

**BY ORDER OF THE COMMANDER  
442D FIGHTER WING**

**442D FIGHTER WING INSTRUCTION  
13-212**



**18 OCTOBER 2024**

**Space, Missile, Command and Control**

**RANGE PLANNING AND OPERATIONS**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This 442d Fighter Wing (442FW) Instruction extends the guidance of Air Force Manual (AFMAN) 13-212 Volume 1, *Range Planning and Operations*, 14 March 2023. This instruction is applicable to all military, civilian and contractor personnel utilizing the Cannon Bombing Range and the Fort Leonard Wood Range 50. Waiver authority is delegated to the Range Operating Authority (ROA). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the recommending office through the 442FW Publications/Forms Managers (442 FSS/SCOK) to Higher Headquarters as necessary. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in Air Force Records Information Management System (AFRIMS) at the Air Force (AF) Portal: <https://afrims.cce.af.mil/>. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

**SUMMARY OF CHANGES**

Changes include the addition of AGR-20 delivery restrictions for A-10 range operations, as well as the establishment of a new naming convention for Contact Points for JTAC mounted operations. The previous requirement to climb/descend to 5000' AGL for hung ordnance has been removed. JTAC Close Air Support training has been clarified to prohibit movement outside established

Observation Positions while A-10's are employing hot ordnance. A requirement has been added for cold trigger/pickle check prior to dynamic dry operations. **Paragraph 2.6** has been revised to remove dictated weather minimums, directing aircrew to utilize AFMAN 11-214 and MDS specific guidance for range operations.

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## Chapter 1

### GENERAL

**1.1. Overview.** The contents of this chapter are governed by paragraph 2.9.16 of AFMAN 13-212 Volume 1 and provide supplemental information for the conduct of operations on Cannon Range. All personnel will comply with this chapter when operating aircraft or performing ground duties within the confines of Cannon Range. The range lies within R-4501, and is part of the Fort Leonard Wood range complex in south central Missouri. The US Army Range Operations maintains control and scheduling of the ground space and is the scheduling and controlling agency for the R-4501 airspace. Refer to [Figure 1.1](#) for local area depiction.

**Figure 1.1. Cannon Range Local Area.**



1.1.1. The 442<sup>nd</sup> Fighter Wing Commander, Whiteman AFB, MO has the responsibility and authority for Cannon Range. The 442FW/CC has delegated the authority for all activities conducted by, or for, Cannon Range to the 442 OG/CC. The Range Operating Authority (ROA) is the 442nd Operations Group Commander. The ROA is responsible for the funding and long-range planning of the range, in addition to the duties prescribed in AFMAN 13-212 Volume 1, Chapter 2. Cannon Range is part of the 442 Operations Support Squadron (OSS) and will coordinate all flying activities with the 442 OSS/CC.

1.1.2. The Range Operations Officer (ROO) is responsible for the safe and successful completion of missions flown on Cannon Range and the supervision of management, planning

and maintenance. The ROO has authority over all ground operations and support functions on the range. The ROO will also be a fully-qualified Range Control Officer.

1.1.3. The Range Control Officer (RCO) is directly responsible for all range operations and air/ground safety during range operations.

**1.2. Scheduling.** The range scheduler is responsible for determining range availability and submitting requests through the Range Facility Management Support System (RFMSS) at Fort Leonard Wood. The ROO, or RCO in the absence of the ROO, resolves conflicts in range utilization with all users.

1.2.1. Units will schedule range periods and request changes through Cannon Range (DSN 676-9220 / FAX DSN 676-9200). An alternate phone number is (573) 563-9203 / DSN 676-9203. Range scheduling requests should be submitted by the 15th of the month (or first work day after the 15th if weekends or holidays preclude accepting requests on the 15th) for the following month's flying schedule (e.g. March 15th for April schedule). Requests for night or weekend flying activities must be scheduled at least two weeks in advance to ensure airspace and personnel are properly scheduled. Cannon Range can accept short notice requests, subject to range and personnel availability. Requests received after the 15th of the month will be scheduled if range time is still available at the requested time, and personnel are available to support the request. Late arrivals and/or cancellations must be coordinated with Cannon Range as soon as possible. The scheduler and ROO will resolve time conflicts in a fair and equitable manner based on priorities. The finalized monthly range schedule will be viewable in CSE by the 20<sup>th</sup> of the month.

1.2.2. Special events, such as expending heavyweight inert ordnance, utilizing Smokey Sam Simulators (SSS) or other threat systems, require coordination prior to range time. Users will contact Cannon Range as soon as possible with these and other special requests.

1.2.3. Users will relay the planned lineup and events to Cannon Range through either telephone (DSN 676-9220 or -9202/Comm (573) 563-9220 or -9202), FAX (DSN 676-9200/Comm (573) 563-9200) or through email at [cannon442fw@gmail.com](mailto:cannon442fw@gmail.com) in order to facilitate efficient handling of the range events. This should be accomplished at least one hour before arrival, if feasible. Information should include, but is not limited to, call sign, number and type of aircraft, pilot numbers (if applicable), weapons delivery events, and targets.

1.2.4. Cannon Range mailing address is listed below in **Table 1.1**.

**Table 1.1. Cannon Range Mailing Address.**

Cannon Range 21900 Hwy 17 S. Laquey, MO 65534
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1.2.5. Cancellations and scheduling efficiency. Units canceling their range time will do so as soon as they find out about the cancellation. This allows other users the range time if needed, the ARTCC to release the airspace if required, and allows maintenance on the range.

1.2.5.1. Users will accurately forecast and schedule their needs. For example, units should not schedule 90-minute range periods while intending to only utilize the last 10 minutes as a matter of scheduling convenience.

1.2.6. Cannon Range is subject to the restrictions of FLW Army Training Center which may periodically require range closure or restricted activities. The Range Control Officer (RCO) will advise units as soon as possible when this occurs.

**1.3. Maintenance.** Range maintenance documentation is maintained at Cannon Range. The ROA is responsible for obtaining support from outside sources for projects beyond the capability of Cannon Range personnel. Cannon Range scheduling will notify users of expected closures at least 30 days in advance, if feasible.

**1.4. EOD and Decontamination/Disposal.** Explosive Ordnance Disposal (EOD) Clearance will be accomplished in accordance with (IAW) AFMAN 13-212 Volume 1 and local directives. Scrap sales will be conducted IAW Department of Reutilization and Management Services (DRMS) and AFRC directives. The ROA is responsible for scheduling range residue removal. The range contractor is responsible for the execution of the de-militarization, removal, and disposal of range residue.

1.4.1. Range personnel will not handle any munitions (except 20mm and 30mm Training Practice [TP] bullet heads) until EOD personnel have certified them “safe”.

1.4.2. All munitions and targets examined by EOD personnel and certified safe for disposal will be marked and stored in the range residue holding area for disposal IAW T.O. 11A-1-60. Items that can be boxed will be sealed using serialized closures.

1.4.3. Detonations will only be made in authorized areas and will not exceed 100lbs Net Explosive Weight (NEW). Exception: Range Operations Officer (ROO) may authorize small detonations (not to exceed 50lbs NEW) OUTSIDE the authorized areas.

**1.5. Reports.** The weapons scoring systems generate hard-copy score sheets. The completed forms will be forwarded to the appropriate unit using the agreed media, usually via fax.

1.5.1. Cannon Range personnel will compile and submit the Range Resources Utilization Data Reports monthly to the ROA, which will forward this data through channels to HQ AFRC/A3. Annual Airspace Utilization reports for Cannon MOA's will be submitted to the FAA Air Force Representative (AFREP) upon request, and to AFRC/A3 annually.

**1.6. Command and Control.** Command and control is exercised through Fort Leonard Wood. The RCO receives control of the range and R-4501 A/C/D/E from Fort Leonard Wood Range Operations (DSN 581-2525) prior to the first range period. The RCO returns control to Fort Leonard Wood during periods of administrative downtime and at the end of the day.

**1.7. Support Agreements.** The 442FW has a Memorandum of Agreement, see [Attachment 8](#), with Fort Leonard Wood for base operational support of Cannon Range.

**1.8. Firefighting.** All firefighting responsibilities on Cannon Range are in accordance with the Integrated Wildland Fire Management Plan, U.S. Army Maneuver Support Center of Excellence and Fort Leonard Wood. All Cannon Range personnel will be trained to the NWCG Type II level and will perform annual recertification. Range personnel will contain and/or extinguish fires within Cannon Range boundaries. If a fire occurs off property or there is a fire that Cannon Range is unable to control, FLW Fire Department will assume firefighting responsibility.

1.8.1. Cannon Range operates under FLW 210-14 Fire Danger Class/Restrictions. The fire index will be assigned by the RCO and is calculated based on conditions at Cannon Range and the FLW Fire Danger Class. Cannon Range has developed a planning matrix to alleviate any

confusion about what events are allowed during certain fire index levels. This matrix is labeled the Cannon Range Operational Condition (CROC), and will be reported upon aircraft arrival, if any color other than green; see [Table 1.2](#). The RCO will make the final determination as to which targets are available and what ordnance will be allowed. Changes will be communicated to scheduled units as early as possible, to aid in mission planning, but is subject to change based on local conditions.

**Table 1.2. Cannon Range Operational Condition.**

CANNON RANGE OPERATIONS CONDITION					
EVENTS	GREEN	YELLOW	ORANGE	RED	BLACK
BDU-33	NO RESTRICTIONS	Cold/No Spots <i>or</i> Hot Spots on RCO Designated Targets Only	Cold/No Spots <i>or</i> Hot Spots on RCO Designated Targets Only	Cold/ No Spots only	
2.75 ROCKETS (TP)	NO RESTRICTIONS	4,000'SR Cease Fire	NOT PERMITTED	NOT PERMITTED	NO MUNITIONS EXPENDITURE PERMITTED
FLARES	>1000' AGL	>5,000' AGL	NOT PERMITTED	NOT PERMITTED	
STRAFE —	NO RESTRICTIONS	NO RESTRICTIONS	No tracers	No tracers	
TP (Call for TPT)	NO RESTRICTIONS	≤ 20kt wind	NOT PERMITTED	NOT PERMITTED	
EOD EXPLOSIVE OPS	NO RESTRICTIONS	NO RESTRICTIONS	NO RESTRICTIONS	NOT PERMITTED	NOT PERMITTED

**1.9. Inspections.** Inspections will be conducted IAW AFMAN 13-212 Volume 1. The 442<sup>nd</sup> FW Safety Office, or FLW Safety office (IAW MOA) will conduct annual safety inspections and report the results to the ROO, 442<sup>nd</sup> OSS/CC, 442<sup>nd</sup> OG/CC and the 442<sup>nd</sup> FW/CC.

1.9.1. Other 442<sup>nd</sup> FW agencies or organizations will periodically conduct inspection to assess and assist range programs, facilities and operations (e.g. fire, bioenvironmental, COMSEC, environmental, occupational health, etc.). Results will be reported to the ROO, 442<sup>nd</sup> OSS/CC, 442<sup>nd</sup> OG/CC and the 442<sup>nd</sup> FW/CC as necessary.

1.9.2. The ROO will ensure Cannon Range is in compliance with applicable U.S. Army and Fort Leonard Wood regulations.

**1.10. Recommended Changes.** Recommendations for change to this instruction will be submitted on an AF Form 847, Recommendation for Change of Publication to the 442<sup>nd</sup> Fighter Wing, at 931 Arnold Ave, Whiteman AFB, MO 65305.

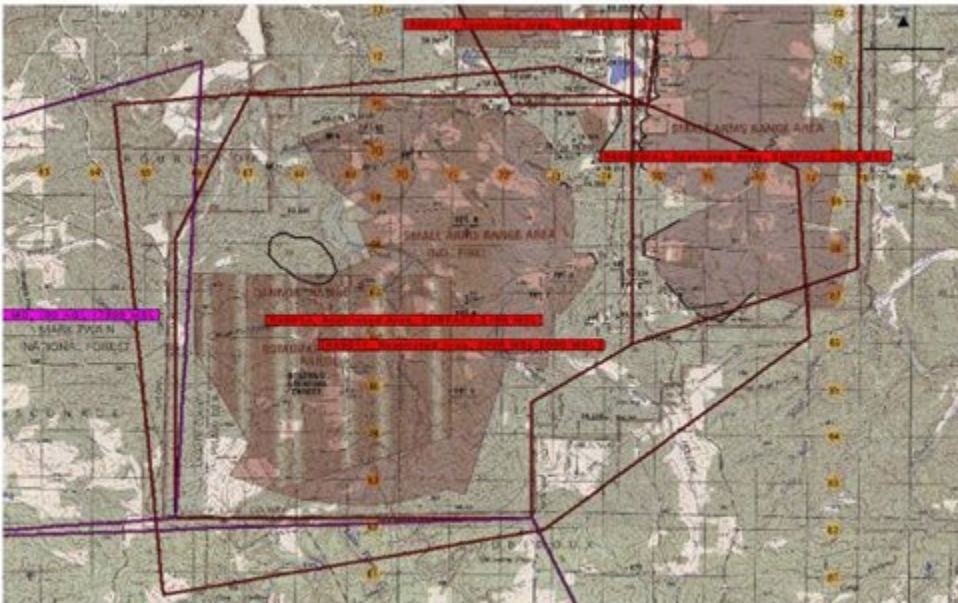
## Chapter 2

### RANGE DESCRIPTION AND INFORMATION

**2.1. Airspace.** Cannon Range is located on the Fort Leonard Wood Military Reservation (FLWMR) within Restricted Area R-4501. R-4501 A, C, D, E ([Figure 2.1.](#)), Cannon MOA's A and B ([Figure 2.2](#)), and the Cannon ATCAA ([Figure 2.2](#)) will normally be activated when air-to-ground operations are being conducted. The RCO will inform flights, upon check-in, if any portion of this airspace is not available. **Restricted Area R-4501 B (SFC-4,300' MSL) and R-4501 F (SFC-3,200' MSL) are not under Cannon Range control.**

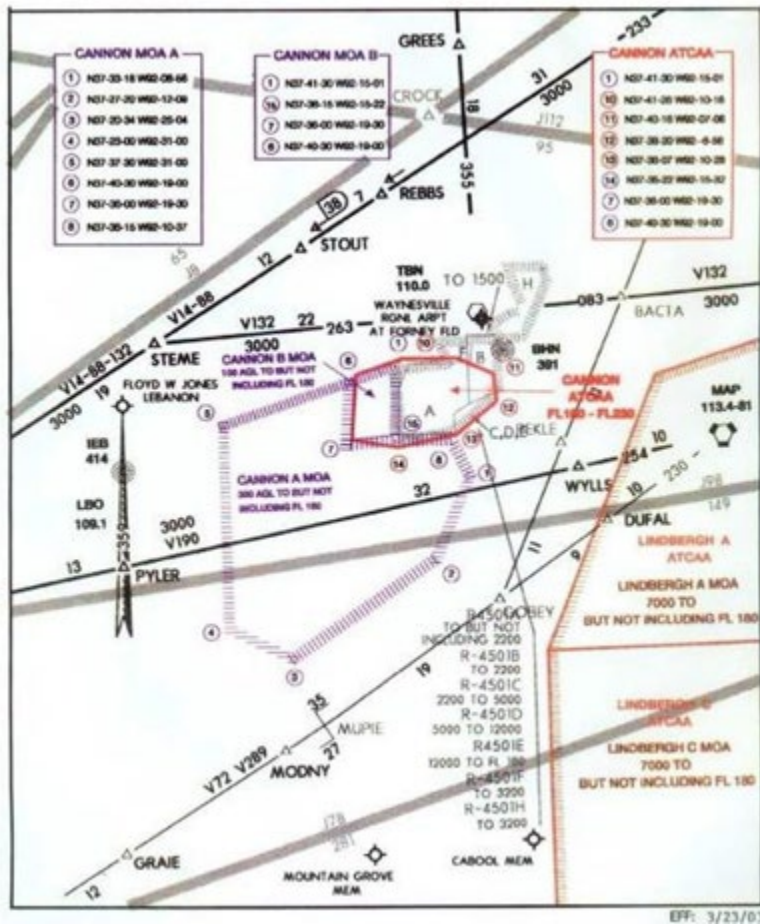
2.1.1. R-4501 A altitudes are from surface to 2,200' MSL, C from 2,200-5,000' MSL, D from 5,000-12,000' MSL, and E from 12,000' MSL to FL180. Boundaries are described in FLIP AP/1A (Special Use Airspace), and depicted in [Figure 2.1](#).

**Figure 2.1. Special Use Airspace.**



2.1.2. Cannon MOA A altitude block is from 300' AGL up to but not including FL180. Cannon MOA B altitude block is 100' AGL up to but not including FL180. Boundaries are depicted in [Figure 2.2](#).

Figure 2.2. Local Airspace.



2.1.3. As the primary using agency of R-4501, Fort Leonard Wood (FLW) will coordinate NOTAM requests between Cannon Range and Kansas City Center (KCC). FLW's Bloodland Range Operations, or Cannon Range through Bloodland Range Operations, may activate or relinquish segments of restricted airspace through KCC. FLW regulation 210-14, Army Regulation 385-63, and KCC/Range Operations Division/Forney Tower, FLW Letter of Procedure, *23 October 2017*, detail the coordinated use of airspace between KCC, Forney Tower, Cannon Range, and the US Army Training Center FLW.

**2.2. Range Description.** Cannon Range main tower (elevation 1122' MSL) is located north of the impact area. The flank tower is located at 250 degrees magnetic for 0.7 nautical miles from the main tower. There are three scoring towers, two of which are 140' located east and southwest of the impact area. The third tower is 70' located southeast of the impact area. An operational helicopter pad is located just south of the main tower. Coordinates for these features are available in [Attachment 3](#). The highest and lowest terrain within the restricted area is 1,292' MSL and 950' MSL, respectively. Minimum Safe Altitude (MSA) at Cannon Range is **2,600' MSL**.

2.2.1. An east-west black asphalt road marks the northern boundary of the target area. There are no targets north of this road. A north-south gravel road located just west of the strafe pit serves as a run-in line for conventional bomb deliveries. Scoreable targets are located approximately 4000 feet south of the main tower, and include AAA pieces, revetments,

vehicles, buildings, bunkers, and movable Joint Modular Ground Targets (JMGT). Targets not scoreable (not visible to both Main and Flank towers) include villages, revetments, JMGTs, and high fidelity threat vehicles. See **Figure 2.4, or Attachment 4**, for target arrangement; see the range CSE website for updates <https://cseaf.eglin.af.mil/CSE/home.aspx>.

