

AIRCRAFT REVIEW -----

PERFORMANCE DATA -----

POWER CHARTS -----

GRADING CRITERIA AND PROF. MANEUVERS --

LIMITATIONS -----

EMERGENCY CHECKLIST -----

COCKPIT CHECKLIST -----

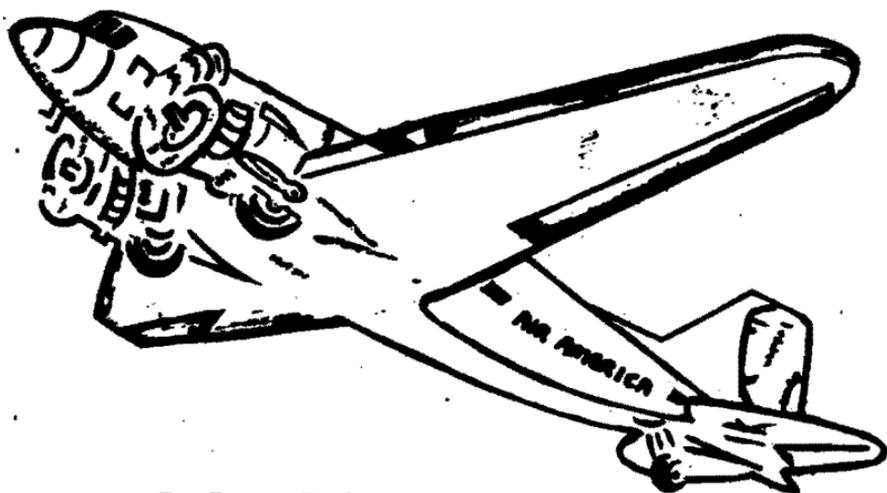
PREFLIGHT CHECKLIST -----

COMMUNICATIONS -----

FLIGHT GUIDE

C - 47

DC-3



COPY 68

FLYING DIVISION

NOTES

PREFLIGHT CHECKLIST

INTERIOR INSPECTION

- 1. Aft CO₂ Extinguisher CHECKED/SA FETIED
- 2. Tail Cone CHECKED
- 3. Access Door CLOSED
- 4. Gibson Girl AS REQUIRE D
- 5. First Aid Kit CHECKED
- 6. Emergency Exits SECURED
- 7. Cabin (Load Secured, Cleanliness, Weight and Balance) CHECKED
- 8. Forward Fire Extinguisher. CHECKED/SA FETIED
- 9. Crash Axe and Dip Stick CHECKED
- 10. Forward Entrance Door SECURED
- 11. Aux. Hyd. Oil Supply CHECKED
- 12. Over-head Escape Hatch SECURED
- 13. Battery and Ignition OFF
- 14. Clear Vision Windows SECURED
- 15. Landing Gear Latch Lever POSITIVE LOCK
- 16. Trim Tabs CHECKED AND NEUTRAL
- 17. Circuit Breakers and Fuses CHECKED
- 18. Log Book CHECKED

EXTERIOR INSPECTION

- 1. Wing Flaps.
 - a. For dents, damage, or distortion.
 - b. Flap actuating cylinders for leaks (hydraulic) and secureness.
- 2. Wing Attachment Bolts.
- 3. Aileron.
 - a. For holes, damage, or distortion.
 - b. Static wicks.
 - c. Aileron hinges, bonding, and trim tab for secureness.

NOTE: Place aileron in approximately 3/4" droop and on passing to right side, check right

aileron for desired droop.

4. Wing Tip.

- a. Wing tip for damage.
- b. Wing tip light and reflector.

5. Leading Edge of Wing.

- a. For damage.
- b. Inspection panels secured.
- c. Landing light.

6. Left Engine.

- a. Exhaust Stacks - Condition and Security.
- b. Fuel and Oil leaks.
- c. General condition.
- d. Engine drain lines.
- e. Cowling for security.

7. Left Propeller.

- a. Check for nicks and cracks.
- b. Oil leaks around blades and dome.
- c. Prop dome retainer ring safetied.
- d. C-clip on front of prop dome.
- e. Slinger ring.
- f. Prop governor and control cable.
- g. Oil delivery lines.

8. Left Nacelle.

- a. Landing gear down lock pin for binding.
- b. Landing gear strut extension and condition.
- c. Fittings.
- d. Tire condition and slippage marks.
- e. Brakes and hydraulic lines.
- f. Oil coolers and doors.
- g. "Y" drain safetied.
- h. Cables and plumbing.
- i. Firewall shutoff valves.
- j. Electrical connections.
- k. CB Extinguisher pressure and connections.

9. Fuselage.

- a. Check pitot masts - check pitot covers OFF, and static holes clean.
- b. Battery compartment and drain.
- c. Check hydraulic leaks.
 - (i) Check pitot heaters.
 - (ii) Check anti-icing equipment in anticipated cold weather operations.
- d. Nose access panel secured.
- e. Check antennas and radio wires.
- f. Check fuel tank drain for water.
- g. Stress plates.
- h. Fire extinguishers thermal discharge discs.

10. Fuel Booster Pumps - Checked.

11. Right Engine, Nacelle, propeller and wing - same as left side.

12. Fuselage.

- a. Inspect tail - wheel
 - (i) Check tire and inflation and slippage mark.
 - (ii) Check ground wire.
- b. Check inside tail-wheel cone.
 - (i) Check oleo-strut.
 - (ii) Check tail-wheel fittings.
 - (iii) Check general area in tail-wheel cone.

13. Tail Section (Empennage)

Check and inspect outward along leading edge horizontal stabilizer.

- a. Check for damage - check condition of de-icer boots.
- b. Check elevators for full-throw note torque and hinges, etc. for damage or looseness and bonding.

- c. Check rudder for full throw - check for damage.
- d. Note radio antenna wires at top of tail fin.
- e. Check static dischargers.
- f. Check trim tabs hinges and bonding, tail lights/rotating beacon.
- g. Continue inspection clockwise around tail section to fuselage, thence forward to main cabin door.
- h. Door pins, jettison handle secure/safetied.

14. First Officer.

Completes the following duties.

- a. Dips fuel tanks for quantity.
- b. Checks oil quantity.
- c. Assures fuel and oil caps are secure.
- d. Checks the general condition of top of wings and engine nacelles.
- e. Removes, stows and secures control locks and pitot covers.

C-47 COCKPIT CHECKLIST

PRE-FLIGHT

- PCP 1. Exterior/Interior Inspection .. COMPLETED
 PCP 2. Circuit Breakers & Fuses CHECKED
 PCP 3. Pitot Covers REMOVED
 PCP 4. External Control Locks STOWED
 PCP 5. Aircraft Log & Papers ABOARD
 PCP 6. Flight Kit ABOARD

BEFORE STARTING ENGINES

* Denotes Thru Flight Checklist Items.

- PCP 1. Seat & Rudder Pedals ADJUSTED
 *P 2. Landing Gear Latch Lever . POSITIVE LOCK
 *P 3. Hydraulic Fluid Level CHECKED
 P 4. Auto-Pilot Emergency Shutoff Valve ... OFF
 P 5. Star Valve OFF
 *P 6. Wing Flap Lever NEUTRAL
 CP 7. Hydraulic Handpump & Pressure . CHECKED
 *P 8. Landing Gear Lever NEUTRAL
 P 9. Fire Extinguisher Switches/Handles ... SET
 P 10. Firewall Shutoff Switches/Handles SET
 P 11. Auto-Pilot OFF
 *P 12. Parking Brakes SET
 P 13. Radio & Electrical Switches OFF
 P 14. Alarm Bell (If Installed) CHECKED
 *P 15. Battery Switch/External Power ... ON/OFF
 *P 16. No Smoking/Seat Belt Signs ON
 PCP 17. Lights SET
 *P 18. Ignition Switches
 . MASTER ON/INDIVIDUAL SWITCHES OFF
 P 19. Fire Detection System CHECKED
 CP 20. Static Selector NORMAL
 *CP 21. Fuel Quantity CHECKED
 *PCP 22. Fuel Tank Selectors SET
 P 23. Oil Coolers COLD
 CP 24. Carburetor Air COLD
 CP 25. Mixtures IDLE CUT-OFF
 P 26. Throttles SET

P 27. Props FORWARD
 *P 28. Manifold Pressure CHECKED
 *PCP 29. Fire Guard Posted CLEAR #2

BEFORE TAXI

*P 1. External Power REMOVED
 *P 2. Battery Switch ON
 CP 3. Generators CHECKED/ON
 *CP 4. Booster Pumps OFF
 *CP 5. Hydraulic System Pressure ... CHECKED
 *CP 6. Inverters CHECKED & SET
 *CP 7. Radios CHECKED & SET
 CP 8. Fuel Tank Selectors CHECK
 *PCP 9. Engine Instruments CHECKED
 PCP 10. Flight Instruments CHECK/UNCAGED
 P 11. Ignition Grounding CHECKED
 *P 12. Gear Pins STOWED
 *PCP 13. Chocks REMOVED
 *PCP 14. Doors & Hatches SECURED

TAXI

*PCP 1. Brakes & Pressure CHECKED
 *PCP 2. Flight Instruments CHECKED

ENGINE RUN-UP

*P 1. Tail Wheel LOCKED
 *P 2. Parking Brakes SET
 CP 3. Manifold Valves BLEED
 P 4. Auto-Pilot BLEED
 *PCP 5. Engine Instruments CHECKED
 CP 6. Fuel Tank Selectors SET
 P 7. Propeller (1700 RPM) CHECKED
 PCP 8. Generators CHECKED
 P 9. Feathering CHECKED
 CP 10. Carburetor Air CHECKED & COLD
 *PCP 11. Ignition CHECKED

The remainder of the checklists must be completed in their entirety.

