FLIGHT GUIDE FOR C–46

COMMUNICATIONS

GROUND	TOWER	DEP CON	RADAR	ENROUTE	CONTROL				NAME

NOTE

PRE-FLIGHT

COCKPIT

1. Battery Switches ..... OFF
2. Mag Switches ..... OFF

EXTERIOR

LEFT WING AREA

1. Wing Flap Follow-Up Cable ..... CONNECTED
2. Wing Flap Surface ..... CHECKED
3. Wing Flap Actuating Cylinders ... CHECKED
4. Fuel Boost Pump Drain ..... CHECKED
5. Boost Pump Case Drain ..... CHECKED
6. Aileron Trim Tab ..... NEUTRAL
7. Aileron Surface ..... CHECKED
8. Static Dischargers ..... CHECKED
9. Position Lights ..... CHECKED
10. De-Icing Boots or Leading Edge .. CHECKED
11. Landing Lights ..... CHECKED
12. Exhaust Stacks - Outboard ..... CHECKED
13. Engine Oil Leaks ..... CHECKED
14. Cowl Latches - Outboard ..... SECURED
15. Prop Blades and Cuffs..... CHECKED
16. Prop De-Icer Slinger Ring ..... SECURED
17. Prop Anti-Icing H.S. ..... CHECKED
18. Brush Block Safety Pins C.E. .... CHECKED
19. Dome Safety Wires ..... CHECKED
20. Front Cowl Latches ..... SECURED
21. Cowl Latches - Inboard ..... SECURED
22. Exhaust Stackes - Inboard ..... CHECKED
23. Engine Drains ..... CHECKED
24. Tire and Wheel ..... CHECKED
25. Brake Assembly ..... CHECKED
26. Hydraulic Lines ..... CHECKED

LEFT NACELLE

1. Generator Blast Tubes ..... CHECKED
2. Accessory Section ..... CHECKED
3. Cowl Hold-Open Rods ..... CHECKED
4. Cowl Flap Actuator ..... CHECKED

5. Oil Cooler Shutters ..... OPEN
6. Oleo Strut Extension ..... 3½"
7. Uplatch Roller ..... FREE
8. Uplatch and Actuator ..... CHECKED
9. Landing Gear Actuator ..... CHECKED
10. Downlock ..... ENGAGED
11. Wheel Well Area ..... CHECKED
12. Crossfeed and Firewall S.O.V. ..... CHECKED
13. Oil Tank and "Y" Drain ..... CHECKED

FORWARD FUSELAGE

1. APU and Heater Exhaust ..... CHECKED
2. Fire Extinguishers Discharge Plugs . CHECKED
3. All Antennaes ..... CHECKED
4. Pitot Covers ..... REMOVED
5. Pitot Tubes and Static Ports ..... CHECKED
6. Pitot Heat (If Required) ..... CHECKED
7. Ventilation and Heater Inlet ..... CHECKED
8. Pitot Mast De-Icing (If Required) .. CHECKED
9. Battery Case and Hydraulic Drains .. CHECKED
10. Forward Baggage Compartment Door ... SECURED
11. Air-Oil Separator Vents ..... CHECKED

GROUND SERVICE COMPARTMENT

1. Hydraulic Accumulator Pressure ..... CHECKED
2. Fluid Lines and Fittings ..... CHECKED
3. CB Sphere Pressure (If Installed) .. CHECKED
4. Door ..... SECURED
5. APU Receptacle ..... CHECKED

RIGHT SIDE THE SAME AS LEFT

AFT BAGGAGE COMPARTMENT

1. Long Range Fuel Tank (If Installed). CHECKED
2. Aileron Boost (A,D, +DM Models) .... CHECKED

3. Rear Spar ..... CHECKED
4. General Condition of Compartment . CHECKED
5. Baggage Compartment Screens and Access Door ..... SECURED

TAIL WHEEL

1. Tail Wheel Lock ..... CHECKED
2. Strut Inflation ..... CHECKED
3. Hydraulic Leaks ..... CHECKED
4. Canvas Cover ..... SECURED
5. Tire Inflation ..... CHECKED
6. Static Ground Wire ..... CHECKED
7. Security of Door Bracket ..... CHECKED
8. Tail Wheel Axle Safety Wire ..... CHECKED

EMPENNAGE

1. De-Icer Boot or Leading Edge ..... CHECKED
2. Control Surface ..... CHECKED
3. Balance Weights ..... CHECKED
4. Hinges, Brackets and Bushings .... CHECKED
5. Static Dischargers ..... CHECKED
6. Elevator Spring Cartridges ..... CHECKED
7. Upper Wing Surface and Fuselage .. CHECKED
8. Anti-Collision and Position Lights ..... CHECKED
9. Control Locks ..... STOWED

INTERIOR

1. Washroom ..... CHECKED
2. Shepherds Hook ..... STOWED
3. Cargo Door Support Stick ..... STOWED
4. Fire Extinguisher ..... CHECKED
5. First Aid Kits ..... CHECKED
6. Galley ..... CHECKED
7. Cargo and Passenger Doors ..... SECURED
8. Emergency Flap-Up Release ..... CHECKED
9. Wing Fuel Caps ..... SECURED
10. Emergency Exits ..... SECURED

11. Cargo Tie-Down ..... CHECKED
12. Heater Emergency Shut-Off Valve ..... DOWN
13. Warm Air "T" Valve ..... UP
14. Auxiliary Hydraulic Fluid Level .... CHECKED
15. Booster System Fluid Level ..... CHECKED
16. Hydraulic Shut-Off Valves ..... ON
17. Main Hydraulic Reservoir Fluid Level .... CHECKED
18. Anti-Icer Reservoir Fluid Level .... CHECKED
19. Emergency Gear Extension Crank ..... CHECKED
20. Fire Axe ..... STOWED
21. External Cockpit Door ..... SECURED
22. Fire Extinguisher ..... CHECKED
23. Evacuation Rope ..... STOWED
24. Emergency Up-Latch Release Handle ..... DOWN
25. Emergency Hydraulic Handpump ..... STOWED
26. Spare Fuses and Bulbs ..... CHECKED

PRE-STARTING

* 1. Generators ..... OFF
* 2. Batteries/External Power ..... ON
* 3. Seat Belt and No Smoking ..... ON
4. Exterior Lights ..... SET
5. Seats and Rudders ..... ADJUSTED
* 6. Brakes ..... SET
7. Preflight Inspection ..... COMPLETED
8. Pitot Covers ..... REMOVED
9. Aircraft Log and Papers ..... ON BOARD
10. Flight Kit ..... ON BOARD
11. Radio Master Switch (Radios Off) ..... ON
12. Circuit Breakers ..... CHECKED
13. Inverters .....CHECKED AND OFF
14. Emergency Boost Valve .....DOWN
15. Emergency Brake Valve ..... DOWN
16. Wing Flaps ..... UP
17. Superchargers ..... LOW
18. Carburetor Heat ..... COLD
19. Gear Handle ..... DOWN & LOCKED

20. Trim Tabs ..... CHECKED
21. Oil Cooler Doors ..... OPEN
22. Landing Lights ..... RETRACTED/OFF
23. Mixtures ..... IDLE CUT-OFF
24. Propellers ..... FORWARD
*25. Throttles ..... SET
26. Cowl Flaps ..... OPEN
27. Fuel Crossfeed ..... OFF
28. Booster Control ..... FORWARD
29. Firewall Shutoff Valves ..... OPEN
30. Heaters ..... OFF
*31. Fuel Selectors ..... ON
*32. Fuel and Oil Quantities ..... CHECKED
33. Static Air Selector (s) ..... NORMAL
34. Gyros ..... UNCAGED
35. Vacuum Selector ..... NORMAL
36. Auto Pilot ..... OFF
37. Warning Lights ..... CHECKED
38. Fire Warning Test ..... CHECKED
39. Manifold Pressure ..... CHECKED
*40. Master Ignition ..... ON
*41. Fire Guard ..... POSTED
*42. Start Right Engine
*43. Starter Switches ..... OFF

* Denotes Thru - Flight Checklist

PRE-STARTING (THRU - FLIGHT)

1. Generators ..... OFF
2. Batteries/External Power ..... ON
3. Seat Belt - No Smoking ..... ON
4. Brakes ..... SET
5. Throttles ..... SET
6. Fuel Selectors ..... ON
7. Quantities ..... CHECKED
8. Manifold Pressure ..... CHECKED
9. Master Ignition ..... ON
10. Fire Guard ..... POSTED
11. Start Right Engine
12. Starter Switches ..... OFF

PRE-TAXI

1. External Power .....DISCONNECTED
2. Batteries ..... ON
3. Generators ..... ON
4. Inverter ..... ON
5. Fuel Selectors ..... FRONT
   ..... CHECKED AND SET ON FRONT TANK (IF FULL)
6. Auto-Pilot ..... BLEED
7. Radios ..... CHECKED/SET
8. Altimeters ..... SET
9. Ignition Grounding ..... CHECKED
10. All Instruments ..... CHECKED

