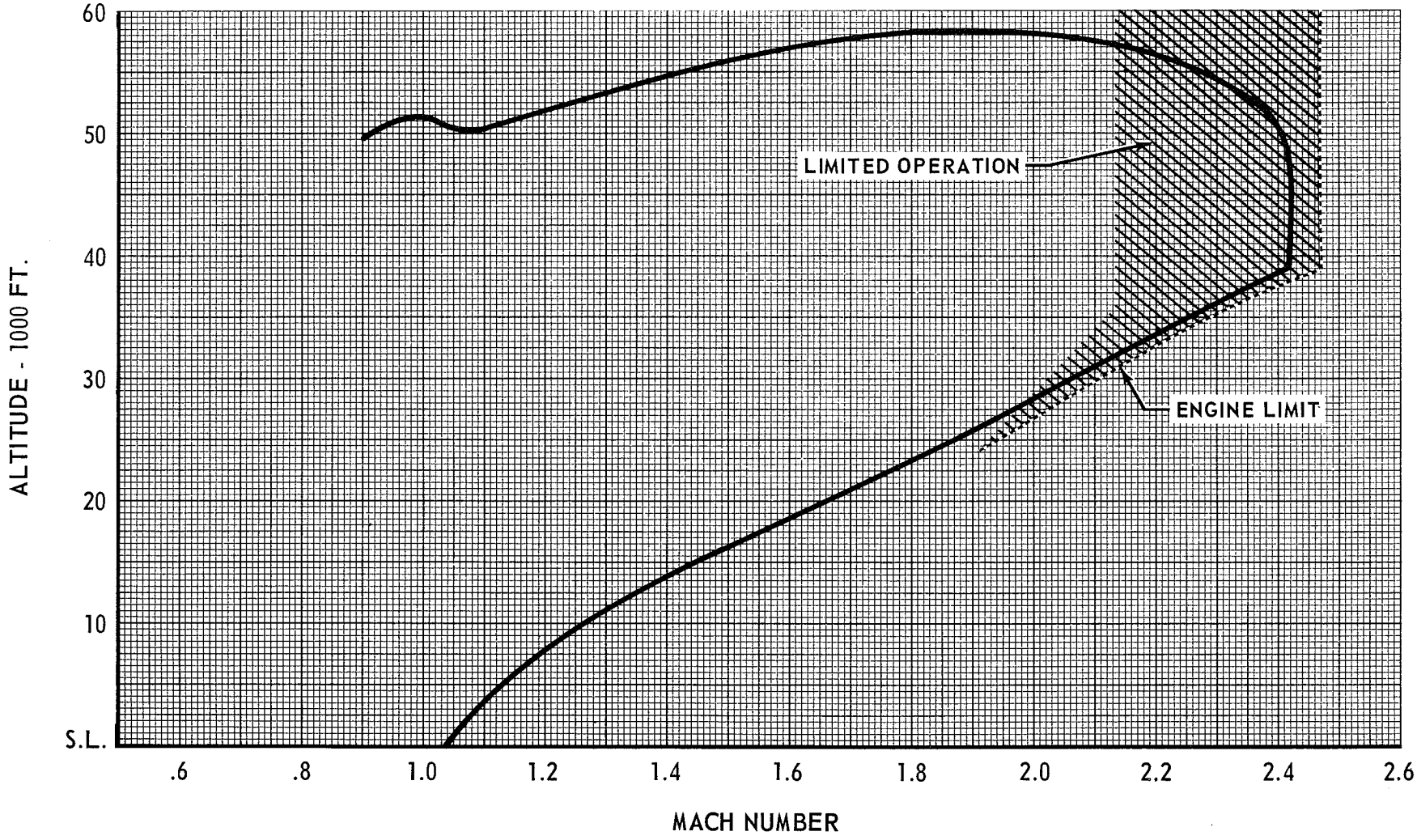
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F-4M(FVS)

MAXIMUM LEVEL FLIGHT ENVELOPE

(2) RB-168-27R ENGINES — MAXIMUM THRUST

(4) AIM-7E MISSILES — GROSS WEIGHT = 46,765 LBS.



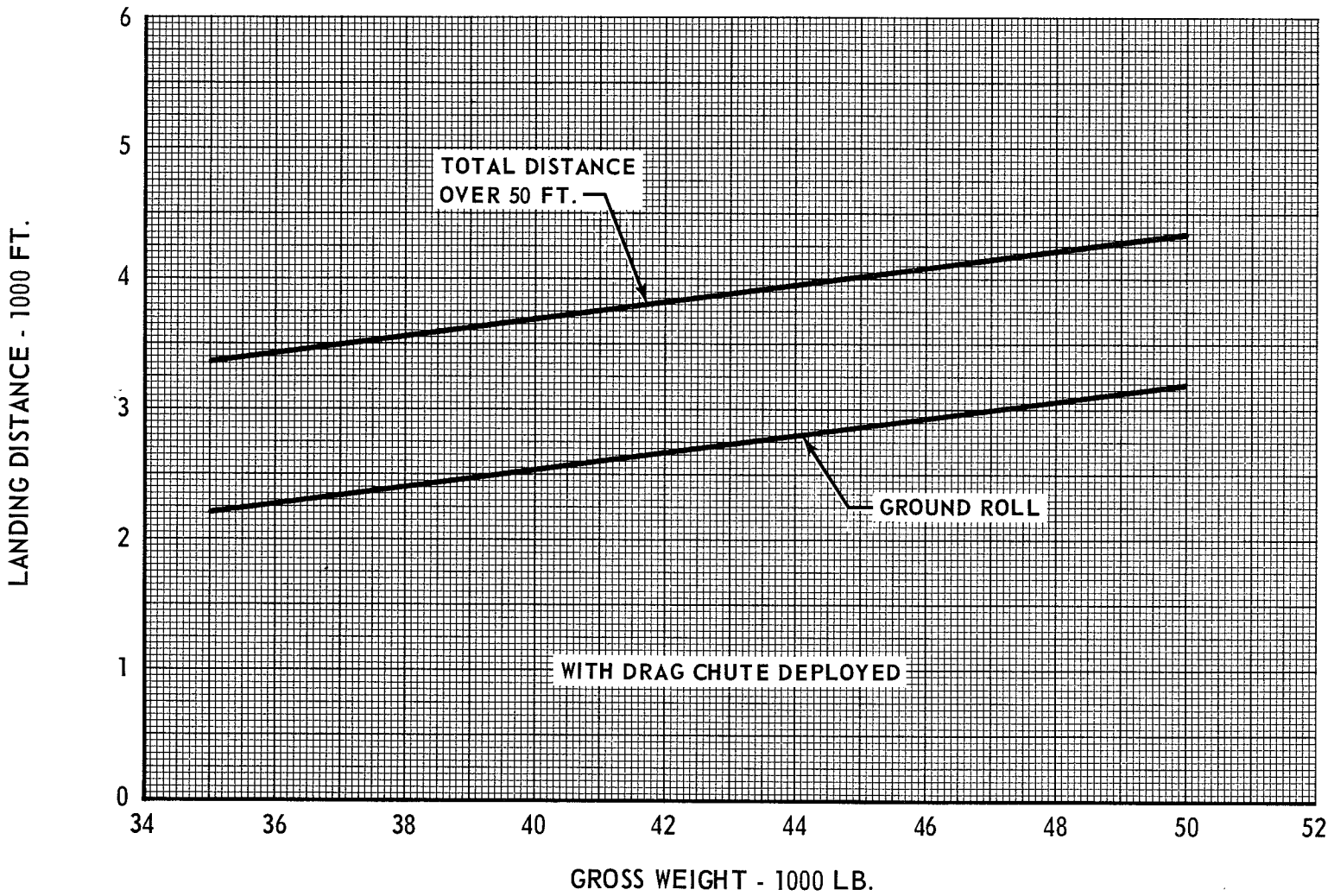
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GA67-00421

