BY ORDER OF THE COMMANDER
301ST FIGHTER WING

301ST FIGHTER WING INSTRUCTION
13-212

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Space, Missile, Command and Control

RANGE PLANNING AND OPERATIONS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This 301st Fighter Wing (301FW) Instruction extends the guidance of Air Force Manual (AFMAN) 13-212 Volume 1, *Range Planning and Operations*, 22 June 2018. This instruction is applicable to all military, civilian and contractor personnel utilizing the Falcon Bombing Range (FAL) and the Fort Sill Quanah Range (QRA). 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 301FW Publications/Forms Managers (301 CF/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 Manual (AFMAN) 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 to document contents include realignment with the new AFMAN 13-212 Volume 1 which replaced AFI 13-212 Volume 1; updates to several target arrays; included physical address/location of the range; changed the range impact area and added a graphic depicting the new Quanah Buffer Area; addition of new R-5601G, H and J airspace; addition of the infrared and laser calibration

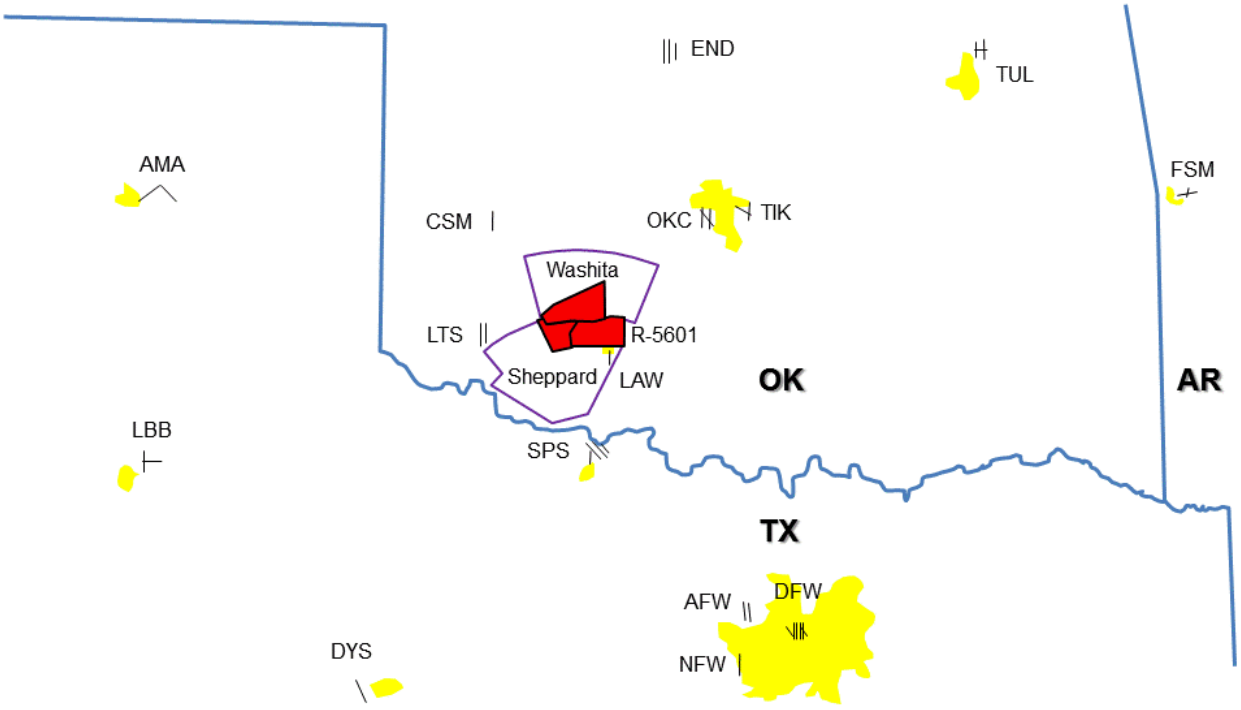
panel and sensor tower strobe lights in the Laser Training Area; addition of new telephone numbers; update of 6th CTS contact information; change of the Falcon Range secondary and the Fort Sill close air support frequencies; revised off-range impact response procedures consistent with Fort Sill directives; clarification of joint terminal attack controller procedures within the impact area; updates to the laser scoring sensors and systems; added parameters' instruction for J-DAM munitions deliveries; updated references and supporting information; update of the range target layout diagram, as a result of new target additions; corrected target and offset aim point coordinates with high-resolution geographical information systems imagery; changed all target and offset aim point latitude/longitude coordinates from 3-decimal place accuracy to 4-decimal place accuracy; changed the MGRS coordinates consistent with the corrected target locations; removed MC-130W references and consolidated all AC-130 attacks into one attack axis matrix.

Chapter 1

RESPONSIBILITIES AND SCHEDULING

1.1. General. 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 Falcon Range. The Commander, 301st Operations Group (301OG) (DSN 739-6910) is responsible for operational control of Falcon Range. The 301st Operations Group Commander (301 OG/CC) monitors range flying and ground support operations to ensure effectiveness and safety. All personnel will comply with this chapter when operating aircraft or performing ground duties within the confines of Falcon Range. The range lies within R-5601, and is part of the Fort Sill range complex in southwest Oklahoma. The US Army Fires Center of Excellence maintains control and scheduling of the ground space and is the scheduling and controlling agency for the R-5601 airspace. Refer to **Figure 1.1** for local area depiction.

Figure 1.1. Falcon Range Local Area



1.1.1. The Range Operating Authority (ROA) is the 301st Operations Support Squadron (OSS) 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.

1.1.2. The Range Operations Officer (ROO) is responsible for the safe and successful completion of missions flown on Falcon 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 Sill. 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 Falcon Range (DSN 639-6300 / FAX DSN 639-7421). An alternate phone number is (580) 442-2043 / DSN 639-2043. 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. Falcon Range can accept short notice requests, subject to range availability. Requests received after the 15th of the month will be scheduled if range time is still available at the requested time. Late arrivals and/or cancellations must be coordinated with Falcon Range as soon as possible. Priority (in order) shall be given to real-world contingency (AEF) training (deploying within 120 days), higher headquarters-directed exercises (such as ORIs), the host unit (301st FW/457th FS), secondary users as defined by the Inter-Service Support Agreement, and finally to casual users. Requests of equal priority will be considered in order of receipt. The scheduler and ROO will resolve time conflicts in a fair and equitable manner based on priorities. The scheduler will then provide a copy of the monthly schedule to all users.

1.2.2. Special events, such as expending heavyweight inert ordnance or utilizing laser operations, require coordination prior to range time. Users will contact Falcon Range as soon as possible with these and other special requests.

1.2.3. Users will relay the planned lineup and events to Falcon Range through either telephone (DSN 639-6300 or -2043/Comm (580) 442-6300 or -2043) or FAX (DSN 639-7421/Comm (580) 442-7421) 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. Falcon Range mailing address is listed below in **Table 1.1**.

Table 1.1. Falcon Range Mailing Address.

Falcon Range PO Box 620 Cache, OK 73527

1.2.5. The physical address of the range gate is listed in **Table 1.2**.

Table 1.2. Physical Address of the Range Gate.

Post Oak Road at Rogers Lane Cache, OK 73527 GPS: N 34.638352, W 98.685531 (N34°38'18.2020", W 98°41'07.9747") MGRS: 14S ND 28820 32988

1.2.6. 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.

1.2.6.1. 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.

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

1.4. Decontamination/Disposal. 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.

1.5. 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. Falcon 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.

1.6. Command and Control. Command and control is exercised through Fort Sill. The RCO receives control of the range and R-5601C/D/E/F and R-5601G if scheduled from Fort Sill Range Control (DSN 639-2994 or -2008) prior to the first range period. The RCO returns control to Fort Sill during periods of administrative downtime and at the end of the day.

1.7. Support Agreements. Copies of support agreements are kept on file at the 301st OG. The Directorate of Resource Management, Manpower and Agreements Branch, Fort Sill, is responsible for the initiation and coordination of support agreements with tenant users.

1.8. Firefighting. Fires will be serviced by the Fort Sill Fire Department in accordance with the current support agreement. RCOs will report all fires to Fort Sill Range Control at DSN 639-2994/-2008. Only the Fort Sill Fire Chief can determine if a fire is minor or not. When practical, a Falcon Range RCO or contract employee will accompany the Fire Department down-range for orientation and safety.

1.8.1. Fort Sill Range Control will provide the specific pyrotechnic restriction status ("Pyro Status") daily or more often if conditions change. Range Control may require a cessation of operations due to increased fire danger. This may be a result of high winds, dry weather conditions, over-tasked Fort Sill or local firefighting equipment, or warnings issued by the National Weather Service. In the event of such conditions, the Fort Sill Fire Chief will issue a series of alerts through Range Control. The RCO may exercise discretion and add restrictions, such as restricting or denying some munitions and/or targets, when local conditions may preclude safe weapons employment. The standard Fort Sill pyrotechnic restrictions are Green, Amber, Red, and Black.

1.8.1.1. Green: All ammunition cleared for use may be expended.

1.8.1.2. Amber: Partial restrictions apply; all ordnance must remain within the impact area. Use extreme caution when employing IRCM flares.

1.8.1.3. Red: No pyrotechnics may be used. This is often referred to as a "RED PYRO" alert. No white phosphorous, illumination, smoke, or tracer ammunition may be employed. EOD detonations are prohibited. No visual threat simulators such as AAA pyrotechnics will be fired. Only cold-charge training munitions, training munitions with the spotting charge removed in accordance with T.O. 11A3-3-7, inert weapons or TP ammunition may be expended. Countermeasure flares may only be employed above 1000' AGL / 2500' MSL (or higher if required to ensure burnout before ground impact). Dry attacks may still be conducted, and there are no restrictions on the use of lasers.

1.8.1.4. Black: No releases of any sort. The combination of humidity, available fuel, and winds raises an extreme danger of range fires, and a spark from a metal-on-metal or metal-on-rock hit may cause an out-of-control range fire. Dry attacks may still be conducted, and there are no restrictions on the use of lasers. Countermeasure flares may only be employed above 1000' AGL / 2500' MSL (or higher if required to ensure burnout before ground impact).

1.9. Recommended Changes. Recommendations for change to this instruction will be submitted on an AF Form 847, Recommendation for Change of Publication to the 457th Fighter Squadron, at 1790 Carswell Avenue, NAS JRB Fort Worth, TX 76127-6200.

Chapter 2

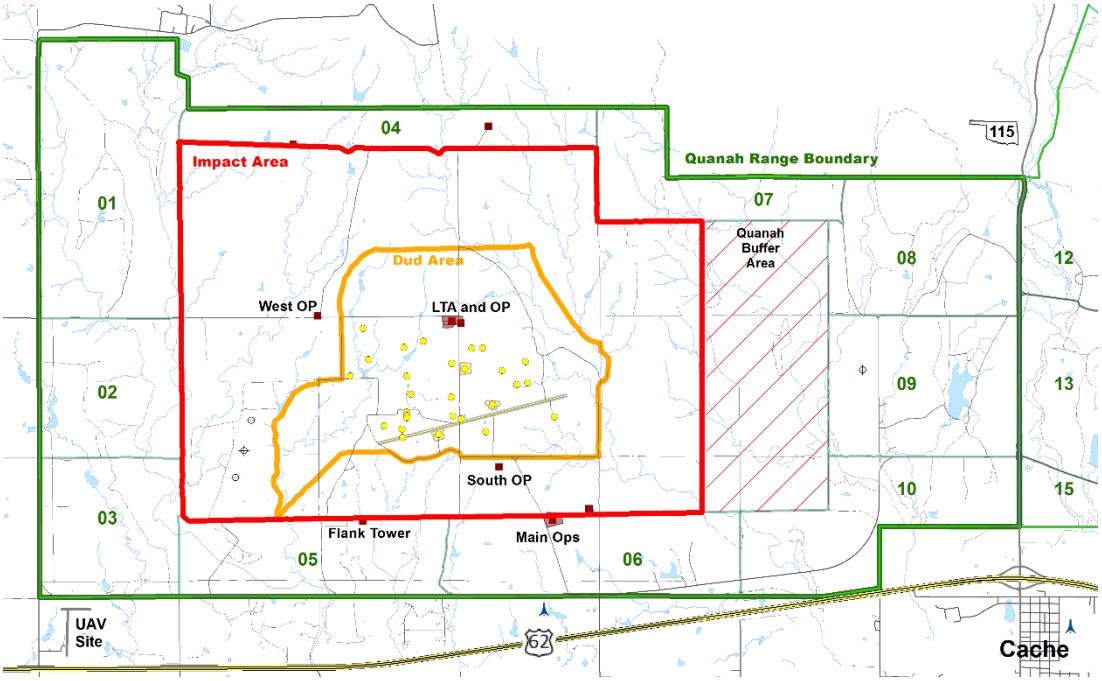
RANGE DESCRIPTION AND INFORMATION

2.1. General. Falcon Range is a Class A (manned) conventional and tactics range approved for both day and night weapons delivery. The range is located on the Fort Sill Military Reservation with the Quanah Range at N34° 39.4' W98° 42.6', SPS (CH 74) 343°/041 NM. The range impact area lies entirely within the Fort Sill Quanah Range Impact Area (QRA). The mean target area elevation is 1400 feet MSL. Normal hours of operation are 0730-1800 CST/CDT Monday-Friday. Operations outside these periods require prior coordination. Refer to **paragraph 1.2** for details.

2.1.1. Range Layout. Falcon Range is a single range consisting of a conventional bomb circle, tactical target arrays, laser targets, and multiple mobile tactical targets. Infrared (IR) targets are available with prior coordination and approval. Ground and airborne laser designator use is approved. See **Attachment 4, Falcon Range Target Layout Diagram.**

2.1.2. The Target Area is defined by the Fort Sill Quanah Range Dud Area. The Hazard Area is defined by the Fort Sill Quanah Range Impact Area. Ten adjacent ground training areas surrounding the impact area complete the Quanah Range maneuver space. The Quanah Buffer Area (QBA) consists of a rectangular 1200 acre area on the east side of the impact area, and can be scheduled for either ground maneuver units or as an overflow area for certain weapons deliveries. Simultaneous use of the buffer area is prohibited. Under normal scheduling the QBA is unoccupied. Refer to **Figure 2.1, GIS Overlay** for a depiction of the range boundary, training areas 01 through 10, the impact, buffer and dud areas.

Figure 2.1. GIS Overlay.



2.2. Weather. Falcon Range possesses weather observation and reporting equipment. This provides immediate weather reporting capability to include ceiling and visibility, type of obscuration, lightning data, surface winds, and precipitation. It does not report upper level winds. Falcon Range cannot provide official forecasts and/or observations but can relay existing conditions and out-the-window observations. Pilots should contact their official weather facility for relevant nearby forecast information.

2.3. Scoring. Bomb impacts are optically plotted and scored by computer using the Weapons Impact Scoring Set (WISS). When the computer system is not working or uninstalled, bomb impacts are mechanically plotted by optical triangulation and scored by computer. WISS allows digital and tape playback for verification and replots, and a score for each weapon during multiple releases, if the impact is within the camera field of view. WISS also allows video recordings for viewing later. Aircrews who want to have a visual record of their deliveries can coordinate with the RCO for a video backup, which can be sent to the user in various digital formats.

2.3.1. Accuracy. Nominal scoring accuracy is 1.5 meters. Bombs plotted three meters or less (computed deliveries) or five meters or less (manual deliveries) are scored as a "bull" or "shack". Scoring accuracy decreases as a function of target distance from the main and flank towers. The targets on range are either point or area. Most targets are of the point variety, but some, such as T-3SE, T-5NW, T-7C, some of the T-9 targets, and T-17 are area targets. Linear targets such as aircraft will have similar scoring, but on a smaller scale. Hits are based on the center of the target, so a hit on a building or bridge may visually be a direct hit but still score as a close miss (7 meters, for example).

2.3.2. RCOs transmit scores using distance/clock position ("7 [meters] at 2 [o'clock]") based on the briefed attack heading. Inform the RCO if the attack heading varies from the standard 080° run-in; weapons scores will be adjusted.

2.3.3. Each scorable target can be scored day or night. Night missions require hot charges (e.g. Mk-4) since scoring requires a visible flash within the camera field of view. Cold charges or inert weapons will not be visible at night. Coordinate desired targets with the RCO prior to complex missions or deliveries to prevent confusion. Certain wind or visibility conditions may limit the effectiveness of the scoring system due to target obscuration. Additionally, wet conditions in the target area may preclude accurate daytime scoring of inert munitions and "duster" training rounds.

2.3.4. WISS can score only one target area/complex at a time. Multiple Desired Points of Impact (DPIs) require coordination for manual scoring backup. Some targets allow the use of one camera system for multiple target arrays. This gives flight leads flexibility when planning attacks on separate DPIs. Suitable target pairs are T-3 and T-4, T-5 and T-18, T-6 and T-17, and T-14 and T-15.

2.3.5. In the event that the WISS is not available, a manual scoring system can be employed. Because it requires multiple personnel in a location not normally manned, it requires at least one hour lead time. Users will be notified of WISS outages and the restrictions that are required

to properly score weapons impacts. Only single releases can be scored on a reduced number of target arrays and specific targets inside the array.

2.4. Target Arrays. The conventional target is T-1. Target arrays T-2 through T-25 are tactical targets located throughout the range complex. Refer to Attachments 4 through 9 for target area details, run-in headings, authorized ordnance, etc.

2.4.1. Target Array 1 (T-1), Conventional Bomb Circle. The bomb circle is an outlined graded circle of 91 meters (300 feet) radius. It has two concentric circles of white tires at 23 meters (75 feet) and 45 meters (150 feet) radius. The center of the circle has a clearly identifiable target for aiming reference (usually a small POL tank, but also may be a salvaged vehicle, commo box, or stack of tires.) The target is painted to contrast with the surrounding area. The DPI is the center of the aiming reference. Additionally, there are three white aim points (highly visible markers) located 12 o'clock from the target on a 080º bearing at 1000, 1500, and 2000 feet. These are used only for aim-off distance reference.

2.4.2. Tactical Target Arrays: Several target sites are available for tactics training, employing sub-scale or inert munitions or for TGP attacks. Several of these targets are not visible from the control towers, resulting in the inability to provide attack results and/or weapons deliveries scores. When identified, dimensions are east-west by north-south. Target descriptions in this instruction may change due to target change-out as a result of damage, or due to target area upgrades. Changes will be made available on the range web pages as range NOTAMs.

2.4.2.1. Target Array 2 (T-2), North Ramp. The North Ramp is a graded east-west rectangle approximately 100 x 85 meters. This target array has ten major DPIs in a circular configuration. T-2W and T-2NW are armored targets. T-2N and T-2NE are buildings oriented east-west. T-2E1 and T-2E2 are vehicles. T-2S is a rocket launcher and T-2SE is a radar/communications van. T-2C is a small shack in the center of the array with a number of barrels and a small pickup truck immediately adjacent, and T-2SW is a mortar pit on the southwest corner of the array. Several full-sized mannequins and personnel simulators complete the array. This target array is suitable for inert heavyweight deliveries. Care must be exercised so as not to drop on the LTA 500 meters north. Refer to **Attachment 5, Target Array Details**, for details.

2.4.2.2. Target Array 3 (T-3), East Ramp. The East Ramp is a graded rectangle 85 x 70 meters. This target array has four individual DPIs, including an SA-8 (T-3NW), a fighter aircraft (T-3NE), an aircraft shelter or bunker constructed of Sea-Land containers (T-3SE) and a security detail vehicle/BMP-2 (T-3SW). Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.3. Target Array 4 (T-4), POL Site. This target array is comprised of several POL tanks (T-4N). A road connects the site to the runway. A refueling pump station and service vehicle (T-4S) is located 25 meters south of the POL tanks. Pilots need to specify whether they are attacking the west or east DPI of the POL. Refer to the run-in restrictions for this target.

2.4.2.4. Target Array 5 (T-5), West Ramp. The West Ramp array resembles a dispersed, revetted alert aircraft parking and munitions holding area. The approximate dimensions of this target are 120 x 100 meters. This ramp has five individual DPIs, consisting of two alert aircraft (T-5E and T-5W), a fuel truck (T-5S), plus a hangar with an aircraft inside (T-5NW). An aircraft on the taxiway (T-5NE) completes the array. Refer to the run-in restrictions for this target. Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.5. Target Array 6 (T-6), Howitzer Row and POL. This target array consists of nine separate DPIs. The western howitzers (T-6W1, T-6W2, and T-6W3) are comprised of three self-propelled howitzers at the west end of an east-west graded area of approximately 225 x 30 meters. An ammo support site (T-6A) and a small support building (T-6B) are located east of the howitzers. The POL site (T-6C) is three POL tanks sited vertically in the middle of the array. T-6D is a single armored vehicle located immediately north of T-6C. T-6E is an APC providing security at the east end of the array. A single SA-13 target (T-6N) is located 90 meters northeast of T-6C. Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.6. Target Array 7 (T-7), Base Operations. The Base Operations array is inside an irregular graded area approximately 90 x 90 meters. This target has five individual DPIs, consisting of a building 13 meters high constructed of Sea-Land containers (T-7C), a visual simulation of a ZU-23-2 on the second story of the building on the northwest side (T-7C AAA), a Jeep (T-7NW), a base ops/FOLLOW ME truck (T-7NE), and a small helicopter (T-7SE). Scoring of T-7C is from the center of the building; it is possible to hit the building and still receive a score of 7-10 meters. It is not a point target. Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.7. Target Array 8 (T-8), Armored Vehicles. This target array has two individual sets of DPIs, consisting of armored vehicle assembly areas. Scoring is not available; T-8N and T-8S are scored to Hit or Miss only. The DPI areas are separated by 350 meters north-south.

2.4.2.8. Target Array 9 (T-9), Village. This target array consists of numerous small buildings and vehicle targets which represent an insurgent camp or village. The actual DPI must be identified for accurate scoring. Some of the buildings are constructed of Sea-Land containers and are linear targets. Scoring is from the center of each structure or target. Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.9. Target Array 10 (T-10), Helicopter. This single helicopter target and support truck is not visible from the range control towers.

2.4.2.10. Target Array 11 (T-11), Vehicles. This cluster of four vehicles is not visible from the range control towers. T-11W consists of two vehicles near a pond. No airborne laser designators are authorized on T-11W due to the close proximity of the pond. T-11NE consists of a technical truck with a ZPU-4 AAA gun mounted in the bed, and T-11SE is a technical truck with a single-shot rocket launcher mounted in the bed and oriented to the

southwest. Only targets T-11NE and T-11SE can be scored, and lasers are authorized on T-11NE and T-11SE.

