TACOM

Lethality, Survivability, Mobility and Sustainment for America's Army

3 Dimensional Solid Model Technical Data Packages

TACOM-ARDEC

Close Combat Armaments Center

Light Armament Division

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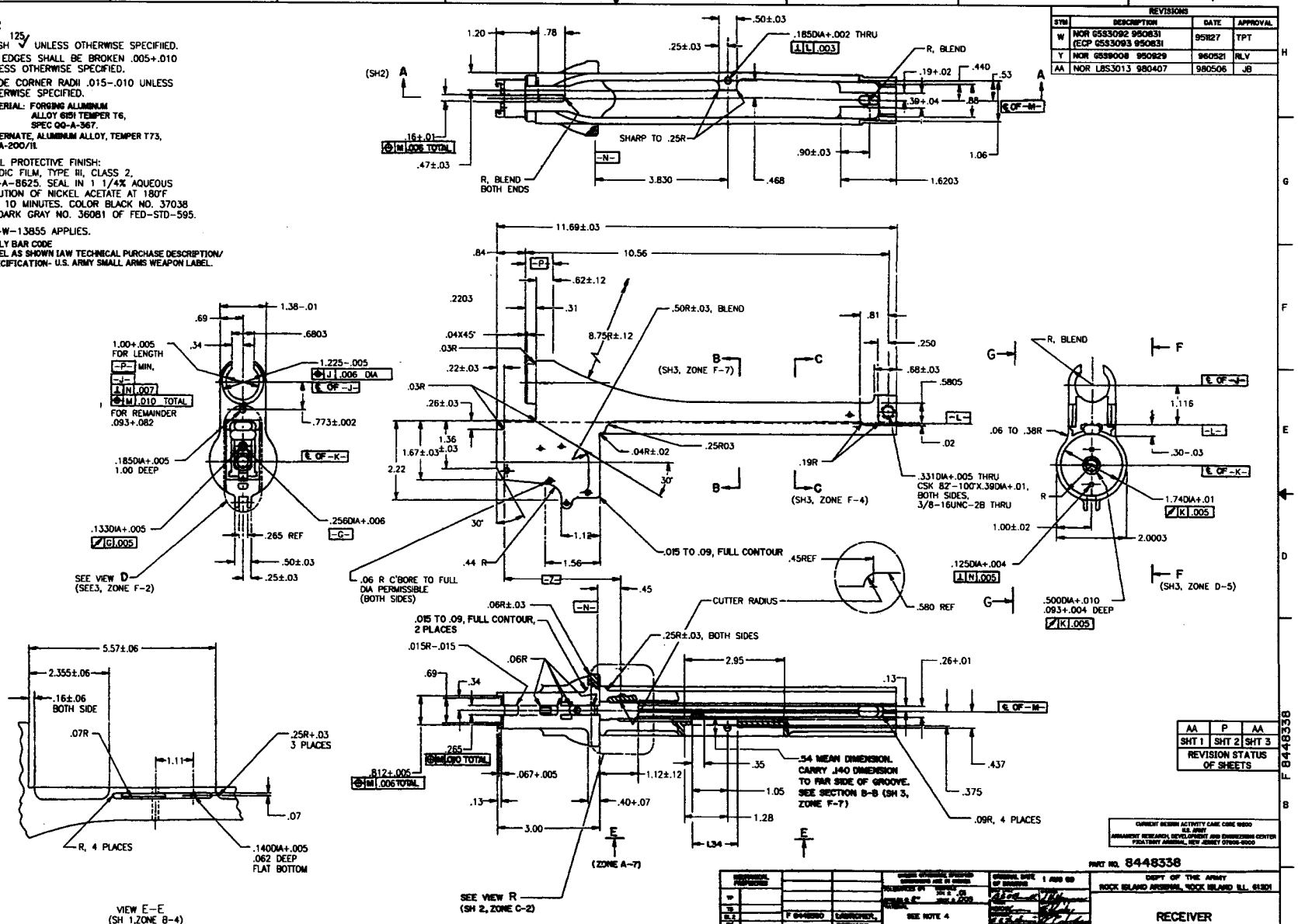
NOTES:

1. FINISH 125√ UNLESS OTHERWISE SPECIFIED.
2. ALL EDGES SHALL BE BROKEN .005+.010 UNLESS OTHERWISE SPECIFIED.
3. INSIDE CORNER RADII .015-.010 UNLESS OTHERWISE SPECIFIED.
4. MATERIAL: FORGING ALUMINUM ALLOY 6151 TEMPER T6, SPEC QQ-A-367. ALTERNATE, ALUMINUM ALLOY, TEMPER T73, QQ-A-200/11.
5. FINAL PROTECTIVE FINISH: ANODIC FILM, TYPE III, CLASS 2, MIL-A-8625. SEAL IN 1 1/4% AQUEOUS SOLUTION OF NICKEL ACETATE AT 180°F FOR 10 MINUTES. COLOR BLACK NO. 37038 TO DARK GRAY NO. 36081 OF FED-STD-595.
6. MIL-W-13855 APPLIES.
7. APPLY BAR CODE LABEL AS SHOWN IAW TECHNICAL PURCHASE DESCRIPTION/ SPECIFICATION- U.S. ARMY SMALL ARMS WEAPON LABEL.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
W	NOR G5S3092 950831 (ECP G5S3093 950831	951127	TPT
Y	NOR G5S9008 950929	960521	RLV
AA	NOR L8S3013 980407	980506	JB



AA	P	AA
SHT 1	SHT 2	SHT 3
REVISION STATUS OF SHEETS		

CURRENT DESIGN ACTIVITY CAGE CODE 19200
U.S. ARMY
ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NEW JERSEY 07806-5000

