



**HMCS BONAVENTURE**

**CARRIER AIR TRAFFIC CONTROL  
PROCEDURES**

**APRIL 1962  
SUPERCEDES  
OCTOBER 1960**

**ROGER DURAMEL, F.R.C.  
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82**

## FOREWORD

This extract from Air Department Standing Orders has been reprinted separately in this convenient size to facilitate reference by the many users.

The booklet may be carried in aircraft, but separate plates for the instrument approach and missed approach procedures are available for insertion in knee-boards or the appropriate publication of Instrument Approach Procedure Charts.

This subject has no security classification, but care must be taken not to relate specific frequencies to channel numbers in the blocks provided in the Approach Charts. This latter subject is classified Confidential.

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CARRIER AIR TRAFFIC CONTROL - VFR

1. GENERAL. This section contains the rules and regulations for the operation of aircraft in the vicinity of the carrier, and the landing approach from the surface of the sea.

2. NEW YORK REGIONAL. See the operations manual.

3. GENERAL FLIGHT RULES. The General Flight Rules apply to all aircraft in the vicinity of the carrier.

**CARRIER AIR TRAFFIC CONTROL - VFR**

4. GENERAL FLIGHT RULES. The General Flight Rules apply to all aircraft in the vicinity of the carrier. The following rules apply to aircraft in the vicinity of the carrier:

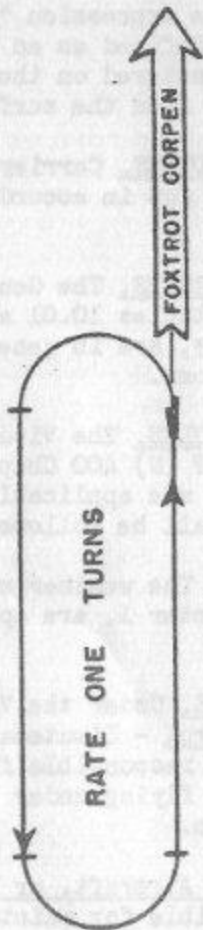
5. GENERAL FLIGHT RULES. The following rules apply to aircraft in the vicinity of the carrier:

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7. GENERAL FLIGHT RULES. The following rules apply to aircraft in the vicinity of the carrier:

CARRIER AIR TRAFFIC CONTROL - VFR

1. DEFINITIONS. Standard definitions set forth in CAP (N) 400, Article 1.04 are applicable. In addition, the expression "Carrier Control Zone" shall be defined as an airspace of 5 n.m. radius centered on the carrier, extending upwards from the surface of the sea.
2. OPERATING PROCEDURES. Carrier operations will be carried out in accordance with ATP 1, Chapter 15.
3. GENERAL FLIGHT RULES. The General Flight Rules, CAP (N) 400, Articles 10.01 and 10.02, regarding right of way, are in general applicable to carrier operations.
4. VISUAL FLIGHT RULES. The Visual Flight Rules contained in CAP (N) 400 Chapter 11, Articles 11.01 and 11.04 are applicable to carrier aviation and shall be followed.
5. WEATHER MINIMA. The weather minima contained in CAP (N) 400 Chapter 1, are applicable and shall be used.
6. RESPONSIBILITIES. Under the Visual Flight Rules,
  - (a) Flying Control - Lieutenant-Commander (Flying) is responsible for the control of air traffic flying under VFR in the Carrier Control Zone.
  - (b) Captains of Aircraft, or Formation Leaders - are responsible for maintaining separation from other aircraft in accordance with the General Flight Rules and Squadron Doctrine.



VFR HOLDING  
ASTERN "DELTA" POSITION

7. VFR DEPARTURE PROCEDURE. When departing VFR aircraft shall maintain 200 feet or below on the FOXTROT CORPEN for 2 minutes, (to provide vertical clearance with landing aircraft) then proceed in accordance with their assigned mission.

When aircraft are required to join up after take-off, a specific pre-flight briefing shall be given, ensuring that aircraft are well clear of the landing pattern before turning to the rendezvous course.

8. VFR APPROACH PROCEDURE. When inbound under VFR, aircraft:
- (a) Shall not enter the Carrier Control Zone without clearance.
  - (b) Shall maintain 1,000 feet or above.
  - (c) If unable to maintain 1,000 feet, shall request Special VFR. (Special VFR will be approved when departing aircraft are clear of the control zone. Traffic information will be passed.)
  - (d) If unable to maintain flight with visual reference to the sea, shall remain clear of the control zone and request IFR clearance.
9. VFR HOLDING PROCEDURE (DELTA POSITION). When the ship is operating in company with other aircraft carriers, the DELTA position will be in accordance with ATP 1 Chapter 15. Otherwise, a DELTA position oriented on FOXTROT CORPEN, as shown in the diagram below will be used, with piston aircraft at 1,000 feet, and jets at 1,500 feet.

10. VFR ADF APPROACH PROCEDURE.

- (1) Holding Pattern - a standard right hand pattern, rate one turns, two minutes out-bound, the inbound heading being the reciprocal of the FOXTROT CORPEN.
- (2) Expected Approach Time - given to each aircraft individually, allowing for a one minute interval at the ramp.

NOTE - prior to passing the approach clearance, Approach Control will confirm that the bottom aircraft of the stack is able to maintain VFR. Should this not be possible at the holding altitude, control may descend the bottom aircraft to 1000 feet to further ascertain whether VFR conditions exist. At this point, if the weather is unsuitable, the transition to IFR will be effected and revised expected approach times will be passed.

- (3) Approach Procedure - depart the beacon at 1500 feet, 130 knots, on the reciprocal of the FOXTROT CORPEN plus 30. Descend to 1000 feet one to two minutes after departure (as instructed by Approach Control) and commence procedure turn to port and home in on the beacon on the FOXTROT CORPEN minus 5. Report steady inbound, reduce to 100 knots, and descend to 500 feet. Further approach instructions will be given as necessary.

## CARRIER AIR TRAFFIC CONTROL - IFR

When IFR conditions exist, the pilot-in-command shall be responsible for the safety of the aircraft. The pilot-in-command shall be responsible for the safety of the aircraft during the approach, landing, and taxiing operations. The pilot-in-command shall be responsible for the safety of the aircraft during the approach, landing, and taxiing operations.

