

The Soldier: America's Most Deployed Combat System



US Army's Search for an Economical Device for Stun Hand Grenade Training

**NDIA International & Joint Services Small Arms
Symposium**

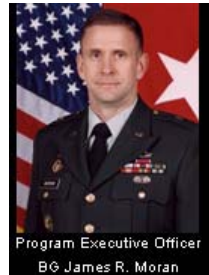
18 May 2005

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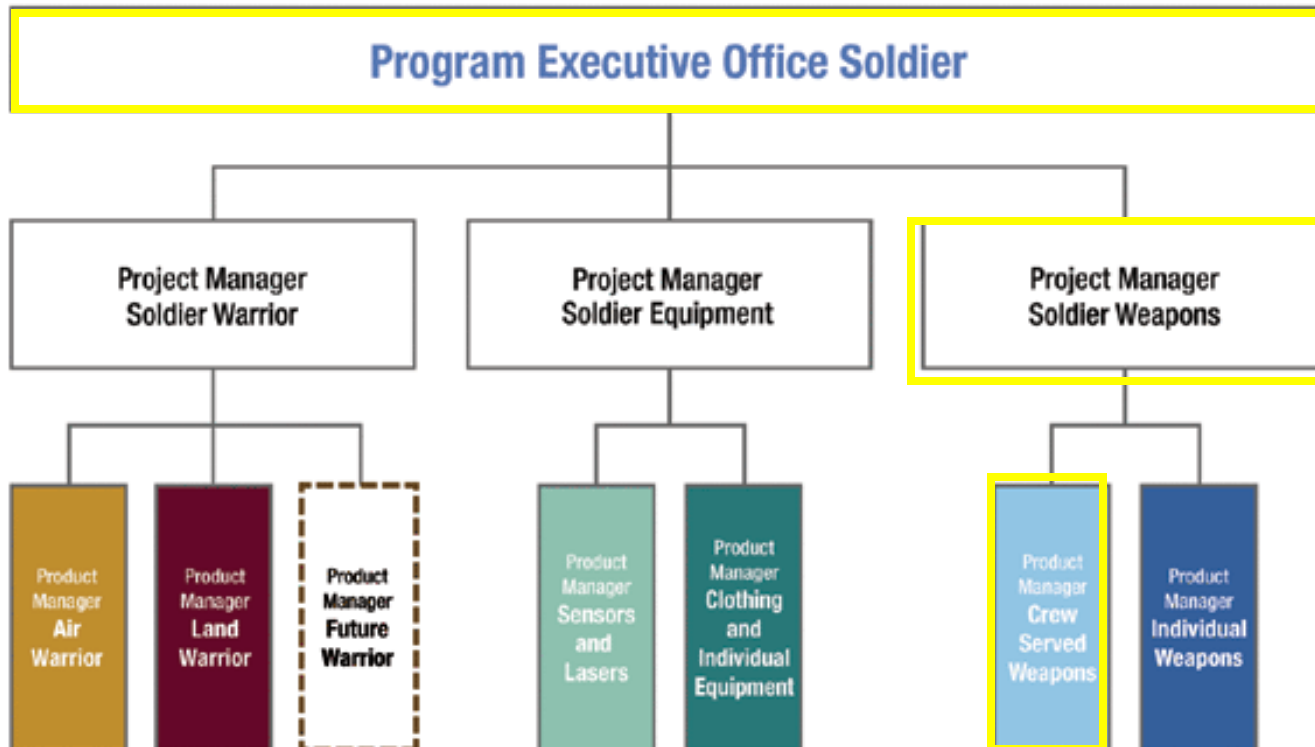
ARMY'S R&D MANAGEMENT for SMALL ARMS AMMUNITION



BG James Moran



Program Executive Officer
BG James R. Moran





In the beginning There was the M84 Non Lethal Stun Grenade

***Which was heavily
Leveraged against
Existing Law Enforcement
Technology***

Type Classified – Oct 1998

Released to Field – June 2002



Height = 5.25"

