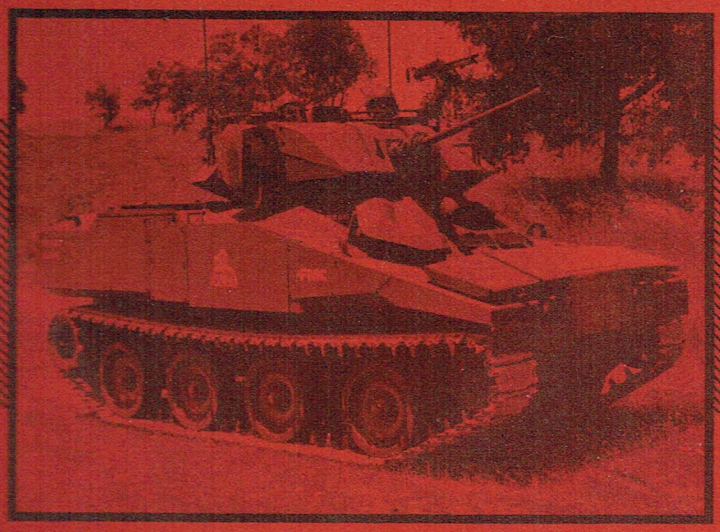
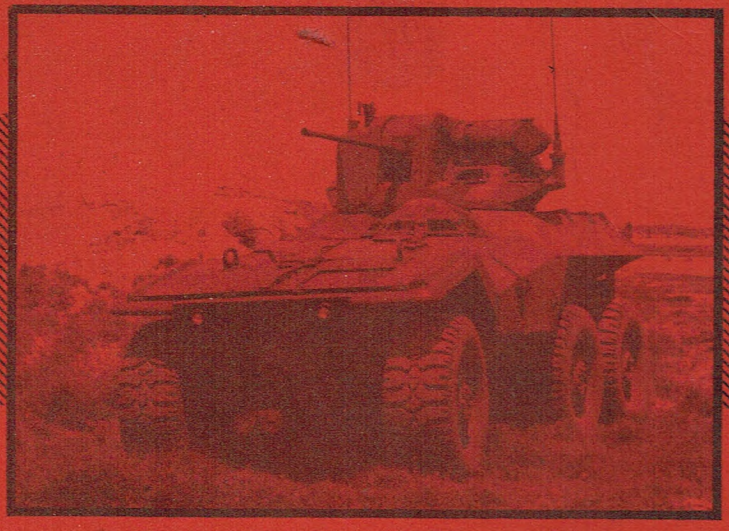
ARMORED RECONNAISSANCE SCOUT VEHICLE, XM800

GENERAL CHARACTERISTICS



FMC



LMSC

Prepared by:

ARMORED RECONNAISSANCE SCOUT VEHICLE
PROJECT MANAGER'S OFFICE

U.S. ARMY TANK-AUTOMOTIVE COMMAND
Warren, Michigan 48090

2015.15.3

INTRODUCTION

Numerous requests have been received from organizational elements of DA, DOD and Industry relative to the status and performance characteristics of the "Scout" vehicle. It must be recognized that the program is in a highly sensitive position in that two contractors are presently in a competitive atmosphere and release of comparative performance data would not be desirable.

This brochure has been prepared indicating performance requirements of each contractor and general information as to individual design goals. This, we believe, will provide all recipients with any necessary general information, without compromise of competitive sensitive data.

EIMER L. BIRK
COL, Armor
Project Manager, ARSV

HISTORY

The Office of the Project Manager, Armored Reconnaissance Scout Vehicle, was established at the U.S. Army Tank-Automotive Command in 1966. The ARSV program has been structured to provide a vehicle which will satisfy the Army's Scout Vehicle Msssion requirements.

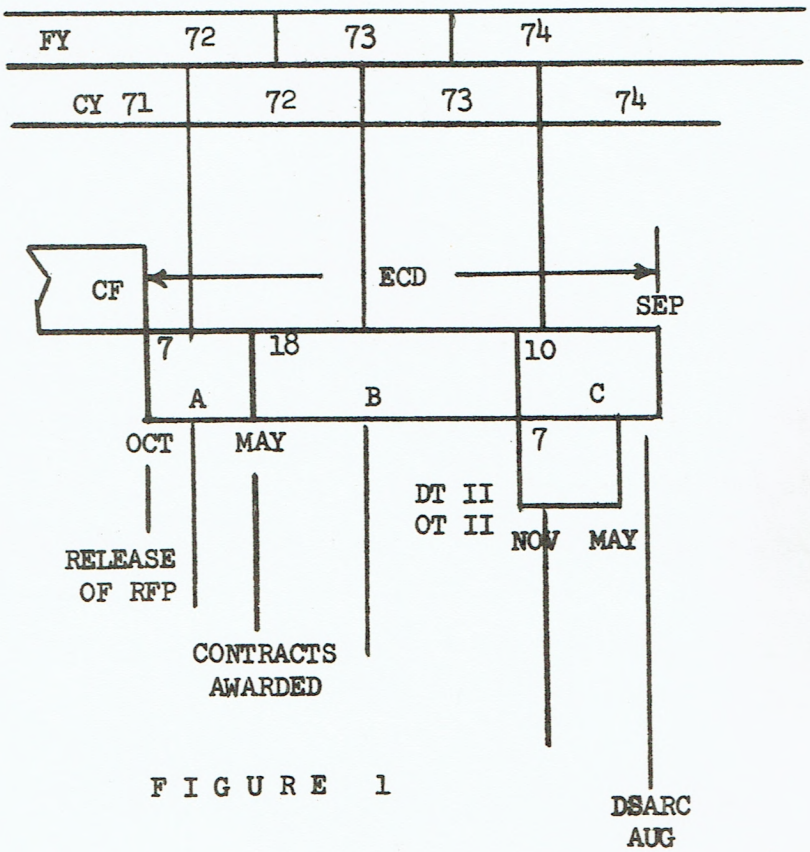
These requirements will provide the Army with the ability to significantly increase operational capability in gaining intelligence information on the battlefield and to prevent surprise attacks from enemy ground forces.

The ARSV is a small, lightly armored, highly mobile, agile, quiet operating vehicle with an inherent swimming capability. It may be either tracked or wheeled. The crew of three will consist of a driver, commander/gunner and observer. A passive fire control/observation system will be provided. It will incorporate space and power provisions for sensor and observation equipment available in the reconnaissance troop unit. The ARSV will mount the Vehicle Rapid Fire Weapon System Successor (VRFWS-S) as primary armament. Should the VRFWS-S not be available, the M139-20MM automatic cannon is acceptable as an interim weapon system to avoid delay in fielding of the ARSV.

After approval by DSARC (in July 71) to proceed into competitive prototyping, a Request For Proposals was released and contracts were awarded in May 1972 to Lockheed Missiles and Space Co., Inc., Sunnyvale, California for a wheeled and FMC Corporation, San Jose, California, for a tracked concept.

The ARSV development program (Figure 1) includes competitive development and fabrication of prototype vehicles by these two contractors during Phase B of Expanded Contract Definition and the submittal of three prototypes each for Government testing.

Development Testing-II/Operational Testing-II to be conducted during the Expanded Contract Definition Phase will not only evaluate the merits of the competing designs, but will also provide preliminary inherent structural, mechanical, electrical, and other physical properties of the vehicle's construction. Reliability, Maintainability and Human Factors are to be evaluated as well as operational consideration. Based on the results of these tests and proposal evaluation, one of these contractors will be selected to continue on into the next phase of the program. The selected contractor will be awarded a Producibility Engineering and Planning/Low Rate Initial Production contract for low rate production.



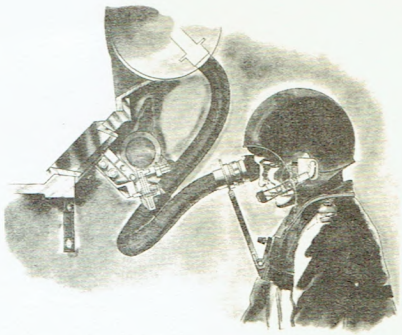
F I G U R E 1

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THE LOCKHEED SCOUT



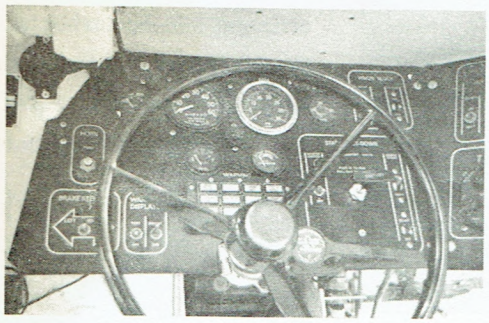


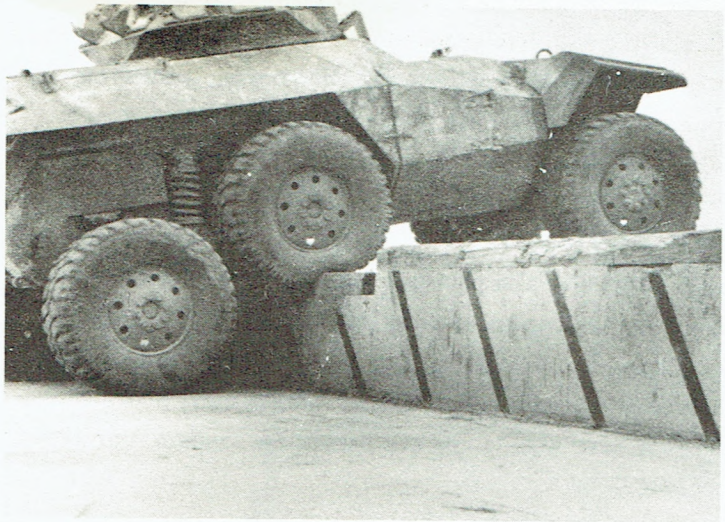








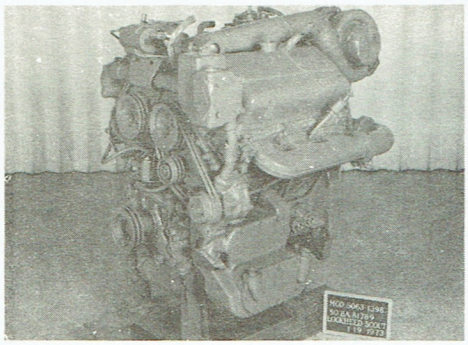




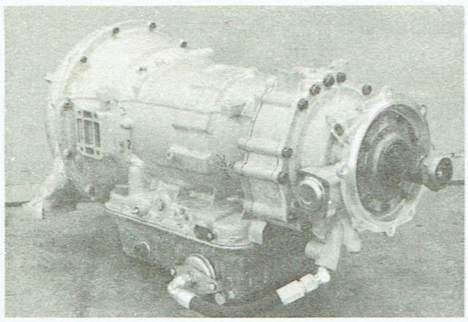




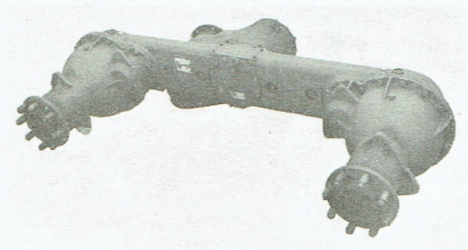
THE POWER TRAIN INCLUDES TIME-TESTED, RELIABLE COMPONENTS



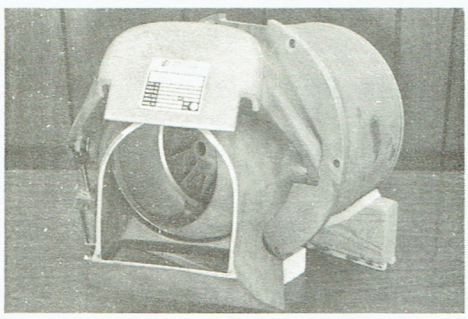
ENGINE: The Detroit Diesel 6V-53T engine is a reliable and efficient 300-hp turbocharged two-cycle engine with excellent fuel economy. It has a significant 300-lb weight advantage over other candidates and was "type qualified" for Government use. This engine has been run 7,000 miles in the contractor's test vehicle.



