NATSAR Manual Amendment Schedule – Approved at Teleconference 1, 2018 (these amendments reflected in the September 2018 version)

Date received	NATSAR Manual reference	Reason for amendment	Previous Wording	New Wording	Approval Status	Responsible
27/03/2018	Vol 1. 1.2.28	This change has come about through consultation with our Diplomatic Clearance team and an ex-military member at JRCC.	1.2.28 JRCC Australia shall take responsibility for organising the entry into and departure from the Australian region of foreign aircraft engaged in SAR operations. If another SAR authority becomes aware of a foreign aircraft being tasked to conduct SAR operations in the Australian region, they should inform JRCC Australia immediately who will organise approvals and diplomatic clearances as necessary.	JRCC Australia shall take responsibility for organising the entry into and departure from the Australian Region, outside of the Australian Sovereign territory (12 Nautical Miles of coast line), of foreign state aircraft engaged in SAR operations. Any Foreign State aircraft which require entering the 12NM limit will require submitting a Diplomatic Clearances through Department of Defence via phone 02 612 84819 or email to ForeignAircraft.Requests@defence.gov.au, and will require involvement from the relevant country's Embassy or High Commission. JRCC may help facilitate this requirement. If another SAR authority becomes aware of a foreign state aircraft being tasked to conduct SAR operations in the Australian region, they should inform JRCC Australia immediately who will help facilitate approvals and diplomatic clearances as necessary.	Approved	Peter Fishpool
28/03/2018	Vol 2. Section 4.5.23	To explain further as per IAMSAR	**Expanding Square Search** This procedure is referred to as an expanding square search as it begins at the reported position or most probable location and expands outwards in concentric squares. It is a very precise pattern and requires accurate navigation. To minimise navigational errors, the first leg is usually oriented directly into the wind. The square search pattern is used when the target is known to be in a relatively small area, no more than 15-20 NM from the start point. The first two legs are held to a distance equal to the track spacing and every succeeding two legs are increased by another track spacing. Turns may be to the left or right, depending upon the observer positions. For successive searches, the direction of the search legs should be changed by 45 degrees. The final track should be the same as the initial search track from the start point. The number of search legs may be 5, or, increasing by increments of 4, 9, 13, 17 etc. Scanning should start at a distance of "S" before reaching the most probable position to avoid leaving an area not scanned near the start point. Observers should be briefed to pay particular attention to the areas outwards of each turn to avoid leaving areas not scanned. The search should be planned so that, whenever possible, the approach to the most probable position, and the first leg, is made into wind as shown in **Error! Reference source not found.**.	**Expanding Square Search** This procedure is referred to as an expanding square search as it begins at the reported position or most probable location and expands outwards in concentric squares. It is a very precise pattern and requires accurate navigation. It may be advisable for vessels, especially when searching for a person in the water with either an expanding square search (SS) to use dead reckoning (DR) navigation rather than more accurate navigational methods. DR navigation will minimize pattern distortion relative to the search object since it will automatically account for the currents affecting the search object's drift during the search. For both vessels and aircraft, if a smoke float or other highly visible, expendable object is available, it should be deployed at datum and the pattern should be performed relative to it. Precise search pattern navigation using high-precision methods such as global satellite navigation systems will produce good patterns relative to the ocean bottom, but not relative to the drifting search object. This could allow the search object to drift out of the search area before the search facility arrives in the vicinity. The square search pattern is used when the target is known to be in a relatively small area, no more than 15-20 NM from the start point. The first two legs are held to a distance equal to the track spacing and every succeeding two legs are increased by another track spacing. Turns may be to the left or right, depending upon the observer positions. For successive searches, the direction of the search legs should be changed by 45 degrees. The final track should be the same as the initial search track from the start point. The number of search legs may be 5, or, increasing by increments of 4, 9, 13, 17 etc. Scanning should start at a distance of "S" before reaching the most probable position to avoid leaving an area not scanned near the start point. Observers should be briefed to pay particular attention to the areas outwards of each turn to avoid leaving areas not scanned.	Approved	Scott Constable

Next Manual Edition 2018

NATSAR Manual Amendment Schedule – Approved at Teleconference 1, 2018 (these amendments reflected in the September 2018 version)

