

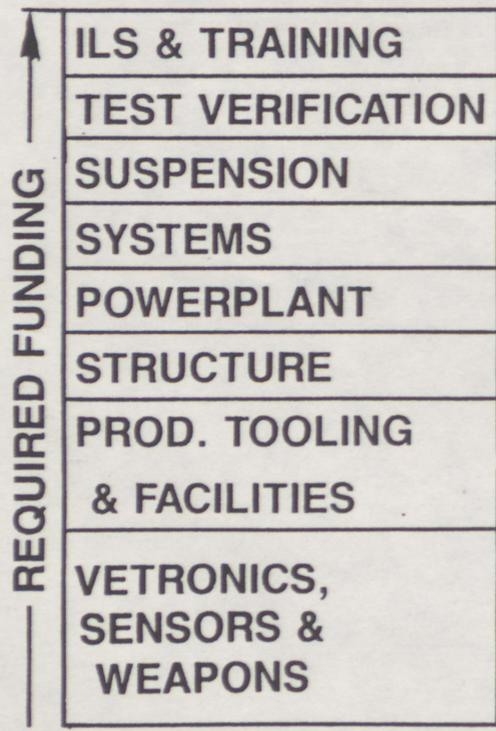
Johnson
may I'd like to discuss the question of reopening
the Block II decision which GD is raising with this patch