Dia = 1.73 "

Wt = 15 oz

Pyro Wt = 3.5 oz

Vent holes = 12

Dual Pull Pins

Delay = 1-2.3 sec





The M84 Stun Grenade (SG) is a single use item for deployment in Closed Rooms ...for



- **HOSTAGE RESCUE**

TEMPORARILY DISORIENT KIDNAPPERS

....But NOT INJURE HOSTAGES

- **ROOM CLEARING**

CONFUSE HOSTILES PRIOR TO ENTRY OF FRIENDLIES

Note: Ineffective outdoors



M84 Stun Grenade



•Manufacturer: UPCO



M84, Grenade, Stun Diversionary/Flash Bang, is a hand thrown one time use flash bang stun device primarily for Special Reaction Team (SRT) use in forced entry scenarios, hostage rescue and could be used for selected MOUT or crowd control operations. The device is designed to be thrown into a room (through an open door, a standard glass window or other opening) where it delivers a loud bang and bright flash sufficient to temporarily confuse, disorient and/or momentarily distract the occupants/threats through intense flash/bang. Flash Intensity: Over 1 Million Candle Power; Noise Level: 170~180dB at 5 feet; No permanent hearing damage

• **Shipped 3 ea per M19A1 Metal Ammunition Container; 4 Per Box
Ammunition, Illuminating UN: 0297 NSN: 1330-01-459-8141
DOD Hazard Class: 1.4G DODAC: 1330-GG09**



M84 Stun Grenade Details



Major Components

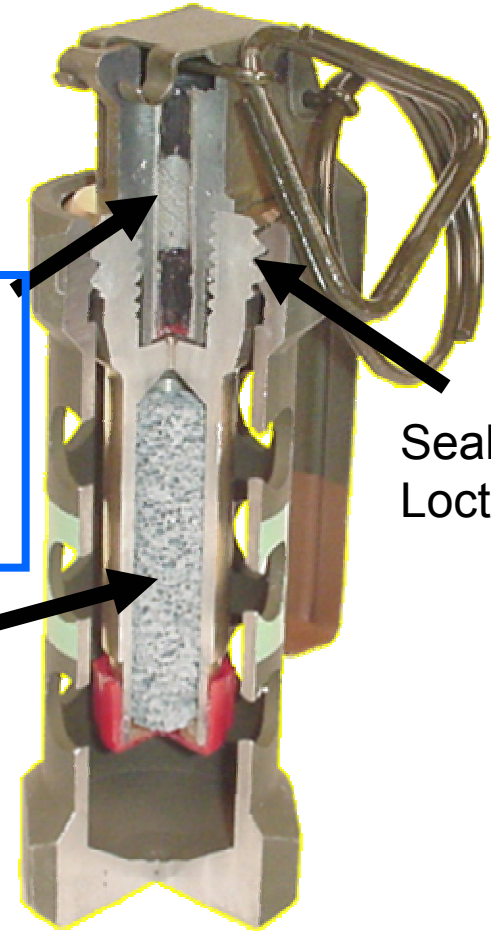


M240 FUZE /CARTRIDGE

STEEL
BODY

M42 Primer
FIRST FIRE MIX
DELAY MIX
SEPARATION CHG

Flash – Bang Composition



Sealed w/
Loctite

Assembled Grenade



....Then in Oct 2000 it was determined that an economical Trainer was required to complement the M84



ARMY STRATEGY



- **PURSUE WITH THE M84 PRODUCER (UPCO) THE CONCEPT OF FIELDING THE TWO MAJOR COMPONENTS OF THE M84 SEPARATELY then :**
 - **(1) ASSEMBLING THEM AS GRENADES BY HAND IN THE FIELD***
 - **(2) DISASSEMBLING SPENT GRENADES BY HAND**
 - **(3) DISCARDING SPENT CARTRIDGES**
 - **(4) Re-ASSEMBLE STEEL BODIES WITH NEW M240 CTGS (10X's Min ; DESIRED – 25X's)**

