

CARP DROP ZONES

Student Handout - DUTIES AND RESPONSIBILITIES OF THE DROP ZONE SAFETY OFFICER (DZSO) AND THE DROP ZONE SUPPORT TEAM LEADER (DZSTL)

Scope - During this period of instruction you will learn the prerequisites for performing the duties of the DZSO/DZSTL. We will also discuss the minimum information that you should receive during the pre-mission coordination, the support requirements necessary to operate a drop zone, and specific duties and responsibilities of the DZSO/DZSTL. We will also discuss drop zone surveys, tactical assessment and how to score an Airforce drop.

Prerequisites - DZSO

- Be an officer or Noncommissioned officer in the pay grade of E5 or above.
- Be Jumpmaster qualified and current as a Jumpmaster.
- Have previously observed the DZSO on a personnel jump.
- Have performed the duties of assistant DZSO at least once.

NOTE: The DZSO is a key member of what we refer to as a Drop Zone Support Team.

NOTE: The difference in the required duties of the DZSO as opposed to those of the DZSTL is tied to whether or not the mission is supported by an Air-Force Combat Control Team. As a result of a signed Memorandum of Agreement (MOA) we are training you to perform duties for select Computed Air Release Point (CARP) operations without the presence of CCT, therefore your designation for those operations will become Drop Zone Support Team Leader (DZSTL).

Prerequisites - DZSTL

- Must be an NCO, Officer, or Civilian equivalent.
- Must have received training and certification on drop zone operations for airdrops made without USAF CCT.
- For personnel and heavy equipment drops, must be a qualified and current Jumpmaster.

NOTE: The Drop Zone Support Team will consist of at least two personnel. The senior person meeting these prerequisites will be designated as the Drop Zone Support Team Leader.

Specific Duties and Responsibilities of the DZSO

- Attends pre-mission briefings.
- Coordinates with USAF CCT if required.
- Opens the DZ through range control and closes it when accountability of personnel, air items, and equipment is completed.
- Has the DZ fully operational one hour prior to the drop time.
- Conduct ground or aerial recon of DZ prior to drop time from the PI
- Establish communications with DACO one hour prior to drop time.
- Co-locates with USAF CCT one hour prior to drop time.
- Monitor surface winds from the point of impact. The assistant DZSO (if required) will monitor surface winds from highest point of elevation on the drop zone or the trail end of the drop zone.
- Establish a 10 minute window NLT 12 minutes prior to the scheduled drop time. Give a GO or NO GO 2 minutes before drop time.
- Controls all ground and air medical evacuation.
- Ensures no drop communication signal is relayed to the aircraft when:
 1. Surface winds exceed 13 knots for a personnel drop.
 2. Any unsafe act is observed either on the ground or in the air.
- Marks the DZ for day or night.

- Operates all visual acquisition aids.
- Submits post mission reports properly.

Mission Briefing Checklist

1. Verify JA/ATT mission sequence number
2. Verify DZ Name/Location
3. TOT (s) or Block time
4. No Drop procedures
5. Verify current DZ survey data
6. Type drop (PE, CDS, HE).
7. Type release (CARP, GMRS, VIRS)
8. Type parachutes
9. Number of jumpers/bundles (ground quick disconnects)
10. Type/number of aircraft.
11. DZ markings
 - Ram
 - Panels/lights
 - Smoke/Flares
 - Emergency no drop procedures
 - Mission Cancellation indication.
12. DZ support
 - Communications available
 - Frequencies/call signs
 - Visual acquisition aids
 - NAVAIDS
13. Aircraft/Mission commanders name, unit, telephone number
14. DZSO/DZSTL name, rank, unit, telephone number.
15. Post mission reports

Personnel Airdrops - Multiple aircraft or single aircraft operations on drop zones 2100 meters and more in length.

- 1 DZSO and 1 Assistant DZSO
- 4 Medics with 2xFLA
- Malfunction officer/NCO (with camera)
- Parachute recover detail
- Parachute turn-in detail
- 2 radios
- Authorized wind measuring devices
- 2 compasses
- Smoke grenades (as required)
- Vehicles (as required)
- Road guards (if applicable)
- Military Police (if applicable)
- Boat detail (if applicable)
- VS-17 Panels (as required)
- Pibal Equipment with helium source (if applicable)
- Signal mirror, strobe light, binoculars.

Personnel Airdrops - Single aircraft operations on drop zones 2099 meters or less in length

- 1 DZSO
- 2 Medics (1 FLA)
- 1 radio

- 1 AN/PMQ-3A Anemometer, or Authorized Equivalent
- 1 Compass
- All other requirements remain unchanged.

DZSTL Additional Support Requirements

- Eleven white omni-directional lights
- One white air traffic control light and/or flares
- One red lens for air traffic control light and/or red flares

NOTE: Having met the prerequisites does not mean we can replace the CCT on all missions. Certain missions will still require their presence. The specific missions the DZSTL will be allowed to support are as follows:

1. Army Primary Mission responsibilities
 - Wartime CDS airdrops to Army units of battalion size or smaller.
 - Peacetime VMC airdrops involving single ship and formations of up to three aircraft.
2. Army Secondary Mission Responsibility
 - Wartime airdrops to Army units of Brigade size or larger.
 - Peacetime C130 AWADS airdrops involving single ship or up to three aircraft in formation
 - All VMC formation drops of four or more aircraft.
3. Marine Corps Primary Mission Responsibility
 - Wartime CDS airdrops to Marine Corps forces.
 - Peacetime VMC airdrops involving single ship and formations of up to three aircraft.
 - Peacetime C-130 AWADS airdrops involving single ship and formations of up to three aircraft.
4. Marine Corps Secondary Mission Responsibility
 - Wartime equipment and personnel airdrops to Marine Corps forces

As the Drop Zone Support Team Leader you must be familiar with AF FORM 3823 (see fig 1), used for drop Zone surveys. You must know its use and what information should be recorded on it.

The actual survey of the drop zone is known as a tactical assessment. This assessment can be done by either an Air Force CCT, or personnel trained to perform duty as a drop zone support team leader.

