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SECRETARY OF THE AIR FORCE

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Flying Operations

C-130 MODULAR AERIAL SPRAY SYSTEM (MASS) PROCEDURES

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This instruction implements Air Force Policy Directive (AFPD) 11-2, *Aircrew Operations* and references Air Force Instruction (AFI) 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, AFI 11-202 Volume 3, *General Flight Rules*, and AFMAN 11-2C-130 Volume 3, *C-130 Operations Procedures*. This is a specialized publication intended for use by Airmen who have graduated from technical training related to this publication. It establishes procedures and guidance for the MASS units to safely and successfully accomplish the worldwide MASS missions. This instruction applies to the 910th Air Force Reserve (AFRC) Wing and any other Regular Air Force, Air National Guard or AFRC individuals or units who become involved with MASS missions. This publication may be supplemented at any level, but all supplements must be routed to the Office of Primary Responsibility (OPR) of this publication for coordination prior to certification and approval." or "This publication may not be supplemented or further implemented/extended. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, Publications and Forms Management, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Disposition Schedule (RDS) in the Air Force Records Information Management System (AFRIMS). This publication requires the collection and or maintenance of information protected by Title 5 United States Code (USC) Section 552a, *The Privacy Act (PA) of 1974*. The

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Chapter 1

POLICY

1.1. Sound Judgment. These procedures provide guidance to plan and execute Modular Aerial Spray System (MASS) missions. Instructions in this AFMAN are mandatory and intended to provide the best possible operating procedures across a wide range of circumstances, but cannot account for every possible situation a crewmember may encounter during a MASS mission. Planners and aircrew must use sound judgment and operational risk management to manage unique mission demands.

1.1.1. **General.** MASS consists of a palletized 2,000 gallon, liquid dispersal, three-module unit with a full range (one-quarter ounce to 45 gallons per acre) flow rate capability equipped with the 463L dual rail cargo handling system and modified by T.O. 1C-130-1253 to accept the MASS. DoD-directed missions requiring fixed-wing aerial spray operations. The term "MASS" is used as a generic term which includes all operations relating to the deployment, employment and redeployment of the MASS. Aerial spray operations encompass controlling arthropod pests of medical importance (i.e. vectors of disease), vegetation pests, vegetation, the dispersal of oil, and testing of new aerial spray procedures, pesticides, materials, and/or equipment.

1.2. Deviations. Do not deviate from policies in this AFMAN except when the situation demands immediate action to ensure safety. **(T-1).** The Pilot in Command (PIC) is vested with ultimate mission authority and responsible for each course of action they choose to take.

1.2.1. The PIC shall report deviations or exceptions taken without a waiver to their Major Command (MAJCOM) Standardization and Evaluation. All deviations and exceptions taken shall be reported in the Daily Situation Report (SITREP).

1.3. Annexes. Annexes to this addendum are applicable to and will be issued to those aerial spray certified crew positions as designated in the current Flight Crew Bulletin (FCB). Annexes are identified as supporting instructions Addenda C checklists (CL). The FCB will further delineate which of the issued annexes must be carried on flights. Supporting instructions and/or guides may be posted in the Flight Crew Checklist outside of the official blue binder pages.

1.4. Improvement Recommendations . Send comments and suggested improvements to this instruction on an AF Form 847, *Recommendation for Change of Publication*, through channels to HQ AMC/A3V, 402 Scott Drive Unit 3A1, Scott AFB IL, 62225-5302 or post to the Air Mobility Command Change of Publication 847 CENTRAL SHAREPOINT® site: **https://cs1.eis.af.mil/sites/amcedc/SitePages/847%20Central.aspx**.

Chapter 2

COMMAND AND CONTROL

2.1. General. Operational control of aerial spray missions is outlined in AFRCI 11-1074, *AFRC Aerial Spray Operations*. The installation, area, or on scene commander is responsible for the aerial spray mission. Aerial spray missions will comply with: **(T-0).**

2.1.1. DODI 4150.7, DOD Pest Management Program

2.1.2. AFI 11-202V3, General Flight Rules

2.1.3. AFMAN 11-2C-130V3, C-130 Operations Procedures

2.1.4. AFMAN 11-2C-130V3Add A, C-130 Operations Configurations/Mission Planning

2.1.5. AFJI 11-204, Operational Procedures for Aircraft Carrying Hazardous Materials

2.1.6. AFI 31-101, AF Installation Security Program, AFRC Sup 1Integrated Defense

2.1.7. AFI 32-1053, Integrated Pest Management Program

2.1.8. AFI 32-1074, Aerial Application of Pesticides

2.1.9. AFRCI 10-204, AF Reserve Exercise and Deployment Program

2.1.10. AFRCI 11-201, Flight Information Publications Flying Operations

2.1.11. AFRCI 11-1074, AFRC Aerial Spray Operations

2.1.12. AFFSA AFRC Waiver to AFI 11-202V3

2.1.13. CFR 137

2.2. Mission Commander.

2.2.1. An aerial spray-certified mission commander will be designated by the 757 AS/CC for all aerial spray missions. **(T-3).** The mission commander is responsible for the safe and efficient execution of the aerial spray mission.

2.2.1.1. Unilateral Training: Mission commander will normally be highly experienced spray aircraft commander, navigator, or certified pest management professional (CPMP) designated by the 757AS/CC. **(T-3).**

2.2.1.2. Other than Unilateral Training: The mission commander will be an experienced rated spray certified aircraft commander or navigator designated by the 757 AS/CC. **(T-3).**

Chapter 3

DEPLOYMENT

3.1. Pre-Mission Actions. 757 AS/DOS (Chief of Spray or Division of Aerial Spray representative) will coordinate mission requirements with the mission commander, the user, and aerial spray maintenance. **(T-3).** Mission requirements will be coordinated with 910th Current Operations, AFRC, and Air Forces Northern Command (AFNORTH) agencies as required. **(T-3).**

3.2. 757 AS/DOS will:

3.2.1. Schedule crew members for aerial spray missions. Coordination will be maintained between the 757AS/DOS and the squadron section schedulers to ensure all aspects of training needs (i.e. tactical, local proficiency, and aerial spray training) are identified and reviewed to maximize unit training needs. **(T-3).**

3.2.2. Generate an operational mission plan for each deployed mission. The operational mission plan will include, but not be limited to, the following information: mission personnel by name, planned sequence of events, required deployment equipment, spray configuration and parameters, details of deployed installation maintenance and pesticide support, entomological details, pertinent radio frequencies, and appropriate telephone numbers. **(T-3).** The plan for actual pesticide missions will be coordinated with 757 AS/DO or higher for approval. **(T-3).** A Concept of Operations will be forwarded to AFRC Current Operations after approval by 757AS/DOS (Chief of Spray) or higher. **(T-3).** Training mission plans may be modified by the mission commander as required.

3.3. Mission Commander (MC) will:

3.3.1. Confirm operational requirements, data, and contingencies of the mission with the CPMP and the user, and relay this information to the aircrew. **(T-3).**

3.3.2. Confirm forecast airspace usage, weather, and Notice to Airman (NOTAM) requirements with the user installation/target and appropriate agencies. **(T-3).**

3.3.3. Report mission progress at the end of each day's operations to AFRC and/or AFNORTH as appropriate. **(T-3).**

3.3.4. Coordinate with CPMP and AFNORTH designated representative during contingency aerial spray missions for all operational requirements and provide mission progress through daily SITREP. **(T-3).**

3.3.5. Ensure all post spray documentation and data is returned to the aerial spray office for record keeping. **(T-3).**

3.4. Certified Pest Management Professional (CPMP) will (as required):

3.4.1. Determine MASS configuration, type of chemical and diluents in coordination with user, application rate and altitude, number and type of nozzles, nozzle configuration, swath width, optimum swath orientation, total acreage and time of application. **(T-3).**

3.4.2. In conjunction with the mission commander, identify weather parameters, pesticide quantity, pesticide load time, and total spray sorties required. **(T-3).**

3.4.3. Ensure the actual flow rate of the MASS is calibrated to within ten percent of the desired flow rate. **(T-3).**

3.4.4. Ensure environmental documentation has been accomplished including but not limited to a validated statement of need, environmental assessment, and National Pollution Discharge Permit. **(T-3).**

3.4.5. Ensure all appropriate aerial spray publications are taken on the deployment. These publications will include: AFI 32-1074, FAR Part 137, Chemical Material Safety Data Sheet (MSDS), AFRCI 11-1074, AFRC Aerial Spray Operations, Oil Spill MOA, and the current pesticide label as required. **(T-3).**

3.4.6. Ensure the Crash/Fire/Rescue supervisor and nearest hospital emergency room supervisor are briefed on the type and quantity of chemical(s) being employed. Confirm the availability of appropriate antidotes in case of exposure. **(T-3).**

3.4.7. Ensure a safety briefing is provided and a MSDS is available to all personnel before the handling of any chemicals for all aerial spray missions. **(T-3).**

3.4.8. Hold the appropriate DoD pesticide application certification (Category 11) and state certification where appropriate. **(T-3).**

3.5. The aerial spray pilots will:

3.5.1. In coordination with CPMP and mission commander, review weather, make weather decision, and complete all planning materials necessary for mission accomplishment. **(T-3).**

3.5.2. Assist the CPMP in determining the total acreage to be sprayed and amount of chemical necessary to complete the planned mission for each day's operation. **(T-3).**

3.5.3. In coordination with the spray navigator, determine the number of swaths, amount of time on swath, spray pattern, and estimated time necessary to effectively spray planned area. **(T-3).**

3.5.4. Ensure time necessary to conduct operation will fit within the time limitations at the spray locations (i.e. Daytime available, range restrictions, etc). If planned treatment area will not fit adequately into the time limitations, develop the plan in coordination with the CPMP and MC to maximize the effective treatment area. **(T-3).**

