CONVAIR CV-580 AIR TANKER OPERATIONAL GUIDELINES AND PROCEDURES

Multi Engine Air Tanker Project Victoria 2010-11

State Aircraft Unit, Victoria Australia

January 2011

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Contents

Front Cover: Bomber 390 Salvo water drop ¼ load volume, Avalon Airport January 2011.

CONVAIR CV-580 AIR TANKER OPERATIONAL INFORMATION

1 INTRODUCTION

A General

The Convair CV-580s (CV-580/s) are a mid-sized turbo-prop aircraft which have been adapted for fire fighting and have been successfully used in fire fighting in the Northern Hemisphere.

The CV-580s are primarily used for first-attack in remote areas, and for laying retardant lines in forest and have the capacity to deliver up to 8000 litres of aerial suppressant.

The provision of the CV-580s also includes one Birddog Air Attack Supervisor aircraft (Birddog-AAS aircraft) which is a Aero Turbo Commander 690A, to be used as a platform for air attack supervision.

The Nominated Operational Base (NOB) is Avalon Airport, additional airports Albury and East Sale have been identified as Reload Bases (RB).

Additional reading is contained with in the State Aircraft Unit (SAU) document, Overview of the Convair CV-580 air tanker, State Aircraft Unit Victoria, September 2010.

B Ability

The aircraft can be dispatched from Avalon to anywhere in Victoria responding to specific fire requests or to reposition as a result of existing or forecast fire conditions.

The CV-580 and the Birddog-AAS aircraft have a ferry speed of up to 530 kilometres per hour which allows the aircraft to access any part of the state from Avalon within an hour. The operational endurance of the aircraft for a mission is three hours.

C Evaluation

The suitability of CV-580s for fire fighting in Victorian conditions will be subject to a trial throughout the fire season.

D Guidelines and procedures

The purpose of these Multi Engine Air Tanker Operational Guidelines and Procedures is to ensure that the aircraft and all fire bombing operations are conducted in a safe, efficient and cost-effective manner.

2 PROVISIONS

A Disclaimer

The advice and information provided in this document is intended as a guide only.

This document may be of assistance, but the State of Victoria and its employees do not guarantee that the document is without flaw of any kind, or is wholly appropriate for your particular purposes, and therefore disclaim all liability for any error, loss or other consequence that may arise from you relying on any information in this publication.

The specifications and performance relating to aircraft provided in this document have been developed for general information and training purposes only and the information contained in this document does not replace aircraft and operator flight manuals or operations manuals.

B Key terminology

MEAT/s	Multi engine air tanker/s
CV-580	Convair CV-580 air tanker
MEAT-Section	Includes, 2 X CV-580 air tankers and the Birddog-AAS aircraft.
Birddog-AAS	Trained air attack supervisor in Birddog-AAS aircraft
Birddog-AAS aircraft	Includes Birddog-AAS and the Pilot in Command.
Incident-AAS	Operational air attack supervisor established over the incident managing the tactical resources.
Vertical separation profile	The nominated vertical airspace over the incident where the MEAT Section will operate usually between ground level and 2000 feet above ground level (AGL), commonly known as the "**stack**".
the "stack"	The order of placement with designated heights above ground for the MEAT-Section within the vertical separation profile, usually ground level to 2500 feet AGL.
"holding area	Nominated airspace with in the vertical separation profile usually 1000 – 2000 feet AGL for the MEATs to orbit prior to entry into the "working area".
"working area	Nominated airspace with in the vertical separation profile usually between ground level and 1000 feet AGL, where the Birddog-AAS aircraft and a MEAT operate.

C Resource identities

Classification	Call sign	Aircraft
Multi engine air tankers	**Bomber 390**	**Convair CV-580**
	Bomber 391	
Light fixed wing	**Birddog 392**	**Aero Commander AC69**

D Preparedness

The MEATs and the Birddog-AAS aircraft (collectively know as the MEAT-Section) will be located at the nominated operational base (NOB) Avalon Airport for operational response.

Two additional operational bases have been identified and are termed as Reload Bases (RB), East Sale Military Air Base, Victoria and Albury Airport, New South Wales.

All fire suppression operations will be conducted from the NOB and the approved RBs only.

The NOB and the RBs will be resourced and supported according to the appropriate fire danger ratings and wildfire activity.

The MEAT-Section has a 15 minute requirement which applies between 1000 and 1800 hours Eastern Summer Time; or between 0900 and 1700 hours Eastern Standard Time, after daylight saving finishes.

During other daylight hours, Daylight – 1000 and 1800 - Dark the MEAT-Section is to remain reasonably available for deployment, generally about 30 minutes notice with the pilot and additional aircrew members contactable and able to fly.

On declared days of Total Fire Ban, the primary response time requirement applies between 0900 and 1900 hours Australian Eastern Summer Time (AEST).

E Requests

All requests are to be conducted pursuant to current Agency[1] aircraft request protocols.

The primary operational application of the MEAT-Section is retardant line building in remote forested areas. The MEAT-Section can be used in extended attack-retardant application as a secondary resource in support of large fire operations with other tactical aircraft.

F Dispatch

All dispatches and operational flights undertaken by the MEAT-Section will be coordinated by the State Air Desk (AirDesk) as authorised by the Victorian State Fire Controller (SFC) or his delegate.

The MEAT-Section will be dispatched as a single resource unit to an Incident where it will be working for the respective Incident Air Attack Supervisor (Incident-AAS).

G Supervision

The Birddog-AAS aircraft will have an assigned Birddog Air Attack Supervisor (Birddog-AAS) who will work with the Incident-AAS to best utilise the MEATs.

The Birddog-AAS aircraft flies the flight profile of the intended drop area prior to the MEAT's drop run to asses the weather conditions and other environmental conditions to determine the immediate hazards and show the area of the drop to MEAT aircrew.

H Operations

All MEAT-Section operations will be subject to the standard State Aircraft Unit (SAU) and Agency air operations procedures, inclusive of the State Aircraft Unit Procedures-2010 (SAUPs) and are subject to the provisions the Visual Flight Rules (VFR).

No suppression, operational trials, training flights and evaluation flights will be undertaken without the supervision of an approved Birddog-AAS and the use of the fully crewed Birddog-AAS aircraft.

No operational fire bombing drops will be conducted with out a pre inspection flight by the Birddog-AAS aircraft.

All three aircraft operate together and the MEAT-Section and will not operate separately or with out the supervision of the Birddog-AAS aircraft.

Fire bombing and general flight operations conducted by the MEAT-Section over an incident will require a vertical airspace profile up to 2500 feet above ground level.

I Aerial suppressants

Only approved retardant and suppressants listed on the Qualified Products List (QPL) United States Department of Agriculture, Forest Service (USDA-FS) are permitted.

[1] Country Fire Authority Victoria and the Department of Sustainability and Environment.

3 CONVAIR CV-580 AIR TANKER

A Bomber 390

Plate 1 Bomber 390 Convair CV-580, C-GYXC, Avalon Airport 2011.

Conair CV-580 Air tanker Trunk 233 4001 390								
Aircraft			Engine		Performance		Capacity	
Make	Model	Wing	No.	Type	Cruise	Range	MTOW	Payload
Convair	CV-580	Low	2	Turbine	265 kts.	945 nm.	58,156 lb	7950 Litres

B Bomber 391

Plate 2 Bomber 391 Convair CV-580, C-FXFA, Avalon Airport 2011.

Conair CV-580 Air tanker Trunk 233 4001 391								
Aircraft			Engine		Performance		Capacity	
Make	Model	Wing	No.	Type	Cruise	Range	MTOW	Payload
Convair	CV-580	Low	2	Turbine	265 kts.	945 nm.	58,156 lb	7950 Litres

Additional information is available in Attachment 1 Convair CV-580 specifications and information.

C Convair CV-580 delivery system

The Conair CV-580 air tanker is fitted with a Retardant Aerial Delivery System (RADS) II-220 delivery system approved by the Interagency Airtanker Board USA (IAB) to hold 2000 US-Gallons[2].

The tank has a single compartment with bulkhead dividers to minimise fluid movement forward and backward and to provide structural integrity and mitigate centre of gravity issues.

Plate 3 RADS II-220 fitted to Bomber 390.

Two opposing doors, which run the length of the tank, are used to control the flow of aerial suppressant. The tank doors are mechanically linked and they open from the centre and operate in unison.

The doors can operate with full or partial tank levels. The onboard controller senses the level of retardant and constantly adjusts the door opening to maintain selected flow rates.

The computerised digital control system used to operate the doors enables the pilot to control coverage level and quantity, producing the desired drop pattern.

The available flow rates are controlled by varying the angle of the door openings and the volume released is regulated by the time period they remain open.

Plate 4 Doors open Coverage Level 4

Plate 5 Doors open Coverage Level 8

Additional Information is available in Attachment 2 RADS II 220 delivery system and information.

[2] IAB specification

4 AERO COMMANDER AC690

A Birddog 392

Plate 6 Birddog 392, Aero Commander AC690 Registered number C-FCZZ.

Aero Commander AC690 Trunk 233 4001 392								
Aircraft			Engine		Performance		Capacity	
Make	Model	Wing	No.	Type	Cruise	Range	PAX	MTOW
Gulfstream	AC690A	High	2	Turbine	285	740 nmi	2	10,250 lb.

Table 1 General specifications Aero Commander.

B Infra-red capability Aero Commander AC 690

The thermal imaging system is a high-resolution infrared imaging system and a CCD colour video camera co-mounted in a gimballed platform. The system enables viewing of a thermal image on the system's video monitor and offers a high-quality, real-time image that can be video taped.

Inframetrics Model 445G Mk II Airborne Thermal Imaging System.

The 445G Mk II offers the following features:

- Rate Stabilization - minimizes the effects of aircraft vibration and motion.
- Four Fields of View in IR - two optical magnifications in combination with the electro-optical zoom offer four electronically switchable fields of view.
- Television zoom control - controls colour video camera 1.2 x to 7.0 x continuous zoom.
- Directional Control - control of both azimuth and elevation through a full 360 degrees.
- Pistol Grip Control Unit - fingertip control of all system functions.
- RS-170 Video Output – balk and white standard (for IR) -
- Closed-Cycle Cooling - the infrared detectors are cooled by a built in micro cooler. This eliminates the need for ground support equipment normally required for open-cycle or gas-cooled systems.

5 NOMINATED OPERATIONAL BASE AVALON

A Avalon Air Base

- Located at Avalon Airport
- Controlled airspace
- High capacity retardant fire bombing base
- Fully supported with aerial suppressant loading crew
- 24 hour refuelling support.
- Operational retardant volume: 34,000 litres
- Retardant stocks: 20 Phos-bin
- Operational water volume: 150, 000 litres (stored)
- Additional water storage: 400,000 litres (secondary)

B Avalon Airbase contact information

Contact	Number	Comment
Dispatch Contact	**0428 964 053**	**Rostered Airbase Coordinator**
Office Phone	03 9014 0840	Avalon airbase office
Air base Trunk	233 4001 646	Avalon airbase office
Air base portable 1	233 4001 744	Rostered airbase coordinator
Air base portable 2	233 4001 745	Ramp & deck contact

C Avalon Airport frequency information

Contact	Frequency	Comment
Avalon Safety	129.10	Access to refuelling/AC parking
Avalon Tower	120.10	Provisions refer to ERSA
Melbourne Radar	135.70	Provisions refer to ERSA

D Runway specifications

Location	Runway		Length		Elevation	Co ordinates	
	Align.	PCN	Feet	Metres	Feet	Latitude	Longitude
Avalon	18 - 36	73	10,000	3048	35	38 02.4 S.	144 28.2 E.

E Hazards

Hazard	Comment
Birds	Significant migratory bird activity with adjoining wetlands.
Aircraft	Increased activity for interstate and international passenger transport

For a site map and additional information refer to Attachment 3 Avalon Airport Air Base.

6 RELOAD BASE ALBURY

A Albury Airport

- Located at Albury Airport.
- Controlled airspace
- Retardant reloading fire bombing base.
- Operational volume retardant: 34,000 litres
- Retardant stocks: 10 Phos-bins
- Operational volume water: 75, 000 litres (stored)
- Additional water storage CWN water tankers.

B Albury contact information

Contact	Number	Comment
Albury Airport	02 6041 2360	General enquiries
Des RYAN	0407 898 178	Airport Operations Manager
Airport Reporting Officer	0418 691 776	
Airport Safety Officer	02 6021 0674	
Hayden Biggs	0428 725 337	SAU Contact
Graeme Briggs	0427 053 298	SAU Contact
State AirDesk	1300 134 144	State Aircraft Coordination

C Albury Airport frequency information

Contact	Frequency	Comment
Albury ATIS	115.6	Provisions refer to ERSA
Albury Tower	124.2	Provisions refer to ERSA
Melbourne Centre	125.2	Provisions refer to ERSA

D Runway specifications

Location	Runway		Length		Elevation	Co ordinates	
	Align.	PCN	Feet	Metres	Feet	Latitude	Longitude
Albury	07 - 25	29	6233	1900	539	36 04.1 S	146 57.5 E

E Hazards

Hazard	Comment
Aircraft	Significant activity for interstate passenger transport

For a site map and additional information refer to Attachment 4 Albury Airport Air Base.

7 RELOAD BASE EAST SALE

A East Sale Military Air Base

- Located at East Sale Military Air Base.
- Controlled airspace
- Retardant reloading fire bombing base.
- Operational retardant volume: 34,000 litres
- Retardant stocks: 10 Phos-bin
- Operational volume water: 75, 000 litres (stored)
- Additional water storage CWN water tankers.

B East Sale contact information

Contact	Number	Comment
Operations	03 5146 7334	RAAF Central Flying School
Hayden Biggs	0428 725 337	SAU Contact
Graeme Briggs	0427 053 298	SAU Contact
State AirDesk	1300 134 144	State Aircraft Coordination

C East Sale Airport frequency information

Contact	Frequency	Comment
Sale ATIS	116.2 P	
Sale Tower	118.3	Provisions refer to ERSA
Sale approach	123.3 P	
Sale Ground	120.10 S127.2 P	Provisions refer to ERSA
Sale delivery	133.6(5)	
Melbourne Centre	124.0	On ground when Sale deactivated

D Runway specifications

Location	Runway		Length		Elevation	Co ordinates	
	Align.	PCN	Feet	Metres	Feet	Latitude	Longitude
East Sale	04 - 22	47	7992	2437	23	38 05.9 S.	147 09.0 E.
	09 - 27		7316	2230			

E Hazards

Hazard	Comment
Birds	Significant migratory bird activity.
weapons	Pistol and rifle range adjoining
Aircraft	Operational military aircraft.

For a site map and additional information refer to Attachment 5 East Sale Air Base.

8 PROVISIONAL AIR BASES

A Provisional Bases

Provisional bases will have limitations on runway capability and manoeuvring capacity within the constructed ramp and apron hard standing.

Operational use from these locations may be considered within the Evaluation Program only.

Provisional Bases

- Located at Mildura, Mangalore, & Hamilton Airports.

9 AVALON AIRBASE ORGANISATION

A Avalon Airbase Coordinator (AAC)

The AAC is tasked to coordinate all daily functions of Avalon Air Base and the aircraft resources assigned to the location.

Resources can include additional aircraft which have been reassigned and or pre-positioned for preparedness and resources participating in the training and evaluation programs

The AAC is also responsible for the retardant & foam stocks and the supplies that keep the base operational.

The AAC is responsible for the dispatch of the MEAT-Section; he is not responsible for assigning the missions.

B Air Tanker Base Loaders (ATBL/s)

Three retardant loaders are permanently assigned to the NOB at Avalon.

The loaders are contract personnel and are responsible for the safe loading of each airtanker and the operation of the associated tanks, pumps and hose equipment.

ATBL/s are also tasked to perform routine daily maintenance on their assigned base when not loading air tankers.

C Birddog Air Attack Supervisor (Birddog-ASS)

Working in conjunction with the ground-based Incident AAS, the Birddog-AAS is responsible for the coordination of the MEAT-Section to achieve the wildfire objectives.

The Birddog-AAS ensures the safety and effectiveness of the aerial suppression actions of the MEAT-Section over the incident and will also monitor the airspace and other air traffic overhead the incident.

The Birddog-AAS role is similar to the role undertaken by the Very Large Air Tanker Project (VLAT-Project) Lead Plane Air Attack Supervisor (L-AAS)[3].

[3] Very Large Air Tanker Operations Program, State Aircraft Unit, Victoria 2010.

