# Newbie’s Guide to DA40 NG

## Malmin ilmailukerho ry

## General remarks

This document was created to tackle some of the common issues and quirks of the aircraft, especially to the newbie pilots of Diamond DA40NG.

If you have any feedback or want to add anything to this document to share with others, please contact Pekka Aakko (pekka ät aakko dot fi). Any personal feedback or information about the aerodome electricity would be appreciated!

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| Revision 0.1 | 05.01.2017 | Document created |
| Revision 0.2 | 10.01.2017 | Winter ops added |
| Revision 0.3 | 18.01.2017 | Airport information section added |
| Revision 0.31 | 10.03.2017 | Additional cleanup & ECU test additions |
| Revision 0.41 | 22.03.2018 | Added more ECU related additions, general fixes, language |

# Some common issues with the aircraft

## Missing lights from the cockpit

You might have some lights (like **flaps)** missing from the cockpit, or the **G1000** is very dim on daylight operations. The main reason is usually that the instrument lights are turned too low. Locate the light switches on the left side of the top cockpit and switch instrument lights off (turn counterclockwise until it clicks). This will turn the dimming of these lights off, restoring the normal light intensity.


## Issues with intercom or radio – pilot & copilot

At times the pilot & co-pilot intercom volumes and squelch settings are messed up. You have trouble hearing your co-pilot/instructor or the radio traffic of the instructor.

To begin solving the issue, please set all the **headset volumes to max**. Then start working on the radios and intercom volume. Also check that the isolation is NOT active.

Set the radio volume from the G1000 radio volume buttons. Intercom volume can be adjusted from the audio panel controls: Pilot Volume and Passenger volume.

You may also need to touch the squelch levels, if you find the voice communication hard or “breaking”. Set the intercom to manual squelch and tune it manually (see next page).

**Radio is too loud for passengers:**

You can't control the radio volume separately for the passengers, but you can control the intercom volume separately. If the passenger headsets have individual volume controls, you can ask them to turn down the volume and you can then compensate by turning up the passenger volume for the intercom. That way the overall intercom volume will be about the same but the radio/ATC volume will be lowered.

## 4.6 AUDIO PANEL PREFLIGHT PROCEDURE

***NOTE:*** *If the pilot and/or copilot are using headsets that have a high/low switch or volume control knob, verify that the switch is in the high position and the volume control on the headsets are at maximum volume setting. On single-pilot flights, verify that all other headsets are not connected to avoid excess noise in the audio system.*

***NOTE:*** *When the **MAN SQ** Key is pressed, the ICS squelch can be set manually by the pilot and copilot. If manual squelch is set to full open (SQ annunciated and the knobs turned counterclockwise) background noise is heard in the ICS system as well as during COM transmissions.*

After powering up the G1000 System, the following steps aid in maximizing the use of the Audio Panel as well as prevent pilot and copilot induced issues. These preflight procedures should be performed each time a pilot boards the aircraft to insure awareness of all audio levels in the Audio Panel and radios.

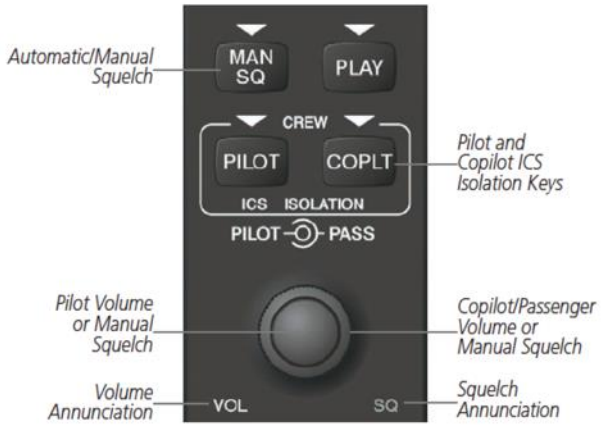



**Figure 4-50 Audio Panel Controls**

**Setting the Audio Panel during preflight:**

1) Verify that the PILOT and COPLT Annunciators are extinguished.
2) Verify that the MAN SQ Annunciator is extinguished.
3) Turn the **PILOT/PASS** Knobs clockwise two full turns. This sets the headset intercom audio level to max volume (least amount of attenuation).
4) Adjust radio volume levels (COM, NAV, etc.) to a suitable level.
5) Adjust the **PILOT/PASS** Knob volume to the desired intercom level.