3.6. The spray mission navigator will:

3.6.1. In coordination with CPMP compute total spray acreage, planned spray on time, and number of swaths required for spray area. **(T-3).**

3.6.2. Ensure availability of a master map depicting accurate area boundaries and environmentally sensitive areas. **(T-3).**

3.6.3. Identify any flight hazards or obstructions within 10 Nautical Miles (NM) of the planned spray swaths, area, or route of flight. **(T-3).**

3.6.4. Ensure all required Differential Global Positioning System (DGPS) equipment is onboard the aircraft and all required planning is completed for DGPS spray missions. **(T-3).**

3.7. The spray flight engineer will:

3.7.1. Check all aircraft maintenance forms to ensure the airplane has been properly configured with all required spray equipment (flight deck instrument panel modification, fuselage/wing booms, MASS, DGPS components, etc.) specific to the mission to be flown. **(T-3).**

3.7.2. Normally act as safety observer during the loading/ downloading of chemical(s) into/out of the aircraft. Consult aerial spray flight engineer's guide for guidance in performing safety observer duties. **(T-3).**

3.8. The aerial spray certified loadmasters will:

3.8.1. Compute calibration tables for the MASS. **(T-3).**

3.8.2. Ensure the maintenance safety equipment, personal protective kit, and related MASS equipment are adequate for the mission. **(T-3).**

3.8.3. May serve as safety observer during the loading/downloading of chemical(s) into/out of the aircraft. Consult aerial spray flight engineer's guide for guidance in performing safety observer duties. **(T-3).**

3.8.4. Will record spray flow rate, gallons dispensed, and boom pressure from each swath and ensure all data is recorded and passed to the aerial spray office at completion of mission. **(T-3).**

3.9. Aerial spray maintenance personnel will:

3.9.1. Check the MASS for leaks and, in conjunction with the CPMP and spray certified loadmasters, calibrate the MASS and. **(T-3).**

3.9.2. Configure the spray aircraft with the MASS and the appropriate booms, load/download the chemical (and diluent, if required) into/out of the MASS with CPMP/spray certified loadmasters coordination, and provide system maintenance and cleaning throughout the mission. **(T-3).**

3.9.3. Provide spill containment materials, spare parts kits for the mission, an in-flight spill kit, personal protective equipment for maintenance personnel, and safety equipment for the mission. **(T-3).**

3.9.4. Aerial spray maintenance personnel, if available, may substitute as safety observers for chemical loading, unloading, and ground flush and purge procedures. **(T-3).**

3.10. The safety observer will:

3.10.1. Establish a safety circle to encompass the aircraft extending ten feet out from the nose, tail, and each wingtip of the aircraft. **(T-3).**

3.10.2. Ensure that no personnel enter the safety circle without having donned appropriate personal protective equipment. **(T-3).**

3.10.3. Ensure that a safety vehicle is readily available during loading, downloading, calibrating, ground flushing, or ground purging of the MASS. **(T-3).**

Chapter 4

PRE-FLIGHT OPERATIONS

4.1. Crew Complement. The basic aircrew for actual pesticide non-contingency aerial spray missions consists of a pilot, copilot, navigator, flight engineer, and two spray certified loadmasters.

4.1.1. For spray training missions dispensing product, two spray certified loadmasters are required; with no MASS or not dispensing product, one spray certified loadmaster is required.

4.1.2. The basic aircrew for a combat contingency aerial spray mission consists of a pilot, copilot, navigator, flight engineer, and two spray certified loadmasters and a spray observer.

4.1.3. A CPMP will supervise spray operations as the certified applicator. The primary position for the CPMP is onboard during aerial spray operations involving pesticide applications. In the event that a spray area is entirely contained within DoD property and if adequate communication exists, the CPMP may supervise the application from the ground, with concurrence by the mission commander. **(T-3).**

4.1.4. All crewmembers performing aerial spray operations will be aerial spray certified or in aerial spray certification upgrade training under the direct supervision of an aerial spray certified instructor of a like crew position. Crewmembers non-current for MASS will regain currency in accordance with AFMAN 11-2C-130V1. **(T-1).**

4.1.5. Mission Essential Personnel (MEP). Due to the hazardous nature of the aerial spray mission, personnel other than members specifically required to accomplish the MASS mission or conduct required MASS training, will not fly on MASS aircraft when dispensing actual chemical. Additional aircrew members and mission essential personnel (MEP) may be approved to fly on non-chemical dispensing aerial spray training missions with 910 OG/CC authorization. As a minimum, they will accomplish appropriate life support training. Eligibility and authority for MEP's is specified in AFI 11-401, Aviation Management and AFRCI 11-1074 for AFRC Aerial Spray Operations. **(T-3).**

4.1.6. Distinguished Visitor (DV) flights will be IAW AFI 11-401.

4.1.7. OCONUS approval request will be IAW AFI 11-401.

4.2. Crew Duty and Crew Rest Limitations. Flight Duty Period for all aerial spray operations is limited to the first 12 hours of the duty day. Aircrew members must be off swath by the end of the 12th hour on duty. Non-spray flight activities may continue beyond 12 hours and are limited to standard flight duty day limitations per AFMAN 11-2C-130 V3. **(T-1).**

4.2.1. Consecutive Duty Day Limitations. During any 14 consecutive days, aerial spray personnel will be off duty for 2 full calendar days. Days off need not be consecutive. **(T-3).**

4.2.2. Safety will not be compromised at any time. The Aircraft Commander may terminate flying activities whenever crew fatigue or any other factor such as heat or visibility (shadows, smoke, thunderstorms etc.) is deemed unsafe to continue.

4.3. Mission Planning.

4.3.1. Flight Plan. The "Remarks" section of the flight plan (DD175, 1801, etc.) will specify: the geographical area to be sprayed; an altitude block in which the aerial spray mission will be conducted; the chemical/pesticide to be sprayed; and the agencies to notify concerning the mission in the event of an emergency (normally the hospital, fire department, and Hazardous Materials (HAZMAT) agency)**.**

4.3.2. Authorization. Actual chemical/pesticide operations will not begin until the following conditions are met: authorization is granted by the CPMP; the survey of the target area is complete; the wind direction and drift at spray dispersal altitude is determined; and the spray swath direction/chart is confirmed with the CPMP.

4.3.3. The survey of the target area will include confirmation of the boundary locations, the location of any environmentally sensitive, no-spray, no-fly areas, and the location of prominent natural and man-made features and hazards.

4.3.4. Swath Direction. Swath direction is coordinated with the CPMP and is determined by the type of application.

4.3.5. Offset. CPMP will recommend a drift offset based on wind speed and direction using data taken from environmental observation or computer model predictions. Offset constraints will be determined by the aircraft commander.

4.3.6. Spray Patterns. Normally a single or a double racetrack pattern will be utilized. The minimum recommended distance between swaths for a double racetrack pattern is 12,000 feet. A course-reversal pattern can be used to meet mission requirements. In all cases, every attempt will be made to ensure subsequent swaths are upwind, or a minimum of 10,000 feet downwind, from previous swaths to prevent the aircraft from flying through chemically saturated air. See **Figures 4.1- 4.8**. for Spray Pattern best practices.

4.3.7. Testing.

4.3.7.1. Protocol. An aerial spray CPMP will design and draft required testing protocols for missions designated primarily for the testing of new aerial spray procedures, pesticides, and/or equipment. Any protocols which affect the non-routine configuration or outputs of the MASS or spray booms will be coordinated with the Aerial Spray Maintenance Flight in order to ascertain the abilities and or capabilities of the Maintenance Flight and the MASS. **(T-3).**

4.3.7.2. Mission Plan**.** Chief of Spray will generate and coordinate an operational mission plan in accordance with **para 3.1.1.2** of this addenda for all missions designated as test missions.

Figure 4.1. Single Racetrack (profile view).