### CARRIER AIR TRAFFIC CONTROL - IFR

The Standard Instrument Procedures (SIP) provide a standard approach, en route, and departure procedure for IFR operations. The pilot-in-command shall be responsible for the safety of the aircraft during the approach, landing, and taxiing operations.

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The Board of Directors of the Corporation has reviewed the report of the Committee on Finance and Management and has approved the same. The Board has also authorized the Corporation to enter into a contract with the Federal Reserve Bank of New York for the purchase of U.S. Treasury Securities on an amortizing basis to the extent of \$100,000,000 during the year ending December 31, 1999.

The Board of Directors has also approved the proposal of the Corporation to purchase U.S. Treasury Securities on an amortizing basis to the extent of \$100,000,000 during the year ending December 31, 1999.



## CARRIER AIR TRAFFIC CONTROL - IFR

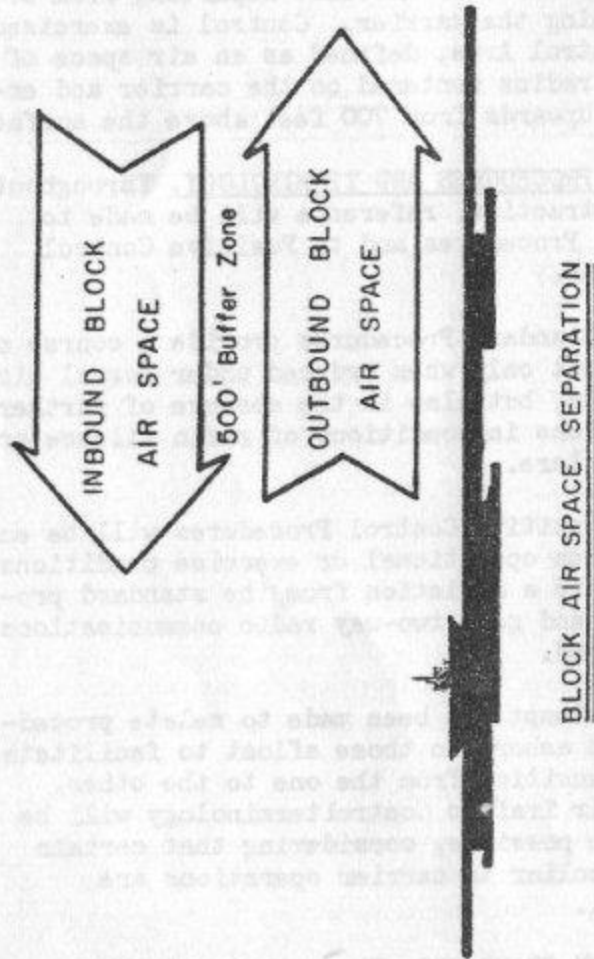
1. RESPONSIBILITIES. When weather conditions fall below the minima prescribed for VFR flight, the Direction Officer shall be responsible for traffic control of aircraft departing from or approaching the carrier. Control is exercised in a Control Area, defined as an air space of 25 n.m. radius centered on the carrier and extending upwards from 700 feet above the surface.
2. GENERAL PROCEDURES AND TERMINOLOGY. Throughout this instruction, reference will be made to Standard Procedures and to Positive Control Procedures.

The Standard Procedures provide a course of action, not only when ordered under normal circumstances, but also in the absence of further instructions in conditions of radio silence or radio failure.

The Positive Control Procedures will be employed when operational or exercise conditions necessitate a deviation from the standard procedures, and good two-way radio communications are assured.

An attempt has been made to relate procedures used ashore to those afloat to facilitate pilot transition from the one to the other. Common Air Traffic Control terminology will be used when possible, considering that certain terms peculiar to carrier operations are essential.

3. SEPARATION STANDARDS. The methods of achieving separation of aircraft are tabled below in order of preference along with recommended minima to ensure a safe flow of traffic.



The relative positions of aircraft, and the traffic density will determine which, if not all of the separation methods will be used.

SEPARATION METHOD	MINIMA RECOMMENDED
ALTITUDE	500 feet
LONGITUDINAL/TIME	2 minutes of flight
LATERAL	5 miles
TRACK	30 degrees

4. SEPARATION PROCEDURES. The very nature of carrier operations, where the ship is into wind for only brief periods to launch and recover aircraft in quick succession, presents one control problem not encountered ashore.

Another but more complex problem arises when aircraft are making an approach or are in the landing pattern in marginal weather conditions, the weather deteriorates rapidly below the minima for Special VFR, and the aircrew lose sight of the ship. Then a safe and speedy transition from VFR to IFR procedures must be effected.

The following operating procedures are intended to provide separation standards for dealing with these two problems safely.

- a. High Density Traffic. In high density traffic situations, safe separation of aircraft can best be provided by altitude separation. Generally this is done by blocking air spaces, with one block assigned to departing aircraft, and a higher block to those arriving.

(1) Departure. In the pre-flight briefing, crews will be advised of the block of assigned inbound altitudes of aircraft airborne at that time. They will then be assigned a block of departure altitudes below the inbound block.

When the sequence of aircraft to be launched becomes apparent, FLYCO will advise Traffic Control who will assign specific aircraft to specific altitudes within the departure block. A precept to be observed here is that the first aircraft off is assigned the highest altitude in the departure block air space, and the last aircraft off, the lowest altitude.

An exception is made to this rule only when launching aircraft directly to a Control Area under IFR. In this instance only it is highly desirable to have aircraft arrive at the Control Area stacked above the aircraft preceding, thus permitting an orderly approach sequence at the destination airfield.

Accordingly, Traffic Control in the carrier will assign the low altitude to the first aircraft off, and higher altitudes to succeeding aircraft. Safe separation of aircraft is achieved by a combination of time and track separation.

(2) Approach. In the pre-flight briefing the pilots will be assigned specific altitudes for their approach and entry to the carrier control area. This provides not only mutual separation of departing and arriving aircraft, but also a holding altitude in the event of radio failure.

b. VFR to IFR Transition.

(1) Distant From the Ship. If during a flight, the weather deteriorates below the minima specified for VFR, the pilot returns to the ship at his assigned inbound altitude and proceeds to the standard holding pattern. The pilot should be at his assigned inbound altitude upon reaching the Control Area. Whilst inbound he should report his movements and ask for further clearance.

