OPERATION TRUE NORTH

Pilot Briefing

Sceneries, Aircraft, & Routes:

Suggested Sceneries:

Freeware CFB Moose Jaw: https://flightsim.to/file/82098/cymj-cfb-moose-jaw-airport
Freeware CFB Cold Lake: https://flightsim.to/file/49377/cfb-cold-lake

Suggested Aircraft:

Freeware F/A-18E "Super Warrior": Upgraded version of the F-18 super hornet over the base MSFS version including features like Air-Air radar, ILS, external fuel tanks, improved flight model. https://msfs.touching.cloud/mods/f-a-18e-super-warrior-mod/ The project is unfortunately on hold and there is a bug that makes one of the screens not work but there is a fix available here: https://flightsim.to/file/47760/touchingcloud-s-f-a-18e-super-warrior-screen-bug-fix)

Payware Blackbird T-6: Fly the CT-156 Harvard II that is flown by student pilots in Moose Jaw. https://blackbirdsims.com/flight/PG.php?id=78

Payware Just Flight Hawk: While recently retired from the training fleet, the CT-155 Hawk was flown in both Moose Jaw and Cold Lake as a Fighter Lead-In Trainer (FLIT). https://www.justflight.com/product/hawk-t1a-advanced-trainer-microsoft-flight-simulator

Freeware INIBuilds A310: Fly the CC-150 Polaris, the RCAF's strategic transport/tanker aircraft. Available in MSFS directly.

Freeware Various A330: Fly the RCAF's newest strategic transport and soon to be MRTT, known as the CC-330 Husky. Available by many different freeware and payware developers.

Freeware Delta Simulations C-17: Fly the RCAF's heavy lift tactical/strategic transport. https://flightsim.to/file/12408/msfs-native-c-17-globemaster

Freeware Default Microsoft DHC-6 Twin Otter: Transport and support for the RCAF's northern operations.

Suggested Routes:

- CF-18/CT-155/CT-156 Long Range Trainer from CYOD-CYMJ:
  CYOD UOD YMJ CYMJ

- Local Approaches in Moose Jaw/Cold Lake

- Upper air work in the Moose Jaw/Cold Lake MTCA

- Looking for something shorter if you're flying a general aviation aircraft? Consider flying to Moose Jaw from Regina or to Cold Lake from one of Edmonton's airports.

Reminder of VATSIM COC:

Although military aircraft are welcome and encouraged at this event, this is **not** a military operations or vSOA event. There will be absolutely no dogfighting, supersonic flight in controlled airspace, air-to-air refuelling, low-level tactical flying, or anything else that conflicts with the VATSIM Code of Conduct or Special Operations policies. This is not negotiable. Controllers will be closely monitoring pilot behaviour, and pilots who ignore these instructions or push boundaries should expect contact from a Supervisor.

The intent of this event is to let pilots fly military aircraft in a realistic, everyday operational context. That means normal VFR or IFR flying, circuits (including radar/IFR circuits), and point-to-point flights between the featured aerodromes. You are encouraged to explore military aircraft and airports, but the aircraft must be flown in a reasonable, predictable manner. If a manoeuvre would be unacceptable for an airliner in the same airspace and phase of flight, it is not acceptable here unless you are part of an approved vSOA operation with explicit approval from the controller.

Speed control will be enforced, particularly for fighters and high-performance aircraft. Do not expect to exceed standard speed restrictions in the control zone or below 10,000 feet. If you cannot comfortably manage your aircraft within those limits, choose something more appropriate or practice beforehand.

We are not trying to work around vSOA or special operations policies. The goal is simply to give everyday pilots a chance to operate in a military environment while still flying their aircraft in a normal, policy-compliant way.

VATSIM Code of Conduct:

https://vatsim.net/docs/policy/code-of-conduct/

VATSIM Special Operations Policy:

https://vatsim.net/docs/policy/special-operations

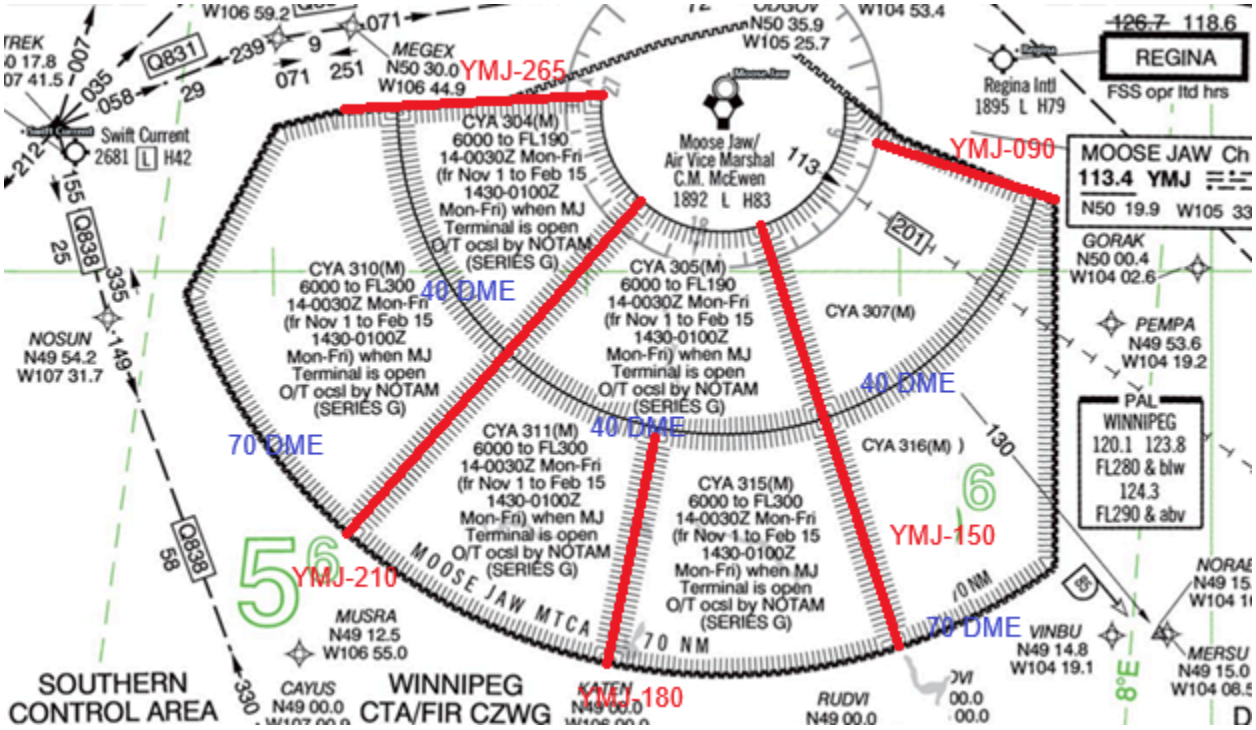
Airspace & Airfield Overview:

15 Wing Moose Jaw is located 4 NM south of the city of Moose Jaw, Saskatchewan. From its beginning it has always been home to RCAF pilot training, its location in the middle of the flat Canadian prairies made it ideal for pilot training. The airbase has three runways: parallel 11L/29R and 11R/29L which are used most frequently, and 03/21 which is typically used for glider operations and emergencies. 11R/29L (commonly called the outer as it is further from the control tower) is mostly utilized for VFR circuits, while 11L/29R (the inner) is typically used for IFR departures/approaches. Runway 29R and 11R are right-hand circuits.

The circuit altitude is 3000 ft for conventional aircraft and 3500 ft for jet aircraft. For VFR aircraft departing, they must remain at 2500 ft or lower until past the departure end of the runway to not interfere with aircraft conducting overhead breaks above, hence why you may notice many military aircraft lift off, raise flaps and gear but otherwise tend to fly low, waiting until the end of the runway to commence their climb.