2.2.2. Two acoustically scored strafe targets are located 2000' south of the main tower. Due to both lanes being set up as "hard" targets the strafe pit is for A-10 use only. The right target is an armored personnel carrier (APC); the left is a 20' shipping container. Either side may be substituted for a variety of armored targets based on target availability. A-10 two target strafe (TTS) is allowed in the strafe pit utilizing the left side followed by right. Contact Cannon Range for the most up to date strafe pit targets and conditions. The foul line is an east-west oriented clearing in the trees 2000' before the strafe pit, immediately west of the main tower. Use caution when conducting low angle strafe as terrain rises rapidly immediately south of the foul line, and gradually decreases to the strafe pit. Aircrew conducting low angle strafe must use 1160' MSL, (75' above the highest terrain between the foul line and the strafe pit), instead of radar altitude (75' AGL), as the minimum recovery/foul altitude. See **Figure 2.3** for strafe pit and surrounding area imagery.

**2.3. General Range Restrictions.** Pilots are cautioned to stay within Cannon Range Airspace. Cannon's airspace consists of Restricted Area R-4501 A, C, D, E; Cannon MOA's A and B; and the Cannon ATCAA. R-4501 B, F, G and H are not controlled by Cannon Range and should not be entered without the proper clearance.

2.3.1. Left hand box patterns east of the range complex overfly small arms ranges (R-4501 B) north and east of the range. Minimum altitude for east conventional patterns is 3,500' MSL until on final unless otherwise approved or amended by the RCO.

2.3.2. The Army conducts explosive training to the east of the main tower (approximately 2 miles), north of the main tower (approximately 1.5 miles), and just northwest of the flank tower, **Figure 2.5**.

2.3.3. An Army Unmanned Aerial Vehicle (UAV) training/operating area, **Figure 2.6**, is located east of the main target area and occasionally is active during Cannon Range mission times. Aircraft operating in Cannon airspace while the UAV airspace is active will remain at or above 1,500' AGL when operating east of the 15S WB 70 grid line (N 37° 37.77) and north of the 65 grid line (W 092° 12.40). The RCO will advise flight leads upon check-in of UAV and FLW small arms activity and restrictions.

2.3.4. Over-flight of FLW general operations area is prohibited without approval of the Forney Army Airfield controller due to Class D Airspace.

2.3.5. A 154' water tower is located near the northeast corner of R-4501 A at WB 74215 70056 or N 37° 40.482' W 092° 09.505'.

2.3.6. Noise Sensitive Areas (NSA's) are depicted in **Table 2.1**.

Figure 2.3. Strafe Run-in.

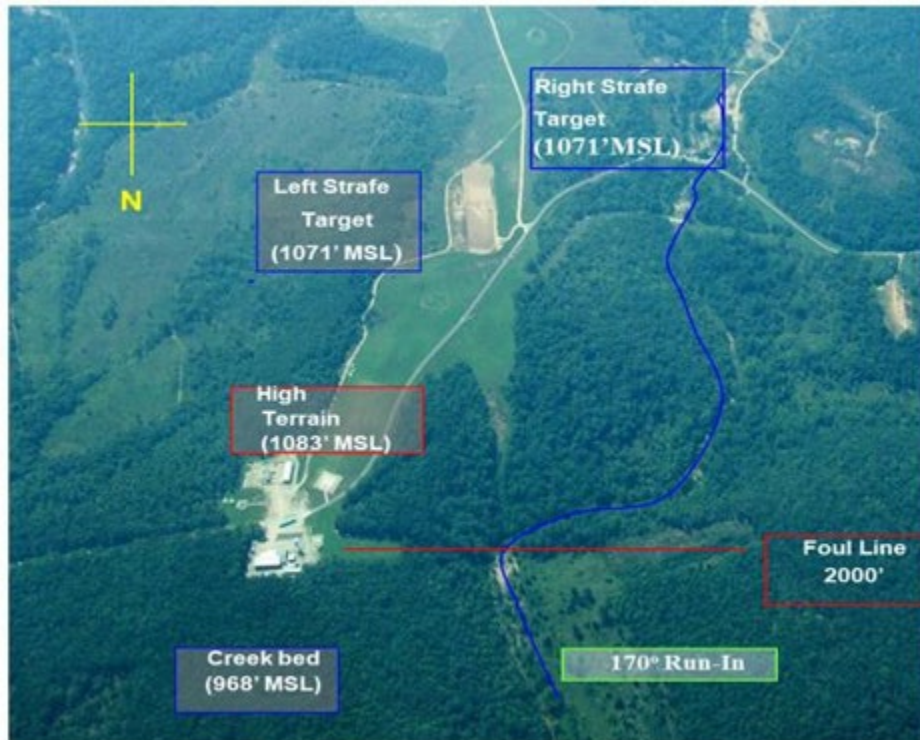


Figure 2.4. Cannon Range Targets.



Figure 2.5. Range Relationship to Fort Leonard Wood.

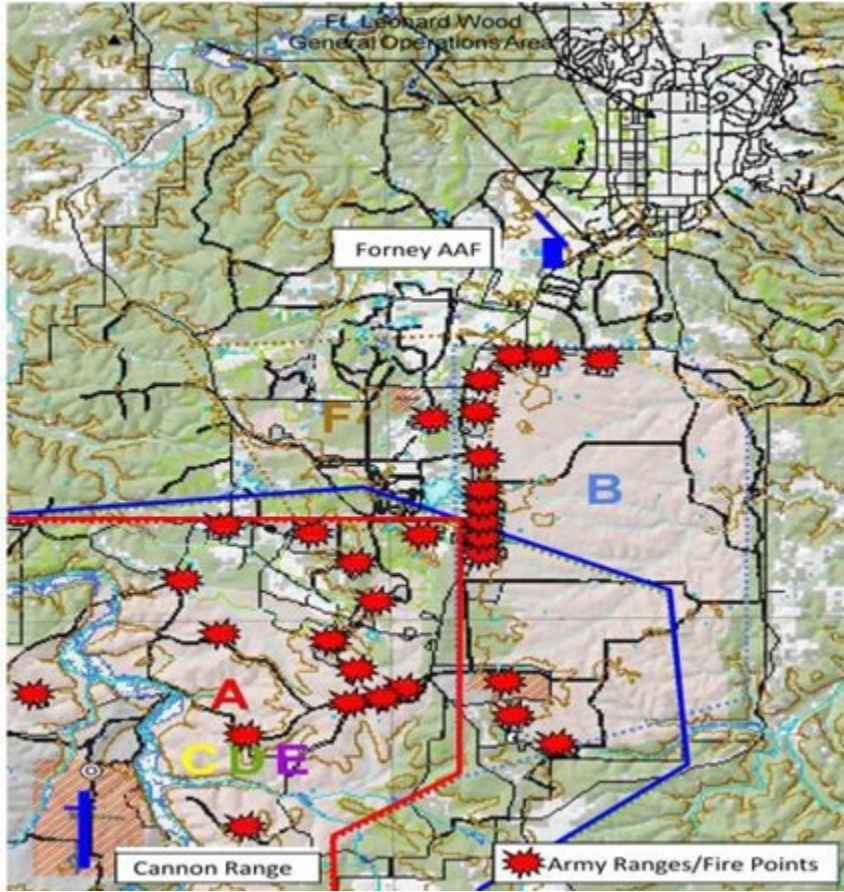


Figure 2.6. UAV ROZ Map.

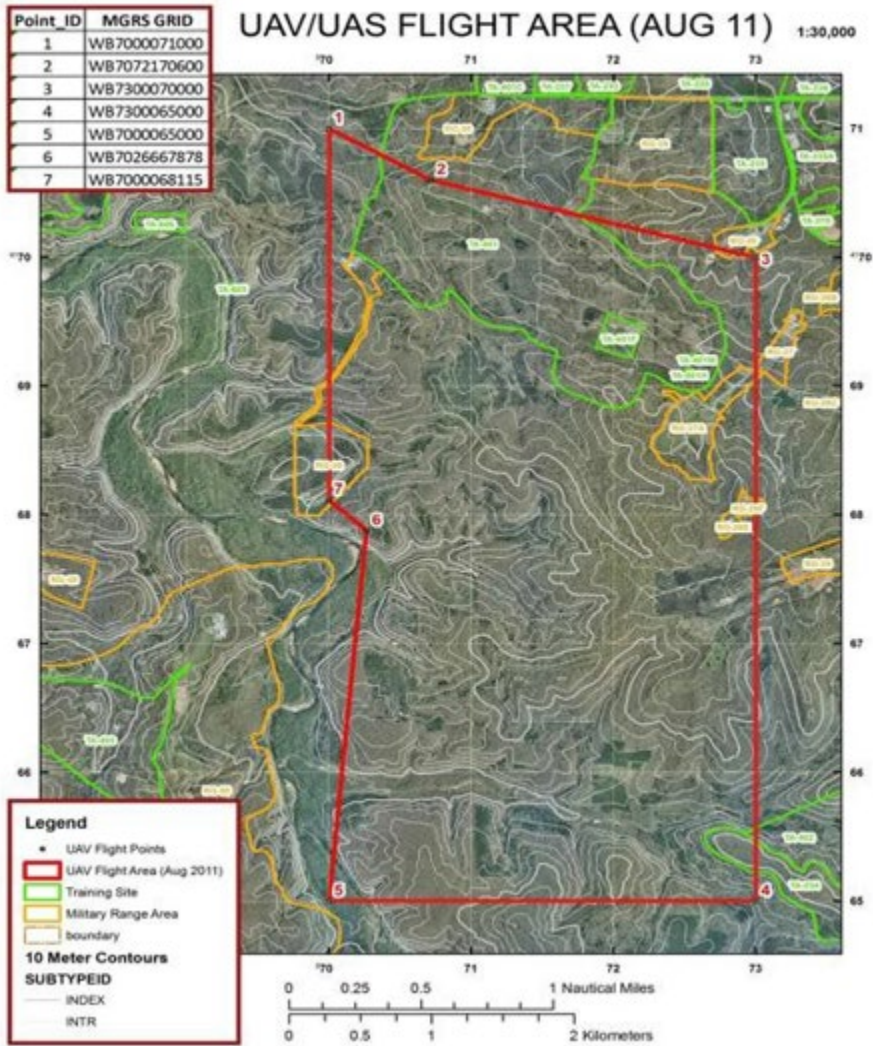


Figure 2.7. Fort Leonard Wood Helicopter Routes.

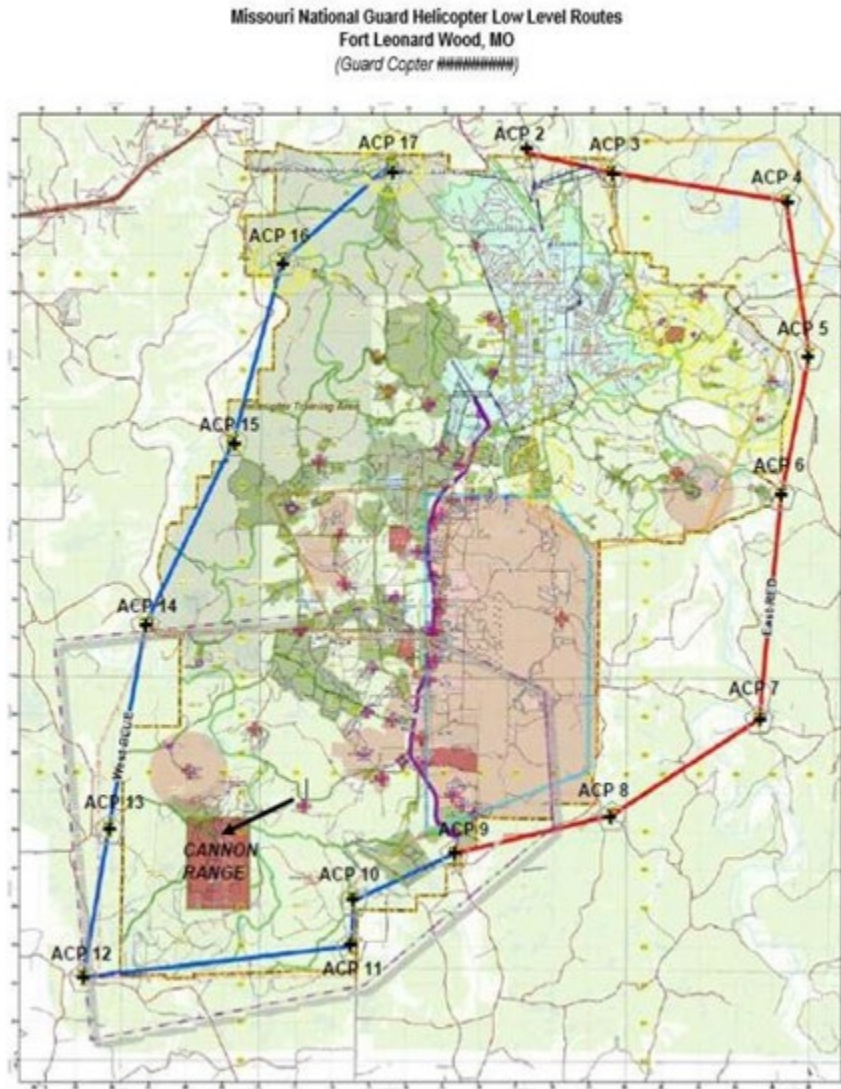


Table 2.1. Noise Sensitive Areas.

#	Radius/altitude	MGRS/15S WB	Description
1	1NM/1000' AGL	652 820	Town
2	1NM/1000' AGL	394 483	Farm
3	1NM/3000' AGL	576 702	Residence
4	.5NM/3500' MSL	655 671	Residence
5	2NM/1000' AGL	693 377	Farm/Airport

**2.4. Authorized Training Ordnance.** Aircraft delivered ordnance at Cannon Range is restricted to BDU-33's and Mk-106/BDU-48's with Mk-4 spotting charges; inert Mk 81-84's without spotting charges, 40MM practice (M-385) inert warhead, 2.75" Rockets (inert warhead), Training practice (TP) ammunition, Training Practice Tracer (TPT), self-protection flares, and chaff. BDU-50's with LGB guidance kits are authorized on designated targets. Inert GBU-38's may be possible depending on WDZ footprint analysis, contact Cannon Range ROO for further information. LUU-

2 and 19 target illumination flares are not authorized. For use of tracer ammunition call Cannon Range Operations. Users must reference [Attachment 2](#) for targets, deliveries, and restrictions.

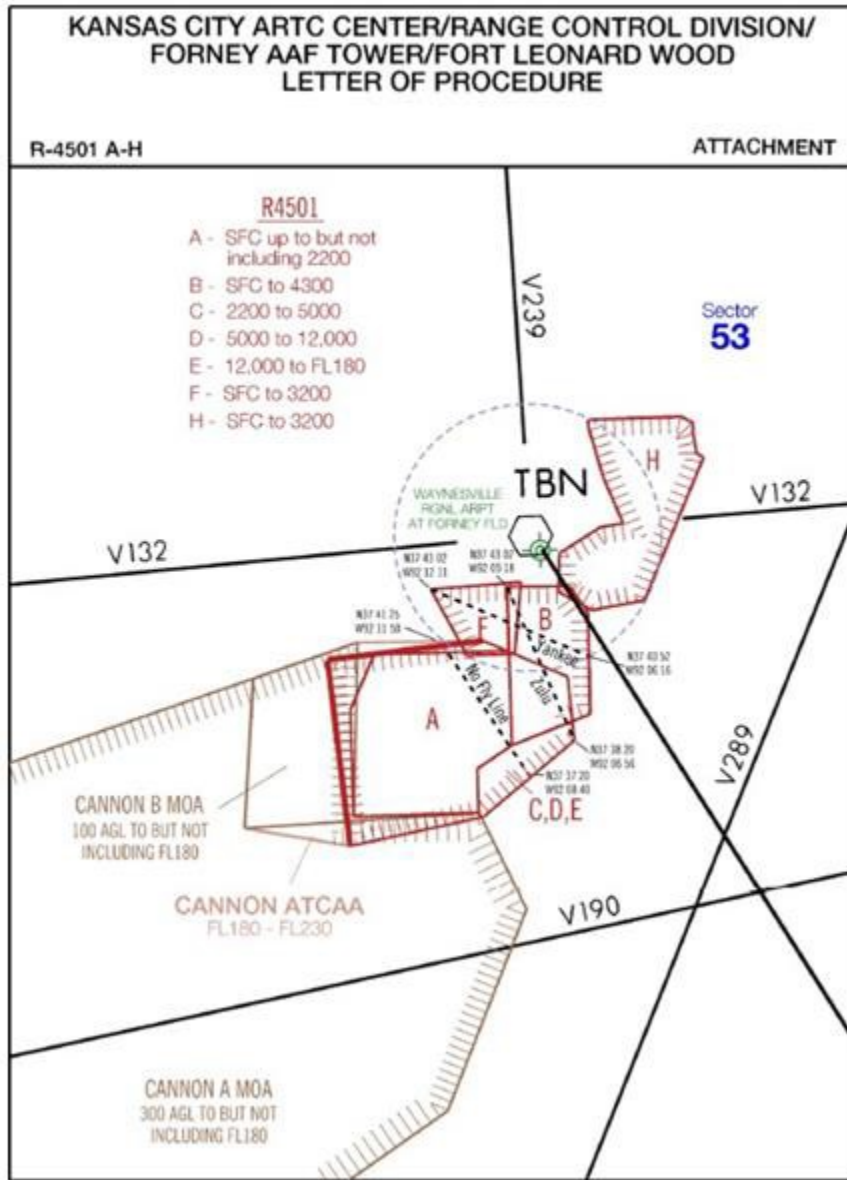
**2.5. Real Estate Boundaries and Associated Restrictions.** Range boundaries fall within the FLW impact area. All Weapon Danger Zones (WDZ's) fall within the Fort Leonard Wood Military Reservation (FLWMR). Prior to release when carrying expendable ordnance, final switch configuration for weapon release will not be accomplished until the aircraft is in such a position that any accidental release of ordnance will impact within the confines of the FLWMR. During multiple pass operations, aircraft will abide by their aircraft specific 11-2MDS operating procedures, and adhere to the above guidance. After completing final weapons delivery, each flight member will perform a weapons system safety check.

**2.6. Weather Restrictions.** Cannon Range is a Visual Meteorological Conditions (VMC) only range and has no radar on station. Aircrew must maintain VMC during weapons employment and will comply with AFMAN 11-214 and 11-2MDS restrictions while maneuvering on range. Aircraft will maintain VMC while maneuvering within conjoining MOA airspace.

2.6.1. Air-to-ground activities will be conducted with the minimums in accordance with AFMAN 11-214 and 11-2MDS manuals. When weather conditions are marginal, the flight lead and the RCO are responsible for determining if range weather will permit range operations.

2.6.2. Upon request from Forney Tower or Kansas City Center (KCC), portions of restricted airspace will be released from range use for instrument approaches and departures at Forney Field. Portions northeast of a line ("Zulu") from N 37° 43' 02" W 92° 09' 18" to N 37° 38' 20" W 92° 06' 56" from 5,000' MSL and below may be unavailable from 15 minutes before an IFR arrival or departure at Forney, continuing through the instrument approach/missed approach or departure. This affects R-4501 B and C, see [Figure 2.8](#). The RCO will notify aircrew when these restrictions are in effect. The No Fly Line depicted in [Figure 2.8](#) applies to UAS usage only. UAS operations will not occur east of the No Fly Line.

