

SEGA  
**GENESIS**<sup>TM</sup>  
16-BIT CARTRIDGE



**M-1 ABRAMS**



**BATTLE TANK**<sup>TM</sup>

SIMULATOR SERIES

**INSTRUCTION MANUAL**



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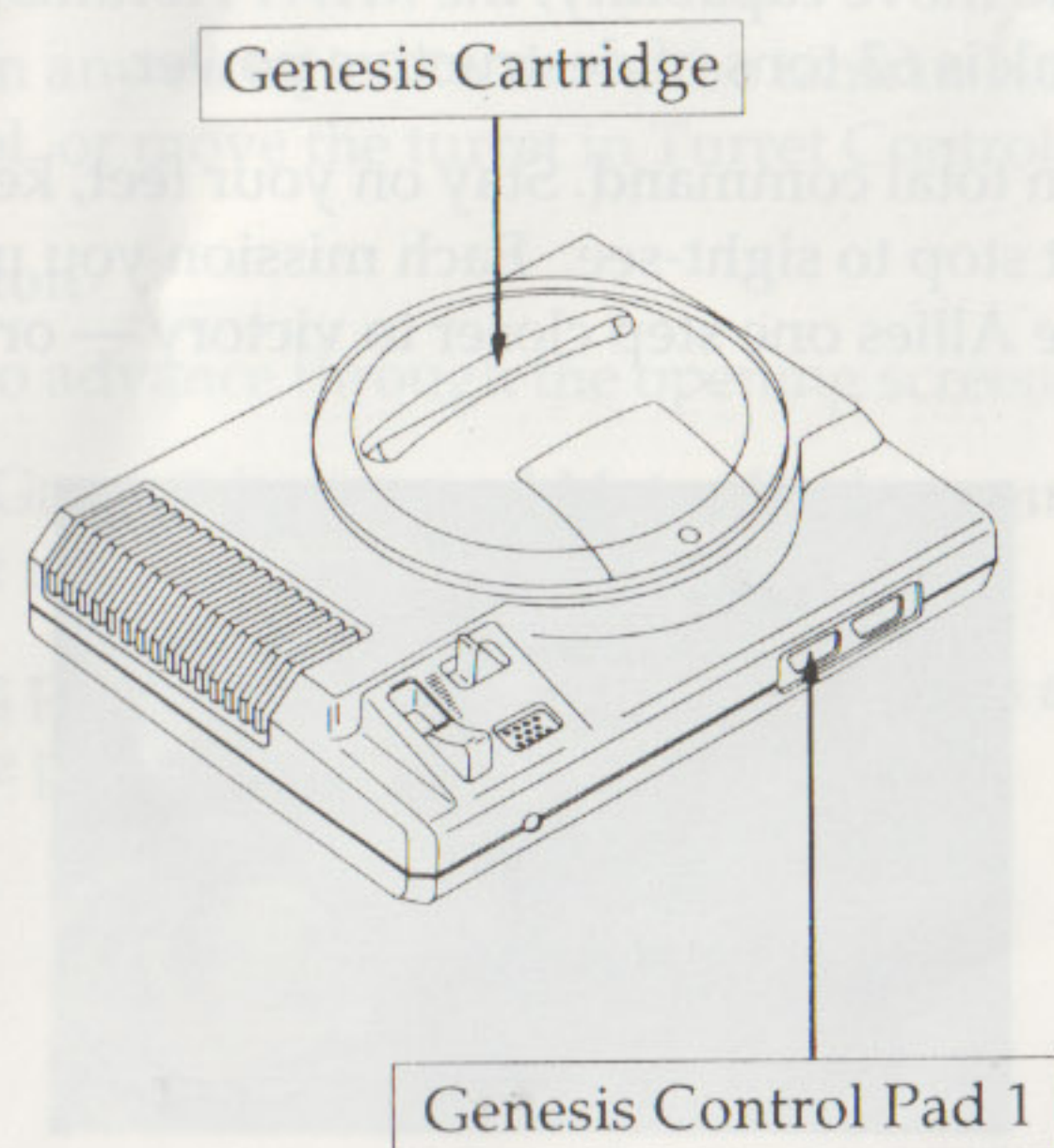
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## Starting Up

1. Set up your Genesis System as described in its instruction manual. Plug in Control Pad 1.
2. Make sure the power switch is OFF. Then insert the Abrams Battle Tank cartridge into the console.
3. Turn the power switch ON. In a few moments, the Abrams Battle Tank Title screen appears.
4. If the Title screen doesn't appear, turn the power switch OFF. Make sure your system is set up correctly and the cartridge is properly inserted. Then turn the power switch ON again.

**Important:** Always make sure the power switch is turned OFF before inserting or removing the cartridge.

**Note:** Abrams Battle Tank is for one player only.



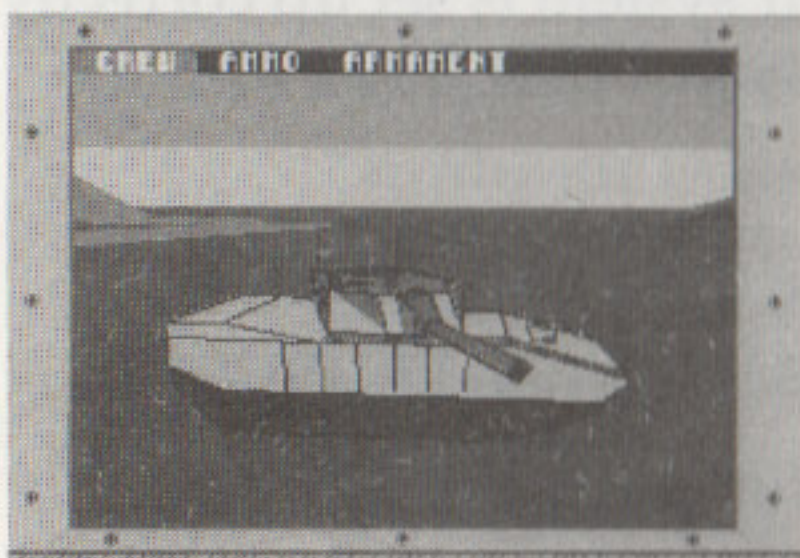


## World War III!

Has it finally happened?

You are assigned to stop the advance of Soviet troops into Germany. Victory hinges on the performance of the primary weapons system in non-nuclear, mechanized warfare: the Abrams M1A1 Battle Tank!

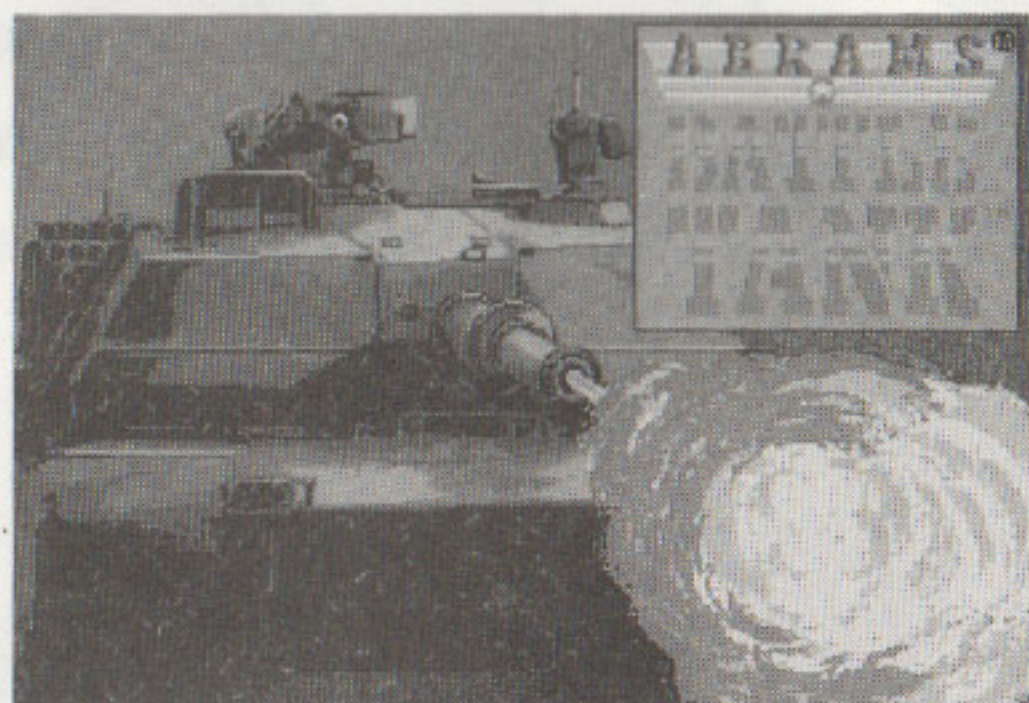
The upgraded Abrams Main Battle Tank recently fielded by the United States is respected by Allies and feared by enemies as the most formidable on-land weapons system in the U.S./NATO arsenal.



Its state-of-the-art battle-field technology includes thermal imaging night-sight capability and an on-board

ballistic computer. Powered by a 1,500 horsepower turbine engine and armed with a 120mm cannon for true fire-on-the-move capability, the M1A1 Abrams Main Battle Tank is 63 tons of destructive power.

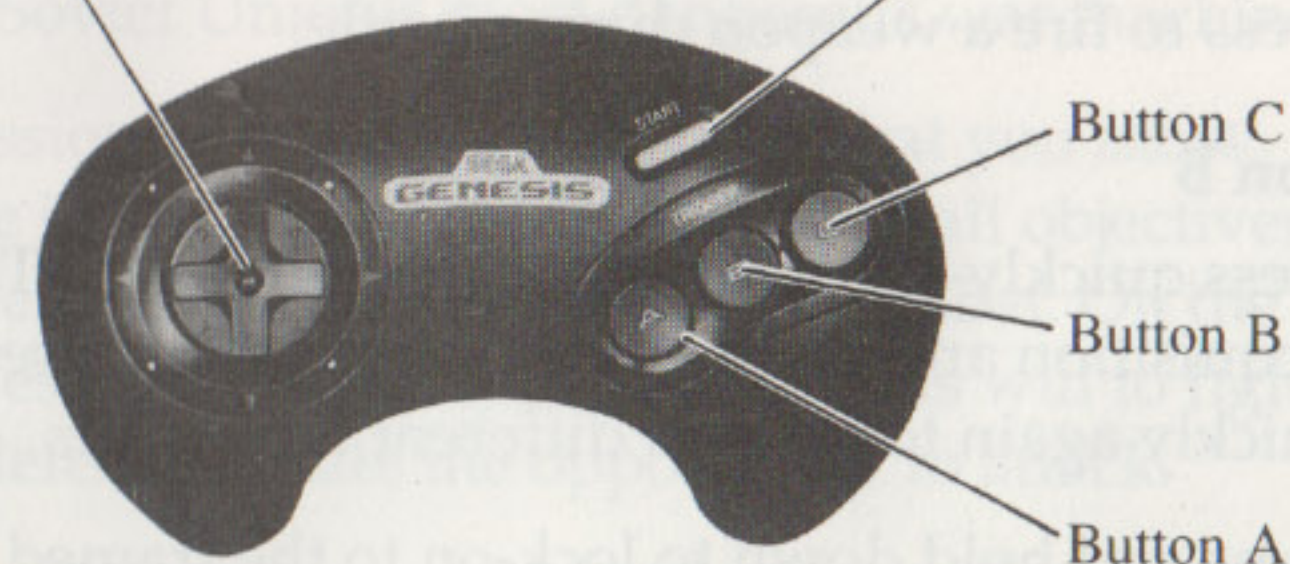
You are in total command. Stay on your feet, keep alert and don't stop to sight-see. Each mission you undertake brings the Allies one step closer to victory — or defeat!



## Take Control!

Directional Button  
(D-Button)

Start Button



### D (Directional) Button

- Press up or down to highlight the choices in a menu or selection window.
- Press left or right to change the settings of a highlighted choice.
- Press in any direction to move the tank in Hull Control, or move the turret in Turret Control.

### Start Button

- Press to advance through the opening screens.
- In the Game Selection and Motor Pool screens, press to start the game.
- During play, press to pause the game. Press again to resume play.



### Button A

- Press to quickly skim through the opening screens and conversation screens.
- Press to check a highlighted selection in a window.
- Press to fire a weapon during battle.

### Button B

- Press quickly to frame a target in the TADS (Target Acquisition and Designation System) box. Press quickly again to frame a different target.
- Press and hold down to lock-on to the framed target.

### Button C

- On the Demo screen, press to open the highlighted menu. Press again to close the menu.
- On a station screen, press to open the Station Control menu. Press again to close the menu.

### Reset Button (on console)

- Restarts the game from the Sega screen.

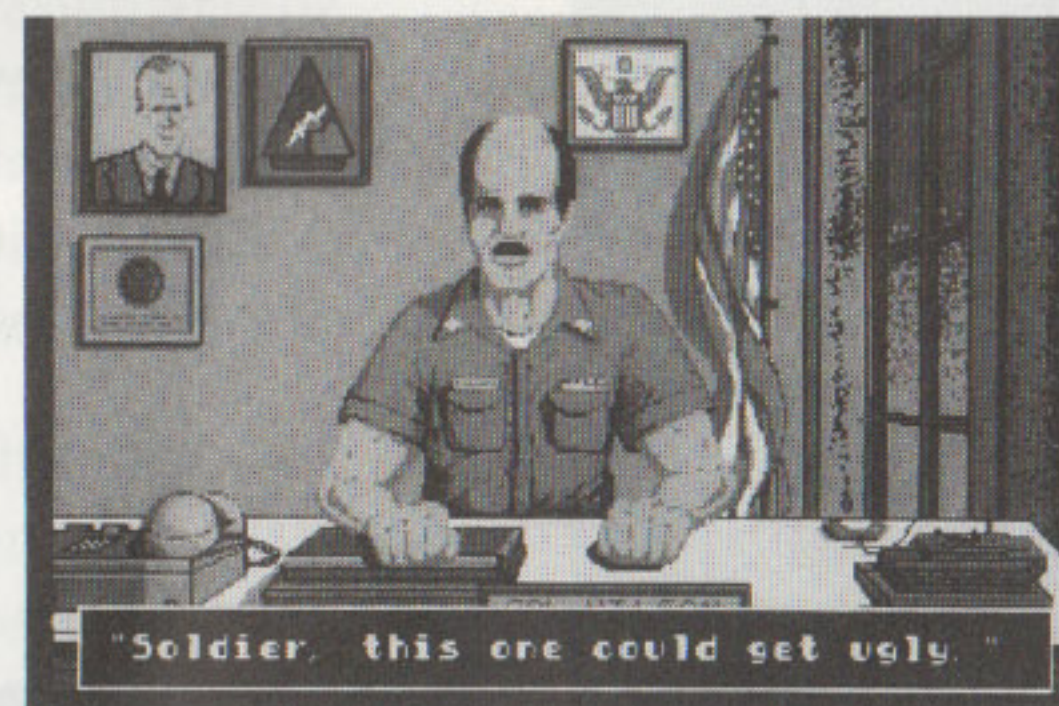
## Mission Objectives

As commander of the M1A1 Abrams Main Battle Tank — the M1 — you will lead your crew into eight missions in the WWII campaign. During the missions, you will face the Soviet Union's most dangerous war machines.

Each mission contains specific goals that you must complete in order to succeed. Your overall objectives are those of any military commander in combat. On the attack, destroy the enemy and shatter his will to fight. On the defense, create the opportunity to attack.

Never hesitate to engage in battle. Just make sure you're not shelling Allies. It won't look good on your military record. And when you can, use the right weapons for the right job.