				To minimise navigational errors, the first leg is usually oriented directly into the wind.		
15/03/2018	Vol 2. Chapter 3 3.6.16	Reworded to reflect change made to 3.5.59	3.6.16 When re-computing a datum that was initially established using the coastal model the drift error (de) of the target must be calculated. As with the case in oceanic search planning, drift error rate estimates usually fall between 1/8 and 1/3 of the total distance drifted. The search planner, depending on the confidence or lack thereof in the relevant drift data, would use a value between 1/8 and 1/3, increasing in size as the confidence in the data decreases. The higher the confidence in the data the smaller the value used to estimate drift error. The search planner may also use values outside this range.	3.6.16 When re-computing a datum that was initially established using the coastal model the drift error (de) of the target must be calculated. As with the case in oceanic search planning, drift error rate estimates usually fall between 12.5% (1/8) and 33% (1/3) of the total distance drifted. The search planner, depending on the confidence or lack thereof in the relevant drift data, would use a value between 12.5% (1/8) and 33% (1/3), increasing in size as the confidence in the data decreases. The higher the confidence in the data the smaller the value used to estimate drift error. The search planner may also use values outside this range.	Approved	John Rice
15/03/2018	Appendix D-7 Worksheet 1	Error in Worksheet	*Change from 30% to 33%*	*Change from 30% to 33%*	Approved	John Rice
15/03/2018	Vol 2 Chapter 3 3.5.59	Omission of statement concerning Drift Error range between 12.5% and 33%	Drift Error (De) 3.5.59 Drift Error (De) is the radius of a circle of probability around the Datum. The circle is externally tangential to two circles of probability drawn around the end of each leeway vector, the radius of each circle being equal to 12.5% of the distance from Last Known Position (LKP) to the end of the appropriate leeway vector.	Drift Error (De) 3.5.59 Drift Error (De) is the radius of a circle of probability around the Datum. The circle is externally tangential to two circles of probability drawn around the end of each leeway vector. Generally, the radius of each circle is equal to 12.5% of the distance from Last Known Position (LKP) to the appropriate leeway vector. However, if the search planner lacks confidence in the data being used to establish drift, a value between 12.5% (1/8) and 33% (1/3) may be used. The less confidence the search planner has in the data, the larger the value used to estimate drift error.	Approved	John Rice SAR Training Australia
11/9/2017	Vol 2, Chapter 2.8	NSW POL Review - To add an additional disadvantage.	Helicopter, Disadvantages: Some of the disadvantages include: a) Effectiveness is governed by the weather. b) Restricted visibility by forest canopy, buildings etc. c) Restricted flight times d) Requirement for fuel in the more remote areas. e) FLIR unable to penetrate forest canopy.	Helicopter, Disadvantages: Some of the disadvantages include: a) Effectiveness is governed by the weather. b) Restricted visibility by forest canopy, buildings etc. c) Restricted flight times d) Requirement for fuel in the more remote areas. e) FLIR unable to penetrate forest canopy. f) Restricted operating distance from shore in the marine environment.	Approved	Darren Wood
12/9/2017	Vol 2, Ch 3.18 App E-5 (merger) Lost person behaviour	Inclusion of new point to cover when a combination of LPB categories are relevant within an incident.	Within the MP behaviour, need to specify which category takes priority when a combination exists for instance an 8 year old with an intellectual disability etc.	In those instances where a missing person may fit into two or more LPB categories (for instance 8yo autistic child), consideration should be given to using the category that has the larger search radius while taking into account the characteristics, traits and strategies of all relevant categories.	Approved	Alistair Nisbet, Jim Whitehead

Next Manual Edition 2018

NATSAR Manual Amendment Schedule – Approved at Teleconference 1, 2018 (these amendments reflected in the September 2018 version)

27/10/2017	New section Chapter 4.13.7	Resulted from discussions at NATSAR 41	*New section* *Search Dogs* Overview 1.1.1 A well trained search dog and handler are an effective search tool, provided that they are used correctly. To obtain the maximum value from search dog teams, it is essential to have an understanding of the search dog capabilities available and the conditions best suited for their deployment. 1.1.2 Lost Person Behaviour methodology recommends the use of dogs in all missing person categories. They are particularly valuable in searches for missing persons with dementia, autism, and who are despondent, as these subjects can often be passively or actively evasive of search teams. Capabilities 1.1.3 Search dogs can be trained in a range of different ways to respond to different conditions and circumstances. Understanding these differences, including the benefits and limitations, will assist in determining the most effective search dog capability to be utilised. Search dog capabilities are categorised into 6 main groups indicated in the table below:	Paper APPROVED at NATSAR 41	Jim Whitehead

SEARCH DOG CATEGORISATION

TYPE	DESCRIPTION	USES
Air Scenting Area Search	Work off lead and use airborne scent. They are normally non-discriminate and will detect any human scent and other relevant scents to home in on their subject.	Considered to be the most efficient tool for search controllers Can efficiently search large areas Can search difficult, steep terrain more easily than humans Can easily integrate into a search area Not bounded by time constraints Can catalogue the smell of team members Can search buildings that have collapsed or otherwise damaged Will detect live and deceased people on land and underwater Best used in less populated areas such as bushland and rural areas including farmland, parkland, golf courses and car parks, shopping centres and sporting complexes after closing Able to locate people who are actively hiding, deceased bodies, deliberately concealed bodies and submerged bodies 'Live find' trained
Ground Disturbance Tracking	Working on lead, this category follows a subject's footsteps by utilising ground scent.	Most effective when a short period of time has passed (preferably 1-2 hours) Requires the search area to be uncontaminated where there has been no other recent foot traffic 'Live find' trained
Scent Specific Tracking	By working on a harness and long lead, this category is trained to detect human scent on the ground. After smelling a scent	Scent discriminating by following the scent trail of a specific individual

