National Défense
Defence nationale

B-GL-332-010/FP-001

INSERT - AVIATION

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Issued on Authority of the Chief of the Land Staff

OPI: DAD 6 2000-02-28

Canada

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PART 8 - ARM INSERT

TAM 809 - AVIATION INSERT

809.01 - GENERAL

1. The content of this Tactical Aide Memoire (TAM) is an abbreviation of selected contents of B-GA-441-001/FP-001, *1 Wing Unit Standing Operating Procedures* (WUSOPs) and B-GA-442-001/FP-001, *1 Wing Tactics, Techniques and Procedures* (TTP) manuals. It is intended to be used as a quick ref guide for tac avn matters. More detailed info is aval in the parent docs.

809.02 - HELICOPTER SQUADRON STEP-UP PROCEDURE

1. The foremost consideration in planning a move is that there must be a capability to maint con of the sqn assets at all times.
2. **Sequence.** The normal sequence of events for a HQ move is as fol:
   a. step-up HQ (C/S 0B) will estb comms on the higher fmn comd net and all stas (less ac) on the Sqn comd net;
   b. bmonitor flight following;
   c. req SITREP from Main HQ (C/S 0) before advising of being ready to assume con; and
   d. thereafter the step-up HQ uses C/S 0.
3. The Duty Ops O must be passed the fol docs before he departs the sqn loc to go to the step-up HQ:
   a. copies of relevant Op O, Op Instr and Trg Instr;
   b. a copy of all Ops and int Log sheets;
   c. copies of all traces and plans for current and anticipated ops;
   d. copies of all msns and tasks; and
   e. confirmed current CEOIs and codewords.

809.03 - FORMAT SQUADRON WNG O, OP O AND FRAG O SQUADRON WARNING ORDERS

1. Sqn Wng O must incl:
   a. sit, incl comd's intentions;
   b. probable msn/tasks;
   c. no move before (NMB) or degree of notice;
   d. RV and time for Orders;
   e. essential sp svc or comd and Sig (e.g. Mov of ech or HQs); and
   f. acknowledgement. (Including who, what, and when).
2. Sqn Wng O might incl:
   a. orders for prelim ops, recce, re-gping or mov;
   b. assy areas;
   c. adv and har parties; and
   d. limitations on recce, mov and use of tpt, incl hels.

SQUADRON OPERATION ORDERS

3. **Sqn Op O.** An outline of the orders format fol:
   a. **Christen the Ground**. Important features/ref pts affecting ops.

b. **Task org**. Incl time of eff changes and states of comd (where applicable). May be incl in Atts and Dets, by flt gp in EXECUTION or as a separate anx in written orders.

c. Sample op O format:

OP O:

1. SITUATION
   a. En Forces. The Int O normally prep this sect. It incl info on en composition, disposn, locs, mov, est strs, ident, capabilities and objs which recipients need to know and the METREP. Info about the en may be by text/verbal and be shown on overlay.
   b. Friendly Forces. This subpara is normally prep by S Ops O. It contains info on friendly forces, other than those comd or con by the Sqn, and which may affect action of subordinate comds. The intentions of the issuing comd's superior are stated here (this info is derived from para 3.a. of the superior comd's op O). PHOTOR sorties of interest to, but not con by, the Sqn are mentioned here as are all OAS (PHOTOR, CAS and BAI) sorties alloc or aval to the Sqn. If TACP alloc, it is noted here.
   c. Meteorology. The Met tech provides the weather regarding the flying ops (forecasts, actuals, outlook, illum for NVG, etc.) and the IO provides the METREP affecting the grd ops (already incl in sub para a. above).
   d. Atts and Dets.
      (1) When not given under Task Org or in an anx, units/subunits remaining, att, or det, along with their comd relationships, are shown here.
      (2) Cbt svc sp units and relationships need not be listed here if an Admin O is to be issued with the op O.
      (3) Tps in loc are normally TACON for def to unit/fmn owning the real estate. There is an obligation on the part of these tps to seek and accept dir for coord of their activities while in another unit's or fmn's area.
      (4) Arty units and their sp relationship are also listed.
2. MISSION Sqn will... “conduct airmobile ops".
3. EXECUTION
   a. Concept of ops. CO’s intent and concept of ops in sufficient detail to allow flt comds to understand the CO’s intention and their part in it. Incl phases (if relevant).
   b. Groupings and Tasks. Detailed instructions to subordinate comds:

Elms	Remarks
Flts (HQ, Util)	Gp, tasks
Atts	Gp, tasks
Arty	Alloc of FOOs, tasks, AD tasks. Coord: CB pol, AMAs, airspace, AD wpns state, pri of fire, etc.
Eng	Alloc of tps, pri of tasks
EW	Gp, task pri, EMCON State
CSS (Maint, Log Sp Flt)	Gp, tasks

c. Coord Instrs.
   (1) Timings. Chronological order.
   (2) Mov and TC. A mov table may be listed in a separate anx.
   (3) Bdrys. Bdrys are usually set out in a trace or an overlay that is incl as an anx to the order.
   (4) Coord Pts.
   (5) Fire Plan. Usually issued later to permit time for detailed coord. Timings for DF plans to HQs are listed. Orders to implement fire plans are issued through arty channels.
   (6) Barrier Plan.
   (7) Def Stores. Def stores is given under coord instrs and not under SERVICE SUPPORT para.
   (8) ISTAR plan. This may be a separate anx and, if so, is referred to here.
   (9) NBCD. Should incl comd's guidance on NBCD, planning reqrs, constraints and a ref to the nuc and chem sp plan. Wng and protective measures should be incl if they are not in SOPs.
   (10) Recce. Limitations on recce if applic.
   (11) Air. Inc here info on air sp con agencies, e.g., TACPs, and offensive air sp msns (PHOTOR, CAS, BAI) aval to the Sqn.
   (12) Airspace. Latest ACO.
   (13) Downed Ac. Evasion plan, SPINs, Recovery Plan.
   (14) Coord Conf. If coord conf is to be held, it should be the last item mentioned under Coord Instrs. Time and loc of coord conf are given.

4. SERVICE SUPPORT.
   a. Locs. A and B ech (if required).
   b. Med. UAS loc, Fd Amb LZ, and CASEVAC procedure.

c. Ammo.
d. Fuel. Current and future forward area rearming and refuelling point (FARP) locs, open and close times.
e. Def Stores. Type, loc.
f. Feeding.
g. PW. Policy, loc of PW coll pt.
h. Rec. Loc of ac MRP.
i. BSA. Loc of fmn log LZ, and backhaul policy.

5. COMMAND AND SIGNALS.
a. Locs and HQs. Incl future locs and opening times for Sqn, Fmn.
b. Altn Comd/HQ. If different fm WUSOPs.
c. Ln. LOs, coord/Contact Pts.
d. CEOI.
e. ISTAR/EMCON/C Surv. Details not covered in Coord Instrs. Could be an anx to orders.
f. Code Words/Nicknames/Nicknumbers. Normally in table format.
g. Password.
h. Timecheck. (Sig NCO).

d. Questions.

FRAGMENTARY ORDERS

4. **Sqn Frag O.** For use in fast moving sit. Use the five standard headings in sequence but only incl essential info or that which as changed. For example:

FRAG O

1. Sit. En tk bn est to be moving to atk 1 Blanks from GR 123456.
2. Msn. Sqn will...in order to...
3. Execution.
   a. A Flt. Screen facing N between posns X and Y.
   b. B Flt. Prep to move four dismounted TOW dets from PZ PRINCESS to LZ FROG. Come to State of readiness D (30 min) from 1300 hrs.
   c. Timings. H hour not before 1430 hrs.
4. Svc Sp. "No change".
5. Comd and Sig. "No change".

809.04 - FLIGHT FOLLOWING

1. Flt following will normally be done by the Sqn main CP; however, Flt CPs may be resp for this function depending on the depl of the Sqn. That is to say, that if the A ech has depl from the BSA then the Flt CP will become resp to C/S 0 for flt following.

2. Departing or arriving plts will report to the CP immed prior to start and after shutdown and will:

a. check with the Duty Ops O/Flt Ops O for any last minute ch to their msn;

b. file a flt plan showing intended rte, turning pts and duration of flt, or leave a trace with ops;
c. complete CF 773; and
d. on completion of msn, debrief with the IO and Duty Ops O, and complete INTREP.

3. Plts shall, whenever possible, contact the Sqn CP every 30 min.

809.05 - SQN FIXED CALLSIGNS

1. Sqn C/S will be IAW ACP 125 CANSUPP – 1(B) table 4B-9-1 (Standard Brigade Group Tactical Helicopter Squadron), as listed below. The letter prefix for hels on other fmn nets is HOTEL, with JULIET as the alternative.

Appt	**C/S**	**Appt**	**C/S**	**Appt**	**C/S**
Sqn HQ		**Maint Flt**		**Log Sp Flt**	
Sqn CP	0, 0A	CP	5A, B, C	CP	8, 8A
A Flt CP	1	Flt Comd	59	Umpires	80A-N
B Flt CP	2	D/Flt Comd	59A	Supply	81
C Flt CP	3	Ac Maint	51	Ambs	83A-C
CO	9	MRP	52, 53	Tpt Sect	84
DCO	9A	Maint Sp	54	A1 Ech	85
Ops O	9B	AVS Sect	55	A2 Ech	85A
SCWO	9C	FARP	55A, B, C	B Ech	85B
LO	9D			Food Svc	87A
Fmn Comd	90			Veh Rec	88
Fmn Air Comd	90A			Flt Comd	89
Sig O	91			D/Flt Comd	89A
Sig Sgt	91A				
RRBs	91B,C				
Adjutant	92				
SOR	92A				
IO	93				
Bde Avn Staff	97				

A Flt Callsigns

Appt	**C/S**	**Appt**	**C/S**
Flt CP	1, 1A	Recce Grd Party Dets	16, 16A, 16B, 16C
Sects	11, 12, 13, 14	FAC	17
Hel/Pilots	11A-M	Flt Comd	19
Hel/Pilots	12A-M	D/Flt Comd	19A
Hel/Pilots	13A-M	Flt Warrant Officer	19C
Hel/Pilots	14A-M	LO's	19E-G
Maint Sect	15		

B Flt Callsigns

Appt	**C/S**	**Appt**	**C/S**
Flt CP	2, 2A	Recce Gnd Party Dets	26, 26A, 26B, 26C
Sects	21, 22, 23, 24	FAC	27

Appt	C/S	Appt	C/S
Hel/Pilots	**21A-M**	Flt Comd	29
Hel/Pilots	22A-M	D/Flt Comd	29A
Hel/Pilots	23A-M	Flt Warrant Officer	29C
Hel/Pilots	24A-M	LO's	29E-G
Maint Sect	25		

C Flt Callsigns

Appt	C/S	Appt	C/S
Flt CP	3, 3A	Recce Gnd Party Dets	36, 36A, 36B, 36C
Sects	31, 32, 33, 34	FAC	**37**
Hel/Pilots	31A-M	Flt Comd	39
Hel/Pilots	32A-M	D/Flt Comd	39A
Hel/Pilots	33A-M	Flt Warrant Officer	39C
Hel/Pilots	34A-M	LO's	39E-G
Maint Sect	35		

809.06 - COMMUNICATIONS - 1 WING HELICOPTERS

1. See USOP Vol 1, article 307.04.

809.07 - NBC DECONTAMINATION OF HELICOPTERS

1. **Immediate and Operational Decontamination Guidelines for Aircraft**.

a. In order to prevent damage to ac mat, the fol decontaminants will be used in the manner described below:

(1) chem cleaners are to be used to decon airframe and mounted armaments;

(2) hot soapy water is to be used to decon canopy and cargo hold areas;

(3) aviation fuel is to be used to decon airframe and certain parts as determined by maint pers;

(4) wiping is to be used to decon instruments and controls; and

(5) hot air is to be used to vaporize and dry contaminants and decon agents.

b. **Immediate Decontamination Procedures:**

(1) Step 1 - Ac is guided into posn and shut down (flight idle in hostile conditions).

(2) Step 2 - Decon agent disperser applies quick spray of chem decon agent to armament.

(3) Step 3 - A decon team member quickly washes ac with warm soapy water.

(4) Step 4 - Another team member rinses off the ac (armaments last).

(5) Step 5 - Tech conducts brief lub and safety check (replace 3-way paper as reqr).

(6) Step 6 - Ac is guided out of area.