Figure 2.8. "East of Zulu" and No Fly line.



2.6.3. The RCO will make the final decision to conduct operations when weather is a factor. Cannon Range will terminate operations for lightning within five miles of the main tower.

## Chapter 3

### NORMAL PROCEDURES

**3.1. General.** All delivery procedures will be in accordance with the appropriate weapon system manual. Aircrew must ensure they remain within Cannon Range airspace and are established within R-4501 prior to releasing ordnance or firing combat lasers.

3.1.1. No more than four (4) aircraft will be in the weapons delivery pattern at one time. This does not preclude a Forward Air Controller Airborne (FAC-A) orbiting above or outside the delivery patterns or other strike aircraft orbiting away from the target area, within Cannon MOA.

3.1.2. Prior to departing range airspace all aircraft will perform and acknowledge an armament safety check with the RCO.

**3.2. Safety.** Cannon range is a training environment filled with many potential safety threats. Risks have been weighed against benefits, and useful training can be safely accomplished when range guidance and good judgement are followed. All personnel working on the range or operating at the range are responsible for ensuring safety is maintained.

3.2.1. A foul will be charged when any of the following occurs:

3.2.1.1. Violation of flight or range safety.

3.2.1.2. If an aircraft passes below the minimum recovery altitude as established in MAJCOM MDS-series instructions.

3.2.1.3. Unintentional double-firing burst versus a single target or strafing past the foul line.

3.2.1.4. Lazy recoveries from a LAS/LRS/TTS pass resulting in the aircraft descending below 75'.

3.2.1.5. Aircraft expending on wrong target.

3.2.1.6. Aircraft expending ordnance without clearance.

3.2.2. Aircrew will not perform further deliveries after receiving a second foul on the range. A single dangerous foul, as judged by the RCO or flight lead, will also restrict aircrew from performing further deliveries during that sortie.

3.2.3. Orange and white are colors associated with manned positions and will not be used to mark any range targets. No orange or white object will be targeted by aircraft using Cannon Range, dry or hot. Also, Main Tower complex, including lower compound and helicopter pad, will not be used as targets under any circumstances. With prior coordination Cannon can provide moving targets for dry attacks. In this situation all aircraft will expend all expendable training ordnance and shall make a switches safe/training mode call prior to prosecuting attacks.

3.2.4. Bird Air Strike Hazard (BASH) reports will be provided to pilots upon initial range entry. Pilots will follow bird hazard guidance specified by their unit or Cannon Range, whichever is more restrictive. Current and forecast Avian Hazard Advisory System (AHAS) bird watch condition can be obtained on the AHAS website (<http://www.usahas.com/>).

USBAM (US Bird Avoidance Model) can be accessed for use in long-range planning through a link on the AHAS site. Cannon Range is not significantly affected by migratory routes or other seasonal bird activity, and is considered to be in “Phase 1” (normal hazard) unless otherwise notified. The phrase “Bird Watch Condition”, or “Birds” for brevity, will be used to describe conditions at Cannon Range. During range missions, the RCO will pass to aircrew the Bird Watch Condition derived from observation (range personnel and/or pilot reports) and AHAS current conditions, whichever is higher. Be advised that not all range airspace can be visually assessed. Specific levels of bird concentrations are described below.

3.2.4.1. **SEVERE.** Heavy concentrations of birds, on or immediately above the range or within the MOA, with specific locations (from observations and/or AHAS current conditions), which represent an immediate hazard to safe flying operations (high bird strike probability). Flight leads must evaluate mission requirements and consider methods to reduce bird strike probability, including eliminating or minimizing low altitude operations, reducing airspeed, or modifying planned events. If the SEVERE condition is due to aircrew or range personnel observations, Cannon Range may restrict missions (e.g. target areas, events, altitudes) while pilots exercise increased clearing and avoidance.

3.2.4.2. **MODERATE.** Concentrations of birds observed in locations representing a probable hazard to safe flying operations. Cannon Range will announce details of bird presence. Aircrew should consider methods to reduce bird strike probability and operate with increased vigilance. If the MODERATE condition is due to aircrew or range personnel observations, Cannon Range will provide specific hazard information while pilots exercise increased clearing and avoidance.

3.2.4.3. **LOW.** Little to no bird activity on and above the range or MOA’s with a low probability of hazard.

3.2.5. RCO’s will periodically update Bird Watch Condition from the AHAS website during flight operations, and may establish a higher Bird Watch Condition based on range personnel or aircrew current observations. When the current Bird Watch Condition is moderate or severe, or the Bird Watch Condition changes during a flight’s range period, the RCO will notify aircrew. If the Bird Watch Condition is from the AHAS website, the RCO will simply transmit the condition (e.g. “Cannon Range and Cannon MOAs are Bird Condition Moderate.”). If the condition is based on human (aircrew or range personnel) observation, the RCO will pass the appropriate bird condition, specific location, and nature of avian activity (e.g. “Cannon Range is Bird Condition Severe for numerous turkey vultures soaring to 2000’ AGL over the strafe pit. The strafe pit is closed; avoid flight within 1 NM of the strafe pit below 3,000 AGL”). Aircrew will modify flight profiles to avoid specific locations of reported bird activity, and will similarly report observed bird activity within Cannon Range and the associated airspace.

**3.3. Mission Planning and Coordination.** Cannon Range offers a diverse training environment for all participants in air-to- ground training. In order to maximize the training value and ensure the safety of range personnel, all users must coordinate their activities with Cannon Range a minimum of two hours prior to the scheduled range period. For aircraft, the mandatory method is via fax, see [Figure A5.1](#). Due to the limited land area and small SUA, careful planning is required to ensure the safe accomplishment of your training mission. Aircrew and JTAC’s must ensure their combination of munition, target, delivery, and attack heading meet the restrictions listed in [Attachment 2](#). Inter-flight frequencies must be provided for all missions. Additional areas to

consider and coordinate during mission planning include: Smokey Sam Simulators (SSS), EC threats, tactical scenarios, heavy-weight munitions, SADL information, mobile targets, laser operations (including laser pointers), moving targets, Combat Search and Rescue (CSAR) support, heated targets, target lighting, aircraft lighting, range identification lighting (night), Close Air Support (CAS) procedures, AHAS forecast, and current range restrictions. Users who are unable to pre-coordinate can expect up to a 15-minute delay while their mission data is loaded and may be limited to Basic Surface Attack (BSA) events from the conventional pattern.

**3.4. Range Entry/Exit.** Contact Cannon Range, callsign “Cannon”, with flight callsign, location and altitude for clearance into Range airspace. Cannon RCO will provide clearance into the airspace, current altimeter, nearby hot ground ranges, UAV status, CROC, bird condition, pertinent weather information and laser status. Once the RCO has issued clearance, pass any changes to previously coordinated lineup and events. If unable to contact Cannon Range on primary frequency, UHF 392.2, remain clear of R-4501 while contacting Forney Tower and request they call Cannon Range via landline.

3.4.1. Cannon Range may pass FAC-A control to qualified aircrews at the discretion of the RCO. In order to ensure realistic training, the FAC-A may control the entry/exit of additional flights from the same squadron, or previously coordinated aircraft. Under all cases the FAC-A must still pass as a minimum the altimeter, bird condition, CROC if other than green, laser status, and any applicable information immediately following clearance into the airspace. The right to control entry/exit of aircraft will be revoked if the above procedures are not followed. If at any time the RCO can’t positively determine who is in the airspace and their location a “terminate” or “knock it off” will be used as appropriate.

3.4.2. Only when R-4501 has been activated with Kansas City Center are aircraft authorized entry into the restricted area. The RCO is responsible for controlling all flights using the range and will monitor all aircraft while on the range. Cannon Range altimeter setting will be used while operating within the Cannon MOA’s, ATCAA, and R-4501, and ceilings will be adjusted to not exceed the highest level based on an altimeter setting of 29.92.

3.4.3. Contact Forney Tower on UHF 268.7 to coordinate alternate entry from the north or east through Forney Airspace (3,000’ AGL/5 NM or 6,500’ MSL over FLW general operations area).

3.4.4. If unable to immediately enter the range, aircraft may hold VFR outside Cannon airspace. Use F8, [Figure 3.1](#), for holding with right hand turns at VFR altitudes. If IFR, contact KCC for holding instructions. With RCO and flight lead concurrence, flights may be cleared into range airspace at altitudes safely above or laterally separated with other aircraft already working the range. Aircraft may hold VFR at their designated IP if cleared into the MOA by the RCO. Cannon Range IP’s and coordinates/descriptions are located in [Attachment 3, Table A3.10](#).

3.4.5. VR 1525 terminates near the Cannon MOA. Contact Whiteman AFB scheduling (DSN 975-1713) to schedule VR 1525, if desired. Users may plan alternate routes to and from Cannon Range at their own discretion. Limited communication entries may be accomplished with approval of the RCO.

3.4.6. If planning for an IFR departure, the flight lead will notify the RCO five minutes before the flight is ready to depart. Range personnel will then coordinate with KCC to obtain a Mode

3.4.7. Squawk and a departure frequency. Do not depart the restricted area without and IFR clearance in IMC.

3.4.8. Flights requesting an instrument or practice approach at Forney AAF following range work should inform the RCO before their last pass. The RCO will pass the request to Forney Tower via the FAA shout-line. When possible, the RCO will inform the flight leader of the active runway, winds, bird condition, and altimeter at Forney. Forney pattern altitude is 2,700' MSL. Piston aircraft and helicopters fly 1,700' MSL while turboprop and large aircraft maintain 2,700' MSL.

**Figure 3.1. Tactical IP's.**



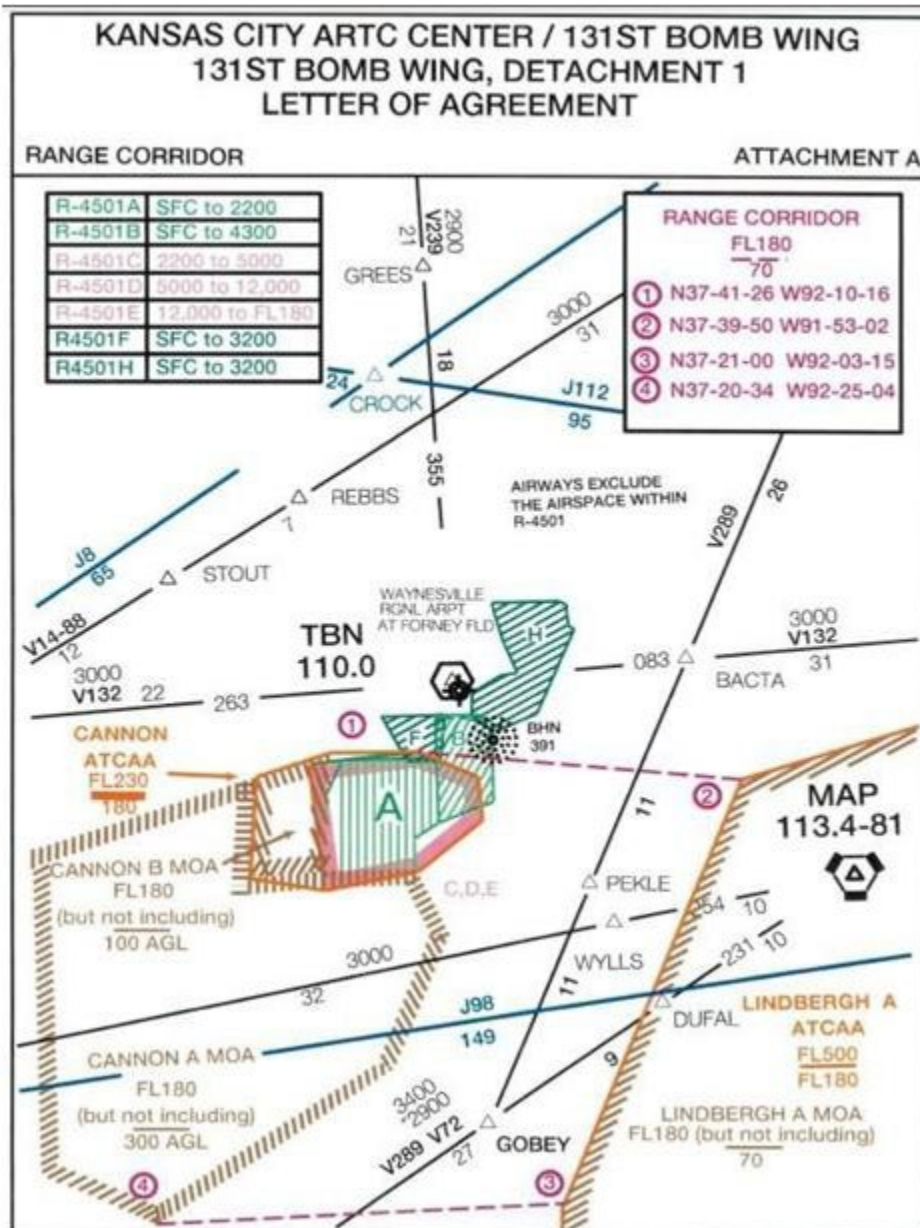
**3.5. Cannon Range and Lindbergh Corridor.** Cannon Range can be linked to the Lindbergh MOA via an IFR corridor. Cannon Range is the scheduling/controlling agency for the corridor, while Lindbergh is scheduled through the 509<sup>th</sup> OSS at Whiteman AFB. Units planning missions using the corridor will coordinate the airspace in advance so that all applicable airspace with KCC is scheduled. The corridor is depicted in [Figure 3.2](#) and has available altitudes of 7,000' MSL-FL180. Flights must specify times and altitude block desired, normally 3,000' block maximum, when scheduling. Lindbergh A MOA, Cannon MOA A, B, and R-4501 must all be activated prior to entry into the corridor. Lindbergh MOA's and Cannon Corridor are activated by user aircraft through Kansas City Center. Contact the Whiteman AFB Airspace Manager at 660-687-7616 or DSN 975-7616 to schedule Lindbergh MOA.

3.5.1. Participating pilot should request activation of the corridor with KCC prior to entering Lindbergh MOA. If returning to the Lindbergh MOA after entering Cannon Range airspace,

pilots will make the time specified in their clearance or remain in Cannon airspace until receiving a new clearance. Lost communications procedures are in accordance with the SUA in which established, or if transiting, SUA to which aircraft are proceeding.

3.5.2. B-2 aircraft that plan on transiting back and forth through the corridor, from Lindbergh A MOA and R-4501, shall make their intentions known with KCC upon entering Lindbergh and receiving clearance for the Lindbergh MOA and Cannon corridor. Once established in Lindbergh aircrews will contact Cannon Tower on 392.2 to receive clearance into R-4501 and the Cannon MOAs. Aircrews will remain on 392.2 throughout the weapons passes, making applicable calls and receiving clearance on that frequency. When the corridor is no longer needed aircrews will notify Cannon Tower, as well as contact KCC to release the corridor back to Kansas City Center. Aircrew will make this call once clear of the corridor and established in Lindbergh MOA. Flight crews should contact KCC on UHF 284.675 to receive flight plan clearance following MOA events and when ready to depart the airspace.

Figure 3.2. Cannon Range and Lindbergh Corridor.



**3.6. Conventional Patterns.** Primary conventional delivery patterns are right turns with a 160° final attack heading. A secondary pattern is right turns with a 090° final. R-4501 B is controlled by Fort Leonard Wood Range Operations for small arms training. A portion of R-4501 B underlays R 4501 C, refer to [Figure 3.3](#). When R-4501 B airspace is active aircraft are restricted to 4,300' MSL and above while operating within the blue shaded area in R-4501 C, D, and E, see [Figure 3.3](#). Indicated patterns are notional and actual ground track may be larger. Even with these patterns, aircraft will be operating in close proximity to restricted airspace boundaries. Avoid NSA #4, [Table 2.1](#), when flying patterns to the west.



3.7.3. Tactical strafe may be accomplished on designated targets, refer to [Attachment 2](#). All tactical strafe targets are considered hard targets. Depending on foliage density and specific designated point of impact (DPI) within the target array, the scoring system may provide distance/clock position score or RCO may be able to provide “hit/miss” scoring.

3.7.4. Conventional rocket deliveries are authorized on specified targets, refer to [Attachment 2](#). Rockets readily start grass fires when they impact prior to propellant burnout. Using a cease-fire range of 4,000’ will ensure the propellant burns out prior to impact, lessening this risk. See [Table 1.2](#) for further details and fire danger restrictions.

### 3.8. Ordnance Scoring Procedures.

3.8.1. Bombs will be scored via triangulation and computer calculations using the Weapon Impact Scoring System (WISS). Scores will be transmitted with distance (meters) and clock position based on run-in heading (given or observed). The clock position given is only accurate if the run-in heading is known ahead of time. Tactical targets are located throughout the impact area and may be used for first run attacks (FRA) and subsequent air scored bombs. To accurately score weapons delivery, WISS requires the information identified on the event fax sheet. Not providing this information may result in inaccurate scores or dry passes. Changes to weapon type (i.e. bombs to bullets), events (VLD to HADB), and attack heading will require time for personnel to input the changes. Delayed notification will likely result in a dry or unscored pass. WISS can provide a variety of data outputs based on user requirements.

3.8.2. Targets must be visible to cameras in at least two locations to be scored. Targets fitting these criteria are generally in the vicinity of Target 0, including all targets on top of the ridge from target 12 and north. Targets visible to the main tower only can be judged “hit/miss” based on visual observation of tower personnel. On occasion one camera may not be able to pick up the impact resulting in the inability to generate a score on an otherwise scoreable target. In this instance the WISS operator, or RCO, will try to give an approximate score, or will mark pass “no spot” on the fax sheet.

3.8.3. The strafe pit (left and right) is acoustically scored with the Improved Range Strafe Scoring System (IRSSS). The system requires 45+ seconds setup time and can provide a variety of outputs. Normally, the RCO will provide number of hits and, time permitting, distance/direction of the center of the burst from the center of the target. Strafe scoring output is listed in feet, as opposed to meters for bomb scoring. Additionally, with prior coordination a graphical depiction of each individual pass showing the impact position of each bullet is available via e-mail or fax. IRSSS is capable of scoring nearly any shape, size, or orientation of target or array of targets. Units desiring to use this unique capability for Turkey Shoots or quarterly Top Gun competitions should contact the Cannon Range RCO for further information. Accurately faxing intended events will ensure the scoring system is ready for planned events. Unexpected switching in-flight from left to right strafe pit targets will require either the 45 seconds for setup or result in unscored passes. Additionally, Targets 1, 4, 6, and 10 may be scored with distance and clock position. Other strafe targets can be visually scored as “hit/miss”.

3.8.4. At night, scoreable targets are the same but bomb scoring is limited to BDU-33’s with “hot spots”. Strafe scoring at night is accomplished the same as daytime however the WISS operator is only able to see sparkles from bullet impacts, therefore scoring for near misses will be severely degraded and inaccurate.

