Mentoring principles

General

Scope

This is a collection of important focus areas. The aim of the following pages is to give some guidance on exactly what to instill in students during the relatively short time they are under supervised training.

No two students or mentors are the same, but the below takeaways/pointers should hopefully help mentors and students alike in making the student well equipped for self teaching and self assessment during solo training **and** after validation.

Training goal

The main goal of training is to form good and safe habits, particularly ones that will be safe and still acceptably efficient when working at max capacity. There is a very natural urge to push for advanced techniques and maximum efficiency, but while discussion and demonstration of these can be a good thing, making them the go-to is not good. A solo student or newly valid controller will normally not have the experience or capacity to push very tight gaps or do minimum separation climb-throughs while also managing other traffic safely.

In short: Don't teach the student to run before they can walk. Once the student is safe and competent and able to self-assess, more advanced techniques can be explored either with guidance or on their own.

When starting the solo training, the student should be very well versed in the below:

- Standard phraseology and good radio discipline.
- Scan & plan, keep looking outwards for the next problem. Normal calls should never come as a surprise, and the response should generally already have been thought out.
- Plan early, but don't marry your plans. If it needs changing, change it.

- Basic controlling techniques. Inventive/advanced techniques should only be experimented with under very low workloads.
- Have a set of "standard techniques" for the control position in order to reduce the mental load of everyday tasks (taxi routings, level assignments, headings) but **WITHOUT** letting them become automatic responses. They must be adjusted as required, and it is often required to do so.
- Base all decisions on logic. A controller should **never** do or say anything "just because" they've seen or heard it somewhere or been told to do it by someone. The student must understand fully why they say and do things, not just what to say and do.
- Manage workload well (see relevant section below)
- Always look for the next job. Do things now rather than later. It's easy for students and low experience controllers to get hung up on things or to relax too much in quiet periods, they need to make a habit of looking for problems and solving them ahead of time, without getting stuck. Once the student starts getting the hang of the basics, prompt them constantly to do the next thing without necessarily specifying what that is.

Take over early, demonstrate good techniques

When student's completely lose control, their confidence will take a big hit. While seeing how bad things can go can be interesting, it's far more beneficial to take over early and demonstrate good techniques.

In addition, it inconveniences pilots when students lose the plot, so avoid this and keep the traffic moving.

If it's taken over early rather than late, you have the chance to talk through what you're doing and provide very good learning. If everything goes wrong first, the student is likely more focused on feeling bad than learning.

As an instructor, trying to fix a traffic scenario that has already gone bad is very challenging and likely to cause problems, so take it early.

Don't get too involved in other sectors

It's a team effort, controllers are cogs in a machine. If too much energy is spent on getting involved with other sectors, your own traffic will suffer and everyone gets annoyed at you.

Resolve situation before transferring aircraft

Don't transfer a conflict unless it is clear that the next sector is better equipped to manage it and it has been well coordinated.

Managing workload

It is shockingly easy as a controller to create high workload scenarios with relatively few planes involved. This is generally done in the name of expedition, and because trying to be expeditious is in the nature of good controlling it is a very common human factor error.

Complex scenarios leads to tunnel-vision, drastically increasing the chances of missing other problems in the sector. New controllers don't have the experience and muscle memory seasoned controllers have built up for normal traffic, and therefore should worry more *(**more**, not exclusively)* about safety than advanced forms of expedition.

A couple of points to consider:

- Use red carpet taxi techniques in high workload or for longer distances / many taxiways. Stopping short of a taxiway for a minute unnecessarily is far better than an all-the-way clearance turning into a collison.
- Climbing via the SID is almost always going to be safe against inbounds (particularly in merge point airspaces) when inbounds and outbounds are following the procedure's vertical profile, while issuing directs early will easily require awkward level restrictions or turns to avoid conflict with inbounds.

- Gambling on aircraft performance to achieve vertical separation or clearing MVA/airspace boundaries, coordinating non-standard directs, accepting any and all training/non-standard request, and all other types of techniques that requires a larger amount of thought/focus/monitoring are OK to demonstrate and teach as posibilities for quiet moments of course, but it must be impressed that these are NOT to be the go-to solution but instead carefully considered and applied only when appropriate.
- Sacrifice some efficiency and use of advanced/non-standard techniques when workload requires, and keeping things predictable for both pilots and controllers. Avoid last minute changes, tight radar circuits, convoluted taxi instructions.
- Don't say yes to everything. Training and non-standard traffic can and must be delayed or turned away when normal traffic loads are high. Noone has the right to do IFR/VFR circuits. Offer alternatives and delay information as appropriate.

Use the tools well

Euroscope and its plugins has lots of features that can dramatically increase situational awareness and prevent forgetting things. Particularly highlighting tags as a simple remind-me (only shown in own client) and use of the remarks field (shown to all ATC) goes a long way in increasing SA.

And remind them that you never know who's observing or watching a stream, so don't write anything that breaks CoC.

Radio discipline

Poor radio management is the easiest way of tanking capacity. Managing the radio well is critical for safe and competent controlling, particularly at high workloads.

Refer to the radio discipline basics

Anticipating the next call

Once the basics are mastered, a neat scan/plan technique is to anticipate who will call you next, and what they will say. Experienced controllers do this all the time, but students will usually require prompting to make it a habit. Typical clues include track handoff, 7000 squawks approaching zone boundary, minutes lapsed since push was started, time at holdingpoint doing run-ups, distance to go vs further descend, etc.