TAXI CHECKLIST

1. Brakes ..... CHECKED
2. Wing Flaps ..... CHECKED AND UP
3. Flight Instruments

ENGINE RUNUP

1. Tailwheel ..... LOCKED
2. Parking Brake ..... SET
3. Fuel Selectors ..... CENTER
4. Mixtures ..... AUTO RICH
5. Engine Temperatures and Pressures ..CHECKED
6. Propellers ..... CHECKED
7. Carburetor Heat ..... CHECKED
8. Generator ..... CHECKED
9. Feathering ..... CHECKED
10. Power Check ..... COMPLETED
11. Magnetos ..... CHECKED

PRE-TAKEOFF

1. Crew Briefing ..... COMPLETED
2. Trim Tabs ..... SET
3. Mixtures ..... AUTO RICH
4. Propellers ..... FWD/LOCKED/AUTO
5. Carburetor Heat ..... COLD
6. Gyros ..... SET
7. Temperatures and Pressures ..... CHECKED

8. Flight Controls ..... FREE AND FULL TRAVEL
9. Fuel Boosters ..... HIGH
10. Doors and Hatches ..... CLOSED
11. Anti-Collision .....ON
12. Cowl Flaps ..... TRAIL
13. Tail Wheel ..... LOCKED

AFTER TAKEOFF

1. Gear Handle ..... UP AND NEUTRAL
2. Fuel Boosters ..... OFF
3. Seat Belts - No Smoking ..... OFF
4. Landing Lights ..... UP AND OFF
5. Cabin Heat ..... AS REQUIRED
6. Wing Scan ..... COMPLETED
7. Cabin Door ..... LOCKED

CRUISE

1. Cowl Flaps ..... CLOSED
2. Cruise Power ..... SET
3. Mixtures ..... AUTO-LEAN
4. All Instruments ..... CHECKED
5. Cabin Heat ..... AS REQUIRED

DESCENT

1. Altimeters ..... SET
2. All Instruments ..... CHECKED
3. Magnetos ..... CHECKED
4. Fuel Selectors ..... SET
5. Emergency Brake Valve ..... DOWN
6. Emergency Booster Control ..... DOWN
7. Auto Pilot ..... OFF
8. Landing Gear Warning Lights .....CHECKED

LANDING

1. Seat Belts - No Smoking ..... ON
2. Heaters ..... OFF
3. Altimeters ..... SET
4. Cabin Door .....UNLOCKED
5. Carburetor Heat ..... COLD
6. De-Icers ..... OFF
7. Rudder Pedals ..... ADJUSTED
8. Mixtures ..... AUTO-RICH

9. Fuel Booster Pumps ..... LOW
10. Landing Gear ..... DOWN
11. Landing Gear Visual Check ..... CHECKED
12. Hydraulic Pressures ..... CHECKED
13. Brake Pressure ..... CHECKED
14. Propellers ..... 2300 RPM
15. Flaps ..... DOWN

AFTER LANDING

1. Cowl Flaps ..... OPEN
2. Propellers ..... FORWARD
3. Wing Flaps ..... UP
4. Fuel Boosters ..... OFF
5. Trim Tabs ..... NEUTRAL
6. Pitot Heat, Anti-Ice/De-Ice .....OFF
7. Anti-Collision Light ..... OFF
8. Radios ..... AS REQUIRED

PARKING

1. Tail Wheel ..... LOCKED
2. Brakes ..... SET
3. Mixtures ..... IDLE CUT-OFF
4. Ignition ..... OFF
5. Radios ..... OFF
6. Inverters ..... OFF
7. Generators ..... OFF
8. Fuel Selectors ..... OFF
9. Hydraulic System and Booster Pressure .....
.....BLEED TO 800 PSI
10. Wheel Chocks ..... INSTALLED
11. Batteries ..... OFF
12. Log Book ..... COMPLETED
13. Control Locks ..... ON

LIMITATIONS

Weight Limits: A-Non Transport Category
B-Transport Category

Basic Operating: See Operating Manual

Maximum taxi (including 100 lbs of taxi and runup fuel	A- 48,100 B- 47,500
Maximum Takeoff	A- 48,000 B- 47,400
Maximum Zero Fuel	A- 47,500 B- 45,168
Maximum Landing	A- 48,000 B- 46,800

Center of Gravity Limits

Forward	19.7%
Rearward	29.7%

Flight Load Acceleration Limits

FLAP UP	+2.51 G
FLAPS DOWN	+2.20 G

Powerplant Limits

Takeoff (2 minutes)

BHP	RPM	MP	P.A.
2000	2700	52	Sea Level
2000	2700	51	1500 Ft.

Maximum Except Takeoff (METO)
Low Blower

1700	2550	44	Sea Level
1700	2550	43	5500 Ft.

OR

1600	2400	43.2	Sea Level
1600	2400	41.5	5500 Ft.

RPM

Takeoff	2700 ± 50 RPM
High Pitch (Ham Std)	1000 - 1200 RPM
Ground Power Check	2500 RPM
Ignition Check	2320 ± 50 RPM
Max RPM Drop	100
Max Differential	40
Idling	550 ± 50 RPM
Idle Mixture Check	10 - 20 RPM (Mom inc. or ¼ in. Hg Dec)
Avoid Continuous	Below 1600

Overspeed: Any overspeeding beyond 2800 but less than 3100 for more than 30 seconds with large throttle opening or for more than 10 seconds with small throttle opening is reason for removal.

Fuel Pressure

Normal Operating	17 - 19
Minimum Idle	9
Fuel Pressure Warning	14
Maximum for Flight	21
High Boost (No Flow 28 Volts)	18 - 21
High Boost (No Flow 24 Volts)	16 - 18

Oil Pressure

Desired at 2000 RPM (15°C)	75 ± 5
Normal Operating	70 - 80
Minimum Cruise	60
Maximum Allowable	100
Minimum Idle	25

Oil Temperature

Desired Cruise	60° - 75°C
Minimum for Flight	40°C
Maximum Allowable	100°C

Cylinder Head Temperatures

Desired	180 - 205°C
Normal Operating	150 - 232°C
Maximum Before Start of Takeoff Roll	170°C
Maximum Ground Operation	200°C
Minimum For Mag Check	120°C
Minimum For Taxi	100°C

Carburetor Air Temperature

Normal Operating	+15 - +32°C
Maximum with heat	+38°C
Icing range	-10 - +15°C

Engine operating limits are based on the R-2800 -75-M3 engine using either Curtiss model C543S-C28-814-3C3-18 or Hamilton Standard propeller and minimum fuel grade 100/130

Fluid Servicing

Fuel		FRONT	RH	236
			LH	236
		Center	RH	292
			LH	292
		REAR	RH	175
			LH	175
				1406
Oil	1120, MIL-L6082 or LAD II		RH	39.8
			LH	39.8
				79.6

Normal Company service 36 each
Minima required BY FAR 121 - 25 Ea

Hydraulic	MAIN	7 Gal
	AUX	8
		15
A & D Models Booster System		1.92
		16.92
Anti-Icing		20.9 Gal

System Limitations

Hydraulic: (MAIN)

Normal Operating	1050 - 1350
Allowable Unloading Range	150 - 250
Time Between Cycles	90 Sec

Booster Control System:

Normal Operating	800 - 1000
Time Between Cycles	20 Sec

Auto Pilot Hydraulic

Desired	130 - 150
Normal Operating	115 - 150
Maximum	170
Minimum	100

Wing Flaps

Full Up to Full Down	10 - 15 Sec

Accumulators

Desired	600 + 50 - 0

Landing Gear Warning

15 - 18"

Vacuum

Normal Operating	4 ± .25"
Minimum	3.5"
Maximum	4.5"

Directional Gyro

4° in 15 Mins

Surface Deicing System

Desired	7 ± .5 PSI
Normal Operating	6 - 8.5
Maximum Allowable	10.0

Electrical

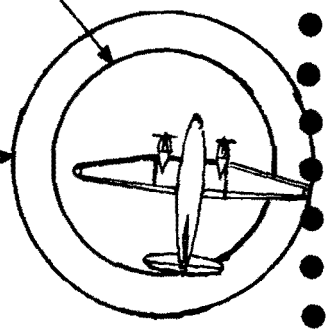
Generator	28 + .1 -.5
Generator Cut-In	26 - 27 Volts
AC Inverter	115 ± 5 Volts

Wheel Base
Turning Radius

43 Feet

Wing Tip
Turning Radius

67 Feet



Wing Span : 108 Feet

Length : 76 Feet 4 Inches

ENGINE AND PROPELLER MALFUNCTIONS

A. Engine Fire During Starting

If an engine fire occurs during the starting procedure:

1. KEEP ENGINE TURNING WITH STARTER.
2. MOVE MIXTURE CONTROL TO IDLE CUT-OFF.
3. TURN BOOST PUMPS OFF AND DISCONTINUE PRIMING
4. THROTTLE - FULL OPEN.
5. IF THE FIRE IS NOT DRAWN INTO THE ENGINE, ACTUATE FIREWALL SHUT-OFF VALVE AND EXTINGUISH FIRE BY USE OF OUTSIDE CO_2 SYSTEM AND/OR AIRPLANE FIRE EXTINGUISHING SYSTEM.

