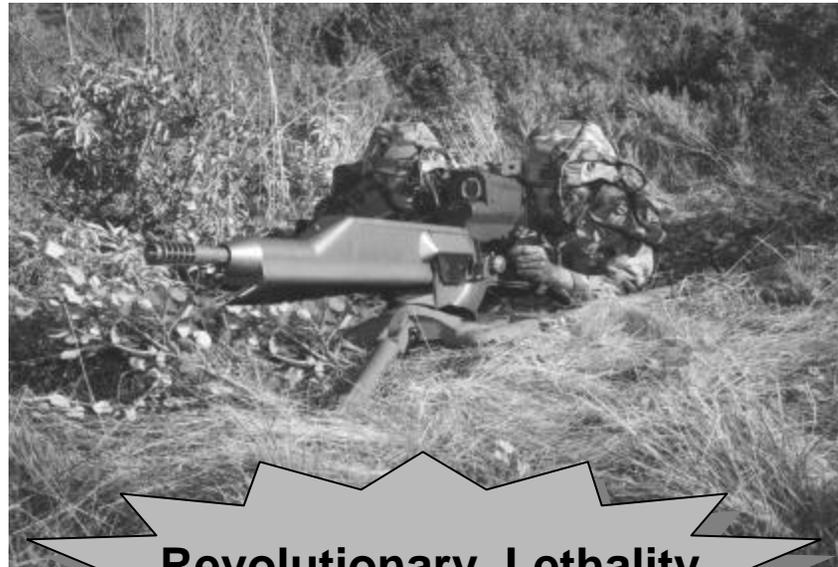




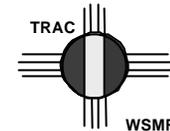
Force on Force Modeling Objective Crew Served Weapon



**Revolutionary Lethality
for the 21st Century
Warfighter**

NDIA, Joint Service Small Arms Symposium
August 2000

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Dep DPO OCSW
TACOM-ARDEC



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TRADOC Analysis Center
White Sands Missile Range

System Overview

WEAPON

- 25mm, 220 spm
- Soft Recoil; Gas Operation
- Full or Semi-Auto
- Gun operates at +/- 70° elevation

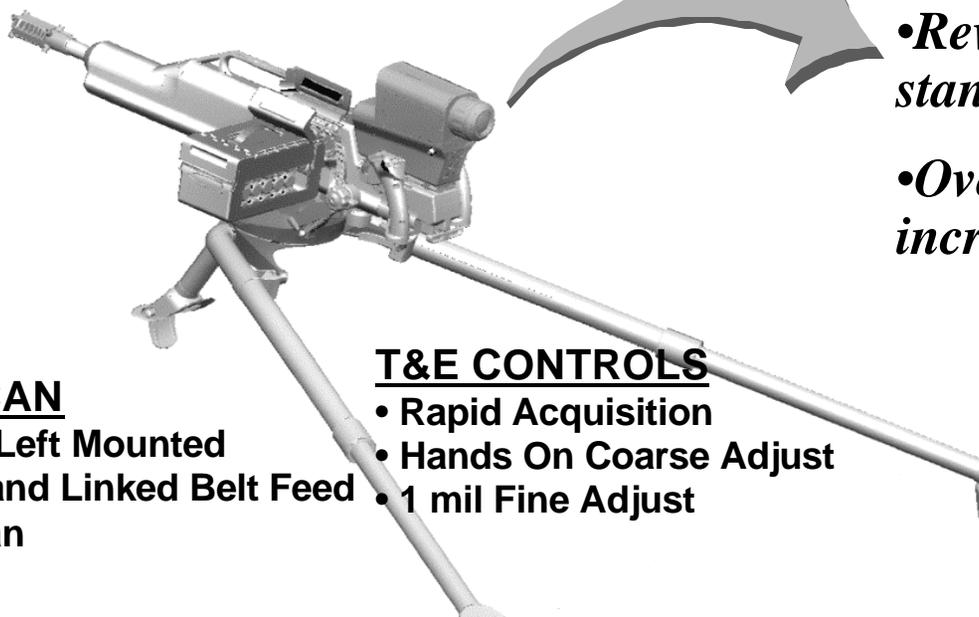
FULL SOLUTION FIRE CONTROL

- Day/Night All Weather Capability
- Direct View Optics
- Laser Range finder
- Fuze Setter Interface