BEFORE TAKE-OFF

- | | | |
|-----|-------------------------------------|--------------------|
| P | 1. Flaps | UP |
| PCP | 2. Engine & Flight Instruments | CHECKED |
| CP | 3. Mixtures | AUTO-RICH |
| P | 4. Props | FORWARD |
| P | 5. Trim | SET |
| PCP | 6. Radios | SET |
| P | 7. Crew Briefing | COMPLETED |
| CP | 8. Booster Pumps | ON |
| P | 9. Anti-Collision Light | ON |
| PCP | 10. Flight Controls | FREE & FULL TRAVEL |
| P | 11. Tail Wheel | LOCKED |

AFTER TAKE-OFF

- | | | |
|-----|--|-------------|
| CP | 1. Landing Gear | UP |
| PCP | 2. METO Power (MAP 42.5" RPM 2550) .. | SET |
| PCP | 3. Temperature & Pressures | CHECKED |
| CP | 4. Landing Gear Lever | NEUTRAL |
| PCP | 5. Climb Power (1000 feet) MAP on Climb
Chart RPM 2350) | SET |
| PCP | 6. Wing Check | COMPLETED |
| P | 7. No Smoking/Seat Belt Sign .. | AS REQUIRED |
| CP | 8. Booster Pumps | OFF |

CRUISE

- | | | |
|-----|-----------------------------|-------------|
| CP | 1. Cruise Power | SET |
| PCP | 2. Engine Instruments | CHECKED |
| CP | 3. Mixtures | AS REQUIRED |

DESCENT

- | | | |
|-----|----------------------------------|-------------|
| PCP | 1. Approach & Landing Data | CHECKED |
| PCP | 2. Altimeters | SET |
| CP | 3. Fuel Tank Selectors | SET |
| P | 4. Auto-Pilot | OFF |
| CP | 5. Hydraulic Fluid Level | CHECKED |
| CP | 6. Mixtures | AS REQUIRED |
| P | 7. Magnetos ... (Optional) | CHECKED |

BEFORE LANDING

- P 1. No Smoking/Seat Belt Signs..... ON
 CP 2. Carburetor Air COLD
 CP 3. Booster Pumps ON
 CP 4. Mixtures AUTO-RICH
 CP 5. Landing Gear DOWN/POSITIVE LOCK
 CP 6. Propellers RPM 2350
 CP 7. Brake/System Pressures CHECKED
 CP 8. Landing Gear Lights GREEN
 CP 9. Flaps AS REQUIRED

AFTER LANDING

- CP 1. Flaps UP & NEUTRAL
 P 2. Props FORWARD
 CP 3. Hydraulic Pressures CHECKED
 CP 4. Inverters OFF
 CP 5. Booster Pumps OFF
 CP 6. Pitot Heat OFF
 CP 7. Anti-Collision Lights OFF
 CP 8. Radios (Not In Use) OFF
 CP 9. Trim Tabs NEUTRAL
 CP 10. Heaters OFF

PARKING

- P 1. Tail Wheel LOCKED
 P 2. Parking Brakes SET
 P 3. Throttles RPM 1200
 CP 4. Mixtures (Right Engine First) IDLE CUT-OFF
 P 5. Ignition Switches OFF
 CP 6. Radios OFF
 CP 7. Fuel Tank Selectors OFF
 CP 8. Wheel Chocks INSTALLED
 P 9. Brakes OFF
 PCP 10. All Switches (Except Generators)..... OFF
 CP 11. Gear & Flap Levers SPLIT
 PCP 12. Log Book & Papers COMPLETED
 PCP 13. Windows, Hatches, & Doors SECURED
 PCP 14. Gear Pins, Control Locks, Pitot Covers
 INSTALLED

THRU FLIGHT CHECKLIST

BEFORE STARTING ENGINES

1. Latch Lever POSITIVE LOCK
2. Hydraulic Fluid Level CHECKED
3. Wing Flap Lever NEUTRAL
4. Landing Gear Lever NEUTRAL
5. Parking Brakes SET
6. No Smoking Seat Belt Signs ON
7. Ignition Switches MASTER ON
8. Fuel Quantity CHECKED
9. Fuel Tank Selectors SET
10. Battery Switch/External Power ON/OFF
11. Manifold Pressure CHECKED
12. Fire Guard Posted CLEAR #2

BEFORE TA XI

1. External Power REMOVED
2. Battery Switch ON
3. Booster Pumps OFF
4. Hydraulic System Pressure CHECKED
5. Inverters SET
6. Radios ON
7. Engine Instruments CHECKED
8. Gear Pins, Control Locks, Pitot Covers
..... REMOVED
9. Chocks REMOVED
10. Doors & Hatches SECURED

TAXI

1. Brakes & Pressure CHECKED
2. Flight Instruments CHECKED

ENGINE RUNUP

1. Tail Wheel LOCKED
2. Parking Brakes SET
3. Engine Instruments CHECKED
4. Ignition CHECKED

C-47 EMERGENCY CHECKLISTENGINE FAILURE/FIRE IN FLIGHT

Maintain controlled flight. Increase power, and retract flaps and gear if required.

1. FEATHER PROPELLER..... BUTTON IN
2. MIXTURE IDLE CUT-OFF
3. CHECK PROPELLER.....
..... FEATHERED-BUTTON OUT
4. CHECK FOR FIRE FIRE/NO FIRE

IF NO FIRE EXISTS: OMIT #5 & 6

5. FIREWALL SHUTOFF VALVE CLOSED
6. FIRE EXTINGUISHER DISCHARGED
7. Ignition OFF
8. Carburetor Alcohol OFF
9. Propeller Alcohol OFF
10. Fuel Booster Pump Switch OFF
11. Fuel Tank Selector OFF
12. Propeller Control AFT
13. Generator Switch OFF
14. Flap & Gear Controls NEUTRAL

NOTE: For SC-47 only, position fuel tank fuel crossfeed, and fuel dump controls to dump excess fuel immediately after completing item #8.

ENGINE UNFEATHERING

1. Airspeed 117 KNOTS MAX
2. Firewall Shutoff Valve OPEN
3. Starter Switch 8 BLADES
4. Fuel Tank Selector AS REQUIRED
5. Carburetor Air COLD
6. Throttle CLOSED
7. Propeller Control AFT
8. Ignition Switch BOTH
9. Fuel Booster Pump ON
10. Feathering Button IN TO 800 RPM

11. Propeller Governing RPM 1200
12. Mixture AUTO RICH
13. Warm engine (RPM 1500, MAP 15")
..... APPLY POWER
14. Generator Switch ON
15. Fuel Booster Pump OFF

OVERSPEEDING AND RUNWAY PROPELLER

1. REDUCE AIRSPEED
. NOT BELOW SAFE SINGLE ENGINE SPEED (V_2)
2. THROTTLE CLOSED
3. PROPELLER CONTROL AFT
4. FEATHER BUTTON
(To Below RPM 2700) .. INTERMITTENTLY IN
5. IF GOVERNOR CONTROL NOT ESTABLISHED ...
..... FEATHER

ELECTRICAL FIRES (Source Unknown)

1. BATTERY & GENERATOR SWITCHES..... OFF
2. HAND FIRE EXTINGUISHERS COMBAT FIRE
3. OXYGEN 100%
4. VENTILATION AS REQUIRED
5. All Switches/Circuit Breakers OFF/TRIPPED
6. Generator Switches (One at a time) ON
7. Battery Switch ON
8. Inverter Switch ON
9. Circuit Breakers/Switches (One at a time) ON
10. Isolate Fire/Smoke Cause
11. Landing Soon As Practicable

SMOKE ELIMINATION

1. Clear Vision Windows OPEN
2. Main Cabin Door OPEN
3. All Other Hatches, Door, & Windows ... CLOSED

LANDING GEAR EMERGENCY EXTENSION

1. Star Valve OFF
2. Landing Gear Lever DOWN
3. Handpump (Pump Gear Down) OPERATE
4. Landing Gear Lever NEUTRAL
5. Warning Lights GREEN - ON
RED - OFF
6. Visual Check GEAR DOWN
7. Landing Gear Latch Lever POSITIVE LOCK
8. Warning Horn (Retard Throttle) CHECKED

BRAKE SYSTEM FAILURE (Pressure Below 600 psi)

1. Star Valve OFF
2. Hydraulic Handpump OPERATE
3. Brake Pedals STEADY APPLICATION

ENGINE SMOKE & FLAME IDENTIFICATION CHART

	Cause	Action
PUFFS OF BLACK FROM EXHAUST ROUGH ENGINE.	Detonation, afterfire, and backfire. Also fouled plugs or failing valves. If fuel pump drive shaft is broken, engine receives insufficient fuel and mixture leans excessively. Indicated generally by high CHT, high CAT, fluctuating MAP, and fuel pressure drop. Lean mixtures cause high CHT. High CAT, above 40 C (104 F), produces detonation. Fluctuation in MAP and fuel flow will result from violent backfire. If detonation continues, engine failure and fire are imminent.	Decrease CAT and CHT and enrich mixture, checking for proper rpm and MAP correlation. Increase airspeed.
THIN WISPS OF BLUISH-GREY SMOKE FROM COWL FLAPS AND EXHAUST AREAS.	Oil leaking onto exhaust stacks and vaporizing. Not a dangerous condition if oil leak is not excessive. No instrument indications except for possible drop in oil quantity.	Normally, no action is necessary unless fire develops. If fire occurs, shut down engine, removing source of heat and fuel, and fire should go out.
GREY SMOKE COMING FROM COWL FLAP OR FORWARD ENGINE SEC- TION.	Cylinder failure, exhaust stack failure. If condition results in blown cylinder head or open exhaust stack, fire and black smoke will appear in exhaust stream.	During takeoff or when more than single engine power is required for safety, reduce power slightly and let engine operate until safe altitude and airspeed are obtained, then feather engine.

