

N-5590.14

Data for H.V.A.P Ammunition
for 76mm and 3" Guns

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WASHINGTON, D. C.

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65454
misc

21 May 1945

SUBJECT: Data for H.V.A.P. Ammunition for 76mm. and 3" Guns

TO: The Commandant, Archives
Command and General Staff School
Fort Leavenworth, Kansas

1. Forwarded herewith are twenty (20) copies of the technical data booklet, subject: Data for H.V.A.P. Ammunition for 76mm. and 3" Guns.
2. This booklet is a revision of the compilation of data, dated 15 August 1944, as a result of standardization of the T4E17 and T4E20 shots as Shot, HVAP - T, 76mm or 3 inch, M93.
3. Additional copies of this booklet may be obtained upon request.

FOR THE CHIEF OF ORDNANCE:

W.A. Weaver

W. A. WEAVER
Colonel, Ordnance Department
Assistant

- 2 Incls
1. Booklet (20)
 2. Receipt



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28 MAY 1945

No P O Ruy #

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Data for

HVAP AMMUNITION

FOR

76 MM. AND 3" GUNS

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OFFICE OF THE CHIEF OF ORDNANCE

MAY 1945

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INTRODUCTION

The success against enemy armor of the hyper-velocity, armor-piercing round developed for the 76 mm and 3 inch guns has resulted in standardization of the T4E17 and T4E20 shots as Shot, HVAP-T, 76 mm or 3 inch, M93. The high muzzle velocity of this round and the use of the tungsten

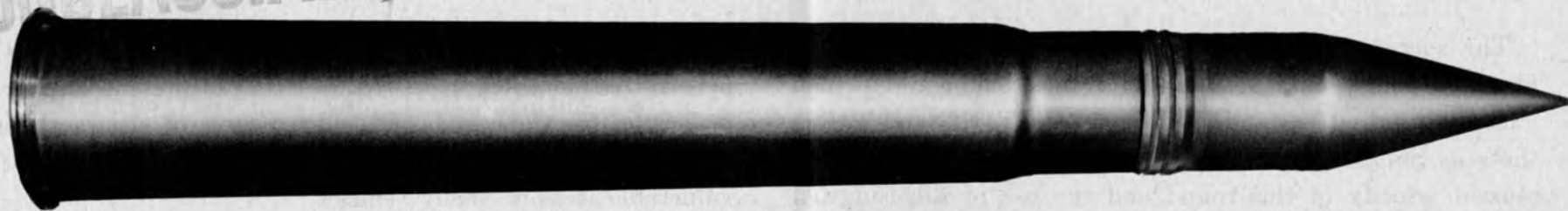
carbide core fills the need for an armor-piercing projectile with penetrative efficiency increased over that of present standard projectiles for these guns. The high degree of accuracy and flat trajectory permit the gunner to select and hit the more vulnerable areas of enemy vehicles.

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**SHOT, HVAP-T, 76 MM AND 3 INCH,
M93 FOR 76 MM AND 3 INCH GUNS**

SINCE TUNGSTEN CARBIDE IS A CRITICAL MATERIAL,
SHOT, HVAP-T, M93, SHOULD BE USED SPARINGLY
AND ONLY WHEN THE SITUATION REQUIRES INCREASED
ARMOR PENETRATION.



SHOT, FIXED, HVAP-T, M93, FOR 3 INCH GUNS

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The heavy armor of enemy tanks necessitated the development of a 3 inch and 76 mm round with greater penetration than that of the standard APC-T Projectile M62 or M62A1 for ranges up to 2,000 yards. This desired increase in penetration was achieved by designing a light weight, hyper-velocity, armor-piercing shot, designated Shot, HVAP-T, 76 mm and 3 inch, M93, for use in the 3 inch guns mounted in the Gun Motor Carriage M10 or M10A1 and the Field Carriages M1A1 and M6, and in the 76 mm Guns mounted in the Medium Tank M4 Series and the Gun Motor Carriage M18 (T70).

