



LANCE

WEAPON SYSTEM

LTV MICHIGAN DIVISION
LING-TEMCO-VOUGHT, INC.



"I DO NOT HAVE TO TELL YOU WHO WON THE WAR
YOU KNOW
THE ARTILLERY DID"

Gen. G. S. Patton Jr.
Artillery Conference
Bad Tolz. Germany 1945

LANCE WEAPON SYSTEM

IN 1962 THE U.S. ARMY ANNOUNCED THE SELECTION OF LTV MICHIGAN AS THE PRIME CONTRACTOR FOR THE NEWEST ADDITION TO THE FAMILY OF SURFACE TO SURFACE MISSILES, THE GUIDED MISSILE SYSTEM "LANCE". THE FOLLOWING NARRATIVE AND PICTORIAL REVIEW IS A BRIEF PRESENTATION OF THE LANCE WEAPON SYSTEM AS IT IS ENVISIONED AND PLANNED TO DATE.

The Weapon System has been given the name LANCE, symbolizing cultural traditions of The North American Indian. Only experienced warriors were permitted to carry Lances. The key to the name of LANCE is portrayed in the emblem with the missile placed in the center. The characteristic crossed weapons of the Army has been maintained. The round shield, constructed and painted symbolically, afforded the Indians maximum physical as well as spiritual protection.



AIR TRANSPORTABLE AND **MOBILE**

Mobility is a significant asset of the LANCE weapon system. The Self Propelled Launcher (SPL) and Transporter Loader (TL) are capable of sustained highway speeds of 30 MPH. Cross country terrain can be negotiated, including ditches and swimming inland waterways.

Ground Support Equipment (GSE) is designed and was test proven to be transportable by truck, train, ship and aircraft. Any of the LANCE vehicles with or without missiles are designed to be dropped from an aircraft such as the C-130. The lightweight launcher with or without missile can be transported by helicopter. The LWL also can be airlifted internally by various types of aircraft for initial air landing operations.