Once this procedure has been completed, the pilot and copilot can change settings, keeping in mind the notes above.

# ECU test failures

ECU test failures are not super rare occurrences with DA40NG and there are things you can do to help pass the tests. Failures come after the engine fails to perform some of the internal tests and may cause the plane to be grounded for maintenance check & reset. Unnecessary maintenance breaks can be avoided with proper precautions.

**Important to keep in mind: always warm up the engine enough.** It is not enough that the parameters are on green levels, it is advisable to run ECU test with two additional degrees on top of the lowest values (eg gearbox temps 36C -> 38C).

Please note, that the gearbox temperatures are not visible on the MFD default page with oil & coolant temperature, but you need to go into ENGINE menu and choose the correct page for gearbox temps.

Especially on cold starts or when the engine has not been used for some time, it is also advisable to run the propeller 2000 RPMs 5-10 seconds before starting the ECU test.

**Please note, that engine temperatures for oil & gearbox have to be on green before increasing engine power over 50%.**

One of the common ECU fail issues happens when the propeller tests fail due to inadequate oil pressure inside the propeller blades. Running the propeller on 2000 RPM for a bit will allow the oil pressure to build correctly and allow the test go through.

ECU fail happens from time to time. The reason usually is not the failure of the ECUs but something else, most likely failure of some sensors or internal tests read by the ECU. One issue has also been data corruption when writing engine data after shutdown. It is important to wait for the “red crosses” to be visible on engine instruments after engine master has been switched off before turning off the electrical power.

When the airplane shows up “ECU failure” during the automated ECU test you can try the following procedure:

1. Shut down the engine according to the checklist procedure. All power off.
2. Restart engine, test voter switches and run the ECU test
3. If the problem persists, shut down engine again according to the checklist procedure
4. Pull out the ECU fuses from circuit breakers to reset all
5. Push the fuses back and restart engine using normal checklist procedures

If these tricks do not help, the plane must be checked by the service personnel. Inform the maintenance person or organization about the issue.

Please see the winter operations section how to keep the ECUs operational during freezing conditions.

## ECU test does not start

The engine temps must be on “green” on all engine parameters (oil & gearbox) before ECU test starts. In this case, just warm up the engine a bit more on max 20% power and start the tests once engine is warm enough. Remember to set the throttle to idle before the test.

**It is advisable to allow the engine to run on warmer temperatures than the minimum for green level (2C is often enough).**

Please observe, that following parameters must be true for ECU test to start:

1) Gearbox (and preferably other parameters) is on green range
2) Throttle lever is on idle
3) Side wind component is not too high

# Winter operations

Flying in winter is obviously different from the summer: what you see outside looks different, fields, lakes, sea etc. The weather is colder and it sets some boundaries for your flight planning and operations.

Diamond DA40 NG can be flown without issues in very cold weather (-30C on takeoff, -35C OAT during cruise, please check your aircraft's AFM for temperature values) so do not be afraid of flying in the cold. Preparations however must be made when parking the aircraft outside without a warm hangar.

**Winter flying is not hard at all, so it should not be feared. With these advices you should be just fine and enjoy the nice rewarding winter sceneries from up & above.**

## Preparations

Before hopping to the aircraft, pay attention to the flight planning. During the winter months, weather can change very rapidly and you should be much more critical if you plan to do cross country trips far away from the home base. Always consider if the flight can be done without weather issues and cancel the flight (or change the destination) if you don't feel comfortable flying.

Always get the latest weather data ahead of the flight. Remember that icing happens much easier during the winter time and flying into clouds is more hazardous than in summer time. DA40 NG is not certified to FIKI (flying into known icing).

Prepare your route, flight plans and plan alternate routes / aerodromes carefully. Pack some warm clothing to the plane with you; even thou it is warm in the cabin, you don't want to freeze to death if something happens and you must make a forced landing to a remote field. And gloves… remember those gloves! Your hands will get cold fast and you must prepare the aircraft for parking outside in freezing temps. So, remember the gloves – once more ☺

If you need to stay longer at the destination without hangar space, check that you have a piece of rope or brushes that you can use to remove possibly snow or frost from the wings, as they can seriously affect the flying characteristics of the plane. Small translucent layer of frost here and there is not bad and it will be gone once you go flying. Do not remove the frost by scraping with force, as it will damage the wings. If you cannot remove the ice/snow/frost with a piece of rope or gentle brushing, you have to melt it in warm hangar or by some other means – like with the warmers you have onboard. Warm water is the last choice (not really even advisable), remember to remove the excess water immediately as it will freeze back again – making the situation possible worse! TKS fluid can be purchased separately for chemical deicing, but this is at your own expense. This is strongly suggested if you know there is a risk of icing on the destination airfield.