ENGINE SMOKE & FLAME IDENTIFICATION CHART

	Cause	Action
LIGHT ORANGE-COLORED FIRE COMING FROM EXHAUST.	On ground at idling speeds indicates too rich mixture. In flight, usually at high power settings, this can occur and indicates too rich mixture. There will be no instrument indications.	On ground, increase throttle and blow fire out. In flight, move mixture control slightly to lean mixture.
HEAVY BLACK SMOKE FROM EXHAUST.	Induction fire. Instruments will indicate sudden drop of MAP and rpm CAT is not reliable indicator because instrument records temperature of air flowing through carburetor, not induction system heat.	Perform engine failure fire procedure. Fire should burn itself out without damaging engine.
DENSE WHITE SMOKE FROM EXHAUST AND/OR COWL FLAP AREAS.	Induction fire in advanced stages. Very dangerous condition. CAT will rise rapidly to maximum reading.	Action in above should have been taken to extinguish fire before it reaches this stage. Use engine failure/fire procedures. Alert crew for bail out. If fire does not go out within 30 seconds, it may be best to order crew to bail out as fire will probably cause explosion in wing.
BLACK SMOKE FROM ACCESSORY SECTION.	Oil fire in accessory section. Fire warning light should come on. CAT will be abnormally high, accompanied by loss of power.	Use engine failure/fire procedures.
BLACK SMOKE AND ORANGE FLAME FROM ACCESSORY SECTION.	Fuel fire in accessory section generally caused by broken fuel line. Low fuel pressure and abnormally high CHT are instrument indications. Fire warning light will come on. Engine operation may be erratic, depending upon malfunction.	Shut off fuel as quickly as possible and use engine failure/fire procedures. Prepare to abandon aircraft if fire does not go out.

LIMITATIONSAIRSPEED

0 - $\frac{1}{4}$ Flaps	104 KIAS
$\frac{1}{2}$ Flaps	100 KIAS
Full Flaps	97 KIAS
Maximum for extending landing gear	140 KIAS
Maximum for level flight	*177 KIAS
Never exceed speed	**221 KIAS

(* Reduce 2 knots for each 1000 lb above 26,000
 ** Reduce 6 knots for each 1000 lb above 26,000)

OIL PRESSURE

Minimum for flight	65 PSI
Normal	65 - 110 PSI
Maximum	110 PSI

FUEL PRESSURE

Minimum for flight	16 PSI
Normal (14 - 16 USA F)	16 - 18 PSI
Maximum	20 PSI

VACUUM PRESSURE

Minimum	3.75 IN. HG
Normal	3.75 - 4.25 IN. HG
Maximum	4.25 IN. HG

MANIFOLD PRESSURE

Auto Lean permitted	600 BHP & BELOW
Auto Rich required	ABOVE 600 BHP
METO Power (Uncorrected)	42.5 IN. HG
Maximum	48 IN. HG

At any power, 10 or more inches of excessive MAP requires engine change. Below METO power 5 - 10 in. Hg. excessive MAP for more than 5 seconds duration requires engine inspection. Any excessive MAP for over 15 sec. at or above METO power requires engine change.

TACHOMETER

Dangerous empennage vibration	....	1300 - 1700 RPM
Auto Lean Permitted	.....	1700 - 2050 RPM
Auto Rich required	.....	2050 - 2700 RPM
Maximum Continuous (METO)	.....	2550 RPM
Maximum (2 minute limit)	.....	2700 RPM
Engine overspeed (Must be inspected)	.....
	.....	2900 - 3050 RPM
Engine overspeed (Engine change)	.....
	.....	above 3050 RPM
Crankshaft vibration	.....	2100 - 2300 RPM

CARBURETOR AIR TEMPERATURE

Possible Icing	.....	-10°C - +15°C
Normal	.....	+15°C - +38°C
Detonation	.....	+50°C

CYLINDER HEAD TEMPERATURE

Auto Lean permitted	.....	150 - 232°C
Auto Rich required	.....	232 - 270°C
Maximum	.....	270°C

OIL TEMPERATURE

Minimum	.....	40°C
Normal	.....	60 - 80°C
Maximum	.....	100°C

HYDRAULIC PRESSURE

Minimum	.....	600 PSI
Normal	.....	600 - 875 PSI
Maximum	.....	900 PSI
Normal (some Company Aircraft)	.....	800 - 1000 PSI
Maximum (some Company Aircraft)	.....	1100 PSI

AUTO PILOT OIL PRESSURE

Minimum	.....	105 PSI
Normal	.....	110 - 130 PSI
Maximum	.....	140 PSI

FLUID SERVICING

Oil

Tank capacity	29 gal.
Usable	22 gal.
Reserved for feathering	<u>3 gal.</u>
Total (Normal Service)	25 gal.

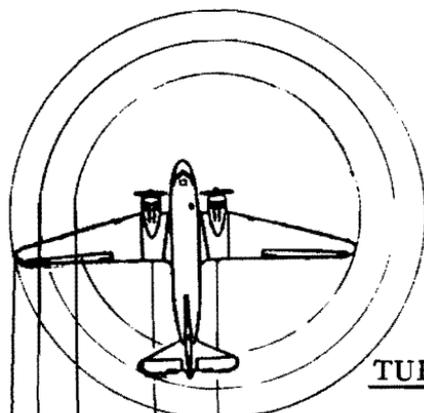
Maximum Oil Consumption 1.5 GPH

If consumption above 1.5, RMD should be consulted for conditions permitting ferry flight to maintenance base.

Hydraulic Oil - Reservoir

Usable to engine pumps	7 qts.
Reserved for handpump	<u>3 qts.</u>
Total (Normal Service)	10 qts.

Fuel - Main Tanks - R. H.	204 gal.	(202)
L. H.	204 gal.	(202)
Auxiliary - R. H.	200 gal.	(199)
L. H.	200 gal.	<u>(199)</u>
Total		(802)

TURNING RADIUS DIAGRAM

Outer Main Gear - 18 Ft. 6 In.

Inner Wingtip - 39 Ft. 8 In.

Horizontal Stabilizer - 49 Ft. 4 In.

Outer Wing Tip - 57 Ft. 6 In.

STANDARDS AND GRADING CRITERIA

Steep Turns	Angle of bank	$\pm 10^{\circ}$
	Airspeed	± 10 Kts
	Altitude	± 100 Ft.
	Roll out	$\pm 10^{\circ}$
Slow Flight	Airspeed	± 5 Kts
	Altitude	± 50 Ft.
	Heading	$\pm 5^{\circ}$
Approach to Stalls	Altitude	+ 50 Ft.
		- 100 Ft.
Normal Turns and holding	Heading	$\pm 5^{\circ}$
	Angle of bank	$\pm 5^{\circ}$
	Airspeed	± 5 Kts
Level Flight	Altitude	± 50 Ft.
	Heading	$\pm 5^{\circ}$
	Altitude	± 50 Ft.
Tracking	Altitude	± 50 Ft.
	Track	$\pm 5^{\circ}$
	Localizer	$\pm 2^{\circ}$
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 Max
Power.

43-52 Knots,
tail starts
to rise.

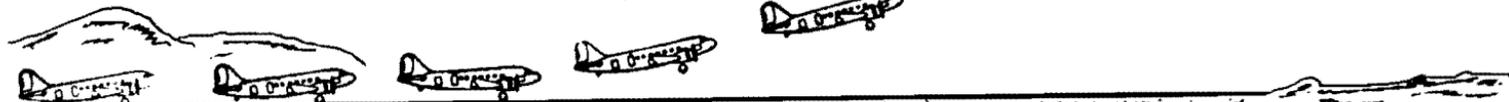
V_{mc} (76 KIAS)

Fly off
at V₂ -
(84 KIAS.)

Positive rate
of climb - Gear
Up, maintain V₂.

Climb at V₂
Until gear is
up, accelerate
to 95 KIAS and
reduce to METO
power (RPM 2550
MAP 42.5). Main-
tain until cir-
cling minimums.

At circling
minimums or
clear of obstruc-
tions, accelerate
to ~~CLIMB AIRSPEED~~ and
reduce to climb
power (RPM 2350
MAP-See Climb
Chart.)



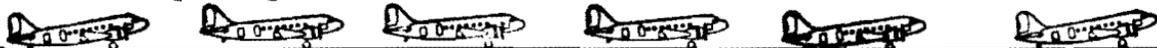
23
NORMAL TAKEOFF

NORMAL
TAKEOFF

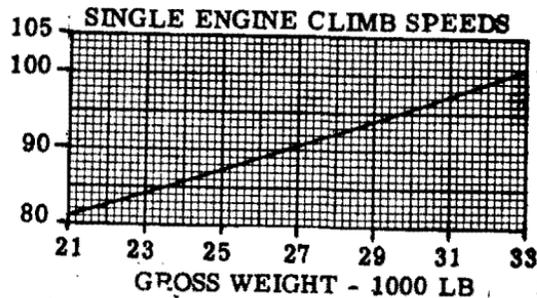
Engine failure
prior to V2
(84 KIAS)

Close throttles,
apply brakes, and
fly tailwheel to
runway with elevator.

Continue braking
as required.



REJECTED TAKE OFF



Continue takeoff, maintain V_2 and when a positive climb is established, gear up.

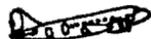
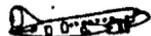
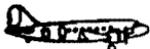
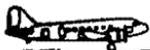
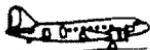
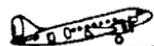
Climb at V_2 until obstruction clearance altitude (circling minimums.)