B. Engine Failure During Take-Off

If an engine should fail during takeoff before reaching V_2, the throttles must be closed and the airplane stopped. If an engine fails as V_2 is reached the pilot may elect to stop or continue the takeoff.

NOTE: V_1 and V_2 are the same for the C-46 in all weight categories.

If the takeoff is continued, initiate feathering immediately and climb out at V_2 speed until obstruction clearance altitude has been reached. Follow engine failure or fire check list.

When continued operation of an engine having any of the following conditions is considered necessary for the safety of the flight, such operations will be at the discretion of the Captain. If the engine operation is continued it is recommended that engine operation be conducted with caution and at the minimum power consistent with requirements.

Experience dictates that prompt analysis and engine shutdown (feather) will minimize severe damage in most cases. Normally, feather or stop the engine when:

1. An extreme or abnormal engine vibration occurs.
2. An excessive or uncontrollable power loss occurs.
3. An uncontrollable rise in oil temperature occurs.
4. A sudden or uncontrollable drop in oil pressure occurs.
5. A sudden or uncontrollable drop in fuel pressure occurs.
6. A sudden or uncontrollable rise of cylinder head temperature occurs.
7. When it is known that two or more cylinders are inoperative.
8. A heavy discharge of oil is seen from the engine breather or exhaust system and/or a sudden decrease in oil quantity is indicated.
9. The cylinder head temperature cannot be kept below the upper limits.
10. An engine fire occurs.
11. A propeller becomes uncontrollable.

C. Engine Failure And/Or Fire

Immediate Action Items

1. PROPELLER ..... FEATHER
2. MIXTURE ..... IDLE CUT OFF
3. PROP FEATHERING AND FIRE .....
   ..... VISUALLY CHECK
   (Hamilton Standard Prop. Check Feather Button Out.)

Fire Action Items Only

1. FIREWALL SHUT OFF ..... CLOSED
2. COWL FLAPS ..... CLOSED
3. FIRE EXTINGUISHERS ..... DISCHARGE

CAUTION: Do not lower landing gear with nacelle on fire.

Secondary Action Items

1. Vacuum Crossfeed ..... AS REQUIRED
2. Feather Switch (C.E.) ..... NORMAL
3. Propeller Control ..... AFT
4. Fuel Booster ..... OFF
5. Fuel Selector and Crossfeed ..... OFF
6. Cowl Flaps ..... CLOSED
7. Generator ..... OFF
8. Ignition ..... OFF
9. Alcohol (Prop. & Carb.) ..... OFF
10. Cabin/Cockpit Heaters ..... SET (Safe Operation)

D. Unfeathering Procedure

1. Maximum Airspeed ..... 130 KNOTS
2. Throttle ..... CLOSED
3. Propeller Control ..... AFT (and Fixed Pitch C.E.)
4. Fuel Selector ..... ON
5. Firewall Shut-Off ..... OPEN
6. Oil Quantity ..... CHECKED
7. Oil Cooler ..... OPEN
8. Generator ..... ON
9. Turn Engine With Starter ..... 16 BLADES (12 Blades - Hamilton Standard)
10. Propeller ..... UNFEATHER (800 RPM) (Do not exceed 800 RPM)
11. Propeller Governor ..... 1200 - 1300 RPM (If RPM does not stabilize-feather)
12. Fuel Booster ..... ON
13. Ignition ..... ON
14. Mixture ..... AUTO-RICH
15. Warm Up (Until 100°C CHT and rising) ..... 1600 RPM, MAP 20HG

E. Runaway Propeller and Engine Overspeeding

While a runaway propeller is an infrequent occurence, it is necessary to be familiar with the procedures involved in coping with such an emergency.

1. If the propeller overspeeds while still on the ground, close throttles immediately and stop the airplane.

2. If the propeller overspeed after the airplane is airborne, attempt to maintain below 3000 RPM by:

   a. Closing the throttle.
   b. Reducing airspeed as rapidly as possible.
   c. Manipulating propeller lever.
   d. Manual RPM decrease (C.E.)
   e. Intermittent Feathering (Maximum of 3 attempts.)
   f. Descending to a lower altitude.

   If the above procedures does not regain RPM control, feather the propeller. If unable to feather the propeller, place mixture to idle cutoff and land as soon as practicable.

   NOTE: If shut-down is required, propeller RPM should be reduced as much as possible before feathering is attempted.

SYSTEM FAILURES

A. Hydraulic Failure

Whenever a hydraulic failure occurs, the following steps will be taken to preclude further loss of fluid under pressure:

1. Landing gear handle ..... NEUTRAL
2. Wing flap selector ..... UP
3. Aileron boost (D Model) ..... OFF

B. Wing Flap Emergency Operation

It is possible to operate the wing flaps by using the hand pump, provided there is fluid in the system.

1. Reduce airspeed to 117 kts IAS.
2. Place wing flap selector valve to desired position.
3. Pumps flaps down (or up) with hand pump until setting is reached.
4. For emergency retraction of the wing flaps, actuate the emergency flap retraction handle located at station 399 (some airplanes) or at the base of the pedestal (other airplanes) which mechanically opens the "Up valve" ports in the wing flap control valve. The flaps will retract to approximately the 5° position as a result of slip stream action.

NOTE: Spare hydraulic fluid is provided on some airplanes in a spare tank above the hydraulic reservoir. This tank should be checked for quantity prior to takeoff. The tank should never be filled to the filler neck in order to prevent leakage at altitude.

C. Landing Gear Emergency Operation

WITH FLUID

1. Place gear selector in the "down" position.

2. Insert hydraulic pump handle and pump until the landing gear locked lights come on.

WITHOUT FLUID

1. Place gear selector in the "down" position.
2. Pull emergency release handle and lock in the "up" position.
3. Prior to inserting the hand crank, visually check that the landing gear has extended.
4. Insert the hand crank and turn counterclockwise until the landing gear locked lights come on and the cables line up with the indices. An amber light indicates a single lock, safe to land, condition.

NOTE: The emergency uplatch release handle incorporates a ratchet device to retain manual extension mechanism is being operated.

The uplatch release also operates three dump valves which send hydraulic fluid back to the reservoir from the main gear retracting cylinders and overboard from the tailwheel retracting cylinder.

The crank for the manual extension mechanism is stowed on the lower surface of the hatch in the pilots' compartment floor. The main landing gear will "free fall" approximately two-thirds down. The tail wheel should "free fall" to the fully extended and locked position. Crank the main landing gear down the rest of the way by using the emergency gear crank. The crank is inserted in the two holes on the left wall located

below the hatch. These holes are marked LEFT and RIGHT (landing gear.)

CAUTION: NEVER INSERT OR USE CRANK UNTIL GEAR HAS EXTENDED AS FAR AS IT WILL GO.

If the tail wheel fails to release, go to the aft bulkhead of the main cabin, reach in through the access opening and pull on the up-latch cable. The tail wheel should then fall into place and lock by gravity. In the event the tail wheel fails to fall free when using this procedure open a hole as indicated on the bulkhead. Attach shepherds hook to cargo door extension rod and pull tail wheel into the down and locked position.

D. Emergency Brake Procedure

1. With a brake pressure reading of 1350 psi, there should be 4 to 6 brake applications remaining.
2. Prior to landing without hydraulic pressure, pull up the emergency brake valve handle.
3. Operate the hydraulic pump handle during landing and taxying.

NOTE: The brakes will not operate satisfactorily with accumulator pressure below 600 pounds.

Once the brake pedals have been depressed, releasing the brake pedals will diminish the available pressure from the accumulator for subsequent brake applications.

E. Fuel System Failure

1. Engine Driven Pump
   a. In the event, of failure of an engine-driven pump, place fuel booster pump switch to the HIGH position.
2. Crossfeed Operation - To Cross Feed Fuel
   a. Turn booster pump to "High".
   b. Select desired fuel tank.
   c. Pull fuel cross-feed valve control.
   d. Turn off boost pump on side not being used.

F. Electrical System Failure

A generator output check should be made every 30 minutes.

1. Generator Failure
   a. If one generator fails, turn off the failed generator.
   b. If both generator fail, turn both off and start APU (if installed.)
   c. If unable to start APU, turn off all electrical equipment and switch props to FIXED PITCH.
   d. Conserve electrical energy for approach and landing, but put props in automatic before landing.