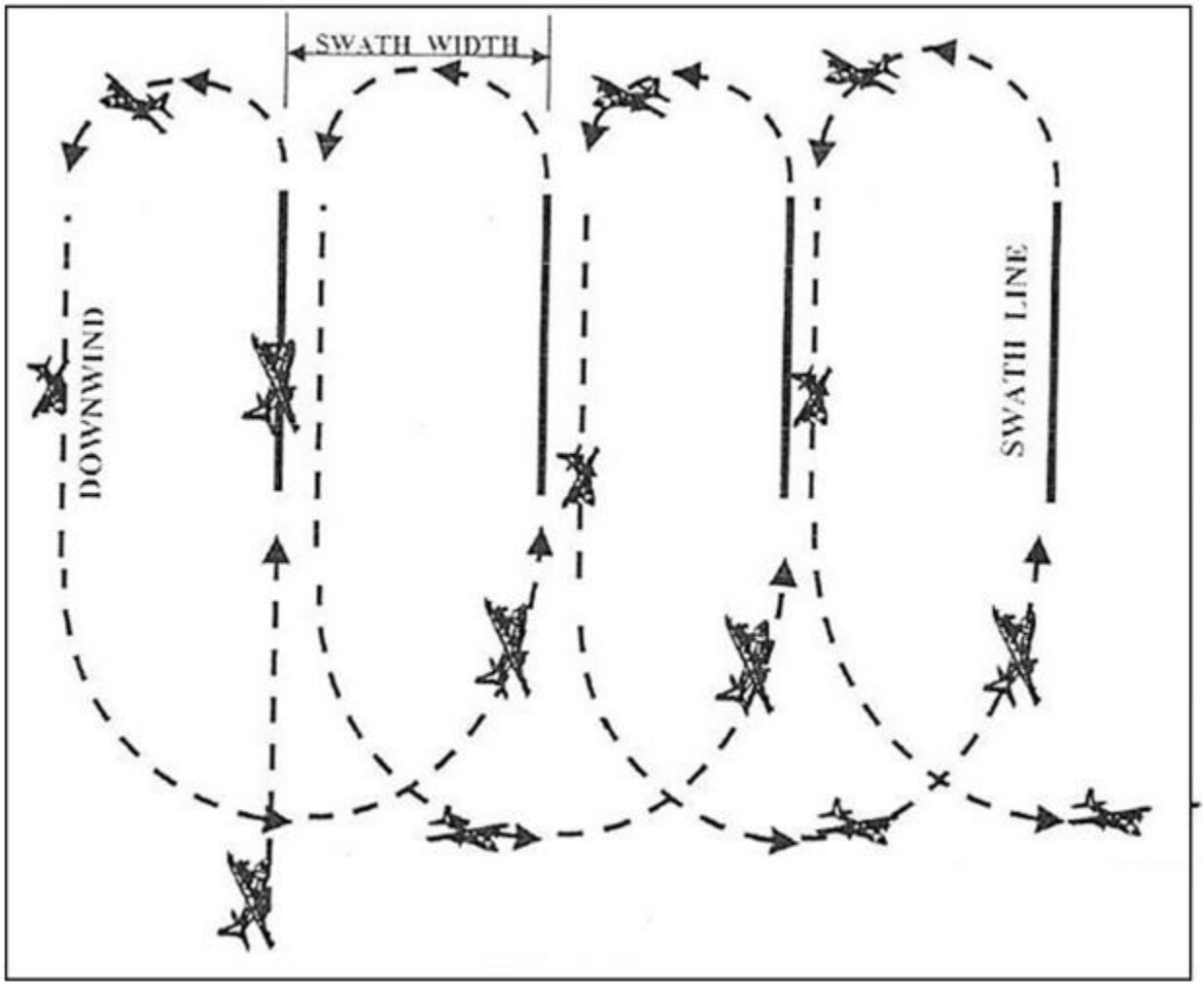


Figure 4.2. Single Racetrack (profile view).

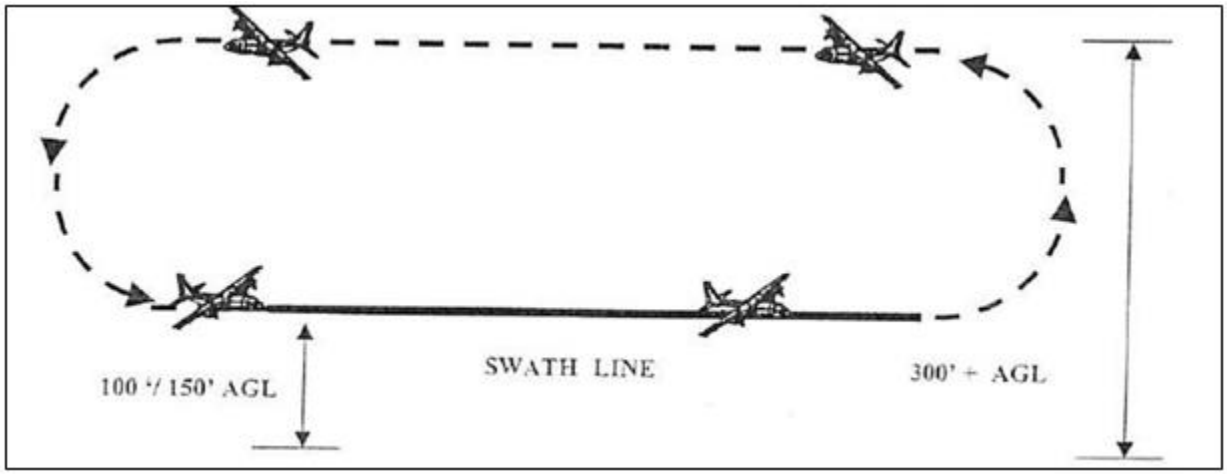


Figure 4.3. Double Racetrack (plan view).

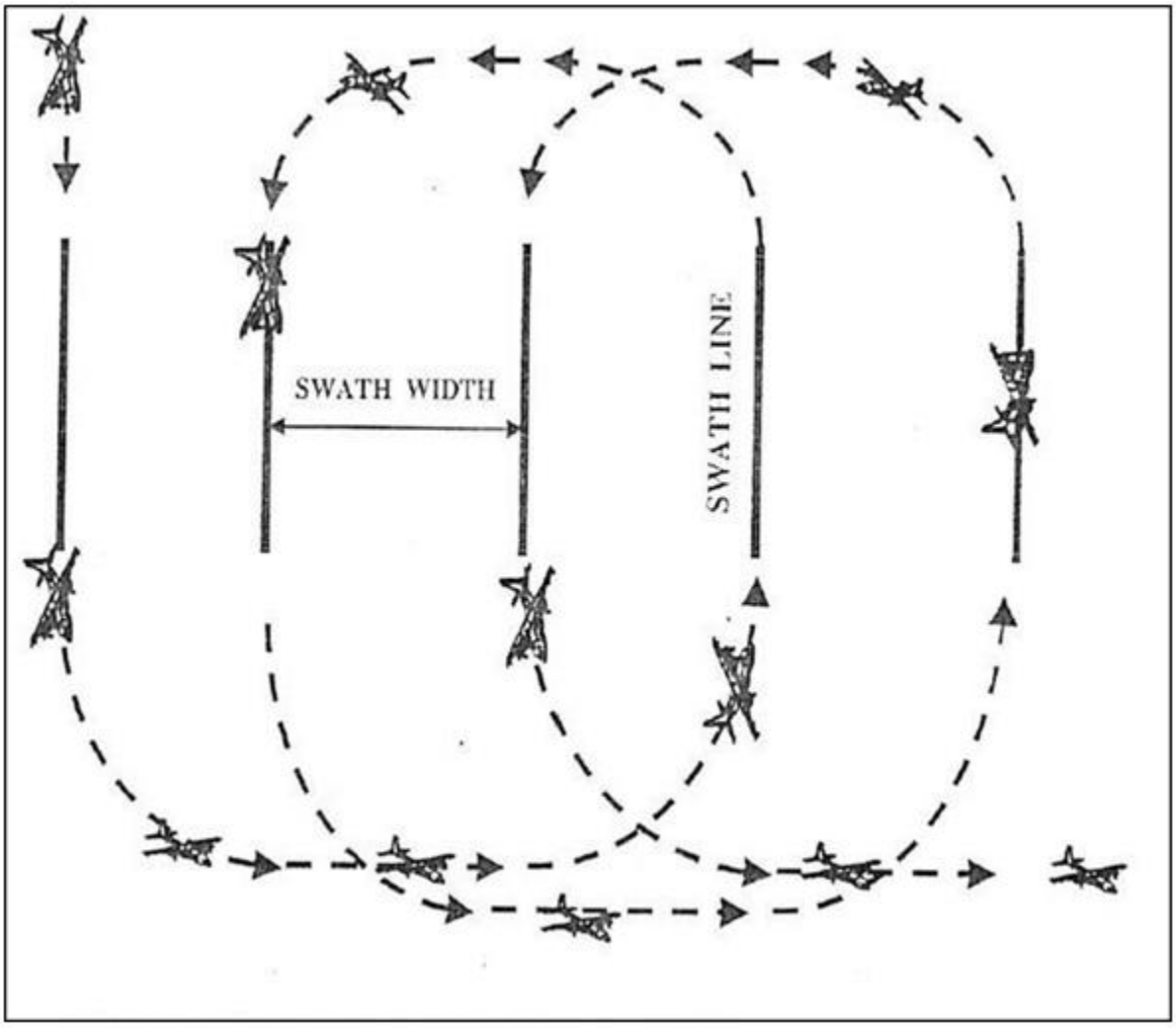


Figure 4.4. Double Racetrack (profile view).

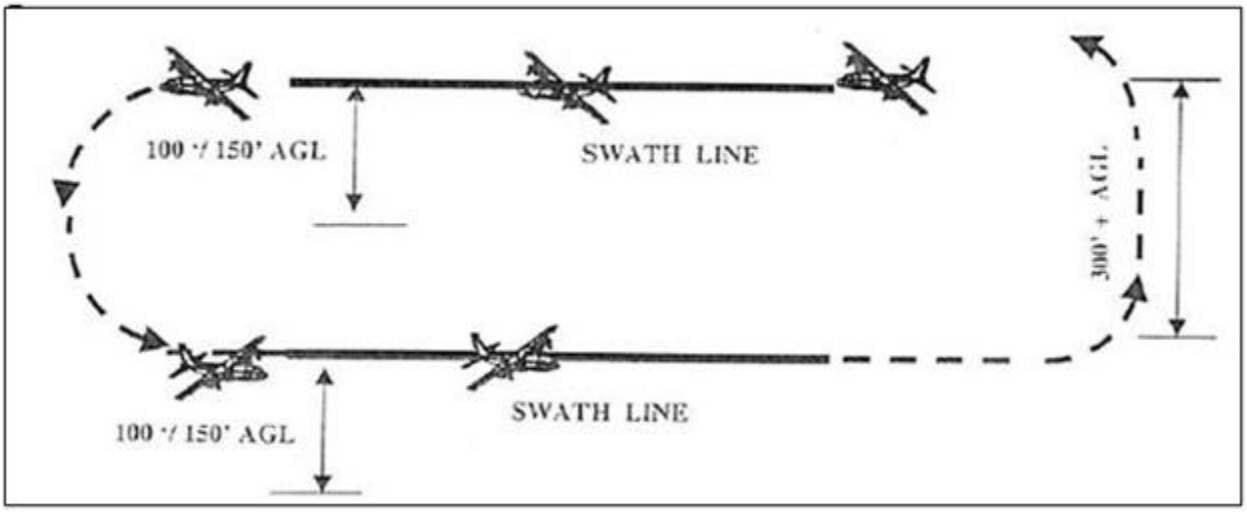


Figure 4.5. Teardrop Course Reversal (plan view).