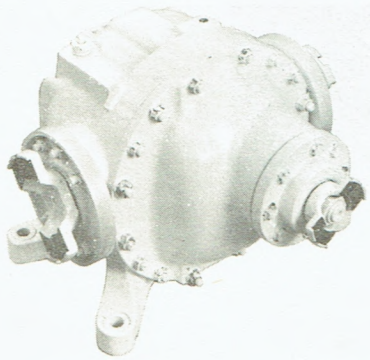
TRANSMISSION: The Allison MT650 transmission is fully automatic, featuring a hydraulic torque converter with a lockup clutch in combination with a planetary gear section that provides smooth shifting with five speeds forward and one reverse. The design permits vehicle push-starting and towing without any driveline preparation. This is a commercial unit adapted to the ARSV application.



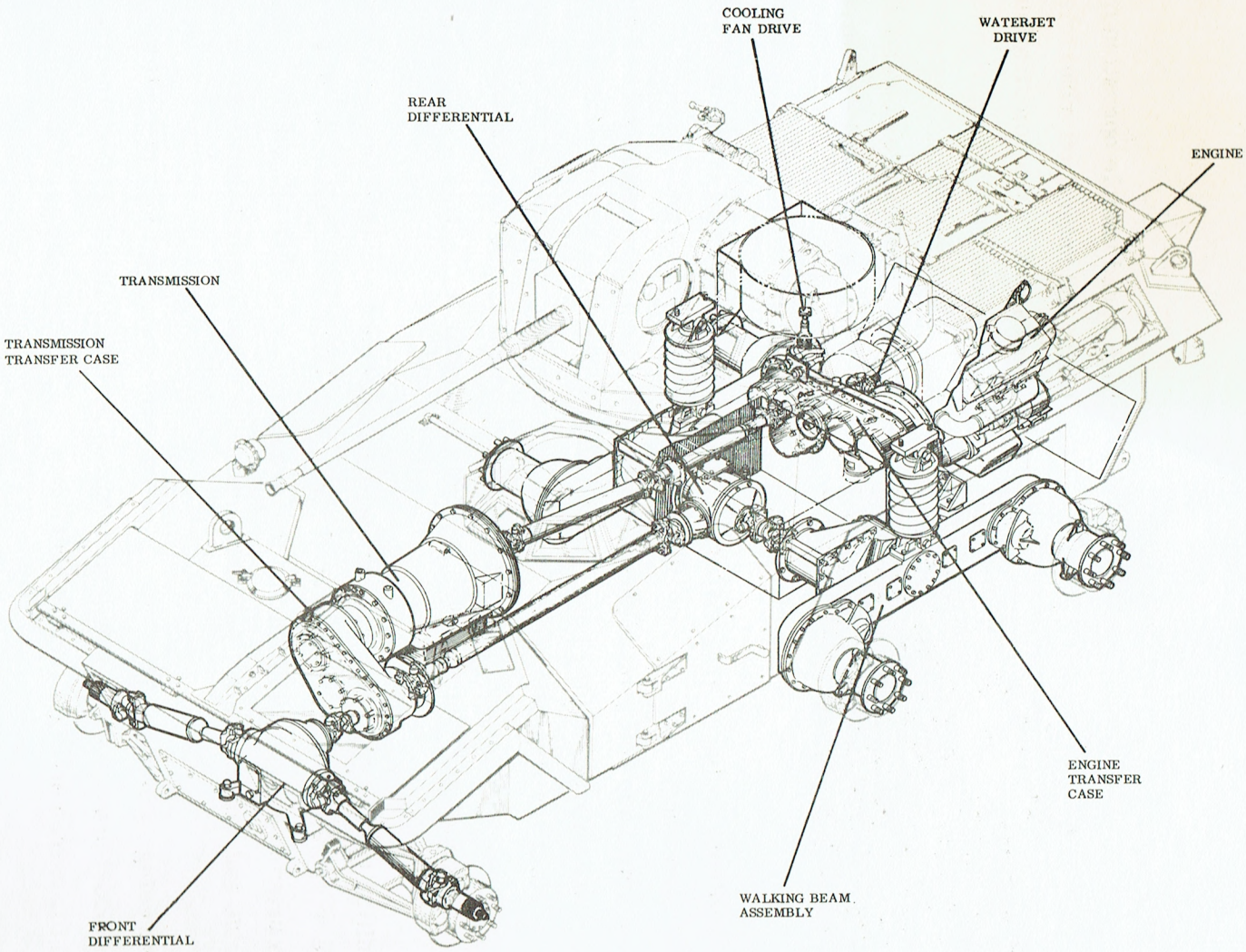
WALKING BEAMS: The powered walking beams are the same as those pioneered and proven on the successful Army XM808 Twister program. The design has been modified to accommodate externally mounted disc brakes. These units provide power to the rear wheels and are part of the tandem rear wheel suspension.



WATERJET: The Aerojet water propulsion unit is a mixed flow pump with a controlled nozzle discharge for forward, reverse, and steering operation in water.



DIFFERENTIALS: Proven Rockwell-Standard gear sets are enclosed in modified housing to fit the ARSV installation for both front and rear differentials.


COOLING
FAN DRIVE
WATERJET
DRIVE
REAR
DIFFERENTIAL
ENGINE
TRANSMISSION
TRANSMISSION
TRANSFER CASE
ENGINE
TRANSFER
CASE
WALKING BEAM
ASSEMBLY
FRONT
DIFFERENTIAL

ROLL ARTICULATION & WALKING BEAM SUSPENSION ARRANGEMENT
KEY FEATURES OF THIS TWO-BODY CONFIGURATION



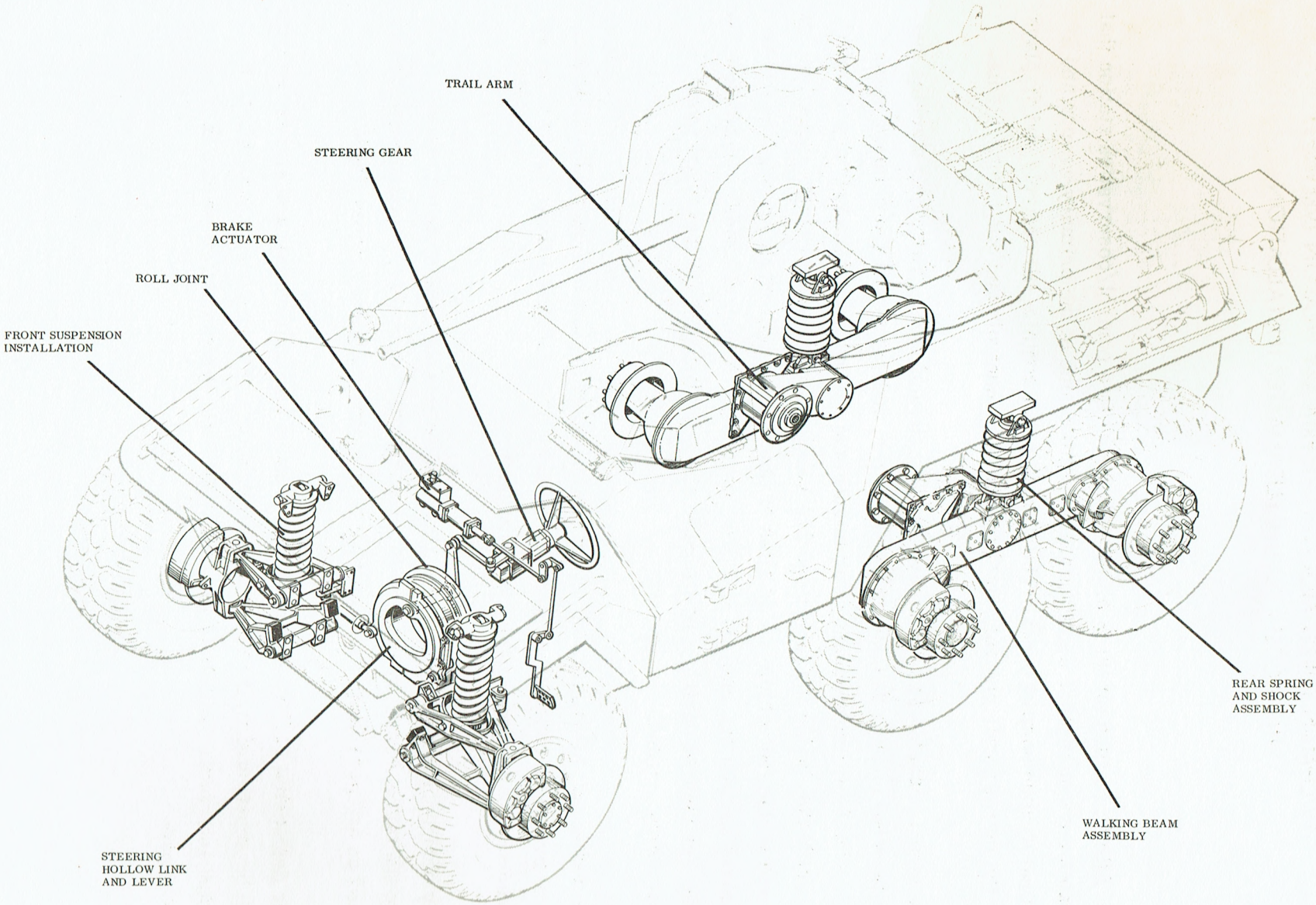
High speed vehicle operation over trails and natural off-road terrain is enhanced by the combination of two-body roll articulation and high wheel travel suspension. The specific features contributing to this high, off-road mobility are:

- Front double A-arm suspension providing 12 in. wheel travel with shock absorbers enclosed in coil spring for added protection.
- Interbody roll joint allows ±25 deg roll articulation, which acts as a transverse walking beam for the front suspension.
- Rear trailing arm powered walking beam suspension has 6 in. of vertical spring travel and allows 20 in. free vertical travel for each wheel — thus maintaining traction over severely irregular terrain.

In addition to high vehicle performance, these design features also result in a more stable weapon platform and improved ride. The large steel belted radial ply tires which provide a large footprint and low ground pressure also contribute to the excellent ride and aggressive action/operation of the vehicle over natural terrain.

The steering system has a unique, pure mechanical path through the roll joint, with power boost provided by a standard commercial unit. Brake-assist steering is provided for extremely tight turning operation.

Disc brakes at each wheel provide excellent stopping capability (approx. 0.8 g). Brake caliper linings are of a new composition and have been tested for long-life durability under severe conditions.


