Sources

- CV-NATOPS
  - Preparing for Flight Operations
  - Air Traffic Control Doctorine
  - Launching Aircraft
  - Recovering Aircraft
- Flight Documents
  - Kneeboard Examples 11.07.25

CV-NATOPS

Summary of CV-NATOPS pdf

Full document can be found discord or clicking here

Preparing for Flight Operations

3.1 THE AIR PLAN

To obtain maximum efficiency from personnel and equipment, carrier air operations must be precisely scheduled in every respect. Air operations and strike operations are the coordinating and scheduling agencies for all flight operations. The strike operations officer will collect all required flight information for preparation of the daily air plan that will be submitted to the operations officer via the air operations officer, for approval and signature.

In order for strike operations to prepare an air plan that is within the capabilities of the air wing and all supporting activities, the following must be reported on a regular basis:

1. An up-to-date inventory of aviation ordnance on board and available for the next day's operation.
2. The status of all embarked aircraft. This report shall be delivered to the bridge, flag bridge, flag operations, air operations, and the air department. In addition to current aircraft status, the report should include expected changes in status and test flight requirements for the following day.
3. Air intelligence information concerning the next day's operation.

Normally, the air plan will be distributed on the evening before the scheduled operations. When the air plan is delayed, the strike operations watch officer shall provide advance information to allow preparations for the first flights. As a minimum, air ops, flight deck control, PriFly, the air department duty officer, all ready rooms, CVIC, the ship's ordnance handling officer, and CDC shall be advised of the following:

1. Launch times
2. Mission

3. Flight composition
4. Fuel requirements
5. Ordnance loading.

The air plan shall include the following:

1. Event number
2. Launch time
3. Recovery time
4. Mission
5. Number and model of aircraft, including spares
6. Squadron and radio call
7. Total sorties
8. Sunrise, sunset, moonrise, moonset, phase
9. Date
10. Fuel
11. Alert aircraft
12. Logistics aircraft
13. Tactical frequencies
14. Notes as required. Notes shall include the following:
    - EMCON/ZIP LIP conditions
    - Ready deck schedule
    - Any other information required including restrictions or hazards to flight.

Upon receipt of the daily air plan, each squadron shall prepare and distribute its flight schedule as required. This
schedule shall designate pilots, radio calls, and the mission for each flight assigned. It is the responsibility of the
aircraft handling officer to ensure strict conformance to the air plan.

3.1.1 The Ordnance Load Plan

Strike operations shall prepare an ordnance load plan that will be utilized as a supplement to the air plan for aircraft
ordnance loads. No changes will be made to the ordnance load plan without approval by the strike operations officer.
It is the responsibility of the aircraft handling officer to ensure strict conformance to the ordnance load plan.

3.3 BRIEFING

It is the responsibility of squadron or unit commanders to ensure all flightcrews have been properly briefed and have

sufficient information to complete the assigned mission. Briefing checkoff lists shall be used as required by
applicable aircraft NATOPS flight manuals. Each briefing must include EMCON procedures, if applicable, and
procedures to be followed in the event of communication or NAVAID failure.

Air ops shall provide the following prelaunch briefing information 2-1/2 hours prior to each event:

1. Launch and recovery times
2. Launch and recovery PIM
3. NAVAID status and frequencies
4. Ship’s weather
5. Weather at bingo fields and en route
6. Emergency data
    - Bearing and distance to nearest land
    - Bearing and distance to nearest suitable landing field
    - NAVAIDs, frequencies, and facilities at nearest field
    - Ready carrier-call, frequencies, NAVAIDs, and PIM
    - Expected final bearing
    - Emergency marshal fixes/altitudes/approach times.
7. Air traffic control data
    - Departure/rendezvous radials
    - Departure frequency and IFF/SIF mode and code
    - Special procedures for ZIP LIP/EMCON conditions (if in effect).
8. Any restrictions or hazards to flight
9. Pertinent information not included in the air plan.

CATCC shall provide to all aircraft not embarked in the ship, but engaged in any support operations (COD, VOD,
etc.) that require them to recover aboard and launch again, all applicable items in the CATCC provided briefing
information listed above.

3.4 FLIGHT PLANS AND ADVISORIES

The requirements for filing flight plans and advisories vary with each operating area and are contained in the DoD
Flight Information Publications (FLIPs) and fleet operating directives. As a rule, flight plans will be required for
flights that:

1. Terminate ashore

2. Proceed across ADIZ boundaries and are not covered by a flight advisory
3. Proceed over land.

Flight advisories shall be filed for flights within ADIZ boundaries by all aircraft that will land back on board ship
and are not covered by a flight plan. Squadrons shall file flight plans (DD175/DD1801) with CATCC to meet time
requirements established by applicable operating area manuals or ICAO guidelines.

3.4.1 Close Proximity Operations

During concurrent flight operations by two or more CVs/LHAs/LHDs, or concurrent operations between a
CV/LHA/LHD and other aviation-capable ships (fixed wing or helicopter), each ship should remain in its assigned
disposition in order to reduce air traffic coordination problems. CATCC/AOCC or HDC must closely monitor and
coordinate flight patterns to avoid mutual interference. Prelaunch procedures shall include exchange of air plans and
prelaunch notification by aviation-capable ships and acknowledgment by the CV/LHA/LHD prior to any flight
operations within 10 nm of the CV/LHA/LHD.

Air Traffic Control Doctorine

4.1 RESPONSIBILITIES

4.1.1 Operations Officer

As defined by Navy regulations, the operations officer shall be responsible for the control of airborne aircraft except
when control is assigned to other authority. This control refers to all airborne operations not incidental to the actual
launch or recovery of aircraft.

4.1.2 Air Operations Officer

The air operations officer is responsible to the operations officer for coordination of all matters pertaining to flight
operations, the proper functioning of the CATCC and shall determine the type of approach and required degree of
control.

4.1.3 Air Officer

The air officer determines the case launch and/or recovery. The air officer is also responsible for visual control of all
aircraft operating in the carrier control zone. Under Case I and II conditions, this responsibility may be extended
beyond the carrier control zone to include all aircraft that have been switched to air officer’s control frequency. For
special operations such as bombing a sled or air demonstrations, the air officer may exercise control outside of the
carrier control zone. Additionally, the air officer is the carrier control zone clearing authority. Agents desiring to
operate aircraft within the control zone must obtain the air officer’s approval prior to entry. This

clearance shall
include the following:

1. Operating instructions as required for avoiding other traffic
2. Information concerning hazardous conditions
3. Altitude and distance limitations to which aircraft may be operated.

4.1.4 Landing Signal Officer

The LSO, under supervision of the air officer, is responsible for the visual control of aircraft in the terminal phase
of the approach immediately prior to landing. LSO specific responsibilities are delineated in the LSO NATOPS
Manual (NAVAIR 00-80T-104).

4.1.5 Landing Signalman Enlisted

The LSE, under the supervision of the air officer, is to ensure helicopters, on signal, are safely started, engaged,
launched, recovered, and shut down. The LSE receives his directions from PriFly via light signals and/or two-way
flight deck communications. It is his responsibility to ensure all tiedowns are removed prior to lift-off and that the
aircraft is properly secured after landing. All signals given by the LSE are advisory with the exception of the
“waveoff” and “hold,” which in all cases are mandatory. During vertical replenishment operations, the LSE directs
the helicopter over the deck and provides signals for the delivery and hookup of cargo. Ensure LSE and Army aircrews
are familiar with engagement/disengagement procedures of rotors, prior to recovery/launch operations.

4.1.6 Pilots

As directed by OPNAVINST 3710.7 series, the pilot is responsible for the safe and orderly conduct of the flight. The
success of carrier operations largely depends upon his knowledge of and adherence to the procedures contained
herein. Any necessary deviation from these procedures or from control instructions shall be reported to the controlling

agency immediately so that allowances can be made.

4.1.7 Combat Direction Center Officer

The CDC officer is responsible for mission control of aircraft assigned to him. This includes providing separation
from other aircraft operations in the vicinity of the carrier and ensuring intercept/mission controllers know the basic
procedures for air traffic control. Additionally, he shall ensure these controllers know their responsibility for traffic
advisories to aircraft operating in visual conditions and for safe separation of aircraft operating in instrument
conditions. Upon request, he shall provide information concerning areas of special operations, such as air-to-surface
weapon drops and air-to-air missile shoots.

4.2 CONTROL CRITERIA

Weather in the carrier control zone is the most prominent factor affecting the type of departure and/or recovery. There
are three types of departure and recovery operations, which are referred to as Case I, Case II, and Case III.

The air officer, unless otherwise specified by higher authority, determines what case launch and/or recovery will be
exercised using the following weather minimums:

Case I: When it is anticipated that flights will not encounter instrument conditions during daytime departures,
recoveries, and the ceiling and visibility in the carrier control zone are no lower than 3,000 feet and 5 nm respectively.

Case II: When it is anticipated that flights may encounter instrument conditions during a daytime departure or
recovery, and the ceiling and visibility in the carrier control zone are no lower than 1,000 feet and 5 nm respectively.

Case III: When it is anticipated that flights will encounter instrument conditions during a departure or recovery
because the ceiling or visibility in the carrier control zone are lower than 1,000 feet and 5 nm respectively; or a
nighttime departure or recovery (one- half hour after sunset and one-half hour before sunrise).

4.2.1 Degrees of Control

The four degrees of control are positive, advisory, monitor, and nonradar control.

4.2.1.1 Positive Control

This control shall be utilized under the following conditions:

1. Ceiling of:
   - Less than 1,000 feet for fixed-wing aircraft
   - Less than 500 feet for helicopter operations.
2. Forward flight visibility of:
   - Less than 5 miles for fixed-wing operations
   - One mile or less for helicopter operations.
3. All flight operations between one-half hour after sunset and one-half hour before sunrise except as modified
   by the OTC or carrier commanding officer.
4. During mandatory letdown in thunderstorm areas.
5. In other situations where supervisory personnel can anticipate weather phenomena that might cause difficulty
   to pilots.

4.2.1.2 Advisory Control

This control shall be utilized when the traffic density in an operating area requires a higher degree of control for safety
of flight than required under visual flight rules. Advisory control is normally limited to VMC and is recommended
for all operations in or adjacent to oceanic control areas or routes. Traffic separation is the responsibility of the
individual pilot with assistance provided by the controlling agency.

4.2.1.3 Monitor Control

This control shall be utilized only when aircraft are operating VMC outside controlled airspace and the responsibility
for separation from other traffic can be safely assumed by the pilot.

4.2.1.4 Nonradar Control

This control shall be used when shipboard radar is inoperative or so degraded as to be inadequate to provide radar
separation of air traffic under conditions normally requiring positive control. The decision to attempt control of
aircraft at night or in instrument flight conditions must be made with careful consideration of such factors as the
following:

1. Actual meteorological conditions
2. Degree of radar degradation
3. Expected duration of radar degradation
4. Fuel states and tanker fuel available for delays
5. Divert field considerations
6. Operational requirement
7. Departure/recovery in progress at the time a nonradar environment develops
8. Availability of other surface or airborne platforms to provide radar traffic separation and approach information.

4.2.2 Electronic Emission Control

The operations officer shall be responsible for EMCON in accordance with NWP 1-10.22 Volume I, NTTP 3-51.1,
effective operation orders, and other governing directives. It may be necessary to develop special procedures for
performing the following operations during EMCON conditions:

1. Aircraft handling
2. Launch
3. Departure
4. Mission

5. Arrival
6. Recovery
7. Maintenance.

COD aircraft will attempt to establish communications en route prior to arriving on station. If no radio contact is made
the COD will return to base.

Detailed briefings covering responsibilities and procedures shall be conducted prior to operating under EMCON
conditions. All flight crewmembers, controllers, aircraft handling personnel, and flight deck ordnance coordinators
shall attend such briefings and familiarize themselves with all procedures within their area of responsibility.
Overhead messages shall include applicable EMCON instructions.

The operations officer shall be responsible for setting the proper HERO conditions for control of radar and radio
emissions while handling ordnance susceptible to RF energy. The air officer shall establish procedures for alerting
flight deck ordnance personnel when the appropriate HERO conditions have been set.

4.3 SEPARATION CRITERIA

The following separation standards shall be utilized for aircraft under positive control. These restrictions do not apply
to tactical maneuvers such as air intercept, rendezvous, and close USW action.

4.3.1 Lateral Separation

1. The following separation standards apply to aircraft controlled by designated air search radars that rotate in
   excess of 7 rpm.
   - Aircraft operating at 50 miles or more from the monitoring antenna shall be separated by a minimum of
     5 miles.
   - Aircraft operating less than 50 miles from the monitoring antenna shall be separated by a minimum of
     3 miles.

- Aircraft on a designated approach or established downwind and inside of 12 miles shall be separated by
  a minimum of 2 miles. Aircraft established on final within 5 miles shall be separated a minimum of
  1-1/2 miles.

2. Aircraft provided positive control with all other radars shall be separated by a minimum of 5 miles.
3. Aircraft provided nonradar control, utilizing a published approach, should be separated by 2 minutes (5 miles
   separation when using DME).

4.3.2 Vertical Separation

1. Jet and turbopropeller (turboprop) aircraft operating at altitudes up to and including FL 290 shall be separated
   by 1,000 feet.
2. Vertical separation may be reduced to 800 feet when inside of 12 nm.
   - Receiver aircraft being provided positive control shall be separated by a minimum of 500 feet vertically
     from tanker aircraft until visual separation between the two aircraft can be maintained.
3. Aircraft operating above FL 290 shall be separated by 2,000 feet.
4. Helicopters shall be separated by 500 feet.

4.4 COMMUNICATION CONTROL

All aircraft are considered under positive communication control while operating at sea unless otherwise directed.
Pilots shall not shift frequencies without notifying and/or obtaining permission from the controlling agency.
Communication procedure during ZIP LIP/EMCON conditions shall be specified during preflight briefing.

4.4.1 Control of Radio Circuits

Control of radio circuits shall be exercised as follows:

4.4.1.1 CATCC

1. Primary control of ship-shore air traffic control administrative frequencies

2. Primary control of assigned CCA frequencies
3. Secondary control of aircraft guard frequencies
4. Secondary control of land/launch frequencies
5. Secondary control of air tactical frequencies.

4.4.1.2 CDC

1. Primary control of all air tactical frequencies
2. Primary control of aircraft guard frequencies
3. Secondary control of ship-shore air traffic control administrative frequencies.

4.4.1.3 PriFly

1. Primary control of land/launch frequencies
2. Secondary control of aircraft guard frequencies
3. Secondary control of departure control and final approach frequencies.