Accelerate to 95 KIAS and reduce to METO (observe 2 min. max. power limit.)

NORMAL TAKEOFF

After V_2 , (84 KIAS) engine fails.

Identify and feather failed engine, apply appropriate emergency procedures.



ENGINE FAILURE AFTER V_2

Tailwheel locked,
hold brakes and
apply power to MAP
35. Release brakes
and apply Max. Power.

Tail low attitude,
allow aircraft to
fly off at 52-61
KIAS. (V_{mc} 76 KIAS.)

Positive rate
of climb, gear
up. Accelerate
to V_2 (84 KIAS.)

Clear of obstacles;
flaps up, accelerate
to 95 KIAS and reduce
to METO power (RPM
2550, MAP 42.5.)

At circling
minimums or
clear of obstruc-
tions, accelerate
to 105 KIAS and
reduce to climb
power (RPM 2350
MAP - See Climb
Chart.)

39 KIAS.
Flaps $\frac{1}{4}$



MINIMUM RUN TAKE-OFF

Climb at 95 KIAS
until circling minimums.

STEEP TURNSSLOW FLIGHT

A/S

A/S 70 KIAS

Flaps

Flaps. ALL CONFIG.

Gear

Gear UP & DOWN

RPM

RPM 2350 (A/R)

MAP

MAP As Required.

APPR

Clean

fig. Landing Config.

Flaps

Flaps Full Down

Gear

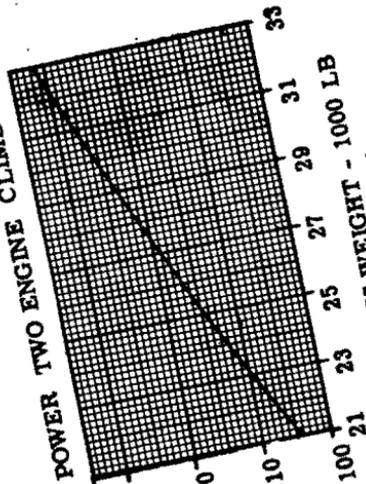
Gear DOWN

RPM

RPM 2350

MAP

MAP 12



begin at 90
 complete at 90 KIAS. Mixture A/R.

APPROXIMATE STALLING SPEEDS (IAS)LEVEL - POWER OFF

GROSS WT.	0 FLAP	$\frac{1}{2}$ FLAP	$\frac{1}{4}$ FLAP	FULL FLAP
(LBS)	KTS.	Kts.	Kts.	Kts.
28,000	70	66	62	60
27,000	68	64	61	59
26,000	66	63	59	57
25,000	65	62	58	56
23,000	62	59	55	53
21,000	59	56	53	51

HOLDING

A/S

105 KIAS

Flaps

UP

Gear

UP

RPM

2050 Short Hold

MAP 23 approx.

RPM

1700 Long Hold

MAP 27 approx.

Mixture

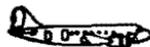
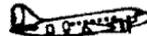
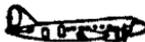
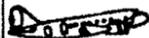
A/L

Cruise Configuration

RPM 2050, MAP 12"
Flaps UP, Gear UP

Maintain heading &
regain any lost
altitude.

Accelerate to
90 KIAS.



Maintain heading
& altitude.

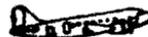
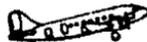
When onset of the initial
buffet is felt: lower nose
to the horizon, level the
wings and simultaneously
command "Max Power."

Approach Configuration

RPM 2350, MAP 12"
Flaps $\frac{1}{4}$, Gear DOWN

When onset of the initial
buffet is felt: lower nose
to the horizon, level the
wings, and simultaneously
command "Max Power."

Flaps UP after 0°
flap stall speed,
maintain heading
& regain any loss
of altitude.



Maintain altitude
& 20° bank.

Rate-of descent
arrested Gear Up.

Accelerate to
90 KIAS.

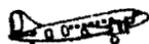
Landing Configuration

(RPM 2550 is used during training rather than the normal landing RPM 2350.)

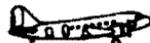
RPM 2550, MAP 12"
Flaps FULL DOWN,
Gear DOWN.

When onset of the initial
buffet is felt: lower the
nose to the horizon, level
the wings and simultaneously
command "Max Power" and
"Flaps $\frac{1}{4}$ "

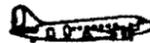
Flaps UP after 0°
flap stall speed,
maintain heading
& regain any loss
of altitude.



Maintain heading
& altitude.



Rate-of-descent
arrested Gear UP.



Accelerate to
90 KIAS.

- NOTE:
1. During training in this maneuver, METO power will be used in lieu of Maximum Power.
 2. During this maneuver the pilot will handle the throttles & F/O set RPM.

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

30 seconds prior to high station: Gear DOWN, Flaps $\frac{1}{4}$, RPM 2350, 95 KIAS, Before Landing Checklist COMPLETE.

At high station: Flaps FULL, MAP approx. 15", descend at 1000'/min.

95 KIAS.

150' above altitude, Flaps UP. MAP approx. 23", 95 KIAS.

Maintain 95 KIAS.

Engine failure: "Max Power, " 15° bank, feather failed engine, climb at V2 (84 KIAS.)

Change direction 180°, climb 1000'.

RPM 2550

One minute and 45 seconds after high station.

METO Power, Gear Up, 30° bank turn, climb at 95 Knots.

Two minutes after High Station.

INITIAL APPROACH

105 KIAS.

Descent & Before Landing checklist COMPLETED up to Gear.

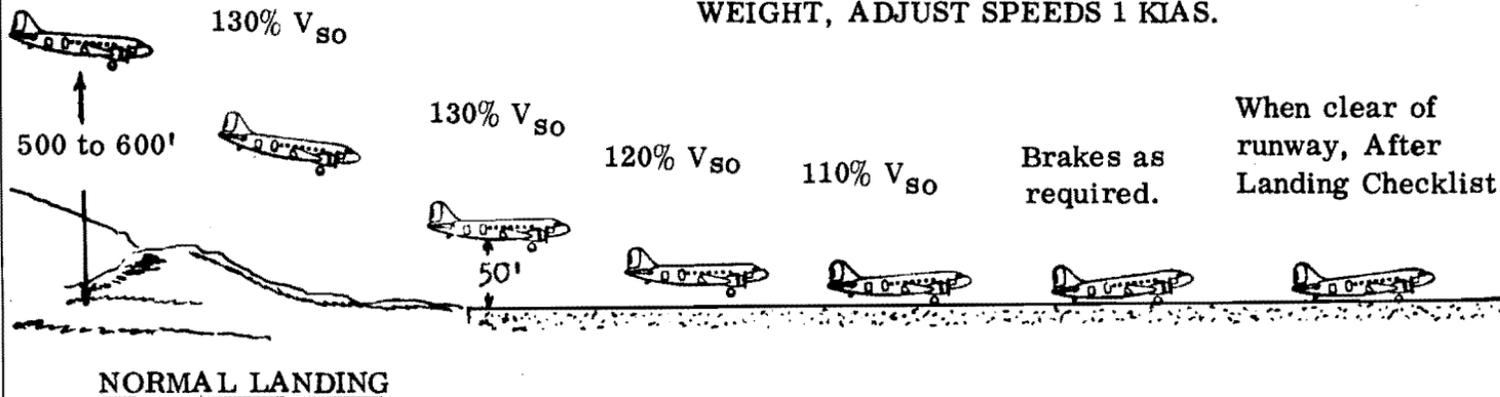


% STALL SPEED (IAS)

Gross Weight 26000 Pounds

GEAR DOWN		VSO	110%	120%	130%	140%
Before Landing	CLEAN	66	73	79	86	92
Checklist COMPLETE,	$\frac{1}{4}$ FLAPS	63	69	76	82	89
← Final Flaps.	$\frac{1}{2}$ FLAPS	59	65	71	77	83
	FULL FLAPS	57	63	68	74	80

NOTE: FOR EVERY 1000 lb. CHANGE IN AIRCRAFT WEIGHT, ADJUST SPEEDS 1 KIAS.



% STALL SPEED (IAS)

Gross Weight 26000 Pounds

GEAR DOWN
Before Landing
Checklist COMPLETE,
95 KIAS.

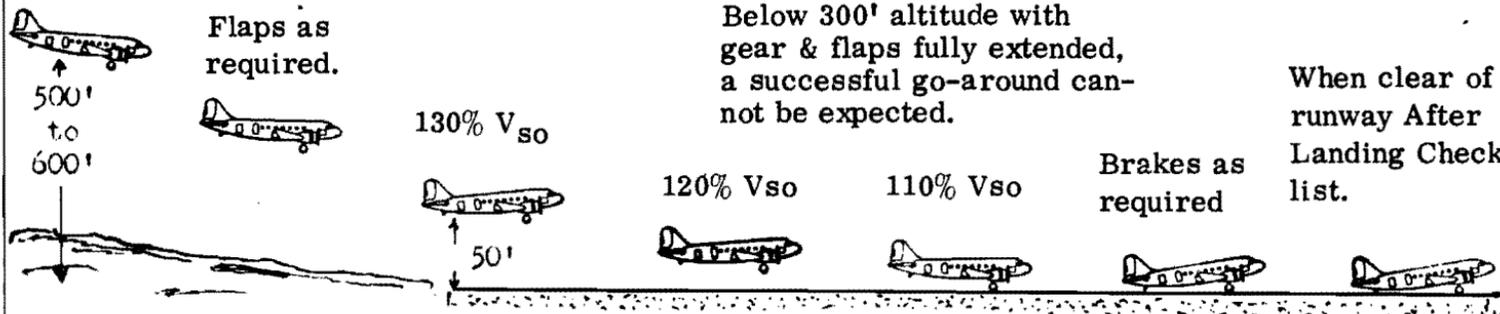
	VSO	110%	120%	130%	140%
CLEAN	66	73	79	86	92
$\frac{1}{4}$ FLAPS	63	69	76	82	89
$\frac{1}{2}$ FLAPS	59	65	71	77	83
FULL FLAPS	57	63	68	74	80

NOTE FOR EVERY 1000 lb. CHANGE IN AIRCRAFT WEIGHT, ADJUST SPEEDS 1 KIAS.