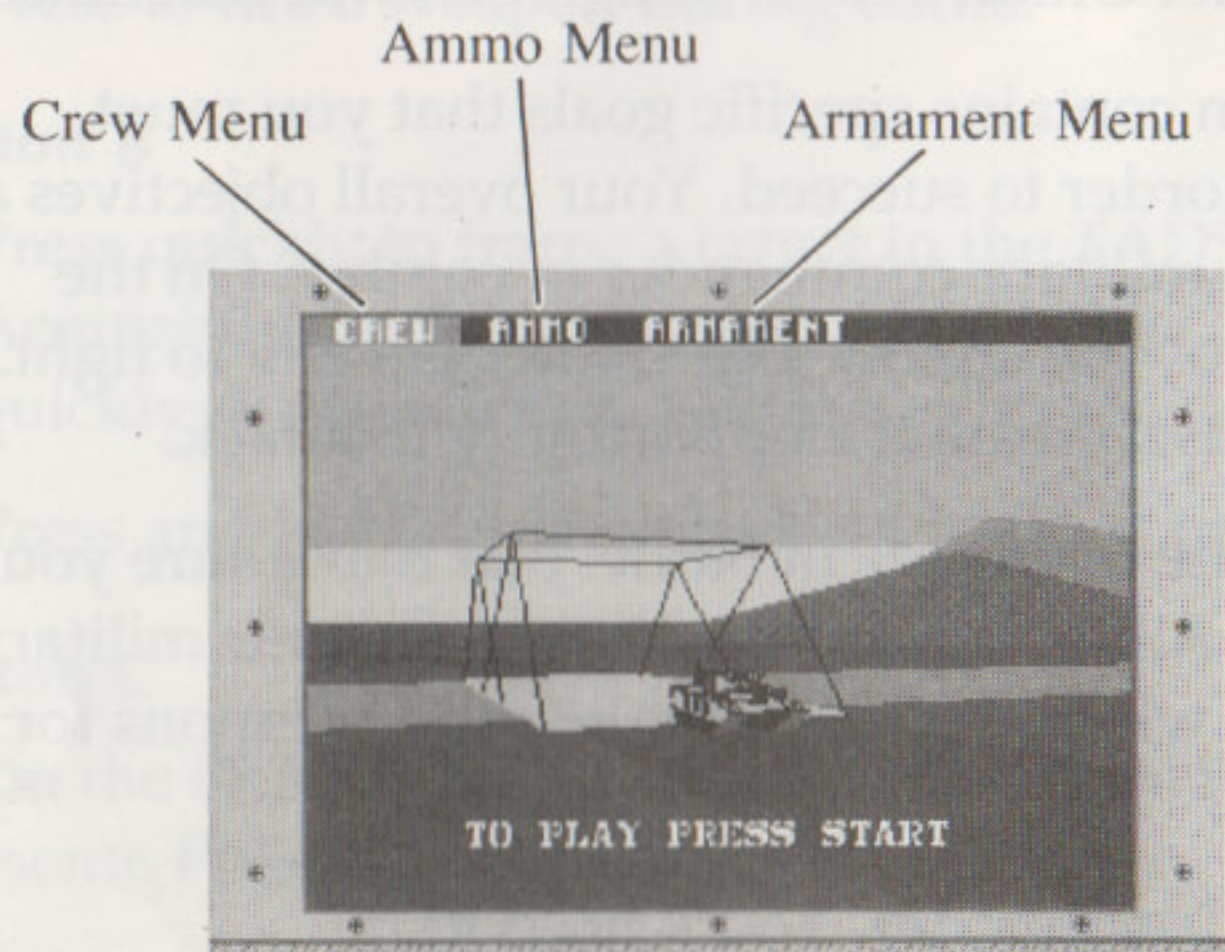
Good luck, Commander. You'll need it!





## The Demo Screen

Press Start at the Title screen to begin a technical survey of your crew, ammunition, and armament. Watch as your M1 battle tank rolls into view on the Demo Screen.



The Demo Screen has three menu options: Crew, Ammo, and Armament. Press the D-Button left or right to highlight a menu. Then press Button A to see it. When a menu window is open, press any button to close it and continue the demo.

### Crew Menu

Selecting Crew opens a window that shows your crew and their color-coded stations in the tank. Your four-man crew consists of the Driver, the Gunner, the Loader, and you, the CO (Commanding Officer, also known as TC, Tank Commander).



## Ammo Menu

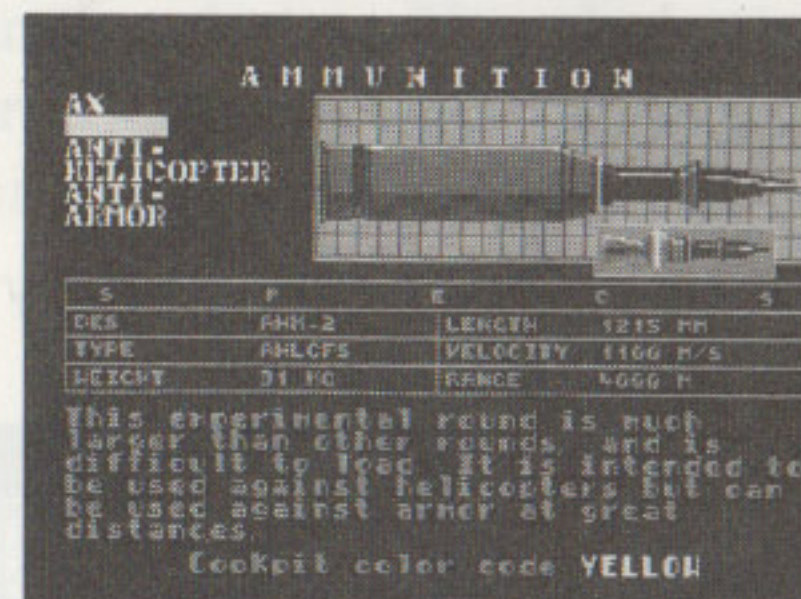


Select Ammo to see its menu of three choices: AX, HEAT, and Sabot. Press the D-Button down or up to highlight a choice, then press Button A.

A window will open describing that type of ammunition. You'll see its name, specs, and description. On the right of the window you'll see its non-deployed and deployed views. You'll also see the color code for finding its ammo switch on your Gunner's display. Press any button to close the window and select another type of ammo or continue the demo.

### AX

Choose this to see information on the anti-helicopter and long-range armor piercing ammunition.



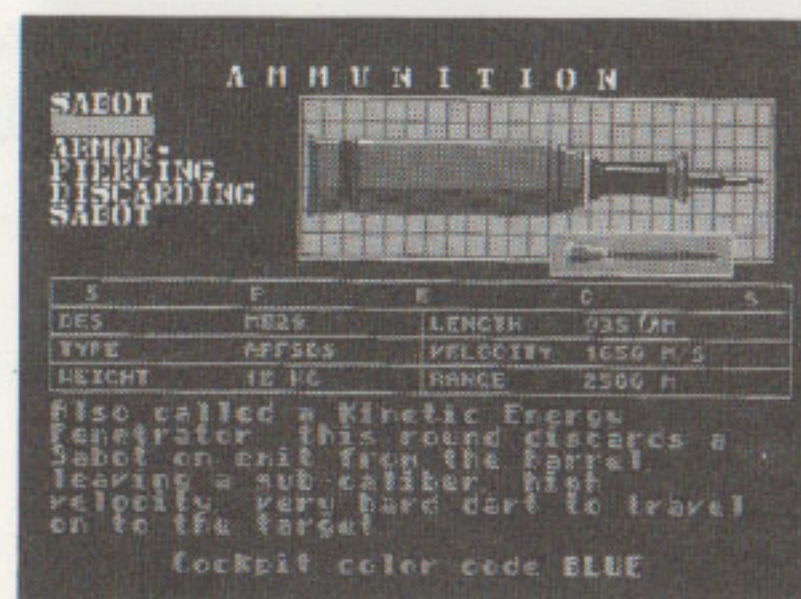
### HEAT

Selecting this shows information about your high-explosive anti-tank warheads.



### SABOT

Choose this to find out about short-range armor-piercing ammunition.



**Note:** See the Ammunition section for more details.



## Armament Menu

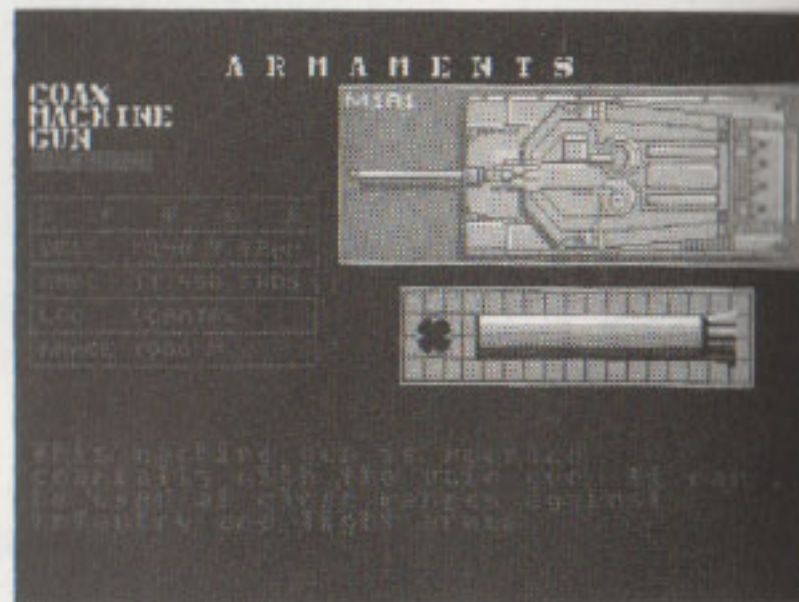


Select Armament to see its menu with these choices: COAX, Cannon, and Smoke. Press the D-Button down or up to highlight a choice, and then press Button A.

You'll see a window describing the armament with its name, specs and details. On the right you'll see its position on the tank, and a close-up of the weapon. Press any button to close the window and select another type of armament or continue the demo.

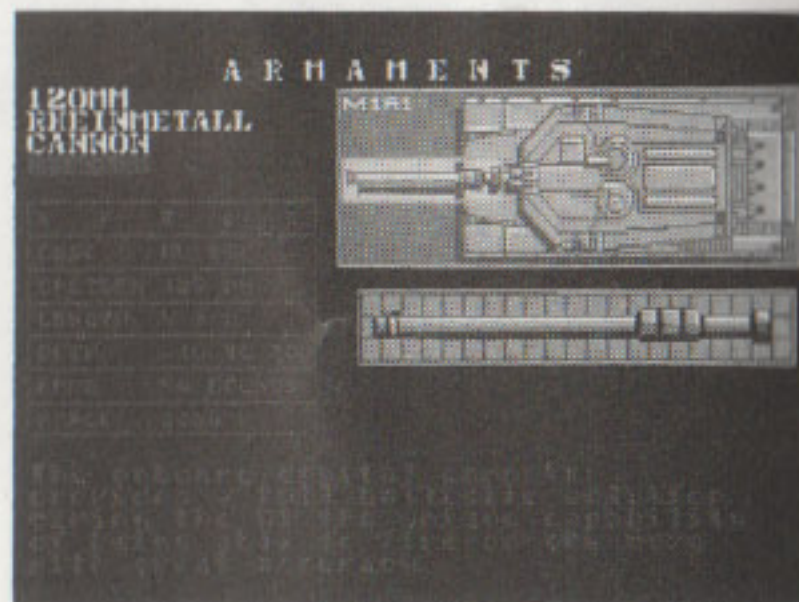
### COAX

Choose this to see information about your coaxial, close-range machine gun for firing on enemy infantry and light armor.



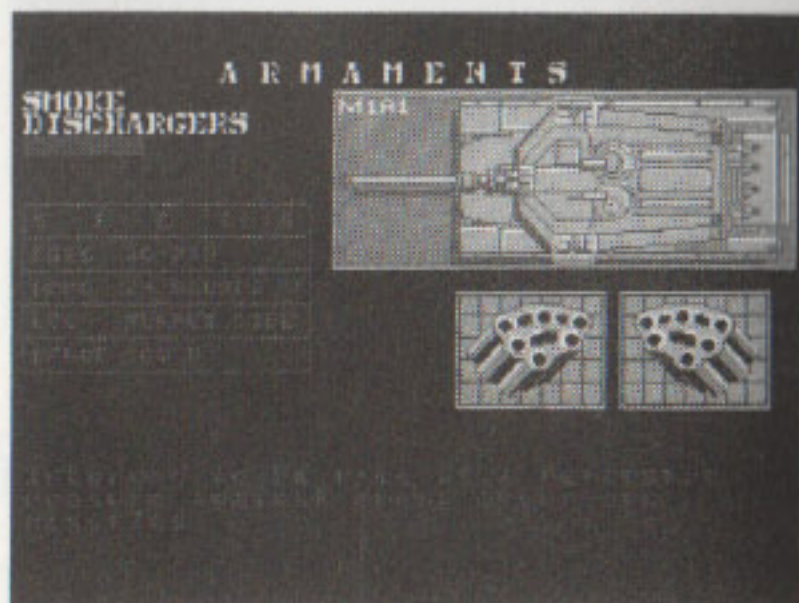
### CANNON

Selecting this shows information about your deadly accurate, fire-on-the-move ballistics.



### SMOKE

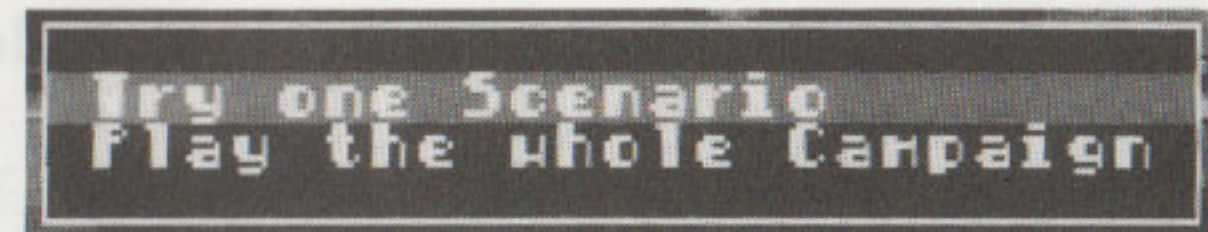
Choose this to find out about your smoke-cover defense against enemy armor and missiles.



**Note:** See the Armament section for more details.

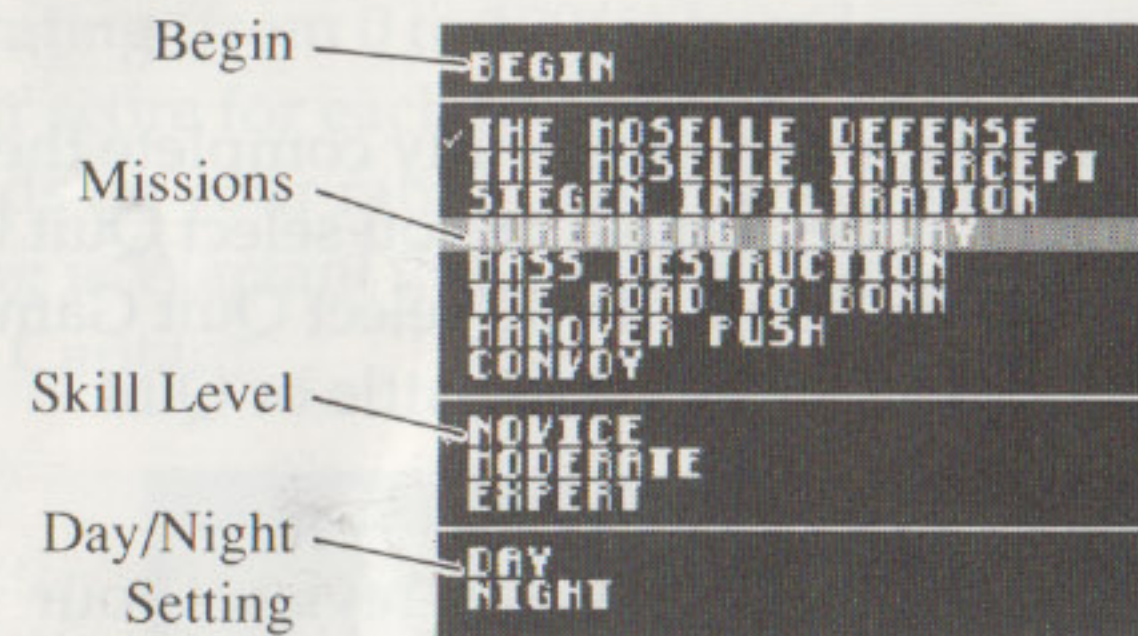
## Getting Started

On the Demo Screen, press Start to begin the game. A window will open with two choices for game play. Press the D-Button down or up to highlight your choice, and then press Button A.



### Try One Scenario

Choose this to undertake a single mission. This choice is excellent for command training, since you control the skill level and choose a day or night setting. This window will open:



Press your D-Button up and down to highlight different selections. When a selection you want is highlighted, press Button A to mark it with the check mark.



## BEGIN

Highlight this and press Button A to begin your mission (or press Start from anywhere in the window). You'll receive your mission briefing from Col. Wilson. Then you'll arrive at the supply depot.

## MISSIONS

Highlight the battle scenario you're ready to undertake.

## SKILL LEVEL

Choose one of three skill levels: Novice, Moderate or Expert. As the levels get harder, your attackers increase. They become more determined to destroy you and tougher for you to hit.

## DAY/NIGHT SETTINGS

Choose whether the battle will take place in daylight with high visibility, or in dangerous darkness.

## ENDING A SCENARIO

A scenario ends when you successfully complete the mission, your tank is destroyed, or you select Quit Game from any menu in the game. If you select Quit Game, you can then choose Continue the Battle or Quit Anyway.

At the end of a scenario, Col. Wilson reviews your efforts and you receive your mission summary. Your score (from 0 to 500) is based on the number of enemy kills and how completely you fulfilled the mission's objective.

## Play the Whole Campaign

Make this choice to go on a tour of duty through all eight scenarios. All the settings will be decided by fate, including the order of battle scenes.

Press Button A to start the campaign, receive your briefing from Col. Wilson, and then go on to the supply depot.