10 AERIAL SUPPRESSANTS

A Aircraft capacity

There are no onboard reservoirs to allow the storage or carriage of aerial suppressants. All aerial suppressants are loaded into the delivery system by external equipment.

B Approval

The USDA maintains a QPL of fire chemical products that have been evaluated and meet Forest Service requirements.

In the absence of a formal testing and evaluation program for chemicals within the State of Victoria and other States and Territories the standards and approvals of the USDA-QPL has been adopted.

Victoria utilises only retardant, suppressants and water enhancers listed on the USDA-FS QPL.

C Retardant

Chemical	Qualified Application				
	Fixed wing air tanker. VLAT	Single engine air tanker	Helicopter fixed tank.	Helicopter under slung bucket	Ground support units
Phos-Chek® D75-R	YES	YES	NO	YES	NO

Source: USDA- FS QPL.

Table 2 Extract USDA-FS QPL Long Term Retardant.

D Class A foam

Chemical	Qualified Application				
	Fixed wing air tanker. Scoopers *	Single engine air tanker	Helicopter fixed tank.	Helicopter under slung bucket	Ground support units
Phos-Chek® WD 881	YES * Includes VLAT	YES	YES	YES	YES

Source: USDA- FS QPL.

Table 3 Extract USDA-FS QPL Class A Foam

E Super Absorbent Polymer

Chemical	Qualified Application				
	Fixed wing air tanker	Single engine air tanker	Helicopter fixed tank.	Helicopter under slung bucket	Ground support units
Thermo-Gel® 200L	NO	YES	NO	NO	NO
Phos-Chek® AquaGel-K	NO	YES	NO	YES	YES

Source: USDA- FS QPL.

Table 4 Extract USDA-FS QPL Water enhancers (Super absorbent polymers).

F Provision

Please note that the USDA-QPL provides additional information on the approved products but it does not change the approval rating.

11 PREPAREDNESS

A Availability

The MEAT-Section has a 15 minute requirement which applies between 1000 and 1800 hours Eastern Summer Time; or between 0900 and 1700 hours Eastern Standard Time, after daylight saving finishes.

During other daylight hours (Daylight - 1000, 1800 - Dark.) the MEAT-Section is to remain reasonably available for deployment, generally about 30 minutes notice with the pilot and additional aircrew members contactable and able to fly.

On declared days of Total Fire Ban, the response time requirement applies between 0900 and 1900 hours (Eastern Summer Time)

B Aircraft loading procedures

To be reviewed in detail with the AAC and loading crews.

C Aircraft refuelling

Refuelling is the responsibility of the pilot in command of each aircraft and is coordinated through Avalon Airport refuelling.

D Jettison areas

If a MEAT is dispatched and becomes airborne and there is no requirement to drop any retardant over a drop zone, a portion of the load may have to be jettisoned in order to maintain legal landing weights.

The amount of retardant dispensed will be at the discretion of the Pilot in Command (PIC) as per the aircraft company operating procedures.

The Birddog-AAS will direct the respective MEAT to the designated local jettison zone area as per the Convair CV-580 Air Tanker Operational Guidelines and Procedures.

Additional information is available in Attachment 6 Offload and jettison management.

E Aircraft maintenance

Any aircraft unserviceability must be reported to the AAC immediately.

The AAC will advise the AirDesk of the issue with an estimate of unavailability.

Daily aircraft inspections will be performed at a time that will not compromise the MEAT-Section's ability to respond to wildfire incidents.

Routine maintenance shall be scheduled to avoid conflict with the MEAT-Section's ability to respond to the wildfire incidents.

F Weather

All aircrew must be aware of current and predicted weather patterns relevant to anticipated firebombing operations.

G Last light

The MEAT-Section aircrew are to be aware of the relevant last light provisions and incorporate them into mission planning.

All fire bombing operations are subject to VFR conditions.

H Avalon Air Base daily briefing

The AAC is responsible for conducting daily briefings which will include information relating to weather briefings and forecasts & operational situation reports relating to fire activity and aircraft activity.

Other aspects include a review of the previous day's events and anticipated workload of the current day and a discussion of any relevant issues that may affect the operation.

I Briefing operation of Reload Bases

RESERVED

J Temporary Restricted Airspace (TRA)

Refer to State Aircraft Unit Procedure AM 1 . 0 5 Management of Aircraft at Incidents.

K Standard Notice to all Airman (NOTAM)

Air Services Australia (ASA) at the commencement of each fire season publish a generic Fire NOTAM which advises all pilots of the potential of aircraft activity associated with fire fighting operations.

L Specific NOTAM

ASA will issue an incident specific Fire NOTAM, upon request of the State AirDesk, for a specific incident(s) where it is felt a higher degree of awareness of fire / aircraft activity is required when the MEAT-Section may be operating.

A request for the implementation of an incident specific Fire NOTAM, shall be made by the incident Air Operations Manager or Aircraft Officer to the State AirDesk, after consultation with the Incident-AAS and pilots.

Requests for the implementation of an incident specific Fire NOTAM to ASA shall only be made by the State AirDesk.

M Provisions

Declaration of a Fire NOTAM in the vicinity of a fire does not prevent itinerant aircraft from potentially conflicting with fire aircraft.

12 RESPONSE RADII

A Avalon Nominated Operational Base

The indicative radius in Figure 1 identifies an initial dispatch footprint from the nominated operational base, Avalon, to an incident located within a 30 minute flight time response.

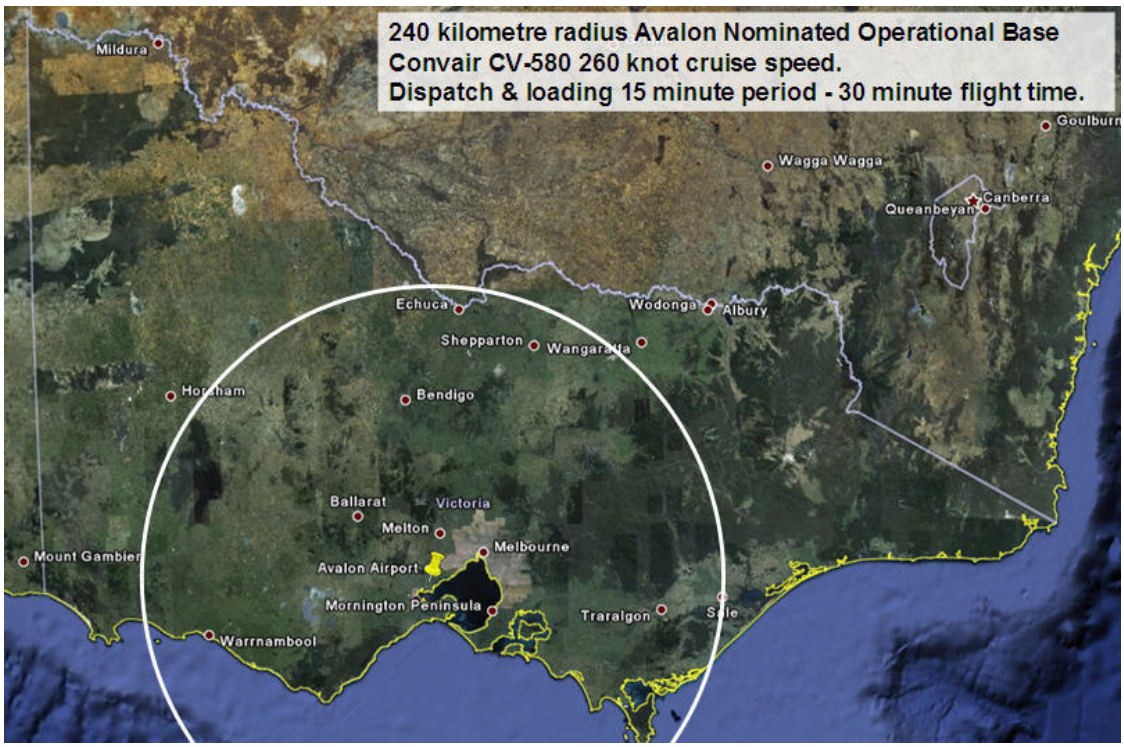

Image Google Earth 2000.

Figure 1 Indicative response radius from proposed nominated operational base, Avalon.

B Albury Reload Base

The indicative radius in Figure 2 identifies an initial dispatch footprint from Albury Airport, to an incident located within a 30 minute flight time response.

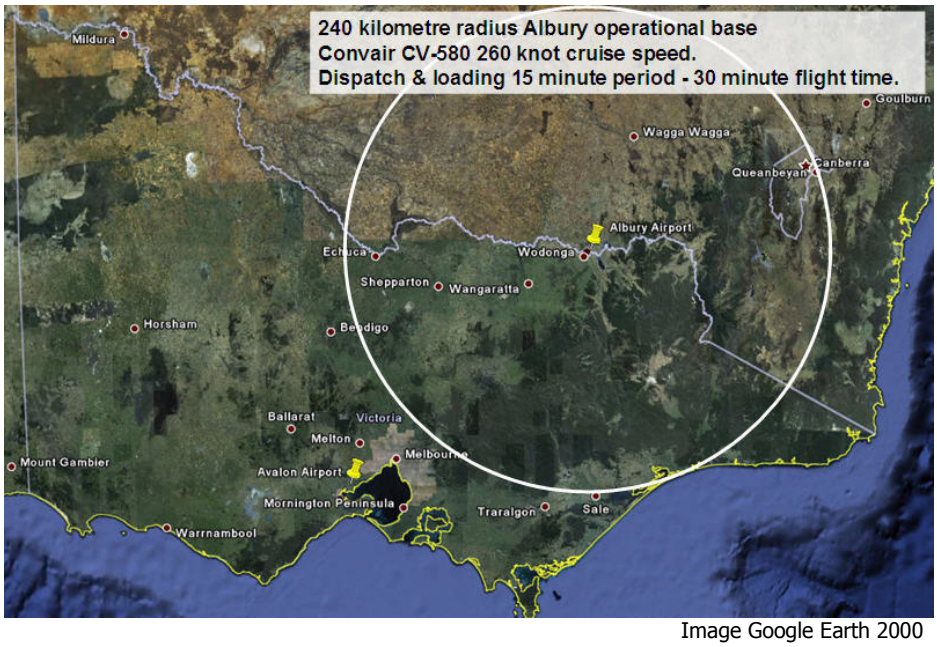

Image Google Earth 2000

Figure 2 Indicative response radius from Albury Air Base.

C East Sale Military Air Base

The indicative radius in Figure 3 identifies an initial dispatch footprint from East Sale Military Air Base, to an incident located within a 30 minute flight time response.

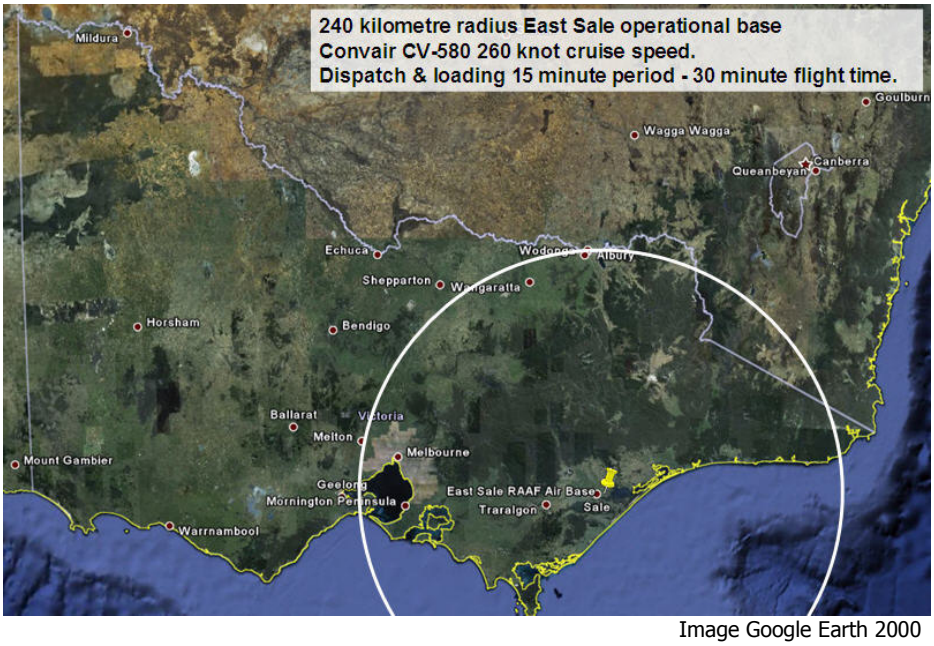

Image Google Earth 2000

Figure 3 Indicative response radius from East Sale Military Air Base.

13 REQUESTS

A Resource request

Resource requests for the operational use of the MEAT-Section can be actioned by the following:

1. the respective Incident Controller (IC) initiates a request via chain of command to the respective State Duty Officer(SDO) or
2. a SDO request for deployment after consultation with Field Managers or Area Operations Controller (when appointed) and
3. A State Fire Controller (SFC) or Chief Officer (CO) request for deployment after consultation with Field Managers or Area Operations Controller (when appointed).

B Approval

The approval from the SFC or will be given subject to:

1. the IMT Strategy (or Incident Shift Plan for Extended Attack) identifying use of MEATs which has been prepared in consultation with incident Air Operations Manager (AOM0,
2. the ability to work safely including maintaining fire fighter and civilian safety in forest and interface environments and avoid dropping suppressant/retardant on houses is understood and
3. the suppressant / retardant type stated and is approved by IC and SFC.

C Minimum requirements

Incident Controllers are to ensure that:

1. an Australian Inter-agency Incident Management System (AIIMS) Air Operations Unit structure established for duration of flight/s and relevant roles filled by authorised personnel,
2. a Communications Plan prepared and communicated to MEAT-Section and a fire common traffic advisory frequency (F-CTAF) is allocated by the State AirDesk and
3. the presence of on-site Incident-AAS is confirmed with communications with on-ground resources in place with the Incident-AAS.

D Provisions

Requesting offers are to be cognizant of the following additional factors to consider when requesting the MEAT Section, which are:

1. the ability to maintain Visual Metrological Conditions (VMC) during flight and/or at the incident drop zone,
2. flight following and agency aeronautical procedures are established and
3. the Avalon take off and Incident on-site wind conditions are within MEAT-Section performance parameters.

E Dispatch

Dispatch coordination has been assigned to the State AirDesk.

F Assignment

The MEAT-Section is assigned to the incident for the day of operation, they return to State conclusion of daily flight operations. Any continued operational use for subsequent daily operation requires a formal request the through established protocols**.**

G Release

The Incident must ensure that aircraft are released from operations as soon as practicable and ensure that the State AirDesk is notified prior to the release of the MEAT-Section.

H Re-deployment

Redeployment of the MEAT-Section engaged in fire suppression operations to operations in a different location is treated as an initial dispatch and requires approval from the SFC.

14 INTER-STATE DEPLOYMENTS

A Inter-state operability

The requesting interstate jurisdiction[4] is to ensure that a suitable operational base has been identified and made available for the operation of the resources.

Additional Information is available in Attachment 8 Potential inter-state operational bases for an indication of the most suitable airports and runways.

An indicative list is also identified and listed with in the document, Overview of the Convair CV-580 air tanker, State Aircraft Unit Victoria, September 2010.

The requesting jurisdictions need to:

- be aware that the resource request includes three aircraft and associated aircrews.
- consider the elapsed time for aircraft to arrive "in State" and "on site" at the temporary reload base.
- asses the capacity to provide resources and support and infrastructure for the duration of the reassignment
- identify the operating environment and provide an analysis of terrain, fuel type-forest grassland or urban interface and fuel loads with respect to aircraft capability and asses the suitability, and potential effectiveness of the tasking.
- consider integration with other resources and
- give an indication of the period of deployment.

B Inter-state requests

Refer to National Aerial Fire fighting Centre, Standard OPS-005 PROCEDURE FOR TEMPORARY REDEPLOYMENT OF FIREFIGHTING AIRCRAFTNAFC.

C Deployment provisions

The resource deployment will consist of the MEAT-Section aircraft, 2 X CV-580 air tankers and 1 X Aero commander AC90 Birddog aircraft: including the respective aircrews, engineering support, aircraft loaders and air base manager, a minimum of 12 personnel.

The dispatch and departure sequence from initial notification will be three hours. The arrival of the aircraft will be subject to the ferry flight legs and number of refuelling stops.

The requesting jurisdiction will be cognizant of the prevailing weather conditions which may be encountered during the mobilisation flight and planned refuelling locations.

