DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

MAINTENANCE INFORMATION ON ROCKET, 2.75-INCH, FLARE: XM278 (IR), ILLUMINATING WARHEAD WITH M442 FUZE, WITH MK66, MOD 2 MOTOR

Approved for public release; distribution unlimited.

Headquarters, Department of the Army, Washington, DC

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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, Flare: XM278 (IR) Illuminating Warhead with M442 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 Intermediate Direct Support and Intermediate General Support Maintenance Manual (Including Repair Parts and Special Tools List) for 2.75Inch 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.

Description:

a. This low-spin folding-fin aircraft rocket (LSFFAR) is an air-to-ground rocket primarily deployed from rotary-wing and other low-speed aircraft.

b. The XM278(IR) illuminating warhead (fig. 1) consists of an ignition system, flare, main parachute, drogue parachute assembly, and an integral fuze and delay assembly. The warhead is enclosed in an aluminum case.

c. The setback-actuated fixed time integral fuze provides a standoff distance of approximately 3,500 meters. The fuze and candle igniter arming are actuated by rocket motor acceleration.

d. The rocket motor is described in TM 430001-30, Chapter 5.

Differences Between Models: N/A

Functioning:

a. The rocket with warhead, flare, XM278(IR) is fired from helicopter with standard 2.75-in. motor Mk 66 to attain elevation between 2000 and 4000 ft at 3000 m downrange. Upon rocket launch, the M442 fuze arms upon acceleration (17 G's approximately required). After 1.0 seconds (at motor burnout) the fuze functions, initiating delay train. After nine seconds, delay ignites first expulsion charge in fuze assembly. Gas pressure forces pusher plate forward, shears pin, separates motor and adapter section from remainder of warhead. Rocket velocity is now 800 fps approximately.

b. The deflector plate, attached by cable to motor adapter, is extended into airstream, deflects path of motor and adapter. Pusher plate, attached to drogue chute, deploys drogue. Rocket warhead velocity then decreases to 200 fps, approximately, during next two seconds.

c. Upon deployment of drogue chute, the gas generator is activated by pull on lanyard attached to drogue. After two seconds, the gas generator functions the second expulsion charge located in retainer block of drogue housing. Gas pressure forces pusher plate forward, shearing pins and separating drogue housing from main chute insert and candle assembly.

d. The pusher plate is attached by a thread-line to the pilot chute. The pilot chute is deployed, and, in turn, pulls bag off main chute. The main chute now deploys the steel cable which is attached to the main chute shroud lines on one end, and, in turn, pulls a lanyard attached to candle igniter assembly.

e. The pull on the lanyard rotates a bellcrank, releasing the firing pin. The firing pin fires a rifle primer, which fires boron pellets. The boron pellets ignite a propellant wafer. Propellant ignites the candle. Ignition gases pressurize nose cap, blowing it free.

f. The candle, suspended from the main chute is now burning. During the first 15 seconds, the igniter housing is burned away. The candle descends at 13 fps, burns for 180 seconds with a light output of 222 watts per steradian in the near infrared spectrum, and a maximum of 1000 candlepower in the visible spectrum.

Use:

To provide helicopters with target illuminating capability from a safe standoff distance in a hostile environment.

Tabulated Data:

Rocket:

Type	MK66, Mod 2
Diameter	2.75 in. nominal
Length (max)	71.12 (w/warhead)
Weight	24.4 lb (w/MK66, Mod 2 motor)
Assembly drawing	12944412
DODAC	1340-H154

Performance:

Operating temperature limits	-25°F to + 140°F (-31.35°C to +59.40°F)
Maximum velocity	1600 fps (488 mps)