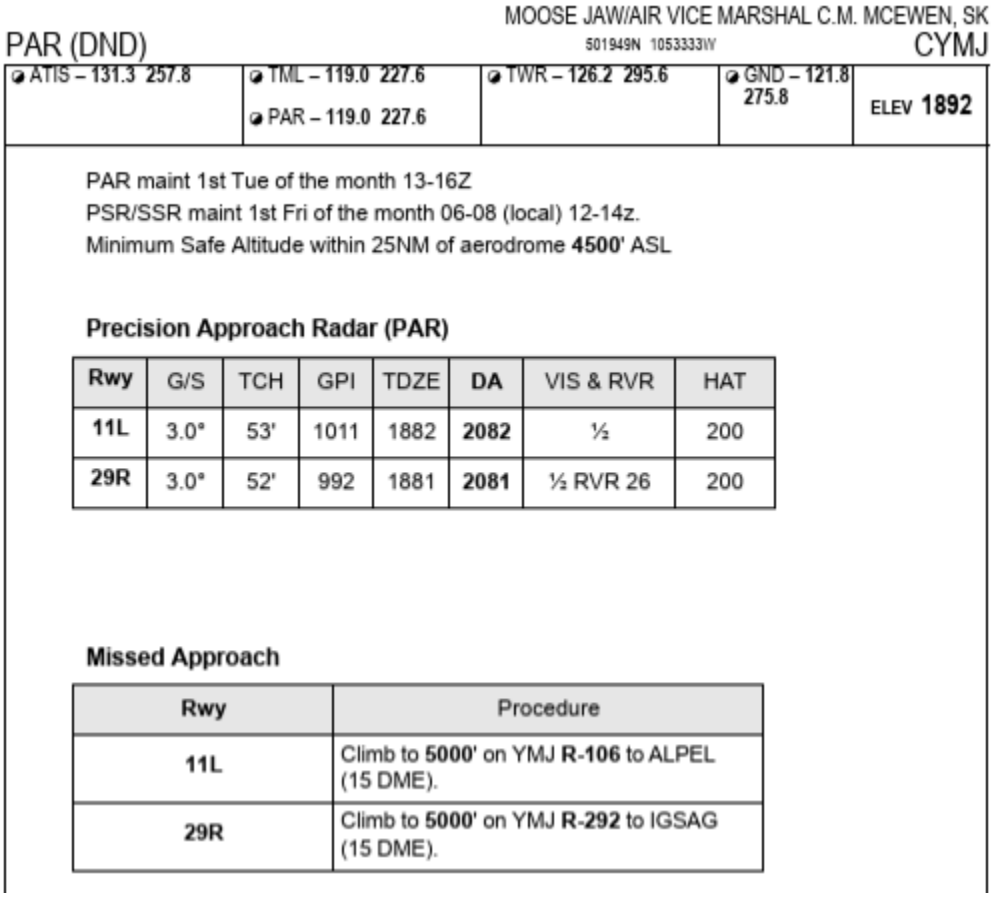
When contacting the different controllers in Moose Jaw, “Moose Jaw” is only used on initial contact and omitted after that to save syllables.

To the south of Moose Jaw, are a variety of advisory areas that can be used for upper air work. Aircraft can fly to the various training areas by following either the YMJ 150 or 210 radials and then proceeding into their preferred block.



Atypical Approaches Available at Moose Jaw:

Precision Approach Radar (PAR) Approach



MOOSE JAW/AIR VICE MARSHAL C.M. MCEWEN, SK

PAR (DND) 501949N 1053333W CYMJ

ATIS – 131.3 257.8	TML – 119.0 227.6 PAR – 119.0 227.6	TWR – 126.2 295.6	GND – 121.8 275.8	ELEV 1892

PAR maint 1st Tue of the month 13-16Z
PSR/SSR maint 1st Fri of the month 06-08 (local) 12-14z.
Minimum Safe Altitude within 25NM of aerodrome **4500'** ASL

Precision Approach Radar (PAR)

Rwy	G/S	TCH	GPI	TDZE	DA	VIS & RVR	HAT
11L	3.0°	53'	1011	1882	**2082**	½	200
29R	3.0°	52'	992	1881	**2081**	½ RVR 26	200

Missed Approach

Rwy	Procedure
11L	Climb to **5000'** on YMJ **R-106** to ALPEL (15 DME).
29R	Climb to **5000'** on YMJ **R-292** to IGSAG (15 DME).

A Precision Approach Radar (PAR) approach is flown entirely by following controller-issued heading and glidepath instructions. There is no published procedure to fly and no vertical or lateral guidance to reference in the cockpit. You may tune the ILS or RNAV for backup awareness, but you must not follow it.

In a simulator, holding very small heading corrections and a precise glidepath angle can be challenging due to the lack of force feedback in most peripherals. If you are not comfortable doing this manually, you may choose to use your autopilot.

Before being established on final, all clearances, headings, and instructions must be read back. Once you are established on final, the controller will advise you not to acknowledge transmissions unless requested. From that point, instructions are not to be read back, but clearances (such as a landing clearance) shall still be read back. This allows the controller to maintain a steady flow of corrections without interruption.

PAR approaches rely on continuous communication. Controllers are expected to transmit frequently, typically about every five seconds. If you experience a prolonged pause in transmissions, treat it as lost communications and immediately execute the missed approach instructions issued. If no missed approach instructions were issued, follow the published missed approach instructions on the chart. Do not wait to see if the controller comes back and instead return to your previous frequency.

Local IFR circuits will be common during this event. Controllers will often ask for your intentions. They are looking for two things: what approach you want, and what you intend to do over the runway, such as a full stop, touch and go, or low approach.

Gear checks are standard during military operations, particularly at training bases. When instructed to check gear down, simply respond with “three green” or the equivalent for your aircraft.

