

BEECHCRAFT TEN-TWO PRACTICE FLIGHT MANEUVERS

PILOT FLIGHT TRAINING GUIDE

GROUP I

A. Pre-Flight Inspection

1. The Instructor/Check Pilot shall conduct an oral examination as required, and complete a thorough pre-flight briefing covering all points of interest regarding the training or check flight.

2. Under the supervision of the Instructor/Check Pilot the pilot will conduct a complete walkaround exterior inspection of the airplane. A general external inspection will be made of tires, engines, props, control surfaces doors and hatches, filler caps, antenna, etc.

3. Under the supervision of the Instructor/Check Pilot the pilot will conduct the interior pre-flight inspection of the airplane. A check will be made on the location and proper stowage of all emergency equipment, all doors and emergency exits properly secured, all circuit breakers, radio switches, etc.

B. Engine Starting Procedures

Normally the pilot will accomplish all function of the pre-flight, engine starting check list and start the engine under the direct instruction and supervision of the Instructor/Check Pilot. (A captain or trainee captain normally will occupy the left or pilot's seat and an Instructor/Check Pilot will occupy the right seat).

C. Taxiing

The Pilot will normally perform all radio calls, readings of check lists, etc.

D. Engine Run-Up

The pilot will perform a complete engine(s) run-up as required and outlined in the aircraft check list under the direct supervision/observation of the Instructor/Check Pilot.

E. Pre-Take-Off Checks

1. Under the supervision/observation of the Instructor/Check Pilot the pilot will complete the Prior to Take Off check list and set all radios on the proper station.

2. Make the turn to take-off position on the extreme end of the runway smoothly and slowly to avoid excessive stress on the tailwheel assembly while locking.

3. The pilot shall align the aircraft in the center of the runway ascertaining that the tail wheel is locked; check that the magnetic compass agrees with runway heading and set the directional and attitude gyros.

GROUP II

A. Normal Take-Off (No Flaps) Fig. 1 page 10)

Hold brakes static power check at 30 inches MAP. Release brakes and apply maximum power of 36.5 inches MAP and 2300 RPM in a smooth manner. The airplane may be steered at the beginning of the takeoff roll with a combination of un-asymmetrical power and rudder pressures. This technique is normally needed when crosswind conditions exist. However, takeoff from limited-length runways will usually require immediate full power from both engines, therefore, reduced power on the engine for steering should be used with caution in such instances. Rudder control becomes effective almost immediately upon application of take-off power.

The wing of the Ten-Two is an extremely "high-lift" type and the aircraft tends to become airborne prior to reaching single engine control speed (V_{mc}) of 78 kts. IAS. Extreme caution must therefore be exercised at maximum gross weight to prevent the aircraft from becoming airborne prior to reaching 94 kts. IAS, (V_1). Immediately after becoming airborne retract the landing gear and attain an airspeed of 102 kts, (V_2) as rapidly as possible. After lift off use extreme caution to prevent the aircraft from setting onto the runway while accelerating to V_2 speed. Continue acceleration to 115 kts. (best rate-of-climb speed). 1,000 feet above the airport complete the after take-off check list.

B. Climbing Turns. (Instrument hood up 200 ft. maximum)

Maintain climb speed of 115 knots. The Instructor/Check Pilot will ask the pilot for turns between various headings (to be picked by the Instructor/Check Pilot). These turns will be made standard rate.

C. Stalls

Upon reaching altitude, the pilot will initiate approaches to power-off stalls. Heading and altitude will be stipulated by the Instructor/Check Pilot. Propellers will be set at 2300 RPM and manifold pressure reduced to 13 inches. Several approaches to stall shall be accomplished and in various configurations (clean, landing, approach, etc.) and in both level and turning flight attitudes. Upon receiving the first indication (buffet) of a stall, recovery shall be made by advancing throttles to maximum power. Special attention shall be given to minimum loss of altitude. In any approach to a stall the pilot shall simultaneously with applying maximum power command, MAXIMUM POWER, FLAPS UP, GEAR UP (gear should not be retracted until a definite indication that descent is stopped is noted on the vertical indicators). In banked approaches to stalls (20° bank will be used) upon receiving the first indication (or buffet) of the impending stall, the pilot shall roll the wings level simultaneously applying MAX. power. The "clean" stalling airspeed shall be noted for use in slow flight.

After completing a series of power-off approaches to stall, a like series of power-on approaches to stalls will be accomplished using 2300 RPM and max. MAP. Again, special attention shall be given to minimum loss of altitude. The standard commands and procedures as set forth in "C" shall be used throughout the stall series.