## ENDING A CAMPAIGN

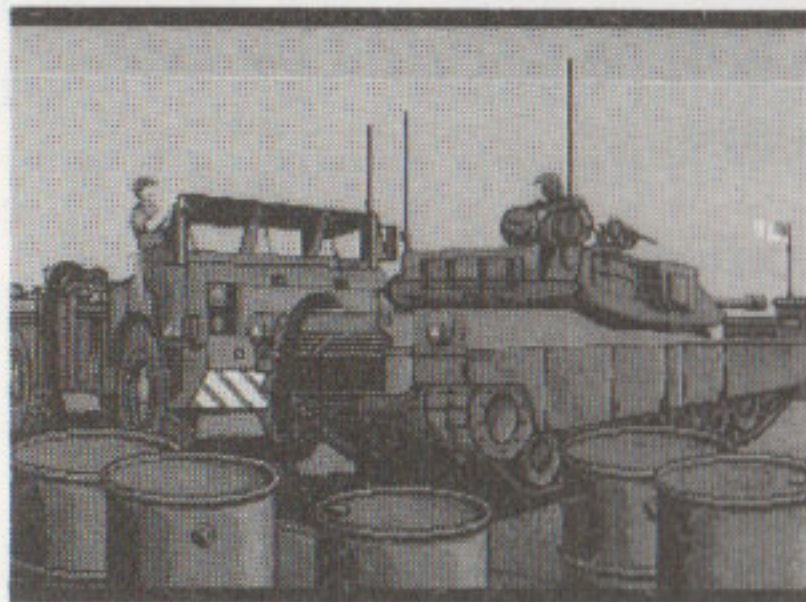
A full campaign ends when you finish all missions, your tank is destroyed, or you quit the game. To leave the game, choose Quit Game from any menu during the battle. Then select either Continue the Battle, Quit Anyway, or Abandon the M1. After quitting, Col. Wilson will review your performance and you'll receive a battle rating. Press Button A to see all campaign summary screens.

Your rating (from 0 to 100) is based on a rough average of your score for each scenario. The ranking you get depends on your rating. The lowest, most humiliating ranking is Warrant Officer. The highest, most praiseworthy, is Captain.





## Supply Depot



On your way to battle, you'll stop by the supply depot. While the supply orderly fills your tank, you can requisition ammo. Press the D-Button down or up to highlight the choices. Press it left or right to change the settings.

### BEGIN

Highlight this and press Button A to begin the battle. (Or press Start from anywhere in the menu.)



### HEAT, SABOT, and AX

Highlight any of these to load ammo. Press right or left to increase or decrease the number. Changing one setting may change the other settings, so that the total amount of ammunition is always 40 or less.

### GOVERNOR

This monitors your tank's engine. Highlight it and press left or right on the D-Button to turn it on or off.

When the governor is off (no checkmark), you can drive the tank at top speed, about 100 km/h. You also run the risk of overheating. As the engine overheats, the tank slows. If you continue your push, the engine will burn out and the tank will stall. Permanently.

When the governor is on (checkmarked), your maximum speed is limited to about 78 km/h, but your engine is protected from overheating.

## M1 Operations

As tank commander, your success depends on your overall knowledge of the M1 and your ability to use the main battle tank to its full potential.

### Station Controls

You can view the battlefield from four different positions: the Driver's station, the Gunner's station, the Tank Commander's station, and the Cupola atop the tank. To succeed, you must become completely competent from each of these positions.

At each station, pressing Button C opens the Station Control menu. Press the D-Button up and down to highlight the selections. Press left or right to change their settings. See **MI Battle Stations** for more information about operating your tank from each position.

**Note:** You cannot control the tank while a Station Control menu is open.

### Moving Your Tank

You can move the tank from all stations by using your D-Button.

D-BUTTON	ACTION
Press up.	Accelerate forward and/or cancel spin.
Press down.	While moving, slow tank down. From a full stop, move tank in reverse and/or cancel spin.
Press left.	Initiate a left spin.
Press right.	Initiate a right spin.



Holding down the D-Button accelerates the tank in the direction it's moving. For example, pressing left and quickly releasing the button starts a slow turn to the left. Pressing left and holding down the button causes the tank to spin faster and faster.

While turning in either direction, press the D-Button forward, backward, or in the opposite direction to stop the turn.

**Note:** When turning, check your heading and bearing. Heading is the tank's direction; bearing is the turret's direction. North is 0, east is 90, south is 180, west is 270.

## Moving the Turret

You can control your turret from all stations. On the Gunner and Tank Commander displays, you'll see the outlines of your tank hull and turret. (You won't see their outlines in the Cupola or Driver's station.)



Press Button C to see your Station Control menu. Move the highlight to Hull Control, then press the D-Button left or right to switch to Turret Control. Press Button C again to close the menu.

Depending on your setting, you'll control either the hull or the turret during battle. On the display, the area (hull or turret) in white is the one under control.

In Turret Control, press the D-Button left or right to turn the turret. Press up or down to raise or lower it. Open your Station Control menu again and highlight Align Turret to realign the turret with the front of the tank.

**Note:** Notice that when you're moving the turret, your bearing (turret direction) changes, but your heading (tank direction) doesn't.

## Scanning the Battlefield

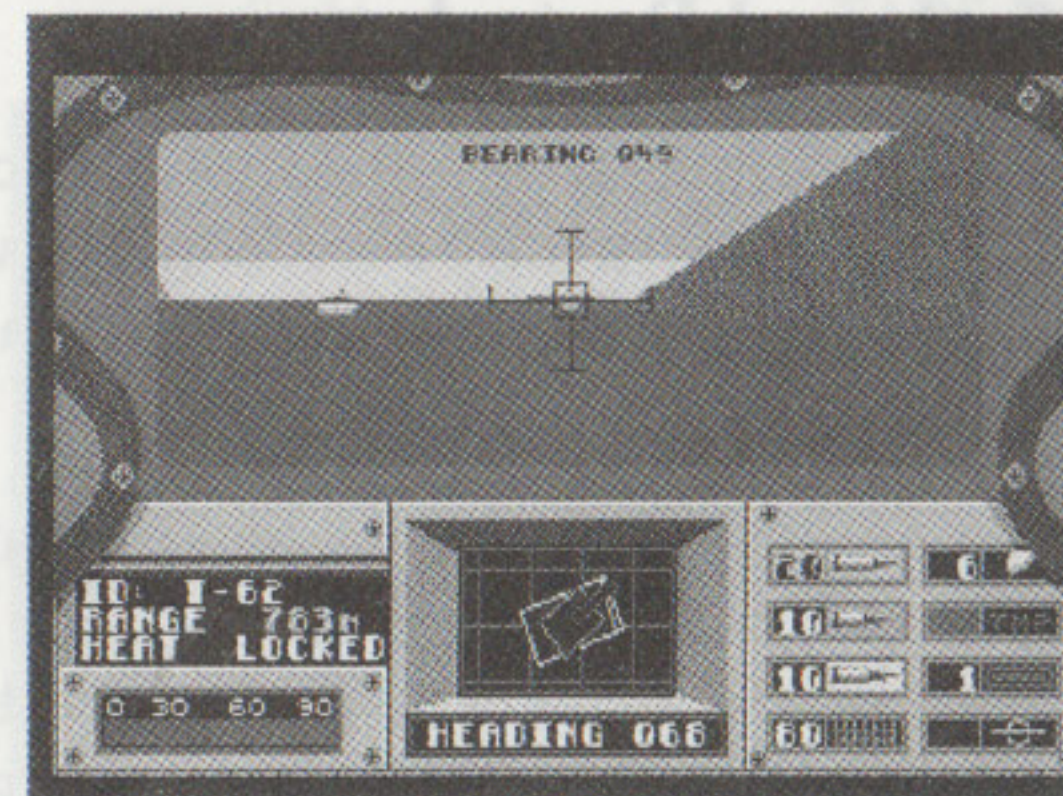
From all stations, you can see the battlefield in the direction the tank (or turret) is heading. From the Tank Commander's station, you can scan the war zone in all directions.

In the Tank Commander's station, open the Station Control menu and highlight the Look option. Then press the D-Button left or right to cycle through four views: front, left, back, and right. Press Button C again to close the menu and look in that direction.



## Firing a Weapon

You can only fire from the Gunner's station. If you're not already in that position, open your Station Control menu and select Gunner. Then find your target and quickly press Button B. The TADS (Target Acquisition and Designation System) box will frame the target.



To frame a different target, press Button B again. If no more targets are available, the TADS box will disappear. If you don't see a box at all, then the target you've chosen is not a legitimate one or is not on your viewer. (You can't target trees, mountains, or Allied bases.)



Check the Target Readout in the lower left corner of your display for the target I.D., its range, and which of your weapons is ready to fire. Press and hold Button B to lock the crosshairs of your sight onto the target. The word "Locked" will appear next to the target name in the ID box.

**Note:** You cannot lock-on while a weapon is being loaded.

Press Button A to fire. You can fire without being locked-on to a target, but your weapon's accuracy will be reduced.

## Using the Radio

Whenever you hear a Morse code signal, open your Station Control menu and select Radio. You'll receive incoming messages from headquarters about battle conditions. If no messages are incoming, you'll get silence. You can only turn the radio on from the Tank Commander's and Gunner's stations.

## Refit, Refuel, and Restock

You start each scenario near an Allied base. Each mission has at least one friendly base; some have more. To repair the tank, refuel, and take on more ammo, drive onto an Allied base.

There is no limit to how many times you can take refuge at a base. While you're there, your tank will be completely repaired and refueled. You can also restock your ammo and reset your governor. (For information about the governor, see the **Supply Depot** section.)

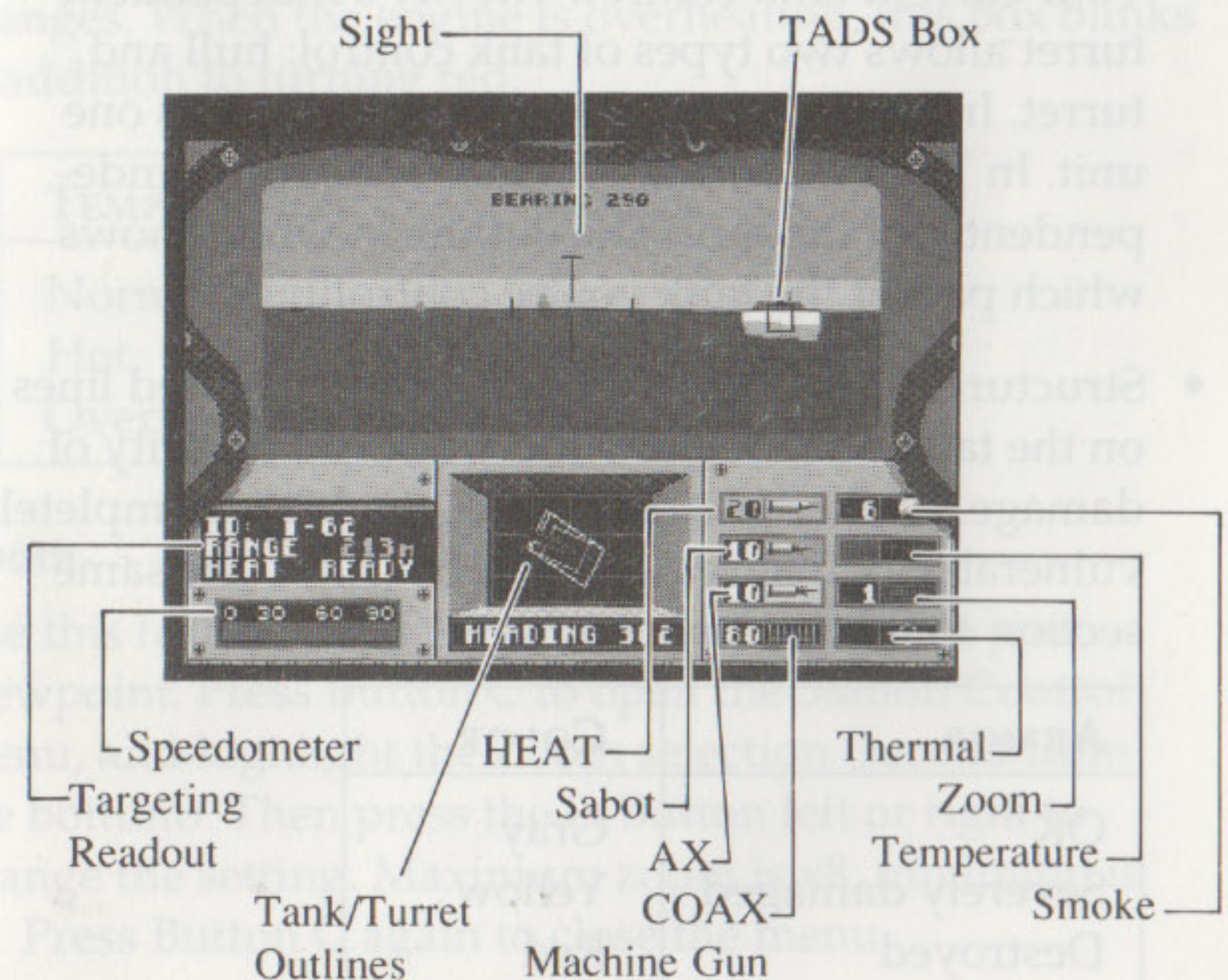
## M1 Battle Stations

The M1 holds four crew members: the tank commander, the gunner, the driver, and the ammo loader. Except for the loader, each crew member has a station from which you can operate the tank and view the battlefield. The tank commander has two stations.

### Gunner's Station

The gunner is responsible for acquiring, identifying, and firing on targets. He has a sight looking down the cannon barrel, and multiple magnifications for viewing distant objects. He also has a thermal-imaging system that lets him see at night or during smoke-covered operations.

The Gunner's Station is the first screen you see when you enter the tank. To return to this station from another position, open the Station Control menu and change the top setting to Gunner.





## Gunner's Viewpoint

From the Gunner's viewpoint, you look out onto the battlefield through the front of the turret.

## Bearing

At the top of the screen is the turret's bearing, or the direction in which it is facing. North is 0, east is 90, south is 180, and west is 270. Since the turret operates independently of the tank's hull, it can be facing in an entirely different direction.

## Tank/Turret Outlines

The outlines on the moving grid at the bottom center show your tank and give you three types of information.

- A visual of the direction the tank is moving (north is the top of the grid). Knowing where the front of your tank is lets you determine whether you're going forward or backward. You can also see where your turret is in relation to the tank's hull.
- Your current tank control. The M1's independent turret allows two types of tank control: hull and turret. In Hull Control, you move the tank as one unit. In Turret Control, you move the turret independently of the hull. The outline in white shows which part of the tank you're controlling.
- Structural damage to the M1's armor. Colored lines on the tank outline show the areas and severity of damage. If an area is destroyed, the M1 is completely vulnerable in that region. Another hit to the same section could destroy your tank!

ARMOR	COLOR
OK	Gray
Severely damaged	Yellow
Destroyed	Red

## Heading

Your heading is the direction in which the front of the tank is pointing. North is 0, east is 90, south is 180, and west is 270.

## Speedometer

The M1 has top speeds of 100 km/h with the governor off and 78 km/h with the governor on. Top speeds are lower when you're traveling over rough terrain.

## Weapons

Weapons include HEAT rounds, Sabot rounds, AX rounds, COAX (coaxial machine gun) rounds and smoke cannisters. Next to each weapon you see the number of ammunition rounds remaining. You load HEAT, Sabot, and AX rounds at the supply depot. While you're there, you also take on 80 COAX rounds and six smoke cannisters.

## Temperature

When the temperature of the engine increases, the color changes. When the engine is overheating, this box blinks in addition to turning red.

TEMPERATURE	COLOR
Normal	Green
Hot	Yellow
Overheating	Red

## Zoom

Use this feature to change the magnification of your viewpoint. Press Button C to open the Station Control menu, and highlight the Zoom selection (second from the bottom). Then press the D-Button left or right to change the setting. Maximum zoom is x8; minimum is x1. Press Button C again to close the menu.



## Thermal Imaging

With this state-of-the-art vision system you can effectively operate in smoke and darkness. Open the Station Control menu and highlight Thermal. Press Button A to toggle the imaging on and off. The screen turns red/black when thermal imaging is on.

## Targeting System

The Gunner's targeting system has five parts:

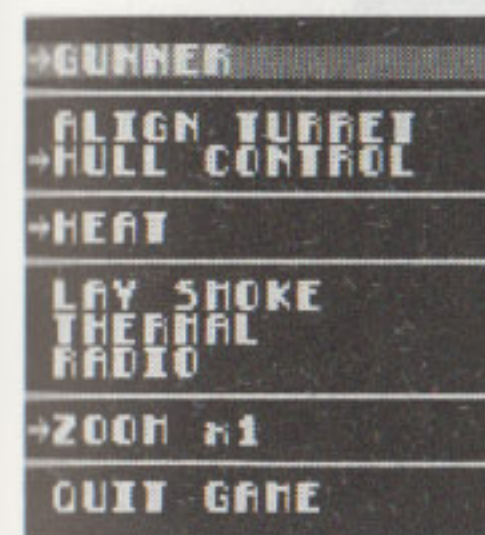
- **TADS (Target Acquisition and Designation System) Box:** This box moves through all targets on screen. Quickly press Button B to activate the TADS box. Continue pressing Button B quickly to toggle through all available targets. When there are no more targets, the frame disappears.
- **Sight:** The crosshairs of the sight show the current position of the targeting system (where the turret is pointed). When you lock-on to a target with TADS, the sight will center on the TADS box. Press and hold down Button B to lock-on to a target.
- **ID:** Located in the Targeting Readout, this identifies the target currently in the TADS box.
- **Range:** Located in the Targeting Readout, this gives the distance of the target in the TADS box. The color in the Range box indicates the probability of a hit, depending on the target's distance and the weapon you've selected.

