

Service Memo for Tactile M 4000:

Problem:

General Service of M 4000 System with Motorfaders.

This procedure should be gone through every time you want to make a service on the console which will cover more than one (faulty) item!

If you have a defective input channel for example, you know where to look for, but if the problem you have is covering several stages (input / group / AUX / output / monitor) of the console, you should check the overall performance prior to your service.

Method:

Switch ON the console and save all stored Data on a Floppy or the HDD.

Attention: also the HDD may go wrong, so have all your important productions saved on a FDD as well. It may sound like double work – but it may save your show one day!!

Take good care of your backups and make them whenever you have updated a running show – mark the versions clearly!!

Once your backup is made and complete, please verify it!! Make a recall from this floppy and see if the faders move the same way you remember to having programmed them!!

Now you are ready to start your service:

General check of console functions:

1. General System check:

In the display select UTILITY and the VERSION. See if all sub-CPU's have been found, in this case they will show their version-number.

If one is missing, it will display an empty space.

2. Fader Check

Press the CLR button under the LCD display.

Now type in the numbers: 41582525 and press ENTER.

You now will see that the display in the LCD will show some numbers above the F 1 to F 4 buttons:

F1: +12dB F2: 0dB F3: -20dB F4: inf. F5: EXIT.

Press the F1 and F3 buttons and watch the faders moving up and down.

Note down every fader which will not run smoothly or not at all!!

Also toggle between F 1 and F 4 and see if all fader travel the full distance without too much delay, or if some faders will only travel up or down!.

Touch the faders to check if the touch-sensor is active (in this case the MAN LED will flicker)

Note down every improper reaction of the faders.

After you have checked every fader individually, press F5: ESC.
Should you accidentally touch the F5 button during your check, repeat the procedure by pressing 2 x CLR and tzye in 41582525 again, press ENTER!

Now select GLOBAL ON and set all faders to any position, press store and A.
Next, set all faders to a different position and press store B.
Now toggle between these two settings. Everything O.K.?
If not, **note down** what is wrong.

3. System Copy

Next point is check the "SYSTEM COPY" functions.

Select a number of functions and fader settings, plus EQ and AUX send gain for the first channel.

Now select GOLBAL COPY ALL and hold down the ACCESS button of the first channel, at the same time press the ACCESS button of any channel – or one after another from 2 to 24.

Now check if the setting from channel 1 has been copied correctly into the other channels. Do this one by one.

Note down if you find any deviation bigger than 1 digit on the display.

4. Checking the Encoders

What looks like a potentiometer is in fact a digital encoder, i.e. this device makes contacts while you turn it – and these contacts are conted by the system. Like any other potentiometer, these encoders age, i.e. they make bad contacts. This can be seen if you turn an Encoder forward, but the LED it drives either stays, jumps forward or backwards, this means, the electrical reaction does not represent your mechanical turn.

In this case, the Encoder is worn out and needs to be replaced.

Note down every Encoder which does not do what it should.

If your console has been used often, or is older than 4 years, we recommend to exchange ALL Encoders in your console.

This is not an easy job and should only be made by qualified engineers.

5. Checking the LED`s in the meterbridge

Press 2x CLR and then enter 41582525 press the ENTER button.

Now turn the DATAwheel under the LCD screen clockwise. You will see that all LED's of the console metering system will light up – one after one, starting with the meters of inputs channel in the console, then going to meter 1 of the meterbridge etc. When ready, all LED's should be illuminated.

If some are missing, you need to take them out and solder in new ones.

6. Checking the AUDIO-path

Now you should either connect an external signal (a CD or MIC) or a test tone generator.

Start with input 1 MIC In make the routing via the groups to the master, select MASTER in the monitoring section and listen to your signal. It should be free of distortion and it should have the same level on both channels.

Then switch ON the EQ in that channel and turn the EQ and listen to the results. There should be no clicks or side noises.

Now select the PAN of the inputs and groups, turn them and listen to the signal. If sharp L or R the signal should be audible on one channel only. Then put the PAN to the centre position and move the fader fully up – see what the meters do. Now slowly move down the fader and listen to the signal.

The signal should disappear gradually from your monitoring system, there should be no audible jumps in levels. And no clicks!!