(7) Remarks:
(a) A holding area for ac may be required, and
(b) in step 1 the 3-way detector paper on the ac is checked t verify whether the ac reqr decon. If decon is not reqr, steps 2 and 3 are omitted.

c. **Operational Decontamination Procedures:**
(1) Step 1 - Ac is guided into posn and shut down.
(2) Step 2 - Two team members commence wiping the airframe with chemically wetted cloths (do not apply chems to rubber seals or canopy).
(3) Step 3 - Another team member then applies warm soapy water to ac beginning with the canopy and working top to bottom.
(4) Step 4 - Ac is rinsed.
(5) Step 5 - Tech enters ac and wipes down instruments with dry cloths and washes seats and floor. The tech must perform indv decon before entering ac and touch only what is necessary.
(6) Step 6 - Tech exits ac and hot air is used to dry the interior.
(7) Remarks:
(a) avn fuel may also be used as a decon agent; and
(b) pers shall maint complete prot when acting as crew on decon ac no matter how detailed the decon.

809.08 - DOWNED AIRCRAFT/AIRCREW

1. The pri of tasks in the event of an ac crash comprise the fol:
a. preservation of life;
b. treatment and evac of pers;
c. prevention of further damage;
d. preservation of crash site; and
e. recording of pertinent info to include:
(1) gathering of facts;
(2) names, addresses and statements of witnesses;
(3) taking fluid samples from ac;
(4) drawing a diagram of crash site and taking measurements;
(5) taking photos of the crash site; and
(6) coord the actions of all pers present to provide as much info to the investigating team as possible.

809.09 - AVIATION FIRE PREVENTION SOPS

1. Smoking is prohibited in the fol areas:
a. at all times onboard a hel;
b. within 100 m of any ac being refuelled or de-fuelled;
c. within 50 m of any veh being refuelled or de-fuelled;
d. in areas which are used for the storage and handling of combustible mat; and
e. within 100 m of a bulk fuel installation.

2. No pers shall carry matches, lighters or similar devices in the immediate vicinity of bulk fuel compounds, in fuelling veh, or when employed in the fuelling of ac or veh.

809.10 - CASUALTY EVACUATION REQUEST (CASEVACREQ)

1. **Purpose -** Used to request med casevac sp for single and multiple evac and by whatever means.
2. See USOP Vol 1, articles 307.02 and 702.02 for request format.

809.11 - FORMAT FOR IMMEDIATE HELQUEST

1. **Purpose** – Used to request hel sp.
2. See USOP Vol 1, articles307.03 and 705.04 for request format.

809.12 - FORMAT FOR AIRCRAFT STATUS REPORT

1. **ACSTAT**
   - a. No. of svc ac by type.
   - b. Non Operational Requires Maintenance (NORM) ac (serial no, reason for status, est date of rtn to svc status).
   - c. Non Operational Requires Supply (NORS) ac by serial no. If after 3 days Immediate Operational Request/Aircraft On Ground (IOR/AOG) is still outstanding, the fol info will be added:
     - (a) IOR/AOG no and date;
     - (b) part no or NATO stock no;
     - (c) description of item;
     - (d) ch to status of IOR/AOG, such as date hastened, est del date, or anticipated del date.

809.13 - FORMAT FOR DEPLOYREP/LOCREP

1. **DEPLOYREP** (Static):
   - a1. loc of reporting HQ;
   - a2. contact point of reporting HQ;
   - a3. hel landing zone of reporting HQ;
   - b. loc of units;
   - c. loc of obsn post line and forward elms (only if not passed by trace); and
   - d. miscellaneous.
2. **LOCREP** (Mobile):
   - a. head of leading elms or column;
   - b. loc of reporting HQ;
   - c. tail of fighting ech veh or pers;
   - d. loc of admini ech; and
   - e. miscellaneous (estimated time of arrival).

809.14 - FORMAT FOR AIRCRAFT CRASH REPORT (CRASHREP)

1. **CRASHREP**
   - a. type of ac;

b. nationality and identifying markings;
c. loc;
d. time;
e. no of pers on board;
f. no killed/Injured; and
g. other info and importance.

809.15 - FARP REPORT AND FARP MOV O

1. **FARP REPORT**
   a. loc
   b. time open;
   c. time closed;
   d. approach from (direction);
   e. C/S authorized to use FARP;
   f. other info: (if time permits)
      (1) en sit;
      (2) wx; and
      (3) etc.

NOTE: Open and close times will be strictly adhered to

2. **FARP MOV O**
   a. loc;
   b. alternate loc;
   c. time open;
   d. time close;
   e. C/S auth to use;
   f. restrictions/priorities; and
   g. other info (en sit, wx, etc).

809.16 - FORMAT FOR MRP REQUEST

1. **MRP REQ**
   a. loc;
   b. ac tail no;
   c. nature of unsvc;
   d. parts required;
   e. special tools reqr;
   f. can ac recover to base;
   g. special instr/info; and
   h. en sit.

809.17 - ISOLATED PERS REPORT (ISOPREP)

1. **Preparation.** An ISOPREP contains info which is used to verify the identity of downed aircrew, in a threat environment for search and rescue purposes. All aircrew, and any pers who accompany them, must have a completed ISOPREP on file prior to flying their first msn into a hostile area. In the event of the downing or crash of an ac, the agency resp for providing

Combat Search and Rescue (CSAR) capabilities will be immediately informed of the event by telephone. The ISOPREPs and the crew's Evasion Plan of Action (EPA) will then be faxed to the CSAR agency. The Int Sect will normally be resp for holding ISOPREPs on file.

2. ISOPREP will contain the fol info:
   a. surname, first name, middle initial;
   b. service number;
   c. rank;
   d. elm (ie: Air Force);
   e. nationality;
   f. birth date (year/month/day);
   g. obvious marks (scars or other distinguishing features, noting size and loc);
   h. blood group;
   i. height in feet and inches;
   j. colour of eyes;
   k. colour of hair;
   l. date the form was filled out (year/month/day);
   m. wing/unit;
   n. four-digit number that can be easily recalled (do not use birth date, last four digits of service number or numbers in a pattern such as 1234);
   o. signature; and
   p. four statements about individual and photo.

809.18 - AIRMOBILE OPERATIONS SOPS

1. **Time Zone.** All times ZULU/GPS.

2. **Grouping.** Fmns will be grouped into elms of four ac divided into two sects of two ac.

3. **Fmn Type and Spacing**
   a. Sects maintain Arrow fmn when in elm fmn. Sects operating alone, maintain Arrow in close or over heavy treed areas and Battle fmn in open, flat terrain. Single elm fmns use Arrow in close terrain and Battle in open terrain that allows sufficient spacing.
   b. Elm spacing will be 2 min apart if elms land separately at LZ; otherwise, spacing will be 30 sec or approx a 1500 m spacing between last ac in preceding elm and first ac in fol elm.
   c. Each elm will make best use of terrain while staying within corridor.
   d. Spacing between ac must be briefed depending on threat, terrain, visibility and lighting.

4. **Start, Taxi, Take-off**
   a. T/O time (Start time is only given if necessary);
   b. taxi in sequence on elm lead's move;
   c. T/O will be on GPS time in trail; and

d. except for initial radio check, if required, all manoeuvres will be predicated on time.

NOTE: Any delays in timings to be expressed in H-hour, L-hour, or Y-Hour + xxx minutes format.

5. **Loading Plan**
   a. ALO to be dispatched to the Lifted Unit Commander (LUC) loc ASAP prior to ops. Will monitor Sqn Comd net.
   b. Chalks (loads) of 8 pax in summer and 6 pax in winter with rucksacks or toboggans. Chalks to be estb in decreasing order of pri left to right, front to back in ref to ac left/right and nose/tail.
   c. Chalks to be formed up in single line at either 12 o'clock or 3 o'clock depending on the landing fmn used. Figures 8-1, 8-2, and 8-3 illustrate the loading procedures.
   d. Delays which will compromise assigned air corridor/fire support coord timings must be comm to elm lead(s) and avn msn Comd/DComd (AMC/DAMC) for go/no go decision.
   e. Ac will depart PZ when thumbs up has been passed from last ac to preceding ac and so on up to lead. Once thumbs up are all given, T/O will be on timings. For night ops, selection of NVG lights from flashing to steady in sequence from last ac to lead when ready to T/O. Once readiness is confirmed, take-off will be predicated on timings as per air mov table/msn planning card.
   f. Lead ground chalk to pop smoke when fmn is on final approach. This will serve to orient aircrew and to confirm the PZ is secure.
   g. Standard chalk load timing of 5 min during summer and 10 min during winter is to be used for planning considerations.
6. **Lifted Unit Bump Plan**
   a. Loads are sited by ALO by serial, in decreasing order of pri from chalk #1; and
   b. if ac goes U/S, the last chalk(s) is/are to be dropped from the serial.
7. **Avn Unit Bump Plan**
   a. Any spare ac started by a plt and a flight engineer (FE) at sqn loc to be used as a spare for U/S on start-up. If crews are aval, the spare ac may be flown to the PZ and can be utilized as a spare there or may be used as a Combat Search and Rescue/ Downed Aircrew Recovery Extraction (CSAR/DARE) ac for msn execution.
   b. Any ac that goes U/S, AC and co-plt take spare ac and FE; U/S ac FE remains behind to secure ac.
   c. If no spare ac and elm lead U/S, AC and co-plt bump crew from ac #4; FE's remain with individual ac.
   d. If AMC ac goes U/S, bump co-plt from ac #4.
   e. Alternate elm lead is ac #3.
8. **Landing Fmn**
   a. Elm will close up to landing fmn at the release point (rel P). Landing fmns depend on threat, ac numbers, and size and shape of

landing area. At night, on touchdown all ac turn NVG lights from steady to flashing. Layout for various landing fmns provided at Figures 8-5 and 8-6.

b. All LZ departures will be individually by ac ASAP and rejoin enroute RV, unless there will be multiple elms in the LZ unloading simultaneously, then depart by elm once thumbs up given as per PZ departure. During night ops, select NVG lights from flashing to steady, in sequence from last ac to lead when ready to T/O.

c. Troop disembarkation is as per Figure 8-4.

9. **Holding Area**

a. Elms will proceed to HA when directed or when loitering is required.

b. Ac will hold by elm, facing inwards for mutual support when the door guns are not mounted or when dual door guns are mounted. When equipped with a single door gun only elms will adopt a box fmn. Distance between ac is area specific with respect to size, shape and terrain. Rule of thumb will have adjacent ac 1/3 effective range of weapon system (600 m range weapons would have ac no more than 200 m apart).

c. AMC/DAMC, elm leads and casevac ac to RV at a predetermined loc upon shutdown in the HA.

d. If shutdown is required, AMC or DAMC as appropriate, will carry a portable radio to maintain comms with the ALO or C2 ac. If portable radio is not aval, lead ac will hold first listening watch for 15 min, followed by two, three, etc.

10. **Aircraft Configuration**

a. Eight man seating configuration.

b. Barrier net installed.

c. All lights OFF during DAY. (Anti-collision lights on for training only.) Fmn lights NVG, all others OFF.

d. ½ litter kit with one stretcher.

e. Fuel:

(1) 1,600 lb initial fuel load lifting from Sqn locs;

(2) 1600 lb will allow 30 km transit to PZ, 2 lifts to LZ (50 kms each), transit to HA 50 km from LZ, hold then transit to FARP;

(3) bingo fuel is the fuel required to fly from furthest point on the planned route to land with 200 lb of fuel at the FARP or unit loc; and

(4) joker fuel is fuel required to complete msn and land at FARP or unit loc with 200 lb of fuel remaining.

f. KY58 and Mode 2 IFF installed and filled.

11. **Weapon State and Usage**

a. **Enemy Ground Fire:**

(1) take immed evasive action, return fire if able, turn away from fire and mask, info elm;

(2) elm lead send contact report to fmn lead or AMC; and

(3) attempt to rejoin the elm or proceed to next RV/air con pt (ACP) for rejoin.

b. **Enemy Air Attack:**

(1) first person making contact, report loc of threat relative to elm;

(2) threatened sect turn towards threat, spread out and attempt to mask;

(3) other sect attempt to mask;

(4) once threat has passed overhead, ac attempt to mask/land until threat exits area; and

(5) ac attempt to rejoin elm or proceed to next RV for rejoin.

c. **Ammunition Usage Rates for Door Guns:**

(1) enroute to PZ – 10%;

(2) enroute to LZ – 40%;

(3) in LZ – 30%; and

(4) enroute to HA/FARP – remaining.