The Shot, HVAP-T, 76 mm and 3 inch, M93, is issued as a complete round. At ranges up to 2,000 yards it gives much greater penetration than does the APC-T Projectile M62 or M62A1, and it is especially effective at shorter ranges. The superior penetration of this shot is caused by a combination of very high velocity and special design features. An aluminum body with an adjustable nose plug, a tungsten core, a steel base, a windshield, and a tracer, comprise the components of the projectile. This construction allows weight to be kept to a minimum.

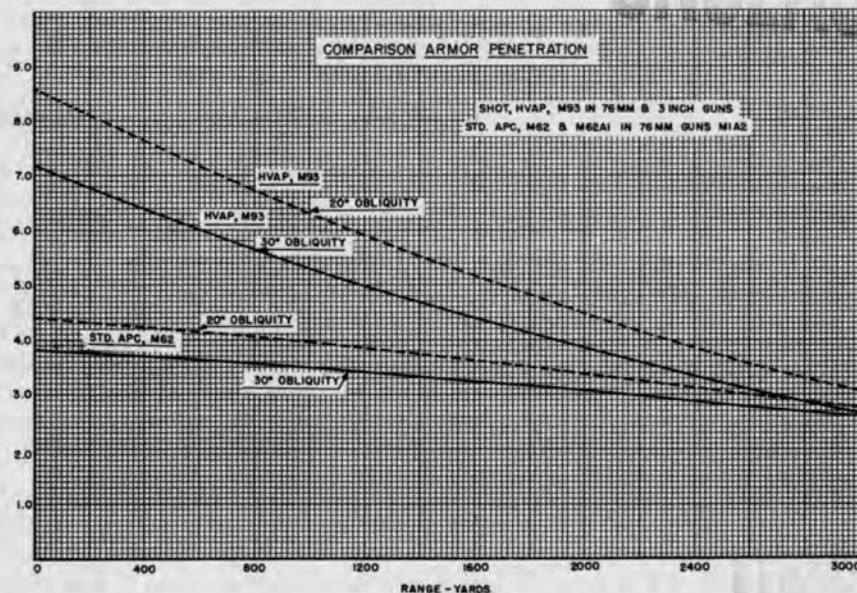
CHARACTERISTICS

SHOT, HVAP-T, 76 MM and 3 INCH, M93

	3 inch M93	76 mm M93
Over-all length, complete round.....	32.88 in.	31.1 in.
Weight of projectile.....	9.35 lb.	9.35 lb.
Weight of complete round.....	20.72 lb.	18.91 lb.
Muzzle velocity.....	3,400 f/s	3,400 f/s

Accuracy firings of Shot, HVAP-T, 76 mm, M93 were made using the 76 mm Gun M1A1 mounted in the Gun Motor Carriage M18 against a vertical target at a range of 1,700 yards. Maximum dispersion on nine rounds, the sighting round being excluded, was 39 inches vertical and 15½ inches horizontal. Similar tests at the same range were made using the 3 inch Gun M7 mounted in the 3 inch Gun Motor Carriage M10. Maximum dispersion on eleven rounds, the sighting round being excluded, was 23 inches vertical and 16½ inches horizontal. These firings are indicative of the great accuracy of this ammunition. While the 3 inch gun gave greater accuracy in this limited test, no essential difference would be found in more extensive firings. Firing tables for the 76 mm and 3 inch Shot, HVAP-T, M93 are reproduced herewith. These tables clearly indicate the flat trajectory characteristic of the rounds.

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Firing tests to obtain penetration data were conducted against various thicknesses of homogeneous plate. The results of these tests permitted a direct comparison between penetration with the Shot, HVAP-T, M93, and with the standard Projectile, APC-T, M62 or M62A1. The chart on this page shows graphically the comparative penetrations of the two types of projectiles, while the table of comparative armor penetration summarizes the data in the chart.