- D. Upon completion of the power-on stall series the Instructor/Check Pilot will ask for slow flight maneuvers which will be accomplished at power-off clean stall speed plus 10 knots. Slow flight in a straight and level attitude and also in 20° banked turns shall be demonstrated by the pilot. Slow flight shall also be accomplished in various flap and gear configurations, thereby incorporating at this point of the flight a trim and power exercise.
- E. After completing the slow flight maneuvers the Instructor/Check Pilot will clear the pilot for steep turns. These will consist of 45° banked turns of 360° each way. Entry IAS shall be 120 knots with propellers set at 2100 RPM. The first turn shall be made to the right in order to allow the Instructor/Check Pilot to properly clear the area. A smooth roll out from the right turn into a left turn will be accomplished continuing turn through 360 degrees. The pilot will be grade upon smoothness of roll in and roll out, ability to hold altitude and constant bank, coming out accurately on a predetermined heading, and general coordination. Altitude limits of plus or minus 100 ft. shall be maintained.
- F. If the aircraft should begin to "dish out" of the turn, the degree of bank should be altered to maintain or regain altitude and attitude, instead of placing excessive back-pressure on the control column. This will include placing an excessive G load on the aircraft.
- G. One or two recoveries from unusual attitudes will be given. These will be accomplished at cruise power setting. To initiate recover, the aircraft should be brought to a wings level attitude first by reference to the turn and bank indicator, and the pitch correction should then be made by referring to the airspeed indicator. Power will be adjusted as necessary during recovery.
- H. At some time during this first portion of the flight, the Instructor/Check Pilot will verbally simulate an emergency (uncontrollable engine fire, fuselage fire, etc.) which will require getting the aircraft on the ground in the most expeditious manner. This will be the signal for the pilot to initiate an emergency-maximum rate descent by POWER-OFF, PROPELLERS HIGH RPM, gear down, FLAPS DOWN. Descent shall be made at maximum flap down speed (104 knots). The Instructor/Check Pilot shall stipulate an altitude below which descent is not to be made. A "lead" of approximately 500 ft. is required on level out altitude. Rate of descent in this configuration is approximately 2200 feet per minute.
- I. Rapid descent and pull up: "Canyon approach" (See TEN-TWO Rapid Descent & Pull Up Fig. 2 page 11). The pilot shall establish straight and level flight in cruise configuration at 120 knots IAS on a pre-selected magnetic heading and altitude. The descent and before landing check list will be completed, with the exception of landing gear and flap extension. The Instructor/Check Pilot will state a time for beginning the descent.

Fifteen seconds before starting the time (for descent), the landing gear will be lowered and the aircraft slowed to maximum flap speed (105 knots). Then the flaps will be lowered and speed maintained at 105 knots. On the commencing descent reduce manifold pressure to that value (approximately 17" MAP) required to maintain 105 knots IAS in a 1000/FPM descent. Upon descending 1000 feet the aircraft will be returned to a level flight attitude and the flaps retracted.

Level flight at 105 knots IAS shall then be maintained for one minute. (Power setting approximately 23 inches MAP). Fifteen seconds prior to anticipated pull up the propellers will be advanced to 2300 RPM. at the completion of one minute of level flight the pilot shall call for "maximum power, flaps up, gear up" and immediately establish a rate of climb while rolling into a 30° bank, for a 180° turning climb out back to original altitude. (Preferably right for instructor pilot convenience). The pilot at the time of applying power, shall use the term MAX. POWER, FLAPS UP, GEAR UP. (The gear should not be retracted while the vertical instruments are indicating a descent). 30° bank and 105 knots IAS should be maintained while turning to a heading 180 degrees from the pre-selected heading on which the approach was started. Reduce power after reaching altitude. The instructor/Check Pilot may during the climb-out elect to cut in an engine. If so, the pilot is expected engine, verbally identifying the engine procedure shutdown. (Note: Do not actually feather an engine at less than 4000 ft. above the terrain). While initiating the engine feathering procedure it will be necessary to reduce the rate of bank approximately one-half (to 15°) and reduce pitch attitude to maintain 102 knots V2 best angle of climb speed. (REMEMBER TO KEEP THE AIRPLANE TURNING TO THE RECIPROCAL HEADING). The "Deferred Action" items check list shall be executed when time permits. The pilot will be instructed to conduct single engine maneuvers at 102 knots. Upon completing single engine maneuvers the pilot will unfeather the engine. He will consult the check list and perform the steps himself while the Instructor/Check Pilot file the airplane.

