

CASARA



2016

HANDBOOK



NOTICE OF CRASH/CASUALTY LOCATION		
DATE	<input type="checkbox"/> SAREX <input type="checkbox"/> ACTUAL	CASE NUMBER/SAR NAME
NOCL TRANSMISSION TIME (UTC)	FLIGHT NO.	AIRCRAFT TYPE & REGISTRATION
ALPHA	<input type="checkbox"/> AFFIRMATIVE <input type="checkbox"/> NEGATIVE	Positive identification that the object sighted, is the search object. Unable to positively determine that the object sighted is the Search object
BRAVO	-----	Eight or nine digit group denoting position without North or West being used.
CHARLIE	<input type="checkbox"/> NEGATIVE <input type="checkbox"/> ANY NUMBER <input type="checkbox"/> UNDETERMINED <input type="checkbox"/> RED <input type="checkbox"/> YELLOW <input type="checkbox"/> GREEN <input type="checkbox"/> BLUE <input type="checkbox"/> WHITE <input type="checkbox"/> GREY <input type="checkbox"/> BLACK	No survivors or casualties can be seen. Indicates number of victims actually seen. The status of the survivors or casualties cannot be determined. * Immediate treatment and evacuation (PRIORITY ONE) * Early treatment and evacuation (PRIORITY TWO) * Routine treatment and evacuation (PRIORITY THREE) * Deferred treatment and evacuation (PRIORITY FOUR) * Uninjured * Missing * Dead
*NOTE: THIS INFORMATION ON THE MEDICAL CONDITIONS OF VICTIMS CAN ONLY BE TRANSMITTED AFTER INVESTIGATION BY SAR TECHS OR OTHER MEDICALLY TRAINED PERSONNEL		
DELTA	<input type="checkbox"/> ONE <input type="checkbox"/> TWO <input type="checkbox"/> THREE <input type="checkbox"/> FOUR <input type="checkbox"/> FIVE - ALPHA <input type="checkbox"/> FIVE - BRAVO	Side of hill plus indicate north, south, east or west slope. In valley plus indicate north, south, east or west side of floor. In level country. Heavily wooded area (can be used in conjunction with #1, 2, or 3) In water - near shore. In water - well off shore.
ECHO	<input type="checkbox"/> ONE <input type="checkbox"/> TWO <input type="checkbox"/> THREE <input type="checkbox"/> FOUR <input type="checkbox"/> FIVE	Request authority to deploy SAR Techs -N/A to CASARA. A helicopter will be required. A ground party could reach the location in good time. A rescue boat will be required. Coroner required - N/A to CASARA
FOXTROT	REMARKS	Briefly provide any detail which allow JRCC to initiate appropriate action, bearing in mind that the transmission is not secure.

GROUND-AIR EMERGENCY CODE

REQUIRE ASSISTANCE			V
REQUIRE MEDICAL ASSISTANCE	I C A O	S Y M B O L S	X
NO OR NEGATIVE			N
YES OR AFFIRMATIVE			Y
AM PROCEEDING IN THIS DIRECTION			→
ALL IS WELL	A D D I T I O N A L	C A N A D A O N L Y	LL
REQUIRE FOOD AND WATER			F
REQUIRE FUEL AND OIL			L
REQUIRE REPAIRS			W

(A space of 10 feet between symbols if possible)

Use strips of fabric, messages trampled in the snow, parachutes, peeled logs, sods, stones, or branches in the snow.

Try to provide maximum contrast.

All figures should be at least 40 feet in length.

Symbols may be used in combination.

Personal Information

i

NAME: _____

ADDRESS: _____

CITY: _____ PROVINCE: _____

POSTAL CODE: _____

PHONE NOs.

Residence: _____ Business: _____

Cellular: _____ E-mail: _____

Contact Person

NAME: _____

ADDRESS: _____

CITY: _____ PROVINCE: _____

POSTAL CODE: _____

PHONE NOs.

Residence: _____ Business: _____

Cellular: _____ E-mail: _____

PLEASE PRINT ALL INFORMATION

Foreword

iv

This publication is designed as a reference supplement only and is not intended to replace or supersede the CASARA Training Manual. In the event of a conflict between the information contained within this publication and the CASARA Training Manual, the CASARA Training Manual shall be taken as the definitive source.

Suggested amendments for this handbook should be sent to:

CASARA National Administrator
P.O. Box 183
Winnipeg Stn Westwin MPO
Winnipeg, MB
R3J 3Y5

Attention: VP Ops and Training

**This handbook is the property of the Civil Air Search
and Rescue Association
(CASARA)**

**If no longer required, please return to your zone representative
or mail to the above address**

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MISSION AND VISION STATEMENTS

1.0

MISSION STATEMENT:

The mission of the Civil Air Search and Rescue Association (CASARA) is to support Canada's Search and Rescue (SAR) program and to promote SAR awareness.

VISION STATEMENT:

The Civil Air Search and Rescue Association (CASARA) will continue to evolve and support the Canadian Search and Rescue (SAR) and Aviation Safety Programs through leadership, continuous training of its volunteers and education of the general aviation community.

1 GENERAL

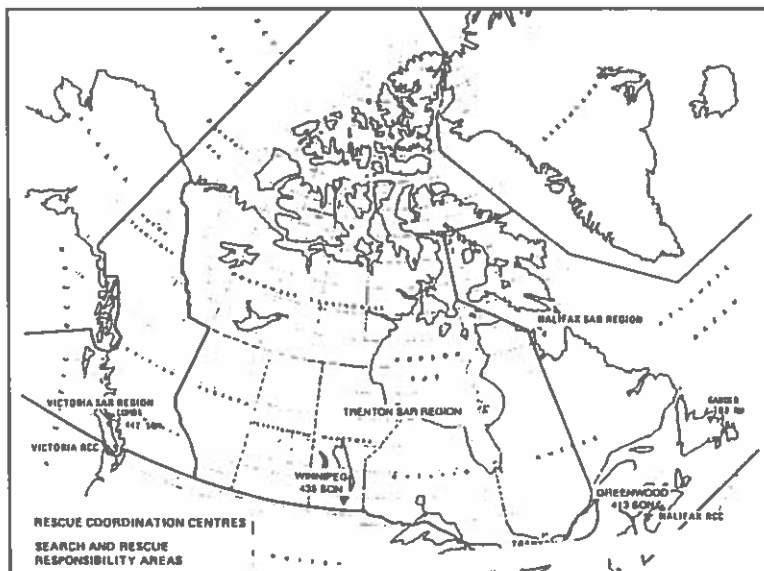
SAR Phone Numbers

1.1

JRCC VICTORIA250-413-8933
1-800-567-5111
(Fax) 250-413-8932
	...JRCCVictoria@sarnet.dnd.ca
JRCC TRENTON613-965-3870
1-800-267-7270
(Fax) 613-965-7190
	...JRCCTrenton@sarnet.dnd.ca
JRCC HALIFAX902-427-2100
1-800-565-1582
(Fax) 902-427-2114
	...JRCCHalifax@sarnet.dnd.ca
SAR FREQUENCIES	...HF VOICE DISTRESS2182 kHz
	...VHF SAR ON SCENE123.1 MHz
	...VHF AERONAUTICAL DISTRESS.....121.5 MHz
	...VHF FM MARINE DISTRESS156.8 (CH 16)
	...UHF MILITARY DISTRESS.....243.0 MHz
	...VHF CASARA OPERATIONS123.3 MHz*

*where authorized

JRCC & SAR REGIONS



Suggested Organization

1.2

JRCC

SEARCHMASTER (MILITARY)

CASARA SEARCH COORDINATOR

SPOTTER CREW CHIEF

PILOT CREW CHIEF

NAVIGATOR CREW CHIEF

- | | |
|---------------------------------|---|
| SPOTTER CREW CHIEF | <ul style="list-style-type: none"> • Provides to CASARA SEARCH COORD assessment of the spotter requirements for the following day and continuing operations. • Prepares a list of spotters assigned to each military and CASARA aircraft. • Prepares an up-to-date back-up (call out) list of available spotters. • Prepares a schedule and assigns spotters. |
| NAVIGATOR
CREW CHIEF | <ul style="list-style-type: none"> • Same information, except with navigators. • Provides navigators for CASARA aircraft only. |
| PILOT
CREW CHIEF | <ul style="list-style-type: none"> • Same information except with pilots and aircraft. |
| CASARA
SEARCH
COORDINATOR | <ul style="list-style-type: none"> • Coordinates with JRCC or Searchmaster, matching requirements to available crews and aircraft. • Coordinates with CREW CHIEFS, advising them of planned requirements and aiding them in scheduling these requirements. |