3.8.5. The scoring computer and software require considerable time to input mission data. If the computer is down more time will be required and scores may not be available until well after mission completion. Users must pre-coordinate mission information to prevent lengthy delays.

3.8.6. Multiple targets or DPI's may be accurately scored with sufficient time between deliveries, usually 25 seconds or more. If not possible, and the targets are visible from the tower, the RCO will visually score deliveries "hit/miss". Also, multiple release impacts may be individually scored when requested. This often requires tapes to be replayed after the mission, so unless requested otherwise only the center of a string will be scored.

### 3.9. Tactical Operations.

3.9.1. Aircrew should be aware that operating in an increased simulated threat level requires additional personnel and/or time for setup and operation of equipment. Plan accordingly by clearly coordinating training needs with range personnel sufficiently early for systems to be prepared.

3.9.2. Have Quick II, secure voice, and radio interference/jamming can be provided with prior coordination. Secure voice and intentional interference is not permitted on the range primary frequency (392.2); these operations may be conducted on the range secondary frequency (276.5), range VHF (139.45), or inter-flight frequencies. Chattermark to discrete frequencies is authorized if the RCO is pre-briefed and maintains radio contact during the entire mission.

3.9.3. The RCO can provide JTAC input to your mission with pre-mission coordination. J-Fire and NATO CAS scenarios (9-lines) are available along with authentication tables. Cannon Range JTAC Mounted Operations SOP, 442nd FW A-10 use only, is available on Cannon Range CSE website. The Mounted Operations SOP, in draft form as of this publication, covers procedures that must strictly be adhered to while conducting CAS with authorized ground parties, wishing to conduct operations outside of established Observation Positions (OP's).

3.9.4. Self-protection flares may be expended within Cannon special use airspace when range fire conditions permit, normally CROC yellow or better. **Flares are not allowed below 1000' AGL at any time.**

3.9.5. The RCO will provide the approval for the use of Chaff in Cannon Range Airspace. Chaff (except for RR-112 and RR-188, training chaff) and Electronic Counter Measure (ECM) operations are not authorized above 3000' AGL.

3.9.6. Smokey Sam Simulators (SSS) are available with minimum 30-minute prior coordination with Cannon Operations. During periods of inclement weather requests for SSS use may be denied to protect the launcher from precipitation. Requests for Smokey SAMS will be submitted via the Cannon Range event fax sheet. Simply mark the box, annotate how many, and at which aircraft the SSS will be launched. SSS will be launched IAW T.O. 11L1-2-23-1, Operational, Organizational and Intermediate Maintenance Instruction— Smokey SAM Simulator/Antiaircraft Artillery Visual Cueing System. Ground safety procedures and restrictions can be found in Cannon Range Business Rules, 2 Oct 2023, [para 7.3](#).

3.9.7. Two electronic threat emitters are available to provide simulated electronic threats (SA-6, SA-8, ZSU 23-4, and Drumtilt radars). The systems are Single Ground Threat Emitters (SGTE) – Lite (AN/UPQ-8V, variant 1D) and operate in the H, I, and J bands. Coordinate

minimum of 30 minutes prior with Cannon Operations, specifying low or high threat. The ability to emit aircraft is dependent on line of sight between the ground operator and the aircraft. Instructions for ground operations and safety procedures, applicable to Cannon Range personnel, can be found in Cannon Range Business Rules, 2 Oct 2023, [Chapter 7](#).

3.9.8. Joint Modular Ground Targets (JMGTs) are moveable medium-fidelity targets constructed of sheet metal and primarily represent threats commonly found in red forces. To maximize the useful life of these targets, only tactical BDU-33 deliveries will be made against JMGTs. Additionally, the Cannon Range RCO may restrict number of passes, ripple quantity or interval, or delivery type.

3.9.9. Additional targets requiring simulated ordnance (i.e. dry AGM-65) include manned vehicles and heated targets. Prior coordination is required.

3.9.10. Pop-up patterns may be planned using the IP's in the Cannon MOA. Altitude restrictions are as published except around noise sensitive areas depicted in [Table 2.1](#).

3.9.11. Joint Air Attack Team (JAAT) procedures can be accomplished on Cannon Range. Profiles include attack aircraft/helicopters performing coordinated close air support under flight lead control. Operations will be conducted IAW this instruction, AFTTP(I) 3-2.6, J-FIRE, *Multi-service Procedures for the Joint Application of Firepower* and AFMAN 11-214.

**3.10. Laser Procedures.** Cannon Range is certified by AFRL 711 HPW/RHDO for the safe use of most DOD fielded fixed-wing, rotary-wing and man-portable laser systems. The most recent AFRL 711 HPW/RHDO Optical Radiation Safety Consultative Letter, Cannon Range Laser Safety Survey, is maintained at Cannon Range. Contact the Cannon Range Control Officer for approval of laser operations and suitable laser, OP and target combinations, which are published in the Consultative Letter. A qualified Laser Safety Officer (LSO) will be in the main tower during all range laser operations. The LSO may be someone other than the RCO.

3.10.1. Users requesting laser employment will contact the range prior to employment. This allows the range to be completely cleared and for ground personnel to don protective equipment. Short-notice requests may take up to 10 minutes to ensure all personnel are clear of the Laser Surface Danger Zone (LSDZ) and have protective equipment.

3.10.2. Ground personnel will wear approved laser eye protection which covers the laser wavelength with an optical density suitable for the laser employed. The RCO will announce before any laser activity the need to wear LEP before commencing laser operations. All personnel will leave the impact area unless actively involved in laser activity (i.e. JTACs performing laser operations). JTACs or similar operational personnel are responsible for providing their own LEP, and if none is available then laser operations are prohibited. Cannon Range has sufficient LEP only for permanent-party range personnel.

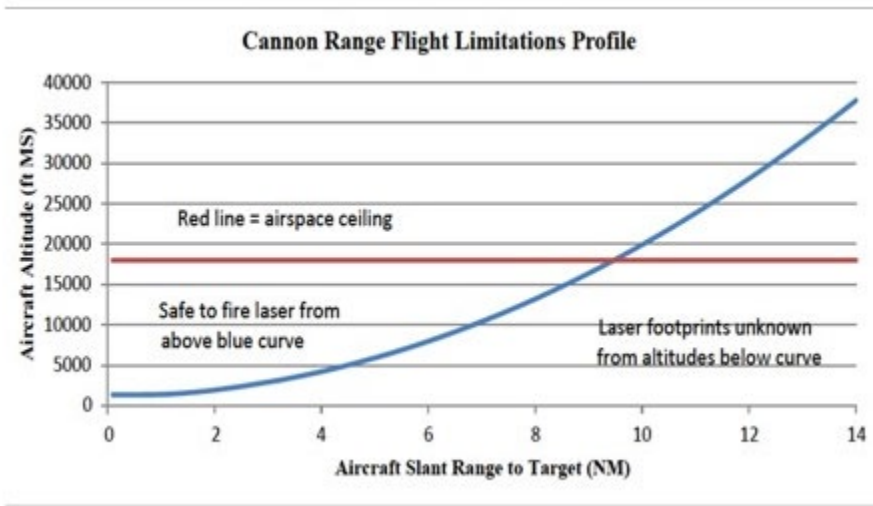
3.10.3. The RCO will not allow any lasers until complete accountability is established for all personnel. On-site personnel will check in with the RCO with their location and LEP status before the RCO allows laser activity.

3.10.4. Ground-based laser designators and rangefinders will not be fired above the horizon. GCP and IZLID laser systems, in low power setting, may be used to rope aircraft by ground personnel, provided the aircraft is above the Nominal Ocular Hazard Distance (NOHD) of the laser. The Green Beam Designator will not be used on Cannon Range.

3.10.5. Ground-based systems will not be fired against any target or on any azimuth that allows the escape of laser energy from the range boundaries at an unsafe power level. Since this cannot normally be determined without extensive research and simulation, only the approved firing point/target combinations will be used.

3.10.6. Aircraft Mounted Laser Systems. All authorized fixed-wing lasers may be employed from any direction, anywhere within the confines of restricted airspace. The minimum safe lasing altitude varies with the type of laser system employed and the distance of the designator aircraft from the target. Refer to [Figure 3.4.](#), Cannon Range Flight Limitations Profile, and [Table 3.1.](#), Flight Profile Limitation (LITENING GEN 4, 5mrad).

**Figure 3.4. Cannon Range Flight Limitations Profile.**



**Table 3.1. Flight Profile Limitation (LITENING GEN 4, 5mrad) Note Unrestricted Laser headings.**

Slant Range to Target (NM)	Minimum Safe Lasing Altitude (feet above MSL)	Slant Range to Target (NM)	Minimum Safe Lasing Altitude (feet above MSL)
14	37,749	7	10,401
13	32,735	6	7,971
12	28,089	5	5,910
11	23,813	4	4,218
10	19,907	3	2,896
9	16,369	2	1,942
8	13,200	≤1	1,358

3.10.7. Cannon tower will provide specific clearance to both air and ground personnel prior to laser use. (e.g. “Rio flight, Cannon Range is Laser Hot”)

3.10.8. Laser operations must be immediately stopped if unauthorized personnel are observed in the LSDZ, equipment malfunction is observed, target is lost in field of view, or any time that laser safety can't be assured.

3.10.9. Cannon Range personnel will continuously monitor the LSDZ to ensure it remains clear of specular reflectors.

3.10.10. All ground-based laser operators must meet the following minimum criteria.

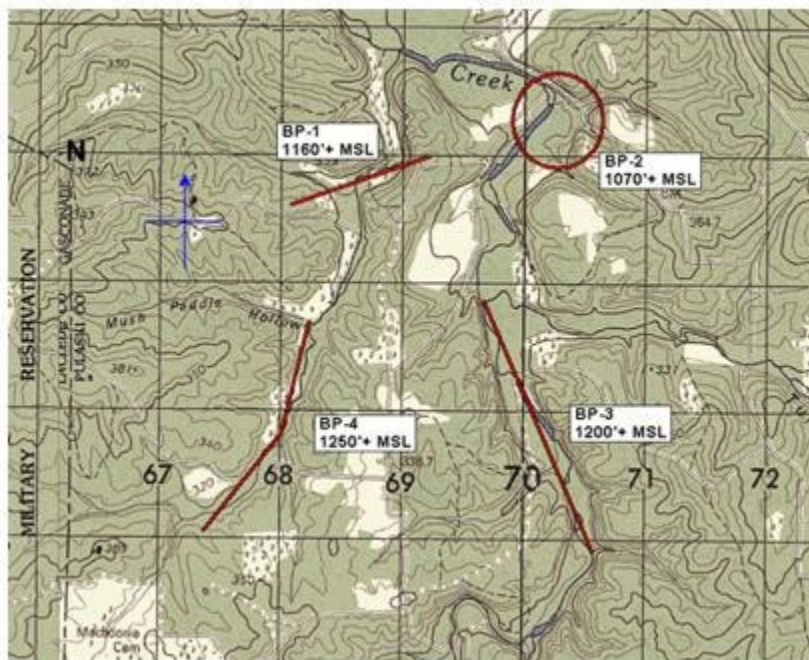
3.10.10.1. Have received a range laser briefing by qualified personnel.

3.10.10.2. Have received training in the proper and safe use of the laser system employed.

3.10.10.3. Have positive two-way communication with the Range RCO/Laser Safety Officer (LSO) during laser operations.

3.10.11. Battle Positions (BP's) areas from which rotary-wing aircraft are allowed to fire their lasers, are located around the target area and depicted in [Figure 3.5](#). All 5 mrad and 10 mrad laser systems with less than 300 M NOHD may be used on targets assigned to each BP.

**Figure 3.5. Battle Positions.**



**3.11. Helicopter Procedures.** Because of the flexibility of helicopter operations, rotary-wing users should coordinate their specific training requirements with the Cannon RCO as early as possible, but NLT the day prior. If the RCO determines a face-to-face brief is required, helicopter units should plan to arrive at Cannon Range with sufficient time to complete the required RCO safety and target briefing in order to begin operations at the start of their scheduled range periods. Safety and target briefing will include targets, firing positions, ordnance, the FLW fire index, use of lasers, and the appropriate WDZ's and associated restrictions and hazards.

3.11.1. 20 minutes will be scheduled for every 2,000 rounds of planned expenditure. If firing is not completed during the scheduled period, the RCO may facilitate any unfinished weapons training by controlling the helicopters between scheduled fixed-wing operations.

3.11.2. Helicopter targets will be determined on an individual basis. Considerations for helicopter targets will be type of ammunition, delivery tactics, amount of planned expenditure, and range fire conditions. Gun to target lines must be coordinated prior to any ordnance expenditure. A list of all Cannon Range targets can be found in [Attachment 3](#).

**3.12. Airdrop Procedures.** Cannon Range's Slingshot Drop Zone (DZ), [Figure 3.6](#), is located within R-4501 A and is approved for both day and night operations. Units are responsible for coordinating use of the routes to and from the drop zone. Units conducting Joint Precision Airdrop System (JPADS) training must provide safety footprints when planning full system GPS-guided deliveries. Slingshot DZ coordinates are listed in [Attachment 3](#).

3.12.1. Cannon Range is the sole scheduling agency for drop zone use. When a DZ has been scheduled, Cannon Range operations will reserve the associated restricted airspace and Cannon MOA's for the duration of the mission.

3.12.2. All racetracks will be in a pattern that avoids east of the main tower, with a 185° or 005° run-in. All DZ escapes will be made to the south or west. Due to the potential hazard associated with R-4501 B, no easterly escapes will be permitted. Note: The extended run-in heading, for north to south run-ins, passes one mile inside Forney AAF class D airspace. Participating aircraft will remain in radio contact with Forney Tower (268.7, 125.4) on a backup radio while flying this pattern in order to keep all parties aware of potential conflicts.

3.12.3. DZ markings and operations will be IAW AFMAN 11-202V3. For daylight operations the point of impact (PI) will be marked with a Raised Angle Marker (RAM). The RAM will be oriented in the direction of incoming airdrops (005° or 185°). For night operations the PI will be marked with a block letter "A" (unless another letter is pre-coordinated). The block letter will be on the run-in axis with the apex of the letter on the PI. The block letter will be at least 35 x 35 feet and consist of at least six white lights (IR lighting and lasers available with pre-coordination).

3.12.4. Check-in will be on Cannon Range primary frequency, 392.2. If desired, winds and other information can be broadcast in the blind at a pre-coordinated time. "No Drop" radio advisories should be transmitted early enough to allow time for authentication, but NLT 1 minute before TOT unless an emergency arises. If conditions preclude a safe airdrop and time is limited the RCO will transmit cancellation of the drop ("No drop, No drop, No drop"). "No drops" will be called on the primary frequency and may be indicated by the absence of DZ markings or the presence of red smoke.

3.12.5. Scores will be passed as soon as they are available and additionally faxed to the unit. Objects that impact within 25 meters of the PI will be scored "PI".

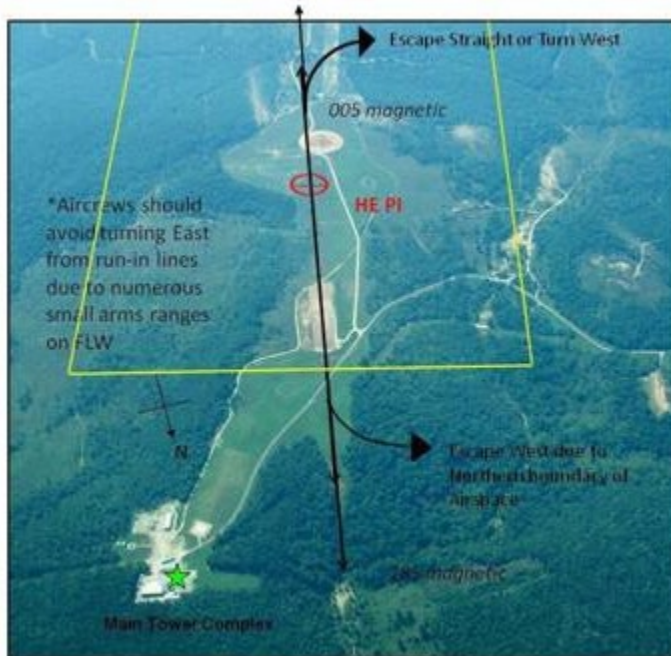
3.12.6. When airdrop operations are in progress do not overfly any of the range towers. Tower locations are located in [Attachment 3](#).

3.12.7. Airdrop coordination must be completed when it is known that airdrop operations are to be conducted on Cannon Range. Short notice operations can be scheduled but are at the

discretion of the RCO and drop zone controller and depend on airspace availability. Cannon Range has DZ controllers available with prior coordination.

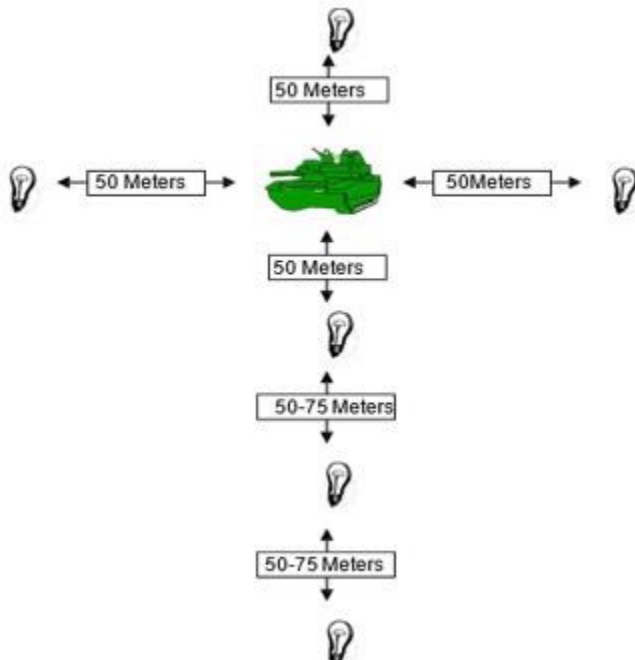
3.12.8. Range crews will assist in recovering dropped items; however, units must coordinate with Cannon Range operations for the return of dropped loads to the appropriate agency.

**Figure 3.6. Slingshot Drop Zone.**



**3.13. Night Procedures.** The main control tower is illuminated by two flashing blue aviation obstruction lights, and the flank tower is illuminated with a flashing red aviation obstruction light. The main tower has the capability to extinguish the blue lights and operate two IR strobe lights (TacAIR Beacon). For all missions, each individual aircraft must confirm they have all manned sites (including JTACs) positively identified prior to beginning ordnance delivery. After this confirmation, friendly position lighting will not be changed without re- confirming pilots are “visual friendlies”. NOTE: Flashing lights mean friendly positions.

3.13.1. Cannon Range is a “night configured” range but requires minimum of two hours prior coordination to ensure range lighting meets user needs. Night lighting will be displayed around Target 5 in either an ordinary white light or IR lighting via mobile, remote- controlled 7.5-watt lighting kits, see [Figure 3.7](#). Target 10 may be illuminated with tiki torches at the four corners of the target. Aircraft lighting will be bright enough for the RCO to be able to see each aircraft in any part of the pattern. Note: The RCO and safety observers are normally NVG equipped.