4.4.2 Voice Procedures

Strict radio discipline is mandatory. Voice procedures must be concise and should not vary appreciably from standard
air traffic control phraseology as set forth in the Carrier Air Traffic Control Handbook NAVAIR AE-CVATC-
OPM-000, FAA Order 7110.65 and ACP 165. Ship’s call sign shall be used on initial contact with marshal. Squadron
tactical call signs should always be used to prevent confusion.

4.4.3 Recording of Radio Circuits

Radio circuits used for the control of air traffic shall be recorded continuously during hours of operation. CATCC
shall ensure PriFly frequencies are recorded during Case I/Case II operations.

4.4.4 Communication Security

COMSEC is best accomplished by strict adherence to established principles of radio discipline. Additionally, secure
voice radio equipment in naval aircraft and carriers offers a significant COMSEC capability that should be utilized
to the greatest extent practicable. All units with COMSEC capability should develop tactical doctrine designed to
deny SIGINT forces access to vital intelligence. Detailed functional descriptions of COMSEC equipments are found
in pertinent classified documents.

All personnel who have access to radio equipment must be briefed that certain restrictions exist on all radio
transmissions to prevent disclosure of EEFIs to the enemy.

4.5 EMERGENCY CONTROL PROCEDURES

From a control standpoint, aircraft emergencies fall in the following three broad categories:

1. Communication failures
2. NAVAID failures
3. Other aircraft system failures.

The nature of some emergencies requires priority and/or diversionary measures. The ultimate resolution of these
emergencies involves a command decision based upon the type of emergency and weather conditions in the recovery
area. It is imperative that the controlling agency collect every pertinent detail that might aid in the evaluation of an
emergency and keep the command and other interested agencies properly informed.

4.5.1 Initial Control Responsibility

The initial control responsibility for aircraft emergencies rests with the agency exercising control of the aircraft when
the emergency occurs. Aircraft in a state of emergency within visual range of the ship will normally be controlled
by the air officer. Outside the visual range of the ship, aircraft in an emergency shall be controlled by either CDC or
CATCC. Aircraft in distress should not change radio frequencies if satisfactory radio contact is

established.

4.5.2 Basic Procedures

The procedures for pilots to follow when experiencing communications and/or navigation equipment failures are
listed in Figure 4-1. Controlling agencies shall be familiar with and alert for conditions indicating communication
or navigation failures and perform the following as appropriate:

1. Attempt to establish communications with the aircraft.
2. Vector the aircraft as appropriate.

If unable to communicate with the aircraft in difficulty:

1. Identify on radar and maintain a track.
2. Vector available aircraft to join if practical.
3. Alert air operations watch officer and PriFly.
4. Broadcast instructions and essential information on normal control frequencies and guard.
   Emergency procedures during penetration or letdown are covered in Chapter 6.
   Emergency procedures for aircraft
   system failures are covered in the appropriate aircraft NATOPS flight manual. Lost communication emergency
   squawks are listed in Figure 4-2.

Launching Aircraft

5.1 PRELAUNCH PROCEDURES

As early as possible before launch, the catapult officer and deck launching officer shall advise the air officer of the
launch wind requirements. The air officer shall relay this information to the bridge.

The aircraft handling officer shall perform the following prior to each launch or setting of Condition I or II, as
described in paragraph 5.12.

1. Assign aircraft to each event specified on the air plan.
2. Brief key flight and hangar deck personnel on the following:
   - Starting and launching sequence
   - Disposition of downed and spare aircraft
   - Aircraft to be towed or taxied forward after the launch
   - Recovery spot (when a recovery is scheduled to follow the launch).
3. Ensure the air gunner or his designated representative attends the aforementioned brief to comment as
   appropriate on ordnance safety precautions or weapon handling procedures incident to the launch and
   forthcoming recovery if applicable.
4. Ensure the launch spot is relayed to the ready rooms and inform PriFly, CATCC, and the ready rooms as early
   as possible of the side numbers of aircraft assigned for launch.
5. Conduct FOD walkdown (minimum one day/one night and as required).

The flight deck officer or his representative shall tour the flight deck to ensure the following:

1. Propellers, tailpipes, and helicopter rotors have sufficient clearance
2. Each aircraft can be safely taxied from its spot
3. Deck-edge antennas are properly positioned and the jackstaff, flagstaff, bow rails, and stern rails have been
   removed and stowed
4. No gear is adrift on the flight deck.

The aviation fuel officer or his designated representative shall ensure all aircraft, including standbys, have been fueled as prescribed in the air plan. Discrepancies shall be brought to the attention of the aircraft handling officer immediately.

The air wing weapon officer or his designated representative shall visually inspect each aircraft to ensure ordnance loading is as prescribed in the ordnance load plan. Discrepancies shall be brought to the attention of the aircraft handling officer and ordnance handling officer immediately.

The launching officer(s) shall brief the topside catapult crew(s) and ensure all equipment is ready and that sufficient launching accessories are available to complete the launch. These tasks shall be completed prior to each launch. In addition, he shall verify fuel and ordnance loading by consultation with aviation fuel and ordnance personnel. He shall then compute aircraft launch weights.

The pilot shall confirm fuel, ordnance, and gross weights in writing, which will be submitted to flight deck control prior to man-up time.

5.1.1 Manning Aircraft

Approximately 45 minutes before launch time, flightcrews will be ordered to man aircraft. When called, they shall proceed to their aircraft via the designated route and conduct preflight inspections as expeditiously as safety permits.

5.1.2 COD/VOD Aircraft

COD/VOD aircraft passengers shall be escorted to and from the aircraft by the ATO or his assistant. The ATO or his assistant shall remain with the passengers until they have been embarked. Passengers and cargo will not be off-loaded until the ATO or his assistant is present. Flight deck survival equipment (cranial helmet, goggles,

and floatation
equipment) shall not be removed until passengers are well clear of the hazards of the flight deck environment.

5.2 LAUNCHING FIXED-WING AIRCRAFT

5.2.1 Engine Start and Turnup

Prior to starting engines, the air officer shall issue appropriate orders or information over the flight deck announcing
system to ensure all prestart preparations are completed and all personnel on the flight deck are alerted.

The air officer shall ensure all flight deck personnel are indoctrinated in and adhere to the positioning of aircraft and
aircraft starting units so that the established minimum distances are maintained. Pilots and aircrews shall be made aware of proper positioning criteria. The responsibility for safe starting of all aircraft rests with the air officer. All
personnel shall follow the prescribed procedures when operating aircraft and aircraft starting units. All unsafe starting
conditions shall immediately be called to the attention of cognizant personnel.

WARNING

Hot exhaust from aircraft and aircraft starting units is a serious hazard when operating in close proximity to aircraft, aircraft components, fuel, weapons, equipment, external store CADs, and personnel.

Engines shall be started only on signal and under the positive control of PriFly. During the starting evolution, the
aircraft handling crew shall remove the towbar if necessary for accomplishment of preflight checks and the plane
captain shall assist the pilot as necessary with preflight checks. Towbars shall remain on or in the immediate vicinity
of aircraft parked in the landing area or in a position that fouls the deck until that aircraft is ready for taxi.

WARNING

Prior to start, ensure nosewheels are not cocked. Cocked nosewheel may pose a threat to flight deck personnel.

The plane directors shall monitor the aircraft throughout the warmup and checkout period. Control is assumed by
the plane captain for preflight checks only.

Turboprop aircraft shall not be turned up above 1,500 shaft horsepower (SHP) without specific clearance from a flight
deck director. The pilot shall request clearance to turn up by giving his director the one finger turnup signal. The
director, after checking chocks and tiedowns and ensure the area behind the aircraft is clear, shall return the signal,
thereby clearing the pilot for turnup.

Note

Clearance for turnup shall not be given by anyone other than a flight deck director.

While an engine is turning up at high power, the director shall continuously check the area behind the aircraft. The
pilot shall frequently look at the director to ensure the “all clear” signal is still being given. After completing all
poststart checks, the pilot shall signal the director, indicating the status of the aircraft. The director will relay the signal
to the officer or petty officer in charge of that area of the flight deck.

5.2.2 Final Preparations for Launch

Approximately 15 minutes before launch, the air officer will initiate the following prelaunch checklist:

1. Wind — Verify the estimated wind available for launch and notify bridge of maximum/minimum wind
   requirements.
2. List — Check ship’s list to ensure a level deck.
3. Jet blast deflector cooling — Ensure saltwater cooling is functioning on all active JBDs.

If aircraft are to be deck launched, the launching officer shall compute the required deck run and confirm it with the
air officer. The catapult launching officer shall inspect the catapult track(s) and adjacent flight deck area to ensure
they are clear of chocks, towbars, or other equipment. By this time, the following personnel should

have manned their
launch stations:

1. LSO
2. Arresting gear personnel
3. ILARTS operator
4. Lens operator
5. Mobile firefighting equipment operators.
6. Mobile firefighting equipment operators.

5.2.3 Taxiing

Before ordering removal of chocks, directors shall signal for the pilot to hold brakes. It is imperative that the pilot
acknowledge this signal by affirmative nod of the head in the daytime and by a flashlight at night. The flight deck
officer will control the rate at which aircraft are moved toward the catapult(s) or deck launch spot, ensuring a constant
steady flow of traffic while avoiding unnecessary crowding. All taxi signals shall be answered promptly and
accurately unless the pilot considers there is a dangerous situation existing or developing, in which case he shall stop.

WARNING

- A director shall not leave an aircraft unattended after chocks and tiedowns have been removed.
- Aircraft shall not be taxied until pretaxi checks and required procedures prescribed in the appropriate NAVAIR weapon/store loading checklists/
store reliability cards have been completed.
- COD aircraft shall not be unchained until all passengers and aircrew are
strapped into their seats and the aircraft commander has passed the up and
ready signal.

Note

All movement of aircraft shall be under the control of a plane director.
Safety personnel shall be posted as required to assist the director.

If a pilot loses sight of his director, he shall stop immediately. The director shall stay in view of the pilot at all times
and remain stationary while controlling aircraft. If it is necessary to change his position while controlling an aircraft
at night, the director shall signal the pilot to hold brakes. He will continue giving the hold brake signal while moving
expeditiously to the new position, then resume movement of the aircraft.

Control of a taxiing aircraft shall not be passed from one director to another until the receiving director signals by
extending one arm vertically that he is ready to accept control. A director shall not give signals to a pilot who is already
under the control of another director except in an attempt to avert an accident.

When a nosewheel tiller/towbar is to be used in taxiing an aircraft, the director shall signal the pilot that a tiller/towbar
is being attached and shall discontinue giving him directional signals. The pilot must then be careful to avoid
differential braking and/or nosewheel steering and use the brakes only for slowing or stopping the aircraft. Nosewheel
steering shall not be engaged with tiller/towbar attached.

CAUTION

Launching fixed wing aircraft while other aircraft are taxied, spotted, or towed close behind a JBD may cause damage to those aircraft. Additionally, launching fixed wing aircraft from catapult #1 with a helicopter spotted in the vicinity of elevator #1 exposes the helicopter to a high level of turbulence which may cause significant damage to the helicopter.

5.2.4 Catapult Launching

Prior to the launch, the launching officer shall relay the minimum and maximum WOD requirements for the
forthcoming launch to the air officer who shall, in turn, advise the bridge.

During CARQUAL operations, the pilot shall transmit aircraft side number, fuel weight, and gross weight during
a two-way radio check. This report is required prior to initial launch, after hot refueling or when pilot switch occurs.
The air officer shall ensure aircraft side number and gross weight is passed to and confirmed by the launching officer.

WARNING

- During CARQUAL operations, close monitoring of aircraft gross weights by the air officer, launching officer, pilots, and squadron representatives is mandatory to ensure operational safety.
- Turboprop aircraft shall not be launched from waist catapults when jet/turboprop aircraft with engines operating on No. 2 catapult or a possibility exists that hot exhaust gases from aircraft spotted anywhere on the flight deck may be ingested into the turboprop engine during launch.
- Squadron aircraft inspectors shall not perform inspections while an aircraft is taxiing. It is mandatory to remain well clear of rolling tires at all times to prevent injury.

CAUTION

Aircraft with wing-or pylon-mounted engines shall not be launched from catapults having only a single panel JBD if aircraft within 200 feet aft of the JBD are not properly tied down.

In positioning an aircraft on the catapult, the director must be acutely aware of the activities of the catapult crewmen
and control the aircraft’s speed and movement in such a way that personnel safety will not be jeopardized. Pilots must
guard against the tendency to use excessive power that invariably results in roughness and poor control and
jeopardizes launching accessories.
As the aircraft approaches the catapult, the director shall ensure the aircraft is in the takeoff configuration. JBDs shall
be raised as appropriate.

CAUTION

All JBD operators/safety observers shall ensure aircraft clearance is sufficient prior to raising or lowering JBD. Catapult three requires a JBD safety observer at all times. Bow catapults utilizing JBD deckedge control boxes require one JBD safety observer per catapult. JBD safety observers shall be positioned on the furthest side of the JBD away from the operator. The safety observer will signal the JBD operator with hand/wands when the aircraft is clear and the JBD can be raised.

For aircraft using the nosegear launch system, the director shall stop the aircraft at the entry wye area of the guide
track. The holdback man shall attach the holdback bar. The director shall signal the pilot and the hookup petty officer
to lower the launch bar.

CAUTION

Aircraft launch bar should not be lowered outside of the entry wye. Excessive wear, burring, and hangup may occur if the bar passes over the deck cleat link track onto the entry wye.

Before taxiing past the shuttle, the pilot shall verify the aircraft gross weight by giving a “thumbs up” signal during
the day or a circular motion with a flashlight at night. A “thumbs down” or negative signal will not be used to indicate
disagreement with the gross weight board. If the pilot does not agree with the gross weight, he will request adjustment
as follows.

1. During the day:
   - To raise the gross weight, hold hand flat with palm up and move in a vertical direction, emphasizing the
     upward motion.
   - To lower the gross weight, hold hand with palm down and move in a horizontal direction.
2. At night:
   - To raise the gross weight, move flashlight in a vertical direction, emphasizing the upward motion.
   - To lower the gross weight, move flashlight in a horizontal direction.

When more than two correction steps are required on the weight board or any difficulty is experienced in confirming
the gross weight, the aircraft shall not be launched until positive determination can be made by the air officer and

confirmed by the pilot and launching officer.

