



Battlefield LIVE

WINNING THE ARMS RACE FACT SHEET

S*A*T*R

The World's First Real-Time Hit-Feedback: S*A*T*R

Battlefield Sports' S*A*T*R enabled LIVE gaming includes:

- **Gaming Guns.** A range of models, with powder-coated aluminium, robust case.
- **Opto-electronics.** Each gaming gun has a lens assembly within a long tube, with a high-grade glass lens and an infrared-red emitter.
- **Radio Functions.** Each gaming guns has a radio antenna which emits a 433 MHz signal.
- **Optik Sensors.** The system has 2 sensor domes which accept 360 degree hits and a sensor dome on the gaming gun barrel. All integrated.
- **Cool Trigger.** Authentic and robust trigger mechanism (not just a button).
- **LCD.** Liquid crystal display with 4 lines of real-time stats.
- **FX & Sound System.** Marine grade, water-resistant speaker system. Most of the sound effects are sourced from the actual weapon the gaming gun is emulating.
- **Predator Muzzle Flash.** The muzzle flash (consists of 9 LEDs, so you can select either green, white, or red muzzle flash and the infrared is centered between)
- **Built Tough.** Stainless steel spined handle for extreme durability. Toughness where it counts.
- **Motherboard.** - All connections to the main board are "plug n play" so components can be removed easily and external components changed without soldering.



Killer Feature [Patent Pending]

The heart of the S*A*T*R system is its real-time hit-feedback system without the need for a central computer. The biggest question, in the past, for live gaming was: "How do you know if you have shot someone?" (Especially if they are some distance away.) S*A*T*R solves this problem. When a gamer hits an enemy the player's gaming gun the shooter's gun instantly says "casualty" or "kill confirmed" or "already dead." *This voice feedback is configurable in 11 languages (or simply customize it with your own language).* The enemy's gaming gun issues a near-miss, wound, or dead sound effect. The system can be configured so the hit-feedback SFX can be turned off. Hit-feedback is also confirmed via flashes the red dot scope, i.e. when you hit someone your gaming gun's red-dot reticule flashes twice. When you get a kill confirmed that dot flashes four times. With this real time peer to peer radio feedback system comes real time statistics displayed on the gaming gun such as number of hits made, number of kills, accuracy percentage and number of spawns. This real time hit feedback is the killer feature commercially because the gamers get a rush when they know they have hit the target. **It is the core of the gaming experience.**

Weapons' Range

Battlefield Sports believes that in commercial combat entertainment weapon ranges need to take into account a number of important factors:

- *An appropriate balance between each gaming gun model. The longer rifles - which are heavier - have the advantage of shooting further than the small gaming guns.*
- *All gaming gun must have sufficient range so that in most commercial battlefields, all are effective against the opposition.*

Weapon Emulations

Battlefield Sports' S*A*T*R system:

- * Emulates 69 weapons, categorized into 4 classes (pistols; SMGs, carbines & Rifles)
- * Difficulty levels - easy / standard / hard.
- * Weapons range set by software (indoor, short, medium or long)
- * Weapons volume set by software (high, medium or low)
- * Ammo is dependent on what the real weapons' ammo count is, including magazine size & number of spare magazines.
- * Health measured in hit points
- * Hit-feedback in 11 languages (SFX able to be turned on or off)
- * Any gaming gun can be configured to be a ref gun.
- * Select muzzle flash color (red, green, white or none)
- * Friendly fire - on or off.

- In an indoor environment, the range of all models can be radically reduced to minimize infrared bounce.
- Sounds are generated by a speaker (not a small explosion like a real combat rifle) therefore the sound generated has a lower volume than a real rifle and therefore effective range of the gaming guns needs to be less. This is required to give the target a reasonable chance to determine the location of the shooter by sound.

The range of a gaming gun is largely determined by the referee configured range setting at time of initial boot (indoor, short, medium or long) and the type of lens used on that particular model. All smaller gaming guns like the P90, Scorpion and Spitfire use a 40mm (1.5in) diameter lens assembly with a 100mm (approx 4in) focal length. While these models have a common combat range of up to 100 meters (330ft), but when configured with in “long” range tests have exceeded 200 meters (660ft).

The Commando and Pulse Rifle have a 50mm (2in) diameter lens with a 100mm (approx 4in) focal length. The wider diameter lens captures the infrared light more efficiently than the 40mm. By keeping the focal length at 100mm (approx 4in), the spread of the infrared beam makes this unit easily able to hit targets by civilian gamers. In a commercial system, the system must be forgiving on the gamers letting them hit targets much more frequently than they would with a real combat rifle. While these models have a common combat range of up to 150 meters (approx 500ft), but when configured with in “long” range tests have exceeded 250 meters (820ft).

Our long arms, the Morita Sniper, Morita SAW, M4 and M16, all have a 50mm (approx 2in) diameter lens with a 165mm (6 ½in) focal length i.e. all have a narrow infrared beam. A narrow beam makes striking a sensor more difficult but also increases the range. While these models have a common combat range of up to 200 meters (660ft), but when configured with in “long” range tests have exceeded 300 meters (985ft). We have even the exceptional result when testing the Morita Sniper (with the telescopic scope) out to 450 meters (1,480ft) plus. There are other factors that can affect range.

- How well the scope is zeroed (and the type of scope). It is especially important the scopes are properly zeroed once per week.
- The type of sensor (current OpTik sensors increases range).
- Battery power level.
- The amount of sunlight shining on the target sensor.
- The cleanliness of the target sensor dome and the shooter’s lens.