F-4M(FVS)

LANDING DISTANCE

STANDARD DAY 59°F SEA LEVEL FULL FLAPS



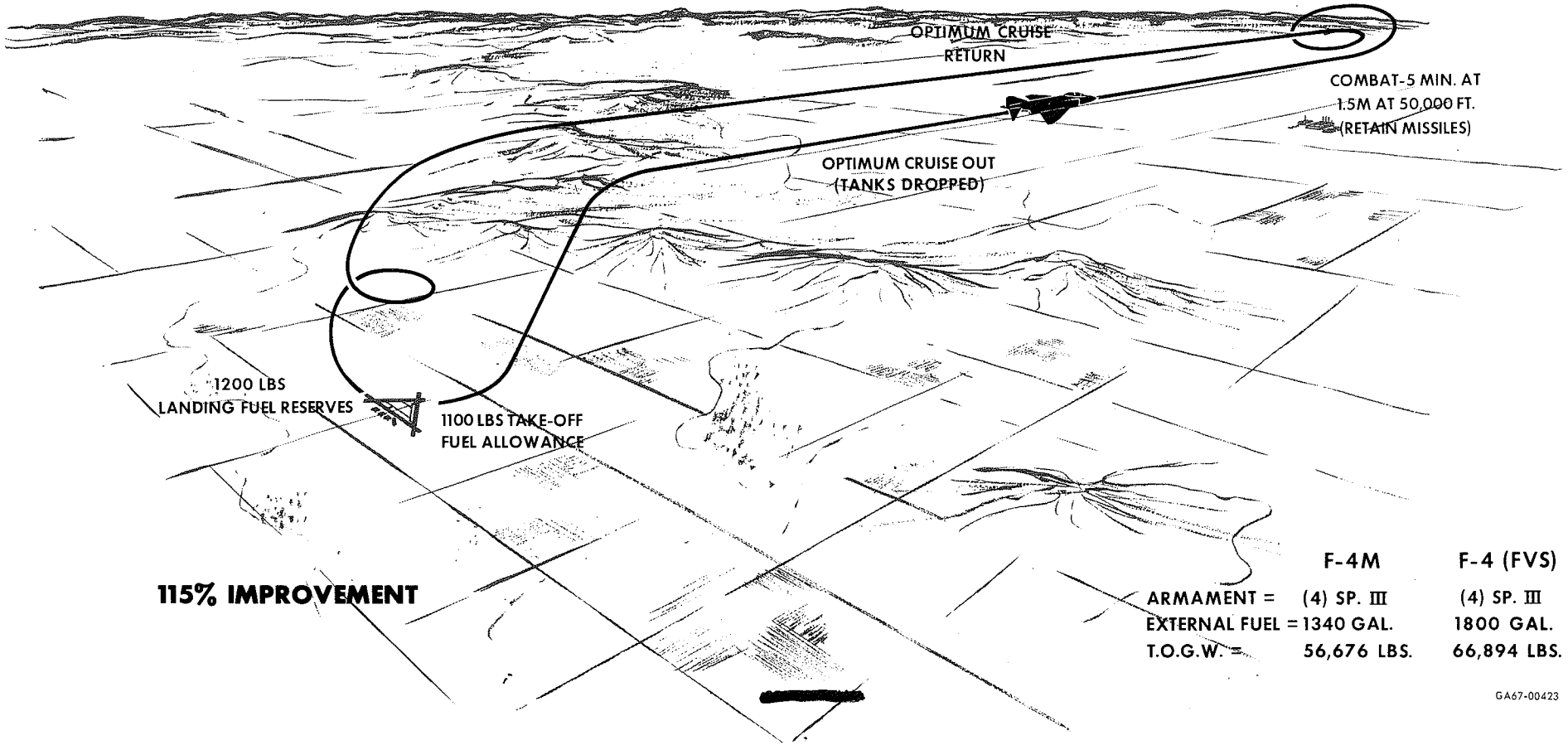
GA67-00428

COMBAT AIR PATROL

TIME ON STATION @ 150 NA. MI.

F-4M 3.27 HRS.

F-4M (FVS) 7.02 HRS.