(2) In the Landing Pattern. If it becomes necessary when aircraft are in the DELTA or the landing pattern, to change from VFR to IFR procedures, FLYCO will individually allocate each aircraft an assigned altitude on Land/Launch. Aircraft shall, unless positive control is possible, climb to altitude away from the ship on the bearing of the aircraft from the ship. Aircraft shall report through each thousand foot level and outbound heading on Land/Launch. When vertical separation has been established aircraft will be instructed to call Approach Control and standard IFR procedures will come into effect.

5. DEPARTURE CONTROL. During the pre-flight briefing, aircrews will be given general instructions regarding departure routing, climb-out procedure and altitude assignment so as to avoid the vital area used by aircraft under IFR closing the ship for an approach. The standard procedures are as follows:

a. Standard Jet Departure. Take off on the Land-Launch frequency, get settled comfortably in the climb, turn starboard to a course FOXTROT CORPEN plus  $45^{\circ}$ , switch to Departure Control frequency, climb on course to one-half assigned altitude, turn port and continue climb to intercept BV beacon. At 1,000 feet on top or at 25,000 feet, whichever is higher, set up standard, right hand holding pattern, oriented on FOXTROT CORPEN, to facilitate join-up.

If the beacon is intercepted before reaching 1,000 on top, continue on the intercept course to that altitude then reverse course and again intercept the beacon to join the holding pattern.

b. Standard Fixed Wing-Piston Departure. On take-off switch to Departure Control for further clearance, maintain the FOXTROT CORPEN for 30 seconds, turn starboard to a course FOXTROT CORPEN plus  $45^{\circ}$ , climbing to 1000 feet.

The further clearance will contain routing instructions and a departure altitude based on take-off sequence, along with the usual IFF check, ships displacement from reference position, etc. Subsequently, the "GO" message will contain the aircrafts' bearing and range from reference position.



c. Standard Helicopter Departure. The instrumentation of helicopters in use at the time of writing is such that instrument flight in poor or near zero visibility conditions is possible but not desirable or comfortable. Therefore one may expect helicopters to operate in low visibility conditions only when quite essential.

After take-off the helicopters clear the ship, remain below cloud or within sight of the surface and call for positive control on their normal control frequency.

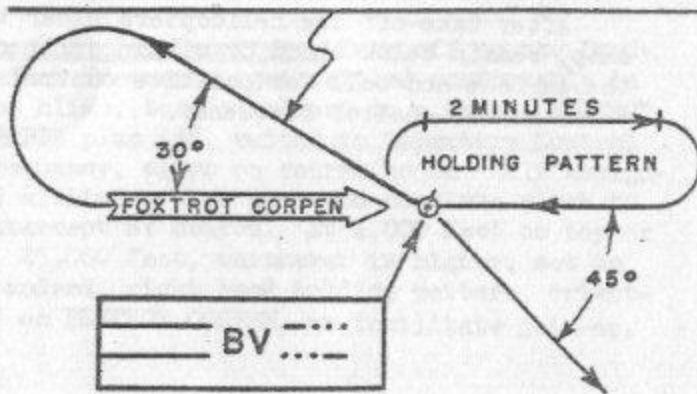
REPORT	DATE	TIME	LOCATION	STATUS	REMARKS
1. OVERBOARD	21	1000	100	OK	
2. MISSING	21	1000	100	OK	
3. ...	21	1000	100	OK	

INSTRUMENT APPROACH CHART - JET

INST APCH PRO (RGN) HMCS BONAVENTURE

SHIPS CALL _____	BCNS _____	FLYCO _____
_____	TACAN _____	CGA _____

**DESCEND OUTBOUND, BOTH ENGINES 80%  
DIVE BRAKES EXTENDED — SPEED 280**



AT HALF ALTITUDE, LEFT PENETRATION TURN

2500'

MISSED APPROACH AND DEPARTURE:  
CLIMB TO 1000' ON COURSE "FOXTROT CORPEN + 45" - CALL APPROACH FFG

1000'

	MINIMA		DECK	MAST	REPORT
	DAY	NIGHT			
	CEIL	VIS	CEIL	VIS	1. OUTBOUND 2. PENETRATION 3. INBOUND AT 1000' <span style="float: right;">B</span>
CGA	300	1/2	300	1/2	
TACAN	300	1/2	300	1/2	
ADF	300	1	500	2	

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HMCS BONAVENTURE



6. APPROACH CONTROL. Pre-flight briefings will include general instructions regarding altitude assignments, approach routing, holding pattern, expected approach time, and descent procedure. The standard procedures are as follows:

a. Standard Jet Approach.

(1) Holding Pattern - a standard right hand pattern, half-rate one turns, two minutes outbound, the inbound heading being the reciprocal of the FOXTROT CORPEN.

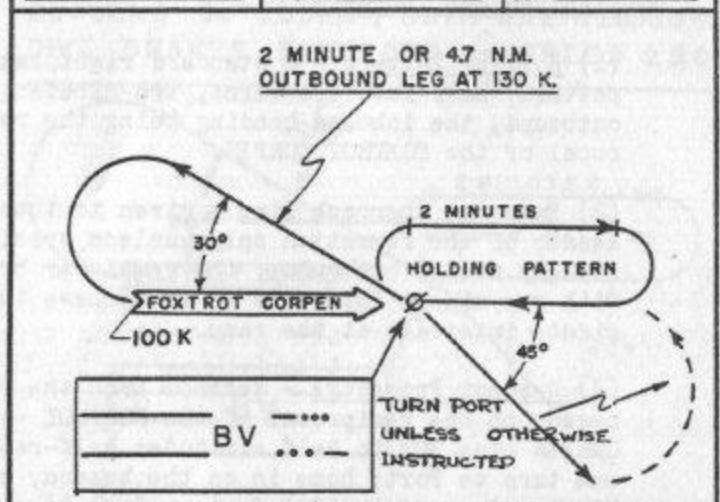
(2) Expected Approach Time - given to the leader of the formation only, unless specifically stated otherwise; the remainder break with one minute intervals so as to have two minute intervals at the ramp.

(3) Descent Procedure - descend from the beacon on the reciprocal of the FOXTROT - CORPEN plus 30° to half altitude; half-rate one turn to Port; home in on the beacon, continuing descent to 1000 feet; reduce to approach speed and perform landing cockpit check. Further approach instructions will be given as necessary.