PROBABILITY OF HIT	COLOR
Less than 25%	Gray
Less than 50%	Green
Greater than 50%	Yellow
Greater than 75%	Red

- **Weapon Load:** Located in the Targeting Readout, this displays the current weapon selected, its loading status, and in-flight tracking status for guided weapons.

## Gunner's Station Control Menu

On the Gunner's screen, press Button C to see a menu of choices. Then press the D-Button up and down to highlight different choices. Press Button C again to close the menu.



**Gunner:** Press the D-Button left or right to change to another position in the tank.

**Align Turret:** Press Button A to align the turret with the front of the tank.

**Hull Control:** Press the D-Button left or right to switch between Hull and Turret Control.

**HEAT:** Press the D-Button left or right to choose a weapon.

**Lay Smoke:** Press Button A to deploy a smoke cannister to cover your tank's movements.

**Thermal:** Press Button A to toggle between normal vision and thermal imaging.

**Radio:** After hearing a radio signal, press Button A to receive possible transmissions from headquarters.

**Zoom:** Press the D-Button left or right to change your zoom factor. The maximum is x8; the minimum is x1.

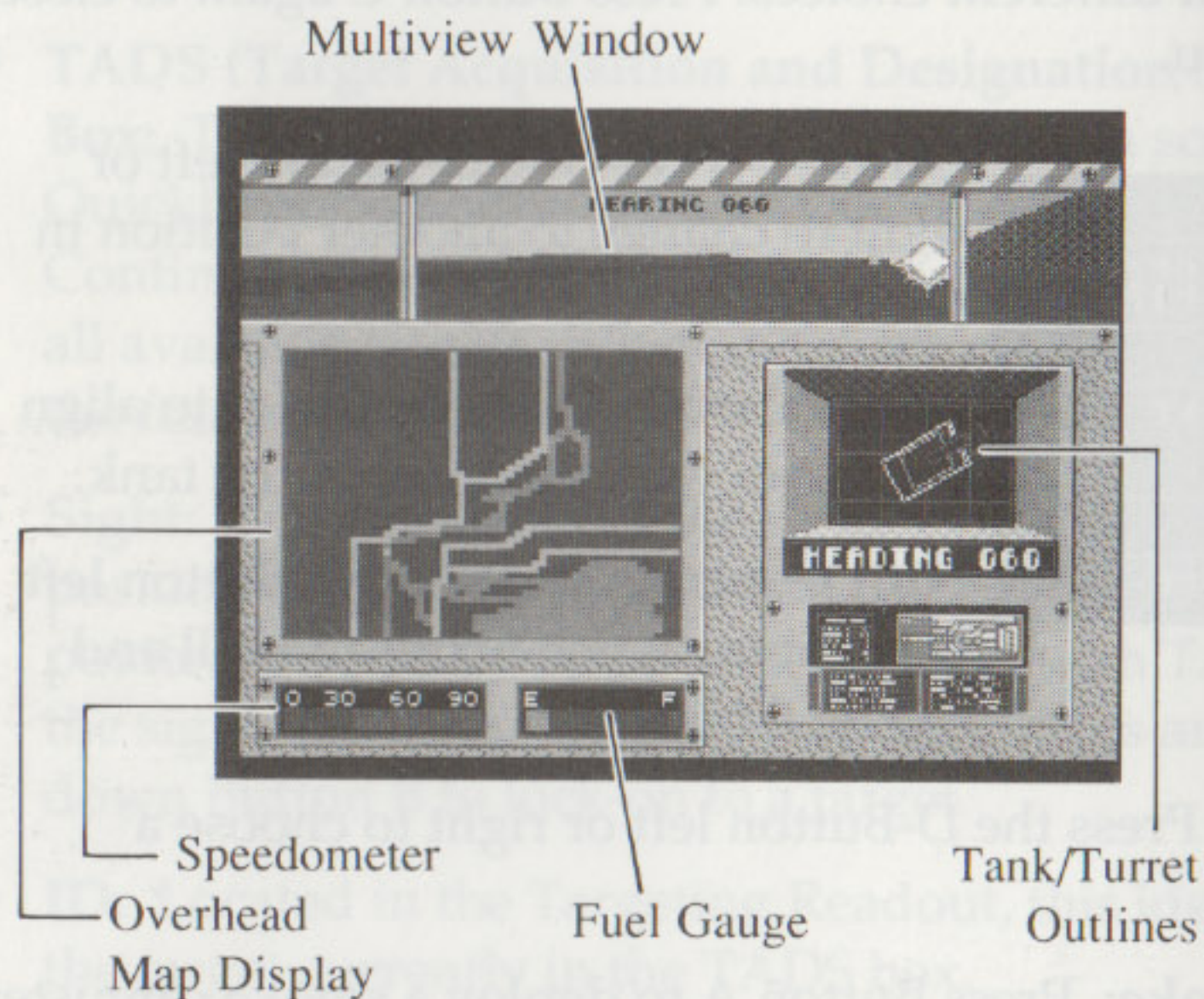
**Quit Game:** Press Button A to end the game.



## Tank Commander's Station

As the tank commander, you make strategic decisions from inside the turret. You have access to all maps of the area and a 360-degree viewing station.

Open the Station Control menu in any other station and change the first choice to Commander. When you press Button C, you'll go to the Tank Commander's Station.



### Multiview Window

This window is your view onto the battlefield. You can pan 360 degrees by revolving the tank. Or you can use the View selection from the Station Control menu to scan the war zone without turning.

### Tank Outlines, Bearing, Heading, and Speedometer

These indicators are the same as in the Gunner's Station. For descriptions, see **Gunner's Station**.

## Overhead Map Display

This shows a bird's-eye look at the terrain. Open the Station Control menu and use the Long Range/Close Up Map choice to toggle between the two views.

## Fuel Gauge

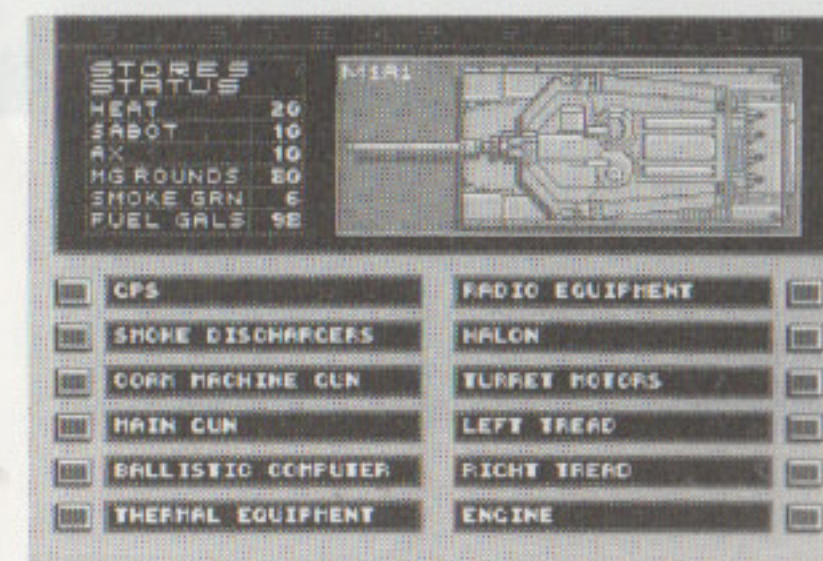
Your M1 holds 100 gallons of fuel. When you run out, you come to a dead stop. Then you've got three choices: wait for an attack, abandon the M1, or hope the mission will be completed. Keep an eye on the fuel gauge. When it's low, stop at a base to refuel — before it's too late.

## Tank Commander's Station Control Menu

On the Tank Commander's screen, press Button C to see a menu of choices. Use this menu and most of its selection, in the same way as for the Gunner's screen. The tank commander's special menu choices are:



**Check Damage:** Press Button A to go to the System Damage screen where you'll see what parts of your tank have taken hits. Learn to gauge the amount of damage quickly. With slight damage you can continue the mission; with severe damage you must return to an Allied base immediately for repairs. Press any button to return to your station.





**Long Range/Close Up Map:** Use the D-Button to toggle between the two bird's-eye views of the battlefield. The Long Range map shows the entire mission. The Close Up map has the most updated information.

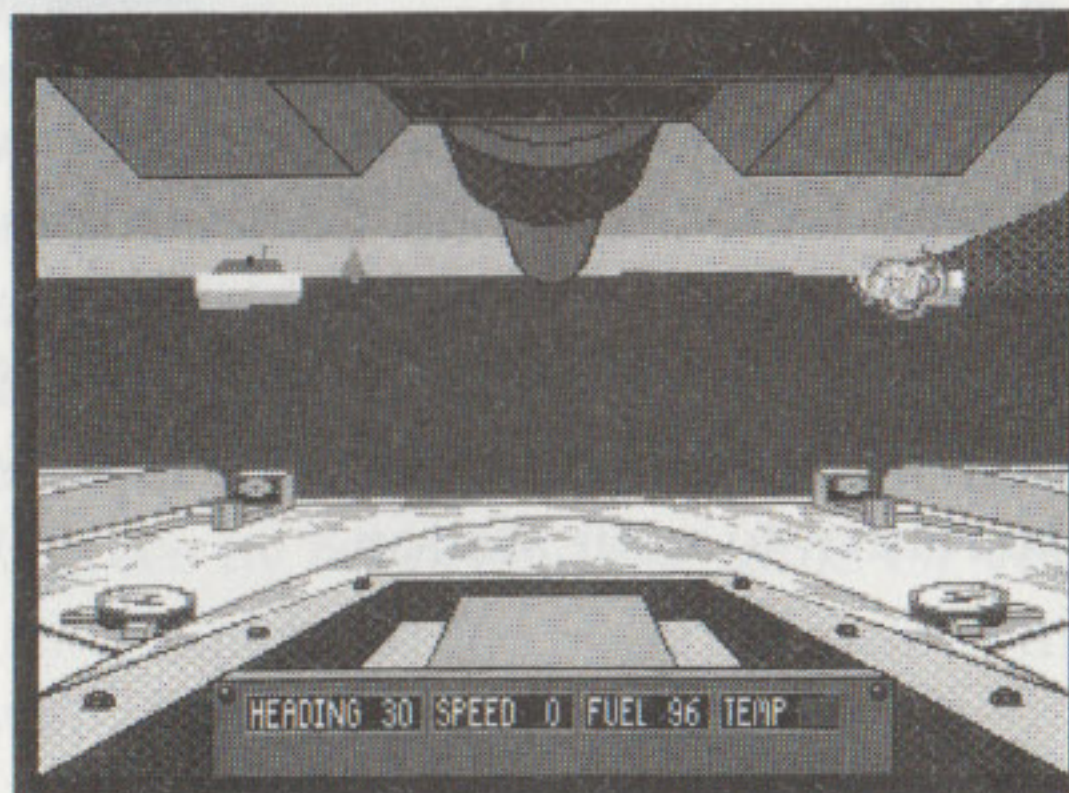
**Governor:** The governor controls your engine speed. Press Button A to toggle this switch on (checked) and off (no check mark). For more information, see the **Supply Depot** section.

**Look Forward/Right/Back/Left:** Press the D-Button left or right to choose one of four views.

## Cupola

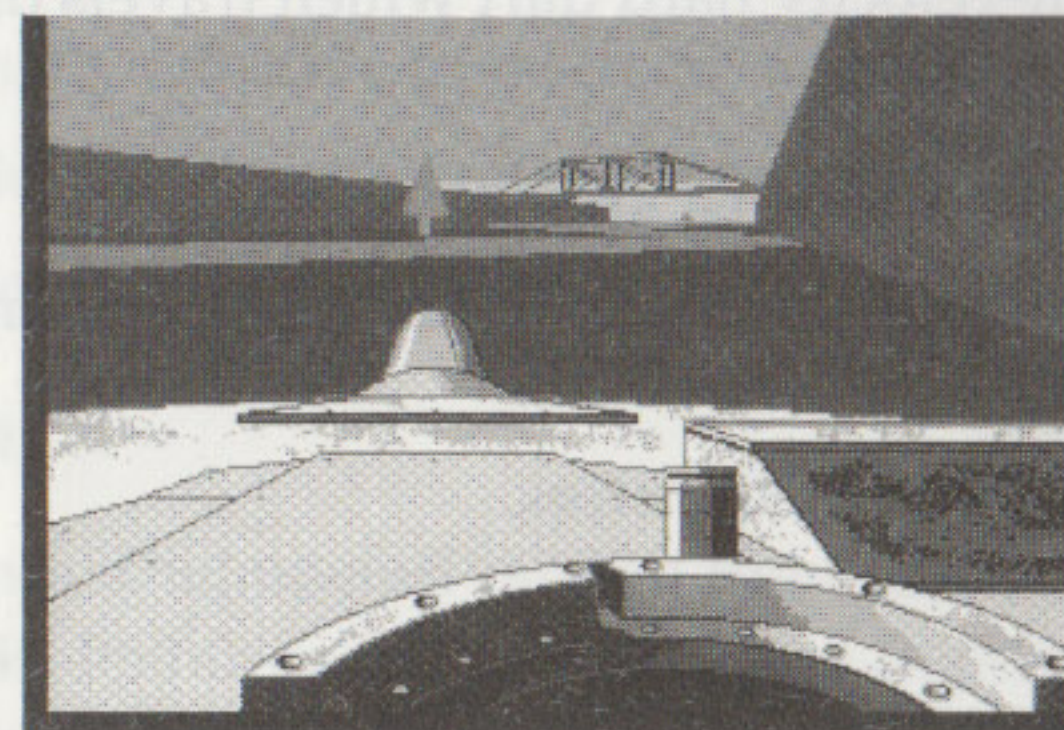
As tank commander, you can "go up top" to see the battlefield through your hatch in the turret. This station is the Cupola. The view from the Cupola is especially useful for spotting airborne enemies.

To get there, open the Station Control menu and change the first selection to Cupola.



## Driver's Station

The driver sits below the main gun in the front of the turret, where he's responsible for navigating the M1. Along the bottom of his display are the tank's heading, speed, fuel, and temperature.



To get to the Driver's Station from any other position, open the Station Control menu and change the first selection to Driver.

## Cupola and Driver's Station Control Menu

The menus for the Cupola and Driver's Stations are the same. They have four selections, which are explained in **Gunner's Station Control Menu**.





## **Ammunition**

### **Sabot**

This is an armor-piercing, fin-stabilized, discarding round. Also called a kinetic energy penetrator, it discards a sabot upon exit from the barrel, leaving a sub-caliber, high-velocity hard dart which travels on to the target. The sabot is:

- very effective against armor.
- ineffective against infantry, constructions, and aircraft.
- effective up to 2500 meters.

### **HEAT**

This high-explosive anti-tank weapon has a warhead with a shaped explosive around a hollow cone. The warhead is detonated before contact, producing a fiery tongue of gas that melts the target's armor. The HEAT is:

- very effective against infantry and constructions.
- effective against armor.
- ineffective against aircraft.
- effective up to 2000 meters.

### **AX**

This experimental anti-helicopter, anti-armor round is effective against all targets. Because of its large shell size and wire guidance, loading is slow. The AX is:

- very effective against aircraft.
- somewhat effective against armor, infantry, and constructions, especially at extended range.
- effective from 770 to 4000 meters.

## **Armament**

### **COAX**

This multi-purpose, coaxial, AA machine gun is an anti-infantry and anti-aircraft weapon. The COAX is:

- mildly effective against infantry and very light armor.
- marginally effective to ineffective against aircraft.
- quick-loading, independent of main rounds.
- effective from 0 to 1000 meters.

### **Cannon**

This 120mm Rheinmetall cannon fires sabot, HEAT, and AX rounds. Its range and effectiveness depend on the type of round fired.

### **Smoke Discharger**

This defensive weapon makes the M1 invisible to an enemy without thermal imaging. Smoke discharges are:

- defensive weapons against sight-guided armaments such as Spigots and Sappers.
- effective for about 20 seconds.
- effective up to 100 meters.