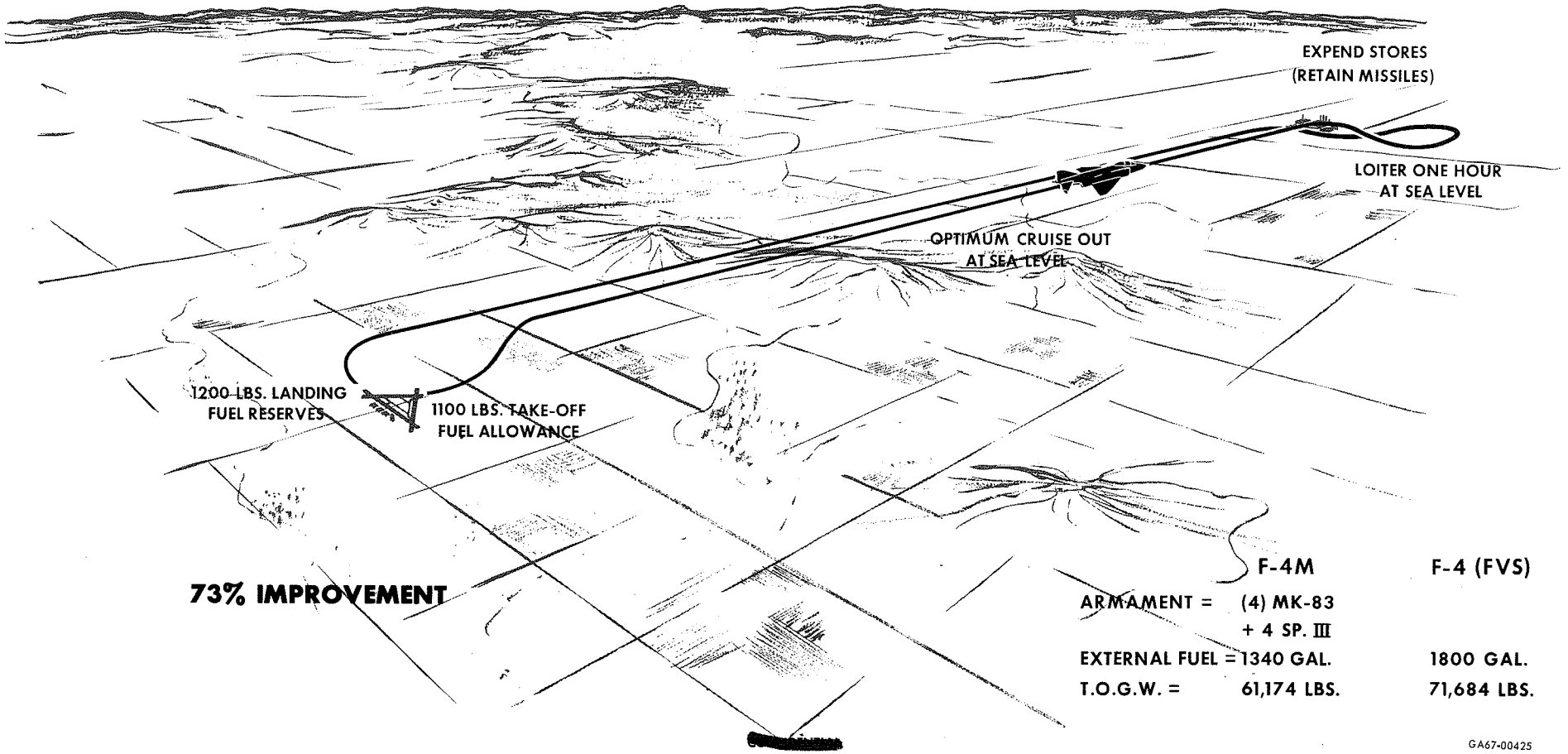
115% IMPROVEMENT

	F-4M	F-4 (FVS)
ARMAMENT =	(4) SP. III	(4) SP. III
EXTERNAL FUEL =	1340 GAL.	1800 GAL.
T.O.G.W. =	56,676 LBS.	66,894 LBS.

GA67-00423

LOW-LOW-LOW MISSION

RADIUS: F-4M 357 NA. MI.
F-4M (FVS) 617 NA. MI.
(LOITER ONE HOUR IN TARGET AREA)