2.4.2.11. Target Array 12 (T-12), Reinforced Bunker. This target is an earthen mound with a door and lumber abutments on the west side. This target array is suitable for inert heavyweight deliveries. Care must be exercised so as not to drop on the LTA 500 meters north.

2.4.2.12. Target Array 13 (T-13), Runway. The runway on Falcon Range is 7400 feet (1.25 NM) long by 120 feet wide. It is oriented 070/250º, and is covered with gravel to present the appearance of a real runway. Due to the linear design of this target, scoring is not available. The remote moving targets are normally operated on the runway.

2.4.2.13. Target Array 14 (T-14), Alert Aircraft. This target array is located on the west end of T-13 and is adjacent to the north and south side of the runway and replicates two aircraft (T-14N and T-14S) on strip alert. A small alert shack, T-14E, is located 10 meters northeast of T-14N. A second shack, T-14W, is located 15 meters southwest of T-14S. A maintenance truck is located adjacent to the cockpit of T-14S. This target array is located just south of T-15. Scoring is available for these targets. Refer to the run-in restrictions for this target.

2.4.2.14. Target Array 15 (T-15), AAA Site. T-15 is a AAA gun site. It is visually modified to present a ZU-23-2 silhouette. This target is located just north of T-14. Refer to the run-in restrictions for this target.

2.4.2.15. Target Array 16 (T-16), Radar Site. Scoring is available for this Fire Can radar van (T-16A) and support vehicle (T-16B). The TTR dish for the Fire Can is on the west face of the target and points southwest. The DPIs are the centers of the radar van and vehicle. Refer to the run-in restrictions for this target.

2.4.2.16. Target Array 17 (T-17), Bridge. This linear target is constructed from Sea-Land containers and is painted gray. It is approximately 200 feet in length. DPIs are provided for the north, south, and center of the bridge and a single Jeep target located on the top of the bridge. Two vehicles are located on each approach to the bridge, and additional targets are located at the southern end of the bridge. The targets can be scored. Scoring of the bridge is from the portions of the target designated, north, center or south sections; it is possible to hit the bridge and still receive a score of 7-10 meters. It is <u>not</u> a point target. The vehicles are considered point targets but because of their linear nature a hit may still not score as a direct hit. Additionally, because the Jeep is located atop the bridge (7 meters elevation) any long bombs may result in significant miss distances. NO STRAFE OR HEAVYWEIGHT ORDNANCE IS ALLOWED. Refer to **Attachment 5** for a detailed target array diagram.

2.4.2.17. Target Array 18 (T-18), ZSU-23-4. This is a single ZSU-23-4 viz-mod located east of T-7. It is at the base of a tree and is camouflaged. Scoring is available for this target.

No airborne laser designators are authorized on this target due to the close proximity of a pond.

2.4.2.18. Target Array 19 (T-19), Downed Aircraft Target. This target simulates a downed counterinsurgency or forward air controller-type aircraft. It is a small aircraft located east of the LTA. It is not scored, but is visible from the main and flank tower. Only subscale munitions and rockets are authorized. NO STRAFE OR HEAVYWEIGHT ORDNANCE IS ALLOWED.

2.4.2.19. Target Array 20 (T-20), Construction Equipment. This target consists of a utility truck, a dump truck, and a backhoe in the process of building a fighting position.

2.4.2.20. Target Array 21 (T-21), 2 Tactical Vehicles. This target array consists of one viz-mod BM-21 rocket launcher truck and one supply truck.

2.4.2.21. Target Array 22 (T-22), 2 Tactical Vehicles. This target consists of two trucks, one dump truck and one utility truck with a AAA piece mounted on the rear. This target array follows a small creek and is adjacent to some vegetation.

2.4.2.22. Target Array 23 (T-23), 2 Tactical Vehicles. This target consists of two trucks, with the northern truck adjacent to a north-south embankment, and the southern truck within a revetment cut from the embankment. This tactically challenging target array is not visible from the range control towers.

2.4.2.23. Target Array 24 (T-24), 2 Tactical Vehicles. This target consists of two tactical vehicles immediately adjacent to the north side of a clump of trees. This target array challenges acquisition and identification, and is not visible from the range control towers.

2.4.2.24. Target Array 25 (T-25), Convoy. This target depicts a tactical convoy consisting of several light trucks or technical vehicles. It is oriented north-south, and is suitable for High Angle Strafe only.

2.4.2.25. AC-130 Target Array. This target array is placed inside a triangular firebreak with an east-west base and a vertex pointing north. This allows for proper identification of the target area. Several targets are placed inside the target array, including armored vehicles and simulated buildings. This is the only target array that can support AC-130 40mm and 105mm training rounds. It can be engaged with strafe from other fixed wing aircraft and sidefire gunnery from helicopters/CV-22s as well. Bombs and rockets are prohibited.

2.4.3. Mobile Vehicle(s). These are various mobile vehicles which can be placed at selected locations within the Falcon Range airspace, including a working replica of a SCUD missile system. These targets are for IR and TGP use only, and will be at the user's request. The location of these targets will be random, unless a user has a specific location based on a scenario. The coordinates will be sent to users and will be in a format and accuracy based on the user's scenario. Because these are mobile targets, they may be outside the impact area. DO NOT EXPEND ORDNANCE ON THESE TARGETS.

2.4.4. No-Drop Targets. There are several no-drop targets inside the impact area but outside the Quanah Dud Area which can be used for dry tactical deliveries. Combat lasers can also be employed against these targets, but no actual ordnance of any kind may be employed. These targets include trucks, construction equipment, a pair of rotators, and an actual BRDM and MTLB. These targets are in a fixed location. Refer to the end of **Attachment 8** for details.

2.4.5. Moving Targets. In order to accommodate training objectives, the range can provide various moving targets in and out of the impact area.

2.4.5.1. Unmanned moving targets. The range possesses several unmanned vehicles which can be used for attacks with both lasers and training munitions. Generally these use HMMWV or SUV-type vehicles. A GPS-guided vehicle is laser-only, and can be used for combat laser designations only. Additional vehicles are command-guided, using a remote driver to operate the vehicle. In order to maintain footprint control and allow the vehicle an opportunity to turn around, the runway (T-13) is the target area of choice. For munitions employment, pilots can attack a towed target array which consists of a target in the shape of a truck towed 150-200 feet behind the tow vehicle. In order to preserve the tow vehicle for future use, aircrews must only attack the towed array, which is painted to contrast with the tow vehicle. Contact the range in advance in order to verify availability, since the vehicle is normally garaged and is not left on the range; at least 3 and up to 24 hours may be required. Inert and training munitions as well as 20mm and 30mm strafe may be used.

2.4.5.2. Manned moving targets. Range personnel can operate range vehicles as needed to allow for dynamic tasking within scenarios. Additionally, the range can provide personnel to maneuver throughout the impact area as part of the scenario. Coordinate with the range at least one hour prior to ensure availability and to provide scenario inputs, if needed. Joint Terminal Attack Controller (JTAC) personnel can act as their own scenario inputs with the concurrence of the RCO, but are restricted to gravel roadways and the LTA. No JTAC personnel are allowed into kinetic target arrays. Attacks will be dry with the flight verifying that no ordnance can be employed prior to commencing any attacks. No lasers may be employed at any time against manned targets unless deemed eye-safe by the 711th HPW/RHDO Optical Radiation Safety Office. Minimum altitudes and ranges will be in accordance with FAA and service directives.

2.4.6. Laser Training Area (LTA). This target area consists of a generic village-type target. Some buildings within the array are constructed of Sea-Land containers and plywood, while others are actual small shack buildings constructed of metal and wood. The area also includes various items associated with cultural buildups, including telephone poles, vehicles of various sizes and types, and a pair of top-down targets constructed of a large tire with high-contrast white gravel, simulating a manhole or hide-site. A laser calibration panel in the middle of the LTA can be electrically heated with 30 minutes prior notice. The scoring system support equipment is located in the middle of the LTA, and two 40’ towers which house the laser sensors are located within the LTA. The western tower is guyed, with the wires marked by orange aerial marker balls. THIS TARGET AREA IS FOR LASER TRAINING ONLY and is

not approved for any weapons deliveries. A number of targets can be scored using combat lasers. Refer to **Attachment 10** for details.

2.4.7. Offset Aim Points (Radar Reflectors). Three radar-reflective offset aim points (OAPs) are available. These reflectors are optimized for a 080º heading. The north OAP consists of 2 metal radar reflectors and is located 3091 meters north of T-1. The south OAP is located 1378 meters southeast of T-1. The west OAP is located 1423 meters south-southeast of T-1 and 617 meters west of the main tower. Refer to **Attachment 7** for coordinates.

2.4.8. Improvised Explosive Devices (IEDs). There are three IED simulators located inside the LTA. These simulators are 105mm inert training rounds partially buried, with electrical wire simulating arming wires. Refer to **Attachment 10** for coordinates.

2.5. Strafe Targets. Most tactical targets are available for high angle strafe (greater than 15° dive), employing 20mm, 25mm, and 30mm TP/TPT. Contact the RCO or refer to Attachment 8 and Attachment 9 for details. The low angle strafe targets are located 500 meters WSW of the bomb circle and consist of two strafe targets oriented north-south mounted between telephone poles and separated by 40 meters. These targets are constructed of drag or cargo extraction parachutes; generally only one will be raised. Low and high angle strafe passes are acoustically scored using the Improved Remote Strafe Scoring System (IRSSS). The scoring system requires a reset time after logging bullet impacts. Allow at least 30 seconds between aircraft on the same target or else the system may not accurately score the impacts. A foul line consisting of two rows of white-painted barrels with marking poles is located 2000 feet west of the strafe pits and is oriented north-south perpendicular to the run-in. A line of barrels leads into the strafe target area from west-to-east. Additionally, 25 meters south of the two low-angle strafe targets is a single high-angle strafe target that is also acoustically scored. It consists of a target on a five-foot high mound of soil. Contact the RCO with the type of ammunition being used. The run-in heading for both low angle strafe and high-angle strafe on the dedicated strafe targets is 080° ± 10°. See **Attachment 5** for diagrams.

2.5.1. The low-angle strafe targets will be closed if standing water accumulates in the strafe beds or if the strafe pits are frozen, as this increases the risk of ricochets and invalidates the weapons footprints. The strafe beds will be maintained in accordance with the schedule of AFMAN 13-212 Volume 1 Chapter 5, or as directed by the RCO based on assessment of the strafe bed conditions.

2.5.2. Low-angle strafe fouls are validated with a camera and recorder system. The RCO immediately observes the cease-fire ranges for strafe, and records the cease fire range for later review.

2.6. Range Real Estate and Airspace Restrictions. Falcon Range is located on the Fort Sill Military Reservation. The air and ground space is part of the US Army Fires Center at Fort Sill, which is the scheduling agency. When the airspace has been activated by Fort Sill, the Falcon Range Control Officer controls only the airspace overlying Falcon Range (R-5601C/D/E/F), and

R-5601G if scheduled. Do not enter the range without clearance from the Range Control Officer. Refer to **Figure 2.2, Local Airspace**.

2.6.1. Fort Sill Artillery Areas. R-5601A/B/J (east of the Falcon Range impact area and east of highway 115) extends from surface to 40,000 feet. These restricted areas are not part of Falcon Range. R-5601B is often referred to as "West Range". Do not penetrate this airspace without clearance from Fort Sill Approach Control, the JTAC (as coordinated prior to the range events), or through the Falcon Range RCO. R-5601A/B/J may be used for overflight in order to employ weapons and lasers from the east with prior coordination at least one day prior. The airspace may not be available on a short-notice basis. If authorized to operate in R-5601A/B/J it is essential that altitude restrictions be followed precisely when surface fires such as artillery and small arms are employed below. Refer to **paragraph 2.7** for scheduling requirements.

2.6.2. Falcon Range. R-5601C/D/E/F overlay the Falcon Range Complex. R-5601G allows Washita MOA extended operations. See **Attachment 3, Restricted Area R-5601**, for restricted area airspace boundaries.

2.6.2.1. R-5601C (defined generally as overlying the Falcon Range range boundary) normally extends from surface to 24,000 feet MSL. Up to 40,000 feet MSL is available upon request. Users requiring the higher airspace must contact Falcon Range at least one day prior to the scheduled range period for this additional vertical airspace.

2.6.2.2. R-5601D (north and west of the impact area) extends from 500 feet AGL to 24,000 feet MSL. Up to 40,000 feet MSL is available with one-day prior coordination. Users requiring the higher airspace must contact Falcon Range at least one day prior to the scheduled range period for this additional vertical airspace. This area overlies the Wichita Mountains Wildlife Refuge. When practical, the minimum altitude when flying over the refuge is 3000 feet AGL / 5500 feet MSL.

2.6.2.3. R-5601E (south of the impact area) extends from 500 feet AGL to 6000 feet MSL. R-5601E lies underneath the Sheppard 1 MOA with a 2000-foot buffer which may also be used as a VFR transition corridor.

2.6.2.4. R-5601F (north and east of the impact area) extends from 500 feet AGL to 24,000 feet MSL. Up to 40,000 feet MSL is available with one-day prior coordination. R-5601F connects the Washita MOA with the R-5601C/D (Falcon Range), allowing increased maneuverability and tactical flexibility.

2.6.2.5. R-5601G (north and east of the impact area) is a large maneuvering area which allows laser employment into the Falcon Range and Fort Sill West Range impact areas and extends from 500 feet AGL to either 7000 or 8000 feet MSL. If the area is not used in conjunction with the Washita MOA above it, then the top is only 7000 feet MSL. If used in conjunction with Washita MOA, then the top extends to but does not include 8000 feet MSL. This area is not available without prior coordination; allow at least 24 hours for scheduling coordination, with one week as the recommended request lead-time. R-5601G

connects the Washita MOA and the Falcon Range and West Range impact areas through R-5601F. This area overlies the Wichita Mountains Wildlife Refuge. When practical, the minimum altitude when flying over the refuge is 5500 feet MSL.

2.6.2.6. R-5601H overlies the Fort Sill cantonment area from surface to 40,000 feet MSL. This small area fills in a hole in the restricted area and provides unmanned aerial vehicles airspace for operations from Henry Post AAF. Much of the area under R-5601H is densely populated and subject to populated area overflight restrictions. Prior permission for activation is required from Fort Sill Range Control.

2.6.2.7. R-5601J (east of the impact area) extends from 500 feet AGL to 24,000 feet MSL. Up to 40,000 feet MSL is available with one-day prior coordination. R-5601J connects the Washita MOA and R-5601G with the R-5601A/B (Fort Sill West Range), allowing increased maneuverability and tactical flexibility.

2.6.3. Sheppard AFB controls two adjacent MOAs:

2.6.3.1. The Sheppard 1 MOA, located directly south of Falcon Range, extends from 8000 feet MSL – FL220. Avoid this high-density student training area unless in contact with Sheppard Area Monitor (236.825) or if approved for use of Sheppard Areas 8 and 9.

2.6.3.2. The Washita MOA, located directly north of Falcon Range, extends from 8000 feet MSL – FL220, to FL260 if requested and approved. Avoid this high-density student training area unless in contact with Fort Worth Center (269.375), or unless scheduled and authorized to use it as part of a Falcon Range or Fort Sill scenario.

2.6.3.3. Sheppard Areas 8 and 9 are located in the extreme northwest part of the Sheppard 1 MOA. These sub-areas may be used in conjunction with R-5601 when Sheppard AFB has activated the MOA. The area is depicted in Attachment 2 and is approximately 10 NM northwest/southeast by 20 NM northeast/southwest. This allows aircraft to operate within special use airspace during operations at Falcon Range. Altitudes are 10,000 feet MSL – FL220.

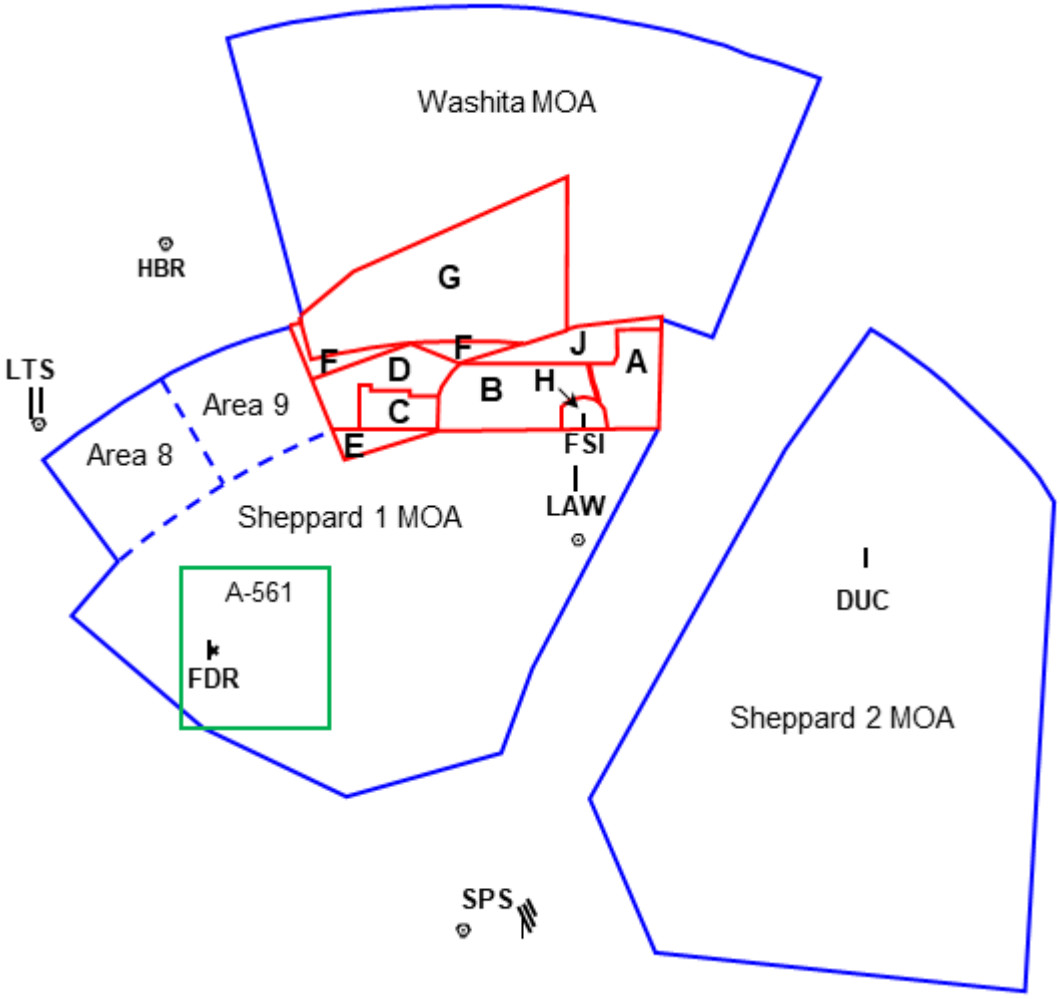
2.6.3.3.1. Sheppard Areas 8 and 9 may be authorized during times the Sheppard MOA is active. Contact Falcon Range to request the airspace, allowing at least 24 hours for coordination; any less will likely result in a denial of the airspace. When requested by Fort Sill Army Radar Approach Control (ARAC), the Altus Shelf (Areas 8 and 9 in Sheppard MOA 1, as depicted in Attachment 2) may be utilized by Fort Sill ARAC for air activities. The Fort Sill Air Traffic and/or Airspace Officer will coordinate with the 80th FTW Scheduling Office and the Sheppard Airspace Management Staff in advance of any operation in this airspace. Sheppard Radar Approach Control will protect that area 10,000 MSL and above until Fort Sill ARAC air activities have ended.

2.6.3.3.2. Sheppard training has priority within the airspace; if Sheppard is using the airspace for primary training it may not be available. If the airspace is allocated to

allow operations with R-5601 then Sheppard AFB aircraft will be restricted from operating within Areas 8 and 9. The airspace can be recalled at any time for Sheppard AFB training.

2.6.3.3.3. Use the Falcon Range frequency for operations in Areas 8 and 9.

Figure 2.2. Local Airspace



2.6.4. The Altus AFB visual and instrument patterns, oriented north/south, are situated east of Altus AFB. The Altus TRSA is approximately 10 NM west of the range boundary and extends from 3500 feet MSL to 7500 feet MSL. Expect to see a variety of large transport aircraft in this pattern.

2.6.5. The terrain rises sharply to over 2500 feet MSL three miles north of the impact area in R-5601D.

2.6.6. There is a lighted tower with guy wires located two miles south of the range on the edge of the restricted area, located at N 3438.400 W 09841.510, elevation 1675’ MSL / 330’ AGL.

2.6.7. Do not overfly the main tower (70 feet AGL) or flank tower (85 feet AGL) below 500 feet AGL. Avoid hot attacks with final headings in the direction of manned sites.

2.6.8. An inactive Remotely Piloted Aircraft (RPA) airfield is immediately adjacent to the southwest part of R-5601C and underneath the western part of R-5601E. The site consists of a north-south runway 2200 feet in length, and an east west 1500-foot runway. If it is ever activated it can be used to launch and recover unmanned aerial vehicles. It will usually be closed when Falcon Range is active with fixed-wing aircraft, but circumstances may allow the simultaneous operation of RPAs while missions are active. In these cases the RPA will remain over or south of US-62 in the R-5601E airspace.

2.7. Large-Scale Airspace Scheduling and Utilization. In order to accommodate large-force employment, heavy bomber missions or inertially-aided munitions, the entire R-5601 complex may be requested. Additionally, portions of the Washita MOA and ATCAA to the north (**paragraph 2.6.3.2**) and the Sheppard 1 Areas 8 and 9 (**paragraph 2.6.3.3**) may be requested for maneuver.

2.7.1. Request the use of the airspace through Falcon Range. Provide the number and type of aircraft, call-sign (if known), the weapons and/or lasers to be employed (if any), tactics and weapons delivery events, the requested airspace and altitudes, the date and time requested, and the flying unit and point(s) of contact. Lasers may only be employed from within the R-5601 complex unless the laser is in an approved eye-safe mode.