Tactical DZ Assessment (Survey)

1. DZ name or intended call sign.
2. Topographical map series and sheet number
3. Recommended approach axis (magnetic course)
4. PI location (8 digit grid coordinate)
5. Leading edge centerline coordinate (8 digit)
6. DZ size in yards/meters
7. Air traffic restrictions/hazards.
8. Name or surveyor and unit
9. Recommendation for approval/disapproval
10. Remarks (as minimum include a recommendation for airdrop options, CARP, GMRS, VIRS, Blind Drop)

Airdrop operations on tactically assessed DZ's will be made only under the following conditions:

1. During training events, the airdrop will be located within a military reservation or upon US government leased property.
2. The supported service will accept responsibility for any damage which occurs as a result of the airdrop activity.
3. There is adequate time for safe effective planning.

NOTE: A tactically assessed DZ can be used only if the following are met:

During contingency/wartime and major training exercise participation, DZSTL's may be expected to tactically locate and assess a potential drop zone for follow-on airdrop resupply/reinforcement missions.

Normally the Air Force Combat Control Teams would be tasked to accomplish this reconnaissance type mission using the AF FORM 3823, but when a CCT is unavailable, the DZSTL may accomplish a tactical drop zone assessment using the tactical assessment checklist.

Once the tactical assessment has been done and approved by the Air Force a guide line for CARP markings must be followed.

AF FORM 3823

All the information we need concerning the drop zone is on an Air Force form called the AF FORM 3823. Refer to figure 1.

The Air Force has a listing of all available drop zones that were approved for use. The list is called and Assault Zone Availability Report (AZAR) This list is attainable through the Air Force.

AZAR is compiled from inputs provided by 21st AF, McGuire AFB, NJ, and 22nd AF, Travis AFB, CA. It identifies drop zones, landing zones, and extraction zones available in CONUS for use by the Air Mobility Command.

The columns of the AF FORM 3823 are explained below and all blocks require an entry including "N/A" if applicable.

- 1a. DZ name
- 1b. ZAR index number (AF drop zone website reference number)
- 2a. Country
- 2b. State
3. Map sheet and series information
- 4a1. Date DZ was surveyed
- 4a2. Name and rank of surveyor
- 4a3. Contact phone number
- 4a4. surveyor's unit
- 4b. DZ approval or disapproval by mission type and night or day use
- 4c. Date approved for ground operations
- 4d. Date of Safety of flight review
- 4e. Date of MAJCOM approval
- 5a. Controlling unit or agency
- 5b. Memorandum of understanding/ Land use agreement
- 5c. Contact phone number
- 5d. Range Control Frequencies (FM/UHF)
- 5e. Contact phone number
- 6a-c. Dimensional data (length, width, radius)
- 6d-f. PI distances from the lead edge of the DZ
- 7a-d. DZ axis data (direction of flight)
- 8a-d. Ground point elevations
- 9a-f. DZ coordinates
- 9g. Point of origin data (prominent terrain feature used to help find the PI)
- 9h. DZ center point and PI grid locations
- 9i. DZ Corners (grid coordinates for the corners of the DZ)
10. DZ Diagram or digital photographic
11. Remarks (All Hazards/Restrictions and pertinent information about the DZ)
12. Photograph available
13. Low level routes available

NOTE: When performing a safety-of-flight review on a foreign DZ, as much information as possible should be filled in on the AF Form 3823. At a minimum, the following items must be filled in: Items 4D, 6A, 6B, 7, 9A-9F, and 9H. A copy of the foreign DZ should be attached to the safety-of-flight review.

ARBORNE UNIT ASSUMES RESPONSIBILITY FOR PERSONNEL INJURY AND EQUIPMENT DAMAGE ON DZ

DROP ZONE SURVEY	1A. DZ NAME Arkansas Rectangular		1B. ZAR INDEX NO. 351		2A. COUNTRY U.S.		2B. STATE GA	
	3. MAP SERIES/SHEET NUMBER/EDITION/ DATE OF MAP V745S 1-DMA 1986(10)							
4. SURVEY APPROVAL/DISAPPROVAL DATA								
4A1. DATE SURVEYED 2004/319		4A2. TYPED NAME AND GRADE OF SURVEYOR Eames, Michael E. SPC			4A3. PHONE NUMBER (DSN) 835-1111		4A4. UNIT HHC (PFDR) 1/507 PIR	
4B. DZ UNIT APPROVAL/DISAPPROVAL A = APPROVED U = DISAPPROVED	FOR	CDS/CR/CRS	PCR	HE	MFF	SATB	CHRC	HSLADS
	DAY	A	A	A	A	A	D	D
	MONTH	A	D	D	A	A	D	D
4C. DATE APPROVED FOR GROUND OPERATIONS 01 APR 04	NAME, GRADE AND SERVICE OF APPROVAL AUTHORITY CALDWELL, JASON C O-3 USA				PHONE NUMBER (DSN) 835-5832		SIGNATURE <i>Jason C Caldwell</i>	
	UNIT AND LOCATION HHC 1-507th							
4D. DATE SAFETY OF FLIGHT REVIEW APPROVED 20 Aug 04	NAME AND GRADE OF REVIEWING OFFICER Brian Benson, Maj, USAF				PHONE NUMBER (DSN) 779-3148		SIGNATURE <i>Brian Benson</i>	
	UNIT AND LOCATION HQ AMC/A39, Scott AFB, IL							
4E. DATE OF MAJOR APPROVAL 20 Aug 04	NAME AND GRADE OF APPROVING AUTHORITY John McDonough, Maj, USAF				PHONE NUMBER (DSN) 779-3148		SIGNATURE <i>John McDonough</i>	
	UNIT AND LOCATION HQ AMC/A39, Scott AFB, IL							
5. COORDINATING ACTIVITIES								
A. DZ CONTROLLING AGENCY OR UNIT Range Control Ft Benning, Ga 31705			B. MEMORANDUM OF UNDERSTANDING AND USE AGREEMENT YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> ATTACHED <input type="checkbox"/>				C. PHONE NUMBER (DSN) 835-1111	
D. RANGE CONTROL Range Control FM 38.60 (LHF 249.5 (Skywatch))						E. PHONE NUMBER (DSN) 835-2152		
6. DZ DIMENSIONS (YDS/MTR) (FOR CIRCULAR DZ, ENTER RADIUS ONLY)								
A. LENGTH 1000 yds			B. WIDTH 600 yds			C. RADIUS NA		
POINT OF IMPACT DISTANCES FROM DZ LEADING EDGE		D. CDS PI 350 yds		E. PE PI 350 yds		F. HE PI 550 yds		
7. DZ AXIS DATA (OPTIONAL FOR CIRCULAR DZ)								
A. MAGNETIC 003 deg		B. GRID (MGRS) 359 deg		C. TRUE 360 deg		D. SOURCE/DATE OF VARIATION DATA 1995/0101		
B. GROUND POINT ELEVATION		A. CDS PI 178'		B. HE PI 181'		C. PE PI 178'		D. HIGHEST 502'
8. DZ COORDINATES								
A. SPHEROID Clarke 1866		B. DATUM 1927 NA		C. GRID ZONE 16		D. EASTING 7		E. NORTHING 35
F. GPS DERIVED COORDINATES YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			G. POINT OF ORIGIN GL 0752 7289 400m @344 deg from Road Intersection to PI.					
H. POINT		MGRS COORDINATES			WGS84 LATITUDE (D-M.MM)		WGS84 LONGITUDE (D-M.MM)	
DZ CENTERPOINT		GL 0735 7336			32 deg 16.782'		84 deg 47.897'	
CDS PI		GL 0737 7328			32 deg 16.739'		84 deg 47.886'	
PE PI		GL 0737 7328			32 deg 16.739'		84 deg 47.886'	
HE PI		GL 0734 7340			32 deg 10.804'		84 deg 47.903'	
9. DZ CORNERS MGRS COORDINATES								
LEFT LEADING EDGE GL 0710 7285				RIGHT LEADING EDGE GL 0761 7286				
LEFT TRAILING EDGE GL 0703 7380				RIGHT TRAILING EDGE GL 0760 7382				