When an aircraft carrying ordnance requires arming, the aircraft will be taxied into the arming area. Nose-tow aircraft shall be stopped after the appropriate JBD has been raised and prior to positioning nose-tow launch bar over shuttle spreader. Prior to arming, aircraft shall be properly configured for flight. The director shall ensure all personnel are clear and then direct the aircrew's attention to the ordnance arming supervisor for arming. When the arming has been completed and the arming crew is clear, the ordnance arming supervisor will signal the pilot with a "thumbs up" signal (day) or display a vertical sweep with a red, banded wand (night) and then direct the pilot's attention back to the director.

As the aircraft is positioned on the catapult, the squadrons' aircraft inspector shall inspect the aircraft to ensure it is properly configured and ready for flight. He shall give a "thumbs up" signal (day) or display a blue wand held vertically (night) to indicate that he considers the aircraft ready for launch. He shall continuously display this signal at a position from which he is clearly visible to the launching officer. Should the aircraft inspector desire to prevent the aircraft from being launched, he shall immediately give a "suspend" signal (day) or display a blue wand moved horizontally (night) to the director or launching officer who has control of the aircraft at the time the discrepancy is discovered.

WARNING

Aircraft shall not have nose-tow launch bar over shuttle spreader until the aircraft is armed and properly configured for flight.

As the ship approaches the launching parameters, the air officer shall monitor the wind repeater and keep the launching officer(s) advised of the relative wind velocity. Upon receiving permission from the bridge to launch aircraft, he shall make a final check to ensure relative wind is within the envelope prescribed in the applicable aircraft launching bulletin. This shall be accomplished before changing the rotating beacon(s) from red to green (this lights the PriFly "go" light on the catapult officer ICCS console when in use), thereby clearing the launching officer(s) to

begin launching.

5.13 CONTROL OF DEPARTING AIRCRAFT

Primary responsibility for adherence to the assigned departure rests with the pilot; however, advisory control shall normally be exercised, with a shift to positive control as required by weather conditions, upon request, or when the assigned departure is not being adhered to. After launch, CATCC shall:

1. Record data as required on status boards.
2. Ensure communications and positive track are established with all aircraft to the extent possible under existing EMCON conditions.
3. Request NAVAID checks as necessary.
4. Maintain advisory control of departing point-to-point flights until pilots shift to en route frequencies and of other aircraft until control is accepted by CDC or another controlling agency.
5. Before releasing aircraft to another controlling agency, give each pilot (or flight leader) any pertinent information, such as changes in composition of flight, changes in PIM, or changes in mission.
6. When transferring control to CDC, give CDC the range and bearing of the aircraft being transferred, and ensure CDC acknowledges assumption of control.
7. File flight plans as necessary.

5.13.1 Departure Radials

Departure radials are based on the use of TACAN for providing lateral separation. The minimum standard separation of departure radials under instrument conditions is 20.

Assignment of departure radials is normally dependent on the following:

1. Mission of the aircraft
2. Number of carriers in the formation
3. Topographical features in the area
4. Those radials reserved for emergencies, letdowns, or helicopter holding.

Direct routing will be utilized as much as possible in order to lessen delay time in the execution of departures.

5.13.2 Departure Communication Procedures

5.13.2.1 Launch Frequencies

Aircraft shall normally launch on the departure frequency that shall be monitored by the tower. Condition and CAP launches will be on a frequency designated by CDC and monitored by the tower.

5.13.2.2 Single-Frequency Departures

These departures are highly desirable and shall be utilized whenever possible. Where single-frequency departures are not possible, single-piloted aircraft shall not be required to change radio frequencies or IFF/SIF codes after launch until at least 2,500 feet of altitude has been reached and the aircraft is in a climbing, wings-level attitude. Single-piloted aircraft that are assigned operating altitudes below 2,500 feet shall not change frequencies or IFF/SIF codes until a level attitude and cruise configuration have been attained. Guard channel shall be monitored at all times.

5.13.2.3 Case III Departure Voice Reports

These reports will vary with weather, state of training, EMCON condition, and the type of operation. The following reports are commonly used:

1. Airborne
2. Passing 2,500 feet
3. Arcing
4. Established outbound (on assigned radial)
5. Popeye, with altitude (see Note)
6. On top, with altitude
7. Kilo.

Note

When in IMC, Popeye will be a mandatory report for departing aircraft passing FL 180 (or assigned departure altitude if lower) if not on top.

5.13.2.4 Lost Communications During Departures

If communications are lost during departure, squawk Modes I and III as listed in Figure 4-2. If in VMC when communications are lost, remain VMC. If able, return to the ship by visual means for recovery. If on top/IMC, proceed to the applicable emergency marshal and commence a descent to depart that fix at EEAT.

5.13.2.4.1 Good Azimuth and No DME

In the event of lost communications and a loss of TACAN DME, the following departure procedure shall be followed utilizing TACAN azimuth. Continue with the prebriefed departure; utilize DR procedures to maintain the appropriate arc until reaching assigned departure radial. Proceed to approximately 50 miles, reverse course, proceed inbound on the assigned departure radial at the emergency marshal assigned altitude, and enter overhead holding using the prebriefed expected final bearing for proper holding orientation. Conserve fuel and be alert for joinup. If not joined by an escort aircraft, commence approach at EEAT. Use prebriefed expected final bearing to determine outbound and inbound tracks.

5.13.2.4.2 Good Azimuth and Good DME

All aircraft will continue with prebriefed departure, climbing outbound on departure radial unless modified by CATCC or until reaching 50 nm DME and commence left-hand holding between between 40 and 50 nm DME. After holding for 30 minutes, proceed inbound on the departure radial, climbing or descending to the emergency marshal assigned altitude. When reaching the distance prescribed for emergency marshal, arc in the shortest direction until reaching the assigned emergency marshal fix, enter holding, and commence approach at assigned EEAT.

Note

Helicopters experiencing lost communications should remain at or below 300 feet, arc to enter starboard Delta, and execute lost communications procedures in accordance with Figure 6-8.

5.13.3 Fixed-Wing Departures/Rendezvous

5.13.3.1 Case I Departure

This departure may be utilized when it is anticipated that flights will not encounter instrument conditions during departures and rendezvous with weather conditions no lower than 3,000 feet and 5 nm visibility.

5.13.3.1.1 Jet/Turboprop Aircraft

After a clearing turn, proceed straight ahead paralleling the BRC at 500 feet until 7 nm. Aircraft are then cleared to climb unrestricted in visual conditions.

5.13.3.2 Case I Rendezvous

Rendezvous shall conform to air wing doctrine.

5.13.3.3 Case II Departure

For departure, visual conditions at the ship may exist down to a ceiling of 1,000 feet and visibility of 5 miles. Launch shall be on departure control frequency.

5.13.3.3.1 Jet Aircraft

After a clearing turn, proceed straight ahead at 500 feet paralleling the BRC. At 7 nm, turn to intercept the 10-nm arc, maintaining visual conditions until established on the departure radial. The 500-foot restriction is lifted after 7 nm if the climb can be continued in visual conditions. Jets shall maintain 300 knots until VMC on top.

5.13.3.3.2 Turboprop Aircraft

After a clearing turn, parallel the BRC at 500 feet. At 6 nm, turn to intercept the 7nm arc, maintaining visual conditions until established outbound on the departure radial. Maintain 500 feet until 12 nm on the departure radial.

Note

COD aircraft will depart straight ahead unless otherwise directed and maintain 500 feet until 12 nm.

5.13.3.4 Case III Departure

This departure shall be used whenever existing weather at the ship is below Case II departure minimums and during all night operations except as modified by the OTC or commanding officer. Case III departures are compatible only with Case III recoveries. The launch shall be on departure control frequency. A minimum launch interval of 30 seconds shall be used between aircraft. When possible, a 60-second interval will be provided when launching a jet aircraft following a turboprop.

5.13.3.4.1 Jet Aircraft

Climb straight ahead accelerating at 300 knots crossing 5 nm at 1,500 feet or above. At 7 nm, execute turn to fly the 10-nm arc until intercepting the departure radial.

5.13.3.4.2 Turboprop Aircraft

Climb straight ahead to 1,000 feet, accelerating to 250 knots after level-off. At 5 nm, turn to intercept the 7-nm arc and arc to the departure radial. Maintain 1,000 feet until 12 nm on the departure radial.

Note

COD aircraft shall depart straight ahead unless otherwise directed and maintain 1,000 feet until 12 nm.

5.13.3.5 Case II/III Rendezvous

Case II/III aircraft shall rendezvous between 20 and 50 miles from the carrier on the left side of the departure radial at a prebriefed altitude (for example, 1,000 feet above the cloud layer). This does not preclude other visual rendezvous procedures as directed by air wing doctrine.

5.13.3.6 Fixed-Wing IMC at Altitude

The first aircraft of each flight shall report to departure control passing FL 180 if not on top. Unless operational necessity dictates otherwise, the departure controller shall assign aircraft that are IMC and appropriate altitude; for example, with four aircraft expected on the same departure radial, altitude assignments would be as follows:

1. First aircraft — FL 220
2. Second aircraft — FL 210
3. Third aircraft — FL 200
4. Fourth aircraft — FL 190.

Note

Carrier-based aircraft shall fly MSL altitudes below 18,000 feet MSL and flight levels at and above 18,000 feet MSL unless regional supplementary procedures, as published in the FLIP Planning document, dictate otherwise.

5.13.4 Helicopter Departure

5.13.4.1 Case I and Case II

Helicopters shall clear the control zone as directed by the tower. When departing for operations within the control zone (for example, SAR), they shall remain under control of the tower or other designated controlling agency.

5.13.4.2 Case III

Whenever possible, helicopters shall be maintained as a flight beneath the clouds. If unable to remain beneath the clouds, they shall proceed individually to prebriefed departure fixes. After takeoff, they shall climb straight ahead to between 200-300 feet (unaided), 150-300 feet (NVD aided), or as assigned by CATCC, and arc within 3 miles to intercept the assigned departure radial. Helicopters being launched from the angled deck will not cross the bow when fixed-wing aircraft are being launched. SAR helicopters will arc to the SAR pattern (see paragraph 3.6) if able to remain beneath the clouds. If the SAR helicopter is unable to remain beneath the clouds, the procedure presented above shall be carried out under positive control of CATCC and position will be taken in helicopter marshal (see Figure 6-5). The climb to departure altitude will be commenced on the departure radial outside 12 nm.

Recovering Aircraft

6.1 ARRIVAL PROCEDURES

6.1.1 Entering the Carrier Control Area

Inbound flights shall normally be turned over to marshal control for further clearance to the marshal pattern. Aircraft
that were unable to check in with strike, mission, or marshal control because of communication difficulties should
proceed as directed in Figure 4-1.

6.1.2 Arrival Information

The flight leader shall provide the following information when checking in with marshal control:

1. Position
2. Altitude
3. Fuel state (low state in flight)
4. Total number of aircraft in flight (lineup)
5. Type approach requested — UTMs sweet (if applicable)
6. Other pertinent information such as navigational aid status, hung or unexpended ordnance, weather, etc., that
   may affect recovery
7. COD load report.

6.1.3 Transient Helicopters

Transient helicopters approaching the carrier for landing shall contact marshal control at least 25 miles out.
During Case III, marshal control will clear helicopters to CV-3 holding or starboard delta as requested. Helicopters
unable to check in with marshal control because of communications difficulties should proceed as directed in
Figure 4-1.

6.2 CASE I

Note

Case I/II recoveries of fixed wing aircraft shall not be conducted concurrently with Case III departures.

This approach may be utilized when it can be anticipated that flights will not encounter instrument conditions at any time during the descent, break, and final approach. A ceiling of 3,000 feet and 5 miles visibility within the carrier control zone is required. The flight leader retains full responsibility for proper navigation and separation from other aircraft. All returning flights will check in with marshal control when entering the carrier control area or as soon as they are released by another controlling agency. Marshal control shall acknowledge the check-in and provide the following information:

1. Case recovery
2. Expected BRC
3. Altimeter
4. Expected “Charlie” time (if other than briefed).

Aircraft shall normally be switched to tower control at 10 nm after reporting the ship in sight (“see you”).

6.2.1 Jet/Turboprop Aircraft Port Holding/Spin Pattern

The jet and turboprop port holding pattern is a left-hand pattern tangent to the BRC or expected BRC with the ship in the 3-o’clock position and a maximum diameter of 5 nm. Flights shall be established at their assigned port holding pattern altitude 10 nm prior to entering the pattern. Entry shall be tangential with wings level. Minimum altitude assignment shall be 2,000 feet MSL. A minimum of 1,000 feet vertical separation between holding altitudes shall be maintained. The squadron/ unit recovery order and altitude assignment shall be as promulgated by ship/air wing doctrine. All aircraft shall maintain the prescribed separation and landing order in the port holding pattern and throughout the descent.

Departure from the port holding pattern for break entry shall be accomplished aft of the ship’s beam. Descent to the

break from the port holding pattern is commenced by the lowest aircraft or flight in time to meet the ramp time. This
descent should be planned so as to arrive at the initial (3 miles astern, 800 feet) wings level, paralleling the BRC.

WARNING

Flight leaders shall exercise caution to avoid aircraft in the tanker pattern.

The flight leader shall either execute a normal break or spin for all or a portion of his flight, depending upon the
number of aircraft in the landing pattern. A spin should normally be initiated at the bow. The spin pattern shall be
flown at 1,200 feet within 3 nm of the ship. A maximum of six aircraft shall be in the landing pattern at one time.
This number may be modified by the air officer. No aircraft shall break more than 4 miles ahead of the ship. Pilots
must exercise caution to avoid departing aircraft and aircraft in the starboard holding pattern. Should a Delta be given
after commencing descent from the port holding pattern, but prior to entering the landing pattern, aircraft shall climb
or descend as required and enter the spin pattern (1,200 feet) unless specifically directed otherwise. Aircraft in the
landing pattern shall continue to maintain proper interval, flying the landing pattern at 600 feet until otherwise
directed. Flights directed to spin or reenter the port holding pattern shall climb only on the upwind or crosswind leg
ahead of the ship’s beam. Aircraft reentering the break from the spin pattern have priority over aircraft entering from
the port holding pattern.

6.2.2 COD Aircraft Starboard Holding

The starboard holding pattern shall be a right-hand racetrack pattern between 45 and 135 relative to the BRC at
500 feet or at 1,000 feet if approved by the air boss, with the closest point of approach no closer than 1 nm. When
ready, the air officer will give a Charlie to aircraft in the starboard holding pattern.

6.2.3 Helicopters

Helicopters shall proceed to hold avoiding the areas depicted in Figure 4-3 during fixed-wing operations. Unless
previously briefed to the contrary, when more than one helicopter is operating in the holding pattern, all helicopters
shall fly a right-hand pattern at 300 feet maintaining 80 knots.

