

Selkirk College IATPL Program Manual

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Dual 1 – Selective Radial Scan (Frasca)

Summary

- Operation of GIST station
- Start up and operation of simulator
- Operation of:
 - Retractable gear
 - Constant speed propeller
 - Other systems
- Selective radial scan
- Operating speed and configurations

Lesson Description

The instructor will show you the basics of operating the instructor control station of the simulator. You need to know this so you can act as a mutual partner with other students.

You will then get into the simulator where you will be shown how the controls are laid out and how to use the gear, flaps, and constant speed propeller. It is imperative that you have read chapter 28 of the FTM, which discusses how to use these devices before this lesson. It is also imperative that you have used the simulation Selective Radial Scan, which not only demonstrates scan but also proper use of the constant speed propeller.

You will start the simulator and do all the checklists except runup (you will be taxiing for takeoff on runway 19 at CYXX) followed by a normal takeoff. You will climb to altitude, make turns and configuration changes, etc. All speeds and procedures used in the simulator are those for the **Beech 95**. The instructor will show you how to use the stopwatch built into the ADF as you will need that when you fly the pattern on the following pages.

By the end of the lesson you will know and be able to quote the power settings and attitudes for the most important configurations:

1. Cruise (140 to 145 KIAS)
2. Hold (120 knots)
3. IFR approach (105 knots)
4. Climb (105 knots)
5. Climb (95 knots)
6. Overshoot

You should write down the power settings you used as they won't change much from day to day. Knowing the correct power and attitude is half the battle when it comes to IFR flying.

For this exercise and all exercises in the future you must bring a pen, paper and functioning timepiece with you.

Assignment

(Point-form answers are acceptable)

1. What are the standard calls you will make after initiating the takeoff roll?
2. What is your main concern when checking for “gauges normal”?
3. In a climb, which levers should be increased first-propellers or throttles? In a descent, which should be decreased first?
4. What do your MP gauges display on the ground with your engines off?
5. What calculation do you use to determine the angle of bank for a rate 1/standard rate turn? Is there an easier way to determine this?
6. Why are there only 2 fuel gauges in the BE-95 when there are 4 fuel tanks?
7. The after takeoff checklist calls for Cowl flaps-set. What would you look at to determine whether or not to close them?
8. Why should you pause between switching fuel tanks in a twin-engine aircraft?
9. According to the Program Manual(FTM/IPM, exercise 24) changing the power by 1 inch of MP will change the airspeed by _____ (if altitude is maintained).
10. According to the Program Manual(FTM/IPM, exercise 24) changing the power by 1 inch of MP will change the vertical speed by _____ (if airspeed is maintained).
11. According to the Program Manual(FTM/IPM, exercise 24) slowing down by 10 knots will require what pitch attitude change? _____
12. What is a standard cruise mixture setting?
13. What is the SOP hold mixture setting?
14. What fuel tanks will you use for takeoff and landing?
15. Explain one situation when you would open the alternate airs.
16. What are the speeds for V_{fe} and V_{le} ?
17. What memorized checks will you do prior to landing or flying a missed approach?

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18. What are the standard calls when flying a missed approach?

19. After Aviate/Navigate/Communicate on the missed approach, which checklist will you complete?

20. In a normal climb what do you have to do with the throttles as you gain altitude?

Readings

- Program Manual - SOPs - Beech 95
- Transport Canada – FTM - chapter 24 and chapter 28
- Program Manual – FTM - Exercise 24 and 28
- Transport Canada – IPM – 2.3.1
- Program Manual - IPM - pages 2 – 10 (Selective Radial Scan)

Simulations

Selective Radial Scan (Intranet)

Precision Pattern (Frasca)

Precision Pattern Test – practice repeatedly and flown as a test on Dual 4

Use the lesson plan called CYXX07 to place the simulator near the button of runway 07 at Abbotsford Airport. Perform before-start and start checks as well as after-takeoff checklist in preparation for flight.

Departure Phase:

1. Takeoff, maintain runway heading and climb to 3,000'. Perform After-takeoff checklist during climb-out. Level at 3,000 feet and setup normal cruise. Start time.
2. After one minute, turn right to 270, while turning slow to 120 KIAS (leave rpm at 2400). Maintain heading, altitude and speed for two minutes.
3. When the two minutes have expired, begin a left turn to 090, while turning accelerate to normal cruise.
4. Maintain heading 090 for one minute.
5. Begin a climb to 6,000'. Climbing through 4,500' turn right to 240. Resume normal cruise at 6,000'.
6. Maintain heading 240 for two minutes. When time elapsed departure phase is complete.

Enroute and maneuvering Phase:

7. Maintain normal cruise. On heading 240 descend to 5,000' at cruise speed and 500 fpm while turning left to 060. After leveling off, maintain cruise on heading 060 for one minute.
8. Slow to 120 KIAS. When established at 120 KIAS perform a 45 degree bank turn to the left to 240 followed immediately by a 45 degree bank turn to the right back to 060.
9. Maintain heading 060 and 120 KIAS for one minute.
10. Maintain 120 KIAS and climb to 6,000' –“kiss – off” 6,000' and descend back to 5,000' maintaining 120 KIAS and 500 fpm.
11. Perform a 45 degree bank turn to the right to 240 followed immediately by a 45 degree bank turn to the left to heading 060.

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12. Accelerate to normal cruise speed. While accelerating turn left heading 330.
13. Fly heading 330 for one minute. When time elapsed enroute and maneuvering phase is complete.

Hold Phase (simulated parallel hold entry – inbound track 060¹)

14. Maintain 5,000 feet. Perform simulated 5Ts while turning left to heading 240. Slow to 120 knots. Establish hold fuel flow. Fly heading 240 for one minute.
15. Turn left to heading 030. Fly 030 for one minute.
16. Turn right heading 240. Fly 240 for one minute.
17. Turn right heading 060. Fly 060 for one minute. When time elapsed hold phase is complete.

