Fort Moore Training Data Simulation Guide

Blackhawk Trail Engagement Exercise Data Generation

OVERVIEW

This guide provides specifications for generating realistic simulated training data for the Fort Moore Blackhawk Trail engagement exercise (0700-0930 hours). The data should reflect the tactical progression from movement to contact to sustained engagement, following the Enhanced Individual Soldier Report System requirements.

FORCE STRUCTURE SIMULATION

Unit Composition

- **Total Participants:** 60 soldiers (4 platoons)
- **BLUEFOR:** 30 soldiers (2 platoons)
  - Callsigns: BLUE01-BLUE30
  - Squad designations: ALPHA (BLUE01-BLUE15), BRAVO (BLUE16-BLUE30)
- **OPFOR:** 30 soldiers (2 platoons)
  - Callsigns: RED01-RED30
  - Squad designations: CHARLIE (RED01-RED15), DELTA (RED16-RED30)

Equipment Simulation

- **PlayerID:** Sequential numbering 1001-1060
- **IP Addresses:** Simulated military network (10.1.x.x range)
- **Battery Levels:** Start at 95-100%, gradually decrease over exercise

---

TEMPORAL DATA SIMULATION

Exercise Timeline (2.5 Hours Total)

```
Phase 1: Preparation & Movement (0700-0830) - 90 minutes
├── Equipment checks & briefings (0700-0730)
├── Movement to positions (0730-0815)
└── Position establishment (0815-0830)

Phase 2: Contact & Engagement (0830-0915) - 45 minutes
├── Initial contact (0830-0835)
├── Sustained engagement (0835-0900)
└── Tactical maneuvering (0900-0915)

Phase 3: Consolidation (0915-0930) - 15 minutes
```

Data Collection Frequency

- **Pre-Battle (0700-0830):** 30-second intervals
- **Battle Period (0830-0915):** 15-second intervals (high-intensity monitoring)
- **Post-Battle (0915-0930):** 60-second intervals

GEOGRAPHICAL SIMULATION

Fort Moore Training Area Coordinates

Base Reference Point: Fort Moore, Georgia

- **Latitude:** 32.3617°N (± 0.01° for training area)
- **Longitude:** 84.9367°W (± 0.01° for training area)

Key Locations

```
General Field (BLUEFOR Start): 32.3600°N, 84.9350°W
Residential Compound (OPFOR Start): 32.3630°N, 84.9380°W
Blackhawk Trail (Objective): 32.3615°N, 84.9365°W
McKenna Tower (OPFOR Objective): 32.3620°N, 84.9370°W
```

Movement Patterns

- **Pre-Battle:** Gradual position changes (50-200m movements)
- **Battle Period:** More dynamic movements (10-100m tactical bounds)
- **GPS Precision:** 6 decimal places for injury detection capability

---

BEHAVIORAL DATA SIMULATION

Posture Progression by Phase

Phase 1: Movement (0700-0830)

- **Standing:** 70% (tactical movement)
- **Prone:** 20% (observation/rest)
- **Moving:** 10% (active movement)

Phase 2: Battle (0830-0915)

- **Prone:** 60% (combat positions)
- **Standing:** 25% (tactical movement)
- **Moving:** 15% (fire and maneuver)

Phase 3: Consolidation (0915-0930)

- **Standing:** 80% (reorganization)
- **Prone:** 15% (security positions)
- **Moving:** 5% (casualty evacuation)

Step Count Simulation

- **Pre-Battle:** 500-2000 steps/hour (tactical movement)
- **Battle Period:** 200-800 steps/hour (limited movement)
- **Individual Variation:** ±30% based on role (leaders move more)

MEDICAL DATA SIMULATION

Heart Rate Patterns

```
Baseline Rates by Activity:
├── Resting: 60-80 BPM
├── Light Movement: 80-120 BPM
├── Tactical Movement: 100-140 BPM
├── Combat Stress: 130-180 BPM
└── Maximum Exertion: 160-190 BPM
```

Heart Rate Timeline

- **0700-0730 (Prep):** 70-100 BPM (anticipation)
- **0730-0815 (Movement):** 100-140 BPM (physical exertion)
- **0815-0830 (Positioning):** 80-120 BPM (settling)
- **0830-0845 (Initial Contact):** 140-180 BPM (combat stress)
- **0845-0915 (Sustained Combat):** 120-170 BPM (sustained activity)

Temperature Simulation

- **Ambient Temperature:** 72°F (22°C) baseline
- **Individual Variation:** ±5°F based on activity level
- **Combat Stress:** +2-4°F increase during engagement

Medical Alert Triggers

- **Heart Rate Alerts:** <60 BPM or >190 BPM (2-3% of soldiers)
- **Temperature Alerts:** >100°F (38°C) or <95°F (35°C)
- **Fall Detection:** 3-5% incident rate during movement phases