2. Over-Voltage
   a. Affected Generator ..... OFF
   b. Generator field circuit breaker ... OFF (If Installed)
   c. If a generator shows excessive emperage.
      1. Reduce electrical load by turning off all unnecessary electrical equipment.
      2. Isolate unit causing excessive load. When faulty unit has been determined, return other units to normal operation.
      3. Monitor electrical load.

CAUTION: If a generator field circuit breaker is not installed and a generator fire is imminent or has started, corrective action will be to feather the propeller and stop engine rotation.

3. Accessories

In the event of loss or failure of electrical accessories, check circuit breakers and fuses on affected item.

FIRE AND SMOKE

A. Electrical Fire
1. Oxygen/Smoke Mask ..... ON
2. Batteries and Generator Switches ... OFF
3. If Fire Continues .....
..... USE HAND FIRE EXTINGUISHER
4. Pull All Circuit Breakers.
5. Batteries (one at a time)..... ON
6. To locate source of fire or smoke, restore DC and AC power and reinstate circuit breakers in order of importance, one at a time, watching for electrical overload or smoke. If source of difficulty is located, isolate that circuit.

B. Cabin/Cockpit Heater Fire
1. Oxygen/Smoke Mask ..... ON
2. Cockpit Windows ..... CLOSED
3. All Heater Switches ..... OFF
4. Nose Air Inlet Valve ..... CLOSED
5. Heater Fuel Shut-Off Valve ..... CLOSED
6. Discharge Heater Extinguisher Hold Switch For 5 Seconds.
7. If Necessary, Proceed With Smoke Evacuation Procedure.
8. Investigate Heater Compartment for Fire.

C. Cabin/Cargo Compartment Fire
1. Oxygen and Smoke Mask ..... ON
2. Use Fire Extinguisher to Combat the Fire.
3. If Necessary, Proceed with Smoke Evacuation Procedure.

NOTE: All fires, regardless of size or location, must be reported to the Company SOM.

D. Smoke Evacuation Procedure
1. Airspeed ..... BELOW 130 Kts IAS
2. Oxygen or Smoke Mask .....ON
3. Overwing Emergency Exits ..... OPEN
Open both overwing emergency exits if possible.

4. Cockpit Door..... OPEN
5. Cockpit Side Windows ..... PARTIALLY OPEN

Do not open cockpit side windows unless the emergency exit(s) are open.

In the event exhaust gases are detected in the flight compartment (cockpit door closed, cockpit side windows closed), visually check both overwing emergency exits. If an exit is open or missing, don oxygen masks and partially open both cockpit side windows. Land as soon as practicable.

EMERGENCY LANDING AND CREW/PASSENGER EVACUATION

A. Landing With One Main Gear Retracted

Complete all items in paragraph A, then proceed as follows:

1. The Captain may elect to make a belly landing. If not, the following procedures will apply:

   a. Secure cabin and cockpit equipment.
   b. On final approach turn off generator switches.
   c. Land slightly faster than usual using full flaps.
   d. After touchdown, hold wing up as long as possible with aileron. Hold heading with rudder.
   e. Close firewall shut off valves.
   f. After aircraft comes to a complete stop, discharge engine fire extinguishers and turn off batteries.
   g. Evacuate aircraft as rapidly as possible.

B. Belly Landing

1. Landing on the runway is preferred to landing off the runway.
2. Use full flaps.
3. Apply procedures outlined for landing with one main gear retracted.

C. Crew Duties After Emergency Landing

1. Captain - Secure cockpit.
2. First Officer - leave flaps full down, leave by the quickest cabin exit with hand fire extinguisher and fire axe, and combat minor fires.
3. Cabin Crew - Assist passengers in evacuating by quickest available exit.

D. Best Evacuation Routes

1. If one main gear is up - Use any exit on gear up side if no fire exits.

2. If a belly landing has been made, use the following exits.

   a. Main cargo door.
   b. Emergency exits over wing if no fire exists.
   c. Cockpit emergency escape door.

3. If both main gear are down - Use the following exits.

   a. Main cargo door.
   b. Emergency exits over wing.
   c. Cockpit emergency escape door.

NOTE: Ditching ropes are available for use at all emergency exits.

Signals:

One Finger:	METO Power (1700 BHP)
Two Fingers:	METO Power (1600 BHP)
Three Fingers:	Climb Power

STANDARDS AND GRADING CRITERIA

Steep Turns	Angle of bank	± 10°
	Airspeed	± 10 Kts
	Altitude	± 100 Ft
	Roll out	± 10°
Slow Flight	Airspeed	± 5 Kts
	Altitude	± 50 Ft
	Heading	± 5°
Approach to Stalls	Altitude	± 50 Ft ± 100 Ft
	Heading	± 5°
Normal Turns and Holding	Angle of bank	± 5°
	Airspeed	± 5 Kts
	Altitude	± 50 Ft
Level Flight	Altitude	± 50 Ft
	Heading	± 5°
Tracking	Altitude	± 50 Ft
	Track	± 5°
	Localizer	± 2°
Instrument approaches (including rapid descent and pullup)	Airspeed	+ 5 Kts
	Glide path	Within 50 Ft
	Altitude	± 50 Ft (except at minimum: + 50 - 0 Ft

GRADE

1	Well Above Average	(90-100)
2	Above Average	(85-89)
3	Average	(80-84)
4	Below Average	(70-79)
5	Unsatisfactory	(0-69)

Tailwheel locked.
Release brakes,
apply take off
Power.

At 50-60 Knots
tail starts to
rise.

Fly off at V2
(88 Knots in
Ground Effect)

Vmc in ground
effect - 80 Kts.

Positive rate of
climb - Gear up.
Maintain V2 (92 Kts.
out of ground effect)

When Gear is up, reduce to
METO (RPM 2550, MAP 44.0).
If clear of obstacles,
accelerate to 111 Knots and
maintain until 500 Ft. or
obstruction clearance
altitude. Then reduce to
RPM 2400 - MAP 43.2

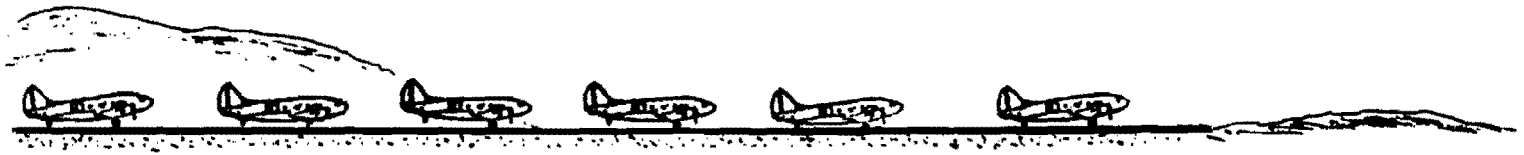
Arrive at
1000 Ft. with
airspeed 122
Kts., then
reduce power
to RPM 2300
MAP 36.5.
Climb check-
list.