AF FORM 3823, 20021001 (EF-V2)

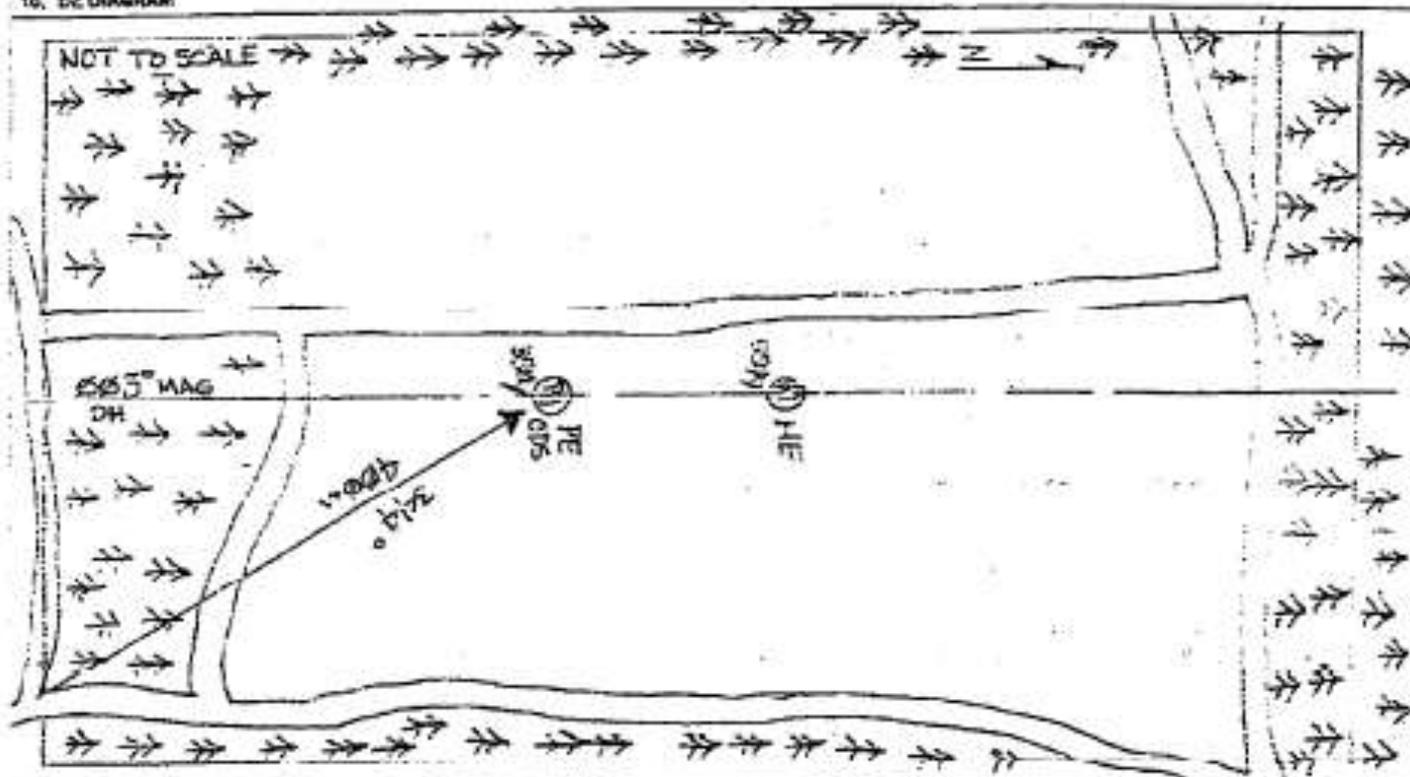
PREVIOUS EDITIONS ARE OBSOLETE.

Figure 1.

DZ NAME

UNKNOWN Rectangular

10. DZ DIAGRAM



11. REMARKS

1. DZ is for single ship operations only.
2. User accepts responsibility for injury to personnel and damage to equipment and property due to airdrop operations from Air Force aircraft.
3. DZ is approximately 40% trees ranging from 15' to 45' in height.
4. Aircraft must contact Range Control at least 10 min. prior to entry into R-300Z.
5. Aircraft must coordinate with Range Control and Columbus Approach for approach access to DZ.
6. Recommend left traffic to avoid overflight of town of Casseta located 2000m @ 026 deg.
7. Telephone tower 795' MSL located 2600m @ 026 deg.
8. TV tower 2249' MSL located 4750m @ 018deg.
9. TVT does not meet minimum size requirements for nighttime personnel drops IAW AFI 13-217.
10. GMRS option should be used for night personnel drops due to width limitation.
11. Water tower 789' MSL located 3650m @ 174 deg.

12. PHOTOGRAPH AVAILABLE

YES NO

LOW LEVEL ROUTES

NONE AVAILABLE

ROUTE NAME/DESIGNATOR

Figure 1. (cont)

NOTE: On most USAF drop zones it is required that the location where the first jumper or container hits the ground be recorded. The clock direction and distance from the PI will be recorded on the AF FORM 4304 and forwarded to higher headquarters. These strike reports are used to evaluate the aircrew. Upon completion they should be forwarded through your unit S3

AF FORM 4304

The AF FORM 4304 is basically a score card for the Air Force. Since the release point is computer by the aircrew on the CARP drop zone, the Air Force must have some documentation on the crew's performance.