• *Lightweight, two-man portable system*

• *Revolutionary, long range standoff lethality*

• *Overmatching capability with increased survivability*

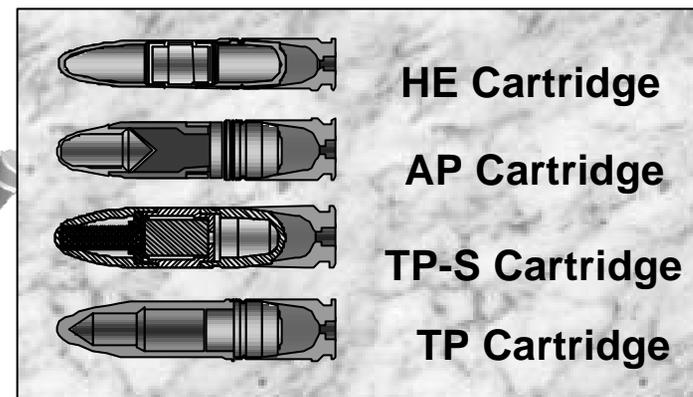


AMMO CAN

- Right or Left Mounted
- L or R Hand Linked Belt Feed
- 31 rds/can

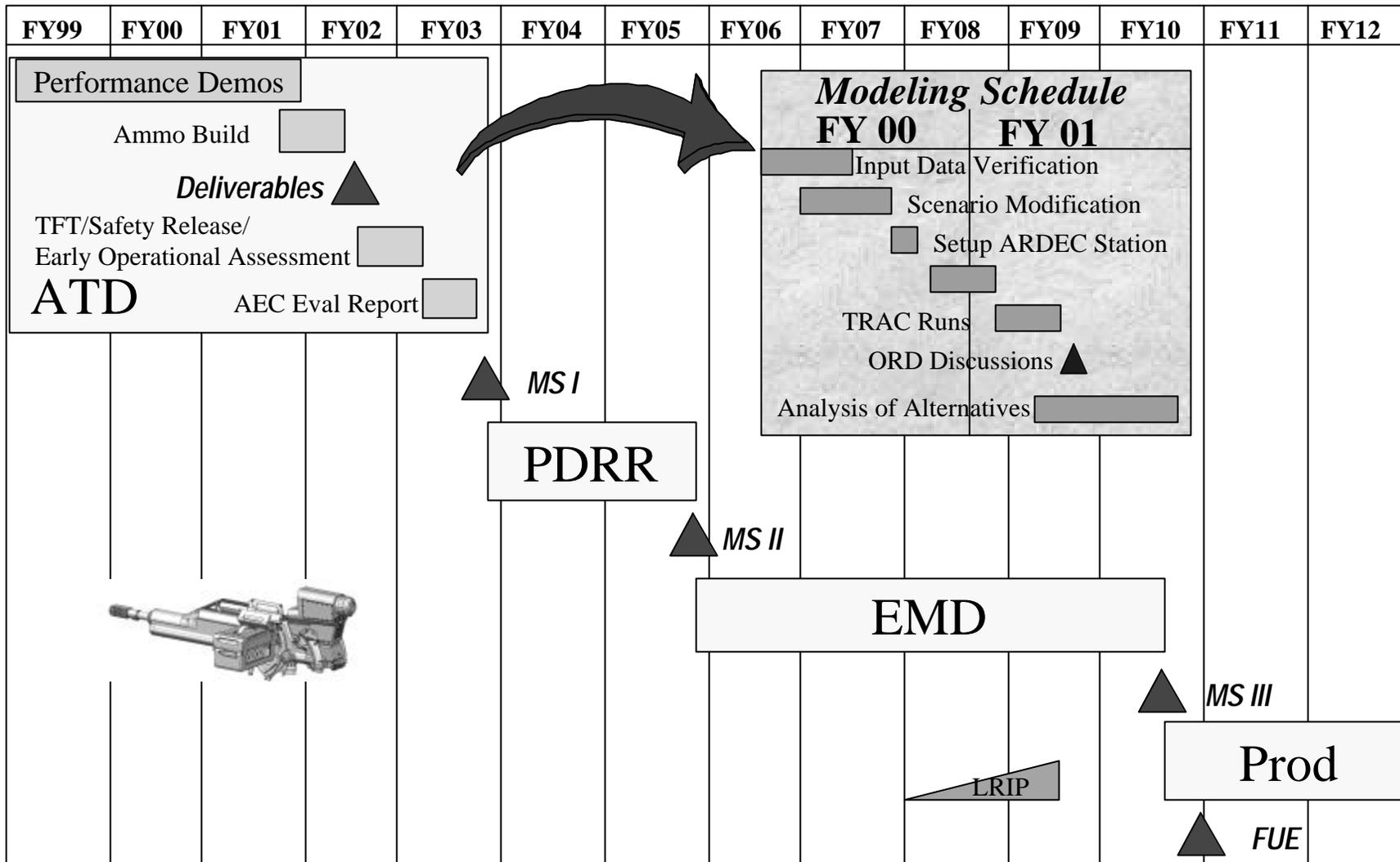
T&E CONTROLS

- Rapid Acquisition
- Hands On Coarse Adjust
- 1 mil Fine Adjust



- System Dispersion *Less than* 1 mil Without Ballast
- No Headspace or Timing Adjustments Required