GENERAL DYNAMICS
Land Systems Division

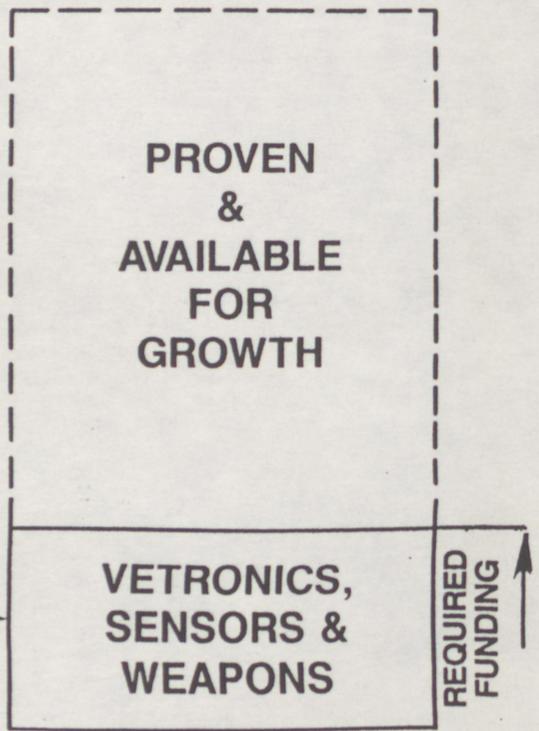
ABRAMS UPGRADE IS A COST EFFECTIVE APPROACH TO DEFEAT FUTURE THREATS

NEW START

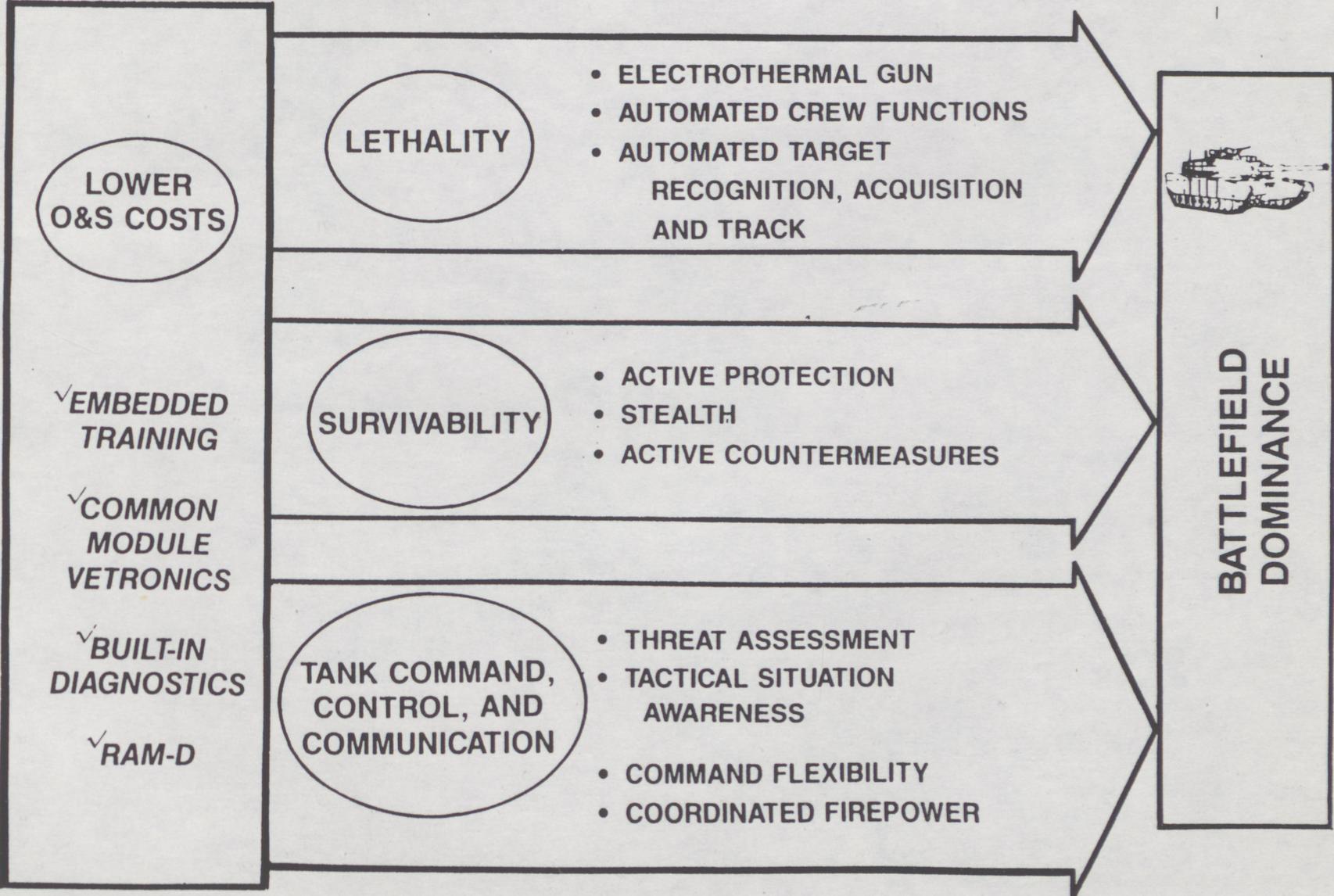
ABRAMS UPGRADE



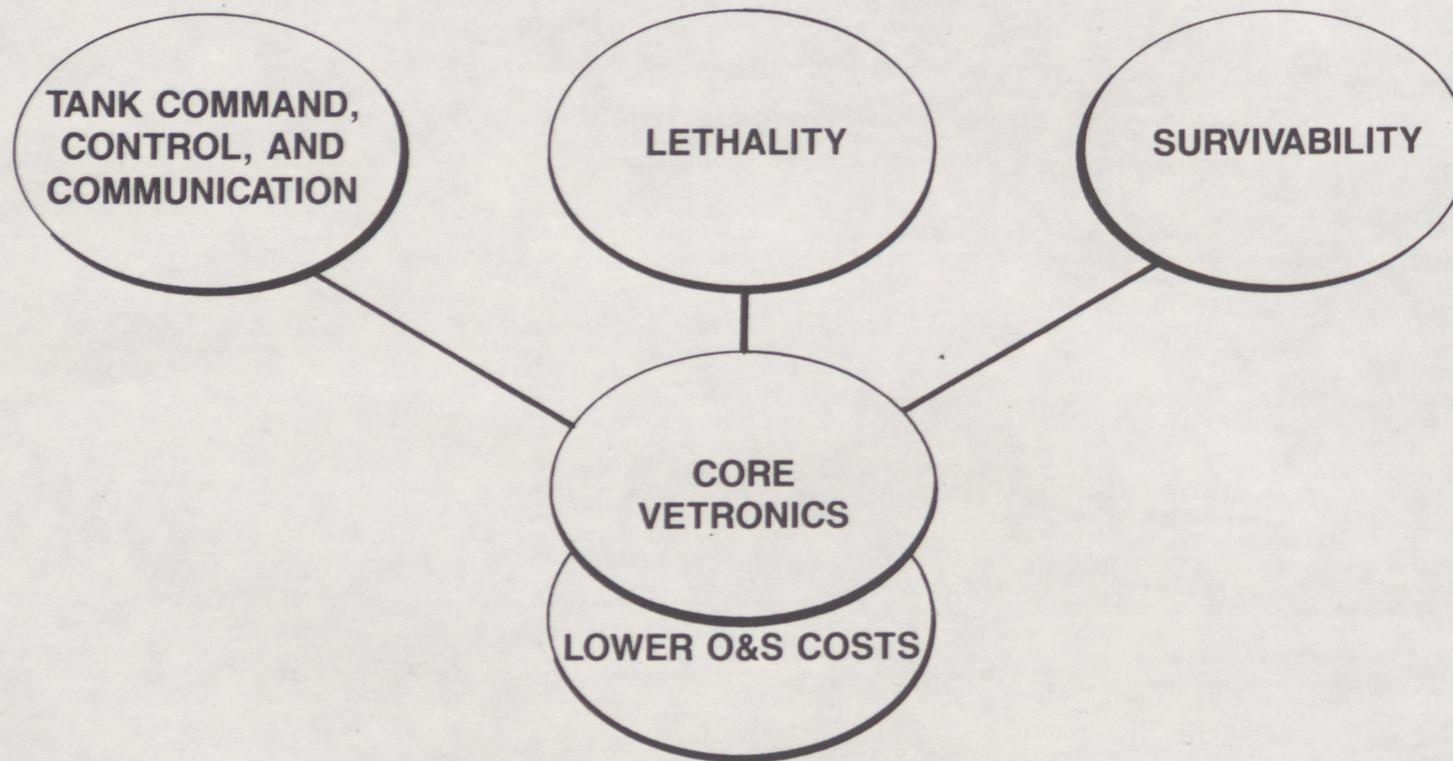
BREAKTHROUGH TECHNOLOGIES



BREAKTHROUGH TECHNOLOGIES CAN MAINTAIN ABRAM'S BATTLEFIELD DOMINANCE

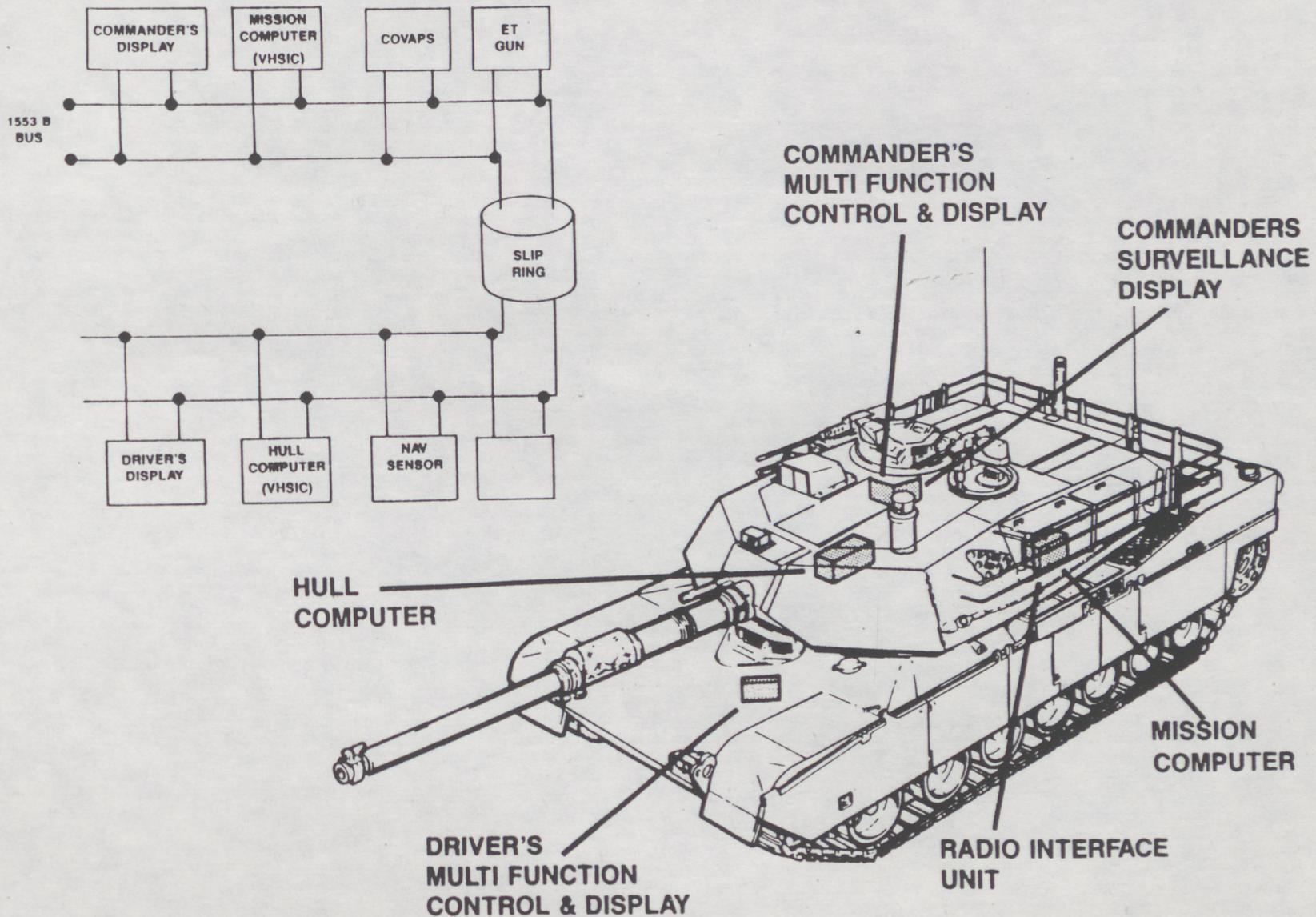


CORE VETRONICS IS THE FOUNDATION