2.7.2. Falcon Range will forward the request to the appropriate Fort Sill agency. Range Control will authorize the use of R-5601 A, B, H and J. The Fort Sill Air Traffic and/or Airspace Officer will coordinate with the 80th FTW Scheduling Office, the Sheppard Airspace Management Staff and Fort Worth ARTCC for the use of Sheppard 1 and/or the Washita MOA and ATCAA.

2.7.3. Allow 72 hours for coordination of the Washita MOA and R-5601B. Requests made with less time may not be completed before the mission time. Note: USAF units should not utilize the Center Scheduling Enterprise (CSE) but instead request from the range directly.

2.7.4. Once approved for R-5601 operations, aircrews will be briefed on their minimum altitude. Do not violate this altitude, since direct and indirect fires, including live artillery, may be present underneath the floor of the airspace with an appropriate buffer.

2.8. Noise Abatement Restrictions. Aircrews using IR-105 / VR-104 / VR-1137 will avoid the town of Cooperton at N3452.0 W9852.0.

2.8.1. The Wichita Mountains Wildlife Refuge is located 3NM north of the impact area. Do not overfly the refuge below 3000 feet AGL / 5500 feet MSL.

2.8.2. Do not overfly the towns of lndiahoma or Cache below 3000 feet MSL.

2.8.3. Do not overfly at low altitude the two small farms 4.2 miles WNW of T-1, one mile west of Indiahoma Road, at N 34 40.7 W 98 46.4.

2.9. Communications. Falcon Range has UHF, VHF, LMR, and telephonic communications equipment.

2.9.1. UHF. Falcon Range primary UHF frequency is 363.7; the secondary UHF frequency is 238.8. Additionally, a tertiary backup of 342.3 may be used with prior coordination.

2.9.2. VHF: Falcon Range has the capability to communicate / control utilizing VHF-AM frequency 141.85 (P) or 140.9 (S).

2.9.3. LMR: Falcon Range utilizes a variety of Land Mobile Radios (LMR) for internal communication requirements and to support weapons scoring, moving target, laser designation, and visual and electronic threat simulators.

2.9.4. DSN, commercial, and field communications are available at Falcon Range.

2.9.5. Frequencies and telephone numbers are listed in **Table 2.1, Falcon Range Telephone List** and **Table 2.2, Falcon Range Frequency Table.**

2.9.6. The flight lead will check in with Falcon Range prior to entering the range airspace. The RCO will then approve the flight onto the range or issue holding instructions and provide target information, as well as the current altimeter setting. After flight read-back, the RCO will relay the winds, weather of significance, and bird activity, as well as any restrictions and personnel locations, if applicable.

Table 2.1. Falcon Range Telephone List

Falcon Range and Fort Sill DSN	DSN 639-XXXX
Falcon Range and Fort Sill Commercial	COMM (580) 442-XXXX
Falcon Range Primary	DSN 639-6300 / 2043 / 5862
Falcon Range FAX	X-7421
Falcon Range (Cache commercial line)	COMM (580) 429-8344
Falcon Range Tower (when manned)	X-6389 / 6397
OL-A, 3rd Weather Squadron (Fort Sill)	X-4000
Fort Sill Airfield Operations	X-5808 / 6160
Fort Sill EOD	X-8888 / 2313
Fort Sill Fire Dept	X-3255 / 4905
Fort Sill Range Control	X-2008 / 2994 / 6191
Army Radar Approach Control (ARAC)	X-2004 / 2387
6th CTS Det 1 (Air Force Detachment)	X-2186 /2189 /3897 /2193
301 FW/CP, NAS JRB Fort Worth	DSN 739-6888/90/92

Table 2.2. Falcon Range Frequency Table

Falcon Range Primary / Secondary / Tertiary	363.7 / 238.8 / 342.3
Falcon Range VHF Primary / Secondary	141.85 / 140.9
Fort Sill Ranges Close Air Support Control	356.5 / 344.5
Altus AFB Approach	257.725 / 125.1
Fort Sill (Henry Post) Approach	322.4 / 120.55
Henry Post AAF (Fort Sill) Tower (Normally closed)	229.4 / 124.95
Lawton – Fort Sill Regional Tower	257.8 / 119.9
Fort Worth Center – North (includes Washita MOA)	269.375 / 128.4
Fort Worth Center – South	350.35 / 126.45
Sheppard Area Monitor (MOAs)	236.825 / 124.85

2.10. Night Vision Device (NVD) and Night Operations. Falcon Range has full night capability. This includes NVD and target marking capability (both IR and visible light).

2.10.1. Range personnel have a variety of night vision devices (Generation III NVGs) and IR pointers. IR Pointers will be employed from the main and flank towers. If aircrews do not wish to use this service, they should coordinate it in advance, as it will be provided to all night missions.

2.10.1.1. The 301st FW Life Support (301OSF/OSL) function provides service and periodic maintenance of NVGs used on-range.

2.10.2. Towers are marked with red obstruction lights for night identification, an infrared (covert) letter “M” oriented so as to appear correctly from west-to-east on the EW building north of the main tower, and an infrared (covert) letter “F” on top of the flank tower. When manned, the towers will also display an infrared strobe light. To preclude NVD washout and halo effects the red obstruction lights will be turned off unless the aircrews request otherwise.

2.10.3. The LTA towers are lighted with visible red strobes which have been filtered to lead requests them to be off.

2.10.4. Standard target lighting is depicted in **Attachment 6**. Nearly any target can be lighted at the aircrew’s request with at least two hours’ prior coordination to allow setup. Targets can be illuminated with both covert (IR/NVD only) or overt (unaided eye) lighting that is radio-controlled from the main tower. However, not all targets have good radio line-of-sight from the towers and some are in inaccessible areas. Contact Falcon Range for capabilities.

2.10.5. Range personnel will ensure cultural lighting around the operations area and the maintenance area is reduced or eliminated. This includes turning off outside lights, weather station obstruction lights, windsock lighting, and any other lights that may cause distraction. The lighting on the weapons residue storage area 450 meters east of the main tower will remain on during night operations.

2.10.6. There is some cultural lighting interference from the sparsely-populated housing areas and US Highway 62 to the south, from the city of Lawton to the east, and from the Wildlife Refuge work center located adjacent to the northwest corner of the range complex.

2.11. Helicopter Operations. Helicopters may use the lighted helipad located 245 meters/800 feet NW of the main tower. The helipad is a square concrete slab 50'x50' (15m x 15m). The helipad has standard "H" markings, and is reinforced and stressed to support aircraft up to 40,000 lbs.

2.11.1. Eight lights provide night identification of the helipad. The lights are normally off; aircrews may request the lights to be turned on with prior coordination. If in contact with the RCO, allow approximately five minutes for the lights to be turned on. Similar coordination is required for the lights to be turned off. The helipad lights are not NVD-compatible.

2.11.2. A lighted windsock is located 110 meters/360 feet to the southeast of the helipad. Windsock lighting requires the same coordination as the helipad edge lighting. The windsock is on a photocell and is normally on after dark, except during scheduled night range missions, when it is turned off to preclude NVD interference.

2.12. Area Overflight. Do not enter or overfly R-5601C/D/E/F/G without approval from the controlling agency. Contact the RCO on 363.7 for entry approval or Fort Sill Approach Control on 322.4 for clearance to over-fly the restricted airspace.

2.13. Weather Requirements.

2.13.1. Day weather requirements. Range weather will be at least 1500 feet AGL / 3 NM for level deliveries; 2000 feet AGL / 3 NM for climbing and diving deliveries; or 500 feet above the highest portion of the pattern to be flown. Service minima may be higher.

2.13.2. Night weather minimums are 3000 / 5 NM. Service minima may be higher.

2.13.3. Pilots will discontinue events and advise the RCO whenever weather prevents positive range or target identification throughout the pattern. Falcon Range Operations will also advise the users at Sheppard AFB and NAS JRB Fort Worth, as well as any other scheduled users, when surface winds on Falcon Range exceed 35 knots. Range winds are available from Falcon Range on request. Range operations will be suspended any time the RCO determines a hazard exists due to excessive winds. The strafe targets may be lowered if the winds are excessive in order to prevent wind damage and prolong their use.

2.14. Range Entry, Holding, and Departure.

2.14.1. Range Entry. Flights may enter Falcon Range under IFR or VFR. If not entering the range via the IR/VR route structure, file to the SPS (CH 74) 338º/040NM. Prior telephone coordination with the RCO (DSN 639-6300/2043) is encouraged to reduce the number of radio transmissions. See **Attachment 2, Aeronautical Chart**, for information concerning Falcon Range environs.

2.14.1.1. VFR Entry. VFR entries may be made from any direction except east (from within R-5601B) unless authorized by Fort Sill Approach Control. Squawk Mode 3 4000 entering the range. Use caution for the Sheppard 1 and Washita MOAs (at or above 8000 feet MSL).

2.14.1.2. IFR Entry. When approaching the range under IFR, use Altus (257.725), Sheppard (269.025), or Fort Sill (322.4) Approach Control services. Contact the RCO upon canceling IFR. Squawk Mode 3 4000 entering the range.

2.14.1.3. Military Training Route (MTR) Entry. Flights may enter Falcon Range via any of the numerous IR and VR routes that terminate near R-5601. Contact Falcon Range 2-5 minutes prior to entry. Enter the range from the northwest, west, or southwest for first-pass tactical deliveries.

2.14.2. Holding.

2.14.2.1. IMC Holding. Hold as directed by the controlling agency.

2.14.2.2. VMC Holding. There are no designated VFR holding areas. Hold outside restricted airspace southwest or northwest of the range. If required, contact Altus Approach 257.725 to avoid the Altus AFB Class C airspace. Avoid continuous overflight of inhabited areas at low altitude during extended holding.

2.14.2.3. Altitude separation. The RCO may allow altitude stacks when coordinated between flight leads and the tactics or events allow one flight to hold over another.

2.14.3. Range Departures.

2.14.3.1. VFR Departure. Remain VMC. Do not exit the range to the east.

2.14.3.2. North Departures. Climb above 5500 feet MSL, but remain below the Washita MOA lower limit of 8000 feet MSL until in contact with Fort Worth Center (269.375).

2.14.3.3. South Departures. Low altitude: remain below the floor of the Sheppard 1 MOA (8000 feet MSL). Medium altitude: climb to 14,500 feet MSL and contact Sheppard Area Monitor (236.825 or 124.85) prior to departing range airspace. Use caution while transiting the Sheppard MOAs / student training areas.

2.14.3.4. West Departures. Avoid the Altus Class C airspace, contact Altus Approach on 125.1 or 257.725.

2.14.3.5. IFR Departure. Exit R-5601 VMC if possible. If unable to remain VMC, remain within R-5601 until receiving an IFR clearance either from Fort Sill, Sheppard AFB or Altus AFB Approach Controls or Fort Worth Center.

2.14.3.6. The Falcon RCO will coordinate IFR clearances/departures with Fort Sill Approach upon request.

2.15. Authorized Ordnance.

2.15.1. Training ordnance (practice sub-scale/full-scale inert heavyweight bombs up to 2000 lbs; 7.62mm, .50 cal., 20/25/30mm TP/TPT, and AC-130 40/105mm TP) is authorized for both day and night operations.

2.15.2. Full-scale inert heavyweight ordnance (inert MK-82, 83, 84, low/high drag and precision guidance variants) operations are approved but must be coordinated with the RCO prior to delivery to coordinate and confirm target selection. Targets T-2, T-8N, T-8S, T-12 and T-20 through T-24 are the Falcon Range heavyweight targets. Final attack heading restrictions are listed in **Attachment 9**, and are derived from the joint WDZ Tool. The restrictions in **Attachment 9** are based on most aircraft and deliveries, but are not all-inclusive. Aircrews will not be allowed to employ heavyweight inert weapons without contacting Falcon Range before their scheduled range time.

2.15.3. Rockets may be employed on all authorized targets except T-25 and the AC-130 target. White Phosphorous (WP) rockets may only be employed against T-1, T-2, T-6, T-8N, T-8S, T-9, T-12, T-17, and T-20 to T-22.

2.15.4. Aircraft-dispensed self-protection flares may be employed above 1000 feet AGL (2400 feet MSL). LUU-2, -4, and -19 illumination flares may be employed above 4500 feet AGL (with a 500 foot delay) but extreme caution must be used to ensure the flares land on the range. Higher delays will require higher minimum altitudes.

2.15.5. Training chaff is authorized in accordance with **AFI 11-214, Air Operations Rules and Procedures**. Prior coordination with Falcon Range is required. No combat chaff may be expended on Falcon Range at any time.

2.15.6. Live ordnance is not authorized.

2.16. Weapons Danger Zones. Weapons Danger Zones on Falcon Range are plotted for user aircraft and are maintained by the ROO and in the control tower. The majority of approved weapons delivery events for assigned users is depicted in **Attachment 9** and shows the most common aircraft and delivery combinations at Falcon Range. Other events may be performed at the discretion of the RCO after a weapons danger zone risk analysis has been performed.

2.16.1. Certain ordnance and delivery parameters combinations may present a risk to areas outside the impact area. These munitions may still be employed but require coordination to ensure the adjacent training areas and/or QBA are clear of ground personnel. Munitions

affected include low- and high-drag full-scale inert ordnance employed from low-angle, low-altitude parameters, LGTR and GBU deliveries. The events affected are depicted in **Attachment 9 (notes)**. Contact Falcon Range to verify approved target/parameter pairings.

2.16.1.1. Training areas can be cleared in advance through Falcon Range scheduling up to 68 days in advance through the RFMSS scheduling program. However, Army ground training may still take priority.

2.16.1.2. If the training areas are occupied by ground personnel and equipment then the weapons deliveries may be restricted to specific targets, the parameters may be modified, or the events may be prohibited.

2.16.1.3. There are three surveyed Observation Points (OPs) within the impact area which may be used for close air support control. If the risk exceeds authorized values approved by AR 385-63 (1:1 million) then the OP must either be vacated for the events, or the events are prohibited.

2.17. Minimums/Fouls. Delivery events and parameters, scoring criteria, spacing, fouls, foul penalties, and restrictions are IAW AFI 11-214 and aircraft-specific operational guidance.

2.18. Range Procedures.

2.18.1. Radio Procedures. Upon initial radio contact, pass any changes to prior coordinated data. If the mission was not coordinated prior to arrival, pass delivery events and targets.

2.18.2. Basic (Conventional Box) Pattern. The basic pattern, day or night, is a rectangular pattern situated north of the target areas. Use left traffic for an east (080º magnetic) run-in and right traffic for a west (260º magnetic) run-in. Refer to **Attachment 9, Falcon Range Attack Axis Matrix**.

2.18.3. Tactical Delivery Pattern. The final tactical attack heading, day or night, varies with the selected target area, delivery parameters, and weapon. Refer to **Attachment 9, Falcon Range Attack Axis Matrix**. For dry attacks, remain within the restricted airspace, otherwise run-in headings are at the discretion of the flight lead/aircrew.

2.18.3.1. Fly the pop-up pattern from the western quadrant only. The final attack heading is generally west-to-east, with further restrictions and refinements to run-ins based on the ordnance being delivered. Recover with a left turn off-target to north, or if to the south to remain within R-5601E.

2.18.3.2. The area east of OK Highway 115 can be used for tactical deliveries with prior coordination. Refer to **paragraph 2.6.1** for further information and scheduling procedures.

2.18.4. High Angle Strafe Pattern. The tactical targets' HAS final attack heading is generally 050°-110° or 230°-290° magnetic and may be flown from a basic or tactical pattern. Scored HAS is on a 080° ± 10° heading (Strafe Target 3).

2.19. Arming Procedures, Forward Firing Ordnance (Rockets/Gun). To preclude off-range impacts, aircrews will ensure that the final aircraft weapons delivery mode is not selected until the aircraft heading complies with the target/munition attack axis restrictions in **Attachment 9** in this instruction. Weapons systems may be active or armed prior to roll in, but the final weapons delivery sub-modes will not be selected (capable of release) until the aircraft complies with attack axis restrictions and is pointed at the target, consistent with existing aircraft directives and safety. Following release the system will be made safe and/or the sub-mode will be deselected after completing the safe escape maneuver unless service guidance directs that the system be made safe during the recovery.

2.19.1. In aircraft that are equipped with hands on throttle-and-stick (HOTAS) weapons mode selection, aircrews will ensure that they do not enter the weapons release mode or sub-mode until the final attack heading and will deselect the weapons release mode or sub-mode during recovery unless aircraft-specific guidance requires deselection after recovery.

2.19.2. In the event of a gun malfunction or a hung rocket or misfire, the primary concern will be to keep all ordnance in the impact area. An immediate KNOCK-IT-OFF call will be made, the MASTER ARM will be placed to SAFE and the aircrew will conduct the appropriate checklist procedure.

2.20. Turret and Side-Firing Ordnance. Aircrews will ensure that ordnance is only employed on approved targets in compliance with the firing headings in **Attachment 9** in this instruction. Aircraft with moveable guns will not point their guns at any manned site.

2.20.1. Immediately after any attack run machine guns will be cleared and placed on SAFE.

2.20.2. If communication is lost at any time between the pilot and the gunner, cease-fire immediately and clear and safe the gun.

2.20.3. In the event of a runaway gun, the gunner will immediately notify the pilot. The gunner will keep the gun pointed down range until the gun ceases to fire. Avoid areas known to be occupied by ground units/personnel.

Chapter 3

ABNORMAL PROCEDURES

3.1. Armament System Malfunctions/Unintentional Release.

3.1.1. 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.

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

3.1.2.1. 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.

3.1.2.2. 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.

3.1.2.3. 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. If possible, pull off to the north to avoid firing toward the populated areas to the south of the range.

3.1.2.4. Hung Ordnance. Prior to departing the range, safe all armament switches and recover IAW applicable command, aircraft, and unit regulations. Avoid populated areas while departing the range.

3.1.2.4.1. 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 between 030° and 090° at an airspeed and altitude consistent with safe operation and will release the round so it impacts near the T-2 target. If sensors are available to track the munition, attempt to mark the impact point and provide the RCO the impact coordinates. On-site EOD personnel will attempt to locate the round and dispose of it in accordance with UXO procedures.

3.1.2.5. 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. Refer to **Attachment 3, Restricted Area R-5601**, for impact area boundaries. The RCO will report the release to Range Control and prepare reports as directed by **Fort Sill Regulation 1-8**, with the reports forwarded to Range Control for Army action.

3.2. External Stores Jettison. For controlled jettison of external stores, including fuel tanks, suspension equipment, and practice ordnance, jettison on a 080° magnetic heading at an airspeed and altitude consistent with safe operation so that impact occurs near the Conventional Bomb Circle (T-1). Live munitions will not be jettisoned at Falcon Range unless an extreme emergency exists. Coordinate with the RCO for jettison of live munitions at Fort Sill's West Range (R-5601B).

3.3. Emergency/Abnormal Operating Procedures.

3.3.1. Emergency Airfields: Check current FLIP documents and NOTAMS for the current status of facilities at emergency airfields. The airfields depicted in **Table 3.1, Emergency Divert Airfields**, have a usable runway length greater than 7000 feet and are listed in order of proximity to the range; Henry Post AAF is the closest available runway but is only 5000' in length with no arresting gear.

Table 3.1. Emergency Divert Airfields

AIRFIELD	ICAO	LAT LONG	TACAN	RWY & LENGTH	TWR	BRG RNG
LAWTON REGIONAL	KLAW	N 3434.1 W 9825.0	31 (VOR)	17/35 (8600')	257.8 *	116º17 NM
ALTUS AFB	KLTS	N 3439.5 W 9916.0	35	17/35 (13,400')	255.6 *	264º 28 NM
SHEPPARD AFB	KSPS	N 3359.1 W 9829.5	45	15/33 (13,100')	279.525 *	165º 40 NM
CLINTON-SHERMAN	KCSM	N 3520.4 W 9912.0	37	17/35 (13,500')	256.9 *	323º 55 NM
WILL ROGERS	KOKC	N 3523.6 W 9736.0	88	17/35 (9800')	269.45	044º 70 NM
TINKER AFB	KTIK	N 3525.1 W 9723.4	105	17/35 (11,100')	289.6	047º 80 NM
HENRY POST AAF	KFSI	N 3439.0 W 9824.1	31 (VOR)	17/35 (5000')	229.4 *	087° 15 NM

* Tower does not operate continuously

3.3.2. Controlled Bailout. The aircraft should be flown on a 045º heading at 2000' AGL (3500' MSL) between the flank tower and the west end of the runway. This ensures 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. If possible, coordinate with the RCO prior to bailout in order to allow any personnel on-range to clear the area.

3.3.3. 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.

3.3.4. Radio/Electrical Failure. Two-way radio communication with Falcon Range is required to expend ordnance on the range. In the event of radio failure on UHF primary 363.7, attempt contact on UHF secondary 238.8, UHF 243.0, and finally VHF 141.85. Depart the range if contact with the RCO is not reestablished.

Chapter 4

RCO PROCEDURES

4.1. RCO Procedures. RCO responsibilities and performance standards are outlined in core personnel documents on file at Falcon Range.

4.1.1. The RCO will ensure that the airspace is opened prior to the start of the first range period. Fort Sill Range Control will provide the opening check-in codes and the pyro status. Fort Sill will also verify the Officer-In-Charge during check-in.

4.1.2. For hot range missions (actual ordnance and/or combat lasers) the RCO will ensure all personnel are out of the hazard area NLT 15 minutes prior to the scheduled range time, except for approved JTACs. This includes the use of roll-calls if verification is uncertain. The RCO will be in position NLT 20 minutes prior to the scheduled start of the range time. The RCO will also ensure all required positions are manned NLT 15 minutes prior to the scheduled start of the range time.

4.1.3. The RCO will ensure the Range Safety Pennant (Red Flag) is flying from the flagpole during times the airspace is active. The pennant will be lowered when the range ground and air spaces have been closed with Fort Sill.

4.1.4. Before the first missions the RCO will verify operation of all radios, the hot line to Fort Sill Approach Control, and the digital voice recorder. The RCO will also verify that a range check has been accomplished, that all personnel including visitors are accounted for, and the targets are of suitable condition, including any standing water which may preclude laser use.

4.1.5. At the conclusion of flying the RCO will verify that the airspace has been closed with Fort Sill Range Control.

4.1.5.1. The checkout with Fort Sill includes number and type of aircraft on-range, personnel, ordnance number and type to include DODIC codes, and any special comments. Fort Sill will provide checkout codes.