Program Schedule

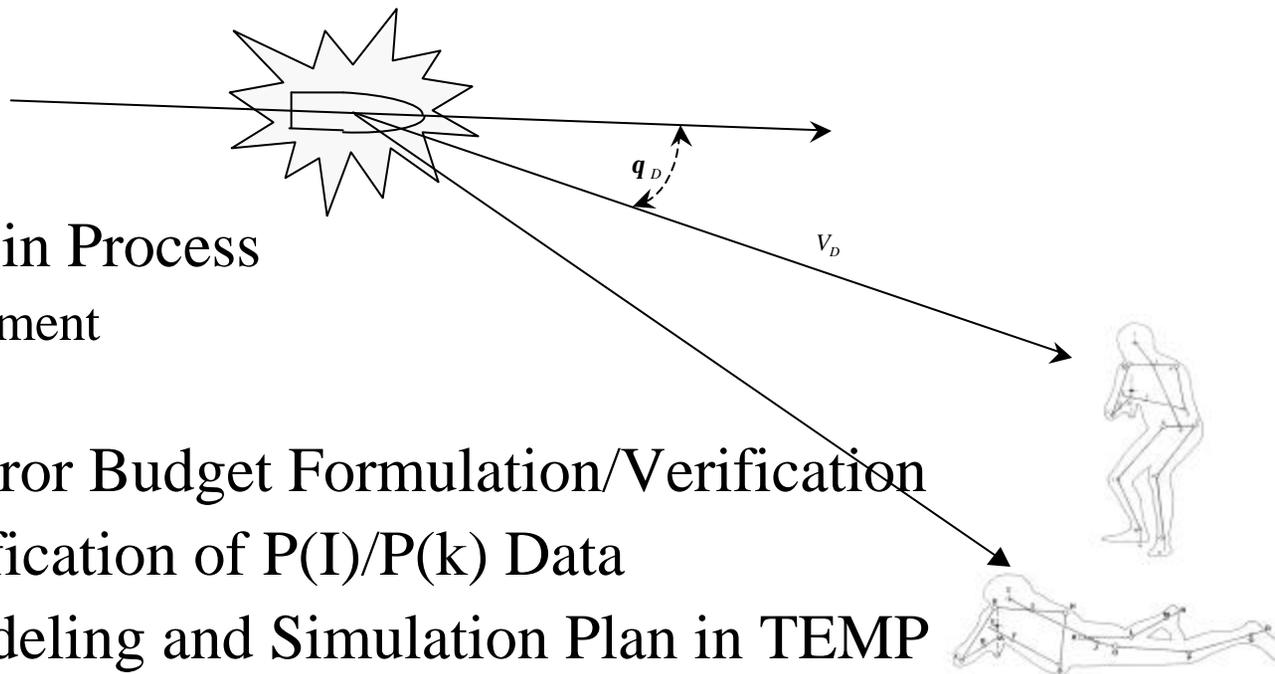


Army's Center for Lethality

ATD EXIT CRITERIA STATUS

	<u>OCSW ATD</u>			
<u>I. LIGHTWEIGHT</u>	<u>THRESHOLD</u>	<u>GOAL</u>	<u>STATUS</u>	<u>REMARKS</u>
-SystemWeight (no Ammo), Lbs	57 lb	38.6 lb	47.92 lb	
- Crew (2 Man) Portable Modules (Transport Module Weight w/ ammo), Lbs	38 lb/person	35 lb/person	38.52	w/ 62 Rounds
<u>II. LETHALITY</u>				
- Accuracy / Dispersion) (deflection error @ 600m)	2 mils	0.5 mils	<1.0 mils	
- Fuze Function Set by Fire Control	Single Shot	Full Auto	Full Auto	
- Air burst Point Range Error (known range, 600 m)	10 m (+/- 5m)	4 m (+/- 2m)	8 m (+/- 4m)	Estimate
- Defeat of Defilade Target	Yes	Yes	Yes	
- High P(i)	3x / 12y / 8z	6x / 24y / 16z	13x / 50y / 31z	*Contractor Estimate
- Armor Penetration (at 0 deg. obliquity)	2" RHA 1,000 m	2" HHA 2,000 m	1.53" RHA	Fwd Initiation
- P(h), Lt Vehicle Target @ 1,000m (Two 5 rd bursts; stationary 2.3 x 2.3m target)	.35	0.75	.	
<u>III. DAY / NIGHT CAPABILITY</u>	1000 m	2,000 m	800 m	GFM Thermal Module (OICW)
- Demonstrate Thermal Module (modular interface to OCSW)				
<u>IV. LAND WARRIOR COMPATIBILITY</u>	LW Interoperable	FXXI LW Wireless Interoperability	LW Connectivity	
			Simulation Measurable	
Based on Government approved Modeling & Simulation:				
<u>V. SURVIVABILITY</u>				
- Casualty Reduction	40 % Reduction	90 % Reduction	TBD	From CASTFOREM Modeling
<u>VI. SUSTAINABILITY</u>				
- Lbs Ammo/ "Kill"	20	6	3.4	*contractor Estimate
<u>VII. AFFORDABILITY</u>				
- Cost /"Kill" (Ammo)	\$300	\$130	TBD	
- Design to Avg Unit Production Cost (HE Ctg)	\$ 29	\$ 22	TBD	

Team Effort

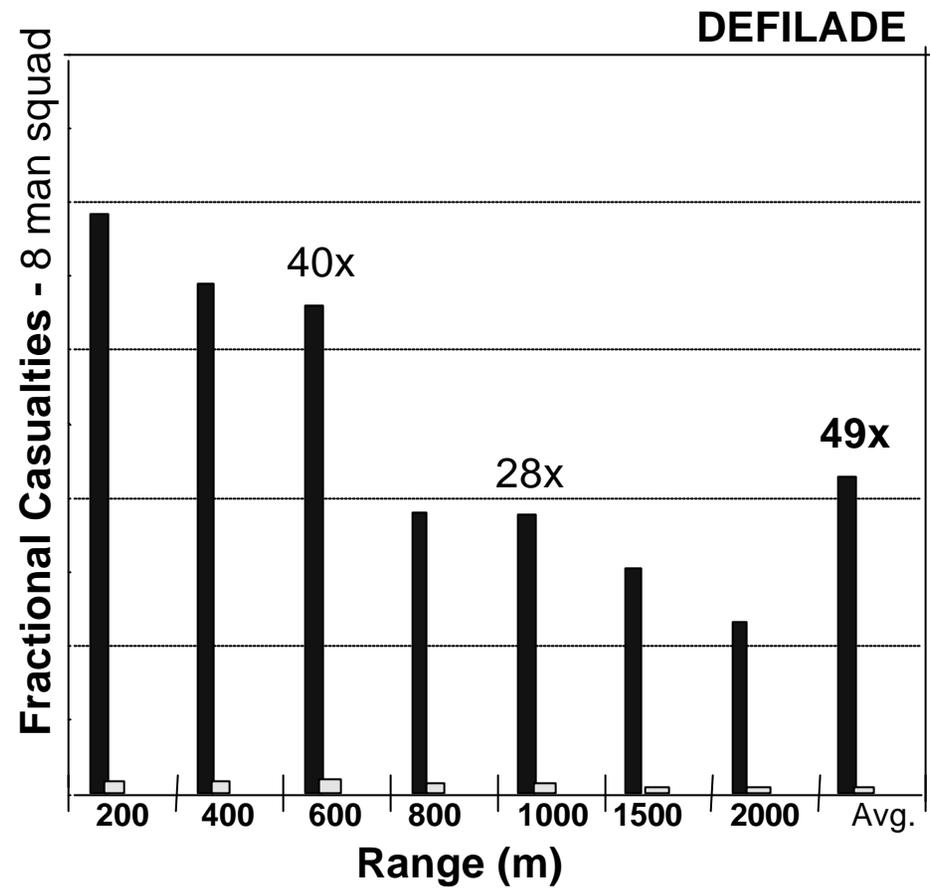
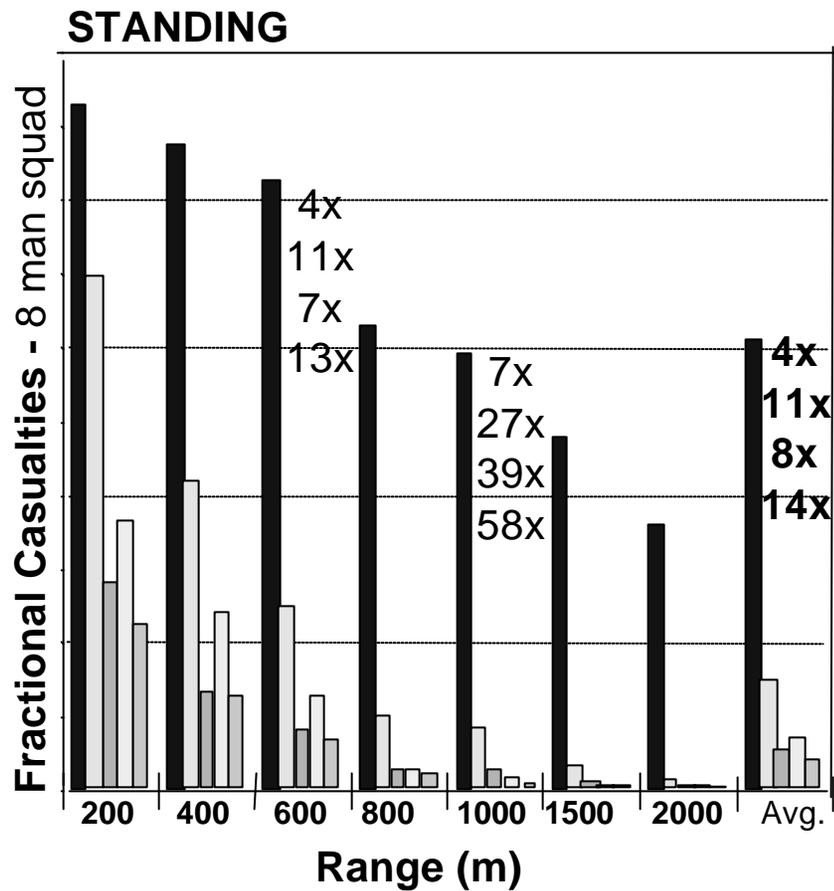