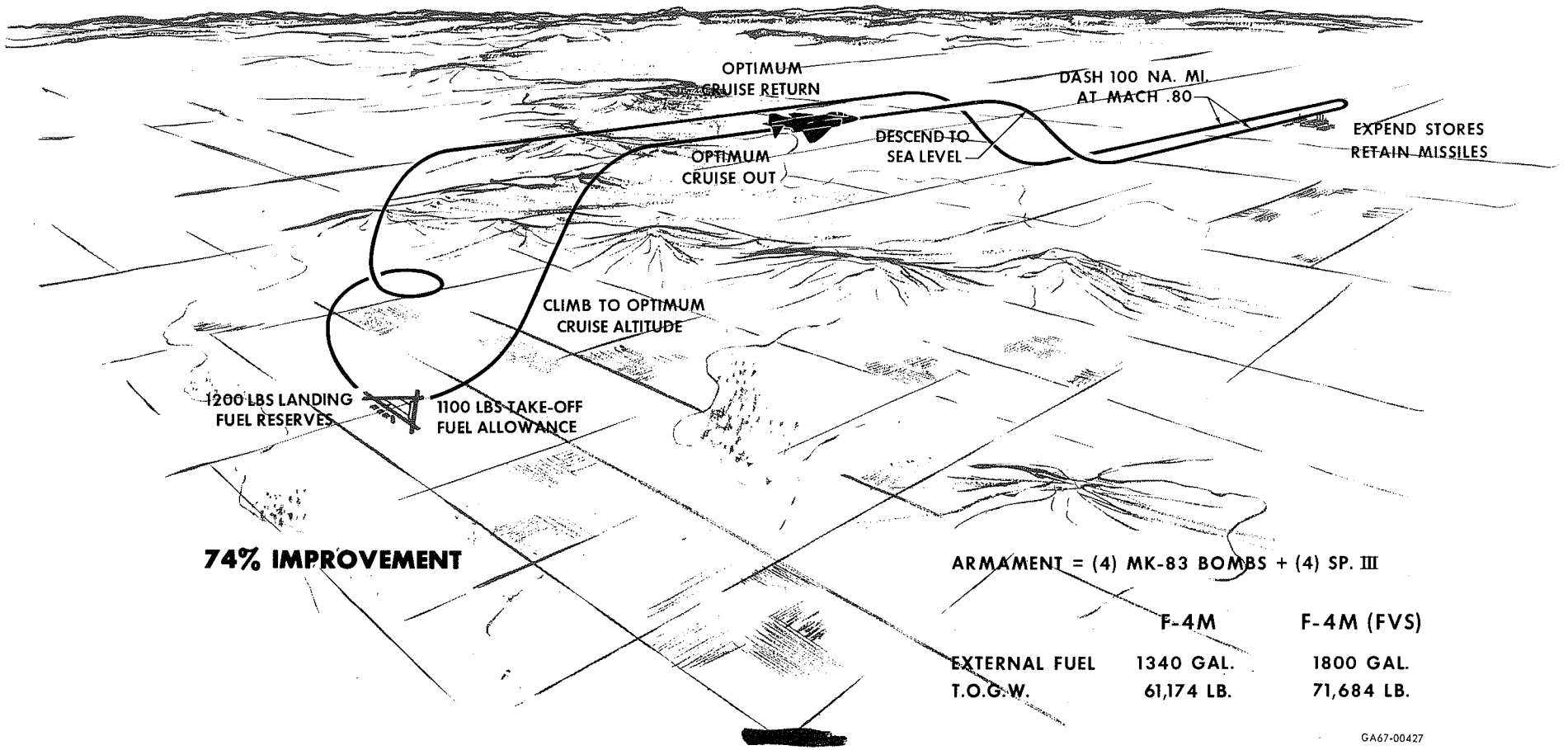
73% IMPROVEMENT

	F-4M	F-4 (FVS)
ARMAMENT =	(4) MK-83 + 4 SP. III	
EXTERNAL FUEL =	1340 GAL.	1800 GAL.
T.O.G.W. =	61,174 LBS.	71,684 LBS.

GA67-00425

HIGH-LOW-LOW-HIGH MISSION

RADIUS: F-4M 766 NA. MI.
F-4M (FVS) 1331 NA. MI.



74% IMPROVEMENT

ARMAMENT = (4) MK-83 BOMBS + (4) SP. III

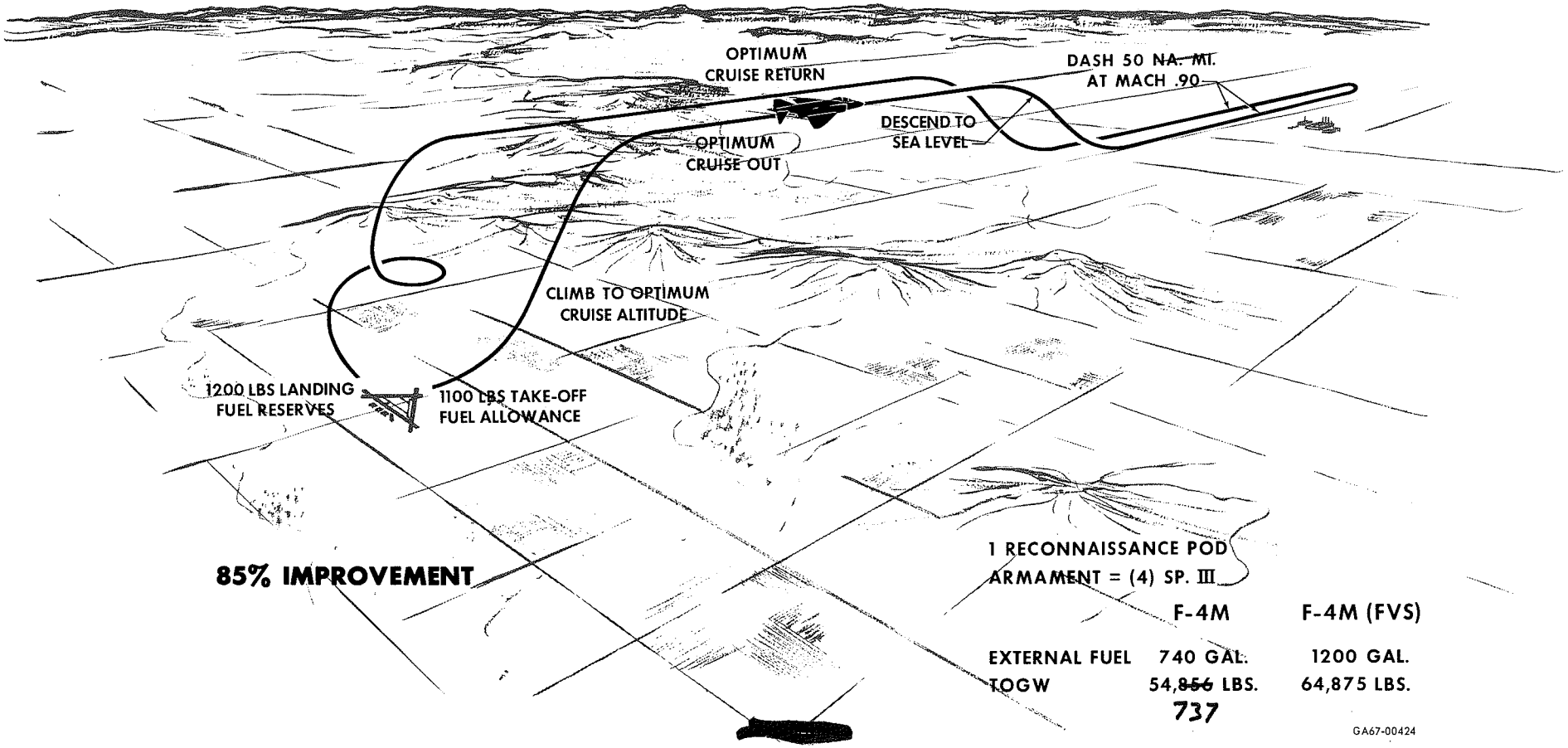
	F-4M	F-4M (FVS)
EXTERNAL FUEL	1340 GAL.	1800 GAL.
T.O.G.W.	61,174 LB.	71,684 LB.