PART NO. 8448338

DEPT OF THE ARMY
ROCK ISLAND ARSENAL, ROCK ISLAND ILL. 61201

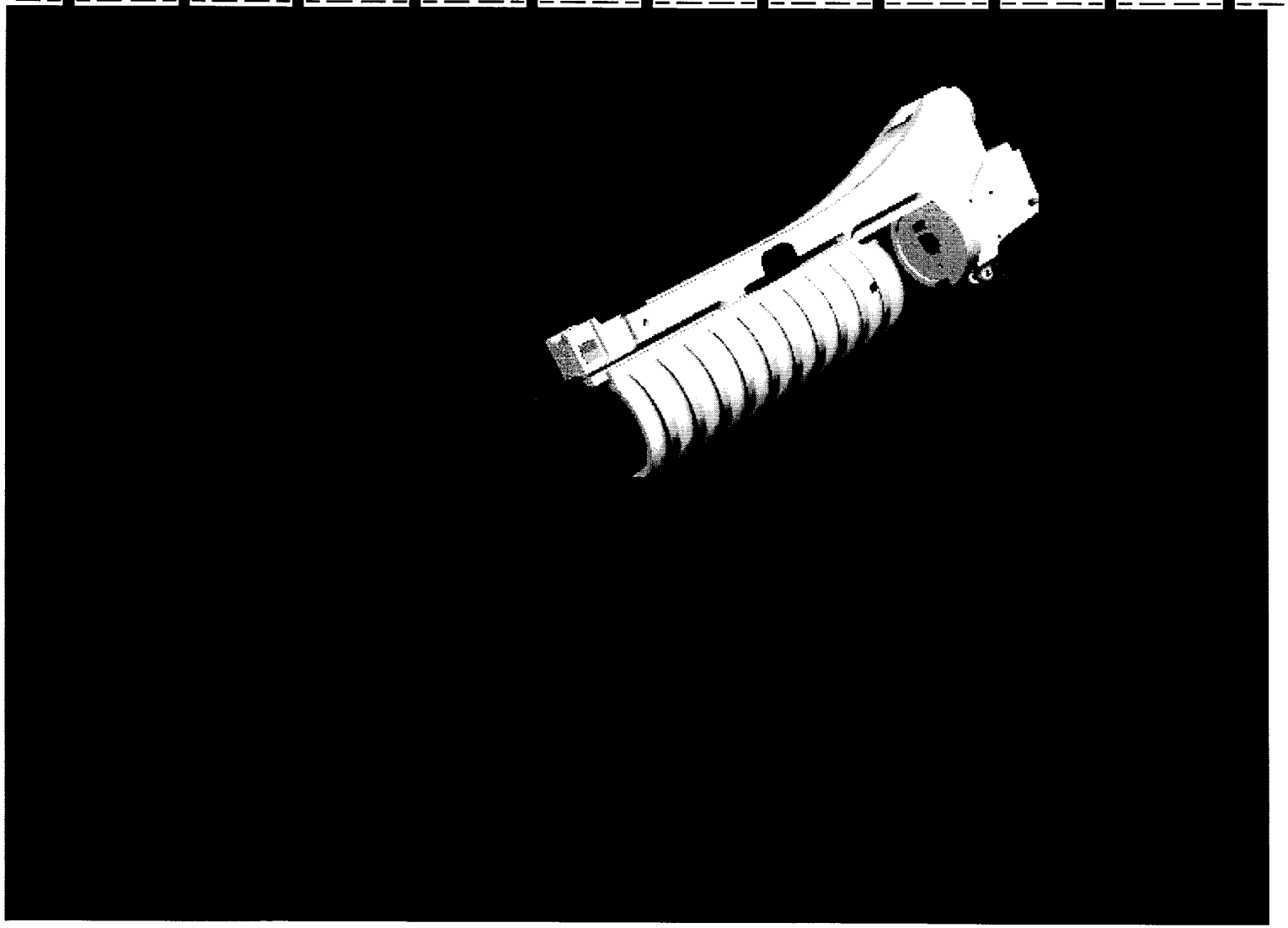
RECEIVER

F 19204 8448338

SCALE 1/1 SHEET 1 OF 3

F 8448338

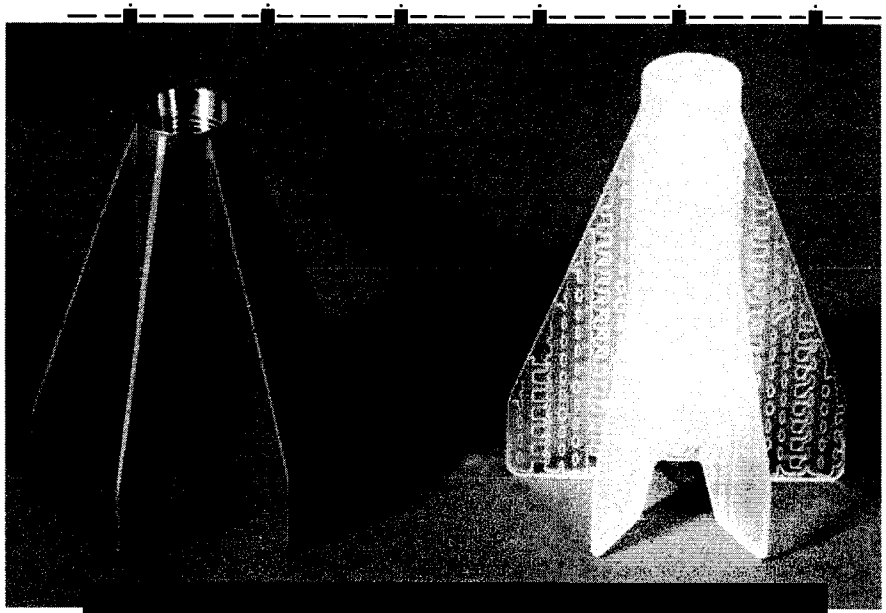
M203 Grenade Launcher

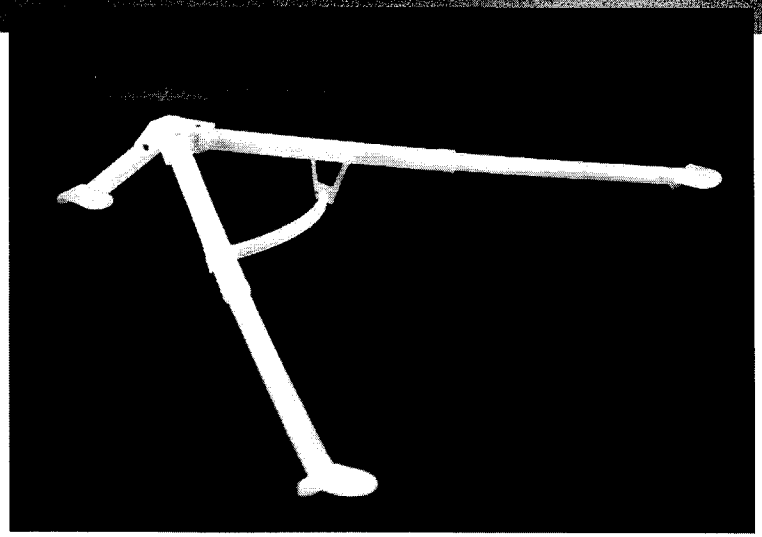


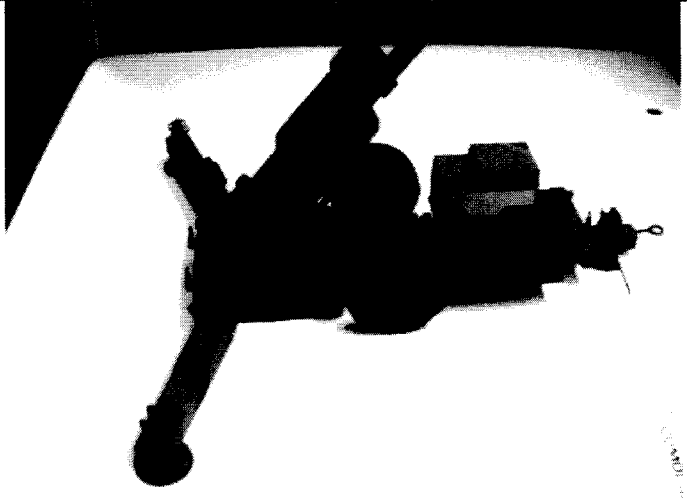
3D SOLID MODEL TDP's

- **PURPOSE: To convert the Government's technical data system (weapons and ammo) currently based on 2-D raster images of line drawings, to a system based on 3-D solid models.**
- **Build an infrastructure so that 3-D tech data can be used for production, design interface and upgrades, logistics support, etc.**