- User Involved in Process
 - TTP Development
 - Weapon Mix
- System IPT Error Budget Formulation/Verification
- AMSAA Verification of P(I)/P(k) Data
- Test IPT - Modeling and Simulation Plan in TEMP
- TACOM-ARDEC / TRAC-WSMR Analysis
 - TTP Development
 - Input to AOA Process
 - Weapon Mix Development
 - ATD Exit Criteria
 - P(I) Sensitivity Analysis



Early Modeling Efforts

Baseline Fractional Casualties Analysis



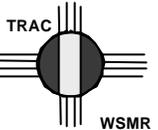
What is CASTFOREM?

Combined Arms and Support Task Force Evaluation Model:

- **High resolution, two sided, force-on-force, stochastic, event-sequenced, systemic simulation model**
- **Represents tactics through the use of decision tables**
- **Models direct fires, indirect fires, dismounted infantry, engineering operations, communications, maneuver with dynamic route selection, detailed search and acquisition systems, limited, combat service support (CSS) operations and realistic battlefield conditions**
- **Detection and engagements at the individual weapon system level**
- **Various Terrain resolutions based on size of battle area**
- **Battlefield environments including static weather, dynamic obscurants and change from day to night.**

Study Issues

- **Basis of Issue** (Number of OCSW Weapons Systems in a Platoon/Company)
- **Lethality** (Probability of Incapacitation ($P(i)$) given a Shot)
- **Area Target Effectiveness** (Examine Tactics, Techniques and Procedures for Area Target Engagements)
- **Range** (Maximum Effective Range of the HE Munitions)
- **Basic Load** (Minimum Number of Rounds for Offensive and Defensive Missions)
- **Final Protective Fires**