The requesting jurisdiction is to be aware that the resource mobilisation is predicated on their ability to provide key resource support.

Repositioning over extended distances will require a consideration of an approximate period of 40 minutes for refuelling if fuel is pre-arranged and confirmed before departure.

The requesting jurisdiction will be identified as the Guarantee for expenditure and invoicing of fuel purchased during the mobilisation and demobilisation flights.

[4] Includes fire authorities and land management agencies within the States and Territories of Australia and New Zealand.

E Temporary reload base

The location of aircraft parking and reloading footprints should take into consideration the capacity of taxiways to be used.

All reloading plumbing fittings fitted to the CV-580s are 3 inch camlock, female connectors.

Provision should be made to allow the filling of both aircraft at the same time where possible.

All pumping equipment associated with the temporary reload base shall be greater that 18 horsepower.

Provision of a temporary reload base should at a minimum include adequate area to accommodate the following footprints:

1. Aircraft manoeuvring/turning ramp space 50 metres X 50 metres.
2. Aircraft parking non operational – 50 metres X 90 metres
3. Refilling and operational parking – 50 metres X 90 metres
4. Infrastructure to support reloading operations – 20 metres X 50 metres

F Aerial suppressants

The minimum volume of water to be available on site for daily operations subject to 2 X CV-580s flying eight missions a day is 128,000 litres.

- Water X 8000 X 2(CV-580) X 8(hours) = 128,000(Litres).

The minimum number of Phos-bins required to mix retardant on site for daily operations subject to 2 X CV-580s flying eight missions a day is 24.

- Retardant X 8000 X 2(CV-580) / 3(Retardant Phos-bins) X 8(hours) = 24(Phos-bins).

The minimum number of Phos-bins required to mix retardant on site for daily operations subject to 2 X CV-580s flying eight missions a day is 24.

- Class A Foam X 8000 X 2(CV-580) / 4(20 Litre pails) X 8(hours) = 32(20 Litre pails).

G Refuelling

The requesting jurisdiction must ensure the provision of bulk fuel or suitable alternatives are available and have contingency arrangements for continuous fuel supply. The refuelling provision should include the ability to conduct pressurised refuelling.

The refuelling facility will need to support a volume of 30,000 litres a day for eight hours flight operation for the MEAT-Section, inclusive of the three aircraft.

H Communications

Jurisdictions must ensure an effective communications plan been developed and equipment provided, subject to engineering requirements have been developed and can be realistically implemented to coordinate the flight operations for the MEAT-Section

I Additional

Jurisdictions are to consider providing access to engineering and support equipment for daily maintenance inspections and unplanned requirements, inclusive of footprints and facilities for spare parts and equipment storage (minimal).

Jurisdictions are to provide access to facilities, including ready room, accommodation and sustenance.

15 DISPATCH

A Dispatch information

The MEAT-Section will be provided with as much incident information known inclusive of no less than the following:

- Latitude & Longitude (in Degrees, Minutes, Decimals)
- Geographic Location (as referred to on a map or chart)
- Elevation (of the incident in feet)
- Magnetic Bearing (from the point of dispatch)
- Distance (in nautical miles from operational base)

For further information refer to Attachment 7 Incident dispatch summary information.

B Supported dispatch sequence

The Avalon Airbase Coordinator will receive dispatch information from the AirDesk and will be responsible for notifying all MEAT-Section members and Avalon Airbase personnel.

The dispatch sequence is outlined in Figure 4.

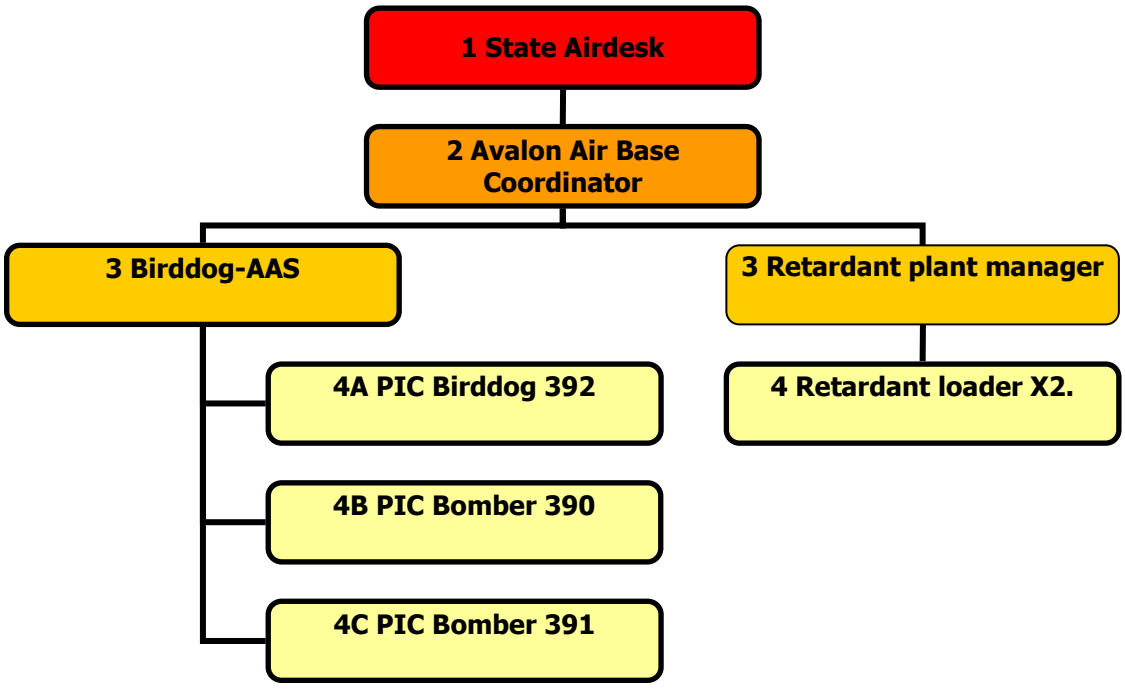

Figure 4 Supported dispatch sequence.

Provisions:

1. Notification is provided by State AirDesk to Avalon Airbase Coordinator, communication provides advice of Incident and dispatch criteria details.
2. Avalon Airbase Coordinator initiates dispatch providing information and hard copy of Incident Dispatch Summary Information Form, with specific details.
3. Primary advice supplied to Birddog-AAS who coordinates with PIC Birddog 392 Bomber 390 & Bomber 391;

Avalon Airbase Coordinator confirms dispatch requirements with Retardant Plant Manager.

4. All PICs will action standard preparedness response;
   Retardant loaders will action standard preparedness response in conjunction with Retardant Plant Manager and Avalon Airbase Coordinator.

The process outlined above does not preclude the options of multiple or opportune notifications to any members of the respective operational functions.

C Unsupported sequence

A primary contact for the MEAT-Section will receive the dispatch information from the AirDesk and will be responsible for notifying all MEAT-Section members and Avalon Airbase personnel.

The dispatch sequence is outlined in Figure 5.

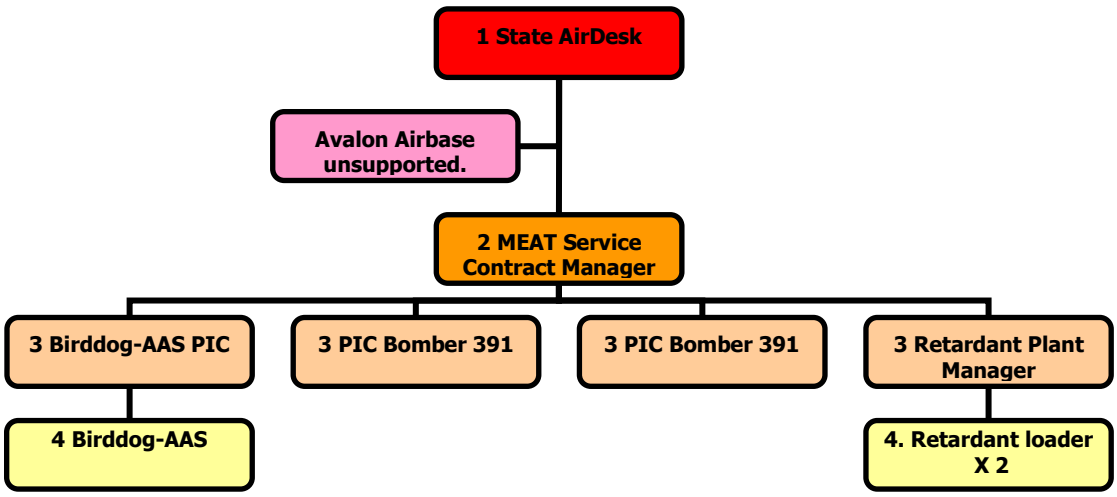

Figure 5 Unsupported dispatch sequence.

Provisions:

1. Notification is provided by State AirDesk to MEAT Service Contract Manager, communication provides advice of Incident and dispatch criteria details.
2. MEAT Service Contract Manager initiates dispatch providing information and hard copy of Incident Dispatch Summary Information Form, with specific details.
3. Primary advice is supplied to Birddog-AAS PIC who coordinates with the PIC of Bomber 390 & Bomber 391;
   MEAT Service Contract Manager confirms dispatch requirements with Retardant Plant Manager;
   All PICs action standard preparedness response;
4. Birddog PIC briefs Birddog-AAS after pick up.
   Retardant loaders action standard preparedness response in conjunction with Retardant Plant Manager and Avalon Airbase Coordinator.

The process outlined above does not preclude the options of multiple or opportune notifications to any members of the respective operational functions.

D Aircrew briefing

The Birddog-AAS will confirm the information with the MEAT-Section aircrew, all members are to record the following mandatory information:

1. Latitude & Longitude coordinates,
2. Geographic location,
3. Magnetic Bearing in degrees from the point of dispatch,
4. Distance in nautical miles from the point of dispatch and
5. Elevation of the incident.

On departure from the NOB the Birddog-AAS will confirm the information and may be given additional incident information from the State AirDesk.

E Loading procedure

Once the aircraft is loaded, the aircraft are not permitted to taxi until the load master has given an all-clear thumbs-up signal.

F Departure altimeter setting

The MEAT-Section will establish and maintain the altimeter setting from their initial point of dispatch. The MEAT-Section will confirm and acknowledge the altimeter setting in use.

The altimeter setting is to be maintained for the duration of the mission or until as such time contact is made with the working Incident-AAS and the operational local altimeter setting is applied.

G Departure reporting

The Birddog-AAS aircraft will relay the estimated time of arrival (ETA) for the incident to the State Air Desk and if possible the nominated Incident-AAS when airborne and established in the ferry airborne.

16 EN-ROUTE MANAGEMENT

A Mission instructions

Standard reporting and actions will be consistent with the State Aircraft Unit Procedures 2010.

B Departure

On departure every attempt will be made by the aircrew to ensure a "Sterile Cockpit".

Departure calls from Avalon Air Base are to be made to the Sate Air Desk at the completion of Air Services Australia (ASA) reporting processes.

The MEAT-Section will also advise Avalon Air Base (233 4001 646) on departure and subsequently a mandatory flight commencement call to the State Air Desk (233 4001 700) to request and establish flight following.

C En-route sequence

Once airborne and en-route, the MEAT-Section will proceed to the fire via the most direct route subjected to flight planning requirements determined by air traffic control and airspace provisions.

When the MEAT-Section is established in cruise flight a review of the estimated time of arrival (ETA) will be provided to the Incident-AAS and as necessary to the State Air Desk.

For sustained operations the Birddog-AAS will confirm with State Air Desk the closest RB and that it is operational capable for reloading of the MEATs.

D Flight following

Each aircraft will be responsible for conducting flight following independently and the flight following is to be conducted with the State AirDesk.

Additionally the Birddog-AAS aircraft is responsible for ensuring the position of each of the group aircraft is known at all times and is accountable for the locations and welfare of all aircraft in the MEAT Section.

C Confirmation

When the MEAT-Section departs the controlled airspace or mandatory frequency area of the NOB the Birddog-AAS aircraft will switch to the allocated fire common traffic advisory frequency (F-CTAF) provided to the MEAT-Section.

Similarly, each MEAT pilot will switch to the F-CTAF and report in to the Birddog-AAS aircraft.

Once the MEAT Section have reported on F-CTAF, the Birddog-AAS will confirm the mission, a brief fire summary, other aircraft or known hazards at the incident and confirm the RB if required.

D En-route contact Incident-AAS

Prior to a 10 nautical mile inbound call, the support Birddog-AAS aircraft should be in contact with the working Incident-AAS and will request the following information:

1. Altimeter setting in use
2. Vertical profile for airspace and separation
3. Incident elevation
4. Fire name
5. Confirm communications plan
6. Confirmation of reload base
7. Confirm tactical resources on the incident
8. information relating to hazards, other air traffic

E 10 nautical mile inbound reporting Birddog-AAS aircraft

At 10 nautical mile the Birddog-AAS aircraft will make an advisory call providing information on location and altitude, including time and distance for arrival on scene of the Birddog-AAS and the MEATs.

F 5 nautical mile inbound reporting Birddog-AAS aircraft

The Birddog-AAS will contact the Incident-AAS in the fire area to confirm the location and the intentions including the approval to enter the operational area with the MEAT-Section.

At this point the Birddog-AAS aircraft will establish and confirm the vertical separation profile for the working incident aircraft, refer to Figure 6 below.

The Birddog-AAS aircraft will also request an altitude to enter the vertical separation profile to commence an assessment and determine pre entry requirements for the MEATs.

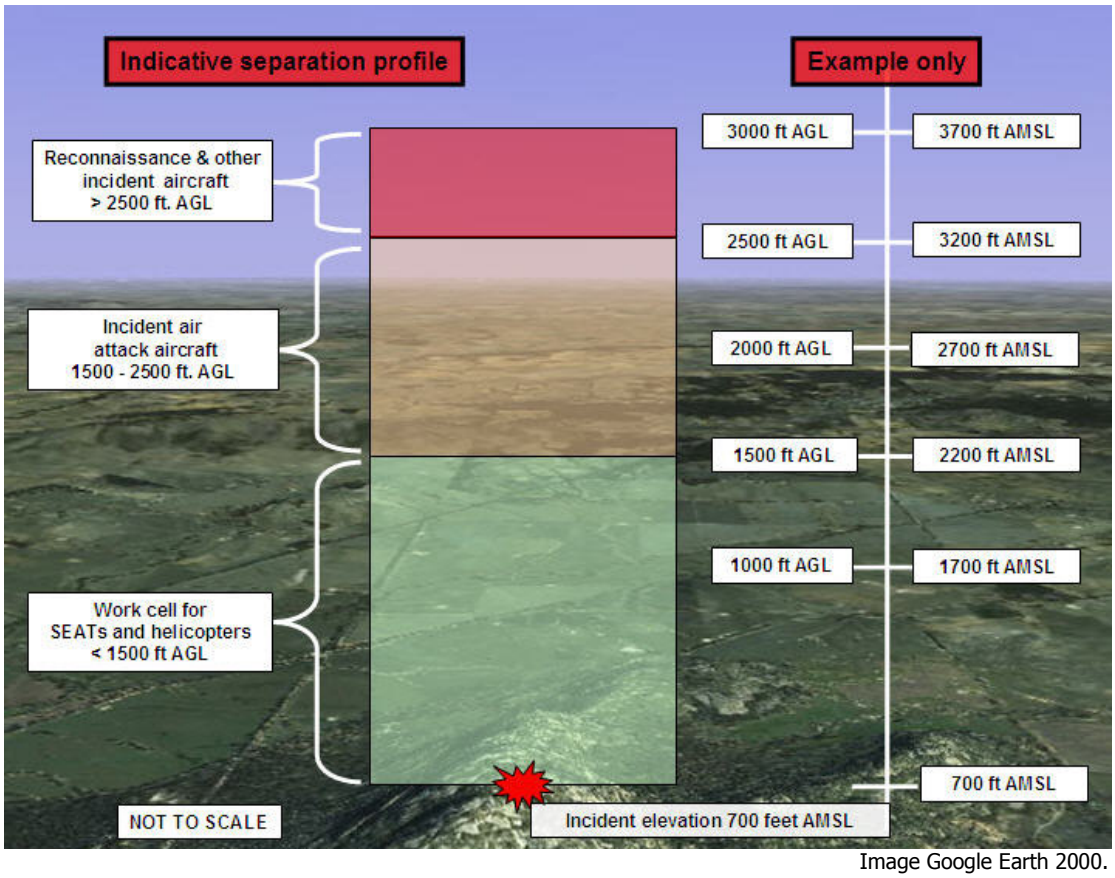

Image Google Earth 2000.