4.1.5.2. During scheduled extended periods of inactivity when the airspace is activated, the RCO should contact Fort Sill Approach Control in order to allow controlled through-flights of the range airspace by other aircraft.

4.2. RCO Training. The ROA is responsible for the training of new RCOs. The ROO will maintain currency tracking and perform RCO quality control functions.

4.2.1. Written Examination. The ROA will administer a written, open-book examination on applicable instructions, regulations, topics and issues. Passing score is 85 percent. The exam will consist of 50 randomly selected multiple choice questions. The testing RCO is immediately decertified if the written examination is failed. If the RCO fails a second time, the RCO must

re-accomplish the entire RCO training program. If the RCO fails a third time, the RCO will be dismissed from performing RCO duties.

4.2.2. On-Range Demonstration consists of day and night qualification. Day qualification is a prerequisite to night qualification. The RCO trainee will observe one mission before controlling the same type of mission. Mission types are basic surface attack (BSA), surface attack tactics (SAT) and close air support (CAS).

4.2.2.1. Day. Each upgrading RCO will observe a qualified RCO demonstrate proper methods and techniques for controlling aircraft during air-to-ground operations. After observing at least four flights conducting range operations, the upgrading RCO will control at least four flights (at least two 4-ships, if 4-ship flights frequently use the range) under the supervision of a qualified RCO. The ROA may reduce the requirements for highly-qualified/previous RCOs.

4.2.2.2. Night. Each upgrading RCO must observe at least one night flight and control at least one night flight of both BSA/SAT and CAS missions under the supervision of a qualified RCO.

4.2.2.3. The ROA will maintain documentation of the training. The training folders will contain the certification letter signed by the OG/CC, training checklists, and individual mission grade sheets and training plan, as well as other certificates and supporting documentation.

4.3. Ordnance Delivery Clearance. There are no provisions for releasing ordnance on Falcon Range without radio contact with the Range Control Officer, i.e. Class B/C operations. The RCO may hand off final authority to other agencies IAW **AFI 11-214** and JP 3-09.3. The RCO retains abort authority at all times.

4.4. Range Safety and Security.

4.4.1. Safety. The RCO may not have a clear view of each possible attack axis or delivery event. Current generation fighter aircraft, employing high altitude tactics, may be difficult to acquire visually. Pilots must positively identify targets prior to expending ordnance.

4.4.2. Do not point at or overfly manned sites during weapons delivery passes.

4.4.3. Heavyweight inert munitions delivered at shallow dive angles can travel as far as 3000 meters beyond the target after breaching. Some may change direction by as much as 30 degrees from the delivery heading. Pilots must adhere to run-in restrictions when employing heavyweight munitions, especially when using shallow delivery angles. Refer to **Attachment 9** for attack axis graphic displays.

4.4.4. Security. 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.

4.5. Visitor Procedures.

4.5.1. All visitors to the range, whether directly involved in operations (e.g. JTACs), supporting operations (e.g. UXO demilitarization) or observation will sign the visitor log and receive a safety briefing before proceeding down-range. Visitors to the range operations complex only will sign the log but are exempt from the range safety briefing. This safety briefing is valid for six months. Fort Sill-assigned range personnel and 301st FW RCOs are exempt from this paragraph.

4.5.2. In accordance with AFMAN 13-212 Volume 1 and Army Regulation (AR) 385-63, Range Safety, visitors not involved in the conduct of training operations will remain clear of the Hazard Area during weapons deliveries. Range personnel will provide escort or surveillance of visitors at all times, except for pre-briefed JTACs when performing mission-related duties, Fort Sill-assigned range personnel, and on-site subcontractors who have been briefed on their authorized locations. The RCO will verify that ordnance delivery patterns will not present any hazard to visitors/spectators. The Footprint Book must show better than one in one million risk analysis for the location of visitors. Restrict deliveries if required (change targets, assign run-in restrictions). If operations must be conducted which subject the visitors to greater than a one in one million risk of weapons effects, then the visitors will be relocated to the range pennant at the south boundary road in accordance with AR 385-63.

4.5.2.1. Time-critical or cost-prohibitive operations such as the installation or repair of infrastructure by outside agencies [contractors, vendors, engineers, etc] or deliveries of materiel may take precedence and require coordination with the aircrews to ensure safety. UXO destruction and relocation at the East Residue Area cannot be placed on hold due to time and funding constraints and may require the denial of certain delivery patterns or tactical events.

4.5.2.2. JTACs may conduct missions within the Hazard Area in accordance with AFI 11-214, AFMAN 13-212 Volume 1 and with the concurrence of Range Control. JTACs must be properly equipped in accordance with AFI 13-112V1, Joint Terminal Attack Controller (JTAC) Training Program, while inside the Hazard Area.

4.5.2.3. Refer to **Attachment 7, Manned Sites and OAPs**, for a description of observation points and offset aim points.

4.5.3. The normal location for visitors to observe range operations is the main tower. Visitors will be briefed on the risk factors of range operations. Visitors who are not comfortable with the risk will be relocated to the range pennant at the south boundary road.

4.6. Bird Conditions. Southwest Oklahoma lies within a migratory flyway for numerous bird species. These range from small birds to raptors and large waterfowl. The most active time for migratory bird activity is mid-fall and late winter/early spring. The range includes habitats suitable for large raptors such as hawks and vultures. These birds may be active at any time of the year.

Vultures and sand hill cranes in particular pose a threat to low-level aircraft since they may congregate in groups at altitudes as high as 2000’ AGL.

4.6.1. The RCO will report both the forecasted bird condition as reported by US AHAS and actual visual sightings or non-sightings during initial check-in and during the range operations.

4.7. Restricted Operations.

4.7.1. A “check-fire” ordered by Fort Sill Range Control curtails all activities on Falcon Range. The RCO will direct aircraft to hold “high and dry” until Fort Sill Range Control allows further activity on Falcon Range.

4.7.1.1. The RCO may allow dry operations with restrictions if allowed by the Fort Sill Fire Department during wildland firefighting operations. The Fire Chief has final authority over the range ground and air space.

4.7.2. The Falcon Range RCO may restrict, suspend or curtail operations as required to ensure the safety of all personnel.

Chapter 5

LASER OPERATIONS AND INERTIALLY-AIDED MUNITIONS

5.1. Coordination. Laser operations require prior coordination to allow public notification and security on the range. Cancellations should be made as soon as possible to preclude unnecessary activation of specialized range control procedures. Contact Falcon Range Control Officer at DSN 639-6300 for approval of laser operations.

5.2. Approved Laser Systems. Falcon 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, Falcon Range Laser Safety Survey, is maintained at Falcon Range and at 301 OG/CC, NAS Fort Worth JRB, TX 76127-6200. Contact the Falcon Range Control Officer for approval of laser operations and suitable laser, OP and target combinations, which are published in the Consultative Letter. Tank-mounted systems were not evaluated and are not approved for use.

5.3. Laser Operations. 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.

5.3.1. General. 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. Falcon Range has sufficient LEP only for permanent-party range personnel

5.3.1.1. 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.

5.3.1.2. Ground-based laser designators and range-finders will not be fired above the horizon. Low-power markers may be fired above the horizon if approved by the Consultative Letter. The Green Beam Designator will not be used on Falcon Range.

5.3.1.3. 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. Under no circumstances will ground-based designators be fired on any azimuth except toward the north due to the proximity of populated areas and OK Highway 115.

5.3.2. Aircraft Mounted Laser Systems. All authorized fixed-wing lasers may be employed from any direction, anywhere within the confines of restricted airspace, and on any target except for T-11 and T-18, or other targets as directed by the RCO. 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 **Table 5.1, Airborne Laser Flight Profile Limitations**.

Table 5.1. Airborne Laser Flight Profile Limitations.

Ground Range to Target (NM)	Minimum Altitude (Feet AGL)	Minimum Altitude (Feet MSL)	Ground Range to Target (NM)	Minimum Altitude (Feet AGL)	Minimum Altitude (Feet MSL)
0.5	150	1550	6	2000	3400
1	300	1700	7	2400	3800
2	600	2000	8	2900	4300
3	900	2300	9	3400	4800
4	1300	2700	10	3800	5200
5	1750	3050	15	6100	7500

Note: This table utilizes a 5 mrad buffer angle, high-power designator and a baseline 1400 feet MSL target.

5.3.2.1. A depression angle of a minimum of 5° ensures that the LSDZ does not exceed allowable limits. The absolute minimum angle for airborne laser designation is 3° unless cleared following evaluation with the Laser Range Management software. Lasing will not be performed below 2000 feet AGL while crossing public highways or over-flight of housing areas, and will not be performed below 3000 feet AGL / 5500 feet MSL over the Wichita Mountains Wildlife Refuge.

5.3.3. Man-Portable Laser Systems. Most DOD man-portable laser systems are approved for use at Falcon Range. There are several target and firing position combinations available. However, not all targets are accessible from all firing positions, and delivery restrictions further limit employment flexibility.

5.3.3.1. Falcon Range has a Ground Laser Target Designator (GLTD) which can be used to designate certain targets for laser-spot search tactics. Normally in the main tower, it can be fired from the flank tower as well. Contact the range at least 3 hours in advance to coordinate its use.

5.3.3.2. GLTD Employment. The range must be cleared prior to GLTD operations; no personnel are permitted inside the impact area during its operation. The operator of the GLTD will install the GLTD and laser spot visual tracker combination on the camera pan-

and-tilt device, and control the targeting from inside the tower. The operator will test its balance and make corrections before connecting the power supply. The RCO will make a "laser hot" radio call, and direct all personnel to wear LEP. Only then may the operator open the apertures (remove the protective covers) from the GLTD. The operator will ensure the GLTD and laser spot visual tracker are boresighted, and make corrections. The operator then will test fire against T-4 to ensure boresight. At no time must the GLTD fire above the horizon. Only approved targets may be engaged, refer to the AFRL 711 HPW/RHDO Optical Radiation Safety Consultative Letter. When not firing, ensure the protective covers are reinstalled.

5.3.3.3. Verify the PRF code with any sensor(s) before firing the GLTD.

5.3.3.4. After firing is completed, disable the GLTD by disconnecting the power first, and then disconnect the pan-and-tilt controls.

5.3.3.5. Falcon Range possesses two Infrared Zoom Laser Illuminator Designators (IZLIDs) and one GCP-1A Ground Commander's Pointer. These and any other markers will only be employed with the operator wearing both NVGs and LEP. Use extreme caution when firing an IZLID from the tower; ensure that the tower catwalk rails are not in the way of firing. From the main and flank tower, operators will use the turret with the IZLIDs.

5.3.3.5.1. Operators of the IZLID and GCP will keep the aperture covers on unless firing. As soon as the firing is completed, replace the cover. For the IZLID, ensure the key is installed before firing, otherwise the unit will not designate. Remove the key before transport after firing.

5.3.3.5.2. The IZLIDs and GCP are stored in the GSA safe. When taking a laser marker out of the safe, sign it out and indicate the time of return when finished. Spare batteries are kept in the tower. Only test the IZLID or GCP from the tower or OP, and always ensure the area downrange is safe. Treat any laser as a loaded weapon.

5.3.4. Approved Ordnance. Only inert GBU-10/12/16, AGR-20 rockets, and Laser Guided Training Rounds (LGTRs) may be employed at Falcon Range. No live munitions or any form of GBU-24, GBU-27 or GBU-28 may be employed at Falcon Range.

5.3.4.1. Restrictions. The WDZ for GBU-10/12/16 Laser Guided Bombs restricts delivery flexibility. Parameters and targets are restricted in both dive angle and attack heading. Off-range or out-of-impact-area impacts are a possibility unless the final attack restrictions are followed absolutely. Contact the Falcon Range RCO for weather back-up options. The restrictions for rockets, LGTRs and approved GBUs are listed in **Attachment 9**.

5.3.5. Logging laser use. The RCO will document the laser use with the range laser log. This log will be compiled and maintained on the shared drive, and is reported to both AFRC and Fort Sill Range Control annually. The log includes the number and type of aircraft, if any, as

well as the type of laser, the targets engaged, the RCO and LSO, and the times on and off. It is maintained for a minimum of 5 years.

5.4. Laser Safety. The RCO will terminate all laser operations if unauthorized personnel are observed in the LSDZ, in the event of equipment malfunction, or anytime laser safety cannot be assured. Pilots must cease active laser operations anytime the intended target is lost from the field of view. Any laser incidents will be promptly reported in accordance with the 711th HPW reporting protocols. A copy of the incident checklist is kept in the RCO Quick Reference Checklist.

5.5. Laser Scoring. Three laser scoring systems are available. All three systems require prior notice for set-up.

5.5.1. The range has a single Laser Spot Visual Recorder System (LSVRS) which uses a camera to score laser energy during day or night operations. The system visually displays laser energy as it hits a target within the camera field of view as a light spot, and can be slewed to different targets. The aircrew only needs to fire a combat laser (1064 nm) at the desired target. Aircrews will also provide the specific DPI and expected LTL to allow the LSVRS operator to score the correct DPI. If the actual DPI name is not known, describe the target in relation to other targets (e.g. "third small building from the west in an east-west row") to allow the proper scoring setup. Horizontal targets cannot be accurately scored. If the laser energy is not within the camera field of view, it cannot be scored. Additionally, the operator may reduce the scoring volume to preclude interference from affecting the score. If the spot is inside the field of view but not the scoring volume on the target, the spot will be visible but no score will be displayed. The LSVRS can, at aircrew request, transmit a tone over the range frequency if the laser energy is within the designated scoring volume. The tone can also be disabled if requested.

5.5.1.1. Aircrews may request a copy of the displayed data, usually in an MPEG or AVI format. Contact the range before flight to coordinate an electronic or CD/DVD copy.

5.5.2. The LSVRS requires aircrews to designate on specific targets within the LTA. The targets are approximately 1 meter square with a black outline around a white square. The targets face their respective sensor and can only be scored on specific laser-to-target lines. Firing outside the LTL tolerance may still produce a score, but its accuracy may be degraded. Some targets require specific LTLs based not only on the sensor location, but on masking of the target. Refer to **Attachment 10** for details.

5.5.3. Falcon Range has a single Laser Evaluator System-Mobile (LES-M) that can be used to validate laser designation and ensure properly bore sighted targeting pods and laser designators. When a laser designator (combat) illuminates the LES-M, it transits a chopped tone over the range frequency. This gives aircrews immediate feedback regarding their laser systems. The tone is low-power and can be overridden by aircraft and RCO radios. The size of the footprint the laser produces is based on range and elevation from the laser to the target. At close range (inside of 1000 feet/300 meters slant range) side lobes may trigger the LES-M to transmit when the centroid of the laser spot is not exactly on the LES-M. For slant ranges of greater than 1000 feet the LES-M will not trigger unless the laser spot is centered within 3 feet (1 meter) of the

LES-M. For the case where the designator is a long distance from the target (24,500 feet/7500 meters), the spot may be as large as 12 feet in diameter, depending on the designator. In this case, there is enough amplitude variation within the main beam that the box still scores accurately within the 3 foot / 1 meter radius.

5.5.3.1. The LES-M is mobile and can be placed on or near any targets. However, it makes that target a no-drop target with a 500-meter no-drop radius around the LES-M. For daily use it is located on a slightly raised platform within the LTA, and is marked by four 4-foot/1.3 meter railroad ties painted white which surround the LES-M in a cross shape, oriented to the cardinal directions. It may also be placed on no-drop targets or on a vehicle parked adjacent to a no-drop when requested. The LES-M can be placed in the bed of a tactical vehicle, which gives aircrews a tactical target to observe.

5.5.3.2. The RCO will provide the coordinates of the LES-M, or flight leads can call ahead and ask for a specific target as part of a scenario. The LES-M requires a power supply (small generator) so plan accordingly. It will not be placed on-range unless requested. LES-M setup outside the LTA requires a minimum of two hours advance notice.

5.5.4. Falcon Range possesses an IR camera system that integrates a laser seeker. This laser seeker allows the viewing of a combat laser spot (1064 nanometers) under most conditions, although night allows better IR contrast. The RCO can assess the aircraft's targeting pod accuracy with this system. The system requires one hour for setup.

5.5.4.1. The laser spot visual tracker is usually in the main tower but can be placed in other locations. Because it is a manual system the location is manned, so no munitions may be dropped nearby. If a target cannot be viewed from the operator's location, it cannot be scored. Additionally, if the aircraft is illuminating a target with vertical development, then the operator may not be able to view the laser spot if it is on the side of the target that is obscured.

5.6. Inertially Aided Munitions (IAMs):

5.6.1. Inertially aided munitions include the GBU-31(V)1 and GBU-31(V)3, GBU-32, and GBU-38 Joint Direct Attack Munitions (J-DAM), the GBU-39 Small Diameter Bomb, and the CBU-103, CBU-104, and CBU-105 Wind-Corrected Munitions Dispensers (WCMD), and follow-on weapons such as the LJDAM and Dual-Mode Laser-Guided Bomb (DMLGB).

5.6.2. The WDZs for IAMs dictate restricted deliveries at most Class A ranges. Unrestricted simulated weapons deliveries (dry-only) are authorized where there is no chance of an actual release using aircraft-specific dry practice procedures. Aircrew will ensure that no actual munitions are selected.

5.6.3. Actual IAM employment is authorized with the following restrictions:

5.6.3.1. Ordnance. Inert GBU-31s, -32s, -38s -44s and -54s are the only authorized IAMs.

5.6.3.2. Targets. IAMs are only authorized on Target T-2. This controls weapons danger zones.

5.6.3.3. Weapons Parameters. Aircrews will set a minimum impact angle of 65º for the weapon, and will attack the target with no more than 10º offset from a direct attack (i.e. target displaced no more than 10º from the flight path of the aircraft) at release. Parameters are critical due to the size of the impact area. Refer to **Table 5.2, J-DAM Weapons Parameters**, for airspeeds and release ranges.

Table 5.2. J-DAM Weapons Parameters

Aircraft/Weapons/Altitude	Release Angle	Release Altitude (**MSL**)	Release Airspeed (KTAS)	Release Heading	Release Range (NM)
A-10 GBU-31/-38/-54 Low	0° to -5°	6500 – 10000	250 – 400	250°-270°	2.0 – 4.0
A-10 GBU-31/-38/-54 High	0° to -5°	10000 - 18000	250 – 400	250°-270°	2.0 – 5.0
B-52 GBU-31/-38/-54 Low	0° to -5°	6500 – 10000	400 - 550	250°-270°	3.0 – 4.0
B-52 GBU-31/-38/-54 High	0° to -5°	10000 - 18000	400 - 550	250°-270°	3.0 – 5.0
B-1 / F-16 / F-15E GBU-31/-38/-54 Low	0° to -5°	6500 – 10000	400 - 600	250°-270°	3.0 – 4.0
B-1 / F-16 / F-15E GBU-31/-38/-54 High	0° to -5°	10000 – 18000	400 - 600	250°-270°	3.0 – 5.0
F/A-18 GBU-31/-32/-38/-54 Low	0° to -5°	6500 – 10000	400 - 600	250°-270°	3.0 – 4.0
F/A-18 GBU-31/-32/-38/-54 High	0° to -5°	10000 – 18000	400 - 600	250°-270°	3.0 – 5.0

5.6.3.4. Airspace. Actual J-DAM deliveries are restricted to employment from over R-5601B on a weapons attack heading of 250º to 270º (260º ± 10º). This requires at least 24 hours' prior coordination to ensure separation from artillery in R-5601B, and allows the temporary closure of OK Highway 115, the eastern border of Falcon Range. This closure is limited to 15 minutes, after which any traffic is cleared for up to ten minutes before resuming any closures. No attacks from the west are authorized due to the risk of an off-range impact outside of government property.

5.6.3.5. Weapon Delivery Modes. Weapons modes that utilize a preplanned coordinate as the target such as Continuously Computed Release Point (CCRP) and Bomb on Coordinate

(BOC) modes are authorized. Reference aircraft specific procedures for limitations. Aircrew will pre-coordinate attacks and delivery modes with the RCO before takeoff.

5.6.4. Triple Check. Each aircraft will accomplish three independent safety checks (two person minimum) before releasing a J-DAM on Falcon Range. These checks must ensure accurate coordinates are loaded into the weapon memory prior to release.

5.6.4.1. The aircrew will verify their coordinates via telephone with the RCO during mission planning. (Check #1)

5.6.4.2. During taxi out, the aircrew will confirm with their SOF, SDO or Operations personnel the target coordinates as loaded into the aircraft with a read-back. (Check #2)

5.6.4.3. On range, radio confirmation of the weapon memory coordinates to the RCO or a JTAC is a required safety check for all aircraft. The aircrew read directly to the RCO or JTAC the coordinates for the weapon memory. (Check #3) Additional checks are aircraft specific.

5.6.4.4. If equipped, each aircraft will also verify that the aircraft system is properly targeted through the use of heads-up display symbology and/or targeting systems (targeting pods).

5.7. Directed-Energy Weapons. Directed-Energy Weapons will not be employed at Falcon Range.

Chapter 6

THREAT SIMULATION

6.1. Resources. Falcon Range provides visual and electronic threat simulators support upon request, consistent with available resources and pyro states. Call Falcon Range at DSN 639-6300 for assistance.

6.2. Visual Threat Simulators. Falcon Range possesses one four-shot Smokey SAM launcher, and two four-missile MANPAD simulators. The range also has one AAA simulator which presents a visual indication of a 57mm anti-aircraft battery. IED simulators may also be available; these simulators provide a visual indication of a ground explosion. The launchers are portable and may be located at a variety of locations on the range, depending upon user requirements. The ROA must approve employment of the visual threat simulators. Falcon Range will then employ the system as directed by the flight lead.

6.2.1. Coordination. The use of visual threat simulators requires prior coordination. All visual threat simulators are subject to availability restrictions; due to funding and storage requirements the simulators are not usually available without significant lead time.

6.2.2. Employment. Falcon Range personnel will employ visual threat simulators at the flight leader's discretion, from the location and at the distance and time requested so that the desired learning objective is obtained. If the flight lead does not brief a specific location, the RCO will direct a launch location consistent with the pyro status and clear of active targets.

6.2.3. Safety. Falcon Range personnel will establish a missile launch site that will ensure a minimum of 2000 feet of vertical and lateral clearance from the flight's anticipated ground track. If the RCO or missile launch personnel perceive that an aircraft might violate the 2000-foot clear zone, the launch effort will be aborted.