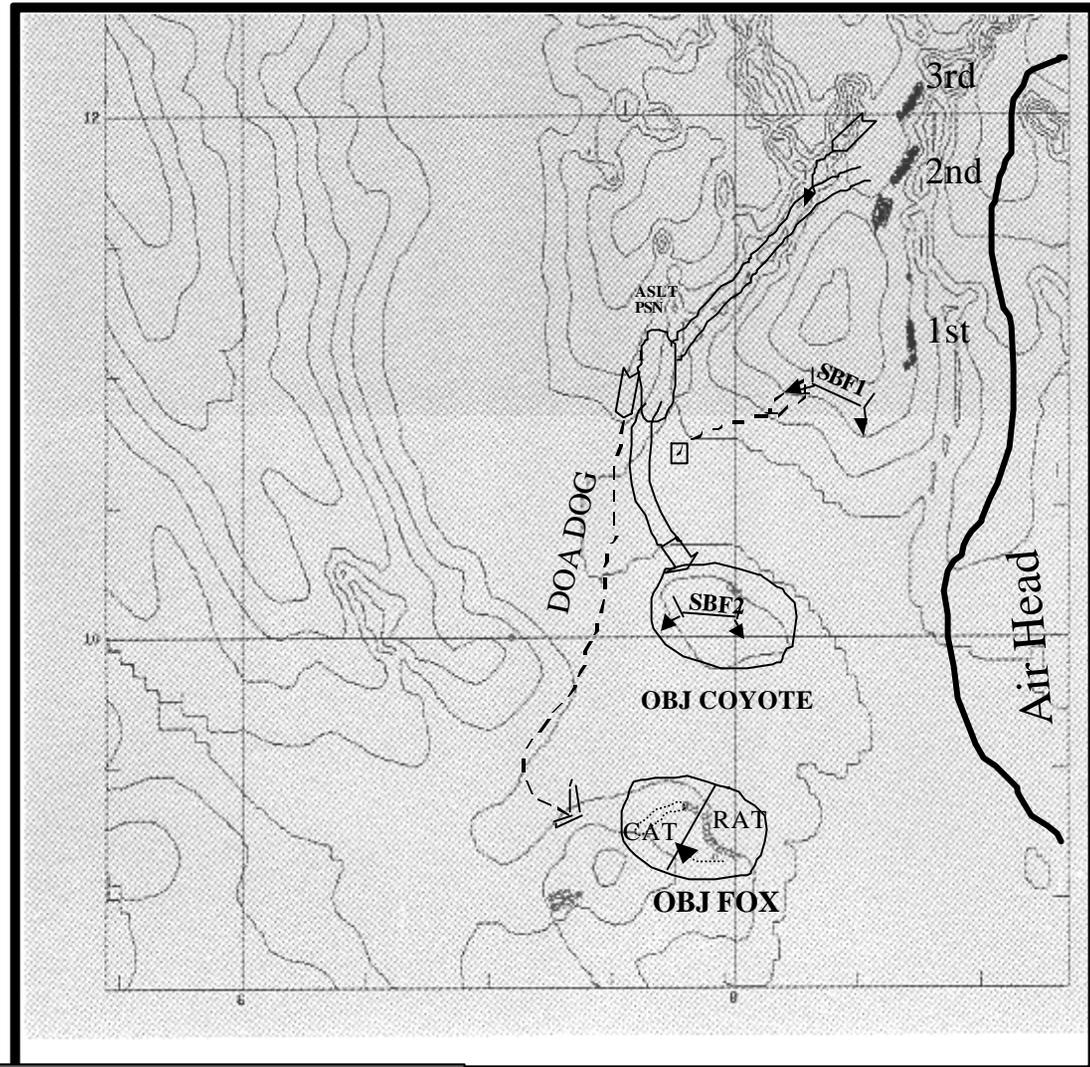


Vignettes

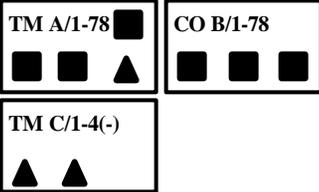
1. 1st PLT establish support by fire 1(SBF1) to fix enemy vic OBJ COYOTE to facilitate movement of 2nd PLT and on order seize OBJ FOX.

2. 2nd PLT seize OBJ COYOTE to prevent interference of friendly forces' movement to OBJ FOX.

3. 3rd PLT seize OBJ CAT to facilitate 1st PLT assault on OBJ RAT.



INITIAL FORCE STRUCTURE

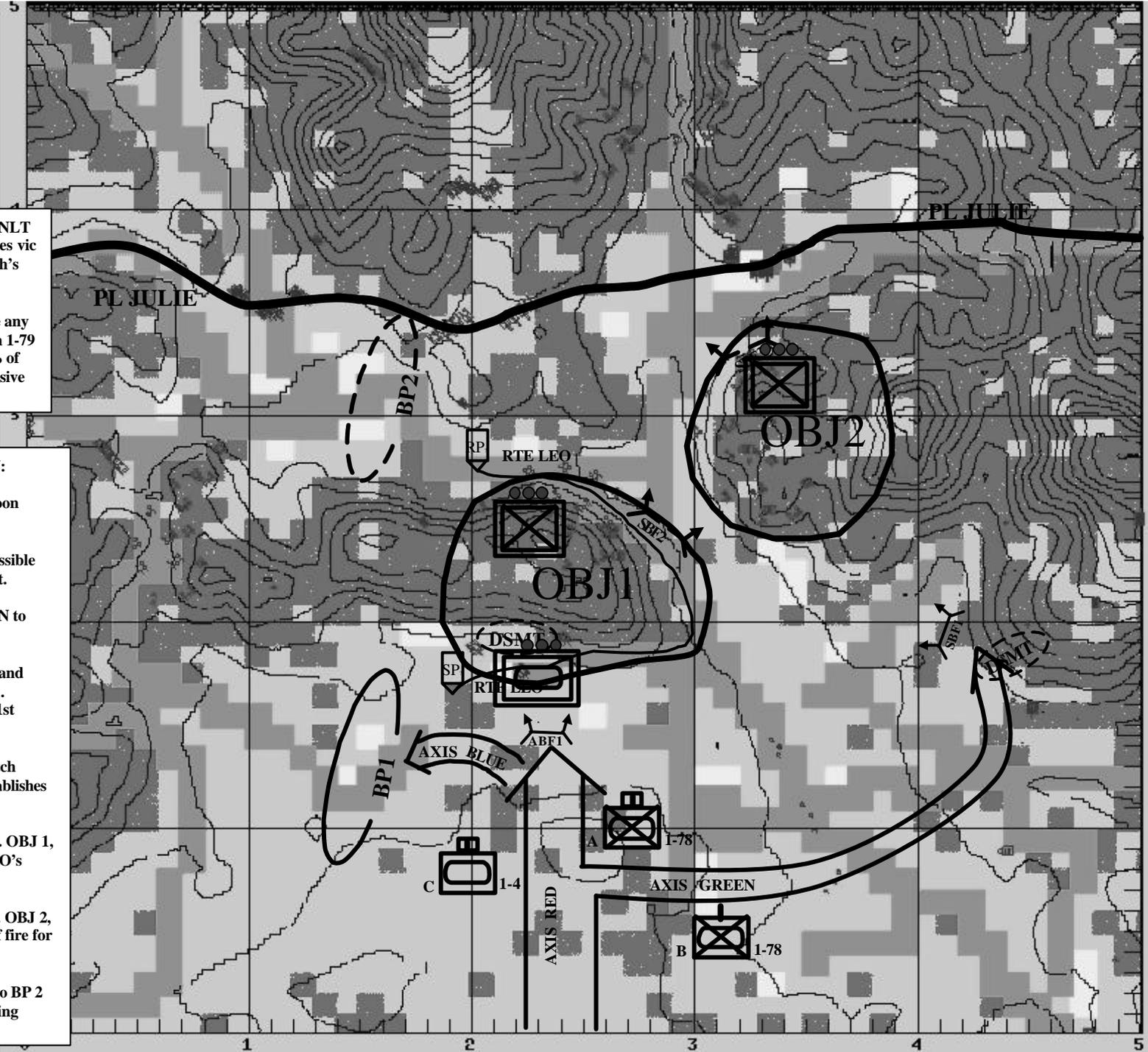


MISSION: TF 1-78 Mech. attacks NLT 0000XXXXY to destroy enemy forces vic OBJ HOTEL to facilitate 1-79 Mech's attack.

INTENT: My intent is to eliminate any forces that may place direct fires on 1-79 South of PL JULIE and retain 70% of our combat power for further offensive operations.

