Flying Tigers Fleet Operations Department
Boeing 767-200/300ER Operations Manual

BOEING 767-200/300ER FLIGHT OPERATIONS MANUAL

virtualATP.org **FLYING TIGERS GROUP** virtualairline.org

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Introduction

1.1 Flying Tigers aircraft installation

All Flying Tigers aircraft are provided free of charge (later freeware). All files are in the zipped / archived format. To install, unzip the downloaded files into a temporary directory. Next, place the folders into the Aircraft directory of your FS2002 or 2002(i.e. <…>Program Files/Microsoft Games/Fs200X/aircraft). This directory really depends on the where you installed your flight simulator originally and the example described above may not represent the actual location. If you encounter any difficulties during the installation do no hesitate to contact Flying Tigers B767 Fleet Manager or Training Department for help.

The installation does not include Aircraft Cockpit Panel or Sound files, therefore when you first use this aircraft it will use default panel and sounds included with your FS2000 or 2002 installation. If you decide to use custom aircraft configuration please refer to the documentation for the panels, FDE's, or sounds you may wish to use.

If you intend to use PSS 747/777, Dream Fleet 737, Wilco 767PIC panels and sounds with aircraft models and FDE's by other designers please obtain manufacturers permission to customize their product before use.

There are however many of custom freeware panels available for download at FS Enthusiast sites on the internet. If you need assistance locating such panels or sounds visit sites like www.avsim.com, www.flightsim.com, www.fsfreeware.com, etc.

In the near future our Fleet Management staff and Training Staff will evaluate some of the best freeware panels available and will be posting links to download the better ones.

1.2 Manual Limitations

Project Open Sky and respective developers have provided the aircraft and components contained therein for use by the Flying Tigers Group.

The manual is provided as freeware and as is, with no warranties expressed or implied. This is a freeware and may not be resold or repackaged, rented, leased, or charged any fee for use of this document.

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This manual is written using the references and interviews obtained from real world sources. However, this is developed for the Virtual flight and MS flight simulation only.

Under no circumstances this manual is to be used as a reference for the real world flight training.

Flying Tigers 767-200/300ER Aircraft Data

2.1 The Boeing 767 Series 200/300ER

The Boeing 767 family is a complete family of airplanes providing maximum market versatility in the 200- to 300-seat market. The Boeing 767 family includes three passenger models - the 767-200ER, 767-300ER and 767-400ER - and a freighter, which is based on the 767-300ER fuselage.

The twin-engine 767 - sized between the single-aisle 757 and the larger, twin-aisle 777 - has built a reputation among airlines for its profitability and comfort.

The Boeing 767's cabin is more than 4 feet (1.2 m) wider than single-aisle jetliners, and the 767's versatile design allows customers to select four, five, six, seven or eight abreast seating to best suit their operational requirements. The 767 seats 181 passengers in a three-class seating arrangement on the 767-200ER. Lower-deck volume available for baggage and cargo is 2,875 cubic feet (81.4 cu m) for the 767-200.

All three passenger models are offered in a variety of takeoff weights, which allow operators to choose only the amount of design weight needed to satisfy their requirements. These offer corresponding design ranges from just over 5,645 nautical miles (10,450 km) to as many as 6,600 nautical miles (12,220 km). This range versatility gives the 767 family the ability to efficiently serve routes as short as U.S. domestic and pan-European to long-range flights over the North Atlantic and North Pacific. The 767 now crosses the Atlantic from the United States to Europe more often than any other jetliner.

Schedule reliability - an industry measure of departure from the gate within 15 minutes of scheduled time - is nearly 99 percent for the 767. Fleet-wide, daily utilization - the actual time the airplane spends in the air - averages more than 10 hours

Boeing has delivered more than 800 767s that are flown by approximately 80 operators around the world. The 767 family has accumulated more than 7.5 million flights and has carried millions of passengers. About 1.3 million of the 7.5 million flights were on extended twin-engine operations (ETOPS) rules.

The 767 family has the lowest operating cost per trip of any twin-aisle airplane. This low operating cost, combined with a choice of three sizes, variable range capability, almost universal airport compatibility and ETOPS capability, makes the 767 a versatile family of airplanes.