TRAIL ARM
STEERING GEAR
BRAKE ACTUATOR
ROLL JOINT
FRONT SUSPENSION INSTALLATION
REAR SPRING AND SHOCK ASSEMBLY
WALKING BEAM ASSEMBLY
STEERING HOLLOW LINK AND LEVER

TWO-MAN TURRET MOUNTS THE PRIMARY WEAPON (VRFWS-1) WILL ACCEPT FUTURE BUSHMASTER INSTALLATION

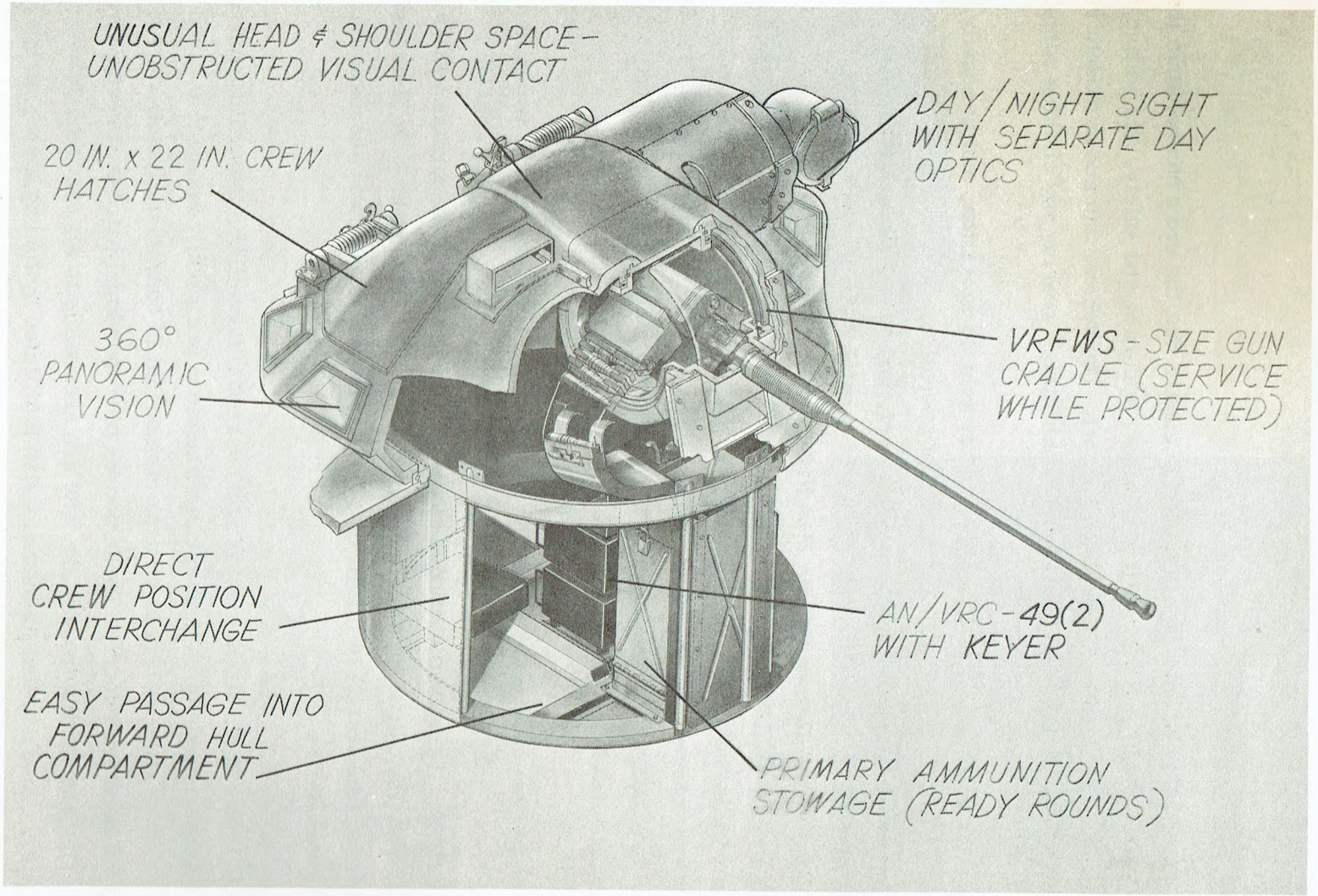
The ARSV two-man turret is a fully integrated fire control/observation station that locates the Commander and Observer on either side of the primary weapon and a central weapon control panel. The control panel contains all controls and displays for the turret power control, stabilization, fire control, and other subsystems.

The turret provides an overlapping 360-deg field of view. The M60D machine gun can be fired through 360 deg by the Observer, independent of the primary weapon. Three-hundred ready rounds of ammunition are provided for the primary weapon (20mm M139) inside the turret and 200 additional rounds are readily accessible and stowed inside the vehicle. Elevation of turret traverse and firing controls for the primary weapon are integral with the Commander's control handle. In addition, an Observer control device is provided to allow the turret to be traversed from the Observer's station.

The Honeywell hydraulic control and stabilization system has been adapted from hardware and technology proven on the M60. The stabilization system is a second generation development with improved performance.

Key components of the communications and reconnaissance systems are integrated into the turret basket together with stowed OEM required for mission performance. Hatches and personnel doors provide four means for turret ingress/egress.

The designated VRFWS-S Bushmaster weapon ammunition feed and stowage system can be substituted in the present superstructure with appropriate changes to the mount interface. Details of the Day/Night Sight System are presented in subsequent pages.


UNUSUAL HEAD & SHOULDER SPACE – UNOBSTRUCTED VISUAL CONTACT
DAY/NIGHT SIGHT WITH SEPARATE DAY OPTICS
20 IN. x 22 IN. CREW HATCHES
VRFWS - SIZE GUN CRADLE (SERVICE WHILE PROTECTED)
360° PANORAMIC VISION
DIRECT CREW POSITION INTERCHANGE
AN/VRC-49(2) WITH KEYER
EASY PASSAGE INTO FORWARD HULL COMPARTMENT
PRIMARY AMMUNITION STOWAGE (READY ROUNDS)

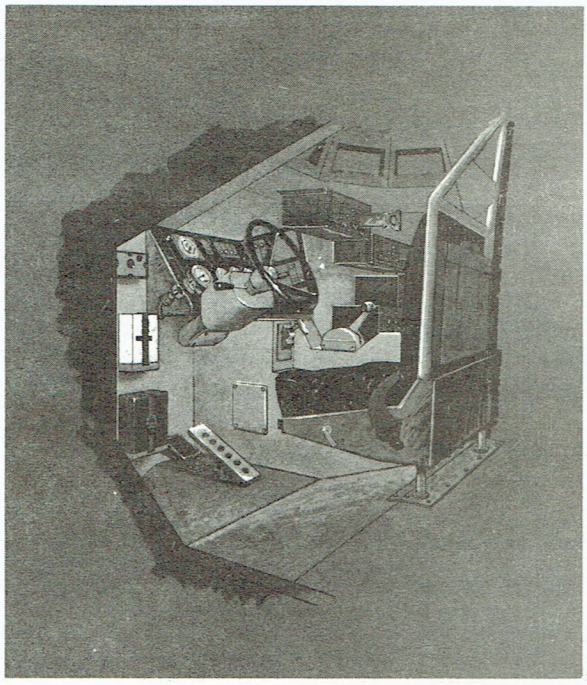
CREW OPERATIONAL REQUIREMENTS AND HUMAN FACTORS ENGINEERING EVIDENT THROUGHOUT VEHICLE DESIGN & GENERAL ARRANGEMENT

This "Crewman's Vehicle" was designed to ensure that the crew can perform their tasks – individually and as a team – with efficiency, accuracy and safety, and with minimal requirements for training and logistic support. The vehicle can accommodate 90 percent of the Army population in body size and capabilities, wearing any clothing complement.

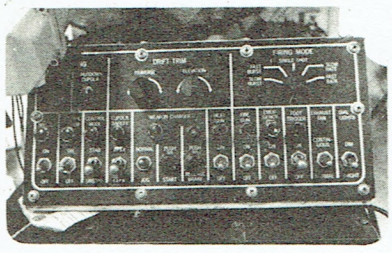
The Driver's station was designed to simplify vehicle operation, and is equally efficient in both the closed- and open-hatch modes of operation. Automotive controls and displays are conventional in design, arrangement, and operation, minimizing training and potential human error. The rotating Driver's hatch incorporates vision blocks and provisions for accommodating the M19 Night periscope or NV Goggles. Four in. of fore/aft and six in. of vertical seat adjustment result in convenient reach and vision envelopes while the Driver is sitting comfortably wearing an integrated lap belt/shoulder harness/inertia reel restraint system. The suspended seat structure and foot controls are designed to minimize injury due to mine detonation. OEM dedicated to the Driver is readily accessible in the seated position.

The vehicle Commander and Observer are seated side-by-side in the two-man turret, sharing communications equipment and the primary control/display console located between them. These two crewmen share a 360-deg view of the terrain with hatches closed. The Day/Night Fire Control/Observation System provides the Commander with viewing capabilities to fulfill the primary Scout mission, and accurate delivery of high rates of fire.

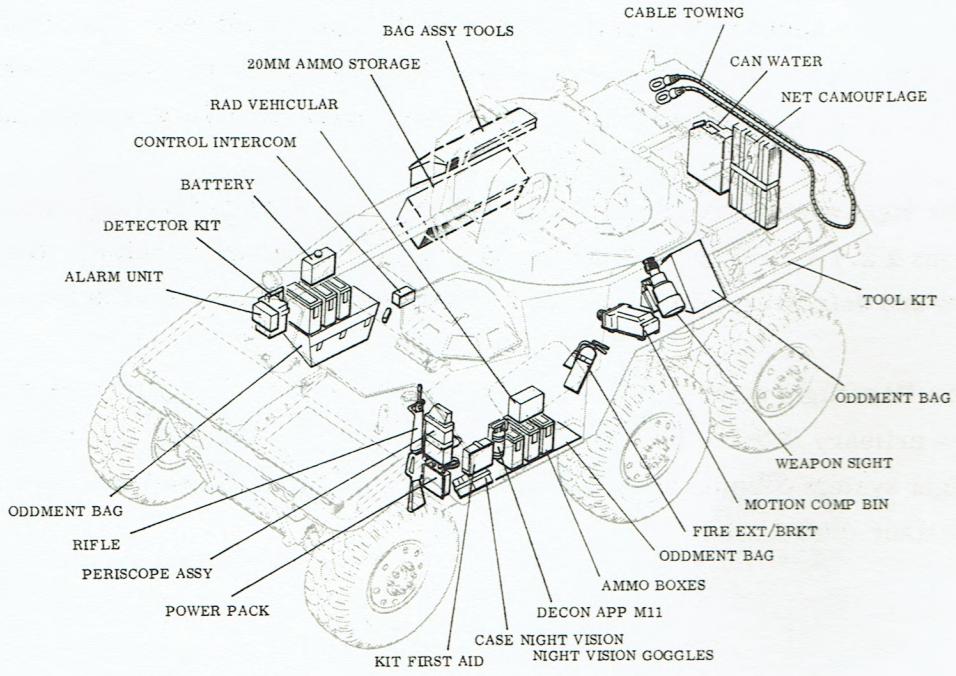
All OEM items which supplement this basic recon/surveillance capability and fulfill the specialized needs of various tactical missions are readily accessible to the crewman who needs them. OEM to be used dismounted is conveniently stowed on or adjacent to the personnel doors. These doors, plus individual hatches, provide five means for entering and exiting the vehicle, and are accessible to all crewmen in event of emergency. Mounting and dismounting are facilitated by folding steps, straps, and handholds strategically placed on the front, sides, and rear of the vehicle.



DRIVER STATION



WEAPON CONTROL PANEL



HULL STOWAGE

INTEGRATED DAY/NIGHT SIGHT SYSTEM USES STATE-OF-THE-ART TECHNIQUES OBTAINS QUALITY VISION DAY & NIGHT

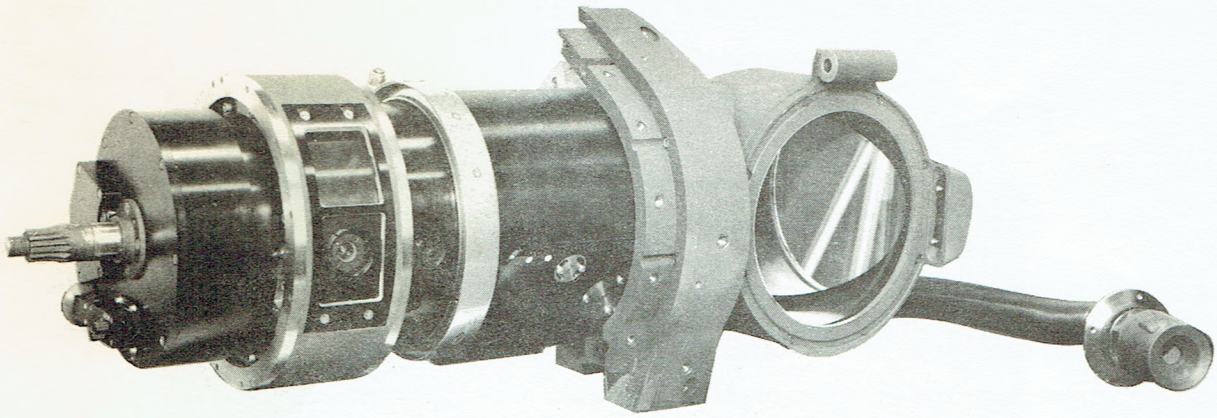
The Lockheed Day/Night observation fire control sight incorporates dual power day and night channels in a common modular package, providing both reconnaissance and gun aiming capabilities.