Urgent/emergency instructions

These should be well known by all controllers, and all students should be able to say them correctly without hesitation:

- Avoiding action: "*CALLSIGN, avoiding action, turn [right/left]* ***immediately*** *heading xxx*" - followed by traffic call: "*Traffic was X o clock...*"
- TCAS RA: Following a resolution advisory *(not TA - traffic advisory)*, ATC **must not** issue any avoiding action. The only response should be "*Roger*", and further instructions should only be issued after the pilot has reported "*clear of conflict*".
- Terrain Awareness System: If a pilot reports to be responding to any terrain awareness systems, such as GPWS, the controller should only respond with and acknowledgement **and** the QNH setting: "*CALLSIGN, roger, QNH 1001*".

Delivery / Ground

Tower

Scan

Scan the runway, short final, and immediate climbout **at all times**. Nothing should ever come as a surprise here. Go arounds, rejected takeoffs, poorly flown circuits, runway incursions, arrival gaps deteriorating, wrong SID, departure separation deteriorating, are all to be expected and there must be no hesitation in taking safe positive action.

Departure gaps in the arrival flow

Is the gap working? What can be done to make sure it works? How do you resolve the situation if it doesn't work?

The most important thing to learn here is how to to make a tight gap work:

- Appropriate use of conditional line ups,
- Instructions to "be ready for immediate departure"
- Issuing immediate takeoff
- Reducing arrivals to minimum approach speed (only if it doesn't impact any following aircraft, and coordination must be done if anyone is on the approach behind!)
- Informing the arrival to expect late clearance
- It is much much better to cancel the takeoff and have a single aircraft go around than to cause a piggy-back go around (but don't stop aircraft who have accelerated more than 200-300m down the runway).
- Always have a plan for if the arrival goes around.

What form of separation is being used

Before solo, the student should always have an answer for this. LOA spacing, radar minsep + coordination, visual, vertical.

Separation is deteriorating or lost

Take action! Issue (terrain safe) instructions to resolve the matter. Use correct phraseology (avoiding action). Discuss hypothetical scenarios and practice doing the radio calls.

Wake scenarios and responsibilities

Sometimes the pilot is responsible, sometimes ATC is responsible. Drill the student until they know the wake rules well. It's smart for the student to have a printout of times and distances at hand.

What if scenarios

When it's quiet, make up hypothetical scenarios for students to enhance learning. Make them say out loud the radio calls involved.

- What is the plan if the aircraft goes around? (They should ALWAYS have a plan)
- Rejected takeoff plan
- Various VFR scenarios
- SVFR
- VFR requests in SVFR conditions or complete IMC
- Weather conditions and implications (Ceiling, visibility, LVP and approach aids, VFR, Deice, runway config, etc)
- Forms of separation (wake, radar, reduced, LOP spacing)

Radar

Scan

Work through the sequence front to back and issue any instructions that can be issued. Look at no. 1, consider if it's appropriate to do anything with their heading/track, level, or speed. Jump to no. 2; heading, level, speed. No. 3, heading, level speed. Then no. 4, no. 5, and so on.

Always prioritise the scan on the base / merge point area and never leave it out of sight or mind. Consider each aircraft in the sequence in turn and quickly determine if you can give a meaningful turn, level, or speed assignment. It is very tricky at high workloads to do this well while also scanning the rest of your sector, so if you have no director you might have to sacrifice efficiency for safety and add extra miles to spacing as a safety buffer as required.

Make sure the student is always thinking **"1 2 3, heading level speed"** when arrivals are in the TMA.

What is the sequence? Is it working? Changes?

Keep asking the student what their sequence is (who is no1, no2, etc.). The sooner they make a habit of deciding their sequence early, the better.

How many miles does the aircraft have from touchdown?

Is the height and speed working well? How does the minimum distance for no1 impact no2, No3, etc.? The use of trackmiles is not a required technique, but can be a very effective tool in analysing a single aircraft's profile situation, and as a tool for comparing two aircraft in a sequence but not following the same path (If spacing is 6 and no1 is 30NM, No2 has to get 36NM plus a couple miles to account for compression, plus wind allowance).

Always apply speed when sequencing

All radar students will struggle with appropriate speed assignments. Speed doesn't always have to be assigned, but must always be considered, and good consistent sequencing is impossible without good speed control. Keep forcing the student to consider their speed assignments. Use of "or greater/less" is normally best reserved for later sessions when the student has started to grasp sensible speed assignments.

Don't give away both horizontal AND vertical

Always ensure at least one form of separation. Make particularly sure students aren't giving directs, climbs, and/or descends just out of habit, as this can easily cause conflict if not carefully considered.

What is the planned spacing?

Every time the student is sequencing aircraft which will end up on the ILS within ~10-12NM of each other or less, the student should for practice reasons have a pre-planned spacing target in their mind. Working to achieve a specific target is a lot more valuable for training than just idly managing a safe arrival flow.

This mindset can turn even fairly slow sessions into useful sessions.

When busy, back to basics

Teaching/demoing various advanced or expeditious techniques is well and good for quieter periods, but instill in the student that when traffic builds, simple and standard techniques is the way to go.

Using the PMS well, vectoring onto nice wide ~90° bases that gives room to judge spacing and time the inbound turn, speed control, keeping things level safe as long as practical, and so on.

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Suggested topics:

- VFR outside and into controlled airspace.
- SVFR
- IFR from outside controlled airspace, and VFR-IFR changes.
- Emergencies
- Airspace dimensions and classes, sectors, terrain safe levels, etc.
- LOA/SOP