- **STANDARDIZED INTERFACES**
- **SENSORS, WEAPONS, AND SUBSYSTEMS LOGICALLY ADDED TO CORE**
- **BUS EXPANSION FOR INCREASED FUNCTIONALITY**
- **SOME CAPABILITY INCREASES WITH SOFTWARE ONLY**
- **NEW TECHNOLOGIES RETROFITTED THROUGH INTERFACE CONTROL**

CORE VETRONICS ARCHITECTURE

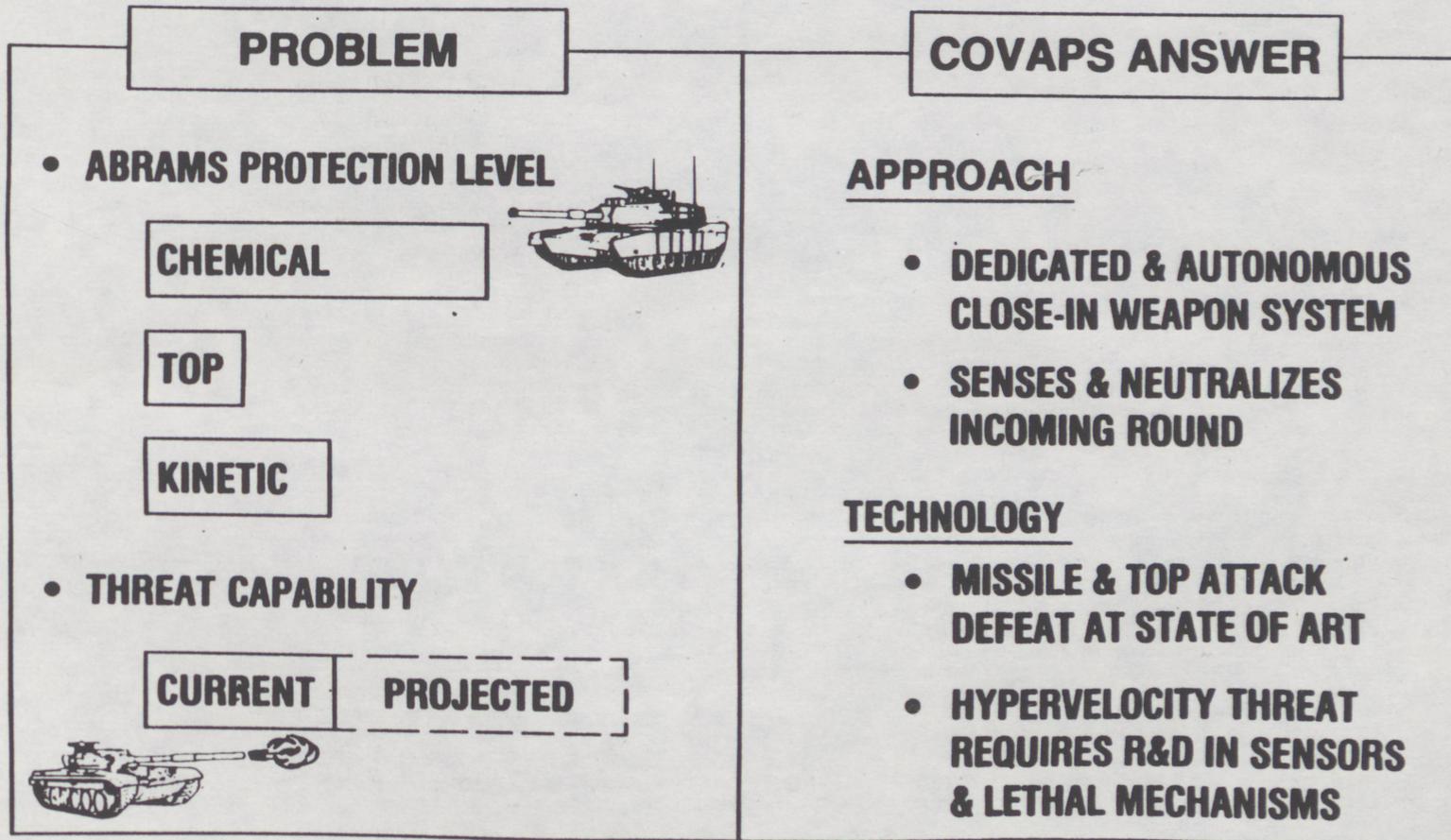


GENERAL DYNAMICS
Land Systems Division

COMBAT VEHICLE
ACTIVE PROTECTION SYSTEM
(COVAPS)