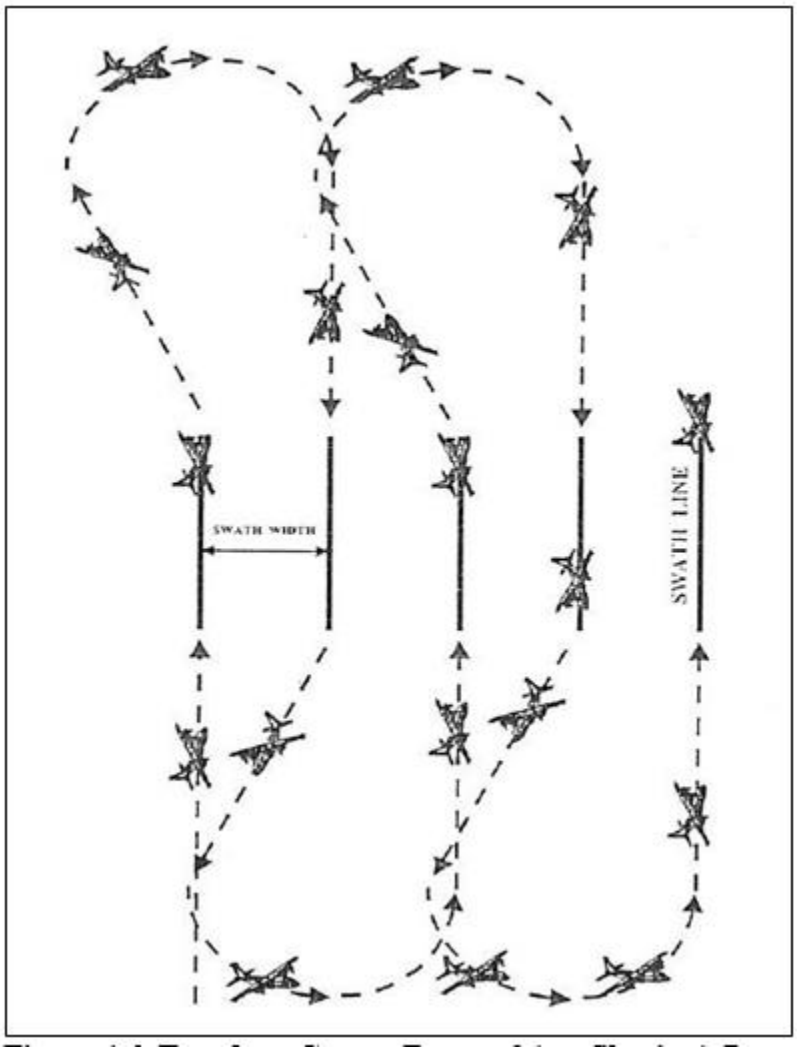


Figure 4.6. Teardrop Course Reversal (profile view).

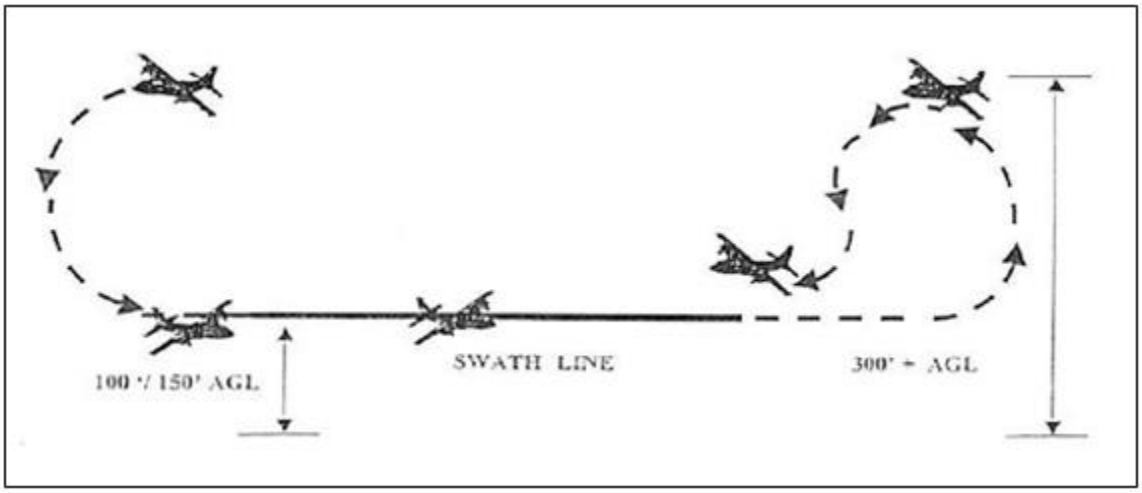


Figure 4.7. 90/270 Course Reversal (Plan view).

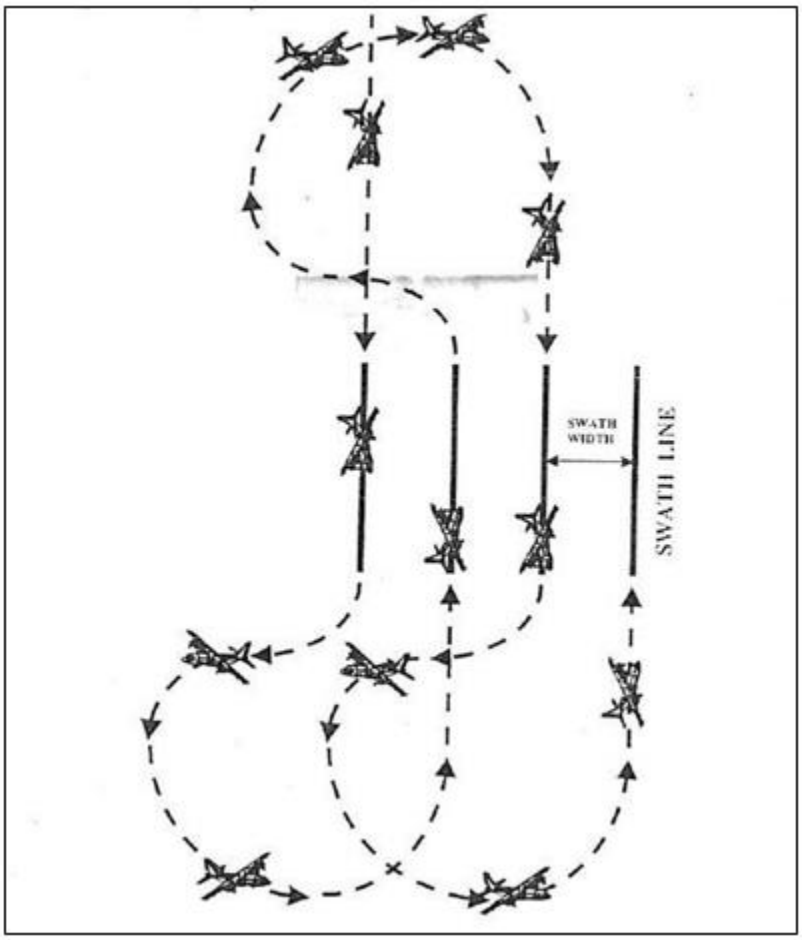
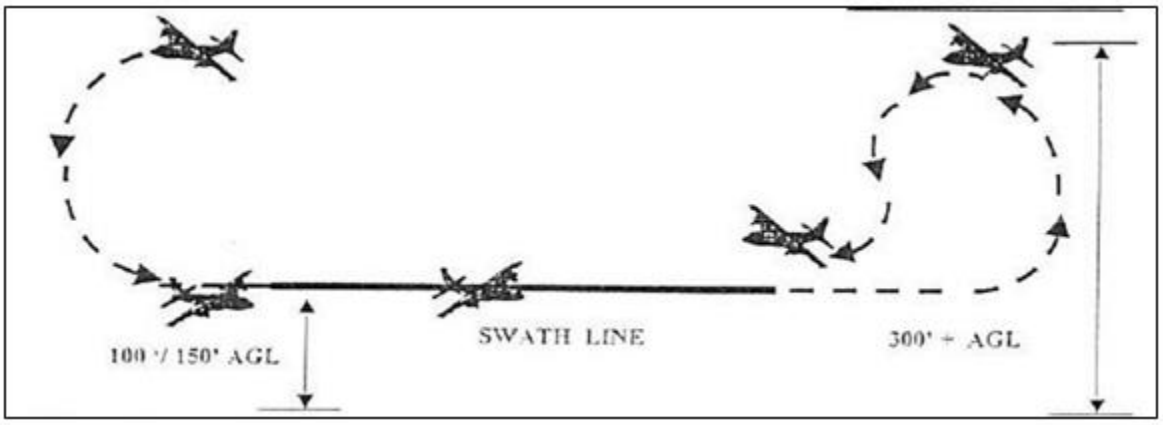


Figure 4.8. 90/270 Course Reversal (profile view).



4.4. Aviation Operational Risk Management (ORM). ORM does not replace sound judgment nor replace "safety of flight" decisions by the aircraft commander or leadership. In situations where accomplishing the provisions of this Addenda C ORM guidance is not possible, final mission acceptance authority remains with the aircraft commander. In unique situations,

process (not worksheet) variations are authorized as long as the intent of this instruction is followed.

4.4.1. MASS ORM Worksheet. MASS ORM is included in the 910 Operations Group (OG) local ORM program and uses the local 910 OG Worksheet which is the standardized 910 AW local ORM tool for risk evaluation, identification, scoring, and acceptance.