Both systems (day or night) employ a common ballistic reticle to provide accurate fire control within the range limitations of the primary weapon. Further, both modes share a common fiber optics bundle system to transfer the image from the sight to the Commander station within the vehicle. The fiber bundle concept provides for greater flexibility in the location, routing, and optimization of both the sight and the Commander station. Attached to the fiber optics bundle system is a 10X eyepiece which can be either soft mounted to the vehicle or attached by means of a shoulder/vest system.

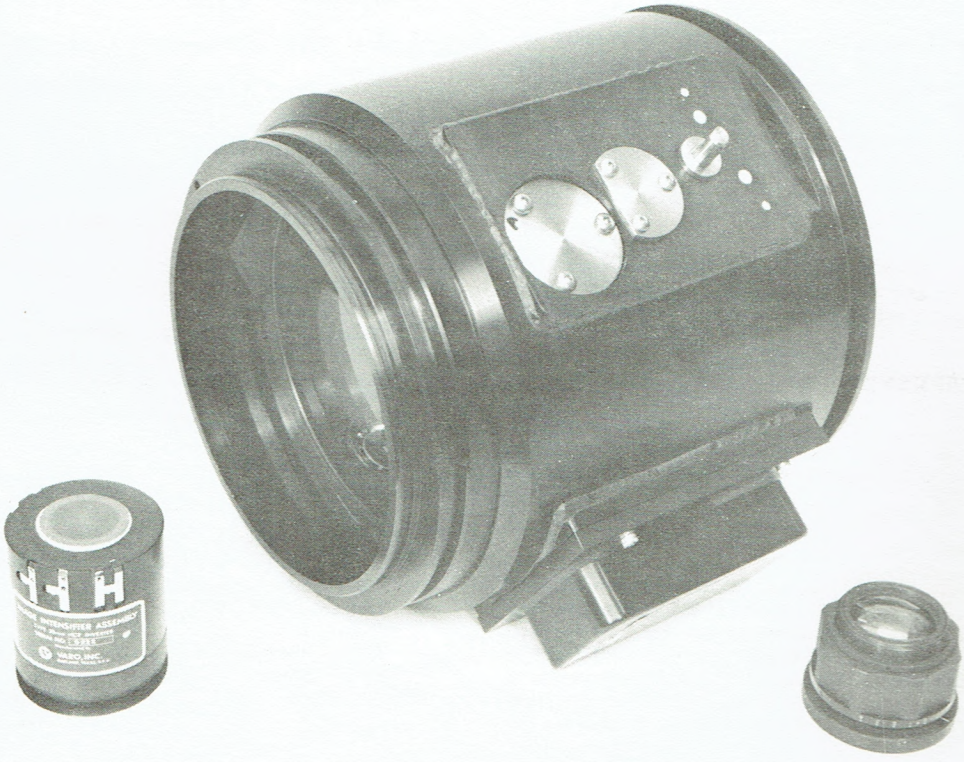
The sight system is designed to have a resolution of 1.6 lp/mr under starlight illumination and 5.1 lp/mr under moonlight conditions. In the night mode, an inverting image intensifier microchannel plate is used as the light amplifier. The night mode further incorporates a dual lens system with a choice of either a 20-deg or 7-deg field-of-view. The day mode also has a dual field-of-view capability of 7 deg and 52 deg.

The sight system operates between -20 deg and +65 deg elevation angles, and it contains a 2.7 V battery for night and emergency reticle illumination. Night window cleaning and defrosting operations, plus reticle illumination, use vehicle power.

The Day/Night sight system provides high-resolution, long-distance viewing to fulfill the primary Scout mission. When coupled with the weapon stabilization system, the sight system permits accurate delivery of high rates of fire under specified light and weather conditions.



DAY/NIGHT SIGHT SYSTEM



DAY/NIGHT SIGHT COMPONENTS

VEHICLE CHARACTERISTICS



GENERAL

Weight (Combat Loaded) GVW ..... 18,700 lb (8470 kg)
Weight, Curb (less Crew & Fuel) ... 17,715 lb (8030 kg)
Unit Ground Pressure (Combat Loaded) ..... 6 - 7.5 psi (0.42 - 0.52 kg/sq cm)
Crew 3
Fuel Tank Capacity ..... 90 gal (341 liters)

ARMOR

Hull ..... 5083 Aluminum with Dual-Hardness Steel and 7039 Aluminum Applique
Turret ..... Cast Aluminum and Dual-Hardness Steel

DAY VISION EQUIPMENT

Driver ..... 5 Vision Blocks
Commander ..... 5 Vision Blocks + Day Sight
Observer ..... 4 Vision Blocks + 1 Periscope

ARMAMENT

Primary ..... 20mm M139 Automatic Cannon
Secondary ..... 7.62mm M60D Machine Gun
Traverse ..... Continuous 360 deg 90 deg/sec
Elevation ..... +65 deg to -20 deg 90 deg/sec
Stabilization System .. Hydraulic with electronic control
Sights ..... Integrated Day/Night Sight
Ring Gear ..... 56-in. P.D. (1.4 m)

AMMUNITION

20mm Linked ..... 500 Rounds
7.62mm ..... 2000 Rounds

ELECTRICAL SYSTEM

Alternator ..... Internal rectifier type, 100 amperes; 28 volts
Batteries ..... 2, type 6TN, 100 amp hr ea., 12 volt

COMMUNICATIONS

Radio Sets ..... AN/VRC-49 1 set
Interphone Model ..... AN/VIC-1 with 3 Control Boxes

FIRE EXTINGUISHER

Fixed ..... 5 lb (2.3 kg) Freon, Engine Compartment.
..... 2.75 lb (1.3 kg) Freon, Front Body.
Portable.. 2.5 lb (1.1 kg) Freon, Personnel Compartment.

ENGINE

Make & Model ..... GM 6V53AT, Al. Turbo-charged
Type ..... 2 cycle, Compression Ignition
Displacement ..... 318 in.^{3} (5183 cc)
Bore & Stroke .... 3.87 in. (9.8 cm); 4.5 in. (11.4 cm)
Governed Speed (max. power) ..... 2800 rpm
Compression Ratio 17:1
Fuel ..... Diesel
Gross Horsepower ..... 300 @ 2800 rpm
Gross Torque ..... 615 @ 2100 rpm
Cooling System ..... Liquid to Air with Variable Speed Fan Drive

TRANSMISSION

Make & Model ..... Allison MT650M
Type ..... Torque converter with lock-up clutch; 5 speeds fwd; 1 rev. Automatic with driver range selection.

VEHICLE CHARACTERISTICS

AXLE (FINAL DRIVE)

Front Differential
- Type ..... Single Speed Hypoid with high traction slip control
- Ratio 7.80:1
- Torque Output Rating ..... 14,000 lb-ft (1936 kg-m)

Rear Differential
- Type ..... Single Speed Spiral bevel with limited slip
- Ratio 2.53:1
- Torque Output Rating ..... 8,500 lb-ft (1176 kg-m)

Rear Walking Beam
- Type ..... Independently sprung on powered trailing arms
- Ratio 3.09:1
- Torque Output Rating ..... 9,850 per wheel lb-ft (1362 kg-m)

WATER PROPULSION

- Type ..... Mixed flow pump

RUNNING GEAR

Suspension
- Rear Body
  - Type ..... Independently Sprung Walking Beams
  - Spring Type ..... Coil
  - Spring Rate ..... 1600 lb/in.
- Front Body
  - Type ..... Independent, Front A-Arm
  - Spring Type ..... Coil
  - Spring Rate ..... 1295 lb/in.

Wheels
- Aluminum 10x20

Tires
- Type ..... Low Press., Steel-Belted (Radial)
- Size and Ply Rating .... LR70-20, 4 Ply, 45-in. dia. (114 cm)
- Section Width ..... 18.0 in. (45.7 cm)

Brakes
- Type & Size ..... Caliper Disc, 14 in. dia. (35.6 cm)
- Actuation ..... Hydraulic Boost

ARTICULATION

- Right Roll ..... 25 deg
- Left Roll ..... 25 deg

PREDICTED PERFORMANCE

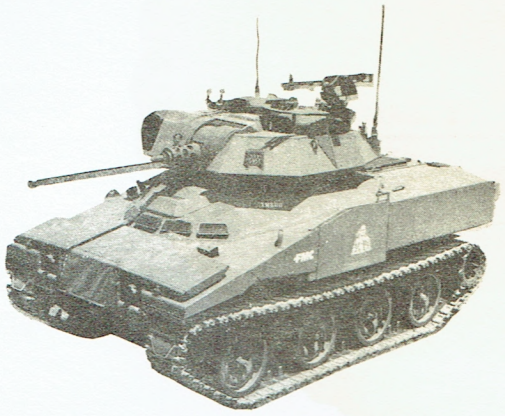
- Net Horsepower ..... 245 hp (248.4 hp metric)
- Gross Horsepower to Weight Ratio ..... 32.1 hp/ton (35.88 hp/t metric)
- Net Horsepower to Weight Ratio ..... 26.2 hp/ton (29.28 hp/t metric)
- Speed (land) ..... 65 mph (105 km/hr)
- Speed (water) ..... 6 mph (9.6 km/hr)
- Speed, up 10% Slope ..... 25 mph (40 km/hr)
- Speed, Reverse ..... 15 mph (24.2 km/hr)
- Slope 60%
- Side Slope 40%
- Trench ..... 72 in. (1.8 m)
- Vertical Wall ..... 36 in. (0.91 m)
- Cruising Range ..... 450 mi. (724 km)
- Acceleration 0 – 30 mph ..... 9 sec
- Turning Radius (Normal) ..... 30 ft (9.14 m)
- (w/Brake Assist) ..... 14 ft (4.27 m)

FMC



Armored Reconnaissance Scout Vehicle,

XM800



CHARACTERISTIC DATA

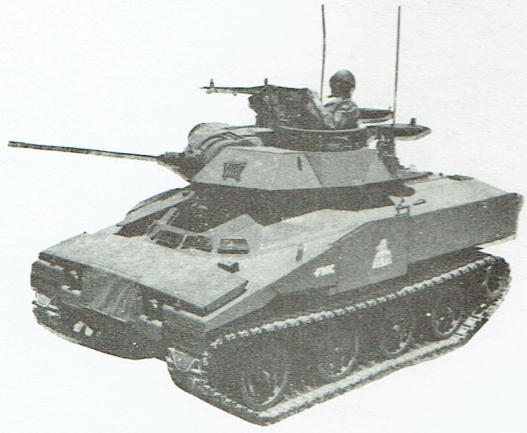
General	
Weight (Combat Loaded)	19,000 lbs. (8618 kg)
Weight (Less Crew & Fuel)	17,593 lbs. (7980 kg)
Unit ground pressure (combat loaded)	4.6 psi (0.3234 kg/sq cm)
Crew	3
Fuel Tank Capacity	105 gal. (397 liters)
Armor	
Top	5083 Aluminum
Vertical Sides & Rear	7039 Aluminum and dual hardness steel
Front Slopes	Kalshield
Bottom	5083 Aluminum
Day Vision Equipment	
Driver	5 Vision Blocks
Commander/Gunner	2 M27 Periscopes; 5 M17 Periscopes
Observer	1 M27 Periscope; 5 M17 Periscopes
Armament	
Primary	20MM M139 Automatic Cannon
Secondary	7.62MM M60D Machine Gun
Traverse	Continuous 360° 90°/SEC
Elevation	+65° to −20° 90°/SEC
Stabilization System	Electric
Sights	Integrated Day/Night Sight
Ring Gear	56 inch P.D. (1.4 m)
Ammunition	**Rounds**
20MM linked	500 ready
7.62MM	2000
Running Gear	
Suspension Type	Rear Drive, Flat Track
Springing Media	Titanium Torsion Bar
No. of Wheels	4 pair each side
Wheel Size	24-inch dia x 2.38 wide (61 cm x 6 cm)
Track Type	Aluminum double pin with detachable rubber pads
Shock Absorbers	2 per side
No. Shoes/Track	64
Pitch	6 inches (15.2 cm)
Width	19 inches (48.3 cm)
Electrical System	
Generator	Amperes: 180 hot, 270 cool Voltage: 28 Vdc
Batteries	4, type 6TN, 100 amp hour ea, 12 V