SURVIVABILITY

ACTIVE PROTECTION NEEDED TO SURVIVE CURRENT AND FUTURE THREATS



THE NEED FOR ACTIVE PROTECTION

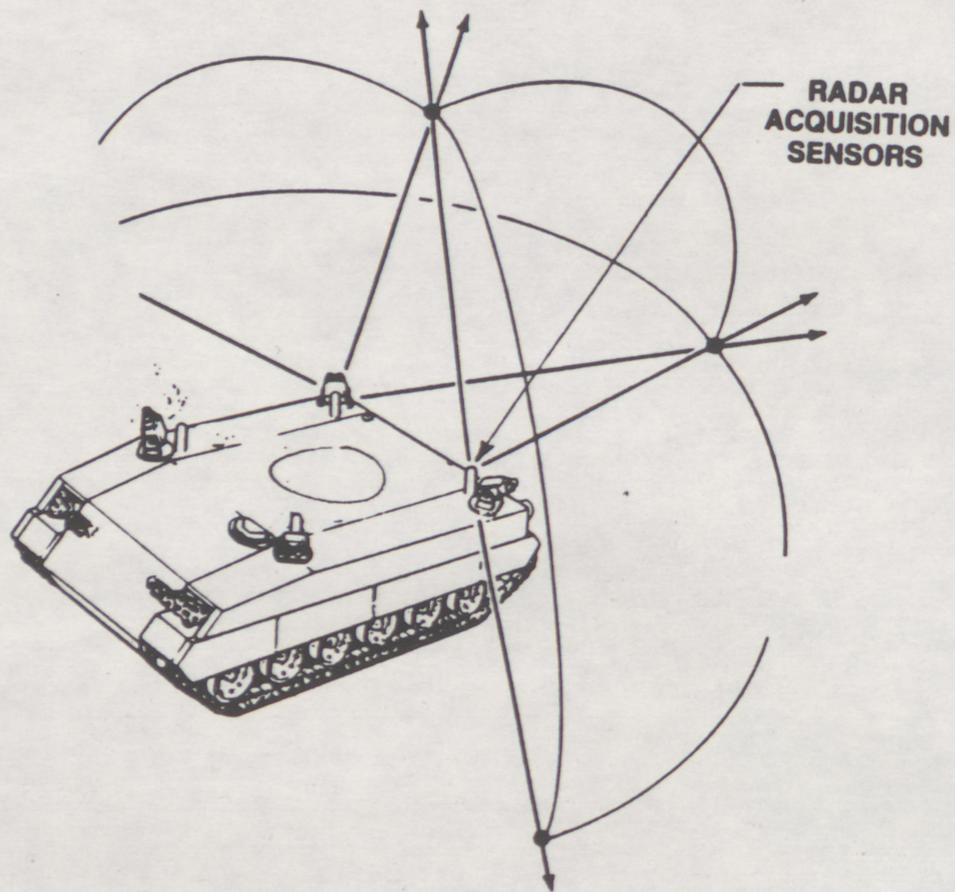
- SURVIVABILITY NEEDS TO BE IMPROVED
- REVERSE WEIGHT GROWTH
- DEFEAT LARGE TOP ATTACK MUNITIONS
- DEFEAT TANDEM MUNITIONS

GENERAL DYNAMICS
Land Systems Division

COVAPS



GENERAL DYNAMICS
Land Systems Division



Active Protection System
Shown on Light Combat Vehicle (Year 1995 - 2005)

Refer to DEOS 4075

ACTIVE PROTECTION

COVAPS I - Defeat Missiles and Top Attack Threats

- MMW Radar Sensor
- Fire Control Computer
- Special Pellet Weapon

COVAPS II - Defeat Hypervelocity Frontal Attack Threats

- MMW Radar or Laser Sensor
- Fire Control Computer
- Explosive Round for Same Weapon

DEVELOPMENT STATUS

- Concept initiated in 1981 as part of Future Close Combat Vehicle System Study
- IR&D Development 1982 to Present (\$3M + Pomona)
 - 1983 - Optimization of COVAPS I Weapon and Ammo System
 - 1984 - Test Range Demo of COVAPS II Defeat Mechanism - Scale Model
 - 1985 - Field Test at Socorro, New Mexico
 - • Target Acquisition and Defeat with given target path
 - 1986 - Optimized Light Weight COVAPS I Weapon and Ammo
 - Initiated MMW Radar Demo Phase Hardware
- Contracts
 - 1984 - \$25k TACOM Contract for Concept
 - 1985 - \$150k TACOM Light Combat Vehicle Integration Study
 - Negotiating DARPA Demo Contract

COVAPS SUMMARY

FUNDED / PENDING

- Initial Concept Feasibility Demonstrated
- GDLS will develop Lightweight Brassboard under IR&D
- DARPA Contract for Demo under Negotiation (\$2M)