COMPARATIVE ARMOR PENETRATION OF SHOT, HVAP-T, M93, IN 76 MM AND 3 INCH GUNS AND PROJECTILE, APC-T, M62 OR M62A1 IN 76 MM GUN M1A2.

Range	Penetration of Homogeneous Plate			
	20° Obliquity		30° Obliquity	
	HVAP-T, M93	APC-T, M62	HVAP-T, M93	APC-T, M62
0 yd.	8.6 in.	4.4 in.	7.2 in.	3.8 in.
500 yd.	7.4 in.	4.2 in.	6.2 in.	3.7 in.
1,000 yd.	6.3 in.	3.9 in.	5.3 in.	3.5 in.
1,500 yd.	5.3 in.	3.7 in.	4.5 in.	3.3 in.
2,000 yd.	4.5 in.	3.4 in.	3.8 in.	3.0 in.
2,500 yd.	3.7 in.	3.1 in.	3.2 in.	2.8 in.
3,000 yd.	3.0 in.	2.8 in.	2.6 in.	2.6 in.

Ballistic data for HVAP rounds are provided 3 inch and 76 mm gun crews by means of firing tables and by aiming data charts. The aiming data charts are usually affixed to the shields of field guns and on the inside of tanks and gun motor carriages.

Eight aiming data charts have been prepared as listed below:

a. ADC 76-A-5 for 76 mm Guns (without muzzle brake) M1A1 and M1A1C on GMC, M18 (T70) with Coaxial Telescopes, M76C (T106), M70H and T93, and Periscope Telescopes, M47A1 and M47A2.

b. ADC 76-D-1 for 76 mm Gun (without muzzle brake) M1A2 on GMC M18 (T70) with Coaxial Telescopes, M76C (T106), M70H and T93, and Periscope Telescopes, M47A1 and M47A2.

c. ADC 76-E-1 for 76 mm Gun (with muzzle brake) M1A1C on GMC M18 (T70) with Coaxial Telescope, M76C (T106), M70H and T93, and Periscope Telescope, M47A1 and M47A2.

d. ADC 76-F-1 for 76 mm Gun (with muzzle brake) M1A2 on GMC M18 (T70) with Coaxial Telescope, M76C (T106), M70H and T93, and Periscope Telescope, M47A1 and M47A2.

e. ADC 76-C-4 for 76 mm Guns (without muzzle brake) M1A1 and M1A1C on MT, M4 and Mod with Coaxial Telescope, M71D, M70H, Periscope Telescopes, M39A2, M47A1 and M47A2 and Periscope, M10G.

f. ADC 76-G-1 for 76 mm Gun (without muzzle brake) M1A2 on MT, M4 and Mod with Coaxial Telescope, M71D, M70H, Periscope Telescope, M39A2, M47A1 and M47A2 and Periscope, M10G.

g. ADC 3-B-5 for 3 inch Gun M5 on Gun Carriage M6 or M1A1 with Coaxial Telescopes M78A1, M79C, T108E2 or T116.

h. ADC 3-D-5 for 3 inch Gun, M7, on Gun Motor Carriage M10 or M10A1 with Coaxial Telescope M70G.

AIMING DATA CHART FOR 76 MM GUNS (WITHOUT MUZZLE BRAKE) M1A1 AND M1A1C ON GUN MOTOR CARRIAGE M18 (T70)

A.D.C. 76-A-5

76-MM GUNS, M1A1 AND M1A1C (WITHOUT MUZZLE BRAKE) ON GUN MOTOR CARR., M18(T70) W/COAXIAL TELESCOPES, M76C(T106), M70H AND T93 AND PERISCOPE TELESCOPES, M47A1 AND M47A2.