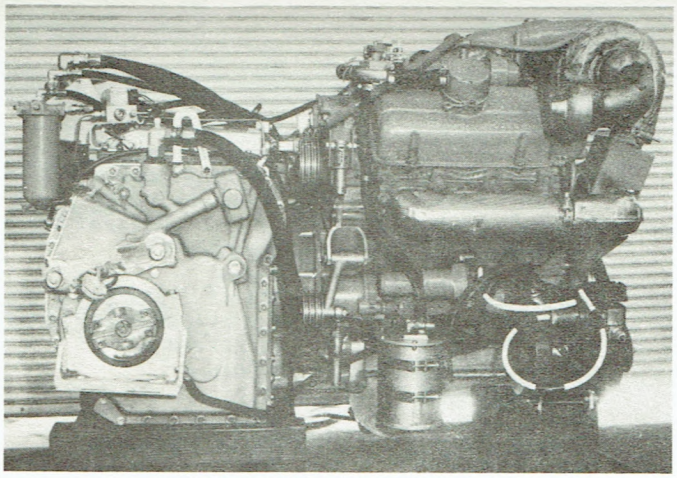
Armored Reconnaissance Scout Vehicle,

XM800

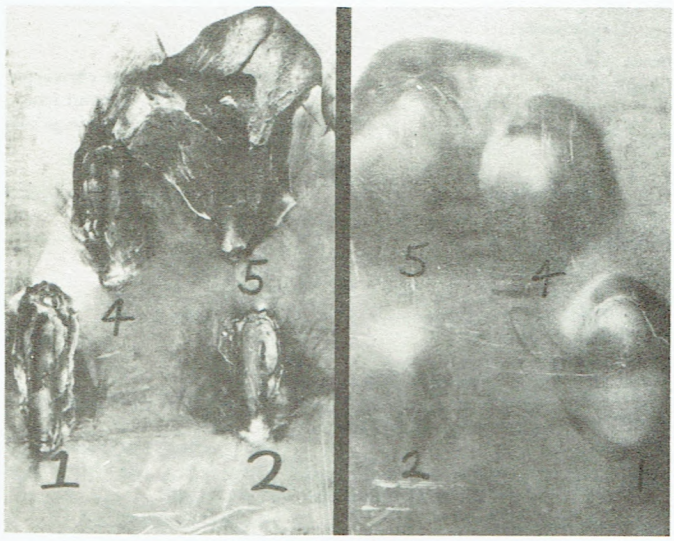
CHARACTERISTIC DATA

Communications	
Radio Sets	AN/VRC-49 1 set
Interphone Model	AN/VIC-1 with 3 Control Boxes
Fire Extinguisher	
Fixed	5 lb (2.3 kg) Halon Engine Compartment (1)
Portable	2.5 (1.2 kg) lb Halon Personnel Compartment (1)
Engine	
Make & Model	GM 6V53AT
Type	2 cycle
Displacement	318 $in.^3$ (5183 cc)
Bore	3.87 in. (9.8 cm)
Stroke	4.5 in. (11.4 cm)
Governed Speed (max. power)	2800 rpm
Compression Ratio	17:1
Fuel	Diesel
Gross Horsepower	280 (283 HP metric)
Gross Torque	590 lb. ft. (81.6 m-kg)
Cooling System	Liquid to Air with Two-Speed Fan Drive
Transmission	
Make & Model	Allison X-200
Type	Cross Drive, torque converter with lock-up clutch; 4 speed fwd, 2 rev. with automatic range selection; hydrostatic steering
Brakes Type	Multidisc, oil cooled, power assist
Final Drive	
Type	Geared
Ratio	2.87:1
Sprocket Pitch Diameter	19.4 in. (49.3 cm)
No. Teeth	10
Predicted Performance	
Net Horsepower @ Sprocket	208 HP (210.9 HP metric)
Gross Horsepower to Weight Ratio	HP/Ton 29.5 (32.9 HP/T metric)
Net Horsepower to Weight Ratio	HP/Ton 21.9 (24.5 HP/T metric)
Tractive Effort to Weight Ratio	TE/WT 1.00
Tractive Effort	19,000 lbs. (8618 kg)
Speed (land)	53 mph (88.5 km/hr)
Speed (water)	4.5 mph (7.2 km/hr)
Speed up 10% Slope	25 mph (40 km/hr)
Speed, Reverse	25 mph max (40 km/hr)
Slope	60%
Side Slope	40%
Trench	72 inches (1.8 m)
Vertical Wall	30 inches (0.76 m)
Cruising Range	450 miles (724 km)
Acceleration 0-30 mph	10 sec
Turning Radius	Axial Pivot

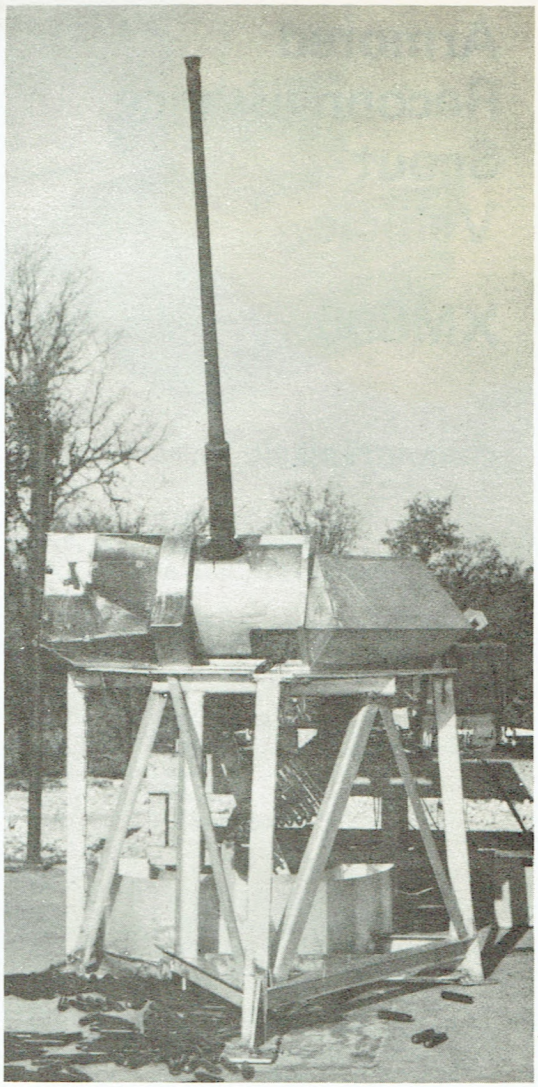




POWER PLANT ASSEMBLY



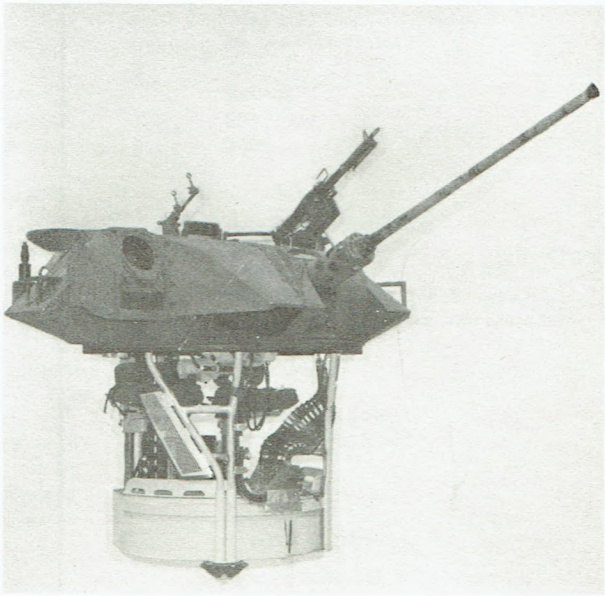
ARMOR TEST SAMPLE



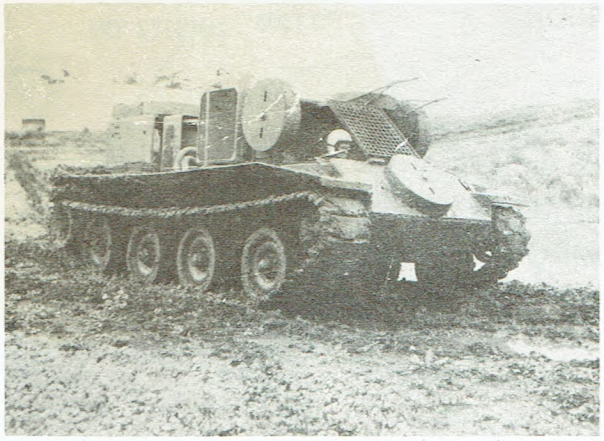
FEED SYSTEM TEST, MAX. ELEVATION



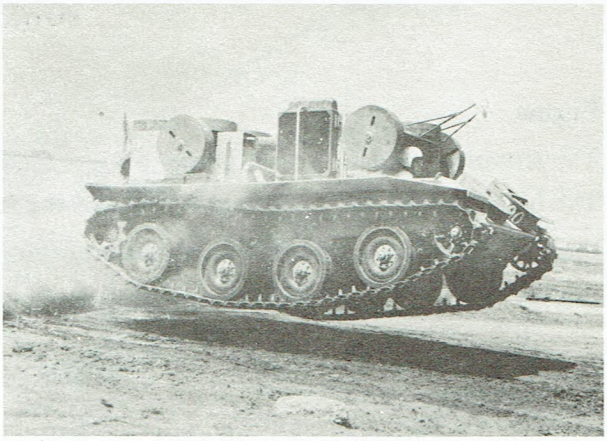
40% SLOPE FIRING TEST



TURRET ASSY



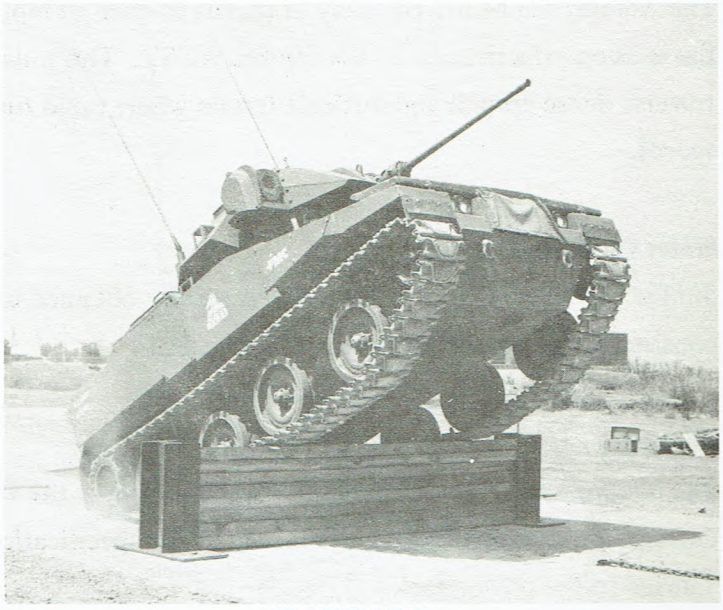
MUD OPERATION, TEST RIG



16" LOG JUMP, TEST RIG



60% SLOPE



30" OBSTACLE



TIGHT TURN TEST



SWIM TEST

POWER TRAIN

Engine

The aluminum block Detroit Diesel 6V53AT engine is turbo-charged to a rating of 285 horsepower. The high horsepower per ton ratio reduces the amount of time the engine must provide full power, thereby providing a marked improvement in the reliability and durability of the automotive sub-system to within the specified requirements.