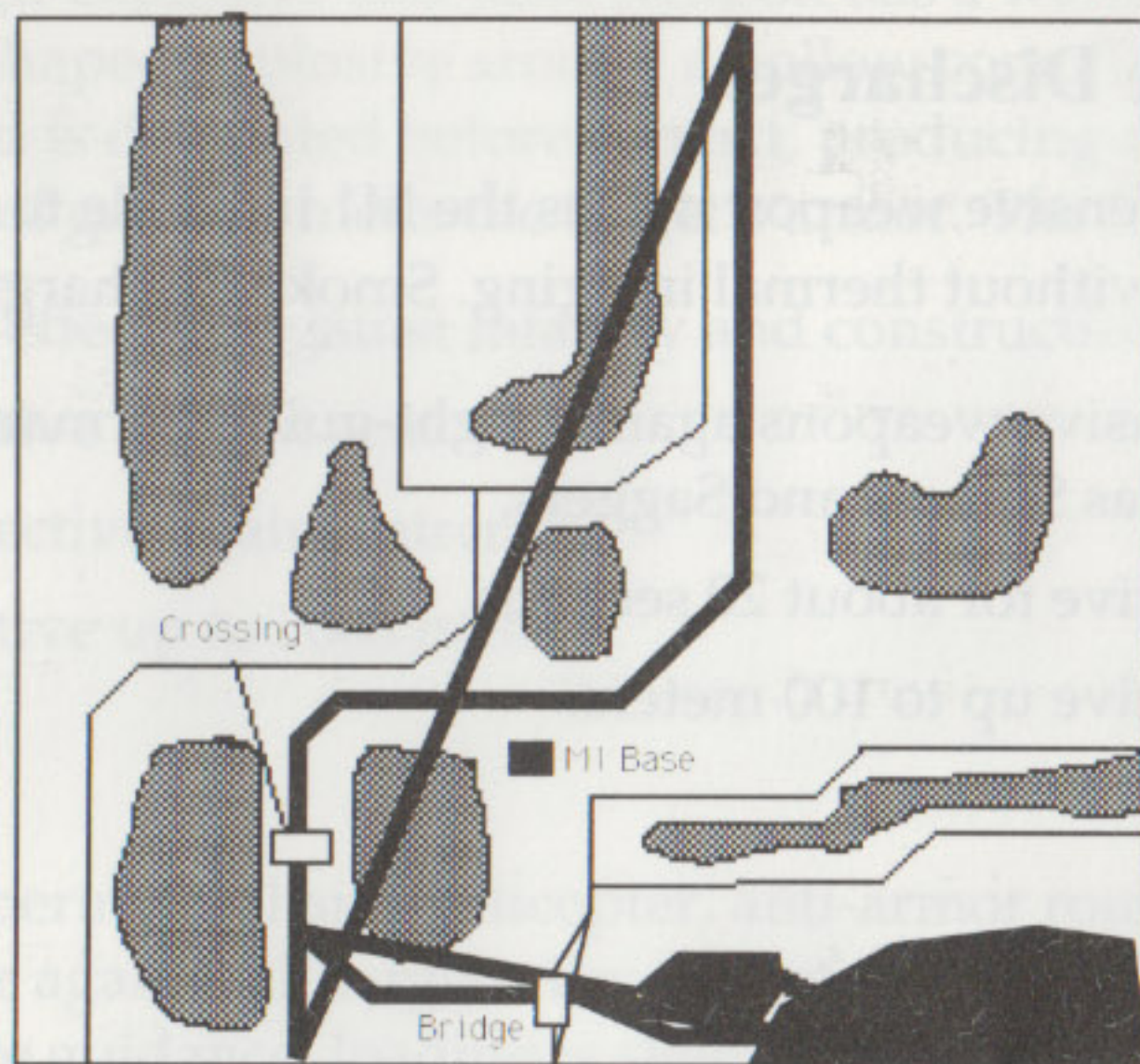


## The WWII Campaign

The following is your briefing on the war missions. The maps are rough sketches of the areas. Use them as guidelines, but do not consider them the ultimate authority on enemy activity and geographic conditions.

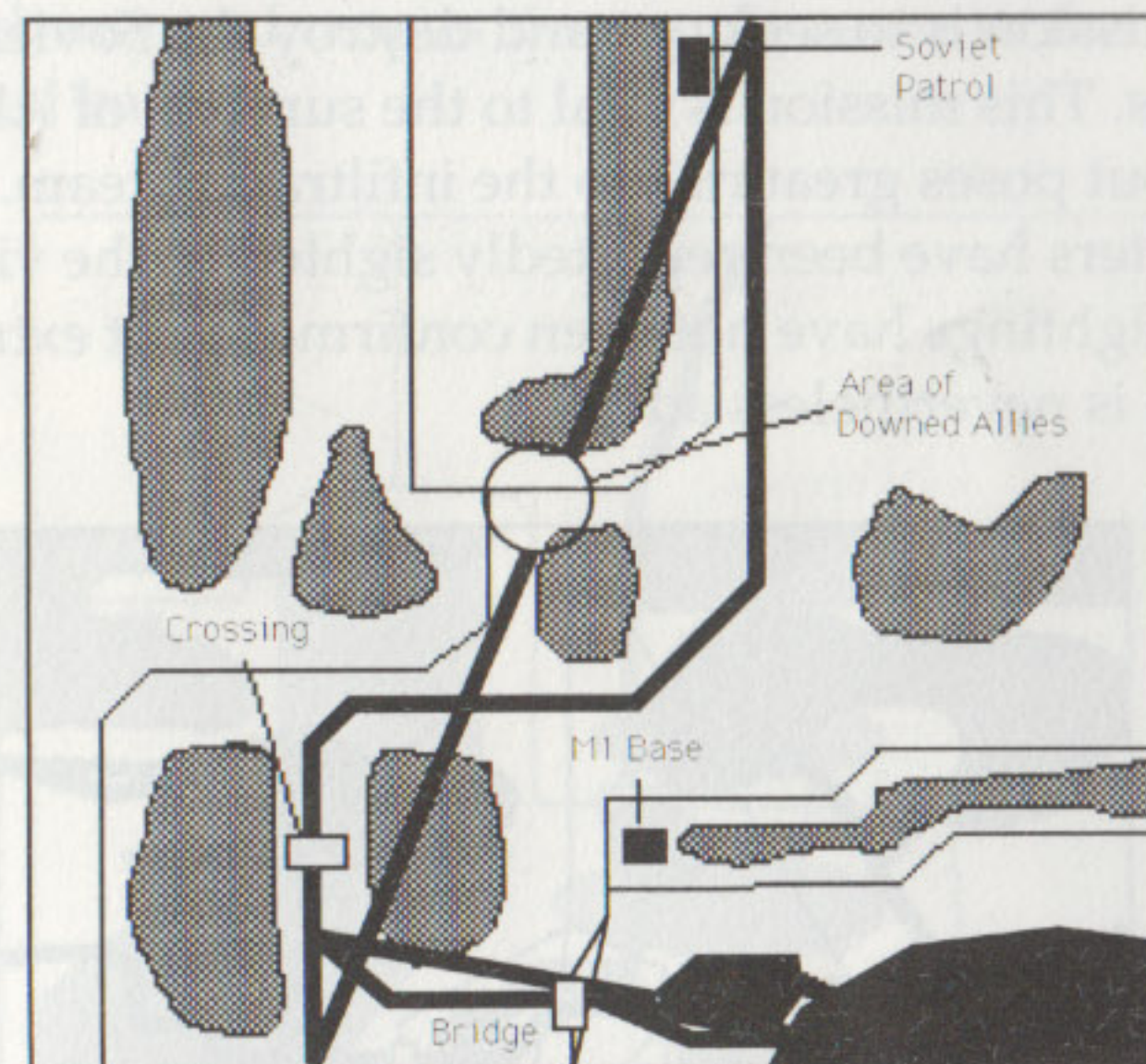
### The Moselle Defense

A crisis code has been transmitted through the intelligence hotline. The Soviets have cut through the Allied defenses and are heading straight for the Moselle River and your position. But that's only part of the problem. Reports are coming in that it is not just a few Soviet vehicles advancing, but waves of them. Your mission is simple: survive the onslaught and destroy all attacking Soviet machines.



## The Moselle Intercept

While at your current station between Pirmansens and the French border, you receive a distress signal from a damaged Allied troop to your west, across the Moselle River. It seems that they were surprised by a Soviet reconnaissance group and had several of their units damaged before they were able to destroy the attackers.



Air scouts have reported a small but powerful Soviet patrol heading southward along the Moselle, a route that will take them directly past the downed Allies. As the closest military base, you are their only hope.

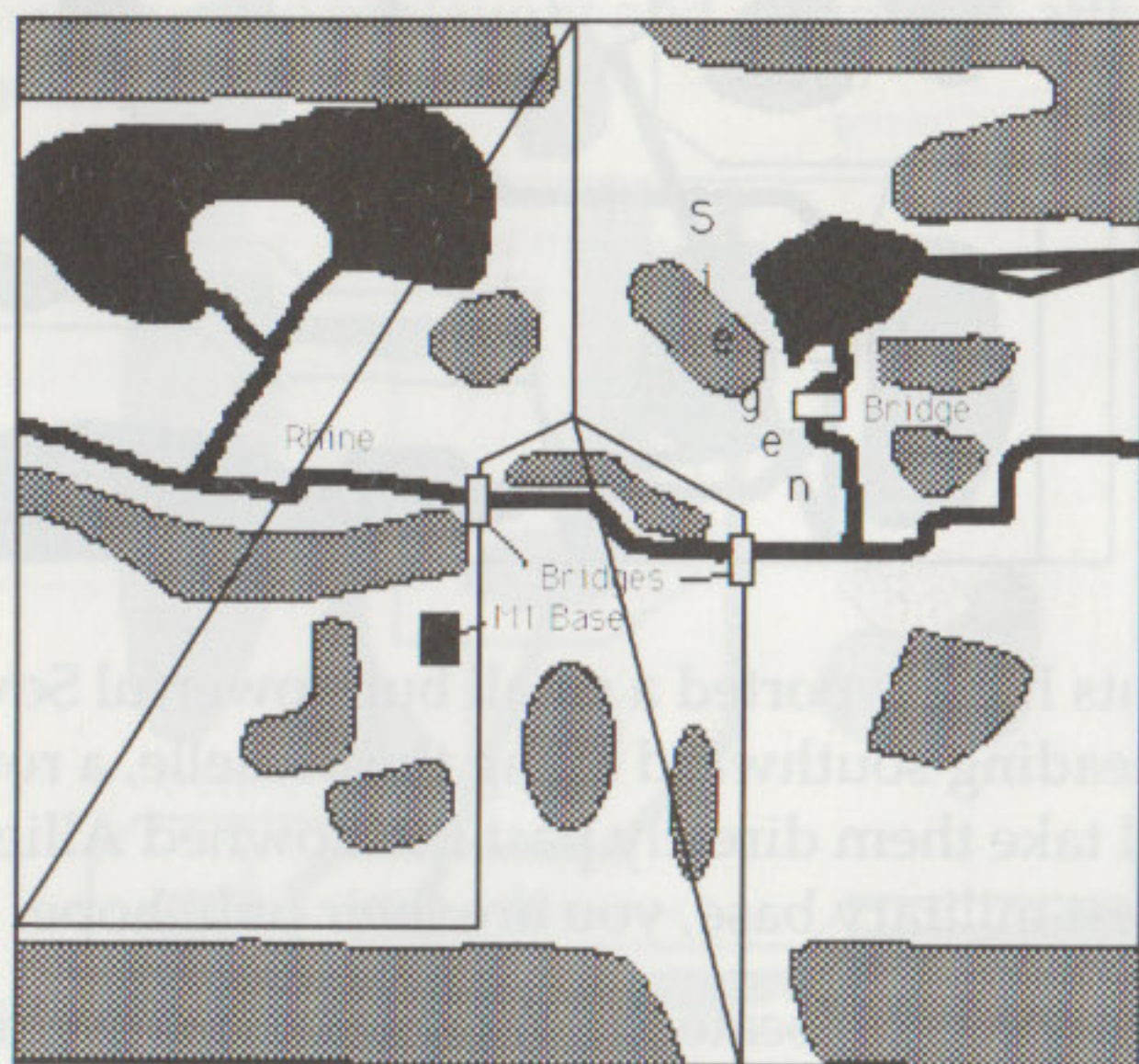
Your mission is to locate the damaged Allied vehicles before the Soviets reach them, and escort them to your base. Although patrols have reported the area fairly clear of enemy activity, you should remain on guard.



## Siegen Infiltration

In the last two weeks, critical supply convoys from Essen have been disappearing in the area of Siegen. Rumors point to the presence of one, possibly two Soviet bases somewhere in the Siegen hills. The area is extremely hilly, providing a perfect setting for ground and air attacks on unsuspecting targets.

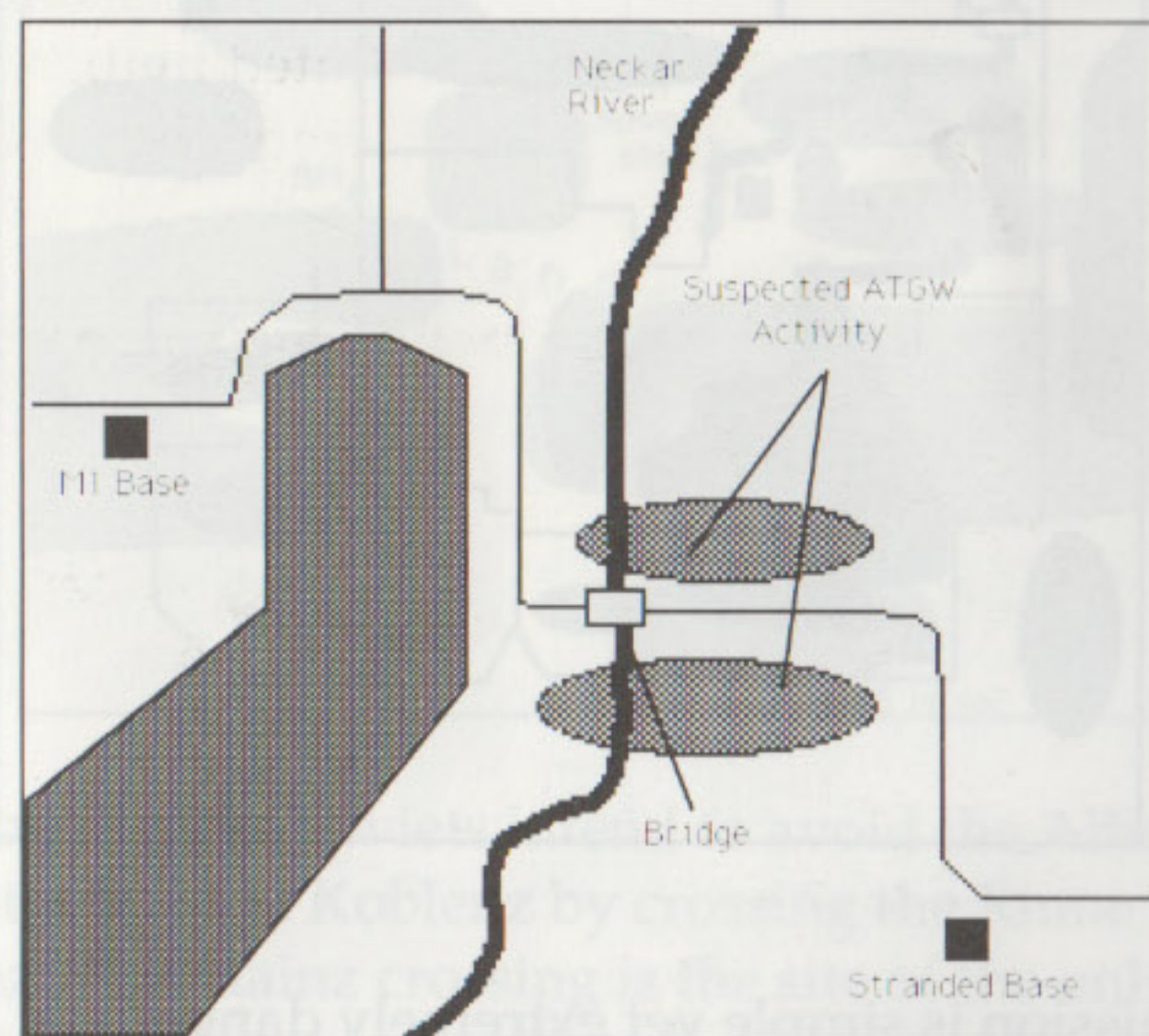
Your mission is to seek out and destroy the Soviet base or bases. This mission is vital to the survival of Allied cities, but poses great risk to the infiltrating team. Hind helicopters have been reportedly sighted in the vicinity. These sightings have not been confirmed, but extreme caution is nevertheless advised.



## Nuremberg Highway

An Allied base along the Nuremberg Highway has been cut off from resupply by Soviet interdiction forces. Two supply convoys sent out to the base never made it. Intelligence reports heavy ATGW activity in the hills along the road.