6.2.4 VFR Day Fixed Wing Carrier Landing Pattern

The landing pattern depicted in Figure 6-1 is used by fixed wing aircraft during day VFR (Case I/II) operations. The
purpose of day case I/II operations is to allow for a primarily pilot controlled pattern and reduce total recovery time
compared to case III operations.

6.2.4.1 Landing Pattern Entry

Entry into the break shall be made at 800 feet. All breaks shall be level. A descent to 600 feet to intercept the
downwind leg of the landing pattern shall commence when established downwind. Descent to 600 feet shall be
completed before reaching the 180 position.

6.2.4.2 Downwind Leg and Approach Turn

The landing pattern downwind leg is flown at 600 feet, 1 to 1-1/2 nm abeam the ship’s stern. Aircraft in the VFR Day
Landing Pattern should be established in the intended landing configuration, wings level at 600 feet with landing
checklist complete by the 180. At the 180, the aircraft should begin the approach turn and gradual descent to pass
the 90-degree position at 450 to 500 feet. The pilot should continue the approach turn until intercepting the extended
centerline of the ship’s angled deck and acquire the optical landing system meatball image. The approach turn from
the 180 to the start should take 45 seconds.

6.2.4.3 Groove and Touchdown

The aircraft should roll wings level on centerline with a centered ball to allow a 15 – 18 second groove before aircraft
touchdown on deck. At touchdown the pilot shall add power as appropriate, and prepare to bolter. Following
arrestment, the pilot shall follow the instructions of the aircraft directors and comply with the procedures in NAVAIR
00-80T-120 (CV Flight/Hangar Deck NATOPS manual).

6.2.4.4 Waveoffs

Pilots shall be prepared to be waved off at any time during a landing approach. Aircraft approaching in an unsafe
condition or situation (e.g., too low, insufficient interval, etc) will be waved off rather than be allowed to continue

to touchdown. Upon being directed to wave off, pilots shall add power as necessary to stop the aircraft’s rate of descent
and commence a climb.

6.2.4.5 Landing Pattern Upwind Leg

Once clear of the ship following a waveoff, touch and go, or bolter, the pilot shall turn to parallel the BRC. Corrections
to parallel the BRC shall not be attempted until a definite climb has been established. The climb to 600 feet landing
pattern altitude should normally be completed prior to commencing the turn to the downwind leg. Aircraft continuing
in the landing pattern shall take normal interval on other traffic in the pattern.

6.2.4.6 Landing Pattern Departure

Aircraft departing the case I/II pattern shall remain in the pattern until established on the upwind leg. From the
upwind leg, aircraft shall clear the pattern by executing a 20 turn to starboard followed by a 20 turn reversal to
parallel the BRC.

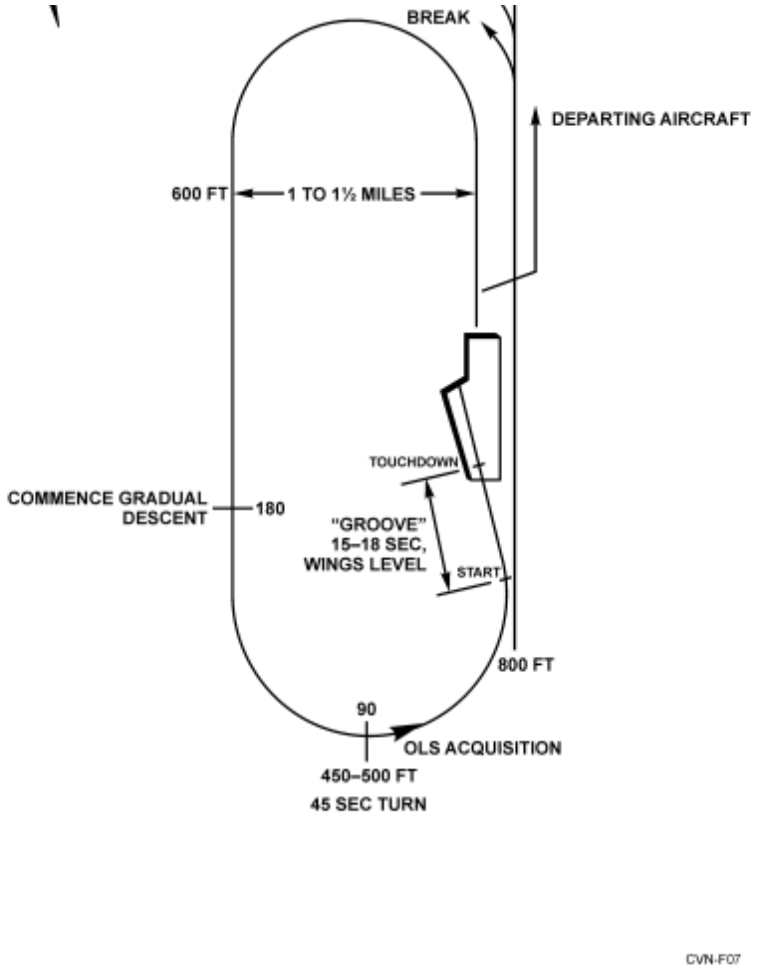


Figure 6-1. VFR Day Fixed

Wing Carrier Landing Pattern

6.2.5 Voice Reports

Flight leaders shall make the following voice reports

POSITION	REPORT
Descending from the port holding pattern	“Commencing”
Three miles astern	“Initial”
Entering spin pattern (when applicable)	“Spinning”
Departing the landing pattern to reenter port holding.	“Departing_____nm upwind”

6.2.5.1 Low Visibility Voice Reports: Anyone Can Recommend Low Visibility Reports

The following additional calls shall be used by flight leaders upon Air Officer’s announcement of “99 low-vis-calls.”
“Commencing”
“Initial”
“Breaking at___nm”
“Departing at ___DME”
“Spin 90”

Flight leaders should amplify low-vis calls as required to add to overall situational awareness and safety of flight
(e.g. – “501, commencing from angels 4 with 2”).

6.2.6 ZIP LIP

Case I procedures shall apply, except for elimination of prescribed voice reports. The flight leader first in recovery
order shall observe the deck and plan his recovery to be at the ramp as soon as a ready deck is available. Should
unprogrammed, unbriefed, or straggler flights arrive for recovery, ZIP LIP shall be broken as required to ensure safety
of flight.

Note
ZIP LIP shall be broken anytime an apparent safety of flight situation develops.

6.2.7 Drag

If a straight-in approach (drag) is requested, it shall be initiated at sufficient distance astern for the aircraft to be
established positively on glidepath and approach airspeed at a minimum of 1-1/2 nm for jet/turboprop aircraft.

6.3 CASE II

This approach shall be utilized when weather conditions are such that the flight may encounter instrument conditions
during the descent, but visual conditions of at least 1,000 feet ceiling and 5 miles visibility exist at the ship. Positive

control shall be utilized until the pilot is inside 10 nm and reports the ship in sight. During Case II recoveries, CATCC
shall be manned and prepared to assume control of a Case III recovery in the event weather conditions deteriorate.
The maximum number of aircraft in the landing pattern is limited to six.

Note

Case II recoveries shall not be conducted concurrently with Case III departures. Should doubt exist regarding the ability to maintain VMC, Case III recoveries shall be utilized.

Penetrations in actual instrument conditions by formation flights of more than two aircraft are not authorized. Flight
leaders shall follow Case III approach procedures outside of 10 nm. When within 10 nm with the ship in sight, flights
will be shifted to tower control and proceed as in Case I. If the flight does not have the ship in sight at 10 nm, the
flight may descend to not less than 800 feet. If a flight does not have the ship in sight at 5 miles, both aircraft shall
be vectored into the bolter/waveoff pattern and action taken to conduct a Case III recovery for the remaining flights.

Note

Weather conditions permitting, helicopters may be assigned Case I procedures concurrently with Case II and III fixed-wing aircraft operations.

6.4 CASE III

This approach shall be utilized whenever existing weather at the ship is below Case II minimums and during all flight
operations conducted between one-half hour after sunset and one-half hour before sunrise except as modified by the
OTC or carrier commanding officer. Night/IMC Case III recoveries shall be made with single aircraft. Section
approaches will be approved only when an emergency situation exists. Formation penetrations/approaches by
dissimilar aircraft shall not be attempted except in extreme circumstances where no safer options are available to
effect a recovery.

Note

Case III recoveries may be conducted concurrently with Case I and II launches.

At night during VMC conditions, helicopters may be cleared to the starboard holding pattern. The same airspeed and
spacing restrictions will apply as in day VMC.

6.4.1 Marshal Procedures

6.4.1.1 Jet/Turboprop Aircraft

The primary TACAN marshal fix is the 180 radial relative to the expected final bearing at a distance of 1 mile for
every 1,000 feet of altitude plus 15 miles (angels +15). The holding pattern is a left-hand, 6-minute racetrack pattern.
The inbound leg shall pass over the holding fix. In no case will the base altitude be lower than 6,000 feet.

6.4.1.2 Helicopters

The primary TACAN marshal is the 110 radial relative to the expected final bearing at a distance of 1 mile for every
500 feet of altitude, starting at 1,000 feet and 5 miles. The holding pattern is a right-hand racetrack pattern with 2-nm
legs. The inbound leg shall pass over the holding fix.

6.4.1.3 Emergency Marshal Fixes

All fixed-wing aircraft are issued an emergency marshal radial 150 relative to the expected final bearing at a distance
of 1 mile for every 1,000 feet of altitude plus 15 miles (angels +15). Lowest altitude for assignment is 6,000 feet for
turboprop/jet. Holding sequence is jets, then turboprops. Holding procedures are right-hand, 6-minute racetrack
patterns. The inbound leg shall pass over the holding fix. Helicopter emergency marshal radial is the same as normal
helicopter marshal radial with helicopter emergency holding normally commencing at 7 miles.

6.4.1.4 Overhead Marshal

Overhead marshal may be utilized as geographical or operational circumstances necessitate. The assigned inbound
magnetic heading to the holding fix should coincide with the outbound magnetic radial of the

approach. If overhead
marshal is used as the emergency marshal fix, EEATs should be every other minute.

6.4.1.5 En Route Radar Approaches

In the event an aircraft or flight cannot reach the marshal point in time to make an assigned approach time, an en route
radar approach may be used to place the flight in the proper approach sequence.
The marshal/approach controller shall employ positive radar control and provide the pilot the purpose and a brief
description of the intended penetration whenever possible.

6.4.1.6 Marshal Altitude Assignment

Every effort should be made to anticipate weather conditions and provide marshaling in visual conditions if practical.
Aircraft below an overcast should not be required to climb into the overcast to comply with base altitude limits if
marshal control can safely exercise control below the overcast. Those aircraft above an overcast should be assigned
altitudes above the overcast and retained in formation where possible. Formation flights shall be limited to a
maximum of four aircraft at any one assigned altitude. Under instrument conditions, a section of two aircraft is the
maximum number authorized in any one flight.

6.4.1.7 Marshal Altitude Separation

Fixed-wing aircraft will normally have a minimum of 1,000 feet verical separation.Vertical separation may be
reduced to 800 feet when inside 12 nm. Helicopters shall be separated by a minimum of 500 feet vertically.

6.4.1.8 Marshal Airspeed

Aircraft will normally fly at airspeeds in accordance with the applicable aircraft NATOPS flight manual.

6.4.1.9 Bow-On-Recovery

A bow-on-recovery occurs when the marshal radial is located ahead of the carrier. Significant potential conflict exists
between departing and recovering aircraft due to airspace constraints associated with opposite direction traffic flow
and the existence of an AN/SPN-43 radar “blind spot” ahead of the ship. CATCC shall communicate bow-on-recovery to all aircrew as soon as bow-on-recovery is determined. Departing aircraft will

receive positive
control to ensure departing aircraft remain clear of recovering aircraft until course conflict is resolved. CATCC shall
provide recovering aircraft positive control and sequencing to ensure adequate separation is maintained.

6.4.2 Marshal Instructions

Marshal control shall ensure the following information has been provided each aircraft prior to entering marshal:

1. Case recovery
2. Type approach
3. Expected final bearing
4. Altimeter
5. Marshal holding instructions
6. Expected approach time
7. Expected approach button
8. Time check
9. Vector to marshal (if required)
10. Multiple marshal stack information (radials/altitudes).

Note

When overhead marshal is utilized, the assigned outbound penetration bearing shall be updated during recovery to maintain a minimum of 25 clockwise from the reciprocal of the final bearing.

6.4.3 General Instructions

The following information shall be provided prior to commencing the penetration/approach:

1. Case recovery
2. Type approach
3. Final bearing
4. Weather and deck conditions
5. Divert field/fuel data
6. Time hack (30 seconds minimum) using GPS time
7. USW datum (if applicable)
8. Density altitude (if applicable)
9. MOVLAS recovery, including station number and location (tactical situation permitting)
10. COD RETRO report (if applicable).

To reduce radio traffic, items of general or collective interest may be transmitted as a “99” broadcast by marshal or

approach control.

6.4.4 Departing Marshal

Each pilot shall adjust his holding pattern to depart marshal at the assigned EAT. Early or late departure shall be
reported to marshal control immediately so that control adjustments can be accomplished if required.

6.4.5 Initial Separation

Unless weather or operating circumstances dictate otherwise, aircraft departing marshal will normally be separated
by 1 minute. Adjustments may be directed by CATCC, if required, to ensure proper separation.

6.4.6 Frequency/IFF/SIF Changes

Changes in radio communication frequencies, IFF and/or SIF mode/code that require accomplishment by the pilot
should be made no later than platform except under emergency conditions. The aircraft shall be in straight and level
flight should such changes be required below an altitude of 2,500 feet.

6.4.7 Instrument Approach Procedures

The approaches described in this paragraph are designed primarily for single-carrier operations; however, with slight
modification, they can be used for the following:

1. Multiple-carrier operations
2. Letdown under reduced navigation and control
3. Letdown using SAR as navigational aids with AEW control
4. Recoveries during EMCON conditions.

The approach charts (Figures 6-2 to 6-5) are designed for use with all aircraft carriers regardless of weather conditions.
It is incumbent on each ship to utilize the standard approaches so that pilots may safely transition from ship to ship
or from visual to instrument conditions with a minimum change in operating procedures.

6.4.7.1 Approach Minimums

The commanding officer shall establish approach minimums that reflect significant changes in operational
capabilities, such as may be occasioned by decreased proficiency of the CATCC or embarked air wing. However,

absolute minimums are as provided in Figure 6-6 (see LSO NATOPS Manual for CARQUAL minimums).
When a suitable bingo field is available, aircraft shall not commence an approach if the reported weather is below
the minimums in Figure 6-6 unless it has been determined that the aircraft has sufficient fuel to proceed to the bingo
field in the event of a missed approach.