Approach and missed approach phase (simulated vectors for approach - course 080).

18. Turn left heading 300. Return to cruise configuration. Maintain 5,000 feet.
19. Fly heading 300 in cruise for one minute. Set HSI course to 080.
20. Turn left heading 260, descend to 4,000' at 500 fpm.
21. Once level at 4,000' and on heading 260 slow to 120 KIAS. Complete Before Landing Checklist, holding at gear.
22. Fly Heading 260 for 30 seconds after “holding at gear”.
23. Turn right heading 350, descend and maintain 3,000' – 120 KIAS.
24. When level at 3,000' turn right heading 050. Fly 050 for 30 seconds.
25. Turn right heading 080.
26. Once on 080 extend gear and commence approach descent 105 KIAS, Flaps 60%, 500 fpm. Descend and maintain 2,500'.
27. Maintain 2,500' for 30 seconds – in approach configuration, at 105 KIAS.
28. Descend and maintain 1,500'. Fly level at 1,500' for 30 seconds.

¹ During 5Ts: at “Track” set HSI course to 060

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29. Start final descent for simulated landing – complete final checks – maintain 105 KIAS and 500 fpm.
30. At 1,000 feet call “Decision height, nothing seen, missed approach, full power, flaps, positive rate, gear up, flaps²” Execute a missed approach beginning at 1,000 feet.
31. Climb on heading 080 to 2,000’, turn right heading 201, maintain 3,000’. Complete the After Takeoff Checklist.
32. Fly heading 201 in cruise. When cruise is established test is over.

Pattern test ends – simulator will be frozen at this point.

² See note 6 on next page for expanded details of overshoot procedure.

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Items for mutual partners to watch for on the pattern

When flying the pattern there are some common errors. Mutual partners should be looking for these and debriefing pilots after practice sessions.

1. At rotation the nose should come up only 7 or 8 degrees so that the airplane accelerates rapidly reaching 89KIAS by 35' agl. The gear should be retracted at 89KIAS. Once the gear is up the pitch should rise to 12 to 13 degrees to maintain 95KIAS all the way to 500' agl.

Power should be reduced to 25² at 500' agl – no need to consult a checklist.

The after takeoff checklist should begin once above 1,000' agl.

2. When leveling from a climb power should remain at 25² until cruise speed is reached.
3. Slowing only requires reduction of manifold pressure. RPM does not require adjustment.
4. To establish approach configuration extend the gear and hold the airplane level. Once the airspeed is less than 113 extend 60% flap. PUSH forward as flaps are extended to prevent ballooning. The airspeed should never drop below 105 (a common mistake).

On the approach adjust manifold pressure as needed to maintain both 105 KIAS and 500 fpm.

5. Props should be moved to full incr. on final approach so that full throttle can be applied on the overshoot (missed approach).
6. Apply full throttle for the overshoot. Then retract flaps half way. Then retract the gear. Then retract the rest of the flaps.

Keep the nose up to about 8 degrees of pitch as flaps are retracted. A common mistake is to allow the nose to drop as flaps are retracted.

Once above 1,000 feet reset power to 25².

Accelerate to cruise speed before reducing power to cruise.

Dual 2 – Pattern Test (Frasca)

Summary

- Test Pattern

Lesson Description

The simulator will be setup for departure from runway 07 in CYXX, as per the instructions on the pattern. You will be expected to fly the pattern without any assistance from the instructor.

The instructor will **not** provide feedback while you are flying. S/he will observe the accuracy of your flying as well as your proper use of the propeller, throttle and mixture controls. The ideal tolerances are to be well within:

- 100 feet of assigned altitude
- 10 degrees of assigned headings
- 10 knots of assigned airspeeds
- 100 fpm of assigned descent rates

Meeting the above standards would result in an assessment of C (low average). Superior students who wish to get an A or B will be well within these tolerances.

Occasional minor deviations from the above will receive marginal grades such as C- or P. Frequent or gross deviations will result in an F grade and you will be required to repeat the pattern before continuing to other exercises.

General Advice

Assignment

1. What are the 5 T's?
2. How will you note the Time?

Readings

- Program Manual – FTM - Exercise 24 and 28
- Program Manual - IPM - pages 2 – 10 (Selective Radial Scan)

Simulations

- Selective Radial Scan
- Mutual practice (Frasca)

Dual 3 – VOR Navigation (Frasca)

Summary

- Limited ground procedures (quick-start)
- Copy ATIS and IFR clearance
- Comparative VOR test
- VOR tracking
- Tune – setup – identify
- GPS is unserviceable for this flight

Route

Victoria departure: V338 YVR V23 HUH V495 YYJ

Flight ends in the air

Lesson Description

You will need your Vancouver Terminal Chart and CAP2

The GPS will be unserviceable for this flight – i.e. you must do all navigation using VOR only.

You will perform a comparative test between your two VOR receivers to confirm they are serviceable.

There will be a pretty strong wind at altitude so bracketing and tracking are MAJOR objectives of this lesson.

At the beginning of the lesson the instructor will tell you the approximate wind and you will then estimate your drift and bracket from there. Near the end of the trip the instructor will change the wind and it will be your job to bracket and then tell the instructor what the wind is. This takes a lot of practice so start working on it.

On this lesson you are learning to:

1. Interpret IFR chart
2. Perform TSI
3. Bracket
4. Track and eliminate drift
5. Make simple radio calls when handed from one IFR controller to the next

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There is no approach at the end of this lesson – the simulator will be frozen in the air at the end. That way you can get maximum time on tracking and bracketing within the lesson period.

Exercise Profile

You will start on the apron in CYYJ but perform no navigation radio ground tests prior to taxiing. You will copy the ATIS and your IFR clearance (samples are provided below for your practice.) Perform an instrument check while taxiing.