Figure 6 Indicative vertical separation profile standard agency fire bombing operations.

G Birddog-AAS aircraft

Upon arriving over the incident, the Birddog-AAS aircraft will enter the vertical separation profile at the pre arranged level and orbit in a clockwise direction.

When he MEATs have reported they are inbound and monitoring the frequency the Birddog-AAS aircraft will confirm the altimeter setting in use over the drop zone.

When the hand-over from the Incident-AAS is complete, the incoming MEATs will report to the Birddog-AAS aircraft.

The control of the MEAT-Section vertical separation profile, known as the "**stack**", will be assumed by the Birddog-AAS aircraft.

Prior to the set up the Incident-AAS will have contacted the ground crew on site to confirm the fire strategy and objectives and removed any ground resources within the drop zone.

H Incident-AAS

See section 18 Incident Air Attack Responsibilities.

17 TASKING

A Planning

The Birddog-AAS aircraft will determine the orientation of the drop based on topographic, geographic or other features.

The terrain type will be a limiting factor for run direction and safe exits, the Birddog-AAS aircraft will identify hazards, escape routes and flight paths.

The Birddog-AAS aircraft will determine the circuit pattern for the intended drop. In determining run directions in other than flat terrain, the team will ensure that all exits are downhill or straight out/ turning/breaking away from hazards.

Prior to the intended drop the Birddog-AAS will reaffirm the objective and plan with the Incident-AAS.

The Birddog-AAS aircraft will complete all procedures which may cause distraction at low level prior to descent.

B Drop zone assessment

The Birddog-AAS will have consulted and confirmed with the Incident-AAS the objectives and developed a strategy prior to descent into low-level operations.

The Birddog-AAS aircraft will identify hazards, exit routes and flight paths which will determine the orientation of flight lines and circuit legs based on terrain.

If the hazards and risk are acceptable to the Birddog-AAS aircraft, they will determine the circuit direction.

In determining run directions in other than flat terrain, the Birddog-AAS aircraft will ensure that all exits are flown at or below target elevation while turning away from any hazards.

If visibility is restricted or the wind conditions are difficult to determine, the Birddog-AAS aircraft will make the initial low-level passes at a higher than required altitude in order to assess the conditions from a safe vantage point.

If hazards pose too great a risk, the Birddog-AAS aircraft will terminate mission and advise the Incident-AAS the drop will be aborted and all resources will be advised.

C Drop zone confirmation

After consideration of the requirements for the drop and the risk management and decision-making process, the Birddog-AAS in consultation with the Incident-AAS will physically fly the bombing runs prior to identifying the target to the MEAT aircrew.

The Birddog-AAS aircraft will take note of any prominent features that may be included in the run description to assist in describing the line and release point to the MEAT aircrew.

E Approach procedures

The preferred approaches for the MEATs are in a left-hand circuit which descend onto the final leg enabling the MEAT aircrew to maintain a visual reference of the drop zone at all times when entering the "**stack**".

At times terrain and visibility restrictions may limit the circuit to a right-hand direction only.

At any time where there is a requirement to cross ridgelines the Birddog-AAS aircraft will identify crossing altitudes and relay them to the MEAT aircrew to aid the flight descent profile. Weather permitting; the minimum altitude for crossing ridges in mountainous terrain is 500 feet AGL.

Steep turns in narrow valleys are to be minimised so as not exceed angle of bank limitations for the MEAT-Section. Any angle of bank in excess of 30 degrees must be identified to the MEAT aircrew.

Any proposed flight into valleys and enclosed terrain must allow manoeuvrability for a 180-degree reversing turn.

F Exit procedures

Bombing runs into rising ground and terrain are restricted.

All runs must include an exit at or below the drop zone elevation to accommodate either a reduction in power or an inability to release the retardant load.

G Target elevation

The altitude is read from the altimeter in the Birddog-AAS aircraft as it passes over the drop zone at the bombing height above ground. Identifying the elevation allows the MEATs to fly an appropriate and safe flight profile to the drop zone when in the bombing circuit.

On steep fires where the elevation may be variable for different drops, the Birddog-AAS aircraft must check the safety and feasibility of each run and exit and call the applicable drop zone elevation to the following fire bombing aircraft.

H Low level hazards

Additional hazards not assessed during the high-level orbit will be identified when flying the actual flight line for the bombing run and these include visibility and turbulence.

For additional information see Section 23 Flight safety considerations.

I Pre entry

Where possible the Incident-AAS should have dropped payloads from all SEATS and fire bombing helicopters prior to the arrival of the MEATs.

The Birddog-AAS aircraft is to establish flight paths to avoid creating hazards to other aircraft within the F-CTAF and drop zone along with persons or property on the ground with consideration to potential wake turbulence created by the MEATs.

If the is a restriction on the vertical separation profile for the "**stack**" when single engine air tankers (SEATS), fire bombing helicopters and the MEAT-Section are on site there may be a requirement to place them in geographically separated circuits.

Additionally the SEATs and fire bombing helicopters resources may be utilised on other sectors of the fire until the completion of the drops from the MEATs.

If geographic separation is not possible consideration will be given to establish SEATs and fire bombing helicopters in an orbit with in a revised and reduced vertical separation profile.

J Standard circuit procedure and terminology

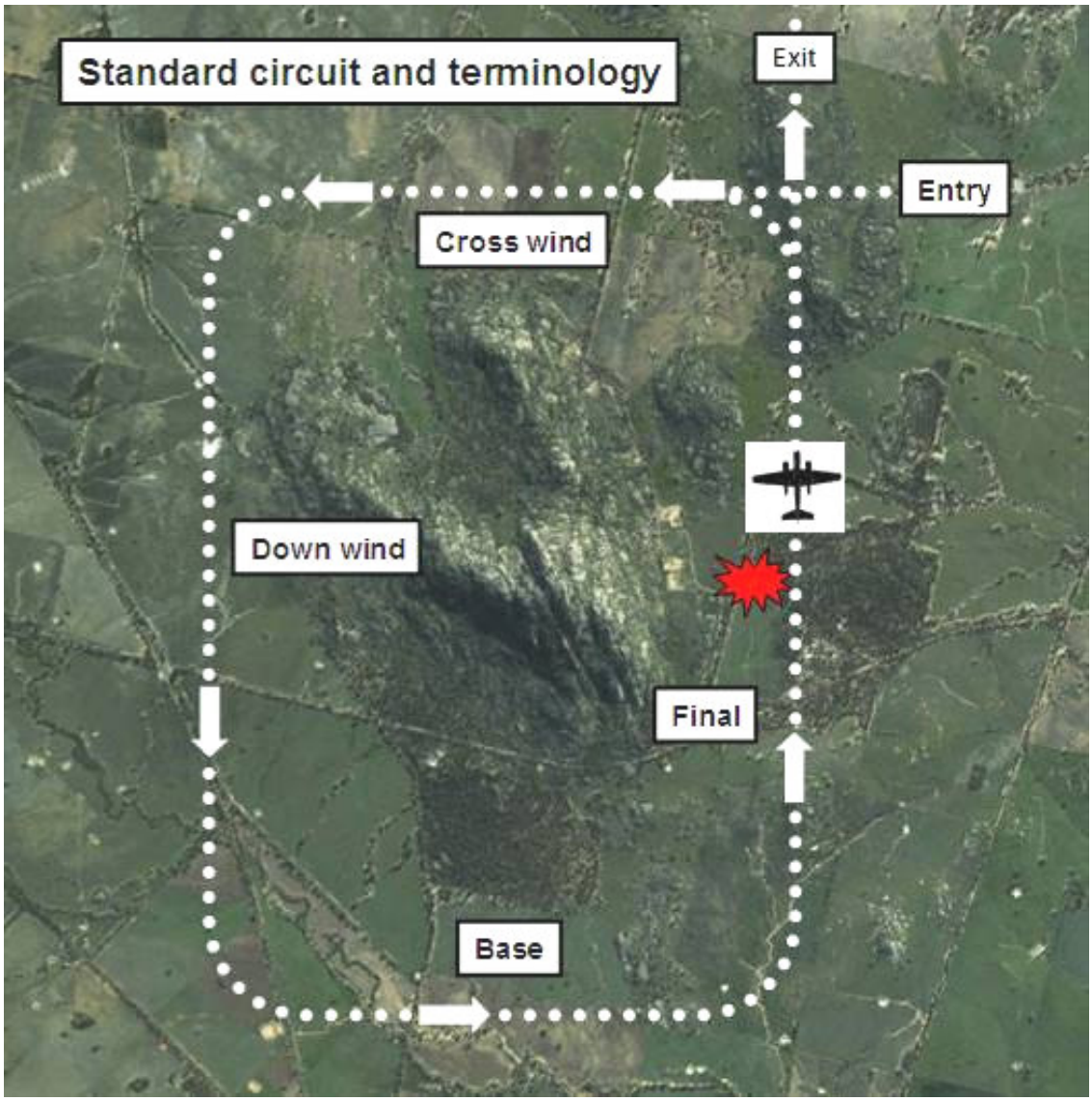

Image Google Earth 2000.

Figure 7 Standard circuit terminology used for flight operations.

18 INCIDENT AIR ATTACK SUPERVISOR RESPONSIBILITIES

A Key points

The MEAT-Section consists of three aircraft, a Birddog and two bombing aircraft.

The Incident-AAS retains overall coordination of all the aerial resources at the incident.

Planning and operation of the MEATs by the Incident-AAS should be based on fixed wing fire bombing aircraft flight characteristics and attributes.

The Incident-AAS should develop a plan of action for two fixed wing bombing aircraft and expect drop footprints to exceed 200 meters in length for drops delivered at the maximum controlled flow rate, coverage level 8.

The Incident-AAS should ensure other tactical aircraft are actively deployed to other locations away from the intended drop zone for the MEAT.

B Pre entry actions

The Birddog-AAS aircraft will make contact with the Incident AAS > 20 nautical mile (MN) from the incident. At 20 NM the Birddog-AAS aircraft will seek permission to enter the F-CTAF and approval to construct the vertical separation profile for the "**stack**".

Prior to the Birddog-AAS aircraft arriving over the incident, the Incident-AAS aircraft will identify and assign and establish itself to an altitude above the MEAT-Section "**holding area**", refer to Figure 9, page 35.

B F-CTAF area

Incident-AAS climbs to the discussed, agreed and assigned altitude above ground level and report at the assigned level, the assigned altitude will be positioned at no less than 2500 feet above ground level (AGL).

The Incident-AAS aircraft must also be prepared to assist with airspace management.

The Birddog-AAS will have consulted and confirmed with the Incident-AAS the objectives and developed a strategy prior to descent into low-level operations.

The Birddog-AAS enters the drop area at 1000 feet AGL and discusses with Incident-AAS desired drop requirements and the appropriate coverage level and subsequently confirms the drop zone with a "**show me"** flight profile, see Figure 13, page 43.

B Communication

All resources are to ensure a sterile F CTAF during operations.

The Incident-AAS aircraft will orbit at the higher level and operate as a communications link between the ground crews, Birddog-AAS aircraft and incident management while maintaining a strategic overview and coverage of the operation.

See Section 21 F-CTAF communications.

B Turn around times

If the MEAT-Section is to return to the incident the Incident AAS needs to consider the ferry speed of the MEATs and distance to the reload base for re-tasking actions and priorities.

The MEAT Section has a ferry speed of 500 kilometres an hour which is near double the ferry speed of some current fleet aircraft.

19 AIRSPACE MANAGEMENT

A Preparation

The Birddog-AAS aircraft monitors the radios prior to the arrival of the MEATs. The Birddog-AAS will handle all agency radio traffic.

Each aircrew member of the Birddog-AAS aircraft team will assume responsibility for monitoring the F-CTAF frequency.

B Separation

The Birddog-AAS aircraft will establish and monitor the vertical separation profile for the "**stack**" over the incident, identifying the **"holding area"** levels and the **"working area"** levels. Refer to Figure 9, page 35.

The airspace over the drop zone from ground level to 1000' AGL is identified as the **"working area"** for the Birddog-AAS aircraft and the approved MEAT.

Prior to entry into the working area the Birddog-AAS aircraft will clear any other tactical aircraft into or away from the **"working area"** as required conducting bombing operations.

Reassignment may include; reloading, refuelling or re-tasking in consultation with the Incident-AAS on other priorities for the incident.

When established in the **"working area"** the Birddog-AAS aircraft may request an altitude and direction of approach and departure for incoming and exiting tactical aircraft.

C MEAT 10 nautical mile inbound call ('5 Minutes Back')

The MEATs will establish contact with the Birddog-AAS aircraft when they are 10 NM or "5 minutes out" from the incident.

At this time the Birddog-AAS aircraft will give the MEAT aircrew the following information:

1.	Altimeter setting	2.	Identity and type of the preceding fire bombing aircraft
3.	Position in the airspace	4.	Brief fire summary and objective
5.	Entry altitude into the airspace.	6.	Orientation and direction of run
7.	Drop zone elevation	8.	Any safety hazards or traffic conflicts

D Vertical separation profile

The Birddog-AAS aircraft will assign the altimeter, entry altitude into the **"holding area"** of the vertical separation profile or "**stack**" at 500 foot intervals and advise the MEAT of the position in the "**stack**".

Example: *Bomber 390 2200 feet AMSL and Number 1 in the "**stack**".*

A second inbound call is given by the MEATs at 5 nautical mile inbound to the incident, confirmation advice will be given by the Birddog-AAS aircraft if the **"holding area"** is available for entry or if required other instructions.

Once the incoming MEAT has entered the **"holding area"** of the "**stack**", the MEAT aircrew must inform and receive acknowledgement from the Birddog-AAS aircraft.

Instruments should not be relied upon to maintain the vertical separation required.

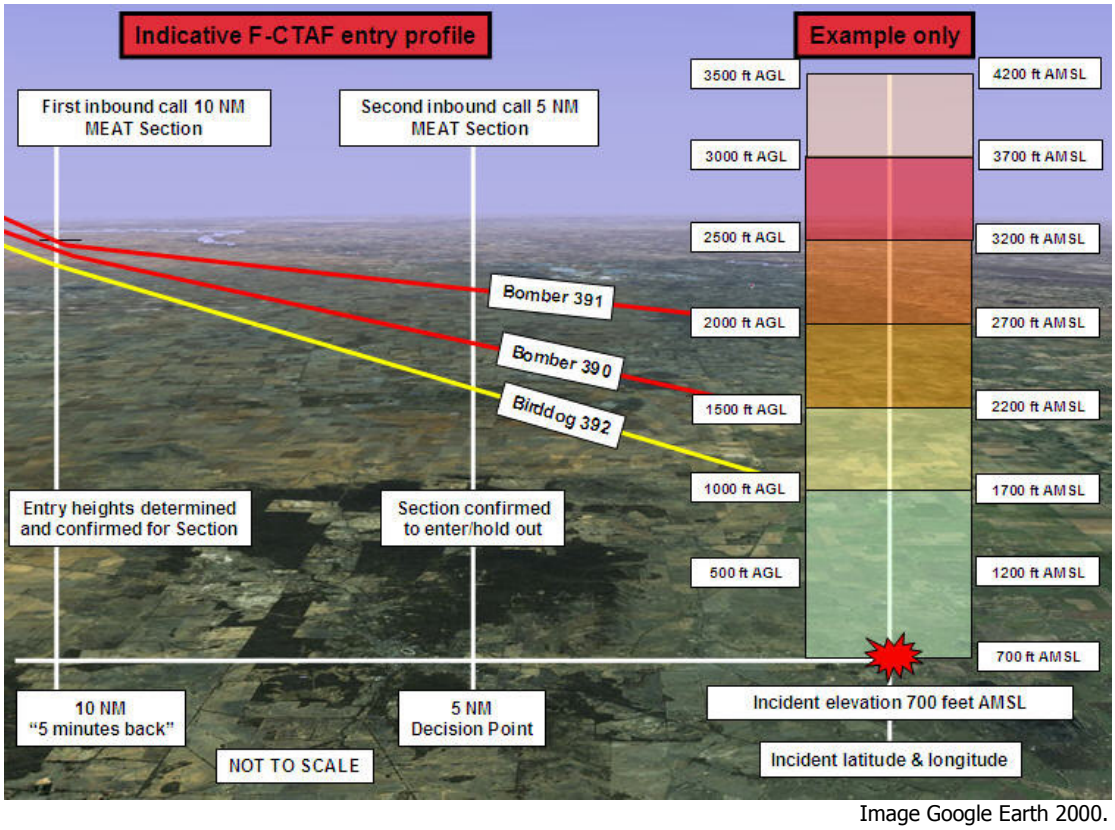

Image Google Earth 2000.

