






Rule 46: Low Light Operations

While Assault assumes mostly daylight hours in combat, the truth is different. Most armies, most professional armies, are very good at operating in low light level environments and train extensively to do so. The Low Light system works best when using the unit status markers in the Neutral Marker page; i.e. laser, moving unit, direct fire, and missile fire markers.

I. Low Light Devices

- A. There are 5 types of “night” vision that will be addressed, un-aided, star-light, white light, infrared, thermal (including FLIR), and low light level TV (LLLTV). The symbols are located on the National Direct Fire Charts for each country.

1. **Un-aided.** 
All units can use un-aided spotting; i.e. optics with no low light devices and eyesight, are very restricted in their low light level combat capabilities.
2. **Star-light** 
Star-light night vision devices, such as the U.S. AN/PVS-7B, uses the ambient light available to enhance the wearer’s night vision capability. These type devices are worn as headgear, attached to helmets or mounted on weaponry; i.e. rifles and machineguns.
3. **White Light** 
Units equipped with white lights, such as older model M-60A1 and M-48A5s, generally will not survive long. Nothing says here I am better than a huge white spot light.
4. **Infrared Light** 
An improvement over white light, Infrared spotlights equip most Warsaw Pact vehicles up to the T-72. A major drawback to Infrared equipped units is that the Infrared light source is visible to all other devices except the un-aided eye and white light.
5. **Thermal Imaging** 
Low light level combat capabilities made great leaps when TI began showing up. Vehicles such as the M2 Bradley and the M1 Abrams lost very little in spotting and combat thanks to this system. In fact, thermals are used 24/7 in conjunction with the day sights. This type device also

includes Vehicle, Aircraft and Helicopter FLIR (Forward Looking Infra-red) systems.

6. Low Light Level Television

LLTV equipped tanks like the M60A3. This type low light device actually had better thermal imaging system than the Abrams until the Abrams were upgraded in the 21st century.

II. Low Light Spotting

The spotting tables for daytime are replaced by Low Light Spotting Tables. These tables are organized by device type and range. Modifiers are applied as specified.

A. Procedure:

1. Determine the unobstructed range to the target unit.
2. Determine the base chance to spot using the Low Light Spotting Table by cross referencing the Low Light Device type with the range in hexes. All units may select un-aided spotting if desired and not use the assigned device. If the spotting unit uses White Light or Infrared Light, place the appropriate marker on the spotting unit. These markers, White Light and Infrared Light, remain on the unit until the end of the next Fire Phase.
3. Check the target status and apply the appropriate modifier.
4. Roll the Die.
5. Apply the appropriate modifiers from the Low Light Spotting Roll Modifiers Table to the die roll. Modifiers are cumulative. A die roll equal to or less than the Base Chance results in the target unit being spotted.
6. RADAR equipped units are not affected by Low Light conditions and may spot and conduct combat normally.

In the Soviet Fire phase, a Soviet T-62A with IR low light device attempts to spot a Belgian Leopard 1A5 that is in a clear hex under cover at a range of 6 hexes. The Leopard has fired at another unit. The base spotting chance is 5. The base chance is modified by +4 because the Leopard fired at another target. The modified Base Spotting chance is now 9.

Low Light Spotting Table

Low Light Device	Base Spotting Roll											
	Range in hexes											
	0	1	2	3	4	5	6	7	8	9	10	12
●	10	6	—	—	—	—	—	—	—	—	—	—
●	10	8	6	5	—	—	—	—	—	—	—	—
○	10	10	10	6	5	—	—	—	—	—	—	—
●	10	10	10	8	6	6	5	—	—	—	—	—
●	10	10	10	10	10	8	6	6	5	4	4	3
●	10	10	10	10	10	10	10	8	6	5	4	4

- Un-aided ● Infrared
- Starlight ● Thermal Imaging
- White Light ● Low Light Level TV

CITV/TI modifier +2

Shtora Defense System Modifiers
+1 to Base Chance Roll on spotting attempt by targeted Soviet AFV against enemy units utilizing laser designators to spot or engage the targeted Soviet AFV
Shtora equipped AFVs
Soviet only- BMP3, BMD3, T-80s, T-90, T-90A

Target Status	
Moving	+2
Firing	+4

The Soviet player then rolls the die and rolls a 6. The Leopard is in clear terrain (-4) but is under cover (+2) for a modifier of -2 to the die roll. $6-2=4$. Since the modified base chance to spot is 9 and the final modified die roll is 4, the Leopard has been spotted by the T-62A.

Low Light Spotting Roll Modifiers

Target Type	CLEAR	WOODS	MARSH	TOWN	URBAN STRIP	Cover ^①	Used White Light	Used Infrared Light ^②	Used Laser ^②
H	+2	+1	+1	0	+1	+4	n/a	n/a	-2
P	-2	-1	-2	+3	+2	+3	n/a	n/a	-2
W	-3	-2	-2	+1	0	+2	n/a	n/a	-2
V/AFV	-4	-3	-3	-1	-2	+2	Auto	-4	-2

① Cover modifier applies to units in bunkers, entrenchments, hull down positions and cover.