Sample ATIS:

Victoria airport ATIS information Lima, weather at _____ zulu, Wind 300 / 10 visibility 6 Haze, ceiling 1200 BKN 2000 OVC temp 22 dewpoint 12, altimeter 30.24. IFR approach is ILS RWY 27, landings runway 27 and 31, departures runway 31. Inform ATC you have information Lima.

Radio call to get Departure Clearance:

Victoria Clearance Delivery Beech 95 (FXFG/GSAK) IFR _____ [airport] 6000.

Sample Departure IFR clearance: ATC clears (FXFG/GSAK) to the _____ airport via Cloake 3 Departure YVR V23 HUH V495 YYJ. Squawk 5331.

Radio call to get Taxi Clearance:

Victoria Ground (FXFG/GSAK) main apron ready to taxi with Lima.

Radio call to get Take-off Clearance:

Victoria Tower (FXFG/GSAK) ready for take-off runway 31.

Radio call to Victoria Terminal:

Victoria Terminal (FXFG/GSAK) off runway 31, 1000 climbing 3000.

To Prepare for this lesson

Practice extensively with VOR tracking and bracketing simulations

Fly the lesson in advance in the Frasca simulator.

Assignment

1. On which frequency will you contact Victoria Clearance Delivery? Victoria Ground?
2. On the first leg of the route which navaid you will Tune-Setup-Identify?
3. What steps will you take in order to complete this TSI?
4. Where, in general, will you complete your TSI's on each leg?
5. What considerations do you have when you call out the Throttle part of the 5 T's?

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6. If you are tracking inbound to a station and the CDI starts moving to the left, which direction will the heading bug need to be set to? Which side is the wind coming from?

Readings

- Tracking and Bracketing in IFR textbook

Simulations

- Bracketing
- VOR Tracking
- Frasca simulator

Dual 4 – ADF Navigation (Frasca)

Summary

- Limited ground procedures (ADF ground test)
- Published departure SID
- RMI tracking
- Fixed-Card tracking
- Introduction to AMORTS (sim frozen)
- Introduction to NDB approach (straight-in approach)
- GPS is unserviceable for this flight

Route

XX R10 WC A16 AP B20 YJ – 180 turn then – B20 AP A16 WC Straight-in NDB 07 approach to Abbotsford.

Note: RMI to YJ then fixed card returning to CYXX.

Note: The GPS will be unserviceable for this flight.

Lesson Description

1. ADF ground test – using XX and LU beacons
2. Abbotsford SID departure – runway 19
3. RMI tracking
4. Fixed Card ADF tracking
5. AMORTS briefing (sim frozen)
6. Straight-in NDB 07 approach (fixed card)

Fly this trip NUMEROUS times before the lesson. ADF fixed-card tracking in particular requires a lot of practice. You should come to this lesson with no doubts in your mind about how to tune and setup (TSI) the radios at every stage of the trip.

There will be no “tricks” on this lesson. It will unfold exactly as described below so there is no excuse for not being prepared. For this exercise and all IFR exercises in the future, bring the appropriate publications with you.

Exercise Profile

You will start on the apron in CYXX and perform an ADF ground test prior to taxiing. To do that you will TSI the LU beacon and confirm the indicated bearing is correct, then TSI the XX beacon and confirm the indicated bearing is correct. PRIOR to the lesson, examine your terminal chart and the CFS entry for CYXX and know the bearings to these beacons. Have these bearings written in a handy spot PRIOR to engine start.

You will copy the ATIS and your IFR clearance (a sample ATIS is provided below for your practice.)

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It is only a short taxi distance to runway 19. Perform an instrument check while taxiing. You should be ready to takeoff as soon as you reach the runway threshold – this means that you will have reviewed and briefed the departure in your mind PRIOR to the lesson and have completed the TSI on the radios prior to taxiing.

Sample ATIS:

Abbotsford airport ATIS information Kilo, weather at _____ zulu, wind 120 / 10 visibility 6 Haze, ceiling 1000 OVC temp 15 dewpoint 12, altimeter 30.18. IFR approach is NDB RWY 07, landings runway 07 expect Abbotsford 7 departure, departure runway 19. Inform ATC you have information Kilo.

Radio call to get Departure Clearance:

Abbotsford Ground, Beech 95 (FXFG/GSAK) IFR Abbotsford 4000.

Departure IFR clearance: ATC clears (FXFG/GSAK) to the Abbotsford airport via Abbotsford 7 departure direct XX, R10 WC A16 AP B20 YJ, 180 left turn, B20 AP A16 WC. Squawk 5432.

Radio call to get Taxi Clearance:

Abbotsford Ground, (FXFG/GSAK) main apron, ready to taxi, with Kilo.

Radio call to get Take-off Clearance:

Abbotsford Tower (FXFG/GSAK) ready for take-off runway 19.

Radio call to Victoria Terminal:

Victoria Terminal (FXFG/GSAK) off runway 19, 1500 climbing 3000.

General Advice and Tips

Remember to bracket when tracking.

Read the ADF very precisely – take note of even a 1-degree tracking error.

Don't chase the needle – bracket. To do this requires keeping track of what headings you have flown and which way the airplane drifted. Practice this skill using the computer simulations.

The simulator will be frozen once you receive the approach clearance so that you can give your AMORTS briefing. The briefing is written out below as a guide and you must be prepared to do it by memory.

The sample AMORTS below refers to “standard speeds”. That means slowing to 120 KIAS prior to WC and then slowing to 105 KIAS with gear down and approach flaps after passing WC (which is the IF). There is no great rush to slow to 105, but you must be stable at 105 with the airplane in approach configuration by the time you get to the FAF (XX beacon).

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WAT-AMORTS

Weather – “Weather is 1,000 and 6, well above minima.”