CASARA DUTY LOG

1.3

Date	Aircraft		Duty					Mission			Remarks
	Type	Reg.	Pilot	Nav.	Sptr	Coord	Other	SAR	Trng	Other	
TOTALS brought fwd											
TOTAL TIME											

Crew Assignment

1.4

DATE _____

SAR/TRNG NAME OR NO. _____

AIRCRAFT TYPE _____ REG. _____

PILOT IN COMMAND _____

NAVIGATOR _____

SENIOR SAR TECH _____

SPOTTER (S) 1. _____

2. _____ 3. _____

4. _____ 5. _____

SEARCH PATTERN _____

SEARCH ALTITUDE _____

SCANNING RANGE _____

SEARCH AREA _____

WEATHER FORECAST _____

NOTES :

Crew Assignment

1.4

DATE _____

SAR/TRNG NAME OR NO. _____

AIRCRAFT TYPE _____ REG. _____

PILOT IN COMMAND _____

NAVIGATOR _____

SENIOR SAR TECH _____

SPOTTER (S) 1. _____

2. _____ 3. _____

4. _____ 5. _____

SEARCH PATTERN _____

SEARCH ALTITUDE _____

SCANNING RANGE _____

SEARCH AREA _____

WEATHER FORECAST _____

NOTES :

Sighting Information

1.5

MISSION NAME OR NO. _____

SPOTTER'S NAME _____

DATE AND TIME OF SIGHTING _____

DESCRIPTION _____

COLOR(S) _____

SIGNS _____

SIGNALS _____

WEATHER AT TIME OF SIGHTING _____

DIAGRAM OF SIGHTING AND AREA



NOTE: Indicate direction of flight and position of the sun.

Sighting Information

1.5

MISSION NAME OR NO. _____

SPOTTER'S NAME _____

DATE AND TIME OF SIGHTING _____

DESCRIPTION _____

COLOR(S) _____

SIGNS _____

SIGNALS _____

WEATHER AT TIME OF SIGHTING _____

DIAGRAM OF SIGHTING AND AREA



NOTE: Indicate direction of flight and position of the sun.

CASARA NAVIGATION FORM

1.6

Date	SAR Name	Search a/c Ident	Flight number								
Search Location	Altitude/Visibility:	Highest Obstacle:		Report Ops Norm:							
Type of Search:	Search Altitude (ASL):	CSP:									
Transit Altitude											
Way Point/Leg	Track (T)	Wind	Hdg (T)	Mag. Var.	Hdg (M)	G/S	Distance	ETE	Fuel Req.	ETA	Remarks
Bingo Leg							Totals				
Fuel Calculations (hrs/min)							Times				
Fuel Consumption (GPH)	Radio Frequencies			ATS			Engine ON (A)	Total Transit (C-A)+(F-D)			
Total Fuel (Hrs:min)	Ground			Tower			Time Up (B)	Total SAR (B-C)			
Minus Reserve (Hrs:min)	Search			Search			ON SAR (C)	Total Time: (F-A)			
Minus Fuel to Land (Hrs:min)							OFF SAR (D)				
Total time available							Time Down (E)				
Plus Engine start Time							Engine OFF (F)				
BINGO Times											
Form Completed By	Print:					Sign:					

BRIEFING SEARCH OBJECT INFORMATION 1.7

DATE	SAR NAME/TASKING NUMBER		
JRCC CONTROLLER			
NATURE OF EMERGENCY			
SEARCH OBJECT TYPE		PHOTO OF TYPE PROVIDED	
CALL SIGN/I.D.			
COLOR/TRIM			
DISTINCTIVE FEATURES			
DEPARTURE POINT		TIME OF DEPARTURE	
ROUTE			
DESTINATION	ETA		ETE
LAST KNOWN POINT			
ENDURANCE		TRUE AIR SPEED	
PILOT'S NAME			
EXPERIENCE			
NUMBER ON BOARD			
NAMES OF POB			
PERTINENT MEDICAL HISTORY			
DISTINCTIVE CLOTHING			
OTHER FEATURES			
HABITS			
PREVIOUS PROBLEMS			
SURVIVAL EXPERIENCE			
SURVIVAL GEAR			
COMMS EQUIPMENT			
WEATHER AT TIME		FREQUENCY	
ELT/EPIRB/PLB TYPE			
OTHER SAR A/C CALL SIGNS AND AREAS BEING SEARCHED			
OTHER INFORMATION			

SEARCH MISSION BRIEFING INFORMATION

1.8

ELT/SIGHTINGS HISTORY:

SEARCH PATTERNS:

ALTITUDE/VISIBILITY:

SEARCH AREA ASSIGNED:

TRANSIT ALTITUDE/ROUTE/CONFLICTS:

TURNS INSIDE/OUTSIDE AREAS:

COMMS FREQS:

ON SCENE COMMANDER (OSC):

PRESENT WEATHER AND FORECAST:

NEW OBSTRUCTIONS:

NOTAMS:

OTHER SAR RESOURCES:

REPORTING OPS NORM:

DEBRIEFING PROCEDURES:

HOMER CHECKS PRIOR TO TAKE OFF:

ALL A/C TO USE "RESCUE" CALLSIGN IN ACTUAL:

RADIO CHECKS PRIOR TO TAKEOFF:

ALL A/C TO REPORT "TIME OFF, BINGO, TIME ON/OFF SEARCH:

SYNCHRONIZE WATCHES:

CASARA HANDBOOKS:

SAFETY OFFICER:

NOTES:

AIR TASKING DEBRIEF

1.9

DATE		<input type="checkbox"/> ACTUAL <input type="checkbox"/> SAREX		CASE #SAR NAME	
AIRCRAFT TYPE		FLIGHT NUMBER		AIRCRAFT REG.	
POINT OF DEPARTURE		POINT OF LANDING			
1. ENGINE START (UTC)		2. TIME UP (UTC)			
3. START TIME IN SEARCH AREA (UTC)		4. END TIME IN SEARCH AREA (UTC)			
5. TIME DOWN (UTC)		6. ENGINE STOP (UTC)			
7. TRANSIT TIME TO SEARCH AREA (3 MINUS 1)		8. TRANSIT TIME FROM SEARCH AREA (6 MINUS 4)			
TOTAL TRANSIT TIME (7 PLUS 8)		TOTAL TIME ON SEARCH (4 MINUS 3)		TOTAL TIME	
AREA(S) ACTUALLY SEARCHED					
TYPE OF SEARCH			ALTITUDE (AGL)		SCAN RANGE (NM)
TYPE OF TERRAIN IN SEARCH AREA (%) FLAT ___ HILLY ___ WOODED ___ WATER ___					
WEATHER CONDITIONS IN SEARCH AREA					
VISIBILITY (SM) ___ WIND DIRECTION/SPEED (DEG. T/KNOTS) ___ CEILING ___					
% OF SEARCH AREA COVERED			SEARCH EFFECTIVENESS (POD)		
OBJECT OF SEARCH LOCATED <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, POSITION (NUMBER AND CONDITION OF SURVIVORS)					
SPOTTER SIGHTING DESCRIPTION AND POSITION			NAMES OF CREW MEMBERS		
1			PILOT		
2.			NAVIGATOR		
3.			LEFT SPOTTER		
4			RIGHT SPOTTER		
5					
6					
COMMUNICATIONS			COPY OF SEARCH MAP SUBMITTED <input type="checkbox"/> YES <input type="checkbox"/> NO		
			COPY OF NAVIGATION LOGS SUBMITTED <input type="checkbox"/> YES <input type="checkbox"/> NO		
WERE ANY CREW MEMBERS AIRSICK? <input type="checkbox"/> YES <input type="checkbox"/> NO			WERE THE SPOTTERS ROTATED? <input type="checkbox"/> YES <input type="checkbox"/> NO		
REMARKS (ACTION TAKEN, PROBLEMS, CRITICISM, SUGGESTIONS)					
ADMINISTRATION/SEARCH COORDINATOR SIGNATURE			PILOT SIGNATURE/LICENCE NUMBER		