NORMAL TAKEOFF

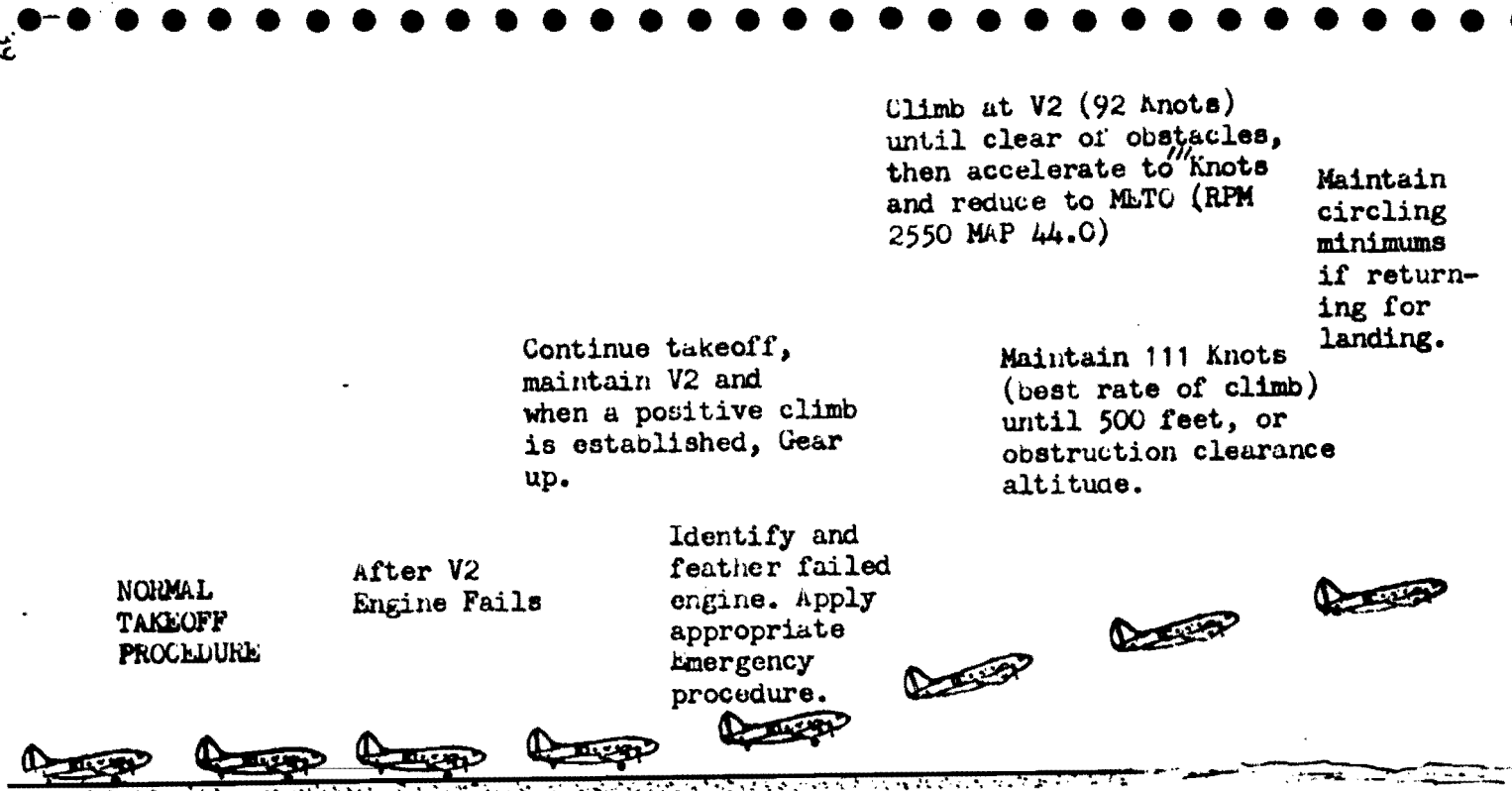
Engine Failure
Prior to V2
(88 Knots)

NORMAL
TAKEOFF
PROCEDURE

Close throttles and return tail to runway as speed permits. Brake as required.



REJECTED TAKEOFF



TAKEOFF WITH ENGINE FAILURE AFTER V2

Tail wheel locked, Flaps ¼, hold brakes and apply power to MAP 30". Release brakes and advance throttles to take-off power.

Fly off between 55–60 Knots.

Accelerate to V2, retract the flaps and continue climb at V2 until clear or obstacles. Accelerate to 111 Knots and reduce to METO power. Observe 2-minute takeoff power limits.

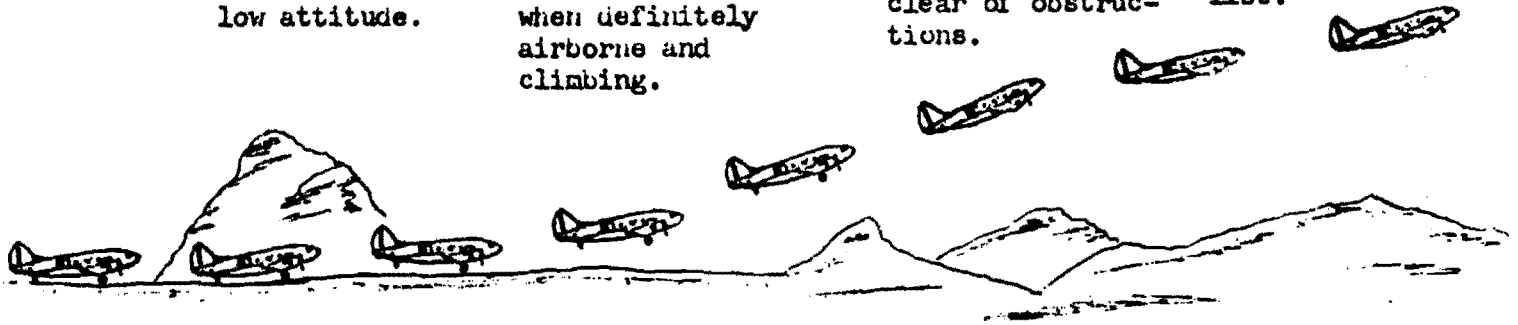
When clear of oostructions, reduce power to RPM 2400, MAP 43.2 Maintain 111.

Arrive at 1000 Ft. with airspeed 122 knots, then reduce power to RPM 2300, MAP 36.5. Climb check-list.

Climb at METO (111 Knots) until clear of obstruc-tions.

Maintain tail low attitude.

Retract the gear when definitely airborne and climbing.



MINIMUM RUN TAKEOFF (MAXIMUM PERFORMANCE)

STEEP TURNS

Mixtures: Rich
RPM: 2000
Airspeed: 130 Kts.

APPROACHES TO STALL

Cruise:

GEAR	UP
FLAPS	UP
MAP	12
RPM	2000
Mixture	Auto Rich

	Approach:	Landing:
Gear:	Down	Down
Flaps:	1/4	Full Down
MAP:	12"	12"
RPM:	2300	2300
Mixture:	Auto Rich	Auto Rich

Note: Use LOW Boost because of possible fuel starvation

APPROXIMATE STALL SPEEDS IAS POWER OFF

Weight	0	1/4	1/2	FULL
48000	72	70	67	62
45000	68	66	64	60
40000	66	64	62	57
35000	64	61	58	53

SLOW FLIGHT 80 Knots 35000 Lbs.

Clean	2300 RPM	18 MAP
Gear Down	2300	22
Gear Down Flaps 1/4	2300	25
Gear Down Flaps Full	2300	32

Cruising Configuration

RPM 2000, MAP 12,
Flaps up, Gear up.

Maintain heading and altitude.

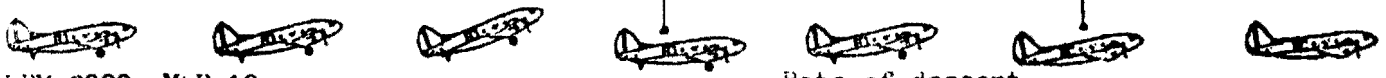
When onset of the initial buffet is felt, lower nose to horizon, level the wings, and simultaneously command maximum power.

Regain any lost altitude at 84 Knots (Vmc).

Accelerate to 100 Knots.

When onset of the initial buffet is felt, lower nose to horizon, sumultaneously command maximum power.

Approach Configuration



RPM 2300, MAP 12,
Flaps $\frac{1}{4}$, Gear down.

Regain any lost altitude at 84 Kts.

Rate of descent arrested, Flaps up, positive rate of climb, Gear up.

Accelerate to 100 Kts.

APPROACHES TO STALLS

Landing Configuration

When onset of the initial buffet is felt, lower nose to horizon, sumultaneously command maximum power, and while accelerating retract flaps to ¼.

Regain any lost altitude at 84 knots.


RPM 2300, MAP 12, Flaps full down, Gear down.



Rate of descent arrested, Flaps up and positive rate of climb, Gear up.

Accelerate to 100 Kts.

NOTE: Maximum power will not be used during training. Climb power will be used instead. (If a full stall is encountered, maximum power will be used for recovery). At least one approach to a stall will be done while in a turn.

APPROACHES TO STALLS

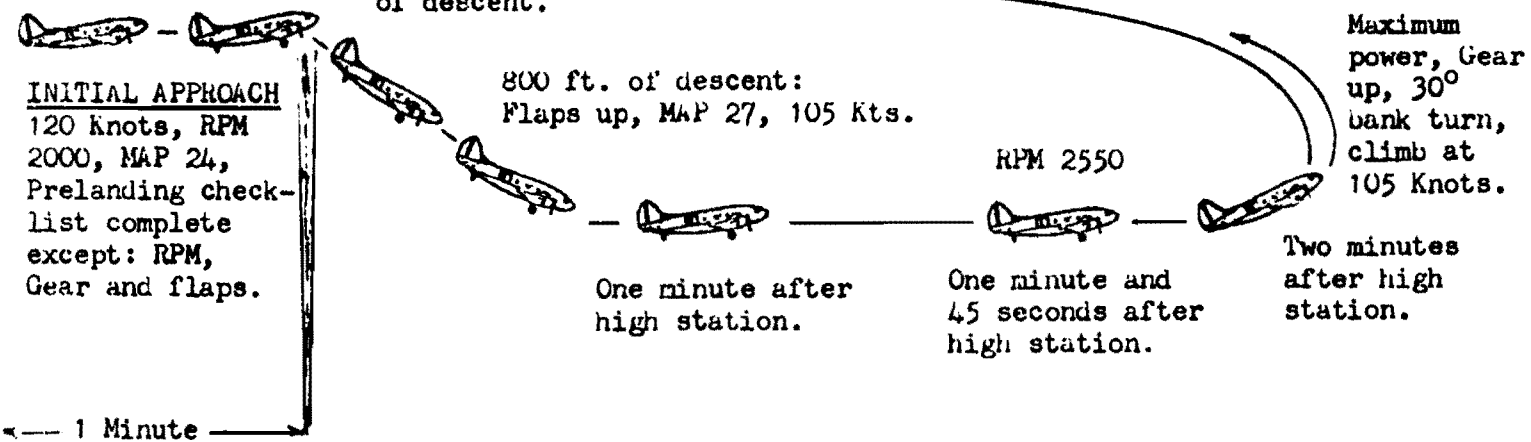
* Instructor/Check Pilot will assign time for simulated high station station passage.