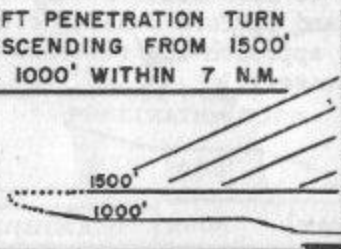
# INSTRUMENT APPROACH CHART - PISTON

INST. APCM PRO (RCN) HMCS. BONAVENTURE

SHIPS CALL _____	BCNS _____	FLYCO _____
_____	TACAN _____	CCA _____



**LEFT PENETRATION TURN  
DESCENDING FROM 1500'  
TO 1000' WITHIN 7 N.M.**



**MISSED APPROACH  
AND DEPARTURE:**

CLIMB TO 1000'  
ON COURSE "FOX-  
TROT CORPEN PLUS  
45°" - CALL  
APPROACH FFC

	MINIMA		DECK		NAST	
	DAY		NIGHT			
	CEIL	VIS	CEIL	VIS	<b>REPORT</b> 1. OUTBOUND 2. PENETRATION 3. INBOUND AT 1000' B	
CCA	300	1/2	300	1/2		
TACAN	300	1/2	300	1/2		
ADF	300	1	500	2		

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HMCS. BONAVENTURE

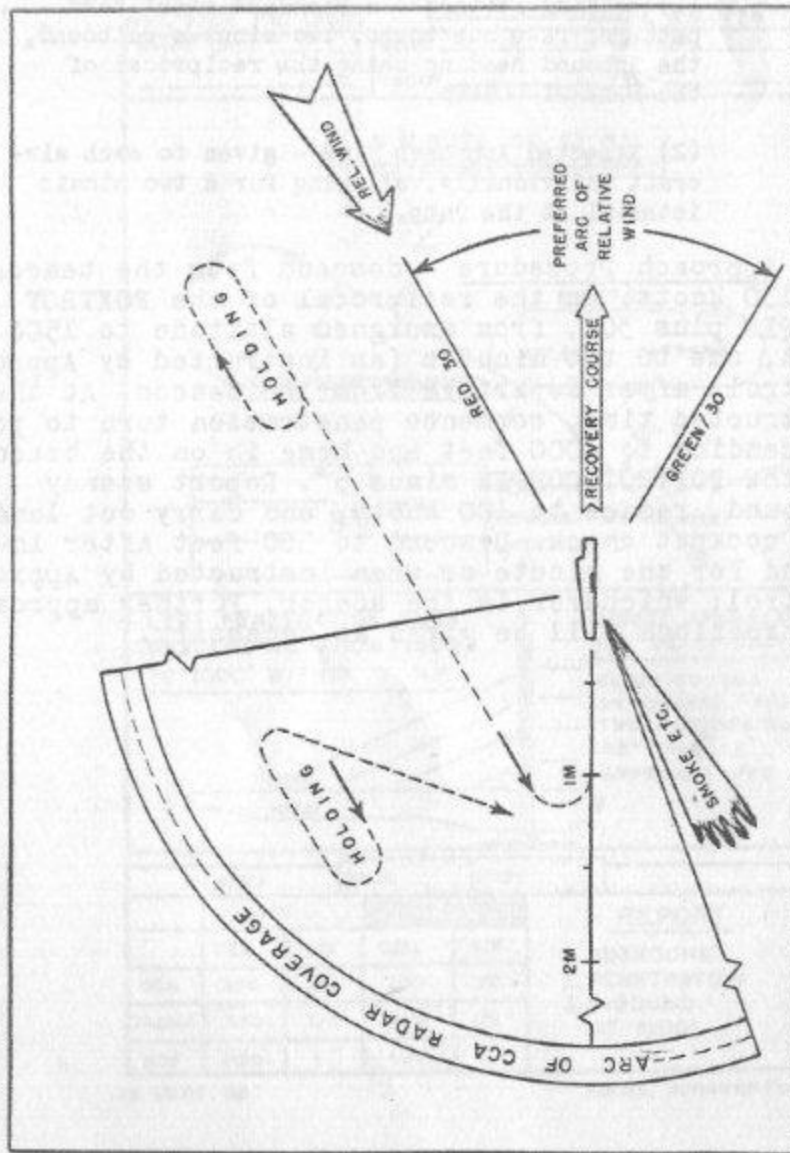
b. Standard Fixed Wing-Piston Approach.

(1) Holding Pattern - a standard right hand pattern, rate one turns, two minutes outbound, the inbound heading being the reciprocal of the FOXTROT CORPEN.

(2) Expected Approach Time - given to each aircraft individually, allowing for a two minute interval at the ramp.

(3) Approach Procedure - descend from the beacon at 130 knots, on the reciprocal of the FOXTROT CORPEN plus 30°, from assigned altitude to 1500 feet, one to two minutes (as instructed by Approach Control) after departure from the beacon. At the instructed time, commence penetration turn to port descending to 1000 feet and home in on the beacon on the FOXTROT CORPEN minus 5°. Report steady inbound, reduce to 100 knots, and carry out landing cockpit check. Descend to 500 feet after inbound for one minute or when instructed by Approach Control; whichever is the sooner. Further approach instructions will be given as necessary.

SAMPLE PATTERN - HELICOPTER APPROACH



c. Standard Helicopter Approach. It is impractical to designate a standard pattern for helicopters since the best approach route will be governed by such variables as wind direction over the deck, location of the helicopters, and requirements to avoid fixed-wing traffic. However, the following axioms apply to any helicopter approach under IFR:

(1) Control Procedure. Positive control should be provided throughout the approach.

(2) Holding. Though seldom encountered with helicopters, any unavoidable delay in recovery may require them to hold. The pattern should be up-wind and clear of sea return on radar displays, or within two miles on the port quarter in the arc covered by CCA radar. During fixed-wing recoveries, helicopters may be required to hold on the starboard side of the ship under positive control or within sight of the ship.

(3) Altitude. Helicopters should remain within sight of the water at a minimum altitude between 50 and 100 feet.

(4) Speed. The indicated air speed should be 75 knots on the initial approach. At one-quarter mile on final, speed should be gradually reduced so that at about 200 yards from the deck it exceeds the relative wind speed by about 20 knots.

(5) Wind Over the Deck. Satisfactory approaches can be made with the wind over the deck from anywhere forward of either beam.

However a relative wind down the angle has been found most suitable.