WARNING:

Below 300' altitude with gear & flaps fully extended, a successful go-around cannot be expected.

When clear of runway After Landing Checklist.

SINGLE ENGINE LANDING

GEAR DOWN

Before Landing Checklist:

COMPLETE.

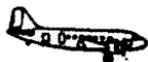


Flaps, Full Down

130% V_{so}

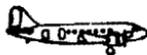


120% V_{so}

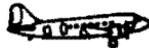


NOTE FOR EVERY 1000 lb. CHANGE IN AIRCRAFT WEIGHT, ADJUST SPEEDS 1 KIAS.

110% V_{so}

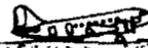
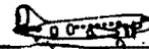
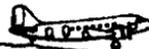


105% V_{so}



Flaps $\frac{1}{4}$
Brakes as
required.

100'



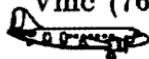
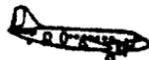
MINIMUM RUN (STOL) LANDING

	<u>% STALL SPEED (IAS)</u>				
	Gross Weight 26000 Pounds				
	VSO	105%	110%	120%	130%
CLEAN	66	70	73	79	86
$\frac{1}{4}$ FLAPS	63	66	69	76	82
$\frac{1}{2}$ FLAPS	59	62	65	71	77
FULL FLAPS	57	60	63	68	74

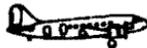


Normal Approach

Apply Maximum
Power, flaps $\frac{1}{4}$.
Accelerate to
V_{mc} (76 KIAS)



Rate of descent
arrested, Gear
Up



Accelerate to
V₂ (84 KIAS)



After Gear
retracted,
Flaps UP, climb
at V₂ (84 KIAS)



Proceed as
for Normal
Take-off.



BALKED LANDING

METO POWER SETTINGS
1060 Brake Horsepower Per Engine
AUTO RICH

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	LB/HR
	-20 ^o	-10 ^o	0 ^o	+10 ^o	+20 ^o	+30 ^o		PER ENG
10,000							2550	735.00
9,000								
8,000								
7,000	39.4	40.2	40.9					
6,000	39.3	40.1	40.9	41.6	42.3			
5,000	39.5	40.3	41.1	41.8	42.6	43.3		
4,000	39.7	40.5	41.3	42.0	42.8	43.5		
3,000	39.9	40.7	41.5	42.2	43.0	43.7		
2,000	40.0	40.3	41.6	42.3	43.1	43.8		
1,000	40.0	40.8	41.6	42.3	43.1	43.8		
0	40.0	40.8	41.6	42.3	43.1	43.8		

CLIMB POWER SETTINGS
850 Brake Horsepower Settings
AURO RICH

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000							2350	500
10,000	33.7	34.3						
9,000	33.7	34.4	34.8	35.3	35.7	36.1		
8,000	33.8	34.4	34.8	35.4	35.8	36.2		
7,000	33.8	34.5	34.9	35.5	35.9	36.3		
6,000	33.8	34.5	34.9	35.6	36.0	36.4		
5,000	33.9	34.6	35.0	35.6	36.0	36.4		
4,000	33.9	34.6	35.0	35.7	36.1	36.5		
3,000	34.0	34.7	35.1	35.8	36.2	36.6		
2,000	34.2	34.7	35.2	35.9	36.3	36.7		
1,000	34.3	34.8	35.3	35.9	36.3	36.7		
0	34.4	34.8	35.4	36.0	36.4	36.8		

CONSTANT CRUISE POWER SETTINGS
700 Brake Horsepower Per Engine
AUTO RICH

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000								
10,000								
9,000	30.4	31.0	31.6					
8,000	30.5	31.1	31.6	32.2	32.8			
7,000	30.6	31.1	31.7	32.3	32.9	33.4		
6,000	30.7	31.3	31.9	32.5	33.1	33.6		
5,000	30.9	31.5	32.1	32.7	33.3	33.8		
4,000	31.0	31.6	32.2	32.8	33.3	33.9	2050	336.00
3,000	31.2	31.6	32.4	33.0	33.5	34.1		
2,000	31.3	31.8	32.4	33.0	33.6	34.2		
1,000	31.3	31.9	32.5	33.1	33.7	34.3		
0	31.4	32.0	32.6	33.2	33.8	34.4		

HIGH SPEED CRUISE
 CONSTANT CRUISE POWER SETTINGS
 640 Brake Horsepower Per Engine
 AUTO RICH

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000	28.2	28.7	29.3	29.8			2050 332.50	
10,000	28.2	28.7	29.3	29.8	30.3	30.8		
9,000	28.4	28.9	29.4	30.0	30.5	31.0		
8,000	28.4	29.0	29.5	30.1	30.6	31.1		
7,000	28.6	29.2	29.7	30.3	30.8	31.3		
6,000	28.7	29.3	29.8	30.4	31.0	31.4		
5,000	28.8	29.4	29.9	30.5	31.0	31.5		
4,000	28.8	29.4	29.9	30.5	31.0	31.5		
3,000	29.0	29.5	30.1	30.6	31.2	31.7		
2,000	29.2	29.7	30.3	30.8	31.4	31.9		
1,000	29.2	29.8	30.4	30.9	31.5	32.0		
0	29.4	30.0	30.6	31.1	31.7	32.2		

CONSTANT CRUISE POWER SETTINGS
600 Brake Horsepower Per Engine
AUTO LEAN
COMPANY STANDARD CRUISE

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg.) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000	27.2	27.7	28.3	28.8	29.3	29.8	2050	265.50
10,000	27.4	27.9	28.5	29.0	29.5	30.0		
9,000	29.2	29.8	30.3	29.2	29.7	30.2		
8,000	29.2	29.8	30.3	30.9	31.4	32.0	1900	255.00
7,000	29.2	29.8	30.3	30.9	31.4	32.0		
6,000	29.3	29.9	30.4	31.0	31.5	32.1		
5,000	29.4	29.9	30.5	31.1	31.6	32.1		
4,000	29.5	30.0	30.6	31.2	31.7	32.2		
3,000	29.5	30.1	30.7	31.2	31.8	32.3		
2,000	29.7	30.3	30.9	31.4	32.0	32.5		
1,000	29.9	30.5	31.1	31.6	32.2	32.7		
0	30.0	30.6	31.2	31.7	32.3	32.8		

CONSTANT CRUISE POWER SETTINGS
500 Brake Horsepower Per Engine
AUTO LEAN

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000	26.1	26.5	27.0	26.3	26.7	27.0	1900	219.00
10,000	27.5	26.6	27.0	27.3	27.5	27.8	1800	215.00
9,000	27.7	28.0	28.5	27.5	27.9	28.2		
8,000	27.9	28.4	28.7	29.1	29.5	29.8	1700	210.00
7,000	28.0	28.5	28.9	29.3	29.6	29.9		
6,000	28.2	28.6	29.0	29.4	29.8	30.1		
5,000	28.3	28.7	29.2	29.6	29.9	30.2		
4,000	28.4	28.8	29.3	29.8	30.0	30.3		
3,000	28.5	28.9	29.4	29.9	30.2	30.5		
2,000	28.7	29.1	29.6	30.0	30.4	30.7		
1,000	28.8	29.2	29.7	30.2	30.5	30.8		
0	28.9	29.4	29.3	30.3	30.7	31.0		

STANDARD HOLDING
 CONSTANT CRUISE POWER SETTINGS
 400 Brake Horsepower Per Engine
 AUTO LEAN

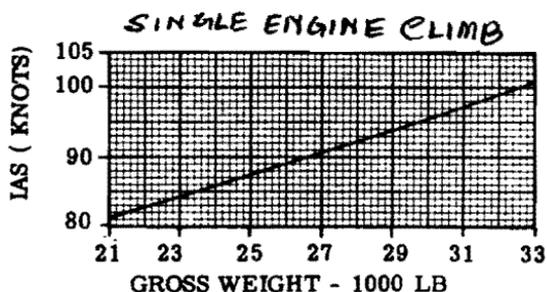
PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg) AT CARBURETOR AIR TEMPERATURE (°C)						RPM	FUEL FLOW LB/HR
	-20°	-10°	0°	+10°	+20°	+30°		PER ENG
11,000	23.1	23.6	23.9	24.3	24.5	24.7	1700	177.50
10,000	23.3	23.7	24.0	24.3	24.6	24.9		
9,000	23.4	23.7	24.1	24.4	24.7	25.0		
8,000	23.5	23.8	24.3	24.4	24.8	25.1		
7,000	23.6	24.0	24.4	24.6	24.9	25.2		
6,000	23.8	24.1	24.5	24.8	25.1	25.4		
5,000	23.9	24.3	24.6	25.0	25.3	25.6		
4,000	24.0	24.4	24.8	25.2	25.5	25.8		
3,000	24.2	24.6	24.9	25.4	25.7	26.0		
2,000	24.4	24.8	25.1	25.5	25.9	26.3		
1,000	24.6	25.0	25.3	25.7	26.1	26.5		
0	24.8	25.3	25.5	25.8	26.3	26.6		