12. **Enroute Emergencies**

a. Inform elm lead, maintain sect integrity;

b. if enroute to LZ, shadow ac will ensure ac on ground and proceed to LZ. AMC/LUC will decide if chalk is recovered; and

c. downed ac crew will carry out DARE/CSAR SOPs.

13. **Downed Aircraft**

a. Administer first aid as req.

b. If possible, report the sit to the AMC.

c. If capture of the ac is likely, prep it and all sensitive eqpt for destr in the fol order of pri:

(1) Priority 1. IFF eqpt and classified electronic eqpt incl DTC with related pubs and docs and other mat as defined by the national government concerned.

(2) Priority 2. Installed armament.

(3) Priority 3. Engine assembly.

(4) Priority 4. Airframe, con surfaces and undercarriage.

(5) Priority 5. Instruments, radios and electronic eqpt.

(6) Priority 6. Electrical, fuel and hydraulic systems.

d. Employ survival radio/locator and visual signaling devices to aid in locating the downed ac.

e. Estb def posns around the recovery site.

f. If not immediately evac, proceed to a preplanned pick-up point or follow the briefed escape and evasion plan.

g. Assist as necessary in the battle damage repair actions and in the evac of the ac and/or pers from the site.

14. **Loc of Key Personnel**

a. Pl comd(s) to be first chalk of every elm;

b. elm lead in #1 ac, alt lead in #3; and

c. AMC in separate C2 ac. If unable to use separate ac, AMC loc with LUC/FOO loaded by ALO.

15. **Communications**
    a. Radio minimize unless silence specified;
    b. if radio check required, check in after engine start on elm freq only. “Blues this is Lead, check in”, “Blue 2”, “Blue 3”;
    c. if check-in time is given, and all elm ac not on Havequick (HVQK) by check plus 5 min, all elm ac to switch to backup elm freq;
    d. if radio is suspected U/S and no radio check is to be carried out, info lead via runner;
    e. tactical C/S on FM nets, fmn C/S on A/A nets;
    f. if FOO is not with AMC/LUC, ensure arty freq are made aval;
    g. standard radio monitoring by CH146 sects within elms in a fmn will be:
        (1) Section Leads in Elements:
            (a) VHF-FM supported unit net;
            (b) HVQK fmn net; and
            (c) HVQK elm net.
        (2) No. 2:
            (a) VHF-FM Tac air net/arty fire direction/sqn comd net as req;
            (b) VHF-FM supported unit net; and
            (c) HVQK elm net.
16. **EMCON**
    a. Doppler silent mode;
    b. radio altimiter OFF, Distance Measuring Equipment (DME) OFF;
    c. transponder: (dependant which side of the IFF on/off line you are)
        (1) all squawk mode 1,2 and 4;
        (2) elms leads squawk mode 3 ac for training; and
        (3) ac #4 calls “mode 1” on elm freq, 5 secs before every half hour unless radio silence is in effect.
17. **Defensive Early Warning Suite (DEWS)**
    a. All ac to have RWR and MAWR selected ON, but Flare set to SAFE; and
    b. if in arrow fmn last ac only to have Flare system ARMED. If sect in Battle fmn, both ac to have Flare ARMED.
18. **Time Check**
    a. GPS time will be obtained before orders and hacked as backup. Once in ac, GPS time used from AMS as primary source.

AIR LOAD TABLE CH-146
Allowable combat load (ACL): 2000 lb.

LOADS	TIMINGS						
PASSENGERS/ EQUIPMENT	**PZ ARR**	**LOAD**	**LIFT**	**SERIAL**	**LOAD**	**LZ**	**REMARKS**
1 WO SMITH 2 MCPL JONES 3 CPL ALPHA 4 CPL BRAVO 5 PTE CHARLIE 6 PTE DELTA 7 PTE ECHO 8 PTE FOXTROT	1315	1330	1	1	1	DODGE	ALT LZ: BUICK
1 SGT GOLF 2 MCPL HOTEL 3 CPL INDIA 4 CPL JULIETTE 5 CPL KILO 6 6 X ERYX MSLS 7 2 X ERYX TUBES 8	1315	1335	1	3	9	FORD	ALT LZ: BUICK
1 2 etc 3 4 5 6 7 8							

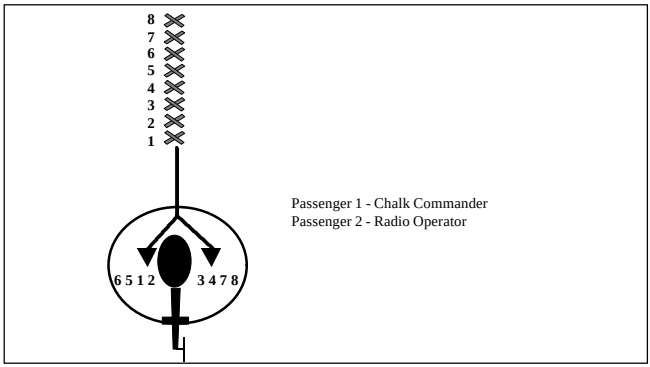


Figure 8-1: Troop Arrangement: Loading from the front.

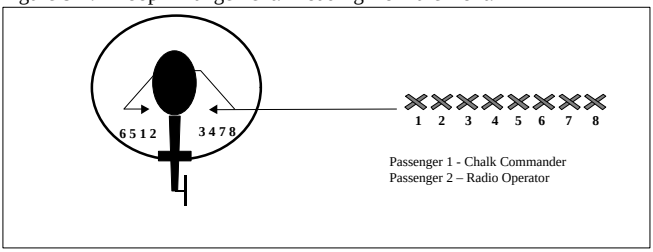


Figure 8-2: Troop Arrangement: Loading from the Side

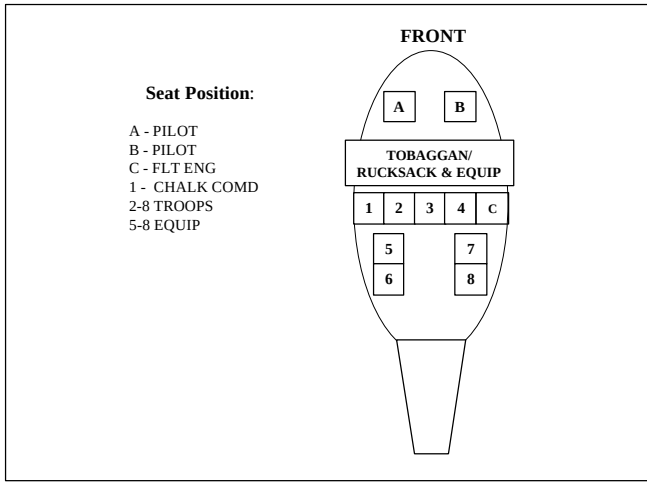


Figure 8-3: CH146 Seating Arrangement

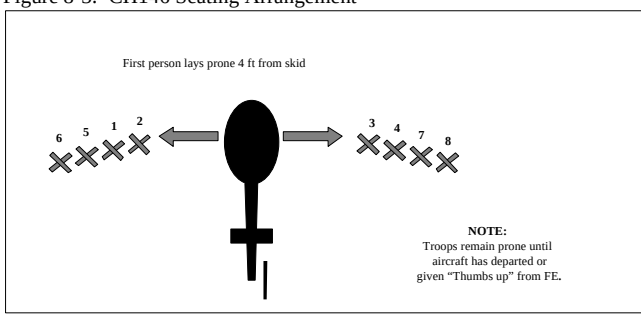


Figure 8-4: Troop Movement & Positioning on Disembarkation

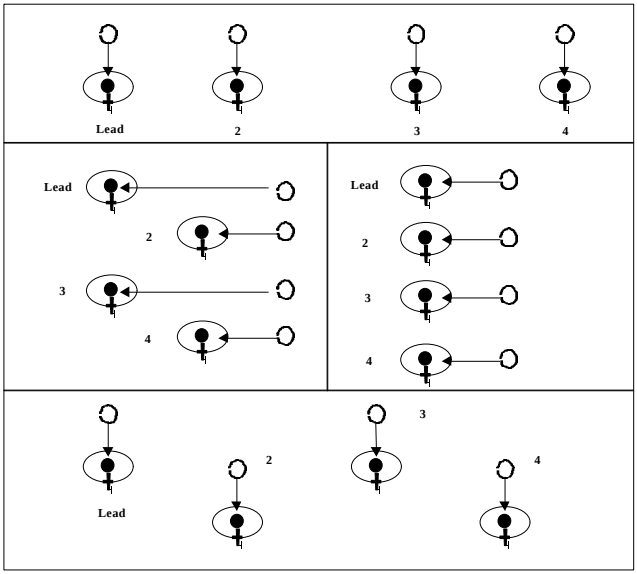


Figure 8-5: PZ Layouts for Various Landing Fmns

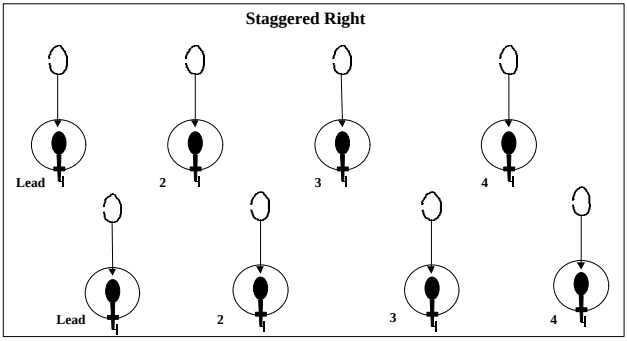


Figure 8-6: PZ Layouts for Various Landing Fmns (cont'd)

809.19 - AVIATION LIAISON OFFICERS AND BRIEFING FORMAT GENERAL

1. The ALO must gather info from the supported unit comd or Point of Contact (POC) to define:

a. **Mission**:
   (1) special eqpt reqrs;
   (2) understanding of the msn and comd's intent;
   (3) copy of graphics and op O; and
   (4) readiness state.

b. **General Info**:
   (1) friendly air def arty (ADA) locs;
   (2) friendly ground units in the area of ops (AO) (C/S and freqs);
   (3) deacon sites;
   (4) med support in the AO;
   (5) decision points to launch the msn;
   (6) boundaries and req coord;
   (7) close air support (CAS) availability (C/S and freqs).

c. **Actions At Supported Unit:**
   (1) determine the ground comd's intent for avn use and msn;
   (2) determine locs of CPs and Tac CPs (for bde and lifted units);
   (3) determine the front line trace of friendly units;
   (4) find out the loc of all arty manoeuver areas (AMA) for all firing btys;
   (5) determine the locs of all friendly ADA assets operating in the AO;
   (6) brief POC on the capabilities of the avn assets supporting him;
   (7) determine the ground tac plan (ground scheme of manoeuvre);
   (8) coord passage of lines;
   (9) determine supported units comms plan;
   (10) coord fires as req (obtain tgt lists from the FOO and assist in dev fire support plans for avn msns);
   (11) coord airspace for the aircrews operating in the AO;
   (12) determine H-Hour (and estb L-Hour or Y-Hour if applicable);
   (13) coord EW support for msns; and
   (14) determine locs of med support facilities in the AO.

2. Once this info has been received, the ALO should return to the parent unit and continue to go between the supported unit and parent unit as nec to coord msn details, conduct msn coord and brief:

a. **Introduction:**
   (1) classification of briefing;
   (2) purpose of briefing; and
   (3) what unit the ALO is from.

b. **Intelligence:**
   (1) en actions in and around the supporting avn unit's AO (past 24 to 48 hours);
   (2) expected en contact in the avn unit's AO; and
   (3) avn constraints that may effect the msn (weather).

c. **Operations:**
   (1) current loc of the supporting avn units(s);
   (2) loc of supporting avn units(s) in the next 24 to 48 hours;
   (3) attachments to the avn unit;
   (4) detachments from the avn unit;
   (5) committed ac not aval for support (div or bde comds ac, CASEVAC etc);
   (6) number and type of ac aval to support the msn;
   (7) planning ACL per ac; and
   (8) number of day and night crews aval for the msn.

d. **Logistics:**
   (1) current ac status;
   (2) current weapons systems status;
   (3) expected ac status in the next 24 to 48 hours;
   (4) expected major weapons system status in the next 24 to 48 hours; and
   (5) current fuel and ammo status.

e. **Command and Signals:**
   (1) C/S and freq of supporting avn units and ALO;
   (2) current chain of comd;
   (3) number of C2 ac aval for the msn;
   (4) planned loc of the ALO – before, during, and after the operation; and
   (5) procedural and positive con measure(s) that exist in the supported units AO (A2C2).

f. **Cross Coordination** (details the ALO should get from the supported unit):
   (1) planning time line;
   (2) msn (two levels up);
   (3) comd relationships;
   (4) initial planning graphics;
   (5) C/S and freq of all supported units; and
   (6) time check.