Figure 8 Indicative F-CTAF entry process.

When the MEAT is established at the assigned altitude and position in the **"holding area"** of the "**stack**" and maintaining visual separation with other aircraft, the MEAT aircrew will:

- announce arrival and altitude "Bomber 390 is overhead at 2200 feet AMSL"
- undertake a left-hand orbit
- observe the action and listen to the instructions given by the Birddog-AAS aircraft.

E Transition within vertical separation profile

With the confirmation that MEAT #1 (E.g. Bomber 390) departing the "**working area**" the other MEAT in the profile will simultaneously descend 500 feet to their new lower position within the **"holding area"** while maintaining visual reference to and separation from the aircraft below them.

MEAT #2 (E.g. Bomber 391) will automatically descend to the base of the **"holding area"** at the designated altitude and prepare for entry into the "**working area**".

The MEAT aircrew will broadcast the manoeuvre with the call sign number and a confirmation of the altitude to which they are descending too, which is to be acknowledged by the Birddog-AAS aircraft.

Instruments should not be relied upon to maintain the vertical separation required.

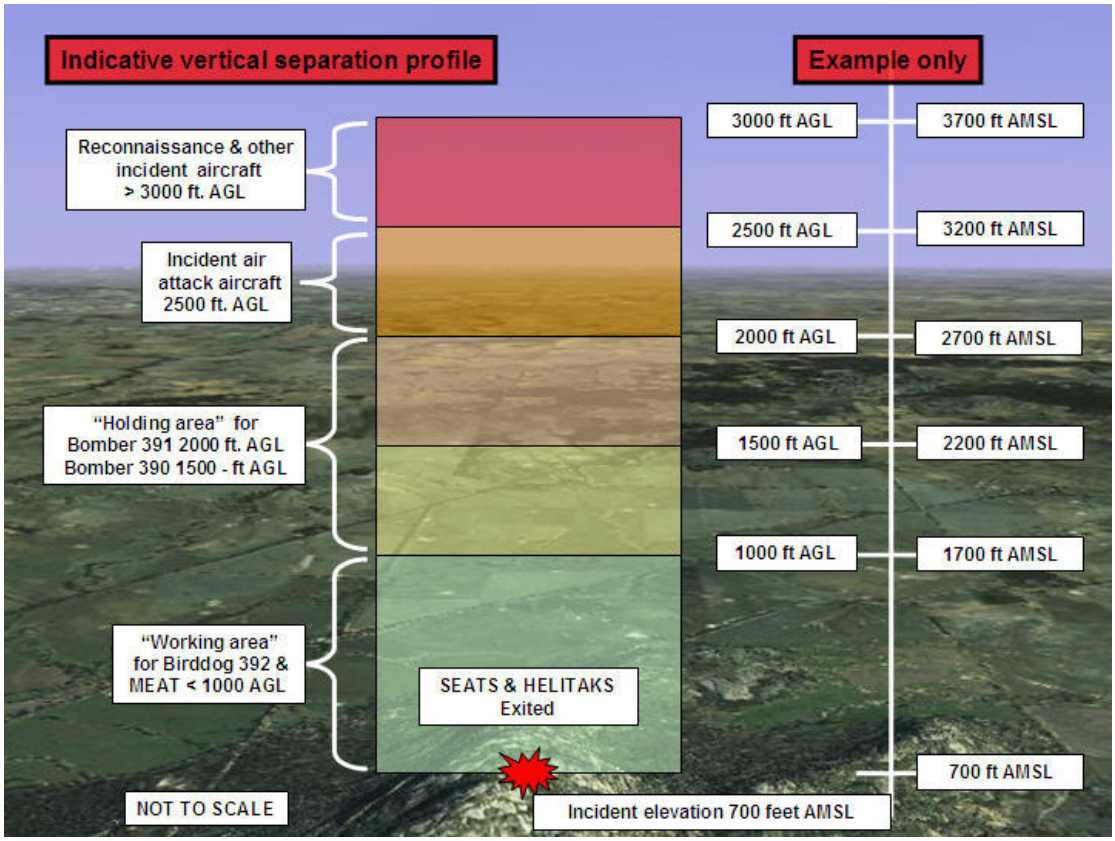

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Figure 9 Indicative separation profile MEAT operations.

F Sustained operations

A returning MEAT will call at 10 NM or '5 minutes back' from the fire and will not enter either the "**stack**" or the **"holding area"** until instructions have been received from the Birddog-AAS aircraft.

When approved to proceed the returning MEAT will enter the **"holding area"** at an assigned altitude.

No incoming MEAT will enter or descend into the "**stack**" until the MEAT they are following has been identified visually.

After an MEAT has dropped and has exited the immediate drop zone, below the base of the **"working area"**, the outgoing MEAT aircrew will contact the Birddog-AAS aircraft to confirm departure.

20 SEPARATION REQUIREMENTS

A Aircraft

The active MEAT will not enter the "**working area**" (up to 1000 feet above target elevation) until cleared into that airspace by the Birddog-Pilot.

The term "cleared for the run" will signify that the Birddog-AAS aircraft is permitting that MEAT to enter the airspace and that all ground crews or personnel are in safe locations relative to the intended drop zone.

Once the "cleared for the run" the MEAT may commence a descent into the "**working area**" for the drop run.

B Circuits

Standard procedure requires the Birddog-AAS aircraft to maintain right-hand orbits or circuits with breaks to the right after a "**Show me**" (Refer to Number 19 Part C) or observation runs whenever possible.

The MEATs will initiate a left-hand orbit, and terrain permitting maintains a left-hand circuit when cleared for the drop run. The MEATs will exit as briefed by the Birddog-AAS aircraft.

C Loss of separation

The two aircraft occupying the "**working area**" within 1000 feet above the ground must maintain visual separation. In visual contact is lost, each aircraft must fly a standard predetermined flight path until visual contact is regained.

D Terrain adjustment

Should terrain or aircrew preference require use of a non-standard pattern, the procedure to provide separation and must be briefed as necessary.

A higher MEAT maneuvering altitude may be required and the Incident–AAS orbiting altitude must be adjusted to maintain standard "**vertical separation profile**" requirements.

E Sterile F-CTAF

Consistent with current standard operating requirements a stronger emphasis is placed on maintaining a sterile F-CTAF for the drop process, this is to allow for the immediate advice of inadvertent hazards or realignment of the flight line for the drop.

All aircrews should and attempt to maintain a "**sterile F-CTAF**" during the drop process.

21 F-CTAF COMMUNICATIONS

A Initial contact

The Birddog-AAS aircraft will be monitoring the assigned F-CTAF frequency when en-route to determine the appropriate time to establish initial radio contact with the Incident-AAS.

The Birddog-AAS aircraft should initiated and establish initial radio contact when practical at a distance > 20 NM from the nominated latitude and longitude for the incident.

The initial radio contact information should include the MEAT-Section call signs, distance, direction and estimated time of arrival from the fire.

A clearance from the Incident-AAS is required prior to entry into the designated F-CTAF and this should be achieved prior to 10 NM.

After receiving a clearance into the F-CTAF, the MEAT-Section will plan to arrive at 10 NM from the incident at an assigned altitude at a speed of approximately 150 knots.

If radio contact can not be established, the MEAT aircrew will establish at a holding point approximately 10 NM from the intended drop zone while maintaining VFR separation from any other inbound and out bound incident aircraft

B MEAT circuits

The MEAT aircrew will advise the Birddog-AAS aircraft when the aircraft are entering overhead the circuit to await further instructions.

The MEATs will establish a left hand circuit around the intended drop zone area.

The left hand circuits will allow the MEAT aircrew to view the working aircraft below them while maintaining VFR separation.

22 OPERATIONAL CIRCUIT PROCEDURES

A Birddog-AAS aircraft circuits

The MEAT aircrew will advise the Birddog-AAS aircraft when the aircraft are entering overhead the circuit to await further instructions.

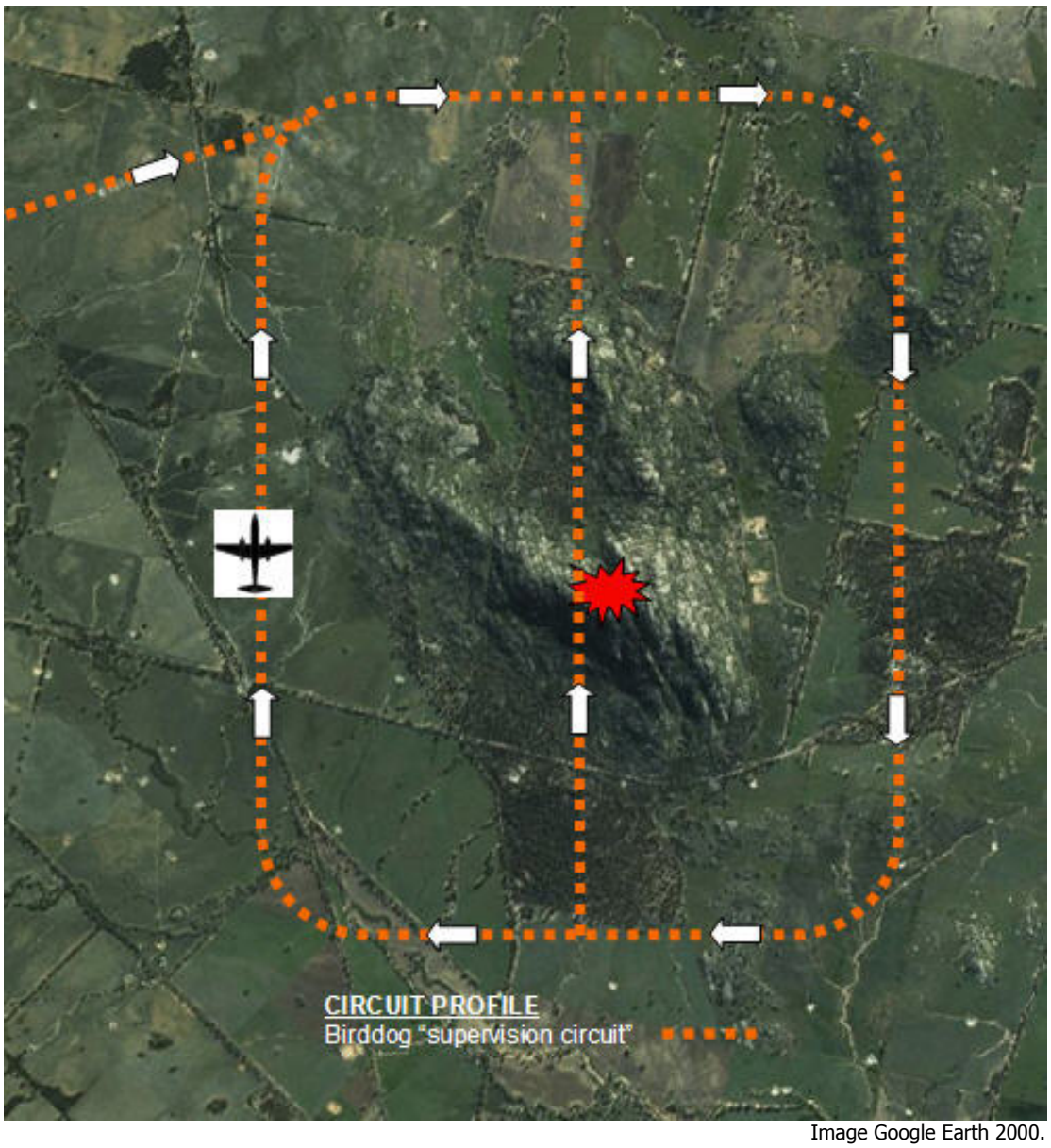

Image Google Earth 2000.

Figure 10 Indicative circuit profile Birddog-AAS aircraft, MEAT operations.

B MEAT circuits

The MEAT aircrew will advise the Birddog-AAS aircraft when the aircraft are entering overhead the circuit to await further instructions.

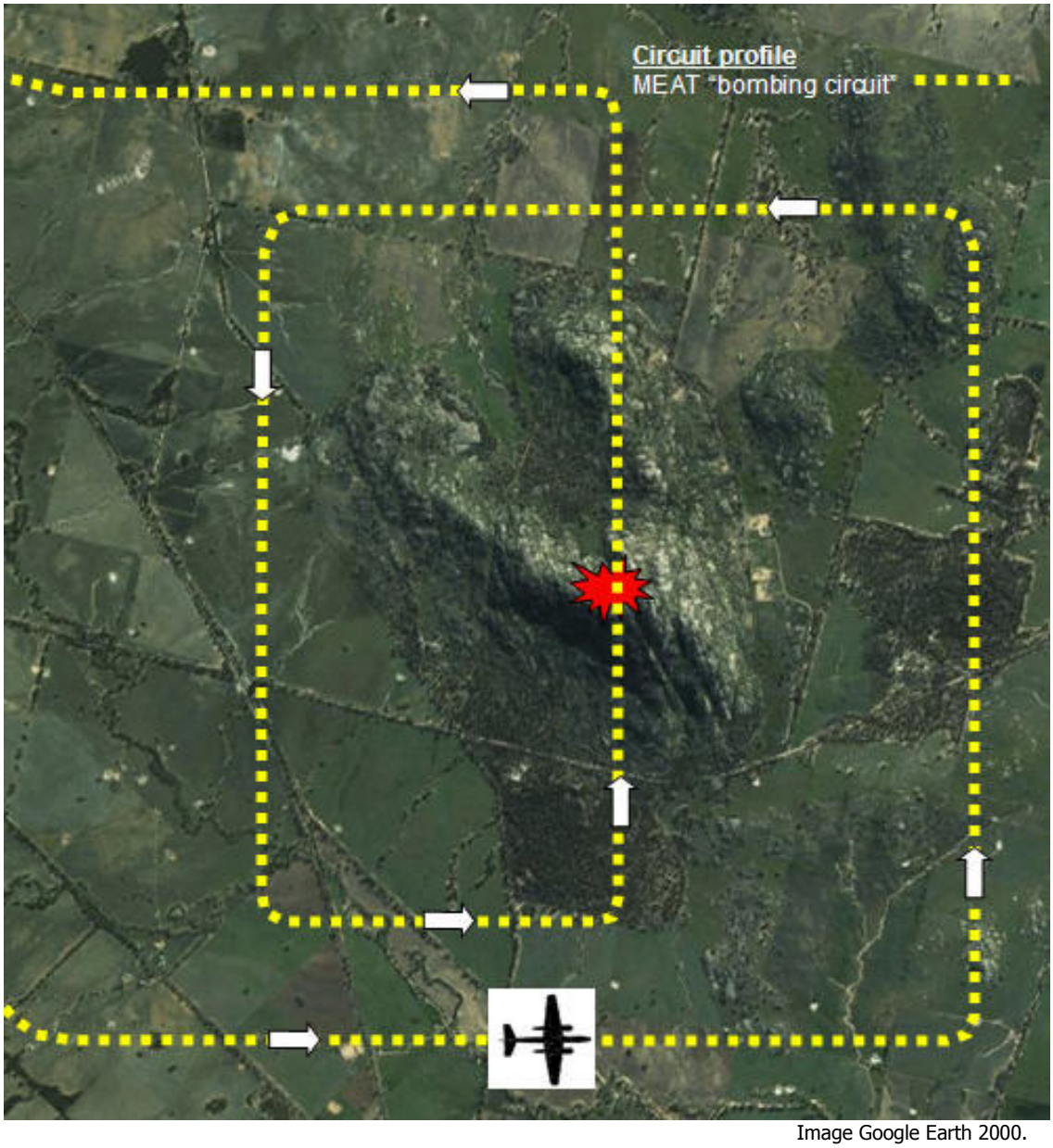

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Figure 11 Indicative circuit profile MEATs.

C Operational circuits

The MEAT aircrew will advise the Birddog-AAS aircraft when the aircraft are entering overhead the circuit to await further instructions.