Approach – “Anticipating the straight-in NDB RWY 07 approach.”

Temperature – “Cold temperature corrections not required.”

Approach -

“Straight in NDB runway 07 Abbotsford,
effective twenty ninth of July one zero,
touchdown zone elevation runway 07 one seven five.”

Minima -

“ I’ll start the descent when cleared for the approach, MEA A16 3,000,
at the white rock NDB track 067 descend 1400,
after the Abbotsford NDB track 068 minimum descent altitude 860,
685 above ground, I have no altimeter bug.”

Overshoot -

“Missed approach point (calculate and state time) past the Abbotsford NDB
The missed approach procedure is _____ (read it out).”

Radios -

“Abbotsford NDB 344”

Timing -

“Timing is (state time as calculated above)”

Speeds and special considerations-

“No cautionary notes.”

Tips for the approach

As soon as you are cleared for the approach you can descend to MEA on A16, i.e. 3,000’.

It takes about 4 to 5 minutes to fly from WC to XX so there is plenty of time to descend from 3,000’ to 1,400’ – as long as you remember to do it. Make sure you do your 5Ts as you pass WC and XX.

At WC you will report (5th T) “WC beacon inbound.” ATC will likely hand you over to CYXX tower.

At XX you will report (5th T) “XX beacon inbound.” Tower will give you a final wind check and probably clear you to land.

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Don't forget to make your 100 above and minimums calls. Don't forget to say "landing" before descending below MDA – once you have the runway in sight.

On occasion pilots have done a poor job of ADF tracking and not acquired the necessary visual reference on the approach – make sure you do the missed approach if your time runs out.

Assignment

1. Who will you contact and on what frequency to get your IFR Departure Clearance?
2. What 3 performance assumptions is the SID based on?
3. If you have a strong crosswind at altitude, how will you avoid homing when flying inbound to AP?
4. How will you determine the halfway point between WC and AP?
5. What items are included in the TSI setup?
6. When you complete a 180° left turn after YJ, what (roughly) will be your bearing to the station?
7. True/False: Being cleared for an approach automatically clears you to the successive minimum safe IFR altitudes published for the approach.
8. If you don't receive a call from the controlling agency with a clearance to descend or start the approach as you come close to your planned top-of-descent point what should you do?
9. Why must you continuously monitor the NDB ident throughout the approach but there is no need to monitor the VOR ident during a VOR approach?
10. What will you use as the time from XX to the MAP on the approach? Would this time change with a strong wind?

Readings

- Review previous readings
- Others as assigned in class.

Simulations

- Tracking ADF
- Bracketing (press "R" for RMI – also practice "F" for fixed card)
- Fly the profile in the Frasca simulator numerous times with a mutual partner.

Dual 5 –DME arc approach (Frasca)

Summary

- Quick start
- Complex IFR departure procedure
- VOR navigation
- VOR approach CZBB via DME arc
- AMORTS (sim frozen)
- GPS is unserviceable for this flight

Route

Depart Nanaimo runway 16.

Nanaimo One Dep – FAXTO transition V23 YVR V338 XIGOS VOR RWY 07 approach.

Missed approach and then try arc approach a second time. Controller will vector airplane to intercept the arc for second approach (so intercept could happen at any angle, not necessarily 90°)

Lesson Description

Depart Nanaimo runway 16 (SPEC VIS)

Fly FAXTO transition to YVR then R173 to intercept arc at XIGOS

Expect a missed approach. The controller will then vector you to intercept the arc for a second try.

Exercise Profile

Sample CYCD Metar:

15010G15KT 6SM OVC020 15/12 A2970 RMK SLP052

Radio call to get Departure Clearance:

Nanaimo radio Beech 95 (FXFG/GSAK) (wait for reply)

(FXFG/GSAK) request advisory and IFR clearance Boundary Bay 3000

Radio call to get Taxi Clearance:

Nanaimo Radio, (FXFG/GSAK) main apron, ready to taxi.

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Aerodrome Advisory:

Active RWY 16, wind 150 at 10 knots, altimeter 29.70.

Radio calls after advisory:

Nanaimo Radio, (FXFG/GSAK), taxiing RWY 16.

Nanaimo Radio, (FXFG/GSAK), taxiing to position RWY 16.

Nanaimo Radio, (FXFG/GSAK) rolling RWY 16

Nanaimo radio, (FXFG/GSAK) clear of the MF switching terminal.

Radio call to Terminal:

Victoria Terminal, (FXFG/GSAK) off runway 16 Nanaimo level 2,000.

Sample CZBB ATIS:

Boundary Bay ATIS information Charlie. Weather at _____zulu. Wind 040 at 5 knots visibility 3SM –RA, 300 FEW ceiling 500 BKN, altimeter 29.71. IFR approach is VOR RWY 07, landings and departures RWY 07. Note-Boundary Bay Outer Tower on 127.6 is not in use. Contact Inner Tower on 118.1. Inform ATC on initial contact you have received ATIS information Charlie.

Initial radio call to Tower:

Boundary Bay Tower, (FXFG/GSAK) 3,000' 5 miles west of YVR, cleared for the VOR RWY 07 approach, with Charlie.

Assignment

1. Who will you contact and on what frequency to get your Departure IFR Clearance?
2. What are the visibility requirements for the BE-95 on a "SPEC VIS" departure?
3. To what altitude must we remain visual over the airport until? Would this be possible given the sample metar?
4. How do you intend to ensure that you "climb visually" over the airport to that altitude?
5. What are the dimensions of the CYCD control zone?
6. When will you contact Nanaimo radio to advise being clear of the control zone?
7. According to the VOR RWY 07 approach plate if you are cleared inbound on V338 for the DME arc what, theoretically, is the lowest altitude you can initially descend to? According to the Terminal Area Chart?
8. Which nav aids will you identify prior to flying the arc on approach?

