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

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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.

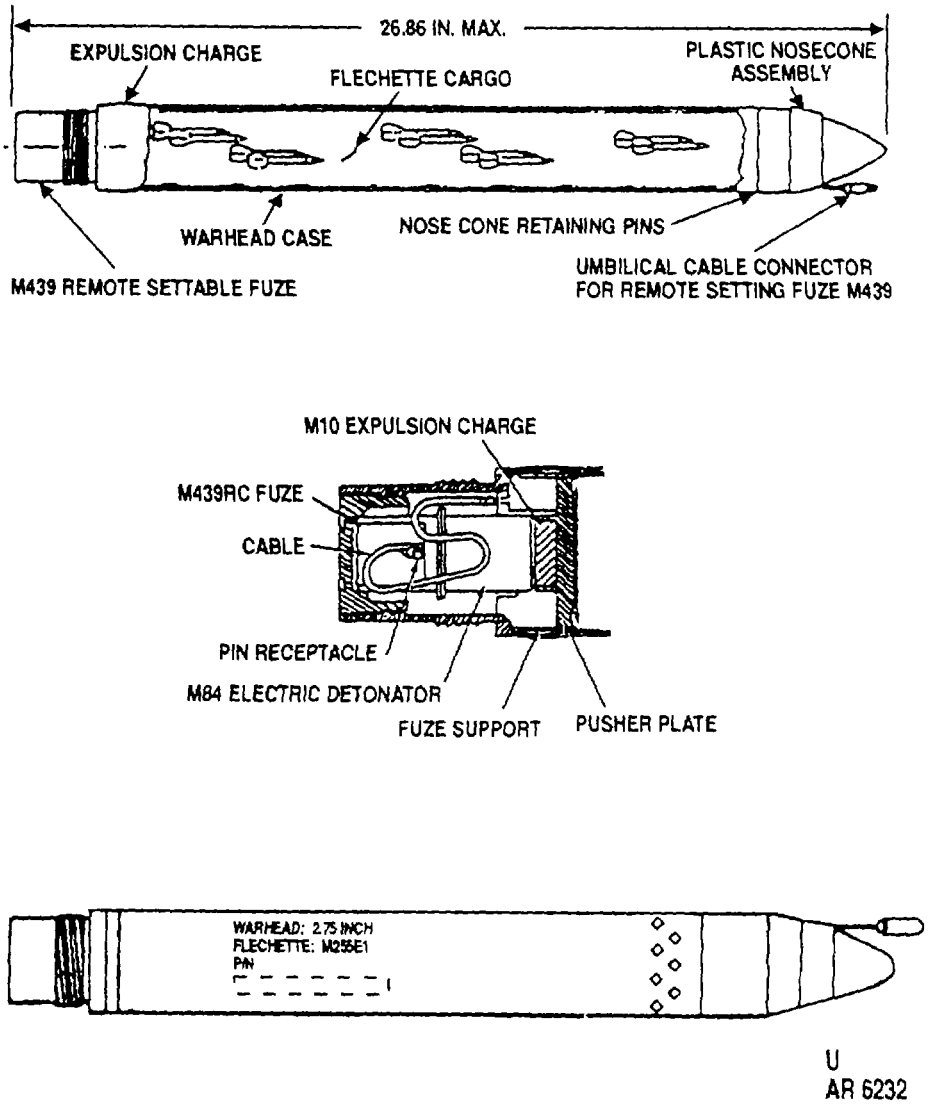

Figure 1. Rocket, Flechette, 2.75-Inch, w/M255E1 warhead w/M439 RC Fuze.