4.5. Briefing Requirements.

4.5.1. Weather.

4.5.1.1. Aircrew will obtain sufficient weather information to safely conduct the flight and comply with AFI 11-202V3, General Flight Rules. **(T-1).**

4.5.1.2. All aerial spray operations will be conducted under visual meteorological conditions (VMC). The ceiling and visibility minimums are 1500'AGL and 5 statute miles (SM). Visibility minimums may be reduced with approval of the 757 AS/CC to standard visual flight rules (VFR) 3 SM. **(T-3).**

4.5.1.3. Wind is the most significant aerial spray application parameter. Maximum legal wind speed may be defined on the pesticide label. Otherwise, the CPMP will ensure that the application is done such that off-target drift is avoided. On ultra-low volume (ULV) missions, a wind speed between 3 and 8 knots on the surface is optimal.

4.5.1.4. Temperature limitations may be defined on the pesticide label.

4.5.1.5. Aerial spray operations will not be conducted above a temperature inversion due to inhibition of chemical settlement.

4.5.2. User Meeting. A meeting will be held prior to all aerial spray pesticide missions ensuring a thorough understanding of the nature and responsibilities of all parties involved in the mission. **(T-3).** A user meeting may not be necessary on subsequent aerial spray pesticide missions conducted at the same validated site during the same calendar year unless required due to mission operational changes or at the request of the installation/area commander.

4.5.2.1. At a minimum, spray attendees will include the installation commander or designated representative, spray mission commander (or designated representative) and the CPMP to brief mission objectives and address chemical treatment and biological issues.

4.5.2.2. Subjects covered will include:

4.5.2.2.1. Applicability of the aerial spray statement of need to the current project parameters.

4.5.2.2.2. Signing a validated map by the installation project coordinator or installation commander confirming the boundaries of the spray area(s) and the location of any environmentally sensitive areas.

4.5.2.2.3. Explanations of the installation/area commander's responsibilities and liabilities.

4.5.2.2.4. HAZMAT requirements:

4.5.2.2.4.1. Review of written authorization to conduct aerial spray operations.

4.5.2.2.4.2. Currency of environmental documentation including applicable environmental impact statements and environmental assessments.

4.5.2.2.4.3. Currency of the installation waste disposal letter.

4.5.3. Staging Site Briefings. (T-3) For aerial spray missions staging out of a site not under the user's operational control, the mission commander will ensure affected staging site personnel are briefed on the appropriate operational aspects of the mission. In-brief may be conducted via telephone.

4.5.3.1. At a minimum, attendees will include the mission commander (or designated representative), CPMP, and the installation commander (or designated representative).

4.5.3.2. Subjects to be covered include appropriate safety, HAZMAT, medical, and operational aspects of the mission.

Chapter 5

GROUND OPERATIONS

5.1. Aircraft Servicing and Ground Operations.

5.1.1. The mission commander in coordination with the CPMP will decide when and what quantity of chemical(s) will be loaded. This information will be passed to the aircraft commander and spray maintenance.

5.1.2. The actual loading/downloading of chemical is conducted by 910 AW Aerial Spray Maintenance IAW T.O. 1C-130H-2-17 and Local CL-9-10AW-60-12. Consideration must be given to environmental conditions and how it impacts loading operations. Heat index, work rest cycles, and amount of chemical to load will all impact time required to complete loading. Loading process should be aligned to reduce as many factors as possible without sacrificing mission accomplishment. CPMP is required to oversee loading operations. **(T-1).**

5.1.2.1. A safety observer will be posted for all pesticide loading/downloading operations.

5.1.2.2. The safety observer will establish a safety circle to encompass the aircraft extending ten feet out from the nose, tail, and each wingtip of the aircraft. They ensure that no personnel will enter the safety circle without having donned appropriate personal protective equipment. They will ensure that a safety vehicle is readily available during loading, downloading, calibrating, ground flushing, or ground purging of the MASS.

5.2. Post Flight Procedures.

5.2.1. Debriefing.

5.2.1.1. The aircrew will debrief the CPMP and mission commander on mission progress to include areas completed/not completed, system malfunctions, sensitive area avoidance, weather data, expected coverage, acreage sprayed, etc. If used, provide the CPMP with a copy of DGPS data.

5.2.1.2. Spray maintenance will debrief the CPMP and mission commander after downloading and cleanup on quantity of material downloaded, amount of waste generated, and location of these materials.

5.2.1.3. As soon as practical after landing, aircrews will provide mission commander with all AFRC required mission data (flight time, acreage, chemical quantity sprayed, aircraft status).

5.2.2. Post Mission Reports. The following reports represent the minimum documentation which must be completed following all actual and testing spray missions. The 757 AS/DOS is responsible for ensuring all documentation is completed.

5.2.2.1. 910 AW Form 0-85, Aerial Spray Mission Report.

5.2.2.2. Certified Pest Management Professional Post-Mission Report.

5.2.2.3. 910 AW Aerial Spray Maintenance Mission Report.

5.2.2.4. A copy of the mission's Concept of Operations message for AFRC Current Operations.

5.2.2.5. Copies of any related reports (i.e., EPA/OSHA reports, safety incident reports, BASH, maintenance inspections, etc.)

5.2.2.6. Copies of the AFTO Form 781 flight logs. (AFTO Form 781 records will also be maintained for training-only sorties.)

5.2.2.7. DGPS Data, if used.

5.2.2.8. Spray certified loadmasters will provide electronic copy of spray data for each pass upon completion of the mission. (T-3)

5.2.2.9. Copies of all Daily SITREP's.

5.2.3. Maintenance. The Aerial Spray Maintenance branch is responsible for the inspection, corrosion control, cleanup, and reconfiguration of the MASS and related equipment.

Chapter 6

FLIGHT OPERATIONS

6.1. Employment: Navigation- Differential Global Positioning System (DGPS) Procedures.

6.1.1. The DGPS differential signal is geographically limited and thus must be activated through a contractual arrangement. Aerial spray maintenance will ensure the currency of contractual arrangements. **(T-2).**

6.1.2. Minimum Components**.** The minimum system components required to fly a DGPS sortie include the DGPS CPU, navigator input/output control panel, pilot or copilot light bar, media data card, and the Global Positioning System (GPS)/DGPS antenna arrays.

6.2. DGPS Employment.

6.2.1. A-B Line. Set an A-B line along the desired direction of flight.

6.2.2. Pattern. Set the desired spray pattern.

6.2.3. Swath Width. Set the desired swath width.

6.2.4. Fly parallel swaths using the DGPS outputs for course guidance. Swath direction will be determined according to type of mission.

6.2.5. Should the DGPS become unusable due to system malfunction or inadequate satellite reception, the DGPS portion of the sortie and all Night Vision Goggle (NVG) spray operations will be terminated. The aircraft commander will determine if a day aerial spray sortie can be completed via ground- referenced navigation using the required spray maps with the concurrence of the CPMP.

6.3. Documentation. The DGPS System is capable of providing a complete history of spray missions flown to include the flight path of the aircraft and areas where the MASS switch was on in spray mode. Whenever the DGPS system is utilized, the navigator will store all mission historical data on either the media card or on the laptop computer (if used) hard drive.

6.4. Objective Area.

6.4.1. Aerial spray crewmembers will use the corresponding Aerial Spray Abbreviated Checklist on all aerial spray sorties. **(T-1).**

6.4.2. Effective communications between aircrew(s), CPMP, and spray maintenance are imperative to mission success. Aircrews will develop a communications plan and brief it to the CPMP. Brief primary and back-up radio frequencies, along with other coordination items (airborne notification, sharing of wind data, etc.) affecting mission effectiveness. Prior to landing, notify maintenance personnel of aircraft status, MASS status, the amount of chemical on board and incomplete flush/purge procedures if applicable.

6.4.3. Documentation. The navigator will record spray-on time, flow rate, total gallons, total number of swaths, and total acreage for each spray mission. The spray certified loadmasters will record for each swath spray-on time, gallons, flow rate, and boom pressure, and will calculate total spray-on time and gallons for each spray mission. All mission documents will be collected and passed to the CPMP and/or spray office personnel upon mission completion.

The flow rate and boom pressure should be confirmed between the spray certified loadmasters and the CPMP after the first swath.

6.4.4. Flush and Purge Procedures. Every attempt will be made to flush and purge the MASS with aerial dispersal approved diluent while airborne after termination of final pesticide spray operation. During any application which cannot accomplish a complete air purge of the MASS while airborne, the flush procedures will be conducted by spray maintenance personnel on the ground. Flush and purge operations will be executed with the smallest amount of diluent practical. Airborne flushing and purging of the MASS will be done within the spray area boundaries. The flush altitude should be as high as practical and must control drift within the spray area boundaries. The minimum airspeed and aircraft configuration for airborne flush and purge will be 150 KIAS with wing flaps 50% extended. Turns can be made using up to 45 degrees of bank provided altitude is above 300 feet AGL. If airborne flush and purge is not practical, ground flush and purge will be the responsibility of 910 AW Spray Maintenance. A safety observer is required during ground flush and purge.

6.4.5. Operating Parameters/Restrictions. Specific mission parameters are determined by the CPMP and as outlined in this section. **(T-1).**

6.4.5.1. All spray operations will be conducted over the validated and confirmed target area.

6.4.5.2. All engines will be shut down for any spray boom maintenance.

6.4.5.2.1. On actual pesticide missions, when within 50 feet of the aircraft while on the ground, all personnel will remain upwind of all installed spray booms unless donned with proper protective equipment.

6.4.5.3. Airspeed.

6.4.5.3.1. Normal spray swath airspeed is planned at 200 knots groundspeed. Airspeed may be adjusted to meet mission requirements.

6.4.5.3.2. Minimum maneuvering airspeed on an aerial spray mission is 170 KIAS with flaps 30% or less. Aerial spray operations will not be conducted below 150 KIAS with flaps less than 50%.

6.4.5.3.3. 210 KIAS is max recommended airspeed with booms installed. Maximum allowed airspeed with aerial spray booms is 250 KIAS.