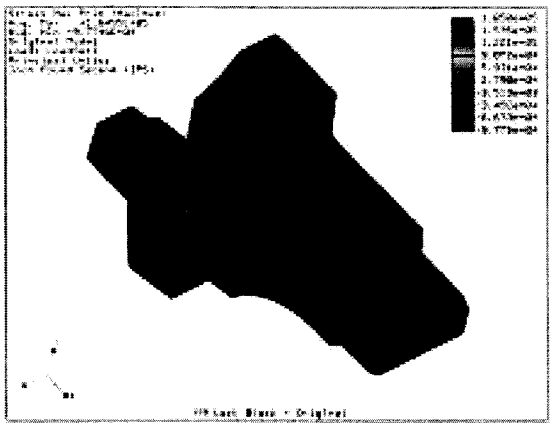
Rapid Prototype

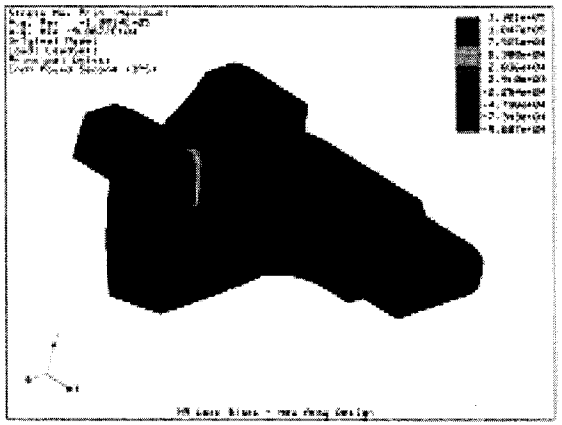


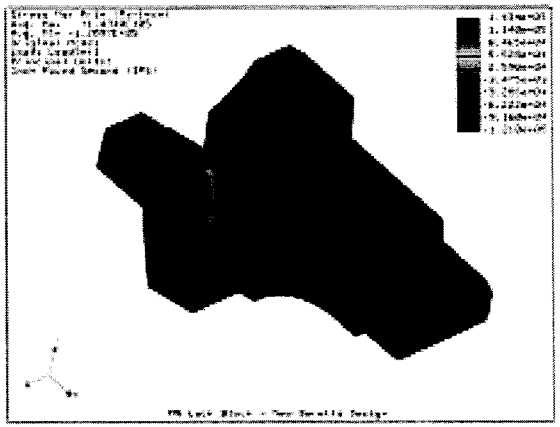


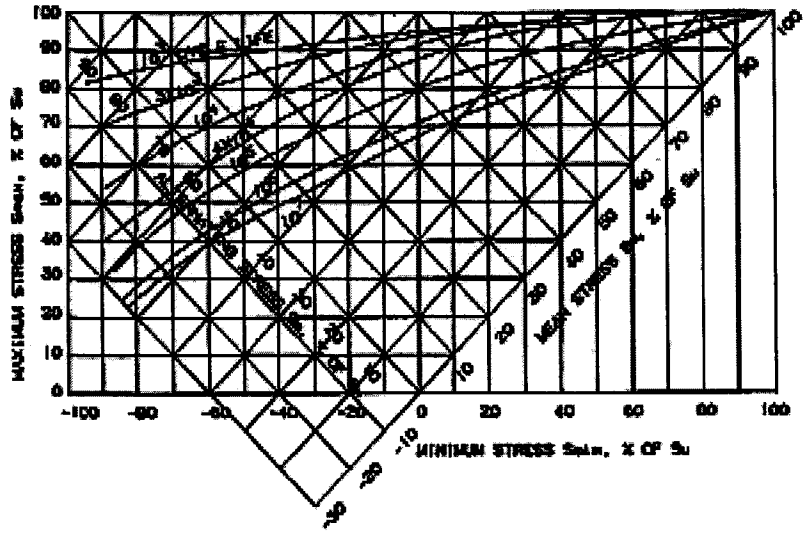


Engineering Analysis

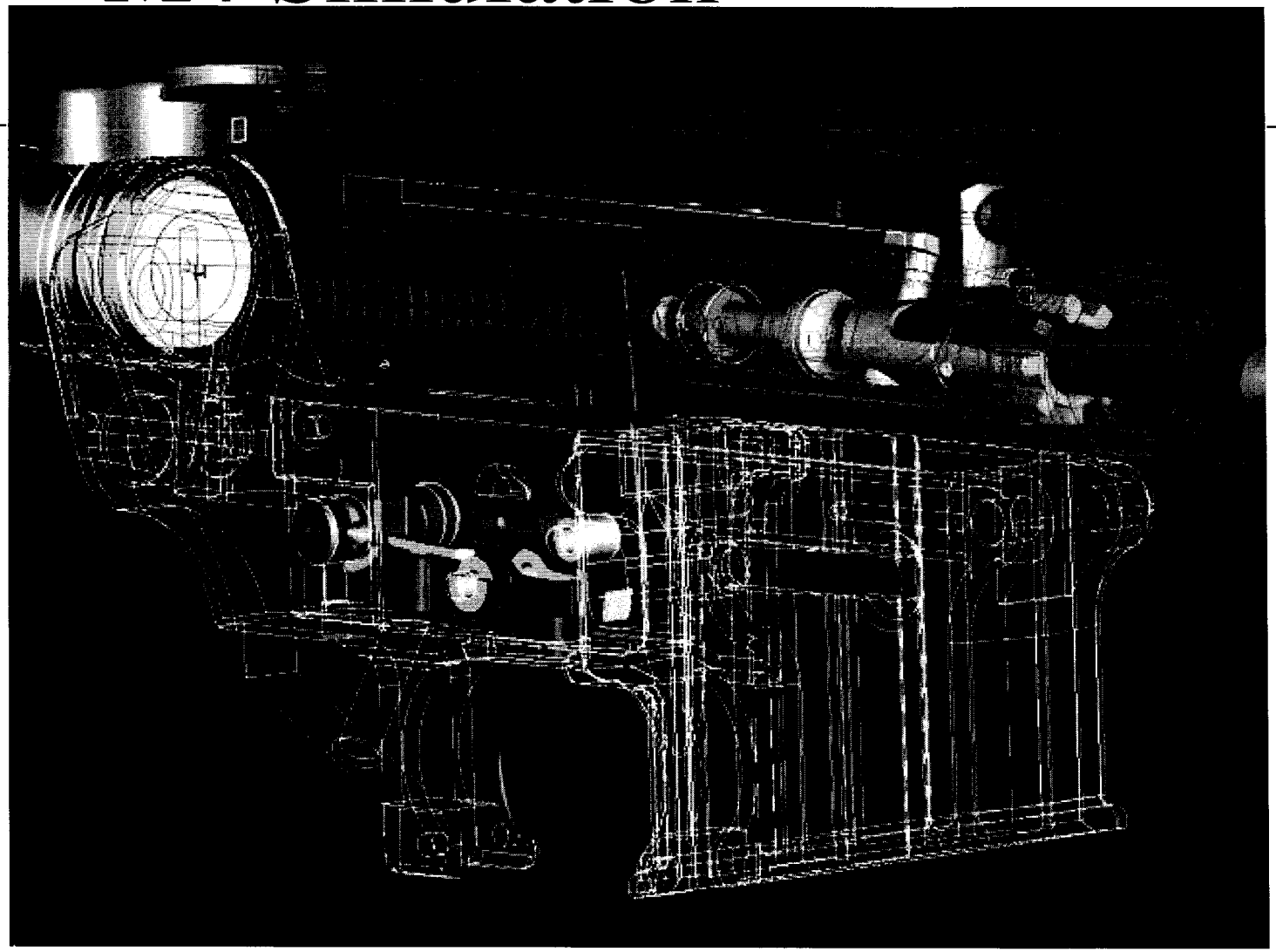








M4 Simulation

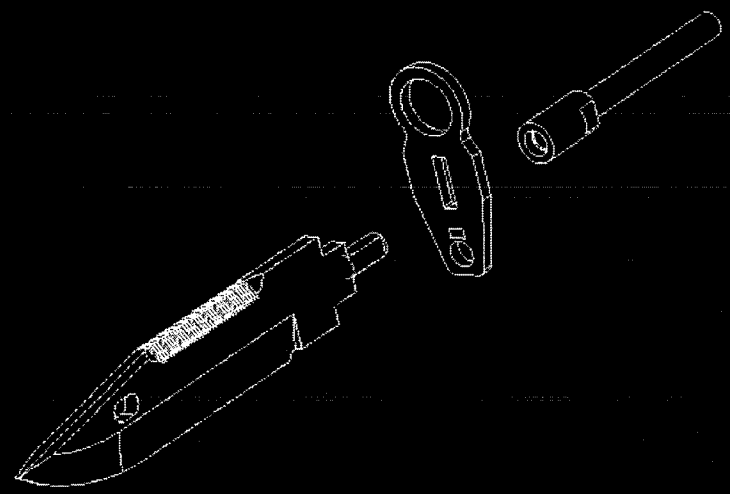


3D SOLID MODELS ALLOW AUTOMATED CREATION OF TECHNICAL MANUAL PAGES