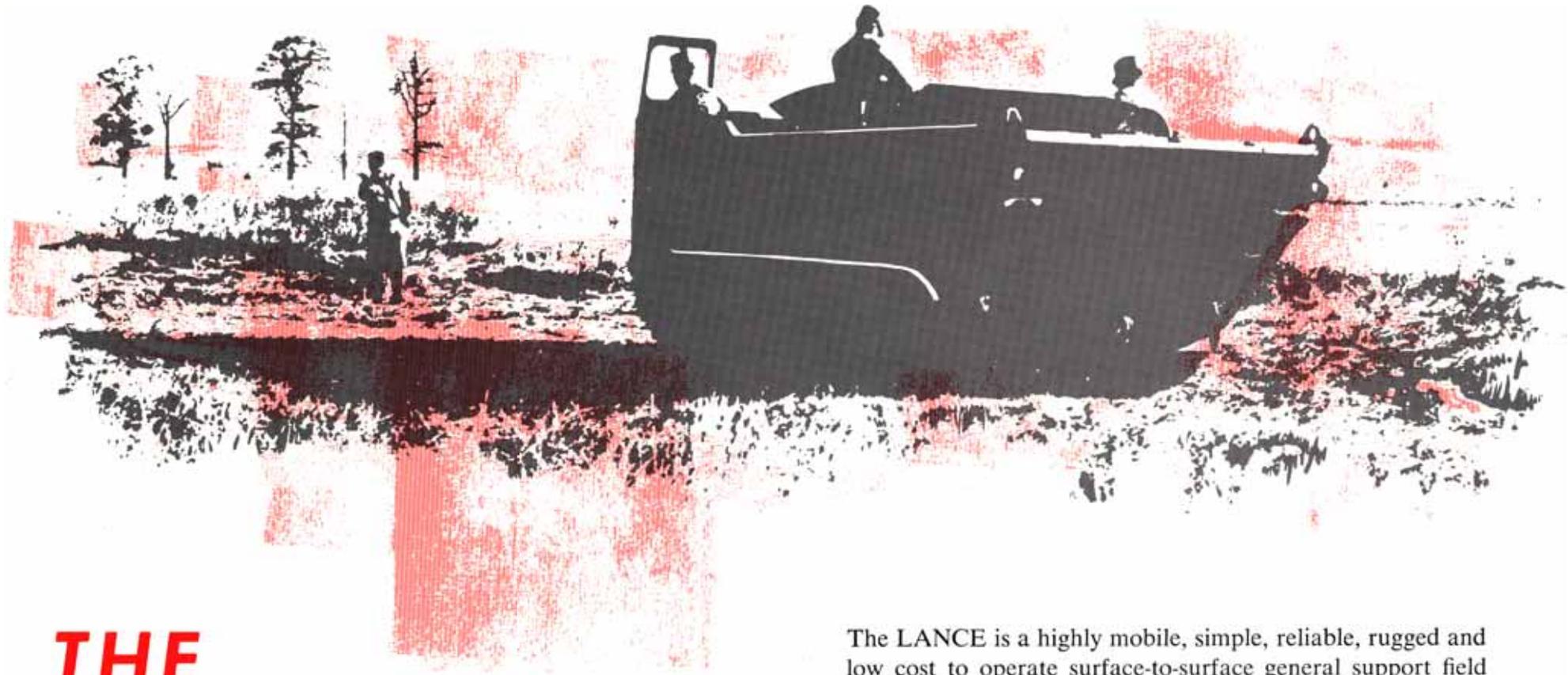
THE MISSILE

The compact Propulsion System features a pressure-fed, storable liquid, bi-propellant system; positive expulsion of propellants provides proper thrusts at the proper time, ensuring maximum target accuracy.

The missile airframe, though of lightweight construction, is extremely rugged, easily maintainable, and practically damage-proof in normal "wooden-round" handling operations. With warhead, LANCE is approximately 20 feet in length, 3,000 pounds in weight, and 22 inches in diameter. All components may be interchanged using standard hand tools.