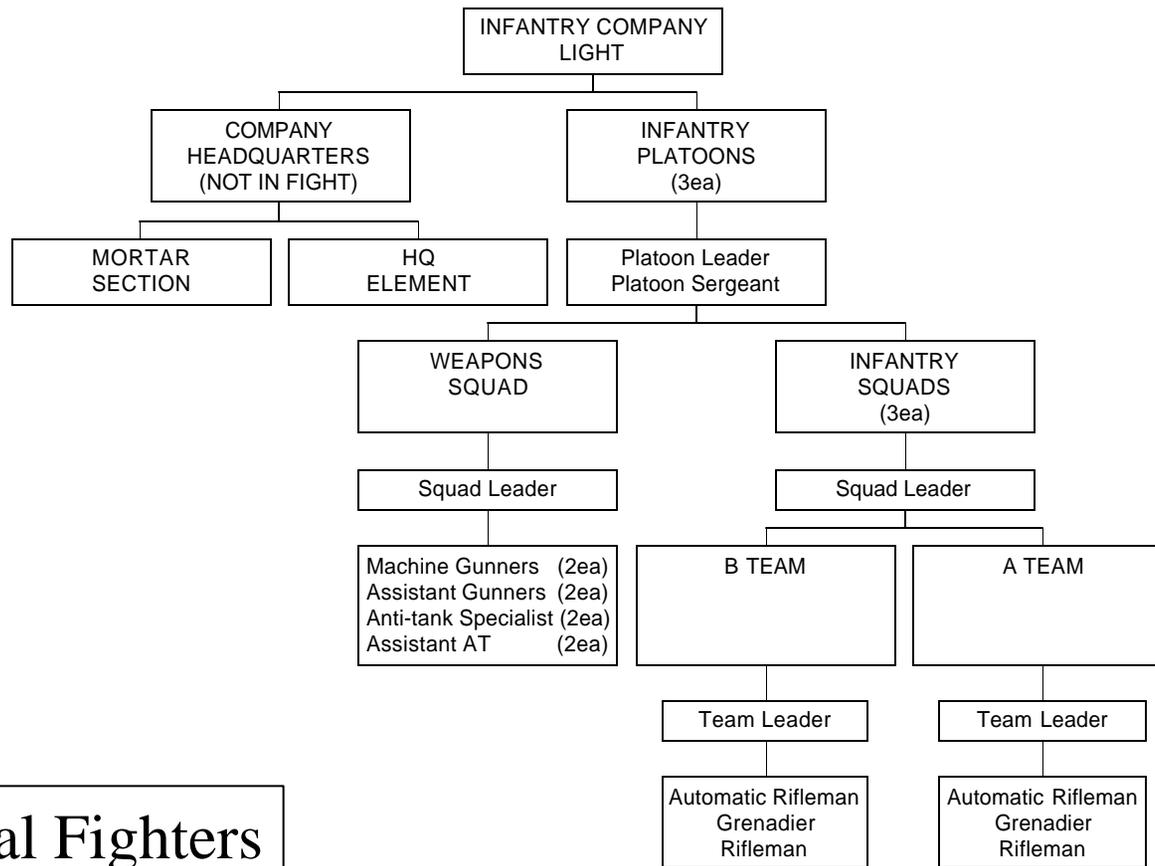
CONCEPT OF THE OPERATION:

1. TM A destroys enemy tank platoon from ATF 1.
2. TM C occupies BP 1 to block possible enemy counter attack from the west.
3. B CO moves along AXIS GREEN to its tentative DSMT point.
4. TM A moves to its DSMT point and prepares to attack enemy vic OBJ 1. Cross attaches mounted section of 1st platoon to TM C.
5. B CO occupies SBF 1 to overwatch TM A's attack. DSMT element establishes an assault position for OBJ 2.
6. TM A attacks to clear enemy vic. OBJ 1, establishes SBF 2 to overwatch B CO's attack on OBJ 2.
7. B CO attacks to clear enemy vic. OBJ 2, establish SBF 3 to provide a base of fire for 1-79 MECH's passage of lines.
8. TM C reposition via RTE LEO to BP 2 to block enemy from counterattacking 1-79 MECH from the west.