6.4.5.4. Altitude. Altitude will be determined by reference to the radar altimeter.

6.4.5.4.1. Normal day spray swath altitude is 150’ (feet) AGL for ULV. Higher altitudes may be used at crew/instructor discretion on training missions and with concurrence of the CPMP on actual chemical applications.

6.4.5.4.2. Minimum spray swath altitude is 100’ AGL.

6.4.5.4.3. Maintain a minimum of 300’ AGL unless on swath, descending onto swath, or climbing out from swath during day operations.

6.4.5.4.4. Spray operations below 300’ AGL are limited to day only operations. Aircrew must exercise judgment in continuing or beginning operations in the civil twilight period of day after sunset and before sunrise without the use of NVGs.

6.4.5.5. Bank Angle. Maximum bank angle for aerial spray missions is 45 degrees except as noted below.

6.4.5.5.1. Maximum bank angle is 30 degrees between 300’ and 200’ AGL.

6.4.5.5.2. Maximum bank angle is 20 degrees below 200’ AGL.

6.4.5.5.3. A turn maneuver requiring a bank angle greater than 20 degrees may be initiated below 200 feet AGL provided a climb is established prior to exceeding 20 degrees.

6.4.5.6. Rapid control inputs should be avoided.

6.4.5.7. Roll reversals are not authorized.

6.4.5.8. Uncoordinated turns using excess rudder deflection will be avoided.

6.4.5.9. Aerial spray aircraft will maintain a minimum lateral spacing of 300 feet from any obstacle unless vertical clearance is assured.

6.4.5.10. Aerial spray aircraft will maintain a minimum lateral separation of 2 miles, or as coordinated with the user, from any “hot” ranges or impact areas.

6.4.5.11. With spray booms installed, aerial spray aircraft will not be flown into areas of forecast icing and/or moderate or greater turbulence.

6.5. Night Vision Goggle (NVG) Operations.

6.5.1. General: This chapter provides guidance for C-130 NVG aerial spray employment. This instruction and the tactical manuals are not exclusive sources for their respective subject matters; some duplication exists to more effectively convey the information.

6.5.1.1. Disease vector control relies on applying the appropriate pesticide, in the appropriate amount, and at the appropriate time. The most effective method of controlling insect pests with aerial application of pesticides is to target them when they are active. Many medically significant pests actively seek hosts after sunset. Night spray applications can greatly increase the effectiveness of controlling night flying disease vectors.

6.5.1.2. Due to the altitudes required to control chemical droplet drift and administer appropriate concentrations at pest level, spray operations are in the Weapons Engagement Zone (WEZ) of small arms and Man Portable Air Defense System (MANPAD) threats for extended periods of time. Mitigation of these threats is the primary objective of tactical flight operations planning, thus the use of NVGs under the cover of night provides significant reduction in the enemy’s ability to acquire and engage aerial spray aircraft.

6.5.2. NVG aerial spray aircrew: Minimum NVG aerial spray aircrew will be the same as defined in **para 4.1** except an additional navigator is required. **(T-3).** The primary navigator is responsible for operating and monitoring the radar for terrain/obstacle identification and programming the DGPS to assure proper swath maintenance and tower notifications. The secondary safety navigator will utilize NVG’s and charts to confirm obstacle identification/avoidance and swath navigation using NVG’s for scanning duties. **(T-3)**

6.5.3. NVG Mission Planning. All pilots, copilots, navigators, and appropriate representatives designated by the mission commander will conduct a spray area study prior to any NVG aerial spray operations. The study will emphasize NVG limitations, swath obstructions, performance factors, terrain, and obstacle clearance. **(T-3).**

6.5.3.1. Charts. If electronic charts are used, a backup paper chart must be immediately available. ***WARNING:*** Aeronautical charts do not depict man-made obstacles less than 200' AGL (may be higher outside the U.S.) or a change in terrain until it exceeds the chart contour interval. Aircrew will use the DGPS with current Federal Aviation Administration (FAA) database to increase situational awareness in flight. **(T-3).**

6.5.3.1.1. Minimize chart clutter. Minimum Safe Altitudes (MSA's) will be annotated on spray charts. **(T-3).** Aerial spray swath centerline tracks will be annotated on the chart. **(T-3).** Start climb points corresponding to obstructions within the planned swath corresponding to obstructions within the planned swath will be annotated on charts as required. **(T-3).**

6.5.3.2. NVG Aerial Spray Altitudes. NVG aerial spray will be flown no lower than 300' AGL. This altitude provides adequate obstacle clearance while controlling spray drift and aircraft exposure. Obstructions 2,000 feet either side of swath centerline. Obstacles within this zone must be visually identified a minimum of 2 NM prior to reaching the obstacle or the calculated start climb point whichever occurs first. If the obstacle is not in sight, a climb must be executed to attain an altitude of 500 feet above the obstacle. Once the obstacle is in sight and clearance is assured, a descent to NVG spray altitude may be initiated. MSA altitudes will be calculated for the entire spray area to include a planned 15 NM buffer zone outside the spray area. When the size of the spray area exceeds 5 NM length and/or width, the area may be divided into sectors with a MSA identified for each sector. Standard ESA altitudes will be calculated based on the highest obstruction within 22 NM of the spray area boundaries.

6.5.3.3. A spray area survey will be conducted for all unfamiliar training locations prior to commencing NVG aerial spray operations below NVG enroute altitudes.

6.5.3.4. NVG aerial spray weather minimum in-flight visibility is 5 SM. All other standard aerial spray flight parameters apply.

6.5.3.5. Missions planned when the lunar illumination is forecast to be less than 10% during the mission require an additional level of ORM. The squadron CC (DO when designated by CC) will be made aware of the ORM assessment and risk mitigation conducted for missions planned to be flown in low illumination conditions. Lunar illumination is reduced by cloud cover.

6.5.3.5.1. ***WARNING:*** Not all light-emitting diode (LED) obstruction lighting systems are compatible with NVGs. Because LEDs have a relatively narrow emission band and do not emit infrared energy like incandescent lights, it is possible for them to be clearly visible to the naked eye, but be below the range in which NVGs are sensitive. During these low light situations, the aircrew must increase vigilance at visually identifying and avoiding all obstacles along the planned swath.

6.5.4. NVG aerial spray procedures:

6.5.4.1. Flaps up obstacle clearance speeds will be posted for all NVG aerial spray operations and updated hourly or after significant changes in aircraft gross weight.

6.5.4.2. Radar altimeter:

6.5.4.2.1. Radar altimeter will be the primary height reference for NVG aerial spray operations.

6.5.4.2.2. Radar altimeter will be set no lower than 50 feet below the planned enroute altitude for low-level operations. (For example, the radar altimeter will not be set below 250 feet when flying 300 foot NVG spray.) The pilot and navigator will use the same setting for their radar altimeters.

6.5.4.2.3. Any crew member noting illumination of the low warning light on the radar altimeter will call “Low Alititude” to indicate this to the PF. ***WARNING:*** The radar altimeter may indicate a higher altitude than the aircraft's actual clearance overwater, due to energy reflected from beneath the water surface.

6.5.4.3. Flights will be conducted using standard aerial spray patterns corresponding to the shape of the spray area, obstacles and terrain, airspace restrictions, and/or any other items impacting the planned swath line of flight.

6.5.4.4. Comply with all standard aerial spray employment and operating parameters identified in **para 6.6.5**.

6.6. In-Flight Emergency Procedures. (T-1)

6.6.1. Chemical Spill. A chemical spill is defined as a quantity of chemical in excess of the amount which can be contained within the MASS. If a chemical spill occurs within the cargo compartment, follow the guidelines below.

6.6.1.1. Spray operations will be terminated immediately. The spray certified loadmasters will take the appropriate actions to minimize the spill.

6.6.1.2. Spray certified loadmasters will immediately don oxygen masks and select oxygen: “**ON, 100%”** (as required).

6.6.1.3. The pilot flying should begin a gentle climb from spray altitude to a MSA while keeping aircraft pitch and roll to a minimum.

6.6.1.4. If required, the aircraft commander will initiate "***Smoke and Fume Elimination***" procedures.

6.6.1.4.1. A spray certified loadmaster will brief paratroop doors unusable, use another exit.

6.6.1.5. The chemical will be identified and an attempt made to contain it within the MASS.

6.6.1.6. Use flaps as required to maintain a level cargo compartment to contain the chemical within the MASS spill pan.

6.6.1.7. If the spill cannot be maintained internally to the aircraft, it is not absolutely necessary to remain over the target area. However, attempt to avoid flying over or

upwind of water, populated areas, and airfield environments until entering a landing pattern.

6.6.1.8. Use 50 percent flaps for landing unless runway requirements dictate otherwise.

6.6.1.9. Land as soon as practical.

6.6.1.10. In order to prevent chemical from splashing out of the MASS spill pan, minimize aircraft deceleration forces on landing roll via gentle braking, judicious reverse thrust, and utilization of all available runway length. Taxi the aircraft at minimum practical speed to appropriate area of the airfield.

6.6.2. Chemical Leak. A chemical leak is defined as a quantity of chemical which can be contained within the MASS.

6.6.2.1. If a chemical leak occurs within the cargo compartment, follow the guidelines below.

6.6.2.1.1. Loadmaster/spray certified loadmasters will don oxygen masks and select oxygen: "**ON, 100%".** (as required)

6.6.2.1.2. Aircraft commander will decide whether to continue or abort the spray mission.

6.6.2.2. If a chemical leak occurs from the booms or its hoses outboard of the cargo compartment, follow the guidelines below:

6.6.2.2.1. Discontinue the spray mission until the leak stops, except as outlined in **paragraph 6.8.2.2.4.**

6.6.2.2.2. Climb to a safe altitude while remaining within the spray area boundaries until the leak dissipates.

6.6.2.2.3. Once the leak stops, if the mission continues and the leak reappears, the spray mission will be aborted.

6.6.2.2.4. If any leak occurs during an oil spill dispersal spray mission, the mission may be continued as determined by the aircraft commander and the CPMP.