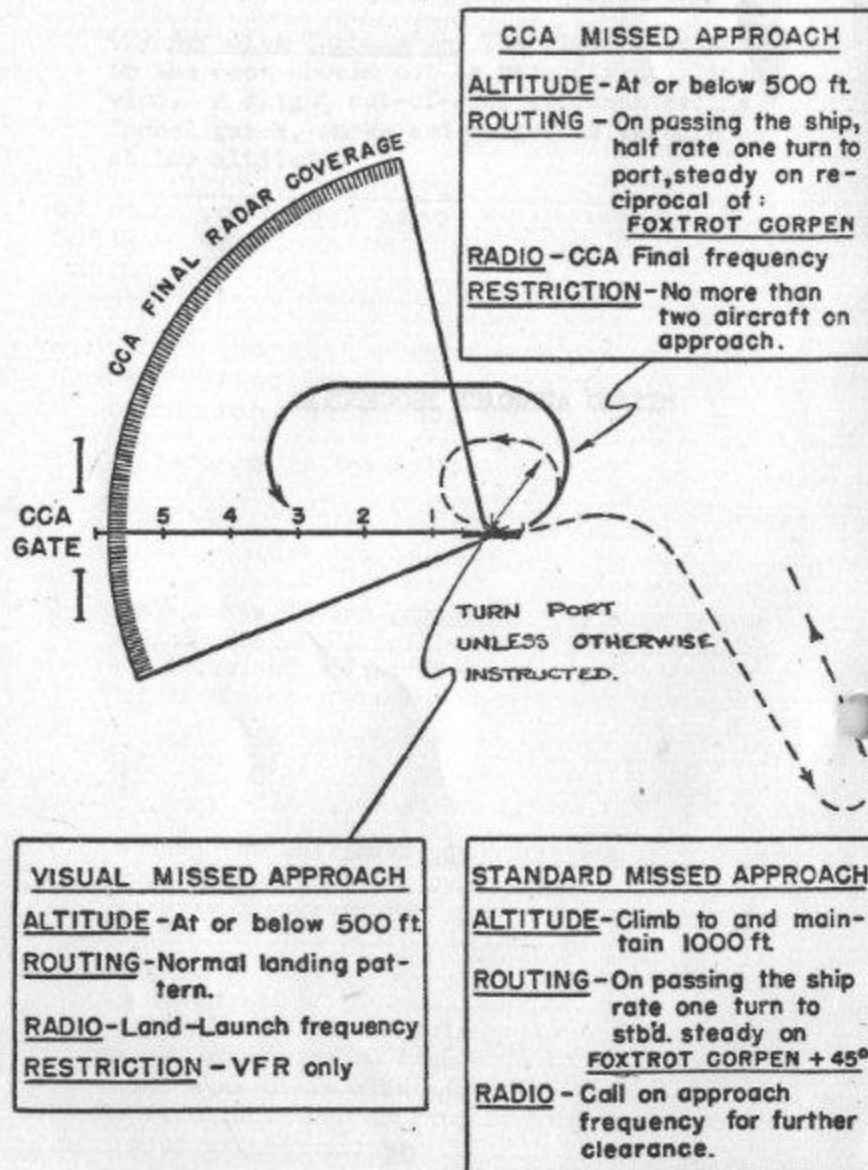
(6) Final Approach. Final approach within the arc covered by CCA radar permits positive control to within one-eighth mile (250 yards).

(7) Avoiding Turbulence. The final approach to the deck should not be made directly into wind. A slight out-of-wind approach avoids funnel gases, smoke and dangerous turbulence at low altitude.

## MISSED APPROACH PROCEDURES



## MISSED APPROACH PROCEDURES



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H.M.G.S. BONAVENTURE



7. MISSED APPROACH PROCEDURES. When a pilot misses his approach to the carrier he shall carry out a standard missed approach procedure similar to that ashore, or he may be instructed to carry out one of two deviations which have certain restrictions. The type of pattern to be carried out will be determined in FLYCO and passed to the pilot by Approach or CCA Final Controller as part of his approach clearance.
- a. Standard Missed Approach Procedure: After passing the ship, call Approach, turn to starboard and climb, on a course FOXTROT CORPEN plus 45 , to 1000 feet. Approach Control will provide further clearance.
- NOTE On being cleared from the Standard Missed Approach, to return to the beacon turn PORT unless otherwise instructed.
- (2) Holding instruction and an expected approach time for another approach.
  - (3) Departure instructions for an alternate airdrome or ready deck.
- b. Visual Missed Approach. Permitted in VFR conditions only (ceiling 1000 feet visibility 3 miles, or better). The pilot maintains 500 feet or below, provides his own separation from other aircraft and communicates with FLYCO on the land-launch frequency.
- c. CCA Missed Approach. Permitted when there are no more than two aircraft in the approach pattern (i.e. the waved off aircraft and no more than one other aircraft approaching.)

The pilot remains on the CCA final frequency, maintains 500 feet or below, and after passing by the ship executes a half-rate one turn to port to the reciprocal of the FOXTROT CORPEN. Further instruction from the CCA final controller will bring him in for another approach.

**NOTE** PRACTICE CCA missed approach may be carried out with three aircraft under VFR conditions.

8. CARRIER ATC TERMINOLOGY. The following paragraphs illustrate the basic contents of voice transmissions which give clearance limits and other information necessary for an instrument approach.

a. Approach Control

(1) Initial Clearance

- (a) YOU ARE CLEARED TO THE BEACON:  
(i) TO HOLD AT ANGELS \_\_\_\_\_. YOUR EXPECTED APPROACH TIME IS \_\_\_\_\_; or,  
(ii) CLIMB TO ANGELS \_\_\_\_\_ ON A HEADING OF \_\_\_\_\_ BEFORE PROCEEDING ON COURSE.
- (b) FOXTROT CORPEN IS \_\_\_\_\_.
- (c) AVIATION WEATHER \_\_\_\_\_.....ALTIMETER \_\_\_\_\_.
- (d) TIME CHECK \_\_\_\_\_.
- (e) CALL FINAL ON CHANNELS \_\_\_\_\_ AND \_\_\_\_\_, BINGO \_\_\_\_\_ FOR RADIO CHECKS.