NATSAR Manual Amendment Schedule – Approved at Teleconference 1, 2018 (these amendments reflected in the September 2018 version)

				article/source from the missing person they will search around the last known position to determine the path the missing person walked in order to find them.	Can be used to rapidly establish direction of travel where a scent source or article of the missing person is available Requires an uncontaminated scent article/source of the subject Handlers prefer to obtain the scent article themselves People in the area are not to interfere with a scent specific tracking dog There is no time constraint. 24 hours on any surface is within their capability and 48 hours or more if the conditions are suitable 'Live find' trained			
				Cadaver/Human Remains Detection (HRD)	Work off lead and search for the presence of deceased persons or human remains that may be on the surface, buried, or hanging.	Used in missing persons response, cold cases, mass graves, disaster responses including fires, floods, earthquakes etc.			
				Water Search	Predominantly Cadaver/HRD trained dogs that are trained to work along the shoreline or from a boat, to search for the presence of human remains in salt or fresh water.	Can work in rivers, lakes, dams, or the ocean Dogs are trained to alert and handlers take a GPS reading to mark location Important that they work closely with Police dive teams on the scene to pinpoint location for divers 'Live find' trained			
				Avalanche	Search avalanche and heavy snow conditions for the presence of persons buried.	Rapid activation of teams is essential Pre-developed MOUs and activation protocols should be in place to optimise response 'Live find' trained			
				Urban Search and Rescue (USAR)	Search collapsed structures and debris piles from man-made or natural disasters for the presence of live victims.	Work off lead without a collar Used to working at distance from their handlers Particularly valuable in areas that are too difficult or dangerous to send humans 'Live find' trained			
				Explanatory terms 1.1.4 **'Live find' Dogs** - The term 'live find' dogs is used for dogs that have been trained to find missing people that are still alive. However, most 'live find' dogs will also be able to find deceased people. 1.1.5 All search dog have been trained as 'live find' dogs, with the exception of Cadaver/HRD Dogs which have been trained specifically to focus on deceased persons. 1.1.6 **'Scent picture'** - All matter gives off scent to some degree which enables Search dogs to utilise their superior sense of smell as their primary search tool. They are able to do this by following a 'scent picture' that is made up of a combination of minute particles that tend to fall to the ground at varying distances from the source. 1.1.7 Composite scents consist of natural and artificial scent. The scent picture will vary with each individual, depending on ethnicity, diet and habits. Other contributing scents may include body odour, hair oil, toothpaste, equipment, footwear and those scents released from brushing and breaking of vegetation and the crushing of small insects. Using Search Dog capability for SAR			

			1.1.8 Determining which type of search dog capability to use for a search can depend on several factors, which need to be considered in the planning stages of a search operation. These factors include: a) time elapsed; b) environmental and weather conditions; c) proximity of search teams; and d) availability. Additional considerations 1.1.9 Types of Dogs - The different search dog capabilities mentioned in the table above can be utilised in tandem for a search and rescue operation. For instance, a Scent Specific Tracking Dog can be utilised to establish direction of travel, and Air Scent Dogs can search offside to the track. 1.1.10 Cadaver/HRD Dogs and 'live find' dogs can also be used in the same search. 1.1.11 Some handlers have their dogs trained for multiple capabilities. For instance, a dog may be trained as air scent and scent specific, cadaver and live find trained etc. 1.1.12 Scent Specific Tracking Dogs require an uncontaminated scent source or article. This can be collected from a scent article such as the missing person's clothing, pillowslip, hairbrush etc. The scent can also be obtained using a gauze pad to absorb scent from the seat of a car or steering wheel. The most important thing is to ensure the scent is collected properly and not contaminated by another person' scent. Most dog handlers like to collect the scent article themselves to ensure its purity. If this is not feasible, it is best to contact the dog handler and find out how they would like the scent article to be collected. 1.1.13 Environmental considerations - It is important to understand that dogs, like other animals, are subject to outside influences which have a direct bearing on their behaviour. Therefore, the performance of any dog, no matter how highly trained, is not always consistent and cannot be expected to work effectively under all conditions. This is often misinterpreted as a fault and instances have occurred where the use of dogs in SAR has been refused, simply due to a misunderstanding of the capabilities and limitations of search dogs as a search tool. 1.1.14 The following will affect the success of a search depending on the type of search dog used: a) Time - This is of prime importance. Search dogs should be deployed early as a fresh scent is easier for a dog to track. Dog teams can be activated and deployed quickly and independently of other search resources, and are a highly effective first response. Ground Disturbance Tracking Dogs may be limited to shorter timeframes when a person has been reported missing due to their training of working footprint to footprint. They are most effective in areas that have been uncontaminated, because they are trained to scent on the most recent person that has walked in the area. b) Vegetation - High undergrowth can restrict the distribution of scent making it more difficult for the dogs to detect. c) Time of Day - Night and early morning is best as evaporation is less rapid. Environmental conditions can also impact a dog's ability to search an area. Search dogs can be utilised both during the day and at night, with scent conditions often more favourable early in the morning and in the afternoon and evening. d) Start Point - Ground Disturbance Tracking Dogs do not need a piece of clothing belonging to the missing person to enable them to find and follow a scent, but if available, this should be preserved. Scent Specific Tracking Dogs require an uncontaminated scent article/source. Air Scent Area Search Dogs do not need a scent source. e) Weather - A mild overcast day favours search dogs as it limits evaporation of scent. Most search dogs can be utilised in any weather, including wet and damp conditions where the scent 'drops' to the ground. 1.1.15 Missing person considerations include: a) Personal Hygiene - A person, because of circumstances or carelessness, who is unclean gives off a greater amount of body odour. b) Food and Equipment - Strong smelling foodstuffs eaten by the missing person increases the scent picture, eg. curry powder or spicy food as do deodorants, perfume etc. c) Running - A person running gives off more scent than a person walking. 1.1.16 The following factors adversely limit the dog's effectiveness:		