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGE CODE	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					BLADE ASSEMBLY 12598166	
1		NONE	19200	12598163	BLADE	1
2		NONE	19200	12598164	GUARD	1
3		NONE	19200	12598165	ROD TANG EXTENDING	1

SCALE : 0.700 TYPE : ASSEM NAME : 19200_12598166 SIZE : A

3D SOLID MODELS ALLOW AUTOMATED CREATION OF TECHNICAL MANUAL PAGES



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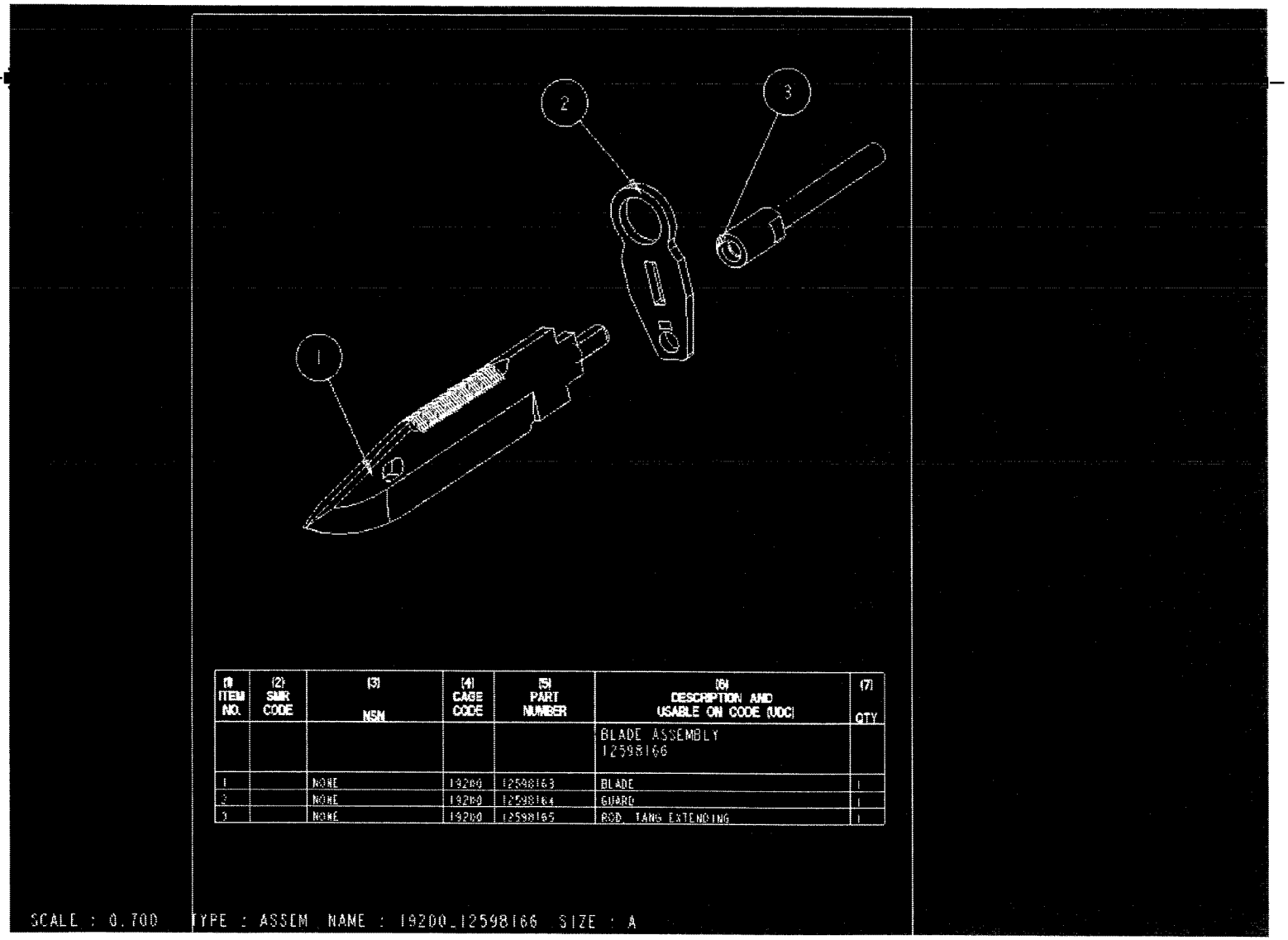