6.4.7.2 Penetration/Approach

1. Jet/turboprop aircraft shall descend at 250 KIAS and 4,000 feet per minute until platform is reached, at which
   point the descent shall be shallowed to 2,000 feet per minute. Unless otherwise directed, aircraft shall
   commence transition to a landing configuration at the 8-nm fix.
2. Helicopters shall descend at 90 knots and 500 feet per minute from marshal, crossing 145 relative to the final
   bearing at or above 900 feet. Unless otherwise directed, helicopters shall commence transition to a landing
   configuration prior to the 3-nm fix.

6.4.7.3 Correcting to the Final Bearing

1. Jet or turboprop aircraft on the CV-1 approach will correct from the marshal radial to the final bearing at 20
   miles in the following manner:
   - The pilot shall make a gradual correction when the final bearing is within 10 of the reciprocal of the
     marshal radial.
   - The pilot shall turn 30 when the final bearing is greater than 10 from the reciprocal of the marshal radial.
     If not established on the final bearing at 12 miles, the pilot shall fly the 12-mile arc until intercepting final
     bearing.
2. Aircraft on the CV-2 approach shall correct to the final bearing in the following manner:
   - If final bearing decreases, fly 90 of penetration turn and arc to the new final bearing.
   - If final bearing increases, fly the standard penetration turn continuing to intercept the new final bearing prior
     to the 10-mile DME fix.

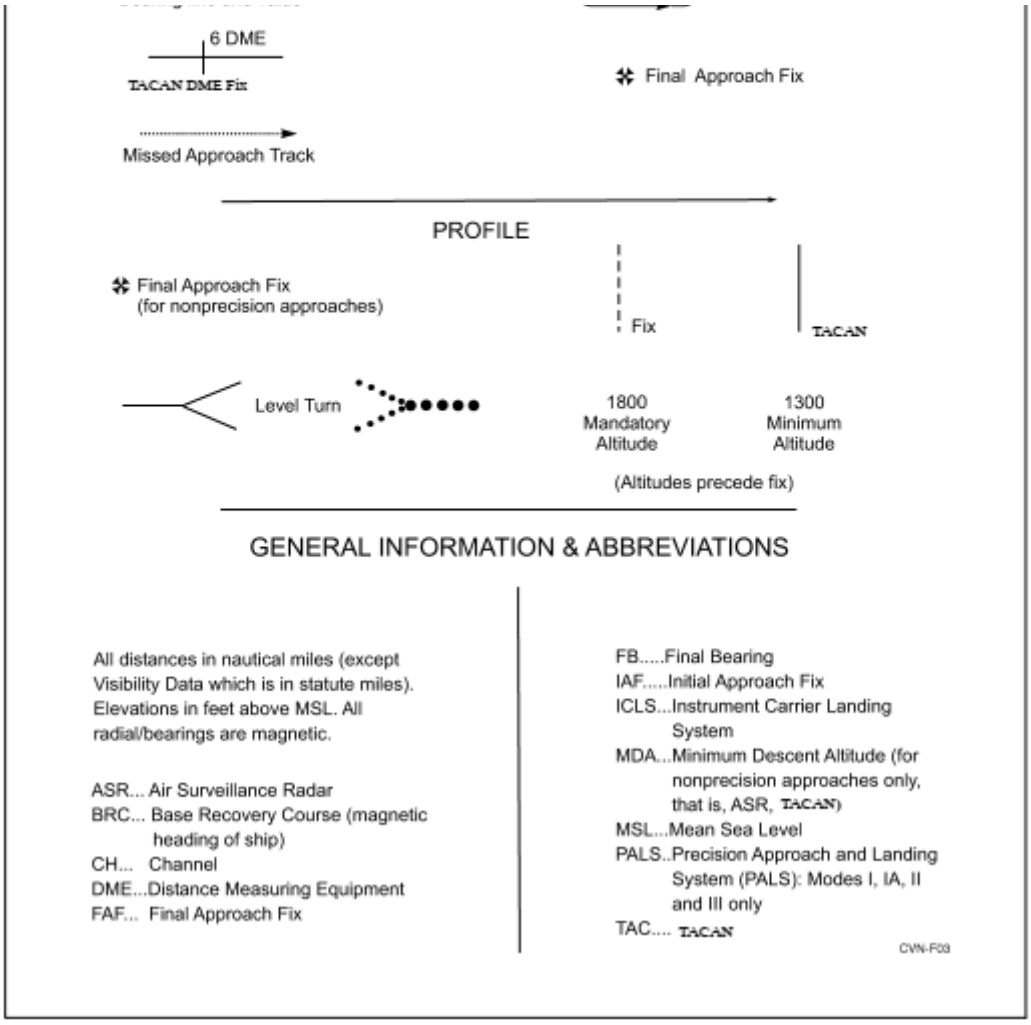
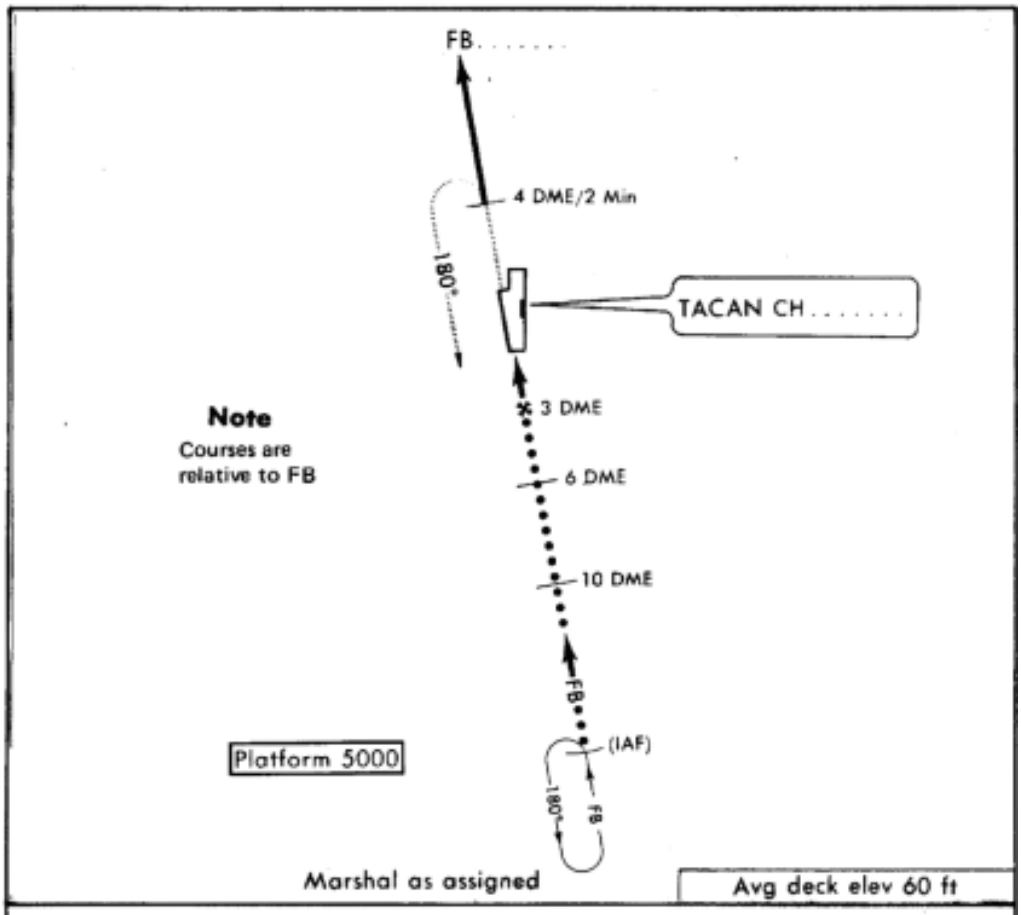
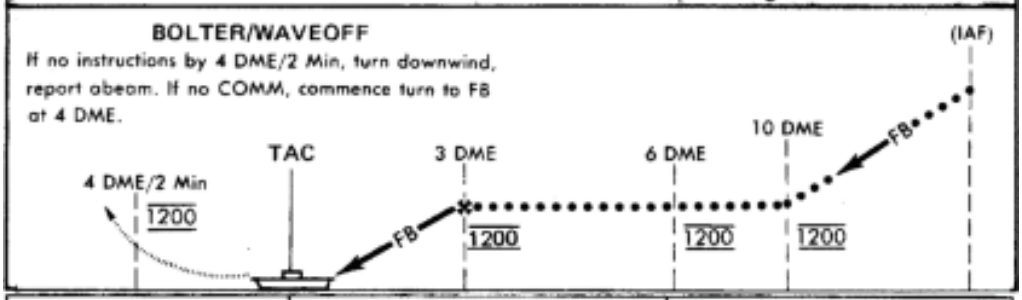


Figure 6-2. Legend Chart

for Aircraft Carrier Instrument Approach Proceduress

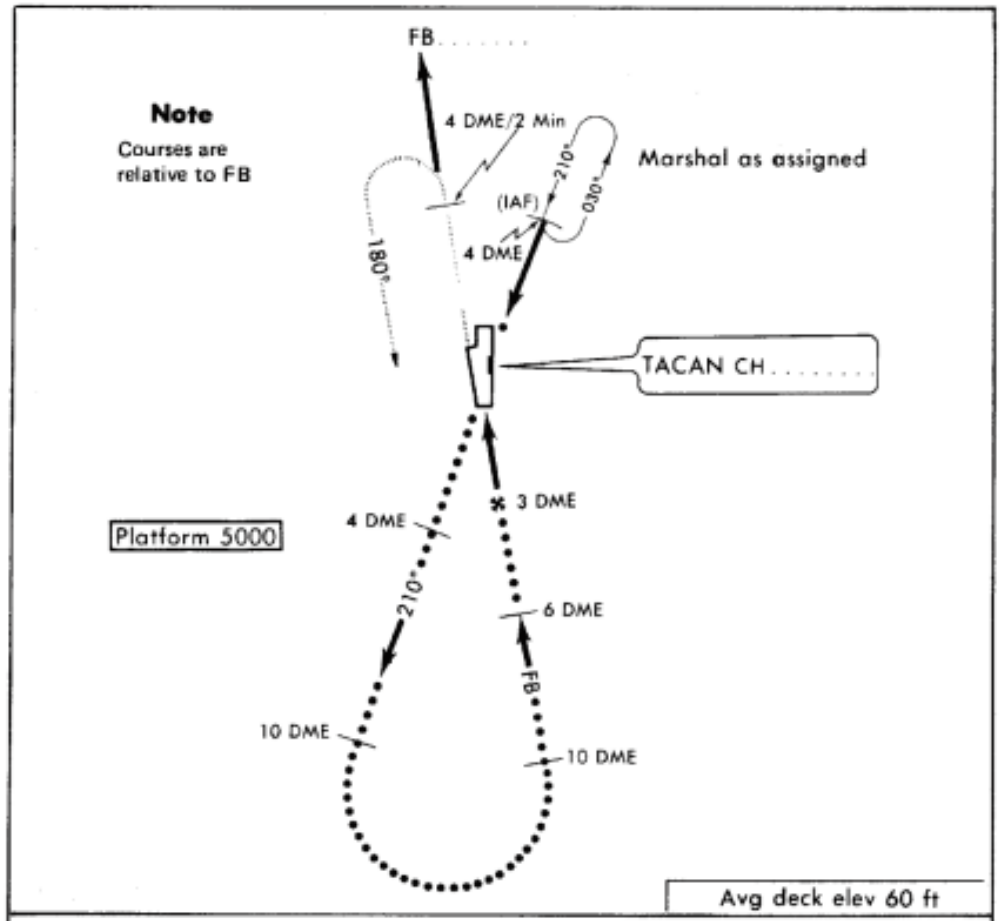




CATEGORY	JET	TURBOPROP
ICLS	360-3/4	300 (300-3/4)
ICLS/ILM with SPN-42/46 monitor	(Mode 1 — As Certified)	
S—PALS	260-1/2	200 (200-1/2)
S—ASR	600-1-1/4 540 (600-1-1/4)	400-1 340 (400-1)
S—TAC		

CVN-F04

Figure 6-3. Approach Chart CV-1 TACAN (Jet and Turboprop)



CATEGORY	JET	TURBOPROP
ICLS	360-3/4	300 (300-3/4)
ICLS/ILM with SPN-42/46 monitor	(Mode 1 — As Certified)	
S—PALS	260-1/2	200 (200-1/2)
S—ASR	600-1-1/4 540 (600-1-1/4)	400-1 340 (400-1)
S—TAC		

CVN F05

Figure 6-4. Approach Chart CV-2 TACAN Overhead (Jet and Turboprop)