Additional note with TKS fluid or similar substances: these will NOT allow you to fly into known icing. You can use such chemicals to help defrost the plane or remove ice in the ground, not when flying. It will not protect your aircraft when flying.

During the freezing winter weather, don't take the gasoline samples from the wings if the plane has spent longer time outside. If you have -3C and lower temps, the possible water is frozen in the fuel tank. This might jam or even break the sample valve. However, you should always take the sample from the main valve underneath the engine.

**Remember when removing the ice:**

1. Remove all ice from wings, ailerons and tail carefully.
2. Don't use excessive force or sharp instruments to remove ice or frost.
3. Don't scrape the plane windows like you would do for a car. This will damage the window.
4. If you use wing covers and they are frozen to the wing, do not forcefully remove them. Thaw the plane inside warm hangar or by some other means (your portable heaters work nicely here).
5. If you suspect that the heaters have not operated during the night, please reset the heaters and warm the engine and cabin before starting the plane (see possible ECU issues later in this document).

## Starting of the engine

Do not start the engine if it is too cold without having a warmer to heat up the engine. DA40 can be started in quite cold environments, but little preheat before start is advisable. See details below. Check your AFM for starting temperatures if you are not sure.

## During the taxi

The ground can be very slippery on winter months due to ice. Use slow taxi speed. When doing ECU tests or engine tests, try to find a suitable "dry" spot where the plane does not slip on ice too much. Make sure you have ample space around the plane to run the tests. If the plane moves too fast or is not controlled, halt the tests and find a better spot for the plane. The engine tests can be also done on the runway, if the traffic situation permits.

## Takeoff

Check the possible snow on the runway, that can affect your takeoff speed or acceleration. Check ATIS data is one is available. Snow can really affect your airspeed build up, so be prepared to abort your takeoff if the speed doesn't build up.

Check the runway visually or ask the aerodrome operator for details.

## Landing

When landing on winter to different airfields, always be prepared for longer landing distances. For example, using excessive braking force on icy runway can lead to the plane sliding uncontrollably. Break with less force. Be sure you have enough usable runway.

Always check from the destination airfield if the runway is usable and can be used for landing. Always make a low approach first to visually check the runway conditions. On certain weather conditions you can experience so called whiteout phenomenon, in which the visibility and contrast are severely reduced by snow. The horizon disappears completely and there are no reference points, leaving the individual with a distorted orientation. This can be dangerous for landing.

## Spot landings / touch & go landings

It is generally advisable, that these will not be executed on very cold weather (-10C or below). The engine will be cooled considerably during the descent with less power and then full power is again applied, which is not good for the engine.

## General observations on the aircraft

DA40NG should always be stored in a warm hangar. If the plane spends time outside the hangar in freezing conditions, special precautions must be made to keep it warm.

**Few C below zero:**

No need to use the engine warmer or cover the wings unless there is heavy snow or other possible bad weather that causes freezing and frost.

Always keep the aircraft cabin warm with a heater. Use the heaters inside the cabin foot space, one located at the pilot side and/or one in the co-pilot side. These should always be on when parked, unless you plan to take just an small break before continuing the flight.

**Colder than -10C, longer stay duration:**

You should use the engine heater. Use the engine cover to keep the warmth of the engine inside the cowling if such cover is available. If your stop is less than three hours, no need to use the engine heaters. A rule of thumb: DA40NG engine will reach zero degrees in about three hours in -20C after it has been parked.

Use **two heaters** inside the cabin foot space, one located at the pilot side and one in the co-pilot side. These should always be on when parked, unless you plan to take short break before continuing the flight.

If you plan to use the heaters, also take the foam “window cover” that will be placed on the open side window of the DA40NG. This will keep the warmth of the heaters inside the cabin and winter weather outside. See pictures from the winter setup below.

If your plane doesn’t have these covers, they are easy to make from foam or purchase a ready-made part.

Remove the heaters while flying, store them in the aft baggage compartment. You do not want them in the pedals while flying.