GUIDANCE AND CONTROL

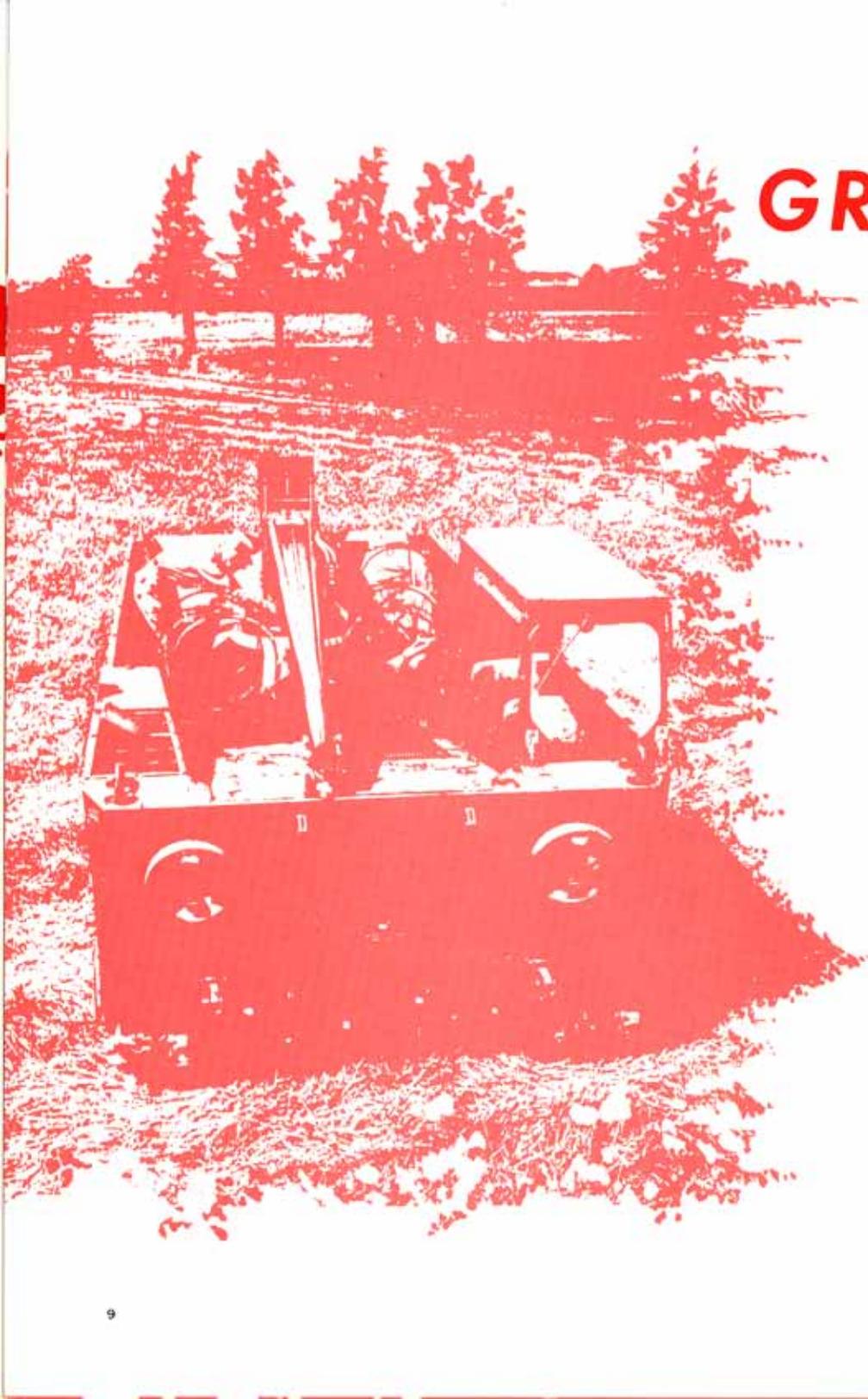
The guidance system represents an advanced low cost, highly simplified inertial concept capable of a high degree of on-target accuracy.



THE SYSTEM CONCEPT

The LANCE is a highly mobile, simple, reliable, rugged and low cost to operate surface-to-surface general support field artillery weapon system. The pre-packaged liquid-fueled missile is capable of delivering a nuclear or nonnuclear warhead with accuracies exceeding that obtained with conventional field artillery, at a high rate of fire with low reaction time. LANCE provides a dependable, versatile type weapon system, capable of operating during adverse weather conditions, for general and limited warfare. The high degree of battlefield invulnerability provided by the combination of low reaction time and system mobility over rough terrain as well as prepared surfaces, makes LANCE particularly valuable as a close support weapon for rapidly moving troops.

GROUND SUPPORT EQUIPMENT



Both major articles of ground support equipment; the Self-Propelled Launcher (SPL) and the Transporter Loader (TL) use a full-tracked modified M-113A vehicle which incorporates a hydraulic suspension lock-out system, a low silhouette, minimum weight, a swimming capability and growth potential. The conversion of the basic vehicle from SPL to TL (and the reverse cycle) can be accomplished simply and quickly in the field. These vehicles offer rapid and easy field operation with the capability to traverse both cross-country terrain and inland waterways. When the basic launcher unit is attached to the modified vehicle the combination becomes the SPL. The TL contains an independent hydraulically operated boom crane mechanism with controls and operator space on the boom itself, and contains support cradles for two missiles. The cradles are bolted to the basic vehicle to allow quick changes to be accomplished by field troops. The TL loads and unloads itself and the launcher and performs various missile handling and other battalion weight lifting operations.