J. The Instructor/Check Pilot will next ask for an ADF orientation and time to the station. After an orientations and time check the pilot will give the ETA to the station and turn inbound. The Instructor/Check Pilot may at this time ask for a bearing interception and a particular track to the station. The Instructor/Check Pilot will simulate the appropriate approach control facility and issue clearance to hold/let down on the appropriate radio. Particular attention shall be given to minimums, times, headings, etc. An engine-out will be given at some point during the simulated instrument let down. Normal single engine procedures will apply except that propeller feathering will be simulated by the Instructor/Check Pilot pulling back the affected engine to 1500 RPM and 15 inches manifold pressure (zero thrust). The Instructor/Check Pilot will not simulate engine shut down until asked to do so by the pilot and will not do so unless the proper engine is identified. After indentifying the engine and giving the "Immediate Action" items from memory, the pilot will then execute the "Deferred Action" or phase two check list.

Note: Although the foregoing applies to an ADF instrument let down the pilot will normally be expected to demonstrate his proficiency at other facilities used for instrument approaches (VOR, GCA etc.) in those areas where such are available. These procedures shall be accomplished in accordance with the accepted procedures, for the type of facility being used.

The pilot will call out "field in sight" upon reaching instrument minimums and/or time elapsed as appropriate. At this point, the Instructor/Check Pilot may take down the instrument hood and direct the pilot to execute a low visibility, minimum altitude go around and landing. If the Instructor/Check Pilot does not remove

The hood the pilot will assume the field was not sighted and immediately execute the published "Missed Approach" procedure.

GROUP III

Procedure for covering the various emergencies are covered in detail in the Cockpit Check List. The use of this Check List cannot be overstressed.

A. At an altitude consistent with safety a simulated fire warning will be given on one of the engines. The pilot should accomplish the basic steps of feathering the engine (engine will not be feathered below 4,000 feet) and simulate extinguisher discharge followed by the completion of the phase II check list. Close attention should be given to the pilot's ability in handling the aircraft, maintaining constant altitude and heading, etc.

B. Cargo compartment and Cabin Fire; Smoke Removal.

The Instructor/Check Pilot and pilot shall review the various methods of combating and cargo and/or cabin fire and procedures for removing smoke from the cabin.

C. Electrical Fires and Failures.

The Instructor/Check Pilot shall review with the pilot the procedure to use in event of an electrical fire which resulted in loss of electrical equipment. The Instructor/Check Pilot and pilot will review orally the procedure for lowering landing gear and flaps in the event of electrical failure.

D. Emergency Descent.

The pilot and Instructor/Check Pilot will review orally the two types of emergency descent and the advantages of each.

E. Propeller Feathering Procedure.

The pilot will be given several simulated conditions at an altitude (above 4,000 ft.) which would require feathering of the propeller. Accuracy in determining the engine to be feathered by cross checking all instruments and the use of the check list cannot be over emphasized.

GROUP IV

A. ADF Instrument Approach (See Ten-Two-VOR-LFR-ADF Fig 3 Page 12)

1. The radio range and ADF approach procedures specified herein shall be considered standard company training procedures unless otherwise listed on the instrument approach chart for the airport being used.

2. Standard Ten-Two radio range and ADF approach procedures shall be conducted in accordance with the following:

- a. Complete preliminary checklist 5 minutes prior to arrival over the radio station.
- b. Maintain cruising speed until over the high station.
- c. Set 22" and 2100 RPM after cross-checking over the station. Gear down.
- d. Take up outbound leg, radial or ADF track.
- e. Stabilize airspeed at 105 knots.
- f. Make appropriate procedure turn to intercept the inbound heading of the approach leg. The procedure turn utilized will be that depicted in the appropriate let-down for the station being used.
- g. Check instruments. Weather conditions, wind, runway in use, etc. should be obtained while inbound. Plan final approach.
- h. Descend to final approach altitude.
- i. Fly definite headings following prescribed approach course.
- j. When over low station turn to heading to field, reduce power and descend to minimum altitude.
- k. Hold minimum altitude the allotted time, if not contact set:
 - i) Maximum power
 - ii) Flaps up
 - iii) Gear up (when descent arrested)
- l. Follow missed approach procedure.