## Important to understand

On a DA40, it is important to understand that the cabin should always be above zero temp. The engine can withstand low degrees and can be started in cold environments. But the ECU related tubing inside the plane are located underneath the pilot and co-pilot seats and have probes that get information about the outside air through small hoses / pipes connected to ECUs. Moisture can condensate on these and if it freezes, the ECUs can generate an ECU fail condition – **this has happened few times when the heating has not been taken care of**. Should this happen, you need a certified technician to reset the system computer and ECUs.

Therefore, it is super important in winter operations that the cabin is kept warm to prevent ECU freezing! Also, the avionics live longer and happier life ;)

Getting the technician to a remote location will take time and it will cost a lot, so be prepared with the heaters.

If you suspect the plane or cabin has frozen, get the cabin properly warmed before starting the aircraft. Better to spend one or two hours heating the plane to make sure all is well than ground the plane to a remote airfield for days in the worst case.


This is what happened when the plane got frozen in Krakow: the (promised) electricity was not available, and outside temperature was -15C. There were two mobile warm air generators that were used to thaw the airplane after spending the night in freezing conditions, one for the cabin and one for the engine. It took two hours to get the plane warmed up – all went well though!

**Additional note regarding portable heaters:**

When you are using the heaters, please consider their power drain. If you run three heaters on max power, it might cause power outlet fuses to go off.

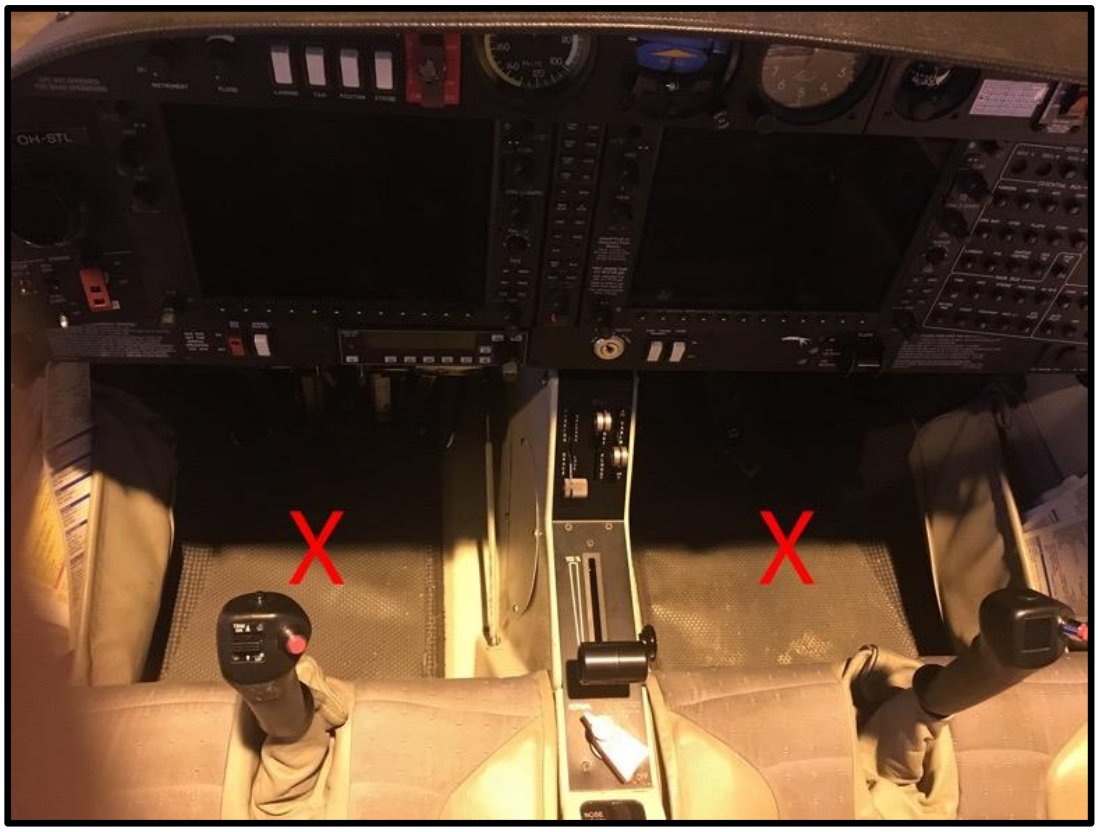
If the outside temperatures are not too harsh, consider running the heaters on lower power setting. This will ensure you have continuous heating during your stay.