6.3. Electronic Threat Simulators. Falcon Range has two threat emitter systems for electronic warfare (EW) training. One AN/UPQ-8(V) system is available, an RWR-LITE, offering limited mid- and high-band threat simulations. Also, for HARM training, a HARM Target Emitter (HTE) is available. For further information about the capabilities and availability of these EW simulators, call Falcon Range.

6.3.1. Coordination. The use of electronic simulators requires prior coordination. Schedule EW support at least one hour before employment, so range personnel can assemble and set up the simulator. Certain weather conditions, such as high winds and/or blowing dust, may require the RWR-LITE to be stowed.

6.3.2. Employment. Falcon Range personnel will employ EW at the flight leader's discretion, from the location and at the distance and time requested. Flight leaders should thoroughly brief the RCO so that desired effect is obtained. If the flight lead asks for the RCO's option, or does not indicate a specific location, then the flight members can expect a randomly chosen origin for the EW emissions. The HTE is in a fixed site near the operations center at Falcon Range.

6.3.3. Target acquisition. The threat emitters will be set up at locations outside the Falcon Range Impact Area. It is possible that the aircraft is acquired late or not at all due to terrain, aircraft altitude, weather, sun angle, or other tactical considerations. The threat emitters do not actually acquire an airborne target and track it; rather, the operator places the optical sight on the target and illuminates the aircraft while holding the sight on the target. This requires visual acquisition and emitter slewing by the operators. The HTE is a static emitter only, and covers a lane for anti-radiation missile training.

6.3.4. Termination. Falcon Range personnel will cease all training EW emissions any time the aircrew transmits “TERMINATE” or “KNOCK-IT-OFF”.

6.4. Electronic Countermeasures. The use of combat electronic jamming in R-5601 is prohibited. Training chaff is authorized in accordance with AFI 11-214. Prior coordination with Falcon Range is required. No combat chaff may be expended in R-5601 at any time.

Chapter 7

CLOSE AIR SUPPORT TRAINING

7.1. Close Air Support Training. Falcon Range supports Close Air Support (CAS) and Forward Air Controller/Joint Terminal Attack Controller (FAC/JTAC) training. Falcon Range personnel are not instructors, but do facilitate training and help ensure safety. **Note**: Do not confuse CAS training at Falcon Range and similar training with Army student controllers on Fort Sill's West Range. Refer to **paragraph 7.2** for West Range information.

7.1.1. Facilities. To support CAS training, Falcon Range offers a combined briefing and training facility for TDY personnel. No overnight lodging facilities are available. Overnight operations within the adjacent training ranges (bivouac operations) require authorization and briefings from Fort Sill Range Control; Falcon Range cannot authorize overnight operations. There are two full bathrooms with shower facilities, a full kitchen, and a break area. The facility is available at no cost. Contact Falcon Range at DSN 639-6300 for details.

7.1.2. Scheduling. See **paragraph 1.2** for general information. Falcon Range does not schedule fighter/attack resources for CAS missions, only the range airspace. Users must ensure there are no conflicts with West Range. Ground and air units that desire to conduct CAS training at Falcon Range must jointly coordinate their schedules with Falcon Range to avoid conflicts with other users.

7.1.3. Operations. Falcon Range will support CAS training at the requested level. Generally, the RCO will complete administrative actions (range clearance, special instructions, and restrictions) on the Falcon Range primary frequency, 363.7. If the JTAC requests a separate frequency, the RCO will then hand off the flight to the JTAC on Falcon Range secondary frequency, 238.8. This action separates administrative and combat training functions. If the target can be scored, the RCO will score each hot pass but will not transmit weapons scores unless requested. Scores will be forwarded to participating units by fax or email, as appropriate.

7.1.4. JTAC Locations. JTACs may use any of several locations to conduct their operations. These locations include either the Main or Flank Towers, and any location outside the impact area. JTACs may control weapons delivery sorties from within the impact area provided the following conditions are met:

7.1.4.1. The mission is dry (no ordnance, or if combat lasers are employed, the JTACs are located outside all laser hazard zones), or;

7.1.4.2. The Falcon Range RCO conducts a risk analysis using the weapons safety program and approves the proposed location, and;

7.1.4.2.1. The mission is conducted from the surveyed observation points.

7.1.4.2.2. The JTAC is no closer than 500 meters to the closest planned target.

7.1.4.2.3. The aircraft are employing munitions under the control of the JTAC. JTACs are prohibited from operating inside the impact area if aircraft are under RCO or flight lead control.

7.1.4.2.4. The pilot has visually confirmed the JTAC location.

7.1.4.2.5. The pilot does not point at or overfly the JTAC location during roll-in, track or recovery.

7.1.4.3. If practical, an RCO-qualified member should accompany the JTAC. (Single RCO procedures, such as extended duty hours, may preclude this.)

7.1.4.4. The JTACs positively mark their position with a recognizable means. Vehicles will be marked with a VS-21 panel or equivalent. Units which do not bring a panel can check one out from Falcon Range.

7.1.5. Surveyed JTAC observation points will have a small metal building nearby, with orange and white markings on top in order to provide a readily identifiable location.

7.1.6. Safety. Pilots, JTACs, and the RCO share the responsibility for conducting CAS operations safely. When personnel occupy locations within the impact area, every weapons delivery pass presents ground personnel with potential hazards. The RCO and JTAC must continually assess the risk level of these operations. JTACs and RCOs will abort questionable weapons delivery passes, and will terminate CAS operations if and when any member's comfort level is exceeded.

7.1.6.1. The RCO generally has a better vantage point from which to view the aircraft, and has the ultimate responsibility for the safe conduct of the range operations. The RCO can abort for safety reasons any aircraft without the permission of the JTAC.

7.2. Fort Sill West Range. Fixed wing air operations at Fort Sill support training of personnel in formal artillery school courses, operational joint force training, and service unique continuation training. The applicable instruction is Fort Sill Regulation 385-1, available for download from the Fort Sill web site (https://sill-www.army.mil/usag/publications.html) in PDF format. Aircrews utilizing the Fort Sill West Range are required to review the regulation before operating within the range airspace. Content and changes to the Army regulation supersede this instruction. Aircrews are responsible for complying with the procedures outlined within the Army directives and all governing regulations. Bring conflicts to the attention of the Air Force 6th CTS Detachment, DSN 639-1766/-3855 or commercial (580) 442-1766/-3855, or Range Control.

7.2.1. Scheduling. Units desiring to schedule range missions for unit level continuation training must realize that Army requirements for use of the range will have priority over aircrew training. To schedule unit level continuation training, contact the Air Force 6th CTS Detachment, DSN 639-1766/-3855 or commercial (580) 442-1766/-3855. This agency will coordinate range times and locations with Range Control, Falcon Range, and ARAC.

7.2.2. Target Area Information. The West Range Impact Area, (for aircraft usage), consists of three CAS target areas, CAS Box 1, CAS Box 2 and CAS Box 3. In addition, dry missions over the Fort Sill Garrison may be conducted in support of various joint training programs.

7.2.2.1. CAS Box 1 is the western target array, with the primary targets located at ND 444394 (N 34º41.750' W 098º30.939').

7.2.2.2. CAS Box 2 is the central target array, with the primary targets located at ND 474378 (N 34º40.865' W 098º28.979').

7.2.2.3. CAS Box 3 is an inert-only target array 1900 meters northeast of CAS Box 2, with the primary targets located at ND 492391 (N 34º41.544' W 098º27.798').

7.2.3. Authorized weapons. Fort Sill Regulation 385-1 provides detailed information on the weapons authorized on the West Range Impact Area. A variety of live, inert and training munitions may be employed on the targets.

7.2.4. Artillery missions may operate simultaneously with fixed-wing operations. Aircrews will adhere to airspace control area lateral and altitude limits if artillery is active when briefed by ARAC, the JTAC, or Range Control.

7.2.5. The approach corridors to Henry Post AAF are located within two NM of West Range. Use caution in the vicinity of Henry Post AAF.

7.2.6. Refer to **Attachment 11**, **Fort Sill Initial/Contact Points and Communication Grid**, for a list of initial and contact points and the radio frequencies used at Fort Sill.

7.3. Range Control. Fort Sill Range Control (DSN 639-2994, -2008) is the final approving authority for all operations within R-5601. Aircraft will cease operations and depart restricted airspace immediately upon request from Range Control.

ALLEN E. DUCKWORTH, Colonel, USAFR
Commander

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*

AFI 11-MDS Series

AFI 11-202V3, *General Flight Rules,* 10 August 2016

AFI 11-214, *Air Operations Rules and Procedures,* 8 July 2020

AFI 13-112V1, *Joint Terminal Attack Controller Training Program,* 29 September 2017

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

AFI 13-217, *Drop Zone and Landing Zone Operations,* 10 May 2007

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

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

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

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

AFMAN 13-212, *Range Planning and Operations,* 22 June 2018

AFMAN 33-322, *Records Management and Information Governance Program,* 23 March 2020

AFMAN 91-203, *Air Force Occupational Safety, Fire & Health Standards,* 11 December 2018

AFMAN 91-223, *Aviation Safety Investigations and Reports,* 14 September 2018

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 Sill Supplement 385-1, *Post Range Regulation*, 24 June 2016

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

J-DAM – Joint Direct Attack Munitions

JRB – Joint Reserve Base

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

LSVRS – Laser Spot Video Recording System

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

QBA – Quanah Buffer Area

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.

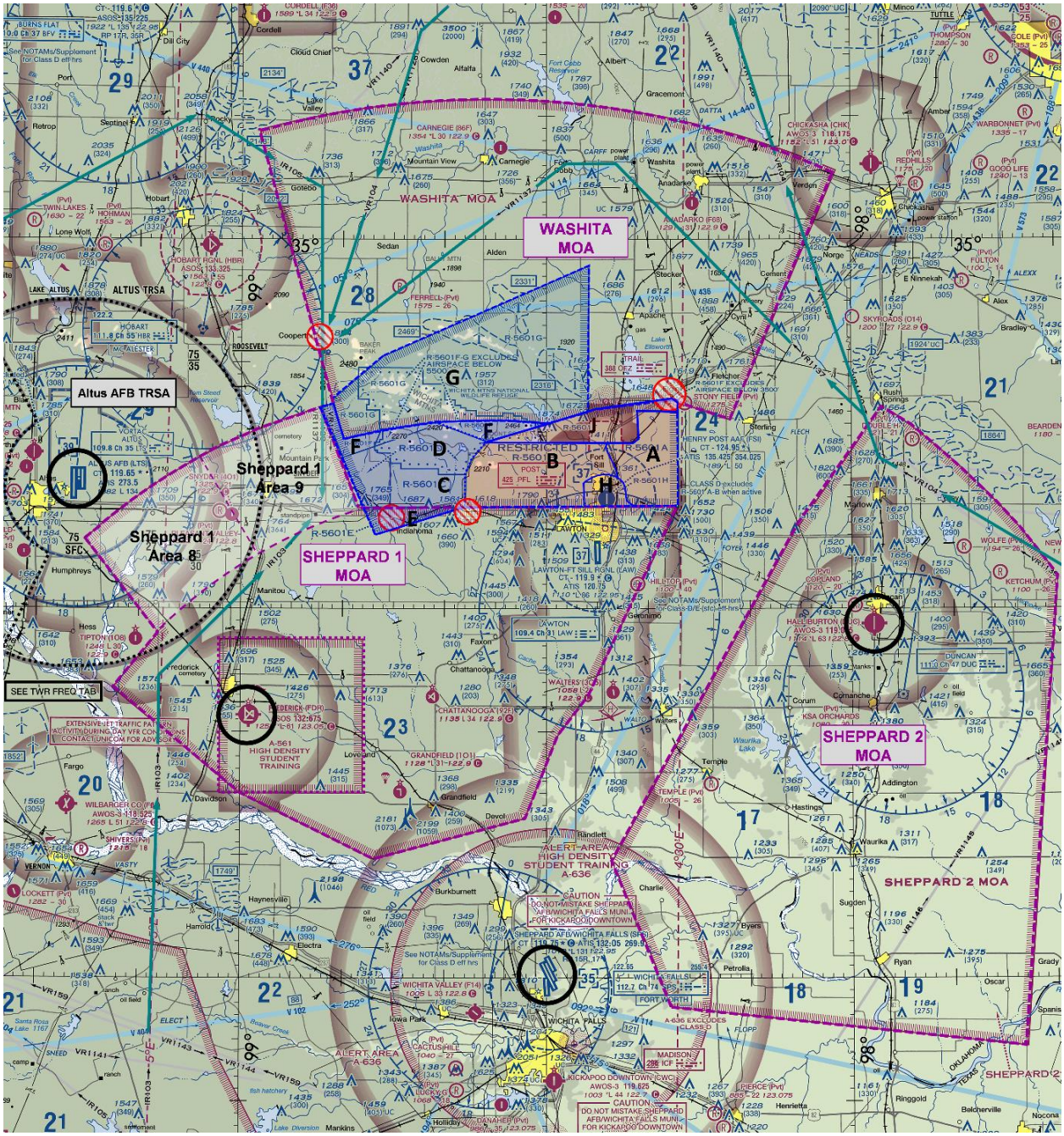
Visual Meteorological Conditions (VMC) – Weather conditions in which visual flight rules apply; expressed in terms of visibility, ceiling height, and aircraft clearance from clouds along the path of flight. When these criteria do not exist, instrument meteorological conditions prevail and instrument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