This versatility is an extreme competitive advantage to an operator that needs to serve a variety of different missions and passenger demands. Extensive commonality with the Boeing 757 offers even more operational versatility to 767 operators.

In May 1985, the U.S. Federal Aviation Administration (FAA) approved 767s for long-range flights of up to 120 minutes from an alternate airport. In March 1989, the FAA approved the 767 as the first jetliner for 180-minute extended twin-engine operation (ETOPS). This allows more direct, time-saving trans-Pacific and trans-Atlantic flights from many U.S. gateways. After more than 15 years ETOPS has proven successful and is now part of airlines' routine operations. 767s fly more ETOPS flights than any other airplane.

-Boeing Aircraft Company

2.2 The Boeing 767 – 200/300ER Critical Speeds (Flying Tigers)

Taxi Speeds:

1. Maximum 25 knots on straight paved taxiways
2. Maximum 10 knots during turns
3. Maximum 10 knots approaching gates and parking areas
   3.1. Maximum during 5 knots during marshalling faze of parking

Maximum Allowable Airspeeds (indicated):

1. Maximum Operating Speed Vmo = 355 kts (Mmo = 0.86M)
2. Landing Gear Operating Speed Vlo = 270 kts (Mlo = 0.78M)
3. Landing Gear Max Extended Speeds Vle = 310 kts (Mle = 0.78M)

2.3 The Boeing 767 – 200ER Sample Vref Speeds (Flying Tigers)

1. Decision Speed [i] V1 = 135 kts
2. Rotation Speed [ii] Vr = 143 kts
3. Take Off Safety Speed[iii] V2 = 156 kts
4. Stall Speed in Clean Configuration[iv] Vs = 158 kts
5. Approach Speed[v] Vapr = 180 kts
6. Speed at RWY threshold[vi] Vat = 140-150 kts
7. Normal Operating Speed True[vii] Vno = 460 – 490 kts
   7.1. Normal Ops Speed Indicated Mno = 0.78m – 0.80m
8. Stall Speed Full Extended Vfe = 117 kts

[i] At this speed all systems of the aircraft must be observed in "Good to Go" state. Engines are operating at optimum levels, etc. If any malfunction is to happen passed the V1 speed captain must continue with the take off roll and rotation. Aborted take off is improbable.
[ii] At this speed copilot announces "Rotate!" and pilot in command rotates the aircraft in accordance to operations manual.
[iii] This speed is used to calculate various regimes of flight, i.e. V2+10 speed is used to fly during the initial climb out or engine failure after rotation.
[iv] Stall occurs when there is not enough air flowing over the a/c wings and wings cannot produce lift required for flight anymore. Imminent loss of altitude and potential aircraft damage exists. Clean Configuration means flaps and gear is up.
[v] Speed to fly and approach faze of the flight. Although ATC might require higher or lower speed to maintain separation with other aircraft. Full flaps and gear extended required. Rule of thumb is: add 15 kts to Vat.
[vi] Self Explanatory.
[vii] Self Explanatory.

2.4 Boeing 767- 200/300ER Sample Flap Retraction Schedule

Flap Position	Safe Extension Speed
0° – 15°	255 kts
1° - 5°	235 kts
5° - 15°	215 kts
15° - 20°	200 kts
20° - 25°	190 kts
25° - 30°	180 kts

Flying Tigers 767-200/300ER Flight Operations

3.1 Boeing 767- 200/300ER Ground Maneuvering.

3.1.1 Pushback, Engine Start – Up, and Taxi

Obstructions and Visibility: Flight crew and ground technicians ***must*** ensure before initiating the pushback and / or engine startup that the Safety Circle[i] around the aircraft is clear of any obstructions, people, equipment, and there is no Foreign Object Debris (later FOD) in the path of the engine intake.

Moreover, to prevent ground personnel injury or death and to protect aircrafts' power-plant from the severe damage, please ensure that there is no people, FOD, or equipment anywhere near the front of the aircraft intake (at least 30 feet in front and around the intake opening of 767), and behind the engine exhaust (at least 100 feet for 767).

Start Engines.

While in the terminal area (departure or arrival marshaling); such as Gates, Aprons, or People Mover Docking areas please ensure that the safe taxi speeds are used. Do not exceed 5 knots while in such areas.