**Figure 3.7. Night Lighting.**

3.13.2. Flights operating with NVD's may bomb/strafe any authorized range targets. Missions not utilizing NVD's will only drop on the illuminated target(s).

3.13.3. Cannon Range lighting is NVD capable. Target 5 lighting may be switched from visible to IR by remote control from the main tower. Prior notification is required to ensure this capability is available.

3.13.4. The RCO will be advised before any flight member fires any type of laser, to include IR pointers, on the range. All personnel on Cannon Range will use NVD's with compatible Laser Eye Protections, if required, when outside during laser operations.

**3.14. Joint Terminal Air Controllers (JTAC) Procedures.** Joint Terminal Air Controllers (JTAC's) periodically train at Cannon Range for Close Air Support (CAS) missions. JTAC's will coordinate with Cannon Range and the units they plan to work with prior to scheduling range time. The following procedures will apply:

3.14.1. All JTAC's will receive a safety and target area briefing immediately upon arrival at Cannon Range.

3.14.2. Aircrew and JTAC's will coordinate appropriate mission specifics prior to the mission. JTAC's will arrive at Cannon Range a minimum of two hours prior to all missions they plan to work or will not be allowed to control.

3.14.3. JTAC controllers will brief the RCO face-to-face on scenario, intended IP's, Observation Position desired, targets, munitions, expected delivery types, run-in restrictions, laser usage, etc., a minimum of one hour prior to first mission. Operations not conducted from an established OP must be dry with switches safe and cold trigger/pickle check acknowledged by the RCO and all flight members. Deviations to this guidance will be approved on a case-

by-case basis and will be published in the Cannon Range Mounted Operations SOP, currently in draft form, posted on the Cannon Range CSE site, or available directly from Cannon Range.

3.14.4. JTAC's may store COMSEC material in the Cannon Range safe while Temporary Duty (TDY) at Cannon Range. Cannon Range is authorized to handle and store materials up to Secret classification. Contact the COMSEC Responsible Officer (CRO) before traveling to the range to ensure COMSEC requirements can be met.

3.14.5. Normal UHF and VHF frequencies and procedures will be observed during CAS/JTAC missions. When JTAC's are on the range, all members of the flight will acknowledge all JTAC friendly locations. JTAC's will always maintain a dedicated two-way communication link with the RCO.

3.14.6. The RCO may pass "Final clearance" control to the JTAC or the FAC(A) after flight check-in. The RCO is responsible for safe operations and will remain in the tower, or suitable alternate, to monitor all activities. The RCO or JTAC/FAC(A) will call a "knock it off" for any unsafe condition. Upon the knock it off call, control reverts to the RCO. All members of the flight will safe up all weapons and laser usage on the range will cease.

3.14.7. Before ordnance is expended JTAC's will talk participating aircrew onto their position. At night JTAC's will normally mark their position(s) with a flashing IR strobe.

3.14.8. JTAC's must have a current letter of qualifications, or letter of X's, signed by their training officer before controlling on Cannon Range. This document must be given to range personnel upon arrival, prior to controlling missions. As a minimum the document must state who is qualified in day/night operations, when the last control was accomplished and identify the instructors.

### 3.15. Communications.

3.15.1. UHF 392.2 is the primary method for RCO-to-aircraft communication. Inter-flight communications will be monitored by the RCO for safety and situational awareness. Aircrew will use their unit's standard inter-flight frequencies unless mission dictates otherwise. Aircrew using a non-standard inter-flight will advise the RCO upon check-in so monitoring may occur. Have Quick II and Secure Voice can be available with prior coordination. Cannon Range doesn't maintain current Secure Voice fills but maintains radios that can provide Secure Voice capability if fills are obtained from users.

**Table 3.2. Cannon Range Frequencies.**

Cannon Range Frequencies	
Primary (always monitored)	392.2 UHF
Secondary (normally monitored)	276.5 UHF
VHF (normally monitored)	139.45 VHF
Guard (always monitored)	243.0 UHF
Forney AAF Tower	268.7 UHF / 125.40 VHF

Forney ATIS	118.7 VHF / 237.5 UHF
Kansas City Center Sector 53	284.67 UHF

3.15.2. Secure Voice may not be used on the range primary UHF frequency, 392.2. It will normally be used on the secondary UHF frequency, or VHF frequency, but may also be used on a user assigned frequency. Users must pre-coordinate frequencies using the fax since Cannon Range will dedicate one radio for secure voice use during range missions. When Cannon Range is operating with limited radio resources secure voice may not be available. During those times aircraft will limit inter-flight use of secure voice to non-target-oriented communications for the purpose of testing their systems. All other communications will be in the clear.

3.15.3. Limited FM capability is provided utilizing a PRC-152 battery operated radio. Cannon Range doesn't have an assigned FM frequency. This radio is not monitored unless requested.

3.15.4. All aircraft on the range will squawk Mode 3, Code 4000.

**3.16. Search and Rescue Training (SAR).** Cannon Range can support Search and Rescue training operations. Cannon can supply a simulated downed aviator somewhere on the range or in the Cannon MOA's with a PRC-90 or PRC-152 radio. ISOPREP cards and other forms of communication or encryption are also available. Cannon Range personnel can also provide white and red forces for scenario usage. Prior coordination is required.

## Chapter 4

### ABNORMAL PROCEDURES

#### 4.1. Armament System Malfunctions/Unintentional Release.

4.1.1. Aircrews will ensure that their systems are safe any time the aircraft is outside the restricted area. Additionally, aircraft will be armed only when consistent with service and command directives, regulations or instructions to ensure munitions remain within the impact area only.

4.1.2. Armament Systems Malfunctions. System malfunctions will be handled IAW applicable command, aircraft, and unit operating procedures.

4.1.2.1. Inadvertent Releases (ordnance fired or released without pilot consent). Check armament switches safe and do not attempt further release in any mode. Immediately report inadvertent releases to the RCO.

4.1.2.2. Unintentional Releases (ordnance fired or released as a result of pilot error). Check armament switches safe and do not attempt further release in any mode until the determination is made that the release was unintentional and not inadvertent. The decision to continue to allow releases is solely the RCO's and will not be arbitrated.

4.1.2.3. Runaway Gun. Recover from delivery, keeping the aircraft pointed down range until the gun ceases to fire. If safety allows, attempt to keep the nose of the aircraft below the horizon until the gun ceases to fire.

4.1.2.4. Hung Ordnance. Handle hung ordnance IAW AFMAN 11-214 and unit procedures, to include the following guidance. Any aircraft with suspected or indicated hung ordnance will adjust the flight pattern as necessary to remain over the impact area as much as safely possible until all bombs can be accounted for. Aircraft shall immediately avoid populated areas and manned range positions, to include Army ranges to the east and northeast. Any attempts to release hung ordnance will be made on a 160° heading, on an RCO approved target. Aircraft with confirmed hung ordnance may attempt to release the hung store. If these attempts fail the aircraft will cease operations, report switches SAFE and return to home station. B-2 aircraft shall ensure doors are closed and munitions are secure prior to transition out of R- 4501. Prior to departing the range, safe all armament switches and recover IAW applicable command, aircraft, and unit regulations, avoiding populated areas.

4.1.2.4.1. Gunship side-firing 105mm cannons that experience a hang-fire (round misfire in the breech) will follow applicable technical orders to extract the round. If it requires jettison overboard the aircrew will fly the aircraft on a magnetic heading of 160° at an airspeed and altitude consistent with safe operation and will release the round so it impacts near target 93. If sensors are available to track the munition, attempt to mark the impact point and provide the RCO the impact coordinates.

4.1.2.5. Off-Range Release. Report any release, whether inadvertent or unintentional, which results in or is suspected to result in an impact outside the impact area to the RCO. The RCO will report the release to Range Operations and prepare reports as directed with the reports forwarded to Range Operations, 442FW/CC, 442FW/SE and 442OG/CC.

**4.2. External Stores Jettison.** For controlled jettison of external stores, including fuel tanks, suspension equipment, and practice ordnance, jettison on a 160° magnetic heading at an airspeed and altitude consistent with safe operation so that impact occurs near target 5.

**4.3. Emergency/Abnormal Operating Procedures.**

4.3.1. Emergency Airfields: Check current FLIP documents and NOTAMS for the status of facilities at emergency airfields. See [Attachment 6, Figure A6.1](#) for a list of emergency divert airfields.

4.3.2. Controlled Bailout. The aircraft should be flown on a 160° heading at 2000' AGL (3100' MSL) between the flank and main towers. This provides the best chance the aircraft crashes on U.S. Government property while minimizing risk to ground personnel. It also keeps the pilot(s) away from hazardous dud areas and expedites pilot recovery. If possible, coordinate with the RCO prior to bailout to allow any personnel on-range to clear the area.

4.3.3. Forced Landing. If an aircraft must make a forced landing within the impact area, aircrews must remain with the aircraft until range personnel can perform recovery operations, unless there is a risk of fire or explosion at the downed aircraft site. This is due to the high risk of unexploded ordnance in the area. If possible, establish radio contact with the RCO.

4.3.4. Radio/Electrical Failure. Two-way radio communication with Cannon Range is required to expend ordnance on the range. In the event of radio failure on UHF primary 392.2, attempt contact on UHF secondary 276.5, and VHF 139.45. Depart the range if contact with the RCO is not reestablished.

## Chapter 5

### RCO PROCEDURES

**5.1. RCO Duties.** The RCO is charged with overseeing the safe accomplishment of flights using the range. The RCO must strictly enforce established range flying procedures and aircraft weapons delivery minimums. The RCO's primary duty is to professionally control aircraft in Cannon Range airspace and ensure all training is accomplished in a safe and efficient manner. The RCO must possess a thorough knowledge of range procedures, duties, and training restrictions. The RCO is the final authority concerning aircraft operations at Cannon Range.

**5.2. RCO Scheduling.** The 442OSF/OLA ROO will ensure only qualified and current RCO's are scheduled to perform RCO duties. The ROO will coordinate the scheduling of guest RCO's to cover mission blocks during RCO/ROO absence.

#### **5.3. RCO Checkout Procedures.**

5.3.1. Upgrading RCO's will have at least the minimum experience described in AFMAN 13-212, [paragraph 2.9.7.1](#).

5.3.2. RCO's must complete the Qualification and Training Checklist contained in [Attachment 7](#).

5.3.3. Candidates must pass a written examination specific to Cannon Range Operations. The test will have a minimum of 30 questions; a passing score is 85%, correctable to 100%. The test will be administered by the ROO or full time RCO.

5.3.4. Upgrading RCO's must perform the on-range section of training to the satisfaction of the ROO and receive a range tour/EOD briefing given by range personnel.

#### **5.4. RCO Certification and Currency.**

5.4.1. The Cannon Range assigned Range Operations Officer (ROO) is responsible for maintaining certification and currency reports for each qualified RCO, and for annually reviewing the RCO Qualification and Training Checklist and written exam. RCO qualification will be annotated on the RCO Qualification and Training Checklist by the qualified RCO providing the instruction and will be reviewed and signed by the ROO.

5.4.2. RCO currency for day missions is 365 days and 180 days for night missions. RCO's are encouraged to participate more frequently.

5.4.3. Non-current RCO's (night or day) may re-qualify by reviewing appropriate academic items and completing on-range training, including controlling an entire mission to the satisfaction of a qualified RCO within the first 180 days after losing currency. The complete RCO checkout will be accomplished for RCO's who exceed this 180 day grace period.

#### **5.5. RCO Daily Operations.**

5.5.1. Prior to departing for the range tower, the RCO will ensure that:

5.5.1.1. All scheduled flights have been confirmed, lineups, events, etc.

5.5.1.2. Current and forecast weather has been obtained.

5.5.1.3. Current AHAS Bird Watch Condition has been checked.

- 5.5.1.4. Range crews have been briefed on mission requirements and requests.
- 5.5.1.5. Required equipment for mission (SSS, emitters, RMAST, etc.) is mission ready.
- 5.5.2. Assigned range personnel opening the range will ensure:
  - 5.5.2.1. The strafe impact area is inspected, ground is not frozen, and the pit is clear of debris.
  - 5.5.2.2. Impact area is clear of personnel and the appropriate security gates are closed.
  - 5.5.2.3. Main and flank tower and scoring trailer are manned as required.
  - 5.5.2.4. RCO Tower Opening Checklist is complete.
  - 5.5.2.5. FLW Fire Index and Cannon Range Operating Condition are established.
- 5.5.3. RCO responsibilities regarding radio procedures:
  - 5.5.3.1. Monitor all radio communications with flights on the range.
  - 5.5.3.2. Ensure all communications are recorded, within system capabilities.
  - 5.5.3.3. Monitor primary range frequency, inter-flight, and Guard. Backup range UHF/VHF range frequency should be monitored if range radio assets are available.
- 5.5.4. RCO Control of Aircraft Responsibilities.
  - 5.5.4.1. Maintain positive control of range airspace and monitor relative position of entering and exiting flights.
  - 5.5.4.2. Monitor weather and bird concentration updates and pass significant changes to aircrew.
  - 5.5.4.3. Clear aircraft for individual hot or dry passes unless final control has been passed to qualified individuals. In all cases, the RCO maintains the authority to abort any and all passes as required. A “knock it off” call will be used to cease all air to ground operations for safety concerns.
  - 5.5.4.4. Shared-use policies contribute to occasional unauthorized range entry. The RCO will request a clearing pass whenever there is any doubt as to range security.
- 5.5.5. RCO’s will be certified in the use of Night Vision Devices (NVD’s) prior to working night missions. RCO’s, main tower operators, and safety observers will go through an initial NVD course for ground personnel, as well as an annual refresher course. RCO’s and safety observers will test and adjust their NVD’s using the ANV-20/20 tester prior to use for night missions.

**5.6. Restricted/Suspended Operations.** In the event of restricted operations, the RCO will notify the flight and receive acknowledgement prior to weapons delivery. If operations are suspended, the RCO will have the flight depart the range airspace of hold high and dry until operations may resume.

**5.7. Emergency Procedures.** In the event of an aircraft or range emergency, the RCO will assist aircrews or range personnel as necessary. The RCO will initiate the Cannon Range Quick Reaction Checklist and complete it as necessary. In case of a fire, do not leave the range until the fire is extinguished or the FLW Fire Department assumes responsibility.

**5.8. Scoring Procedures.** The RCO will normally pass scores for non-tactical attacks. Tactical missions, or faxes that appear tactical, will not have scoring capability by default. Score sheets will be faxed or emailed to the units at the end of the range period.

**5.9. Closing the Range.** Ensure FLW Range Operations is notified when the range is closed. Range personnel will perform all other closing functions. The RCO is responsible for the completeness and accuracy of these functions.

**5.10. Reports and Recordkeeping.** Ensure score sheets reflect the events/scores accurately and that fouls or other pertinent remarks are annotated clearly. Review daily record keeping for completeness and accuracy and ensure airspace has been scheduled or Notices to Airman (NOTAM's) have been issued for the next day of scheduled use. Provide voice recordings as required.

MICHAEL D. LEONAS, Colonel, USAF  
Commander, 442d Fighter Wing

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

**NOTE:** The user of this instruction is responsible for verifying the currency of the cited documents.

FAA Order 7110.65(x), *Air Traffic Control*

AFMAN 11-MDS Series

AFMAN 11-202V3, *Flight Operations*, 10 January 2022

AFMAN 11-214, *Air Operations Rules and Procedures*, 29 November 2022

AFMAN 10-3505V1, *Joint Terminal Attack Controller Training Program*, 6 November 2023

AFPD 13-2, *Air Traffic, Airfield, Airspace and Range Management*, 2 January 2019

DAFMAN 13-217, *Drop Zone and Landing Zone Operations*, 21 April 2021

AFI 32-1015, *Integrated Installation Planning*, 30 July 2019

AFI 48-139, *Laser and Optical Radiation Protection Program*, 12 September 2018

DAFI 91-202, *US Air Force Mishap Prevention Program*, 11 March 2020

DAFI 91-212, *Bird/Wildlife Strike Hazard (BASH) Management Techniques*, 31 May 2018

AFMAN 13-212V1, *Range Planning and Operations*, 13 March 2023

AFI 33-322, *Records Management and Information Governance Program*, 27 July 2021

DAFMAN 91-203, *Air Force Occupational Safety, Fire & Health Standards*, 24 March 2022

DAFMAN 91-223, *Aviation Safety Investigations and Reports*, 19 September 2023

AFTTP 3-2.5, *Multi-Service Brevity Codes*, 1 June 2018

AR 385-63, *Range Safety*, 30 January 2012

DAFMAN 13-201, *Airspace Management*, 09 Dec 2020

Fort Leonard Wood Regulation 210-14, *Ranges, Training Areas, and Training Facilities*, 21 November 2017

Joint Publication 3-09.3, *Close Air Support*, 10 June 2019

***Adopted Forms***

AF Form 847, *Recommendation for Change of Publication*, 22 September 2009

***Abbreviations and Acronyms***

**AAA**—Anti-Aircraft Artillery

**AEF**—Air and Space Expeditionary Force

**AFI**—Air Force Instruction

**AFRC**—Air Force Reserve Command  
**AGL**—Above Ground Level  
**AHAS**—Avian Hazard Advisory System  
**APC**—Armored Personnel Carrier  
**ARAC**—Army Radar Approach Control  
**ARTCC**—Air Route Traffic Control Center  
**ATCAA**—Air Traffic Control Assigned Airspace  
**ATIS**—Automatic Terminal Information Service  
**BDU**—Bomb, Dummy Unit  
**CAS**—Close Air Support  
**CCRP**—Continuously Computed Release Point  
**CDT**—Central Daylight Time  
**CSE**—Center Scheduling Enterprise  
**Comm**—Commercial (telephone)  
**CST**—Central Standard Time  
**DOD**—Department of Defense  
**DODIC**—Department of Defense Identification Code  
**DOL**—Directorate of Logistics  
**DPI**—Desired Point of Impact  
**DSN**—Defense Switching Network  
**EOD**—Explosive Ordnance Disposal  
**EW**—Electronic Warfare  
**FAA**—Federal Aviation Administration  
**FAC**—Forward Air Controller  
**FLIP**—Flight Information Publication  
**FM**—Frequency Modulation  
**GBU**—Guided Bomb Unit  
**GCP**—Ground Commanders Pointer  
**GIS**—Geographic Information System  
**GLTD**—Ground Laser Target Designator  
**HAS**—High Angle Strafe  
**HTE**—HARM Threat Emitter

**HOTAS**—Hands on Throttle-and-Stick

**IAM**—Inertially Aided Munitions

**IED**—Improvised Explosive Device

**IFR**—Instrument Flight Rules

**IMC**—Instrument Meteorological Conditions

**IR**—Infrared

**IRSSS**—Improved Remote Strafe Scoring System

**IZLID**—Infrared Zoom Laser Illuminator Designator

**JDAM**—Joint Direct Attack Munitions

**JTAC**—Joint Terminal Attack Controller

**LAS**—Low Angle Strafe

**LES-M**—Laser Evaluator System-Mobile

**LGTR**—Laser-Guided Training Round

**LMR**—Land-Mobile Radio

**LOA**—Letter of Agreement

**LSDZ**—Laser Surface Danger Zone

**LTA**—Laser Training Area

**LTL**—Laser-to-Target Line

**MANPAD**—Man-Portable Air Defense

**MGRS**—Mercator Grid Reference System

**MOA**—Military Operating Area

**MSL**—Mean Sea Level

**MTR**—Military Training Route

**NAS**—Naval Air Station

**NATOPS**—Naval Air Training and Operating Procedures Standardization

**NOTAM**—Notice to Airmen

**NVD**—Night Vision Device

**NVG**—Night Vision Goggle

**OAP**—Offset Aim Point

**OP**—Observation Point

**ORI**—Operational Readiness Inspection

**PDF**—Portable Document Format

**POL**—Petroleum, Oils and Lubricants  
**PRF**—Pulse Repetition Frequency  
**RCO**—Range Control Officer  
**RFMSS**—Range Facility Management Support System  
**ROA**—Range Operating Authority  
**ROO**—Range Operations Officer  
**RPA**—Remotely Piloted Aircraft  
**SDO**—Squadron Duty Officer  
**SOF**—Supervisor of Flying  
**TGP**—Targeting Pod  
**TP**—Training Projectile  
**TPT**—Training Projectile - Tracer  
**TRSA**—Terminal Radar Service Area  
**UHF**—Ultra-High Frequency  
**UTM**—Universal Transverse Mercator  
**UXO**—Unexploded Ordnance  
**VFR**—Visual Flight Rules  
**VHF**—Very High Frequency  
**VMC**—Visual Meteorological Conditions  
**WDZ**—Weapons Danger Zone  
**WGS**—World Geodetic System  
**WISS**—Weapons Impact Scoring Set  
**WP**—White Phosphorus - Willie Pete

### ***Terms***

**NOTE**—The purpose of this glossary is to help the reader understand the terms used in this publication. It does not encompass all pertinent terms. Joint Publication 1-02, *DoD Dictionary of Military and Associated Terms*, and Air Force Doctrine Document 1-2, *Air Force Glossary*, contain standardized terms and definitions for DoD and USAF use.