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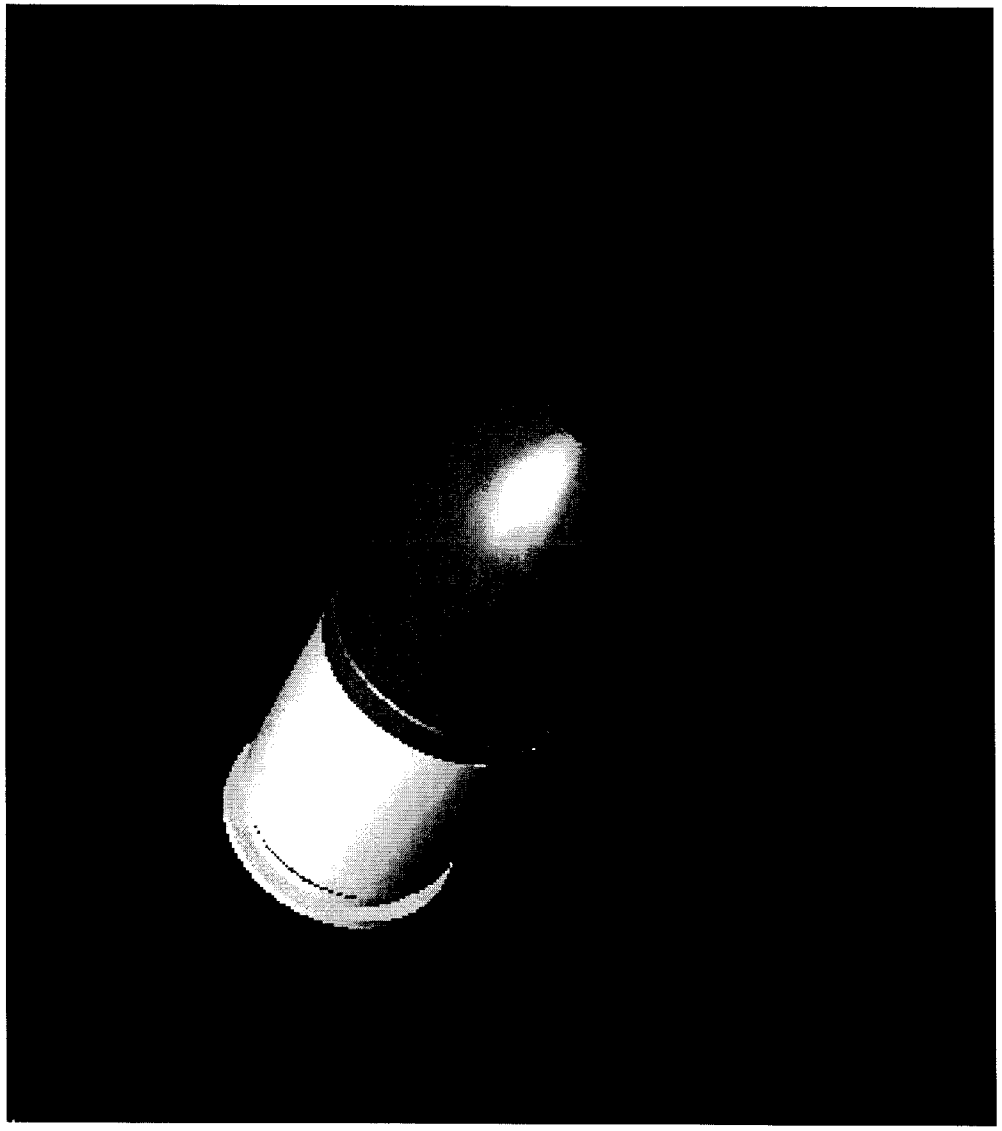
3		NONE	19200	12598165	ROD TANG EXTENDING	1