The following is a list of the blocks and an explanation of the contents on the AF FORM 4304 (refer to figure 2)

1. DATE: Enter date and year. Use either calendar or Julian date. When a "time" is required use local or GMT consistent with the date.
2. LOCATION: Enter DZ name.
3. CCT AND UNIT: DZSTL name and unit.
4. DZ/LZ CONTROL OFFICER AND UNIT: Self-explanatory.
5. DROP ZONE SAFETY OFFICER AND UNIT: Self-explanatory.
6. LINE NO: One line filled out for each pass of each aircraft. No drop passes should use a line number also. The remarks column should reflect the reason for the no drop situation.
7. TYPE ACFT: Mission design series.
8. UNIT: Unit of aircraft.
9. CALL SIGN: Call sign of lead and, if applicable, formation position number.
10. TYPE MISSION: Refer to LEGEND for abbreviations. Your initial appropriate training will dictate what type of drop zone you are qualified to operate.
11. ETA: Estimated time of arrival, estimated TOT, or S3 air brief. Keep the unit of time consistent throughout the form (e.g., local or GMT).
12. ATA/ATD: Actual time of every pass and actual time of departure.
13. STRIKE REPORT:
 - *YDS: Distance first jumper/container/pallet lands from PI in yards. If within 25 yards it is scored a PI
 - *CLOCK: Use direction of flight as 12 o'clock and back its azimuth as 6 o'clock, estimate direction from PI to first jumper/container/pallet. If item and conditions permit, the actual measurement is preferred.
14. LZ: Mark the "S" box if a landing occurred in the touch down box (first 500 ft). If the landing was not successful (i.e., go-around), short of the touchdown zone, or 500 feet beyond the beginning of the touchdown zone, mark the "U" box and provide comments in the REMARKS box.
15. SURF WIND: Surface wind direction in degrees, and velocity in knots.
16. SCORE METHOD: Refer to LEGEND for abbreviations.
17. MEAN EFFECTIVE WIND: Time taken and at what altitude.
 - * TIME: Self-explanatory.
 - * ALT: Should be drop altitude
 - * DIR & VEL: Wind direction in degrees and velocity in knots.
18. Remarks: Enter remarks as appropriate.

NOTE: The DZSTL forwards the AF Form 4304 to his air operations officer who in turn submits it through the chain of command to the USAF representatives.

DROP ZONE/LANDING ZONE CONTROL LOG													DATE				
LOCATION				CCT AND UNIT				DZ/LZ CONTROL OFFICER AND UNIT				DROP ZONE SAFETY OFFICER AND UNIT					
LEGEND																	
AH-Airland (Heavy) AL-Airland CD-CDS/CRL/CRS GM-GMRS				HE - Heavy Equipment HO - HALO/HAHO IL - Inverted "L"				LS-Instrument Landing System PE-Personnel RB-Radar Beacon Drop				SCORE METHOD M - Measured P - Paced E - Estimated					
LINE NO	TYPE ACFT	UNIT	CALL SIGN	TYPE MSN	ETA	ATA		STRIKE REPORT		LZ		SURF WIND	SCORE METHOD	MEAN EFFECTIVE WIND			REMARKS
						ATD	YDS	CLOCK	S	U	TIME			ALT	DIR & VEL		
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AF IMT 4304, 20020903, V1 REPLACES AMC 168, DEC 92

Figure 2.

Computed Air Release Point Drop Zones

The DZSTL and DZ party marks the PI on the DZ, and the aircraft navigator computes the release point from the air.

The primary means of marking the point of impact for daytime is the raised angle marker (RAM)

The Ram will be aligned into the aircraft line of flight with the base placed at the PI

For night time operations markings will consist of a code letter at the PI. One flanker light will be placed 250 meters to the left and one 250 meters to the right of the PI, and an amber rotating beacon. The (for night drops only) amber rotating beacon is placed a minimum of 1000 meters from the PI or at the trailing edge of the surveyed DZ whichever is closer to the PI (normally on DZ centerlines).

For DZ identification/authentication, one and only one, of the point of impact lights may be covered with a green or blue filter. The particular color and position of the colored light will be used for DZ identification. This identification must be agreed upon by the planning staff and pre-coordinated with the aircrew. *** Example: A drop zone marked with a NATO Code Letter, with a green light at the top, could be used to authenticate a particular personnel drop zone for a specific mission. ***

A circular/random approach drop zone is one that does not have a set drop heading. Therefore, the aircraft can approach the drop zone from any direction. When mission requirements dictate the use of circular or random approach DZs, the **MISSION COMMANDER** will notify the aircrew and the **DROP ZONE COMMANDER** of drop heading to be used at least 24 hours in advance.

For circular or random approach drop zones the authorized shape designator is the same as for rectangular DZs.

NOTE: Circular/random approach drop zones will be used during VMC operations only.

For other than CDS drops, smoke, if used, will be displayed next to and down wind of the RAM.

NATO Combined Exercise Markings

The primary means of marking the point of impact for daytime is the RAM. A code letter may be used to supplement the RAM when it is necessary to provide authentication and/or to differentiate between DZs within the same local area.

These code letters will form a block letter. A minimum of 9 panels will be used to form a block letter for day time operations with a minimum size of 35 feet by 35 feet (refer to figure 6). For night time operations a minimum of 9 omni-directional white lights will be used to form the block type code letter. Night code letters are a minimum of 35 feet by 35 feet. The authorized code letters for use on rectangular DZs are J, C, A, R and S. For circular or random approach drop zones the authorized code letters are H and O. A circular/random approach drop zone is one that does not have a pre- determined drop heading. Therefore, the aircraft can approach the drop zone from any direction. The PI markings are the only markings required on a circular CARP drop zone.

Smoke, other than red, may be displayed adjacent to and downwind side of the RAM/letter identifier to assist in visual acquisition of the DZ and to indicate the surface wind direction. For daytime operations either side of the VS-17 panels may be used. Whatever color best contrasts with the surrounding environment.

NOTE: The panels in the block code letter are not elevated.