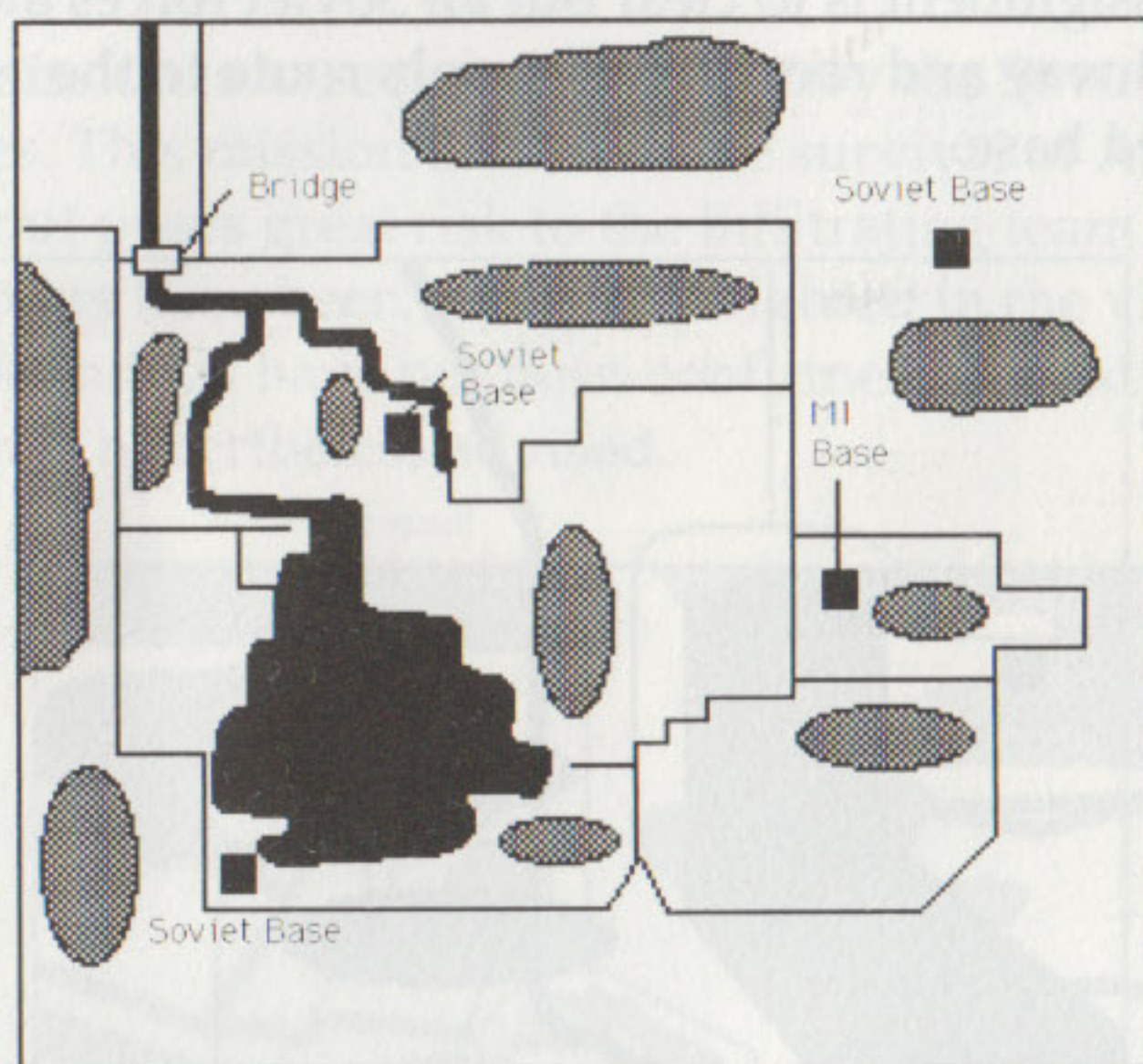
Your assignment is to clear out all Soviet forces along the highway and reopen the supply route to the stranded base.





## Mass Destruction

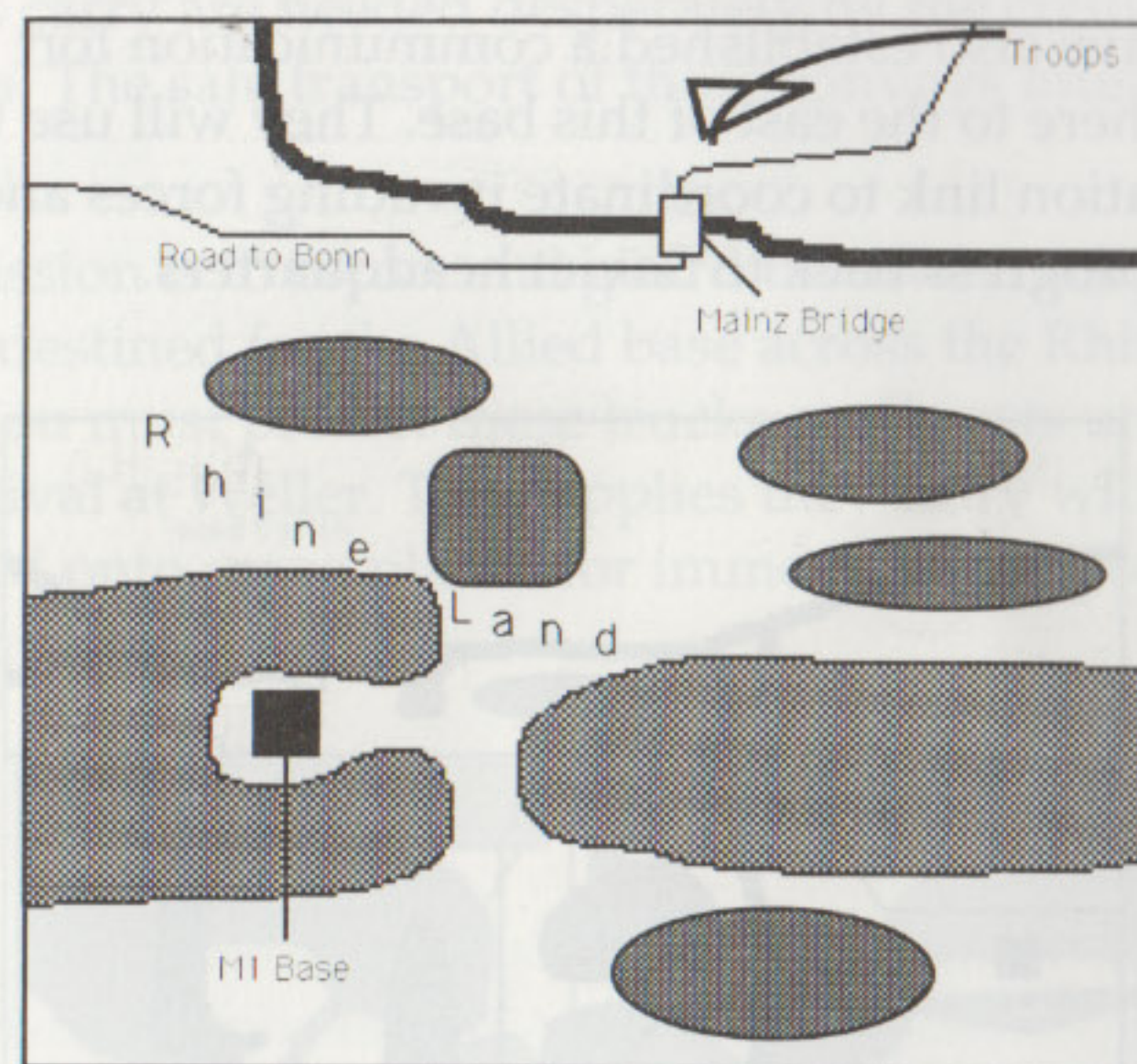
Positioned near the Emes River in West Germany, the M1 base has found itself in a potentially devastating situation. Soviet troops have poured down from the north and west and now threaten to completely envelope the region unless stopped.



Your mission is simple yet extremely dangerous. Destroy the three enemy bases in your vicinity. Destruction of these command centers will severely weaken the Soviet movement and ensure the safety of your own base and its personnel.

## The Road to Bonn

The tide is turning against the Allies. Frankfurt has just fallen and intelligence reports describe a massive Soviet Armor convoy en route toward Bonn. While small, Bonn has become strategically important to front line control.



Undoubtedly, the Soviets intend to avoid the Allied forces stationed at Koblenz by crossing the Rhine River at Mainz. The Mainz crossing is the site of the only remaining bridge into the Rhineland, one of the few unprotected routes through Allied front line defenses. The Soviet forces will attempt to secure this bridge to prepare the way for a full-scale invasion force. You must stop them.

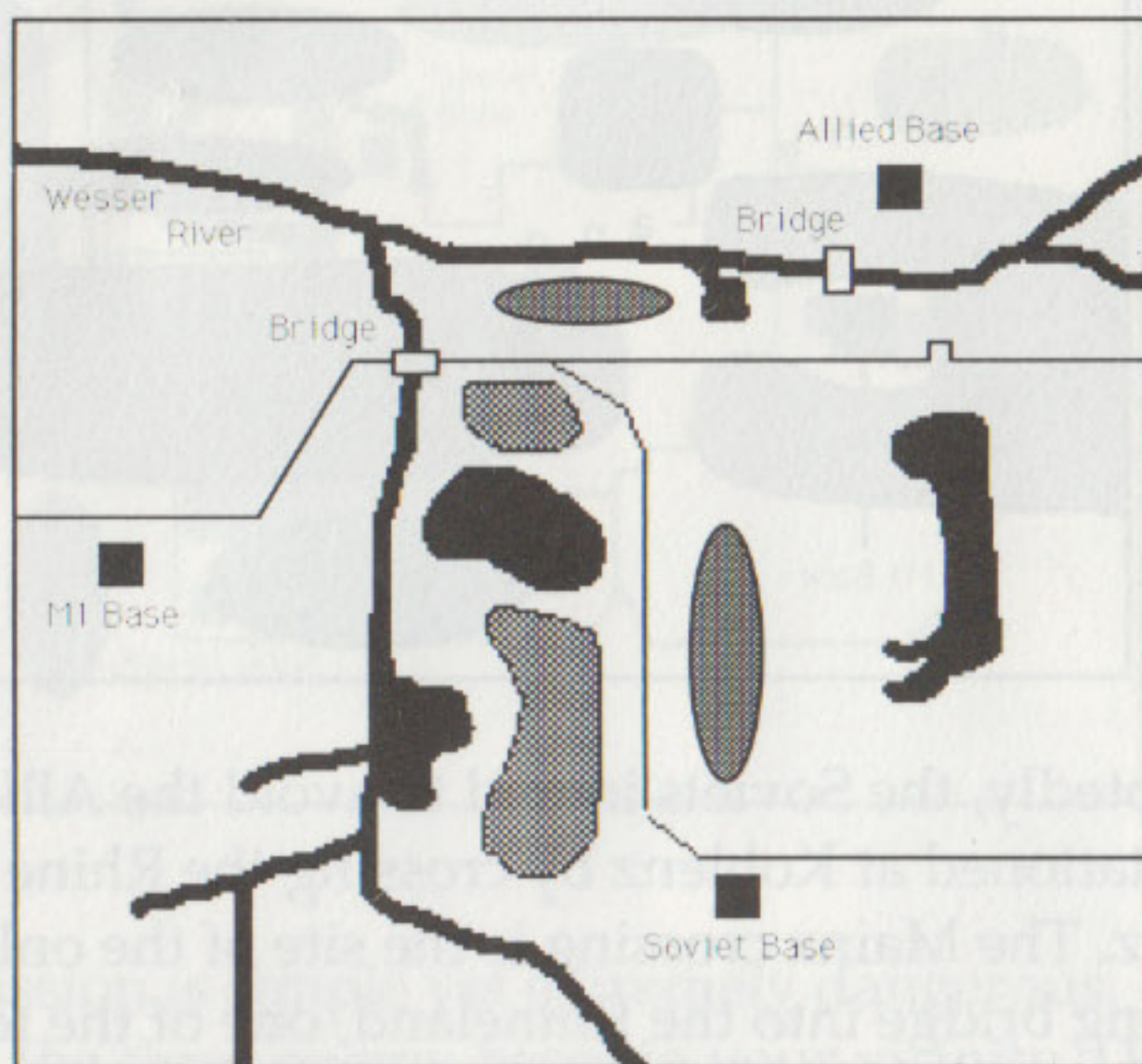
Your primary mission is to destroy the Mainz bridge. Without this passage, Soviet forces will have to face the Allied front line head on. Your secondary mission is to destroy as much of the Soviet reconnaissance team as possible.



## Hanover Push

The Soviet forces have overrun Hanover and installed a base near the city. Intelligence reports that they have amassed a large store of weapons and vehicles and are planning a full-scale sweep into Cologne.

They have also established a communication fort somewhere to the east of this base. They will use this information link to coordinate invading forces and report progress back to Soviet headquarters.



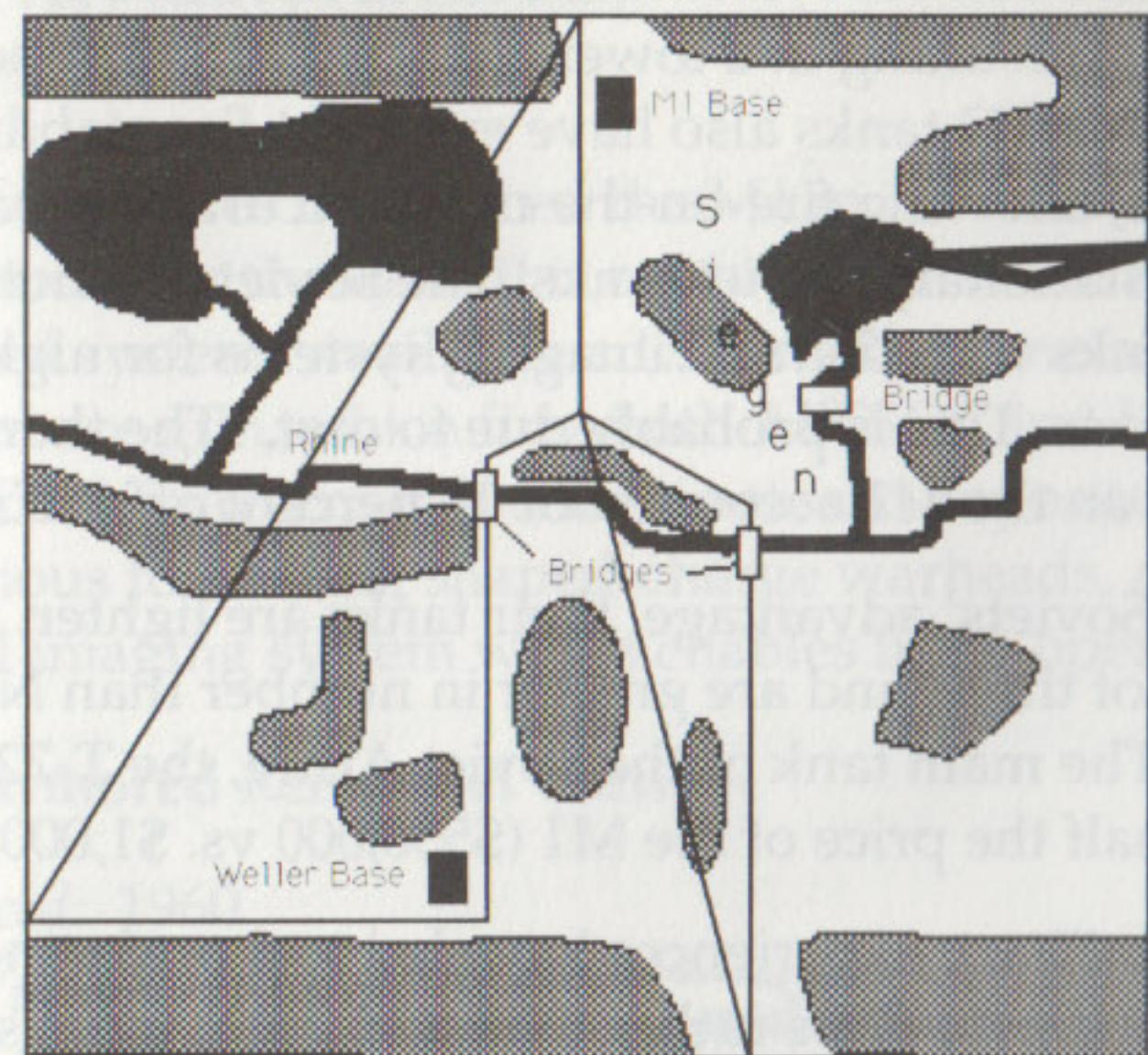
Your primary mission is to destroy the Soviet base. If the Soviets are allowed to secure this base, they will gain a major foothold into the Allied front line. You are to do whatever is necessary.

Your secondary mission is to locate and eliminate the communications fort near the Hanover base. Without this link to the front, the Soviets will have no way to coordinate attacks or communicate with their forces. This will severely weaken their efforts on the front line.

## Convoy

There has been some serious trouble in the Siegen area. Despite numerous seek-and-destroy missions by the Allies, the Soviets continue to attack Allied supply convoys destined for Weller. The supplies that these convoys carry are needed desperately by the civilians in that area. The safe transport of these convoys must be ensured.

Your mission is to escort and guard the five-truck convoy destined for the Allied base across the Rhine River. You must protect these trucks at all costs until their arrival at Weller. The supplies they carry will then be loaded onto cargo planes for immediate air drop to the needy cities.





## NATO vs. Soviet Vehicles

The comparison between Soviet tanks and their NATO counterparts is a comparison between quantity and quality. The Soviet tank force is much larger than NATO's (about 95,000 Soviet vs. 32,000 NATO), but technologically, Soviet tanks are about six years behind.

Soviet tanks lag most in the areas of armor protection, accurate fire control, and night-vision equipment. Current Soviet tanks are not equipped with Chobham armor, which offers excellent protection against shaped charge warheads (HEAT rounds). Since most infantry anti-tank weapons use HEAT rounds, Chobham armor makes a tank impervious to nearly all infantry weapons.

Soviet fire control systems are not as accurate as NATO's, resulting in a lower chance of first-round kills. Recent NATO tanks also have excellent fire stabilizing systems, allowing fire-on-the-move accuracy equal to that of stationary Soviet tanks. The Soviets do not equip their tanks with thermal imaging systems for night operations. This is probably due to cost. (The thermal system on the M1 accounts for 10 percent of its cost.)

To the Soviets' advantage, their tanks are lighter, require a crew of three, and are greater in number than NATO tanks. The main tank of the Soviet Army, the T-72, costs about half the price of the M1 (\$550,000 vs. \$1,000,000).