SHOT, AP-T M79 2600 F/S	PROJ., APC-T M62 OR M62A1 2600 F/S	SIGHT DIAGRAM		SHELL, HE M42 OR M42A1 2700 F/S	SHOT, HVAP M93(T4E20) OR T4E17 3400 F/S	ELEV MIL'
		BORE SIGHT	LINE			
200	200			200	200	2.5
400	300			400	500	4.0
800	700	8	8	800	1200	7.2
1100	1100			1300	1700	10.6
1500	1500	16	16	1700	2200	14.3
1800	1900			2100	2700	18.3
2100	2300	24	24	2500	3200	22.6
2400	2700			2900		27.2
2700	3100	32	32	3300		32.2
3000	3500			3700		37.8
3300	3900			4100		43.8
3400	4100	42	42	4300		47.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M47A1 & M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 76 MM GUN M1A2 (WITHOUT MUZZLE BRAKE) ON GUN MOTOR CARRIAGE M18 (T70)

A.D.C. 76-D-1

76-MM GUN, M1A2 (WITHOUT MUZZLE BRAKE) ON GUN MOTOR CARR., M18(T70) W/COAXIAL TELESCOPES, M76C(T106), M70H AND T93 AND PERISCOPE TELESCOPES, M47A1 AND M47A2.

SHOT, AP-T M79 2600 F/S	PROJ., APC-T M62 OR M62A1 2600 F/S	SIGHT DIAGRAM		SHELL, HE M42 OR M42A1 2700 F/S	SHOT, HVAP M93(T4E20) OR T4E17 3400 F/S	ELEV MILS
		BORE SIGHT	LINE			
200	200			200	200	2.5
400	400			400	500	4.0
800	800	8	8	800	1200	7.2
1100	1200			1300	1700	10.6
1500	1600	16	16	1700	2200	14.3
1800	2000			2100	2700	18.3
2100	2400	24	24	2500	3200	22.6
2400	2800			2900		27.2
2700	3200	32	32	3300		32.2
3000	3700			3700		37.8
3300	4100			4100		43.8
3400	4300	42	42	4300		47.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M47A1 & M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 76 MM GUN (WITH MUZZLE BRAKE) M1A1C ON GUN MOTOR CARRIAGE M18 (T70)

A. DC. 76-E-1

76-MM GUN, M1A1C (WITH MUZZLE BRAKE) ON GUN MOTOR CARR., M18 (T70) W/COAXIAL TELESCOPES, M76C(T106), M70H AND T93 AND PERISCOPE TELESCOPES, M47A1 AND M47A2.

SHOT, AP-T M79 2600 F/S	PROJ, APC-T M62 OR M62A1 2600 F/S	SIGHT DIAGRAM		SHELL, HE M42 OR M42A1 2700 F/S	SHOT, HVAP M93(T4E20) OR T4E17 3400 F/S	ELEV. MILS
		BORE SIGHT	LINE			
300	300	---	---	300	500	2.5
500	500	---	---	500	800	4.0
900	800	8	8	900	1400	7.2
1200	1200	---	---	1300	1900	10.6
1500	1600	16	16	1700	2400	14.3
1900	2000	---	---	2100	2900	18.3
2200	2400	24	24	2500	---	22.6
2500	2800	---	---	2900	---	27.2
2800	3200	32	32	3300	---	32.2
3000	3600	---	---	3700	---	37.8
3300	4000	---	---	4100	---	43.8
3500	4200	42	42	4300	---	47.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M47A1, M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 76 MM (WITH MUZZLE BRAKE) GUN M1A2 ON GUN MOTOR CARRIAGE M18 (T70)

A. DC. 76-F-1

76-MM GUN, M1A2 (WITH MUZZLE BRAKE) ON GUN MOTOR CARR., M18 (T70) W/COAXIAL TELESCOPES, M76C(T106), M70H AND T93 AND PERISCOPE TELESCOPES, M47A1 AND M47A2.