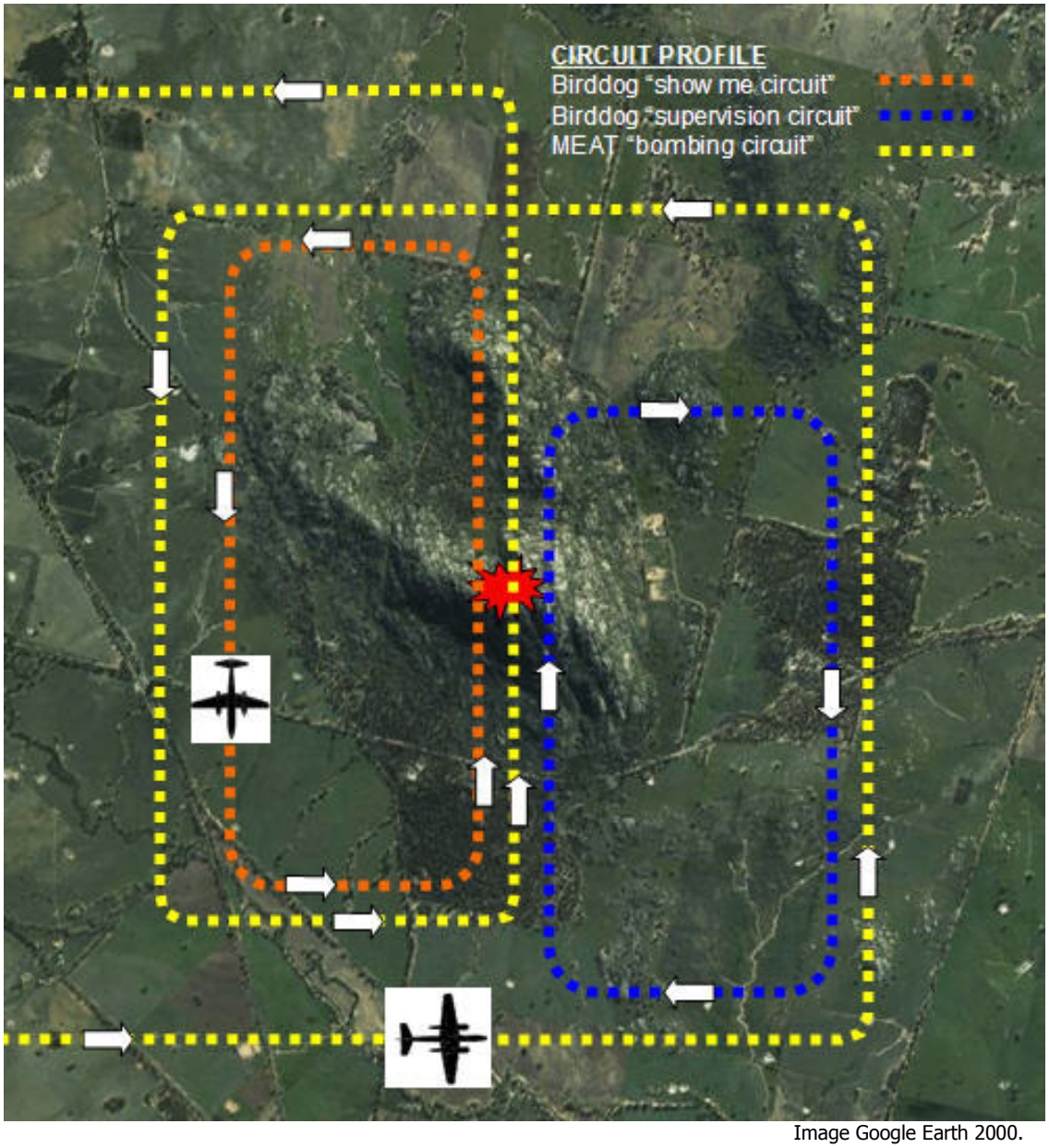

Image Google Earth 2000.

Figure 12 Indicative separation profile MEAT operations.

Provisions:

- Birddog circuit (right-hand) positioning to check line and observe drop.
- Birddog circuit (left-hand) on dummy run.
- MEATs turn left* on exit (Circuit and exit directions are dependant on terrain & obstacles.).
- Birddog turns right* on exit.

23 FLIGHT SAFETY CONSIDERATIONS

A Hazards

Terrain may limit fire bombing run directions and the availability of exits.

The influence and dominance of prevailing winds will impact on flight operations, especially under mountain flying conditions.

Prevailing winds will limit the ability of MEAT to manoeuvre in mountainous terrain, including the accuracy of drops.

The potential of turbulence associated with the wildfire conditions including downdrafts will require extra vigilance.

Extra vigilance is to be maintained in conditions were low visibility- smoke, cloud, diminishing daylight, valley shadowing, sun glare may be present.

Consideration is to be given to local weather conditions that may be encountered.

The presence of obstructions- powerlines, cables, tall trees, stags, towers or proximity to built up areas may restrict the potential for low level work.

24 TASKING PROFILES

A Drop zone identification

The MEAT aircrew will advise the Birddog-AAS aircraft when the aircraft are entering overhead the circuit to await further instructions.

The Birddog-AAS aircraft will acknowledge the presence and provide the MEAT aircrew with a more detailed description of the proposed run and drop zone.

Initial information provided will include:

• Target elevation	• Direction of run
• Direction of approach for the circuit (left or right-hand)	• Placement of drop
• Correction for wind drift	• Type of drop
• Hazards	• Exit

The Birddog-AAS aircraft will identify reference point(s) and a nominated anchor point to assist the MEAT aircrew in determining the appropriate flight line and drop zone and will describe any hazards on the final approach.

The Birddog-AAS aircraft will describe the exit and any hazards on exit.

All radio communication will be short during the run and drop zone description to facilitate interaction between the birddog crew and between the pilots in multiple-crew air tankers.

Once the drop zone has been identified and confirmed by the MEAT aircrew, the Birddog-AAS aircraft will position the aircraft to allow an unobstructed view of the run and the drop to allow for corrections and follow up assessments as required.

When the MEATs are in the final leg of the circuit a sterile F-CTAF is to be maintained unless there is a compromise of safety or the flight path needs to be amended.

During the commencement of the final circuit leg the MEAT aircrew will confirm the drop type selected and the drop system is armed. The Birddog-AAS aircraft will acknowledge this transmission and correct the drop type if required.

The siren will be used on every incident and the Birddog-AAS aircraft will not commence fire bombing operations until ground crews have been confirmed by the Incident-AAS they are clear of the drop zone.

B Techniques

Following confirmation that the MEAT is in position to observe the run, the Birddog-AAS aircraft will use one of the following techniques to identify the drop zone:

- The ***Show-Me*** - this is the preferred and standard method for firebombing operations.
- The ***Lead-In*** -this method is used when the run, or line and drop zone are difficult to see or describe due to visibility or lack of references.
- The ***Called-Drop*** -this method is used when the MEAT aircrew understands the run but cannot identify the drop zone.
- The ***Sequential drop*** -this method is used when there is a reduced vertical separation profile because of wether or controlled airspace.

C Show-Me

The ***Show-Me*** is a simulated bombing run made by the Birddog-AAS aircraft to demonstrate the run and identify the target to the MEAT aircrew.

The ***Show-Me*** is used for the first MEAT on a specific run or when an incoming MEAT has not viewed the previous drop.

Subsequent run and drop descriptions may be given only if the Birddog-AAS aircraft has previously flown and checked them for safety.

Prior to the ***Show-Me*** process it is preferable for the MEATs to approach the target using a left-hand circuit.

It is acknowledged that some times terrain and other limitations may limit the operations to right-hand circuits only.

The Birddog-AAS aircraft will confirm that the airtanker is in position to observe and the intended ***Show-Me*** run.

The Birddog-AAS aircraft will describe the circuit announcing the turns onto new legs of the circuit, giving clear references. Ridge crossing elevations will be advised to the MEATs through the circuit.

When the Birddog-AAS aircraft is on the final leg and approaching the drop zone the Birddog-AAS aircraft will identify and confirm the drop zone elevation and activate the siren as a warning of an imminent drop.

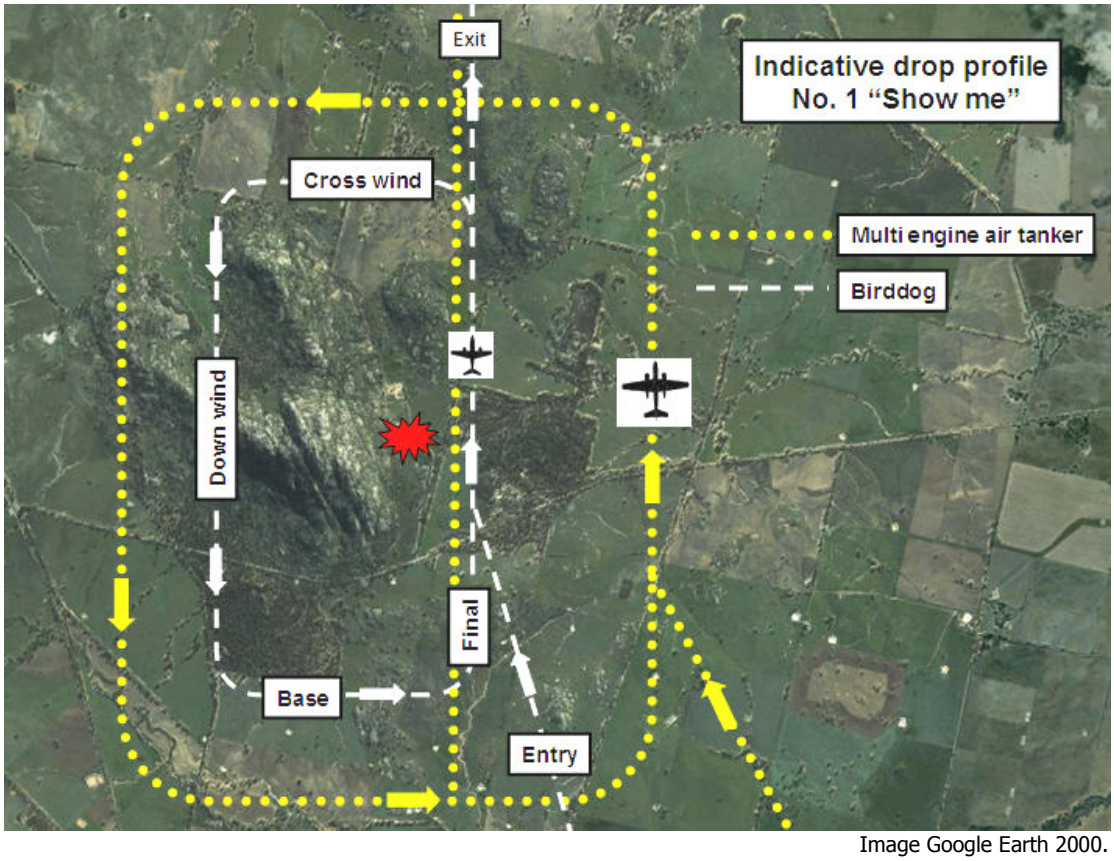

Image Google Earth 2000.

Figure 13 Indicative drop profile "Show-Me" technique.

D Lead-In

The ***Lead-In*** procedure is similar to the VLAT Project- Lead Plane Profile[5], it is normally used when the flight line and drop zone may be difficult to see or describe due to visibility or lack of references which is often encountered on flat terrain.

The Birddog-AAS aircraft will identify any hazards and will describe the exit route to be flown by the airtanker.

The Birddog aircraft will "**join up**" and be normally positioned in front of the MEAT on the base leg of the circuit.

Prior to the "**join up**" process the Birddog-AAS aircraft will confirm and establish with the MEAT aircrew the direction the Birddog aircraft will turn after identifying the drop zone.

During the ***Lead-In*** procedure the MEAT will follow the Birddog-AAS aircraft at a safe distance.

Any airspeed adjustments are amended after instructions from the MEAT aircrew to the Birddog-AAS pilot.

The Birddog-AAS aircraft will return overhead as quickly as safety and practicality to asses the drop and confirm the instructions for the MEAT aircrew.

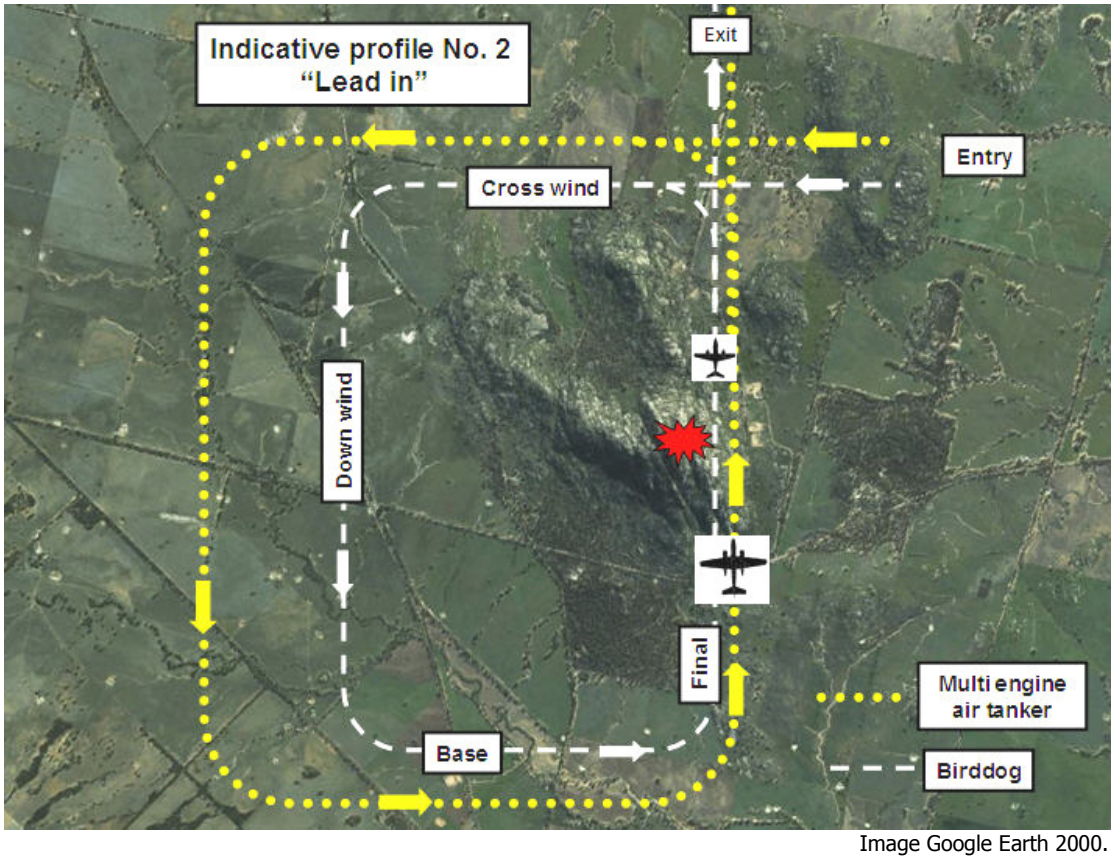

Image Google Earth 2000.

Figure 14 Indicative drop profile "Lead-In" technique.

[5] Very Large Air Tanker Operations Program State Aircraft Unit Victoria 2010.

E Called Drop

A ***Called-Drop*** is used when the aircrew of the fire bombing aircraft can verify the flight line but cannot clearly identify the drop zone.

To safely conduct this manoeuvre the Birddog-AAS aircraft pilot must give full consideration to the climb capabilities and to wake turbulence produced by the MEAT.

Similar to the ***Lead-In*** the Birddog-AAS aircraft will "**join up**" and be normally positioned at 90 degrees to the MEAT on the final leg of the circuit.

Prior to the "join up" process the Birddog-AAS aircraft will confirm and establish with the MEAT aircrew the direction the Birddog-AAS aircraft and MEAT aircraft will turn after exiting the drop zone.

The Birddog-AAS aircraft will identify any hazards and will describe the exit route to be flown by the MEATs.

On the final leg of the circuit the Birddog-AAS aircraft will confirm the flight line and will transmit "Ready - Now". The MEAT aircrew will release the load on the command "Now".

The Birddog-AAS aircraft will immediately turn in the direction briefed prior to the drop.

The MEAT aircrew will release the load and exit as briefed.

The Birddog-AAS aircraft will return overhead as quickly as safety and practicality to asses the drop and confirm the next instructions for the MEAT aircrew.