You can expect to hear phraseology similar to the following during a typical PAR approach:

- ➔ **BDIT22:** Moose Jaw radar, BDIT22, level 5000.
- ➔ **PAR:** BDIT22, Moose Jaw radar, altimeter 29.92.
- ➔ **BDIT22:** Altimeter 29.92, BDIT22.
- ➔ **PAR:** BDIT22, turn left heading 020 for base, descend 4000.
- ➔ **BDIT22:** Left heading 020, descend 4000, BDIT22.
- ➔ **PAR:** BDIT22, turn left heading 310 for final approach.
- ➔ **BDIT22:** Left heading 310, BDIT22.
- ➔ **PAR:** BDIT22, 15 miles from Moose Jaw, cleared for the PAR runway 29R, decision altitude 2081’.
- ➔ **BDIT22:** Cleared for the PAR runway 29R, BDIT22.
- ➔ **PAR:** Turn left heading 290.
- ➔ **BDIT22:** Left heading 290.
- ➔ **PAR:** You are now on final approach. Do not acknowledge transmissions unless requested.
- ➔ **PAR:** Approaching descent point, standby for descent.
- ➔ **PAR:** 8 miles from touchdown.
- ➔ **PAR:** Begin descent now for a three-degree glidepath.
- ➔ **PAR:** Slightly right of course, turn left heading 288.
- ➔ **PAR:** Slightly right of course, correcting nicely.
- ➔ **PAR:** Slightly below glidepath, adjust rate of descent.
- ➔ **PAR:** On glidepath, on course.
- ➔ **PAR:** BDIT22, cleared touch and go runway 29R, wind 270 at 10, check gear down.
- ➔ **BDIT22:** Cleared to land runway 29R, 3 green, BDIT22.
- ➔ **PAR:** Approach decision altitude.
- ➔ **PAR:** Passing decision altitude.
- ➔ **PAR:** Radar observes you in the overshoot. Contact Moose Jaw terminal on 119.0.
- ➔ **BDIT22:** Over to terminal, BDIT22.

Be kind and professional to our controllers, and expect the same in return. PAR approaches are uncommon and not easy to practice on the network. There will be some growing pains on both

sides of the frequency. Patience and respect are of utmost importance, especially during a busy, first-of-its-kind event like this.

We expect a high volume of PAR approach requests. You may only be transferred to the PAR controller once an approach clearance is imminent (or in some cases has already been issued by the overlying controller!), so things can happen quickly. Be ready to change frequencies promptly and check in immediately when instructed. You may be placed in a hold while waiting for a PAR approach. (Plan your fuel accordingly!) A PAR controller can only work one aircraft at a time, and in some cases the overlying controller may not be able to support a PAR request at all. Flexibility and preparedness will help keep the operation running smoothly.