SHOT, AP-T M79 2600 F/S	PROJ, APC-T M62 OR M62A1 2600 F/S	SIGHT DIAGRAM		SHELL, HE M42 OR M42A1 2700 F/S	SHOT, HVAP M93(T4E20) OR T4E17 3400 F/S	ELEV. MILS
		BORE SIGHT	LINE			
300	400	---	---	300	500	2.5
500	500	---	---	500	800	4.0
900	900	8	8	900	1400	7.2
1200	1300	---	---	1300	1900	10.6
1500	1700	16	16	1700	2400	14.3
1900	2100	---	---	2100	2900	18.3
2200	2500	24	24	2500	---	22.6
2500	2900	---	---	2900	---	27.2
2800	3300	32	32	3300	---	32.2
3000	3700	---	---	3700	---	37.8
3300	4100	---	---	4100	---	43.8
3500	4300	42	42	4300	---	47.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M47A1 & M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 76 MM GUNS (WITHOUT MUZZLE BRAKE) M1A1 AND M1A1C ON MT, M4 AND MOD

A.D.C. 76-C-4

76-MM GUN, M1A1 AND M1A1C (WITHOUT MUZZLE BRAKE) ON MED. TANK, M4 AND MOD. W/COAXIAL TELESCOPES, M71D, M70H AND PERISCOPE TELESCOPES, M39A2, M47A1 AND M47A2 AND PERISCOPE, M10G.

CAL. 30 MG	SHOT, AP-T		PROJ. APC-T		SIGHT DIAGRAM	SHELL, HE		SHOT, HVAP		ELEV. MILS
	M79 2600 F/S	M62 OR M62A1 2600 F/S	M42 OR M42A1 2700 F/S	M93(T4E20) OR T4E17 3400 F/S		M42 OR M42A1 2700 F/S	M93(T4E20) OR T4E17 3400 F/S			
300	200	200				300	500	2.5		
400	400	400				400	800	4.0		
700	800	700	8	8		900	1400	7.2		
800	1100	1100				1300	1900	10.6		
1000	1500	1500	16	16		1700	2400	14.3		
1100	1800	1900				2100	2900	18.3		
1200	2100	2300	24	24		2500	3300	22.6		
1300	2400	2700				2900		27.2		
1400	2700	3100	32	32		3300		32.2		
1600	3000	3500				3700		37.8		
1700	3300	3900				4100		43.8		
1700	3400	4100	42	42		4300		47.0		

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M39A2, M47A1 AND M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 76 MM GUN (WITHOUT MUZZLE BRAKE) M1A2 ON MT, M4 AND MOD

A.D.C. 76-G-1

76-MM GUN, M1A2 (WITHOUT MUZZLE BRAKE) ON MED. TANK, M4 AND MOD. W/COAXIAL TELESCOPES, M71D, M70H AND PERISCOPE TELESCOPES, M39A2, M47A1 AND M47A2 AND PERISCOPE, M10G.

CAL. 30 MG	SHOT, AP-T		PROJ. APC-T		SIGHT DIAGRAM	SHELL, HE		SHOT, HVAP		ELEV. MILS
	M79 2600 F/S	M62 OR M62A1 2600 F/S	M42 OR M42A1 2700 F/S	M93(T4E20) OR T4E17 3400 F/S		M42 OR M42A1 2700 F/S	M93(T4E20) OR T4E17 3400 F/S			
300	200	200				300	500	2.5		
400	400	400				400	800	4.0		
700	800	800	8	8		900	1400	7.2		
800	1100	1200				1300	1900	10.6		
1000	1500	1600	16	16		1700	2400	14.3		
1100	1800	2100				2100	2900	18.3		
1200	2100	2500	24	24		2500	3300	22.6		
1300	2400	2900				2900		27.2		
1400	2700	3300	32	32		3300		32.2		
1600	3000	3700				3700		37.8		
1700	3300	4100				4100		43.8		
1700	3400	4300	42	42		4300		47.0		

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED. READ SIGHT SETTING FROM SIGHT DIAGRAM. NOTE: WHEN USING TELESCOPE, M70H OR PERISCOPE TELESCOPES, M39A2, M47A1 AND M47A2 INCREASE ELEVATION 1-MIL OR INCREASE ESTIMATED RANGE TO TARGET BY 100-YD. BEFORE USING THIS DIAGRAM.