NATSAR Manual Amendment Schedule – Approved at Teleconference 1, 2018 (these amendments reflected in the September 2018 version)

			a) Temperature – High (dry) temperature will quickly reduce the scent due to evaporation. b) Wind – A strong wind rapidly disperses the scent. Dry and windy conditions are less optimal than cool and still conditions, however the dog handler will be able to advise the search coordinator as to how they will most effectively undertake the search, and what constraints they may have. c) Ground surface – Dry, bare ground adversely affects tracking dogs. d) Manure – Heavily manured land may disguise the scent. e) Water – Substantial running water courses can be an obstacle for tracking dogs. f) Scene contamination – People and vehicles in the search are do not necessarily interfere with search dogs. Dogs can work on contaminated ground but it is best practise to keep foot searchers out of the area being searched by a search dog while it is working. Search Dog teams in Australia 1.1.17 Search dog teams have been developed in most states across Australia and may be sourced (dependent on availability) from: a) Police b) State Emergency Services c) Private Search Dog Groups 1.1.18 Currently there is no Australian standard for search dog capabilities in place. Many search dog teams have been trained and assessed to UK, New Zealand, Swiss or other standards. Establishing strong working relationships between Police and Search Dog teams is fundamental to ensuring that mutual understanding, trust and confidence is built. These relationships are established through combined training and exercising between the different agencies and groups involved in SAR operations within that area. 1.1.19 Please note that bite trained police dogs that have been trained for more specific policing duties and not trained as a search dog, have limitations in searches particularly when required off lead. These types of dogs may in turn, be unsuitable when search teams are being used in the field or in public places. Tasking of Search Dog teams 1.1.20 It is important for the Police to have state arrangements and protocols in place with search dog teams to allow for rapid tasking to occur, this means the search dog team can begin responding while the human search teams are being mobilised. This is a distinct advantage, particularly in time critical response efforts.		
23/01/2018	Defence letter of promulgation	Updated		Updated in line with IGA review.	Approved	James Frost
11/9/2018	Vol, 2, Chapter 1.2.14	To include reference of marine rescue bases monitoring VHF Ch 16	State and Territory limited coast radio stations, port authorities, merchant ships, fishing craft and pleasure craft use VHF Ch 16. Merchant ships maintain a continuous bridge listening watch on VHF channel 16 to the maximum extent practicable when at sea.	Merchant ships maintain a continuous bridge listening watch on VHF channel 16 to the maximum extent practicable when at sea; and is monitored in all active marine rescue bases (e.g. Marine Rescue NSW monitor VHF Ch 16).	Approved	Darren Woods, Jim Whitehead
6/02/2018	Volume 1, Chapter 3.3	Update of link and hosting website	This Handbook and other EMA publications can be found on the Emergency Management Institute Publications page of their website eee.em.gov.au.	Emergency Management Australia (EMA) has developed a handbook, “Managing Exercises” that is Handbook 3 of the Australian Emergency Management Handbook and Manual Series. This manual should be used as a guide and to assist SAR personnel designing and conducting search and rescue exercises. This Handbook and other EMA publications can be found on the Australian Institute for Disaster Resilience website at https://aidr.infoservices.com.au/collections/handbook.	Secretariat change. No approval required.	JRCC – Cindy-Lee Francis