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9. What distance from the DME arc will you start the intercept turn if slowed to the initial approach speed and configuration? What heading will you initially turn to?
10. Will this distance be the same if you do not approach the arc at 90°?
11. Approximately how long will it take to fly the whole arc?

Readings

- DME arc section of IFR text
- AMORTs section of IFR text

Simulations

- Flying a DME arc (Intranet)
- Practice the profile in the Frasca with a mutual partner

Dual 6a – PDTs (CBT)

- Inbound and outbound PDT with HSI and RMI
- Inbound and outbound PDT with Standard VOR indicator
- Inbound and outbound PDT with RMI only
- Inbound and outbound PDT with fixed card

This is a computer based test of your ability to perform PDTs.

An instructor will observe you performing PDTs using the computer simulation. You will be required to demonstrate 100% proficiency using all the above panel configurations.

Practice, practice practice.

Assignment

1. What would you set your HSI to if instructed to track outbound on the 324° radial?
2. What is the learned phrase used to orient yourself to an inbound PDT? An outbound one?
3. Which “head” and “tail” do these phrases refer to?
4. Do PDT's take wind drift into account?

Dual 6b – PDTs (Frasca)

Summary

- KLN90 ground tests
- IFR departure from CYXX
- Series of PDTs
 - RMI works at beginning of flight
 - Switch to fixed card ADF late in lesson
- Intro to KLN90b GPS in PDTs
- Flight ends in the air

Route.

There is no actual route for this flight. You will depart from CYXX on a SID and then do a series of PDTs using GPS, VOR and ADF

Lesson Description

Prior to meeting with your instructor at the scheduled start time of your lesson complete the before and after-start checklists, the taxi checks, and the ADF ground tests. The instructor may ask you how the ground tests went but will not review the steps with you.

Build a GPS flight plan as FLP11 going from:

- CYXX
- XX
- WC
- AP
- YVR
- YYJ

Expect a series of PDTs with a mixture of ADF, VOR and GPS waypoint PDTs. Use the GPS as much as possible.

Late in the lesson the GPS will likely fail and the ADF will turn into a fixed card so be ready for that.

In order to get as many PDTs in as possible the lesson will end in the air (i.e. no approach)

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Exercise Profile

You will copy the ATIS and your IFR clearance (a sample ATIS is provided below for your practice.)

Sample ATIS:

Abbotsford airport ATIS information Papa, weather at _____ zulu, wind 120 / 10 visibility 3 FU ceiling 800 OVC temp 27 dewpoint 20, altimeter 29.95. IFR approach is ILS RWY 07, landings and departures RWY 07. Inform ATC you have information Papa.

Radio call to get Departure Clearance:

Abbotsford ground, Beech 95 (FXFG/GSAK) IFR Abbotsford 5000.

Radio call to get Taxi Clearance:

Abbotsford Ground, (FXFG/GSAK) main apron ready to taxi, with Papa.

Assignment

1. What does “cleared present position direct” to a fix mean? Is this a PDT?
2. How would you navigate “present position direct” to a navigation aid?
3. How would you navigate “present position direct” to a GPS waypoint?
4. What is the quickest way to retrieve a waypoint from your current KLN 90 flight plan?
5. How do you determine the bearing to a station for a GPS PDT?
6. How do you determine the bearing to a station for a VOR PDT when your RMI is only a fixed card?
7. What is the difference between OBS mode and LEG mode on the GPS?
8. Once you’ve turned to your intercept heading on a PDT, how will you determine when to start your turn towards the desired track?

Readings

- Using the KLN90B GPS in your IPM
- GPS Assignment #1 sections –Perform a Ground Test Procedure
–Create a flight plan

Dual 7 – Operation of Turbo-Prop Aircraft 1 (Alsim)

Summary

- SOP's
- Proper utilization of checklist
- Altitude alerter
- FD setup and usage
- Power settings and configurations
- Normal takeoff
- Climb to altitude
- Descent
- Visual landing
- GPS is U/S

Route

Calgary (CYYC) local flight.

You will taxi out and takeoff then climb eastward away from Calgary up to FL200. If your first takeoff is not performed correctly the simulator will be reset on the runway so that you can try again. As you descend you will complete all the necessary descent checklists.

Lesson Description

The exercise serves as an introduction to the handling characteristics of the Alsim and crew coordination. Preparation of the flight deck will be completed by the instructor prior to your arrival in the sim. You will be expected to complete a departure briefing and perform all checks and SOP calls for the climb to FL200 and descent back down for landing.

Exercise Profile

PNF will copy ATIS, and call for IFR clearance.

Set up the FD for takeoff.

Complete departure briefing and before takeoff checklist to the line.

PNF will call tower ready for takeoff.

Complete the before takeoff checklist.

A few takeoffs to obtain proficiency.

Step climb to altitude completing necessary checklists.

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Complete a briefing for the visual approach.

Complete checklists associated with descent.

Visual landing.

Taxi clear of runway and complete the after landing checks.

General Advice

Although this lesson is an introduction to the Alsim you are expected to come prepared. This means knowing all your speeds, flows, checklists, checks, and SOPs. The best way to get on top of the SOPs is to practice in front of the static trainer with a partner. Practice all calls and checklists in the order they will occur on the flight. Be sure to practice as PF and PNF. If you can't perform the SOP calls flawlessly without hesitation in front of the static trainer you surely won't be able to do it in the sim. Your instructor will ask you to perform the SOP calls with your partner prior to entering the sim. If it is clear that you haven't prepared to the level that is expected an F will be assigned.

When practicing your SOPs, make sure you use correct terminology at all times. Inventing your own version of the calls is unacceptable. This may seem picky, but you will be expected to learn and perform company specific SOPs verbatim for the rest of your career as a pilot. These SOPs are developed and implemented to ensure there are no miscommunications between crew members, and the aircraft is handled in the safest possible way. Even minor deviations from the SOPs are unacceptable. If you learn them correctly the first time it will make your life much easier.