3. **Summary.** Once this info has been received, the ALO should return to the parent avn unit and continue to go between the supported unit and parent unit as necessary to coord msn details, conduct msn coord and brief.

809.20 - TACTICAL FORMATION PROCEDURES

GENERAL

1. Tac fmn procedures and techniques must ensure safe and effective con of the sect, elm and fmn in a potentially hostile environment. The best structure of a fmn should be considered from Unit→PZ→LZ→HA→Unit. Each phase will have its own factors that must be considered which may result in each having a different fmn and spacing. Any procedures must be flexible enough to allow adjustment due to variations in terrain, weather, visibility, ac configuration and fmn size.

2. The fmn must ensure that it allows for protection of the elm or sect. This can take the form of mutual support from ac weapon systems, overlapping arcs of obsn, or adequate manoeuvring space for each ac. The fmn should be planned so that if one ac is engaged, the others are not engaged at the same time. A proper analysis of each msn must take into account all factors for proper fmn design.

FORMATION SPACING

3. Tac fmns are inherently vulnerable because numerous ac occupy a small volume of space and time. Their noise, visual, electronic and heat signatures make them easier to acquire than single ac.

4. The spacing that can be used can range from 3 rotors, for low illumination NVG fmns where the cover of darkness will allow for the closer fmns, up to 1000 metre spacing for open terrain, single elm or sect, day operations.

5. Since no single spacing covers all contingencies, the msn comd or elm/sect lead(s) must assess each situation and route segment to determine the best spacing for the msn.

6. Spacing between elms will be 2 min if sequencing into the same LZ or 30 sec (1500 m) spacing between elm leads if landing at the same time in the same LZ or if separate LZs are used for each elm.

PICK-UP ZONE, LANDING ZONE AND HOLDING AREA FORMATIONS

7. The fmn choices for the LZ, PZ and HA are dependent on the fol factors: environment (snow, dust etc…), size of zones, number of ac, terrain/slope and threat. The fmn for the PZ and LZ must be considered by the ALO for each msn dependent on the site the LUC has chosen. Although the standard is Line Abreast Right, this must not be the automatic choice without consideration being made to the fol factors:

   a. the fmn prevents all except the two outboard door guns to be utilized in the event of enemy attack;
   b. arcs of obsn are reduced;
   c. straight line fmns are easy targets for air attack; and
   d. trail ac have to close in to land, resulting in extra manoeuvring at the critical portion of the flight, especially with NVG.

8. The standard that must be kept is that the troops will approach from either the 12 o'clock posn or the 3 o'clock posn where the FE will have eyes on them at all times.

9. HA fmn is a simple square with all ac pointed inwards. This allows the best 360 degree obsn plus all door guns are able to be used for mutual support. It also provides reduced walking distance if the elm lead requires face to face comms with pers and enhances the capability to communicate via visual signals within the fmn.

COMMUNICATIONS

10. An effective fmn plan must always take into account the threat of EW and ECM. Pre-flight briefings and SOPs should alleviate the reqr for radio transmissions. The optimum aim is to develop NORDO procedures and eliminate radio comms. The fol is a guideline for comms discipline:

a. strict adherence to orders and timings will minimize the reqr for comms and coord;
b. short and accurate transmissions when required;
c. maximum use of codewords and tac C/S during radio comms will reduce the chances of disclosing info; and
d. minimizing the use of transponder, DME, Doppler and radio altimiter may aid in reducing the electronic signature of the fmn.

WEAPON STATES

11. Within a fmn, tight discipline must be adhered to with respect to def weapons usage. The fmn lead is resp for briefing the weapon states for the various stages of the msn. The standard definitions will apply:

a. WEAPONS HOLD;
b. WEAPONS TIGHT; and
c. WEAPONS FREE.

FLIGHT PROCEDURES

12. **Approach to Landing**. On approaching the LZ the lead ac should initiate a slow deceleration to ensure the ac within his elm are in a posn to carry out a tac approach while maintaining the maximum use of the terrain for cover. This may require that the elm slows from an en route "contour" tac flight technique to an NOE type profile. Care must be taken to avoid slowing the fmn too quickly and increasing the time req for the approach, or stepping up of the fmn on final. Once the lead ac has identified his landing point he should proceed directly to that point with the remainder of the fmn/elm proceeding to their landing points as soon as they are identified. The ideal approach will terminate with all ac within the fmn/elm touching down at approximately the same time. This procedure reduces the fmn's vulnerability during that time in which it is least manoeuvrable.

13. **Departure**. The departure from the LZ should normally be in the sequence of landing; however, in the event that this is not possible the fmn/elm lead may detail a departure route with a join-up procedure or independent recovery. Sects should depart together to maintain integrity. Hesitation of any one ac during this manoeuvre may delay the landing sequence for the fol fmn/elm.

809.21 - TACTICAL LANDING SITE PREPARATION

AIM

1. The aim of this sect is to describe the selection criteria and systems for marking hel LZ for day and ni ops.

INTRODUCTION

2. The selection criteria and systems of marking hel LZ for day and ni ops described here represent the ideal sit. At times it may be nec to accept reduced criteria, however the ultimate decision will rest with the hel comd or fmn leader. In future, the dimensions may reqr alteration as new types of hels are introduced. All slopes and dimensions are IAW NATO standards. 1 Wg now uses NVG for most ni ops. NVG ops are termed as "aided".

TERMINOLOGY

3. The fol terms are frequently used in this sect:

   a. **Cleared to Ground Level.** To ensure a safe landing, it is essential that solid obstacles and inflammable and loose mat be cleared; the term "cleared to ground level" is used to indicate this. It is not nec to clear grass up to 0.3 m (1 ft) high that might cover a level field unless a fire risk exists. (See Note)

   b. **Hard Surface.** The centre of the landing point, where the helicopter lands, must be solid enough to bear its weight. The term "hard surface" is used to indicate this sit.

NOTE: If ground obstructions cannot be cleared, some hel ops can be carried out without the hel actually landing. The same dimensions of clearing and ground markings are reqr, and the hel will hover above the obstructions that prevent it from landing. Every effort should be made by the ground troops to improve the landing point surfaces to enable the ac to land.

LANDING SITE DIMENSIONS

4. The size of the landing site (LS) will depend on the number and size of the landing points (LPs) within it and the dispersion reqr between LPs based on the tac sit. Supported units must either comply with hel unit reqrs or coord a reduced size of LS before an op starts. The criteria provided in Figures 8-8 to 8-10 represent the minimum dimensions of each LP. Hel units will designate Size 1, 2, 3, 4, or 5 Circular Landing Points to be utilized by their units for specific ops. Numerous considerations, such as hel type, unit proficiency, nature of loads, climatic conditions and day or ni ops may apply to the size of the LPs used. In the absence of info from the hel unit, a Size 5 LP will be chosen. The minimum recommended distance between LPs within a LS where no consideration is given to dispersion between hels is as follows:

   a. Size 1 - 25 m;
   b. Size 2 - 37 m;
   c. Size 3 - 50 m;
   d. Size 4 - 80 m; and
   e. Size 5 - 100 m.

NOTE: Distances are measured from center to center.

APPROACHES

5. Ideally, approaches should be obstruction-free with exit paths into wind. The criteria below represent the min reqr to permit full flexibility in hel ops. Approaches, which do not meet these criteria, may be acceptable depending on the nature of the ops undertaken; e.g. in light wind conditions, a single approach and reciprocal exit may be acceptable. However, when these criteria cannot be met, the hel unit must be consulted.

6. **By Day.** Within the selected approach and exit paths, the normal maximum obstruction angle to obstacle should not exceed six degrees as measured from the edge of the cleared to ground level area to a distance of 500 m (maximum obstacle height 52 m (170 ft)) (see Figure 8-7). This limit may be waived at the discretion of the pilot.

7. **By Night**. Normal ni approaches are aided (NVG). This para deals with unaided approaches. The selected approach and exit paths should contain a sector of not less than 16 degrees in azimuth as measured from the edge of the cleared to ground level area. The width of the approach and exit paths should not be less than the width of the area of the LS cleared to 0.6 m. Less than 50 m will not be acceptable, and more than 100 m is not nec. Within the selected approach/exit paths, the maximum obstruction angle should not exceed four degrees as measured from the edge of the cleared to ground level area to a distance of 3000 m (maximum obstacle height 210 m (690 ft) (see Figure 8-7). However:

a. when the primary (unaided) methods ("T" or inverted "Y") of marking the LS are used (see Figure 8-11) the maximum obstruction angle on the approach and exit paths of obstacles is four degrees (or 1 in 16);
b. when a glide path indicator is used, the obstruction angle is increased to six degrees and should be extended to the range of the indicator, or 3000 m whichever is greater, and cover the projection angle of the indicator in azimuth; and
c. there are no restrictions on the obstruction angle to obstacles, other than those within the approach and exit paths. However, prominent obstructions in the area of the LS not marked on the map as such must be reported to the hel unit.

SURFACES

8. The surface of the centre of the LP must be even and sufficiently firm to allow a fully loaded ground vehicle (e.g. 1 1/4 ton for Recce Hel, 4 tons for Lt Tpt Hel and 10 tons for Med Tpt Hel) to stop and start without sinking. The whole LP must be cleared of any loose mat or piles of dust/sand that could be blown up by the rotors of the hel. LPs with sandy or dusty surfaces should be stabilized or covered by an agreed method. Any snow on any LP should be packed or removed to reveal any hazardous objects and reduce the propagation of blowing snow; a marker is essential to provide a visual reference for depth perception and also reduce the effect of whiteout.

SLOPE OF GROUND

9. Ideally, the ground on the LS should be level. Where there is a slope, it should be uniform. If the fol criteria cannot be met, the use of the LS must be confirmed by the hel unit.

10. **By Day.** Slope should not exceed seven degrees (or 1 in 8) in any direction if the hel is to land. However a greater slope may be acceptable for hover ops.

11. **By Night.** A reverse slope, as viewed from the approach path, is not normally acceptable. Forward and/or lateral slope should normally not exceed three degrees.

> **NOTE:** When coord with the hel unit is possible, these angles of slope may be exceeded, based on the capability of the ac.

CONCEALMENT

12. A LS in close proximity to the Forward Line of Own Troops (FLOT) should be masked from enemy ground and electronic obsn. The selection of approach and exit routes should also be based on the avail of good masking features.

MARKING OF LANDING SITES AND LANDING POINTS

13. LSs and LPs should be marked when circumstances allow. Marking should be kept to the minimum and only displayed when actually reqr, in order not to disclose posns to the en.

14. **Displays of Markers**. There is a danger of insecure markers being dislodged by the downwash from the hels and causing damage by being sucked up into the rotor or engine. Therefore, panels should be avoided and lights should therefore be firmly secured, or removed before the hel hovers above them.

15. **Methods of Marking**. Some minimal methods of marking the LS by day and ni are illustrated in Figure 8-11.

VISUAL IDENTIFICATION OF LANDING SITES

16. Identification of LSs may be effected by one of the fol methods:

a. **Coloured Smoke, Flashing Lights, or Pyrotechnics**. To prevent deception by the en, the fol identification sequences should be used:
   (1) ground unit releases smoke, etc, on request;
   (2) hel pilot states the color he has seen; and
   (3) ground unit confirms color is correct.

b. Pre-arranged display of marshalers, figures, letters or light codes.

DESIGNATION OF LANDING ZONES AND SITES

17. LZs are designated by colour or codeword. LSs are designated by LZ colour or codeword/prefix and number. Where unit LZs are large, the numbering of LSs can be grouped by geographical or sub-unit areas. Thus the LSs in one sqn/flight area may be known as RED 30, RED 31, RED 32, etc, and in another area the LSs may be designated RED 40, RED 41, etc.

RADIO AIDS

18. Whenever radio comm and electronic aids (including ATC facilities) are located at a LS, antennae should be offset from the LS to prevent the en from

fixing on the loc of the site with electronic devices. Only essential comm for con of hels at the LS should be used.