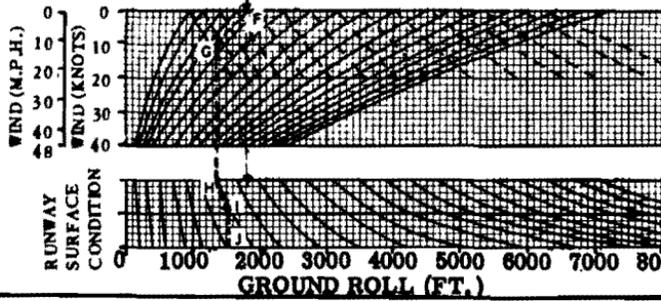
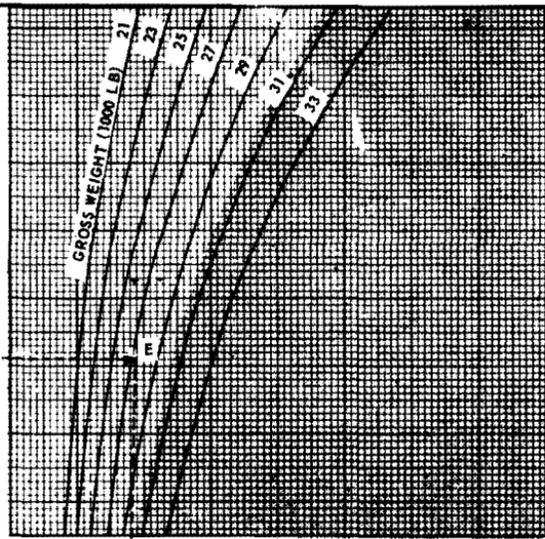
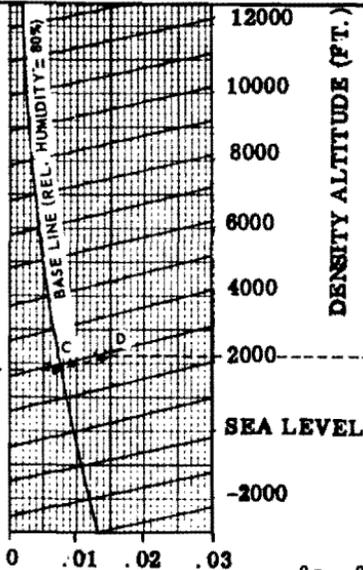
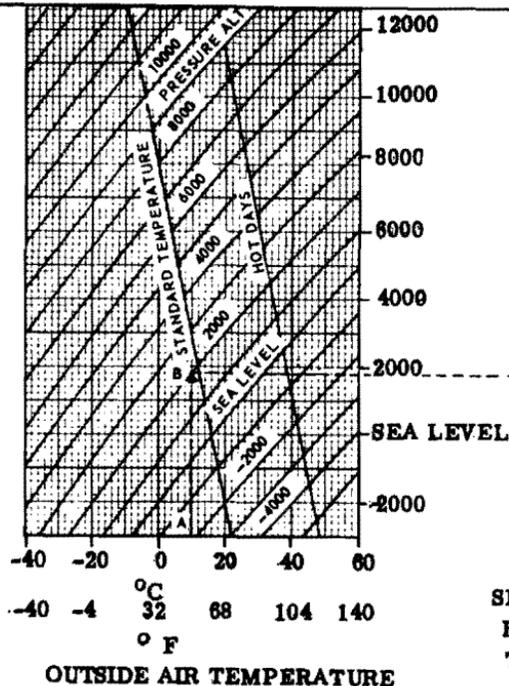
MAXIMUM ENDURANCE
 CONSTANT CRUISE POWER SETTINGS
 300 Brake Horsepower Per Engine
 AUTO LEAN

PRESSURE ALTITUDE (FEET)	MANIFOLD PRESSURE (In. Hg) AT CARBURETOR AIR TEMPERATURE ($^{\circ}$ C)						RPM	FUEL FLOW LB/HR
	-20 $^{\circ}$	-10 $^{\circ}$	0 $^{\circ}$	+10 $^{\circ}$	+20 $^{\circ}$	+30 $^{\circ}$		PER ENG
11,000							1700	142.00
10,000	18.8	19.2	19.4	19.6	19.9	20.2		
9,000	19.0	19.3	19.6	19.8	20.1	20.3		
8,000	19.2	19.5	19.8	20.0	20.3	20.6		
7,000	19.4	19.7	19.9	20.2	20.5	20.8		
6,000	19.6	19.9	20.1	20.5	20.7	20.9		
5,000	19.8	20.0	20.2	20.7	20.9	21.1		
4,000	20.0	20.2	20.4	20.9	21.1	21.3		
3,000	20.2	20.5	20.7	21.1	21.3	21.5		
2,000	20.4	20.7	20.95	21.3	21.5	21.7		
1,000	20.6	21.0	21.2	21.5	21.7	21.9		
0	20.8	21.2	21.5	21.7	21.9	22.1		

PERFORMANCE DATA

<u>Abreviation</u>	<u>IAS (Kts)</u>	<u>Remarks</u>
V _{ne}	221	Never exceed (Reduce 6 Knots for each 1000 pounds above 26,000)
V _{no}	177	Normal operating (Reduce 2 Knots for each 1000 pounds above 26,000)
V _{le}	140	Landing Gear operating
V _b	122	Max speed in turbulance
V _{fe}	104	Flap Extension $\frac{1}{4}$
	100	Flap Extension $\frac{1}{2}$
	97	Flap Extension Full
V _x	84	Best angle of climb (single engine)
V ₂ (V ₁)	84	Safe S. E. Speed
V _{mc}	76	Minimum Control
	SEE CHART PAGE 23	Normal Climb Holding
V _y	105	
	See chart	Best Rate of climb (single engine)





SPECIFIC HUMIDITY
HEADWIND _____
TAILWIND -----

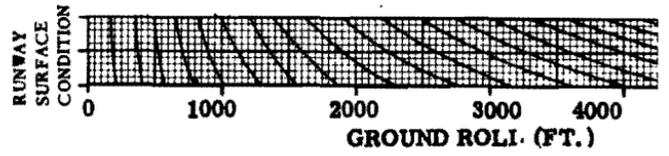
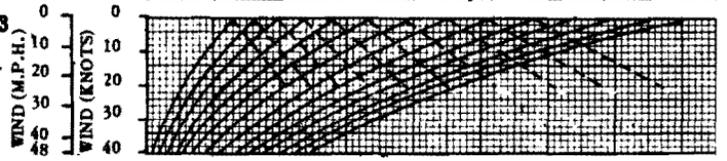
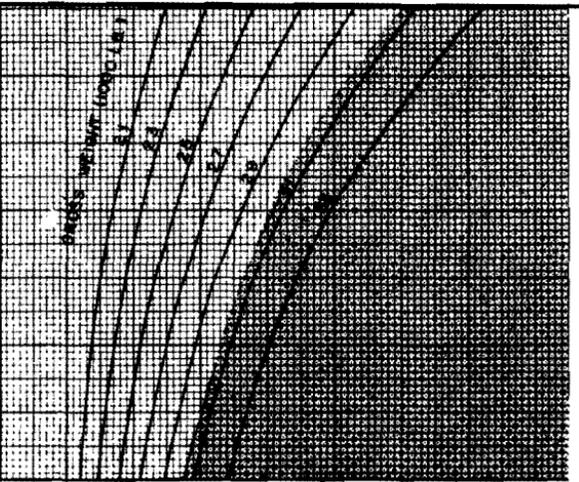
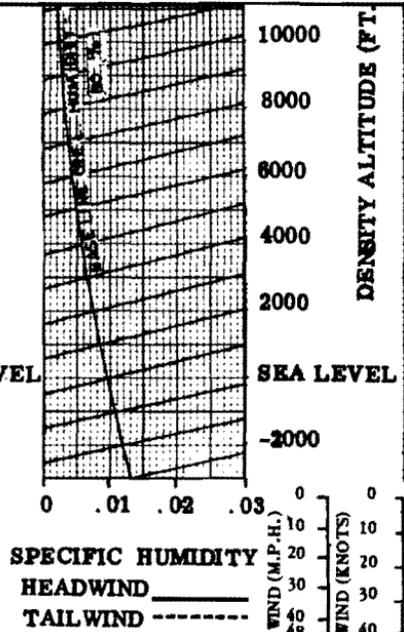
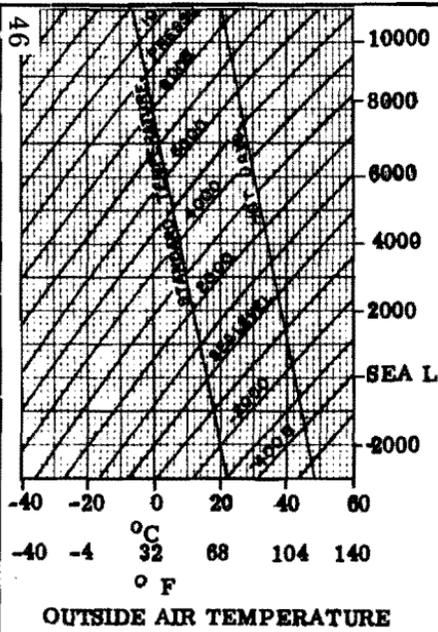
To obtain the approximate distance over a 50 foot obstacle, multiply the zero wind, hard surface runway take-off ground roll distance by 1.95 (ratio of distance over a 50 foot obstacle to take-off ground roll distance).