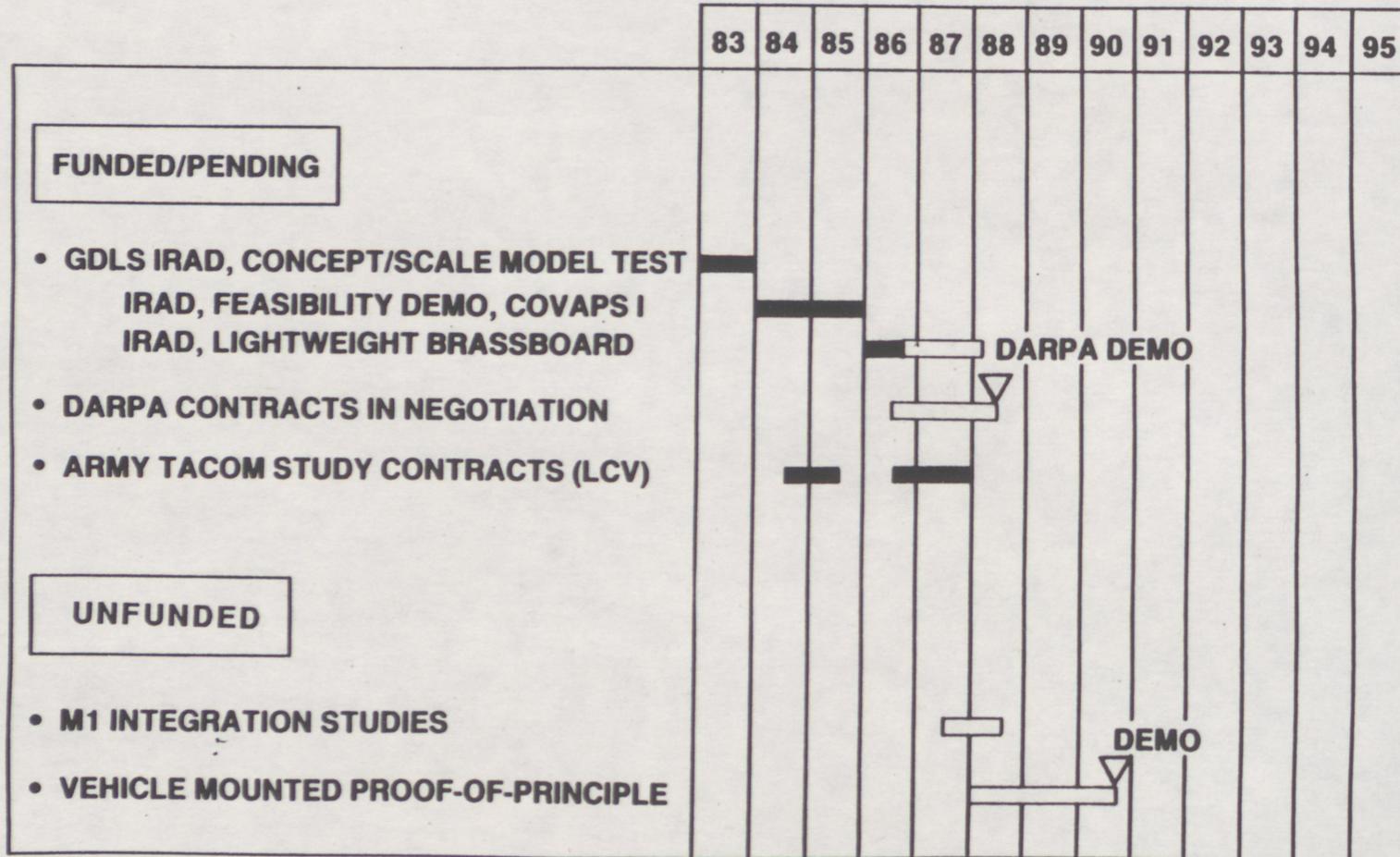
UNFUNDED

- Phase II Vehicle Mounted Demonstration - Start Early '88

\$11M - COVAPS I - 30 Months

\$18M - COVAPS II - 36 Months

PLANNING SUPPORTS MID - 1990's FIELDING



PROGRAM OBJECTIVE

DEVELOP AN ELECTROTHERMAL GUN WEAPON SYSTEM THAT WILL PROVIDE A SIGNIFICANT INCREASE IN MUZZLE VELOCITY AND KINETIC ENERGY OF A PROJECTILE BEYOND THAT AVAILABLE WITH CHEMICAL PROPELLANTS AND TO INTEGRATE THE ET GUN INTO A

- TANK WEAPON SYSTEM**
- ARTILLERY WEAPON SYSTEM**

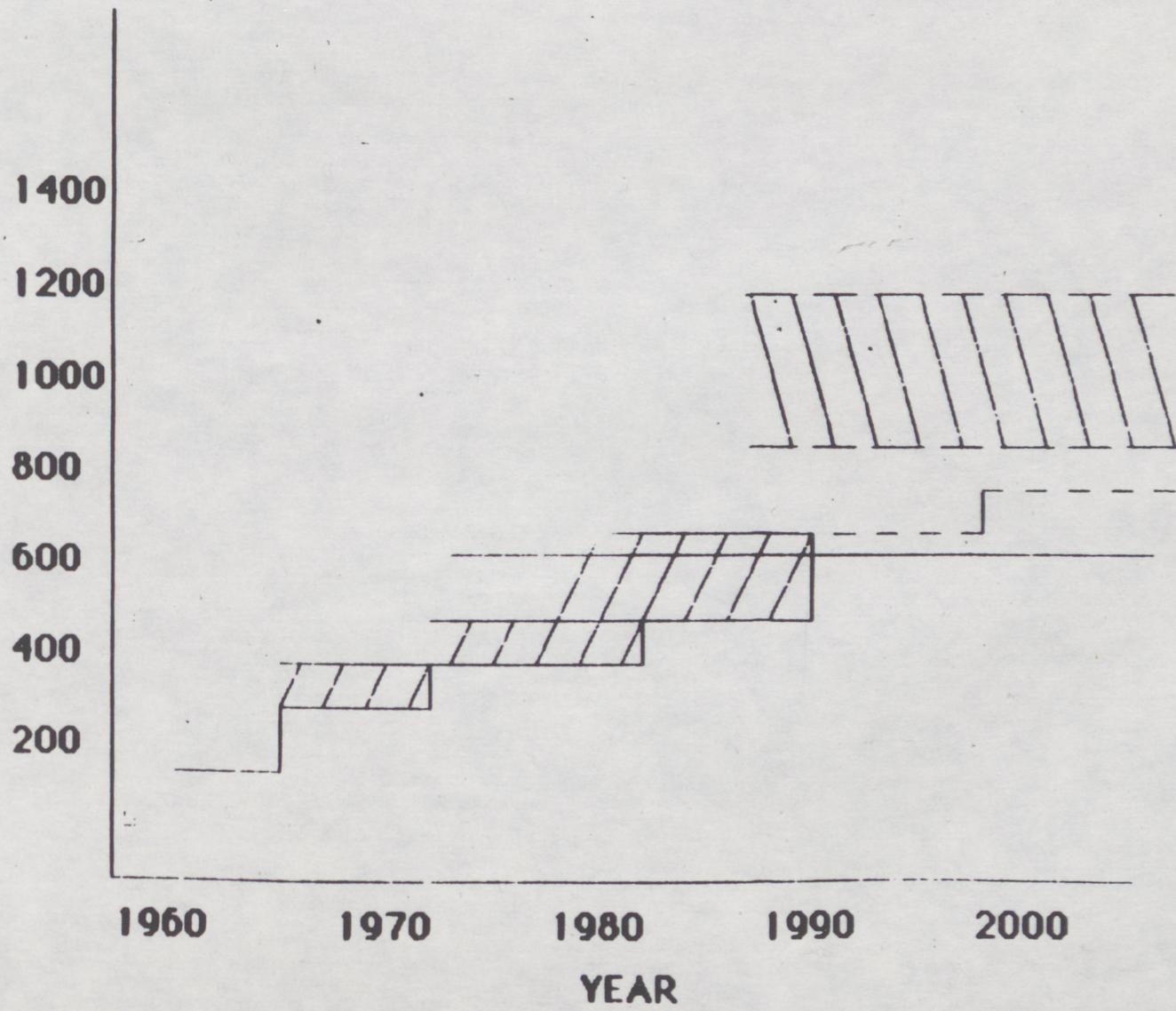
GENERAL DYNAMICS

Land Systems Division

INDUSTRY TEAM

- **GENERAL DYNAMICS IS FORMING AN INDUSTRY TEAM WITH EXPERTISE IN EACH OF THE KEY AREAS FOR DEVELOPMENT AND DEMONSTRATION**