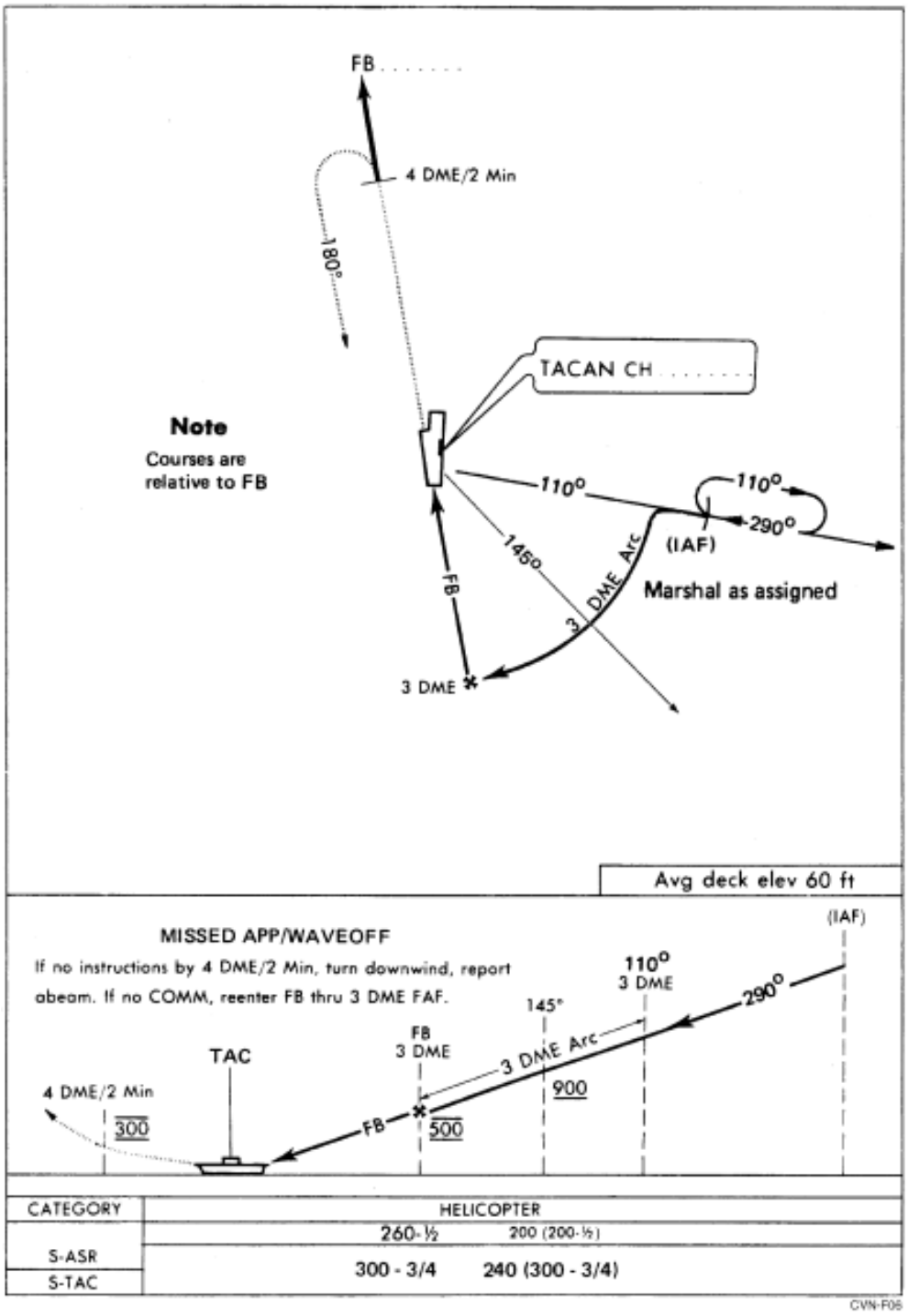


Figure 6-5. Approach Chart CV-3 TACAN (Helicopter)

6.4.8 Missed Approach/Waveoff/Bolter

Jet and turboprop aircraft shall climb straight ahead on the extended final bearing to 1,200 feet altitude and wait for
instructions from approach control.
Helicopters shall climb straight ahead on the extended final bearing to 300 feet altitude and await instructions from
approach control.
All waveoff/bolter pattern turns shall be level.
If no instructions are received prior to reaching 4 miles or 2 minutes ahead of the ship, the pilot will

attempt to make
contact with the ship, giving identification and position. If instructions are not received, he will assume
communication failure and execute a turn downwind reporting downwind abeam. If radio contact is not reestablished,
he will proceed downwind and reenter as follows:

1. Fixed-wing aircraft commence turn to final at the 4 nm DME or 2 minutes past abeam position.
2. Helicopters reenter through the 3 nm DME fix or turn inbound 2 minutes past abeam.
3. PALS aircraft shall be alert for data-link displays.

6.4.11.2 Aircraft in Company

An aircraft with navigation and/or communication equipment inoperative in the company of an escort aircraft with
navigation and communication equipment in working order will be handled as a single aircraft in the recovery
procedure. The escort aircraft becomes the flight leader and will visually communicate with the distressed aircraft
in accordance with standard aircraft NATOPS procedures. The distressed aircraft will assume a position o the
starboard wing of the lead aircraft. Transition to landing configuration should be made clear of clouds either above
or below the overcast as desired. The controller shall be advised when this transition does/will occur, when the lead
aircraft has the OLS in sight, he will visually communicate a lead change and break off to the left. The distressed
aircraft will continue a visual approach to landing. The escort aircraft will parallel the final bearing course and
maintain a position so as to be easily acquired and be rejoined by the distressed aircraft in the event of a bolter or
waveoff. Unless otherwise directed, the escort aircraft will repeat the above procedures until the distressed aircraft
is recovered and then continue normal procedures for his own recovery. The SPN-42/46 radar should be locked onto
the lead aircraft. The PALS final controller should instruct lead aircraft “beacon on,” wingman “beacon off,” and then
select “beacon lock only” on the SPN-42/SPN-46 console.

If the address of the escorted aircraft is inserted in the PALS, the escorted aircraft will receive needle information. When the lead aircraft breaks away on OLS acquisition, this may give the escorted aircraft an erroneous “fly down, fly right” presentation on the needles. The displayed error may become progressively larger as both aircraft close on the ship regardless of the approach actually being flown by the escorted aircraft.

6.4.11.3 Failure of Carrier Navigation Aids/CATCC Radars Prior to Approach

Individual ships should develop special procedures to recover airborne aircraft in the event of a casualty to shipboard
air traffic control equipment. Selection of special/alternate approach procedures will be dictated by the availability
of suitable navigational equipment aboard escort ships and/or embarked aircraft. Should the use of assist navigation equipment or utilization of airborne radar and control become necessary, approach minimums, separation
between aircraft, and size of the recovery will be adjusted so as to ensure safety of recovery operations.

6.4.12 Radar Handoff Procedures

Positive radar identification shall be accomplished by the receiving agency prior to transfer of control. Control will
be transferred only after the receiving agency has notified the transferring agency that positive radar contact has been
established.

6.4.13 Voice Communication Procedures

6.4.13.1 Compulsory Arrival, Marshal, and Approach Voice Reports

1. Entrance into carrier control area — Information required from flight leader (see paragraph 6.1)
2. Receipt of:
a. Marshal instructions
b. Type recovery

c. EAT or Charlie time
d. Altimeter setting
3. Entering holding/marshal with altitude, fuel state, and hung/unexpended ordnance (if any)
4. Altitude changes
5. Commencing approach, with fuel state, altimeter setting
6. Frequency changes
7. Platform (jet/turboprop aircraft)
8. Ten miles (jet/turboprop aircraft)
9. “Coupled/needles” as appropriate and “command control” if Mode I/IA approach
10. Three miles (helicopters)
11. Breaking away (section approaches only)
12. Ball call report — (side number, aircraft type, ball or Clara/Clara lineup, fuel state, hung/unexpend ordnance, coupled/uncoupling (if applicable), automatic/manual)
13. Waving off
14. Abeam, with fuel state after bolter/waveoff.

6.4.13.2 Phraseology

Standard ATC and precision instrument approach phraseology shall be used with the following exceptions:
1. Fuel state reports (thousands of pounds; for example, “3.5”)
2. Altitude (angels; for example, “1.2”)
3. Heading changes on Case III final approach after lock-on or final radar contact (normally soft headings; for

example, “301, right five”).

6.5 RECOVERING FIXED-WING AIRCRAFT

6.5.1 Preparation for Recovery

Preoperational checks of the arresting gear, optical landing aids, and associated equipment are ordinarily completed
before the beginning of air operations; therefore, preparation for recovery generally consists of nothing more than
manning the necessary stations. Whenever fixed-wing aircraft are airborne, all arresting gear equipment sha be
maintained in a ready status unless the commanding officer has granted permission to place specific iten equipment out of commission for maintenance or other reasons.

Fifteen minutes before each scheduled recovery or immediately upon hearing the word passed to prepare to recover
aircraft, personnel will man stations and take the following preparatory actions.

The air officer shall perform the following:

1. Confirm the recovery time with CATCC and the bridge.
2. Obtain the expected BRC.
3. Provide CATCC the break time for Case II recoveries or ramp time for Case III recoveries.
4. Monitor/update fuel status of returning aircraft, information on hung or unexpended ordnance, aircra emergencies, if any, and the current altimeter setting.
5. Confirm with the bridge that the fantail and adjacent sponson(s) are secured during recovery of fixed-win aircraft.

The ILARTS and PALS radar operators shall ensure equipment is turned on and operating.

The PriFly lens operator shall receive permission from the air officer prior to turning on lens.

The recovery equipment controller in PriFly shall perform the following:

1. Ensure all arresting gear engines, the arresting gear deck-edge station, ILARTS room, and lens room ai manned and ready to recover aircraft.
2. Report to the air officer when all stations are manned, giving the existing arresting gear engine and ler settings.

The arresting gear officer shall perform the following:

1. Inspect the landing area for loose gear.
2. Ensure all after deck-edge antennas are positioned as required.
3. Check the condition of crossdeck pendants, barrel fittings and wire supports, and ensure retractable sheaves
are in the raised position.
4. Ensure all aircraft and mobile equipment parked on the flight deck are inside the safe-parking line.
5. Ensure hook runners and the deck-edge operator are on station.
6. Ensure the ready barricade, including deck ramps, is in a ready status, with a clear route to the area and a tractor
with driver is standing by.
7. Ensure waist catapult slot buttons are installed in accordance with current bulletins and ensure the deck status

light is operating.
8. Notify PriFly when the deck is ready.
The flight deck officer shall perform the following:
1. Ensure the mobile crane, a forklift, and a tractor are warmed up and that drivers are standing by. Also ensure
operationally ready mobile firefighting equipment is manned and that all have clear access to the flight deck.
2. Ensure the crash crew is on station and that directors and plane handlers in sufficient number are standing by.
3. Ensure the flight deck area is clear of all unnecessary personnel.
4. Ensure the flight deck is clear of unnecessary equipment and that all deck hatches in the landing area are closed
and properly secured prior to signaling a ready deck forward.

The LSO shall perform the following:
1. Conduct a two-way radio check and sound- powered phone checks on appropriate circuits.
2. Check the landing area lights and lens for proper brilliance when turned on and check the cut and waveoff lights
for proper operation.
3. Ensure the following distress equipment is available at the LSO platform:
a. Battery-powered marker
b. Life preserver ring
c. Very pistol
d. Search and rescue sonobuoy
e. Aldis lamp (night operations only).
The catapult officer shall ensure the following:
1. Catapult shuttles are properly positioned and shuttle cover installed on catapult 3.
2. Track slot seals are in place on bow catapults (except during CARQUALs).
3. Catapult deck gear is clear of landing area.
4. For ships so equipped, waist ICCS is fully lowered.
The weapons officer shall ensure the following:
1. An EOD representative shall be stationed in flight deck control during all operations when aircraft are carrying
weapons. Unless assistance is required, EOD personnel should not normally be exposed to the flight deck during launches or recoveries.
2. The EOD officer, Air Gunner, and air wing weapons officer are equipped with an SRC-22 (or equivalen communication set during launch and recovery operations.

6.5.2 Flight Deck Procedures

For detailed flight deck procedures, refer to CV Flight/Hangar Deck NATOPS Manual (NAVAIR 00-80T-120).

6.5.3 Special Safety Precautions

Observe the following safety precautions.
1. While aircraft are being recovered, no personnel other than those required by this instruction shall be in th catwalks, on the flight deck, or in the arresting gear engine rooms or ILARTS/lens room without the express

permission of the air officer.
2. The deck will be considered foul any time unauthorized personnel are in or around aircraft parked adjacer to the landing area.
3. Personnel shall not stand in or otherwise block entrances to the island structure or exits leading off the catwalks.

4. Personnel shall not sit on missile equipment, chocks, deck-edge coaming, or any other object during fligl quarters or while aircraft is turning on the flight deck. Personnel should not turn their backs on aircraft landing
or taxiing out of the gear.
5. In taxiing aircraft out of the gear, directors must be aware of the activities of the hook runner, tillerbar man,
and wing riders.
6. All taxi signals shall be answered promptly and accurately unless the pilot considers that a dangerous situation
exists or is developing, in which case he shall stop immediately.
7. If a pilot loses sight of his director, he shall stop immediately. The director shall exercise care to remain in plain
view of the pilot at all times.
8. No director shall give signals to a pilot who is being controlled by another director except in an attempt to avert
an accident.
9. Personnel having reason to suspect the readiness or condition of any arresting gear engine, crossdeck pendant,
or associated equipment shall immediately cause the deck to be fouled by informing the arresting gear officer,
deck-edge operator, and the recovery equipment controller in PriFly.
If the arresting gear crew is required to enter the landing area during aircraft
recovery, a safety person shall be stationed forward of that crew, facing aft,
to ensure the arresting gear crew is warned of approaching aircraft in time
for them to safely exit the landing area.
10. If during recovery operations any part of the aircraft affecting safe recovery strikes the ramp, aircraft, or other
equipment on deck or ship’s structure other than normal flight deck protrusions (crossdeck pendants, flight deck light covers, ILARTS heads, or waist catapult ramps) and the aircraft subsequently bolters, no further effort shall be made to effect a normal carrier arrestment.
11. PALS radar beacon-equipped aircraft parked or taxiing aft of the island shall have the beacon switch in off or
standby position during recovery operations. Aircraft preparing for launch shall delay PALS beacon self-test until forward of the island or airborne.
12. Pyrotechnic devices shall not be used in marking aircraft accident sites to preclude igniting aviation fuel
To minimize the possibility of an aircraft landing on a foul deck, the following procedures are mandatory.
1. The lens (and at night, the landing area lights) shall never be turned on without the express permission of

the
air officer.
2. Except for the purpose of conducting tests, neither the lens nor the landing area lights shall be turned on until
the controlling LSO establishes positive communications with the air officer.
3. The waveoff lights shall be continuously activated anytime the lens or landing area lights are turned on an the LSO is not on the platform.
4. Aircraft shall be permitted to conduct practice CCA approaches, including PALS approaches. When the OLS
is on and deck lights (night only) are on, PriFly and the LSO platform shall be manned by qualified personnel.
Both stations will have communications with the aircraft; assigned minimums shall be no lower than 200 feet and one-half mile. With OLS and deck lights (night only) off, the LSO platform need not be manned. CCA

shall not assign minimums lower than 500 feet and 1 mile. In all cases, CCA will issue, “This is a practice approach to a low approach only. Upon reaching (minimums), execute waveoff.”
5. To avoid unnecessary delay in recovering the first aircraft, the lens and/or landing area lights may sometimes
be turned on a short time before the ship is completely ready to commence recoveries. When this is done, the LSO shall wave off approaching aircraft at a distance of one-half mile or greater if he has not received the “clear
deck” signal.
6. During instrument recoveries, PriFly will keep CATCC advised as to the status of the deck and provide th estimated time the deck will be clear. CATCC shall keep PriFly advised as to the type and position of the nearest
aircraft.
7. Combat and CATCC must keep PriFly informed of any aircraft known or suspected to have radio failure.
8. After calling “ball,” if no verbal/visual acknowledgment of positive control by the LSO is received, the pilot
shall execute his own waveoff early enough to clear the landing area by 100 feet above flight deck level.
The deck is foul when any of the following conditions exist:
1. The red rotating beacon is on.
2. Personnel, aircraft, support equipment, or loose gear are in the landing area.
3. Arresting gear engines are not properly set and in battery.
4. There is a known or suspected malfunction of recovery equipment.
5. After each touch and go, arrestment, bolter, or waveoff.