**Air Traffic Control Assigned Airspace (ATCAA)**—Defined airspace normally within the Class A airspace (above 18,000 feet MSL) and established in accordance with FAA JO 7610.4(X) by a LOA with the ATC facility having responsibility for the airspace.

**Class A Range**—A manned range as defined in AFMAN 13-212 Volume 1, Range Planning and Operations, where a range control officer is present with two-way radio voice communication capability.

**Class B Range**—A manned or unmanned range with scoring capability, but no range control officer.

**Comprehensive Range Plan (CRP)**—The range commander’s plan, approved by the MAJCOM, that establishes the vision with supporting goals and develops the strategy for attaining the vision through objectives and an implementation approach.

**Essential Personnel**—Those personnel on a range participating in a test, training or evaluation scenario involving the employment of ordnance (air/surface/sea) including Mission Essential Personnel and those personnel not required for ordnance employment including maneuver elements, opposition forces, instructors, evaluators, etc.

**Explosive Ordnance Disposal (EOD)**—The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance. It may also include explosive ordnance that has become hazardous by damage or deterioration.

**Guard**—A radio frequency that is normally used for emergency transmissions and is continuously monitored. UHF band: 243.0 MHZ; VHF band: 121.5 MHZ.

**Hazard Areas**—The Hazard Area is a composite of all WDZs and surface danger zones (SDZs) for all authorized weapon delivery events against targets or DPIs approved for actual ordnance expenditures.

**Impact Areas**—The Impact Area is that area on a range immediately surrounding the target(s) or designated mean point(s) of impact approved for actual ordnance delivery.

**Instrument Flight Rules (IFR)**—Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

**Instrument Meteorological Conditions (IMC)**—Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling; less than minimums specified for visual meteorological conditions.

**Joint Terminal Attack Controller (JTAC)**—An individual qualified IAW JP3-09.3 to provide terminal control for the delivery of weapons by aircraft.

**Military Operations Area (MOA)**—Airspace designated for nonhazardous military activity, established outside the Class A airspace (below 18,000 feet MSL).

**Military Training Route (MTR)**—A low-level, high-speed training route established IAW criteria in FAA Joint Order 7610.4, Special Operations. MTRs are used by DoD to conduct low altitude navigation and tactical training, in instrument and visual weather conditions, below an altitude of 10,000 feet MSL and at airspeeds more than 250 KIAS. Routes are established as IFR routes (IR) or VFR routes (VR). The FAA has approval authority to implement IRs and the appropriate MAJCOM approves VR implementation. Environmental documentation is required for implementation IAW AFI 32-1015. VRs are processed through the FAA via the AFREP. MTRs are published in FLIP AP/1B and charted on FAA Sectionals and DoD Low IFR charts. AFREPs assign all route numbers.

**Mission Essential Personnel**—Those personnel on a range directly required for the employment of ordnance (air/surface/sea) in a test, training or evaluation scenario. This may include JTACs, range control officers, scorers, and any other personnel identified as required.

**Night Vision Device (NVD)**—Any electro-optical device that is used to detect visible and infrared energy and provide a visible image. Night vision goggles, forward-looking infrared, thermal sights, and low-light level television are night vision devices.

**Night Vision Goggles(s) (NVG)**—An electro-optical image intensifying device that detects visible and near-infrared energy, intensifies the energy, and provides a visible image for night viewing. Night vision goggles can be either hand-held or helmet-mounted.

**Notice to Airman (NOTAM)**—A notice containing information concerning the establishment, condition, or change in any aeronautical facility, service, procedures, or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

**Range Control Officer (RCO)**—The person responsible for range operations and safety. Except in situations where the RCO delegates weapons release clearance to a qualified flight lead, individual pilot or Forward Air Controller, or other briefed person.

**Remotely Piloted Aircraft (RPA)**—An unmanned aircraft flown remotely from a ground or air control station. May also referred to as an unmanned aerial vehicle, or UAV.

**Supervisor of Flying (SOF)**—A rated officer authorized by the flying unit commander to monitor and supervise current flight operations.

**Surface Danger Zones (SDZ)**—The ground and airspace designated for vertical and lateral containment of a user-determined percentage of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems including demolitions.

**Visual Flight Rules (VFR)**—Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

**Visual Meteorological Conditions (VMC)**—Weather conditions in which visual flight rules apply; expressed in terms of visibility, ceiling height, and aircraft clearance from clouds along the path of flight. When these criteria do not exist, instrument meteorological conditions prevail and instrument flight rules must be complied with.

**Weapons Danger Zone (WDZ)**—The ground and airspace for lateral and vertical containment of a user-determined percentage of projectiles, fragments, debris, and components resulting from the firing, launching, and/or detonation of aviation delivered ordnance. This three-dimensional zone accounts for weapon accuracy, failures, ricochets, and broaches (resurfacing) of a specific weapon/munitions type delivered by a specific aircraft type. Where software-selectable, this instruction requires 99.9999% containment (1:1,000,000 escapement) or better for all fires, whether SDZs, aviation-delivered gun ammunition, or all other aviation-delivered ordnance, in accordance with Fort Sill Regulation 385-1.



	270 +/- 30	270 +/- 30	270 +/- 30	270 +/- 30	270 +/- 30	
Notes:						
1. Pilots must strictly adhere to published delivery parameters in <b>Table A2.11</b> , including valid slant ranges for each delivery.						
2. No direct over-flight of Main Tower complex or any manned position. Do not point at towers or manned sites during delivery. Daily restrictions may apply.						

**Table A2.3. Aircraft: A-10, Weapon 30MM TP.**

A-10 30MM					
Event	LAS (Note 4)	LRS (Note 2)	HAS (Note 1)	TTS (Notes 1, 2)	VLRS (Note 3)
Target					
Strafe Pit	170 +/- 10	170 +/- 10		170 +/- 10	
1			180 +/- 90		
4	160 +/- 20	160 +/- 20	180 +/- 90	160 +/- 20	160 +/- 20
6			180 +/- 90		
10	160 +/- 20	160 +/- 20	180 +/- 90	160 +/- 20	160 +/- 20
24	205 +/- 35	205 +/- 35	180 +/- 90	205 +/- 35	
56 Truck			090 +/- 30 270 +/- 30		
57 Truck			090 +/- 30 270 +/- 30		
Notes:					
1. <b><u>HAS must be 20 degree dive or greater.</u></b> TTS using greater than 20 degree dive may use HAS restrictions. HAS scoreable on Targets 1, 4, 6, and 10. Confirm location of Target 56/57 Trucks prior to executing HAS on those targets.					
2. LRS planned for 20 degree dive angle and shallower. For LRS and TTS (when less than 20 degrees dive), flight path on final must be <b>WEST</b> of main tower for Targets 4, 10, and the strafe pit. For Target 24, flight path on final must be <b>EAST</b> of the Main Tower for LRS, and TTS less than 20 degrees.					
3. VLRS limited to day only with 7 SM visibility					
4. LAS cease fire is 3000' SR for hard targets					
5. No direct over-flight of Main Tower complex or any manned position. Do not point at towers or manned sites during delivery. Daily restrictions may apply.					

Table A2.4. Aircraft A-10, Weapon MK-82 CF Inert, MK-82 AIR High Drag Inert.

	A-10 Mk-82 CF Heavyweight Inert			A-10 Mk-82 AIR HD Heavyweight Inert	
Event	DB, HADB, LALD	LAT, VLD (See Note 1)	MAT	VLD	LAHD
Target					
4	All	225 +/- 45 090 +/- 30	All (Note 2)	150 +/- 90	180 +/- 120
40	All	250 +/- 50 090 +/- 45	All	090 +/- 45	180 +/- 140
41	All	250 +/- 50 090 +/- 45	All	100 +/- 60 250 +/- 45	180 +/- 120
50	135 +/- 45 315 +/- 45	135 +/- 45	Not Permitted	130 +/- 40 315 +/- 45	150 +/- 30 320 +/- 40
90-92	All	250 +/- 50 090 +/- 45	All	Not Permitted	Not Permitted
Notes:					
1. Minimum altitude for Mk-82 CF VLD is 900' AGL. See parameters Table A2.11.					
2. Not permitted with personnel on OP Phantom.					
3. No direct over-flight of Main Tower complex or any manned position. Do not point at towers or manned sites during delivery. Daily restrictions may apply.					

Table A2.5. Aircraft A-10, Weapon MK-82 AIR LD, Inert.

A-10 Mk-82 AIR LD Heavyweight Inert (Note 5)				
Event	LALD, DB, HADB (Note 4)	VLD (Note 1, 2)	LAT (Note 2)	MAT, HARB
Target				
4	060 +/- 30 265 +/- 25	060 +/- 30 265 +/- 25	060 +/- 30 265 +/- 25	Not Permitted
40	260 +/- 40	260 +/- 40 060 +/- 30	050 +/- 10 260 +/- 40	Not Permitted
41	060 +/- 30 285 +/- 55 070 +/- 50* (Note 6)	260 +/- 40 060 +/- 30	060 +/- 30 260 +/- 40	Not Permitted

<b>50</b>	<b>145 +/- 25</b> <b>325 +/- 25*</b> <b>(Note 3)</b>	<b>145 +/- 25</b> <b>325 +/- 25</b>	<b>310 +/- 10</b> <b>145 +/- 25</b>	<b>Not Permitted</b>
Notes:				
1. VLD min altitude is 900' AGL, max altitude is 1500' AGL. See parameters <b>Table A2.11</b> .				
2. 8,000' AGL max altitude for LAT deliveries. See parameters <b>Table A2.11</b> .				
3. No HADB on 325 +/-25 heading (Target 50 only)				
4. HADB maximum release altitude 9,000' AGL. See parameters <b>Table A2.11</b> .				
5. No direct over-flight of Main Tower complex or any manned position. Do not point at towers or manned sites during delivery. Daily restrictions may apply.				
6. 070 +/-50 valid for DB deliveries only.				

**Table A2.6. Aircraft A-10, Weapon GBU-12.**

<b>A-10 GBU-12 (Notes 1, 2)</b>		
<b>Event</b>	<b>LGB-Level</b>	<b>LGB-Dive</b>
<b>Target</b>		
<b>12</b>	<b>070 +/- 20</b>	<b>070 +/- 20</b>
<b>41</b>	<b>NOT PERMITTED</b>	<b>050 +/- 20</b>
<b>90-92</b>	<b>070 +/- 20</b>	<b>070 +/- 20</b>
Notes:		
1. No direct over-flight of Main Tower complex or any manned position. Do not point at towers or manned sites during delivery. Daily restrictions may apply.		
2. Restricted deliveries available. Pilots must review and strictly adhere to all published parameters located in <b>Table A2.11</b> , specifically airspeed and altitude limitations.		

Table A2.7. Aircraft B-2, Weapon BDU-50 Conical Fin, Single Bomb Release.

<b>B-2 BDU-50 CF (SINGLE BOMB)(See Note 1)</b>			
Event	LVL-Low (2-5k' AGL)	LVL-Med (5-9k' AGL)	LVL-High (9-17k' AGL)
Target			
90	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
91	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
92	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-1	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-2	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-3	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45

Table A2.8. Aircraft B-2, Weapon BDU-56 Conical Fin, Single Bomb Release.

<b>B-2 BDU-56 CF (SINGLE BOMB)(See Note 1)</b>			
Event	LVL-Low (2-5k' AGL)	LVL-Med (5-9k' AGL)	LVL-High (9-17k' AGL)
Target			
90	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
91	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
92	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-1	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-2	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45
93-3	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45	090 +/- 45 270 +/- 45

Table A2.9. Aircraft B-2, Weapon BDU-38 Free Fall, Single Bomb Release.

<b>B-2 BDU-38 Free Fall (FF) (SINGLE BOMB) (See Note 1)</b>			
Event	LVL-Low (2-5k' AGL)	LVL-Med (5-9k' AGL)	LVL-High (9-17k' AGL)
Target			
90	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20
91	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20
92	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20
93-1	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20
93-2	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20
93-3	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20	090 +/- 20 270 +/- 20

Table A2.10. Aircraft B-2, Weapon BDU-50 Conical Fin, Multiple Release.

<b>B-2 BDU-50 CF (See Note 1, 2)</b>			
Event	LVL-Low (2-5k' AGL)	LVL-Med (5-9k' AGL)	LVL-High (9-17k' AGL)
Target			
90	090/270 +/- 10	090/270 +/- 10	090/270 +/- 10
91	090/270 +/- 10	090/270 +/- 10	090/270 +/- 10
93-1	090/270 +/- 10	090/270 +/- 10	090/270 +/- 10
93-2	<b>NOT PERMITTED</b>	<b>NOT PERMITTED</b>	<b>NOT PERMITTED</b>
93-3	<b>NOT PERMITTED</b>	<b>NOT PERMITTED</b>	<b>NOT PERMITTED</b>
92	090/270 +/- 10	090/270 +/- 10	090/270 +/- 10

**Notes for all B-2 delivery tables:**

1. Assumptions are 300' stick length, maximum 10 bombs per pass, middle of stick on target.
2. All deliveries will avoid run-in headings pointing toward the main or flank tower, or any other manned site.

Table A2.11. A-10 Delivery Parameters.

A/C	Weapon	EVENT	Min Airspeed (KTAS)	Max Airspeed (KTAS)	Min Altitude (AGL)	Max Altitude (AGL)	Min Release Angle	Max Release Angle	Slant/Release Range
A-10	2.75 in	HARR	360	466	10000	14000	-20	-50	10k-18k feet
A-10	2.75 in	HAR	360	466	1000	10000	-15	-50	5k-12k feet
A-10	2.75 in	HATR	350	466	5000	12000	-20	-50	10k-18k feet
A-10	2.75 in	LATR	270	390	1000	7000	-2	-20	10k-18k feet
A-10	2.75 in	LAR	270	390	100	5000	-2	-15	4k-10k feet
A-10	2.75 in	AGR-20	350	466	5000	12000	-20	-50	6814-14k feet
A-10	30 mm	HAS	350	466	1000	12000	<b>-20</b>	-60	
A-10	30 mm	LAS	315	370	75	2000	-1	-20	
A-10	30 mm	LRS	270	390	75	3000	-1	-20	12k max SR
A-10	30 mm	TTS	300	390	75	3000	-1	-20	
A-10	30 mm	VLRS	300	390	200	14000	-1	-50	12k-24k feet
A-10	BDU-33	DB	360	420	1000	6000	-25	-50	
A-10	BDU-33	HADB	360	466	4500	9000	-25	-50	
A-10	BDU-33	LAHD	285	370	800	1500	-5	-25	
A-10	BDU-33	LALD	315	370	1000	4000	-15	-30	
A-10	BDU-33	LAT	300	400	1000	10000	0	-5	
A-10	BDU-33	MAT	300	400	10000	17000	2	-5	
A-10	BDU-33	VLD	300	390	480	1500	0	-5	
A-10	GBU-12	LGB-LVL	300	350	3000	9000	0	-10	5002-14,411 feet
A-10	GBU-12	LGB-DIVE	360	466	5000	9000	-10	-50	3077-11459 feet
A-10	GBU-38	LVL	220	250	8000	13000	0	-2	1.59-1.86 NM, Min Impact Angle 90 degrees
A-10	MK-82 AIR HD	LAHD	285	370	800	1500	-5	-25	
A-10	MK-82 AIR HD	VLD	285	370	480	1000	0	-5	
A-10	MK-82 AIR LD	DB	360	420	1000	6000	-25	-50	
A-10	MK-82 AIR LD	DB	360	420	1000	6000	-25	-50	
A-10	MK-82 AIR LD	HADB	360	466	4500	9000	-25	-50	
A-10	MK-82 AIR LD	HADB	360	466	4500	9000	-25	-50	
A-10	MK-82 AIR LD	LALD	315	370	1000	4000	-15	-30	
A-10	MK-82 AIR LD	VLD	285	370	900	1500	0	-5	
A-10	MK-82 AIR LD	LAT	300	400	1000	10000	0	-5	
A-10	MK-82 CF	DB	360	420	1000	6000	-25	-50	
A-10	MK-82 CF	DB	360	420	1000	6000	-25	-50	
A-10	MK-82 CF	HADB	360	466	4500	9000	-25	-50	
A-10	MK-82 CF	HADB	360	466	4500	9000	-25	-50	
A-10	MK-82 CF	LALD	315	370	1000	4000	-15	-30	
A-10	MK-82 CF	LAT	300	400	1000	10000	0	-5	
A-10	MK-82 CF	MAT	300	400	10000	17000	2	-5	
A-10	MK-82 CF	VLD	285	370	900	1500	0	-5	

Table A2.12. B-2 Delivery Parameters.