IMPORTANT NOTES

1. Never change the heading of the airplane until the new heading is definitely in mind.
 2. Always fly definite headings.
 3. Never anticipate the on-course when making a low frequency range approach.
 4. All power settings suggested here are approximate and will vary with different loads. These settings should be used only as a guide.
- B. IIS Instrument Approach (See Ten-Two IIS Fig. 4 page 13)
1. The IIS approach procedures specified herein shall be considered standard company training procedures unless otherwise listed on the instrument approach a chart for the airport being used.
 2. Standard Ten-Two IIS approach procedures shall be conducted in accordance with the following:

- a. Complete pre-landing check list prior to arrival over the first fix.
- b. Maintain cruising speed until over first fix.
- c. When over first fix or past the fix outbound, set 2100 RPM and slow airplane to 120 knots.
- d. Complete procedures turn and intercept ILS localizer.
As small as possible in order to remain on the localizer.
- e. Just prior to intercepting the glide slope within 10 seconds, lower the landing gear and slow aircraft to MAX flap speed (109 knots). Upon intercepting the glide slope, reduce power to maintain 105 knots, and approximately 500 ft. per minute (glide slope angle of descent). The recommended procedure is to stay on or slightly above the glide slope instead of climbing to intercept it.
- f. The degree of success of an ILS approach depends upon the preparedness achieved before departing from the outer marker and the accuracy established on the localizer and glide slope immediately after departure from the outer marker.

NOTE: All power settings suggested here are approximate and vary with different loads.

C. VOR Instrument Approach (See Ten-Two VOR-ADF-LFR Fig.5, Page 14)

The Instructor/Check Pilot will emphasize the importance of observing the proper procedure relative to station and marker identification, procedure turn (type and direction), altitude observance, etc. It should be emphasized that technique relative to heading control, speed control and general aircraft management are of equal importance.

D. GCA and Radar Approach

GCA procedures will vary slightly at different airfields and with the point of pick up. In general:

1. Follow directions of the controller while at all times monitoring the aircraft position in relation to VOR/ADF station.
2. Maintain cruise speed until directed by the Controller.
3. Reduce to approach speed of 120 knots, on the instruction of the Controller.
4. Pre-landing check list will be complete with the exception of "Gear Down" which will be done 10 seconds from interception of the glide path. The aircraft will be slowed to maximum flap down speed after gear is lowered and before interception of the glide path.
5. On interception of the glide path, establish desired descent with power and follow the glide path with the yoke. Airspeed should be maintained at 100 knots with the yoke, making power adjustments as necessary to control descent.

E. Traffic Control Procedures

The Instructor/Check Pilot shall closely observe the pilot's technique and response to instructions and directions received from Air Traffic Control. The pilot shall be graded and/or instructed on his judgment and familiarity, with instructions/directions received and his ability to execute properly such instructions.

The pilot should use all means available to expeditiously conduct necessary approaches and traffic patterns in a safe and methodical manner in order that undue delays and/or misunderstandings will not arise, clear, concise and approved radio procedures shall be used at all times, read backs shall be executed by the pilot on all clearances received.

F. Landing Normal (See Ten-Two - Off and Landing Fig. 6, Page 15)

The pilot will demonstrate his ability to land the aircraft under normal conditions. Grading will be based on basis of proper planning, altitude control, flap management, airspeed control, smoothness and co-ordination.

G. Landing Night

Night landing will be made using the same procedures as during day landings (See Ten-Two Take-Off and landing Fig. 1). The rotating beacon will be turned off when the aircraft taxis off the runway.

H. Landing Cross Wind

A normal approach shall be made to a cross-wind landing, the landing to be completed using "full" flaps. The Instructor/Check Pilot should emphasize the importance of speed control (approach and boundary), and maintaining alignment on the approach and landing flare by lowering a wing and keeping nose straight with rudder.

I. Landing (Zero Flap)

The pilot will demonstrate his ability to land the aircraft without the use of flaps. The final approach should be somewhat longer than for a normal landing. The control of speed, both approach and boundary, probably reaches its greatest importance in a "No Flap" landing. Setting up attitude and airspeed as early as practical should be stressed and maintaining both to near touchdown - controlling descent with power. Power reduction should be very gradual during flare out. Any abrupt reduction in power during the approach or flare out could result in a shoot or hard landing.

J. Landing (Engine (s) out)

When one engine is simulated to be inoperative the airspeed on final approach will be not less than 102 knots. The approach will be slightly steeper than a normal approach using "0" degree flaps until a point is reached from which a safe landing is assured. At this point the landing gear will be lowered and the wing flap set as required for an approach and landing at minimal power or power off.

