

# A Bausch & Lomb Metallurgical Microscope

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I recently acquired a used Bausch & Lomb metallurgical microscope from the shopgoodwill.com auction website. It was in remarkably good condition and required minimal cleanup. It did not require degreasing or repainting as many of the used scopes I have acquired had.



It came with a 5X eyepiece and three axial illumination objectives. I already had another axial illumination objective of the same vintage in my collection.

Here are two side views of the microscope:



The tube length is 215mm to accommodate the beam splitter assembly and required objectives specifically designed for the 215mm tube length.

The beam splitter used to transmit light downward through the objectives could be flipped aside with a knob above the turret to enable transmitted light microscopy.

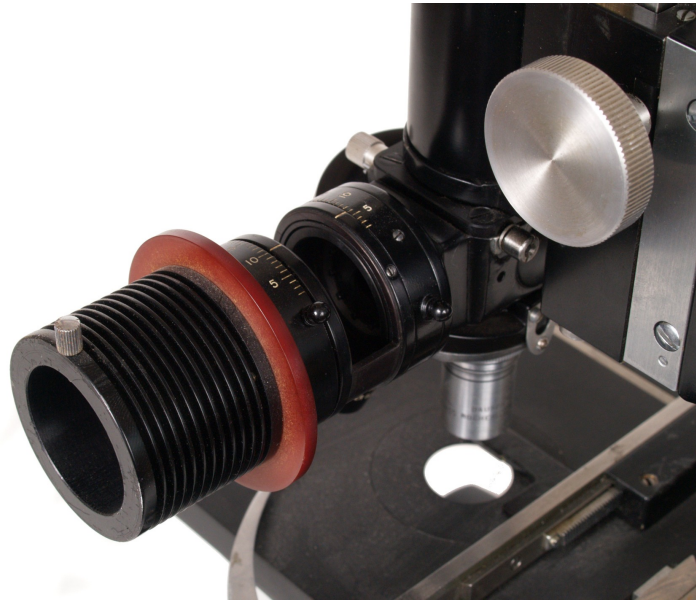
The stage is somewhat larger in area than other microscopes in my collection, no doubt to accommodate gross specimens.



Coarse focus could be attained either through raising or lowering the tube or the stage. This also enabled accommodating gross specimens to adjust for the working distance either way. The fine focus knobs on each side controlled fine focus through the stage.



The condenser assembly included a filter cavity, a field diaphragm and condenser diaphragm.



Compared to other metallurgical microscopes I have used, this condenser assembly is remarkably bright.

As I mentioned earlier, the scope came with three axial illumination Bausch & Lomb objectives – I already had another one in my collection. The specifications for the objectives are:

- 0.25 N.A. 10X 215mm T.L.
- 0.40 N.A. 20X 215mm T.L.
- 0.40 N.A. 20X 215mm T.L.
- 0.65 N.A. 40X 215mm T.L.

All are marked USE WITHOUT COVER GLASS. The 10X and my 20X have black plastic barrels and have plastic sleeves around the optical path to pipe light down through the sides of the objective to illuminate the subject; similar to the performance of a ring light in addition to light piped down through the objective optics.