Aircraft	Weapon	EVENT	Min Airspeed (KCAS)	Max Airspeed (KCAS)	Min Airspeed (KTAS)	Max Airspeed (KTAS)	Min Altitude (AGL)	Max Altitude (AGL)	Min Release Angle (steepest dive, most nose low)	Max Release Angle (shallowest dive or greatest loft)
B-2	BDU-50CF, BDU-56CF, BDU-38FF	LVL-Low	240	325	250	375	2000	5000	-1	0
B-2	BDU-50CF, BDU-56CF, BDU-38FF	LVL-Medium	240	310	250	400	5000	9000	-1	0
B-2	BDU-50CF, BDU-56CF, BDU-38FF	LVL-High	240	310	275	425	9000	17000	-1	0

## Attachment 3

## RANGE FACILITY/TARGET DESCRIPTION/COORDINATES

Table A3.1. Target Description/Coordinates.

TARGET DMP1	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
0 (Zero)	Traffic circle w/bldgs	WB 68895 65966	N 37° 38.295 W 92° 13.147	1091	2, 5	BDU-33
0-1	Eastern compound	WB 68955 65984	N 37° 38.305 W 92° 13.106	1122	2	BDU-33
Trk 1 East	Truck in West opening of eastern compound	WB 68948 65988	N 37° 38.306 W 92° 13.111	1122	5	BDU-33
0-2	2 <sup>nd</sup> Tan building 2 from East	WB 68923 65989	N 37° 38.308 W 92° 13.128	1110	2	BDU-33
Trk 2	Single deuce truck North West	WB 68836 66034	N 37° 38.331 W 92° 13.185	1105	5	BDU-33
0-3	Middle compound (opening North)	WB 68910 65970	N 37° 38.297 W 92° 13.137	1091	2	BDU-33
Trk 3	Single truck w/ trailer between 0-3 and 0-4	WB 68895 65976	N 37° 38.300 W 92° 13.147	1104	5	BDU-33
0-4	Small green building West of 0-3	WB 68888 65972	N 37° 38.298 W 92° 13.152	1100	2	BDU-33
0-5	Northwestern tan buildin	WB 68879 65989	N 37° 38.308 W 92° 13.158	1100	2	BDU-33
Trk 4 West	Western most truck on E-W road	WB 68856 65978	N 37° 38.301 W 92° 13.174	1084	5	BDU-33
0-6	Garage	WB 68905 65907	N 37° 38.264 W 92° 13.138	1094	2,5	BDU-33
0-7	Gas station	WB 68896 65857	N 37° 38.236 W 92° 13.146	1098	5	BDU-33
1	35' tall sniper tower w/ 2APCs	WB 68880 65765	N 37° 38.184 W 92° 13.157	1111	2	<b>30MM HAS ONLY, BDU-33</b>
2	Revetted vehicle – revetment: open to north	WB 68808 65797	N 37° 38.204 W 92° 13.207	1098	5	BDU-33
3	2-ton truck	WB 68745 65870	N 37° 38.244 W 92° 13.251	1087	5	BDU-33
** 4	Armored vehicle	WB 68554 65945	N 37° 38.290 W 92° 13.380	1055	5	<b>BDU-33, Rockets, 30MM</b>
5	2-ton truck	WB 68805 66147	N 37° 38.397 W 92° 13.207	1082	4	BDU-33

Table A3.2. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATE S	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
6	APC	WB 68923 66027	N 37° 38.331 W 92° 13.185	1099	4	<b>30MM HAS ONLY, BDU-33</b>
7	M-60 Tank ("Fire Tank")	WB 68983 66045	N 37° 38.337 W 92° 13.087	1077	4	BDU-33, Rockets
8	Helicopter	WB 6903 6606	N 37° 38.342 W 92° 13.047	1085	5	BDU-33, Rockets
9	Revetted truck	WB 69002 65987	N 37° 38.306 W 92° 13.074	1086	5	BDU-33
**10	Armored convoy	WB 69034 65757 (center)	N 37° 38.181 W 92° 13.053 (center)	1079	4	BDU-33, Rockets, 30MM
**10-1	1st Vehicle from NW corner	Varies	-	-	4	BDU-33, Rockets, 30MM
**10-2	2nd Vehicle from NW corner	Varies	-	-	4	BDU-33, Rockets, 30MM
**10-3	3rd Vehicle from NW corner	Varies	-	-	4	BDU-33, Rockets, 30MM
**10-4	1st Vehicle from NE corner	Varies	-	-	4	BDU-33, Rockets, 30MM
**10-5	2nd Vehicle from NE corner	Varies	-	-	4	BDU-33, Rockets, 30MM
**10-6	3rd Vehicle from NE corner	Varies	-	-	4	BDU-33, Rockets, 30MM
11	Residential complex	WB 68943 65736	N 37° 38.172 W 92° 13.113	1121	2,5	BDU-33
11-1	Southern building	WB 68941 65726	N 37° 38.168 W 92° 13.117	1121	2	BDU-33
11-2	Western building	WB 68938 65735	N 37° 38.170 W 92° 13.8	1122	2	BDU-33
11-3	Northern buildings	WB 68945 65745	N 37° 38.175 W 92° 13.114	1120	2	BDU-33
11-4	Eastern buildings	WB 68952 65720	N 37° 38.165 W 92° 13.108	1116	2	BDU-33
12	Captown buildings	WB 68911 65618	N 37-38.107 W 92-13.139	1110	2	BDU-33
12-LGB	Dozer	WB 68880 65719	N 37° 38.162 W 92° 13.159	1110	4	BDU-33
12-1	Ministry of Truth (Southwest building)	WB 68911 65618	N 37° 38.107 W 92° 13.139	1114	2	BDU-33
12-2	Central West Building	WB 68913 65669	N 37° 38.134 W 92° 13.137	1112	2	BDU-33
12-3	Northwest building	WB 68902 65696	N 37° 38.149 W 92° 13.144	1110	2	BDU-33, GBU-12
12-4	Northeast building	WB 68952 65652	N 37° 38.125 W 92° 13.110	1104	2	BDU-33

Table A3.3. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
12-5	Southeast building	WB 68958 65631	N 37° 38.113 W 92° 13.107	1104	2	BDU-33
20	JMGT	WB 68950 66287	N 37° 38.468 W 92° 13.108	1015	3	BDU-33
21	Train (East)	WB 69195 66221	N 37° 38.431 W 92° 12.942	980	4	BDU-33
21-1	Train engine	WB 69195 66221	N 37° 38.431 W 92° 12.942	980	4	BDU-33
22	POL complex	WB 69364 66256	N 37° 38.450 W 92° 12.827	974	4	BDU-33
22-1	Revetted storage tank	WB 69358 66243	N 37° 38.443 W 92° 12.831	975	4	BDU-33
22-2	Revetted storage tank	WB 69364 66256	N 37° 38.450 W 92° 12.827	973	4	BDU-33
22-3	Revetted storage tank	WB 69376 66269	N 37° 38.456 W 92° 12.819	973	4	BDU-33
22-4	Revetted storage tank	WB 69375 66295	N 37° 38.471 W 92° 12.819	974	4	BDU-33
23	Tank Convoy (North of POL)	WB 69434 66429	N 37° 38.543 W 92° 12.778	972	4	BDU-33
23-1	East End	WB 69523 66469	N 37° 38.564 W 92° 12.717	966	4	BDU-33
23-2	Tank	WB 69493 66456	N 37-38.557 W 92-12.738	970	4	BDU-33
23-3	Tank	WB 69469 66441	N 37° 38.549 W 92° 12.755	971	4	BDU-33
23-4	(Center DMPI in target system)	WB 69434 66429	N 37° 38.543 W 92° 12.778	972	4	BDU-33
23-5	Tank	WB 69435 66422	N 37° 38.539 W 92° 12.777	972	4	BDU-33
23-6	Tank	WB 69353 66357	N 37° 38.504 W 92° 12.834	974	4	BDU-33
23-7	Tank	WB 69365 66354	N 37° 38.503 W 92° 12.826	974	4	BDU-33
23-8	West End	WB 69374 66353	N 37° 38.502 W 92° 12.819	974	4	BDU-33
**24	Convoy South of POL	(Center) WB 69284 66132	(Center) N 37° 38.383 W 92° 12.882	986	4	BDU-33, 30MM, Rockets
**24-1	1st Vehicle from North	WB 69296 66195	N 37° 38.417 W 92° 12.873	978	4	BDU-33, 30MM, Rockets
**24-2	2nd Vehicle from North	WB 69301 66125	N 37° 38.379 W 92° 12.870	986	4	BDU-33, 30MM, Rockets
**24-3	3rd Vehicle from North	WB 69270 66087	N 37° 38.359 W 92° 12.891	1002	4	BDU-33, 30MM, Rockets

Table A3.4. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
25	JMGT scud launcher	WB 6914 6577	N 37° 38.190 W 92° 12.969	1095	1	BDU-33
30	Vehicle convoy	WB 68735 66190	N 37° 38.417 W 92° 13.255	1065	5	BDU-33
30-1	1st Vehicle from North – Deuce	WB 68734 66212	N 37° 38.429 W 92° 13.255	1061	5	BDU-33
30-2	2nd Vehicle from North – Deuce	WB 68735 66190	N 37° 38.417 W 92° 13.255	1063	5	BDU-33
30-3	3rd Vehicle from North - Deuce	WB 68736 66147	N 37° 38.394 W 92° 13.254	1065	5	BDU-33
30-4	4th Vehicle from North - Deuce	WB 68739 66115	N 37° 38.376 W 92° 13.252	1069	5	BDU-33
30-5	5 <sup>th</sup> Vehicle from North - APC	WB 68752 66089	N 37° 38.362 W 92° 13.244	1072	5	BDU-33
40	Missile trailers	WB 68122 65371	N 37° 37.977 W 92° 13.676	1008	2	BDU-50
40-1	Nor	WB 68126 65384	N 37° 37.984 W 92° 13.673	1008	2	BDU-50
40-2	Vacant	WB 68122 65371	N 37° 37.977 W 92° 13.676	1008	2	BDU-50
40-3	South	WB 68093 65346	N 37° 37.963 W 92° 13.696	1008	2	BDU-50
41	Vehicle	WB 68684 65596	N 37° 38.096 W 92° 13.292	1103	4	BDU-33, BDU-50
41-1	Vehicle	WB 68684 65596	N 37° 38.096 W 92° 13.292	1103	4	BDU-33, BDU-50
41-2	Support truck (2 ton)	WB 68667 65606	N 37° 38.101 W 92° 13.304	1103	4	BDU-33, BDU-50
42	Bridge and Convoy	WB 68522 65446	N 37° 38.016 W 92° 13.404	1065	4	BDU-33
42-1	Bridge	WB 68522 65446	N 37° 38.016 W 92° 13.404	1075	4	BDU-33
42-2	AP C	WB 68483 65424	N 37° 38.004 W 92° 13.430	1100	4	BDU-33
42-3	Deuce	WB 68456 65389	N 37° 37.985 W 92° 13.449	1116	4	BDU-33
42-4	Deuce	WB 68470 65321	N 37° 37.948 W 92° 13.439	1120	4	BDU-33
43	JMGT ZSU 23-4	WB 68666 65334	N 37° 37.954 W 92° 13.307	1082	1	BDU-33
44	Terrorist Training Camp "Al-	WB 68593 65179	N 37° 37.871 W 92° 13.357	1135	2, 3	BDU-33

Table A3.5. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
44-1	NW bldg	WB 68582 65216	N 37° 37.893 W 92° 13.364	1135	2	BDU-33
44-2	North central bldg	WB 68594 65214	N 37° 37.894 W 92° 13.356	1135	2	BDU-33
44-3	North eastern bldg	WB 68608 65212	N 37° 37.879 W 92° 13.347	1135	2	BDU-33
44-4	Building	WB 68586 65178	N 37° 37.873 W 92° 13.362	1135	2	BDU-33
44-5	Building	WB 68578 65157	N 37° 37.860 W 92° 13.368	1135	2	BDU-33
44-6	Central bldg with courtyard	WB 68587 65148	N 37° 37.860 W 92° 13.355	1135	2	BDU-33
44-7	Central bldg with sniper tower	WB 68594 65133	N 37° 37.850 W 92° 13.352	1135	2	BDU-33
44-8	East central bldg	WB 68610 65140	N 37° 37.857 W 92° 13.345	1135	2	BDU-33
44-9	SW bldg	WB 68570 65105	N 37° 37.837 W 92° 13.367	1135	2	BDU-33
44-10	SE bldg	WB 68611 65119	N 37° 37.840 W 92° 13.349	1135	2	BDU-33
44-11	Van	WB 68606 65163	N 37° 37.865 W 92° 13.350	1135	2	BDU-33
44-12	Van	WB 68608 65113	N 37° 37.840 W 92° 13.350	1135	2	BDU-33
44-13	Water tower	WB 68594 65117	N 37° 37.870 W 92° 13.354	1135	2	BDU-33
44-14	Sand pit	WB 68597 65193	N 37° 37.880 W 92° 13.354	1135	2	BDU-33
44-15	Security checkpoint	WB 68648 65225	N 37° 37.895 W 92° 13.319	1115	1,3	BDU-33
45	Tanks (SA threat)	WB 68546 64999	N 37° 37.774 W 92° 13.390	1142	4	BDU-33
46	Helo LZ (approx 6) helos)	WB 68688 64900	N 37° 37.719 W 92° 13.294	1112	5	BDU-33, Rockets
46-1	North end of LZ	WB 68692 64987	N 37° 37.766 W 92° 13.291	1122	5	BDU-33, Rockets
46-2	South end of LZ	WB 68682 64811	N 37° 37.671 W 92° 13.299	1112	5	BDU-33, Rockets
47	GCI Site	WB 68843 64999	N 37° 37.772 W 92° 13.188	1118	5, 1	BDU-33
47-1	Radar Dish	WB 68843 64999	N 37° 37.772 W 92° 13.188	1118	1	BDU-33
47-2	Control vehicle (APC)	WB 68840 65040	N 37° 37.794 W 92° 13.190	1118	4	BDU-33
47-3	Security checkpoint/ bunker	WB 68855 64951	N 37° 37.746 W 92° 13.180	1114	3	BDU-33
48	AAA piece	WB 68819 65197	N 37° 37.880 W 92° 13.204	1126	3	BDU-33
49	Al Randeed Shwarma Schack	WB 68741 64869	N 37° 37.703 W 92° 13.258	1102	2, 5	BDU-33

Table A3.6. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
50	Ammunition bunkers	WB 68938 64332	N 37° 37.411 W 92° 13.127	1075	3, 5, 4	BDU-33, BDU-50
50-1	NE Bunker	WB 68980 64342	N 37° 37.416 W 92° 13.099	1075	4, 3	BDU-33, BDU-50
50-2	SW Bunker	WB 68941 64283	N 37° 37.385 W 92° 13.125	1075	4, 3	BDU-33, BDU-50
50-3	Middle West Bunker	WB 68938 64332	N 37° 37.411 W 92° 13.127	1075	4, 3	BDU-33, BDU-50
50-4	NW bunker	WB 68936 64363	N 37° 37.428 W 92° 13.129	1075	4, 3	BDU-33, BDU-50
52	SW revetment (Vacant)	WB 68572 64156	N 37° 37.318 W 92° 13.377	1113		Dry
53	Central revetment (with JMGT MiG-29)	WB 68567 64261	N 37° 37.375 W 92° 13.380	1113	1	Dry
54	NW revetment (Vacant)	WB 68567 64368	N 37° 37.432 W 92° 13.379	1129		Dry
55	Artillery piece	WB 68616 64437	N 37° 37.470 W 92° 13.350	1105	1	BDU-33
56	Village	WB 68597 64584	N 37° 37.549 W 92° 13.358	1111	2	BDU-33
56-North Gate	North gate of village	WB 68576 64656	N 37° 37.593 W 92° 13.372	1123	2	BDU-33
56-Truck	North end truck	WB 68553 64500	N 37° 37.504 W 92° 13.390	1150	5	BDU-33, 30MM <b>HAS only</b>
56-1	Building Set – <u>North East</u> section village	WB 68606 64614	N 37° 37.570 W 92° 13.350	1156	2	BDU-33
56-2	Building Set – Just South of Set 1	WB 68609 64571	N 37° 37.540 W 92° 13.350	1143	2	BDU-33
56-3	Building Set – extreme <u>South East</u> in village	WB 68599 64498	N 37° 37.500 W 92° 13.360	1165	2	BDU-33
56-4	Building Set – just west of Set 3	WB 68584 64512	N 37° 37.510 W 92° 13.370	1180	2	BDU-33
56-5	Building Set – Just North of set 4, center of Village	WB 68581 64556	N 37° 37.530 W 92° 13.370	1150	2	BDU-33
56-6	Building Set – <u>South West</u>	WB 68560 64518	N 37° 37.510 W 92° 13.380	1145	2	BDU-33
56-7	Building Set-Central	WB 68580 64586	N 37° 37.550 W 92° 13.370	1139	2	BDU-33

Table A3.7. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
56-8	Building Set-Central	WB 68557 64581	N 37° 37.550 W 92° 13.380	1138	2	BDU-33
56-9	Building Set-Central	WB 68544 64561	N 37° 37.540 W 92° 13.390	1120	2	BDU-33
56-10	Building Set— Western most set of buildings	WB 68522 64592	N 37° 37.550 W 92° 13.410	1140	2	BDU-33
56-11	Building Set— Western buildings, just North of Set 10	WB 68514 64628	N 37° 37.570 W 92° 13.410	1126	2	BDU-33
56-12	Building Set	WB 68603 64643	N 37° 37.580 W 92° 13.350	1152	2	BDU-33
57	Nuclear Facility	WB 68602 64841	N 37° 37.688 W 92° 13.353	1125	2	BDU-33
57-1	Nuclear Storage Facility	WB 68585 64828	N 37° 37.680 W 92° 13.360	1147	2	BDU-33
57-2	Nuclear Reactor	WB 68562 64861	N 37° 37.700 W 92° 13.380	1144	2	BDU-33
57-3	Truck	Various	Various		4	BDU-33, 30MM <b>HAS</b> <b>only</b>
57-4	Chemical storage bldg	WB 68598 64843	N 37° 37.690 W 92° 13.360	1155	2	BDU-33
57-5	East guard tower	WB 68594 64811	N 37° 37.670 W 92° 13.360	1159	2	BDU-33
57-6	West guard tower	WB 68576 64776	N 37° 37.650 W 92° 13.370	1110	2	BDU-33
57-7	Barracks	WB 68592 64899	N 37° 37.720 W 92° 13.360	1140	2	BDU-33
57-8	Support building	WB 68590 64878	N 37° 37.710 W 92° 13.360	1150	2	BDU-33
57-9	Support building	WB 68564 64808	N 37° 37.670 W 92° 13.380	1125	2	BDU-33
57-10	Support building	WB 68600 64794	N 37° 37.660 W 92° 13.350	1102	2	BDU-33
60	Two story revetted buildings (Tommy Town)	WB 688 645	N 37° 37.503 W 92° 13.220	1093	2	Dry
60-1	Revetted C2 building	WB 68821 64502	N 37° 37.504 W 92° 13.206	1050	2	Dry
60-2	Revetted building	WB 68795 64512	N 37° 37.509 W 92° 13.224	1060	2	Dry

Table A3.8. Target Description/Coordinates.