- **WE HAVE INITIATED AN IR&D PROGRAM AND ARE FUNDING SUPPORT FOR THIS PROGRAM FROM GT DEVICES IN THE AREAS OF:**
 - **120 mm GUN DEFINITION**
 - **PRIMARY POWER SOURCE INTEGRATION**
 - **POWER CONDITIONING**



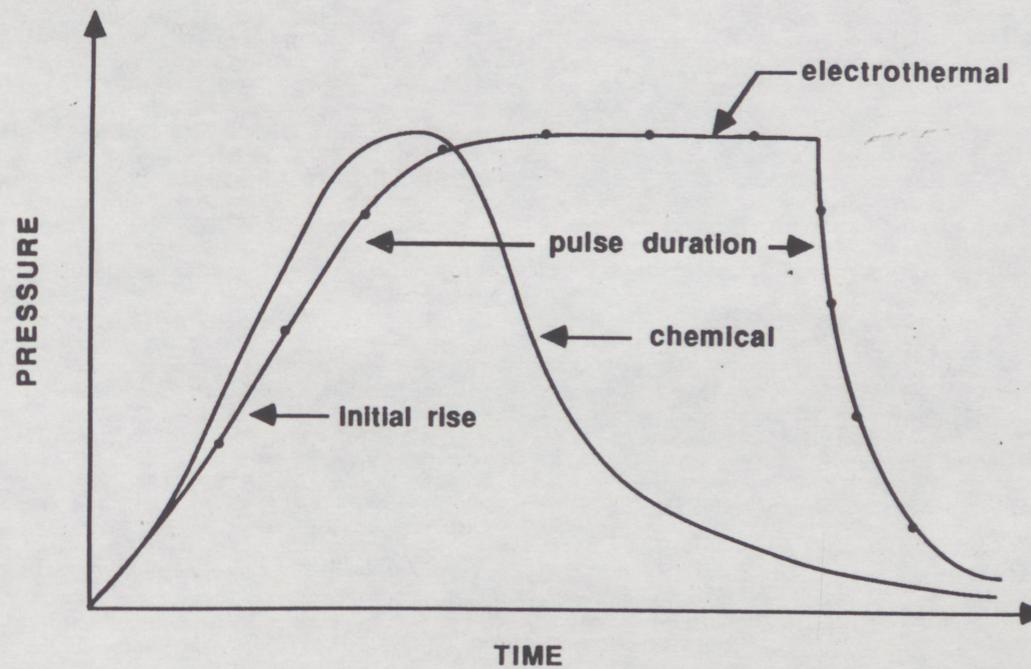
DEMONSTRATED AT GTD

- INCREASE PROJECTILE ENERGY FOR SAME GUN TUBE
- INCREASE PROJECTILE VELOCITY FOR SAME GUN TUBE

BORE	LAUNCHER	VELOCITY	ENERGY
20 mm	CHEMICAL	1.2 km/s	56 kJ
	ET	2.2 km/s	120 kJ

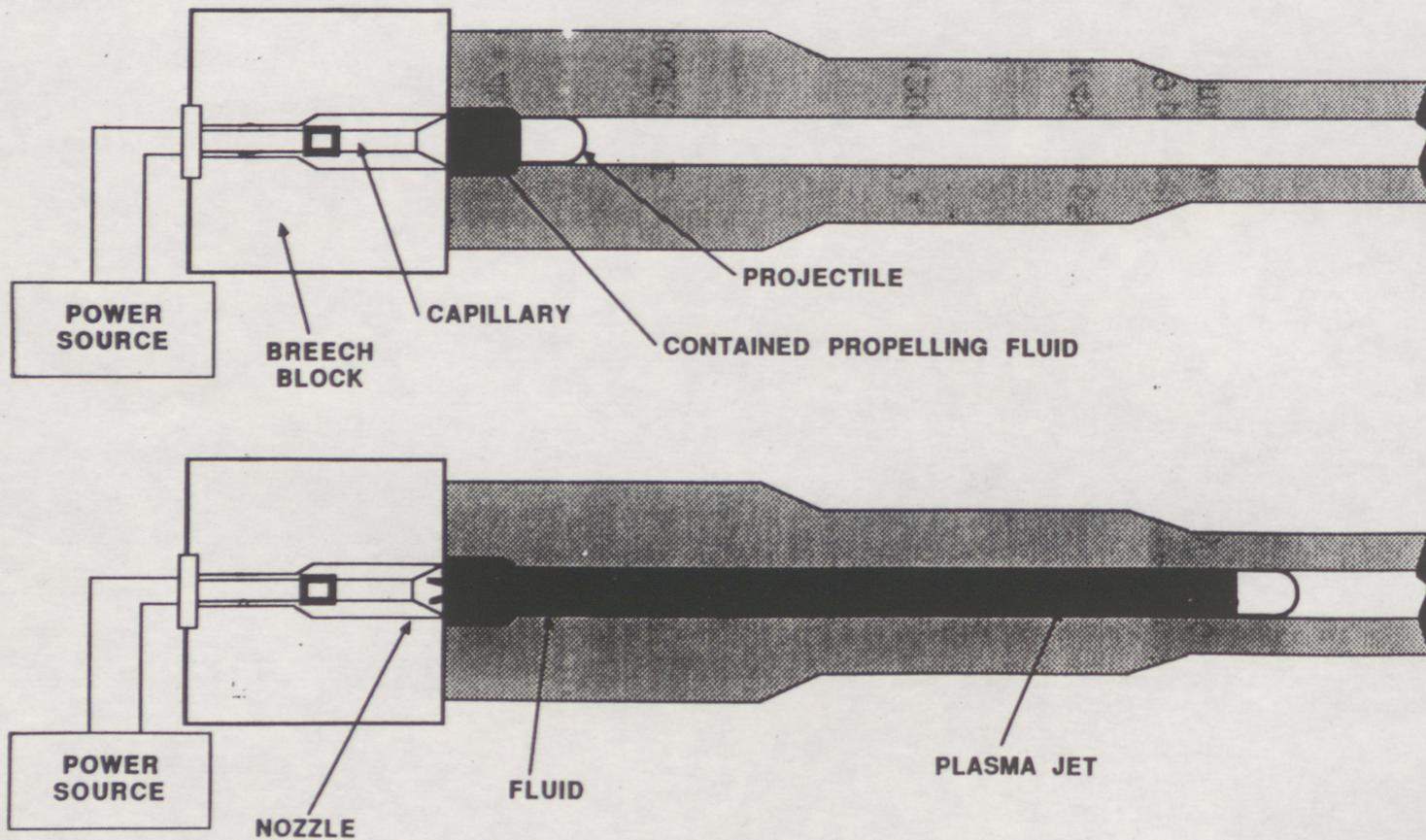
ET GUN USES SAME GUN TUBE AND COMPONENTS AS CONVENTIONAL GUN

ET GUN SYSTEM ADVANTAGE

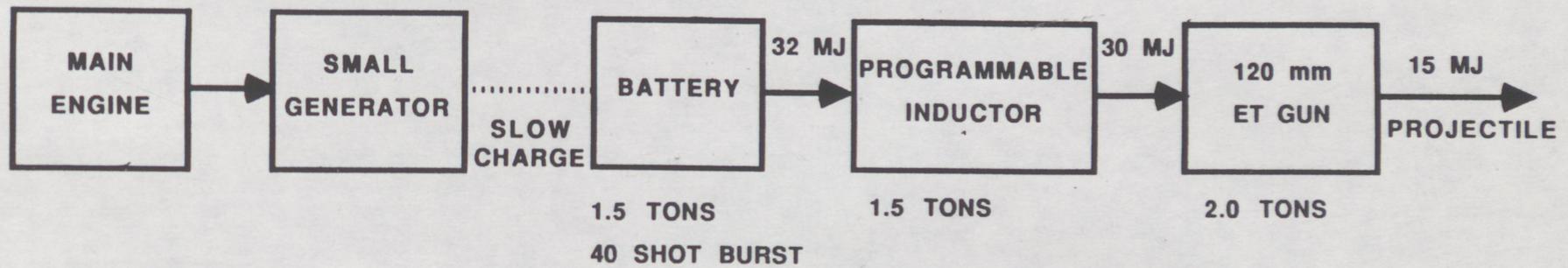