Assignment

1. According to the SOPs how will you set the flight director for takeoff?
2. What "line" is referred to in the SOP call "Before Takeoff Checklist to the Line"?
3. When will the PF remove his/her "hovering" hand and place it on the yoke?
4. What are the PF and PNF standard calls prior to entering an active runway?
5. According to the Alsim AFM what is the initial climb speed?
6. When can you first engage the autopilot on departure? Are there any associated standard calls?
7. What are the standard calls you make when you climb through 18,000'? On the descent, when would the PNF initiate this call?
8. According to the AFM what are the power settings for takeoff, climb and cruise?

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9. Are the cruise checks completed as challenge and response or silently by the PNF?
10. What will the cabin controller be set to on descent?
11. What is the rule of thumb for planning a descent (see SOP 2.5.23 or Navigation for Professional Pilots)?
12. What are the PNF and PF SOP calls at 1,000 and 100 feet below the desired altitude?

Readings

- Program Manual - SOPs - Two Crew – Alsim (no emergencies, start procedure, or instrument approach procedures)
- Alsim AFM – Airspeed limitations, power settings.

Simulations

Static trainer practice

Alsim computer based trainer – flight director operation (Intranet)

Normal takeoff video – intranet

Dual 8 – Operation of Turbo-Prop Aircraft 2 (Alsim)

Summary

- Power settings and configurations
- Captain and First Officer before start flows
- Normal takeoff
- Climb to altitude
- Vectored straight in VOR approach
- Missed approach procedure
- AMORTS (sim frozen)
- GPS U/S

Route

The route is exactly the same as on Dual 7 except this time the weather is IFR. You will be given vectors for the straight in VOR RWY 25 approach to return to the airport. In the real world sometimes the weather is “below minimums,” that will be the situation on this flight. At the end of the IFR approach you will not see the runway – therefore you will execute the missed approach procedure.

Lesson Description

This lesson builds on the SOP framework from the last dual. You will be responsible for completing all flows, including the Before Start flows, from this point onwards. The main objective is to further familiarize with the handling characteristics of the Alsim, and perform the SOP approach and missed approach procedure. You won't climb quite as high but the instructor may have you do some climbs and descents for practice. Getting set up for the approach requires familiarity with all the functions of the ALSIM avionics. An AMORTS briefing will be required prior to initiating the approach.

Exercise Profile

Complete all flows and checklists.

Copy ATIS and clearance.

Set up the avionics for the flight.

Set up the FD for takeoff.

SID departure.

Level off and complete the cruise checks.

Complete AMORTS.

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Follow approach – this time weather is below minimums so you will have to follow the missed approach procedure.

General Advice

Spend time in front of the static trainer perfecting your SOP calls. Added to the list of required calls and procedures are missed approach and non-precision instrument approach.

You should be able to figure out your safe altitude at every stage of the descent.

Assignment

1. In the Captain's flow, what are you checking for when you press the "test" button?
2. Which inverter will the Captain select for the flight?
3. Who is responsible to silently complete the Before Start Checks and when will he/she verbally call them complete?
4. What will you set the (pressurization) cabin controller to prior to this departure?
5. What will your red altimeter bugs be set to prior to this departure?
6. When will you set up the flight director for departure ?
7. Who will you contact to receive your departure clearance?
8. What information will you provide on that initial radio call?
9. What is the holding configuration and speed in the B210?
10. What information should you provide on initial contact to Calgary Departure?
11. What should be the PNF's response if instructed to "squawk ident" by Calgary Departure?
12. How far back from the airport would you need to start a descent if you planned a standard 3° glideslope?
13. What is the rule of thumb for initiating your rollout to wings level at the end of a turn?
14. What is the meaning of a radio call from Calgary Arrival saying "Selkirk 108 descend when ready"?

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15. When will the PNF's hand be placed on the prop levers for landing?

16. According to the SOPs what are the required calls as you approach MDA on a non-precision instrument approach?

17. What are the SOP calls and procedure for a missed approach?

18. When are the propeller levers moved full forward on a successful approach?

- Program Manual - SOPs - Two Crew – Alsim (no emergencies, or start procedure)
- Alsim AFM – Airspeed limitations, power settings.

Simulations

Static trainer practice

Normal takeoff video – Intranet

Missed approach video – Intranet

Dual 9 – VOR approach (ALSIM)

Summary

- Quick start
- SID departure from Calgary
- Series of VOR and ADF PDTs
- Basic full-procedure VOR-approach
- GPS unserviceable for this flight
- Real-time AMORTS

Route

Depart from Calgary international via SID then reposition as needed to do PDTs in southern Alberta.

At the end you will be cleared for a full procedure VOR RWY 23 approach at Lethbridge. You could be arriving from any quadrant so be prepared to do any type of procedure turn.

Lesson Description

This lesson is the first of a series of lessons that introduce full procedure approaches.

These lessons also review PDTs and tracking which you should have fully mastered by now – although this is your first chance to do them in a crew environment.

The focus is on the following elements:

- SOP's
- Correct and efficient TSI
- AMORTS
- Basic approach procedures – procedure turn.

The simulator will be repositioned often, creating an environment which requires a new radio setup to be completed for each PDT. You must learn to complete your TSI and AMORTS correctly and in a timely manner.

To Prepare for this Lesson

Practice PDTs using the ALSIM simulation.

Practice VOR approaches using the IFR approaches simulation and ALSIM Simulation

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Practice the approaches in the Frasca

Practice all your two crew SOP calls with a partner in front of the static trainer.