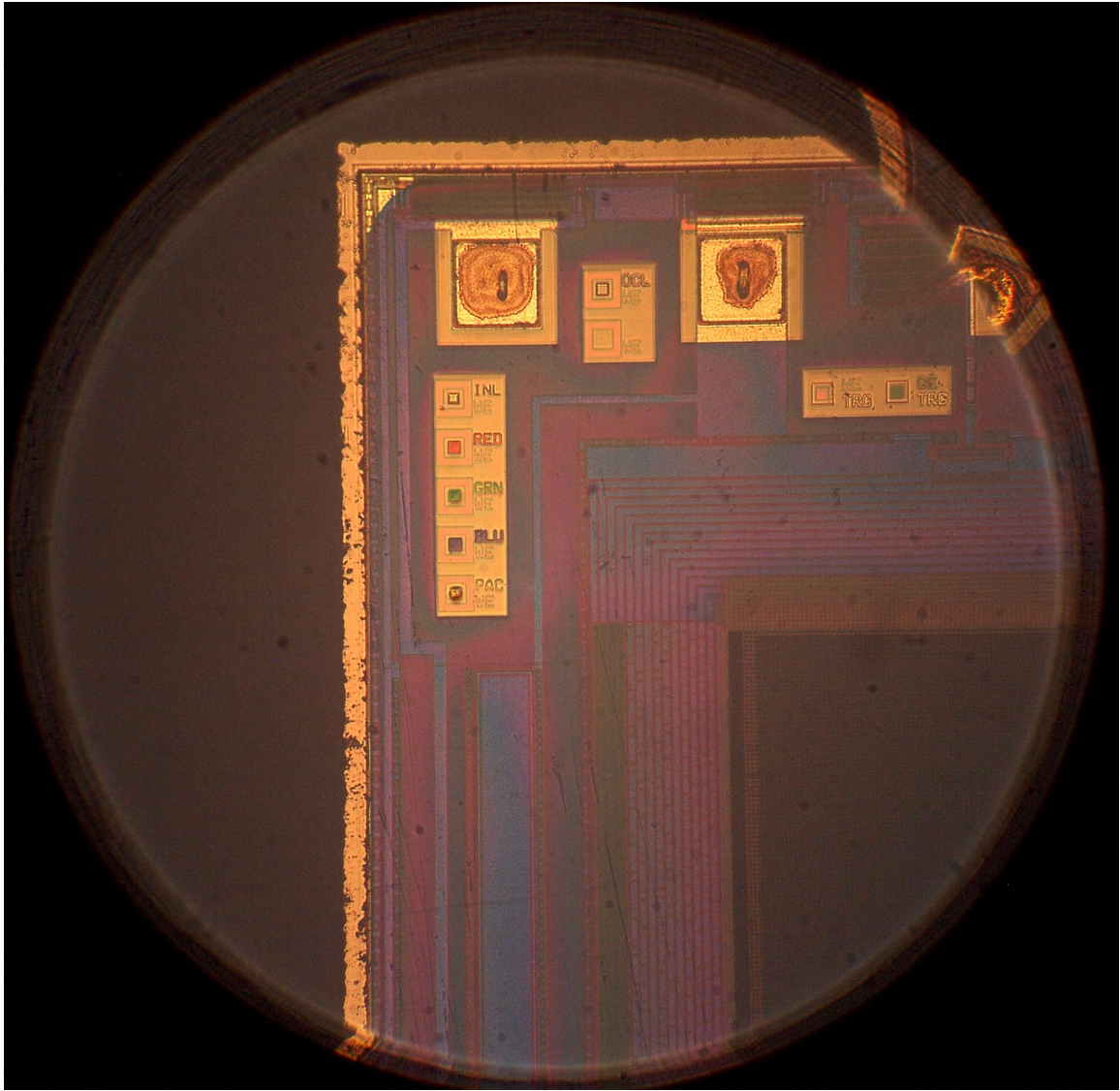


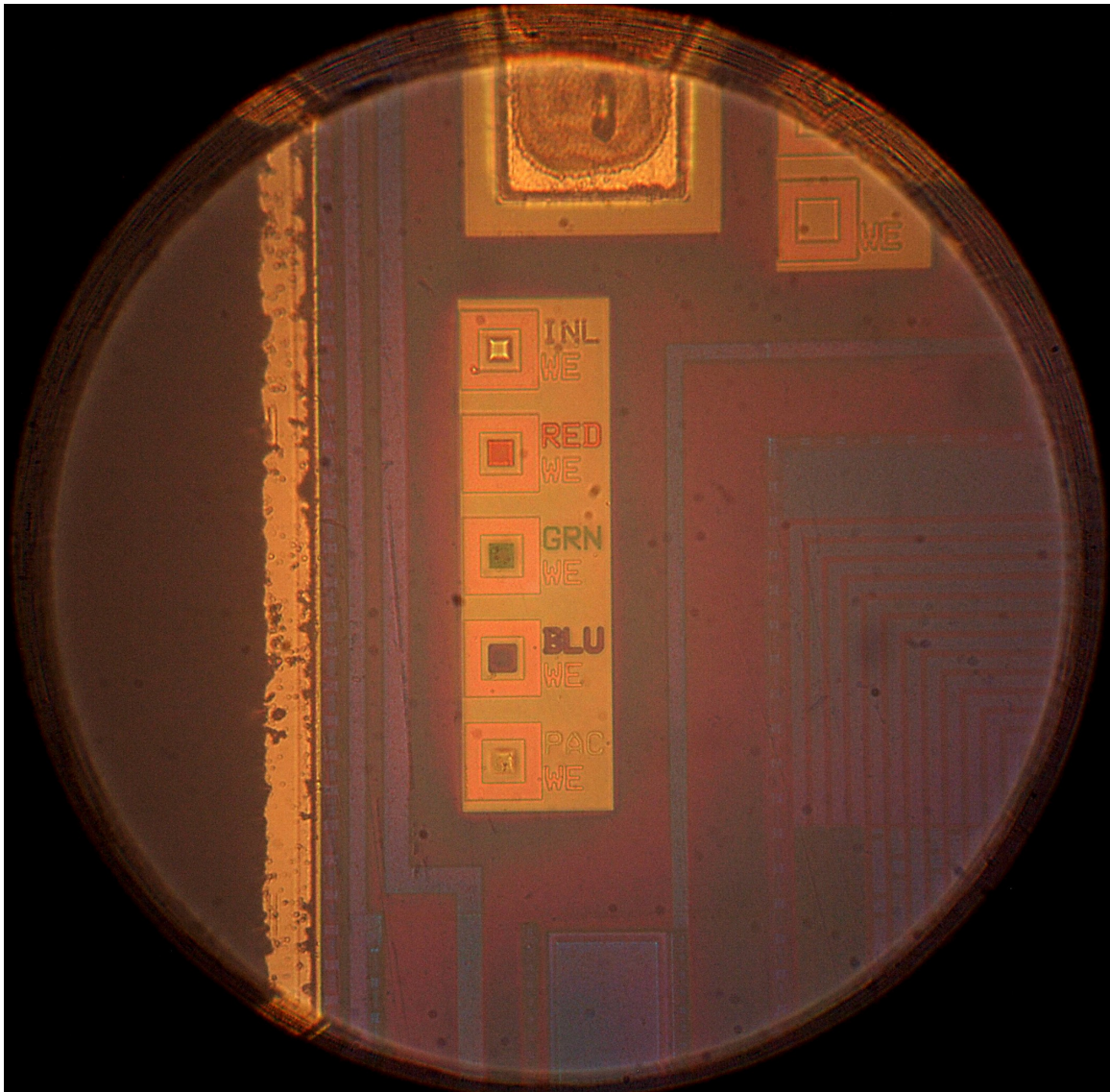
As you can see in the right image, the sleeve carries the RMS thread mount.

So, how well does this scope perform? The following images are test shots of a digital camera CCD. The light source was an articulated microscope illuminator positioned at the end of the condenser assembly. Instead of the eyepiece, a 1X relay lens microscope adapter was used in the eyepiece tube with a Micro Four Thirds camera.