Nine is only the minimum number of panel and lights; you may use more if available. *** For example, the Romeo will not be very distinct using only nine lights. This could be important if you are using the code letters for authentication purposes. ***

When mission requirements dictate, the random PI placement option may be used. In this option, the mission commander will notify the DZC at least 24 hours in advance that the random PI placement is to be used. When the DZ is set up the DZC will randomly select a point on the DZ and establish that point as the PI for the drop. The DZC will ensure that the DZ minimum size requirements for the load being dropped are met and that the entire DZ falls within the surveyed boundaries. The **MISSION COMMANDER** or **SUPPORTING FORCE COMMANDER** may also request that the DZ be set up with the PI at a specific point on the DZ. These requests must also be made at least 24 hours in advance. The requester will either ensure the minimum DZ size criteria is met for the type of load being dropped and the entire DZ falls within the surveyed boundaries or accepts responsibility for the drop if they do not. Both of these procedures will be used during VMC operations only. Mission planners will insure requests for these types of operations are consolidated to prevent more than two PI location changes on one DZ during a mission or operation.

For CDS, the visual acquisition signals will normally be displayed on DZ centerline, 150 yards/137 meters short of the intended PI.

On small CDS DZs where obstacles may prevent timely visual acquisition by the aircrew, the visual signals may be displayed at the trailing edge of the DZ on centerline or at another location on the DZ. If this option is exercised, the DZC must insure that all participating air crews are thoroughly briefed on the change in location.

CARP DZ Sizes (Refer to figure 3).

Peacetime requirements: Computed Air Release Point

CARP DZs for one jumper will be a minimum of 600 yards by 600 yards. Add 75 yards to the length for each additional jumper.

CARP DZs for the Container Delivery System (CDS) can be found in AFI 13-217.

CARP DZs for heavy equipment will be a minimum of 600 yards wide and 1000 yards long for one platform. If utilizing a C-130, add 400 yards to the length for each additional platform. If utilizing a C-17 add 500 yards to the length for each additional platform.

If using more than one aircraft not in trail formation, add 100 yards to the width of all CARP DZs

From official sunset to sunrise, add 100 yards to the length and width of all CARP DZs.

NOTE: To convert yards to meters, multiply yards by .9144 to convert meters to yards, divide meters by .9144

ALTITUDE (AGL)	WIDTH (NOTE 1, OR C-17 NOTE 3)	LENGTH (NOTE 2)	
PERSONNEL (Static Line)			
To 1000 ft	600 yds / 549 m	1 Parachutist	600 yds / 549 m
		Additional Parachutist	Add 75 yds / 69 m to the trail edge for each additional parachutist. (PI for ST/ Pararescue personnel)
Above 1000 ft of	Add 30 yds / 28 m to width and length for each 100 ft above 1000 ft. (Add 15 ft / 14 m to each side of DZ, 15 yds / 13 m to each end.)		
HEAVY EQUIPMENT			
To 1100 ft	600 yds / 549 m	1 Platform	1000 yds / 915 m
		Additional Platforms	Add 400 yds / 366 m (C-130), 500 yds / 457 m (C-17/C-5) to the trail edge for each additional platform
Above 1100 ft.	Add 30 yds / 28 m to width and length for each 100 ft above 1100 ft. (Add 15 ft / 14 m to each side of DZ, 15 yds / 13 m to each end.)		
<p>Note: 1 (N/A for AFSOC assigned / gained, aircraft OPCON to USSOCOM, or theater special operations command):</p> <ul style="list-style-type: none"> a. For day visual formations increase width by 100 yds / 92 m (50 yds / 46 m on each side) b. For C-130 SKE AWADS formation, increase width by 400 yds / 366 m (200 yds / 184 m on each side) c. At night increase width by 100 yds / 92 m for single ship visual drops (50 yds / 46 m on each side) or 200 yds / 184 m for visual formations (100 yds / 92 m on each side) <p>Note: 2 (N/A for AFSOC assigned / gained, aircraft OPCON to USSOCOM, or theater special operations command):</p> <ul style="list-style-type: none"> a. At night increase width by 100 yds / 92 m for single ship visual drops (50 yds / 46 m on each side) (N?A for C-17 doing GPS drops.) <p>Note: 3 C-17 DZ width adjustments (more that one may be required)</p> <ul style="list-style-type: none"> a. For visual formations (day or night) increase width by 100 yds / 92 m (50 yds / 46 m on each side) b. For night pilot directed airdrops, increase width an additional 100 yds / 92 m (50 yds / 46 m on each side) (Does not apply to aircraft performing GPS Drops.) c. For SKE HE / CDS formations minimum DZ basic width using center PI's is 1240 yds for 2 ship elements and 1800 yds for 3 ship elements. When using offset PI's minimum basic width is 1100 yds for 2 ship elements and 1300 for 3 ship elements. 			