Engine Power Usage: After pushback is completed, or as soon as clear of the parking apron:

- Obtain taxi clearance from the appropriate ATC controller.
- Ensure that that slope does not exist in your area and as you release the parking brake the aircraft will not start undesirable roll.[ii]
- If a slope exists which might cause the aircraft to start rolling, advice the ground crew and have your aircraft pointed in a different direction. ***DO NOT*** attempt to compensate for a slope with the aircraft engine power. This might cause severe damage to the aircraft airframe[iii], power-plants and landing gear.
- To start the initial taxi roll-out release the brakes and smoothly increase the power, do not exceed 60% N2, so not cause any damage to the high pressure compressor mechanism of the engine.

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[i] Aircraft Safety Circle – is an imaginary circle with extends around the aircraft the diameter at least 20 feet longer then the aircraft's wingspan. The center of this imaginary circle should be located at the root of the aircrafts wings.

[ii] If the aircraft roll backward down the hill and you hit the brakes instinctively it might tip over and drop on its tale. I am sure your chief pilot will not be very happy about this. (ed)

[iii] Airframe – Fuselage.. But please use correct terminology. Word Fuselage is good for texture designers and peoples other non-professionals. We are the Pilots of the most professional and safest airline in the world so use Professional terminology please.

- When initializing the taxi roll set the power to approximately 55%N1 (this setting will be dictated by Taxi Weight of the Aircraft) and wait for the aircraft to respond. Do not over throttle the aircraft because it will result in higher then needed power setting and unjustified fuel burn.

Taxi and Ground Maneuvering: Do not forget that 767, or any airplane for that matter, have been designed to be graceful and responsive in the air and on the ground this beautiful machine turns into a "cow on the skates." It is imperative to remember this anytime you, pilot, are preparing to execute any kind of maneuver on the ground, whether it is a turn, straight line taxi, or breaking.

When entering a turn always overshoot a centerline of your intended travel path, so to compensate for the aft position of your airplane's main gear. Whenever initiating a turn rotate the stearable (nose) gear smoothly to prevent the tires to lose traction and skid. Do not turn at speed higher than 10mi/hr.

Remember that a 767 main gear tire cost our airline about $5,000 each and brake pads are in range of $1,000-2,000 proper braking technique is important. Whenever a breaking is anticipated, such as parking or entering a turn, for example, anticipate such maneuvers in advance and use the aircraft throttles to reduce the engine thrust and allow for a natural braking. Besides the economical reasons, this technique also provides a more comfortable riding environment for the passengers and flight attendants.

3.2 Boeing 767- 200/300ER Take Off

3.2.1 Before Take off Check List: The "Before Take Off" check list should almost or completely finished by the time you reach the active runaway holding point. The name of this check list speaks for itself, and it must be completed before the aircraft is aligned for take off on the active runway.

3.2.3 Runway Alignment: After directive from the ATC received to align to the runway:

1. Make sure there is ***NO AIRCRAFT ON FINAL OR APPROACH TO THE SAME RWY YOU ARE ALIGNING FOR***.
2. Only after you and your copilot are COMPLETELY sure that the runway is clear for your take off, align to the runway.
3. Remember, not to put your nose wheel exactly on the centerline. The reason for this is first, the centerline runway lights will damage the nose gear tire, and second, pilots are allowed to

compensate for the cross wind and put the aircraft slightly to the

right or left of centerline. For example, if the crosswind is from your right put the aircraft slightly to the right of the centerline. Once the aircraft is lined up for the departure, take a quick look at the heading indicator and compass, making sure that the both reading are in agreement with the runway heading.

4. Set Parking Brake.

3.2.4 Take off Roll: Once take off clearance received and read back to the ATC controller:

1. Advance your aircraft throttles smoothly to approximately 70% of the take off power.
2. Allow all the engines to stabilize at 70%
    2.1. Observe engine instrumentation. Once insured that both engines are operating at their proper pace…
3. Release the brakes and advance the throttles to the D-TO (De-rated take off power approx 98%).
4. Continue with take off roll.