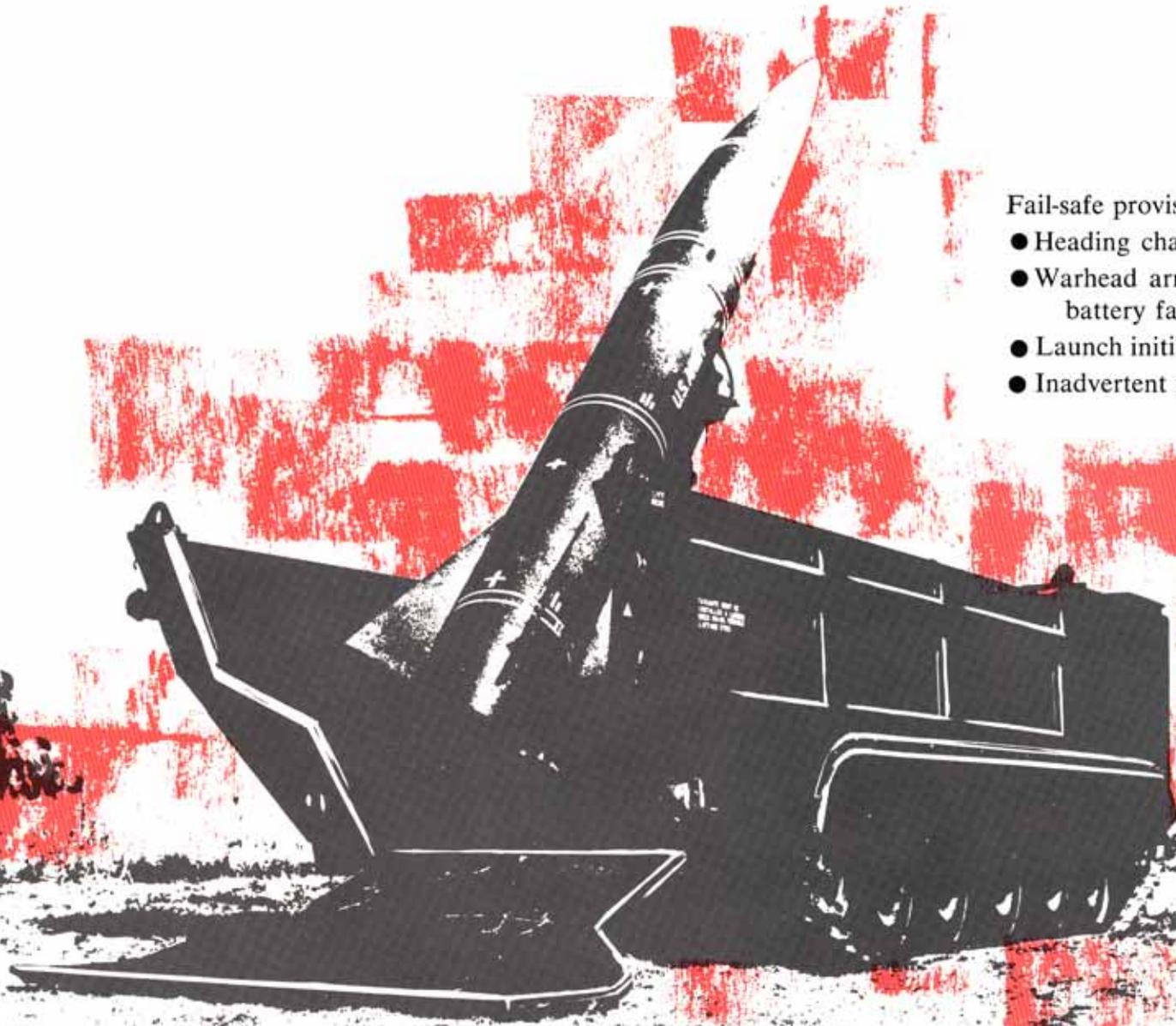
CHECK-OUT & FIRING EQUIPMENT

The pre-fire tester is used for go-no-go electronics verification of the missile, and insertion of guidance data and also contains the firing interlock circuitry. The firing pack contains two guarded toggle switches; one to arm the missile and one to fire the missile. The firing pack is connected through a 100 meter (328 ft.) cable to the missile system.

SAFETY

Fail-safe provisions of the system prevent:

- Heading changes of more than eight degrees
- Warhead arming and gyro spin-up in case of battery failure
- Launch initiation without gyro spin-up, and,
- Inadvertent fire.