NOTICE OF CRASH/CASUALTY LOCATION (NOCL) 1.10

DATE	<input type="checkbox"/> SAREX <input type="checkbox"/> ACTUAL	CASE NUMBER/SAR NAME
NOCL TRANSMISSION TIME (UTC)	FLIGHT NO.	AIRCRAFT TYPE & REGISTRATION
THIS IS RESCUE (IN THE CASE OF AN ACTUAL) (A/C CALL SIGN) - STANDBY FOR NOVEMBER OSCAR CHARLIE LIMA.		
ALPHA	<input type="checkbox"/> AFFIRMATIVE <input type="checkbox"/> NEGATIVE	Positive identification that the object sighted, is the search object. Unable to positively determine that the object sighted is the Search object
BRAVO	_ _ _ _ _	Eight or nine digit group denoting position without North or West being used.
CHARLIE	<input type="checkbox"/> NEGATIVE <input type="checkbox"/> ANY NUMBER <input type="checkbox"/> UNDETERMINED <input type="checkbox"/> RED <input type="checkbox"/> YELLOW <input type="checkbox"/> GREEN <input type="checkbox"/> BLUE <input type="checkbox"/> WHITE <input type="checkbox"/> GREY <input type="checkbox"/> BLACK	No survivors or casualties can be seen. Indicates number of victims actually seen. The status of the survivors or casualties cannot be determined. * Immediate treatment and evacuation (PRIORITY ONE) * Early treatment and evacuation (PRIORITY TWO) * Routine treatment and evacuation (PRIORITY THREE) * Deferred treatment and evacuation (PRIORITY FOUR) * Uninjured * Missing * Dead
*NOTE: THIS INFORMATION ON THE MEDICAL CONDITIONS OF VICTIMS CAN ONLY BE TRANSMITTED AFTER INVESTIGATION BY SAR TECHS OR OTHER MEDICALLY TRAINED PERSONNEL		
DELTA	<input type="checkbox"/> ONE <input type="checkbox"/> TWO <input type="checkbox"/> THREE <input type="checkbox"/> FOUR <input type="checkbox"/> FIVE - ALPHA <input type="checkbox"/> FIVE - BRAVO	Side of hill plus indicate north, south, east or west slope. In valley plus indicate north, south, east or west side of floor. In level country. Heavily wooded area (can be used in conjunction with #1,2, or 3) In water - near shore. In water - well off shore.
ECHO	<input type="checkbox"/> ONE <input type="checkbox"/> TWO <input type="checkbox"/> THREE <input type="checkbox"/> FOUR <input type="checkbox"/> FIVE	Request authority to deploy SAR Techs - N/A to CASARA. A helicopter will be required. A ground party could reach the location in good time. A rescue boat will be required. Coroner required - N/A to CASARA
FOXTROT	REMARKS	Briefly provide any detail which allow JRCC to initiate appropriate action, bearing in mind that the transmission is not secure.

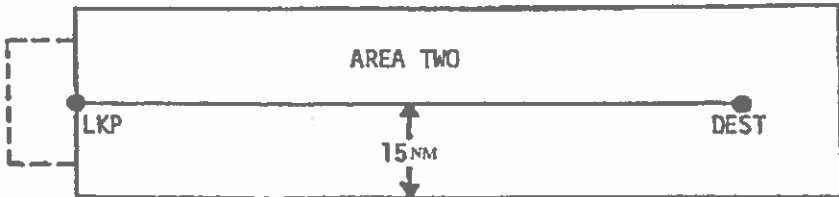
CANADIAN SEARCH AREA DEFINITION METHOD (CSAD) 1.11

The use of the Canadian Search Area Definition (CSAD) requires the following information:

- 1 the last known position (LKP);
- 2 the intended route; and
- 3 the intended destination.

The CSAD method applies to all intended track lengths. The two areas are:

- 1 **Area One** — A rectangle 10 miles each side of track beginning 10 miles before LKP and extending 10 miles beyond destination; and
- 2 **Area Two** — A rectangle 15 miles each side of track beginning at the LKP and extending 15 miles beyond destination. Area Two includes that portion of Area One where overlapping occurs.



Where an enroute turning point includes a track direction change of greater than 20 degrees the outside boundary of each area shall be an arc using the turning point as centre and a radius equal to 10 miles for Area One and 15 miles for Area Two.

2 ELECTRONIC SEARCHES

INITIAL ELT DETECTION

2.1

STEP	DESCRIPTION
1	Upon initial detection, immediately note the TIME, POSITION, DIRECTION OF FLIGHT AND ALTITUDE.
2	Note your aircraft's position on a map as precisely as possible

INITIAL TRACK SEARCH

2.2

STEP	DESCRIPTION
1	A search aircraft proceeds to the Last Known Position (LKP).
2	The search aircraft flies along the track to destination: <ul style="list-style-type: none"> assumed electronic coverage is at least 30 NM either side of track, depending on altitude.
3	A second line is flown, 60 NM either side of the original track: <ul style="list-style-type: none"> in mountainous terrain, track spacing is reduced by one half.
4	If sufficient fuel, a third search line may be flown on the other side of the original track.

<u>ELT SIGNAL CONFIDENCE</u>	<u>RADIO STRENGTH</u>	<u>APPROXIMATE RECEPTION ALTITUDE</u>
1 - 50+ miles 2 - 20 - 50 miles 3 - 5 - 20 miles 4 - 0 - 5 miles	1 - WEAK 2 - ↓ 3 - ↓ 4 - ↓ 5 - STRONG	1000' = 6 - 8 miles 5000' = 15 miles 10000' = 30 miles 20000' = 60 miles

ELT HOMING - PROCEDURE A (AURAL NULL)

STEPS TO FOLLOW

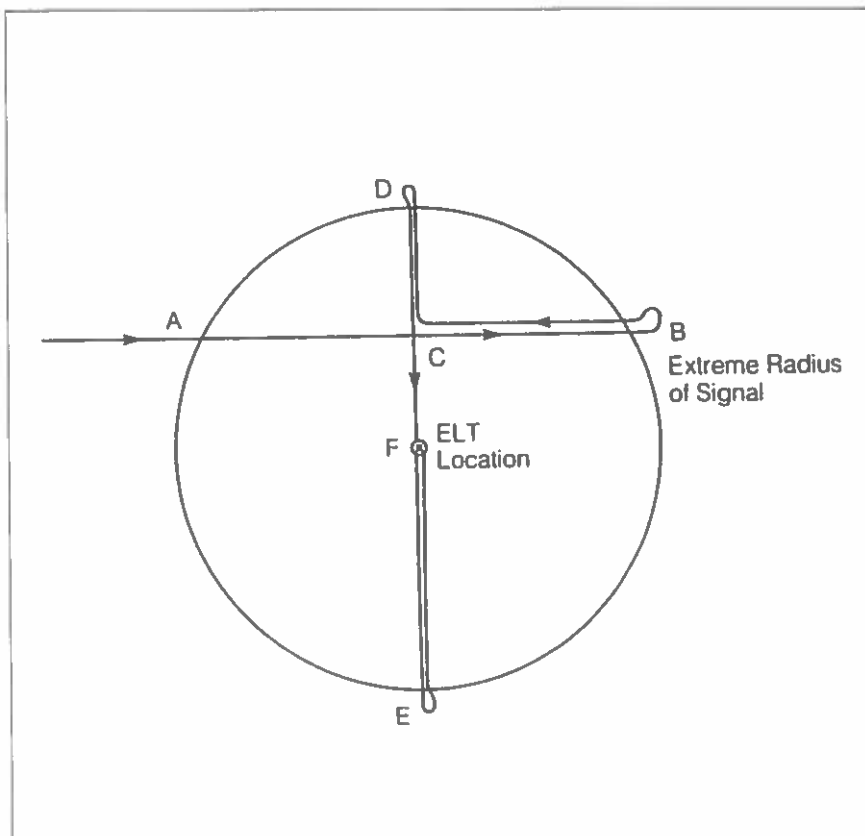
STEP	DESCRIPTION
1	Once the signal has been detected; <ul style="list-style-type: none"> • pin-point your aircraft position on map, • descend to a minimum reception alt, • adjust radio volume for minimum reception (A).
2	Maintaining a constant altitude and volume setting to step 8: <ul style="list-style-type: none"> • fly a constant heading and draw the track made good on the map.
3	When signal fades out, pin-point position of fade-out (B).
4	Calculate mid-point of track made good (C).
5	From this mid-point, plot at 90 degrees a new desired track which extends on both sides of the track made good.
6.	Return to the mid-point and fly (either direction) to make good the new track.
7	Signal strength will change; plot point at which signal fads out (D).
8	Reverse course: signal should build and fade. Plot point at which signal fades out (E). <p style="text-align: center;">NOTE</p> In theory, the ELT should be located at the mid-point of the second track (F).
9	Based on the second track, repeat steps 4 to 8 at reduced altitude if possible.