3.2.5 Rejected Take Off:

If the situation arises in which the rejected take off is unavoidable (ATC Directive, Obstruction on the RWY, Engine Failure) before reaching the decision speed Rejected Take Off procedure is implemented by the flight crew>

1. Retract full spoilers in order to reduce aircraft's wings lift and provide for additional deceleration
2. If you current speed is less that 60 kts apply full Thrust Reversers on all operation engines.
3. If the aircraft starts to drift return throttles back to idle and realign to the RWY.
4. Remember that automatic braking which is applied by the RTO is very sudden and abrupt.
5. When safe turn of the RWY and stop at the holding line.

3.2.6 Rotation and Initial Climb-Out Preparation:

The rotation of the aircraft and initial climb-out of the Tower Airspace, in many real world pilots' opinions, is THE most critical faze of the flight; even more dangerous and critical than approach and landing.

Sure, slow smooth landings could be harder to perform to the most of us, then climbs. But your rotation and initial climb-out will set the pace for your whole flight; this is where you and your aircraft are the most vulnerable to weather conditions and what surroundings might bring forth to you.

Consider the following:

1. No Anti-ice, except for the Pitot Heat [i]
2. Extreme Nose up attitude, resulting in limited visibility from the cockpit
3. High angle of attack and relatively slow speed
4. Extreme Induced Drag [ii]
5. Other aircraft on approach. This become the most critical when different runways are used for Departure and arrivals.

Therefore, take off and initial climb-out must be treated if not with more caution then same as approach and landing.

Rotation and climb is solely dependant on the aircraft Take Off weight and current weather conditions. Rotation speed, **Vr**, and initial climb speed, **V2+10**, must be calculated by the flight crew prior to taxi. There are many programs available that will do this for you, but in the reality pilots determine their V speeds manually from charts and then check it against the values given by the FMC computer.

For example, let say our aircraft's Projected Take off Weight [iii] is 260,000lbs. Then, looking at the chart across; I find that:

V1 = 122 kts   Vr = 126 kts   V2 = 133 kts

[i] Anti-ice will only work when considerable air speed is gained. If there is Ice or Snow accumulation during the roll, rotation or initial climb the Wing and Nacelle anti ice system will fail and the aircraft will stall and crash. Please remember this.

[ii] Induced drag – is the Drag imposed on the aircraft by anything protruding from the airframe and wings. For example, things like gear, flaps, APU intake flap, etc.

[iii] Remember that PTOW will be less than your current weight on the ramp. Reason for this is that your APU will burn some fuel, and then you will burn an average of 2,500 lbs during taxi, and so on…

The next important thing to know is what my flap retraction schedule is is going to be. To determine this I go back to the same chart at find:

15 – 5 → 142 kts 5 – 1 → 149 kts 1 – 0 → 181 kts

Once the pilot determined the V speeds for the flight now it's the time to adjust them for the current temperature. To do this, another chart is used, and its called ***767-200 Take Off Speed Adjustment***. The V speeds will have to be adjusted accordingly depending on the Pressure Altitude of the Airfield and Current Air Temperature. If, for example we are somewhere in Alps and our PA is 6,000 ft and the day is really hot, 38°c then V1 and Vr speeds will have to be increased by 2 and V2 decreased by 1. The reason for this is that once the pressure altitude increases, the Density of the air will decrease, proportionally and therefore, the ability of the wings to generate the lift will decrease as a result. To compensate for this we increase the V speeds for the current flight.

According to what is said above the V speeds will be:

V1 = 124 kts Vr = 128 kts V2 = 132 kts[i]

3.2.6 Rotation, Take Off, and Climbing Techniques:

It is very important that the proper technique is applied during the rotation.

For example, if the pilot "Over-rotates" (pulls too hard) the aircraft the aircraft might tail-strike the runway or result in aircraft rotation and angle of attack to high which in turn might cause the wings of the aircraft to stall.

If the pilot "Under-rotates" the aircraft during the take off roll this will result in a decreased climb performance, excessive ground run and ultimately high fuel burn, and excessive tire expense.

Rotate the air craft smoothly at the Vr speed in such way that nose gear detaches from the pavement at the speed right above the Vr and, most importantly, the lifts off occurs at V2. Rule of thumb is to observe the AOA during the rotation; you should be able to lift off the 767 at approximately 5-8° deck angles.