General Advice

This lesson requires a high degree of proficiency with all of your two crew SOPs, PDT's, procedure turns, and AMORTS. Practice in the Frasca, with the computer based training aids, and in front of the static trainer until you can effectively perform in a timely fashion. All the things you work on at this point will be built on in subsequent lessons. From now on all AMORTS will be completed in real-time. As you progress through the syllabus you will find things start happening more quickly. Absolute mastery of all your skills and procedures is vital.

Assignment

- 1..What would you do if on the Calgary 2 Departure off of runway 16 you were vectored to turn right at 4,200'?
2. If the metar indicated a ceiling of 3,000' AGL and a temperature of +3° on the day of your flight, what altitude would you anticipate turning on engine anti-ice?
3. What items are included in the PF's TSI? The PNF's?
- 4..Approximately where would you be located prior to your approach clearance if you decided to complete a standard procedure turn? An S-turn? A modified racetrack turn?
5. What will the PNF verbalize after station passage over YQL?
- 6.Within how many NM is it safe to do the procedure turn on the approach?
- 7.What information will you use to determine how long to fly outbound for on the initial segment of the approach?
- 8.If the weather is at minimums where do you anticipate breaking out of cloud on approach? Where is the runway located relative to this position?
9. What are the mandatory radio calls for approach into an uncontrolled aerodrome such as Lethbridge?

Readings

- Program Manual - SOPs - Two Crew
- Others as assigned in class.

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Simulations

- Intercepting a course simulation
- Alsim simulator (Intranet)
- Static trainer
- IFR Approaches simulation – VOR approaches
- Videos – non-precision approach and missed approach

Dual 10 – NDB approach (Alsim)

Summary

- Quick start
- SID departure
- Series of VOR and ADF PDT's
- Basic full procedure NDB approach
- Missed approach procedures
- GPS unserviceable for this flight

Route

Depart from Calgary international via SID then reposition as needed to do PDTs in southern Alberta and Saskatchewan.

At the end you will be cleared for a full procedure NDB RWY 15 approach at Saskatoon.

You could be arriving from any quadrant so be prepared to do any type of procedure turn.

Lesson Description

It begins with a few PDTs.

After the PDTs you will be cleared to ZSS beacon for the full procedure NDB RWY 15 approach to Saskatoon.

The approach will initially result in a missed approach (i.e. weather is marginal) so be prepared.

You will fly the missed approach and then do the approach a second time. The weather MAY become good enough to land on the second approach

To Prepare for this Lesson

Practice PDTs using the Alsim simulation

Practice NDB approaches using the IFR approaches simulation and Alsim simulation

Fly profile in the Frasca until you are comfortable with the procedures.

Practice all your two crew SOP calls with a partner in front of the static trainer.

Practice your AMORTS for the approach to be flown.

Watch the videos for – non-precision approach and missed approach.

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General Advice

This lesson requires a high degree of proficiency with all of your two crew SOPs, PDT's, standard procedure turns, and AMORTS. Practice in the Frasca, with the computer based training aids, and in front of the static trainer until you can effectively perform in a timely fashion. As you progress through the syllabus you will find things start happening more quickly. Absolute mastery of all your skills and procedures is vital.

Assignment

1. During the missed approach if no particular turn direction is required what considerations do you have in deciding to turn left or right?
2. What constant descent point will you plan to utilize on this approach once established inbound?
3. Considering your GPS is unserviceable on this flight, how will you determine when you are within the 25nm safe sector from the Yellowhead NDB?

Readings

- Program Manual - SOPs - Two Crew
- Others as assigned in class.

Simulations

- Alsim simulator (Intranet)
- Static trainer
- Intercepting a course simulation
- IFR Approaches simulation – NDB approaches
- Videos – non-precision approach and missed approach

Dual 11 – GPS Navigation (Alsim)

Summary

- Limited ground procedures (quick-start)
- Setup and use of Garmin 430 GPS for navigation and approach
- Drift correction enroute
- RNAV SID
- RNAV approach

Route

Depart from Springbank to Medicine Hat

BACHO SID V305 YXH – expect RNAV RWY 03 approach

Lesson Description

Springbank to Medicine Hat for RNAV 03 approach.

The entire flight is done using GPS navigation. The flight starts with an RNAV departure and ends with an RNAV approach.

To Prepare for this Lesson

Review radio calls from Avia 161 class notes

Learn to use the Garmin 430 GPS. You need to know how to complete the ground checks, setup a flight plan and add a SID and Approach to it. Then you need to know how to activate the approach.

Waypoints needed for the route are:

- CYBW
- YYC
- YXH
- CYXH

The above simple flight plan is all you need to get started. To this you then add the appropriate SID for the active runway (get ATIS to know what that is) and you add the approach for Medicine Hat.

You can practice all the above processes using the GNS430 simulation. Be sure to do so repeatedly until you can perform all the necessary steps. We DO NOT want you learning

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how to use the GPS in the ALSIM – you should learn it on the computer before coming to the ALSIM.

Review the approach plate thoroughly and ask any questions you have well before the lesson so that you can digest the information. We will go over the descent profile in class prior to this lesson.

Assignment

1. Do you meet all of the requirements to fly the departure (think visibility, climb rate, CDI sensitivity, Notams)?
2. How would you determine your climb rate with your whiz wheel?
3. What should your track bars be set to prior to takeoff?
4. How can the PNF confirm waypoints on the GPS for departure?
5. Will the GPS be set to OBS or LEG mode on departure?
6. What will the PNF do and say at 4,340' after takeoff?
7. How should you respond if the controlling agency instructs you to “contact Edmonton Centre 124.525”?
8. How do you use the “nearest” function on the Garmin 430?
9. What will the altimeter bugs be set to during the AMORTS?
10. At some point you will need to leave V305 and proceed direct to the VEVSA waypoint to begin the approach. How will you coordinate this with ATC, and when?
11. How will you know when you are within 25 nm of LODLO?
12. When should you contact Medicine Hat radio and give your estimated time of landing?
13. How should you be configured and at what airspeed prior to the IWP?
14. What considerations do both pilots have when the PNF calls the “Throttle” part of the 5 T's?
15. At two miles from the FAWP you must confirm the GPS has “cycled”. What are you looking for specifically?