30 sec prior to high station.
Gear: Down RPM 2300, Flaps full down, MAP 18.
Slow to cross station at 105 knots.

If engine fails, shallow bank to 15° and maintain V2 (92 K) and continue climb if possible.

180° turn.

1000 FPM rate of descent.

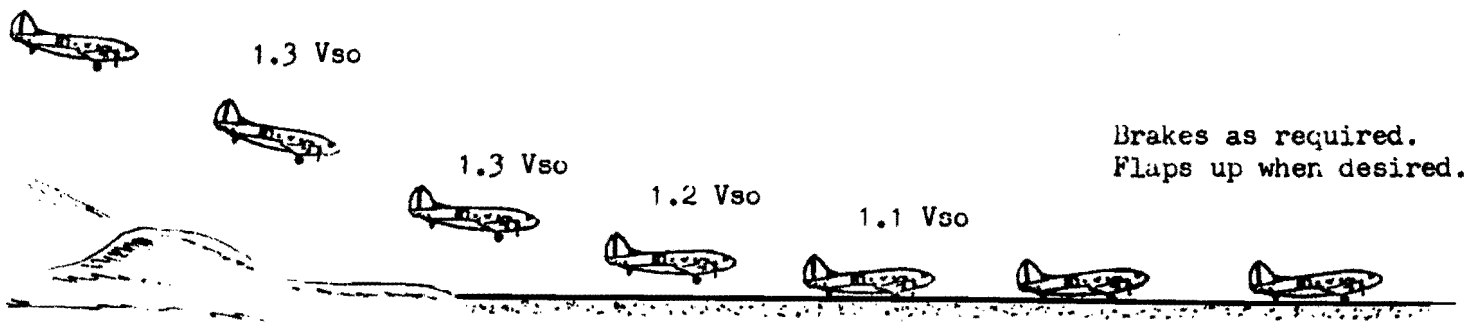


CANYON APPROACH (RAPID DESCENT AND PULL UP)

Before landing checklist
Complete - Gear Down,
Flaps Full Down.
Minimum approach speed
- Vmc.

Gross Wt. Vs ➢ Stall Speed (IAS)

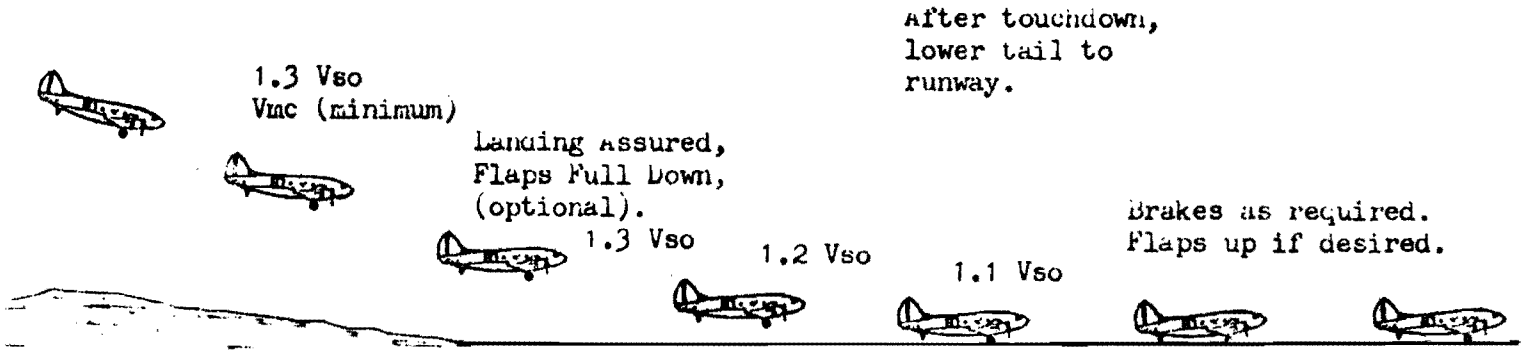
	Full Flaps					Zero Flaps	
	Vso	1.05 Vso	1.1 Vso	1.2 Vso	1.3 Vso	Vso	1.3 Vso
48000	62	65	69	75	81	72	94
45000	60	63	66	72	78	68	89
40000	57	60	63	69	74	66	86
35000	53	56	59	64	69	64	84



NORMAL LANDING

Before landing checklist complete. Gear down, Flaps (optional)

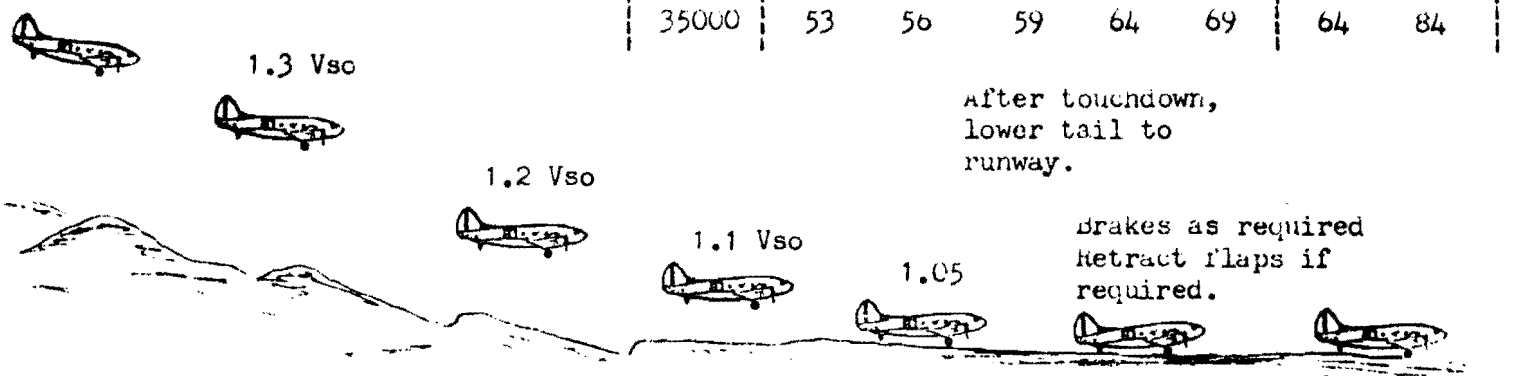
Gross Wt.	Vs % Stall Speed (IAS)						
	Full Flaps					Zero Flaps	
	Vso	1.05 Vso	1.1 Vso	1.2 Vso	1.3 Vso	Vso	1.3 Vso
48000	62	65	69	75	81	72	94
45000	60	63	66	72	78	68	89
40000	57	60	63	69	74	66	86
35000	53	56	59	64	69	64	84



SINGLE ENGINE LANDING

Before Landing Checklist
Complete - Flaps Full Down
Gear Down. Minimum approach
speed - Vmc

Gross Wt.	Vs % Stall Speed (IAS)						
	Full Flaps					Zero Flaps	
	Vso	1.05 Vso	1.1 Vso	1.2 Vso	1.3 Vso	Vso	1.3 Vso
48000	62	65	69	75	81	72	94
45000	60	63	66	72	78	68	89
4000	57	60	63	69	74	66	86
35000	53	56	59	64	69	64	84



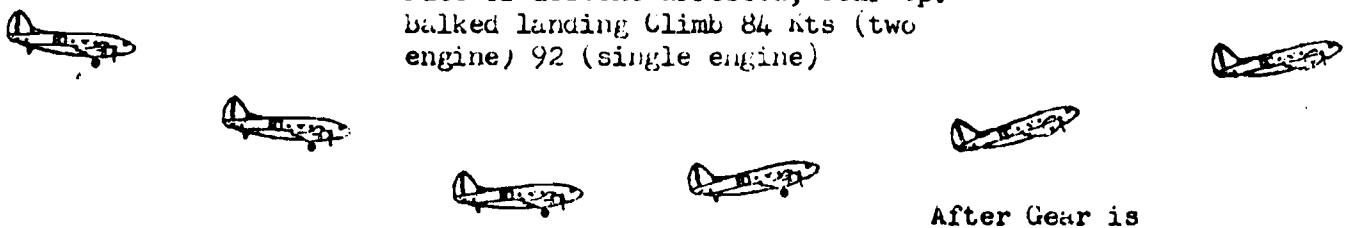
MINIMUM RUN LANDING (MAXIMUM PERFORMANCE)

-- NORMAL APPROACH --

BALKED LANDING:
Apply Maximum power,
Flaps ¼ .