Raise your landing gear at V2+10. However, if the take off is performed from a short field, raise the gear at the moment when the positive climb rate is observed. (At least 500 feet/min)

[i] No adjustments to the V speeds are required at the sea level until 49°c, and then you add 2 kts to all V 1 and Vr and decrease V2 by 1kts.

The initial climb is generally performed in the following way:

1. Use the take off power until reaching 1500 ft ASL and maintain the V2+10 kts speed. Do not (!) exceed the 20° AOA. Retract flaps to 10°.
2. After the passing the 1500 ft mark, set the climb power. Retract flaps to 5°.
3. While accelerating to 190 kts raise the flaps to 1° and continue your climb to 3000ft at 180 kts.
4. After crossing the 3000 ft trim the nose down to maintain 1200-1500 ft/min climb. At this point the 767 will start acceleration to 250 kts. Retract flaps.
5. At this point the pilot should select the Autopilot VNAV feature, if available, or proceed with the altitude climb as per ATC or DP. At this point the Best Climb Schedule should be followed.

3.2.7 Engine Power Loss During Take Off:

1. First thing that should be done in case of the partial or full power loss during rotation or take off is *continuing the lift off.* Attempting to reject at this point will result in runway overrun and possible catastrophic aircraft destruction.
2. Ensure that the loss of power occurred due to a mechanical or any condition but the engine fire.
3. In the event of the engine fire complete engine fire checklist.
4. During the loss of power on one engine the aircraft will experience an excessive amount of yaw in the direction of the failing engine. Pilot in command must be prepared to compensate for this using yaw damper (rudders).
5. Declare the Emergency to the ATC. Tune the transponder to Squawk 7700 then Ident.
6. Trim the aircraft to fly at the minimum of V2+10 speeds until the safe altitude is reached. Normally it is a holding altitude for the field. Maintain sufficient power on the operation engine, but do not over-throttle it to prevent compressor destruction and one more engine failure.
7. After the minimum safe altitude is reached consult the ATC to reduce the altitude to build up some more airspeed.
8. Remember to fly the airplane first. Only when conditions are safe proceed with the investigation to determine the cause of the loss of the engine power. Prepare for the safe approach and landing of the aircraft.

3.2.8 Crosswind Takeoffs:

Very often your flight will have to depart from the field where the crosswind conditions exist. The wind will try to push the aircraft from its intended path and pilot in command will have to use rudder pedals to compensate for this condition.

In some occurrences, as the aircraft approaches the V1, the aircraft might experience some wing roll. To prevent engine strike during take off use small and smooth aileron inputs into the wind.

3.3 Boeing 767- 200/300ER Climb

Smooth turns and changes in altitude will provide the most comfortable conditions for you payload, your passengers. Pilots are required to use the 757 Vector (VNAV) and Lateral (LNAV) systems during climbs and departure procedures above 3000 ft. If the VNAV or LNAV are not available use Auto-Flight systems and Speed Hold along with auto-throttle.

Follow assigned DP to provide for safe flow of traffic in the terminal area and to accommodate existing noise restrictions.

Climb at 250 kts to 10,000 feet MSL then at 290 kts (0.72M) above 10,000 feet MSL; at high gross weights, transitioning from 290 kts to. 75 mach will provide for optimum fuel savings. At approximate altitude of FL200 transition to Mach speed 0.75

3.4 Boeing 767- 200/300ER Cruise

3.4.1 Climbing to Cruise Flight Level:

1. The auto-throttle must be engaged to maintain desired airspeed. It is recommended to climb at 1500-1800 ft/min until FL250
2. At Fl250 reduce climb rate to 800-1000 ft/ min
3. At the FL300 level the aircraft off. Fly level for at least 10 minutes.
4. Climb to your final cruise level at 500-800 ft/min

3.4.2 Cruise Speed

The desired cruise speed will mostly depend on the aircraft weight upon its reaching the cruise flight level. The calculation of the speed does not seem to be very complicated, however it is a normal procedure to use published determine the cruise Mach.

For example if your GW is 280,000lbs[i] then for the economy cruise of M = 0.797 you have to be at FL = 330 and your IAS = 284 kts, very simple chart.