K. Go Around (Engine Out)

1. During a single engine approach the pilot may be given a go-around upon reaching airport minimums.
2. The pilot will normally be instructed to continue for landing by making a close-in circling approach under simulated weather condition of published circling minimums. On the downwind leg one engine will be retarded to zero thrust and the approach continued as a single engine circling approach with a full stop landing. The Instructor/Check Pilot will closely monitor the airspeed, power and wing flap/landing gear management.

L. Landing, Circling Minimums Condition

Landing at circling minimum conditions will normally be combined with an instrument approach. The conditions simulated will be those minimum applicable to the airport to which the approach is being conducted. The Instructor/Check Pilot shall emphasize the maintenance of altitude and airspeed control as well as prudent management of the aircraft during the circuit of the airport and alignment with the runway.

- M. The pilot and the Instructor/Check pilot will orally review the procedure for combatting a brake fire. Bring the aircraft to a complete stop using higher than normal RPM on the affected brake side in order to keep the fire away from the wing and out of the wheel well. Request the tower to alert the fire trucks and prepare to evacuate the passengers. (Note: Dry power should always be used on brake fires, if available). If CO₂ is used, the person should stand aft when applying the CO₂ to eliminate dangers of a blow out or a bursting wheel assembly when the CO₂ is applied.

N. Emergency Evacuation

The pilot and the Instructor/Check Pilot will orally review emergency evacuation procedure including the location and operation of all emergency exits.

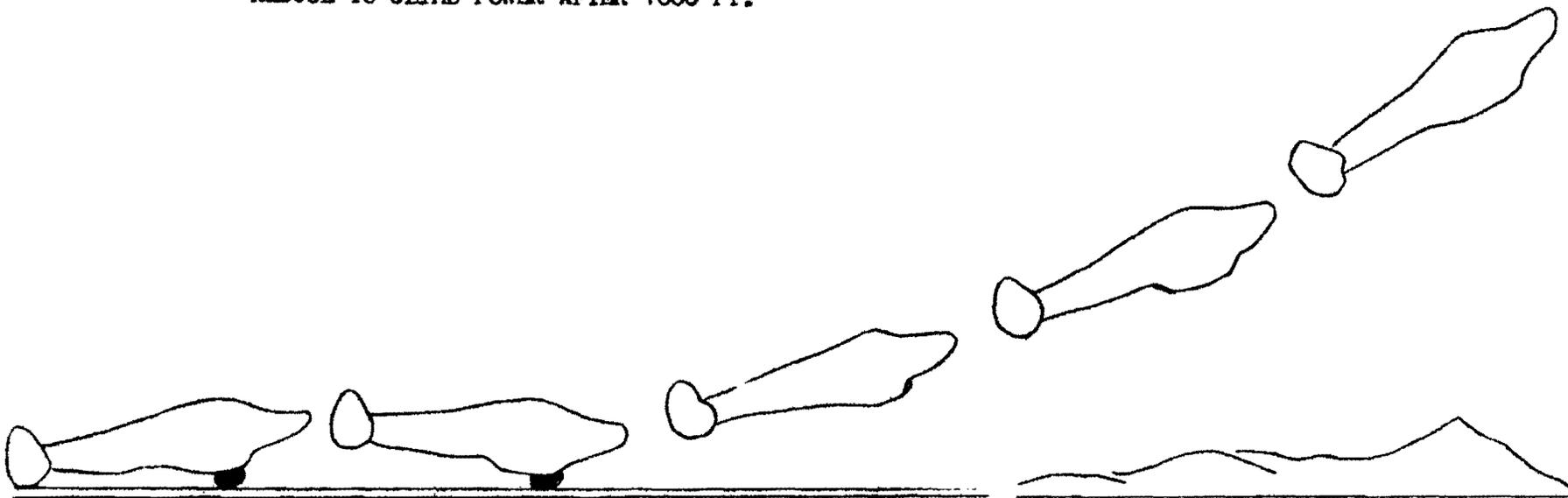
O. Ditching Drill

The pilot will review with the Instructor/Check Pilot the procedures to be used during ditching. The pilot will conduct an actual ditching drill while acting in the capacity of the pilot-in-command. The procedures used will be those outlined in the Operations Manual and as placarded in the aircraft.

Both the pilot and the Instructor/Check Pilot are directly responsible to ascertain that the aircraft will at all times be operated in accordance with the limitations outlined in the approved Ten-Two Airplane Flight Manual. Use of the cockpit check list cannot be over emphasized.