# Sample setup of heating on DA40

This is a sample setup when DA40 / OH-STL is flown to another airfield. The pictures are taken from Tampere (EFTP), with -23C temps outside.

OH-STL parked next to the electricity box next to ATC tower. Extension cord roll placed underneath the wing.

No engine cover was used, as the stay was just three hours.




Two heaters were placed inside the cabin: one at the pilot side, one at the co-pilot side.

Special piece of foam “window cover” was put to the open small window, power cord pushed through the foam cut. This will keep the warmth inside and (cold) weather outside.


We did not use engine heater, but one could be placed underneath the plane, the air flowing toward the engine space. Add an engine cover to keep the warmth in.


OH-WOW at Oulu airport, with engine cover, wing covers and heaters in place.

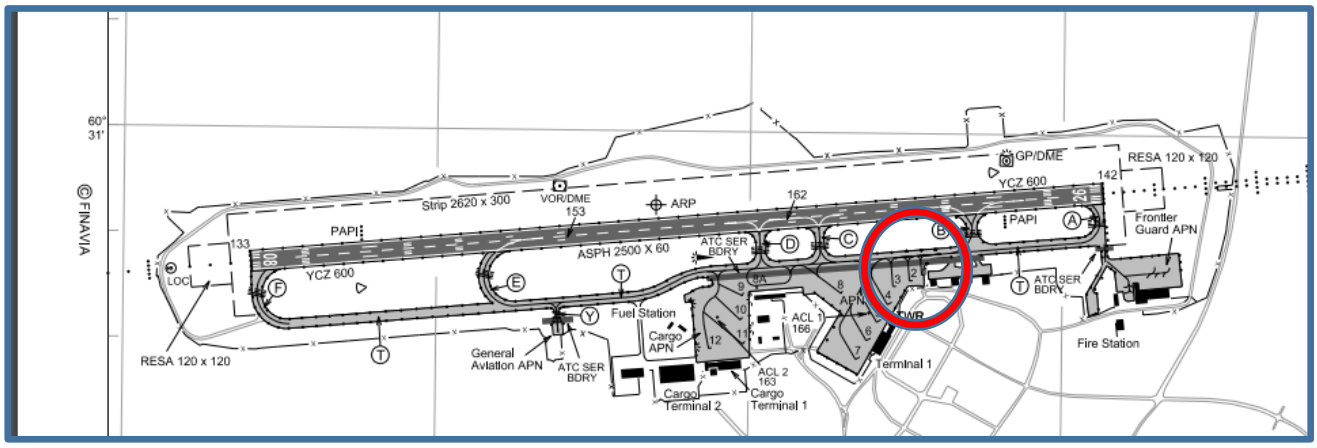
# Where to get electricity?

It is your responsibility as a pilot to ensure you get electricity from the destination airfield before you take off. The problems with ECU can lead to the plane being grounded with a massive invoice coming on your way to sort the issue.

## TURKU (EFTU)

Electricity is available from electricity box between stands 1 and 2. With longer cord, both stands get electricity.

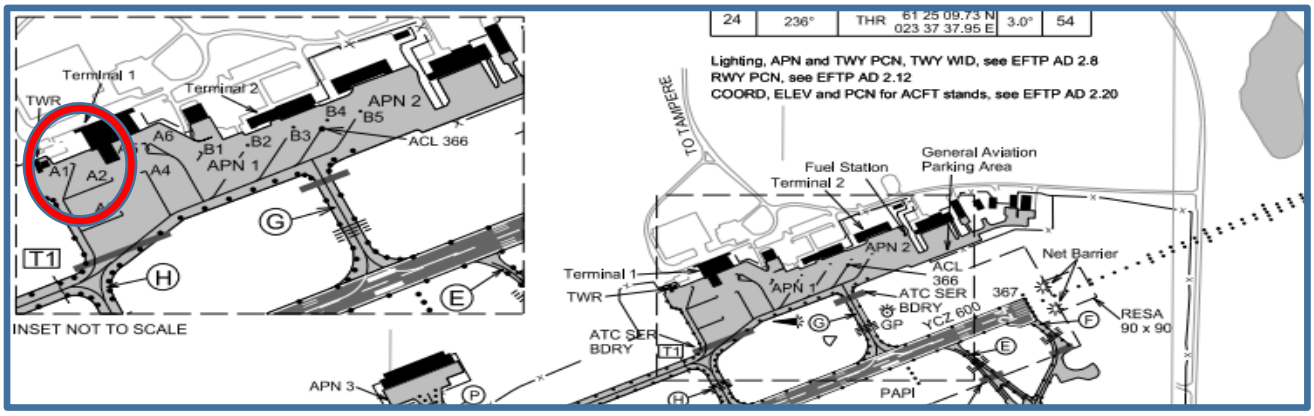
Talk to the ATC upon reaching EFTU or call before to make sure you get the electricity. There can be a small charge on day basis on electricity.