Note

During night operations when the deck is open, but momentarily foul, the
landing deck lights will remain on and foul deck waveoff will be controlled
by the LSO.

During night operations, green wands shall be used only by those air department personnel authorized to launch
aircraft or signal a clear deck.

6.5.4 Control of the Landing Pattern (VMC)

The air officer is charged with the overall control of the VMC landing pattern (Figure 6-1) and is assisted by the LSO.

Specific responsibilities are assigned as follows.

6.5.4.1 Air Officer

1. Provide pilot with sufficient information to ensure that aircraft are established in the landing pattern in time
to meet the expected Charlie time.
2. Assign or revise the landing order as necessary.
3. Regulate the number of aircraft in the landing pattern to ensure a steady flow of traffic while preventing the
pattern from becoming extended or overcrowded.
4. Monitor the landing interval.
5. Whenever possible, maintain visual contact with all aircraft in the Charlie pattern.
6. Maintain an accurate count of the number of aircraft to be recovered and inform the bridge when only tw
remain.

7. Monitor the upwind pattern, being particularly alert to warn pilots of aircraft boltering or waving off of their
proximity to aircraft launching or breaking.
8. Maintain visual contact with aircraft that have radio failure and instruct the LSO with regard to visual signals
to be given.
9. Inform the LSO of any unusual condition(s) affecting the normal recovery of aircraft.

6.5.4.2 LSO (Under the Supervision of the Air Officer)

1. Control all fixed-wing aircraft approaches after the 180 position.
2. Ensure that approaching aircraft are properly configured.
3. Monitor the operation of the OLS and cross check the approach radar/ICLS glidepath angle.
4. Instruct and supervise the LSO talker and hook spotter.
5. Assist in controlling aircraft that have radio failure by flashing the cut or waveoff lights in accordance wit
signals delineated in Figure 6-11.
6. Whever possible, maintain visual contact with all aircraft in the Charlie pattern.
7. Inform the air officer of any unusual conditions affecting the safe recovery of aircraft.

6.6 RECOVERING HELICOPTERS

6.6.1 Recovery Procedures

When recovering after night plane guard duties, helicopters should be provided positioning information by CATCC
in order to expeditiously intercept the glideslope and effect a landing following recovery of the last fixed wing
aircraft. When a flight of helicopters is being recovered under VMC, the leader of the flight should plan to be at the
ramp within a minimum safe interval after the last fixed ?wing aircraft has landed. The helicopter which is the

farthest
advanced on the inbound radial and has not turned to parallel the ship’s course will be considered No. 1 in the landing
pattern and should expeditiously effect a landing following recovery of the last fixed?wing aircraft. The helicopter
cleared No. 1 to land should be assigned a landing spot farthest forward into the wind. Subsequent helicopters should
be cleared to land in sequence behind the No. 1 helicopter. In the event the last fixed?wing aircraft waves off, all
helicopters shall reposition in the pattern (with CATCC assistance as required) to take interval on that last fixed?wing
aircraft. Prior to issuing landing clearance, the air officer shall ensure the helicopter may land within the relative wind
envelope prescribed in the respective aircraft NATOPS flight manual, and the tower shall transmit relative wind
direction, speed, and landing spot(s). For landings not oriented to the angle or axial centerline (day VMC only), the
air officer will ensure an adequate waveoff path is available to the helicopter.

Because of the severe rotorwash and wing-tip vortices produced by CH-53E, MH-53E and V-22 aircraft, land/launch operations should not be conducted upwind of other aircraft or any unsecured area. Because of this severe hazard, consideration should be given to conducting CH-53E, MH-53E and V-22 operations from after-deck spots only.

Note

Rotating beacon light signals for helicopter operations are contained in the Aircraft Signals NATOPS Manual (NAVAIR 00-80T-113).

Army helicopters are not equipped with an automatic blade fold/spread system. Time for manually folding and spreading main rotor blades should be taken into account for tactical planning during shipboard operations.

Certain Army and Air Force helicopters are not equipped with a rotor brake. Extended rotor coast down times can be expected. These times can vary with relative wind speed and direction, and can exceed 8 minutes in winds as light as 20 knots. The ship shall be ready to provide optimum winds for the windmilling stop of the rotor system.

During Case III recoveries, the approach shall be flown as directed by CATCC until the pilot acquires visual contact
with the optical landing aids, at which time the pilot shall “call the ball.” Control will then be assumed by th air
officer, who shall issue final landing clearance. In the event of a waveoff, the pilot shall parallel the final bearing
course and report to CATCC for control. At night, navigation lights shall be steady bright and anticollision

lights on
until established on the final bearing, at which time the position lights shall be placed on dim and steady. The forward anticollision light shall be turned off when the meatball is in sight.
When the word is passed to stand by to land helicopters, the LSE shall take a position clearly visible to the pilot. The
tower will obtain a “gear down” report from the pilot before issuing final landing clearance. As the helico approaches, the LSE shall ensure the landing gear is down, the rotating beacon that controls his area of the flight deck
is green or amber, as appropriate, and that the landing area is clear of personnel, equipment, and loose gear.
Except in unusual circumstances, helicopters shall be landed only on marked spots visible to the pilot during the final
approach.
Except for the “waveoff” and “hold” signals, the LSE signals will be accepted as advisory and the pilot has full
responsibility for the proper and safe operation of the aircraft. At night when two or more helicopters are landing,
the navigation light shall remain STEADY/DIM and the tail anticollision light shall remain ON until touchdown.
After landing and before disengagement, chocks will be placed on the main wheels and the initial aircraft tiedowns
will be attached by the deck crew. A hold signal will be given by the LSE while tiedowns are being attached to indicate
that an unsafe takeoff condition exists. Navigation lights shall be switched to FLASHING DIM (day: FLASHING
BRIGHT) until the rotors have been disengaged and are fully stopped. The LSE will then signal for the aircraft lights
to be turned OFF. When helicopters are recovered immediately ahead of fixed-wing aircraft, pilots shall shut down
and disengage as expeditiously as feasible. They shall remain in their aircraft until towed clear of the fixed-wing
landing area. An amber or red light will be ON whenever rotors are engaged on deck.

6.6.2 NVD Equipment Aided Approaches

Crews aided with NVD may make a visual approach to a spot rather than a Carrier Controlled Approach (CCA)
provided such an approach is coordinated with Air Officer/PriFly, are not IMC, and have sufficient illumination/
visibility.
Night Vision Device (NVD) Centerline Visual Approach. During VMC and using NVDs, the HAC may accept a
visual approach to the fantail and proceed along the centerline for landing on the designated spot. After the last fixed
wing aircraft on final is identified by the Air Boss/CATCC, the helicopter will take interval and land visually
Night Vision Device (NVD) Slide-in Visual Approach. At the HAC’s discretion, the helicopter may slide in to a
landing on the designated spot. Visual contact with the ship and NVD usage is required.

6.7 SPECIAL PROCEDURES FOR CARRIER QUALIFICATION LANDING

6.7.1 Fixed-Wing Aircraft

The number of aircraft in the Case I or II pattern should be limited to four and shall not exceed six. Maintaining a proper and uniform interval is very important in the CARQUAL pattern. The air operations officer
and the air officer shall make appropriate recommendations. Jet/turboprop aircraft night CARQUALs shall b under
CCA control. Advisory control may be specified by the ship's commanding officer when weather permits. The air officer must be acutely aware of the responsibility to ensure the
initial separation between bolter/waveoff and departing aircraft during
CARQUAL and cat-trap-cat evolutions.
NAVAIR 00-80T-105
ORIGINAL 6-30
CATCC's restricted radar coverage (blindspot) ahead of the ship requires
aircrew to exercise good lookout doctrine and radio discipline upon
departure.
During night CARQUALs, CCA shall utilize a single frequency to control all aircraft in the CARQUAL pattern.
Anytime CARQUAL or refresher landings are being conducted, a senior representative of each squadron involved
should be present in the tower. During IMC and night operations, his station will be in air operations. He must be
well qualified in the aircraft and prepared to advise the air officer in the event of an emergency.
It is the responsibility of the air operations officer to keep the air officer accurately apprised of the number of landings
required for each aircraft. Air operations/ CATCC will maintain a status board that will show landings required,
landings completed, and location of each aircraft (in Delta, in the Charlie pattern, or on the deck).
The air operations officer is responsible for providing the air officer with accurate bingo/divert data. Before commencing and/or during CARQUALs, he shall compute the distance and bearing to the bingo/divert field and the
fuel required for the model aircraft involved. Bingo/divert data will be broadcast on the recovery frequency by PriFly
or CCA as appropriate.
The decision to divert aircraft will be made by the commanding officer or his designated representative. The air
operations officer and the air officer shall make appropriate recommendations during IMC/night and VMC operations, respectively. In addition, the LSO will make timely divert recommendations to the air officer based on
unsatisfactory pilot performance or unsatisfactory CARQUAL conditions around the ship. It is the pilot's responsibility to inform the tower if he reaches bingo fuel state and has not been ordered to divert.
Changing pilots when an aircraft is on the flight deck with engine(s) running is an inherently dangerous practice
requiring extreme care. When a change is made, the aircraft shall be chocked and have at least the initial tiedowns
attached. Pilots shall not leave/switch their seats until given the "tiedowns in place" signal by the aircraft director.
Note
It is the pilot's responsibility to inform the tower when reaching holddown
fuel state after trapping and the aircraft has not been taxied to a refueling
spot.
6.7.2 Helicopters
When feasible, two landing spots will be utilized for CARQUAL landings. The pattern shall be a left-hand racetrack

on the port side of the ship. Pattern spacing shall be adjusted to permit one aircraft to be launched prior to another
being landed. When the pilot acquires the meatball, he shall report his side number, “ball,” and “gear down.”
Night CARQUALs shall be under CCA control. Advisory control may be specified by the ship’s commanding officer
when weather permits.
The pilot in the right seat shall be in control of the aircraft unless the tower is informed to the contrary. When changing
pilots, the aircraft will be chocked and have initial tiedowns attached.

6.8 EMERGENCY LANDING
6.8.1 Fixed-Wing Aircraft
At first indication of a possible emergency landing, the air officer will pass the word “stand by to make a ready deck.”
At this time, arresting gear and Crash Salvage personnel, ILARTS, and lens operators will immediately man their
stations. It is the responsibility of PriFly to contact the LSO, who will proceed to the platform. The squadron duty
officer will be notified. Tractors will be attached to all aircraft parked in the landing area, tiedowns will be removed
when directed by the plane directors, and directors and chock men will stand by. A helicopter should be manned and
started unless an airborne helicopter is available for plane guard. If the emergency condition requires a straight-in
approach or a straight-in approach is contemplated, the SPN-41 shall immediately be activated without pilot request.
When it has been determined that an emergency landing will be made, the Air Officer will pass the word, “Make a
ready deck,” at which time the landing area will be cleared as expeditiously as safety permits. Personnel concerned
will stand by to rig the barricade if called for. The air officer shall pass an expected Charlie time to the distressed
aircraft.
Pilots of aircraft returning to the ship for an emergency landing shall not shift from the control frequency to tower
frequency until directed to do so unless radio contact has been lost on the control frequency. Normally, the tower and
LSO will shift to the control frequency, thereby avoiding the necessity of a frequency change by the pilot. In no case
will the pilot of an aircraft in distress leave an assigned frequency without broadcasting the frequency to which he
is shifting.
As the ship is being prepared for the landing of aircraft, the air officer will pass as much pertinent information as
possible to the flight deck, bridge, LSO, and CATCC. The air officer shall determine the amount and type of
firefighting equipment to be broken out and direct the deployment of personnel, depending upon the nature and
seriousness of the emergency.
6.8.2 Helicopters
As much deck space as possible will be made available for emergency helicopter landings. If time permits, the senior

helicopter squadron or unit officer on board should take station in the tower or in CATCC, and the air officer should
determine the optimum relative wind and request the bridge to maneuver the ship as necessary. In clearing a helicopter
for an emergency landing, PriFly will ordinarily designate an area of the flight deck rather than a specific landing
spot. Once the aircraft is on final approach, it is imperative that the ship hold a steady course.
During an emergency landing, the LSE, if immediately available, shall stand at the upwind edge of the designated landing
area. The LSE signals are advisory in nature, except for the waveoff and hold signals, which are mandatory. The LSE
shall give a waveoff only in case of a foul deck or if instructed by the tower to do so.

6.9 EMERGENCY SIGNALS

6.9.1 Visual Signals to Ship From Aircraft With Radio Failure

Figures 6-7 and 6-8 provide visual signals to be used in the event of radio failure. Aircraft configuration is the primary
daytime indicator of the pilot's desires or intentions. At night, aircraft lighting configuration is the primary indicator
of the pilot's desires or intentions.

6.9.2 Visual Signals to Aircraft From Ship Under EMCON or Lost Communication Conditions

Figure 6-9 provides visual signals for giving commands or advisories to aircraft when the ship has lost its
communication capability or is under EMCON conditions.

6.9.3 Carrier Pattern Emergencies

The LSO will make appropriate recommendations to the air officer or pilot as indicated in Figure 6-10.

6.9.4 Day Communication Emergencies

Figure 6-11 describes appropriate action for day communication emergencies.

6.9.5 Night Communication Emergencies

Figure 6-12 describes appropriate action for night communication emergencies.

6.10 TANKER OPERATIONS

Tankers assigned duties in support of the recovery of aircraft shall use the following procedures:

1. Only those tankers that have a known good store and sufficient fuel to meet receiver fuel requirements shall
display the flashing green light.
2. For optimum utilization of tankers, single-cycle operation is recommended.
3. A specific existing agency (i.e., departure control) shall be designated tanker control with the responsibility
to monitor:
   a. Tanker give-away fuel status
   b. Tanker location
   c. Location and fuel requirements of the low state aircraft
   d. Coordination of the tanker and receiver rendezvous.

6.10.1 Recovery Tanker Procedures

6.10.1.1 CASE I/II

After launch, the oncoming recovery tanker shall switch to departure control for assignment. All tanker packages
should be checked as soon as possible after launch. When it has been determined that the new tanker store is
operational, departure control should be advised immediately. The recovery tanker shall maintain a rendezvous circle
oriented on the CV (Figure 6-13). The rendezvous circle shall contain four reference points. Minimum pattern altitude

shall be 1,500 feet. This pattern is a left-hand circle within 5 nm of the CV during launch and recovery operations.
When the last jet is aboard, the tanker shall climb to prebriefed altitude and switch to assigned frequency for control.