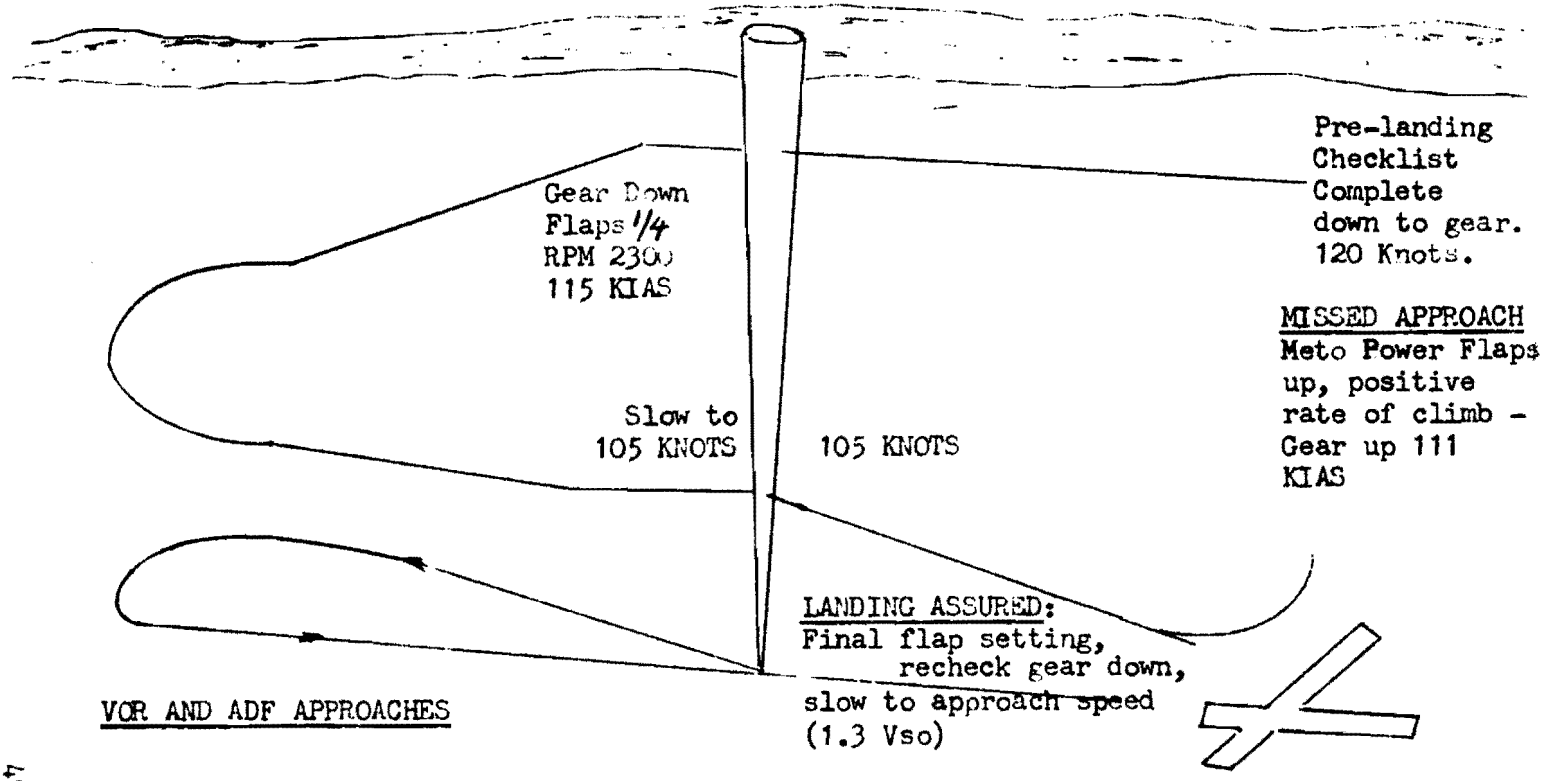
Proceed as during normal takeoff or takeoff with engine failure.

Rate of descent arrested, Gear Up. balked landing Climb 84 Kts (two engine) 92 (single engine)

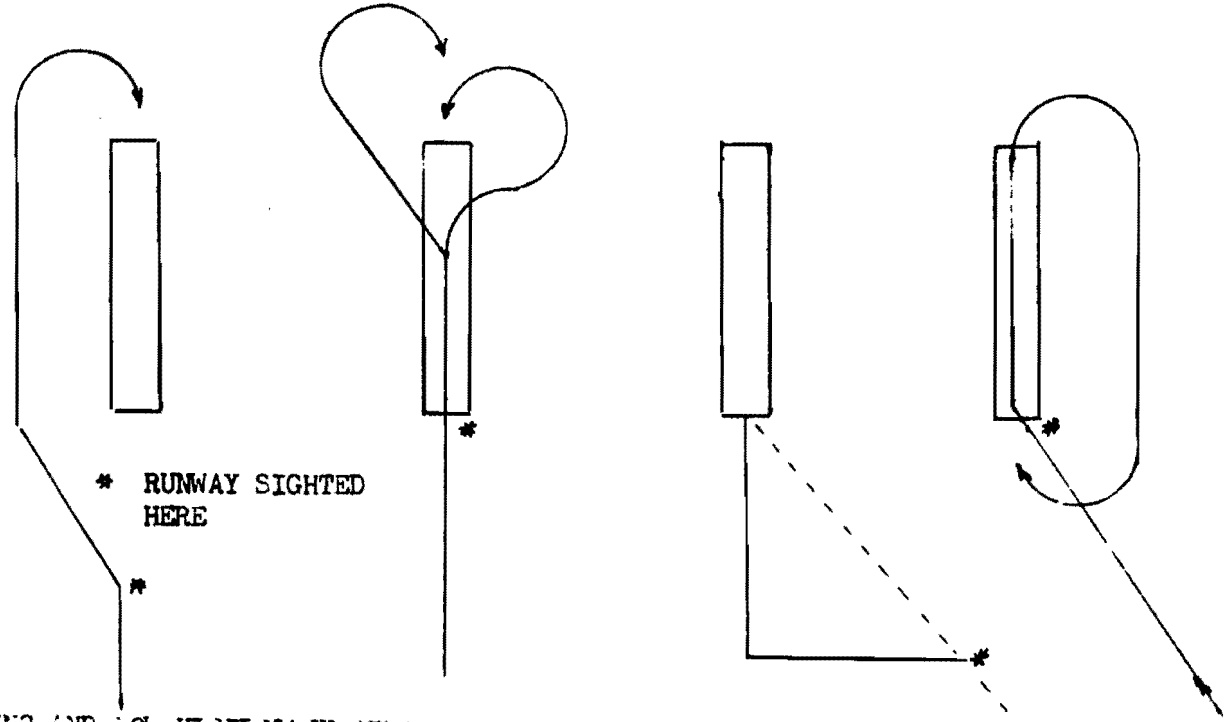


After Gear is retracted, Flaps up, climb at V2; (92 K)