NORMAL TAKEOFF

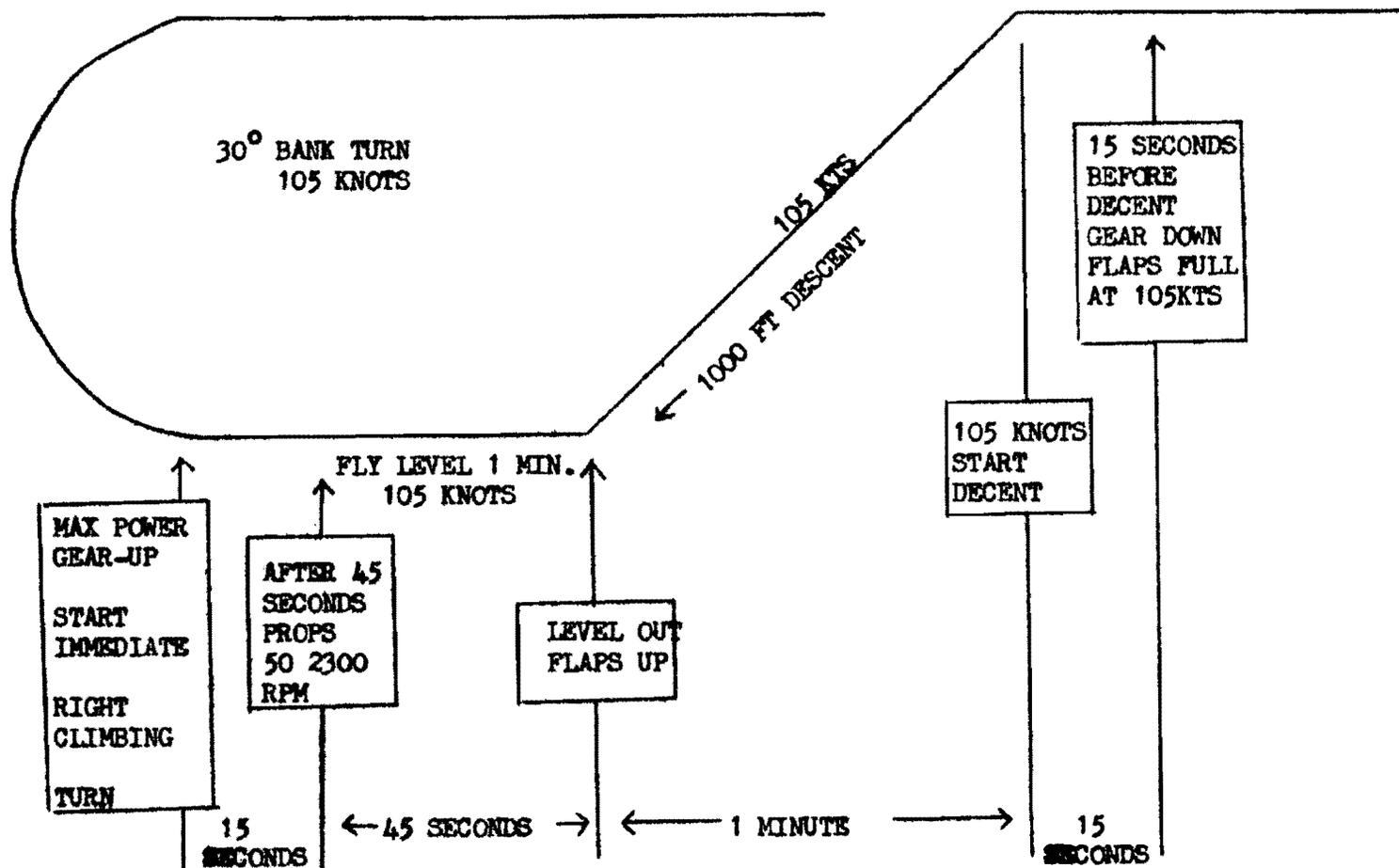
- A. FLAPS-UP. HOLD BRAKES. APPLY POWER.
- B. RELEASE BRAKES AT 30°, 2100 RPM, APPLY MAX. POWER.
- C. RAISE TAIL.
- D. LIFT OFF AT VTO FOR EXISTING CONDITIONS.
- E. AND RETRACT LANDING GEAR.
- E. MAKE FIRST POWER REDUCTION AFTER GEAR UP AND CLEAR OF OBSTACLES.
- F. ATTAIN 115 KNOTS AS SOON AS POSSIBLE AND REDUCE TO CLIMB POWER AFTER 1000 FT.



AIRCRAFT MODEL	MAX GROSS WEIGHT	TAKEOFF SPEED CLEAR 50' OBS	SINGLE ENGINE CLIMB	NORMAL CLIMB IAS
BECH TEN-TWO	10,200	102 kts.	102 kts.	115 kts.