GA67-00427

RECONNAISSANCE

HIGH-LOW-LOW-HIGH MISSION

RADIUS: F-4M 665 NA. MI.
F-4M (FVS) 1229 NA. MI.



85% IMPROVEMENT

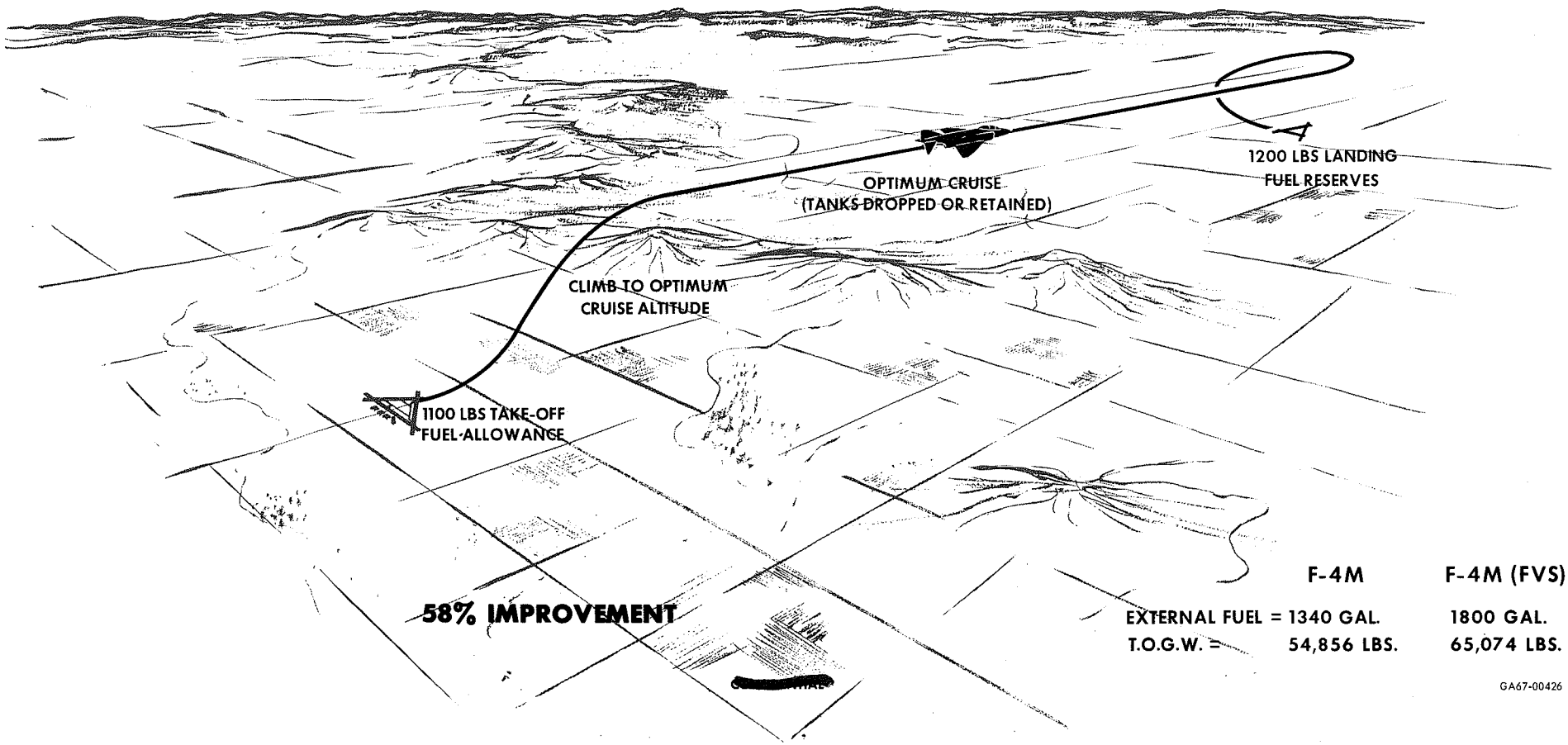
1 RECONNAISSANCE POD
ARMAMENT = (4) SP. III

	F-4M	F-4M (FVS)
EXTERNAL FUEL	740 GAL.	1200 GAL.
TOGW	54,~~856~~ 737 LBS.	64,875 LBS.

GA67-00424

FERRY MISSION

RANGE: F-4M 2289 NA. MI. (TANKS DROPPED
2071 NA. MI. (TANKS RETAINED)
F-4M (FVS) 3557 NA. MI. (TANKS DROPPED)
3264 NA. MI. (TANKS RETAINED)



	F-4M	F-4M (FVS)
EXTERNAL FUEL =	1340 GAL.	1800 GAL.
T.O.G.W. =	54,856 LBS.	65,074 LBS.

GA67-00426

~~CONFIDENTIAL/PROPRIETORY~~

M. DONNELL DOUGLAS CORPORATION
BOX 516
ST. LOUIS, MISSOURI 63166

4/67

ADVANCED F-4M
ENGINE SUMMARY

		ROLLS ROYCE RB 168 -25R	ROLLS ROYCE RB 168 -27R	ADVANCED (MOD. 199)	ADVANCED GE-1	ADVANCED P & W
PHYSICAL						
BY PASS RATIO		.62	.62	APPROX. 1.0	.5	.66
AIR FLOW	lbs./sec.	205	205	205	202	202
WEIGHT	lbs.	4050	4481	3270	2822	3030
THRUST TO WEIGHT RATIO		5.0	4.6	6.5	7.5	7.1
PERFORMANCE						
SEA LEVEL STATIC (SPEC.)						
MAX. THRUST	lbs.	20,095	20,514	21,050	21,100	21,400
S.F.C.	hrs.	2.056	1.95		1.83	2.19
MILITARY THRUST	lbs.	12,125	12,251	12,150	12,880	12,300
S.F.C.	$hrs.^{-1}$	.69	.67		.70	.73
36,089 FT. M = .8 (INSTALLED)						
MIL POWER THRUST	lbs.	3390	3590	3350	3420	2935
S.F.C. @ F_W = 2,000 LBS.	hrs.	.92	.84	.80	.82	.90
36,089 FT. M = 2.0 (INSTALLED)						
MAX. POWER THRUST	lbs.	15,710	17,917	19,494	19,200	18,120
S.F.C.	hrs.	2.60	2.20	2.31	2.26	2.47