ELT HOMING - PROCEDURE A (AURAL NULL) (cont)

COMMENT

Repeating the procedure at a lower altitude may reduce the area in which the ELT is located sufficiently to permit a visual search, using an expanding square or sector search.

ILLUSTRATION



NOTE

Accurate navigation is necessary for the Aural Null procedure to be effective.

ELT HOMING - PROCEDURE B (AURAL NULL)

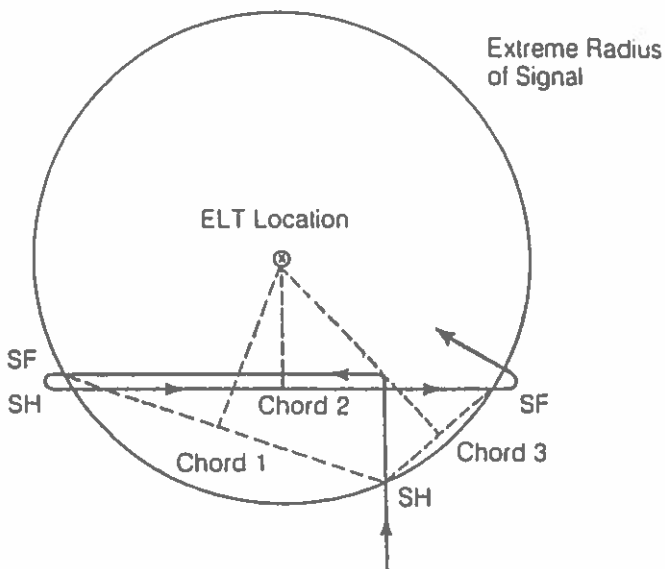
The method has both an advantage and a disadvantage.

ADVANTAGE	DISADVANTAGE
<ul style="list-style-type: none"> • Faster than Procedure A. 	<ul style="list-style-type: none"> • Requires sufficient cockpit space to adequately plot information

STEP	DESCRIPTION
1	Position of the search aircraft is plotted as soon as the signal is heard.
2	Pilot continues on same heading for short distance.
3	Pilot then turns aircraft 90 degrees either left or right and proceeds until the signal fades.
4	This position is noted.
5	The pilot now turns the aircraft 180 degrees, and again plots: <ul style="list-style-type: none"> • where signal is heard, • where it fades.
6	Approximate location of signal is plotted by: <ul style="list-style-type: none"> • drawing chord lines between each set of 'signal heard' and 'signal fades' positions, • drawing perpendicular bisectors of each chord.
7	Based on the second track, repeat steps 4 to 6 at reduced altitude if possible.

ELT HOMING - PROCEDURE B (AURAL NULL) (cont)

STEP	DESCRIPTION
8	Aircraft proceeds to the point at which all three perpendiculars intersect, and descends to a level appropriate for sighting.



NOTE

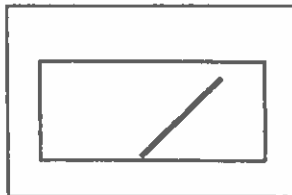
Accurate navigation is necessary for the Aural Null procedure to be effective.

ELT HOMING - USING L-TRONICS HOMER (LH10A)**GROUND OPERATION IN THE SIGNAL STRENGTH MODE**

1	Use ground antenna only.
2	Set frequency, REC mode, SENS minimum, VOL at 12 o'clock.
3	In this mode the meter reads signal strength, left (weaker) to right (stronger).
4	Turn SENS up until the meter goes up scale and the signal is audible.
5	Turn in a circle until the needle goes furthest upscale. In this position, the arrow on left arm of the antenna assembly will be pointing at the signal source.
6	Without changing controls, turn antenna until horizontal with the ground. A noticeable increase in signal strength means transmitter is horizontal. Use special antenna assembly shown in manual.
7	As volume increases and/or needle nears right-hand stop, decrease SENS.
8	The closer to target, the more rapidly volume and sensitivity increase.
9	To elevate quality of bearing, turn a full circle. If multiple reading of about equal upscale movements results, move to another location.

MIN

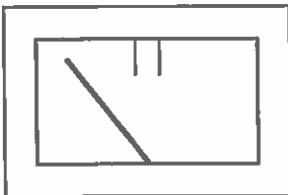
MAX



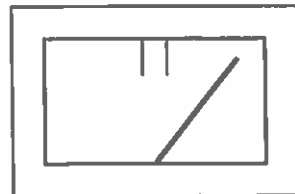
ELT HOMING - USING L-TRONICS HOMER (LH10A AND LA10A)

GROUND AND AIR OPERATION IN THE LEFT-RIGHT HOMING MODE

1	Use either aircraft or ground antenna.
2	Set frequency, DF mode, SENS minimum, VOL at 12 o'clock
3	Turn SENS up until meter needle goes left or right and signal is audible.
4	Turn toward needle until it centers. You are facing the target.
5	Left to right needle swing is normal when walking, driving or flying. Follow headings that keep left and right swings about equal.
6	As volume increases and/or needle gets too sensitive, decrease SENS. Slight left-right swing and audible signal is enough.
7	The closer to target, the more rapidly volume and sensitivity increase.
8	To evaluate the quality of the bearing, turn a full circle. If the needle centers more than twice 180 degrees apart, move to another location or fly a circle, keeping needle either left or right with a constant indication.



TURN LEFT



TURN RIGHT

ELT HOMING - USING L-TRONICS HOMER (LL-16)

GROUND OPERATIONS IN THE SIGNAL STRENGTH MODE

1	Unfold antenna blades and then the handle.
2	To turn on and off, press and HOLD the ON/OFF button until it beeps.
3	If light required press "Light".
4	Press Up or Down Arrows to set volume.
5	Select channel 0-9 (1=121.5, 2=243.0, 3=121.6, 4=123.10) (Diagram 1).
6	If required to enter frequency Press F then FREQ (KEYPAD 1) enter frequency then F when done or if using Arrow Keys Press F then FREQ then use up or down arrow keys.
7	Press "CAL". Hold DF in operating position. CAL on screen goes out when done. Check for "GOOD" (Diagram 1).
8	Press "DF-REC" button. Screen showing RECEIVE will appear.
9	Turn to get the tallest strength bar or highest numbers. In this setting signal is off the left end of homer (NOTE: Arrows MAX SIG REC MODE) (Diagram 2).
10	To elevate quality of bearing, turn a full circle. If multiple readings of about equal signal strengths result, move to another location.
11	The closer to target, the more rapidly volume and sensitivity increases and one or two of the Attenuator Flags will appear beside strength bar.
12	Normal for bar to fluctuate and flags to appear and disappear when very close to the beacon.



Diagram 1

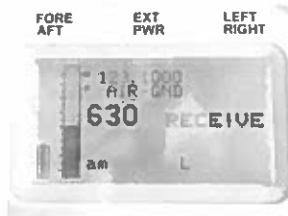


Diagram 2

2.8

ELT HOMING - USING L-TRONICS HOMER (LL-16)

GROUND AND AIR OPERATIONS IN THE LEFT RIGHT HOMING MODE

1	Unfold antenna blades and then the handle or use aircraft, vehicle antennas.
2	To turn on and off, press and HOLD the ON/OFF button until it beeps.
3	If light required press "Light".
4	Press Up or Down Arrows to set volume.
5	Select channel 0-9 (1=121.5, 2=243.0, 3=121.6, 4=123.10).
6	If required to enter frequency Press F then FREQ (KEYPAD 1) enter frequency then F when done or if using Arrow Keys Press F then FREQ then use up or down arrow keys.
7	Press "CAL". Hold DF in operating position. CAL on screen goes out when done. Check for "GOOD".
8	Press "DF-REC" button. For DF, screen showing FORE/AFT - LEFT/RIGHT arrow bars with strength bar will be displayed. (Diagram 1).
9	Turn in the direction of the longer filled in bar until the bar is centered in the middle of the cross display (displayed centered) (Diagram 2).
10	To elevate quality of bearing, turn a full circle. If the bar centers more than twice, 180 degrees apart, move to another location (reflections).
11	Turn to tell, if bar moves opposite of turn (ELT in Front). If bar moves in direction of turn (ELT Behind).
12	Confirm two centers 180 apart. Bar centered with highest strength reading (of the two centers) means you are facing the target.
13	The closer to target, the more rapidly volume and sensitivity increases and one or two of the Attenuator Flags will appear beside strength bar. (Diagram 2).
14	Normal for bar to fluctuate and flags to appear and disappear when very close to the beacon.
15	Information will be provided on the front left side of the homer.