(2) Approach Clearance

- (a) YOU ARE CLEARED FOR AN APPROACH. CROSS THE BEACON AT ANGELS \_\_\_\_\_.  
(i) TAKE DEPARTURE AT \_\_\_\_\_ (OR EXPECTED APPROACH TIME); or,  
(ii) REPORT BY THE BEACON OUTBOUND.
- (b) OUTBOUND HEADING \_\_\_\_\_ FOR \_\_\_\_\_ MINUTES.
- (c) When inbound at 5 miles: (REDUCE TO INITIAL APPROACH SPEED) CARRY OUT LANDING COCKPIT CHECK.
- (d) When CCA radar has contact: CALL FINAL ON CHANNEL \_\_\_\_\_. REPORT HEADING AND ALTITUDE.

b. Final Control

(1) Landing and Missed Approach Clearance.

(a) YOU ARE CLEARED FOR:

- (i) AN ARRESTED LANDING; or,
- (ii) A TOUCH AND GO LANDING; or,
- (iii) A LOW APPROACH AND OVERSHOOT.

(b) WITH A:

- (i) STANDARD MISSED APPROACH, TO CALL ON CHANNEL \_\_\_\_\_ FOR FURTHER CLEARANCE; or,
- (ii) CCA MISSED APPROACH, TO CALL ON THIS CHANNEL FOR FURTHER CLEARANCE; or,
- (iii) VISUAL MISSED APPROACH, TO CALL ON CHANNEL \_\_\_\_\_ FOR FURTHER CLEARANCE.

(2) Alternate Instructions

- (a) IF NOTHING HEARD FOR 5 SECONDS, DESCEND TO 200 FEET FOR VISUAL APPROACH AND CALL ON CHANNEL \_\_\_\_\_ OR \_\_\_\_\_. IF UNABLE VISUAL, CARRY OUT A STANDARD MISSED APPROACH.

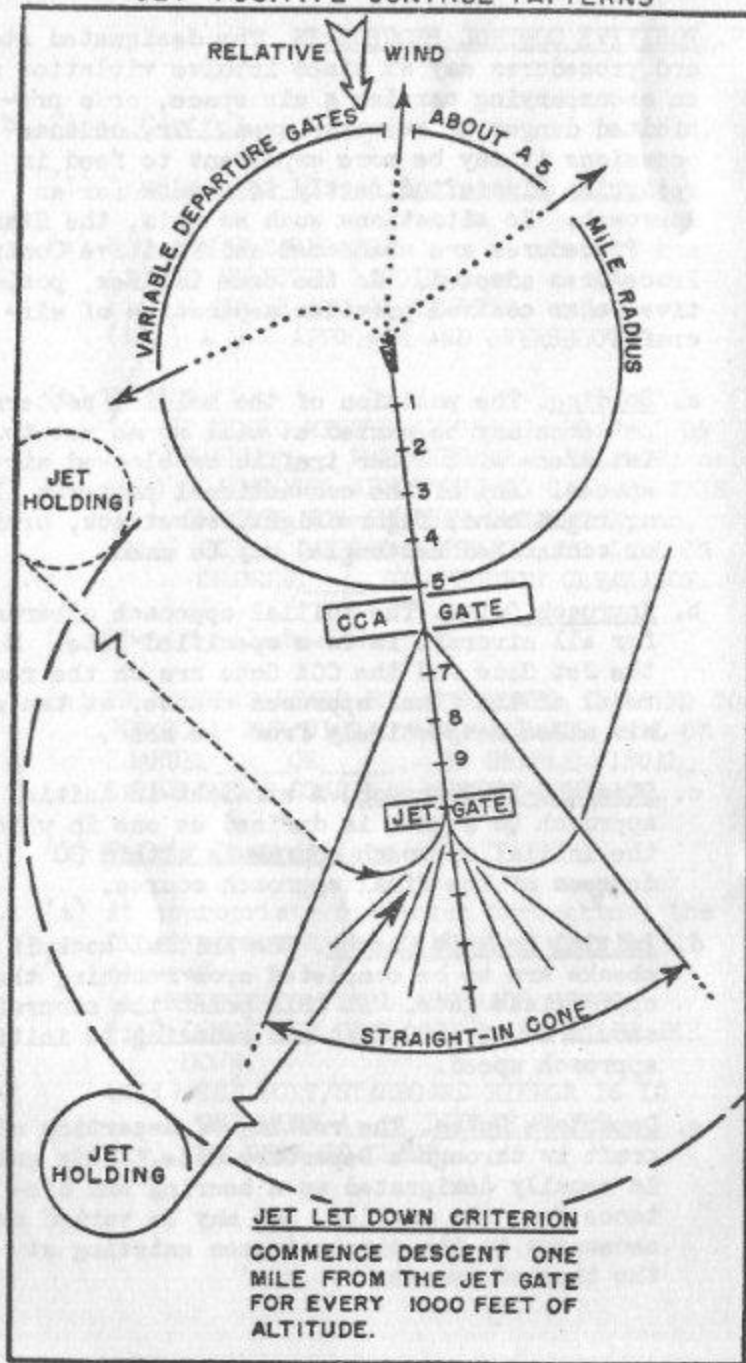
(3) Safety Instructions

- (a) At appropriate distances throughout the final approach the following must be covered:

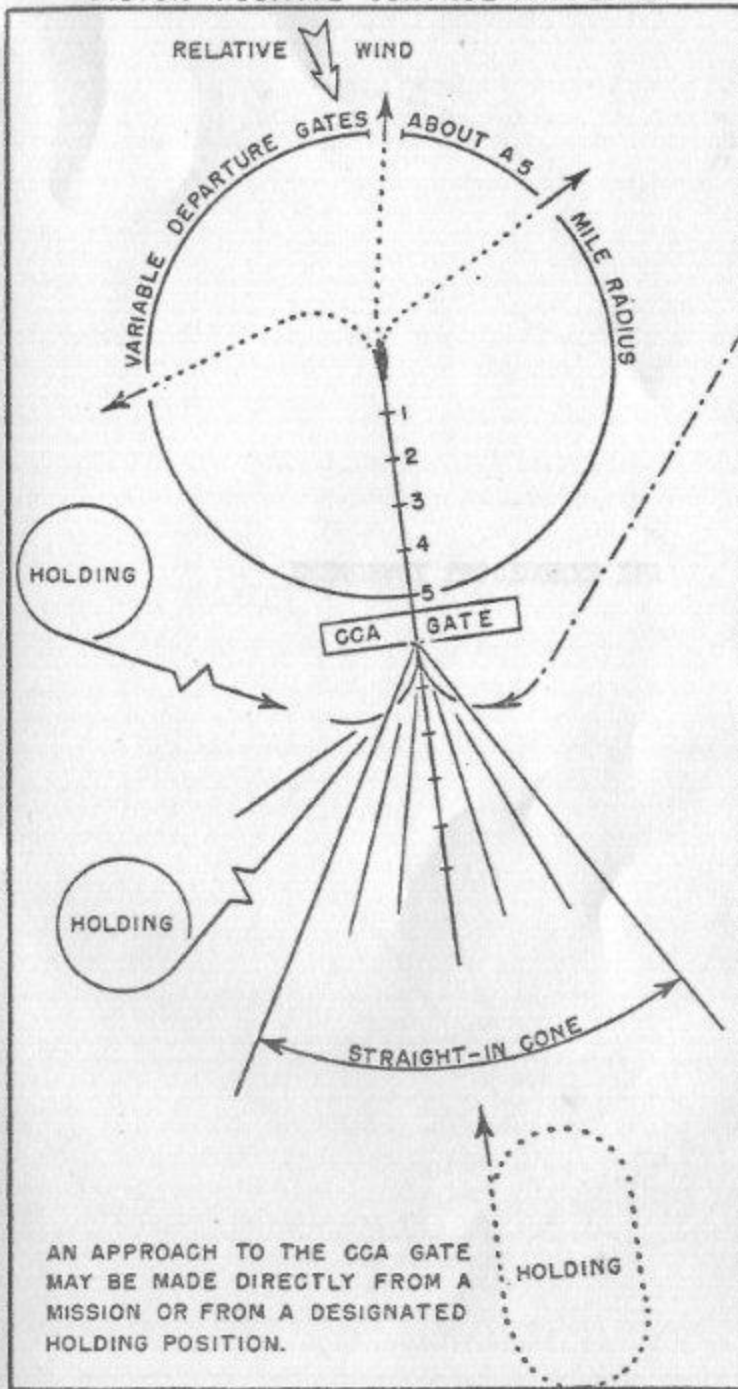
- (i) REDUCE TO FINAL APPROACH SPEED.
- (ii) CHECK THE GEAR, HOOK AND FLAPS ARE DOWN.
- (iii) THE PORT/STARBOARD MIRROR IS IN USE WITH A \_\_\_\_\_ DEGREE SLOPE.
- (iv) THE DECK IS CLEAR.

9. POSITIVE CONTROL PROCEDURES. The designated standard procedures may at times involve violation of an accompanying carrier's air space, or a prohibited danger or exercise area. Or, on some occasions it may be more expedient to feed in returning aircraft directly to a gate for an approach. In situations such as this, the Standard Procedures are abandoned and Positive Control Procedures adapted. As the name implies, positive radar control provides separation of aircraft.
- a. Holding. The position of the holding pattern or patterns may be varied at will so as not to interfere with other traffic or blocked air spaces. Any of the conventional patterns (left or right hand, figure eight, racetrack, orbit, or controlled rectangle) may be used.
  - b. Approach Gates. The initial approach clearance for all aircraft is to a specified gate. Both the Jet Gate and the CCA Gate are on the reciprocal of the final approach course, at ten and six miles respectively from the ship.
  - c. Straight-In Approach. A straight-in initial approach to a gate is defined as one in which the initial approach course is within 30 degrees of the final approach course.
  - d. Initial Cockpit Checks. The initial cockpit checks are to be completed upon reaching the appropriate gate. At this point the aircraft should be at 1000 feet and reducing to initial approach speed.
  - e. Departure Gates. The routing of departing aircraft is through a Departure Gate. This gate is usually designated as a bearing and distance from the carrier, and may be varied as necessary in the circumstances existing at the time of launch.

# JET POSITIVE CONTROL PATTERNS



PISTON POSITIVE CONTROL PATTERNS





... in all respects, comply with the rules of navigation and of communication for possible instrument flight. It also includes the following: There are important basic principles for the pilot in command which would include the identification of a return to the air, the possibility of a direct approach to a ready landing, or ground a landing without delay.

- a. There should be an established procedure for a return to the air in a standard instrument approach (SIA) or IAP.