180° FROM ORIGINAL HEADING
ORIGINAL ALTITUDE

PRE LANDING
CHECK LIST
120 KNOTS
PROPS 2100 RPM



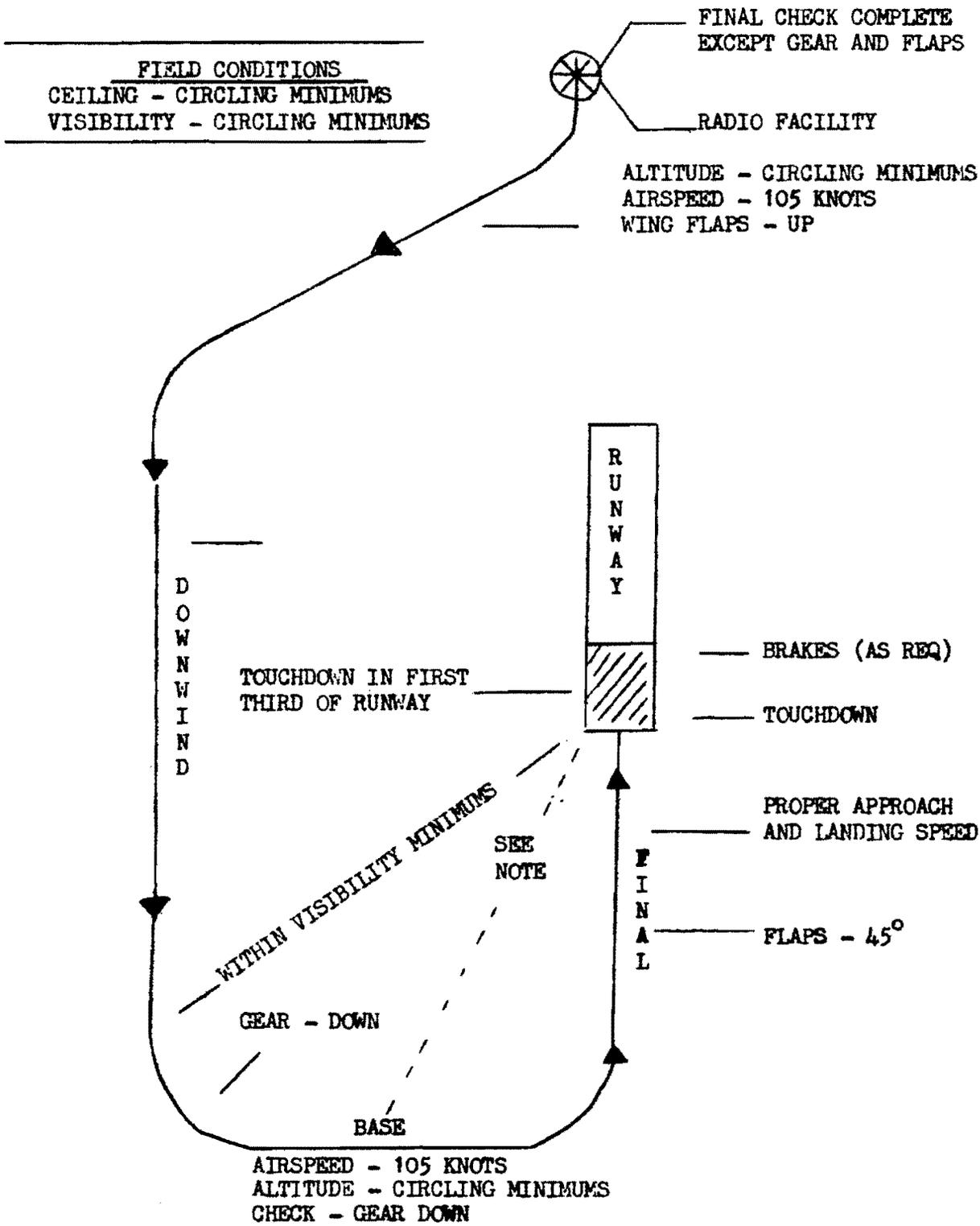
TRIASO RAPID DESCENT AND PULL UP DIAGRAM