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[i] To determine your Gross Weight, record you ZFW (zero fuel weight) before the taxi. At the time you are ready to calculate your GW look up your fuel weight and add it to the ZFW.

Flying Tigers pilots are required to cruise their 767 at no higher than FL350, and cruise M = 0.8

For the 767 PIC lucky owners, to have your cruise speed at constant check, set your "Cost Index"[i] value at 40. This will give you an optimum fuel burn and cruise speed of M = 0.797.

Flying Tigers pilots are required to use the Auto-Throttle or VNAV to maintain a proper engine power setting during the Cruise phase.

3.4.3 Additional Tasks

Typically flight crews monitor aircraft systems, fuel consumption, navigation, and radios. Often ATC requires the crew to change its routing so staying on the cockpit is imperative during the flight.

3.5 Boeing 767- 200/300ER Descend

3.5.1 Standard Descend Procedure

Clean configuration with Flight Idle power is the preferred method to descend from the cruise flight level. Flight detent or speed will only be used when "Expedite …" command is issued from the ATC or when the immediate needed to reduce aircraft speed exists. To provide for more comfort for the passengers when approaching to the desired flight level reduce the descend rate to the 500 ft/min and ensure a smooth transition.

For a straight-in landing with zero wind use the 3x1 descent ratio. This means that if your aircraft is at FL310 then start your descent about 93nm from the runway end of intended landing.

Remember to subtract the field elevation.

An empirical formula exists to calculate your T.O.D. (Top of Descend)

TOD = [(AGL/1000) * 3]

AGL = FL – FIELD ELEVATION

For example, if you are cruising at the flight level FL 310 inbound LLBG, then

1. Calculate your AGL altitude: AGL 31000 – 200 = 30800 (FL308)
2. Calculate TD: TD = (30800/1000) * 3 = 30.8 * 3 = 92.4 mi

This means if you have a nice straight in approach into Tel Aviv start your descend 92.4 miles inbound the LLBG.

[i] Cost Index - is ratio of cruise level and fuel burn. To set it on 767 PIC, go to the PERF page on the "Init Ref" page of the FMC, look at the last value on the left side of the FMC screen, then key 40 on the key pad and press LASK next to the Cost Index.

Rate of descent should be between 1500 - 2000 fpm and at flight idle power. The start down point will need to be adjusted for wind (*Dogleg Approach*) or for ATC restrictions.

To fly a Dogleg Approach subtract 2 miles for each 10 kts of head winds and add 2 miles for each 10 kts of tailwind.

For example, if there is a 25 kts headwind, 92.4 – 3 = 89.4 miles.

For safety pilots are encouraged to add additional 10 miles to their TD to leave some room for error.

Most ATC controllers will require you to cross about 30 miles from the airport at either 10,000 or 11,000 feet. Some will require 250 kts at the mileage fix also.

Keep track of how well you are doing during the descent using the same rule.

Here are some examples of TD's:

- At 25,000 feet above field - should be 75 miles out
- At 20,000 feet above filed - should be 60 miles out
- At 15,000 feet above field - should be 45 miles out

3.5.2 Standard Holding Procedure

The higher the holding altitude is the better. This will drastically affect your fuel consumption, therefore plan for it accordingly, know what are the holding points and holding altitudes for your destinations and incorporate them into your fuel plan.

Pilots are required to hold their holding speed until they are 3 minutes inbound from the holding fix. At this point start reducing to assure that the proper speed is attained *before* entering the holding pattern.

3.6 Boeing 767- 200/300ER Approach and Landing

3.6.1 ILS Approach:

If the situation permits, tune in the ILS frequency a few miles before entering the ILS transmitter range.

ILS is very precise and sensitive system of navigation aid. Its transmitters are notorious, however, for being vulnerable to the array of interferences from which may make signal corrupt. Thus, constantly cross check your ILS receivers for errors.

3.6.2 Glide Slope and VASI/PAPI

The VASI / PAPI and ILS glide slope should be used in cooperation with each other if the visibility permits. This should be done for both VFR and IFR approaches to assure a proper and smoothest approach path.

