High security lockpicking

In the following, I will give a brief overview on how to ascend from classic pin tumbler cylinders to more complex locks. This document is only meant to give a generic overview, from the questions and suggestions I get I will do a video series and go more into detail on the requested topics and what else is important in my opinion. Motivated pickers often experience a learning plateau at a certain level of difficulty, but can already open various locks with safety pins. You don´t have to master all the locks that seem to be easier than the next lock you will pick, just go for it and with some work it sure will pop open. Here is a ranking of various locks and their level of difficulty:

https://www.reddit.com/r/lockpicking/wiki/beltranking

Keep in mind that the rating of some locks can differ quite a bit from the actual difficulty, e.g. due to the bitting or objective perception of the lock classification team. As an example is the Assa 600, as well as the Ikon Sk6 Vector are both ranked as blue belt difficulty, but the Assa 600 is significantly more difficult. Of course the perception of difficulty differs from picker to picker, I perceive a few higher ranked locks to be easier than some lower ranked ones, even though I understand why it´s the other way around for someone else. If one lock just won´t open, that doesn´t mean you shouldn´t try a higher ranked one that seems more doable to you, don´t let a lock frustrate you so much that you stop increasing your skill level. You can eventually come back at it later and it might be really easy by then.

From classic pin tumbler cylinders, the next step is often associated with a leap into the cold water, because many locks then contain combinations of different mechanisms, especially variants with sidebars. These new mechanisms initially seem to be impossible to pick. But that's a good way to gain confidence, experience and learn something new.

For the sake of completeness, I will provide an overview of the basics, which one should master in order to venture into the world of high-security locks:

1. The necessary prior knowledge: https://www.lysator.liu.se/mit-guide/MITLockGuide.pdf
2. What skills should I already have?
    a. Understand feedback from the most common security pins (spool pins, serrated pins, and mushroom pins)
        -> see https://www.youtube.com/watch?v=NI4JeCvS2u0 and for advanced safety pins: https://www.youtube.com/watch?v=ee3rV4j3VkA
    b. Detecting pin states (Not binding, binding, set, overset)
    c. To have a feel for the necessary tension (in short: generally not too much, adapt it to how much is needed, back off tension when you can´t set something, allow counter rotation if needed...)

d. Disassemble locks and get them together again.

i. Useful tools here are cylinder shoes, plug followers, various tweezers, core shims and a pinning tray. Eventually sectioned followers are needed.

ii. For more complex mechanisms, it makes sense to take pictures or videos during disassembly. This helps when getting things mixed up and you can check again later, what exactly was in it and how it all works together.

3. Exercise, of course, is the most important thing. It´s necessary to get a good feel for what's going on in the lock. Practice locks are a great thing to use. For example the revolver from Sparrows. Of course you can also build your own one, then you can choose the lock yourself and have influence on profile, tolerances, lock type (maybe even a dimple one). To make one, take a pin tumbler cylinder of your choice (preferably a free one from a locksmiths) and drill down (/ file down) until the chambers are exposed and then screw in allen screws (it´s easier if you thread it before, but not all the way that makes picking more difficult!):

Now you can change the bitting or the safety pins (preferably from other free cylinders from your local locksmith, if possible with a C-clip and not with one you have to bend) however you want. If you can´t get it open anymore, you can still "disarm" the lock with the allen screws. (It is best to gut it the conventional way with a follower and leave the allen screws alone, otherwise the threads will wear over time)

If you feel comfortable with the things above you may go on with the following topics:

1. How it sidebar mechanisms work

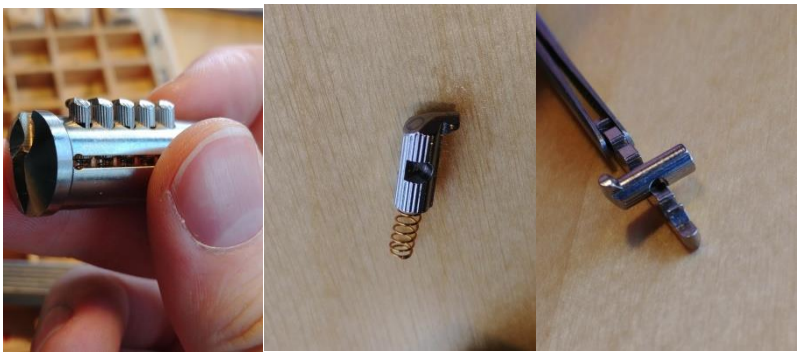
a. A sidebar can be found in pretty much any high-security lock. The simple principle is a sidebar in the core, which is usually pressed by springs out of the core into a

groove in the bible. The core then contains blocking elements (=sliders, fingerpins or rotating discs), which prevent the penetration of the sidebar, unless they are all brought into their correct position. The sidebar then retracts into the core and disengages with the groove in the bible, the core can now rotate freely. The blocking elements that are used for this usually have several notches (gates), of which only one is deep enough to let the sidebar into the core. This groove is called True-Gate. Every other, shallower one is called False-Gate. The peculiarity is that these false-gates allow just a slight penetration of the sidebar and then can get bound up there quite much (unless you release tension).