Transmission

Handling at all speeds is provided by the Allison X200 four-speed hydrostatic steering transmission. The XM800 can be driven safely at speeds of over 50 mph. The ability to turn on its axis adds to the mission effectiveness of the tracked ARSV. This unlimited turning radius allows vehicles to traverse dense growth and difficult terrain where rapid turns can be negotiated at higher average speeds.

Water Operation

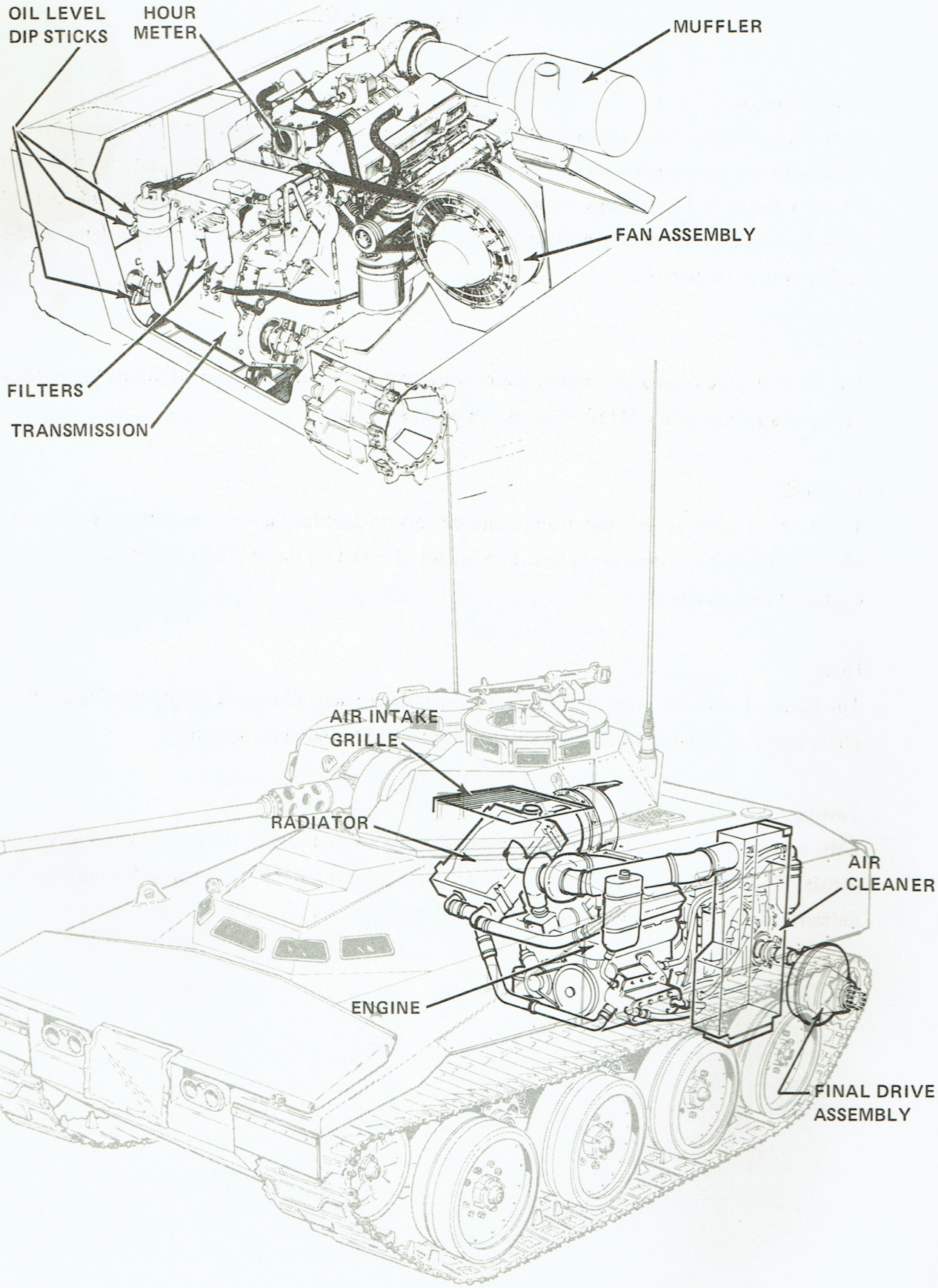
Similar manueverability in the water is readily obtained using track propulsion only. The vehicle consistantly obtains over 4 mph in the water.

Cooling

The cooling system on the tracked ARSV will allow the vehicle to sustain maximum performance during the worst conditions established in the specifications (maximum ambient of 130°F) without damage to the power pack.

Noise

Noise reduction to within the limits of the system signature specification has been achieved through a major effort in the design of the fan and muffler. The infrared signature will also meet the requirements defined by the system specification.


OIL LEVEL
DIP STICKS
HOUR
METER
MUFFLER
FAN ASSEMBLY
FILTERS
TRANSMISSION
AIR INTAKE
GRILLE
RADIATOR
AIR
CLEANER
ENGINE
FINAL DRIVE
ASSEMBLY

SUSPENSION

Overall Design

An advanced design track and suspension system coupled with a low ground pressure enables this Scout vehicle to negotiate submarginal terrains and tough cross-country in minimum time. Crossing 6 foot trenches or 30 inch logs without a hang-up is commensurate with the ability to complete a mission. The rear sprocket drive location minimizes the possibility of enemy action rendering the vehicle totally inoperable.

Track

The 19-inch wide forged aluminum, double-pin track with steel engagement points has twice the torsional strength of the M113A1 track yet weighs 30% less.

Suspension

An advanced suspension design using titanium torsion bars for lighter overall weight provides 12 inches of roadwheel travel compared to 6 inches of travel on the M113A1, resulting in improved cross-country speeds.

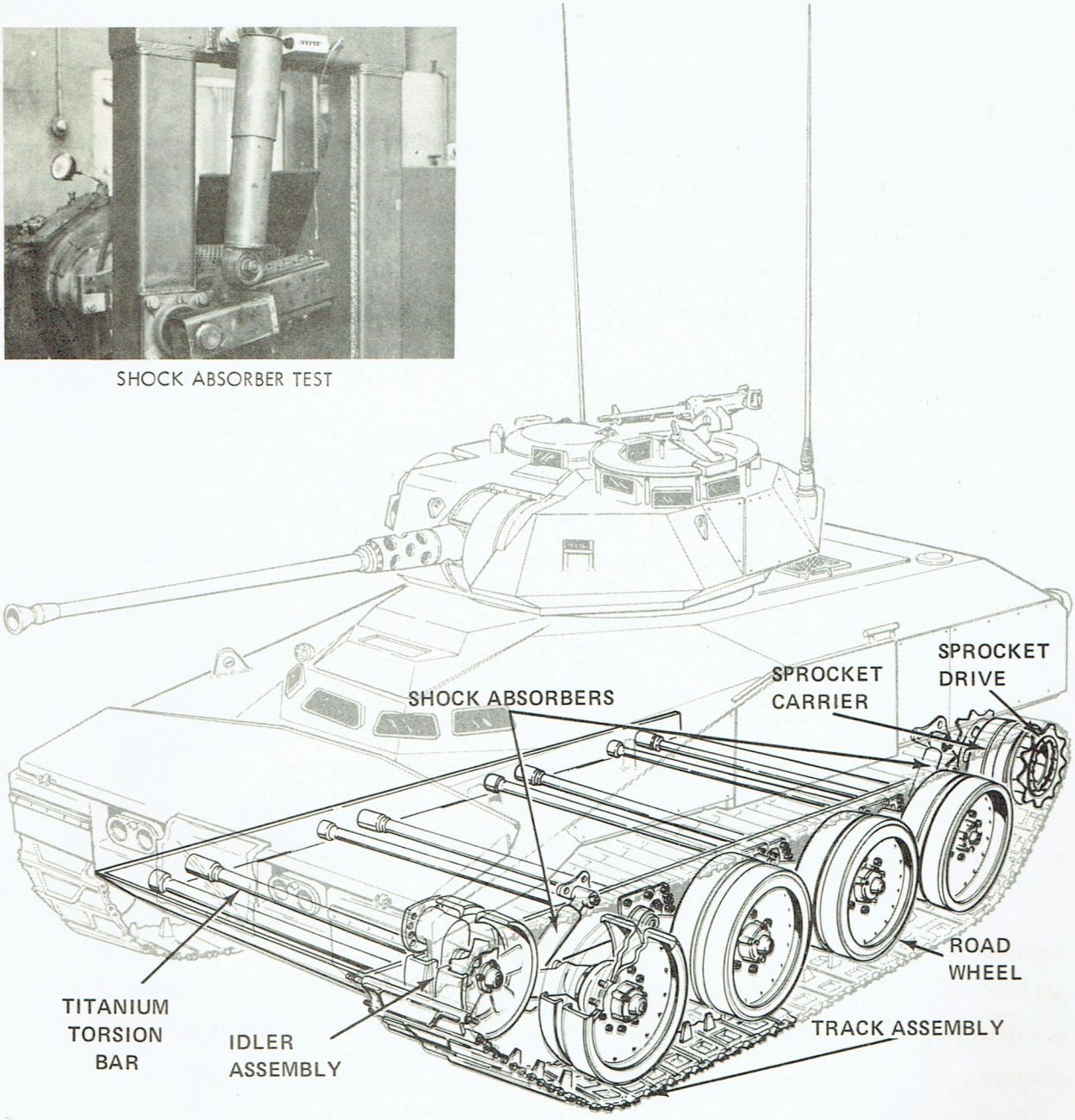
Noise

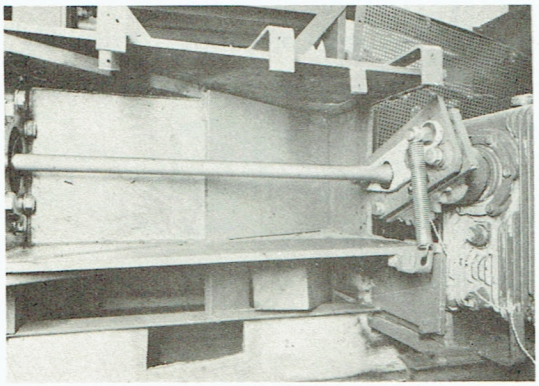
The inherent noise of a tracked vehicle has been specifically addressed during the design and testing phase and now satisfies the system specification for external noise signature.

Testing

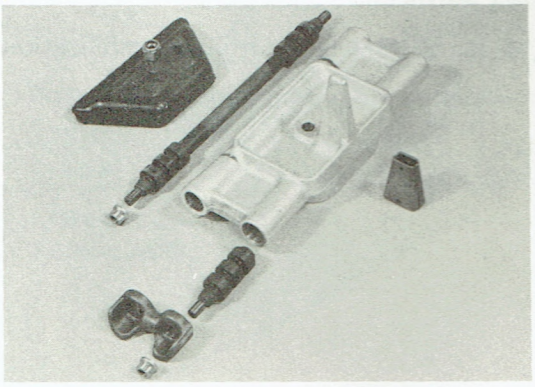
FMC is continuing to test these advanced designs to assure meeting the system reliability requirements. The track and suspension system will have substantial miles of vehicle testing prior to delivery of the vehicles to Aberdeen Proving Ground during early FY 74.

