Jajos best advice to start making an XML

If you are thinking about making your own XML, here are some of my best tips and tricks. First of all, congratulations on the decision. Having your own XML is the only way to get photos exactly like you want them. It is a very complicated and time consuming process, but it is great fun and chances are that you will develop your interest in photography along the way. There are a few things to think about before starting the development.

What is a good photo for you?

The single most important advice before starting to make your XML is to spend some time thinking what a great photo is for you. We are all different and we see the world differently. What makes a photo realistic is very much affected by the way you see things in your daily life. Maybe accurate capture of light and shadows? Perhaps you want really strong colors and "wow" factor so you can share them on social media without post processing? Maybe you want the cleanest possible photos without any noise at all?

It is going to be very hard to get everything right. You will be required to compromise so it is important to have a priority list what your XML is going to do best.

If you have other people using your XML you will get many "requests" to change this and that. Sometimes this can be useful feedback, but don't try to make everyone happy. Stay focused to your own vision otherwise you will be lost.

Issues are OK

You will always find issues in situations where your photos does not come out as you want them to. This is unavoidable and ok. The important thing is that a high ratio of photos have the desired result. If you try too hard to fix rare issues, you might screw up the more important shooting scenarios. Accept flaws and look at the big picture.

Take lots of photos

You will never be able to make a perfect XML by only shooting the same scenarios over and over again at home. Go out, try to take as many photos as possible in

different light and conditions. Focus on the type of photos you normally take while using the camera as a daily driver.

Start from scratch

It is tempting to just take someone else's XML and start changing settings. Unfortunately, if you go this route, you will not learn the basics of creating an XML and it will be much harder to get the end result you are looking for. Also, if you ever want to share your XML with others it is best to make it from scratch to avoid being accused of plagiarism. But the most important reason is that you will learn more.

Save often

Save your development XML as often as possible and always make a new name (like dev1, dev2, dev3). That way you can reverse a previous setting change if you take wrong decisions (you will do, many times!)

Basic configuration, checklist

The steps to get the core XML working will be:

- Select a GCam port - there are many different ports of GCam that have their own strengths and issues. The best advice is to see what other developers are using for your smartphone model. It is usually the best choice as there are more people to ask if you get trouble. Avoid the latest versions GCam (8.8, 8.7) as they are often more buggy and have less options for configuration.
- Get the GCam port running without crashes and make sure it saves the photos taken - 1) you might have to configure Hardware Level 2) set correct Interface Model and HDR Model (test them all to see which one that works best and have working night sight and so on) 3) the Viewfinder format 4) RAW format 5) Disable Hexagon DSP (not always needed) 6) Change stream settings if a specific mode is crashing
- Setup the AUX cameras to get all lenses working. On some ports they will be automatically detected, otherwise you need to configure them. Using an app like Camera2API Probe will let you know which unique ID each lens has
- Setup a proper noise model for each camera to get better noise performance. Check what sensor model each camera is using (Google it). If you cannot find it

in the list of built-in noise models you might have to find one in the community and load it in Gcam

Selecting merge method and configuring the amount of frames in merge

One of the basic settings that will greatly affect the quality and look of your photos is selecting the merge method to use. When you take a photo in HDR+ or HDR+enhanced, it will take several and then combine them into one photo with better quality and bigger dynamic range. Test each of the methods and pick the one you like best. The two most common are "Sabre merge" and "Spatial RGB". Sabre has a very soft look with very low sharpening by default. Spatial RGB gives sharper images and has better noise control but looks slightly more processed and takes longer to process after image is taken.

When you have selected a merge method you should also configure how many frames that will be combined. This will affect exposure time (more frames takes longer) and quality (more frames gives better dynamic range, less noise and more detail). In most ports, 28 is the maximum.

Color correction

By default, GCam will probably not have very accurate colors. You need to check the color correction section and try different preconfigured profiles to make corrections to the final image. Try them all and select the one you like best. You can also do manual color corrections but this is more advanced and probably overkill in the beginning.

Lib patcher: Start trimming the configuration

Now that you have a basic GCam that does not crash and can save photos you need to start playing with the lib patcher. This is the feature where you can control every aspect of GCam and how the images are processed. Many settings will affect each other so it is like solving a very complex puzzle but don't worry - you will learn how everything works together with time. Each setting will have a default value set by the default Google lib. You can usually see which value that is the default one when you click on a setting and see the available options. Start playing with the values by setting something that is both much lower and much bigger than the default value. This way you will get a feeling how it will affect the end result.

Checklist for important things to tweak in the lib patcher

There are more settings than most people can learn to master in a lifetime, but the important ones to check out are:

- Denoise (can be made in many different places in the patcher, like main configuration, sabre configuration and more)
- Sharpening
- HDR and exposure (most important is to set the right HDR ratio in "Exposure" and HDR range in "Light and Shadow" to get good shadow and highlight control)

When the GCam port is updated

There are constantly new versions released by developers that will fix bugs and improve performance. After each update it can be critical to recheck your settings and tweak them if the behaviour of the port is different. Usually, when there is an update within the same GCam major version (8.4, 8.7, 8.8 etc) there are no need for big changes in your configuration. If you upgrade to a new major version (like going from 8.4 to 8.8) you will have to go through all settings again and see what has changed.

Enjoy your own GCam configuration

Congratulations. You have created the perfect camera for YOU and probably increased the value of your expensive phone investment greatly. Now go out and take lots of great photos to share with family and friends.