

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

MAINTENANCE INFORMATION
ON
ROCKET, 2.75-INCH, FLECHETTE: M255E1
WARHEAD WITH M439 RC FUZE, WITH MK66 MOD 2 MOTOR

Approved for public release, distribution unlimited.

Headquarters, Department of the Army, Washington, DC
18 July 1993

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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SECTION I. INTRODUCTION

1. Purpose. This bulletin provides supplemental maintenance level information on Rocket, 2.75-Inch, Flechette: M255E1 Warhead with M439 RC Fuze, with MK66 Mod 2 Motor.

2. General. This bulletin contains data that will be incorporated into the following ammunition technical manuals.

a. TM 43-0001-30 Army Ammunition Data Sheets for Rockets, Rocket Systems, Rocket Fuzes, and Rocket Motors.

b. TM 9-1340-222-20 Unit Maintenance Manual (Including Repair Parts and Special Tools List) for 2.75-Inch Low Spin, Folding Fin

Aircraft Rockets; 2.75-Inch Spin Stabilized, Wrap Around Fin Aircraft Rockets; 66MM Light Antitank Weapon Systems; 3.5-Inch Rockets and M3A2E1 Rocket Motor (JATO).

c. TM 9-1340-222-34 Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for 2.75-Inch Low Spin, Folding Fin Aircraft Rockets; 2.75-Inch Spin Stabilized, Wrap Around Fin Aircraft Rockets; 66MM Light Antitank Weapon Systems; 3.5-Inch Rockets and M3A2E1 Rocket Motor (JATO).

d. SB 742-1 Ammunition Surveillance Procedures.

SECTION II. INFORMATION TO BE INCORPORATED INTO MAINTENANCE TECHNICAL MANUALS

3. General. The information in the following paragraphs will be incorporated as changes to the affected manuals.

4. Description and Tabulated Data.

Use:

The M255E1 warhead contains approximately 1179 60-grain flechettes for use against light material targets and personnel.

Description:

The complete round consists of a warhead with an integral fuze and a rocket motor (figure 1). The warhead consists of a nose cone assembly, a warhead case, an integral fuze, approximately 1179 60-grain flechettes, and an expulsion charge assembly. The nose cone assembly, a plastic cone bonded to a metal cupshaped base, is attached to the body by shear pins. The body is a hollow cylinder loaded with approximately 1179 60-grain flechettes. A metal pusher plate is located just aft of the flechette cargo stack and is forward of the expulsion charge assembly. The threaded end of the body is machined internally to accommodate a base-detonating, remote settable, variable range fuze.

The primary warhead fuze, M439 RC, is a resistance-capacitance electronic variable time delay fuze. The time delay is remotely set for the desired functioning distance (time) by charging the circuit from the fire control center.

The fuze begins timing at the first motion of the rocket and will function at the prescribed time if the Safety and Arming Device (S&A) is armed. The S&A is a mechanical acceleration integrator with an unbalanced rotor holding the M84 electric detonator and a runaway escapement. An acceleration greater than 27G is necessary to arm the fuze. The M439 RC fuze is a base mounted, forward firing fuze.

The fuze connector cable extends from the fuze, through the warhead (in a lengthwise groove), and exits the give for connection to the launcher by an umbilical cable.

The flechette cargo contains approximately 1179 60-grain flechettes, which are deployed by initiation of a 5.5 gram expulsion charge.