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~~CONFIDENTIAL/PROPRIETORY~~

GROUP - 4
DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS

[redacted] U.K. – FAM (FVS) Tech Data RSB

INTER-OFFICE MEMO

Memo No: 610

Date: 21 July 1967

TO: Alexander Marshall AM

CC: R. H. Belt, M. H. Bernard, C. M. Forsyth, Frank Laacke, S. K. Landgraf, C. W. Miller, R. A. Noyes, E. W. Vogel

SUBJECT: Model F-4(FV)S AFVG Performance Data

References:
(a) Alexander Marshall, Frank Laacke, and E. W. Vogel Meeting of 14 July 1967
(b) Alexander Marshall's Memo No. 80-IL-467, dated 20 December 1966
(c) Alexander Marshall's Memo No. 80-IL-528, dated 14 July 1967
(d) MAC Report F393, "F-4(FV)S Aerodynamic Data", dated 10 March 1967
(e) RB168-27R Engine Performance Transmittal No. 66-3, dated 5 January 1966, Revised 6 January 1966
(f) RB168-27R Engine Performance Transmittal No. 66-171, dated 6 December 1966
(g) GE1/10S092B Engine Performance, EPT 66-149, dated 7 October 1966

Enclosure: (1) Performance Summary, APS 1994, dated 21 July 1967 (6 Pages)

1. Enclosure (1) summarizes the performance for the F-4(FV)S with the J79-GE-10, RB168-27R and GE1/10S092B turbojet engines installed, as requested by Reference (a). The mission definitions, based on References (b) and (c), are outlined on Page 6 of Enclosure (1).

2. The drag of Reference (d) with the J79-GE-10 engines installed has been adjusted for the fuselage, inlet, and boattail drag differences, associated with the installation of the RB168-27R and GE1/10S092B engines. The RB168-27R engine thrust and fuel flow data used herein are presented in References (e) and (f). The GE1/10S092B engine data are presented in Reference (g).

3. The mission performance data shown in Enclosure (1) are based upon the following items:

(a) Maximum V/W_o for cruise
(b) AVTUR/50 Fuel at 6.65 pounds per gallon
(c) No fuel flow safety factor
(d) Reserve fuel allowance in agreement with References (b) and (c)
(e) External tanks dropped, weapons retained

R. J. Baldwin
Vice President
Aircraft Engineering

G. S. Graff
Vice President
Engineering Technology

DMS:pmh:mre

MCDONNELL DOUGLAS CORPORATION

[redacted]

[redacted]

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MAC 231CM (REV 14 JUN 62)

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F-4(FV)S
PERFORMANCE SUMMARY
AWG-10 SINGLE SHOT S_W = 500 FT.^{2}

Engines		(2)RB168-27R	(2)GE1/10S092B
Internal AVTUR/50 Fuel (1)	Gal.	2,601	2,601
TAKEOFF AND LANDING PERFORMANCE			
Takeoff Gross Weight (2)	Lb.	55,210	52,130
Takeoff Distance Over 50 Ft. Obstacle Maximum/Military Power	Ft.	1,330/3,100	1,200/3,050 (3)
Landing Gross Weight (4)	Lb.	38,974	35,695
Landing Distance Over 50 Ft. Obstacle (5)	Ft.	3,364	3,177
COMBAT PERFORMANCE			
Combat Gross Weight (60% Internal Fuel) (6)	Lb.	47,751	44,671
Maximum Level Flight Speed (Maximum Power)	M	2.37	2.53 (10)
Supersonic Combat Ceiling (Maximum Power)	Ft.	57,200	61,300
Acceleration Time (Maximum Power)			
.8M to 1.8M @ 36,089 Ft.	Min.	2.82	2.40
.9M to 2.0M @ 36,089 Ft.	Min.	3.23	2.55
MISSION PERFORMANCE			
Mission A (Lo-Lo-Lo-Lo) (7)			
Radius	N.M.	376	442
Takeoff Gross Weight	Lb.	56,757	53,677
Weapon Loading		(1) MK-28 + (4) AIM-7F Missiles	
Radius	N.M.	587	679
Takeoff Gross Weight	Lb.	65,705	62,625
External Fuel	Gal.	1,200	1,200
Weapon Loading		(1) MK-28 + (4) AIM-7F Missiles	
Mission B (Lo-Lo-Lo-Lo) (8)			
Radius	N.M.	152	156
Takeoff Gross Weight	Lb.	56,757	53,677
Weapon Loading		(1) MK-28 + (4) AIM-7F Missiles	
Radius	N.M.	365	597
Takeoff Gross Weight	Lb.	65,705	62,625
External Fuel	Gal.	1,200	1,200
Weapon Loading		(1) MK-28 + (4) AIM-7F Missiles	
Ferry Range (Retain/Drop Tanks)	N.M.	3,491/3,923	3,932/4,508
Takeoff Gross Weight (9)	Lb.	66,024	62,944
External Fuel	Gal.	1,800	1,800

See Notes on Page 3.

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GROUP -4
DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS