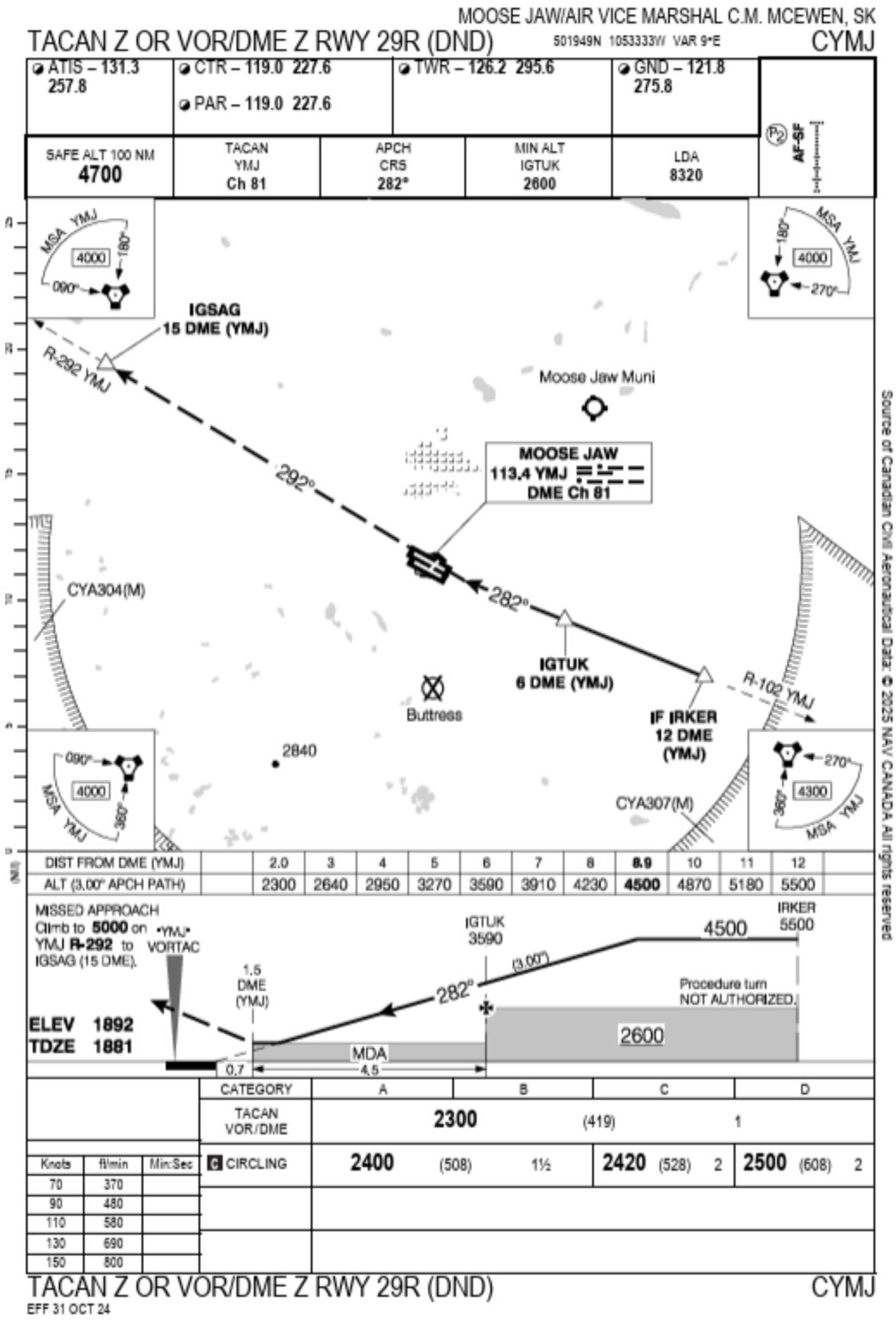
TACAN Approach

A Tactical Air Navigation System (TACAN) is a military navigation system. Functionally similar to a VORTAC, it is slightly more accurate, portable, and equipped military aircraft can use an air-to-aid mode to track each other. It can be used for both enroute navigation and as an approach aid for non-precision approaches. Many fighter jets and other trainers are not necessarily RNAV equipped/able to perform RNAV approaches and the fact that TACANs can be field-deployed explains why these approaches are often in use at military airports.

There are three common types of TACAN approaches:

- Straight in radial approach
- Penetration approach (HI)
- ARC approach (HI or standard)