Advantages of 3D TDP's

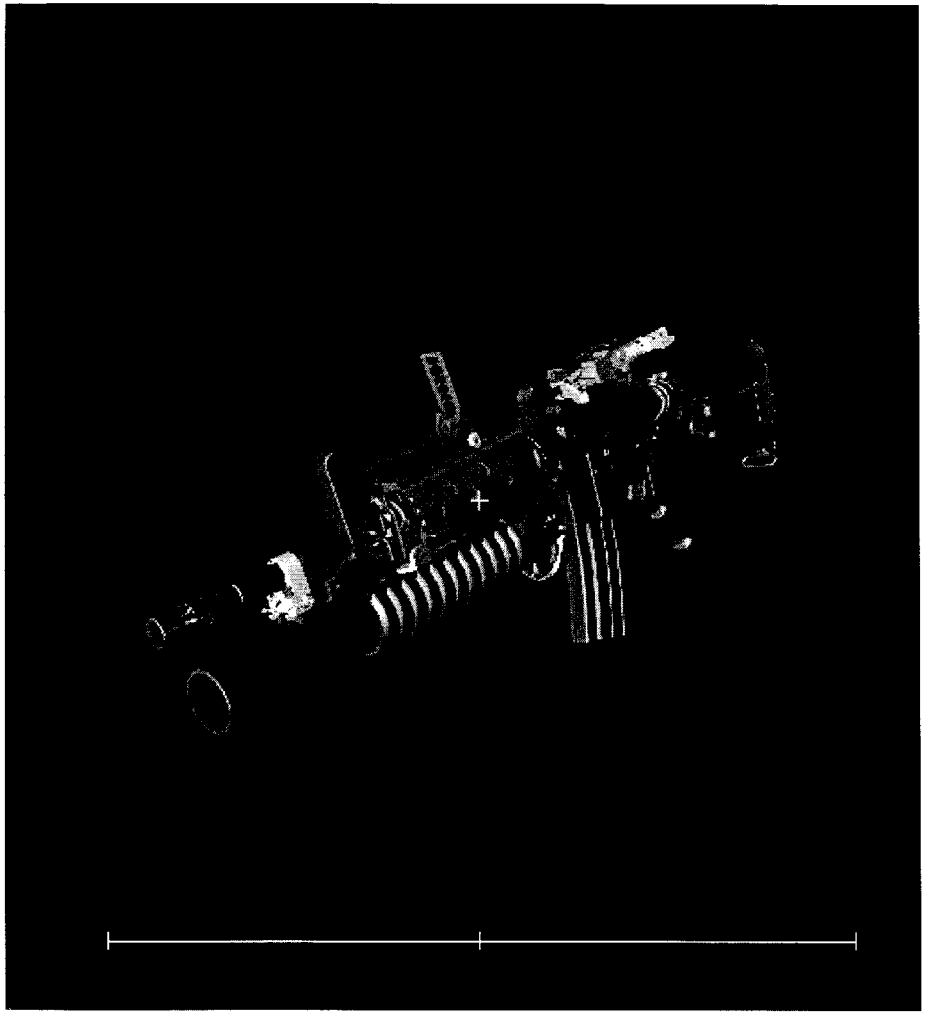
- Faster design upgrades
- Build virtual parts and assemblies in the computer
- Infinite viewpoints and exploded views of assemblies
- Reduced manufacturing lead time and cost
- Automated generation and update of line drawings
- Engineering analysis capabilities (stress, thermal, interference fit, tolerance stack-up, etc.)
- Rapid prototyping