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F-4(FV)S
PERFORMANCE SUMMARY
AWG-10 SINGLE SHOT S_W = 500 FT.^{2}

Engines		(2)J79-GE-10
Internal AVTUR/50 Fuel (1)	Gal.	2,601
TAKEOFF AND LANDING PERFORMANCE		
Takeoff Gross Weight (2)	Lb.	54,380
Takeoff Distance Over 50 Ft. Max./Mil. Power	Ft.	1,710/3,400
Landing Gross Weight (4)	Lb.	38,399
Landing Distance Over 50 Ft. (5)	Ft.	3,330
COMBAT PERFORMANCE		
Combat Gross Weight (60% Internal Fuel) (6)	Lb.	46,921
Maximum Level Flight Speed (Max. Power)	M	2.27
Supersonic Combat Ceiling (Max. Power)	Ft.	57,100
Acceleration Time (Max. Power)		
.8M to 1.8M @ 36,089 Ft.	Min.	3.08
.9M to 2.0M @ 36,089 Ft.	Min.	3.35
MISSION PERFORMANCE		
Mission A (Lo-Lo-Lo-Lo) (7)		
Radius	N.M.	322
Takeoff Gross Weight	Lb.	55,927
Weapon Loading		(1)MK-28+(4)AIM-7F Missiles
Radius	N.M.	518
Takeoff Gross Weight	Lb.	64,875
External Fuel	Gal.	1,200
Weapon Loading		(1)MK-28+(4)AIM-7F Missiles
Mission B (Lo-Lo-Lo-Lo) (8)		
Radius	N.M.	148
Takeoff Gross Weight	Lb.	55,927
Weapon Loading		(1)MK-28+(4)AIM-7F Missiles
Radius	N.M.	347
Takeoff Gross Weight	Lb.	64,875
External Fuel	Gal.	1,200
Weapon Loading		(1)MK-28+(4)AIM-7F Missiles
Ferry Range (Retain/Drop Tanks)	N.M.	3,054/3,420
Takeoff Gross Weight (9)	Lb.	65,194
External Fuel	Gal.	1,800

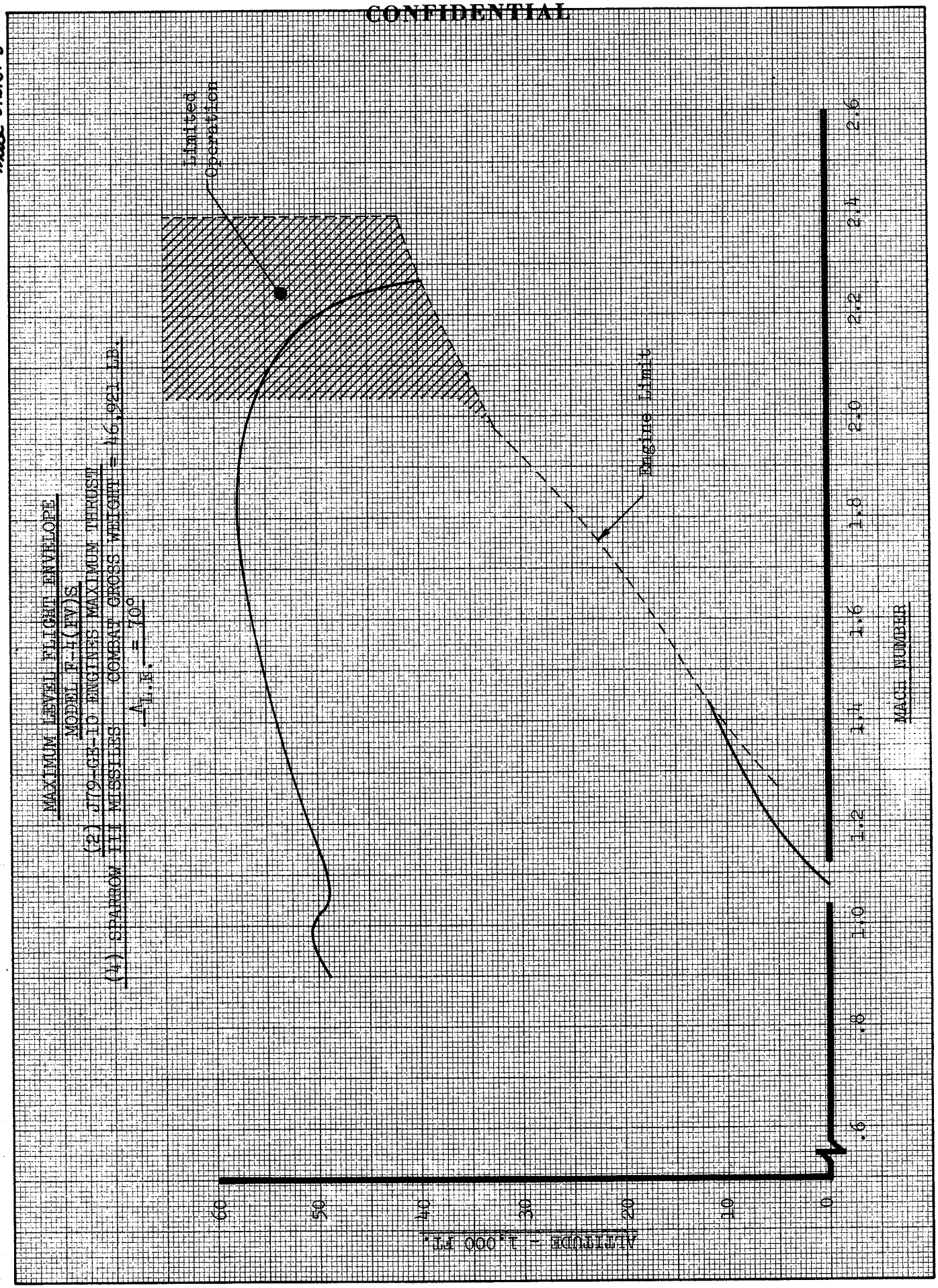
See Notes on Page 3.

F-4(FV)S
PERFORMANCE SUMMARY
AWG-10 SINGLE SHOT S_W = 500 FT.^{2}

NOTES:
(1) AVTUR/50 Fuel @ 6.65 Lb./Gal.
(2) Gross Weights Include 2,500 Lb. of Stores and Full Internal Fuel
(3) Takeoff Power Rating
(4) Gross Weights Include Fuel for 30 Minutes Loiter + 2,500 Lb. of Stores
(5) Landing Speed = 1.1 $V_{PA_{Min.}}$, Where $V_{PA_{Min.}}$ = 1.15 $V_{S_{PA}}$
(6) Gross Weight Includes (4) AIM-7F Missiles
(7) Mission A Combat Allowance is Five (5) Minutes at Mach = .90, Military Thrust
(8) Mission B Combat Allowance is Five (5) Minutes at Mach = .90, Maximum Thrust
(9) Gross Weights Do Not Include (4) AIM-7F Missiles
(10) Structural Limit $M_{Max.}$ = 2.4