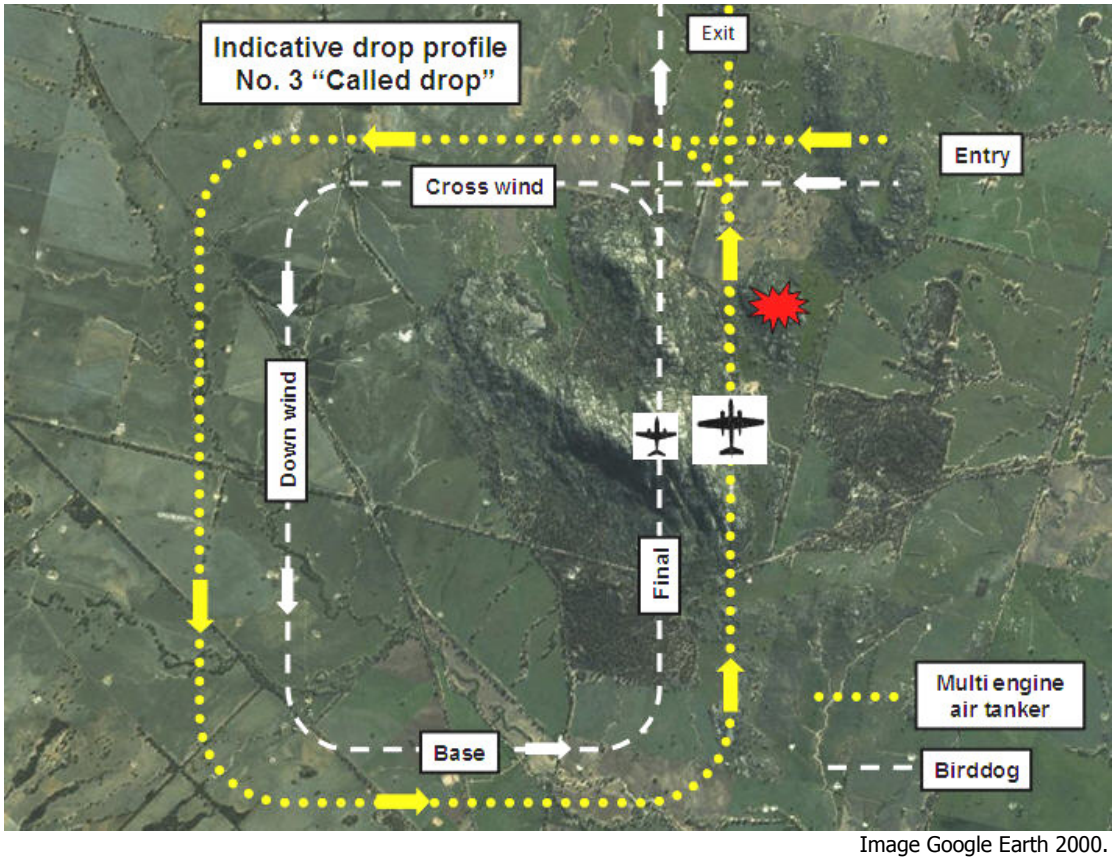

Image Google Earth 2000.

Figure 15 Indicative drop profile "Called-Drop" technique.

F Sequential-drop

The ***Sequential -Drop*** is primarily utilised in retardant line construction, it allows for the rapid use of multiple fire bombing aircraft or when the vertical separation profile will be in conflict with a low cloud base or controlled airspace.

To commence the Sequentiql-Drop the lead MEAT must be in position to observe the ***Show-Me*** from the Birddog-AAS aircraft.

Consideration must be given to wake turbulence during the sequential drops from preceding fire bombing aircraft.

All runs undertaken by the MEATs must fly in the same direction and drop types must use the entire load of each aircraft.

Only 'tag-on', 'roll-up' and 'parallel' drops may be used. No line shall be turned more than ten degrees from the preceding line.

Once cleared for the run, the initial MEAT aircrew will maintain visual separation with preceding MEAT at all times and space themselves so that the Birddog –AAS aircraft can assess each drop and adjust the instructions of the following MEAT.

The MEATS in the sequence will be given a common exit point and process.

In the event of a go-around, the MEAT will fly the exit as instructed and request permission to remain in the "**working area**" or rejoin the top of the "**stack**".

The MEAT aircrew must be given the option to accept or decline "**Sequential-drop**" instruction.

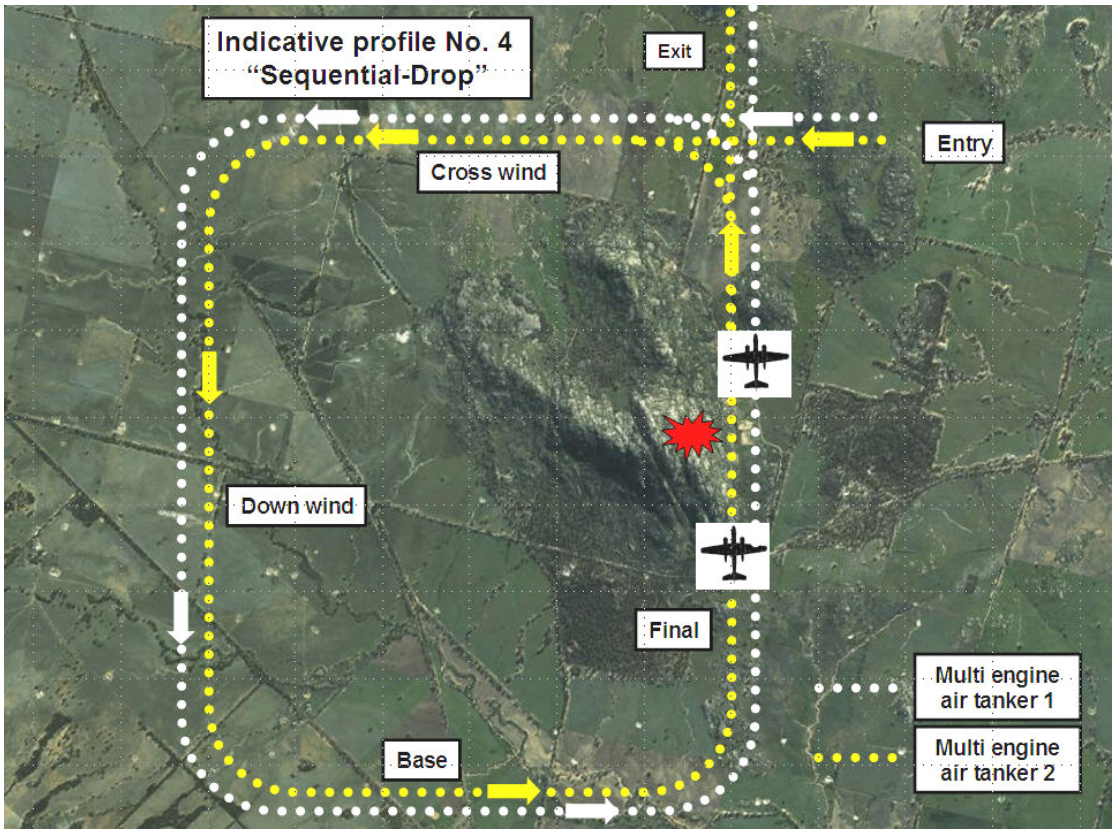

Image Google Earth 2000.

Figure 16 Indicative drop profile "Sequential drop" technique.

25 DROP SELECTION

A Drop review

The Birddog-AAS aircraft will observe the MEAT after the drop to ensure that it clears the drop area and then advise the MEAT aircrew if there were any issues. Issues may include the load not being released, the doors not closing, an incorrect drop type or retardant trailing from the tank.

The Birddog-AAS aircraft will position the aircraft directly above the drop zone as the MEAT drops providing the Birddog-AAS with an unobstructed view, a right-hand turn will be undertaken to allow the Birddog-AAS to view the drop and resultant footprint.

As soon as possible after the drop, the Birddog-AAS aircraft will provide the MEAT aircrew with an assessment of the accuracy of the drop.

Accuracy, drop times and load placement will be recorded on the Birddog-AAS's Air Attack Supervisor Report[6] and should be referred to during the post-mission debrief session.

Following the assessment, the Birddog-AAS aircraft after consultation with the Incident AAS will instruct the MEAT aircrew to proceed with the next drop or fly to a designated base to reload or stay.

B Flow rates and coverage levels

The flow rates are pre-selectable coverage levels[7] ranging from 0.5 to Salvo.

Indicated coverage levels and flow rates.

Coverage	Flow rates		Volume	
Level	US-Gal.	Litres	US-Gallons / 10 feet²	Litres / 1 metre²
0.5	83	379	05	0.2
1	166	757	1	0.4
2	250	1135	2	0.8
3	333	1514	3	1.2
4	500	2271	4	1.6
6	666	3028	6	2.4
8	749	3407	8	3.2
Salvo	Total contents evacuated.		≤ 10	≤ 4.07

Source: IAB USA.

Table 5 Indicative coverage levels and flow rates.

[6] State Aircraft Unit, Victoria.
[7] This is an expression of the volume, in US gallons, of aerial suppressant delivered per 100 square feet on a horizontal surface.

C Drop volume

The tank controller allows for the following drop volumes and applicable coverage levels:

Summary of drop volumes and indicative flow rates										
Drop load	Volume		Coverage Levels							
	US-gal.	Litres								
Full load	2100	7949	0.5	1	2	3	4	6	8	Max.
½ loads	1050	3974		0.5	1	2	3	4	6	Max.
1/3 loads	700	2649				0.5	1	2	3	Max.
¼ loads	525	1987				0.5	1	2	3	Max.
1/6 loads	350	1324						0.5	1	Max.
1/8 loads	263	995							0.5	Max.

Source: IAB USA.

Table 6 Summary of drop volumes and indicative flow rates.

D Indicative application

The following coverage levels are recommended for use in south eastern Australian vegetation types.

Indicative coverage level applications Australia					
Delivery system	Flight profile	Grass land	Open woodland	Forest	High elevation forest
CV-580 RADS II-220 Variable flow	Level	CL >4	CL 6	CL 8	CL 8 – MAX.
	Downhill	CL 6	CL 8	CL 8 -MAX	MAX

Source: SAU VIC.

Table 7 Indicative coverage level applications Australia.

E Cereal crop residue drops

Fire bombing drops in cereal crop residue can be conducted subject to the following provisions:

- Cereal crop residue which is predominately vertical in arrangement (IE: recently harvested) require drops to be **150 feet or less** above the average horizontal surface of the fuel with a recommended application of no less than **Coverage Level 4**.[8]
- Cereal crop residue which has a combination of horizontal (IE: wind thrown and storm damaged) and vertical fuel arrangement will require drops to be **150 feet or less** above the average horizontal surface of the fuel with a recommended application of no less than **Coverage Level 6**.[9]

[8] State Aircraft Unit, 2005, 2010 & 2011.
[9] State Aircraft Unit, 2005, 2010 & 2011.

Amendments to the height and speed of the drop and the coverage level will be determined by the prevailing winds, the aerial suppressant used and the composition of the species of crop residue.

F Urban interface drops

Fire bombing drops within the urban interface can be conducted subject to the following provisions:

- The height of the delivery system attached to the aircraft shall not be lower than **150 feet above** the highest near horizontal surface (IE roof of a house)[10].
- The coverage level pre selected for the drop from the MEAT is no greater than **Coverage Level 4**.[11]
- Only water, water injected with Class A Foam concentrate and super absorbent polymer (Thermo-Gel® 200 and Phos-Chek® AquaGel-K) can be used.
- The use of chemical retardant (Phos-Chek® D75-R) is not recommended for urban interface use, but it is not prohibited, drops may be effective but the residue requires extensive clean up compared to other aerial suppressants.

Amendments to the height and speed of the drop and the coverage level will be determined by the prevailing winds, the aerial suppressant used and the density of the development with in the drop area.

[10] State Aircraft Unit 1998, 2000 & 2002.
[11] State Aircraft Unit 1998, 2000 & 2002.

26 DROP ASSESMENTS

A Review

The Birddog-AAS aircraft will position the aircraft directly above the drop zone as the MEAT drops providing the Birddog-AAS with an unobstructed view, a right-hand turn will be undertaken to allow the Birddog-AAS to view the drop and resultant footprint.

C Completion of the drop

The Birddog-AAS aircraft will observe the MEAT after the drop to ensure that it clears the drop area and then advise the MEAT aircrew if there were any issues.

Issues may include the load not being released, the doors not closing, an incorrect drop type or retardant trailing from the tank.

D Drop Assessment

As soon as possible after the drop, the Birddog-AAS aircraft will provide the MEAT aircrew with an assessment of the accuracy of the drop.

Accuracy, drop times and load placement will be recorded on the Birddog-AAS's Air Attack Supervisor Report[12] and should be referred to during the post-mission debrief session.

Following the assessment, the Birddog-AAS aircraft after consultation with the Incident AAS will instruct the airtanker pilot to proceed with the next drop or fly to a designated base to reload or stay.

E Drop Height

The Birddog-AAS aircraft will assess the MEAT for drop height to ensure a height of approximately 150 feet above the canopy or bare ground is attained.

Low drop heights should be avoided to minimise the risk to the MEAT aircrew and ground crews in the vicinity of the drop to reduce unnecessary risk and avoid less-effective drop footprints on the ground.

F Drop Speed

The Birddog-AAS aircraft will assess the MEATs for drop airspeed ensuring that excessive speed is avoided minimising inadequate fuel coverage on the ground and similarly low drop speeds should be avoided to prevent excessive concentrations on the ground and less-effective line length.

Requesting slower drop speeds will compromise safety may affect safety and manoeuvrability of the MEATs.

[12] State Aircraft Unit, Victoria.

27 EXIT PROCESS

A Wake turbulence

It is recommended to wait 5 minutes, but no less than 3 minutes, after the MEAT has dropped to resume conventional tactical aircraft operations.

Non-essential aerial resources should be moved to an area to avoid any turbulence created by the MEATs.

B Departure

The fire bombing aircraft will advise that the load has been dropped and is exiting the drop zone in the nominated and agreed direction.

C Birddog requirements

In consultation with the Incident AAS the Birddog-AAS aircraft will determine the next appropriate action for the Birddog-AAS.

Depending on the proximity of the Incident and the NOB or RB inclusive of the ferry distances the Birddog-AAS aircraft may remain on site as an additional observation platform to await the return of the MEATs and resume fire bombing operations.

In the short term and prior to departure assume coordination of tactical resources over the Incident while the Incident-AAS undertakes refuelling or re-assessment of priorities.

D Objective achieved

If the tasking action has been successful the Birddog-AAS aircraft may remain on site to gather digital and infra red information for the Incident-AAS regarding wildfire activity and subsequently the evaluation program.

At the conclusion of the mission the MEAT-Section is to return to the NOB or RB and await further instructions.

E Sustained operation

Subject to the location of the incident and NOB and RB inclusive of the ferry distances the Birddog may elect to seek and an alternative airport to enable refuelling prior to the MEATs retuning back to the incident.

Returning to the NOB or the RB the MEAT aircrew will contact the specified base advising of the further requirements the reload instructions.

F Stand down

When the MEAT-Section returns to the NOB or the RB for stand down, all aircraft will be refuelled and prepared for a subsequent dispatch, the Birddog-AAS aircraft is refuelled first.

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ATTACHMENTS

1. Convair CV-589 specifications and information.
2. RADS II 220 delivery system information.
3. Avalon Airport Air Base
4. Albury Airport Air Base
5. East Sale Air Base
6. Offload and jettison
7. Incident dispatch information
8. Potential inter state operational bases
9. Resource support inter state deployments

CONVAIR CV-580 AIR TANKER OPERATIONAL INFORMATION

Attachment 1

Convair CV-580 specifications and information

Conair Convair CV-580 with RADS II-220 retardant delivery system.