 - **ACHIEVE A 15 - 30 % COST SAVINGS VS THE M84 (REDUCED NEED FOR STEEL BODIES)**
 - **REALIZE AN 80% REDUCTION IN TEST & EVALUATION COST (ONLY UNIQUE DIFFERENCES VS THE M84 REQUIRED EVALUATION)**
- * No sealant applied at Threaded Joint**

UNIQUE FEATURES OF TRAINER



- ***FUZE/CTG & STEEL BODY SHIPPED TO FIELD IN THEIR OWN PACK (VS M84 WHICH IS SHIPPED AS AN ASSEMBLED HAND GRENADE)***
- ***ASSEMBLED / DISASSEMBLED BY HAND IN THE FIELD***
- ***BODY MUST BE RE-USEABLE & USES RECORDED***
- ***COMPATIBLE WITH PROJECTED TRAINING SCENARIO'S***
- ***PAINTED BLUE TO SIGNIFY TRAINER VS OLIVE DRAB OF M84***



XM 102 RELOADABLE PRACTICE STUN HAND GRENADE (RSPHG) HARDWARE



Figure 3-5a. Components of XM102 Reloadable Stun Practice Hand Grenade: Practice Stun Grenade Body and M240 Fuze Cartridge.



Figure 3-5b. Screwing the M240 Fuze Cartridge onto Grenade Body.

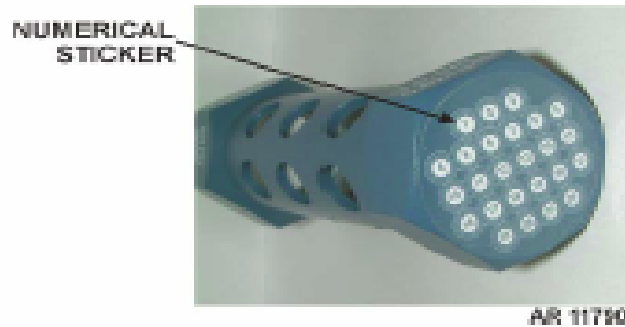


Figure 3-5c. Remove numerical sticker in sequence after each use.



XM 102 PACKAGING



- 12 M240's per M2A1 Metal Container



- 12 Bodies per Cardboard Container



PERFORMANCE SPEC REQUIREMENTS



	M84 GRENADE	XM 102 GRENADE	Rqmt
Pin Pull	28.9 lbs avg	28.9 lbs avg	15 - 40 LBS
Weight	14.35 oz avg	14.35 oz avg	23 oz max
LENGTH	5.25 in avg	5.25 in avg	6 in max
DIAMETER	1.3 in avg	1.3 in avg	2 in max
DELAY	1-2.3 SEC	1- 2.3 SEC	1-2.3 Sec
FLASH @ 5 FEET	4.5 M Cp avg	Same as M84	1M CP Min
BANG @ 5 FEET	175.15 DB avg	Same as M84	170 -180 DB



QUALIFICATION TEST RESULTS



PERFORMANCE PHASE

Conditioning	# Tested	Result
Secure Vib (SCV) @ Hot	24	no failures
Secure Vib (SCV) @ Cold	24	no failures
SCV (H) + Hot Soak + 7 ft Drop	24	no failures
SCV (H) + Cold Soak + 7 ft Drop	24	no failures
SCV (H) + Hot Soak + 7 ft Drop + Loose Cargo Vib (hot)	48	no failures
SCV (H) + Cold Soak + 7 ft Drop + Loose Cargo Vib (Cold)	48	no failures
SCV (H) + Hot Soak + 7 ft Drop + Loose Cargo Vib (hot) + 5ft Drop (H)	24	no failures
SCV (H) + Cold Soak + 7 ft Drop + Loose Cargo Vib (hot) + 5ft Drop (C)	24	no failures

SAFETY PHASE

40 ft Drop @ Hot	48	no failures
40 ft Drop @ Cold	48	no failures
Jolt	12	no failures
Loose Cargo (bare fuze)	12	no failures
5 ft Drop Bare Fuze	12	1 dud