3.6.3 Use of Engine Thrust

Remember, throttles should be your primary flight control along the lateral axis of the aircraft (pitch). After the aircraft has been properly trimmed for the approach descend, there should be none or very little of elevator input once established on the ILS. Advance throttles carefully to climb, and retard to descend. If there is an elevator input needed use electric trim rather then control column to adjust a/c pitch.

Any excessive elevator input during the final approach phase might lead to the aircraft stall or excessive climb and glide slope misalignment.

3.6.4 Auto-throttle

Flying Tiger pilots are required to use auto-throttle for the airspeed control during the approach.

However, pilot in command must be prepared to override or disconnect the A/T if the need arises, or if the manual control mode is preferred by the cockpit crew.

3.6.5 Final Approach

If the current approach is not CATIII, disconnect the auto land at an altitude of 200 ft minimum and continue with visual approach.

Some airports have CatIIIC ILS approaches where landings are permitted with a zero lateral and vertical visibility.

Only at these airports and if your aircraft is equipped with the full Auto-land (767 PIC) is permitted by the Flying Tigers Group.

- For CAT I ILS : Disconnect Auto-land at 200 ft continue by hand
- For CAT II ILS : Disconnect Auto-land at 100 ft then by hand
- FOR CAT III A, B, C ILS allow for the Auto-land flare and touchdown, continue by hand.

Examples of such ILS are KJFK, LFPG, and EGLL. Confirm with the ATC or Charts which ILS category is the RWY you are intending to land on.

For heavy aircraft it is a good practice to touch down at the point about 1000 feet from the runway threshold.

The 3° glide slope results in approximately 300 feet of altitude for every mile from the end of the runway plus the aerodrome elevation.

$$ALT = (300 * DME) + Elev$$

Thus, if you are 10 miles from runway 26 threshold at RJAA, start your glide slope at approximately:

$$\text{ALT} = (300 * 10) + 141 = 3141 \text{ feet}$$

The rate of descend to the runway is determined by half of your approach speed multiplied by ten:

$$RD = (Vapr / 2) * 10,$$

Where *Vapr* – current approach speed and *RD* - Rate of Descend

For example if your current Vapr = 143 kts, then RD = (143 / 2) * 10 = 715 ft/min.

3.6.5.1 Missed approach

In the even when the missed approach is required:

1. Level off the aircraft Announce to the ATC: "JAPAN AIR 352 is going missed"
2. Retract landing gear
3. Apply GA power (~96% N1) / Flaps 15°
4. Start Climbing to holding altitude
5. Wait for further instructions from ATC

Reason for missed approach could be aircraft on the runway when you are at decision height or runway not in sight or ATC directive to go around.

3.6.7 Ground Effect

Ground effect is an aerodynamic phenomenon which occurs at the altitude half of the aircraft wingspan. For example, if the 767 wingspan equals 156 feet then your aircraft will encounter ground effect at approximately 80 feet AGL. At this point the aircraft will seem to "float" above the pavement resist to your attempt to touch it down.

At this point let the airspeed diminish and the aircraft will exit the ground effect and touch down on its own. Do not attempt to force the aircraft out of the ground effect; this may result in a nose gear touching down first and possible nose gear failure and crash.

3.6.6 Touchdown

What is the best rate of descend at touchdown? My personal answer is zero. However it is not possible but this is what any pilot should be very close to.

After passing runway threshold reduce your rate of descend slowly by applying very smooth back pressure on the control column and reducing the power to idle. You target rate should be anywhere between 30 ft/min to 400 ft/min. The rate of descend will vary dependant on weather conditions, ATC speed requirements during the approach and few other factors.

After the main gear touches down lower the nose gear to the pavement and engage speed brakes and the thrust reversers. Remember that the thrust reversers are only effective until 60-80 kts. Therefore, disconnect the reverse at or about 70 kts.

Record your Time On and Flight Fuel.

3.6.8 Taxi and Parking

Use the same procedures as described in section 3.2 of this manual.

Make sure you turn off the landing lights and strobes upon turning off the runway. Start the APU once started taxiing to the gate. Single Engine taxi is not allowed.

Turn off the taxi lights at before making a last turn towards the gate. Once marshaled into the gate set the parking brakes and shot down the engines at this time record your block time and block fuel.

Complete the PIREP.

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