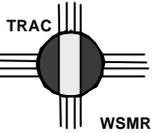


BLUE

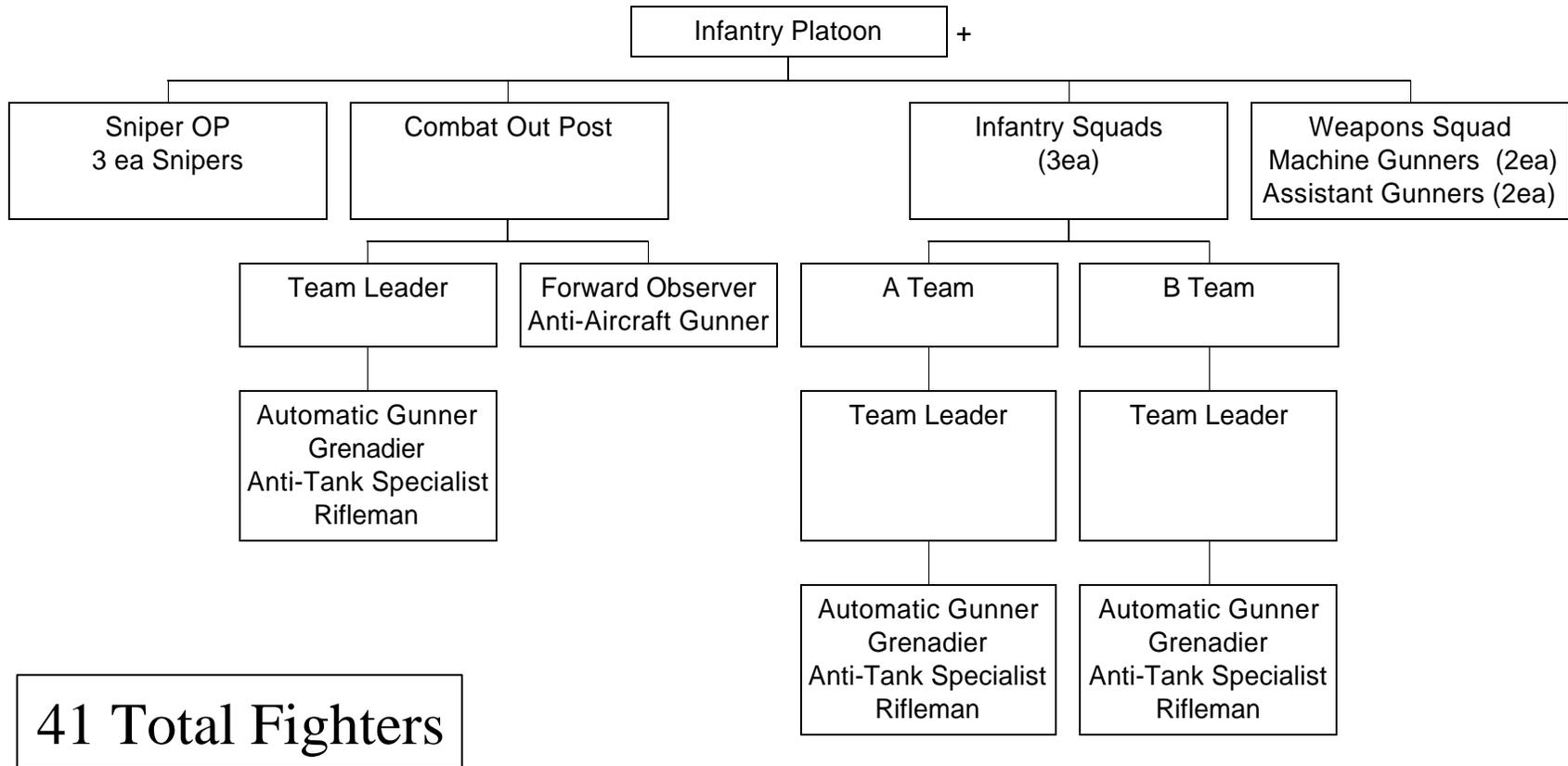
Nine Man Squad Force Structure



114 Total Fighters



RED Force Structure



41 Total Fighters

Killer/Victim Score Board

Engagements classified as

- Exposed
- Defilade

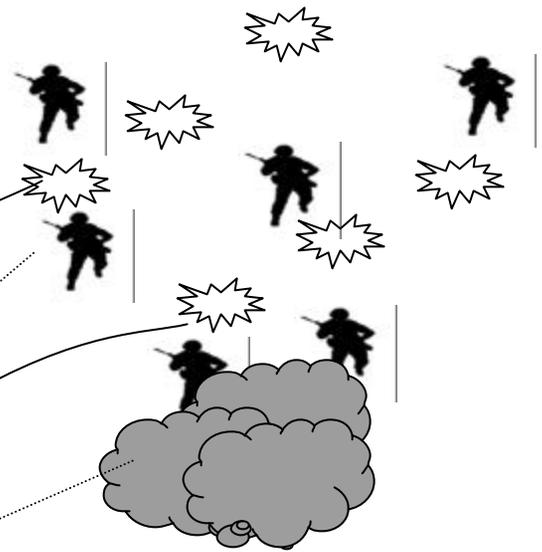


Kills assessed in

- 30 sec
- 5 min
- 30 min

Hits and Kills Classified as

- Exposed
- Defilade
- Incidental Exposed
- Incidental Defilade



Area Target Effectiveness Questions

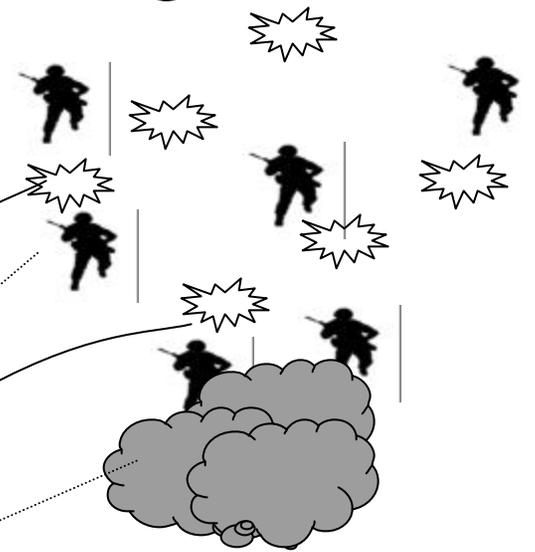
What is the range break between treating targets as individuals or as an area target?

What deflection change is most efficient when traversing across an area target?

What is the number of targets in an area to be considered a high payoff target?

What is the most efficient space between bursts in depth?