COLOURED LIGHTS

19. Red lights are reserved for the indication of obstacles.

NIGHT OPERATIONS

20. **Night Tactical Landing Light System (Unaided Vision):**
    a. At night, unaided approaches to a tac LS reqr the use of a tac landing light system. Such a system must be capable of providing the aircrew with visual cues that will aid in determining alignment with the approach axis, angle of descent, rate of closure and provide a ground hover ref. The source of light may consist of hand-held lights, beanbag lights, phosphorescent tubes, etc. Regardless of the type of light source used, it must be capable of being secured so that the wind force of the hel will not cause it to be extinguished. If a battery-powered light is used, it is desirable that each light yield approximately the same light intensity. A white light provides the best light source for a tac LS system.
    b. The two recommended tac landing light systems are the "T" and the "inverted Y" (see Figure 8-11). Both systems provide the visual cues required to execute a safe approach to a tac LS. Other systems requiring fewer lights may be used as an emergency system as sits dictate; however, no less than two should ever be used. Viewing of one light causes an apparent motion of the light and results in false interpretation by the aircrew. Also important is the separation between the lights. If only two lights are used, a minimum separation of 5 m (paces) is reqr.
    c. Prior to arriving at a LS where a tac landing light system is employed, it is essential that the aircrew knows which system is being employed. The aircrew should receive such info from the supported unit in the pre-msn briefing or by radio from the ground party resp for setting up the system.
    d. The glideslope indicator used in land ops must cast three separate coloured beams of light: amber (top beam), green (centrebeam), and red (bottom beam). Any variation of the colour coding must be clearly briefed to visiting aircrew.

21. **Landing Light System for Night Vision Goggles (NVG):**
    a. The use of NVG can offer tac advantages and reduce or remove the need for landing light systems. A number of factors will, however, govern the op reqr for ground lighting:
        (1) ambient light levels;
        (2) visibility;
        (3) number of hels;
        (4) msn reqrs; and
        (5) carriage of underslung loads.
    b. In general terms, a single hel moving troops may not require a landing aid if light levels and visibility are adequate, whereas large

scale ops may. Supported units should liaise with avn units at an early stage of the planning process to determine the op reqr.

c. The intensity of most electric lights used in ground landing light systems is too bright for NVG. To use ground lights when the aircrew are equipped with NVG, it will be nec to reduce light emission to an appropriate level. If this reduction is not done, the performance of the NVG will be seriously reduced. Normally, approach aids are not required for NVG approaches, but there may be a reqr for a minimal light source to designate the actual LZ.

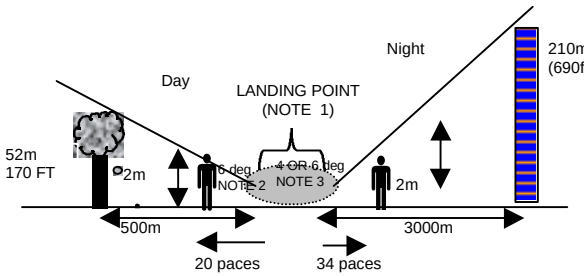


Figure 8-7: Landing point obstruction angles on approach and exit paths - day & night.

NOTES:

1. The obstruction angle is measured from the point where the landing or take-off paths intersect the stipulated "cleared to ground level" area of the LP.
2. By day the obstruction height cannot exceed an approach angle of 6 degrees out to 500 m from the LP.
3. By night the obstruction height cannot exceed an obstruction angle of 4 degrees out to 3000 m from the LP unless a glideslope indicator is used when the obstruction angle can be 6 degrees.

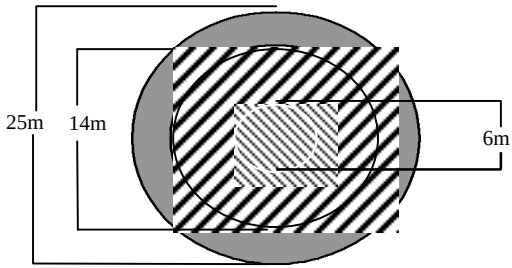


Figure 8-8: Size 1 Landing Point Circular

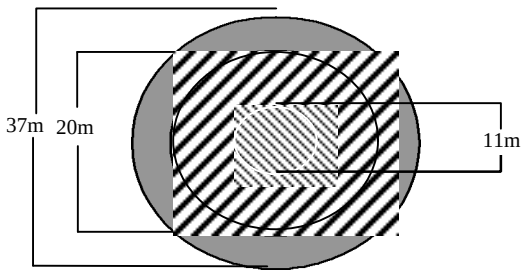


Figure 8-9: Size 2 Landing Point Circular
(CH146 LANDING SITE)

FREE OF OBSTRUCTION OVER 0.6M(2FT) HIGH

CLEARED TO GROUND LEVEL

HARD SURFACE

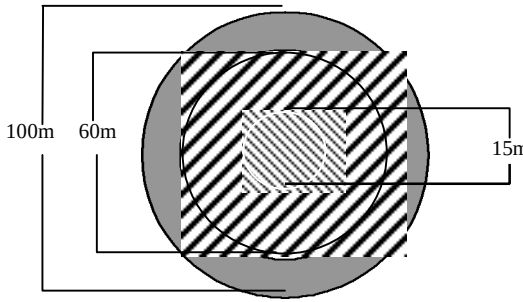


Figure 8-10: Size 5 Landing Point Circular

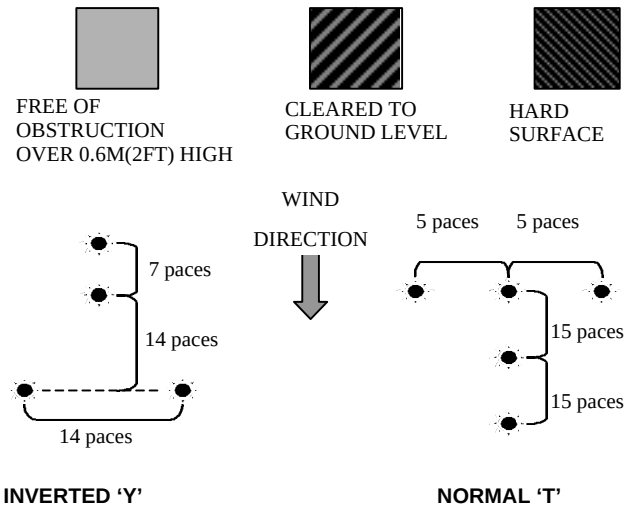


Figure 8-11: Landing Aid Dimensions -"Y" & "T"

809.22 - FORWARD AREA REARMING AND REFUELLING POINT OPERATION TACTICAL SOP

EQUIPMENT

1. Two HLVW Bowsers will be placed on-line with an additional one in reserve if possible.

SITE SELECTION

2. a. Use tree lines, vegetation, terrain folds, and reverse slopes to mask if at all possible.
   b. Do not co-locate the FARP with a Tac Comd Post or Holding Area.
   c. Consider the fol:
      (1) the number and type of ac to be refuelled;
      (2) the minimum spacing reqrs between refuelling points is 100 ft;
      (3) adequate obstacle clearance for safe take-off and landings; and
      (4) designated arrival, departure and holding areas.

WORK PRIORITIES

3. a. **Security:**
      (1) estb a perimeter and prepare fighting posns and range cards as reqr;
      (2) sweep the site for demolitions or anti hel obstacles;
      (3) recce the site for appropriate refuelling and rearming points; and
      (4) set up crew-served weapons.
   b. **Communications**. Upon arrival, the FARP must estb comms with the Sqn CP or alternate giving SITREP, estimated time of op and hel LZ report. These comms will be secure.
   c. **Setup**:
      (1) determine posns of refuel and rearm points; and
      (2) posn vehs into final parking locs.
   d. **Vehicle Maintenance.** Perform preventative maint checks and services on vehs.
   e. **Camouflage.** Camouflage all vehs and eqpt.
   f. **Other Maintenance.** Perform other maint on eqpt and weapons as reqr and time permits.
   g. **Resupply.** Resupply as reqr fuel, ammo and veh POL.
   h. **Mess, Personal Hygiene, and Rest.** These are accomplished as msn duties allow.

SECURED RADIO

4. a. The FARP will have an op VHF-FM and AM radio. These radios are used only as directed by the msn orders, or in the fol circumstances:
      (1) resupplies are requested;
      (2) site is compromised;
      (3) FARP is not op as planned; and
      (4) serious incident occurs in the FARP, ex. ac accident or fire.

b. Outbound ac can relay critical messages from the FARP to the Sqn CP or Tac Base as required. This prevents enemy detection of the FARP by radio transmissions.

AIRCRAFT PROCEDURES

5. a. **Landing**

(1) When 5 km out from the FARP, the lead ac or AMC will make a call in the blind on the secured freq stating that ac are inbound. An example would be "56 (FARP) this is 39 with three on Dog". This is telling the FARP that four ac are on Dog route. This alerts the FARP and other ac of his intentions. The FARP does not reply unless the area is not secured or safe. Terms which violate OPSEC will not be used; for example "ac", "inbound", "outbound", or "FARP".

(2) Ac will be flown tacly within 3 km of the FARP. Approaching ac must maintain visual contact with departing ac.

b. **Positioning**

(1) FARP pers will use standard hand and arm signals to assist pilots in positioning ac into refuelling and rearming points.

(2) Door guns will be in the stowed and made SAFE prior to marshalling into refuelling or rearming points.

(3) Pilots will posn ac at the refuelling points so that refuelling nozzle is on the right side of the ac.

REFUELLING PROCEDURES

6. **Safety**

a. Fuel handlers will ensure they are grounded before commencing refuelling.

b. To avoid static discharge hazard, do not remove clothing within 50 feet of refuelling op or near flammable vapor-air mixture.

c. Fuel soaked clothing will be rinsed with water before removal.

d. **Hot Refuelling:**

(1) Ensure 25 m separation exists between refuelling points.

(2) Ensure that armament systems are SAFE.

(3) Stabilize ac and deplane all passengers and move them at least 18 m from ac before conducting refuelling ops. No transmissions are permitted but monitor all comms. Pilots secure all electrical eqpt.

(4) FE if present, will deplane and man refuelling point fire guard once passengers are clear of ac.

(5) Await "thumbs up" from pilot before refuelling team approaches ac.

(6) Ground the nozzle to the rod and bond to ac.

(7) Pilot will monitor fuel flow and give "thumbs up" or "down" depending on if fuel gauge is reading an increase. Within 50 lbs of required load, pilot will place left hand at right shoulder and once fuel load is achieved, make a lateral

movement with his hand. The point controller will relay this to the nozzle man.

(8) Refueller will disconnect the refuelling nozzle and cap it, replace the hel fuel port cap, and return the nozzle to the closed posn and disconnect grounding wire.

(9) The pilot will indicate to the refuelling point controller that passengers/refuelling crew can proceed to/from hel using intercom or "thumbs up" signal.

(10) Satisfied that everybody is ready, the refuelling point controller will signal the refuelling crew to move out (reverse "move in" signal). He will then direct all passengers and crews back into the hel. If they were used, ICS comms will be disconnected at this time.

(11) The refuelling point controller will direct the hel away from the refuelling point using standard marshalling signals as required.

e. **NVG Procedures**. Procedures to be followed when conducting Hot Closed Circuit Refuelling (HCCR) with NVG:

(1) Groundcrew unaided:

(a) the procedures that apply to the HCCR conducted under NVG ops are the same as those conducted under unaided flights;

(b) aircrew are to ensure that the ac is visible to the groundcrew at all times, especially during the ac's final approach to the refuelling area; and

(c) hand signals used by air/groundcrew are to be seen by both parties.

NOTE: Markers, marshalling wands and lights on bowser must be nvg compatible and visible to both groundcrew and aircrew, e.g., green light.

(2) Groundcrew wearing NVG:

(a) the differences in the conduct of HCCR when the groundcrew are wearing NVG are as follows:

(i) during the approach:
-anti-collision: OFF
-NVG posn lights: BRIGHT
-IR searchlight: as req;

CAUTION: Should be exercised when using the IR searchlight to avoid shining into eyes of ground pers; potential exists to severely degrade marshaller's NVG.

(ii) on short final:
-NVG posn lights: DIM;

(iii) during refuelling:
-NVG posn lights: DIM
-IR searchlight: OFF.

