DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ARTILLERY AMMUNITION: AUTHORIZED PROJECTILE, FUZE AND PROPELLING CHARGE COMBINATIONS FOR HOWITZER, MEDIUM, SELF-PROPELLED, 155MM: M109A5 AND M109A6, WITH CANNON M284

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Headquarters, Department of the Army, Washington, DC
15 September 1994

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INTRODUCTION

SCOPE

This manual contains a listing of authorized projectile, fuze, and propelling charge combinations for the self-propelled, 155mm, M109A5 and M109A6 medium howitzer. For ready reference and ease of handling, this information is published in chart form. When a conflict exists in the data in this manual and other published technical manuals, this manual will take precedence.

PRECAUTIONS

Precautions and restrictions to be observed in handling fuzes and firing ammunition with the charge/projectile-fuze combinations indicated in this manual are published in TM 9-2350-311-10 and TM 9-2350-314-10.

KEY	TO ABBREVIATIONS AND SYMBOLS
X	AUTHORIZED
•	AUTHORIZED
BE	Base ejection
ET	Electronic time
GB	Nonpersistent toxic (casualty) nerve gas
H	Mustard gas
HC	Hexachlorethane-zinc (smoke mixture)
HD	Distilled mustard gas
HE	High explosive
HEAT	High explosive antitank
HERA	High explosive rocket assisted
ICM	Improved Conventional Munitions
MT	Mechanical time
MTSQ	Mechanical time and superquick
P	Requires removal of supplementary charge if present.
PD	Point detonating
Prox	Proximity
VX	Persistent toxic (casualty) nerve gas
WP	White phosphorus

AUTHORIZED PROJECTILE, FUZE AND PROPELLING CHARGE COMBINATIONS HOWITZER, MEDIUM, SELF-PROPELLED, 155MM: M109A5 AND M109A6, WITH CANNON M284'[1]

FUZE												*TYPE AND MODEL NO. OF PROJECTILE*	PROPELLING CHARGE											FIRING LIMITATIONS
ET		PD		MT	MTSQ				PROX				(GREEN BAG) M3 & M3A112 CHARGES			(WHITE BAG) M4A1 & M4A2 CHARGES					M119A1	M119A2	M203 &	
		M557/	M739		M501		M577	M582		M732	M514										CHG 8	CHG 7[7]	M203A1 CHG 8	
M762	M767	M572	Series	M565	Series	M564	Series	Series	M728[5]	Series	Series[5]		3	4	5	3	4	5	6	7				
	X	X	X			X		X		X		HE, M107 NORMAL CAVITY	•	•	•	•	•	•	•	•	•	•		
	X	X	X			X		X	P	X	P	HE, M107 DEEP CAVITY	•	•	•	•	•	•	•	•	•	•		
X				X			X					HE, M449, M449A1, ICM	•	•	•	•	•	•	•	•	•	•		
X[6]							X[6]					HE, M483A1, ICM	•	•	•	•	•	•	•	•	•	•		
X							X					HE, M692, M731 (ADAM)	•	•	•	•	•	•	•	•	•	•		
X							X					HE, M718 (M718A1), M741 (M741A1)	•	•	•	•	•	•	•	•	•	•		

See footnotes at end of table.

AUTHORIZED PROJECTILE, FUZE AND PROPELLING CHARGE COMBINATIONS HOWITZER, MEDIUM, SELF-PROPELLED, 155MM: M109A5 AND M109A6, WITH CANNON M284'[1]

FUZE												TYPE AND MODEL NO. OF PROJECTILE	PROPELLING CHARGE											FIRING LIMITATIONS
ET		PD		MT	MTSQ				PROX				(GREEN BAG) M3 & M3A112 CHARGES			(WHITE BAG) M4A1 & M4A2 CHARGES					M119A1 CHG 8	M119A2 CHG 7[7]	M203 & M203A1 CHG 8	
		M557/	M739		M501		M577	M582		M732	M514													
M762	M767	M572	Series	M565	Series	M564	Series	Series	M728[5]	Series	Series[5]		3	4	5	3	4	5	6	7				
X				X			X					ILLUMINATING M485A1, M485A2	•	•	•	•	•	•	•	•	•	•		M485AI/A2 projectiles are not reliable when fired at charges 6, 7, and 8 with fuze settings of 10 seconds or less.
	X	X	X			X		X				AGENT H, HD, M110	•	•	•	•	•	•	•	•	•	•		M110 agent burster loaded with tetrytol cannot be stored or fired at temperatures exceeding + 125°F (+52°C).
		X	X									AGENT, GB2 M687	•	•	•	•	•	•	•	•	•	•	•	

See footnotes at end of table.