② IR modifier only applies if spotting unit is using Starlight, Infrared, Thermal Imaging or Low Light Level TV (LLTV)

All modifiers are cumulative.

Radar-equipped units are not affected by Low Light conditions and spot as normal

III. Low Light Combat

Low light devices have an impact on combat. The Thermal and LLLTV systems allow the unit to engage targets almost as well as if daylight. These modifiers are applied in

addition to other modifiers as specified on the Anti-Armor and Conventional/Indirect Fire tables.

- A. Procedure:** Determine the range that the combat takes place by cross referencing the range with the device type. The maximum range for the weapon system is dependent upon the Low Light Level Device being used and NOT the ammunition type. Engagement range is any range with an assigned Low Light Combat Modifier value. Now, find the appropriate base Hit for the Low Light Device selected. Apply all appropriate modifiers for combat.
1. For Anti-Armor combat apply the Low Light Combat value to the base Hit chance. Roll the die and apply the appropriate modifiers to determine if a hit occurs. Then check for penetration. Low Light Combat value ONLY affects the Base Hit Chance in Anti-Armor Combat.
 2. For Conventional/Indirect fire apply the Low Light Combat value to the DIE ROLL.
 3. The use of FLARES and Ambient Light may affect the use of Low Light Combat Modifiers (See Rule 46.V.)
 4. Only Helicopters organically equipped with ATGM or have an ATGM as a weapons pod option may conduct Low Light Combat. These weapons systems use thermal imaging integrated into the weapons package.
 5. Air Defense units with a ** or † may conduct SAM or AAA attacks as normal. IR Seeker and Radar guidance weapons systems are not affected by lighting conditions.
 6. All Aircraft are considered to be equipped with a Thermal Imaging (FLIR) Laser Designating weapon system with the applicable Low Light Combat modifiers.

The Soviet T-62A, having spotted the Belgian Leopard 1A5, decides to engage the Leopard with a HEAT round at 6 hexes. Since the range of 6 hexes is within the IR low light device range, the T-62A has a -3 modifier to the Base Hit Chance.

Low Light Combat Modifiers

Low Light Device	Base Hit Modifier											
	Range in hexes											
	0	1	2	3	4	5	6	7	8	9	10	12
●	-2	-3	—	—	—	—	—	—	—	—	—	—
○	0	-1	-2	-3	—	—	—	—	—	—	—	—
○	0	0	0	0	-1	—	—	—	—	—	—	—
●	0	0	0	0	-1	-2	-3	—	—	—	—	—
●	0	0	0	0	0	0	0	0	0	0	0	0
●	0	0	0	0	0	0	0	0	0	0	0	0

Apply to Die Roll for Base Chance to hit
Apply to Conventional Fire Die Roll

- Un-aided
- Starlight
- White Light
- Infrared
- Thermal Imaging
- Low Light Level TV

The HEAT round has a base hit chance of 1 at 6 hexes. Applying the Low Light Combat modifier for Infrared of -3 brings the base chance to hit to -2; however, the base chance to hit can never be modified below 1 so the modified base chance to hit is 1. Since the Leopard is under cover this is multiplied by 1/2 and rounded up. The base chance to hit remains at 1. If the Soviet T-62A had used an AP round the Base Chance to Hit would also have been a modified 1.

Soviet Direct Fire Data Chart 2

Unit	Ammo	ROF	Range Effectiveness														Ammo Supply
			Range in hexes														
			0	1	2	3	4	6	8	10	12	14	16	18	20	22	
T-62A	AP (A)	1	8:18	9:18	8:17	7:17	5:17	3:16	2:15	1:14	—	—	—	—	—	—	4
	HEAT (A)	1	7:18	8:18	8:18	5:18	3:18	1:18	—	—	—	—	—	—	—	—	2

IV. Low Light Movement

Low light level affects the movement capability of V/AFV class units. Units may choose to use Un-Aided movement, White Light movement or Aided movement. Un-aided movement is just that, the unit moves under black out conditions. White Light movement occurs when the unit uses headlights to illuminate the area in front of it. Aided Movement occurs when using a low light driving aid; i.e. infrared viewer for the driver. These type devices do not provide modifiers to spotting attempts.

- 1. Un-aided Movement:** Units using unaided movement subtract -3 from their movement allowance. Movement allowance may not be reduced below 0 and all units may move at least 1 hex. All units may move at least 1 hex regardless.

2. **White Light Movement:** Units using white light movement move at normal movement allowance. A White Light marker is placed on the vehicle and may not be removed until the end of the next Fire Phase. Units using White Light Movement suffer all the penalties associated with being the target of spotting attempts.
3. **Aided Movement:** NATO (including Sweden and Austria) units using aided movement subtract -1 from their movement allowance. Warsaw Pact (including Finland and Yugoslavia) units using aided movement subtract -2 from their movement allowance. Movement allowance may not be reduced below 0 and all units may move at least 1 hex. Only AFV/AIFVs may use Aided Movement. V class units may not use Aided Movement.
4. **Helicopters:** All helicopters are considered to use Aided Movement. Only Helicopters organically equipped with Thermal Imaging (FLIR) may engage in combat (See Advanced Capability Chart in Charts & Tables for listing). Helicopter Low Light Movement is a modification of the Maneuverability Rating. NATO helicopters add +1 to the Maneuverability Rating. Warsaw Pact Helicopters add +3 to their Maneuverability Rating.
5. **Aircraft:** Aircraft add +1 to their altitude value; i.e. Attack Aircraft fly at 2 levels above the terrain in low light conditions instead of 1 level.