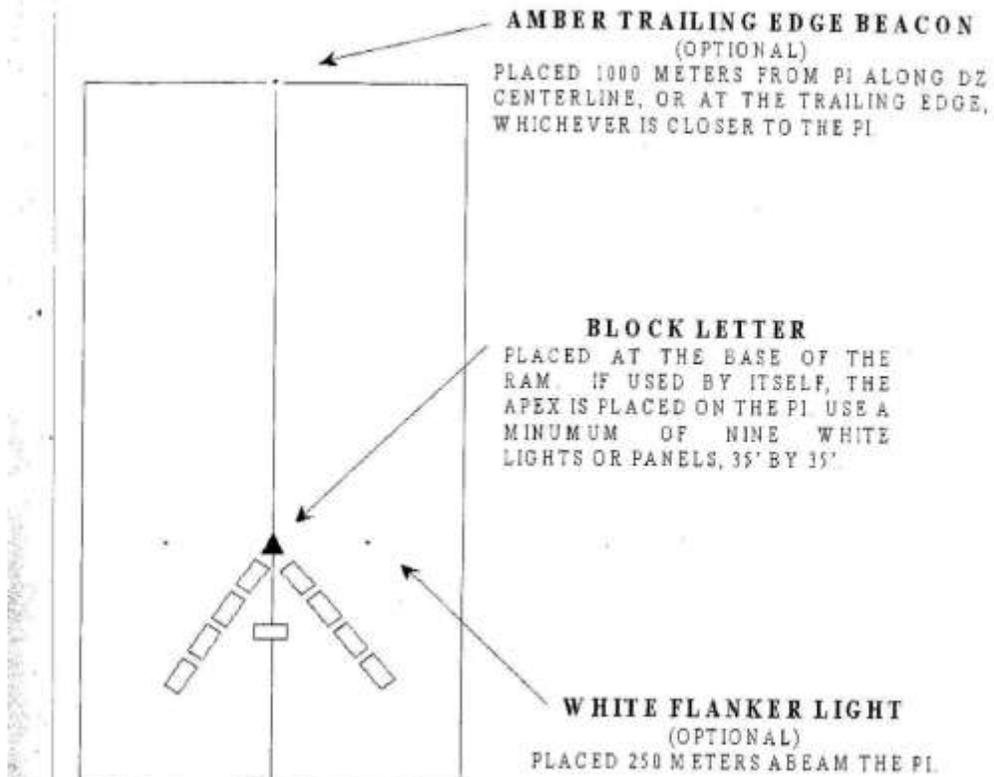
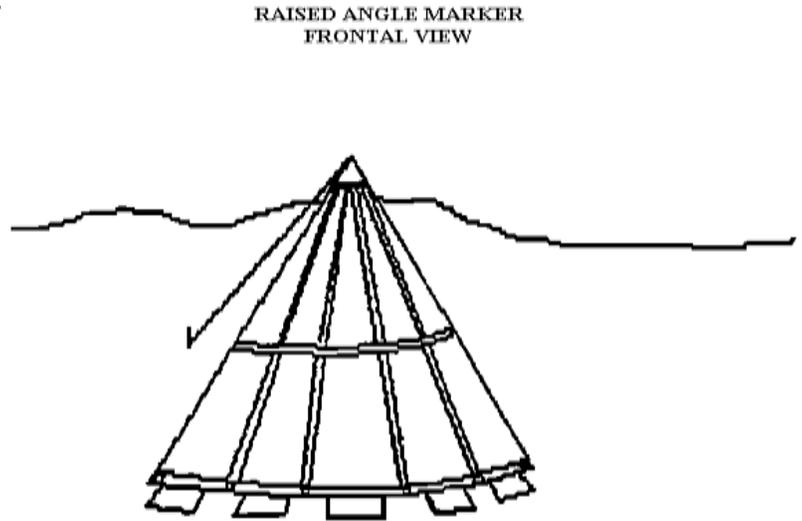
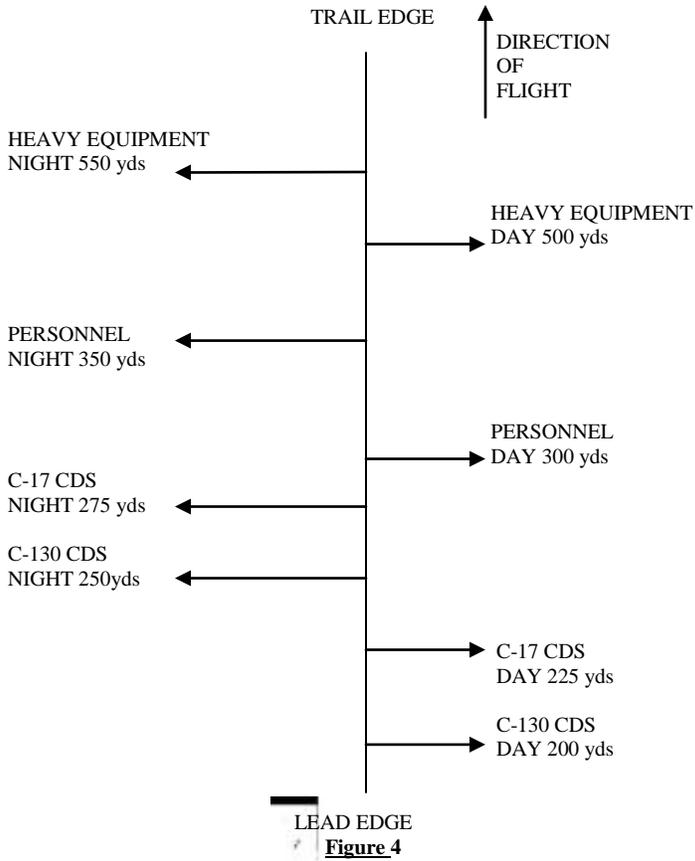
Figure 3.

Point of Impact Locations (Refer to figure 4).

For C-130 CDS drops, the PI will be a minimum of 200 yards from the leading edge of the drop zone and centerline, 250 yards at night. C-17 CDS drops will be a minimum of 225 yards from the leading edge and centerline, 275 yards at night.

For personnel drops (C-130, C-17) the PI will be a minimum of 300 yards from the leading edge of the drop zone and centerline, 350 yards at night.

For heavy equipment drops the PI will be a minimum of 500 yards from the leading edge of the drop zone and centerline, 550 yards at night.



The added acronyms are as follows:

CRS - Containerized Release System

HAHO - High Altitude High Opening

CRRC - Combat Rubber Raiding Craft

HSLADS - High Speed Low Level Aerial Delivery System

NOTE: Zone markers are used in conjunction with AWADS drops. This is considered part of the DZSTL's secondary mission.

Control Center Locations (CARP DZs)

The control center is the location where the DZSTL will control and observe the airborne operation. This is one of the locations where wind readings are taken. The DZSTL should have all radios, signaling devices, and appropriate forms positioned at the control center.

The location of the control center will be determined by the type of mission.

For personnel drops the control center will be located at the PI

For CDS drops the control center will be located 200 yards to the 6 o'clock position of the PI.

For free drops, heavy equipment, and AWADS with a ceiling of less than 600 feet the control center will be located off the drop zone. However, it should be located so that the approaching aircraft can be observed along with the PI. For example the leading edge may be a poor location due to obstruction by the wood line.

No Drop Signals/Mission Cancellation Signals

No drop signals: the lack of a code letter, red smoke, red flares, red beam from a B-2 light gun, or any other pre-coordinated signal on the DZ indicates a NO DROP condition. Communication security permitting, these visual signals are confirmed by radio communication to the aircraft.

The drop aircraft should continue to do racetracks until a signal for clearance to drop is given. A no drop may be given when winds exceed the maximum limitations for that type of drop, when there are vehicles moving on the drop zone, or any other unsafe act is observed on the drop zone. In pre-coordination it should be determined how many NO DROP passes the aircraft will fly until the mission is canceled and the aircraft begin to return to base.

To signal a mission cancellation to the aircraft, form VS-17 panels into a block X, scramble the code letter, remove the markings or any other pre-coordination signal on the drop zone.