(b) Hand signals used by air/groundcrew are done with a NVG compatible light (i.e., IR light) which can be seen by both parties.
(c) Refuelling area should be situated in a low light environment.

EMERGENCIES

7.a **Fuel Spill or Leak.** Should a fuel spill or leak occur:

(1) All refuelling ops shall cease.
(2) The refuelling point controller or fireguard will advise the pilot by intercom or by using the standard marshalling signal for fuel spill or will tell the pilot.
(3) The refuelling point controller or refueller will investigate the cause of the spill and assess corrective action and whether refuelling is to continue. The pilot will be advised accordingly of need to shut down the hel or to vacate the refuelling area for HCCR.

NOTE: Fuel spills must be cleaned up. In ground terrain this may not be possible and hence because of the contamination the refuelling point must be moved.

b. **Fire.** In case of fire:

(1) The refuelling point controller or fire guard will advise the pilot by intercom or by using the standard marshalling signal for ac on fire or will tell the pilot.
(2) Fuel delivery shall immediately cease.
(3) The fire safety or extinguisher man will combat the fire. His prime concern will be the protection of human life.
(4) If the fire is at the hel or delivery end of the fuel line, the refuelling controller will advise the pilot to shut down the hel and evacuate. The refueller will not disconnect the fuel nozzle from the ac. The refuelling eqpt operator will stop the delivery of fuel at the source.
(5) If the fire is elsewhere in the refuelling point and free of the hel, the refuelling point controller will direct the refueller to free the hel; then, the refuelling point controller will marshal the hel away from the refuelling point.
(6) The refuelling point controller or fire guard will assume direction of fire fighting activities until the arrival of more effective fire fighting services.

809.23 - PERFORMANCE CHARACTERISTICS OF HELICOPTERS

Ac Type	Category (2)	Pax (3)	Payload (kg)/Range (km) (4)						Weapons	Normal Cruise	LP Size (5)	Fuel Usage	Maximum Usable
			Radius of Action 50 km		Radius of Action 120 km		Internal Payload at Max Range			Speed (kts)		Rate (ltrs/hr)	Fuel (ltrs)
			Internal Payload	Slung Payload	Internal Payload	Slung Payload	Internal Payload	Max Range					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
BELGIUM													
A 109 BA	Armed	**0**	585	-	475	-	150	360	6 TOW	120	**3**	275	725
A 109 BA	Recce/ Liaison	6	585	-	475	-	150	360	-	130	3	275	725
ALOUETTE II 318C	Recce/Utility	3	400	250	280	250	160	320	-	90	3	140	565
ALOUETTE III 316O	Utility	5	400	300	330	300	200	225	-	90	3	200	560
CANADA													
CH-146 UTTH	Utility	8	1,500	1,500	1,450	1300	900	550	TBD	120	2	425	1,000
DENMARK													
CAYUSE OH-6	Recce	3	360	200	300	200	240	550	-	100	1	100	227
FENNEC AS 550	Armed	-	-	-	-	-	-	-	4 TOW	100	2	175	540
FRANCE													
ALOUETTE II 313	Utility	2	300	350	160	160	80	400	-	5	3	170	565
ALOUETTE II 318	Utility	2	300	400	200	250	130	640	-	90	3	140	565
ALOUETTE III 316	Utility	5	300	650	300	550	360	500	-	100	3	200	560
COUGAR	Transport	18/24	3,200	3,200	2,900	2,900	1,900	750	-	145	3	600	1,980
DAUPHIN	Utility	7	900	0	750	0	200	730	-	145	3	380	1,125
FENNEC AS 55UN	Utility	5	630	630	500	500	50	750	20 mm Cannon (Air Force version)	120	3	230	730
FENNEC AS 355	Armed	-	-	-	-	-	-	-	20 mmCannon	*	*	*	*
GAZELLE 341C	Armed/ Recce	-	-	-	-	-	-	-	20 mm Cannon	120	3	170	530
GAZELLE 342M	Utility	3	400	-	300	-	100	650	-	120	3	180	530
GAZELLE 342 M1	Armed	-	-	-	-	-	-	-	4 HOT day/night	*	*	*	*
GAZELLE 342 ML1	Armed	-	-	-	-	-	-	-	4 HOT or 4 MISTRAL	130	3	180	530
LYNX MK IV	Armed	-	-	-	-	-	-	-	*	120	3	380	950
PANTHER	Armed	-	-	-	-	-	-	-	*	135	3	380	1,125
PUMA 8a	Transport	12/16	2,100	2,100	1,800	1,800	1,250	450	-	130	3	600	1,565
SUPER FRELON	Transport	27	2,100	2,900	1,600	2,450	1,100	480	-	120	3	1,000	3,500
GERMANY													
CH-53 G	Transport	36	6,500	6,500	6,000	6,000	5,500	360	-	120	4	1,200	2,230

Ac Type	Category (2)	Pax (3)	Payload (kg)/Range (km) (4)						Weapons	Normal Cruise	LP Size (5)	Fuel Usage	Maximum Usable
			Radius of Action 50 km		Radius of Action 120 km		Internal Payload at Max Range			Speed (kts)		Rate (ltrs/hr)	Fuel (ltrs)
			Internal Payload	Slung Payload	Internal Payload	Slung Payload	Internal Payload	Max Range					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
UH-1D	Utility	4-9	1,210	1,210	1,000	1,000	800	350	-	90	3	300	780
BO 105 M	Recce/ Liaison	4	660	-	550	-	350	425	-	110	3	220	550
BO 105 P	Armed	-	-	-	-	-	-	320	6 HOT	100	3	240	500
GREECE													
CH-47	Transport	44	12,690	12,690	12,690	12,690	-	-	*	120	3	2,700	5,083
OH-58	Utility	5	499	544	499	544	-	-	*	90	1	95	270
UH-1H	Utility	11	2,041	1,814	2,041	1,814	-	-	*	90	2	362	791
ITALY													
A 109 T/A (EOA 1)	Recce/ Liaison	5	500	-	450	-	200	430	-	125	1	230	703
A 109 T/B (EOA 2)	Armed	-	-	-	-	-	-	-	Rockets 70 mm	125	1	230	530
A 129	Attack	-	-		-	-	-	-	8 TOW Rockets 81 mm	125	1	360	900
AB 205	Utility	13	1,599	1,594	1,368	1,341	1,208	340	MG + Rockets	80	2	318	830
AB 206	Recce	2	316	396	238	318	171	326	Minigun 7.62	80	1	110	291
AB 212	Utility	13	1,513	1,482	1,249	1,232	1,091	303	MG + Rockets	80	2	318	768
AB 412	Utility	13	1,600	1,400	1,380	1,183	1,260	360	MG + Rockets	80	2	303	783
CH 47C	Transport	38	9,300	8,700	8,500	7,500	7,500	450	MG 7.62 mm	90	3	1,300	3,960
NETHERLANDS													
ALOUETTE III	Utility	5	*	*	*	*	*	*	-	100	3	200	560
APACHE NAH-64D	Attack								30mm Gun 2.75 FFAR AGM	100	2	478	1900
BO-205CB/CB4	Utility	3	300/300	0/400	300/300	0/300	300/300	0/200	-	120	5	250	568
CHINOOK CH-47D	Transport	33	10,500	9,000	*	*	*	*	-	120	3	1,000	3,558
COUGAR AS 532 U2	Transport	28	4,500	3,000	4,000	3,000	3,500	3,000	-	130	3	500	1,950
NORWAY													
BELL 412 SP	SAR	11	1000		600		500		-	120	1	400	1,216
PORTUGAL													
ALOUETTE III S316O	Utility	5	400	300	*	*	*	*	12 x 2.75" Rocket or 1 x 20 mm Cannon	90	2	210	550
PUMA SA 330	Transport Support	18	2,400	2,100	*	*	*	*	-	120	3	660	2,250
SPAIN													

Ac Type	Category (2)	Pax (3)	Payload (kg)/Range (km) (4)						Weapons	Normal Cruise	LP Size (5)	Fuel Usage	Maximum Usable
			Radius of Action 50 km		Radius of Action 120 km		Internal Payload at Max Range			Speed (kts)		Rate (ltrs/hr)	Fuel (ltrs)
			Internal Payload	Slung Payload	Internal Payload	Slung Payload	Internal Payload	Max Range					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
B0-105 (HR-15)	Recce	3	660	-	*	*	*	*	20 mm GUN	100	1	210	580
B0-105 (HR-15)	Armed	-	-	-	*	*	*	*	6 HOT	100	1	210	580
CHINOOK CH-47C (HT-17)	Transport	33	9,000	9,000	*	*	*	*	-	120	6	1,300	3,885
CHINOOK CH-47D (HT-17)	Transport	33	9,000	9,000	*	*	*	*	-	120	5	1,300	3,885
IROQUOIS UH-1H (HU-10)	Utility	10	1,100	1,800	*	*	*	*	40 mm M94 2.75" M-20D 7.62 mm GUN 12.70 mm GUN	90	2	313	800
IROQUOIS UH-1N (HU-18)	Utility	12	1,500	2,270	*	*	*	*		90	2	340	800
KIOWA CH-58A (HR-12)	Recce	3	432	-	*	*	*	*	7.62 mm MG	90	1	85	240
SUPER PUMA (HT-21)	Transport	22	3,000	3,000	*	*	*	*	-	120	3	530	1,460
TURKEY													
AGUSTA BELL AB-204	Utility	8	1,206	*	*	*	*	*	7.62 mm MG-3	80	2	-	-
AGUSTA BELL AB-205	Utility	11	1,542	*	*	*	*	*	7.62 mm MG-3	90	2	318	791
AGUSTA BELL AB-212	Utility	12	1,650	2,270	*	*	*	*	-	130	2	583	1,458
BLACK-HAWK UH-60	Utility	14	3,674	3,629	*	*	*	*	-	145	2	560	1,370
COBRA AH-1P	Attack	-	-	-	-	-	-	-	10 mm GUN 2.75" RP TOW	123	2	318	791
COUGAR AS-532	Utility	18-24	4,500	*	*	*	*	*	-	139	3	600	1,980
IROQUOIS UH-1H	Utility	11	1,542	-*	*	*	*	*	7.62 mm MG-3	90	2	318	791
KIOWA B/C OH-58	Recce	2	408	-	-	-	-	-	7.62 mm MG	90	1	115	344
SUPERCOBRA AH-1W	Attack	-	-	-	-	-	-	-	20 mm GUN 2.75" RP TOW, HELLFIRE	151	2	525	786
UNITED KINGDOM													
CHINOOK HC Mk 2	Transport	30-54	9,200	9,200	8,500	8,000	7,200	400	7.62 mm MG 7.62 mm Minigun	135	5	1539	3718
PUMA HC Mk 1	Transport	12-16	2,000	2,000	1,800	1,800	1,300	320	7.62 mm MG	130	3	690	1312

Ac Type	Category (2)	Pax (3)	Payload (kg)/Range (km) (4)						Weapons	Normal Cruise	LP Size (5)	Fuel Usage	Maximum Usable
			Radius of Action 50 km		Radius of Action 120 km		Internal Payload at Max Range			Speed (kts)		Rate (ltrs/hr)	Fuel (ltrs)
			Internal Payload	Slung Payload	Internal Payload	Slung Payload	Internal Payload	Max Range					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
SEA KING Mk 4	Transport	20-27	2,720	2,472	2,350	2,350	0	1,016	-	100	5	675	3,750
LYNX AH Mk 7	Utility	9	1,020	940	680	680	450	550	7.62 mm MG	120	1	380	950
LYNX AH Mk 7	Armed	-	missile off		-	-	-	-	8 TOW	120	1	450	950
			540	460	440	440	190	490					
LYNX AH Mk 9	Utility	9	1,100	1,100	910	910	700	500	7.62 mm MG	145	1	550	950
GAZELLE AH 1	Recce	-	280	215	200	135	200	510	-	130	1	190	440
GAZELLE AH 1	Liaison	1-3	305	240	225	160	225	530	-	130	1	190	440
UNITED STATES													
OH-6 CAYUSE	Recce	3	454	-	*	*	*	*	-	90	1	83	231
OH-58C KIOWA	Recce	3	408	-	*	*	*	*	-	90	1	102	270
OH-58D KIOWA	Recce	-	-	-	*	*	*	*	.50" MG 70 mm RP HELLFIRE, STINGER	90	1	155	424
UH-1H IROQUOIS	Utility	11	1,542	1,542	*	*	*	*	7.62 mm MG	90	2	318	791
UH-60 BLACKHAWK	Utility	14	3,674	3,629	*	*	*	*	7.62 mm MG	120	2	560	1370
CH-47C CHINOOK	Transport	33	10,206	9,072	*	*	*	*	7.62 mm MG	120	3	1,769	4,321
CH-47D CHINOOK	Transport	33	10,886	9,072	*	*	*	*	7.62 mm MG	120	3	1,515	3,916
AH-1F COBRA	Attack	-	1,088	-	*	-	*	-	20 mm Gun 2.75" RP, TOW	120	2	370	985
AH-64 APACHE	Attack	-	-	2,700	-	*	-	*	30 mm Cannon 70 mm RP, HELLFIRE	140	2	478	1,400
AH-1T SEA COBRA	Attack	-	1,365	1,365	*	*	*	*	2.75" FFAR 5" ZUNI 20 mm, TOW SIDEWINDER, SIDEARM	140	2	466	1,223
AH-1W SUPER SEA COBRA	Attack	-	1,814	1,814	*	*	*	*	2.75" FFAR 5" ZUNI 20 mm, TOW HELLFIRE, SIDEWINDER SIDEARM	140	2	525	1,165
UN-1N HUEY	Utility	8 (6)	907	907	*	*	*	*	2 x .50Cal M-60 MG	110	2	350	786