---

CASUALTY SIMULATION

Expected Casualty Rates (Per Requirements)

```
OPFOR (30 soldiers):
├── KIA: 15 soldiers (50%)
├── WIA: 4-5 soldiers (15%)
└── GOOD: 10-11 soldiers (35%)

BLUEFOR (30 soldiers):
├── KIA: 1-2 soldiers (5%)
├── WIA: 12 soldiers (40%)
└── GOOD: 16-17 soldiers (55%)
```

Casualty Timeline Distribution

- **0700-0830:** No casualties (training safety)
- **0830-0845:** 20% of total casualties (initial contact)
- **0845-0900:** 60% of total casualties (peak engagement)
- **0900-0915:** 20% of total casualties (final maneuvers)

Injury Detection Simulation

- **Pre-Battle Injuries:** 1-2 incidents (GPS + posture change)
- **Location:** Static GPS (±10m) with posture change to "Down"
- **Medical Response:** Automatic injury report generation

WEAPONS ENGAGEMENT SIMULATION

Weapon Systems

```
BLUEFOR Weapons:
├── M4A1 Carbine (Primary)
├── M249 SAW (Squad Automatic Weapon)
└── M240B (Machine Gun)

OPFOR Weapons:
├── AK-74 (Primary)
├── RPK (Light Machine Gun)
└── PKM (Machine Gun)
```

Engagement Patterns

- **Initial Contact (0830-0835):** BLUEFOR initiates (shooter callsigns populated)
- **Return Fire (0835-0845):** OPFOR responds aggressively
- **Sustained Fire (0845-0915):** Both forces engage continuously

Hit Zone Distribution

- **Torso:** 60% (center mass targeting)
- **Extremities:** 30% (arms/legs)
- **Head:** 10% (precision shots)

TECHNICAL DATA SIMULATION

Network Characteristics

- **RSSI (Signal Strength):** -40 to -80 dBm (varying by position)
- **MCS (Modulation):** 0-15 (adaptive based on signal quality)
- **NextHop:** Network routing between nodes

- **Battery Drain:** 1-2% per hour during normal ops, 3-4% during combat

Data Quality Considerations

- **Missing Data:** <2% (realistic network interruptions)
- **GPS Accuracy:** Maintain 6+ decimal places for injury detection
- **Timestamp Integrity:** Ensure sequential, no gaps >60 seconds

---

TACTICAL BEHAVIOR SIMULATION

Leadership Patterns

- **Squad Leaders:** Higher step counts, more standing time
- **Automatic Riflemen:** More prone time during engagement
- **Designated Marksmen:** Extended prone positions during battle

Unit Cohesion Indicators

- **BLUEFOR Positioning:** Coordinated, defensive positions along Blackhawk Trail
- **OPFOR Movement:** Aggressive advance toward McKenna Tower
- **Tactical Bounds:** 50-100m movements during fire and maneuver

---

DATA VALIDATION REQUIREMENTS

Critical Checks

1. **Temporal Sequence:** All timestamps must be sequential
2. **GPS Validity:** Coordinates within Fort Moore training area bounds
3. **Heart Rate Limits:** 30-250 BPM physiological range
4. **Battle Detection:** Ensure 45-minute battle period is identifiable
5. **Casualty Logic:** KIA soldiers stop reporting data post-casualty

Quality Assurance

- **Minimum Duration:** 150 minutes total (0700-0930)
- **Force Ratio:** Exactly 30 BLUEFOR, 30 OPFOR
- **Data Completeness:** >98% of expected records present
- **Medical Alerts:** 5-8% of soldiers trigger at least one alert

---

SAMPLE DATA STRUCTURE

```csv
callsign,squad,ip,playerid,casualtystate,processedtimegmt,latitude,longitude,battery,posture,shootercallsign,weapon,mu
BLUE01,BLUEFOR,10.1.1.101,1001,GOOD,08/06/2025 07:00:00,32.360123,-84.935456,98,Standing,None,M4A1,N/A,None
RED01,OPFOR,10.1.2.101,1031,GOOD,08/06/2025 07:00:00,32.363234,-84.938567,97,Standing,None,AK-74,N/A,None,73
```

IMPLEMENTATION NOTES

Randomization Guidelines

- **Individual Variation:** Each soldier should have consistent baseline characteristics
- **Realistic Progression:** Gradual changes in heart rate, position, activity
- **Tactical Coherence:** Unit movements should reflect military doctrine

Special Scenarios

- **Medical Emergencies:** 1-2 soldiers with legitimate medical alerts (not performance-impacting)
- **Equipment Failures:** Occasional data gaps for 1-2 soldiers (realistic technical issues)
- **Fall Incidents:** 3-5 fall detections during movement phases (training realism)

Scenario Fidelity

The simulated data must support the training objectives while maintaining the medical monitoring focus outlined in the Enhanced Individual Soldier Report System requirements. Performance evaluation should clearly distinguish between controllable tactical factors and medical conditions.

This simulation guide ensures realistic, tactically coherent data that supports both the Fort Moore training scenario objectives and the Enhanced Individual Soldier Report System's medical monitoring and performance assessment capabilities.