Straight in Radial Approach

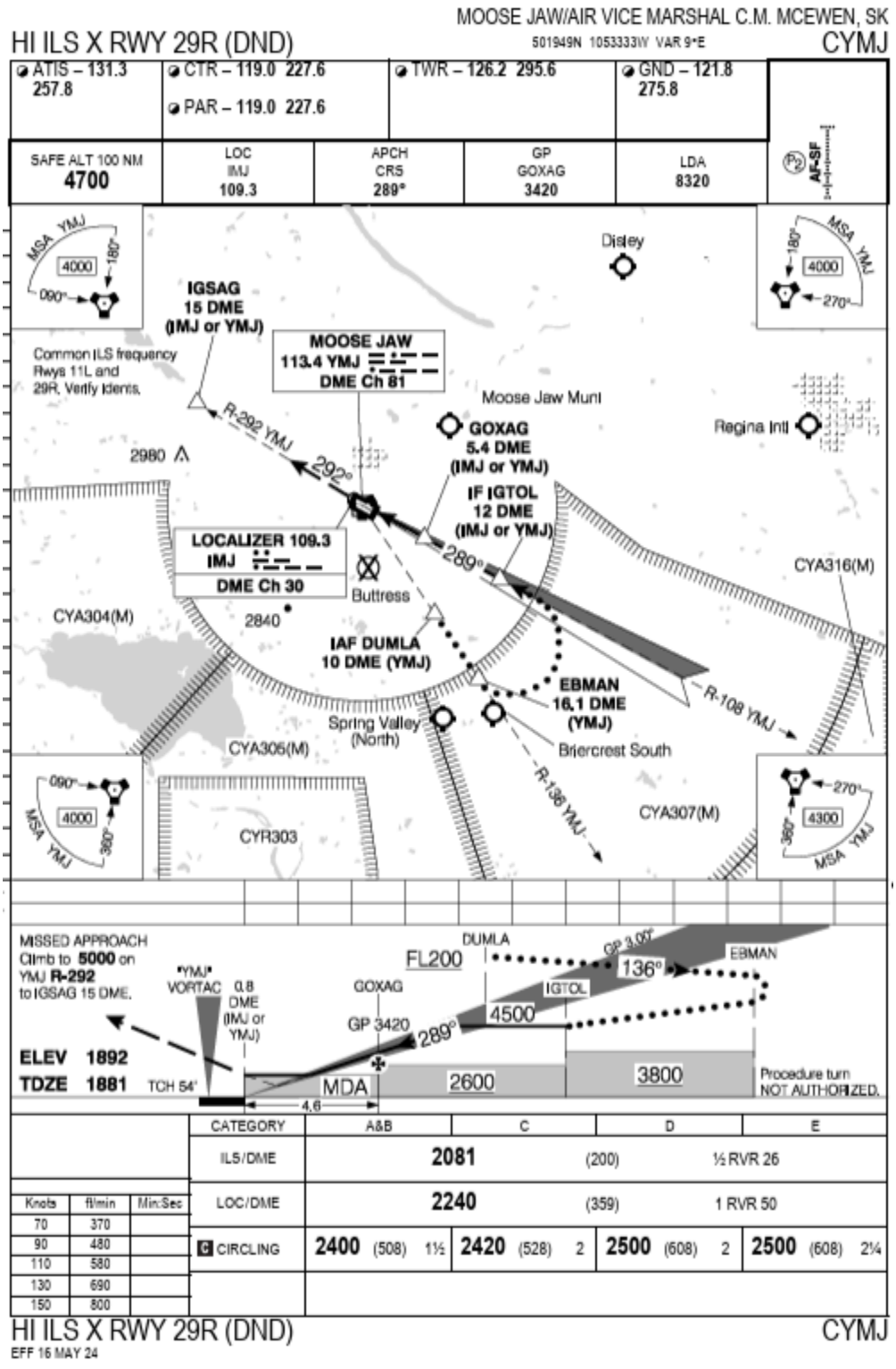


The simplest of TACAN approaches, this one would be flown by being given radar vectors by Terminal to intercept the 282 radial to the Moose Jaw TACAN. Unlike an ILS you don't have glideslope information so there are two ways you could fly this approach vertically: "dive and drive" or Constant Descent Angle (CDA).

Using the "dive and drive" method you can descend as low as Minimum Sector Altitude (MSA) once you are cleared for the approach and within 25 nautical miles of the TACAN. In Moose Jaw the MSA is 4000 ft for every quadrant except for the southeastern quadrant which is 4300 ft. Once you are established on the 282 radial you can descend as low as 2600 ft and once past the Final Approach Fix (FAF) which is IGTUK and identified by being at 6 DME you can descend to the Minimum Descent Altitude (MDA) of 2300 ft. You can't descend lower than this altitude unless you become visual with the runway environment by the Missed Approach Point (MAP) which is identified by being at 1.5 DME. Ideally you'll become visual sooner and transition to flying visually to line up on the runway (you will be at a slight offset) and using the PAPIs to guide your descent to the runway.

Using the CDA method, you could intercept the 282 radial at 4500 ft and once you are at 8.9 DME you could commence your constant descent down to MDA. Since there is no glideslope, you have to monitor your own descent rate. Luckily there is a table published in the bottom left corner with descent rates for a 3 degree glidepath based on various ground speeds. Using this table as a starting point and then checking your altitudes against the DME crosschecks on the chart should give you a relatively constant descent to the MDA easing your workload compared to the "dive and drive" method. The advantage to the other method though is you may become visual sooner so depending on the weather each has their merits.