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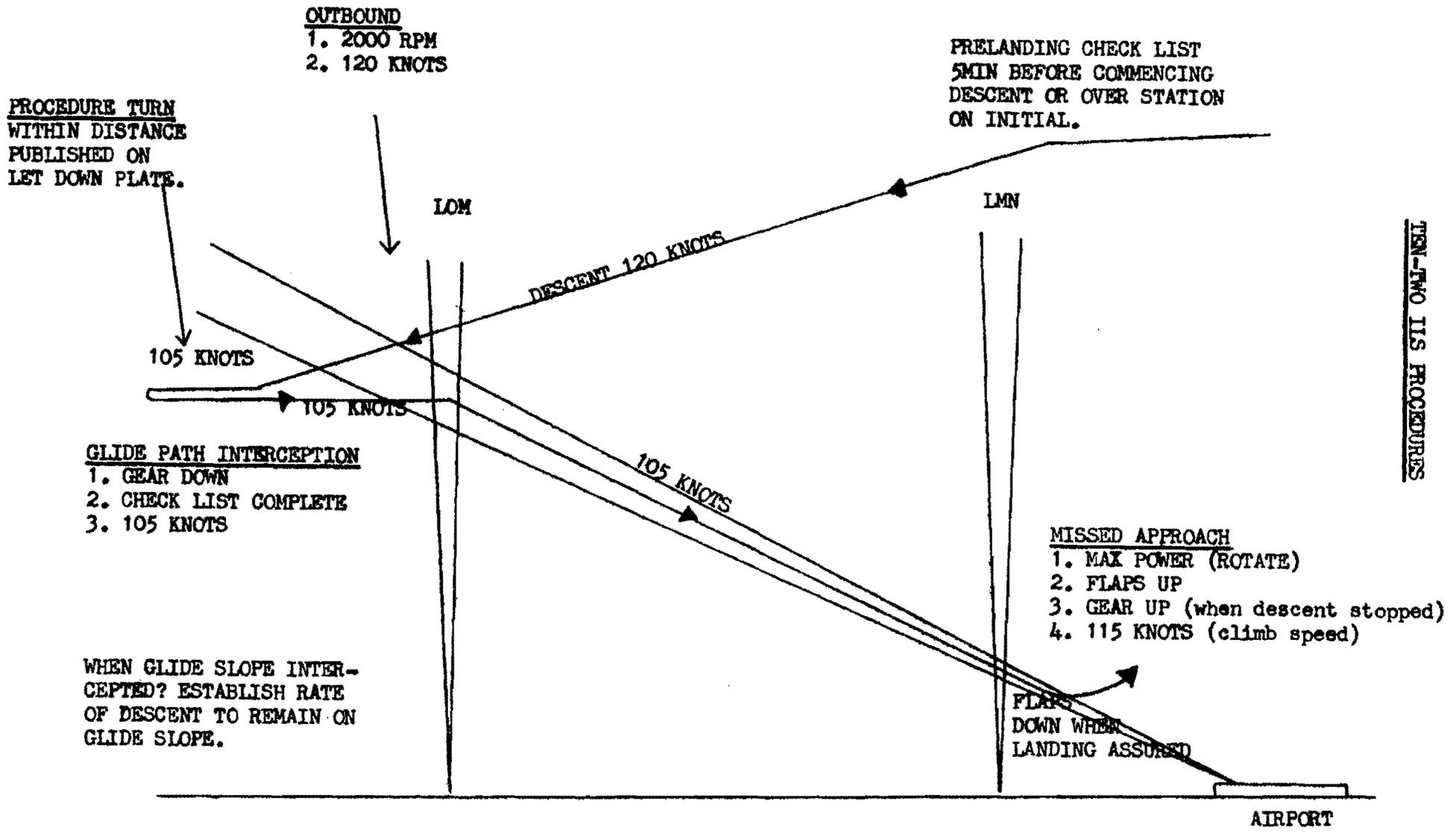
TEN - TWO LANDING DIAGRAM

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CIRCLING { MINIMUM CONDITIONS
MAXIMUM LANDING WEIGHT



NOTE: DESCENT BELOW CIRCLING MINIMUMS PROHIBITED UNTIL APPROACH AND/OR THRESHOLD LIGHTS IN SIGHT.



TEN-TWO IIS PROCEDURES

HOLDING
1. LANDING GEAR UP
2. 120 KNOTS

PRE LANDING CHECK LIST
FIVE MINUTES BEFORE
HIGH STATION

- 1. REDUCE TO 105 KNOTS
- 2. LANDING GEAR DOWN
- 3. PRE LANDING
CHECK LIST COMPLETE

MISSED APPROACH
1. "MAX" POWER
2. WING FLAPS UP
3. LANDING GEAR UP
4. EXECUTE MISSED
APPROACH