TAKE - OFF PERFORMANCE

WING FLAPS = UP

45

HARD
 SOD
 SOFT

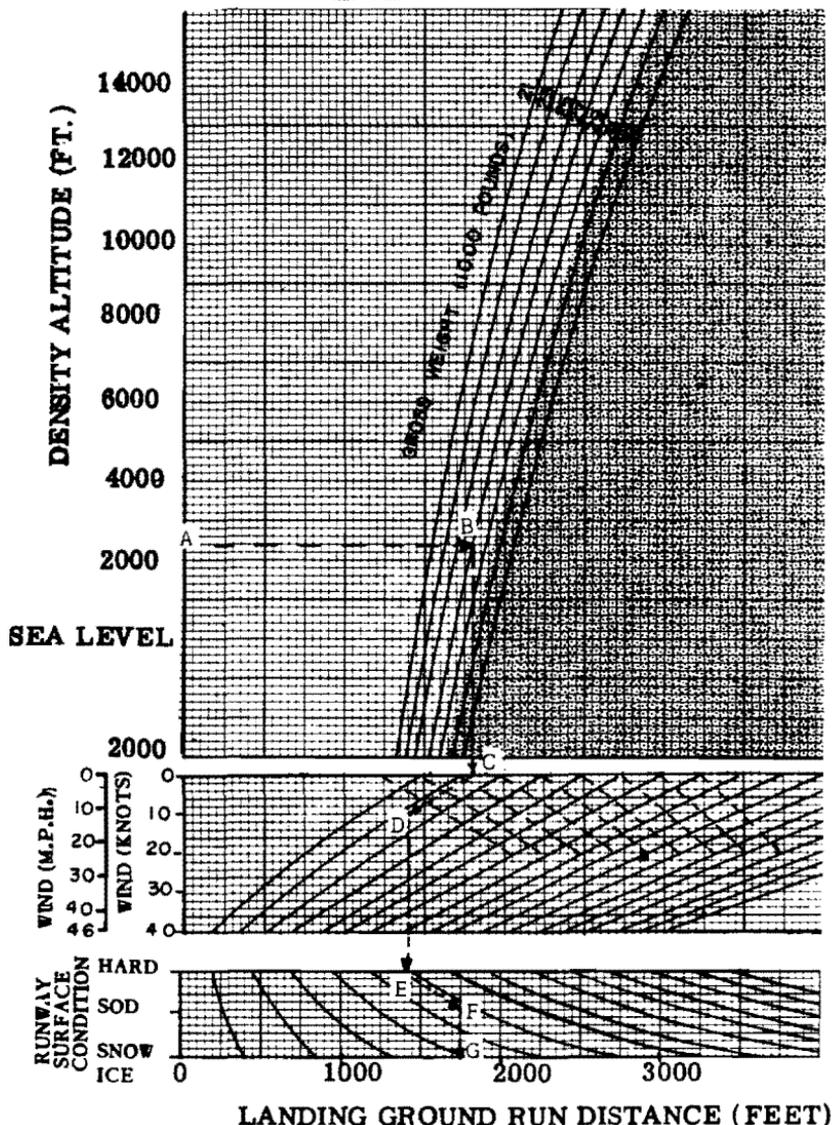


TAKE - OFF PERFORMANCE
WING FLAPS = 1/4 DOWN

• To obtain the approximate distance over a 50 foot obstacle, multiply the zero wind, hard surface runway take-off ground roll distance by 1.95 (ratio distance over a 50 foot obstacle to take-off ground roll distance).

LANDING GROUND RUN

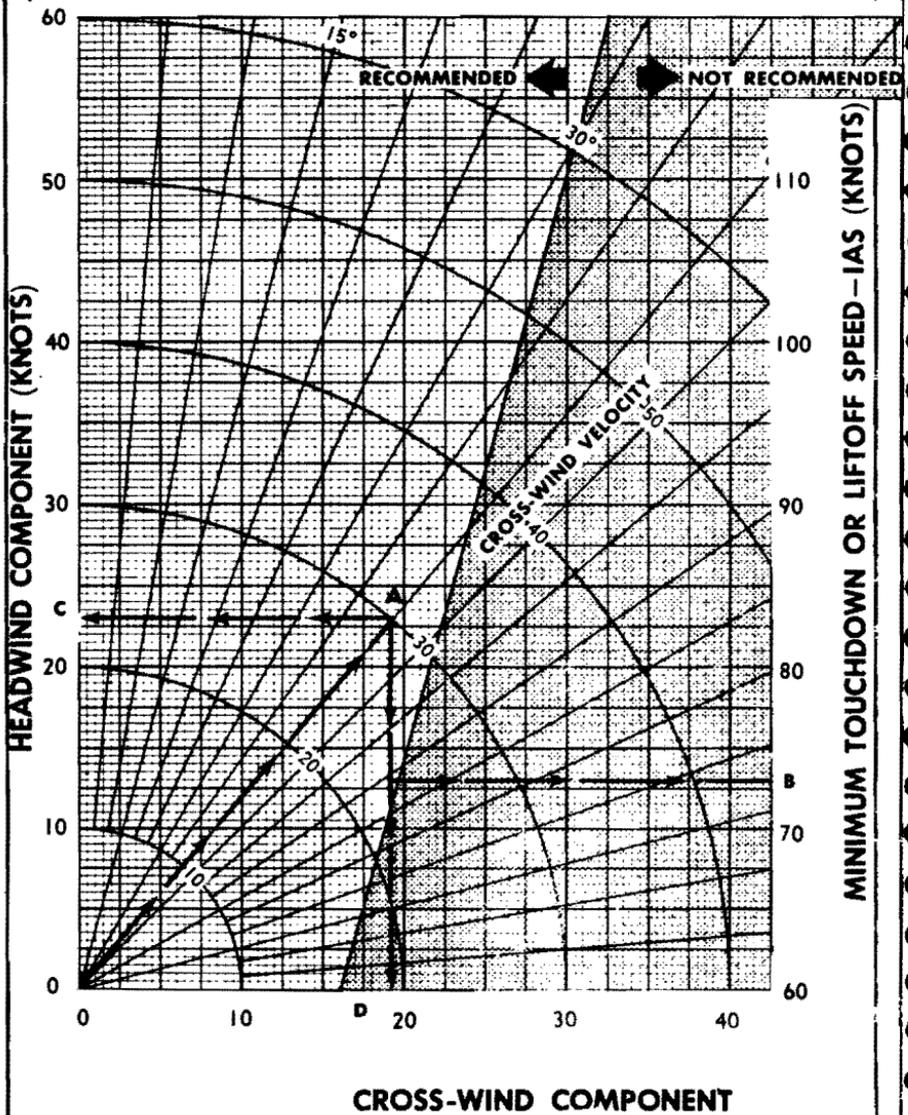
TOUCHDOWN AT 1.1Vs
WING FLAPS = 45 DEGREES
IDLE POWER

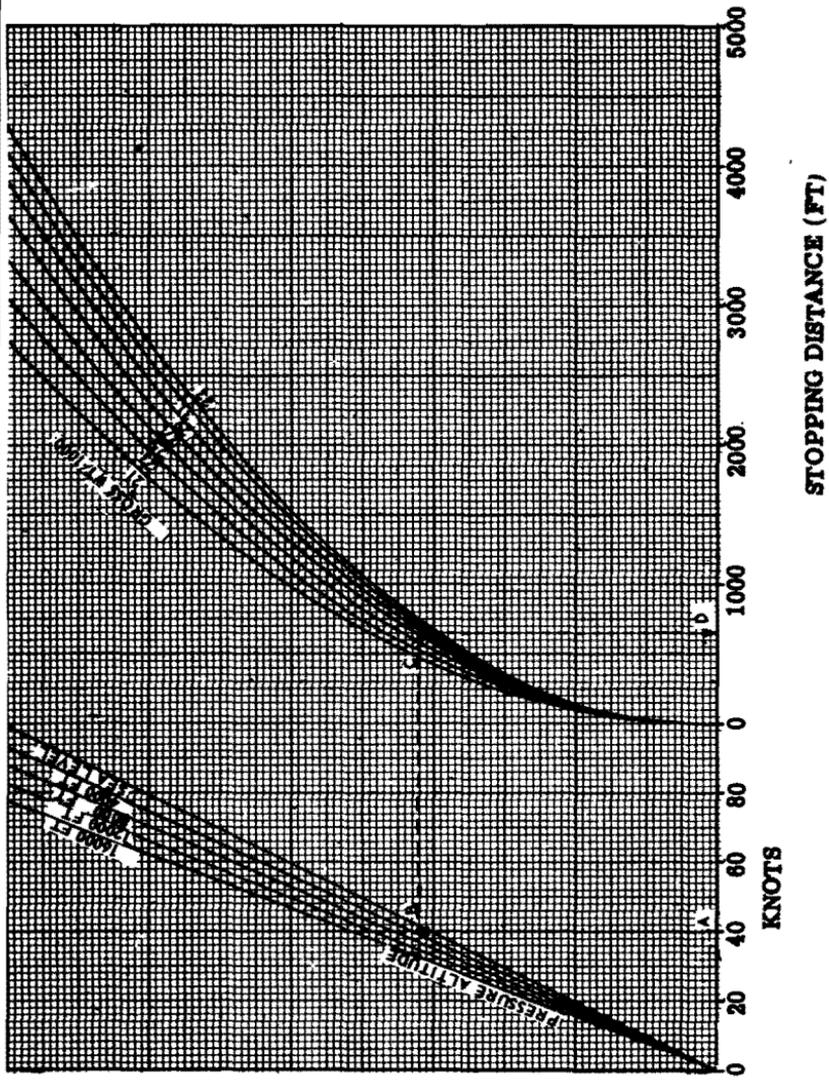


LANDING GROUND RUN DISTANCE (FEET)