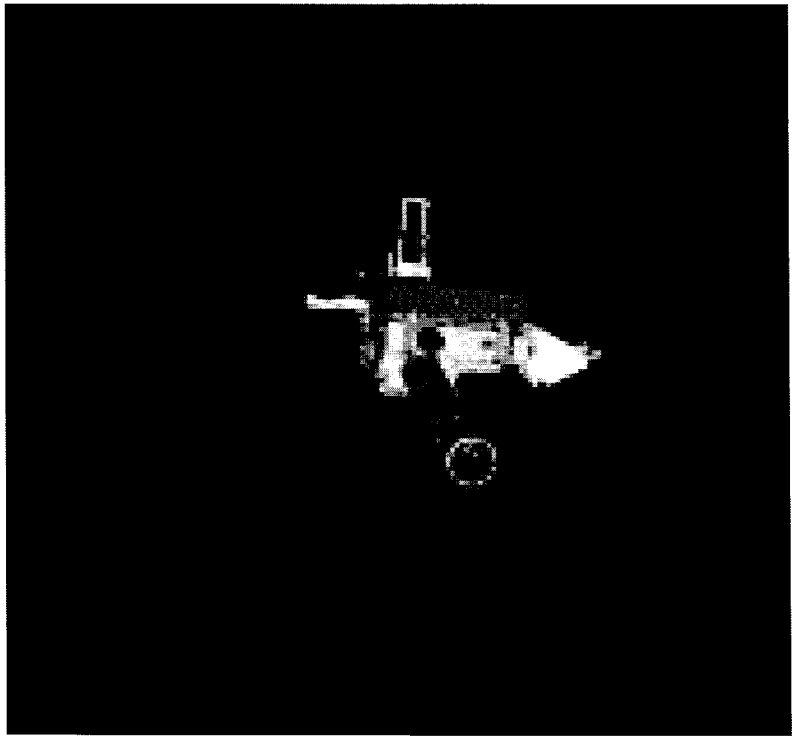
40mm M781 Cartridge



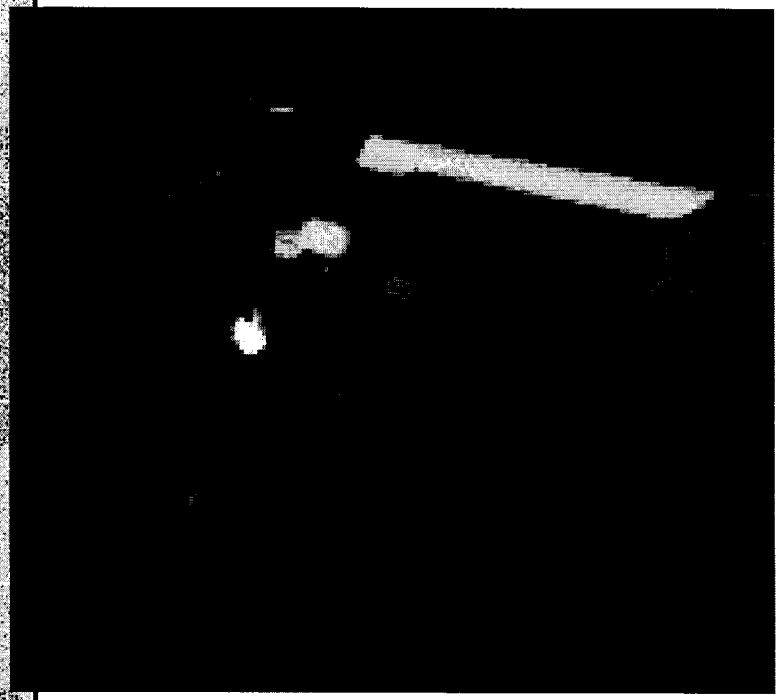
40mm Escapement Assy

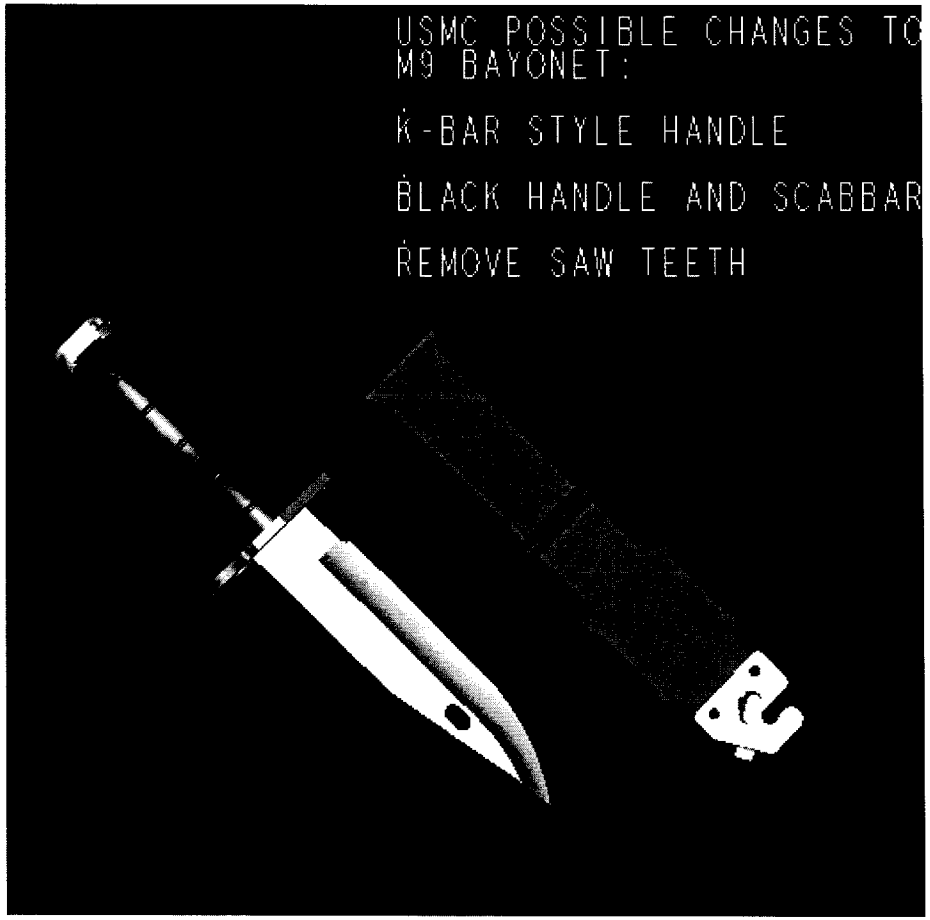
M203 Grenade Launcher & Mk19 Grenade Launcher



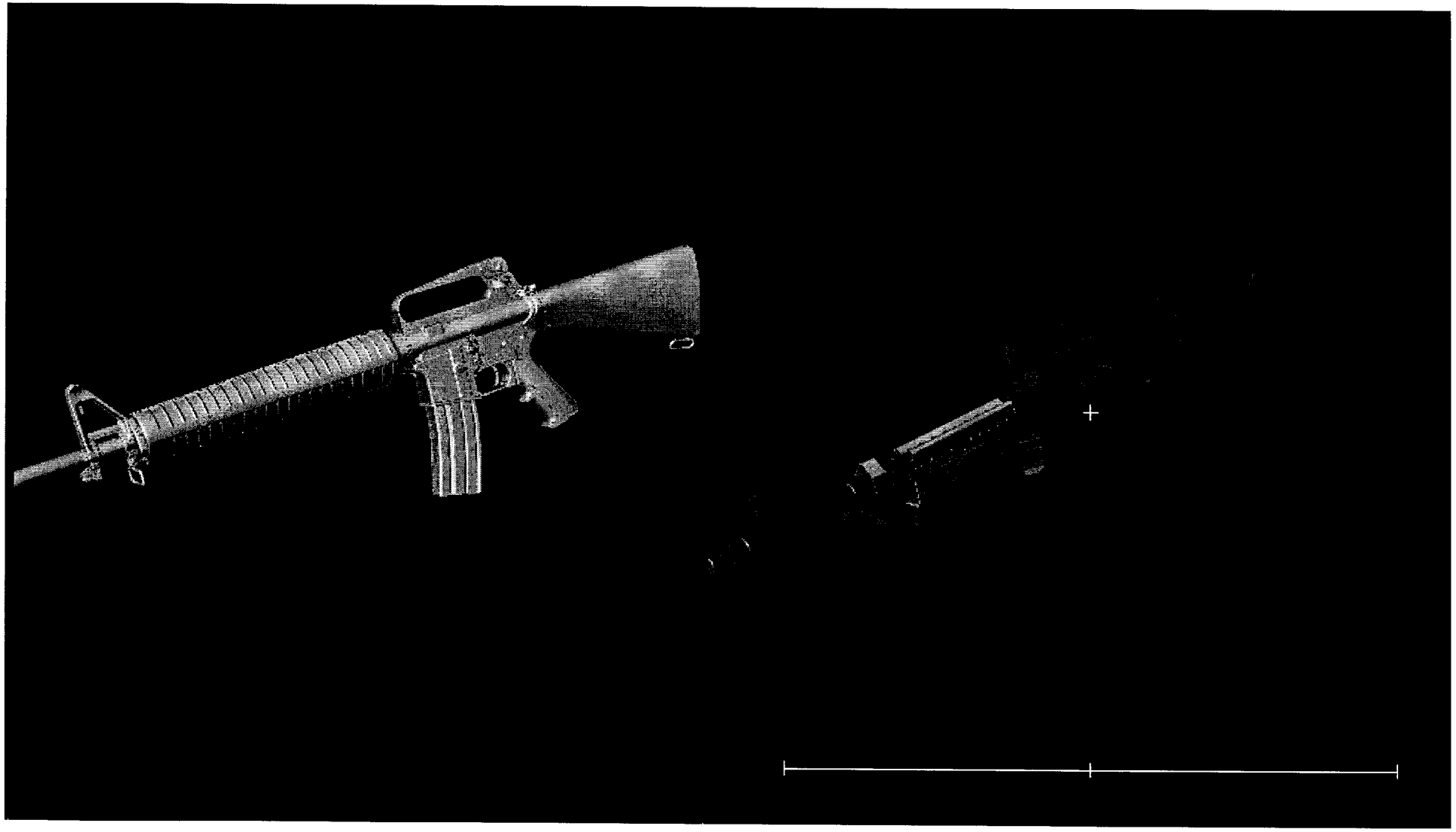


M4 Carbine/ M9 Pistol/ M9 Bayonet





M240 MG & M16 Rifle



Small Arms Mounts

GETTING TO A 3D ENVIRONMENT

- Convert current weapon/ammo systems when it makes good business sense.
- Obtain future system's technical data in 3-D format.
- Low priority legacy systems will continue using 2D system.
- Performance specs (I.e. no tech data of any form) still an option when it makes sense.

3D TDP Requirements

- Model centric approach.
- 2D drawings still used…linked to 3D models.
- Configuration manage 3D and 2D as a unit.
- 3 Documents concerning 3D TDPs:
  - 3D TDP Modeling Requirements
  - 3D TDP Data Management
  - 3D TDP Best Practices

3D TDP Training Requirements

3D TDP Training Course	Training Hours	Training Source
Basic Pro/E	40	In-house, contractor, local
Fundamentals of Drawings	24	In-house, contractor, local
TACOM Modeling Standards	24	In-House
Intralink for Users	16	In-House
Advanced Drawings	40	In-house, contractor, local
Fundamentals of Sheetmetal	24	In-house, contractor, local
Advanced Surfacing	24	Contractor

New Course "3D Solid Modeling for Logisticians" being developed.