Signals for clear to drop should be covered also. Unless radio communications are specifically required, any pre-coordinated markings, other than red smoke, flares, or lights displaced on the DZ indicate clearance to drop.

DZST Equipment Familiarization

AN/PMQ 3A (anemometer): This is a calibrated, hand held wind measuring device, used for measuring ground wind. Oriented correctly, it will give wind direction in degrees, by pressing the trigger. It is capable of reading the wind from 0 to 15 knots on the low scale and from 0 to 60 knots on the high scale. Select High or low using the High/Low selector switch. The anemometer must be calibrated every six months.
NSN: 6660-00-515-4339

Turbo Meter: This is an electronic wind speed indicator. It provides wind speed accurately, and is pocket size for convenience. The turbo meter has four scales which are displayed on a three digit light Emitting Diode display. The scales are knots per hour, feet per second, meters per second, and miles per hour. For best results, keep axis of turbo meter within 20 degrees of the direction of wind.
NSN: 1670-00-T33-900

Amber Rotating Beacon: Electric driven light which provides amber rotating light for trail edge marker on a night CARP drop zone.
NSN: Local purchase item.

VS-17 Marker Panel Aerial: Two sided panel. One side is fluorescent orange, sometimes referred to as international orange. The other side is cerise or commonly referred to as red. The panel is 2 feet wide and 6 feet long. It has six tie down points used to attach the panel to stakes. It also has three snap fasteners on the short ends in the stow pocket. It should be folded up so the olive drab (OD) green is showing. The color of the panel used should best contrast the surrounding area.
NSN: 8345-00-174-6865

Light, Marker, Ground Obstruction: Also known as the beanbag light. It is powered by one BA-200. The color of the light can be changed with the use of interchangeable colored plastic domes. These can be used in light holes or on the surface, secured with tent pegs, or by filling the bottom with sand or rocks.
NSN: 6230-00-115-9996

Whelen Light: Named after the Whelen Corporation which manufactured the light. It is powered by either the BA-4368 or the lithium battery used in the PRC-77 radios. The light is placed on top of the battery and is ready for operation. The color of the light can be changed with different colored domes.
NSN: Local purchase item

M-2 Light Baton: A flashlight powered by 2 BA-30's. The color of the light can be changed with different lenses that are stored in the base compartment of the light. This light is used in light holes or on top of the ground attached to a tent peg.
NSN: 6230-00-926-4331

Aerial, Marker, Distress: An omni-directional flashing (strobe) light. This has a very far range. A directional cover can snap on the top for the stealth operator. Colors can be changed with snap on caps. The strobe light also has infrared (IR) capabilities.
NSN: 6230-00--67-5209

Mirror, Emergency signaling, type II: The signal mirror when used properly, can be used to signal aircraft by reflecting sunlight. There is a set of instructions on the back of the signal mirror for proper use and aiming. The signal mirror can still be used on hazy days. One misconception is that it can only be used when facing the sun. It can be used in all directions and can be seen as far as the horizon will go.
NSN: 6350-00-105-1252

SE-11 Light Gun: A long range directional visual signaling device used to signal aircraft to mark the release point on the drop zone. It is powered by 5 BA-30's and can be set up for remote operations. It has a red cap/lens, normally used as a no drop signal.
Light, Traffic Air B-2 replaces SE-11
NSN: 6210-00-578-6754

Pilot Balloon: the piball is a ten or thirty gram rubber balloon that, when filled with helium to the specified circumference is used to measure the mean effective wind which is the average wind from the ground to drop altitude.
NSN: Balloon Meteorological 10 Gram 6660-00-663-7933
Balloon Meteorological 30 Gram 6660-00-663-8159
10 gram 57 inch day, 74 inch night
30 gram 78 inch day, 94 inch night

Lighting Unit (Piball): This light is attached to the piball for night operations. The piball is inflated to a greater dimension to compensate for the weight of the light so that the same ascension rate is achieved. The piball light has a wet cell battery that is activated by water, or fluid. When temperatures fall below 50 degrees the piball light activates faster by using warm water.
NSN: 6660-00-839-4927

Drift Scale: Slide type scale that uses a 90 degree angle to measure the ascent of the piball for determining the mean effective wind.
NSN: Locally produced by TASC (a protractor with a string through the center with a weight can be used). Also for this purpose, the Thedolite, NSN 6675-00-861-7939, Pocket Transit (with built in clinometer) NSN 6675-00-641-5735, and the Clinometer, NSN 6675-00-313-9730

AN/PRC-119: Frequency modulation of FM man portable radio used for contacting the aircraft with FM communication capabilities. This radio can also be used for Navaid with aircraft that have FM homing capabilities. It has a range of 4 to 16 kilometers without power increasing accessories.

PRC-113: Is a man portable UHF/VHF AM and has quick jam resistant electronic counter-countermeasures (ECCM) transceiver. Designed for short range (5 to 15 miles) tactical ground to ground or ground to air communications.

DZST GUIDE TO REFERENCES:

- AFI 13-217
- AFI 11-231
- AFI 11-2c130 Volume 1
- AFI 11-2c141 Volume 1
- FM 3-21.220
- FM 3-21.38
- TC 31-24
- Memorandum of agreement, Airdrop operations without combat control teams (CCTs), dated 27 June 1987

10-GRAM HELIUM BALLOON

Inflate balloon to 57-inch circumference for day and 74-inch circumference for night.