Attachment 2

AERONAUTICAL CHART: FALCON RANGE ENVIRONS

Figure A2.1 Aeronautical Chart

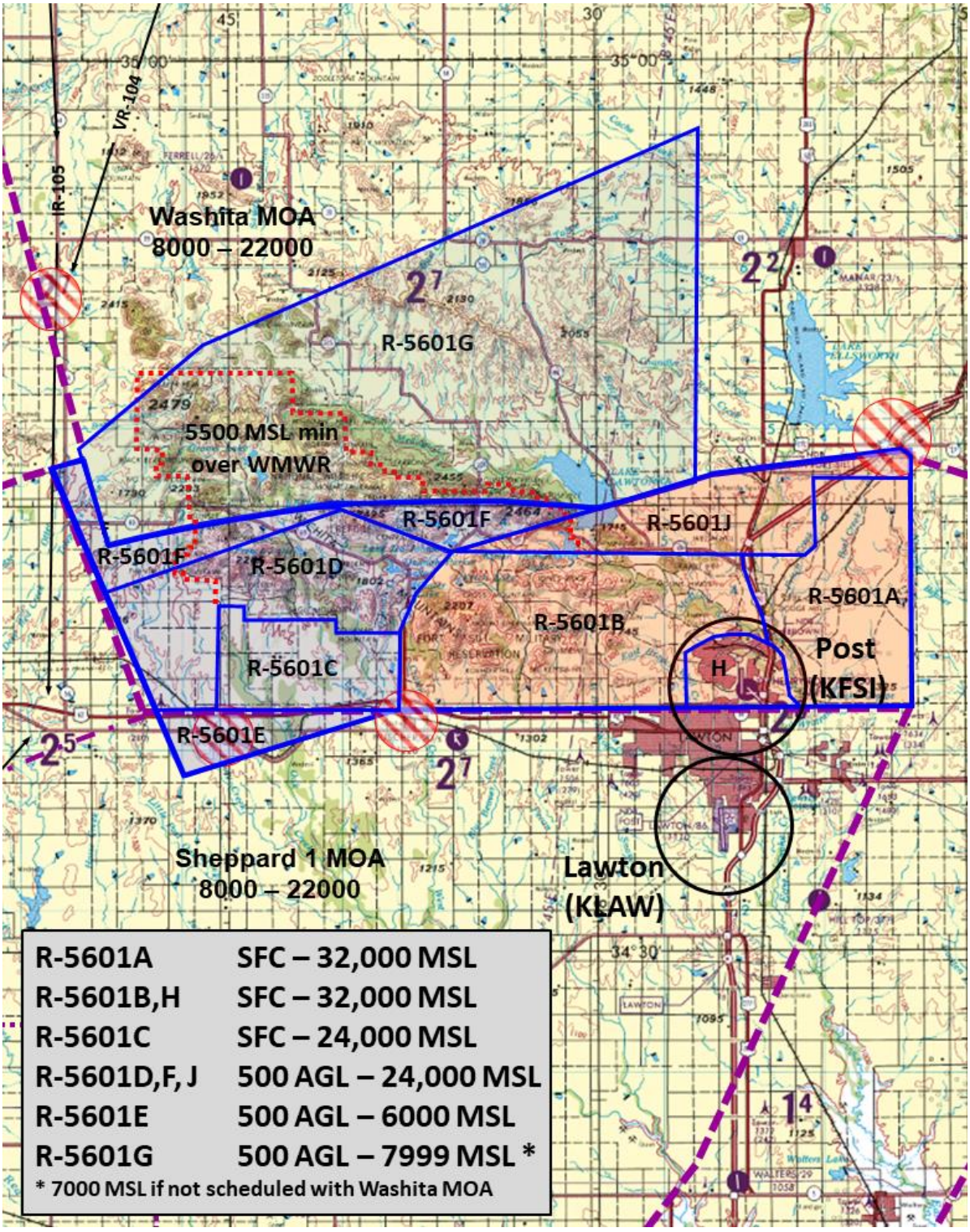


Source: FAA Raster Graphics, Dallas-Fort Worth Sectional Chart, 2020

Attachment 3

RESTRICTED AREA R-5601

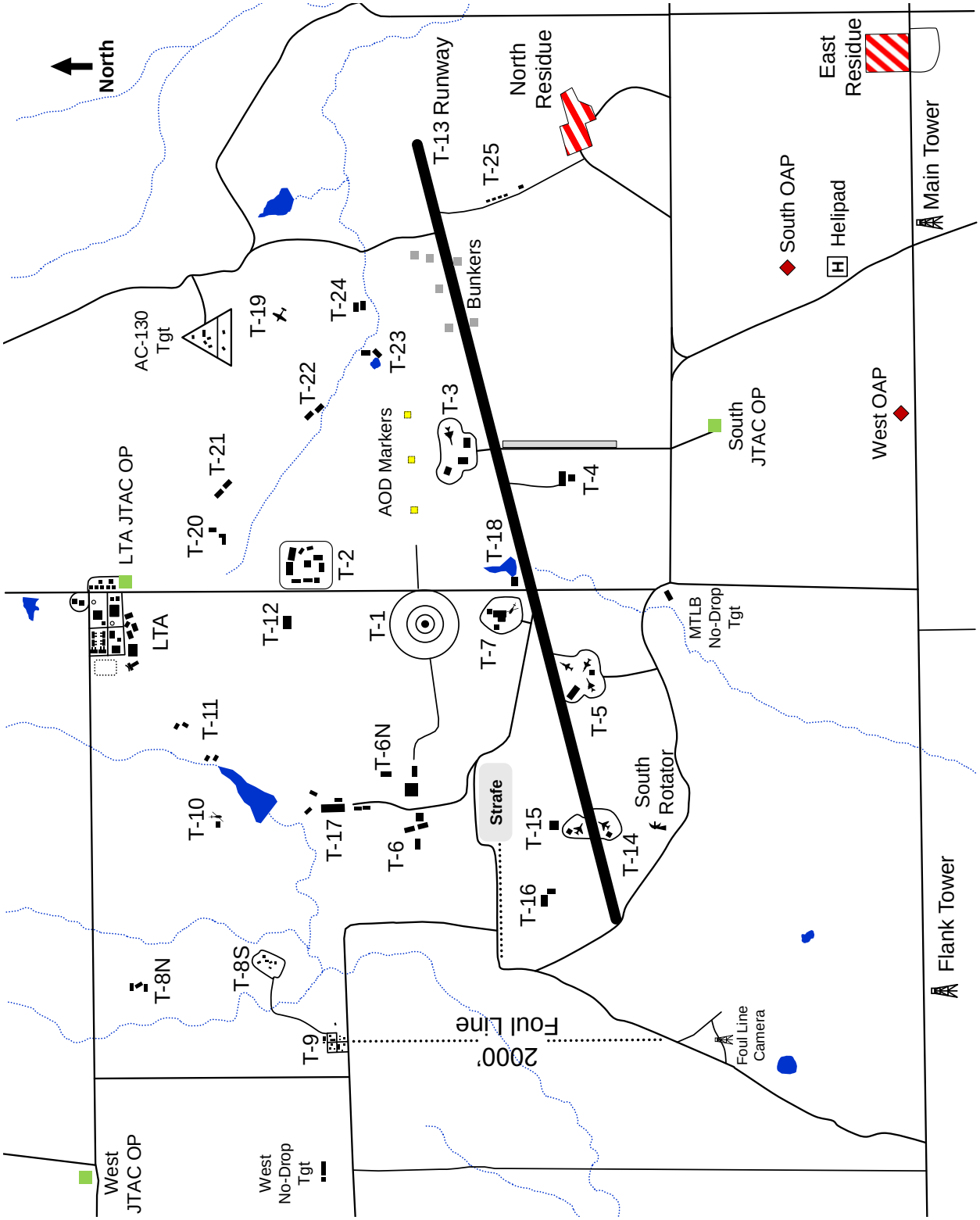
Figure A3.1 Restricted Area R-5601



Attachment 4

FALCON RANGE TARGET LAYOUT DIAGRAM

Figure A4.1 Target Layout/Overview



Attachment 5

TARGET ARRAY DETAILS

Figure A5.1. Target Array Details

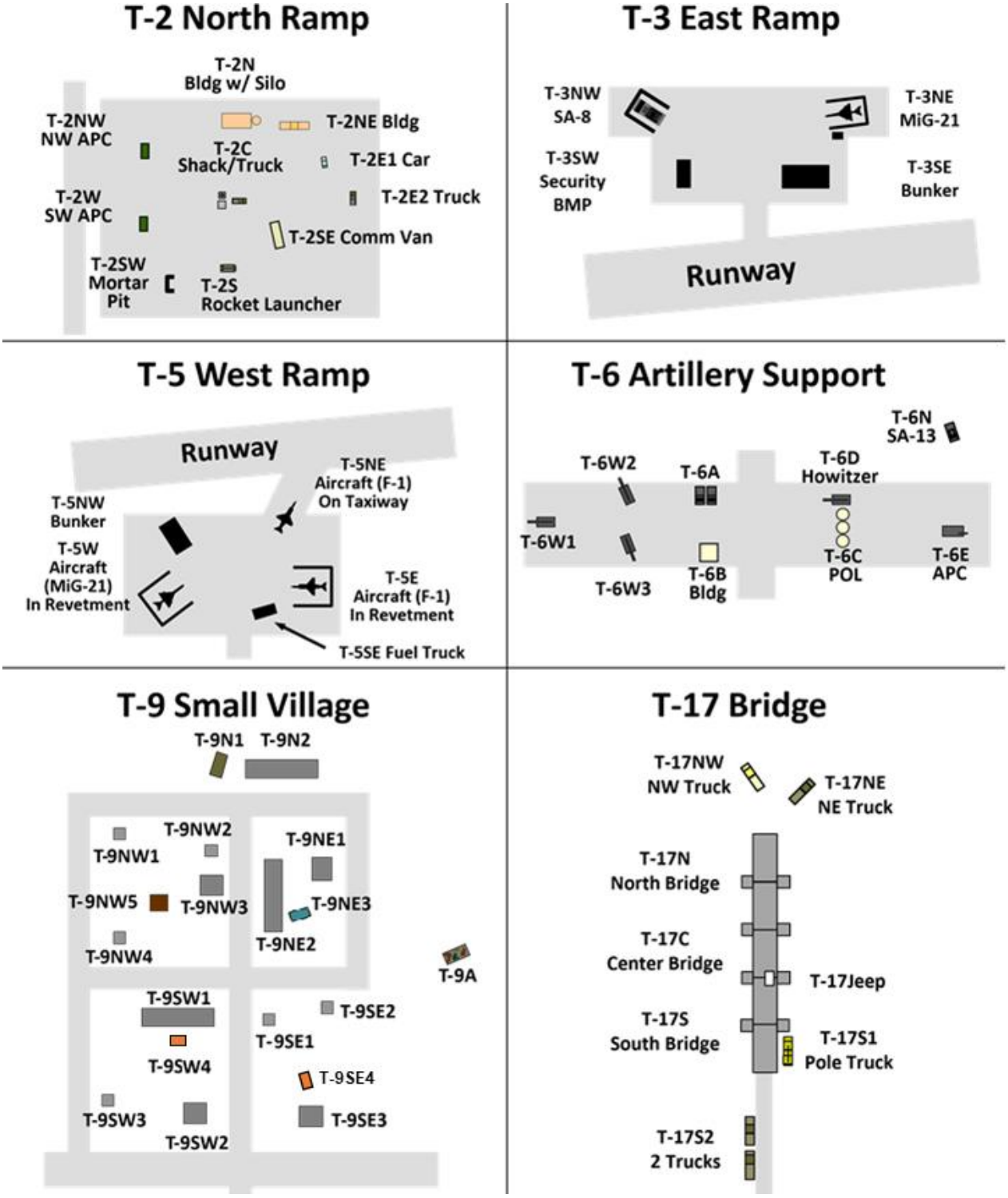
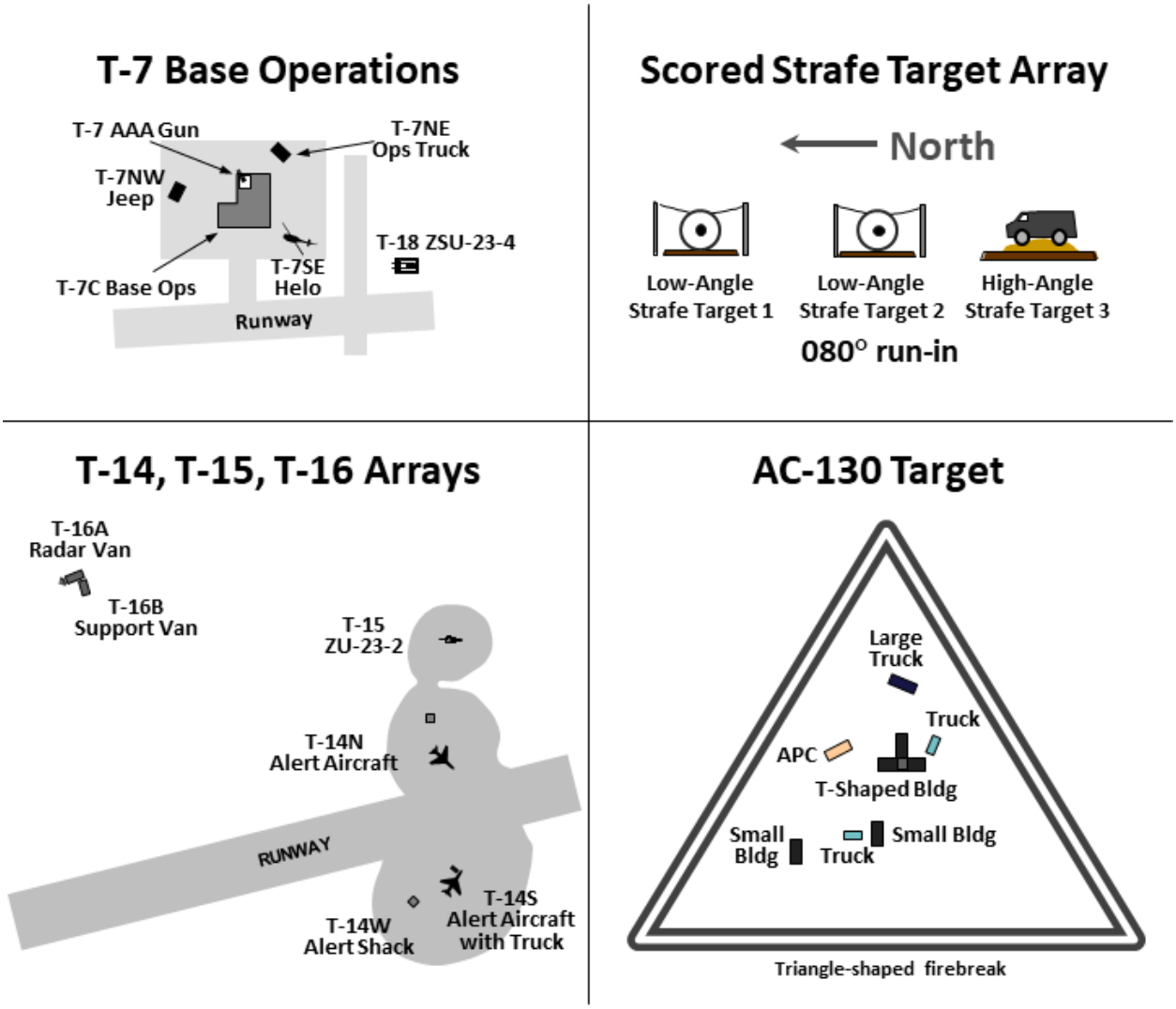


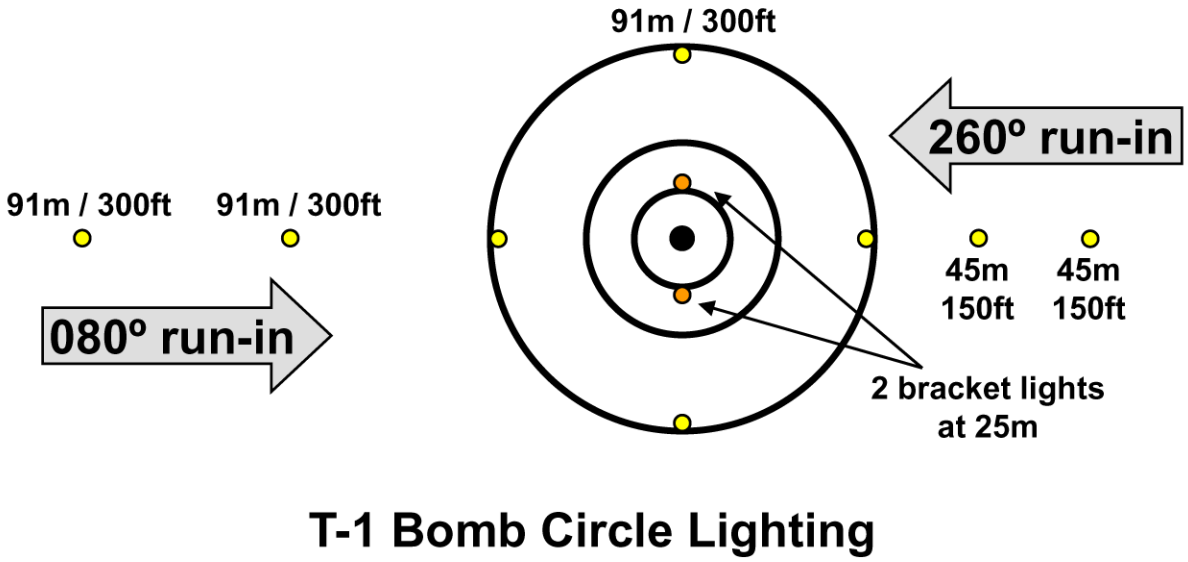
Figure A5.2. Target Array Details



Attachment 6

FALCON RANGE NIGHT LIGHTING DETAILS

Figure A6.1 Night Lighting Details



Note: Night lighting may be reduced to 4 lights around the T-1 target for non-BSA scenarios.

Attachment 7

MANNED SITES AND OAPs

Table A7.1 Manned Sites and OAPs

Manned Sites and OAPs	Description	Latitude	Longitude	MGRS (14S ND)	Elev. (Ft.)
Main Tower	Lighted 75’ Tower and Administration Area.	N 34 38.802	W 098 41.525	28219 33904	1394
Flank Tower	Lighted 85’ Tower 1 NM West of Main Tower.	N 34 38.769	W 098 42.914	26097 33840	1368
Range Residue Storage Area	Fenced area with large building 500 meters east of the Main Tower.	N 34 38.840	W 098 41.206	28705 33980	1370
LTA	Laser training area village “Royville” with numerous targets for lasers only.	N 34 40.009	W 098 42.262	27086 36136	1465
West JTAC OP	OP NW of T-8N and west of LTA by rubble pile. Marked by small building on west side.	N 34 40.070	W 098 43.247	25581 36243	1456
LTA JTAC OP	2-story OP in SE portion of LTA. Part of large east-west CONEX.	N 34 40.000	W 098 42.163	27237 36120	1466
South JTAC OP	OP NW of main operations. Marked by small building on SW side.	N 34 39.100	W 098 41.887	27663 34457	1424
Foul Line Camera Tower	Unlighted guyed 40’ tower on the south end of the foul line. 620 meters NNW of the flank tower.	N 34 39.096	W 098 43.006	25955 34444	1377
NW WISS Score Tower	Unlighted tower with solar panels on south side.	N 34 41.121	W 098 43.430	25297 38185	1524
NE WISS Score Tower	Unlighted tower with solar panels on south side.	N 34 41.228	W 098 41.959	27542 38384	1529
OAP – 1	North Radar Reflector.	N 34 41.2019	W 098 41.9612	27539 38341	1545
OAP – 2	South Radar Reflector.	N 34 39.0113	W 098 41.6132	28082 34294	1401
OAP – 3	West Radar Reflector.	N 34 38.8154	W 098 41.9299	27599 33930	1397

Attachment 8

FALCON RANGE TARGET LIST

A8.1. WGS-84, derived from GIS survey imagery (5cm) March 2019 and November 2019, coordinates are for the center of all DPIs.

Table A8.1. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-1	91 meter radius conventional circle w/ inner 23/45 meter circles	N 34 39.5425	W 098 42.2452	1430	Sub-Scale	27114 35273
T-2N	Stacked and vertically aligned building	N 34 39.7449	W 098 42.1422	1445	Full-Scale	27269 35647
T-2NE	East-west oriented 4m x 12m building	N 34 39.7393	W 098 42.1226	1446	Full-Scale	27300 35637
T-2E1	Car on east side of 100m x 85m rectangle	N 34 39.7279	W 098 42.1171	1443	Full-Scale	27308 35616
T-2E2	Truck on east side of 100m x 85m rectangle	N 34 39.7159	W 098 42.1085	1443	Full-Scale	27322 35594
T-2S	Rocket Launcher on south side of 100m x 85m rectangle	N 34 39.6989	W 098 42.1419	1444	Full-Scale	27271 35562
T-2SE	Communications van on southeast corner of 100m x 85m rectangle	N 34 39.7029	W 098 42.1281	1443	Full-Scale	27292 35569
T-2SW	Mortar pit on southwest corner of array	N 34 39.6958	W 098 42.1561	1443	Full-Scale	27249 35556
T-2C	Small building with barrels and pickup truck in center of target array	N 34 39.7168	W 098 42.1430	1444	Full-Scale	27269 35595
T-2W	N-S oriented APC on west side of 100 x 85 meter rectangle	N 34 39.7125	W 098 42.1656	1434	Full-Scale	27235 35587
T-2NW	N-S oriented APC on northwest side of 100 x 85 meter rectangle	N 34 39.7351	W 098 42.1656	1434	Full-Scale	27234 35629

Table A8.2. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-3NW	SA-8 missile system	N 34 39.5064	W 098 41.9695	1433	Sub-Scale	27535 35207
T-3NE	Revetted aircraft on east side of 70 x 80 meter rectangle	N 34 39.5017	W 098 41.8982	1437	Sub-Scale	27644 35199
T-3SE	Hangar on SE side of 70 x 80 meter rectangle	N 34 39.4755	W 098 41.9157	1435	Sub-Scale	27617 35149
T-3SW	Security detail BMP	N 34 39.4812	W 098 41.9540	1433	Sub-Scale	27559 35162
T-4	POL site consisting of 5 horizontal tanks.	N 34 39.3326	W 098 41.9867	1415	Sub-Scale	27510 34886
T-4S	POL Support (Jeep and pump house) 25 meters south of T-4	N 34 39.3186	W 098 41.9812	1415	Sub-Scale	27518 34860
T-5NW	Hangar on NW side of 120 x 100 meter rectangle	N 34 39.3205	W 098 42.3695	1410	Sub-Scale	26925 34862
T-5W	Aircraft w/ service equipment on west side T-5 array	N 34 39.2911	W 098 42.3568	1403	Sub-Scale	26945 34807
T-5S	Fuel truck on south side of ramp	N 34 39.2882	W 098 42.3343	1408	Sub-Scale	26979 34802
T-5E	Alert aircraft on east side of 120 x 100 meter rectangle	N 34 39.2962	W 098 42.3195	1405	Sub-Scale	27001 34817
T-5NE	Aircraft on northeast taxiway by runway	N 34 39.3324	W 098 42.3175	1406	Sub-Scale	27005 34884
T-6A	Ammunition support	N 34 39.5607	W 098 42.5918	1427	Sub-Scale	26584 35305
T-6B	Ammunition support structure (small building)	N 34 39.5517	W 098 42.5910	1428	Sub-Scale	26585 35288

Table A8.3. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-6C	POL site consisting of 3 vertical tanks & pump house (west side)	N 34 39.5598	W 098 42.5501	1430	Sub-Scale	26648 35303
T-6D	M-110 SP howitzer located immediately north of T-6C	N 34 39.5619	W 098 42.5503	1429	Sub-Scale	26648 35307
T-6E	Single APC oriented east-west	N 34 39.5579	W 098 42.5152	1429	Sub-Scale	26701 35300
T-6N	SA-13. Oriented north-south with TEL to the north.	N 34 39.5992	W 098 42.5173	1430	Sub-Scale	26698 35376
T-6W1	West howitzer in fighting position facing west	N 34 39.5519	W 098 42.6410	1427	Sub Scale	26509 35288
T-6W2	North howitzer in fighting position facing northwest	N 34 39.5590	W 098 42.6139	1427	Sub-Scale	26550 35301
T-6W3	South howitzer in fighting position facing southeast	N 34 39.5490	W 098 42.6130	1427	Sub-Scale	26552 35283
T-7C	Base Operations building.	N 34 39.4248	W 098 42.2318	1414	Sub-Scale	27135 35055
T-7C AAA	ZU-23-2 gun on 2nd story of the NW corner of building.	N 34 39.4289	W 098 42.2301	1432	Sub-Scale	27137 35063
T-7NW	Jeep target NW of Base Operations	N 34 39.4332	W 098 42.2572	1410	Sub-Scale	27096 35070
T-7NE	Base Ops “Follow Me” Truck	N 34 39.4433	W 098 42.2289	1409	Sub-Scale	27139 35089
T-7SE	Base Operations Helicopter located 25 meters SE of Base Ops	N 34 39.4084	W 098 42.2164	1411	Sub-Scale	27158 35025
T-8N	Two groups of armored and service vehicles. Arrays separated by 400 meters north-south.	N 34 39.9708	W 098 42.9099	1430	Full-Scale	26096 36061
T-8S		N 34 39.7771	W 098 42.8669	1410		26163 35703

Table A8.4. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-9N1	Truck, oriented north-south, facing south	N 34 39.6929	W 098 43.0089	1417	Sub Scale	25947 35547
T-9N2	Building, 4m x 13m, oriented east-west	N 34 39.6930	W 098 43.0026	1418	Sub-Scale	25956 35547
T-9NW1	Shack, 2m x 2m	N 34 39.6849	W 098 43.0211	1417	Sub-Scale	25928 35532
T-9NW2	Shack, 2m x 2m	N 34 39.6847	W 098 43.0132	1417	Sub-Scale	25940 35532
T-9NW3	Small Building, 4m x 4m	N 34 39.6811	W 098 43.0127	1417	Sub-Scale	25941 35525
T-9NW4	Shack, 2m x 2m	N 34 39.6672	W 098 43.0215	1418	Sub-Scale	25927 35518
T-9NW5	10-meter Lookout Tower	N 34 39.6800	W 098 43.0177	1420	Sub-Scale	25933 35523
T-9NE1	Small Building, 4m x 4m	N 34 39.6823	W 098 42.9985	1418	Sub-Scale	25963 35527
T-9NE2	Building, 4m x 13m, oriented north-south	N 34 39.6809	W 098 43.0055	1416	Sub-Scale	25952 35525
T-9NE3	Small pickup truck adjacent to T-9NE2	N 34 39.6788	W 098 43.0028	1417	Sub-Scale	25957 35524
T-9SE1	Shack, 2m x 2m	N 34 39.6689	W 098 43.0052	1418	Sub-Scale	25952 35503
T-9SE2	Shack, 2m x 2m	N 34 39.6697	W 098 42.9989	1417	Sub-Scale	25962 35504
T-9SE3	Small Building, 4m x 4m	N 34 39.6633	W 098 42.9992	1417	Sub-Scale	25962 35497
T-9SE4	Small Vehicle, Oriented NW-SE	N 34 39.6655	W 098 43.0015	1418	Sub-Scale	25958 35492
T-9SW1	Building, 4m x 13m, oriented east-west	N 34 39.6720	W 098 43.0181	1416	Sub-Scale	25933 35508
T-9SW2	Small Building, 4m x 4m	N 34 39.6630	W 098 43.0132	1416	Sub-Scale	25940 35492
T-9SW3	Shack, 2m x 2m	N 34 39.6664	W 098 43.0226	1418	Sub-Scale	25926 35498

Table A8.5. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-9SW4	Mini-Truck	N 34 39.6688	W 09843. 0008	1418	Sub-Scale	25949 35503
T-9A	APC located 20 meters east of the main array	N 34 39.6770	W 098 42.9773	1415	Sub-Scale	25995 35518
T-10	Helicopter and support vehicle	N 34 39.8529	W 098 42.6009	1437	Sub-Scale	26569 35845
T-11W	Miscellaneous vehicles	N 34 39.8755	W 098 42.4760	1434	Sub-Scale	26759 35887
T-11NE	Tech Truck with mounted AAA gun	N 34 39.9129	W 098 42.4294	1443	Sub-Scale	26830 35956
T-11SE	Truck with rocket launcher	N 34 39.9043	W 098 42.4281	1444	Sub-Scale	26832 35940
T-12	Reinforced earth bunker with door on west	N 34 39.7494	W 098 42.2416	1458	Full-Scale	27118 35655
T-13W	East-west runway oriented 07/25.	N 34 39.2510	W 098 42.7900	1391	Sub-Scale	26284 34732
T-13E	7400 feet long by 120 feet wide.	N 34 39.5580	W 098 41.3630	1395	GBU	28461 35306
T-14N	North Alert Ground Attack Aircraft	N 34 39.3087	W 098 42.6183	1403	Sub-Scale	26545 34839
T-14S	South Alert Ground Attack Aircraft	N 34 39.2723	W 098 42.6145	1395	Sub-Scale	26551 34771
T-14W	Alert Shack on south side of runway	N 34 39.2661	W 098 42.6296	1395	Sub-Scale	26528 34760
T-14E	Alert Shack on north side of runway	N 34 39.3221	W 098 42.6231	1405	Sub-Scale	26538 34864
T-15	23mm AAA Site. Oriented to the west.	N 34 39.3445	W 098 42.6161	1404	Sub-Scale	26548 34905
T-16A	Fire Can radar van with TTR dish on west face	N 34 39.3643	W 098 42.7525	1407	Sub-Scale	26340 34941
T-16B	Radar support vehicle (van)	N 34 39.3620	W 098 42.7491	1407	Sub-Scale	26345 34937
T-17N	North end of bridge	N 34 39.6937	W 098 42.5800	1440	Sub-Scale	26602 35550

Table A8.6. Falcon Range Target List

Target DPI	Description	Latitude (North)	Longitude (West)	Elev. (Ft)	Weapon	MGRS (14S ND)
T-17C	Center of bridge and jeep on top	N 34 39.6742	W 098 42.5781	1440	Sub-Scale	26605 35514
T-17S	South end of bridge	N 34 39.6605	W 098 42.5786	1440	Sub-Scale	26604 35489
T-17S1	Pole truck adjacent to southeast bridge	N 34 39.6617	W 098 42.5747	1440	Sub-Scale	26610 35491
T-17S2	2 vehicles 20m south of bridge	N 34 39.6399	W 098 42.5771	1439	Sub-Scale	26606 35451
T-17NW	Truck 25m NW of bridge	N 34 39.7162	W 098 42.5860	1442	Sub-Scale	26592 35592
T-17NE	Truck 25m NE of bridge	N 34 39.7156	W 098 42.5742	1442	Sub-Scale	26610 35591
T-18	ZSU-23-4 by tree and pond	N 34 39.4058	W 098 42.1718	1410	Sub-Scale	27226 35020
T-19	Downed Aircraft Target	N 34 39.7606	W 098 41.6851	1442	Sub-Scale	27968 35678
T-20	3 construction equipment vehicles	N 34 39.8447	W 098 42.0899	1440	Full-Scale	27349 35832
T-21	2 supply trucks	N 34 39.8469	W 098 42.0066	1439	Full-Scale	27476 35836
T-22	Truck with AAA piece / dump truck	N 34 39.7060	W 098 41.8617	1417	Full-Scale	27698 35576
T-23	2 tactical vehicles within revetments	N 34 39.6186	W 098 41.7486	1404	Full-Scale	27872 35415
T-24	2 tactical vehicles adjacent to trees	N 34 39.6307	W 098 41.6689	1397	Full-Scale	27993 35438
T-25	Convoy	N 34 39.4169	W 098 41.4669	1410	20/25/30 mm	28303 35044
Strafe Target 1	North Low Angle Strafe target	N 34 39.4497	W 098 42.5833	1413	20/25/30 mm	26598 35099
Strafe Target 2	South Low Angle Strafe target	N 34 39.4276	W 098 42.5826	1413	20/25/30 mm	26599 35059
Strafe Target 3	Scored High Angle Strafe target	N 34 39.4152	W 098 42.5811	1413	20/25/30 mm	26601 35036

Table A8.7. Falcon Range Target List

Target DPI	Description	Latitude	Longitude	Elev. (Ft)	Weapon	MGRS (14S ND)
AC-130 Target coordinates are ± 3 meters due to target movement and post-strike replacement						
AC-130 T-Bldg	T-shaped building with lookout tower	N 34 39.875	W 098 41.718	1440	AC-130 All strafe	27918 35890
AC-130 SW Bldg	Southwest target, single building	N 34 39.862	W 098 41.739	1438	AC-130 All strafe	27885 35866
AC-130 S Bldg	South building with adjacent truck	N 34 39.865	W 098 41.726	1440	AC-130 All strafe	27905 35872
AC-130 APC	Armored vehicle	N 34 39.874	W 098 41.730	1441	AC-130 All strafe	27899 35888
AC-130 Truck	Large truck	N 34 39.888	W 098 41.723	1445	AC-130 All strafe	27909 35914

Table A8.8. Falcon Range Target List

No-Drop Targets	Description	Latitude	Longitude	Elev. (Ft)	MGRS (14S ND)	Notes
North No-Drop Target	1 truck, 1 BRDM by NW-SE road	N 34 40.4412	W 098 42.0410	1438	27421 36934	850 meters NE of LTA
South No-Drop Target	MTLB on SW corner of 3-way	N 34 39.1837	W 098 42.2007	1395	27184 34610	330 meters SE of T-5
West No-Drop Target	Rocket launcher and truck	N 34 39.6973	W 098 43.2462	1433	25584 35554	160 meters W of T-9
North Rotator	Rotating Radar Antenna	N 34 39.9821	W 098 42.3232	1481	26993 36086	SW part of LTA
South Rotator	Rotating Radar Antenna	N 34 39.1881	W 098 42.6219	1397	26540 34617	140 meters S of T-14

No-drop targets are designed for applied tactics (dry/simulated ordnance) and lasers only. No actual weapons of any kind may be employed against them.