Predator Muzzle Flash

Each S*A*T*R gaming gun comes with the predator muzzle flash system. Each unit inside the lens assembly has 9 hyper-bright LEDs that surround the infrared emitter. The LEDs are split into 3 colors – white, red & green. What colour LED shines depends on the software configuration. With 3 LEDs in use, around the IR emitter, the muzzle flash is quite evenly distributed. At close quarters, at night, or indoor games, it is possible to aim using the muzzle flash. Having the muzzle flash as part of the lens assembly prevents gamers cheating by covering the LED since if they cover the lens assembly, they also stop the infrared beam coming out.

Display

A backlit LCD is included on all model gaming guns. During the live game the display will show:

Hit Points (health)	HP 2/ 5 A 57/ 99	Current Ammunition
Reloads (Ammunition)	R 0/ 6 H18 K 1	Hits, Kills
Accuracy	A 7% 5 0 Indr	Spawns, Range
Status	Ready FA 7.65V	Fire Mode, Voltage



Ref Gun (Master Controller)

Battlefield Sports’ S*A*T*R ref guns come with a sling & an antenna.

The ref gun is designed to be used solely by the Referees or Marshals.

- * Perform & count re-spawns
- * Reload ammo
- * Pause & resume via infrared or radio.
- * End a game on whole battle group
- * Set the battle group
- * Set teams
- * Set difficulty level
- * Set weapon configurations
- * Automatic game timer which ends the game
- * Set gaming gun to a specific battle
- * Set health. Set difficulty level.



Medic Box

Battlefield Sports’ S*A*T*R medic boxes come with an antenna.

The Medic Box is designed to perform “re-spawns.” On each successful re-spawn the “spawn” counter increments on the display. The medic box can also be configured to operate as an ammunition supply point. The medic box can perform a configurable number of re-spawns or a re-spawns for a specified time automatically resetting counters with each new game.

Recoil Simulation

Physical recoil is problematic in a commercial gaming gun because any electro-mechanical device invariably drains substantial battery power. It is very important that a gaming gun can be used for many hours without a battery re-charge.

In S*A*T*R, except in easy mode, recoil is emulated by controlling the red dot scope. Immediately after a shot is fired, the red dot is turned off making additional shots a lot less accurate. The amount of time the red dot is off depends on the weapon being emulated, the more recoil the real weapon has, the longer the red dot is switched off.

Scopes

The pistol red dot or rifle telescopic scope is vital for game play in Battlefield LIVE. This is because there is no visible fall of shot with an infra-red system. All Battlefield Sports' gaming guns therefore come with some type of scope for aiming. It is vital that the scope is regularly zeroed by the operator to make sure the scope is closely aligned with the actual infra-red beam (typically done using an indoor target range with an infrared camera and TV monitor). On most models a 30mm red dot scope is installed at the factory during manufacturing. These scopes are especially made for Battlefield Sports with 2 wires for powering the scope from the main internal circuit board. This wiring system has two advantages over standard red dot scopes which are:

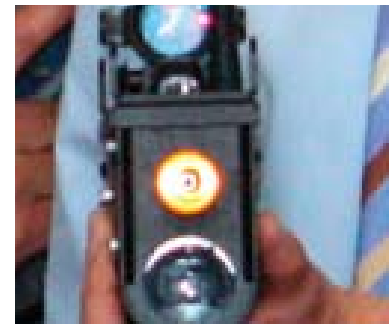
- *The scope automatically turns off when the gaming gun is turned off. It is automatically turned on, when the weapon is turned on.*
- *The scope battery does not go flat quickly, a common problem with powered scopes; instead the scope draws power from the main circuit board via the large 4,000mAmp NiMH battery which comes with every gaming gun.*

The red dot scopes are very easy to use and therefore suitable for players of all ages and experience. The Morita Sniper, on the other hand, comes standard with a 3-9x40 telescopic rifle scopes to suit its role as a sniper rifle. The Pulse Rifle, M4, M16, and Commando carbine can all accept telescopic scope instead of a red dot scope. Telescopic scopes are more accurate than red-dot scopes, however they are challenging to use well so a typical commercial battlefield will only have a few of these.

In Summary

The Battlefield Sports' S*A*T*R system is a fine balance between innovative technology and practical gaming experience. Combined they have produced the most robust, most widely used commercial battlefield live system in the world today.

Contact your local agent to see what we can do for you.



Lens Assembly

The lens assembly is a key technology used to create an authentic combat entertainment experience. In traditional indoor laser tag, the infrared beam is very wide, so wide, that aiming was almost unnecessary. Battlefield Sports research into advance glass optics means we have enabled a fairly tight beam. The beam is not as tight as a real laser. Using varying focal lengths and lens diameters has allows us Battlefield Sports to achieve crucial differentiation between models.

Table 1: Gaming Gun Suitability			# Battlefield Sports highly recommends the fake barrel be removed on these models for indoor use (to minimize injury risk)	
Terrain/ Group Type	Indoor	Jungle	Woodland	Sparse / Desert
Pre-Teens	Scorpion Spitfire#	Scorpion Spitfire	Scorpion Spitfire Commando	Scorpion Spitfire Commando
Youth	Scorpion Spitfire#	Scorpion Spitfire	All but at least 50% being P90s or Commandos	All but mostly P90s or Commandos
Corporate	Scorpion Spitfire# P90# Commando	Scorpion Spitfire P90	All but approx. 50% should be Scorpions, Spitfires or P90s.	All but mostly P90s and/or Commandos
Military	Spitfire P90	Spitfire P90 M4 M16 Morita SAW	Spitfire P90 M4 M16 Morita SAW Morita Sniper	M4 M16 Morita SAW