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16. What is the SOP standard call by the PNF when the DH light illuminates?
17. When will you slow to $V_{ref} + 20$ KIAS?
18. What will the PNF set in the altitude alerter after the FAWP?
19. What are the checklist items that only pertain to RNAV approaches?
20. On the final segment of the approach, will a standard 3° descent work to get you to your MDA prior to the MAWP?

Readings

- Review previous readings
- Others as assigned in class.

Simulations

Garmin 400 simulation
Static Trainer
Bracketing
ALSIM simulation – use to practice tracking and bracketing

Dual 12a – Holds (CBT)

- Hold entries with all visual aids active
- Hold entries with HSI
- Hold entries with Standard VOR indicator
- Hold entries with RMI
- Hold entries with Fixed Card ADF
- Estimating drift and timing in hold

This is a computer based test of your ability to perform Holds

All visual aids on the simulation must be turned off during the test.

Using the “Do Another” button the instructor will have you do a rapid series of hold entries and you are expected to perfectly specify the type of entry required and describe the turns involved. You will do this in all the panel configurations specified above.

You will then do a series of Holds in which you will be given one minute to estimate inbound and outbound drift and time for the hold given the wind generated by the program. If your estimate does not match the instructors s/he will ask you to justify your estimate.

Dual 12b – Holds (Frasca)

Summary

- Hold entries
- Use of KLN90b GPS in hold entries

Route

Lower mainland

Lesson Description

You will depart from Victoria on a SID. Once airborne the instructor will clear you for a series of PDTs followed by a hold. You will intercept the assigned track and then specify the type of hold entry required and the turns that will be needed.

The instructor will then reset your position and repeat the exercise.

If you progress flawlessly you may move on to wind drift corrections – which is normally the main thrust of the next lesson.

Note that anything more than a few minor errors in your hold entry determinations means that you have not prepared adequately for this lesson using the computer simulations and will result in an F.

It is imperative that you maintain your instrument scan and fly accurately while determining the hold entries. This has sometimes been a problem for some students who have practiced exclusively using the computer simulations and not logged enough hours in the Frascas.

Assignment

1. What speed and configuration should you be at prior to entering the hold?
2. What is wrong with the following hold clearance:
“GSAK cleared present position direct to the YJ NDB to hold southwest, inbound track 163°, maintain 8,000”
3. True/False: Hold entries are determined based on the aircraft’s track to the station.
4. When doing an offset entry you are required to track outbound 30° (or less) from the station. How will you accomplish this if doing a VOR or NDB hold? What about over a GPS waypoint?

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Readings

- KLN-90b Pilots Guide
- AIM - RAC 10
- IFR for Professional Pilots - holds

Simulations

- Holds

Dual 13 – Holds (Frasca)

Summary

- Hold patterns – wind correction

Route

Lower mainland.

Lesson Description

You will depart Vancouver on a SID. The format of this lesson is very similar to Dual 12 but this time there will be a strong wind and you will be expected to adjust for wind in the hold.

If you have been practicing you should be very accomplished at estimating drift and timing corrections already. Your instructor will challenge you toward the end of this lesson with an “unknown wind.” You should be able to adjust for this and then provide a reasonably accurate estimate of what the wind is.

Assignment

1. What is the magic number for the BE-95 in a hold?
2. When evaluating your Expect Further Clearance or Expect Approach Clearance time what things will you consider?
3. True/False: In a hold you will always restart the time going outbound when the station is 90° off your wingtip.
4. For the BE-95 if using the GPS in a hold, what should your cross-track be with no wind when you turn inbound?
5. What is the rule of thumb for timing errors in a hold?
6. When you shorten the distance you fly in a hold, will you need to increase or decrease your crab angle?

Readings

- As on Dual 12

Simulations

- Holds

Dual 14 – ILS (Alsim)

Summary

- Series of ILS approaches

Route

Vancouver international

Lesson Description

You will takeoff from CYVR for a series of ILS approaches. Any of Vancouver's ILS could be used so review all the approach plates – note that some of them have rather complex missed approach procedures.\

The lesson will involve as many ILSs as we can fit into the allotted time. All the approaches will be hand flown – i.e. no autopilot.

The first one or two approaches will be flown with the flight director. For subsequent approaches the flight director will be failed and you will fly the approaches on raw data only.

Flying an ILS, especially in the last few hundred feet agl, is one of the most challenging procedures in IFR flying. This lesson is an opportunity for you to bear down and practice that skill to perfection.

Assignment

1. When will you put the gear down on the ILS approach?
2. When will you put the flaps down fully on the ILS approach?
3. If you continue on the ILS right to landing where on the runway will you touchdown?
4. What considerations do you have if you are cleared for a new approach after your AMORTS and approach TSI have already been completed for the old one?

Readings

- IFR for Professional Pilots - ILS

Simulations

- Practice in Frasca

Dual 15 – LOFT – 2nd year Captain (Alsim)

Note: this lesson can be booked anytime after you complete Dual 11

Summary

- LOFT trip
- Emergencies

Route

The Captain will be a second year student. The captain will flight plan a route and you will meet up with him/her just before the flight for a route, weather and NOTAM briefing.

Lesson Description

You are a new first officer with the company. You will fly the route assigned for the day. Various complications and emergencies will arise. You and your captain will have to think your way carefully through the scenario.

Both you and the Captain know the company SOPs – so be sure to use them

Follow the Captains instructions but offer suggestions as appropriate. Try to be the best first officer you can be.