		DROP ALTITUDE IN FEET											ASCENSION TABLE		
		500	750	1000	1250	1500	1750	2000	2500	3000	3500	4000	4500	TIME	ALT (FT)
ELEVATION ANGLE	70	02	02	01	01	01	01	01	01	01	01	01	01		
	60	03	02	02	02	02	02	02	02	02	02	02	02		
	55	03	03	03	03	03	03	03	03	03	03	03	03		
	50	04	04	03	03	03	03	03	03	03	03	03	03	0:10	80
	45	05	04	04	04	04	04	04	04	04	04	04	04	0:20	170
	40	06	05	05	05	05	05	05	04	04	04	04	04	0:30	250
	35	07	06	06	06	06	05	05	05	05	05	05	05	0:40	330
	30	08	07	07	07	07	07	07	07	06	06	06	06	0:50	400
	25	10	09	09	09	08	08	08	08	08	08	08	08	1:02	500
	24	11	10	09	09	09	09	08	08	08	08	08	08	1:10	540
	23	11	10	10	09	09	09	09	08	08	08	08	08	1:20	610
	22	12	11	10	10	10	10	09	09	09	09	09	09	1:30	670
	21	12	11	11	10	10	10	10	10	10	10	10	10	1:43	750
	20	13	12	11	11	11	11	11	10	10	10	10	10	1:50	790
	19	14	13	12	12	11	11	11	11	11	11	11	11	2:25	1000
	18	15	13	13	12	12	12	12	12	11	11	11	11	2:44	1100
	17	16	14	13	13	13	13	12	12	12	12	12	12	3:05	1250
	16	17	15	14	14	14	13	13	13	13	13	13	13	3:49	1500
	15	18	16	15	15	14	14	14	14	14	14	14	14	4:30	1750
	14	19	17	16	16	16	15	15	15	15	15	15	15	5:11	2000
13	21	19	18	17	17	17	17	17	17	17	17	17	6:34	2500	
12	22	20	19	19	18	18	18	18	17	17	17	17	7:58	3000	
11	24	22	21	21	20	20	20	19	19	19	19	19	9:22	3500	
10	27	25	23	23	22	22	22	21	21	21	21	21	10:44	4000	
09	30	27	26	26	25	24	24	24	23	23	23	23	12:08	4500	

30-GRAM HELIUM BALLOON

Inflate balloon to 75-inch circumference for day and 94-inch circumference for night.

		DROP ALTITUDE IN FEET											ASCENSION TABLE		
		500	750	1000	1250	1500	1750	2000	2500	3000	3500	4000	4500	TIME	ALT (FT)
ELEVATION ANGLE	80	01	01	01	01	01	01	01	01	01	01	01	01		
	70	03	03	03	02	02	02	02	02	02	02	02	02		
	60	04	04	04	04	04	04	04	04	04	04	04	04		
	55	05	05	05	05	05	05	05	05	05	05	04	04	0:10	120
	50	06	06	06	06	06	06	06	06	05	05	05	05	0:20	240
	45	07	07	07	07	07	07	07	07	07	06	06	06	0:30	360
	40	09	08	08	08	08	08	08	08	08	08	08	08	0:42	500
	35	10	10	10	10	10	10	10	09	09	09	09	09	0:50	600
	30	12	12	12	12	12	12	12	11	11	11	11	11	1:02	750
	25	15	15	15	15	15	15	14	14	14	14	14	14	1:10	830
	24	16	16	15	15	15	15	14	14	14	14	14	14	1:17	1000
	23	17	17	16	16	16	16	15	15	15	15	15	15	1:48	1250
	22	18	18	17	17	17	17	17	16	16	16	16	16	2:10	1500
	21	19	19	18	18	18	18	17	17	17	17	17	17	2:34	1750
	20	20	20	19	19	19	19	18	18	18	18	18	17	2:56	2000
	19	21	20	20	20	20	20	19	19	19	19	19	18	3:43	2500
	18	22	22	21	21	21	21	21	20	20	20	20	20	4:31	3000
	17	23	23	23	22	22	22	22	22	21	21	21	21	5:21	3500
	16	25	25	24	24	24	24	23	23	23	23	22	22	6:09	4000
	15	27	27	26	26	25	25	25	25	24	24	24	24	7:00	4500
14	29	29	28	27	27	27	27	27	26	26	26	25			
13	31	30	30	30	30	29	29	29	28	28	28	27			

When transmitting the wind to the aircraft, make sure that it is identified as the "mean effective wind" or "surface wind." If transmitting the MEW include the altitude to which it was taken in your transmission. Any indication of erratic winds or wind shears should be reported at this time.

Phraseology for MEW: "Lifter one-six, mean effective wind to one-thousand feet, three-five-zero at one-nine."

Phraseology for surface wind: "Lifter one-six, surface wind three-six-zero at seven."

If surface wind is three knots or less it will be broadcast as "wind calm."

Phraseology for no surface wind: "Lifter one-six, wind calm, clear to drop."

Phraseology for surface wind and MEW: "Lifter one-six, surface wind three-six-zero at seven and mean effective wind to eight-hundred feet, three-five-one at one-three."

Note: The MEW speed has NO influence on no-drop situations. Only the surface wind will determine whether a no-drop is applicable.

When transmitting the wind to the aircraft, make sure that it is identified as the "mean effective wind" or "surface wind." If transmitting the MEW include the altitude to which it was taken in your transmission. Any indication of erratic winds or wind shears should be reported at this time.

Phraseology for MEW: "Lifter one-six, mean effective wind to one-thousand feet, three-five-zero at one-nine."

Phraseology for surface wind: "Lifter one-six, surface wind three-six-zero at seven."

If surface wind is three knots or less it will be broadcast as "wind calm."

Phraseology for no surface wind: "Lifter one-six, wind calm, clear to drop."

Phraseology for surface wind and MEW: "Lifter one-six, surface wind three-six-zero at seven and mean effective wind to eight-hundred feet, three-five-one at one-three."

Note: The MEW speed has NO influence on no-drop situations. Only the surface wind will determine whether a no-drop is applicable.

CARP DROP ZONE

Personnel

	600 yds length X	600 yds width	
Night	+100	+100	
Altitude	+ 30	+ 30	planning altitude 1000 ft add 30 yds per 100 ft over
Not in trail	- 0 -	+ 100	
Additional Jumpers	+ 75	- 0 -	per additional jumper

Heavy Equipment

	1000 yds length X	600 yds width	
Night	+100	+100	
Altitude	+ 30	+ 30	planning altitude 1100 ft add 30 yds per 100 ft over
Not in trail	- 0 -	+ 100	
Additional platforms	+ 400 (C-130) or + 500 (C-17)		per additional platforms

Alternate Door Exiting Procedures for Training (ADEPT)

ADEPT option 1	½ total jumpers, minus 1
ADEPT option 2	total jumpers, minus 1
Mass Exit	½ total jumpers

Point of Impact (PI) Location

PE	▶ Day - centerline, 300 yds from the lead edge Night - 350 yds
CDS	▶ C-130 Day - centerline, 200 yds from the lead edge Night - 250 yds C-17 Day - centerline, 225 yds from the lead edge Night - 275 yds
HE	▶ Day - centerline, 500 yds from the lead edge Night - 550 yds

Drop Zone Control Center

PE	▶ at the PI
CDS	▶ 200 yds from the PI to the 6 o'clock
HE, AWADS or Free Drop	– off the drop zone at the best vantage point