Soviet military experiences have led to a preference for a large mediocre force rather than a smaller, more skilled one. NATO units still believe they can exact a disproportionate kill rate against Soviet tank formations. The Soviets believe that even though they may suffer heavy tank losses, in the end quantity has a special quality all its own. A popular phrase in the Soviet military is "Numbers annihilate!"

## NATO Vehicle Specifications



### M1A1 Abrams Main Battle Tank

*Introduced:* 1981

*Combat weight:* 63 tons

*Length:* 7.91m

*Width:* 3.65m

*Height:* 2.37m

*Maximum speed:* 78 to 100km/h

*Primary armament:* 120mm smooth-bore cannon (40 rounds)

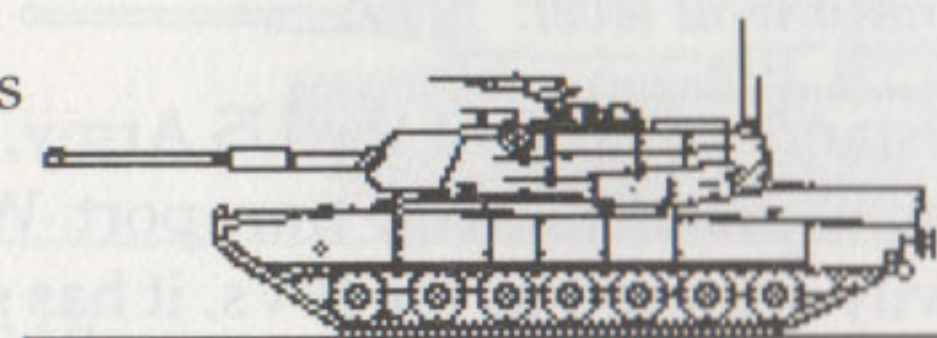
*Secondary armament:* 7.62mm MG (80 rounds)

*Reload:* 4 seconds

*Range:* 2250m

*Armor:* very heavy (Chobham)

*Overall threat level:* N/A



The United States introduced the M1 in 1981 as a replacement for the M60. It is equipped with the most advanced systems available: a 120mm Rheinmetall smooth-bore gun, which fires both APFSDS and HEAT shells, Chobham armor, a ceramic-steel composite nearly impervious to existing shaped-charge warheads, and a thermal imaging system which enables night operations.

### M113 Armored Personnel Carrier

*Introduced:* 1960

*Combat weight:* 12 tons

*Length:* 4.86m

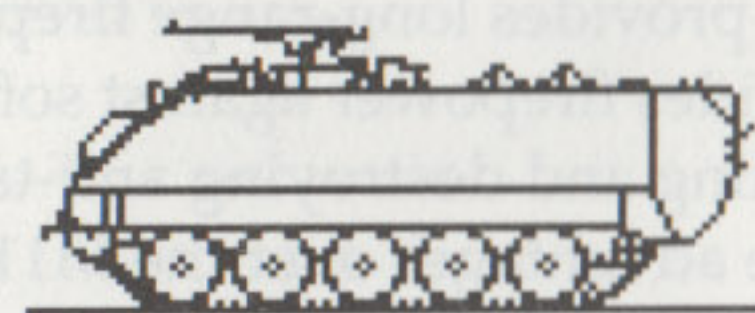
*Width:* 2.28m

*Height:* 2.54m

*Maximum speed:* 67km/h

*Primary armament:* 12.7mm MG

*Secondary armament:* none



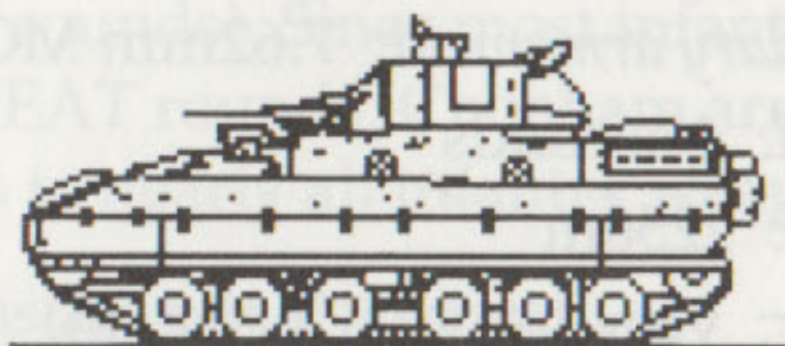


*Reload:* N/A  
*Range:* 750m  
*Armor:* light  
*Overall threat level:* N/A

The standard APC of the US Army, the M113 is a reliable, practical troop transport. While it is not as heavily armored as the IFVs, it has seen numerous variants and improvements since entering the service.

### **M2 Bradley Infantry Fighting Vehicle**

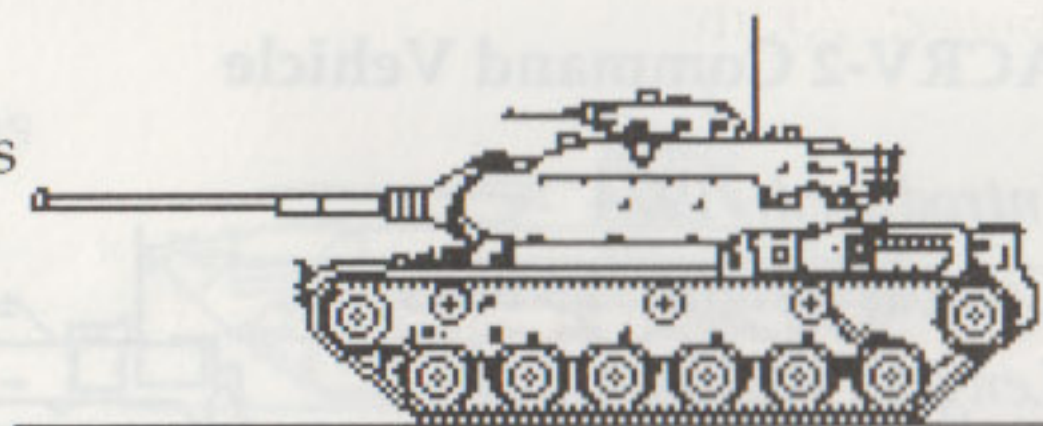
*Introduced:* 1981  
*Combat weight:* 24 tons  
*Length:* 6.45m  
*Width:* 3.23m  
*Height:* 2.56m  
*Maximum speed:* 66km/h  
*Primary armament:* TOW missile (6 rounds)  
*Secondary armament:* 25mm chaingun (40 rounds)  
*Reload:* 4 seconds  
*Range:* 2500m  
*Armor:* light  
*Overall threat level:* N/A



This infantry fighting vehicle (IFV) was developed as a counter to the Soviet BMP. The M2 is designed to be used with the M1 as part of a tank/infantry team. The tank provides long-range firepower, while the IFV provides firepower against softer targets, and assists in spotting and destroying anti-tank weapons. The M2 has three advantages over the M113 in this role: better mobility and cross-country speed, greater firepower, and superior armor protections.

### **M60a3 Main Battle Tank**

*Introduced:* 1977  
*Combat weight:* 57 tons  
*Length:* 6.94m  
*Width:* 3.63m  
*Height:* 3.27m  
*Maximum speed:* 48km/h  
*Primary armament:* 105mm rifled-bore cannon (6 rounds)  
*Secondary armament:* 7.62mm MG (40 rounds)  
*Reload:* 4 seconds  
*Range:* 750m  
*Armor:* heavy  
*Overall threat level:* N/A



The M60a3 is the most recent version of the highly successful M60 series. It is a solid tank, but its small-bore gun, slower speed, high profile and relatively light armor make it no match for more modern tanks such as the Soviet T-80.

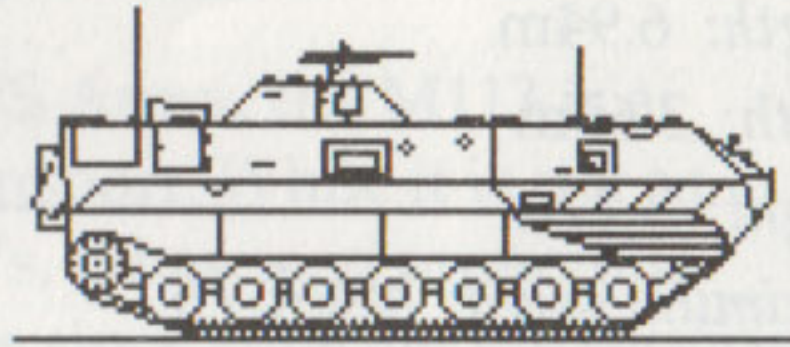


## Soviet Vehicle Specifications



### ACRV-2 Command Vehicle

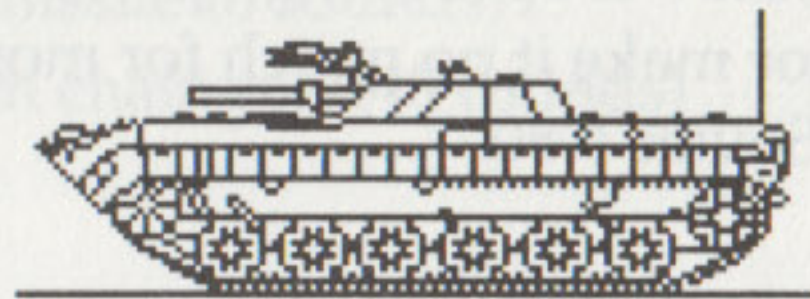
*Introduced:* 1974  
*Combat weight:* 13 tons  
*Length:* 6.32m  
*Width:* 2.84m  
*Height:* 2.34m  
*Maximum speed:* 58km/h  
*Primary armament:* none  
*Aarmor:* light  
*Overall threat level:* negligible



This basic tracked vehicle can serve as a mobile command post. It is not designed to fight on the front lines.

### BMP-1 Infantry Fighting Vehicle

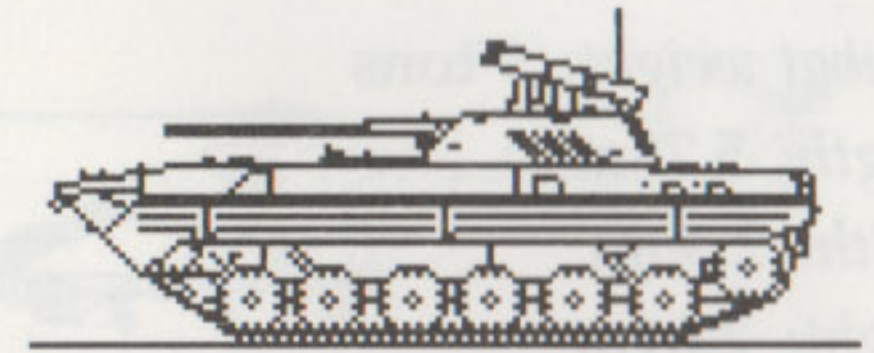
*Introduced:* 1967  
*Combat weight:* 14 tons  
*Length:* 6.74m  
*Width:* 2.94m  
*Height:* 2.15m  
*Maximum speed:* 78km/h  
*Primary armament:* Sagger missile (5 rounds)  
*Secondary armament:* 73mm gun (40 rounds)  
*Reload:* 3 seconds  
*Range:* 1500m  
*Aarmor:* light  
*Overall threat level:* moderate



This original infantry fighting vehicle has thicker armor and better armament than an APC, and is equipped with a Sagger ATGW. It carries a crew of three and can carry a nine-man infantry squad.

### BMP-2 Infantry Fighting Vehicle

*Introduced:* 1981  
*Combat weight:* 16 tons  
*Length:* 6.71m  
*Width:* 3.09m  
*Height:* 2.06m  
*Maximum speed:* 62km/h  
*Primary armament:* Spandrel missile (4 rounds)  
*Secondary armament:* 30mm MG (40 rounds)  
*Reload:* 3 seconds  
*Range:* 2500m  
*Aarmor:* moderate  
*Overall threat level:* high



The logical development of the BMP-1, it has a larger turret equipped with a 30mm cannon, a 7.62mm coaxial machine gun, and a Spandrel ATGW.

### BRDM-2 Tank Destroyer

*Introduced:* 1966  
*Combat weight:* 8 tons  
*Length:* 5.75m  
*Width:* 2.35m  
*Height:* 2.31m  
*Maximum speed:* 95km/h  
*Primary armament:* Sagger missile (14 rounds)  
*Secondary armament:* 14.5mm MG  
*Reload:* 3 seconds  
*Range:* 1500m  
*Aarmor:* light  
*Overall threat level:* moderate

This wheeled vehicle is used by the Soviets as both a reconnaissance vehicle and a tank destroyer. For reconnaissance, it usually doesn't have an ATGW.



### **BRDM-3 Tank Destroyer**

*Introduced:* 1974

*Combat weight:* 9 tons

*Length:* 5.78m

*Width:* 2.38m

*Height:* 2.61m

*Maximum speed:* 95km/h

*Primary armament:* Spandrel missile (15 rounds)

*Secondary armament:* 14.5mm MG (40 rounds)

*Reload:* 3 seconds

*Range:* 2500m

*Armor:* light

*Overall threat level:* extremely high

The BRDM-3 improves over the BRDM-2 by replacing the Sagger with the more powerful Spandrel missile.

### **BTR Armored Personnel Carrier**

*Introduced:* 1978

*Combat weight:* 12 tons

*Length:* 7.85m

*Width:* 2.80m

*Height:* 2.45m

*Maximum speed:* 80km/h

*Primary armament:* 14.5mm MG (40 rounds)

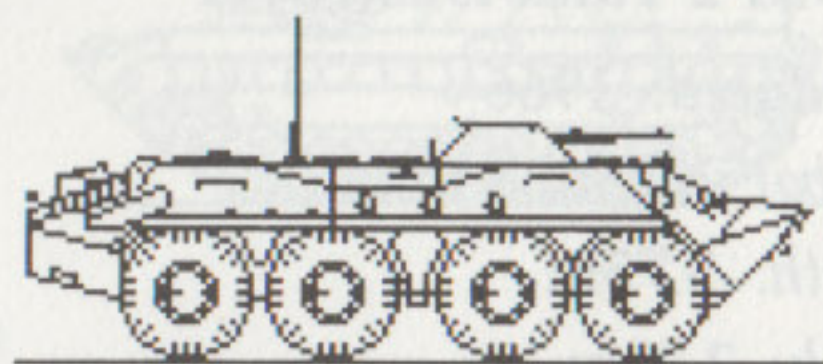
*Secondary armament:* none

*Range:* 750m

*Armor:* light

*Overall threat level:* negligible

This amphibious wheeled APC is widely used by Warsaw Pact forces. It has a crew of two and can carry up to nine passengers. It is adequate as a troop transport, but should avoid combat due to its thin armor.



### **Mi-24 Hind Assault Helicopter**

*Introduced:* 1971

*Combat weight:* 11 tons

*Length:* 17.0m

*Width:* 12.0m

*Height:* 6.51m

*Maximum speed:* 320km/h

*Primary armament:* Spiral missile (4 rounds)

*Secondary armament:* 23mm cannon (40 rounds)

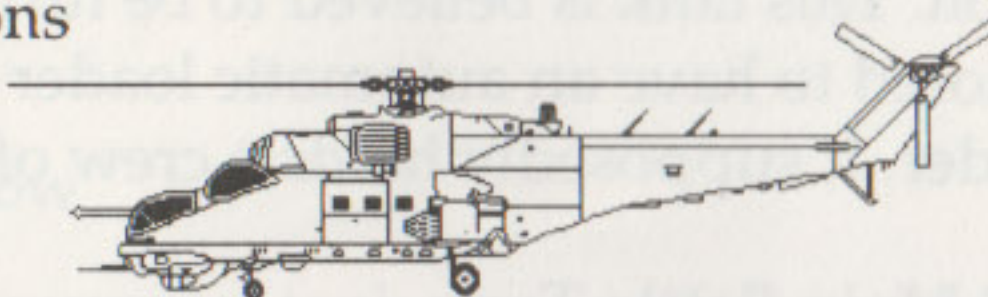
*Reload:* 3 seconds

*Range:* 2750m

*Armor:* light

*Overall threat level:* extremely high

The Hind is large, fast, and heavily armed with anti-tank guided weapons. It can carry eight fully-equipped combat troops. Soviet forces in Afghanistan began operating the Hind in December 1979.



### **FST-1 Main Battle Tank**

*Introduced:* 1988

*Combat weight:* unknowns

*Length:* unknown

*Width:* unknown

*Height:* unknown

*Maximum speed:* unknown

*Primary armament:* 135mm smooth-bore cannon (40 rounds)

*Secondary armament:* unknown

*Reload:* 4 seconds

*Range:* 2250m

*Armor:* heavy (reactive)

*Overall threat level:* extremely high

NO PICTURE  
AVAILABLE



This recently introduced tank is undergoing full-scale field trials in an inner-military district of the Soviet Union. This tank is believed to be turretless. It is rumored to have an automatic loader and a thermal blinder. It supposedly holds a crew of two.