Ac Type	Category (2)	Pax (3)	Payload (kg)/Range (km) (4)						Weapons	Normal Cruise	LP Size (5)	Fuel Usage	Maximum Usable
			Radius of Action 50 km		Radius of Action 120 km		Internal Payload at Max Range			Speed (kts)		Rate (ltrs/hr)	Fuel (ltrs)
			Internal Payload	Slung Payload	Internal Payload	Slung Payload	Internal Payload	Max Range					
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
									2.75FFAR GAU 17				
CH-46E SEA KNIGHT	Transport	15 (6)	2,268	2,268	*	*	*	*	2 x .50Cal (12.7mm)	120	3	700	1,398
CH-53A SEA STALLION	Transport	30 (6)	6,305	6,305	*	*	*	*	2 x .50Cal (12.7mm)	130	4	1,050	2,414
CH-53 D SEA STALLION	Transport	30 (6)	5,715	5,725	*	*	*	*	2 x .50Cal (12.7mm)	130	4	1,165	6,987
CH-53E SUPER SEA STALLION	Transport	30 (6)	12,474	12,474	*	*	*	*	2 x .50Cal (12.7mm)	130	4	1,805	9,051

NOTES:

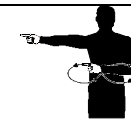
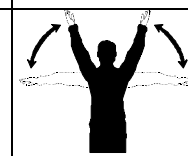
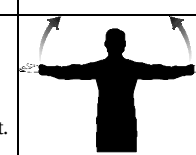
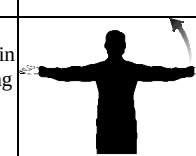
1. Units of measurement - kilograms (kg), kilometres (km), nautical miles per hour (kts), litres (ltrs).
2. Ac Category - see Glossary.
3. Number of passengers depends on ac configuration.
4. Internal Fuel Tanks, Sea Level, International Standard Atmosphere (ISA) conditions (underslung load configuration may influence radius of action).
5. LP size - see Figure 8-8 to 8-10.
6. Combat loaded troops.

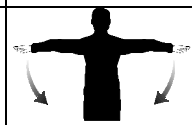
809.24 - MARSHALLING SIGNALS

1. The following signals are general marshalling signals for all ac. Signal numbers conform to STANAG 3117.

1. **AFFIRMATIVE (I WILL COMPLY OR I UNDERSTAND)** **DAY:** Hand raised, thumb up **NIGHT:** Same as day signal with wand held as extension of the arm. **AIRCREW:** One Flash. **CONFORMS TO THE INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) SIGNAL - 'ALL CLEAR'**	
2. **NEGATIVE (I WILL NOT COMPLY OR NOT CLEAR)** **DAY:** Arm held out, hand below waist level, thumb turned downward. **NIGHT:** Same as day signal with wand held pointing down. **AIRCREW:** Steady light. **NO ICAO SIGNAL**	
3. **THIS WAY** **DAY:** Arms above head in vertical posn with palms facing inward. **NIGHT:** Same as day signal with wands held vertically and held as extension of the arms. **CONFORMS TO ICAO SIGNAL**	
4. **SLOW DOWN** **DAY:** Arms down with palms toward ground, then moved up and down several times. **NIGHT:** Same as day signal with wands held horizontally. **CONFORMS TO ICAO SIGNAL**	
5. **TURN TO LEFT** **DAY:** Point right arm downward, left arm repeatedly moved upward and backward. Speed of arm movement indicating rate of turn. **NIGHT:** Same as day signal with wands held as extension of the arms. ***NOTE: Signals are also used for spot turns for hovering ac** **CONFORMS TO ICAO SIGNAL**	

6. **TURN TO RIGHT** **DAY:** Point left arm downward, right hand repeatedly moved upward and backward. Speed of arm movement indicating rate of turn. **NIGHT:** Same as day signal with wands held as extension of arms. ***NOTE: Signals are also used for spot turns for hovering ac** **CONFORMS TO ICAO SIGNAL**	
7. **MOVE AHEAD** **DAY:** Arms a little apart, palms facing backwards and repeatedly moved upward-backward from shoulder height. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
8. **STOP** **DAY:** Arms crossed above the head palms facing forward. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
9. **REQUEST/CLEARANCE FOR PERSONNEL TO APPROACH AIRCRAFT** **DAY:** A beckoning motion with either hand at eye level. **NIGHT:** A continuously flashing light. **CONFORMS TO ICAO SIGNAL**	
10. **REQUEST BY MARSHALLER TO MOVE PERSONNEL TOWARDS AIRCRAFT** **DAY:** Left hand raised vertically overhead, palm towards ac. The other hand lowered, palm facing inwards. **NIGHT:** Same as day signal but only the raised wand illuminated and flashing. **NO ICAO SIGNAL**	
11. **PERSONNEL APPROACH THE AIRCRAFT** **DAY:** Either hand raised vertically overhead, palm toward ac. The other hand indicated to pers concerned and gestures toward ac. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	

12. **FIRE** **DAY:** Make rapid horizontal figure of eight motion at waist level with either arm, pointing at source of fire with the other. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
13. **ABANDON AIRCRAFT** **DAY:** Simulate unfastening seat belt and shoulder straps and throwing them up and off. **NIGHT:** Same as day signal with wands held as extension of arms. **NO ICAO SIGNAL**	
14. **TAKE-OFF** **DAY:** Arms extended horizontally sideways beconing upwards. **NIGHT:** Same as day signal with wands held as extension of arms. **NO ICAO SIGNAL**	
15. **HOVER** **DAY:** Arms extended horizontally sideways, palms downwards. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
16. **VERTICAL MOVEMENT – MOVE UPWARDS** **DAY:** Arms extended horizontally sideways beconing upwards, with palms turned up. Speed of movement indicates rate of ascent. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
17. **MOVE TO LEFT** **DAY:** Right arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction in a repeating movement. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	

18. **MOVE TO RIGHT** **DAY:** Left arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction in a repeating movement. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
19. **CLEAR** **DAY:** Both arms extended on same side above shoulder level in direction clear to fly off. **NIGHT:** Same as day signal with wands used as extension of arms. **NO ICAO SIGNAL**	
20. **WAVE OFF** **DAY:** Waving of arms over the head. **NIGHT:** Same as day signal with wands held as extension of arms. **COMFORMS TO ICAO SIGNAL**	
21. **LANDING DIRECTION** **DAY:** Marshaller stands with arms raised vertically above head and facing towards the point where the ac is to land. The arms are lowered repeatedly from a vertical to a horizontal posn, stopping finally in the horizontal posn. **NIGHT:** Same as day signal with wands held as extension of hands. **CONFORMS TO ICAO SIGNAL**	
22. **MOVE DOWNWARDS** **DAY:** Arms extended horizontally sideways beckoning downwards with palms turned down. Speed of movement indicates rate of descent. **NIGHT:** Same as day signal with wands held as extension of arms. **CONFORMS TO ICAO SIGNAL**	
23. **HOOK UP LOAD** **DAY**: Rope climbing motion with hands. **NIGHT:** Same as day signal with wands held as extension of hands. **NO ICAO SIGNAL**	

24. **WINCH DOWN** **DAY:** Left arm horizontal in front of body, fist clenched, right hand with palm turned downwards making downward motion. **NIGHT:** Same as day signal with wands held horizontally, perpendicular to ac. **NO ICAO SIGNAL**	
25. **FUEL LOAD IS CLOSE TO BEING REACHED** **DAY:** Right hand is held across the chest at the left shoulder indicating that the required fuel load is close to being reached. This signal is normally followed by the signal, Stop Refuelling. **NIGHT:** Same as day signal with wands held as extension of hands. **NO ICAO SIGNAL**	
26. **STOP REFUELLING** **DAY:** Right hand is waved laterally repeatedly. Unless in an emergency, this signal normally follows the signal, Fuel load is close to being reached. **NIGHT:** Same as day signal with wands held as extension of hands. **NO ICAO SIGNAL**	
27. **FUEL SPILL** **DAY:** Right hand is drawn across the forehead with the left hand extended and pointed toward fuel spill. **NIGHT:** Same as day signal with wands held as extension of hands. **NO ICAO SIGNAL**	

809.25 - MARSHALLING HELICOPTERS DURING SLINGING OPERATIONS

1. **General.** All marshallers shall know the current NATO standard marshalling signals applicable for helicopter slinging operations and any supplementary Canadian signals designed for 1 Wing slinging operations.

2. **External Loads**

   a. A marshaller and at least one hookup person should be provided for each helicopter when attaching external loads.

   b. The hookup person will ensure the discharge of static electricity from the helicopter before attaching the load. The marshaller must be positioned in sight of the helicopter pilot and will direct the helicopter until it is directly over the load. The flight engineer will

direct the pilot by onboard verbal communications to both augment the marshaller when approaching the load and then become the primary means of providing directions, once the helicopter is positioned over the load. The hookup person will hookup the load to the helicopter hook.

c. After hooking up the load, the marshaller will indicate to the pilot that the load is attached. The hookup person will ensure that the hook is properly closed and will guide the slings until the slack is taken up to ensure that they do not foul the load.

d. When the slings are seen to be taught and correctly fitted, the hookup person will move a safe distance away, (about 20 meters to the right side of the helicopter, where the flight engineer is positioned to see the personnel move away). When the load is clear of the ground and the marshaller is satisfied that it is secure and properly suspended, an "affirmative" (all clear) signal shall be given to the pilot.

3. **Night Operations**

a. When possible, marshallers shall examine the landing site during daylight hours, prior to conducting night ops;

b. Lighting devices will be required by the marshallers to display signals to the aircrew. The intensity of these lights will vary depending on the means of vision (i.e. unaided or with night vision devices) used by the aircrew;

c. Reference lighting for external load operations will be provided by the supported unit IAW 1 Wing TT&Ps Part 2, CH. 11;

d. **Personnel.** There must be strict movement of personnel on the ground during NVG ops as personnel without NVGs will not adequately be able to see the position of the helicopter. The optimum situation is to have both the marshaller and the hookup person equipped with NVGs. The marshaller will use red chemical lights as marshalling wands; and

e. **Lighting**. During all NVG helicopter operations, there must be strict light discipline in the LZ/PZ. As the helicopter approaches the pickup point, only the load to be picked up will be marked with a red chemical stick. The aircraft may have no visible exterior lights on during the operation except for the IR searchlight and essential internal cockpit lighting. The FE will illuminate the cargo hook with a handheld flashlight during the hookup. When personnel not conducting the hookup are not equipped with NVGs, the aircraft shall operate with navigation lights on DIM as a minimum and the position where the load is to be dropped will be identified by a red chemical light. If there is more than one drop-off point in the LZ, the marshaller must indicate which drop-off point is to be used by pointing to the required spot.

f. **Helicopter Unit**. The hel unit can issue special instructions on slinging ops procedures in response to unusual situations.

4. **Emergencies**. In an emergency, the hel can have to touch down quickly and not land on the load. As the hel will attempt to land to the left of the load, the loadmaster should move away from it towards the right as quickly as possible as shown in Figure 8-14 or according to instructions for unusual situations.