AIMING DATA CHART FOR 3 INCH GUN M5 ON GUN CARRIAGE M6 OR M1A1

3-INCH GUN, M5 ON GUN CARR., M6 OR M1A1 w/ COAXIAL TELESCOPES, M78A1, ADC 3-B-5 M79C, T10B2 OR T86.

SHOT, AP-T, M79 2,600 f/s	PROJ, APC-T, M62 or M62A1 2,600 f/s	SIGHT DIAGRAM		SHELL, HE, M42 or M42A1 2,800 f/s	SHOT, HVAP-T, ELEV M93(T4E20J4E17) # 3,400 f/s
		BORE	SIGHT LINE		
200	200			200	400 1.7
400	300			500	700 3.2
800	700	8		900	1,300 6.4
1,100	1,100			1,400	1,800 9.8
1,500	1,500	16		1,800	2,300 13.5
1,800	1,900			2,300	2,800 17.5
2,100	2,300		24	2,700	3,300 21.8
2,400	2,700			3,100	26.4
2,700	3,100		32	3,500	31.4
3,000	3,500			3,900	37.0
3,400	4,100		42	4,500	46.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED.
READ SIGHT SETTING FROM SIGHT DIAGRAM.
NOTE: BORE SIGHT ON THE INTERSECTION OF THE CENTER LINE, EXTENDED IF NECESSARY, AND THE HORIZONTAL PORTION OF THE BORE SIGHT CROSS.

AIMING DATA CHART FOR 3 INCH GUN M7 ON GUN MOTOR CARRIAGE M10 OR M10A1

3-inch GUN, M7 on GUN MOTOR CARR., M10 or M10A1 w/ COAXIAL TELESCOPE, M70G. ADC 3-D-5

SHOT, AP-T, M79 2,600 f/s	PROJ, APC-T, M62 or M62A1 2,600 f/s	SIGHT DIAGRAM		SHELL, HE, M42 or M42A1 2,800 f/s	SHOT, HVAP-T, ELEV M93(T4E20J4E17) # 3,400 f/s
		BORE	SIGHT LINE		
300	200			300	200 1.5
500	300			500	500 3.0
800	700	8		900	1,100 6.2
1,200	1,100			1,400	1,700 9.6
1,500	1,500	16		1,800	2,200 13.3
1,800	1,900			2,300	2,700 17.3
2,100	2,300		24	2,700	3,200 21.6
2,400	2,700			3,100	26.2
2,700	3,100		32	3,500	31.2
3,000	3,500			3,900	36.8
3,400	4,100		42	4,500	46.0

TO USE CHART: GET ESTIMATED RANGE AND LOCATE IN COLUMN UNDER AMMUNITION BEING FIRED.
READ SIGHT SETTING FROM SIGHT DIAGRAM.