## TAMPERE (EFTP)

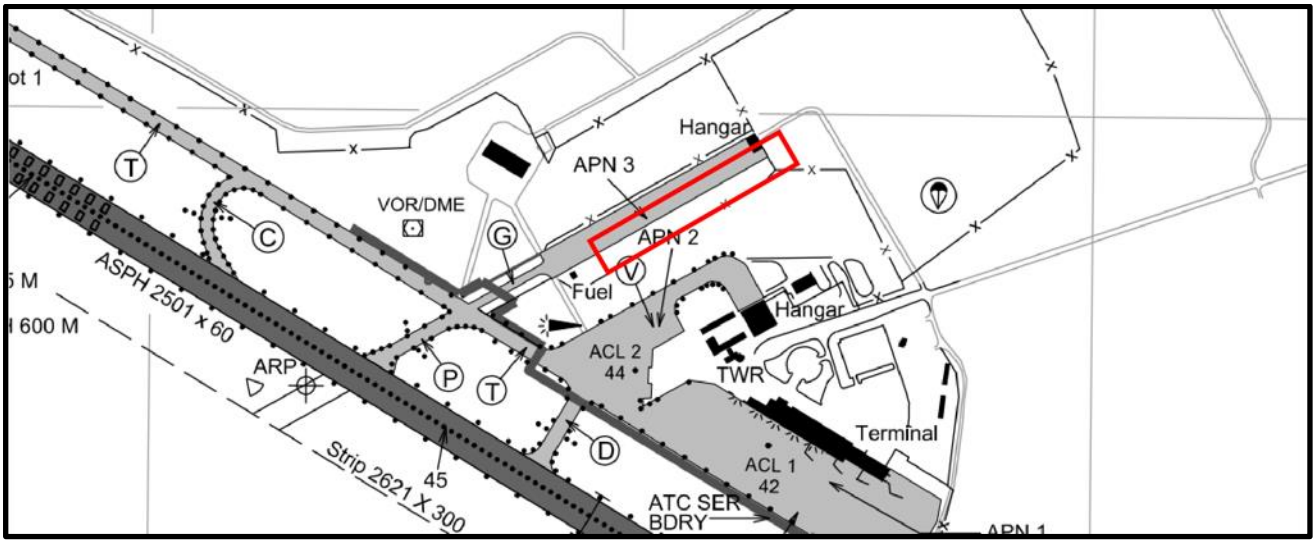
Electricity is available from electricity box in front of the tower, next to terminal 1. See example photo. You must call the ground maintenance personnel to open the box (telephone 020 708 5454). Ask the ATC for a permission to leave the plane there and tell them that you require electricity. For additional help from service center, call 020 708 5521.

There is a charge of 20 euros per day for electricity, payable to Finavia info desk in terminal one. Credit cards approved. Also prepare for security check when going out from terminal.



## OULU (EFOU

Electricity is available from electricity boxes on GA apron 3. During winter time, you can need 20m cord depending how the snow has been plowed from the apron.




Talk to the ATC upon reaching EFOU to make sure you get the electricity. There can be a small charge on day basis on electricity.

Tervalentäjät club might have hangar space available for visiting aircraft. JET-A1 can also be purchased from the aviation club if airport fueling is not open.

## HAAPAVESI (EFHP)

Electricity is available at the both ends of the runway. You need at least 25 meters of extension cord. Call the airfield operator first to make sure of the electricity and runway condition.

https://lentopaikat.fi/haapavesi-efhp/ for contact information

Hangar space may be available for visiting aircraft.

## KÄRSÄMÄKI (EFKR)

Electricity is available near the hangar. You need at least 25 meters of extension cord. Call the airfield operator first to make sure of the electricity and runway condition.

https://lentopaikat.fi/karsamaki-efkr/ for contact information

Hangar space may be available for visiting aircraft.

If you get more information about other fields and how to get electricity, please contact the updater of this document (Pekka Aakko, pekka ät aakko dot fi) and we will gladly add & share the information.