

Tube pictures using the webcam

translated by Ton Regeling (thank you very much to him)

To document your tube collection it would be good if you had pictures of them. This enables you to accurately document the tube condition, especially in the case of used tubes. The new tubestock database allows you to add any data including images to the tube documentation.

You can make this pictures using a any digital camera, but you would have to do some work:

- Rotate the image
- Resize the image
- Resample the image to a lower resolution – you don't need the very high resolution pictures most modern cameras produce
- Save as an appendix to the tube documentation in the tubestock database

It would be more practical if these steps could be automated. Unfortunately most digital cameras can't be controlled using a PC..

Webcam als camera:

You can also make pictures using a USB webcam, Let's look at a webcam and the picture they make:

1. Resolution is 640 x 480 pixels (VGA) – this is good enough if you just want to look at them on screen, even if you can't enlarge them. Also if you want to sell your tubes on E-Bay this resolution is good enough.
2. Portrait mode: most tubes are higher than they're wide and usually you'll want a portrait mode picture. You can accomplish this by simply rotating the web cam. You can rotate the image using software for on screen viewing.
3. USB connection. Most webcams are automatically recognized by Windows. To control them using USB is not a problem.
4. They are cheap. I use a 16 Euro web cam that I bought off of E-Bay. I don't know if more expensive cams yield better pictures: often times the brand name and the optics determine the price.
5. Close up shots: this is a problem with most cheap webcams: close up shots are not focussed. We'll solve this problem.

Hardware:

Close up shots are a problem because most web cams can't focus if the object is too close to the lens. We can solve that by putting a lens in front of the webcam.

Professional photographers will laugh: I simply mounted a cheap magnifier in front of the webcam. Of course you can also use a more expensive camera lens if you have one and if you so desire.

I used the following parts:

Webcam + magnifier:



Plastic tube with lid from a home improvement store to attach the lens:

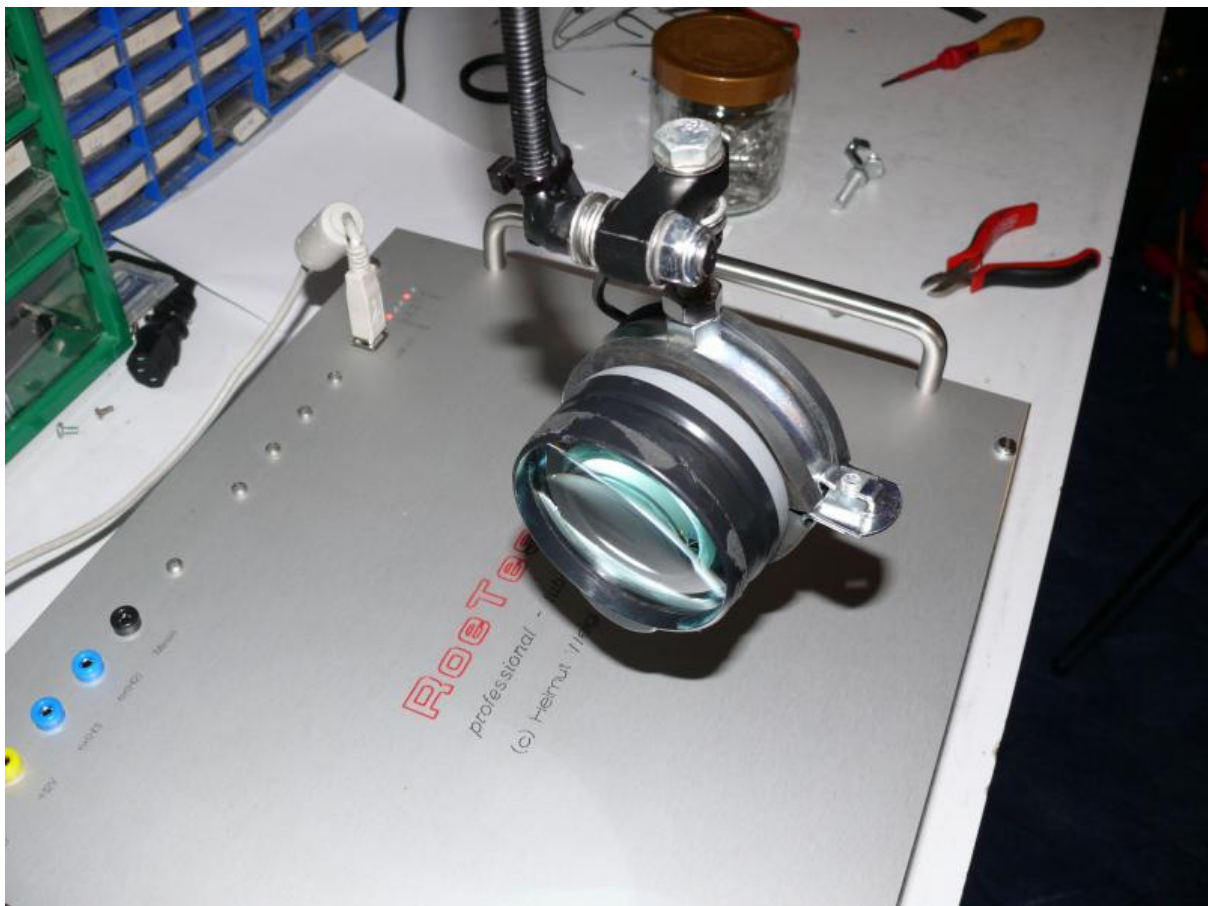


Cut the plastic tube to a length such that the distance between the lens and the webcam is a couple of centimeters. The magnifier determines the right distance, so try out different length. In my case the distance wasn't critical since the webcam automatically focusses.

Drill a hole in the lid and glue the webcam to the lid. I used some rubber between the camera and the lid, to make sure no light would come through. I taped the green led on the webcam using black tape, so it doesn't reflect in the lens. Put the lid on the tube but don't glue it so you can still rotate the web cam. I used tape to attach the magnifier to the tube. Paint the inside of the plastic tube with no-gloss black paint so there are no reflections.

Now we need a monopod or a similar device for the webcam such that we can rotate the webcam around the tube and we can make pictures of a tube from all sides. I attached my monopod directly to my tube tester. This way I can make pictures of a tube without removing it from the socket.

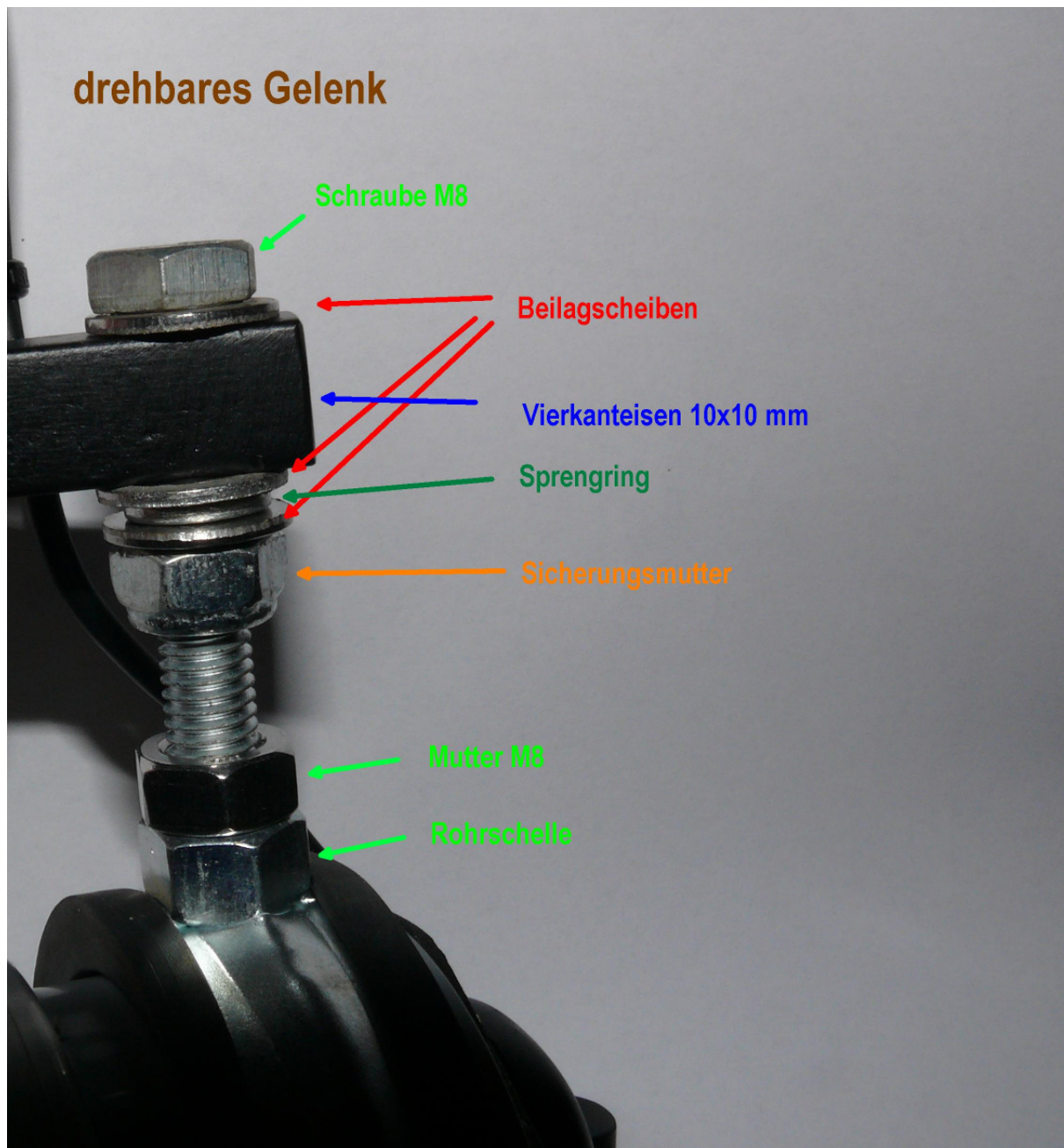
See the pictures below:





My monopod is simply made of some flat iron and round iron tubes, threaded rods and a bunch of nuts, bolts and washers. The monopod is attached using a pipe clamp.

All monopod joints can rotate. Spring washers are used to make sure the joints stay in position. Fasten the nuts lightly, so the joints can still rotate:

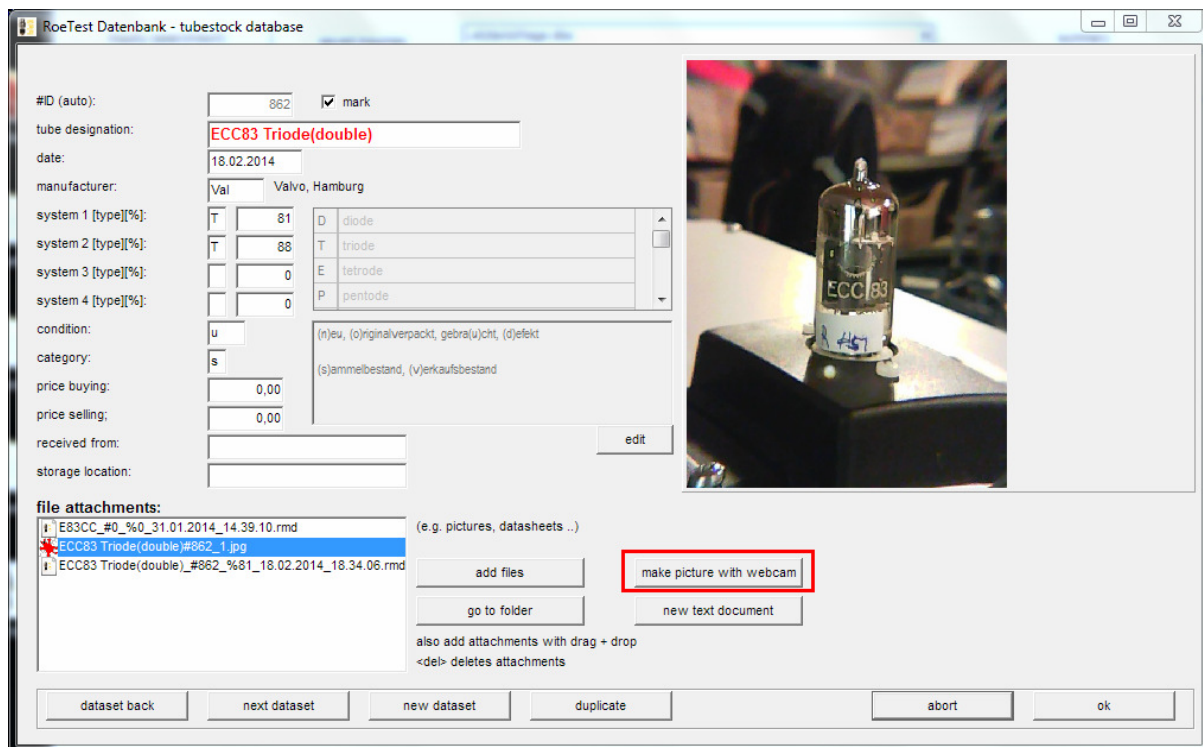


Lighting:

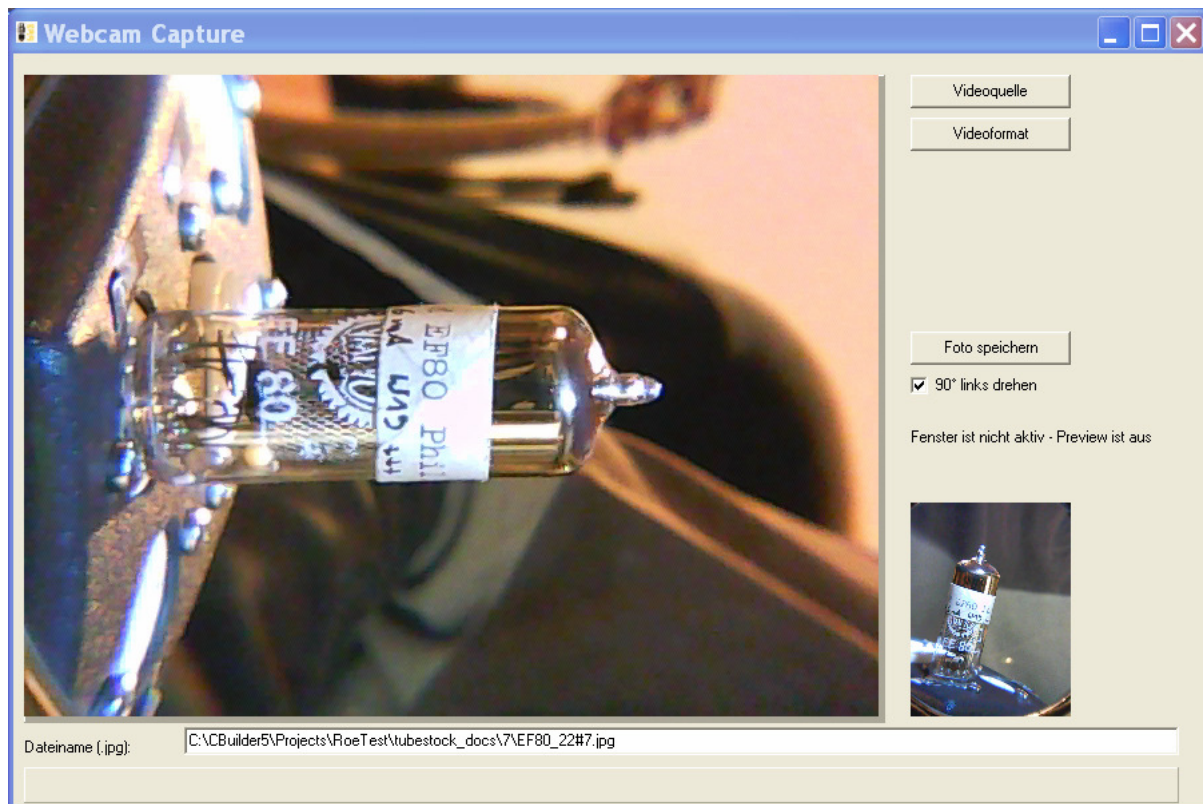
Since the webcam has no flash, make sure there is enough light for it to work. Day light is best but avoid direct sun light. Otherwise try lamps, but try to avoid that the light reflects on the tube. Lighting from above usually works best. Experiment a little. You can also try and attach some LEDs to the monopod.

Software:

In the tubestock database program use the button „make a picture with webcam“ to make a picture of the tube:



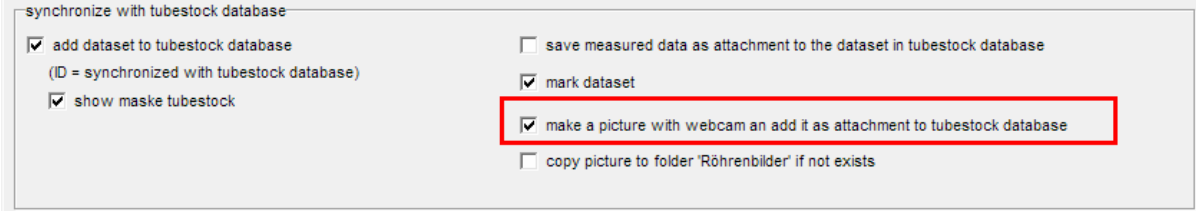
This automatically opens a webcam view and starts the webcam. The picture is made and automatically added to the database as an appendix. File names are automatically assigned.



The webcam viewer remains open in the background either until you close it or you close the database program. This makes it faster to make multiple pictures of a tube since we don't have to restart the webcam each time. I use 2 monitors with my PC

so I can move the preview window around a bit and have it visible together with other screens. You could also use a large hi-res monitor. Continuous preview mode is disabled because it uses too much of the CPU resources.

You can also integrate the webcam pictures in the batch processing mode of the RoeTest program:



synchronize with tubestock database

- add dataset to tubestock database
(ID = synchronized with tubestock database)
- show maske tubestock
- save measured data as attachment to the dataset in tubestock database
- mark dataset
- make a picture with webcam and add it as attachment to tubestock database
- copy picture to folder 'Röhrenbilder' if not exists

Obviously photo quality is no match for a proper digital camera but for simple documentation purposes the quality is good enough. If you want you can use appropriate backgrounds such as black paper.

If you have multiple webcams:

My laptop already had a built-in webcam and when I connected the USB webcam it didn't even detect it. I solved this by simply disabling the built-in webcam (control panel->devices).