10X objective

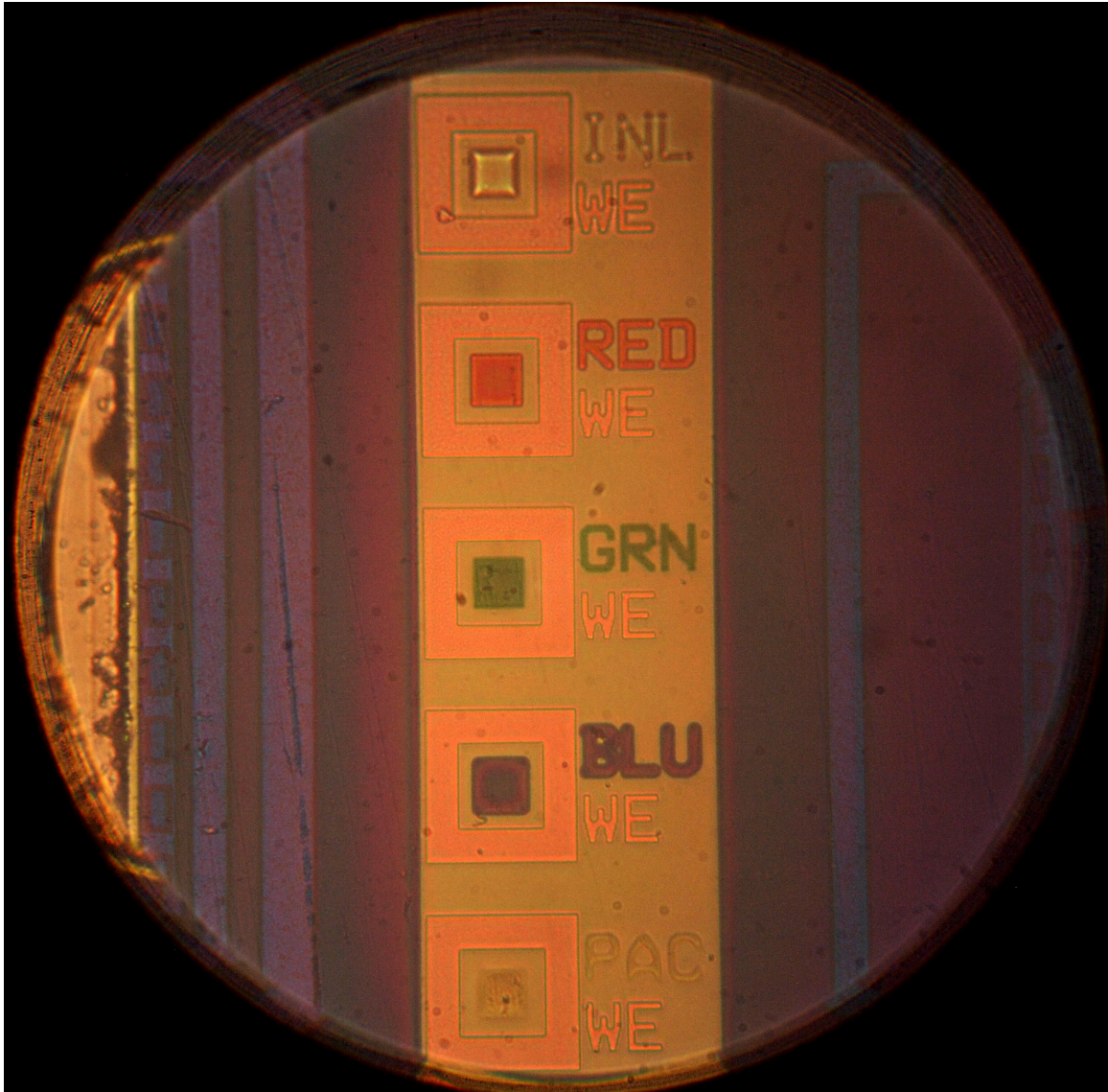






20X objective

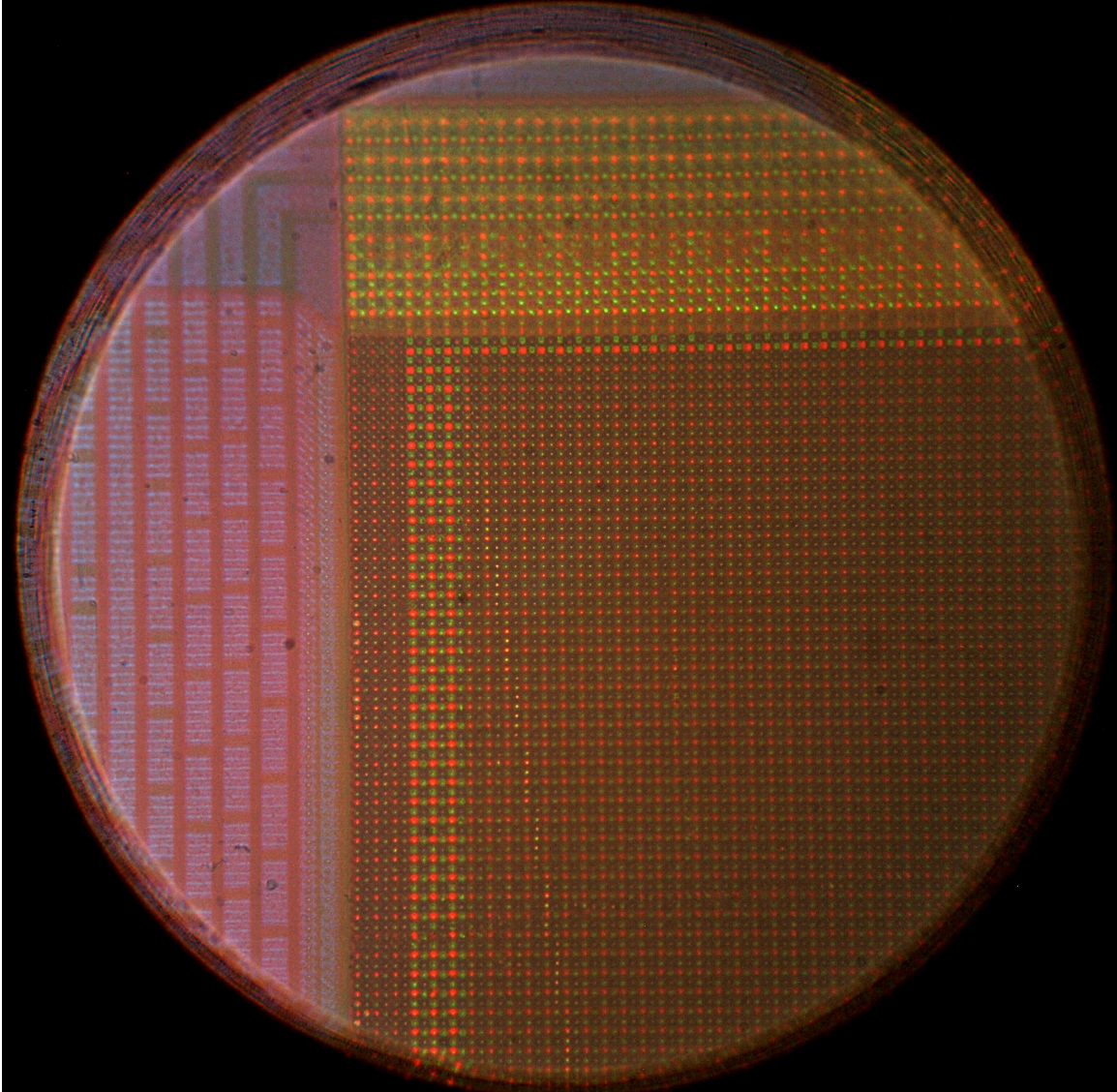




40X objective

As a further test of the resolution with the 40X objective, I took a test shot of the pixel field of the CCD sensor. The pixel sites are approximately 4 microns in diameter.





In all, pretty fair performance for an instrument over fifty years old. I was really impressed by the flatness of field.

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