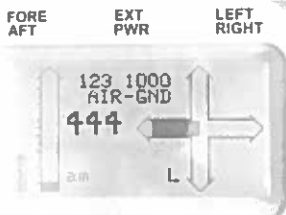


Diagram 1

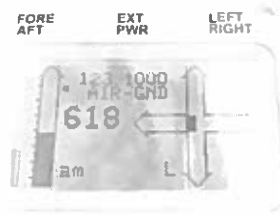


Diagram 2

3 VISUAL SEARCHES - COVERAGE AND TRACK CRAWL

INTRODUCTION

Although there are no hard and fast rules, generally the heights and visibility distances used for search area coverage are as follows:

HEIGHTS AND VISIBILITY DISTANCES

3.1

COVERAGE	HEIGHTS AND DISTANCES		
First	<ul style="list-style-type: none"> • Day: 1500 ft. AGL • Night: 3000 ft. AGL 	3 NM visibility	5 NM visibility
Following	<ul style="list-style-type: none"> • 1000 ft. AGL 	1NM visibility	
Following	<ul style="list-style-type: none"> • 500 ft. AGL 	1/2 NM visibility	
ELT	<ul style="list-style-type: none"> • First: 10000 ft. AGL • Second: 5000 ft. AGL 	30 NM max reception	15 NM max reception

VISUAL SEARCHES - TRACK CRAWL

3.2

TRACK - LINE SINGLE UNIT RETURN

STEP	DESCRIPTION
1	The searchmaster of JRCC designates: <ul style="list-style-type: none"> • LKP and intended destination, • altitude to be flown, • visibility distances

VISUAL SEARCHES - TRACK CRAWL (cont)

STEP	DESCRIPTION
2 (ILLUS. 1)	Search crew proceeds to LKP and begins to fly a track parallel to the intended flight route: • distance = visibility distance.
3 (ILLUS. 2)	Search crew proceeds to LKP and flies along intended flight route to destination, plus visibility distance.
4	Search crew flies a parallel track on the other side of the intended flight route.

COMMENT

Illustration 1 displays a track crawl pattern for use when the search aircraft must break off the search at the same end of the track as the search originated.

Illustration 2 should be used when the crew intends to break off the search at destination.

ILLUSTRATION 1

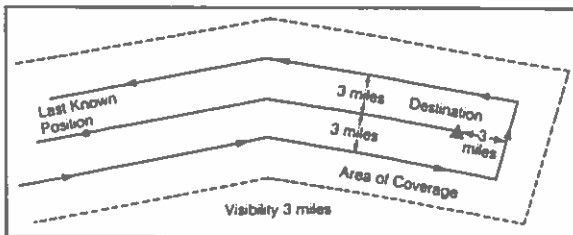
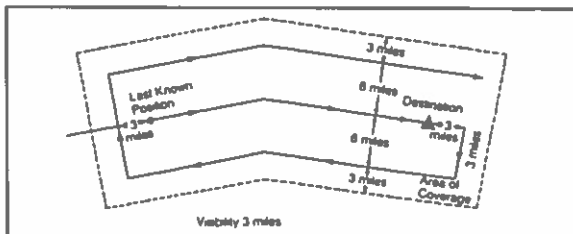


ILLUSTRATION 2

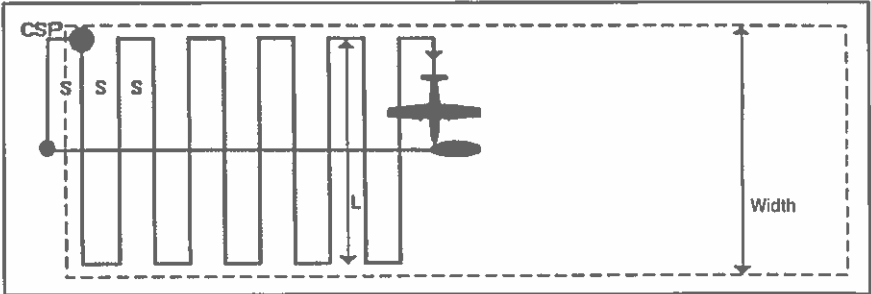


COMMENT

For both patterns, searching during turns is very important, otherwise some areas will not be searched.

VISUAL SEARCHES - CREEPING LINE AHEAD (CLA)/PARALLEL TRACK

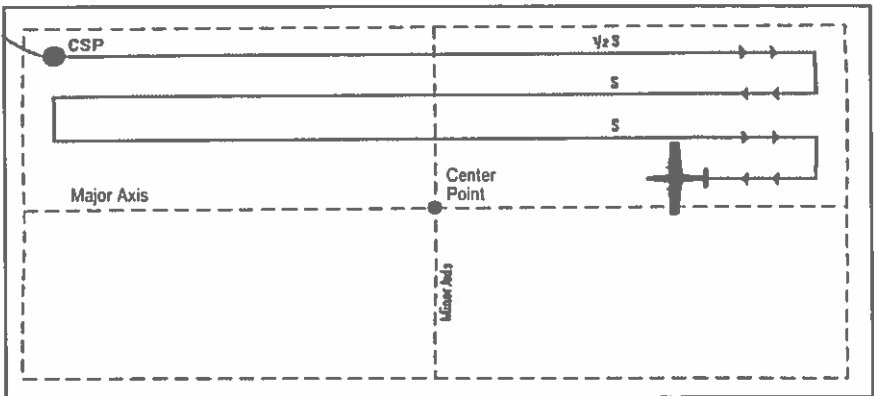
These are two types of patterns which require successive search legs advancing across a search area. They are Creeping Line or Parallel Track patterns. Both are employed to provide uniform coverage over areas where only the approximate position of the target can be estimated. Such patterns are called Creeping Line when the legs are parallel to the shortest side of the search area.



CREEPING LINE PATTERN

Creeping Line patterns are suitable for rapid advancement along a given track or drift line.

A Parallel Track differs from a Creeping Line in that the legs are parallel to the longest side of the search area.



PARALLEL TRACK

Parallel track patterns are more suitable for large areas since there are fewer turns and navigation is normally more accurate

VISUAL SEARCHES - EXPANDING SQUARE

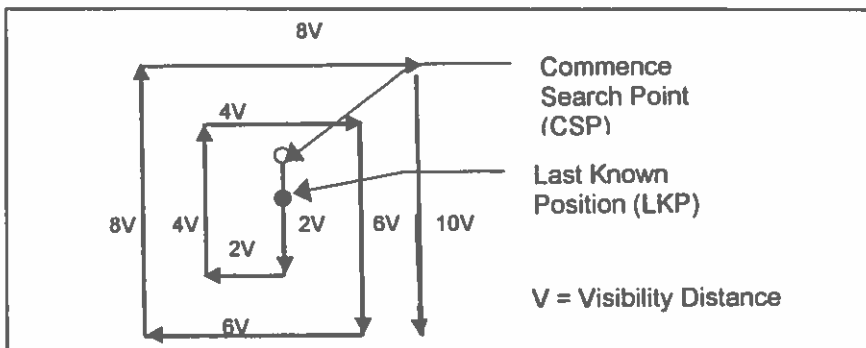
EXPANDING SQUARE SEARCH

STEP	PROCEDURE
1	The searchmaster or JRCC designates: <ul style="list-style-type: none"> • LKP, • altitude to be flown, • visibility distance. • extension of search area.
2	Search crew proceeds to CSP.
3	Fly lines at right angles to each other with a track spacing of two visibility distance(s), increasing by twice the visibility distance on completion of two lines.
4	For second coverage, rotate the search pattern 45 degrees left or right.