FIRING TABLE FOR 3 INCH GUN M7 ON GUN MOTOR CARRIAGE M10 AND M10A1, SHOT, HVAP-T, M93

Range yards	Elevation mils	Time of Flight sec.	Max. Ord. feet	Terminal Velocity f/s	Range yards	Elevation mils	Time of Flight sec.	Max. Ord. feet	Terminal Velocity f/s
0	0.6	0.00	0	3,400	1,800	10.2	1.88	14	2,406
100	1.0	0.09	0	3,343	1,900	10.9	2.01	16	2,354
200	1.4	0.18	0	3,286	2,000	11.6	2.14	18	2,302
300	1.8	0.27	0	3,229	2,100	12.3	2.27	20	2,250
400	2.3	0.37	1	3,172	2,200	13.0	2.40	23	2,199
500	2.8	0.47	1	3,116	2,300	13.8	2.54	26	2,148
600	3.3	0.57	1	3,060	2,400	14.6	2.68	29	2,097
700	3.8	0.67	2	3,004	2,500	15.4	2.83	32	2,047
800	4.3	0.77	2	2,948	2,600	16.2	2.98	36	1,997
900	4.9	0.87	3	2,893	2,700	17.1	3.13	39	1,948
1,000	5.4	0.97	4	2,838	2,800	18.0	3.28	43	1,899
1,100	5.9	1.07	5	2,783	2,900	18.9	3.44	48	1,851
1,200	6.5	1.18	6	2,728	3,000	19.9	3.61	53	1,803
1,300	7.1	1.29	7	2,674	3,100	20.9	3.78	58	1,756
1,400	7.7	1.40	8	2,620	3,200	21.9	3.95	63	1,709
1,500	8.3	1.52	9	2,566	3,300	22.9	4.13	69	1,663
1,600	8.9	1.64	10	2,512	3,400	24.0	4.31	75	1,618
1,700	9.5	1.76	12	2,459	3,500	25.1	4.50	82	1,573

NOTE: When firing from Field Carriages M1A1 and M6 subtract 0.6 mil from each of the above values of elevation.

**FIRING TABLE FOR 76 MM GUNS M1A1, M1A1C AND M1A2 (WITHOUT MUZZLE BRAKE) ON MEDIUM TANK M4
(AND MODS) FIRING SHOT, HVAP-T, M93**

Range yards	Elevation mils	Time of Flight sec.	Max. Ord. feet	Terminal Velocity f/s	Range yards	Elevation mils	Time of Flight sec.	Max. Ord. feet	Terminal Velocity f/s
0	0.2	0.00	0	3,400	1,800	9.8	1.88	14	2,406
100	0.6	0.09	0	3,343	1,900	10.5	2.01	16	2,354
200	1.0	0.18	0	3,286	2,000	11.2	2.14	18	2,302
300	1.4	0.27	0	3,229	2,100	11.9	2.27	20	2,250
400	1.9	0.37	1	3,172	2,200	12.6	2.40	23	2,199
500	2.4	0.47	1	3,116	2,300	13.4	2.54	26	2,148
600	2.9	0.57	1	3,060	2,400	14.2	2.68	29	2,097
700	3.4	0.67	2	3,004	2,500	15.0	2.83	32	2,047
800	3.9	0.77	2	2,948	2,600	15.8	2.98	36	1,997
900	4.5	0.87	3	2,893	2,700	16.7	3.13	39	1,948
1,000	5.0	0.97	4	2,838	2,800	17.6	3.28	43	1,899
1,100	5.5	1.07	5	2,783	2,900	18.5	3.44	48	1,851
1,200	6.1	1.18	6	2,728	3,000	19.5	3.61	53	1,803
1,300	6.7	1.29	7	2,674	3,100	20.5	3.78	58	1,756
1,400	7.3	1.40	8	2,620	3,200	21.5	3.95	63	1,709
1,500	7.9	1.52	9	2,566	3,300	22.5	4.13	69	1,663
1,600	8.5	1.64	10	2,512	3,400	23.6	4.31	75	1,618
1,700	9.1	1.76	12	2,459	3,500	24.7	4.50	82	1,573

NOTE: When firing from Gun Motor Carriage M18 with M1A1, M1A1C or M1A2 guns without muzzle brake add 1.2 mils to each of the above values of elevation. When firing from GMC M18 with M1A1C or M1A2 with muzzle brake subtract 0.4 mil from each of the above values of elevation.

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PACKING

Each HVAP-T, M93 round is packed in a fiber container. Two containers are placed in a wooden box with a total weight of 76 pounds and a volume of 1.85 cubic feet for the 3 inch shot, and a total weight of 75 pounds and a volume of 1.82 cubic feet for the 76 mm shot. A special marking in red appears on each cartridge case, container, and box which reads: HYPER VELOCITY MV 3400 f/s.

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