HEADWIND ———
TAILWIND - - - -

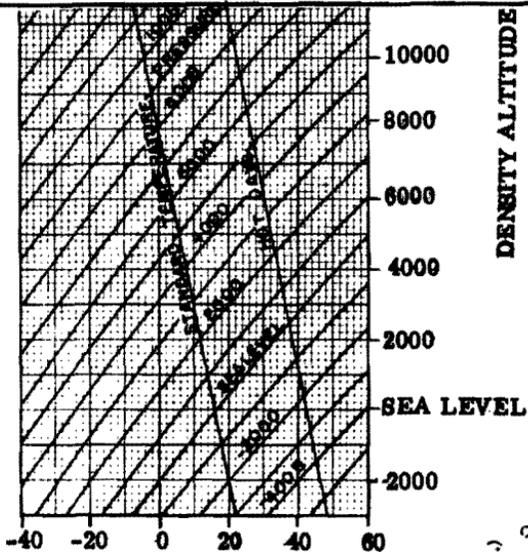
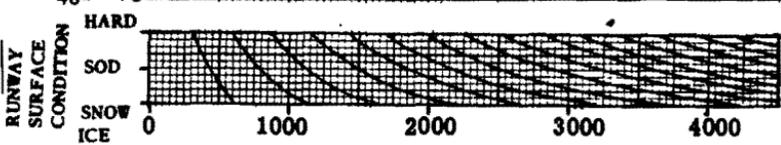
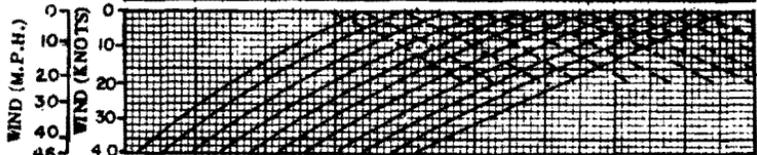
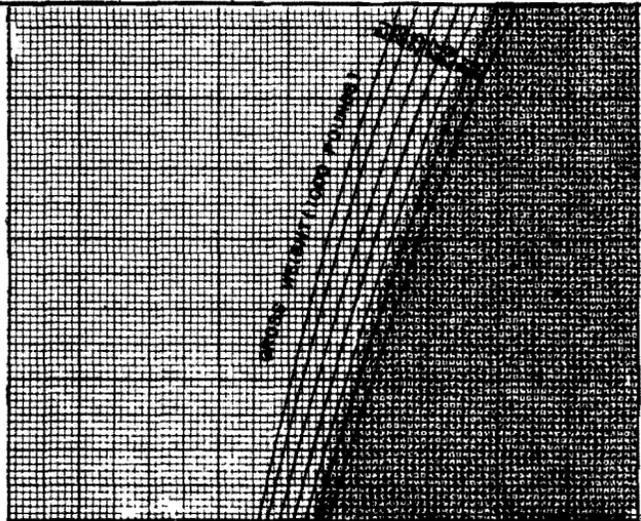
1. Speed at 50 foot height = 120 percent of stall speed.
2. Speed at touchdown = 110 percent of stall speed.
3. Wing flaps = 45 degrees.
4. This chart is for landing ground run distance only. Air run from a 50 foot height to touchdown is approximately 30 percent of landing ground run on hard surface for 45 degrees flap.





DISTANCE TO STOP - ABORTED TAKE - OFF

WING FLAPS = UP



OUTSIDE AIR TEMPERATURE

HEADWIND _____

TAILWIND - - - - -

This chart is for landing ground run distance only. Air run from a 50 feet height to touchdown is approximately 50 percent of landing ground run on hard surface for 0 degree flap. Total landing distance from a 50 feet height is the sum of the air run plus the ground run distance for any prevailing runway surface condition.

50

LANDING GROUND RUN
WING FLAPS = 0 DEGREES

AIRCRAFT REVIEW

1. Given: Gross weight - 26000 pounds;
Pressure altitude - 2000 feet;
OAT +10°C; Hard surface, Level
runway; No wind.
Determine the accelerate stop distance if the takeoff
is aborted at 70 KIAS :
 - a. 3150 feet.
 - b. 3325 feet.
 - c. 3750 feet.

2. Given: Gross weight - 26000; Pressure altitude -
Sea level; OAT +10°C; Hard surface, Level
runway; No wind.
Determine the minimum runway length for takeoff:
 - a. 1000 feet.
 - b. 1100 feet.
 - c. 1200 feet.
 - d. 1300 feet.

3. The wheel base turning radius of the C-47 aircraft
is:
 - a. 57 feet 6 inches.
 - b. 48 feet 11 inches.
 - c. 49 feet 4 inches.
 - d. 66 feet 9 inches.

4. During landing gear retraction, the latch lever
will not remain in the "unlocked" position. The
most probable cause for this malfunction is:
 - a. Binding or jammed gear lock.
 - b. Broken cables.
 - c. Cables off the routing pulleys.
 - d. Broken or missing latch spring.

5. During the above problem, the latch lever will not go to the "unlocked" position. The most probable cause for this malfunction is:
 - a. Binding or jammed gear lock.
 - b. Broken cables.
 - c. Cables off the routing pulleys.
 - d. Broken or missing latch spring.

6. In the event of inverter failure there _____ an automatic changeover relay that switches on the spare inverter.
 - a. Is
 - b. Is not

7. On some aircraft, the bus priority relay will automatically disconnect the Main Junction Box #2 bus and the Radio Junction Box #2 bus when either or both generators are not supplying DC power. To override the bus priority relay you must assure that:
 - (a) Ground test power switch is "ON", light "ON".
 - (b) Ground test power switch is "OFF", light "OFF".

8. Maximum allowable oil consumption for C-47 is:
 - (a) 1.5 GPH
 - (b) 1.8 GPH
 - (c) 1.5 GPH at main base, 1.8 at out station one time flight to main base.

9. During flight at 9000 feet, the fuel pressure suddenly drops to 10 psi or less on an engine, but the engine continues to operate normally. The gross weight of the aircraft is 25000 pounds and the minimum enroute altitude to destination is 2000 feet. Your first reaction will be:
 - a. Place fuel boost pump switch "ON".
 - b. Reduce power and descend to a lower altitude.
 - c. Place mixture on that engine to idle-cut off.
 - d. Continue to destination and report discrepancy to maintenance.
10. In the above question fuel pressure drops to zero and engine begins to fail. You place the fuel boost pump switch "ON" and notice no increase in fuel pressure. Assuming full fuel tanks CB's in, your reaction should be (HC-47 excepted):
 - a. Change fuel tank selection.
 - b. Feather affected engine.
 - c. Turn cross feed "ON".
11. Your first reaction to counteract engine failure due to fuel starvation is:
 1. Turn fuel boost pump "ON".
 2. Change fuel tank selection.
 3. Retard throttle on affected engine.
12. Concerning fuel requirements for IFR flight, your destination has an approach facility approved for a ceiling of 400 feet and one mile. Your forecast weather for 2 hours before until 2 hours after your ETA is 1500 ft. overcast and visibility 3 miles. What are your fuel requirements for this flight?

- a. Fuel from departure point to destination plus 45 minutes reserve computed at cruise fuel consumption.
 - b. Fuel from departure point to destination, thence to your alternate computed at cruise fuel consumption plus 45 minutes reserve computed at maximum endurance fuel consumption.
 - c. Fuel from departure point to destination, thence to your alternate plus 45 minutes reserve computed at cruise fuel consumption.
 - d. None of the above.
13. For your IFR flight, the destination has a forecast weather of 1000 overcast and visibility 2 miles. What are your fuel requirements for this flight?
- a. Fuel from departure point to destination plus 45 minutes reserve computed at cruise fuel consumption.
 - b. Fuel from departure point to destination, thence to your alternate computed at cruise fuel consumption plus 45 minutes reserve computed at maximum endurance fuel consumption.
 - c. Fuel from departure point to destination, thence to your alternate plus 45 minutes reserve computed at cruise fuel consumption.
 - d. None of the above.
14. The following are mandatory weather and safety of flight reports:
1. The time and altitude of passing reporting points.
 2. Any unforecast weather and conditions encountered.
 3. Any other information relating to safety of flight.
 - a. True.
 - b. False.

15. The following are mandatory ATC reports:
 1. The time and altitude reaching a holding fix or point to which cleared.
 2. When vacating any previously assigned altitude.
 3. When leaving any assigned holding fix.
 4. When leaving final approach fix inbound on final approach.
 5. When an approach has been missed.
 6. A correct estimate any time it becomes apparent that a previously submitted estimate to a reporting point will be in error in excess of 3 minutes.

16. Upon take-off it is discovered that the co-pilot's airspeed indicator is inoperative you would:
 - a. Return and land immediately.
 - b. Continue to destination, if able, under VFR conditions.
 - c. Continue to destination even if under IFR conditions.

17. During engine start it is discovered that the left tachometer is inoperative. You would:
 - a. Continue flight.
 - b. Shut-down and have it repaired.
 - c. Continue flight only if left manifold pressure is operative.

18. The flight attendant reports puff's of black smoke from the right engine exhaust. Your first action would be to:
 - a. Feather engine immediately.
 - b. Place mixture control to auto-rich.
 - c. Monitor the engine and see if it gets worse.
 - d. None of the above.

19. The co-pilot reports bluish-grey smoke from cowl flaps and exhaust areas. Your action would be to:
- Use engine fire procedures immediately.
 - Feather engine immediately.
 - Enrich mixture.
 - Do nothing immediately, but monitor condition and if fire occurs use engine fire procedures.
 - None of above.
20. Your landing runway is 30. Your wind is from 250° at 26 knots. It is safe to land if your touchdown speed is above:
- 70 Knots.
 - 78 Knots.
 - 60 Knots.
 - 76 Knots.
21. You are required to make a STOL approach and figure your touchdown speed will be 65 Knots. What is the maximum recommended cross-wind component you can have to make a safe landing?
- 16 Knots.
 - 20 Knots.
 - 15 Knots.
 - $17\frac{1}{2}$ Knots.