All questions against a given $P(i)$



OCSW Defensive Fire Control

Current

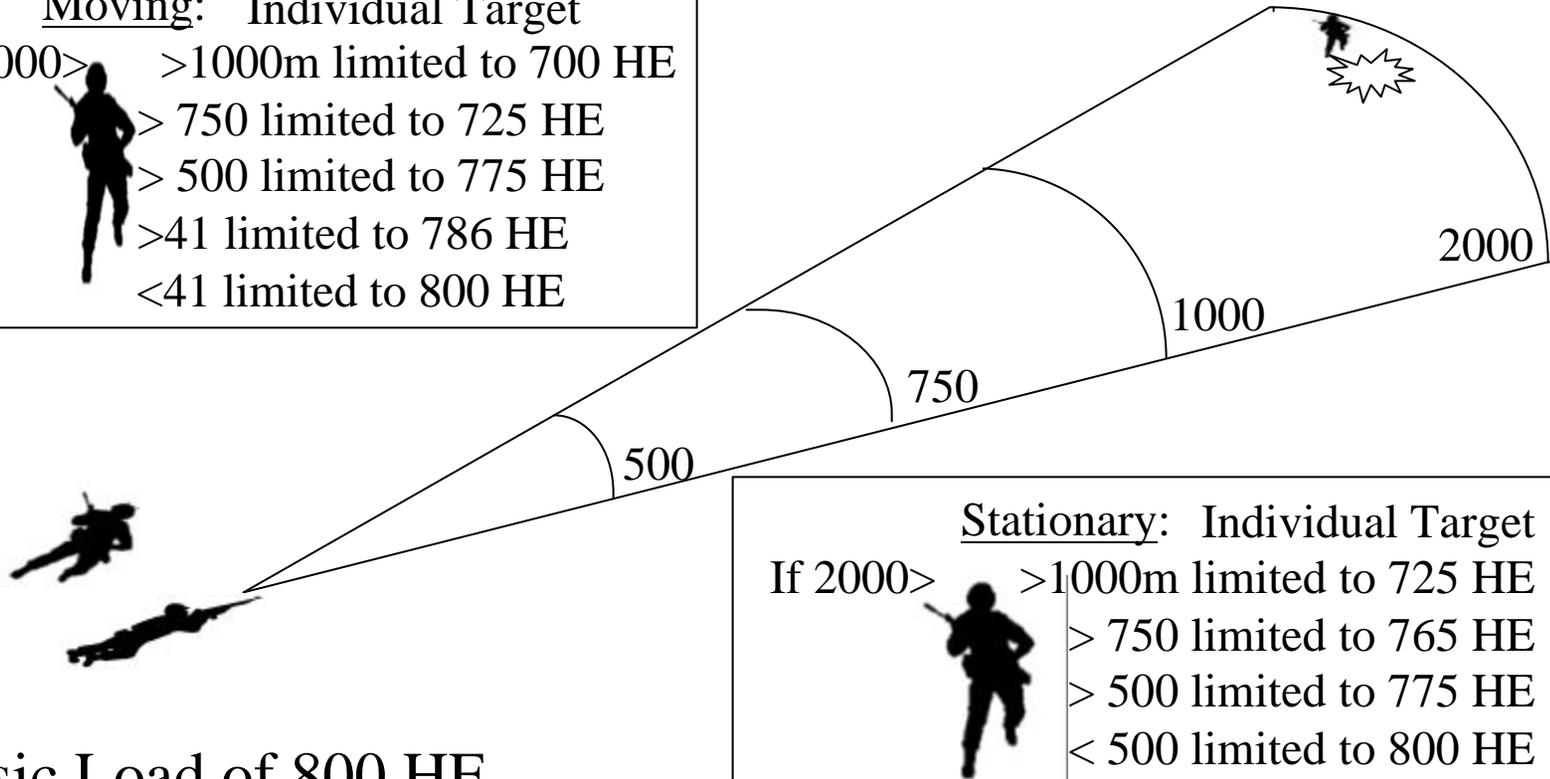
High Payoff Target: If  <2000m engage (HPT)

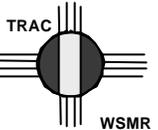
HPT: MG Teams
Snipers

Moving: Individual Target
If 2000>  >1000m limited to 700 HE
> 750 limited to 725 HE
> 500 limited to 775 HE
>41 limited to 786 HE
<41 limited to 800 HE

Stationary: Individual Target
If 2000>  >1000m limited to 725 HE
> 750 limited to 765 HE
> 500 limited to 775 HE
< 500 limited to 800 HE

Basic Load of 800 HE





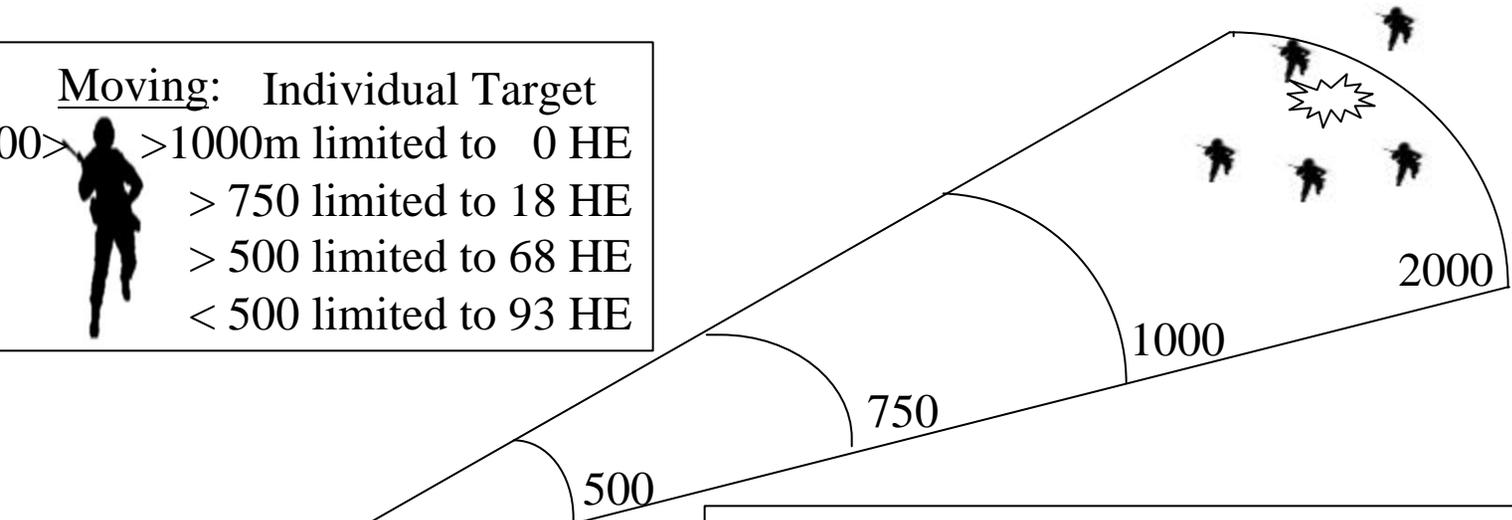
OCSW Defensive Fire Control

In Development

MG Teams
HPT: Snipers
Area Targets
Vehicles

High Payoff Target: If  <2000m engage (HPT)

Moving: Individual Target
If 2000>  >1000m limited to 0 HE
> 750 limited to 18 HE
> 500 limited to 68 HE
< 500 limited to 93 HE



Stationary: Individual Target
If 2000>  >1000m limited to 18 HE
> 750 limited to 58 HE
> 500 limited to 68 HE
< 500 limited to 93 HE

Basic Load of 93 HE

Working Actions

- Area Target Definition
- Area Target Engagement Methodology in Model
 - Identification of a Group of Soldiers as an Area Target
 - Defining Aim Points for Area Coverage
- Final Protective Fire
 - Methodology
 - Develop Scenario That Forces the Need
- Redefining Ammunition Constraints by Range
- Creating/Changing a Scenario to Compare with MK19



QUESTIONS