Attachment 9

FALCON RANGE ATTACK AXIS MATRIX

A9.1. The following tables contain general rules for weapons employment. WDZ Tool (footprint program) parameters and algorithms may change based on current weapons data. If there are additional restrictions which read "**WDZ Restricted**", then there may be significant aircraft/weapons/parameter restrictions, or closure of adjacent training areas may be required. Additionally, Note 3 addresses JTACs occupying one of the three on-range observation points (OPs). If Note 3 applies, then the OP must either be unoccupied or alternate targets with acceptable risk values must be used. In both cases the range must be contacted to coordinate weapons events.

Table A9.1. Aircraft: AC-130

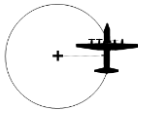
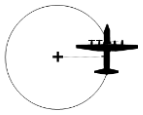
Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-17, T-19, strafe pits	30mm	-5º to -45º	3000 to 15,000	Circling	4,6,7		Do not fire toward any manned sites or the LTA. Use JFIRE MSD for manned OP distances.
Only targets: AC-130 Target Array	105mm PGU-43 TP **(Small amount of HE)**	-5º to -45º	3000 to 15,000	Circling	**3**,4, 6,7		Do not fire toward any manned sites or the LTA. Use JFIRE MSD for manned OP distances.

Table A9.2. Aircraft: CV-22 / MV-22

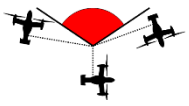
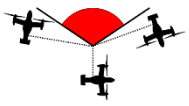
Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-17, strafe pits	7.62mm Sidefire	-2º to -30º	100 to 1000	235° to 105° clockwise	**3**,4, 6,7		Do not fire toward any manned sites or the LTA. Minimum firing range 100 meters.
All except T-7, T-17, strafe pits	.50 cal Sidefire	-2º to -30º	100 to 1000	235° to 105° clockwise	**3**,4, 6,7,8		Do not fire toward any manned sites or the LTA. Minimum firing range 100 meters.

Table A9.3. Aircraft: A-10

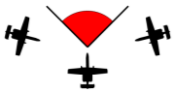
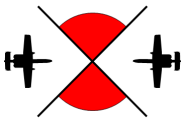
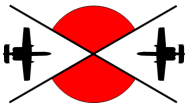
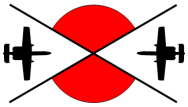
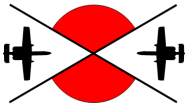
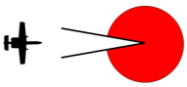
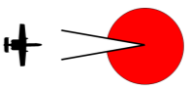
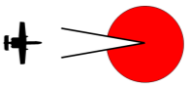
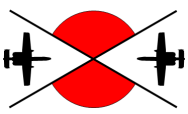
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale	0º to -60º	300 to 15,000	215º to 125º	1,4,6		Pop-ups from west only.
All except T-25	Sub-scale Loft/Toss	-20º to +45º	300 to 10,000	035º to 125º 215º to 305º	1,2, 6,7		Pop-ups from west only.
All except T-25	2.75” Rockets (TP)	0 to -45º No loft	1000 to 15,000	050º to 110º 230º to 290º	**3**,4, 6,7		None.
T-1, T-2, T-6, T-8N, T-8S, T-12, T-17, T-20, T-21, T-22	2.75” Rockets (WP)	0 to -45º No loft	1000 to 15,000	050º to 110º 230º to 290º	**3**,4, 6,7		Targets EOD-restricted.
All except T-7, T-17, T-19	30mm	-15º to -60º	1500 to 10,000	050º to 110º 230º to 290º	**3**,4,6		WDZ restricted. Contact Range for details.
High Angle Strafe Target (Acoustic)	30mm High Angle Strafe	-15º to -60º	1500 to 10,000	070º to 090º	**3**,4,9		Only on the scored high angle strafe target.
Low Angle Strafe Targets (Acoustic)	30mm Low Angle Strafe	LAS 0º to -20º	75 to 2000	070º to 090º	**3**,4		Only on the scored low angle strafe targets.
Low Angle Strafe Targets (Acoustic)	30mm Long-Range/ Two-Tgt Strafe	LRS TTS 0º to -20º	75 to 5000	070º to 090º	**3**,4		Only on the scored low angle strafe targets.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert Mk-82 Mk-84 High Drag	0 to -15º	500 to 2500	050º to 110º 230º to 290º	**3**,4, 5,6, 8,10		WDZ Restricted, Contact Range for details. Pop-ups from west only.

Table A9.4. Aircraft: A-10

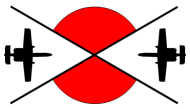
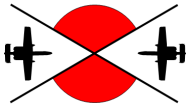
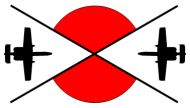
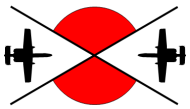
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert Mk-82 Mk-84 Low Drag	0 to -30º	500 to 2500	050º to 110º 230º to 290º	**3**,4,5,6		Pop-ups from west only.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert Mk-82 Mk-84 Low Drag	-20º to -60º	1000 to 10,000	050º to 110º 230º to 290º	**3**,4,5, 6,7		None
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert GBU-10 System Level	0 to -15º	5000 to 15,000	050º to 110º 230º to 290º	**3**,4,5, 6,7		None
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert GBU-12 System Level	0 to -15º	5000 to 15,000	050º to 110º 230º to 290º	**3**,4,5, 6,7		WDZ Restricted, contact Range for details.

Table A9.5. Aircraft: F-16

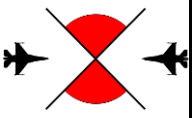
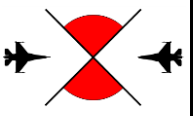
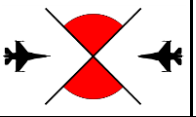
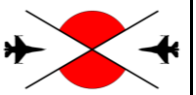
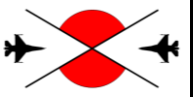
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale	0º to -30º	300 to 3000	035º to 125º 215º to 305º	1,**3**, 4,6		Pop-ups from west only.
All except T-25	Sub-scale	0º to -60º	1500 to 15,000	035º to 125º 215º to 305º	1,2, 4,6		Pop-ups from west only.
All except T-25	Sub-scale Loft/Toss	0º to +45º	500 to 5000	035º to 125º 215º to 305º	1,2, **3**,4, 6,7		Pop-ups from west only.
All except T-25	2.75” Rockets (TP)	0 to -30º	1000 to 15,000	050º to 110º 230º to 290º	2,**3**, 4,6,7		Pop-ups from west only.
T-1, T-2, T-6, T-8N, T-8S, T-9, T-12, T-17, T-20, T-21, T-22	2.75” Rockets (WP)	0 to -30º	1000 to 15,000	050º to 110º 230º to 290º	2,3, 4,6,7		Targets EOD-restricted. Pop-ups from west only.

Table A9.6. Aircraft: F-16

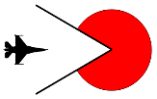
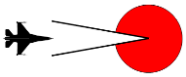
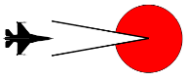
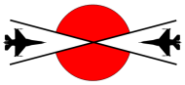
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-1, T-2, T-12, T-20 thru T-24	2.75" Rockets (TP and WP) Loft	0 to +45	500 to 5000	050º to 110º	2,**3**, 4,6,7		WP loft rounds restricted to T-1, T-2, T-12, T-20, T-21 and T-22 only.
T-1, T-2, T-3, T-6, T-7, T-8N, T-8S, T-9, T-12, T-19 thru T-24	AGR-20 Laser-Guided Rockets	-5º to -45º	5000 to 15,000	050º to 110º 230º to 290º	2,**3**, 4,6,7		WDZ Restricted, contact Range for details.
All except T-7, T-13, T-17, T-19.	20mm High Angle Strafe	-15º to -60º	1000 to 10,000	050º to 110º 230º to 290º	**3**,4, 6,8		WDZ Restricted, contact Range for details. T-5 target 050º - 090º west-to-east.
T-13 Moving Target	20mm High Angle Strafe	-15º to -60º	1000 to 10,000	020º to 050º 290º to 330º	**3**,4, 6,8		Requires advanced notice to ensure system is operational.
High Angle Strafe Target (Acoustic)	20mm High Angle Strafe	-15º to -60º	1000 to 10,000	070º to 090º	4, 9		Only on the scored high angle strafe target.
Low Angle Strafe Targets (Acoustic)	20mm Low Angle Strafe	0º to -20º	75 to 2000	070º to 090º	4		Only on the scored low angle strafe targets.
T-2, T-12, T-20 thru T-24	Inert MK-82 AIR HD	0º to -15º	300 to 2000	060º to 100º 240º to 280º	2,**3**,4 5,6, 8,10		WDZ Restricted, contact Range for details. 550 KTAS max release speed. Pops only from the west.
T-2, T-12, T-20 thru T-24	Inert MK-82 AIR HD	0º to -30º	300 to 2000	060º to 100º 240º to 280º	2,**3**,4 5,6, 8,10		WDZ Restricted, contact Range for details. 550 KTAS max release speed. Pops only from the west.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD	0 to -15º	500 to 2000	065º to 095º 245º to 275º	2,**3**,4 5,6,8		WDZ Restricted, contact Range for details. 550 KTAS max release speed.

Table A9.7. Aircraft: F-16

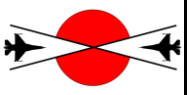
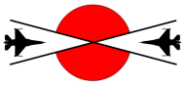
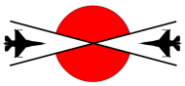
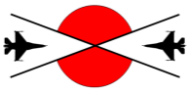
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD	-5º to -30º	1000 to 5000	050º to 110º 230º to 290º	2,**3**,4 5,6,8		WDZ Restricted, contact Range for details.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD Loft/Toss	0º to +45º	1000 to 5000	050º to 110º 230º to 290º	2,**3**,4 5,6, 7,8		WDZ Restricted, contact Range for details.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 MK-84 LD	-15º to -60º	2000 to 15,000	050º to 110º 230º to 290º	2,**3**,4 5,6,8		WDZ Restricted, contact Range for details.
T-2, T-12, T-20 thru T-24	Inert MK-84 AIR HD	0º to -15º	300 to 2000	065º to 095º 245º to 275º	2,3, 4,5, 6,8, 10		WDZ Restricted, contact Range for details. 500 KTAS max release speed
T-2, T-12, T-20 thru T-24	Inert MK-84 AIR HD	0º to -30º	300 to 2000	065º to 095º 245º to 275º	2,**3**, 4,5, 6,8, 10		WDZ Restricted, contact Range for details. 500 KTAS max release speed
T-2, T-8S, T-12, T-20 thru T-24	Inert MK-84 LD	0º to -15º	500 to 2000	065º to 095º 245º to 275º	2,**3**,4 5,6,8		WDZ Restricted, contact Range for details. 500 KTAS max release speed
T-2, T-12, T-20 thru T-24	Inert MK-84 LD	0º to -30º	1500 to 5000	060º to 100º 240º to 280º	2,**3**,4 5,6,8		WDZ Restricted, contact Range for details.
T-2, T-12, T-20 thru T-24	Inert MK-84 LD LAT/Loft	+5º to +45º	1000 to 5000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details.

Table A9.8. Aircraft: F-16

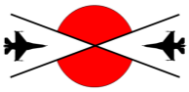
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert GBU-10 System Level - Dive	0º to -30º	2000 to 5000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, prior coordination required.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert GBU-10 System Level - Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, prior coordination required.
T-2, T-8N, T-8S, T-12, T-20 thru T-24, T-13 MVR	Inert GBU-12 System Level - Dive	0º to -30º	2000 to 5000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, prior coordination required. Prior coordination required for T-13.
T-2, T-12, T-20 thru T-4, T-13 MVR	Inert GBU-12 System Level - Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4,5 6,7,8		WDZ Restricted, contact Range for details. Prior coordination required for T-13.
T-8N. T-8S, T-24	Inert GBU-12 Level - Dive	0º to -30º	15,000 to 20,000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details.

Table A9.9. Aircraft: F/A-18

Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale	0 to -60º	300 to 15,000	035º to 125º 215º to 305º	1,2, **3**,4,6		None
All except T-25	Sub-scale	0 to +45º	500 to 5000	035º to 125º 215º to 305º	1,2, **3**,4,6		None

Table A9.10. Aircraft: F/A-18

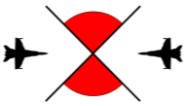
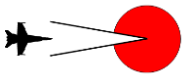
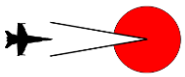
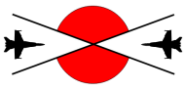
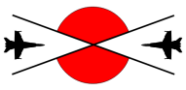
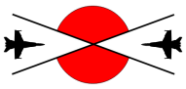
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-17, T-19	20mm High Angle Strafe	-15º to -60º	500 to 10,000	050º to 110º 230º to 290º	**3**,4, 6,8		WDZ Restricted, contact Range for details. T-5 target 050º - 090º west-to-east.
T-13 Moving Target	20mm High Angle Strafe	-15º to -60º	1000 to 10,000	020º to 050º 290º to 330º	**3**,4, 6,8		Requires advanced notice to ensure system is operational. WDZ Restricted.
High Angle Strafe Target (Acoustic)	20mm High Angle Strafe	-15º to -60º	500 to 10,000	070º to 090º	4, 9		Only on the scored high angle strafe target.
Low Angle Strafe Targets	20mm Low Angle Strafe	-1º to -20º	75 to 2500	070º to 090º	4		Only on low angle strafe targets.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	BDU-59 LGTR System Level / Dive	0º to -30º	2000 to 5000	060º to 100º 240º to 280º	**3**,4, 6,7,8		WDZ Restricted, prior coordination required.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	BDU-59 LGTR System Level / Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4, 6,7,8		WDZ Restricted, prior coordination required.
T-2, T-8N, T-8S, T-12, T-20 thru T-24, T-13 MVR	Inert GBU-10 GBU-12 GBU-16 System Level/ Dive	0 to -30º	2000 to 5000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details. Prior coordination required for mover, (GBU-12 only)
T-2, T-8N, T-8S, T-12, T-20 thru T-24, T-13 MVR	Inert GBU-10 System Level/ Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details. Prior coordination required for mover.

Table A9.11. Aircraft: F/A-18

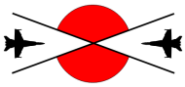
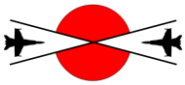
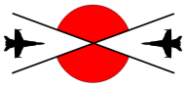
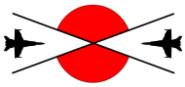
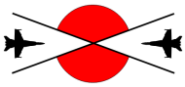
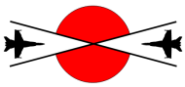
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-8N, T-8S, T-12, T-20 thru T-24, T-13 MVR	Inert GBU-12 System Level/ Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details. Prior coordination required for mover.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert GBU-12 System Level/ Dive	0º to -30º	15,000 to 20,000	065º to 095º 245º to 275º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details.
T-2, T-8N, T-8S, T-12, T-20 thru T-24, T-13 MVR	Inert GBU-16 System Level/ Dive	0º to -30º	5000 to 15,000	060º to 100º 240º to 280º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details. Prior coordination required for mover.
T-2, T-12, T-20 thru T-24	Inert MK-82 AIR HD Low-Angle High Drag	0º to -30º	300 to 2000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8, 10		WDZ Restricted, contact Range for details. 550 KTAS max release speed.
T-2, T-12, T-20 thru T-24	Inert MK-83 AIR HD Low-Angle High Drag	0º to -30º	300 to 2000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8, 10		WDZ Restricted, contact Range for details. 550 KTAS max release speed.
T-2, T-12, T-20 thru T-24	Inert MK-84 AIR HD Low-Angle High Drag	0º to -30º	300 to 2000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8, 10		WDZ Restricted, contact Range for details. 500 KTAS max release speed.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD	0º to -10º	500 to 2000	065º to 095º 245º to 275º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. 550 KTAS max release speed.

Table A9.12. Aircraft: F/A-18

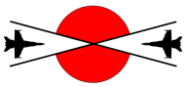
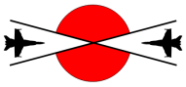
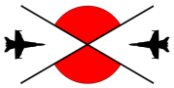
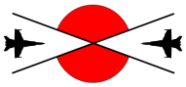
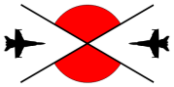
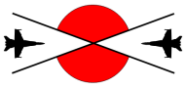
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-12, T-20 thru T-24	Inert MK-83 LD	0º to -10º	500 to 2000	065º to 095º 245º to 275º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. 550 KTAS max release speed.
T-2, T-12, T-20 thru T-24	Inert MK-84 LD	0º to -10º	500 to 2000	065º to 095º 245º to 275º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. 500 KTAS max release speed.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD	-5º to-30º	1000 to 5000	050º to 110º 230º to 290º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. Numerous prohibitions.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-83 LD	-5º to-30º	1500 to 5000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. Numerous prohibitions.
T-2, T-12, T-20 thru T-24	Inert MK-84 LD	-5º to-30º	1500 to 5000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. Numerous prohibitions.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD LAT/Loft	-5º to +45º	1000 to 5000	050º to 110º 230º to 290º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details.
T-2, T-12, T-20 thru T-24	Inert MK-83 LD LAT/Loft	-5º to +45º	1000 to 5000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details.
T-2 west-to-east T-22 east-to-west	Inert MK-84 LD LAT/Loft	-5º to +45º	1000 to 5000	060º to 100º 240º to 280º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details. Numerous prohibitions.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 Mk-83 Mk-84 LD	-20º to -60º	2000 to 15,000	050º to 110º 230º to 290º	2,**3**, 4,5, 6,8		WDZ Restricted, contact Range for details.

Table A9.13. Aircraft: F/A-18

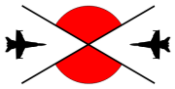
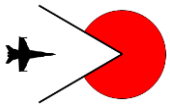
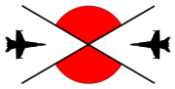
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	2.75" Rockets (TP)	0 to -30º	1000 to 15,000	050º to 110º 230º to 290º	2,**3**, 4,6,7		Pop-ups from west only.
T-1, T-2, T-6, T-8N, T-8S, T-9, T-12, T-17, T-20, T-21, T-22	2.75" Rockets (WP)	0 to -30º	1000 to 15,000	050º to 110º 230º to 290º	2,**3**, 4,6,7		Targets EOD-restricted. Pop-ups from west only.
T-1, T-2, T-12, T-20 thru T-24	2.75" Rockets (TP / WP) Loft	0 to +45	500 to 5000	050º to 110º	2,**3**, 4,6,7		WP loft rounds EOD-restricted to T-1, T-2, T-12, T-21 and T-22 only.
All except T-4, T-25	5" Rockets (TP)	0 to -30º No loft	1000 to 15,000	050º to 110º 230º to 290º	**3**,4, 6,7		WDZ Restricted, contact Range for details. Prohibited on T-4.
T-1, T-2, T-12, T-20 thru T-24	5" Rockets (TP)	0 to +45º	500 to 5000	050º to 110º 230º to 290º	**3**,4, 6,7		WDZ Restricted, contact Range for details.