Convair CV-580 with RADS II-220 retardant delivery system				
Aircraft Type		Conair Convair CV-580 Multi engine air tanker (MEAT)		
Aircrew		Pilot / Second officer		
Capability		VFR fire fighting operations	IFR Repositioning.	
Specified min. take off distance		5000 feet.	1524 metres.	
Engines / Propellers		Allison 501 D13 3750 shp.	Aero-products A6441FN-606A	
Additional capabilities		Water Methanol Injection	Traffic Collision Avoidance Detection	
Gross Take-Off Weight		58,156 pounds.	26,379 kilograms.	
Empty Weight		31,500 pounds.	14,288 kilograms	
Maximum landing weight		52,000 pounds.	23,586 kilograms.	
Wingspan-		105 feet 4 inches.	32.10 metres.	
Length-		81 feet 6 inches.	24.84 metres.	
Height		29 feet 2 inches.	8.89 metres.	
Cruise Speed	No suppressant	285 knots (at 8000 feet ASL)	527 kilometres/hour	
	fully loaded	265 knots (at 8000 feet ASL)	490 kilometres/hour	
Minimum drop speed		125 knots.	231 kilometres/hour.	
Fuel Types		Turbine Jet "A", "B"		
Operational fuel uplift		8,000 pounds.	4235 litres	
Operational fuel consumption		2700 pounds/hour.	1225 litres/hour.	
Endurance	No suppressant	5.0 hours.		
	fully loaded	3.0 hours.		
Range	No suppressant	1425 nautical miles.	2639 kilometres.	
	Fully loaded -	945 nautical miles.	1750 kilometres.	
Operational loiter speed		150 knots.	277 kilometres/hour.	
Delivery system-		Aero Union RADS II-220 Tank-Constant (variable) flow.		
Capacity-		2100 US–Gal.	7950 litres.	
Compartments / Drop doors		1	2	

Attachment 2

RADS II 220 delivery system and information

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Retardant Aerial Delivery System II 220				
Designer			Aero Union Corporation, Chico California USA.	
Deliver system configuration			External fixed belly tank	
System type			Constant (variable) flow.	
Capacity			2,100 US-Gallons.	7,950 litres.
System dimensions (inc. fairing)		Length	38 feet 2 inches.	11.63 metres.
		Width	7 feet 2 inches	2.18 metres
Compartments			1	
Drop door information		Doors	2	
		Length	18 feet 3 inches.	5.58 metres.
		Width	8.11 inches.	205.7 millimetres
Drop speed		Minimum	125 knots.	231 kilometres/hour.
Loading capability			Camlock 3 inch.	75 millimetres
Number of loading ports			2 loading ports left and right hand side (mid tank)	
Suppressants			Only approved USDA QPL Products.	
	Retardant		D75R	
	Foam		Class A WD 884	
	Super absorbent polymers		Phos-Chek® AquaGel-K	Thermo-Gel®.
Off load -		Capability	YES Camlock 3 inch	75 millimetres.
		Valve location	Rear underside	X 1.
On board suppressant reservoirs			NIL	
Venting		Negative pressure	YES	X 2 (NACA).
		Atmospheric -	YES	X 20.
Emergency dump system -			YES	

Drop loads -	**1/8**	**1/6**	**1/4**	**1/3**	**1/2**	**Full load**

Coverage Levels -	**0.5**	**1**	**2**	**3**	**4**	**6**	**8**	**Maximum**

Attachment 3

Avalon Airport Air Base

1 Avalon Airbase site plan

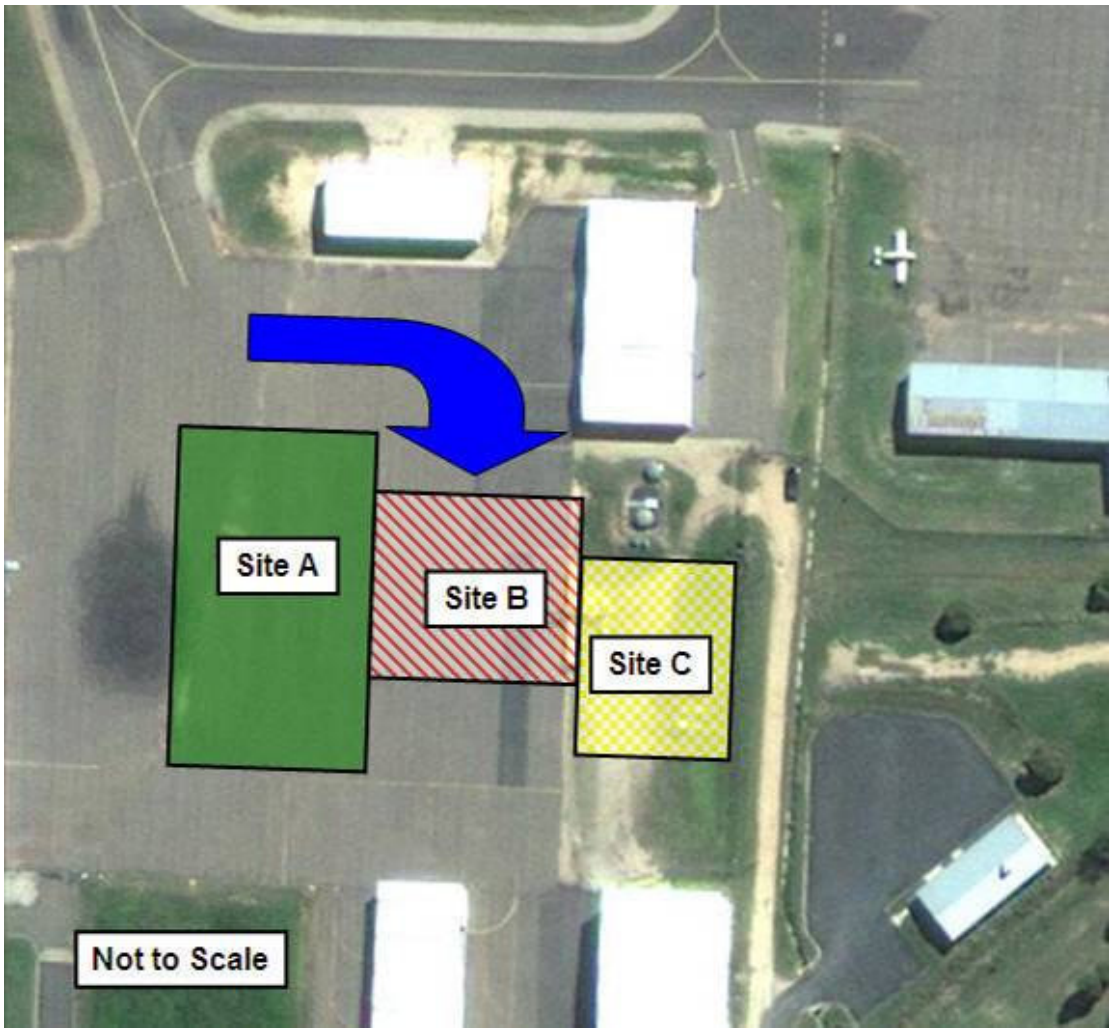
2 Legend

Site	Comment
A	Convair CV-580 and AC690 aircraft parking.
B	Reloading pad.
C	Water modules and retardant plant.
D	Restricted operational zone, QANTAS Operations.

Attachment 4

Albury Airport Air Base

1 Albury Air Base site plan



2 Legend

Site	Comment
A	Aircraft parking
B	Reloading zone
C	Water and retardant plant

Attachment 5

East Sale Air Base

1 East Sale Air Base site plan

2 Legend

Site	Comment
A	Convair CV-580 and AC690 aircraft parking.
B	Reloading pad.
C	Water modules and retardant plant.

Attachment 6

Offload and jettison management

1 Provision

Please note that Drop zone Alpha identified in Offload and jettison management becomes unavailable during the period 20 February 20011 to 8 March 2011 inclusive because of the Avalon Airshow.

2 Plan

The location of the jettison sites are on aerial maps at Avalon Airbase and include the latitude and longitude of the sites both of which are contained within the Avalon Airbase Management Plan.

3 Static offload provisions

In the event of a cancellation of a mission after being loaded with aerial suppressant while the MEATs are stationary on the ramp or in the processes of a taxi to the take off position an off load plan and facility has been developed.

4 Water

In the event that the payload is not recycled water it will be recirculated back into the nominated and reserved water cells (ISO-containers) for future use. If the payload is recycled water it will be discharged into the storm water reservoir for further dilution and to be used as aircraft wash down water.

5 Retardant

One of the water cells has been nominated as the emergency "retardant offload storage receptacle". The retardant is to be returned to the retardant holding tank and integrated into the retardant plant.

6 Other suppressants

Water cell Number 6, is identified as the "product[13] offload storage receptacle". The product will be redistributed and at a later date incorporated in flight operations and evaluations pursuant to the requirements of the Aircraft Delivery System Program SAU.

7 Planned jettison airborne

Provision has been made in the event that a cancellation could occur of a mission after the MEATs takes off loaded with aerial suppressant.

Four sites have been identified which allows the MEATs to safely discharge the load that it may be carrying. The planned jettison is subject to provisions and the jettison zones used will be dictated by the product carried.

The key requirements excluding water and provisional on wind speed and direction of the jettison plan are to

1. Drop at a height greater than 1000 feet above ground level (AGL) and
2. Regulate the flow of the drop by selecting a coverage level ≤ 2.

7 Water

All loads of water, reclaimed and recycled are to be discharged over the plantations and shelter belt tree plantings established by Avalon airport management within the land managed and owned by Avalon Airport. Jettison Zone Delta.

[13] Water injected with foam concentrate and super absorbent polymer.

8 Retardant and other suppressants

All loads of retardant and other suppressants can be dropped in jettison zones A, B, C & D.

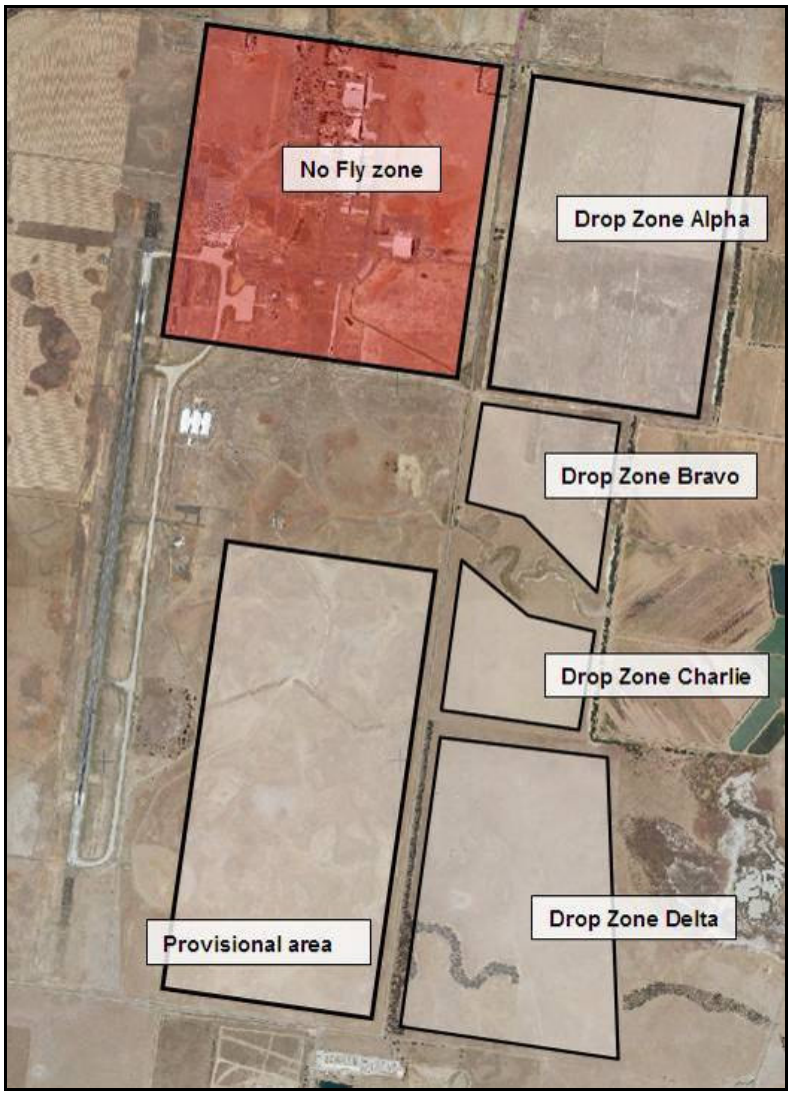
9 Emergency jettison airborne

In the event of an incomplete take off, several areas have been identified for the discharge of the load; the areas identified include the planned jettison zones and non utilised areas of cleared land with in the airport environs. Discharge of the load in onto the airport runway in emergency conditions will be avoided in where practical.

10 Incomplete take off

Discharge timing and location of the discharge will be at the discretion of the PIC of each MEAT. Aircrew, Avalon Airport management and Avalon Tower have been briefed and understand the requirements of the "emergency jettison airborne" provisions.

11 Site plan



Attachment 7

Incident Dispatch Information

Note: All criteria are to be completed.							
Dispatch Officer				**Date**			
(Air Desk/ SAC)				**Time (24hr.)**			
Incident Name / Locality							
Direction / Bearing			**Distance. Approx. NM**				
Location Lat & Long Approx. Decimal	**Latitude** **S**		**Longitude** **E**				
Incident elevation approx.		**Feet.**					
Load Specification	**Retardant**	**Water**	**SAP**	**Foam**			
Reloading information	**Avalon**	**Interstate TOB**	**TOB Load**	**W / F / R / SAP**			
Fire-CTAF		**Simplex**		**Trunk**			
Flight Following	**Conducted with State Air Desk 700 (230 2001 700)**						
Air & Ground Contacts & Resources							
Incident Air Attack		**Aircraft**					
Ground Contact		**Location**					
Helicopter resources	**FBD**						
	HTK						
Fixed wing resources	**SEAT**						
	FW other						
Hazards	**Airborne**						
	Ground						
Avalon Airbase Contacts	**Trunk**	**233 4001 646**		**Simplex**	**110**		

Attachment 8

Potential inter-state operational bases

1 New South Wales

Potential operating bases New South Wales							
Location	**Runway/s**		**Length**		**Elevation**	**Co-ordinates**	
	Align.	**PCN**	**Feet**	**Metres**	**Feet**	**Latitude**	**Longitude**
Albury	07-25	29	6234	1900	539	36 04.1 S	146 57.5 E
Ballina	06-24	15	6239	1900	7	28 50.0 E	153 33.7 E
Cooma	18-36	18	6955	2046	310	36 18.0 S	148 58.4 E
Coffs Harbour	03-21	25	6824	2080	18	30 19.0 S	153 07.0 E
Nowra	03-12	43	6712	2046	400	34 56.0 S	150 32.2 E
	08-26	43	6870	2094			
Richmond	10-28	47	7001	2134	67	33 36.0 S	150 46.8 E
Sydney	07-25	67	8300	2530	29	33 55.8 S	151 10.6 E
	16L-34R	67	7998	2438			
	16R-34L	67	12,998	3962			
Tamworth	12L-30R	19	7218	2027	1334	31 05.0 S	148 17.6 E
Wagga Wagga	05-23	20	5800	1768	724	35 09.9 S	147 28.0 E
Williamtown	12-30	50	8000	2438	31	32 42.7 S	151 50.1 E
Wollongong	16-34	23	6712	1819	31	34 33.7 S	150 47.3 E

Source: ERSA March 2010.

2 Australian Capital Territory

Potential operating base Australian Capital Territory.							
Location	**Runway/s**		**Length**		**Elevation**	**Co ordinates**	
	Align.	**PCN**	**Feet**	**Metres**	**Feet**	**Latitude**	**Longitude**
Canberra	17-35	62	5800	1768	1886	35 18.4 S	149 11.7 E

Source: ERSA March 2010.

2 South Australia

Potential operating bases South Australia							
Location	**Runway/s**		**Length**		**Elevation**	**Co-ordinates**	
	Align.	**PCN**	**Feet**	**Metres**	**Feet**	**Latitude**	**Longitude**
Adelaide	05-23	72	10171	3100	20	34 56.7 S	138 31.8 E
	12-30	54	5419	1652			
Port Augusta	15-33	21	5413	1650	56	32 30.4 S	137 43.0 E
Ceduna	11-29	10	5708	1740	77	32 07.8 S	133 42.6 E

Source: ERSA March 2010.

4 Western Australia

Potential operating bases New South Wales							
Location	**Runway/s**		**Length**		**Elevation**	**Co-ordinates**	
	Align.	**PCN**	**Feet**	**Metres**	**Feet**	**Latitude**	**Longitude**
Albury	07-25	29	6234	1900	539	36 04.1 S	146 57.5 E
Coffs Harbour	03-21	25	6824	2080	18	30 19.0 S	153 07.0 E
Nowra	03-12	43	6712	2046	400	34 56.0 S	150 32.2 E
	08-26	43	6870	2094			
Richmond	10-28	47	7001	2134	67	33 36.0 S	150 46.8 E
Perth	07-25	67	8300	2530	29	33 55.8 S	151 10.6 E
	16L-34R	67	7998	2438			
	16R-34L	67	12,998	3962			
Tamworth	12L-30R	19	7218	2027	1334	31 05.0 S	148 17.6 E

Source: ERSA March 2010.