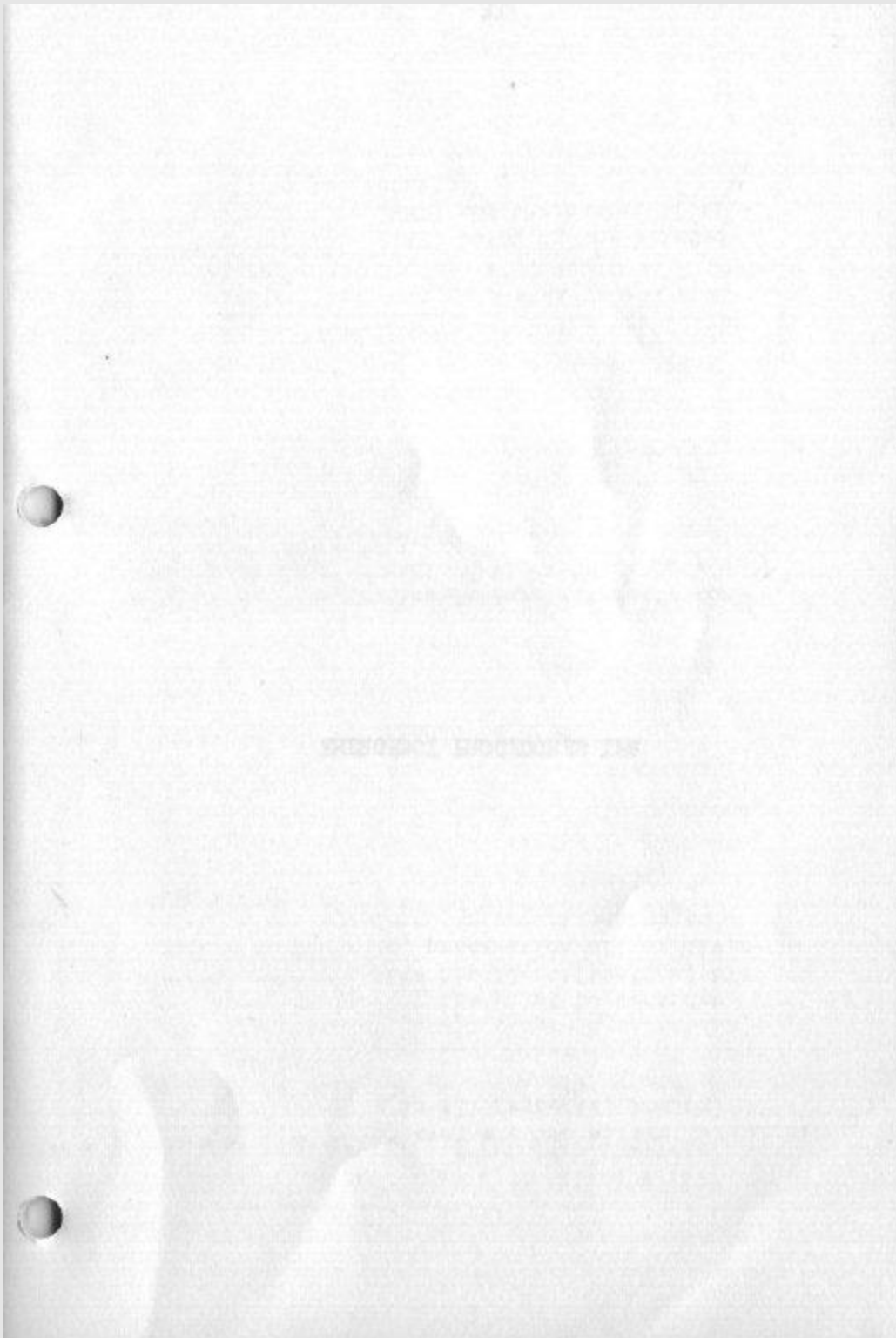
### EMERGENCY PROCEDURES IFR

- b. The higher the altitude, the greater the power, IFR and radio range.
- c. In any electronic failure which causes navigation or radio equipment to fail, the pilot should be advised.
- d. The triangular warning system should be used when a pilot is unable to land or to clear an obstacle.

### EMERGENCY PROCEDURES IFR

- a. A standard instrument approach to the primary airport or alternate airport should be used in any case of an instrument approach, and a standard instrument approach to the alternate airport should be used in any case of an instrument approach to the primary airport.





## EMERGENCY PROCEDURES - IFR

1. GENERAL. Seldom if ever are two aircraft emergencies alike in all respects, making impossible the task of categorizing and of legislating for possible incidents. If time and circumstances permit, there are certain basic principles for the pilot to consider which would expedite his identification, his return to the ship, preparation of, or diversion to a ready deck, or prompt search and rescue action.
  - a. There should be no hesitation in declaring an emergency in a standard distress message (MAY DAY - PAN)
  - b. Emergency IFF should be used.
  - c. The higher the altitude, the greater the radar, IFF and radio range.
  - d. In any electronics failure alternate communication or radio navigation methods should be considered.
  - e. The triangular distress patterns should be flown when within expected radar or IFF coverage.
2. RADIO FAILURE.
  - a. Expected Approach Time. In the pre-flight briefing, each aircraft will be assigned an inbound altitude, and a provisional Expected Approach Time (EAT) based on the briefed recovery time (BRT) and the number of aircraft in the detail.

For example, in a launch of four piston aircraft, the EAT's assigned will be:

A/C 1	-	BRT plus 15 mins	(lowest inbound altitude)
2	-	"	20 mins
3	-	"	25 mins
4	-	"	30 mins (highest inbound altitude)

These EAT's would be used only in the event of radio failure.

This problem is not so acute with jets since they usually launch by sections. The provisional EAT for jets is applicable then only to single aircraft launches or to a section which becomes separated. The provisional EAT for jets commences at BRT minus 15 minutes.

- b. Outside the Control Zone. If complete radio failure occurs when the pilot is well clear of the control zone, he should attempt to establish or maintain VFR or visual conditions below cloud. He may then close the carrier only if it is obvious that he will not interfere with IFR traffic in the zone.

If unable to establish or maintain VFR or visual conditions, the pilot shall close the carrier at his assigned inbound altitude and commence an approach at his assigned provisional EAT. If on completing an approach the carrier cannot be sighted the pilot should either depart for his alternate, or commence a square search in visual conditions. (left hand turns for complete radio failure; right hand turns when pilot has receiver only operative.)

- c. After a Revised EAT. If the radio failure is experienced after a revised EAT or Departure Time from a holding pattern has been assigned, the pilot shall commence his approach at the last assigned time.
  - d. During Missed Approach Procedure. If the radios fail during any Missed Approach Procedure and before further clearance is obtained, the pilot shall:
    - (1) Carry out a Standard Missed Approach procedure and maintain the FOXTROT CORPEN plus 45 at 1000 feet for 5 minutes prior to returning to the beacon at your assigned NORDO altitude.
    - (2) Commence another approach at the last assigned departure time plus 30 minutes.
  - e. Minimum Altitude. In any NORDO approach, once established inbound, the pilot may descend to minimum altitude seeking visual conditions. If unable to gain visual contact the pilot shall take up his last assigned altitude and depart for the briefed, VFR ready deck or alternate aerodrome.
  - f. Fuel State Caution. Before a NORDO approach is made, due regard must be given to the fuel state. When the BINGO state is reached, the pilot must have the carrier in sight, have reason to believe Special VFR weather or better exists at the ship, or depart for his alternate. Enroute, emergency IFF should be shown, and if fuel conditions permit, the appropriate triangular distress pattern should be flown.
3. LOW FUEL. When an aircraft reaches the BINGO fuel state the pilot should be in sight of the carrier.

If not, a prompt decision will be made whether to recover the aircraft or divert it to an alternate. This decision will be passed to the pilot along with the necessary FIGEDNS.

In IFR conditions, if the decision is to recover the aircraft, the pilot will receive an immediate clearance for the most expeditious approach.

4. HYPOXIA. Whenever there is the remotest suspicion that a pilot is subject to a lack of oxygen, he shall be given an immediate clearance to descend to a safe altitude. Especially in IFR conditions, he must be talked to and forced to concentrate on his instruments. If possible he should be accompanied or intercepted by another aircraft.

When the pilot reactions seem normal again, he will be re-called to the ship and recovered.

NOTES