TARGET DMPI	DESCRIPTION	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)	ELEVATION (MSL)	TARGET TYPE	ALLOWABLE ORDNANCE
90	Two story HVT building	WB 68859 65722	N 37° 38.163 W 92° 13.173	1090	2	<i>B-2 HW/A-10 LGB/Mk-82 CF Only</i>
91	Two story HVT building	WB 68854 65568	N 37° 38.080 W 92° 13.177	1106	2	<i>B-2 HW/A-10 LGB/Mk-82 CF Only</i>
92	Two story bldg	WB 68833 65336	N 37° 37.955 W 92° 13.193	1110	2	<i>B-2 HW/A-10 LGB/Mk-82 CF Only</i>
93-1	Two story command post	WB 69031 65231	N 37° 37.897 W 92° 13.059	1125	2	<i>B-2 HW Only</i>
93-2	Vacant					
93-3	Vacant					

1. **All Deliveries:** No direct over flight of Main and Flank towers or manned positions.

2. Targets available for Heavyweight, Rockets, or Strafe are annotated in Attachment 2 under the specific type of delivery or event. Find your aircraft, find your type of ordnance and event and see the available targets.

Contact RCO **2 hours** prior to mission if planning deliveries with personnel at OPs Phantom or Thud

**Target Composition is noted as follows:**

- 1 – Thin skinned sheet metal
- 2 – **Thin walled** shipping containers, wood or metal floors, aluminum or steel siding and roof
- 3 – Natural materials used for majority of target, i.e. sandbags, dirt mounds, berms, wood
- 4 – Hard target, i.e. heavy steel
- 5 – Vehicle type target, steel

**JMGT** -- Joint Modular Ground Target – Medium fidelity movable sheet metal targets built on-range

A-10 30 MM Strafe Targets<sup>1</sup> – 1, 4, 6, 10, 24, 56 truck, & 57 truck

A-10 Rocket Targets<sup>1</sup> – 4, 7, 8, 10, 24, & 46

DMT -- Dry Movable Targets are available to be utilized within or near target sets; however, munitions will not be released directly on the DMTs (technical vehicles, mortar sites<sup>2</sup>, motorcycles) without prior approval from the RCO.

Notes:

1. \*\* indicates the targets are approved both rockets and 30 mm
2. BDU-33s can be utilized on mortar sites

Table A3.9. Range Facility Description/Coordinates.

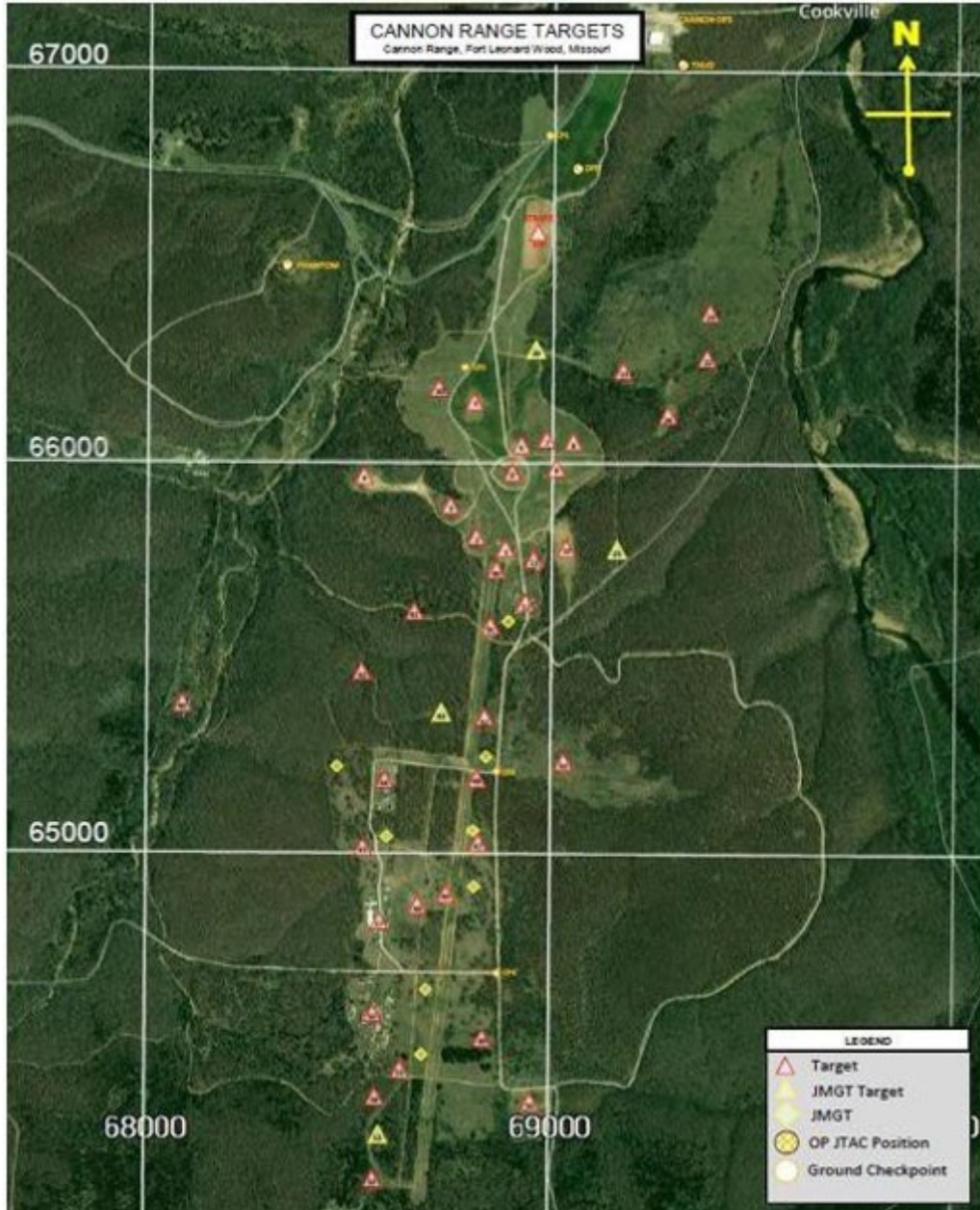
Cannon Range Facilities				
	Elevation	Description	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)
Main Tower	1122 (base)	50' tall	WB 69213 67196	N 37° 38.959 W 92° 12.924
Flank Tower	10 61	60' tall	WB 68072 66811	N 37° 38.755 W 92° 13.702
Scoring Tower #1	11 50	140' tall	WB 70506 66458	N 37° 37.554 W 92° 12.049
Scoring Tower #2	12 76	70' tall	WB 71303 64824	N 37° 37.661 W 92° 11.508
Scoring Tower #3	11 60	140' tall	WB 68466 64061	N 37° 37.278 W 92° 13.455
Helipad	11 11	90' x 90'	WB 69175 67088	N 37° 38.901 W 92° 12.951
OP Thud (JTAC position)	1083	Amphibious Bridging Vehicle	WB 69320 67016	N 37° 38.861 W 92° 12.852
OP Intruder (JTAC position)	11 22	Pavilion at base of tower	WB 69189 67191	N 37° 38.956 W 92° 12.940
OP Phantom (JTAC position) <i>formerly "OP 13"</i>	10 94	150' X 150' earthen berm, radar trailer in middle	WB 68341 66497	N 37° 38.585 W 92° 13.521
OP Cobra (JTAC position) <i>aka "Macedonia Tower"</i>	1274	Ft Leonard Wood observation tower	WB 67788 63207	N 37° 36.808 W 92° 13.916
OP Voodoo (JTAC position) <i>aka "FLW Fire Point 5"</i>	1260	Ft Leonard Wood artillery range tower	WB 7131 6482	N 37° 37.664 W 92° 11.505
Defensive Fighting Position (DFP) (JTAC position)	1073	Small wooden/ sandbag structure NE of strafe pits	WB 69062 66730	N 37° 38.708 W 92° 13.191
Checkpoint 1 (CP-Whisky) Mounted Operations	1093	Y-intersection at paved road and trail	WB 68991 66837	N 37° 38.767 W 92° 13.077
Checkpoint 2 (CP-Yankee) Mounted Operations	1076	T-intersection at gravel road and E/W fire line	WB 68789 66245	N 37° 38.445 W 92° 13.129
Checkpoint 3 (CP-Papa) Mounted Operations	1135	T-intersection West of Tgt 93	WB 68866 65216	N 37° 37.893 W 92° 13.174
Checkpoint 4 (CP-Oscar) Mounted Operations	1083	T-intersection	WB 68873 64677	N 37° 37.609 W 92° 13.173

Table A3.10. Range Initial Points.

Cannon Range IP's				
	Elevation	Description	UTM WGS 84 COORDINATES	LAT/LONG (dd.mm.mmm)
F2	984	Road/Creek	WB 527 491	N 37° 29.25 W 92° 24.25
F3	1312	Road Bend	WB 645 585	N 37° 34.30 W 92° 16.15
F4	1279	Road Intersection	WB 715 509	N 37° 30.15 W 92° 11.45
F6	886	Bridge	WB 866 574	N 37° 33.55 W 92° 01.15
F7	968	Bridge	WB 557 546	N 37° 32.20 W 92° 22.18
F8	1197	Powerline/Road	WB 587 764	N 37° 44.00 W 92° 20.06
Yeti	1230	Road Bend	WB 544 639	N 37° 37.24 W 92° 23.00

Attachment 4  
CANNON RANGE TARGET OVERLAY


Figure A4.1. Target Layout/Overview.



**Attachment 5  
CANNON RANGE LINEUP SHEET**

**Figure A5.1. Range Lineup Sheet.**

**CANNON RANGE LINEUP SHEET**



<b>Range Time</b>	
-------------------	--

Flight Data			
Position #	Call Sign	Gun #	Tail #
1			
2			
3			
4			
5			

<b>Intraflight Frequency</b>	
------------------------------	--

**HAVE Quick:** Yes / No  
**Secure Voice:** Yes / No  
**SADL Airkey:** \_\_\_\_\_  
**EC Threats:** Yes / No (Circle desired threats)  
**Target Acft:** #1 #2 #3 #4 All  
 SA-6 Druntilt (AAA) SA-8 ZSU 23-4  
**Smokey SAMs:** Yes / No # \_\_\_\_\_  
**Target Acft:** #1 #2 #3 #4 All  
**Lasers (circle all that apply):**  
**LITENING/LANTIRN:** Combat Training  
 ACP  
**SOFLAM GCP TGO IZLID**

**Requested Night Lighting:**  
 IR / Conventional / Smudge Pots

Events					
Pass #	Event	Target	Weapon & #	Heading	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

**Remarks:**

Attachment 6

EMERGENCY AIRFIELD INFORMATION

Figure A6.1. Emergency Airfield Information.

**Emergency Airfield Information**

**Forney Army Airfield (TBN)**

Distance From Cannon	7 NM
Heading	029° M
Elevation	1159' msl
Length	6038' X 150'
Runways	14 / 32
Cables	None
Frequencies	133.8 / 317.5 (KCC) 241.0/125.4 (Tower)
Coordinates	N37° 44' W92° 08'

**Whiteman AFB (SZL)**

Distance From Cannon	91 NM
Heading	315° M
Elevation	871' MSL
Length	12,400 X 200
Runways	01 / 19
Cables	None
Frequencies	127.45 / 284.0 (Appch) 255.6 (Tower)
Coordinates	N38° 43' W93° 33'

**Lambert St. Louis International (STL)**

Distance From Cannon	110 NM
Heading	052° M
Elevation	604' MSL
Length	11,019' X 200'
Runways	12 / 30
Cables	BAK-12A(B) RWY 12R/30L
Frequencies	133.55 / 338.25 (Appch) 257.7 (Tower)
Coordinates	N38° 45' W90° 22'

**Springfield Regional (SGF)**

Distance from Cannon	61 NM
Heading	246° M
Elevation	1267' MSL
Length	7003' x 150'
Runways	14 / 32 & 02 / 20
Cables	None
Frequencies	121.1 / 290.5 (Appch) 257.8 (Tower)
Coordinates	N37° 15' W93° 23'

**Rolla National (VIH)**

Distance from Cannon	36 NM
Heading	035° M
Elevation	1148' MSL
Length	5500' x 100'
Runways	04 / 22 & 13 / 31
Cables	None
Frequencies	323.1 (KCC) 123.0 (CTAF/Unicom)
Coordinates	N38° 07.65' W91° 46.17'

**Floyd W Jones, Lebanon (LBO)**

Distance From Cannon	21 NM
Heading	270° M
Elevation	1319' MSL
Length	5,000 X 75
Runways	18 / 36
Cables	None
Frequencies	121.1 / 290.5 (Appch) 122.8 (CTAF/Unicom)
Coordinates	N37° 38.90' W92° 39.15'

All headings magnetic from Target 0

## Attachment 7

## RCO QUALIFICATION AND TRAINING CHECKLIST

Figure A7.1. RCO Qualification and Training Checklist.

**RANGE CONTROL OFFICER QUALIFICATION AND TRAINING CHECKLIST**

Name: \_\_\_\_\_

A. Prerequisites: RCO must meet prerequisites of AFMAN 13-212

B. General Intro:

1. Wing scheduling \_\_\_\_\_
2. Unit Level On-Scene Mishap Investigation Commander \_\_\_\_\_
3. Public Affairs Training \_\_\_\_\_
4. Weather minimums Day \_\_\_\_\_
5. Weather minimums Night \_\_\_\_\_
6. Communications procedures \_\_\_\_\_
7. Pattern safety and hazards \_\_\_\_\_
8. Responsibilities and Authority of the RCO \_\_\_\_\_

C. Academic Training:

1. AFII1-202, Volume 3, General Flight Rules \_\_\_\_\_
2. AFI 11-2MDS series \_\_\_\_\_
3. AFII1-214; Foul Criteria \_\_\_\_\_
4. AFMAN 13-212, and supplements \_\_\_\_\_
5. AFMAN 13-212, 442 FW Supplement Cannon Range \_\_\_\_\_
6. Weapons delivery patterns for each event and type aircraft using the range, Day \_\_\_\_\_
7. Weapons delivery patterns for each event and type aircraft using the range, Night \_\_\_\_\_

D. Range briefings and Demonstrations:

1. Obtaining and interpreting Weather \_\_\_\_\_
2. Pattern spacing and sequencing \_\_\_\_\_
3. Foul Criteria and procedures \_\_\_\_\_
4. Cease fire determination \_\_\_\_\_
5. Range Hazards areas, WDZ, pattern safety, Range safety \_\_\_\_\_
6. Inspection of strafe impact areas \_\_\_\_\_
7. Capabilities and limitations of the range facilities \_\_\_\_\_
8. Range Utilization Report/ Range record keeping \_\_\_\_\_
9. Primary and secondary radio procedures \_\_\_\_\_
10. Basic bomb scoring procedures \_\_\_\_\_
11. Lost communication procedures \_\_\_\_\_
12. Crash and rescue procedures \_\_\_\_\_
13. Evacuation of injured personnel \_\_\_\_\_
14. Range fire protection/fire suppression procedures \_\_\_\_\_
15. Coordination with Range Control \_\_\_\_\_
16. Laser Operations \_\_\_\_\_
17. EOD briefing, proper handling of training munitions \_\_\_\_\_

E. Written Examination

1. Pass a written examination with a minimum score of 85% corrected to 100% \_\_\_\_\_

F. Day Range Training: Complete the following supervised by a qualified RCO

1. Observe a qualified RCO for at least one mission \_\_\_\_\_
2. Control at least two flights \_\_\_\_\_
3. Date Day Qualified \_\_\_\_\_

Figure A7.2. RCO Qualification and Training Checklist.

- G. Night Range Training: When day-qualified complete the following supervised by a night qualified RCO.
1. Observe a night qualified RCO for one flight (unaided) \_\_\_\_\_
  2. Control a minimum of one night flight (unaided) \_\_\_\_\_
  3. Observe a night qualified RCO for one flight (aided) \_\_\_\_\_
  4. Control at least one night flight (aided) \_\_\_\_\_
  5. Complete NV training \_\_\_\_\_
  6. Date Night Qualified \_\_\_\_\_

\_\_\_\_\_  
Range Operations Officer

Attachment 8

442FW(CANNON RANGE)/FORT LEONARD WOOD SERVICE AGREEMENT

A8.1. Only the signature page is shown here due to space requirements, however the full support agreement is maintained by the ROO at Cannon Range, and the 442<sup>nd</sup> MSG/CC at Whiteman AFB.

Figure A8.1. Cannon Range/Fort Leonard Wood Inter-Service Support Agreement.

SUBJECT: MOA W90GZM-19-004 USAGFLW and 442<sup>nd</sup> Fighter Wing (Cannon Range) for Garrison Support

7.9. EFFECTIVE DATE: This MOA takes effect as of last signature date.

7.10. EXPIRATION DATE: This Agreement expires nine (9) years from last signature date.


8. AVAILABILITY OF FUNDS: This MOA does not document the obligation of funds between the Parties. Any obligation of funds in support of this MOA will be accomplished using a Military Interdepartmental Purchase, DD Form 448. Any obligation of funds between Army units will be accomplished using the appropriate General Fund Enterprise Business System (GFEBS) transaction.


8.1. ECONOMY ACT DETERMINATION AND FINDINGS: No goods or services will be procured for Receiver from a contractor by Supplier. The Supplier has determined that the capabilities exist to render the requested support without jeopardizing its assigned missions.

AGREED:

For the 442<sup>nd</sup> Fighter Wing-

For USAGFLW-

  
\_\_\_\_\_  
ROGER P. SURO  
Brigadier General, USAF  
Commander, 442<sup>nd</sup> Fighter Wing

  
\_\_\_\_\_  
ERIC B. TOWNS  
COL, CM  
Commanding

17 MAY 2019  
(Date)

7 June 2019  
(Date)

**Attachment 9****CANNON RANGE PRIMARY USERS AND CONTACT INFORMATION****Figure A9.1. Cannon Range Primary Users and Contact Information.**

442 FW, Whiteman AFB, MO	DSN 975-3485
509/131 BW, Whiteman AFB, MO	DSN 975-4863
Boeing Flight Test and Operations	314-545-6529
139 AW, ANG, St Joseph, MO	DSN 356-3260
1-135 AVN Regt, MONG, Whiteman AFB, MO	DSN 975-5765
3-135 AVN Regt, MONG, Forney AAF, MO	573-638-9500
41 AS, Little Rock AFB, AR	DSN 731-4110
48 AS, Little Rock AFB, AR	DSN 731-2817
29 WPS, Little Rock AFB, AR	DSN 731-6539
1-160 SOAR, Fort Campbell, KY	270-798-1382