SHOCK ABSORBER TEST





TORSION BAR TEST



TRACK SHOE ASSY

Overall Design

Ample space is provided in the two-man weapon station to allow maximum effectiveness of the command, control, observation, and firing missions of the ARSV. The 56-inch ring gear coupled to the General Electric power control system provides maximum azimuth and elevation movement rates. This all-electric system includes stabilization that provides high first round hit capability while on the move in the roughest terrain.

Primary Weapon

The commander has total control of his vehicle and its mission from his position in the weapon station providing him with 360° of vision. The observer has 250° of vision. The commander controls the power control, stabilization and primary weapon fire control system in the vehicle as well as the day/night sight. However, the commander and observer can easily exchange positions within the confines of the weapon station basket. The reliability of the singlefeed system for the 20mm M139 has been confirmed through extensive testing.

Secondary Weapon

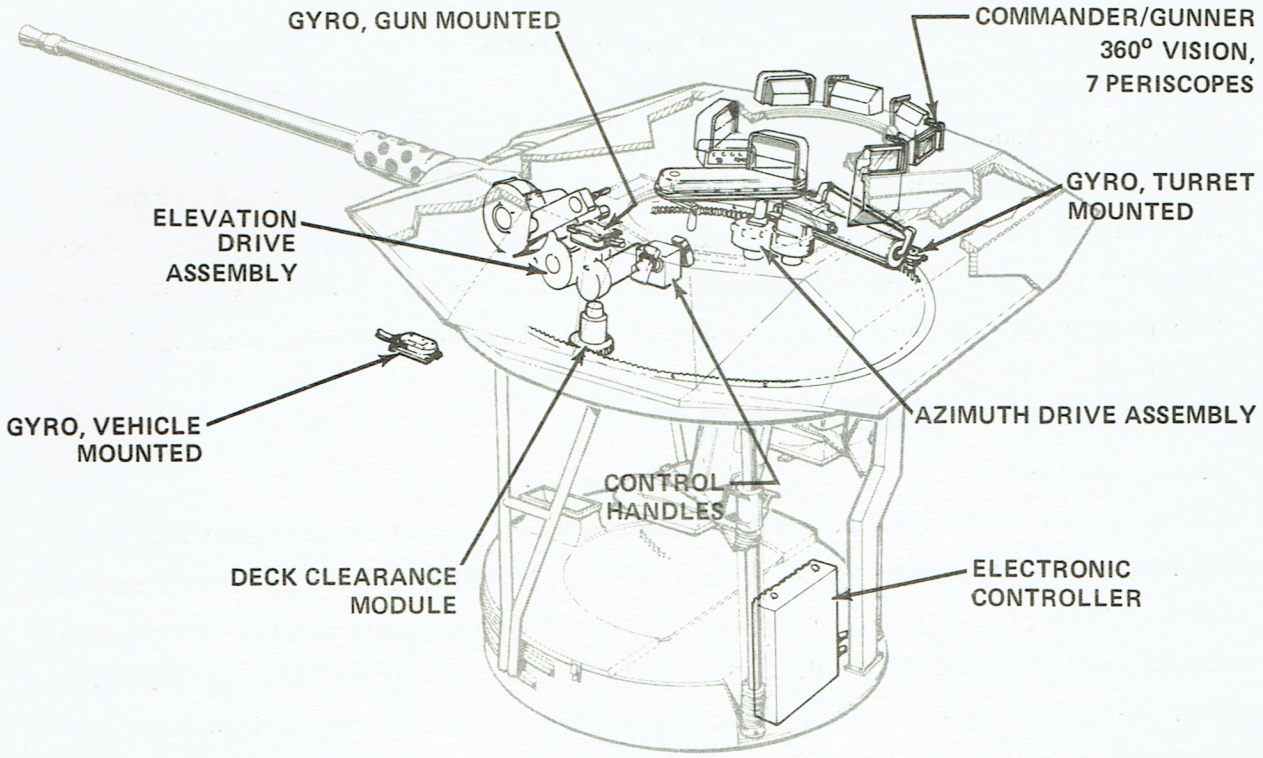
The 7.62mm, M60D secondary weapon is mounted on a skate mount above and around the observers hatch. This arrangement allows easy movement of the mount around the circumference of the hatch providing 360° of covering fire from an open hatch position.

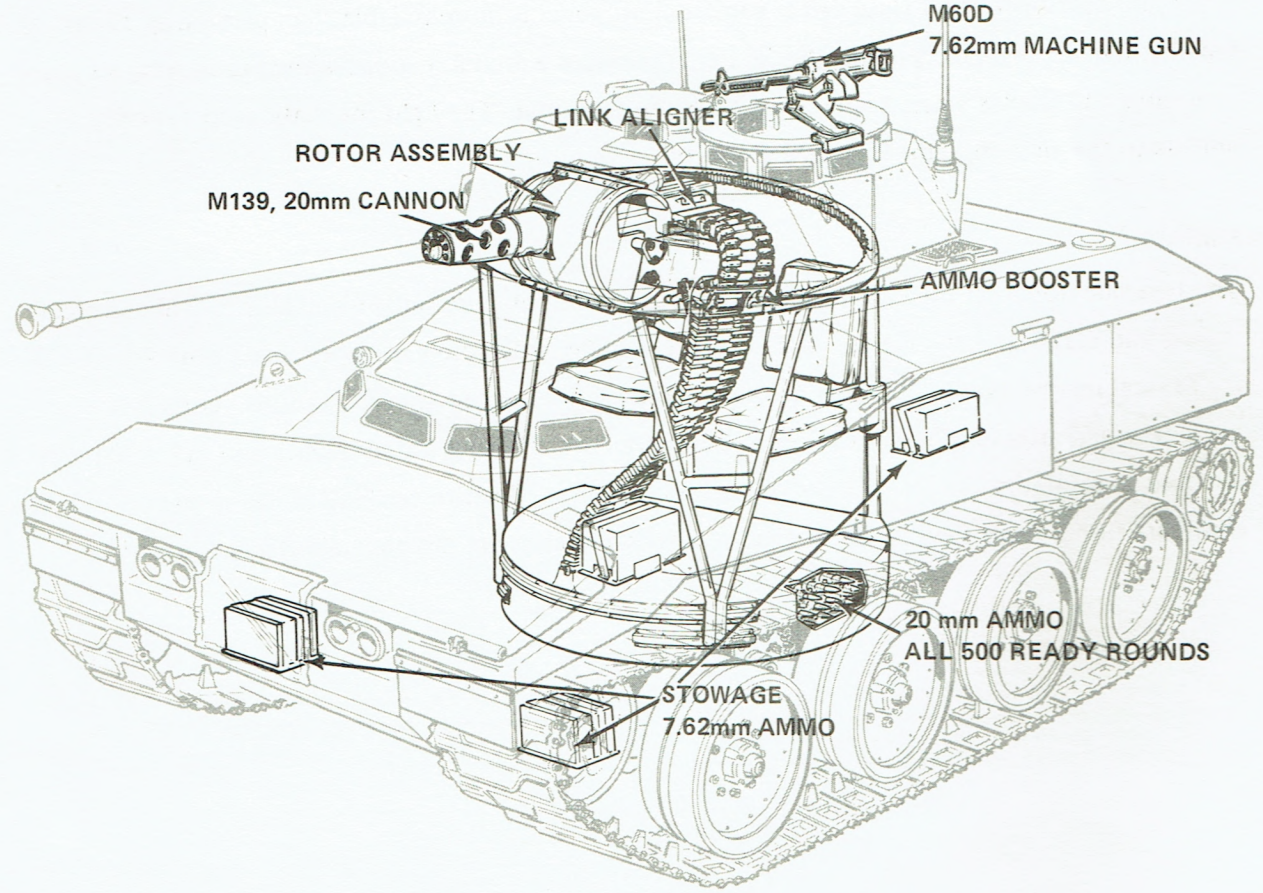
Ammunition Stowage

All 500 on-board rounds of ammunition for the 20mm M139 are ready rounds located in the base of the weapon station. The 7.62mm ammunition is stowed within easy access of the observer's position.

Power Control and Stabilization

The all-electric power control and stabilization system provides quiet operation, particularly for the silent watch mode of operation. The system can be operated in manual, powered, and stabilized modes.


GYRO, GUN MOUNTED
COMMANDER/GUNNER
360° VISION,
7 PERISCOPES
GYRO, TURRET
MOUNTED
ELEVATION
DRIVE
ASSEMBLY
GYRO, VEHICLE
MOUNTED
AZIMUTH DRIVE ASSEMBLY
CONTROL
HANDLES
DECK CLEARANCE
MODULE
ELECTRONIC
CONTROLLER


M60D
7.62mm MACHINE GUN
LINK ALIGNER
ROTOR ASSEMBLY
M139, 20mm CANNON
AMMO BOOSTER
20 mm AMMO
ALL 500 READY ROUNDS
STOWAGE
7.62mm AMMO

Ease of Maintenance

All on-vehicle daily maintenance has been simplified by the location of access points within easy reach through the rear door. These include the oil level dip sticks for the engine, transmission and final drive, oil and fuel filters and the air cleaner. The rear mounted power pack is easily installed through the rear of the vehicle using a system of rollers and guides in the bottom of the hull. One locator pin and two bolts per side secure the assembly.

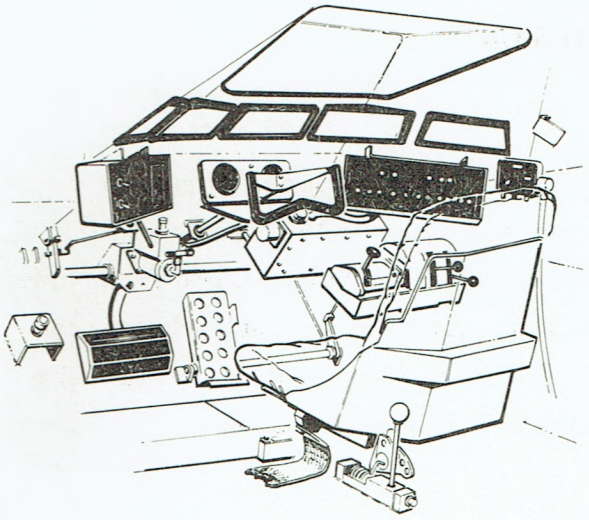
Ease of Operation

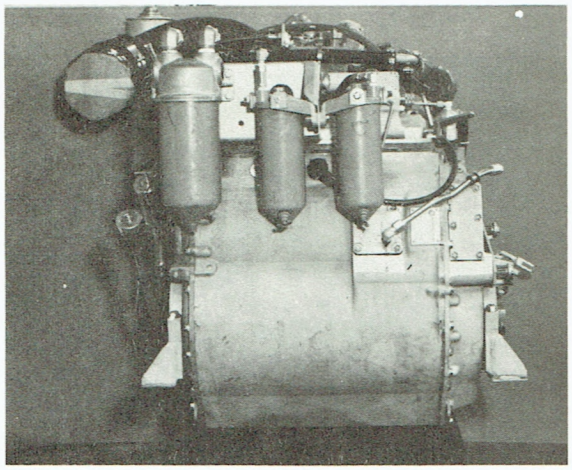
Human factor analysis identified the functions of each crew member at his position and for his ancillary duties. Stowage is arranged at each station as defined by task analysis with greater usage items in closest proximity to the individual. The driver's seat is adjustable both horizontally and vertically and is suspended from the roof to minimize injury due to mine blast. The seats in the turret are vertically adjustable. All seats are equipped with seat belts and inertial reel shoulder harnesses.

The FMC-developed solid state driver's instrument panel is more reliable than previously designed panels. This LED (light emitting diode) panel provides a digital readout while monitoring various functions and flashes when a condition becomes abnormal. The light intensity automatically adjusts to the ambient light to assure visibility.