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MOSE 072/67-3

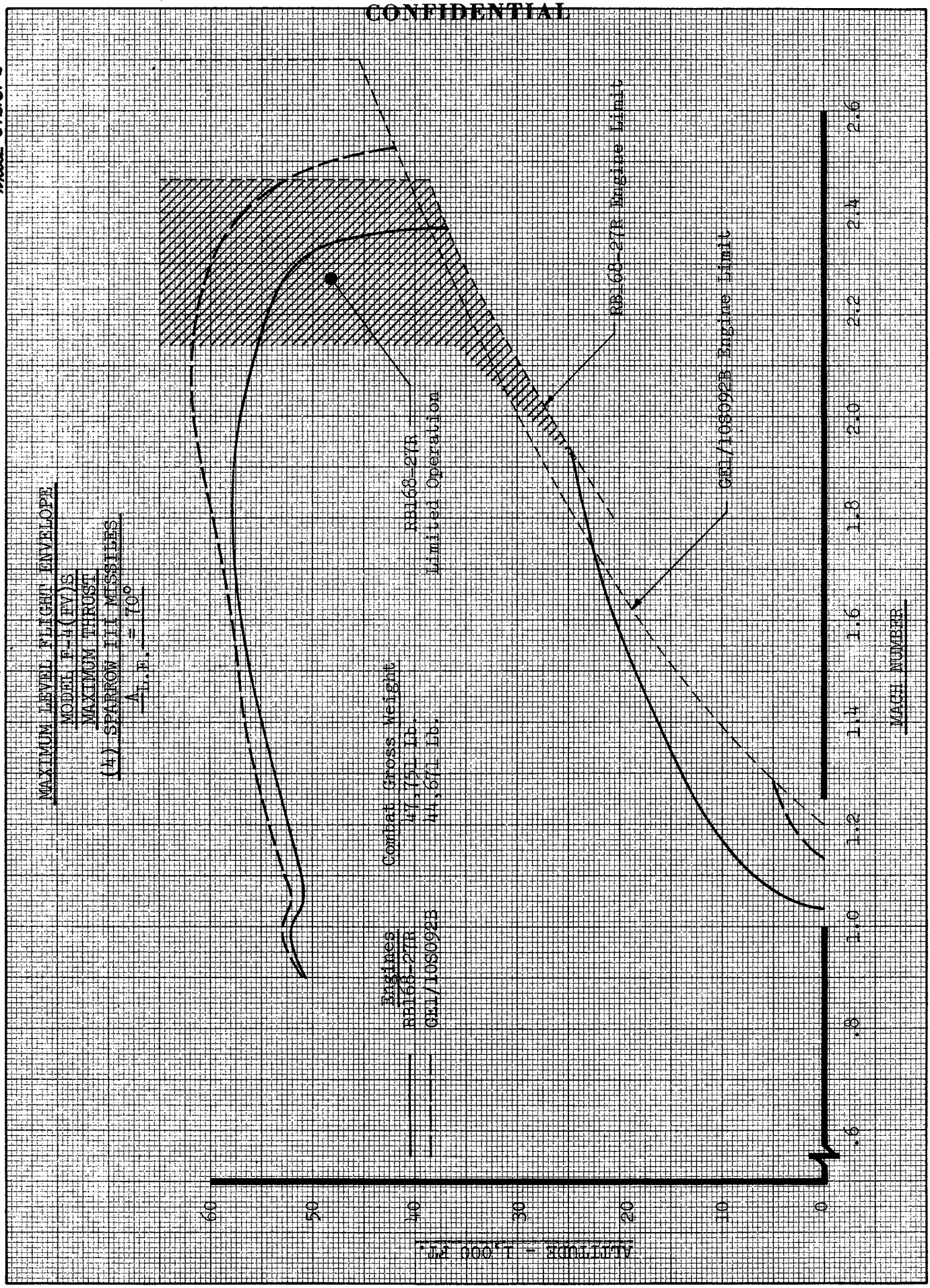


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MAC 1984GGC (REV 16 JAN 62)

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MISSION DEFINITIONS

1. Mission A (Lo-Lo-Lo-Lo)

   a. Takeoff Allowance:
      1. Fuel for five (5) minutes at idle thrust + fuel for taxi
      2. Fuel required for military thrust takeoff over 50 ft. obstacle
   b. Military thrust acceleration from velocity at 50 ft. to 400 kts. (credit distance).
   c. Cruise out at sea level at 400 kts.
   d. Dash out at sea level 100 nautical miles at Mach = .90.
   e. Combat allowance at sea level: Five (5) minutes at Mach = .90, military thrust (no distance credit).
   f. Retain weapon and missiles.
   g. Dash in at sea level 100 nautical miles at Mach = .90.
   h. Cruise in at sea level at 400 kts.
   i. Landing Reserve:
      1. Fuel for ten (10) minutes in P.A. configuration at sea level (1g)
      2. Fuel for five (5) minutes at idle thrust
      3. 220 lb. of usable fuel

2. Mission B (Lo-Lo-Lo-Lo)

   a. Takeoff Allowance:
      1. Fuel for five (5) minutes at idle thrust + fuel for taxi
      2. Fuel required for military thrust takeoff over 50 ft. obstacle
   b. Military thrust acceleration from velocity at 50 ft. to 400 kts. (credit distance)
   c. Cruise out at sea level at 400 kts.
   d. Dash out at sea level 100 nautical miles at Mach = .90.
   e. Combat allowance at sea level: Five (5) min. at Mach = .90, maximum thrust (no distance credit).
   f. Retain weapon and missiles.
   g. Dash in at sea level 100 nautical miles at Mach = .90
   h. Cruise in at sea level at 400 kts.
   i. Landing Reserve:
      1. Fuel for ten (10) min. in P.A. configuration at sea level (1g)
      2. Fuel for five (5) minutes at idle thrust
      3. 220 lb. of usable fuel

3. Ferry Mission

   a. Takeoff Allowance:
      1. Fuel for five (5) minutes at idle thrust + fuel for taxi
      2. Fuel required for military thrust takeoff over 50 ft. obstacle
   b. Military thrust acceleration from velocity at 50 ft. to 400 kts. (credit distance)
   c. Military thrust climb to optimum cruise altitude.
   d. Cruise out at optimum conditions
   e. Landing Reserve:
      1. Thirty (30) minutes at maximum endurance conditions