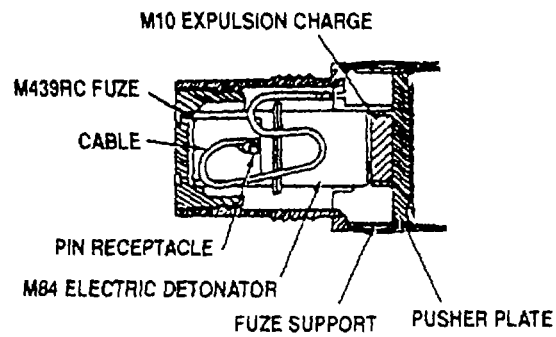
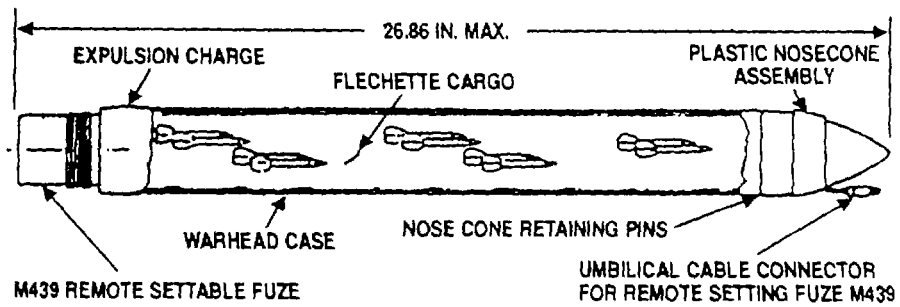
The spin-stabilized wrap-around fin aircraft rocket is an air-to-ground rocket primarily deployed from rotary-wing and other low-speed aircraft. It can also be used on Air Force and Navy jet aircraft, as well as in the Mobile Ground Launcher System.

Functioning:

The rocket motor functions when current passes through the launcher firing contact to the igniter in the rocket motor. The current generates the heat necessary to detonate the igniter charge which ignites the propellant grain. Combustion gases from the burning propellant pressurize the chamber and exhaust through the nozzle, providing the unequal forces required for rocket thrust.

Upon receipt of the fire signal from the pilot, the remote fuze setter processes the proper time constant (delay) to the M439 RC electronic time fuze immediately prior to firing the rocket. The intervalometer delivers a 160 millisecond pulse interval. The pulse is divided into a 45 millisecond fuze charging pulse, followed by a 45 millisecond rocket firing pulse. The remaining 70 milliseconds are used as dwell interval to maintain spacing between pairs of rockets fired.

After the rocket is fired and experiences sustained acceleration, the setback weight of the S&A device within the fuze moves rearward sufficiently to allow the roller attached to the unbalanced rotor to move out of the groove provided by the setback weight. Once the roller is free, the unbalanced rotor rotates in response to the acceleration forces. The rotation of the rotor is delayed by a runaway escapement which provides an arming delay (a function of the acceleration) until the rocket is a safe distance from the aircraft. When the setback weight experiences the necessary magnitude of acceleration, the rotor will lock into place with the M84 detonator lined up with the propellant charge and the fuze is armed. The detonator is now connected to the firing circuit, the connection between the electronic module and the umbilical cable is broken, and electronic timing is started.



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Figure 1. Rocket, Flechette, 2.75-Inch, w/M255E1 warhead w/M439 RC Fuze.

From 1.2 to 25 or more seconds after firing, depending upon the range setting, the detonator is initiated electrically and ignites the expelling charge. Gases from the expelling charge force the pusher plate and cargo stack forward, shearing the nose cone (ogive) retaining pins and ejecting the flechettes into the airstream. The actual ejection range is some distance from the target as determined by the fire control computer along with the aircraft QE based on aircraft elevation, ground speed, and range to target.

Tabulated Data:

Warhead:

ModelM255E1

Type	Flechette
Body	Aluminum
Color	Olive drab w/white markings
Diameter	2.75 in.
Length	26.86 in. (max)
Weight	13 lb
Assembly drawing (w/MK66 Mod 2 motor).....	13058370-13
DODAC	1340-H462

Performance:

Operating temperature limits -50°F to + 150°F
(-46.560C to + 65.560C)

Maximum velocity1950 fps (600 mps)

Motor:

Type	MK66, Mod 2
Type	MK66, Mod 2
Diameter	2.75 in. nominal
Length (max).....	41.7 in.
Weight	24.4 lb (w/MK66, Mod 2 motor)
Igniter	2.2-3.5 ohms resis- tance
DODAC.....	1340J147

Fuze:

Model.....	M439
Type	RC time fuze
Diameter	1.5 in. (max)
Length	2.77 in. overall
Weight	0.6 lb
Arming distance	96-126 m
Setback to arm	27g

Delay element.....	Electronic
Delay time	Variable
Detonator	M84 electrical

Packaging (Box):

Packing and Marking	
Drawing	9230116
Dimensions	72-13/16 in. x 8-11/16 in. x 9-1/2 in. w/MK66, Mod 2 motor
ic contents.....	3.5 cu ft
al explosive weight	7.13 lb (3.24 kg)
al weight (w/contents	
4 warheads w/motors	
assembled in fiber	
containers).....	138 lb (62.6 kg) w/MK66, Mod 2 motor
cking	1 rocket consists of warhead M255E1 and Rocket motor MK66 Mod 2 per fiber container; 4 fiber containers per wooden box

Packing (repair parts listing):

SMR code.....	XBOOO
Description	Container, Am- munition: fiber, PA89 for Rocket 2.75 inch: war- head, flechette: M255E1 and motor MK66 Mod 2
Lot number.....	9335611
General supply code.....	19200
Unit of measure	ea
Quantity incorporated in unit	1
Shipping and Storage Data (Complete Round):	
D hazard class.....	(03) 1.2 C
T hazard class	1.2C
T shipping class	A
T designation.....	Rocket, UN: 0436 NSN: 1340-01- 309-5799
T label	Explosive 1.2 C
DAC	1340-H462

5. Storage and Surveillance.

a. Quantity Distance Class and Storage Data:

Rocket, Flechette, 2.75-Inch, w/M255E1 warhead w/M439 RC fuze and Rocket Motor MK66 Mod 2.

OD Class 1.2
Storage Class A
Total Explosive Weight 7.13 lb

b. Visual Inspection Procedure for Complete Rounds and Unassembled Component Defect Classification.

(1) Inspection characteristics. Igniter circuit resistance (1992 values) not within prescribed limits, 2.2 to 3.5 ohms (MK66, Mod 2).

(2) Defect class. Major.

(3) Tool. Test.

(4) Fuzes with loose ogives will be reported to Commander, AMCCOM, ATTN: AMSMC-MAW, Rock Island, IL 61299-6000.

c. Torque Test.

will be torqued at 55+20-0 foot-pounds in the tightening direction.

(2) The 55+20-0 foot-pounds indicated on the rocket motor is the minimum assembly torque for field use.

d. Pre-Issue Inspection (PII). Pictorial evidence of non-standard conditions, whenever pertinent and practical, should be included and forwarded to Commander, AMCCOM, ATTN: AMSMC-QAM-C, Rock Island, IL 61299-6000.

e. Disposition of Inspection Samples. Samples containing major defects will be reported to Commander, AMCCOM, ATTN: AMSMC-MAW, Rock Island, IL 61299-6000.

f. Records and Reports. A complete report of all tests and inspections should be submitted by the Product Assurance Directorate, Surveillance Division, at the conclusion of the inspection/test of each lot in storage and should be made by letter to the Commander, AMCCOM, ATTN: AMSMC-QAM-C, Rock Island, IL 61299-6000.

6. Identification of Rocket Configuration used by Army, Navy, Air Force, and Marine Corps. The identification of rocket configuration is listed in table 1 below.

Table 1. Identification of Rocket Configuration

DODIC/NSN	Warhead	Fuze	Motor	Packing
H462/1340-01-309-5799	M255E1 Flechette	M439 RC	MK66 Mod 2	1 Rocket per fiber container; 4 fiber containers per wooden box

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By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

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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 decigrams = .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 milliliters = .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

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
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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