COMMENT

For accuracy, assess the drift and apply corrections before the search starts. For simplicity, fly the cardinal headings. Accurate navigation is extremely important for searches utilizing the expanding square search method. Searching while the aircraft turns is necessary. Each crew should decide which way they wish to make their turns, left or right.

ILLUSTRATION



VISUAL SEARCHES - SECTOR SEARCH

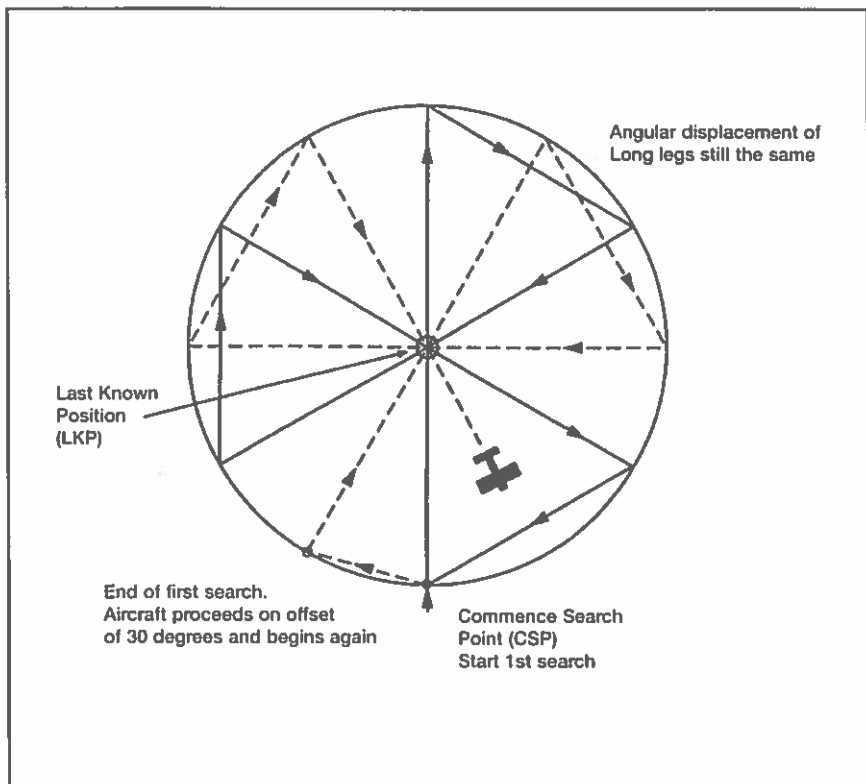
The sector search is used when the last known position (LKP) is established with a high degree of accuracy and the search area is relatively small.

The sector search could be used:

- when persons are lost in bushland and their whereabouts established in a small area,
- on completion of an Emergency Locator Transmitter (ELT) or Personal Locator Beacon (PLB) homing when the source of the signal cannot be readily seen.

STEP	PROCEDURE
1	The searchmaster or JRCC designates: <ul style="list-style-type: none">• LKP,• altitude to be flown,• visibility distances.
2	Search crew proceeds to Commence Search Point (CSP) or LKP.
3	Fly lines radiating from the center every 60 degrees.
4	For second coverage rotate the search pattern 30 degrees left or right.

VISUAL SEARCHES - SECTOR SEARCH (cont)



Normally, sector search patterns should not have a radius greater than 10 nautical miles (M) for aircraft or 5 M for vessels; another type of pattern should be used for search areas any larger than 300 square miles. Usually a six sector pattern is used, simplifying the navigation in that each turn is 120 degrees to the right. If a second pattern is required, it is commenced 30 degrees off the first.

VISUAL SEARCHES - CONTOUR SEARCH

ASSESSING THE AREA

STEP	PROCEDURE	DESCRIPTION
1	Plot the area	<ul style="list-style-type: none"> • receive assigned area and mark on map
2	Study the topography	<ul style="list-style-type: none"> • look for heights, orientation of ridge lines, local air strips, contour gradients, glaciers
3	Check the weather	<ul style="list-style-type: none"> • check present and forecast weather
4	Proceed to area	<ul style="list-style-type: none"> • look for signs of strong winds or turbulence
5	Check out the area	<ul style="list-style-type: none"> • cross area 1000 ft. above highest peak • check the weather • confirm relationship of map to ground
6	Plan your search	<ul style="list-style-type: none"> • note all prominent features • plot escape routes

COMMENT

The instruction here assumes an assigned altitude of 500 ft. and a scanning range of 1/2 mile

FLYING THE CONTOUR

STEP	PROCEDURE
1	Fly across the peak at 500 ft. AGL to allow good inspection of the summit
2	Note the altitude.

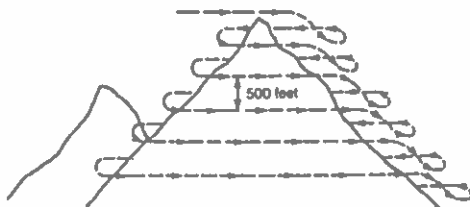
3.6

VISUAL SEARCHES - CONTOUR SEARCH (cont)

FLYING THE CONTOUR (cont)

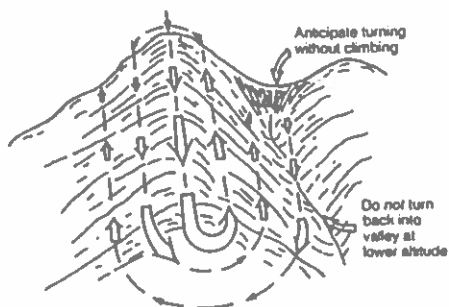
STEP	PROCEDURE
3	Fly away from the mountain and make a descending turn to arrive at the same location, flying the opposite direction, 500 ft. lower.
4	Fly the altitude "hugging" the mountain.
5	Turn away and repeat steps 3 and 4 as required.

ILLUSTRATION - FLYING THE CONTOUR



NOTE

Patterns are flown with left or right hand turns based on aircraft requirements and the terrain to be searched



VISUAL SEARCHES - CONTOUR SEARCH (cont)

TIPS REGARDING CONTOUR SEARCHES

TIP	DESCRIPTION
1	Check the weather for the area - select best route and alternate or cancel out.
2	Keep your aircraft as light as possible.
3	Avoid areas of turbulence.
4	Keep your airspeed up in areas of downdrafts.
5	Stay away from whiteout conditions.
6	Never fly into a valley that is too narrow to permit a 180 degree turn at your altitude.
7	Be aware of the effect of temperature on true altitude when temperature is below ISA.
8	Always have a planned emergency exit route.
9	In valleys, fly the right-hand rule.
10	Always be prepared to do 180 degree turn.
11	Be aware of the cable spans.
12	Never fly "UP" valleys.

CHECK LIST:

HAVE YOU . . .

- . . . checked the weather and terrain along your intended flight route?
- . . . checked the weather and terrain along your alternate routes?
- . . . identified an escape route at every point?
- . . . identified safe altitudes for entering valleys?
- . . . identified places where you might need to make sharp turns?
- . . . identified possible areas of high velocity valley winds?
- . . . allowed for greater turning radius and shallower climbs gradient?

4 LOCATION OF SEARCH OBJECT

STEPS TO FOLLOW

4.1

STEP	DESCRIPTION
1	Contact JRCC/searchmaster/CASARA search coordinator or military aircraft: <ul style="list-style-type: none"> • for aircraft, use frequency provided by searchmaster in preflight briefing • relay through nearest FSS or ATC unit.
2	Provide the following information using NOCL message (Form 1.10): <ul style="list-style-type: none"> • track, • your aircraft identification, • nature of the sighting, • position and time of sighting, • available information about survivors, • how long you can remain on scene before diverting for fuel, • any other pertinent information.
3	Request an ETA for on-scene of SAR aircraft, and transit altitude: <ul style="list-style-type: none"> • if you can, hold an altitude higher than SAR transiting aircraft to provide a homing target.
4	Provide whatever assistance you are able to give when requested.
5	All other aircraft remain on assigned task.