ACCURACY AND EFFECTIVENESS

The effectiveness of LANCE in accurate delivery of the payload on target is assured by use of:

- An advanced guidance concept

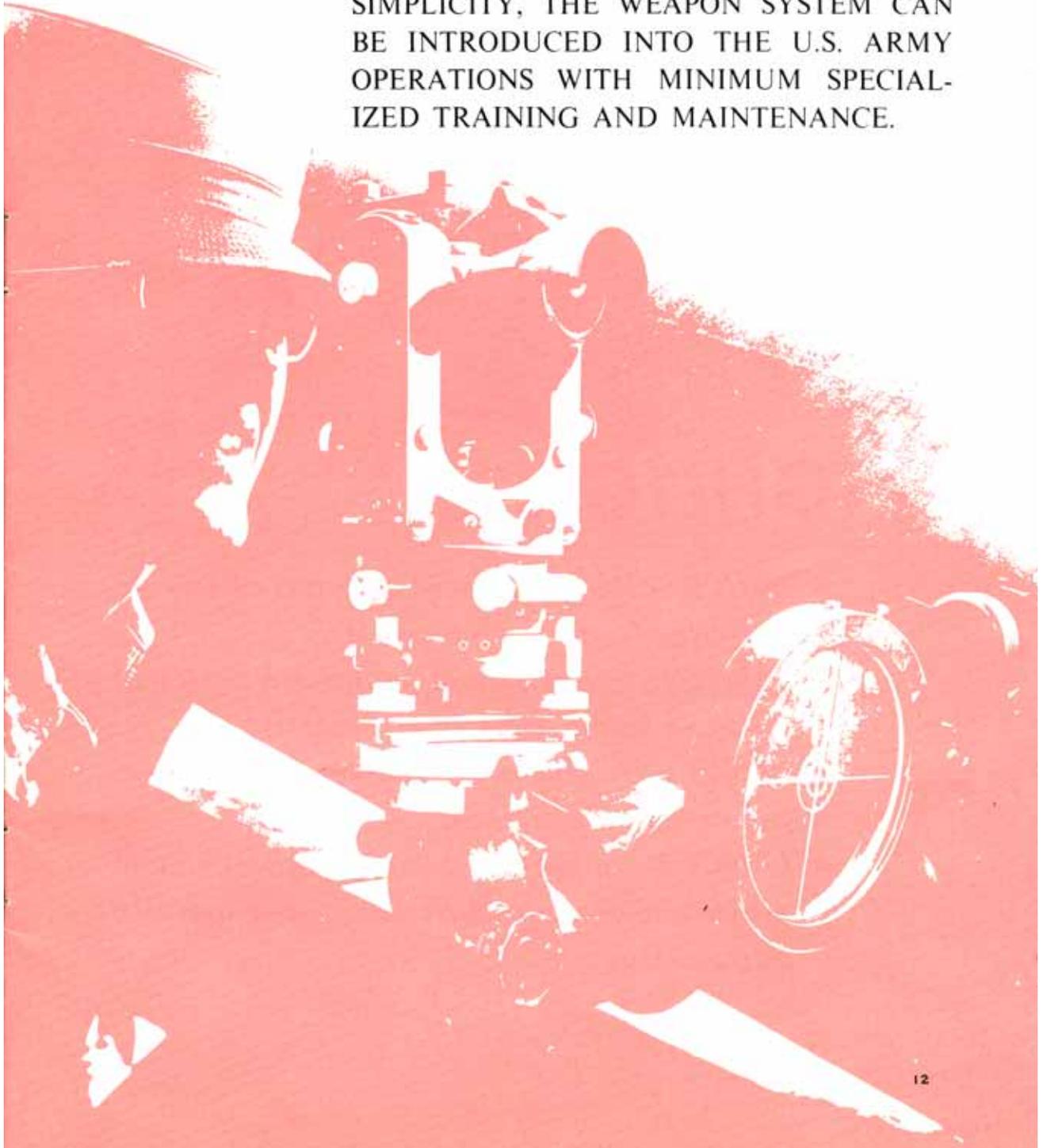
- A dependable, storable, relatively maintenance-free propulsion system

- Overall simple, durable and versatile support equipment.