AUTHORIZED PROJECTILE, FUZE AND PROPELLING CHARGE COMBINATIONS HOWITZER, MEDIUM, SELF-PROPELLED, 155MM: M109A5 AND M109A6, WITH CANNON M284'[1]

FUZE												*TYPE AND MODEL NO. OF PROJECTILE*	PROPELLING CHARGE										FIRING LIMITATIONS
ET		PD		MT	MTSQ				PROX				(GREEN BAG) M3 & M3A112 CHARGES			(WHITE BAG) M4A1 & M4A2 CHARGES					M119A1 CHG 8	M119A2 CHG 7[7]	M203 & M203A1 CHG 8	
		M557/	M739		M501		M577	M582		M732	M514													
M762	M767	M572	Series	M565	Series	M564	Series	Series	M728[5]	Series	Series[5]		3	4	5	3	4	5	6	7				
	X	X	X			X		X				SMOKE, WP M110(M110E1), M110A1(M110E2), M110A2(M110E3)	•	•	•	•	•	•	•	•	•	•		M110 (M110E1) burster loaded with tetrytol cannot be stored at temperatures exceeding + 125° F (+52°C)
					X							SMOKE, BE, HC M116, M116B1	•	•	•	•	•	•	•	•	•	•		
X				X			X					SMOKE, BE, HC, M116A1	•	•	•	•	•	•	•	•	•	•		
X[6]							X[6]					HE, EXTENDED RANGE, M864[4,9]	•	•	•	•	•	•	•	•	•	•	•	
		X	X						P	X		AGENT, (GB OR VX) M121A1	•	•	•	•	•	•	•	•	•	•		M728 and M732 fired with "VX" projectile in combat emergency only.

See footnotes at end of table.

AUTHORIZED PROJECTILE, FUZE AND PROPELLING CHARGE COMBINATIONS HOWITZER, MEDIUM, SELF-PROPELLED, 155MM: M109A5 AND M109A6, WITH CANNON M284'[1]

FUZE												*TYPE AND MODEL NO. OF PROJECTILE*	PROPELLING CHARGE											FIRING LIMITATIONS
ET		PD		MT	MTSQ				PROX				(GREEN BAG) M3 & M3A112 CHARGES			(WHITE BAG) M4A1 & M4A2 CHARGES					M119A1 CHG 8	M119A2 CHG 7[7]	M203 & M203A1 CHG 8	
		M557/	M739		M501		M577	M582		M732	M514													
M762	M767	M572	Series	M565	Series	M564	Series	Series	M728[5]	Series	Series[5]		3	4	5	3	4	5	6	7				
	X	X	X					X		X		HERA, M549, M549A1[4]								•	•	•	•	Rocket on firing only.[10]
FUZE IS INTEGRAL PART OF PROJECTILE												HEAT, M712 (COPPERHEAD)		•	•	•		•	•	•	•	•		
	X	X	X			X		X		X[11]		PRACTICE, M804/M804A1	•	•	•		•	•	•	•	•	•		
X							X					SMOKE, WP[5]	•	•	•		•	•	•	•	•	•		
	X	X	X			X		X		X		HE, M795	•	•	•		•	•	•	•	•	•	•	

See footnotes at end of table.

WARNING:

1. **PRIMER M82 IS THE ONLY AUTHORIZED PRIMER TO BE USED IN THE M284 CANNON.**
2. **M116 AND M116B1 RESTRICTED FROM OVERHEAD FIRE WITH ZONE 7 OF M4A1 AND M4A2 CHARGES DUE TO POSSIBLE BASE PLATE SEPARATION CREATING DOWNRANGE SAFETY HAZARD.**
3. **USMC TRAINING USE ONLY. FIRING LIMITS 0°F- + 120°F (-18°C to +49°C).**
4. **DO NOT FIRE THE M549/M549A1/M864/M825/M825A1 PROJECTILES IF THE OBTURATING BAND IS MISSING OR BROKEN. IF THE BAND IS DISPLACED AND CAN BE REPOSITIONED AND REMAIN IN THE GROOVE, THE PROJECTILE CAN BE FIRED.**

NOTE:

5. THE LETTER P SHOWS COMPATIBILITY FOR PROXIMITY FUZES THAT REQUIRE REMOVAL OF THE SUPPLEMENTARY CHARGE TO MAKE ROOM FOR THE LONG INTRUSION FUZE.
6. THE M483A1/M864 PROJECTILE MAY BE USED FOR SELF-REGISTRATION (AS A SPOTTING ROUND) BY REPLACING THE EXPULSION CHARGE ASSEMBLY WITH A PROJECTILE SPOTTING CHARGE ADDED TO THE M577 OR M762 SERIES FUZE.
7. THE M119A2 CHARGE 7IS EQUIVALENT TO THE M119A1 CHARGE 8. REFER TO FIRING TABLES FOR SMALL DIFFERENCES IN VELOCITY WHICH AFFECT RANGE.
8. M825 PROJECTILES (MANUFACTURED JAN 85 - MAY 86) FIRED AT TEMPERATURES ABOVE 110°F (WP LIQUIFIED) HAVE RESULTED IN FLIGHT INSTABILITY AND SHORT ROUNDS. THIS INSTABILITY DOES NOT OCCUR BELOW 110°F (WP SOLID). THIS RESTRICTION DOES NOT APPLY TO M825A1 PROJECTILE.
9. THE M864 WILL BE FIRED TO ACHIEVE RANGES BEYOND THE CAPABILITIES OF THE M483A1 PROJECTILE OR WHEN THE M483A1 IS NOT AVAILABLE.
10. THIS RESTRICTION DOES NOT APPLY WHEN FIRING THE M732 SERIES FUZE WITH THE M549/M549A1 PROJECTILE.
11. M732 FUZE CANNOT BE USED WITH M804AI PROJECTILE.

12. DO NOT FIRE CHARGES 1 AND 2, GREEN BAG, M3A1 IN THE HOWITZER, SP 155MM: M109A5/M109A6. THE FIRE CONTROL SOLUTION TO FIRE THESE CHARGES IN THE M109A5/M109A6 IS NOT AVAILABLE.

By Order of the Secretary of the t:

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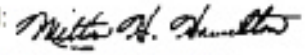
Official: 

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07520

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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