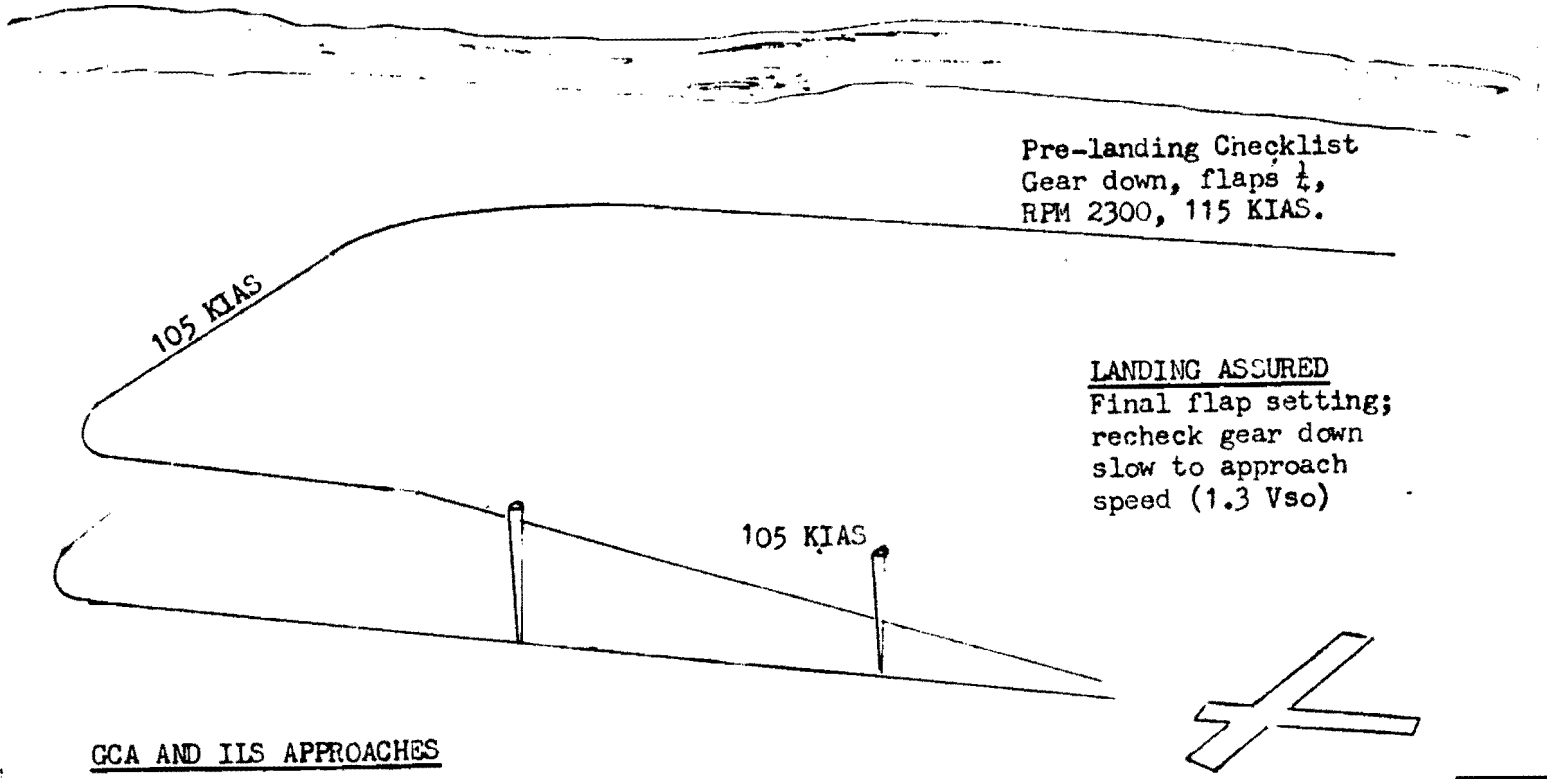
BALKED LANDING


Pre-landing
Checklist
Complete
down to gear.
120 Knots.
Gear Down
Flaps 1/4
RPM 2300
115 KIAS
MISSED APPROACH
Meto Power Flaps
up, positive
rate of climb -
Gear up 111
KIAS
Slow to
105 KNOTS
105 KNOTS
LANDING ASSURED:
Final flap setting,
recheck gear down,
slow to approach speed
(1.3 Vso)
VOR AND ADF APPROACHES

NOTE: Maintain 115 Knots from low station until on BASE LEG.



CIRCLING AND LOW VISIBILITY APPROACH

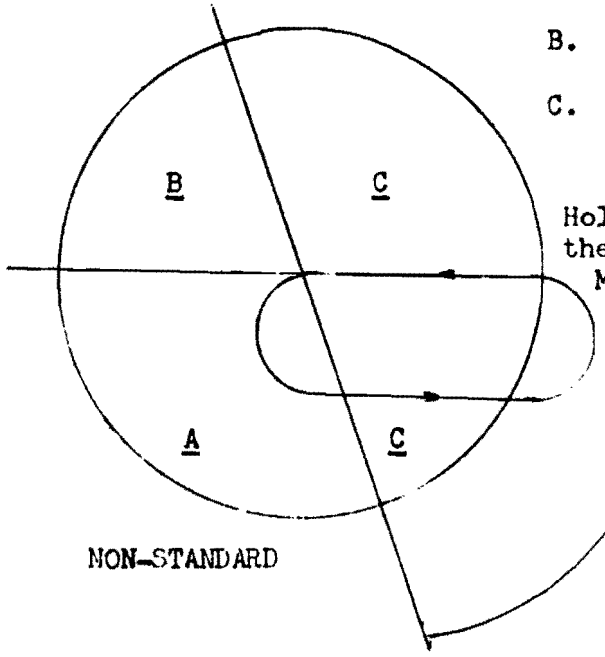


GCA AND ILS APPROACHES

A. Parallel Procedure

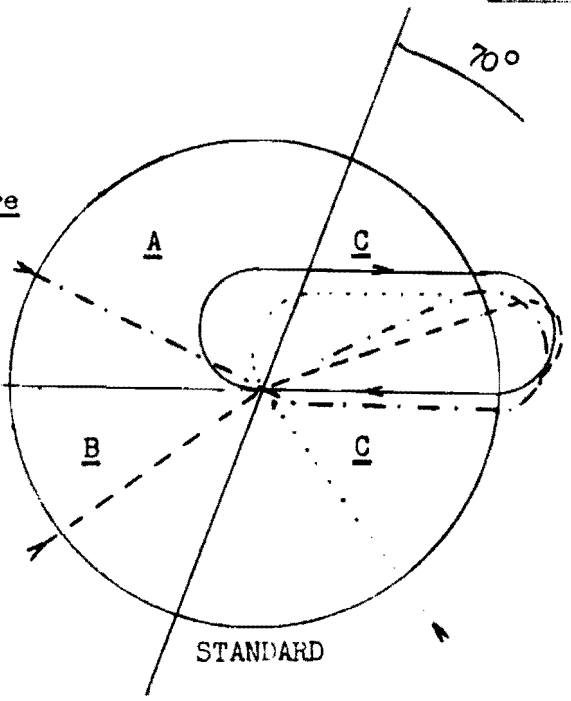
B. Tear Drop Procedure

C. Direct Entry Procedure



NON-STANDARD

Holding is measured on the inbound leg. One Minute at 14000 and below; One and one half minute above 14000 Ft.



STANDARD

PERFORMANCE DATA

ABBREVIATION	IAS (Kts)	REMARKS
V_{ne}	234	Never Exceed
V_{no}	191	Normal Operating
V_a	130	Design Maneuvering
V_b	130	Max Gust Intensity
V_{le}	130	Landing Gear Op.
V_{fe}	117	Flap Extension
V_y	111	Best Rate S.E.
V_x	92	Best Angle S.E.
V_2	92	Out of Ground Eff.
V_2 (V_1)	88	In Ground Effect
V_{mc}	84	Out of Ground Eff.
V_{mc}	80	In Ground Effect
	122	Normal Climb
	139	Normal Cruise
	120	Holding
___	___	_____
___	___	_____
___	___	_____
___	___	_____
___	___	_____
___	___	_____

APPROXIMATE STALLING SPEEDS

INDICATED AIRSPEED

V_s

GROSS WT	0 FLAP	¼ FLAP	½ FLAP	FULL FLAP
LBS	Kts	Kts	Kts	Kts
48000	72	70	67	62
45000	68	66	64	60
40000	66	64	62	57
35000	64	61	58	53

GROSS WT. Vs % STALL SPEED-IAS

FULL FLAP

GROSS WT	Vso	1.05 Vso	1.1 Vso	1.2 Vso	1.3 Vso
48000	62	65	69	75	81
45000	60	63	66	72	78
40000	57	60	63	69	74
35000	53	56	59	64	69

GROSS WT. Vs % STALL SPEED-IAS

ZERO FLAP

GROSS WT	Vso	1.3 Vso
48000	72	94
45000	68	89
40000	66	86
35000	64	84

CLIMB POWER

R-2800-75M3

1280 BHP - AUTO RICH - 131 GPH P/Engine

Alt	RPM	MAP	Std. Temp.
1000	2300	36.5	+ 13
2000	2300	36.0	+ 11
3000	2300	36.0	+ 9
4000	2300	35.5	+ 7
5000	2300	35.0	+ 5
6000	2300	34.5	+ 3
7000	2300	34.5	+ 1
8000	2300	34.0	- 1
9000	2300	34.0	- 3
10000	2300	33.5	- 5
11000	2300	33.0	- 7

STANDARD CRUISE

880 BHP - AUTO LEAN - 67 GPH P/Engine

Alt	RPM	MAP	Std. Temp.
2000	1800	33.2	+ 11
3000	1800	32.8	+ 9
4000	1800	32.6	+ 7
5000	1800	32.4	+ 5
6000	1800	32.2	+ 3
7000	1800	31.9	+ 1
8000	1810	31.5	- 1
9000	1850	30.6	- 3
10000	1870	30.0	- 5
11000	1900	29.2	- 7
12000	1940	28.5	- 9