The system is boresighted and layed by using standard field artillery procedures and techniques. Reliability provides consistent and accurate performance required by the Military Characteristics.



BECAUSE OF THE SYSTEM'S OPERATIONAL SIMPLICITY, THE WEAPON SYSTEM CAN BE INTRODUCED INTO THE U.S. ARMY OPERATIONS WITH MINIMUM SPECIALIZED TRAINING AND MAINTENANCE.

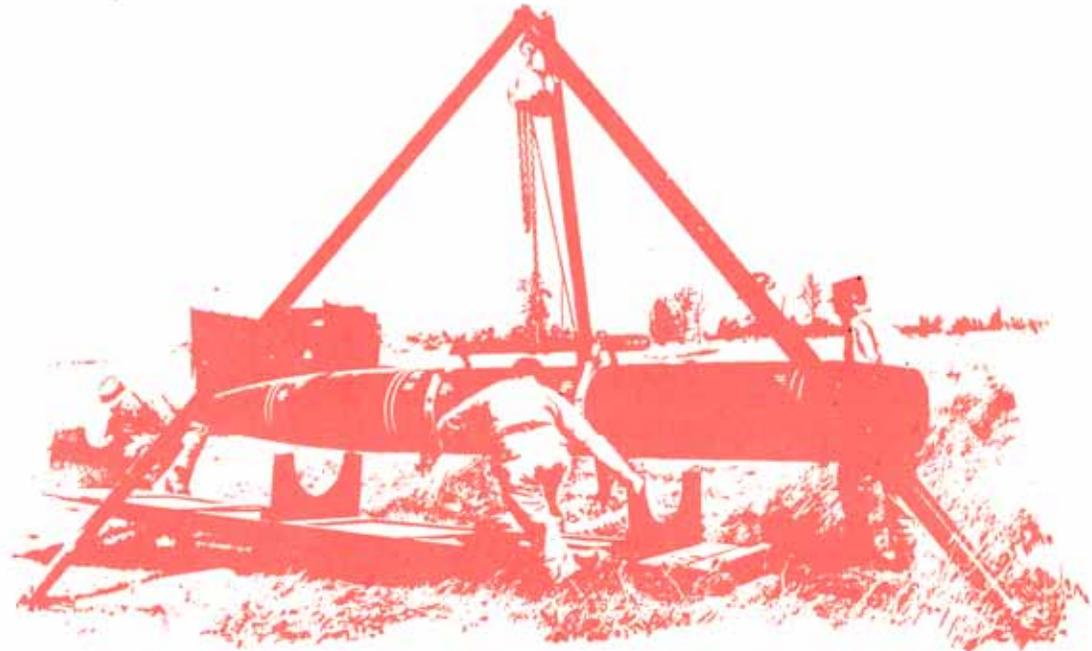




H I G H L I G H T S

- LANCE is fully mobile in **all** types of terrain and fires from its own carrier;
- LANCE is rugged, will withstand rigors of forward battle-zone operation;
- LANCE is reliable at all times with consistent, accurate performance.
- LANCE is simple to operate, with minimum maintenance and has long storage life capability.

IN SUMMARY...



THE LANCE WEAPON SYSTEM WILL SIGNIFICANTLY INCREASE THE FIRE POWER CAPABILITY AND TACTICAL EFFECTIVENESS OF DIVISIONS IN THE FIELD. THE PRIME CONTRACTOR, LING TEMCO VOUGHT MICHIGAN DIVISION, WILL DEVELOP, TEST AND INTRODUCE THE WEAPON SYSTEM TO THE U.S. ARMY UNDER SUPERVISION OF THE U.S. ARMY MATERIEL COMMAND.

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TOMORROW'S WEAPONS FOR TODAY'S ARMY

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