**CONTROLLED PRESSURE ALLOWS GREATER PROJECTILE ENERGY
WITH SAME GUN TUBE AND RECOIL**

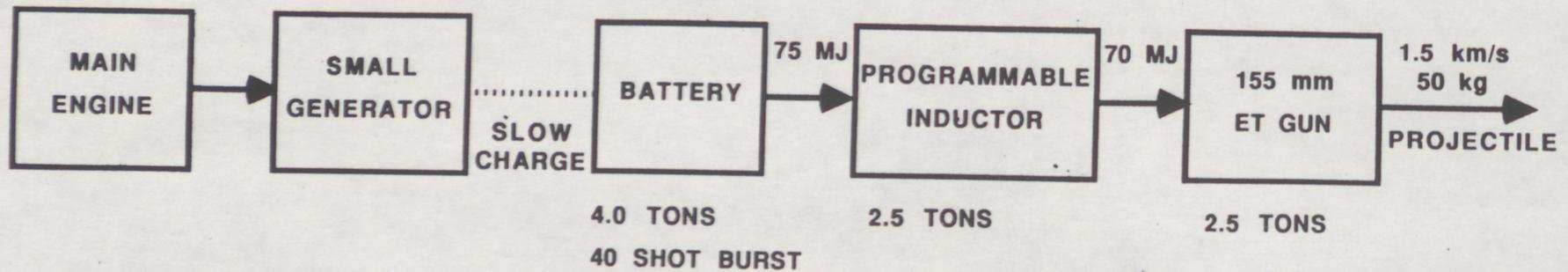
ELECTRO THERMAL GUN BASICS



ET GUN WEAPON SYSTEM FOR TANKS



ET GUN WEAPON SYSTEM FOR ARTILLERY



SCOPE OF WORK

THREE PHASE PROGRAM

PHASE I

- DEMONSTRATE A 120 mm ET GUN AT 15 MJ

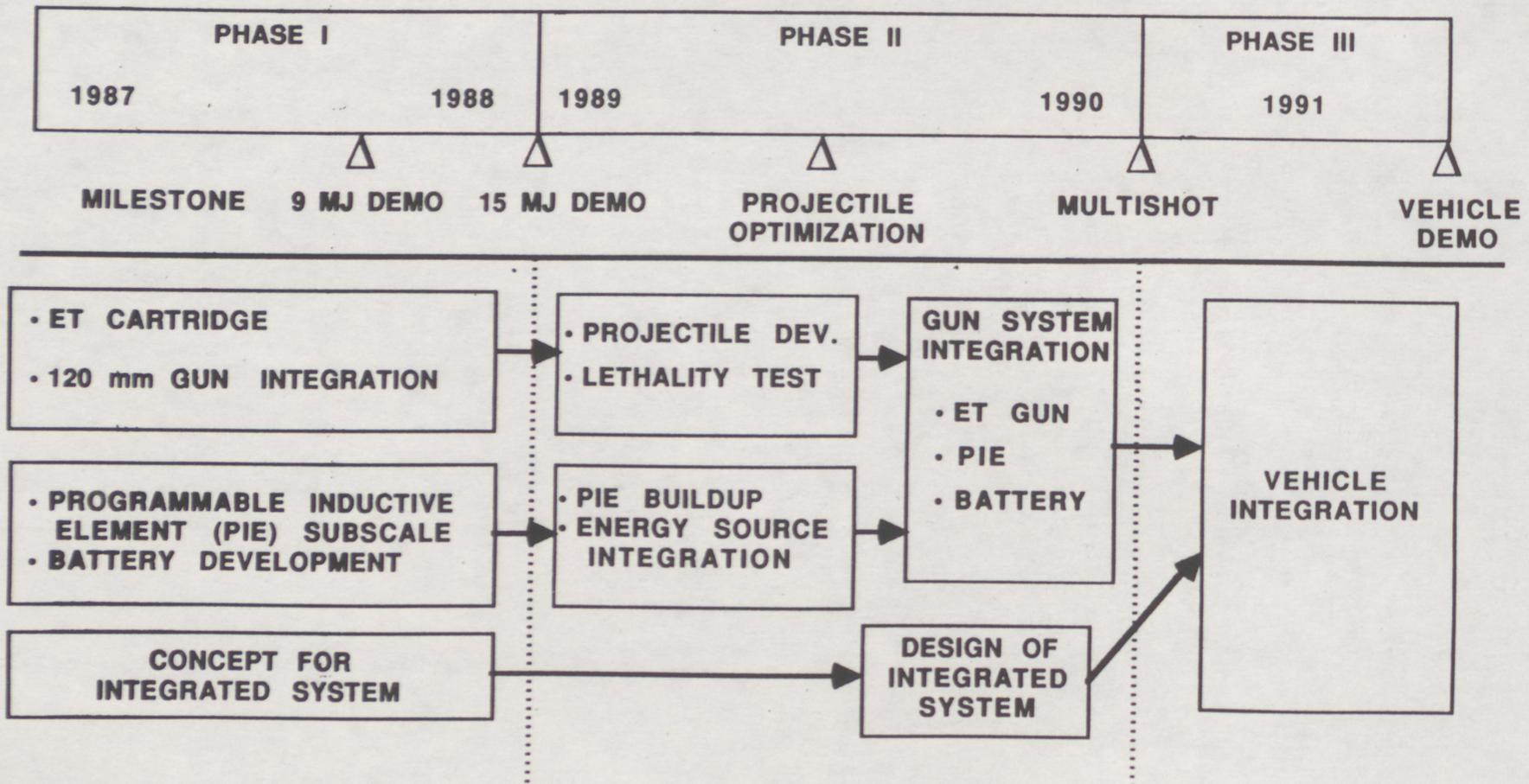
PHASE II

- EVALUATE LETHALITY OF A 15 MJ PROJECTILE (VELOCITY RANGE 1.6 to 3 km/s).
- DEVELOP SYSTEM COMPONENTS FOR A FULLY INTEGRATED ET GUN
- DEMONSTRATE MULTISHOT CAPABILITY

PHASE III

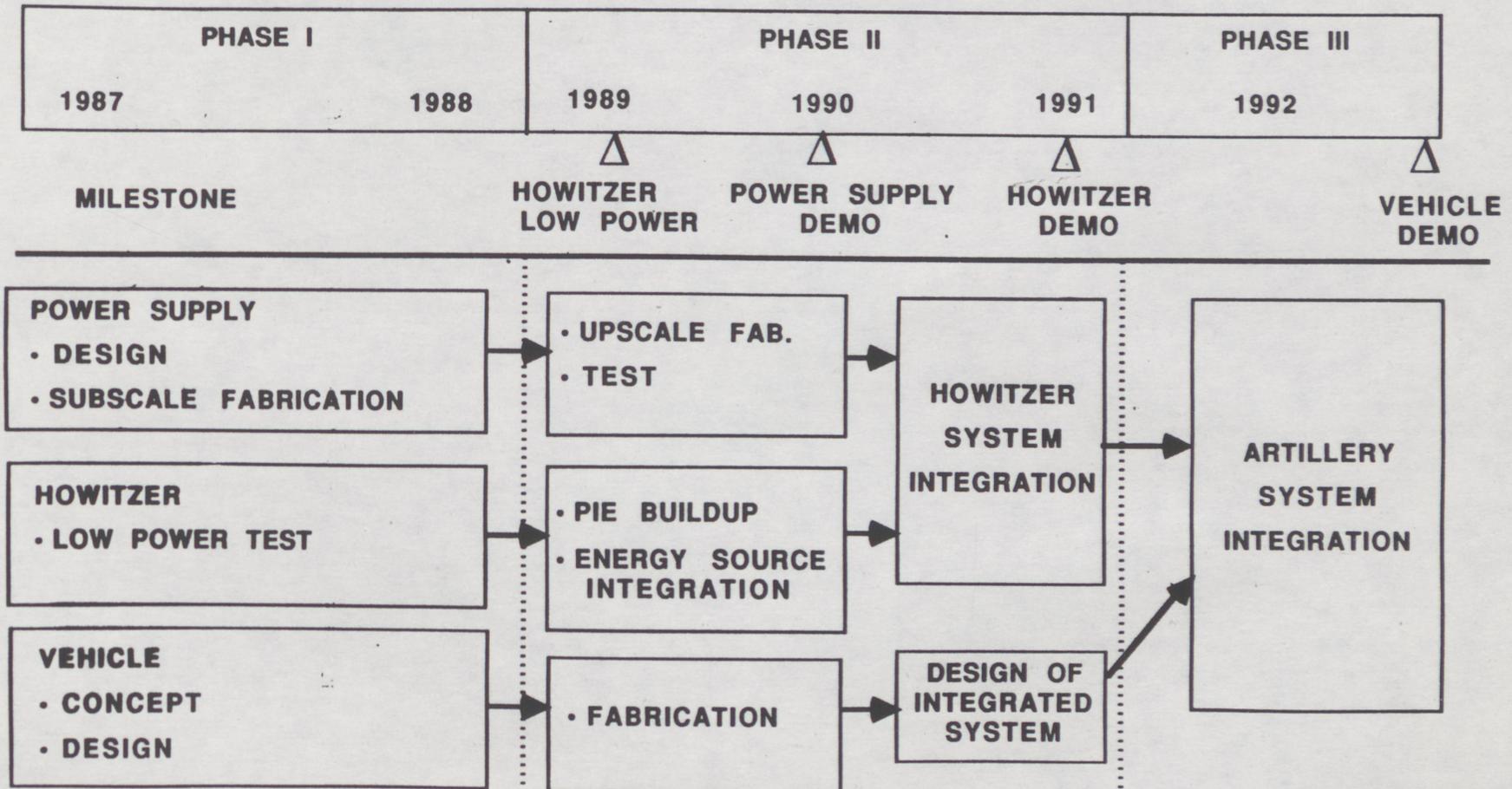
- INTEGRATE ET GUN WEAPON SYSTEM INTO A COMBAT VEHICLE

DEMONSTRATION IN 1991 WILL LEAD TO FIELDED SYSTEM IN MID-90's (120 mm GUN)



DEMONSTRATION IN 1992 WILL LEAD TO NEW S. P. HOWITZER IN LATE 1990's

(155 mm S. P. HOWITZER)



SUMMARY

- **THREAT DICTATES NEED**

- **INDUSTRY TEAM BEING FORMED**

- **RECOMMEND INITIATING DEMONSTRATION PROGRAM**
 - **OPTIMIZE PROJECTILE AND VELOCITY**
 - **DEMONSTRATE LETHALITY**
 - **INTEGRATE 120 mm ET GUN IN VEHICLE**
 - **INTEGRATE 155 mm ET GUN IN A HOWITZER**

- **COMPATIBLE SCHEDULE WITH ARMY'S AFV PROGRAM**

- **PARALLEL PROGRAM WITH DARPA EM GUN INITIATIVE**
 - **ATTAINABLE GOALS**
 - **RISK REDUCTION**

- **ACHIEVES REQUIRED LETHALITY TO DEFEAT PROJECTED THREAT
IN YEAR 2000 AND BEYOND**