5 SPOTTING

SPOTTER'S CHECK LIST

5.1

- PILOTS should ensure that spotters are thoroughly briefed on the following:

OBJECT OF SEARCH

- Aircraft - Vessel - Person
- Colour, Registration
- Last known position
- Number of persons
- Signals available (ELT, EPIRB-PLB)

TYPE OF SEARCH

EXPECTED TERRAIN IN SEARCH AREA

EXPECTED WEATHER IN SEARCH AREA

SCANNING PROCEDURES

SPOTTER ROTATION SCHEDULE

INTERCOM USE

EMERGENCY PROCEDURES IN EVENT OF FORCED LANDING (including survival gear on board and ELT location and operating procedure.)

PLANNED STOPS (OVERNIGHT, LUNCH)

DRESS FOR OUTSIDE ENVIRONMENT

CLOCK PROCEDURE OF PILOT NOTIFICATION IF SEARCH OBJECT SIGHTED

PENCIL AND PAPER FOR SIGHTING DIAGRAM

NOTE

Ground to air emergency code on inside back cover.

SCANNING PROCEDURES

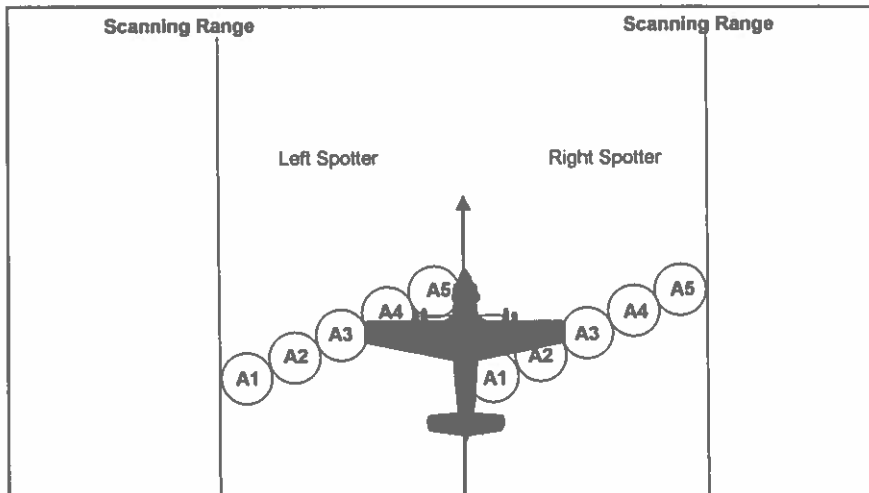
5.2

STEP	PROCEDURE
1	Establish the scanning range.
2	Establish scan lines.
3	When scanning from the right side of the aircraft your eyes should move from the aircraft to the outer edge of the scanning range, return to the starting position and scan the next line. When scanning from the left side of the aircraft, start your scan line at the edge of the scanning range and move your eyes inwards toward the aircraft. Return to the starting position and scan the next line.
4	REMEMBER - in CASARA aircraft, the scans are done at right angles to the fuselage. In some military aircraft, the spotter can look towards the rear, and sometimes below the aircraft.

COMMENT

It takes 2 to 8 seconds to scan one line depending on the speed and altitude of the aircraft.

ILLUSTRATION



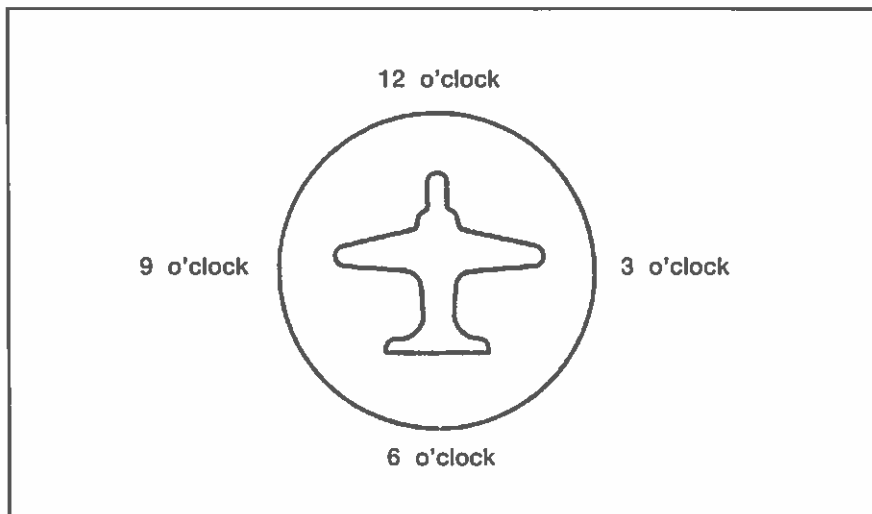
REPORTING TO CREW

5.3

SEARCH OBJECT SPOTTED

STEP	DESCRIPTION
1	Fix the location of the object relative to surrounding geographical features.
2	Report the position to the pilot using the clock system, and give approximate distance from search aircraft.
3	Ask for another spotter to observe it and keep its location in sight.
4	Assist the pilot with direction to guide him/her to the sighting using clock and distance.

Illustration



6 NAVIGATION

NAVIGATOR DUTIES

6.1

STEP	DESCRIPTION
1	Study your map.
2	Envisage your intended mission: <ul style="list-style-type: none"> • from point of departure, • through the search operation, • to your return to the aerodrome.
3	Assess the features that will help you to navigate.
4	Calculate the time at which you will have to break off the flight so as to return with a safe fuel reserve. Verify this reserve with the aircraft commander.
5	Calculate the distances from check-point to check-point.
6	Prepare a map of your search assignment. Accurate map preparation is the cornerstone of an effective search.
7	Maintain an accurate log of all flight activity (see 1.6). Record NOCL information. Show to whom and time sent.

GEOREF SYSTEM

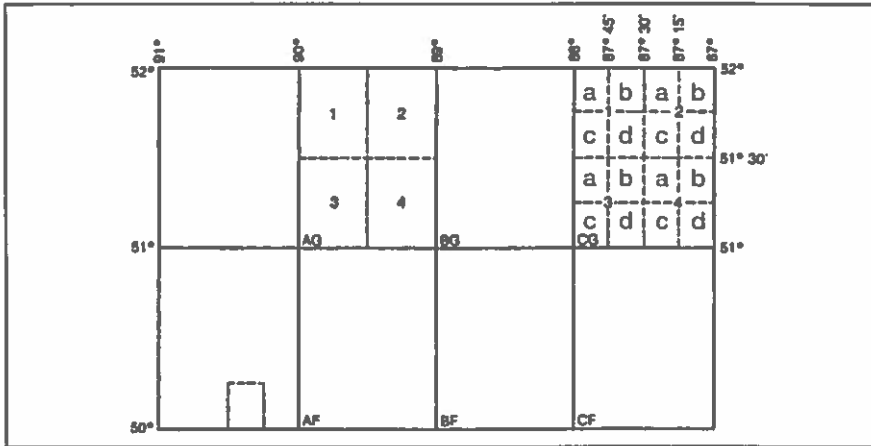
6.2

DESCRIPTION

Every 1:500 000 scale aeronautical map is as follows:

- rectangles of one degree of latitude and one degree of longitude,
- identified by a two-letter symbol, printed in purple on the lower left corner of latitude,
- each rectangle is divided into four smaller rectangles of 30 min of longitude by 30 min of latitude,
- identified by numbers 1 to 4, starting at the upper left corner and going from left to right. The numbers are not printed on map,
- these small rectangles are subdivided into four sub-areas measuring 15 min of longitude by 15 min of latitude,
- identified by letters a, b, c, d in same sequence as above. The letters are not printed on map.

GEOREF SYSTEM - ILLUSTRATION



SEARCH AREA IDENTIFICATION USING GEOREF

STEPS TO FOLLOW

STEP	DESCRIPTION
1	Rough in the boundaries of your area in pencil. Note the A/C call-signs allocated to adjacent areas.
2	Study the area looking for terrain features and determine which search procedure would be best.
3	Plan flight path lines to be into wind to best eliminate drift.
4	Draw search lines on your map.
5	Survey the lines looking for check-points.
6	Check the height of the terrain, add it to the intended search altitude, and write it down near the start of the first line.
7	Pick an altitude for transiting to search area, considering: terrain, traffic.