5. **Multi-Helicopter Slinging Operations**. In situations when more than one helicopter operates in one PZ/LZ, coordination is essential. The distance between pickup points should never be less than 35m, but may be more, depending on the terrain, obstacles and aircraft characteristics. The use of aviation LOs to coordinate multi-helicopter slinging/pickup operations.

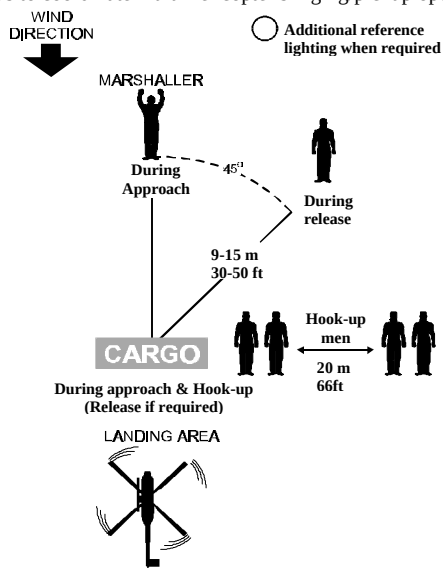


Figure 8-12

809.26 - GLOSSARY

AIRCRAFT CAPTAIN/AIRCRAFT COMMANDER. The aircrew member designated by competent authority as being in comd of an ac and resp for its safe op and accomplishment of the assigned msn. (AAP-6).

AIRMOBILE OPERATION. An op in which combat forces and their eqpt manoeuvre about the battlefield by ac to engage in ground combat. (AAP-6).

AIRSPACE CONTROL ORDER (ACO). When all airspace requests have been correlated and conflicts resolved, the Air Component Comd will promulgate the Airspace Con Order (ACO). Airspace Con Means (ACMs)

and procedures are normally in force for the period of validity of the ACO. (See ATP-40(A)).

ANTI-ARMOUR HELICOPTER. A hel armed primarily for use in the destruction of armored targets. Also called ‘antitank hel’. (AAP-6).

ARMED HELICOPTER. A hel fitted with weapons or weapon systems. (AAP-6).

ASSAULT AIRCRAFT. Powered ac, including hels, which move assault troops and cargo into an objective area and which provide for their resupply. (AAP-6).

ATTACK HELICOPTER. A hel specifically designed to employ various weapons to attack and destroy enemy targets. (AAP-6).

AVIATION. Hels and other battlefield aerial vehicles, together with their organic support, employed in land ops.

CHALK COMMANDER. The comd of all troops embarked under one chalk number. (AAP-6).

CHALK NUMBER. The number given to a complete load and to the transporting carrier. (AAP-6). (See also ‘Serial’.)

CLOSE FORMATION. Fmn spacing normally three to five rotor disc diameters at night and not less than 5 rotors during the day between ac in a sect and ten rotors between sect leads in an elm measured between tip-path planes between ac.

CONTOUR FLIGHT. A flight technique designed to take advantage of terrain cover, while enabling the pilot to maintain en route airspeeds ranging from 60 to 120 KIAS. Flown at relatively constant altitudes AGL, between 15 and 50 feet, the flight path is varied to make use of the aval ground, obstacles and/or vegetation.

CREWMAN. A member of the hel crew who travels in the cargo/passenger compartment in certain Hels. His duties include taking charge of the chalk troops from emplaning to deplaning.

ELEMENT. A sub-component of a large fmn normally comprised of two or more sects with a designated lead having responsibilities in conjunction with the fmn's op, but subordinate to the fmn leader. Elms should normally be composed of hels with similar capabilities.

EXTENDED FORMATION. Fmn spacing normally ten rotors to 1000 meters between ac in a sect and 300 to 1000 meters between sect leads in an elm.

F-HOUR. F-Hour is the time at which the first hel crosses the Forward Line of Own Troops (FLOT) in a cross-FLOT op.

FORMATION LEADER. The individual given responsibility for the planning and conduct of the op of the fmn as a whole.

H-HOUR. The specific time at which an op or exercise commences or is due to commence. It is also the time at which the Line of Departure is crossed by the leading elms in an attack.

HELICOPTER. See ‘Anti-armor Hel’
‘Armed Hel’
‘Assault Ac’
‘Attack Hel’
‘Obsn Hel’
‘Reconnaissance Hel’
‘Transport Hel’
‘Utility Hel’

HELICOPTER-BORNE OPERATION. An op in which hels act in support of a fmn, unit or organization to accomplish the movement of troops, supplies and/or eqpt.

HIGH PAYOFF TARGETS. Targets of significance and value to the enemy, the destruction, damage or neutralization of which can lead to a disproportionate advantage to friendly forces.

HOISTING. Lowering or raising troops or cargo by means of a winch or hoist under the con of a hel crew member. (Also known as 'Winching' NATO.)

HOOK-UP MAN. The person resp for attaching the external load and for controlling the take-up of strain of the load sling.

IDENTIFICATION, FRIEND OR FOE (IFF). A system using electromagnetic transmissions to which eqpt carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces. (AAP-6). (See also ‘Selective Identification Feature’.)

LANDING LIGHT SYSTEM. Lighting eqpt on the ground to assist approach and landing.

LANDING POINT. A point within a LS where one hel or vertical take-off and landing ac can land. (AAP-6).

LANDING SITE. A site within a landing zone containing one or more LPs. (AAP-6).

LANDING ZONE. Any specified zone used for the landing of ac. (AAP-6).

L - HOUR. In airmobile ops, the time at which the first hel of the heliborne assault wave touches down in the landing zone (LZ)

LOOSE FORMATION. Normally five to ten rotor disc diameters between ac in a sect and 300 meters between sect leads in an elm measured between tip-path planes between ac.

MARSHALLER. A person who directs the ground movement of ac by the use of hand and arm or light signals.

MULTI-ROLE HELICOPTER A multi-role Hel is one that is specifically designed to carry out more than one role.

NAP-OF-THE-EARTH (NOE) FLIGHT. Flight technique is designed to make the maximum use of the aval terrain masking features. Airspeed varies from translational to 60 KIAS at 15 feet (AGL). The slower airspeeds enable the pilot to maintain minimum obstacle clearance while attaining maximum cover from vegetation, topography and other visual obstructions. This profile may be most appropriate for ops in close proximity to the enemy, high threat environments, or, on approach and departures from areas under obsn.

OBSERVATION HELICOPTER. Hel used primarily for obsn and reconnaissance but which may be used for other roles. (AAP-6).

PAYLOAD. The sum of the weight of passengers and cargo that an ac can carry. (AAP-6).

RADIUS OF ACTION. The maximum distance a ship, ac, or vehicle can travel away from its base along a given course with normal combat load and return without refuelling, allowing for all safety and operating factors. (AAP-6).

RAPID REFUELLING. A means of refuelling hels with engines running and rotor(s) running or stopped.

RECONNAISSANCE HELICOPTER. A hel designed primarily for reconnaissance ops. Also called ‘obsn hel’.

SECTION. Normally constitute two ac operating together in fmn with one designated as lead and the other as wingman. As a sub-component of a larger fmn, the sect leader may be given responsibilities or tasks for his sect, but remains subordinate to the fmn leader.

SELECTIVE IDENTIFICATION FEATURE (SIF). Airborne pulse-type transponder that provides automatic selective identification of ac in which it is installed, to friend-or-foe identification installations, whether ground, shipboard, or airborne. (AAP-6). (See also 'Identification Friend or Foe'.

SERIAL. An elm or a group of elms within a series which is given a numerical or alphabetical designation for convenience in planning, scheduling and con (AAP-6). (See also 'Chalk Number').

TACTICAL AIR MOVEMENT SECTION (TAMS). Pers who are concerned with organization and con of loading within a pick-up zone/site.

TACTICAL REFUELLING. Refuelling during ops normally conducted away from a fixed facility.

TERRAIN FLIGHT. Flight close to the earth's surface during which airspeed, height and/or altitude are adapted to the contours and cover of the ground in order to avoid enemy detection and fire. (AAP-6). This includes - low flying, contour flying and Nap of the Earth (NOE) flying.

TRANSPORT HELICOPTER. A utility hel used primarily for the carriage of troops and/or eqpt. (Also called 'cargo hel'). (See also 'Utility Hel'.) Transport Hels are designated according to their maximum all up mass, as follows:

Light	6-7.99 tonnes;
Medium	8-10.99 tonnes; and
Heavy	11 tonnes and over (AC 225 (Panel X)).

UTILITY HELICOPTER. A multi-purpose hel capable of lifting troops but may be used in comd and con, logistics, casualty evacuation or armed hel role. (AAP-6).

WEAPONS CONTROL STATUS (WCS). Weapons con of AD weapons systems is expressed as a status declared for a particular area and time. They define the degree of freedom to be afforded to AD weapon systems and may be caveated hel or fixed wing as appropriate. AD weapons systems that are able to engage targets in volumes of airspace allocated to friendly air activity automatically adopt a specified restrictive WCS in the appropriate

engagement arcs regardless of the fact that a more permissive WCS might apply to them. (See ATP-40(A)).

Y - HOUR. In airmobile ops the time at which the first hel in the first wave departs the Pick -up-Point or Pick-up Zone (PZ).

809.27 - ABBREVIATIONS

AC	Aircraft Captain/Aircraft Commander
ac	Aircraft
ACL	Allowable Combat Load
ACO	Airspace Control Order
ACP	Air Control Point
ACSTAT	Aircraft Status Report
AD	Air Defence
ADA	Air Defence Artillery
AGL	Above Ground Level
AH	Attack Helicopter
ALO	Air Liaison Officer
AMA	Artillery Manoeuvre Area
AMC	Aviation Mission Commander
AMS	Avionic Management System
AO	Area of Operations
ATC	Air Traffic Control
A2C2	Army Airspace Command and Control
AUC	Aviation Unit Commander
AUW	All-up Weight
CAS	Close Air Support
Cas	Casualty
CEOI	Communications Electronic Operating Instructions
CO	Commanding Officer
COMD	Commander
CP	Command Post
C/S	Call Sign
CSAR	Combat Search and Rescue
CSS	Combat Service Support
C2	Command and Control
DARE	Downed Aircrew Recovery Extraction
DCO	Deputy Commanding Officer
DEWS	Defensive Early Warning Suite
DF	Defensive Fire
DME	Distance Measuring Equipment
DTC	Data Transfer Cartridge
ECM	Electronic Counter-measures
EMCON	Emission Control
EW	Electronic Warfare
FAC	Forward Air Controller

FARP	Forward Area Rearming and Refuelling Point
FE	Flight Engineer
FLOT	Forward Line of Own Troops
FRAG O	Fragmentation Order
GPS	Global Positioning System
HA	Holding Area
HCCR	Hot Closed Circuit Refuelling
HELQUEST	Helicopter Request Message
HF	High Frequency
HVQK	Have Quick
ICAO	International Civil Aviation Organization
IFF	Identification Friend or Foe
IMC	Instrument Meteorological Conditions
IR	Infra-red
ISA	International Standard Atmosphere
LO	Liaison Officer
Loc	Location
LP	Landing Point
LS	Landing Site
LUC	Lifted Unit Commander
LUH	Light Utility Helicopter
LZ	Landing Zone
MAWR	Missile Approach Warning Receiver
MCL	Maximum Combat Load
MRP	Mobile Repair Party
NBC	Nuclear, Biological, Chemical
NOE	Nap of the Earth
NORDO	No Radio
NORM	
NORS	
NVG	Night Vision Goggles
OP	Observation Post
Op	Operation, Operational
Op O	Operations Order
OPSEC	Operational Security
POC	Point(s) of Contact
POL	Petrol, Oil and Lubricants
PUP	Pick-up Point
PZ	Pick-up Zone
rel P	Release Point
RT	Radio Telecommunications
RV	Rendez-vous
RWR	Radar Warning Receiver
SAMS	Squadron Aircraft Maintenance and Servicing
SAR	Search and Rescue
SBG	Standard Brigade Group

SOP	Standard Operating Procedure(s)
SPINs	Special Instructions
Tac CP	Tactical Command Post
TACON	Tactical Control
TACP	Tactical Air Control Party
TAM	Tactical Aide Memoire
TAMS	Tactical Air Movement Section
TTP	Tactics, Techniques and Procedures
VMC	Visual Meteorological Conditions
WCO	Weapons Control Order
wx	Weather