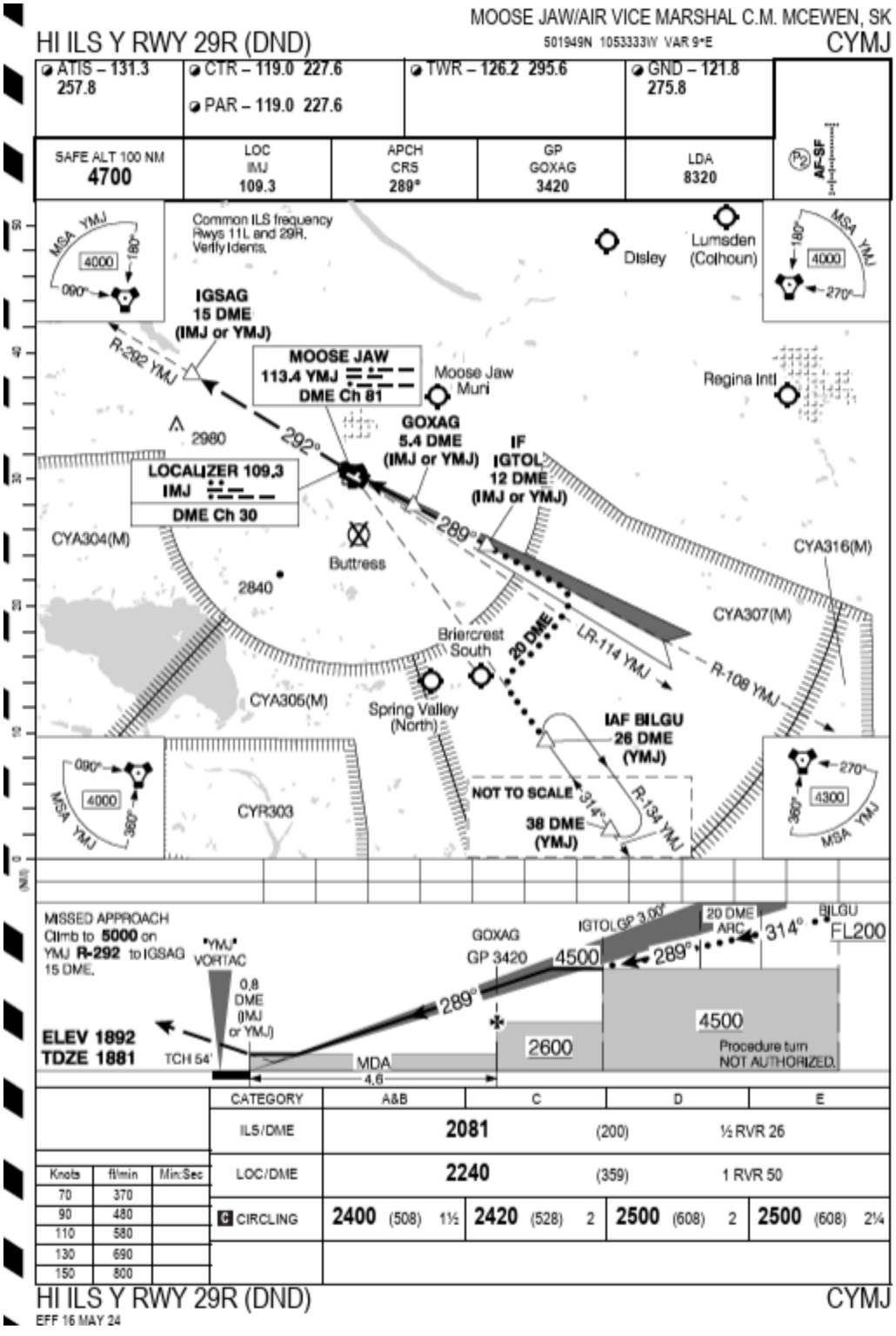
Penetration Approach (HI)



A HI Approach is one that starts at a high altitude (typically around FL200) that transitions an aircraft quickly from the high-altitude enroute airspace right to the instrument approach. The military uses these approaches for two reasons. First, if the airfield can only be secured to a certain radius, this is a way to keep within a safe zone at all times by only descending within a tight radius to the airport quickly. Secondly, many fighter jets or trainers do not have extensive de- and anti-icing capabilities. Some jets only have the ability to fly fast enough that the Total Air Temperature (TAT) from the friction of their speed will go above 0 degrees and melt the ice. Therefore, if icing conditions are expected a very quick descent through the icing to get to warmer temperatures close to the surface is necessary. The HI approach is either a penetration type or an arc type depending on the direction that the aircraft is approaching in relation to the runway in use and the location of the TACAN.

The HI ILS X 29R into Moose Jaw for example would generally be used by aircraft approaching from the North. They would fly directly to the Moose Jaw TACAN before flying the 136 radial outbound at FL200 or above until they reach DUMLA which is the Initial Approach Fix (IAF) for this approach. At that point a rapid descent can be initiated to be at the Intermediate Fix (IF) which is IGTOL at 4500 ft. Penetration approaches are based on a descent *gradient* of 800 ft/NM. Convert gradient to rate by first taking your ground speed and dividing it by 60 determine your speed in nautical miles per minute. Take the 800 ft/NM gradient and multiply it by this speed of NM/minute to determine your descent rate in feet per minute. Once you reach EBMAN (identified by being at 16.1 DME) you begin your arc to intercept the 288 radial inbound. It should take you one minute to do a 180 degree turn (or 30 degrees heading change every 10 seconds). This maneuver will definitely test your ability to maintain a good instrument crosscheck as you judge descent and turn rates simultaneously. A common error is letting your speed decrease in the turn which tightens the turn radius and then you won't complete the turn on the correct radial. With the descent, you must remember the "minute to live" rule which is that your descent rate shall never exceed your altitude above ground. I.e. don't descend at 3000 ft per minute if you are only 2900 ft AGL. Once you have intercepted the 288 radial inbound and levelled off at 4500 ft, this is when you would switch your navigation equipment from the TACAN to the ILS, making sure to set the ILS course of 289. This level off point is also where you will need to slow down to be able to configure for landing. Unique to Military Terminal Control Areas (MTCAs) is the fact that you aren't restricted to 250 knots below 10,000 ft. You should be able to remain on the localizer and then begin your final descent off the glideslope, flying this approach like any other ILS.