7 CHECK LISTS

7.1

PRE-SEARCH CHECK LIST

The pilot-in-command should complete the following before commencing search:

- A. ONCE AIRBORNE - CONTACT JRCC/SM OR CASARA SEARCH COORDINATOR AND ADVISE TIME OFF AND ETA FOR COMMENCE SEARCH POINT.
- B. MONITOR VHF EMERGENCY FREQUENCIES AND FREQUENCIES WHICH MAY BE USED BY THE MISSING CRAFT, AND BE ALERT FOR BOTH MODULATED AND UNMODULATED SIGNALS.
- C. MAINTAIN LOG TO ENSURE A COMPLETE RESUME OF ALL ACTIVITIES ARE AVAILABLE FOR DEBRIEFING.
- D. ARRIVE AT ASSIGNED STARTING POINT TO ENABLE AIRCRAFT TO BE ESTABLISHED ON INITIAL SEARCH TRACK BEFORE REACHING COMMENCE SEARCH POINT (CSP).
- E. ASSIGN SPOTTERS SCHEDULE IN WINDOWS.
- F. ASSIGN SPOTTER SCANNING DISTANCE.
- G. INTERCOM CHECK OR INTERCREW COMMUNICATION SIGNALS.
- H. PRE-SEARCH BRIEFING COMPLETE.
- I. AIRSPEED - SEARCH SPEED.
- J. SPOTTERS - READY.
- K. FLAPS - SET FOR SEARCH SPEED.
- L. STALL SPEED - CALCULATED FOR SEARCH CONFIGURATION.
- M. HOMING EQUIPMENT - SELECTED.
- N. RADIO ALTIMETER - SET SEARCH ALTITUDE.
- O. FUEL - SUFFICIENT FOR PLANNED MISSION.
- P. LANDING LIGHT ON.

ON-SEARCH CHECK LIST

7.2

- A. CALL JRCC/SM OR CASARA SEARCH COORDINATOR AT COMMENCE SEARCH POINT.
- B. ALTITUDE - ASSIGNED SEARCH ALTITUDE.
- C. SPOTTERS - IN POSITION - COMMENCING TO SEARCH.
- D. CONTACT JRCC/SM OR CASARA SEARCH COORDINATOR HOURLY ON THE HOUR, OR AS REQUIRED, FOR "OPS NORMAL" STATING:
 - POSITION,
 - WEATHER
 - FUEL, IN HOURS AND MINUTES, EXCLUDING RESERVES.
- E. WEATHER CHECKS - SEARCH AREA, DESTINATION, ALTERNATE.
- F. FUEL - TO ALTERNATE.
- G. TIME - UPDATE ESTIMATE OF TIME TO LEAVE SEARCH AREA.
- H. MONITOR SPOTTER ROTATION SCHEDULE AND ENSURE SPOTTERS ARE RESTING DURING BREAKS.
- I. LOG - ALL SIGHTINGS, UNSEARCHED AREAS, WEATHER CONDITIONS (ie - Location of fog banks, etc.) (use Form 1.5).

POST-SEARCH PROCEDURE

7.3

-
- A. ADVISE CREW OF DEPARTURE FROM SEARCH AREA.
 - B. ADVISE JRCC/SM OR CASARA SEARCH COORDINATOR OF DEPARTURE FROM SEARCH AREA.
 - C. ON LANDING - DEBRIEF WITH CREW, THEN:
 - DEBRIEF WITH JRCC/SM OR CASARA SEARCH COORDINATOR.

7.4

CREW DEBRIEF

- A. COMPUTE SEARCH TIME.
- B. COMPUTE TRANSIT TIME.
- C. ASSESS SEARCH EFFECTIVENESS.
- D. DETERMINE PERCENT OF SEARCH AREA COVERED.
- E. ASSESS CREW AVAILABILITY FOR SUBSEQUENT TASKINGS - PASS TO CREW CHIEFS.
- F. ENSURE MAP MARKED WITH AIRCRAFT IDENT, CREW NAMES, AND DATE/TIME. (Sighting Information - See Form 1.5).
- G. QUESTIONS?

NOTE

Obtain record of fuel cost for later reimbursement..

JRCC / SM / CASARA SEARCH COORDINATOR

7.5

Provide the following:

- A. LOG OF SIGHTINGS. (Sighting Information - See Form 1.5)
- B. DIAGRAM OF SIGHTINGS.
- C. SEARCH TIME.
- D. TRANSIT TIME.
- E. TYPE OF SEARCH CARRIED OUT.
- F. SEARCH EFFECTIVENESS.
- G. UNSEARCHED AREAS.
- H. WEATHER CONDITIONS (SHOWN ON MAP) BOTH HAZARDOUS TO AVIATION AND PERTINENT TO SEARCH.
- I. ALSO PROVIDE YOUR MAP WITH ALL THESE DEBRIEF POINTS WRITTEN ON IT FOR LATER REFERENCE.

INSURANCE - GENERAL INFORMATION

The CASARA National Organization maintains insurance for the following purposes:

- a. Aircraft Hull and Liability Insurance.
(The above insurance is purchased as secondary insurance and is intended to supplement the owner's private insurance.)
- b. Premises, Property and Operations Liability Insurance.
- c. Personal Accident Insurance.
- d. General Liability and Miscellaneous Articles Floater.

A copy of all policies has been forwarded to each Director. Refer to the individual policy for specific limits and exclusions.

In all cases of claims or probable claims, the incident must be reported to the following ASAP:

- a. Prov/Terr Director and Zone Commander.
- b. If SAR Ops - to SM and/or JRCC.
- c. The private insurer of the volunteer aircraft.
- d. CASARA Insurance agent: Brian Julien
403-735-2424 (office)
403-735-2396 (fax)
- e. CASARA Administrator: 204-953-2290
204-953-2293 (fax)

Use the fastest means of communication.

Provide nature, cause and extent of damage and injury, with identification of persons involved and names of witnesses, if possible.

Cooperate with involved third parties and exchange names and addresses, as well as render aid if required..

THERE IS NO HULL INSURANCE COVERAGE WITH RESPECT TO ULTRALIGHT AIRCRAFT, EXPERIMENTAL AIRCRAFT, ROTARY WING AIRCRAFT OR MILITARY AIRCRAFT.

UNDER NO CIRCUMSTANCES ADMIT LIABILITY.

BINGO TIME

7.7

The latest time you can leave an area and still have your reserve fuel when you land.

EXAMPLE:	Total Fuel (Hrs:min)	4:00 hours
	Minus Reserve (Hrs:min)	00:30 mins
	Minus Fuel to Land (Bingo Leg) (Hrs:min)	00:20 mins
	Total time available	03:10 hours
	Plus Engine Start Time	14:00 hours
	BINGO Time	17:10 hours

This means that at 1710 hours, you must leave your search area, and transit for landing.

ELT REQUIREMENTS FOR JRCC

7.8

JRCC requirements whenever we turn an ELT off.

MAKE AND MODEL: _____

SERIAL NO: _____

A/C LAT/LONG: _____

POSITION OF SWITCH: _____

TIME TURNED OFF: _____

A/C CALL SIGN: _____

ADDITIONAL REMARKS: _____

FIRST ON THE SCENE CHECK LIST

7.9

- A. CONFIRM ROLES AND RESPONSIBILITIES**
- Identify roles and responsibilities before commencing ground homing.
- B. APPROACH AND ASSESS HAZARDS**
- Approach with caution
 - Identify potential hazards
 - Identify yourself to casualties
- C. ALERT SAR AUTHORITIES**
- Prepare and send NOCL message
- D. MAKE THE SCENE SAFE**
- Manage immediate safety hazards
 - Protect against Bio Hazards
- E. SURVIVOR CARE**
- Positively identify aircraft and occupants
 - Administer medical aid/First Aid
 - Create a safe zone
 - Conduct a limited search for missing occupants (if applicable)
 - Deal with deceased
- F. SECURE AND MAINTAIN THE SCENE**
- Secure the scene
 - Maintain communications and update information with authorities
 - Provide ongoing casualty care
- G. PREPARE FOR THE ARRIVAL OF SAR RESOURCES**
- Air Rescue - Helicopter landing or hoist recovery
 - Ground Rescue - Crews arriving on foot or vehicle
 - Water Rescue - Crews arriving by boat
- H. HAND OFF TO AUTHORITIES**
- Provide a detailed briefing
 - Document details
- I. RETURN TO BASE**
- Check gear and supplies
 - Ensure ongoing safety of team
 - Manage encounters with the media or next-of-kin
 - Safeguard documentation

NOTE

For further details and explanation refer to www.casara.ca