b. Here are few examples:

↑ Here you can see the sidebar of an Ikon R10 (MT5+). On the left you can see the sidebar sticking out of the core, because of wrongly positioned sliders. In the middle it can be seen with correctly positioned sliders, the locking bar can now be pressed into the True-Gates and allows a free rotation in the bible. And on the right you can see the grove in the bible, in which the sidebar is usually wedged.

↑ Here you can see the sliders from the R10 on the left, they have less deep notches, these are false-gates (actually there are much deeper false gates than these serrations e.g. in an Assa Twin 6000 or an Evva ICS). These are deep enough so that the sidebar can get caught in it, but not deep enough that the sidebar can completely enter core. In the middle and on the right you can see the sidebar.



↑ Here every fingerpin not only needs to be brought into the correct height, but also to be rotated correctly. Therefore, the false-gates are here Vertical serrations, this is more effective then horizontal notches in this case.

2. The main "tricks" that make heavy locks easier:

a. A tight-fitting (usually TOK) tensioner provides the necessary control of the core rotation

b. With a well-fitting tensioner you can selectively turn back the core, this is necessary to set e.g. Assa gin bottles or almost any kind of sliders as such.

c. ! All properly set locking elements are frictionless on a very small radius of movement, a spring is now the only force effecting this slider (if there even is a spring). If you can feel that, you can recognize set pins very well. For sliders and fingerpins (everything that interacts with a sidebar), this so-called "jiggle test" is indispensable!

d. For some locking elements, it makes sense to not permanently exert pressure on the locking elements. Since these otherwise become so wedged into their false gate that you have to continue to turn back even further and thus other locking elements spring back from their correct position. This problem is found, for example, with locks such as EVVA DUAL, ICS and ASSA Twin 6000 (actually all decent sprung slider locks with deep enough false gates). Especially on the Twin 6000 (on the gin bottle spools and the sidepins) it is usually better to build up pressure in a pulsating manner on the locking element, while lightening the tension briefly and then increasing it again when the element is set, so that it can come loose from the sidebar or an undercut (notch in the core, where spools can get caught).

e. The deep understanding of a lock and its weaknesses is the key to lockpicking. Of course there are weaknesses that are found on many mechanisms (the jiggle test is a good example here).

3. Tooling

a. A good selection of hooks is the best foundation to pick most locks. It makes sense to have a good selection of thicker (0.5-0.65mm) and thinner (about 0.4mm) picks (no rakes needed) to be as prepared as possible.

b. Many locks need special tools e.g. dimple locks, for these it is proficient to use dimple picks (aka Flags). It should also be practiced, as it is again indispensable for many challenging locks.

c. The right tensioners are just as important as the right picks. TOK tensioners (aka pry bars or flat bars) are usually the most preferable type. TOK (= Top Of the Keyway !!! In Europe the locks are used with the bottom up so don´t get confused here!!!). BOK (Bottom often The Keyway) is the more inaccurate method. To avoid confusion: TOK is contained in virtually no pick set and actually acts in the middle of the core. BOK is what everyonehas in his pick set, these are used at the edge of the core.

i. You can make tensioners yourself particularly well from windscreen wiper inserts. However, the TOK tensioners are usually not that good when they are home brew.

d. How do I decide what´s the right tool?

i. I choose the tightest-fitting TOK tensioner as possible.

ii. I try my favourite hook (should be a standard hook and thicker than 0.5mm). If I can´t move this one well in the keyway, then I take a thinner hook. Should I notice that I can´t reach something, then I will use a deeper hook where needed.

iii. When I realize that something is not working out I try to think about why it is not and this usually leads me to what else I could make myself, if necessary, from feeler tape, cheap chinese dimple sets or whatever is available.
Sometimes, however, creativity is needed.