6.6.3. Emergency ground egress. Removal of the Wingman GPS antennae cables prior to removing the forward escape hatch is necessary to prevent entanglement.

6.6.4. In-flight emergency: In the event of an aircraft in-flight emergency, the pilot flying will initiate a climb to at least 500' above the highest obstacle within 3 NM until the situation is resolved and under control.

6.6.5. Physiological incidents: If there is a perception that individuals are exposed or experiencing adverse effects due to chemical exposure, they are required to immediately seek medical assistance and undergo cholinesterase testing if applicable.

6.7. NVG Aerial Spray Emergency Procedures. (T-1)

6.7.1. Crew Disorientation. When any crew member becomes disoriented on a NVG aerial spray mission, start a climb to Emergency Safe Altitude (ESA). Continue the climb until the ESA or obstacle clearance is assured. After obtaining a positive fix and orientation is regained, the crew may descend and resume operations.

6.7.2. Spatial Disorientation. The pilot monitoring will be ready to immediately take control of the aircraft if the flying pilot experiences spatial disorientation. In any spatial disorientation event, start a climb to at least MSA until the pilot experiencing the problem is ready to resume pilot monitoring or flying duties.

6.7.3. Inoperative NVGs. During NVG spray operations, the pilot monitoring must react quickly to assume control and execute a climb to MSA in the event the flying pilot's NVGs fail.

6.7.4. Aircraft System Failure. Begin a climb to MSA when a known or suspected malfunction prevents continued safe operations.

6.7.5. Emergency Climb. The procedure should be considered in cases of, but not limited to: certain equipment malfunctions, spatial disorientation, inadvertent weather penetration, aircraft altitude and/or airspeed becoming critically low, and/or loss of situational awareness during NVG aerial spray operations. Any crew member may initiate this procedure and emergency climb execution will begin as soon as possible.

6.7.6. Emergency Climb Procedure.

6.7.6.1. Announce – "Emergency Climb" to the crew over interphone.

6.7.6.2. Execute – "*GCAS Escape Maneuver*" as outlined in TO 1C-130H-1.

6.8. Aircraft Operating Restrictions. (T-1)

6.8.1. C-130 MEL**.** In addition to minimum equipment guidance for all C-130 operations, the following minimum equipment guidance applies to all aerial spray operations.

6.8.2. Pilots radar altimeter must be operational. Preferred mounting location is on the flight deck glare shield.

6.8.3. Groundspeed readout must be operational. Preferred Doppler readout mounting is on the flight deck glare shield. Secondary equipment for ground speed readouts are the pilot Integrated Display Computer Unit (IDCU), copilot IDCU and DGPS lightbar.

6.8.4. Oxygen onboard for takeoff must be sufficient to accomplish the planned flight from the target area to recovery base (minimum of 5 liters). Oxygen on board for takeoff must be sufficient to accomplish the planned flight from the target area to recovery base (minimum 5 liters). Use the Oxygen Duration Chart in T.O. 1C-130-1 to determine the minimum oxygen requirements prior to each actual spray mission.

6.8.5. Maps covering the entire target area to include a 5 to 10 NM turning radius buffer zone must be available on all spray missions for the navigator and copilot. In general, use a 1:24,000 scale map for spraying areas less than 20,000 acres and a 1:50,000 scale map for areas exceeding 20,000 acres. Other maps may be used at the discretion of the mission commander if mission constraints dictate. Maps may be computer generated (digitized color) or manually drawn. As a minimum, maps will depict the target area boundaries, environmentally sensitive areas, no-fly zones, no-spray zones, and all known obstructions to flight (i.e. towers) at or above spray AGL altitude.

6.8.6. MASS. The capability to determine the dosage output of the MASS is mandatory for all actual chemical missions. The MASS flow meter and the MASS gallon totalizer must be

operational on all actual chemical missions. The pulse counter may only be used in lieu of the gallon totalizer to complete a mission after airborne failure.

6.8.7. DGPS System should be operational. In the event of a DGPS failure, the aircrew in coordination with the CPMP will decide if visual procedures can be used to effectively complete the mission. NVG aerial spray operations will be terminated in the event of DGPS failure.

MARK C. NOWLAND, Lt Gen, USAF
Deputy Chief of Staff, Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

T.O. 1C-130-1253, *Installation of Modular Aerial Spray System (MASS), C-130H Aircraft*

T.O. 1C-130H-2-17, *Maintenance Instructions, Modular Aerial Spray System (MASS), C-130H Aircraft*

T.O. 1C-130H-1, *C-130 Flight Manual*, 17 March 2010

AFPD 11-2, *Aircrew Operations*, 19 January 2012

AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, 19 Jan 2012

AFI 11-202, Volume 3, *General Flight Rules*, 10 August 2016

AFI 11-401, *Aviation Management*, 10 December 2010

AFMAN 11-2C-130V3 Addenda A, *C-130 Operations Configurations/Mission Planning*, 13 August 2009

AFMAN 11-2C-130V3, *C-130 Operations Procedures*, 23 April 2012

AFMAN 11-2C-130V3 Addenda C CL-1

AFMAN 11-2C-130V3 Addenda C CL-2

AFMAN 11-2C-130V3 Addenda C CL-3

AFMAN 11-2C-130V3 Addenda C CL-4

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

AFTO Form 781, *ARMS Aircrew/Mission Flight Data Document*

Abbreviationsand Acronyms

AGL—Above Ground Level

AFNORTH—Air Force Northern Command

AFRIMS—Air Force Records Management System

ARMS—Aviation Resource Management System

CL—Check List

CPMP—Certified Pest Management Professional

DGPS—Differential Global Positioning System

DOS—Division of Aerial Spray

DV—Distinguished Visitor

ESA—Emergency Safe Altitude

FAA—Federal Aviation Administration

FCB—Flight Crew Bulletin

GPS—Global Positioning System

HAZMAT—Hazardous Materials

HV—High volume

IDCU—Integrated Display Control Unit

KIAS—Knots Indicated Air Speed

LED—Light Emitting Diode

LV—Low volume

MANPAD—Man Portable Air Defense System

MASS—Modular Aerial Spray System

MC—Mission Commander

MEP—Mission Essential Personnel

MSA—Minimum Safe Altitude

MSDS—Material Safety Data Sheet

NM—Nautical Miles

NOTAM—Notice To Airman

NVG—Night Vision Goggle

OPR—Office of Primary Responsibility

ORM—Operational Risk Management

PIC—Pilot in Command

RDS—Records Disposition Schedule

SITREP—Situation Report

SM—Statute Miles

UHV—Ultra-high volume

ULV—Ultra-low volume

WEZ—Weapons Engagement Zone

Terms

A—B Line - A directional line entered into the DGPS system by defining two geographical points. Normally entered as a reference line to define all subsequent swath lines.

Aerial Spray— Dispersal delivery of chemicals via airborne aircraft.

Back-To-Back Pattern— An aerial spray pattern which defines swaths consecutively. Single racetracks or course reversals may be flown according to space and time constraints.

Booms— Plumbing attached to the MASS, mounted on either the aircraft wings or fuselage, which contains the nozzles used to control the rate of spray of the chemical.

Course Reversal— An aerial spray flight pattern with opposite swath directions consisting of consecutive swathes separated by a course reversing turn. The aircraft flies the initial swath and then executes a course reversal (90/270 turn, teardrop turn, etc.) onto the next consecutive swath in the opposite direction.

CPMP— Professional scientist who has DOD certification to apply restricted use pesticides.

Deposition Spray— Chemical applied to a surface such as leaves for pests to ingest, water for oil dispersion, soil for herbiciding, etc.

DGPS Patterns— Aerial spray flight patterns loaded into and referenced using the on-board DGPS system. All patterns, except the back-to-back pattern which is on open pattern, are closed patterns.

DGPS System— An aerial spray navigation system providing greater navigation precision, heightened aircrew situational awareness, increased operating flexibility, real-time spray monitoring, and more in-depth mission documentation/history.

Double Racetrack— An aerial spray flight pattern with opposite swath directions. The aircraft flies the initial swath direction, executes a 180-degree turn onto the next swath (opposite the first swath direction and normally a minimum of 12,000 feet separation), and then executes another 180- degree turn onto the next swath in the original swath direction.

Expand Patterns— An aerial spray pattern which defines swaths from the center of the area progressively outward toward the boundary edges. A double racetrack method is normally used to fly this pattern.

HV— Application rate of 2 to 10 gallons of chemical applied uniformly per acre. Generally used for environmental decontaminants, fire retardants, or vegetation control operations.

LV— Application rate of 1/2 to 2 gallons of chemical applied uniformly per acre. Generally used in vegetation pests, larvicides, and vegetation control operations.

Lightbar— An LED system, mounted on the aircraft dashboard, which provides the pilot with navigational information and swath guidance.

Mapping Display Screen— A display screen mounted on the right side of the flight deck which provides the aircrew with a real-time display of aircraft motion, flight history, and spray system activation in relation to the programmed target area.

MASS— The MASS is a liquid dispersal, three-module unit attached to modified standard C-130 aircraft cargo pallets which provide roll-on/roll-off capability. The modules contain three centrifugal pumps, a 220-gallon flush tank, and four 500-gallon storage tanks providing a full range (one-quarter ounce to 30 gallons per acre) flow rate capability.

Pesticide— Agent used to control or destroy pests.

Polygon— Any geometric shape of three sides or more defining an area and entered into the DGPS system. Typically used to define the spray target area and/or no-fly zones.

Quick Racetrack Pattern— An aerial spray pattern which defines swaths consecutively in a constant size loop from one edge of the area to the opposite edge. A double racetrack method is normally used to fly this pattern.

