

Washing of T&M Instruments

This procedure for washing old T&M instruments is based on the suggestions found in the book "Oscilloscopes - Selecting and restoring a Classic" written by Stan Griffith. The result of wet washing, rather than dry cleaning is really amazing. If the metal parts do not have any corrosion, a condition is achieved which is comparable with "ex works". Follow this procedure:

- ☑ To avoid new dirt (leaking electrolytics...) after washing operate the instrument via an isolation-transformer. If necessary do any repairs, so that a functional test can be performed before and after washing.
- ☑ Remove tubes, transistors etc. from their sockets (store the parts in paper bags, and note their part no. and/or location), paper covers of electrolytics, shielding sheets, electro-mechanical (moving coil etc.) instruments,
- ☑ Remove any other parts which are affected by water, as well as parts which can be disturbed during washing with a brush. Do not remove the front panel knobs at this time.
- ☑ Transformers and coils with open windings/cores may be sealed with tape (not mandatory).
- ☑ Remove any stickers or markings with Sticker-Remover (RS Label Remover).
- ☑ Prewash locations with oil or grease with Degreaser.
- ☑ Spray all switches, contacts, pots and so on with Contactclean , let it act on them and operate them a few times. Then spray with Contactclean .
- ☑ Spray the entire instrument with water but do not submerge - an instrument is no submarine!
- ☑ Wash instrument with brush, Foamwash and some more water from a spray can.
- ☑ Spray all switches, contacts and pots with Foamwash, briefly let it act and then again operate them a few times.
- ☑ Wash the entire instrument with plenty of deionized (important to avoid conductive ion pollution) water, until all Foamwash is rinsed away (approx. 10 liters for a large instrument). Position the instrument so that there are no pools of liquid left inside.
- ☑ Carefully blow any drops of water away from the inside of the instrument with oilfree compressed air (RS Aerosol Duster).
- ☑ Dry the instrument for at least 6 hours with warm air from a heating fan , direct the air stream through the entire instrument (use cardboard sheets to cover the sides and top).
- ☑ Do not turn-on the instrument for at least another week (to give any residual humidity time to leave).
- ☑ Spray switches and contacts with Top-Pin and oil the bearings (fan, rotary switches).
- ☑ Clean the tubes with a lightly moistened cloth (improves heat transfer; but you may lose the markings!).
- ☑ Remove all knobs and wash them with Foamwash and a tooth brush.
- ☑ Finish the front panel with Glas Cleaner.
- ☑ Replace tubes and all removed parts (check for proper position).
- ☑ Operate the instrument and perform a functional test.

After washing, the instrument should look like new, even any oxide on the contacts should have vanished. Sometimes aluminium or steel parts do have some oxidation – this cannot be removed (unless you use sand paper – but sanded spots don't look very nice). You can use a high pressure cleaner, it should have an inlet for detergent, and be self-suctioned (to draw deionized water from containers) – don't use maximum pressure and do not spray from a short distance directly onto the parts! I have used this washing procedure on approx. thirty instruments and never caused new faults due to washing – but of course I cannot give any guarantee. Parts of the enclosure become nice again with a new coat of paint. Painting with a roller is convenient, as the paints used are usually have a dull finish. Brushing will give a better finish on hammertone paint.

Sources

Foamwash: Electrolube SafeWash, RS, Best.-Nr. 290-4881
Contaclean: Cramolin, Newark/Farnell, Best.-Nr. 840-026
Wash: Cramolin, Newark/Farnell, Best.-Nr. 840-040
Top-Pin: Cramolin, Newark/Farnell, Best.-Nr. 840-154

Repairs

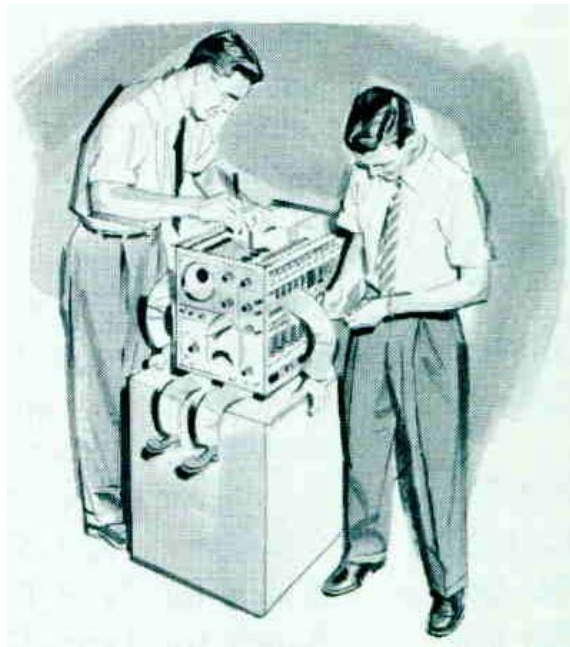
Most of my instruments are repaired to a condition where they function in principle. I do not recommend a 100% calibration – little problems appear from day to day. After the restoration you should power-on the instruments every month or so, to avoid problems due to the storage.

For day-to-day work you should use newer, transistorized instruments. There is no annoyance if your instruments aren't reliable due to a repair session!

I always try to locate 2 instruments of one type, because you then have all spare parts. This is true even for the tubes – using new-old-stock tubes in old equipment is too expensive. Exchange of all capacitors which is recommended by some gurus, is overstated. As long as a part does its job there is no reason to replace it.

What is really needed is the technical documentation, without it, no professional starts any repair.

To close I want to say, that the better instrument is always the better buy. Especially as to regain the physical condition is extremely hard work. "Dead bodies" just make sense as spare parts only.



(Tektronix, catalog, 1963)

Have fun while trying-out!
Stefan Graef