If you hear anything which you have the impression is not correct, **note it down** and describe the problem with your own words, so you understand what you mean!!

Then connect your signal to the LINE input and repeat the procedure.

Then you may do the same for TAPE.

If you hear anything which you think is not normal, note it down.

Then repeat that full procedure with all the other input channels.

7. To check the correct level settings, please refer to the technical manual.
8. Look for the page where you see the location of the VCA trim-potentiometers. Every VCA has a level and a distortion control.
9. Set the distortion control first for min. distortion figures at the relevant testpoint which can be looked up in the service manual. Then set the level accordingly so your external meter (test equipment) will read + 4dBu at the output.
10. If you find any output which can not be adjusted, or where you have an unbalanced signal or the signal is uneven between left and right output, you should look after the VCA itself (they are mounted on a sub-PCB in the M 420 and M 430) and check if they are O.K. In some cases it is possible that due to the heat inside the audio racks some of the tracks are shorted against a soldering pin, and so the VCA will not work. This should be looked after with great care!! If everything is all right, but the problem still is there, please check the IC following the VCA (4458) which is soldered on the main PCB close to the VCA. In some cases the IC is dead, or one of the capacitors has a short circuit somewhere on the PCB in the close vicinity.

When you have finished the test of all audio paths, please make sure to have noted down all the problems you have found. Then you may start looking for the problems on the PCB – otherwise you will get crazy by pulling the individual channels in and out of the audio racks.

One practical advice: if you have a defective input PCB inside the M 420, it is impossible to repair this inside the audio rack. Take out the M 420 from the 19" rack and put it on a table, connect it to the rest of the system as it was before.

Take out input ½ as well and put this into the position of the defective channel, quickly check for performance and then start working on the defective channel. We found it very easy to check this upper PCB outside the M 420:

Simply take a thicker cardboard which should be longer and wider than the input PCB. Tape this to the top of the M 420. Now disconnect the channel ½ from the

internal wiring and connect the short looms from CH ¾ to the input PCB on top of the cardboard. The looms are just long enough to cover the distance. Now you can trace the tracks on the component and the soldering side quite easy, you can move the PCB upside down, even if it is powered up – **but be very careful not to touch any of the tracks with your fingers!!**

When you have repaired all defective stages, put back the PCB into the M 420 and check for performance again.

Servicing the PCB's inside the M 430 is a bit more difficult – here you should look for some extension cables to operate the PCB's outside the M 430.

Servicing the M 490 is quite easy – it has standard components inside, and only uses one special 5V switching power supply. We have that unit in stock as a complete spare part.

Servicing the M 440 needs to save all the stored data on a floppy and the internal HDD before. Make sure that this backup is made completely!!

Once you disconnect any internal power cable, the unit will lose its memory due to the RAM being unpowered. All your stored data will be lost at that moment!!

There are almost no serviceable parts inside the M 440, apart from the battery-charger and the batteries there is nothing inside which could be serviced on site.

Be very careful with the Floppy and the hard disc!!!

The floppy still is available in most computer shops, but for the HDD we are facing a problem to supply spare ones!! In 1995 this type of HDD was available everywhere, and a HDD with 250 MB or later 320 MB was “upper class”. Today, these units are no longer in production and there is no unit on the market which could replace the HDD.

Currently we are thinking about a solution via mobile-disc cards, but this is at an early stage! The reason why we mention this is, that we hope to find a good solution which could help all users.

The HDD inside the M 440 is running all the time – it has nothing to do until you want to store some data, or want to recall them. During normal work all data are stored in the E-E-Proms inside the M 420 and M 430 and the RAM in the M 440. So the HDD is only needed when data are needed from / to the HDD. So 98% of the time the HDD is running unused – and not needed for the operation of the system!!

The only time when the HDD is needed is when you start the DYNAMIC AUTOMATION. In this case the internal TC-generator will run and its data is stored on the HDD, at the same time all switches and faders moved against timecode are stored on the HDD.

This is the only time when the HDD is really needed.

So we think that a 128 MB or 256 MB memory stick could store the normal data. If you know where some of the old HDD's are sitting in a warehouse, please let us know, we would take some of them.

Thank You.