V. Artificial and Ambient Light

Artificial light sources, such as flares, are used to provide short term illumination to a small area. Flares can either be of the handheld type, trip-flares or the artillery deployed type. Ambient light would be that light produced by a full or half moon. Ambient Light mainly affects those units equipped with un-aided, starlight, white light and infrared light; providing the latter two with an option of not using the equipment but relying on un-aided spotting.




1. **Trip-Flares:** These flares are generally emplaced prior to the start of play. Each infantry or engineer "P" class unit may emplace 1 trip flare in any hex (except all-water hexes) within a 1 hex range. Record the location of a Trip flare on the Engineering Log-sheet as if it were an engineering action. Trip flare markers are placed as soon as an enemy unit enters the hex during a movement phase. Trip flares illuminate the hex that they are placed in. All spotting attempts in this hex are conducted as if under

daylight conditions and normal spotting rules apply. Remove the Trip Flare marker at the end of the next Fire Phase.

2. **Hand-launched Flares (HLF):** These type flares are hand-held/launched, (think supersize Roman candle). Each “P” class unit has 2 hand-launched flare available per game. Record the use of a HLF as if it were a round of ammunition. HLF is a movement oriented action but does NOT require Operation Point expenditure. A “P” class unit may use a HLF in any Movement Phase regardless of who the phasing player is.




- a. Place a  marker 2 hexes from the firing unit in the designated hex.
- b. Spotting may occur in the hex and within a 1 hex radius from the flare marker as if under daylight conditions; normal spotting rules apply.
- c. At the END of the next Fire Phase remove the flare marker.


3. **Artillery Emplaced Flares (AEF):** These flares are launched from field artillery and mortars. They have a longer duration than hand launched flares and are affected by wind. See the Indirect Fire Data charts for availability of flares. Some small caliber mortars (U.S. M224 60mm Mortar) have flares in the ammunition section of the Direct Fire Data Charts.

- a. Record the Flare Mission just as you would any Indirect Fire Mission (exception: Enhanced SPG {Rule 18.E.1.} and direct fire mortar, both of which may fire and place the flare in any eligible Fire Phase); do NOT place a fire mission marker.



- b. On execution of the fire mission, place a  marker in the designated hex.
- d. Spotting may occur in the hex and within a 2 hex radius from the flare marker as if under daylight conditions; normal spotting rules apply.
- c. At the end of the next Fire Phase replace the flare marker with a



-  marker; if there is a moderate wind move the marker 1 hex in the wind direction. If there is a strong wind move the marker 2 hexes in the wind direction.
- d. Spotting may occur in the newly illuminated hex and within a 1 hex radius from the flare marker as if under daylight conditions; normal spotting rules apply.

e. At the end of the next Fire Phase remove the flare marker.

- 4. Flares and Combat:** If a unit is spotted by a spotting attempt that used flare illumination and the flare marker is still in place, combat may occur as if in daylight conditions with no Low Light Combat modifiers applied.

B. Ambient Light

At the setup determine the level of Ambient Light available after determining the weather status. Ambient Light will only be available in clear weather. Roll the die and cross reference for the available light on the Ambient Light Table. Place a



Full Moon marker or a



Half Moon marker anywhere on the map as a player aid.


Natural Light Table

Full Moon	Half Moon	None
1-5	6-8	9-10






1. If the result is a Full Moon subtract -2 from all spotting attempt die rolls
2. If the result is a Full Moon Low Light Combat modifiers are halved (round up)
3. If the result is a Half Moon subtract -1 from all spotting attempt die rolls.
4. Units using Un-Aided and Aided movement have +1 added to their movement allowance in addition to the modifiers required by Low Light Movement (Rule 46. IV.)

VI. Imaging Equipment

Imaging Equipment Symbols are quick references to aid the player in determining the type of enhanced optical equipment specific to a weapon system. CITV and Thermal Imagery are explained in Rule 9 Spotting and Low Light equipment is explained in Rule 46. This section will explain the quick reference system. These symbols are located on the National Direct Fire Data charts, and Advanced Capabilities Charts. The Unit Data Cards specifies the type equipment in the OPTICS section.

The basic IES is the Circle. All units are equipped with the  **Un-aided** symbol to start out with. Enhancement is indicated by modification of this basic symbol by changing color and adding graphics.

The color selections correspond to the type of imagery equipment built into the weapons system:

-  Un-aided
-  Infrared
-  Starlight
-  Thermal Imaging
-  White Light
-  Low Light Level TV