Arc Approach (HI or Standard)



Arc approaches also exist, and can either be a standard or a HI approach. In the example above, the approach is also a HI approach commencing at BILGU at or above FL200. Ideally you'd be approaching from the southeast and can intercept the 134 radial, otherwise you could approach from the northwest, perform a parallel hold entry, then commence the procedure. Upon overflying BILGU, like the previous approach you will need to commence your rapid descent but at 20 DME you will start a turn where you will maintain a 20 DME arc until the 114 radial where you will begin a turn to intercept the 108 radial. By 12 DME you will be at or above 4500 ft and switch to the localizer to fly the ILS like normal.

Radar Square

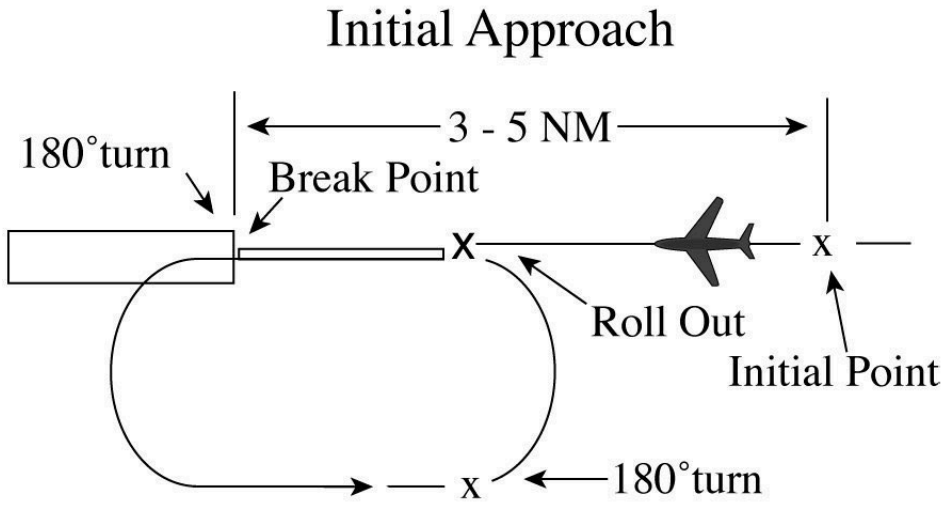
While civilian student pilots tend to perform IFR training in VMC, military student pilots can perform IFR training in actual IMC. This is done by flying the "Radar Square". The radar square is essentially a regular traffic circuit however since you may not be visual and flying VFR, the terminal controller will vector you for crosswind, downwind, base, and to join final depending on the type of instrument approach being flown.

VFR Procedures In Moose Jaw:

Overhead Break

An overhead break is a landing procedure often used by military aircraft (although civilian aircraft can do it too, although it is dependent on aircraft performance to perform properly). The maneuver allows a rapid entry to the VFR circuit saving fuel and time, with the added benefit of allowing formations to join the circuit in a safe and controlled manner together.

To perform an overhead break an aircraft makes their standard initial calls to tower requesting the break and intentions (full stop or touch and go). The aircraft will be cleared to fly to an "initial point" generally 3 or 5 nautical miles back from the runway. The aircraft flies a rapid (250 kts or so depending on the aircraft) final then "breaks" at a point over the runway (may be over the threshold or midfield) where a high G level 180 degree turn is made to roll out on downwind. In this tight turn to downwind, the aircraft experiences significant induced drag allowing it to quickly bleed speed to roll out and configure for landing followed by another 180 degree turn to short final. It is important to note that aircraft can not break past the departure end of the runway so they don't interfere with departing aircraft, likewise departing aircraft are given a departure limitation of no higher than 2500 ft until past the departure end of the runway.



Tips and Tricks for Military Aircraft:

Above all else, ensure you know how to fly your aircraft before flying on VATSIM with it.

Flying a fighter jet or jet trainer means you have a lot of thrust at your disposal, however when flying typical IFR or VFR profiles this thrust can become difficult to manage if you fall behind the aircraft. On top of this, military aircraft tend to be designed to be inherently unstable as that increases their maneuverability. Planning ahead and being aware of what your aircraft is doing is very important. It is very likely once you are airborne you will need to reduce power quickly to ensure you don't exceed your altitude and speed constraints listed on IFR procedures.

Many military aircraft do not have autopilot or may have relatively primitive systems. Being able to hand fly the aircraft is a must. If you are in an aircraft with fly-by-wire like the F18 this might help you a little bit when you need to shift attention to changing radio frequencies or adjusting your course selections, but in an aircraft like the hawk or the harvard where you don't have such a luxury you will need to ensure you have the aircraft well-trimmed otherwise you might find yourself off course when you go heads up again.