### **T-62 Main Battle Tank**

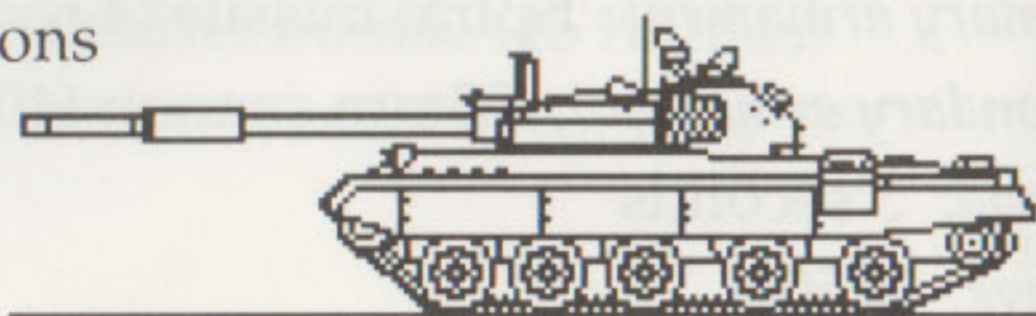
*Introduced:* 1962

*Combat weight:* 44 tons

*Length:* 6.63m

*Width:* 3.30m

*Height:* 2.39m



*Maximum speed:* 50km/h

*Primary armament:* 115mm smooth-bore cannon (40 rounds)

*Secondary armament:* 7.62mm MG (40 rounds)

*Reload:* 12 seconds

*Range:* 750m

*Armor:* heavy

*Overall threat level:* very low

The T-62 was the first tank to be fitted with a 115mm smooth-bore gun. It is believed that about 20,000 T-62s were manufactured. On release it was an adequate tank, but now it is badly outclassed.

### **T-64 Main Battle Tank**

*Introduced:* 1965

*Combat weight:* 42 tons

*Length:* 6.45m

*Width:* 3.62m

*Height:* 2.331m



*Maximum speed:* 60km/h

*Primary armament:* 125mm smooth-bore cannon (40 rounds)

*Secondary armament:* 7.62mm MG (40 rounds)

*Reload:* 10 seconds

*Range:* 1250m

*Armor:* heavy

*Overall threat level:* low

The T-64 was a controversial tank design, with many Western military commentators evaluating it as less than adequate. However, the radical design was a milestone in Soviet tank evolution. Not only did the Soviets increase the gun size to 125mm, they also incorporated an automatic loader. This allowed them — to the great surprise of the West — to reduce the crew to three.

### **T-72 Main Battle Tank**

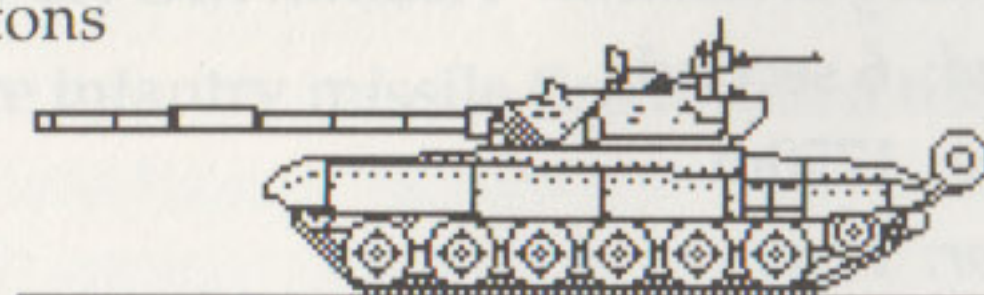
*Introduced:* 1972

*Combat weight:* 45 tons

*Length:* 6.95m

*Width:* 3.60m

*Height:* 2.37m



*Maximum speed:* 60km/h

*Primary armament:* 125mm smooth-bore cannon (40 rounds)

*Secondary armament:* 7.62mm MG (40 rounds)

*Reload:* 8 seconds

*Range:* 1500m

*Armor:* heavy

*Overall threat level:* moderate

The T-72 (also known as the T-74) is the principal MBT of the Soviet Army. It is armored to a level comparable to the US M60a3.

During fighting in Lebanon in 1982, Israeli forces had no difficulty knocking out T-72s with 105mm APFSDS shells and TOW anti-tank missiles.



The 125mm gun is a potent weapon, but suffers from dispersion problems at ranges greater than 1000 meters. The gun is stabilized, and although the accuracy is nowhere near that of the M1, it does offer some level of fire-on-the-move capabilities.

### **T-80 Main Battle Tank**

*Introduced:* 1980

*Combat weight:* 46 tons

*Length:* 6.91m

*Width:* 3.64m

*Height:* 2.28m

*Maximum speed:* 68km/h

*Primary armament:* 125mm smooth-bore cannon (40 rounds)

*Secondary armament:* 7.62mm MG (40 rounds)

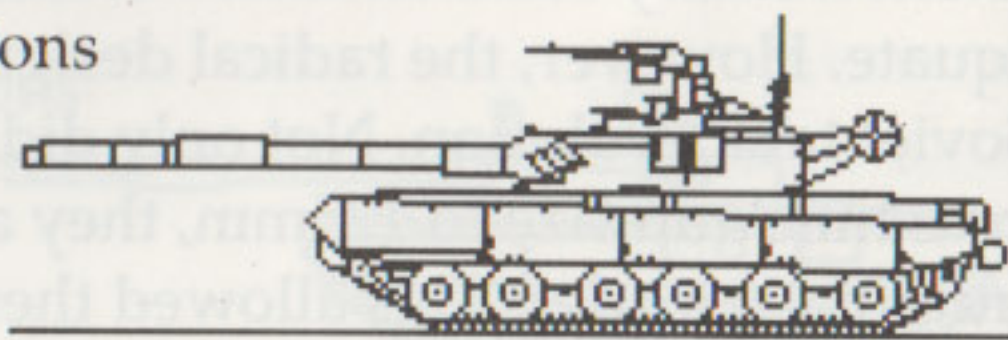
*Reload:* 6 seconds

*Range:* 1750m

*Armor:* heavy

*Overall threat level:* high

The T-80 is an evolution of the T-64 design. It has improved mobility, with a 1,000 horsepower turbine engine and a new suspension system. It also has a laser rangefinder and an anti-PGM electronic warfare system. It is being retrofitted with reactive armor bricks to protect it against infantry anti-tank rockets and missiles.



## **Anti-Tank Guided Weapons**

Anti-tank guided weapons are either mounted on a vehicles such as APCs or set up on the ground and operated by infantry. Most of the systems pass guidance information from the operator to the missile through a wire. Some are radio guided, but these are susceptible to jamming. All of them fire HEAT missiles.

### **AT-3 Sagger**

During the Arab-Israeli War in October 1973, two-man teams of Egyptian infantry opened what looked like small suitcases and inflicted incredible casualties on Israeli battle tanks. Ever since, the little missile code-named Sagger has been treated with great respect.

### **AT-4 Spigot**

A high-performance infantry missile fired from a tube.

### **AT-5 Spandrel**

Mounted on BRDM-3s and BMP-2s, this missile is significantly more effective than the Sagger. Soviet forces in Germany are thought to have replaced all Swatter and Sagger missiles with Spandrels, giving them a great increase in anti-tank capabilities.

### **AT-6 Spiral**

This large, laser guided weapon mounted on the Hind-D helicopter is capable of demolishing an AFV.



## Missile Watch

In the 1973 Arab-Israeli War, the Egyptians employed Soviet Sagger ATGWs. In the opening conflict, the Egyptians shocked the world by knocking out many Israeli tanks. However, after their initial surprise, the Israeli tank commanders rapidly developed the practice of getting off a quick round in the direction of any puff of dust or other visual sign which might indicate the launching of an ATGW.

Since the velocity of a shell from a tank gun is much greater than that of any current anti-tank missile, the tank would usually win these quick-draws, or at least cause the missile operator to miss his target.

Experienced tank commanders maintain a missile watch. Even a missile with little backblast will likely kick up dust, snow or sand. Even if the backblast is not detectable, the missile itself can usually be seen. A good defensive tactic against anti-tank missiles is to make rapid movement for cover while firing at the missile's operator. Doing this can reduce missile effectiveness by ten times or more.

## M1 Survival Tactics

### Against Guided Weapons

- Maintain a vigilant missile watch in missile areas.
- Move cautiously and under cover in missile areas.
- When a missile is incoming, return fire to disrupt guidance. HEAT and AX rounds are effective, sabots are not.
- Lay smoke to hide yourself, or head for cover!

### Against Tanks

- Spot them first and fire first! Use sabot rounds.
- Use smoke cover and thermal imaging in a tight spot.
- When you can't find cover, keep moving to decrease the chance of being hit.
- Point the front of the tank toward the enemy. Never expose your flank or rear.
- Engage the enemy's flank or rear.

### Against Helicopters

- Lay smoke and switch on thermal imaging.
- Use AX rounds.

### In General

- Before starting out, decide on the setting of your governor. For missions requiring fast movement, turn it off so the M1 can travel at top speeds. Also, make sure your ammo mix is appropriate for the fighting you anticipate.
- Fire on the most dangerous targets first.
- Minimize exposure by using natural terrain for cover.
- When an enemy hits you, you'll get a bearing readout of their position. Quickly point your turret to that bearing and fire back!



## Glossary

**AA** Anti-Aircraft.

**AFV** Armored Fighting Vehicle. Includes tanks, infantry fighting vehicles, armored personnel carriers, and tank destroyers.

**AP** Armor Piercing.

**APC** Armored Personnel Carrier.

**APFSDS** Armor Piercing Fin-Stabilized Discarding Sabot. See **sabot**.

**ATGW** Anti-Tank Guided Weapon. These missiles must be guided by the operator, normally on a wire.

**AX** Anti-helicopter, anti-armor round.

**BMP** Boyevaya Mashina Pyekhot (Russian for "infantry fighting vehicle").

**BRDM** Bronirovannaya Razvedivatel'naya Dozornaya Mashina (Russian for "armored scout patrol vehicle").

**BTR** Bronetransporter (Russian for "armored transporter").

**Chobham armor** Currently the best ceramic-steel composite armor available. The ceramic material degrades the effectiveness of shaped charge warheads (HEAT shells), as it does not melt under the extreme heat of the charge. Because Chobham armor is lighter than traditional armor, it is usually much thicker.

**COAX** Coaxial machine gun. It is mounted next to the main gun of a tank and is usually 7.62mm.

**Cupola** A one-man, freely rotating turret on top of a tank or personnel carrier that incorporates a hatch and usually a machine gun.

**GPS** Gunner's Primary Sight. The gunner lays the gun on the target through this sight.

**HEAT** High Explosive Anti-Tank. These shells rely on a shaped charge. When the shell contacts its target, the charge within sends out a fiery tongue that burns through the armor. HEAT rounds travel slower than kinetic energy shells since the shaped charge doesn't form properly at high velocities. They are not as effective against Chobham armor.

**km/h** Kilometers per hour.

**m** Meters

**m/s** Meters per second.

**MG** Machine Gun.

**reactive armor** Like Chobham armor, reactive armor is designed to lessen the effectiveness of HEAT shells. It explodes on contact from incoming shells, causing the blast tongue from HEAT shells to misform. Some recent ATGWs (HOT, Milan, and TOW-2) have been designed to cope with reactive armor. However, reactive armor bricks and plates have been retrofitted to tanks designed without Chobham armor, thus supplying a measure of anti-HEAT protection. Reactive armor is also known as "active armor."

**sabot** A type of APFSDS, this is the kinetic energy penetrator of preference. The round consists of a small tungsten alloy or depleted uranium penetrator that has a diameter smaller than the diameter of the gun tube. In order to fire the penetrator from the larger caliber gun, a sabot is fitted around it, which falls away once the round has cleared the barrel. Sabot rounds travel much faster than HEAT rounds (1600m/s vs. 900 m/s) and have a greater range.

**TADS** Target Acquisition and Designation System



**thermal imaging** A system that detects the heat emitted by an object and translates it into a visible image. It has the advantage of working at night without moonlight, in smoke or fog, and in other low-visibility situations. It is very expensive.

**TOW** Tube-launched, Optically tracked, Wire-guided anti-tank weapon. This is the US standard ATGW. The operator merely holds his sight on the target and the missile will track to it.

## Handling The Sega Genesis Cartridge

- The Sega Genesis Cartridge is intended exclusively for the Sega Genesis System™.
- Do not bend, crush or submerge in liquids.
- Do not leave in direct sunlight or near a radiator or other source of heat.
- Be sure to take an occasional recess during extended play.

**WARNING:** For owners of projection televisions. Still pictures or images may cause permanent picture tube damage or mark phosphor of the CRT. Avoid repeated or extended use of video games on large screen projection televisions.

### Limited Warranty

Sega of America, Inc., warrants to the original consumer purchaser that the Sega Genesis Cartridge shall be free from defects in material and workmanship for a period of ninety days from the date of purchase. If a defect covered by this limited warranty occurs during this 90-day warranty period, Sega will repair or replace the defective cartridge or component part, at its option, free of charge.

This limited warranty does not apply if the defects have been caused by negligence, accident, unreasonable use, modification, tampering, or any other causes not related to defective materials or workmanship.

To receive warranty service, call the Sega Consumer Service Department at the following number:

1-800-USA-SEGA



Our Consumer Service Department is in operation from 8:00 a.m. to 8:00 p.m. (Pacific Time), Monday through Friday and from 8:00 a.m. to 6:00 p.m. (Pacific Time), Saturday and Sunday. DO NOT RETURN YOUR SEGA GENESIS CARTRIDGE TO YOUR RETAIL SELLER. Return cartridge to Sega Consumer Service. Please call first for further information.

If the Sega technician is unable to solve the problem by phone, we will provide you with instructions on returning your defective cartridge to us. The cost of returning the cartridge to Sega's Service Center shall be paid by the purchaser.

### Repairs After Expiration of Warranty

If your Sega Genesis Cartridge requires repairs after termination of the 90-day limited warranty period, you may contact the Sega Consumer Service Department at the number listed above. If the technician is unable to solve the problem by phone, he will advise you of the estimated cost of repair. If you elect to have the repair done, you will need to return the defective merchandise, freight prepaid and insured against loss or damage, to Sega's Service Center with an enclosed check or money order payable to Sega of America, Inc. for the amount of the cost estimate provided to you by the technician. If, after inspection, it is determined that your cartridge cannot be repaired, it will be returned to you and your payment will be refunded.

### Limitations on Warranty

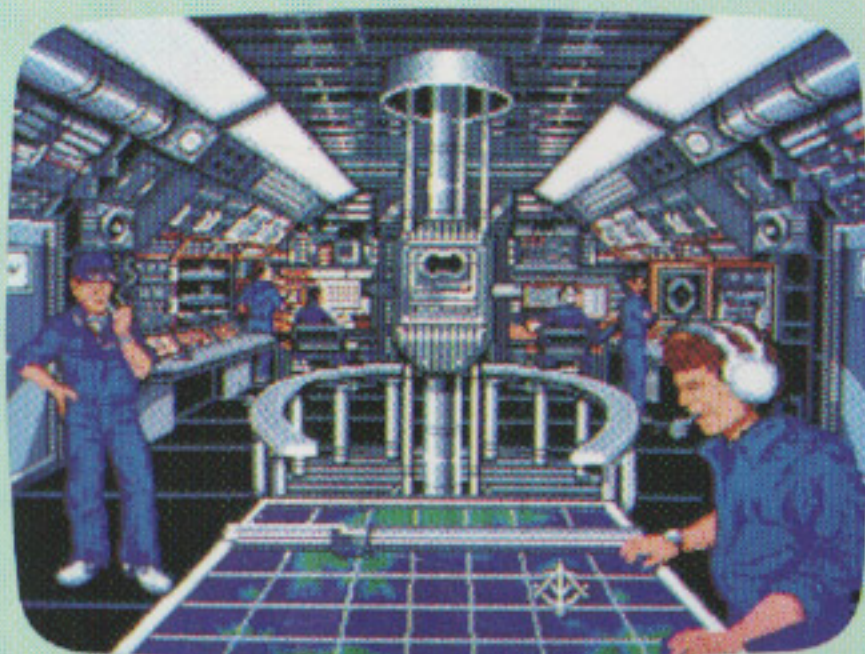
Any applicable implied warranties, including warranties of merchantability and fitness for a particular purpose, are hereby limited to ninety days from the date of purchase and are subject to the conditions set forth herein. In no event shall Sega of America, Inc., be liable for consequential or incidental damages resulting from the breach of any express or implied warranties.

The provisions of this limited warranty are valid in the United States only. Some states do not allow limitations on how long an implied warranty lasts, or exclusion of consequential or incidental damages, so the above limitation or exclusion may not apply to you. This warranty provides you with specific legal rights. You may have other rights which vary from state to state.



ANOTHER TRUE MILITARY  
SIMULATOR FROM SEGA —

# 688 ATTACK SUB™



## COMMAND...

You command a 688 SSN nuclear attack sub. Dive to 150 feet, activate the HUD, search the 3-D contour map for the Soviet boomer. Sonar reports a contact at bearing 350. You analyze the sound: is it a school of fish, the enemy sub, or a torpedo coming for you?



## SEARCH...

Your towed array of microphones picks up more sounds. You cut engine speed for quiet, drift, then move across a thermal layer. If the torpedo is coming in from long range, you can outrun it. Close range, you better take evasive action.



## DESTROY...

Weapons systems armed with wire-guided Mark 48 torpedoes. You hold missiles in reserve. Sonar firmly ID's the target: Soviet Typhoon-class missile sub. You order: launch torpedoes.

Simulations so real you  
can feel yourself sweat.

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