Total

369



Performance of Steel Body



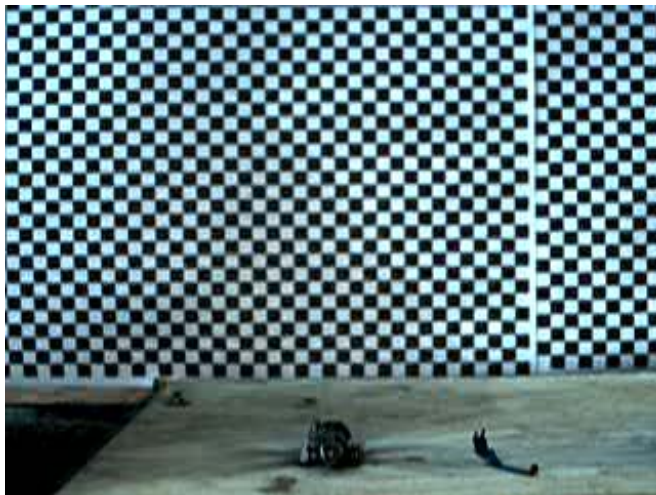
- During Testing 369 XM 102 Grenades were fired but only 4 Bodies were used
 - 2 Bodies were fired 69 x's
 - 1 Body was fired 115 x's
 - 1 body was fired 118 x's

- No structural damage was noted and no difficulty was experienced in assembly or disassembly

Note :

Results confirmed US Army ARDEC Math Model which predicted unlimited re-use (since internal stresses are well below body strength)

TEST SHOTS





ARMY TEAM CONCLUSION



- Team Members
 - US Army Military Police School – Proponent
 - US Army Aberdeen Test Center – Tester
 - US Army Development Test Command – Safety Certifier
 - US Army & Evaluation Command – System Evaluator
 - US Army Research Development & Eng Center – Developer
 - US Army Research Lab – MANPRINT Assessor
 - US Army Center for Health Promotion & Preventative Medicine
- Concluded that :
 - XM 102 satisfies all Safety, Performance and Operational Requirements stated in its Operational Requirements Document &
 - Is ready to enter into Production & Deployment



TIMELINE



- Nov 95 - Requirements Doc (ORD) for M84 Stun Grenade Appv'd
- Dec 98 - M84 Type Classified
- *Oct 2000 - Need for (XM 102) Reload able Trainer Established*
- Oct 2001 - XM102 R&D (Soldier Enhancement) Pgm Initiated
- Nov 2002 M84 Released to Field *
- *Aug 2004 XM 102 Production Qualification Test Conducted*
- *May 2005 XM 102 Type Classification Anticipated*
- *May 2006 XM 102 Material Release to Field Anticipated*
- * ***Conditionally... pending Fielding of a Trainer***



ARMY MANAGEMENT ORGANIZATION for PRODUCTION of SMALL ARMS AMMUNITION



BG Paul Izzo



PEO Ammunition

Industrial Base

PM Close Combat Systems

PM Combat Ammunition Systems - Indirect Fire

PM Maneuver Ammunition Systems - Direct Fire

PM Joint Services

Networked Munitions / Munitions / Countermine

Demolitions / Non-Lethal

Mortars

Excalibur

Large Caliber

Medium & Small Caliber

DEMIL



BOTTOM LINE



- **THE ARMY'S SEARCH FOR AN ECONOMICAL TRAINING COMPANION FOR THE M84 SG HAS BEEN SUCCESSFULLY CONCLUDED**
- **CONCEPT of a RE-USABLE BODY HAS BEEN PROVEN**
- **PRODUCTION HARDWARE BUYS AND FIELD RELEASE IS ANTICIPATED IN FY 06**
- **ARMY MANAGEMENT WILL SHIFT FROM PEO-SOLDIER /PM-SW TO PEO – AMMUNITION /PM-CCS IMMEDIATELY UPON TYPE CLASSIFICATION APPROVAL**