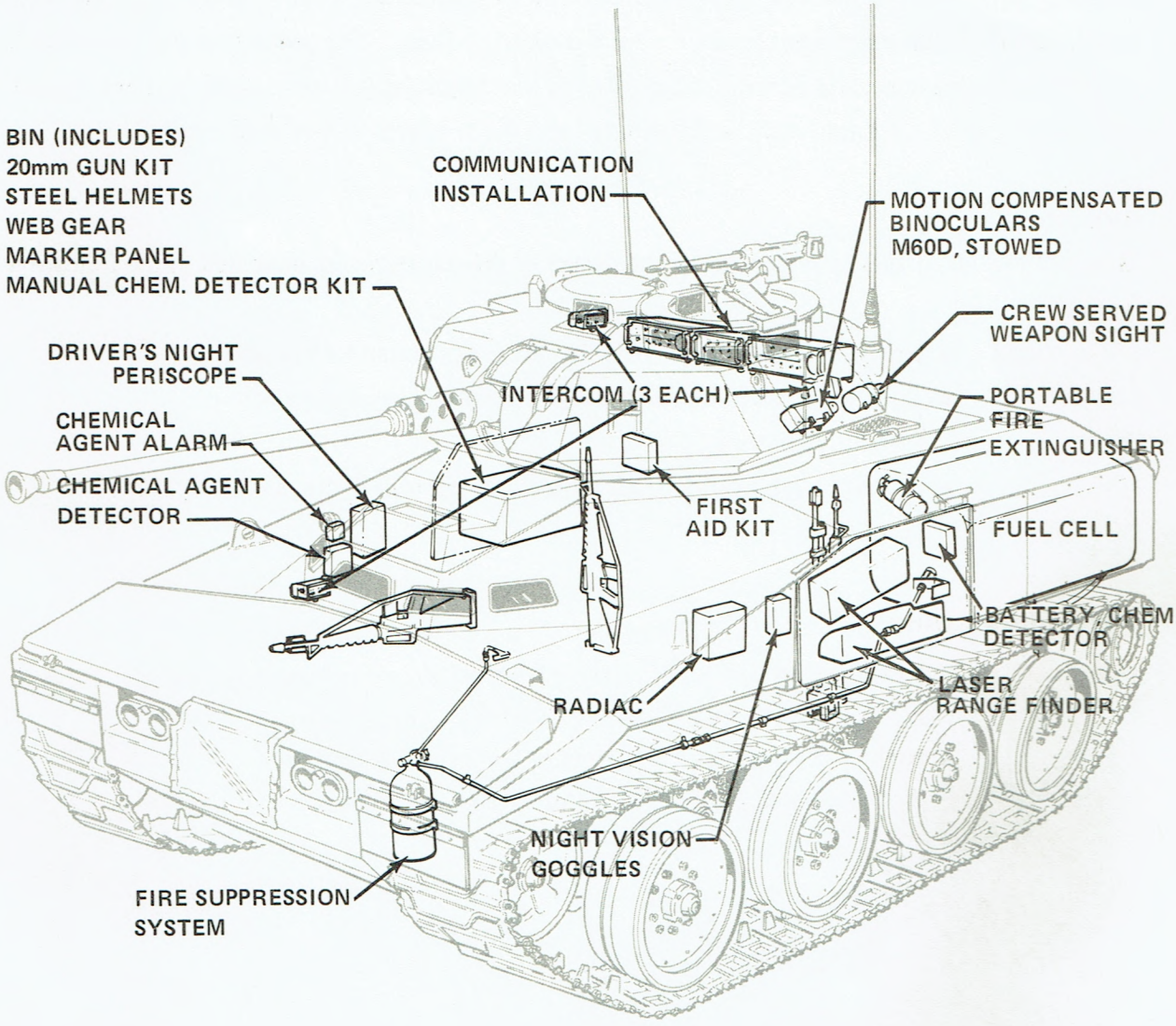
Safety

The two side doors on the vehicle simplify the reloading of ammunition and also provide discreet ingress and egress and emergency exit from the vehicle. Each crew member also has his own hatch for normal ingress/egress. Padding has been strategically located at crew stations. Guards have been provided around moving parts or hot components. Positive hatch latches and safety interlocks are used to minimize operational and servicing accidents. Positive ventilation has been provided to eliminate fumes from the primary weapon. Shells and clips are discharged outside the vehicle.





ENGINE ASSY, SERVICE POINTS



DAY/NIGHT SIGHT

Overall Design

The integrated day/night sight provides low power channels for general surveillance/target acquisition and high power channels for long range surveillance/fire control. Developed for FMC by Delco Electronics Division of General Motors Corporation, this sight integrates high and lower power daylight and high and lower power night light channels into an articulated telescope configuration. The articulated telescope readily interfaces with the weapon station, the head being mounted outside the commander's station in a position of maximum protection.

Image Intensifier Tube

The night vision capability is provided by a generation II image intensifier (I^2) tube. The manual gain control, which could not be incorporated in generation I tubes, allows optimum use under ambient illumination levels ranging from dusk to starlight. The generation II I^2 tube offers a significant advantage over generation I devices in that bright light sources, such as flares, tracers and muzzle flashes, do not result in "blooming" and the resultant loss of vision.

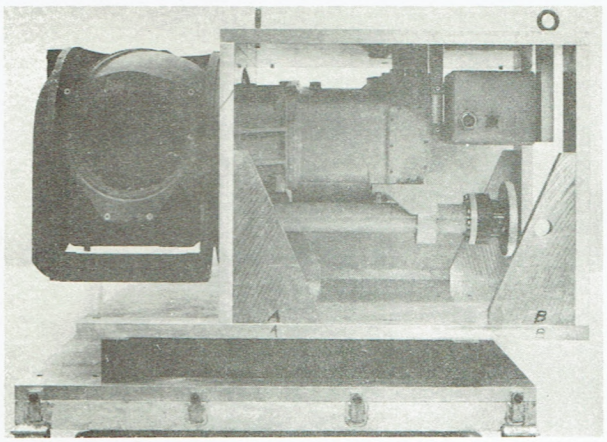
Benefits

Some of the advantages as evidenced by the design of the telescope are indicated in the following areas:

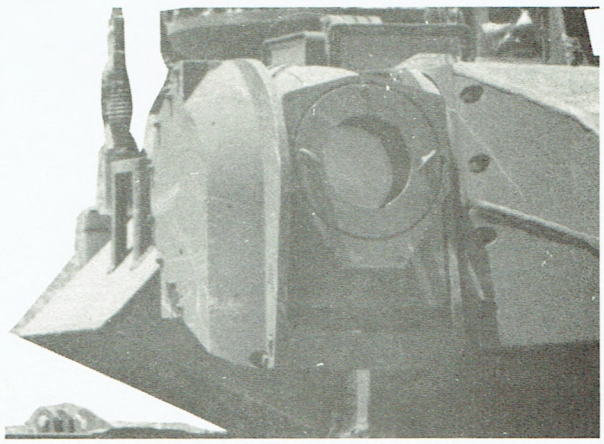
- Open and closed hatch visibility for the commander/gunner.
- Total night performance through the full range of elevation without vignetting.
- Low vulnerability to attack with small aperture within an armor shell.

Visual Characteristics

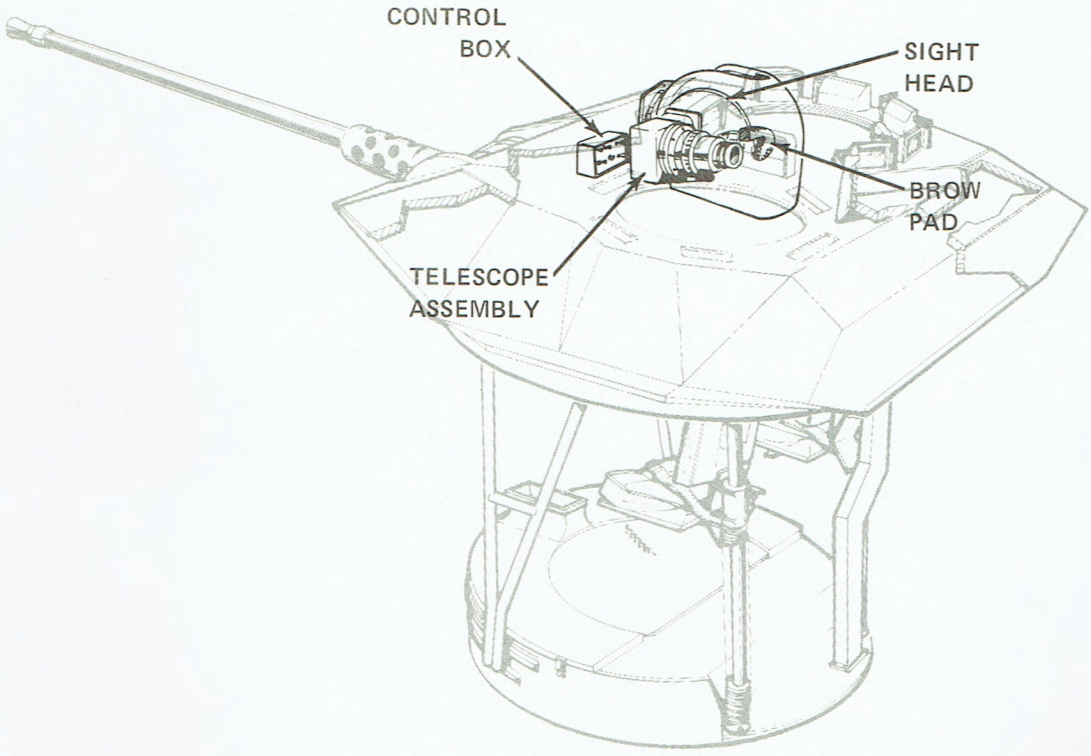
- Day – 3 power with 20^{o} field of view
  8 power with 8^{o} field of view
- Night – 3 power with 20^{o} field of view
  8 power with 7^{o} field of view

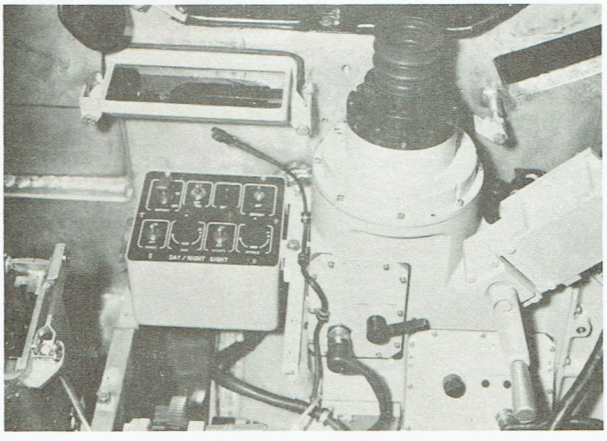


SIGHT ASSY, FRONT

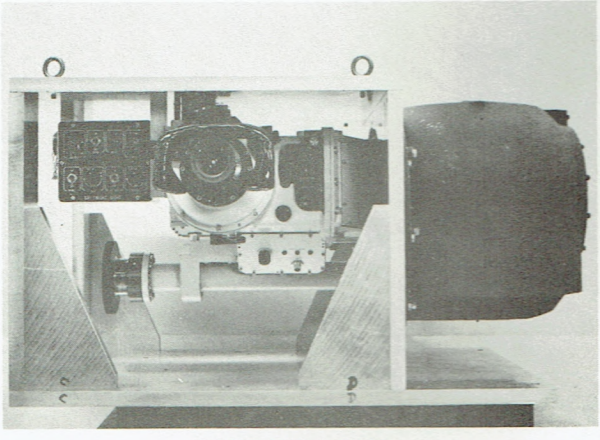


SIGHT ASSY, INSTALLED





SIGHT ASSY, INSTALLED



SIGHT ASSY, REAR