Table A9.14. Aircraft: B-1

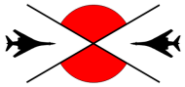
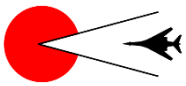
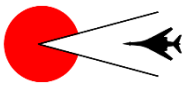
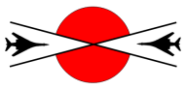
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale System Level	0º to -5º	500 to 25,000	050º to 110º 230º to 290º	1,**3**, 4,6,7		Do not exceed 650 KTAS at release.
T-22, T-23, T-24	Inert MK-82 AIR HD Level	0º to -5º	300 to 3000	245º to 275º	**3**,5, 6,7, 8,10		Do not exceed 650 KTAS at release. WDZ Restricted.
T-23, T-24	Inert MK-82 LD Level	0º to -5º	500 to 5000	245º to 275º	**3**,5, 6,7,8		Do not exceed 650 KTAS at release. WDZ Restricted.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 MK-84 LD	0º to -5º	5000 to 25,000	065º to 095º 245º to 275º	1,5, 6,7		WDZ Restricted contact Range for details. Do not exceed 650 KTAS at release

Table A9.15. Aircraft: B-2

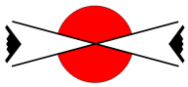
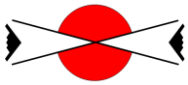
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 LD System Level	0º to -5º	500 - 5000	065º to 095º 245º to 275º	**3**,4, 5,6, 7,8		WDZ Restricted, contact Range for details. 500 KTAS max at release.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert MK-82 MK-84 LD System Level	0º to -5º	5000 to 25,000	065º to 095º 245º to 275º	**3**,4, 5,6 7,8		None.

Table A9.16. Aircraft: B-52

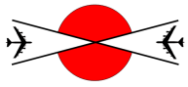
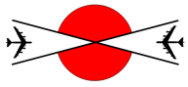
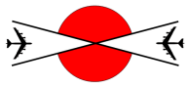
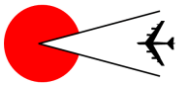
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2, T-12, T-8S, T-20 thru T-24	Inert MK-82 AIR HD Low Level	0º to -5º	300 to 3000	065º to 095º 245º to 275º	**3**,4, 5,6, 8,10		WDZ Restricted, contact Range for details. 550 KTAS max at release.
T-2, T-12, T-8S, T-20 thru T-24	Inert MK-82 LD Low Level	0º to -5º	500 to 5000	065º to 095º 245º to 275º	**3**,4, 5,6, 8,10		WDZ Restricted, contact Range for details. 550 KTAS max at release.
T-2, T-8N, T-8S, T-12, T-20 thru T-24	Inert Mk-82 Mk-84 LD System Level	0º to -5º	5000 to 25,000	065º to 095º 245º to 275º	4,5, 6,7,8		550 KTAS max at release.
T-2	Inert GBU-12 System Level	0º to -5º	10,000 to 16,500	245º to 275º	**3**,4, 5,6, 7,8		WDZ Restricted, prior coordination required, contact Range for details.

Table A9.17. Aircraft: AH-64

Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-13, T-17, T-19, strafe pits	30mm	+5º to -30º	50 to 1000	050º to 110º 230º to 290º	**3**,4, 6,7,8		WDZ Restricted, contact Range for details. Maximum firing range 3 km.
T-13 Moving Target	30mm	+5º to -30º	50 to 1000	355º to 040º	**3**,4, 6,7,8		WDZ Restricted, contact Range for details. Maximum firing range 3 km.
All (including T-13) except T-18, T-19, T-25	2.75” Rockets	+10º to -30º	50 to 1000	050º to 110º 230º to 290º	**3**,4, 6,7,8		WDZ Restricted (Mover), contact Range for details.

Table A9.18. Aircraft: AH-6

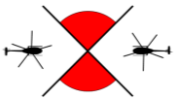
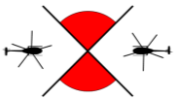
Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-17, T-19, T-25, strafe pits	.50 cal	0º to -30º	100 to 1000	050º to 110º 230º to 290º	**3**,4, 6,7,8		WDZ Restricted, contact Range for details.
All except T-13, T-19, T-25	2.75” Rockets	+15º to -30º	100 to 1000	050º to 110º 230º to 290º	**3**,4, 6,7		T-5 and T-14 restricted firing headings, contact Range.

Table A9.19. Aircraft: MH-60 DAP

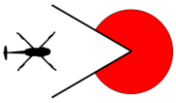
Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-1, T-2, T-3, T-6, T-8N, T-8S, T-9, T-20 thru T-24, T-25, AC-130 Target	30mm Fixed	-1º to -30º	50 to 1000	050º to 110º	**3**,4, 6,7,8		WDZ Restricted, contact Range for details.

Table A9.20. Aircraft: UH/MH-60 CH-47 UH-1 HH/MH-53 CH-146

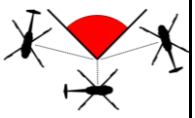
Target	Weapon	Release Angle	Release Alt. (AGL)	Firing Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-7, T-17, T-25, strafe pits	7.62mm Sidefire	-2º to -30º	50 to 1000	235º to 105º (350º±115º)	**3**,4, 6,8		WDZ Restricted, contact Range for details. Do not fire toward any manned sites or the LTA.

Table A9.21. Aircraft: RPAs (MQ-9 and MQ-1)

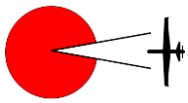
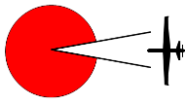
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
T-2	Inert GBU-12 (MQ-9)	0º to -5º	5000 to 20,000	050º to 110º 230º to 290º	**3**,4,7		Releases west-to-east above 15K AGL affect LTA and West OPs.
T-2	Inert GBU-38 (MQ-9)	0º to -5º	18.000 to 25,000	250º to 270º (Offset L/R ± 10º, or 0.25 NM)	**3**,4, 7,8		WDZ Restricted, contact Range for details. Requires closure of OK Hwy 115 and R-5601B restrictions.
T-2	Inert GBU-44 (MQ-1)	0º to -5º	5000 to 15,000	250º to 270º (Offset L/R ± 10º, or 0.25 NM)	**3**,4, 7,8		WDZ Restricted, contact Range for details. Requires closure of OK Hwy 115 and R-5601B restrictions.

Table A9.22. Contract CAS, Manual Deliveries (A90, BAC-167, IAR-823, OV-10, PC-9)

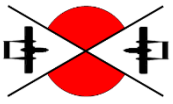
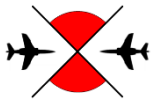
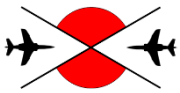
Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale	0º to -45º	500 to 10,000	035º to 125º 215º to 305º	1,2, 3,4,6		Pop-ups from west only.
All except T-7, T-13, T-17, T-19, strafe pits	7.62mm	-5º to -35º	100 to 4000	050º to 110º 230º to 290º	1,2, 3,4,6		Do not fire toward any manned sites or the LTA.

Table A9.23. Contract CAS, Computed Deliveries (A-4, AT-38, AT-802, CF-5, Alpha Jet)

Target	Weapon	Release Angle	Release Alt. (AGL)	Run-In Heading	Notes	Attack Axis Graphic	Additional Restrictions
All except T-25	Sub-scale	0º to -45º	500 to 10,000	035º to 125º 215º to 305º	1,2, **3**,4,6		Pop-ups from west only.
All except T-7, T-13, T-17, T-19, strafe pits	7.62mm	-5º to -35º	100 to 4000	050º to 110º 230º to 290º	1,2, **3**,4,6		Do not fire toward any manned sites or the LTA.

Notes:

1. Sub-scale munitions include BDU-33/MK-76, BDU-48, etc.

2. Low-altitude ingress and pop-up or fly-up is restricted to west-to-east (080º) run-in headings.

3. Observation Points (OPs) for JTACs affected by parameters. Alternate targets may be required, or OP may require vacating. Range Operations has expanded requirements for employment.

4. Do not over fly main or flank tower; do not release weapons when pointing at main or flank tower.

5. Heavyweight munitions, delivered from shallow dive angles, travel as far as 3000 meters and can change direction by as much as 30° after breaching.

6. These restrictions may be modified with the concurrence of Falcon Range after computing weapons footprints using the ACC-approved footprint program.

7. Ensure releases take place within the restricted airspace.

8. Some weapons events place the weapons danger zones outside the impact area. These events can still be performed but prior coordination (as much as 8 weeks) is required with Fort Sill in order to allow the events. Users must call the range in advance to ensure the adjacent training areas are clear.

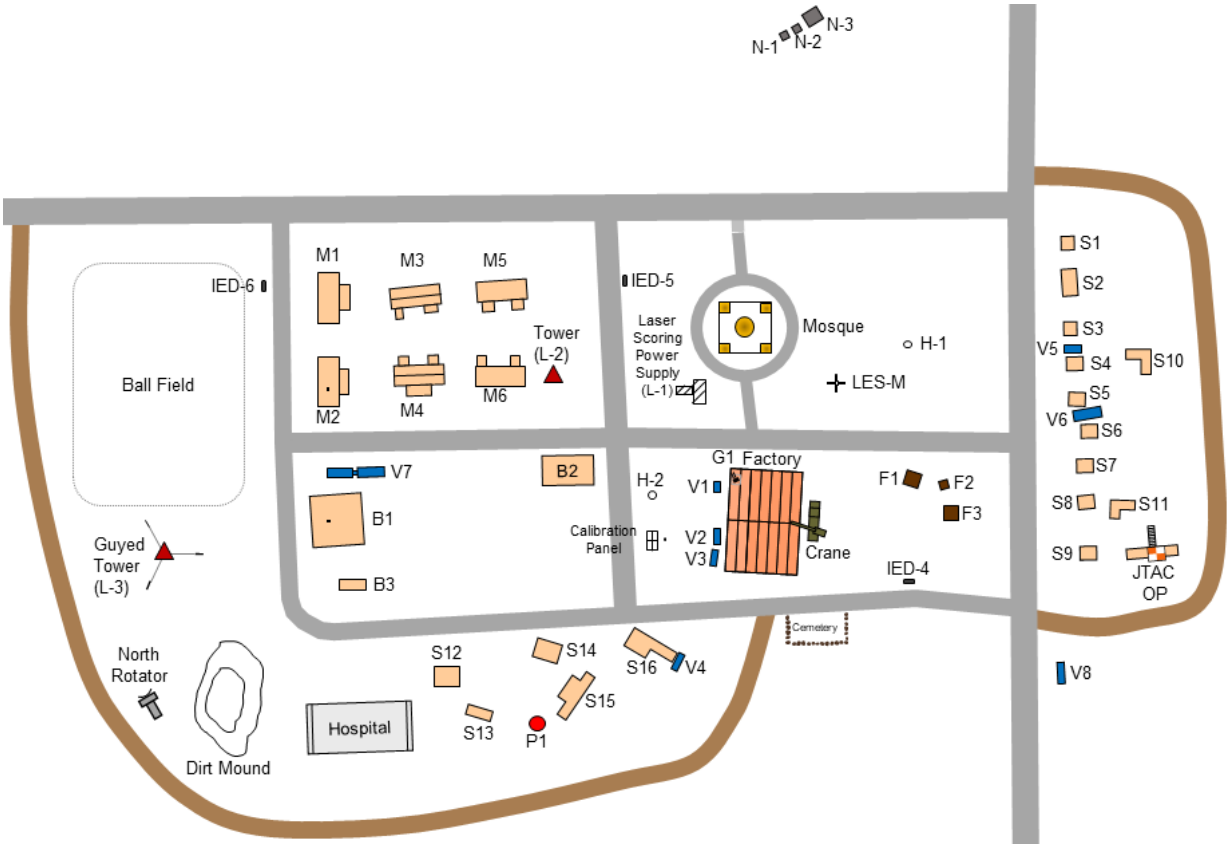
9. High-angle strafe on the scored HAS target (Strafe Target 3) is restricted to 080º ± 10º.

10. High-drag munitions utilize flagger/failure modes for computation of footprints/WDZs.

Attachment 10

LASER TRAINING AREA SCORING TABLES

Table A10.1. Laser Scoring Matrix



Name	Description	Latitude/ Longitude	Elev.	MGRS	Scoring Sensor	Sensor LTL (1)
L-1	Laser Power Supply CONEXs	N 34 40.0227 W 098 42.2358	1465	27125 36160	None	N/A
L-2	East LSVRS Sensor Tower	N 34 40.0239 W 098 42.2580	1470	27091 36162	None	N/A
L-3	West LSVRS Sensor Tower	N 34 40.0013 W 098 42.3204	1452	26996 36120	None	N/A
LES-M	Laser Evaluator System	N 34 40.0234 W 098 42.2144	1472	27158 36161	Self	Any
Hospital	Rectangular Hospital	N 34 39.9792 W 098 42.2894	1469	27044 36069	None	Any
Factory	West Center Face	N 34 40.0060 W 098 42.2316	1470	27132 36129	LSVRS-1	090º ± 80º
Factory	North Center Face	N 34 40.0125 W 098 42.2252	1470	27142 36141	None	Any

Table A10.2. Laser Scoring Matrix

Name	Description	Latitude/ Longitude	Elev.	MGRS	Scoring Sensor	Sensor LTL (1)
Mosque	Mosque w/ Minarets	N 34 40.0311 W 098 42.2280	1469	27137 36176	None	N/A
Cal Panel	Calibration Panel	N 34 40.0029 W 098 42.2431	1460	27115 36124	None	N/A
JTAC OP	Orange and White OP	N 34 40.0016 W 098 42.1649	1466	27234 36121	None	N/A
IED-4	Artillery Shells Partially Buried	N 34 39.9971 W 098 42.2030	1465	27176 36113	None	N/A
IED-5	Artillery Shells Partially Buried	N 34 40.0367 W 098 42.2481	1475	27107 36186	None	N/A
IED-6	Artillery Shells buried by M1	N 34 40.0358 W 098 42.3045	1476	27020 36184	None	N/A
S1	Northern Shanty Row	N 34 40.0415 W 098 42.1779	1470	27214 36195	None	N/A
S2	Shanty	N 34 40.0365 W 098 42.1778	1471	27214 36186	None	N/A
S3	Shanty	N 34 40.0302 W 098 42.1779	1471	27214 36174	None	N/A
S4	Shanty	N 34 40.0260 W 098 42.1770	1471	27216 36167	None	N/A
S5	Shanty	N 34 40.0213 W 098 42.1767	1472	27216 36158	None	N/A
S6	Shanty	N 34 40.0171 W 098 42.1748	1472	27219 36150	None	N/A
S7	Shanty	N 34 40.0126 W 098 42.1756	1473	27218 36142	None	N/A
S8	Shanty	N 34 40.0078 W 098 42.1754	1472	27218 36133	None	N/A
S9	Southern Shanty Row	N 34 40.0013 W 098 42.1751	1472	27218 36121	None	N/A
S10	Northeastern Shanty	N 34 40.0266 W 098 42.1667	1466	27231 36168	None	N/A

Table A10.3. Laser Scoring Matrix

Name	Description	Latitude/ Longitude	Elev.	MGRS	Scoring Sensor	Sensor LTL (1)
S11	Southeastern Shanty	N 34 40.0068 W 098 42.1686	1470	27228 36131	None	N/A
S12	2-Story Shanty Bldg	N 34 39.9864 W 098 42.2755	1470	27065 36093	LSVRS-1	090º ± 80º
S13	1-Story Shanty	N 34 39.9809 W 098 42.2708	1469	27072 36083	LSVRS-1	090º ± 80º
S14	Larger 1-Story Bldg	N 34 39.9890 W 098 42.2601	1466	27089 36098	LSVRS-1	090º ± 80º
S15	1+2 Story Shanty	N 34 39.9837 W 098 42.2544	1465	27097 36088	LSVRS-1	090º ± 80º
S16	Long 1+2 Story Bldg	N 34 39.9892 W 098 42.2434	1466	27114 36098	LSVRS-1	090º ± 80º
P1	Red POL Tank	N 34 39.9804 W 098 42.2615	1469	27087 36082	LSVRS-1	090º ± 80º
H-1	NE Spider Hole	N 34 40.0283 W 098 42.2031	1476	27176 36171	None	N/A
H-2	SW Spider Hole	N 34 40.0088 W 098 42.2435	1469	27114 36135	None	N/A
F1	NW Support Bldg	N 34 40.0110 W 098 42.2023	1466	27177 36139	None	N/A
F2	Center Support Bldg	N 34 40.0104 W 098 42.1971	1467	27185 36137	None	N/A
F3	SE Support Bldg	N 34 40.0061 W 098 42.1963	1466	27186 36130	None	N/A
Crane	Crane on East End of Factory	N 34 40.0051 W 098 42.2175	1467	27154 36128	None	N/A
B1	West Gen Purpose Bldg	N 34 40.0057 W 098 42.2968	1472	27033 36129	LSVRS-1	090º ± 80º
B1 Top	Top-Down Target on B-1	N 34 40.0058 W 098 42.2941	1481	27037 36129	LSVRS-1	090º ± 80º
B2	East Gen Purpose Bldg	N 34 40.0121 W 098 42.2605	1469	27088 36141	LSVRS-1	090º ± 80º

Table A10.4. Laser Scoring Matrix

Name	Description	Latitude/ Longitude	Elev.	MGRS	Scoring Sensor	Sensor LTL (1)
B3	Small Building (Snack Bar)	N 34 39.9975 W 098 42.2907	1474	27042 36114	LSVRS-1	090º ± 80º
G1	ZU-23-2 AAA Gun on Factory	N 34 40.0121 W 098 42.2301	1490	27134 36140	LSVRS-1	090º ± 80º
V1	North Vehicle (Service Cart)	N 34 40.0104 W 098 42.2337	1469	27129 36138	LSVRS-1	090º ± 60º
V2	Central Vehicle (Heavy Equip.)	N 34 40.0032 W 098 42.2330	1470	27130 36124	LSVRS-1	090º ± 60º
V3	South Vehicle (Wreck)	N 34 40.0002 W 098 42.2336	1471	27129 36118	LSVRS-1	090º ± 60º
V4	Small Auto by S16 Building	N 34 39.9879 W 098 42.2404	1474	27119 36096	LSVRS-1	090º ± 80º
V5	North Shanty Row – Blazer	N 34 40.0277 W 098 42.1776	1474	27214 36170	None	N/A
V6	Center Shanty Row - Truck	N 34 40.0195 W 098 42.1761	1474	27217 36155	None	N/A
V7	Truck With Trailer by B-1	N 34 40.0118 W 098 42.2932	1477	27038 36140	LSVRS-1	090º ± 80º
V8	South of Shanty Row -Technical	N 34 39.9858 W 098 42.1795	1462	27212 36092	None	N/A
N-1	Southwest Shack	N 34 40.0723 W 098 42.2175	1476	27147 36248	None	N/A
N-2	Center Shack	N 34 40.0707 W 098 42.2201	1476	27150 36249	None	N/A
N-3	Northeast Shack	N 34 40.06 W 098 42.2268	1476	27154 36252	None	N/A
M1	Northwest Marketplace Building	N 34 40.0346 W 098 42.2942	1476	27037 36182	LSVRS-1	090º ± 80º

Table A10.5. Laser Scoring Matrix

Name	Description	Latitude/ Longitude	Elev.	MGRS	Scoring Sensor	Sensor LTL (1)
M2	Southwest Marketplace Building	N 34 40.0235 W 098 42.2958	1476	27034 36162	LSVRS-1	090º ± 80º
M2 Top	Top-Down Target on M2	N 34 40.0228 W 098 42.2942	1480	27037 36160	LSVRS-1	090º ± 80º
M3	North-Central Marketplace Building	N 34 40.0350 W 098 42.2804	1479	27058 36183	LSVRS-1	090º ± 80º
M4	South-Central Marketplace Building	N 34 40.0249 W 098 42.2796	1479	27058 36164	LSVRS-1	090º ± 80º
M5	Northeast Marketplace Building	N 34 40.0357 W 098 42.2668	1478	27078 36184	None	N/A
M6	Southeast Marketplace Building	N 34 40.0246 W 098 42.2671	1478	27078 36164	None	N/A
Rotator	Rotating Radar Antenna	N 34 39.9821 W 098 42.3231	1481	26993 36086	None	N/A

Note (1). Laser-target line (LTL) is recommended for best scoring. LTL outside of recommended headings may still provide scoring but with slight to total degradation due to obstructions or field-of-view limitations.

Attachment 11

FORT SILL INITIAL/CONTACT POINTS AND COMMUNICATION GRID

Table A11.1. Fort Sill Initial/Contact Points and Communications

NAME	GRID (MGRS)	LAT/LONG	DESCRIPTION
CP Standpipe	ND 115323	N 34º 37.970’ W 098º 52.470’	Standpipe SW of US 62 and OK 54 intersection
CP Lima (L)	ND 446476	N 34º 46.174' W 098º 30.757'	North end of Lake Lawtonka, IRW (CH 88) 226056
CP Romeo (R)	ND 356260	N 34º 34.510' W 098º 36.712'	SPS (CH 74) 350035
IP Bravo (B)	ND 271353	N 34º 39.543' W 098º 42.245'	Bomb circle on Falcon Range
IP Kilo (K)	ND 372405	N 34º 42.352' W 098º 35.627'	Ketch Lake
Point Sierra (S)	ND 467370	N 34º 40.435' W 098º 29.415'	Signal Mountain
Point Alpha (A)	ND 392340	N 34º 38.830' W 098º 34.335'	Two adjacent ponds
IP November (N)	ND 361376	N 34º 40.785' W 098º 36.355'	Small lake
Grid Zone Origin (14S ND, WGS 84) = N 34º 20.4782' / W 099º 00.0000'.			

ORGANIZATION	FREQUENCIES
CAS Control Frequency (West Range)	356.5 (P) / 344.5 (S)
Fort Sill Approach IFR Clearance/Service/ VFR Flight Following	322.4 / 120.55 (P) 290.375 / 118.6 (S)
Fort Sill Range Control	34.50 (FM) / 38.50 (FM)
Fort Sill ATIS	354.025 / 135.425
Fort Sill METRO	306.5
Falcon Range	363.7 (P) / 238.8 (S) / 342.3 (T)
Altus Approach	257.725 / 125.1 (P) 350.35 Fort Worth Center (S)
Fort Worth Center – North Fort Worth Center - South	269.375 / 128.4 350.35 / 133.5