Tech Data Formats

- Tech data will be delivered in 5 formats:
  - Pro/ENGINEER native solid models
  - Pro/ENGINEER native drawings
  - VRML file of solid models
  - STEP file of solid models
  - Adobe acrobat (.pdf) drawings (contractually binding)

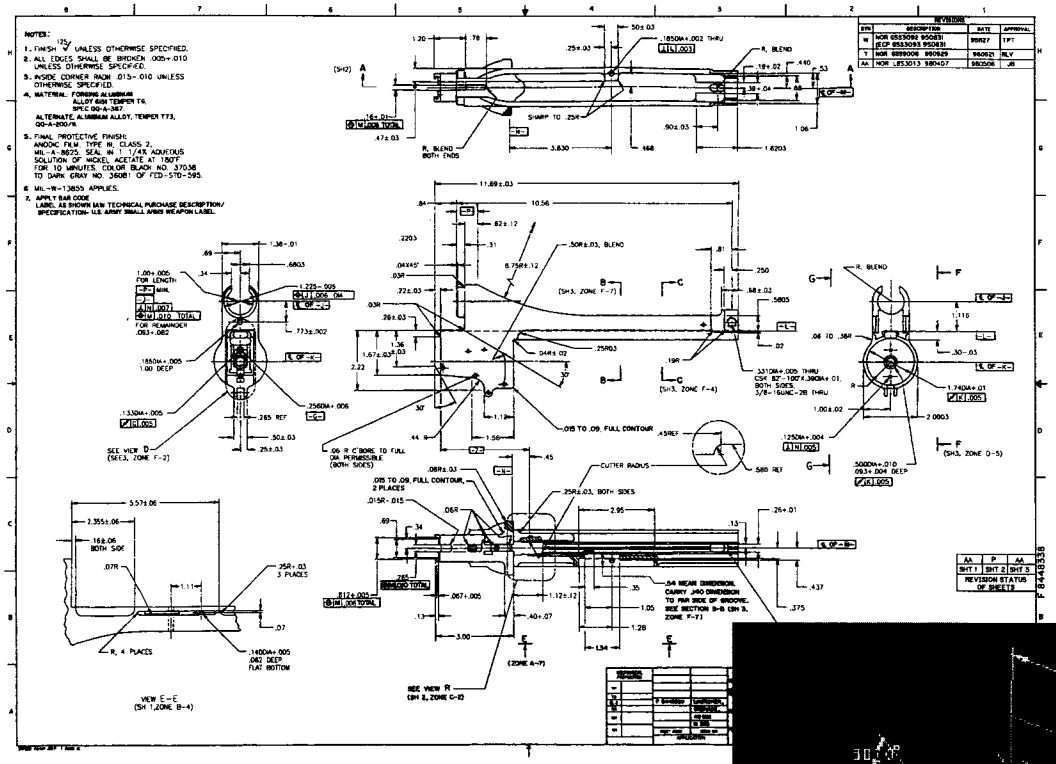
CHALLENGES

- CAD System interoperability:
  - Pro/E Catia
  - Unigraphics Solidworks
  - Solid Edge Mechanical Desktop/Inv

- Training.

How you can help

- Engineers – Get 3D training on how to prepare 3D technical data. Start using it.
- Program Managers – Encourage your systems engineers and development contractors to develop and maintain 3D technical data for your system.
- Logistics Specialist – Learn how to use solid models to create TMs/process sheets/assembly instructions, etc.
- Training personnel – Learn to use the solid models to create computer based training.
- Manufacturing – Learn to incorporate solid models in the manufacturing process.



FROM THIS

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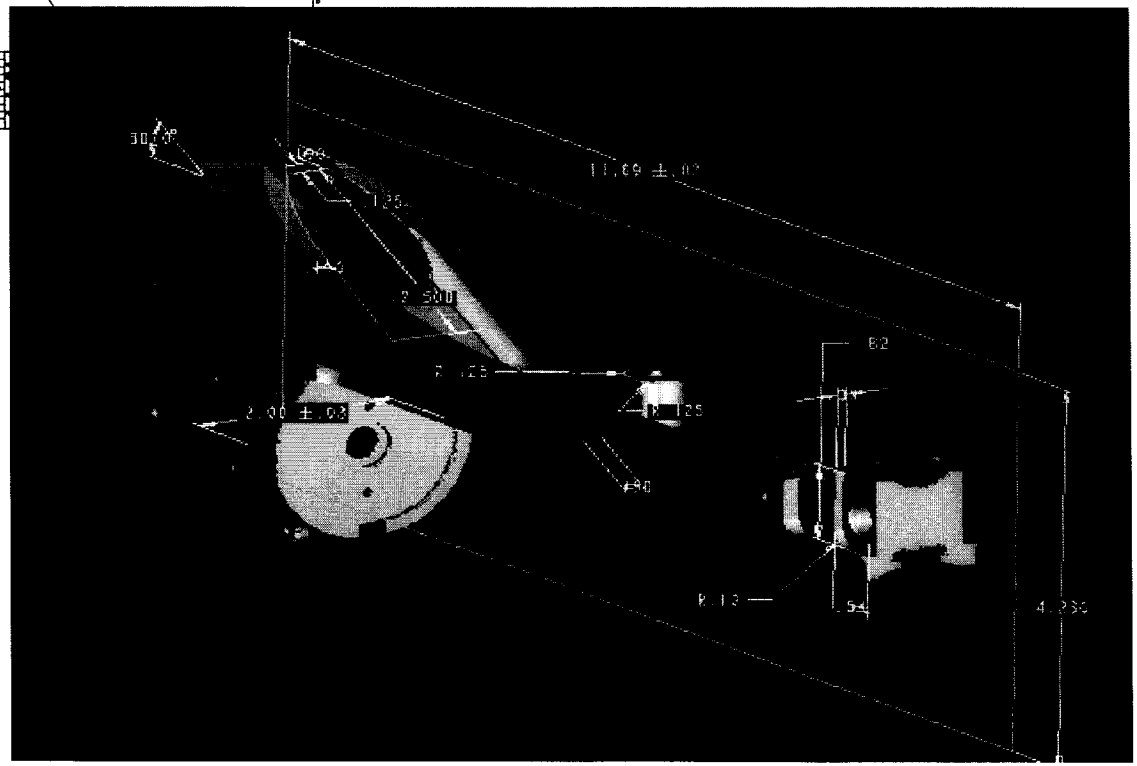

TACOM

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Windhamj@ria.army.mil

http://w4.pica.army.mil/ardec-ri/tacom_3d.htm