Racetrack Pattern— An aerial spray pattern which defines swaths starting at the outside edges of the area. The next swath leads to the center of the area, followed by constant loops until reaching the opposite edge. A double racetrack method is normally used to fly this pattern.

Reverse Racetrack Pattern— An aerial spray pattern which defines swaths starting in the center of the area, followed by a 180 degree turn to a swath down the outside edge of the area, followed by swaths working double racetrack style to the opposite edge of the area.

Single Racetrack— An aerial spray flight pattern with a single swath direction/heading. The aircraft flies the swath heading, executes a 180-degree turn to a downwind opposite of the swath heading, and then executes another 180-degree turnonto the next swath.

Space Spray— Chemical applied directly to an air space, normally for the control of flying insects.

Spray Operator— C-130 mission-ready qualified loadmaster who has completed aerial spray training, specifically on the MASS, and been certified to participate in aerial spray operations

Attachment 2

AERIAL SPRAY CONFIGURATIONS

A2.1. Configuration SP-1. Cockpit only configuration for spray training. Normally used for Pilot/Navigator proficiency or Aerial Spray familiarization.

Figure A2.1. Configuration SP-1.

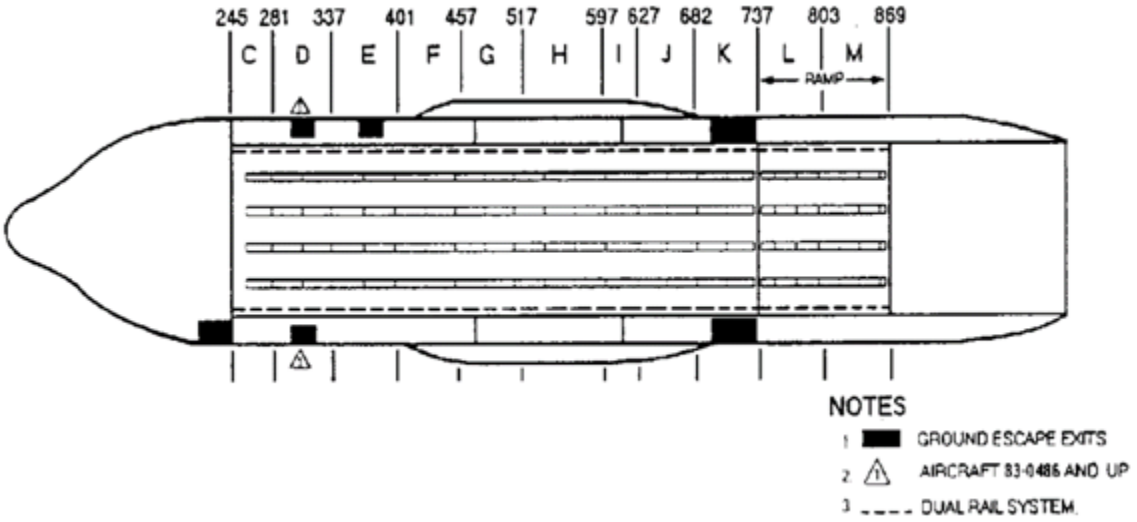


Table A2.1. Configuration SP-1.

Reference 5, DD Form 365-4 (Steward's Equipment)	QTY	WT	STA	MOM
Liquid/Water Containers	A/R			
Passenger Service Kit	1	10	A/R	
Reference 6, DD Form 365-4 (Emergency Equipment)	**QTY**	**WT**	**STA**	**MOM**
Refer to AFMAN 11-2C-130V3 Addenda A Table 2.2	A/R			
Reference 7, DD Form 365-4 (Extra Equipment)	**QTY**	**WT**	**STA**	**MOM**
Ramp Support	1	85	A/R	
NOTES 1. All restraint rails and roller conveyors installed. 2. Time to configure is one person, one hour.				

A2.2. Configuration SP-2. Two module system consisting of the MASS control panel, one twin 500 gallon tank platform and associated spray boom components. Spray booms assembly located at F.S. 727.

Figure A2.2. Configuration SP-2.

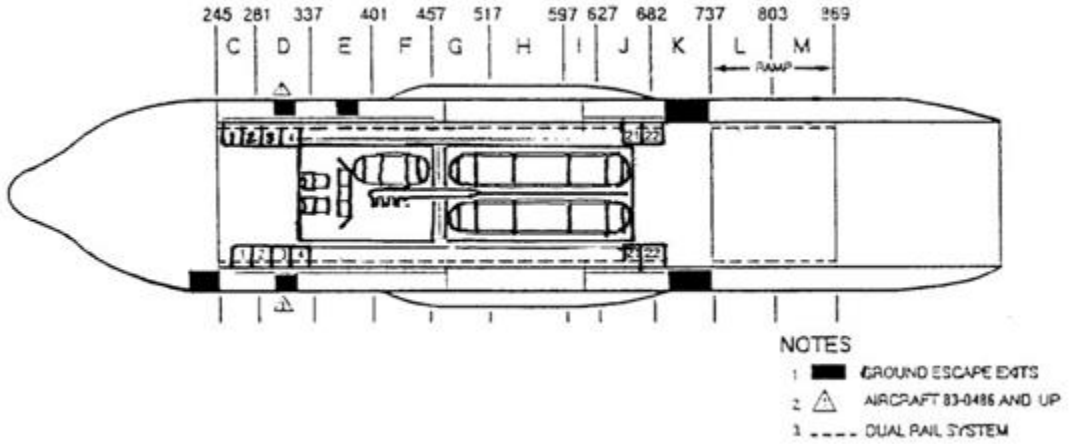


Table A2.2. Configuration SP-2.

Reference 5, DD Form 365-4 (Steward's Equipment)	QTY	WT	STA	MOM
Liquid/Water Containers	A/R			
Passenger Service Kit	1	10	A/R	
Reference 6, DD Form 365-4 (Emergency Equipment)	**QTY**	**WT**	**STA**	**MOM**
Refer to AFMAN 11-2C-130V3 Addenda A Table 2.2	A/R			
Reference 7, DD Form 365-4 (Extra Equipment)	**QTY**	**WT**	**STA**	**MOM**
Main Landing Gear Tiedown	2	17	A/R	
Ramp Support	1	85	A/R	

NOTES:

1. 23 seats total crew and passengers.
2. All restraint rails and roller conveyors installed.
3. If cargo permits, side-wall seats may be available.
4. Roller conveyors not required will be removed and secured on top of the dual rails.
5. Remove the three center litter stanchions, and the cargo winch.
6. Time to configure is one person, one-half hour.

A2.3. Configuration SP-3. Three module system consisting of the MASS control panel, two twin 500 gallon tank platforms and associated spray boom components. Spray booms assembly located at F.S. 727.

Figure A2.3. Configuration SP-3.

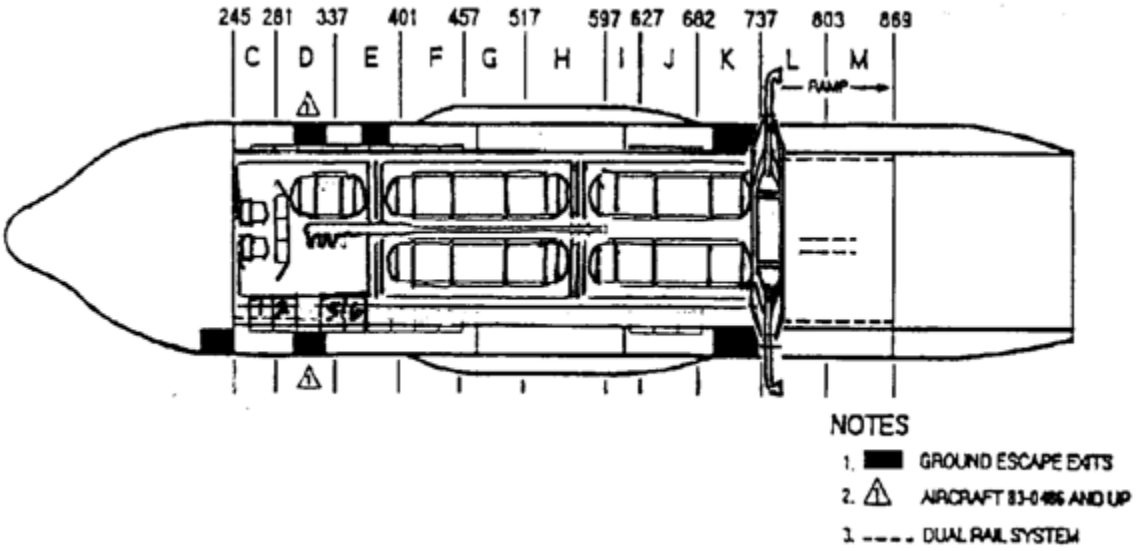


Table A2.3. Configuration SP-3.

Reference 5, DD Form 365-4 (Steward's Equipment)	**QTY**	**WT**	**STA**	**MOM**
Liquid/Water Containers	A/R			
Passenger Service Kit	1	10	A/R	
Reference 6, DD Form 365-4 (Emergency Equipment)	**QTY**	**WT**	**STA**	**MOM**
Refer to AFMAN 11-2C-130V3 Addenda A Table 2.2	A/R			
Reference 7, DD Form 365-4 (Extra Equipment)	**QTY**	**WT**	**STA**	**MOM**
Main Landing Gear Tiedown	2	17	A/R	
Ramp Support	1	85	A/R	

NOTES:

1. Total seating for 11- crew and passengers; two seats are available on 20-inch centers and four seats are available where the nitrogen bleed tanks are positioned on the spray system, but only if they are not piggybacked.
2. All restraint rails and roller conveyors installed.
3. If cargo permits, side-wall seats may be available.
4. Roller conveyors on the ramp will be removed and secured on top of the dual rails.
5. Remove all litter stanchions and the cargo winch.
6. Time to configure is one person, one-half hour.