4. How do I handle new challenges?

a. First I try to get all sorts of information. Often these are quite useful:

i. http://www.wiki.koksa.org/Kategorie:Profilzylinder (watch out it´s german)

ii. http://www.lockwiki.com/index.php/Main_Page

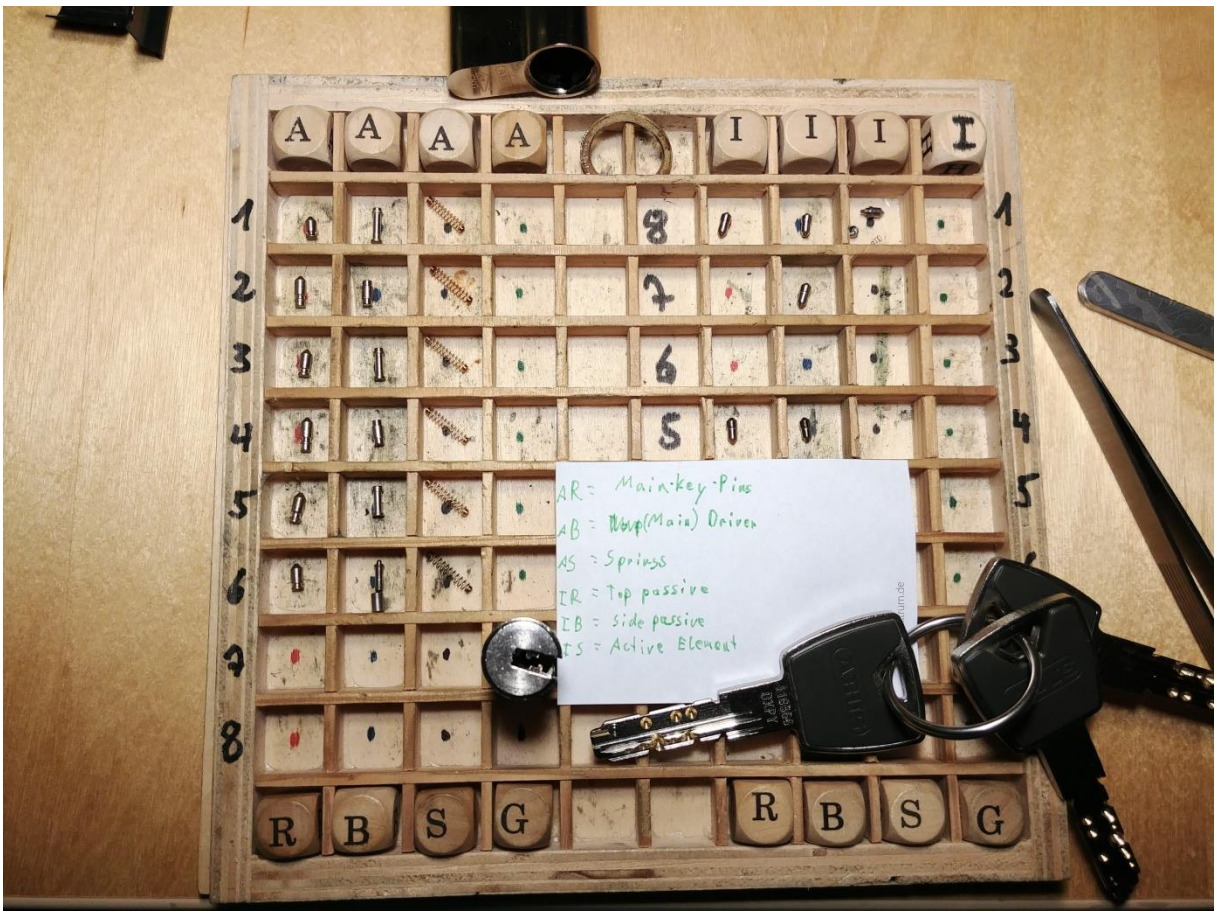
b. Then I gut the lock to get a better understanding what I have to do exactly. When you look at something yourself, you can understand more aspects than by looking at pictures. At the same time, I am looking for ways to make it especially easy for me later on and can already try out which tools might work well.

c. Last but not least, I try to recognize the weaknesses of the lock mentioned so far, in which I go through the process of picking in my mind and think about which details are to be considered. For this reason, it often makes sense to exchange with others when struggling with a certain lock.

d. Then I start picking

e. When I am sure I can´t pick a lock yet or at point d. have noticed that it is very tricky, and then I try progressive pilling. So depending on the mechanism, I start with a reduced number of blocking elements and then gradually add more. This is a very powerful approach, because you can make a lock only a little bit more demanding. I personally use it only very occasionally because it should only help you to understand what you are doing. E.g. once you know feedback from the jiggle test you don´t really need to progressive pin your other slider locks. Then you might just learn the (exact) lock you´ve got by heart and that´s not really the spirit of picking (in my opinion but I don´t mind if anyone disagrees).

Here are a few more pictures if you are interested:



↑ Abus XP20S. You can clearly see how useful it is to have some knowledge on the lock before actually picking it.

↑ Assa Twin 6000. Here we have a sidebar mechanism with very deep false gates. Also the pinning of this lock is not as intendet. So even when you know what should be inside, you never know whats actually inside. Better have a look before to not break anything.

Further information on those and other locks you can find on may youtube channel:

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