PILOT'S DESIRES OR INTENTIONS	VISUAL SIGNAL
I desire immediate landing.	Fly up the port side of the ship, low and close aboard, rocking wings, in a landing configuration with hook down. Navigation lights bright and steady with anticollision light on. If turning final in VFR pattern or approaching final on a CCA, momentarily turn on the taxi light, if available.
I desire to land but can wait for the next recovery.	Fly up the port side with the landing gear up, hook down, navigation lights bright and steady, and anticollision light off while abeam the ship.
I am proceeding to the bingo field.	Fly up the port side of the ship, rocking wings, with landing gear and hook up, navigation lights bright and steady, and anticollision light on. If fuel state and nature of the emergency permit, continue making passes until joined by a wingman. Upon reaching bingo fuel state, proceed alone, setting IFF/SIF to emergency when departing.
NOTE 1. The requirement for gear down and rocking wings as the signal for an immediate landing is not required when considered unsafe by the pilot due to the nature of the emergency; for example, loss of an engine in multiengine aircraft. 2. At night, aircraft flying close aboard the port side of the ship without lights are considered to have an emergency requiring immediate landing.	

Figure 6-7. Emergency Signals to Ship From Fixed-Wing Aircraft With Radio Failure

PILOT'S DESIRES OR INTENTIONS	VISUAL SIGNAL
I require immediate landing.	Fly close aboard starboard quarter, remaining clear of other traffic, with gear down and floodlights/landing light on. With complete electrical failure, fire a red flare to seaward.
I desire to land but can wait for the next recovery.	Fly by or hover on the starboard side of the ship, low and close aboard, with navigation lights bright and flashing and anticollision light on.

Figure 6-8. Emergency Signals to Ship From Helicopters With Radio Failure

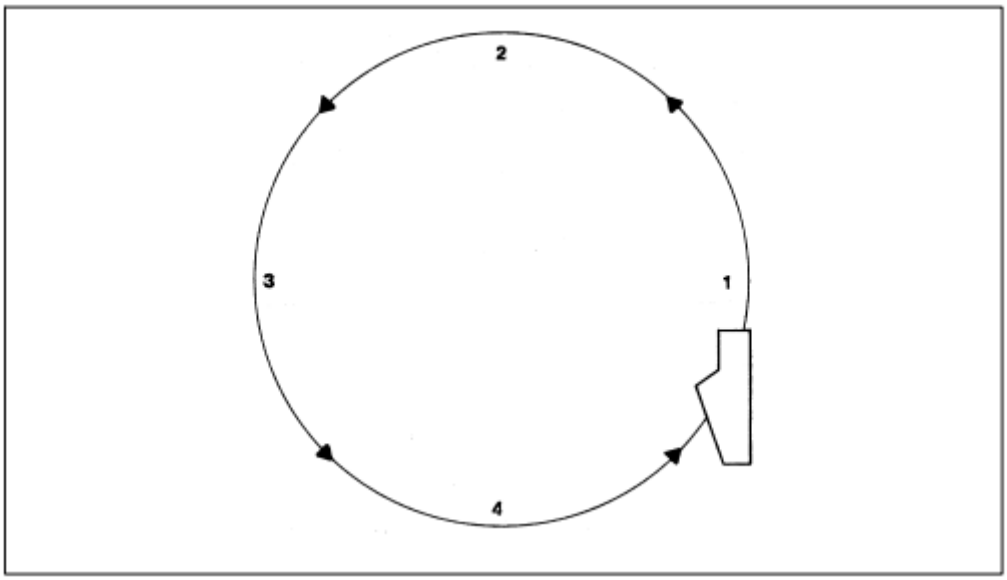


Figure 6-13. Tanker Rendezvous Pattern

6.10.1.2 Case III

The recovery tanker pattern shall be assigned by departure control. It shall be at least 1,000 feet above the overcast or VMC between layers, but not less than 2,500 feet MSL. The tanker pilot shall advise departure control of the best altitude and position to conduct emergency tanking. Positive control shall be provided for tanker overcast penetrations. Departure control shall assist in positioning the tanker near a potential receiver and shall keep the tanker informed of the potential receiver's position.

Note

Tanking shall not be attempted below 1,500 feet during Case I/II and 2,500 feet during Case III.

6.10.2 Rendezvous Procedures

6.10.2.1 Rendezvous Low (Day and Night)

When directed to "hawk" (closely monitor) a particular aircraft that is a potential receiver, the tanker pilot shall position the tanker to be at the 2-o'clock position of the low-state aircraft as it bolters or waves off. The minimum altitude for rendezvous shall be 1,500 feet day, 2,500 feet night, ensuring a minimum of 500 feet vertical separation between receiver and tanker aircraft until visual separation can be maintained. When directed, the tanker shall switch to the potential receiver aircraft's frequency. If visual contact is not acquired, the controlling agency shall provide assistance until visual contact is established. The receiver should generally make the final rendezvous on the tanker.

Positive radio communications must be established if the tanker will be rendezvousing on the receiver at night. The tanker should stream the drogue as the receiver joins, thus expediting plug-in. The tanker pilot

shall report to tanker
control the following:
1. When the receiver is taking on fuel
2. When refueling has been completed, the amount of fuel transferred, and update give-away.
6.10.2.2 Rendezvous High/On Top (Day and Night)
Departure control shall provide positive control until visual contact is established. The receiver shall make the final
rendezvous on the tanker and report as previously described.
6.10.3 Recovery Tanking Pattern
After the receiver is engaged, the tanker aircraft shall establish a racetrack pattern in the vicinity of the ship. Unless special
circumstances exist, the tanker should not proceed more than 10 miles ahead of the ship. The downwind leg should be
3 to 5 miles abeam and tanking should be completed prior to reaching a point 6 miles astern to allow for proper pattern
entry. If tanking is done above an overcast, departure control may direct adjustment of the pattern so as to allow for normal
descent and CCA pickup.
6.10.4 Recovery (Case III)
The desire to expedite tanker recovery must not jeopardize flight safety. The recovery tanker shall be given positive
control unless executing an instrument approach procedure published in this section or operating under night
EMCON conditions. The aircraft shall be level during the turn to final bearing and given sufficient clearance to pass
through 6 miles at 1,200 feet.
Note
If recovery tanker is established 1,200 feet abeam, the six mile gate is not
required.

6.10.5 Fuel Transfer and Dump Control
Each ship/air wing shall promulgate supplementary instructions that shall include the following instructions.
1. Bingo data for all embarked aircraft.
2. Low state figures (i.e., state at which aircraft will normally be ordered to tank) and amount of fuel to be
transferred to each type aircraft when no divert field is available.
3. Procedures for control of tanker fuel by CATCC.
4. Minimum fuel for barricade engagement.
Except in an emergency, tankers shall obtain clearance from departure control before transferring or dumping fuel.
Departure control shall be advised of any changes of tanker fuel state and give-away as appropriate.
Shipboard recovery of a tanker aircraft with an extended hose presents a
missile hazard that may be caused by shattering of the drogue/basket as it

strikes the ramp area. Prior to recovery, the flight deck should be cleared of all but required recovery personnel. Only the controlling LSO should remain on the platform, and he should utilize the safety net as the aircraft crosses the ramp. If possible, aircraft adjacent to the landing area should be respotted forward or struck below to the hangar deck.

Even though the probability of damage to the aircraft by drogue/basket slap during a bolter is slight, the pilot should be aware of this possibility.

6.11 DIVERSION OF AIRCRAFT

The air operations officer or the air officer shall normally be responsible for making the recommendation to the commanding officer as to which aircraft should be diverted in the interest of flight safety. The air operations officer shall, if practicable, determine the condition of the navigation, communication, and lighting facilities of divert field prior to the first Case III recovery. The following factors shall be considered when anticipating a divert:

1. Aircraft fuel state
2. Bearing and distance of field
3. Weather at divert field, current and forecast
4. En route upper level winds
5. Suitability of field for type of aircraft
6. Navigational assistance available
7. Aircraft mechanical condition
8. Ordnance restrictions

9. Condition of carrier deck
10. Availability of tankers
11. Pilot performance.

CATCC/CDC shall be alerted to the impending divert of an aircraft or group of aircraft and shall take control of the aircraft when diverted. CDC shall also ensure the ship’s lookouts are alerted to the forthcoming divert, model aircraft, side number, and on what relative bearing the aircraft is expected to depart the ship.

If the tanker refueling hose cannot be retracted, the hose shall be guillotined prior to recovery. If the hose fails to separate, the aircraft shall be diverted to a suitable landing field. When the situation prevents an aircraft divert and it is equipped with an external refueling store, the store shall be jettisoned prior to attempting a carrier landing. If the hose cannot be guillotined and/or the refueling store jettisoned, normal arrested landing procedures shall be utilized.

When it is determined to divert an aircraft, approach control shall notify the pilot by passing the following information only: “(call sign) signal divert/bingo, (name of field) passing angles 2.5 go button (XX).” After the

switch to departure
control once above 2,500 feet, the pilot shall be advised to check gear up/hook up and also have information relayed
regarding the magnetic heading and the distance to the divert field. A readback of diverting instructions from the pilot
or flight leader is mandatory on departure frequency. While under positive control and en route to the divert airfield,
any additional information available shall be provided the pilot concerning latest en route and field weather, squawk,
altimeter setting, and position from which divert is being initiated. If operating outside an ADIZ boundary, the CDC
controller shall provide the pilot with the necessary ADIZ information. The appropriate Air Defense Sector shall be
advised of the diverted aircraft’s departure point, ADIZ penetration point, time of penetration, altitude, ETE,
destination, and any additional information that may be pertinent to safety of flight. The CDC controller shall
maintain a radar plot and radio monitor on all diverted aircraft as long as possible and retain responsibility for the
aircraft until positive radar handoff to FACSFAC/ARTCC or other appropriate controlling agency.
Under IMC, the aircraft shall be instructed to shift to the appropriate airspace controlling agency (FAA or other)
frequency after the additional divert information has been received. Once communications have been established
with this controlling agency, the flight plan particulars shall be furnished, including the ADIZ penetration
information for relay to an air defense sector. The aircraft will receive a clearance. If communications cannot be
established, as is often the case, the pilot should file using GCI Common.
The air operations officer shall ensure a divert flight plan is transmitted to the appropriate divert airfield and similar
information to the pertinent air defense system agency should an ADIZ penetration be involved; he is also responsible
for receipt of an arrival report on the diverted aircraft. The pilot shall ensure an arrival report is transmitted
immediately upon landing via the most expeditious means (i.e., POTS, HF/UHF radio, INMARSAT, immediate
message, etc.).
Squadron or unit commanders and the air operations officer are jointly responsible for ensure aircraft performance
data pertinent to divert is available to and understood by air control personnel.

Flight Documents

- Briefings
- Kneeboards
- Flight Charts
- Situation Briefs

Flight Documents

Kneeboard Examples 11.07.25

Page 1	DATACARD
ATIS	

Airbase

	Airbase	TCN	UHF	VHF	Elv	RWY	ILS
DEP	CVN-75 Harry S. Truman	55X	-	127.5	0	-	5
ARR	Incirlik	21X	360.1	122.1	190ft	05	-
ALTN	CVN-75 Harry S. Truman	55X	-	127.5	0	-	5

Flight

Pos	Name	IDM	TCN	TO	LND	Notes:
1 Lead	F0Xtwo	ED 11	71X	1400-1430	1500-1600	Stick to your flight plan. Only change route if threats appear.
2 Wing	reaper	ED 12	72X	1400-1430	1500-1600	
3 Element	Dylman	ED 13	73X	1400-1430	1500-1600	
4 Wing	-	-	-	-	-	

Package

Callsign Pack	Aircraft type	UHF	VHF	IDM	TCN	Task
Phobetor 1	F/A-18C Hornet	301.0	-	ED 11-13	71-73X	Transition
Phobetor 2	F/A-18C Hornet	302.0	-	SD 11-12	81-82X	Escort

Flightplan

STPT	Action	HDG	Dist	Mach / GS	Alt	Min.Fuel	Formation
0	-	-	-	-	-	-	-
1	Form Up with Phobetor 2, Orbit	-	~20NM	300kts	20000ft	6000lbs	Vic
2	Turn Point	-	34NM	-	25000ft	6000lbs	Vic
3	Turn Point	-	38NM	-	25000ft	3000lbs	Vic
4	Turn Point, Prep. Straight in approach	-	23NMM	-	10000ft	2000lbs	Vic
5	Incirlik	-	15NM	0kts	0ft AGL	2000lbs	-
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

Page 2		DATACARD							
		Callsign	F0xtwo	Package	Phobetor 1	Mission	Transition		
TO / Loadout	Config					TO Spec		Fuel	
	A-A	2x AIM-120C AMRAAM		Gross Wgt	47309lbs	Rotation	-	TO Fuel	17536lbs
	A-G	-		Drag ind	-	Refusal	-	Set Fuel	
	ECM	-		ALOW	10000ft	Mil Power	-	JOKER	6000lbs
	Tanks	3x FPU-8A, 2x Travel Pod		MSL	25000ft	Mil Climb	-	BINGO	3000lbs
TGT	Primary					Secondary	-		
	DMPI					DMPI	-		
	Lat&Long					Lat&Long	-		
Weapon	Type					Profile 1		Rel Angle	
	SNSR					Arming dly		SGL/PAIR	
	OPS time					Burst Alt		Ripple	
	Release					Fuse		Spacing	
	Attack type								
Delivery				OA1	OA2	PUP	Pull Hdg		
	TBRG						Climb		
	RNG						Pull Dwn		
	ELV						Turn		
	Ingress Alt			Rel Height			Attack Hdg		
	Ingress Spd			Rel Spd			TGT in HUD		

	COMM 1: ARC-210				COMM 2: ARC-210			
Buttons	Button	Purpose	Freq.	Additional	Button	Purpose	Freq.	Additional
	1	Departure	127.5	55X, 5 ICLS	1	Flight (Phobetor 1)	301.0	
	2	CSG (STRIKE)			2	Element (Phobetor 1)	301.5	
	3	Revovery (Marshal)	127.5	55X, 5 ICLS	3	Flight (Phobetor 2)	302.0	
	4	AWACS (MAGIC)			4	Element (Phobetor 2)	302.5	
	5	AWACS (IMAGE)			5			
	6	Tanker (Arco 1-1)		11Y	6			
	7	Incirlik	122.1	21X	7			
	8				8			
	9				9			
	10				10			
	11				11			
	12				12			
	13				13			
	14				14			
	15				15			
	16				16			
	17				17			
	18				18			
	19				19			
	20				20			