



# Calibration Manual

Oscilla® SM930 (1. Version)

Specifications are subject to change without notice  
2017-03-22

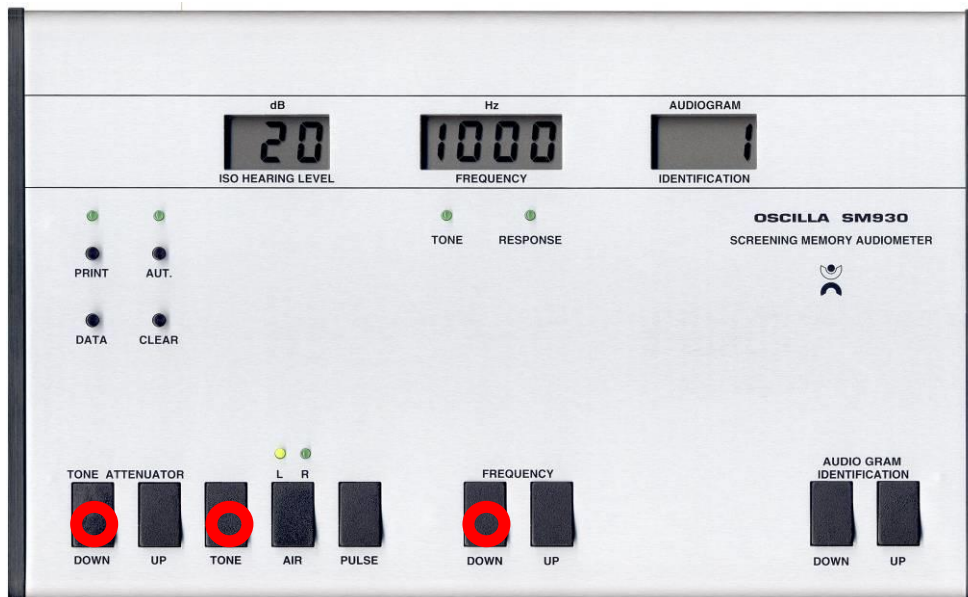
### General information:

Due to tolerances in electronics and transducers (telephones and bone conductor), it is necessary to calibrate the sound level to the correct intensity. Calibration is done with the transducers that belong to the audiometer. If a transducer is replaced the audiometer has to be calibrated with the new transducer.

The device has a built-in table for the ISO hearing level offsets (called RETSPL values). These offsets are added to the displayed sound level when the device is in normal operation mode, to obtain the ISO hearing level. When in calibration mode these offsets are not effective. Therefore all frequencies should be calibrated to equal levels, namely 80dB. This makes it easy and quick to perform the calibration. Remember to add the correction factors for the calibration microphone.

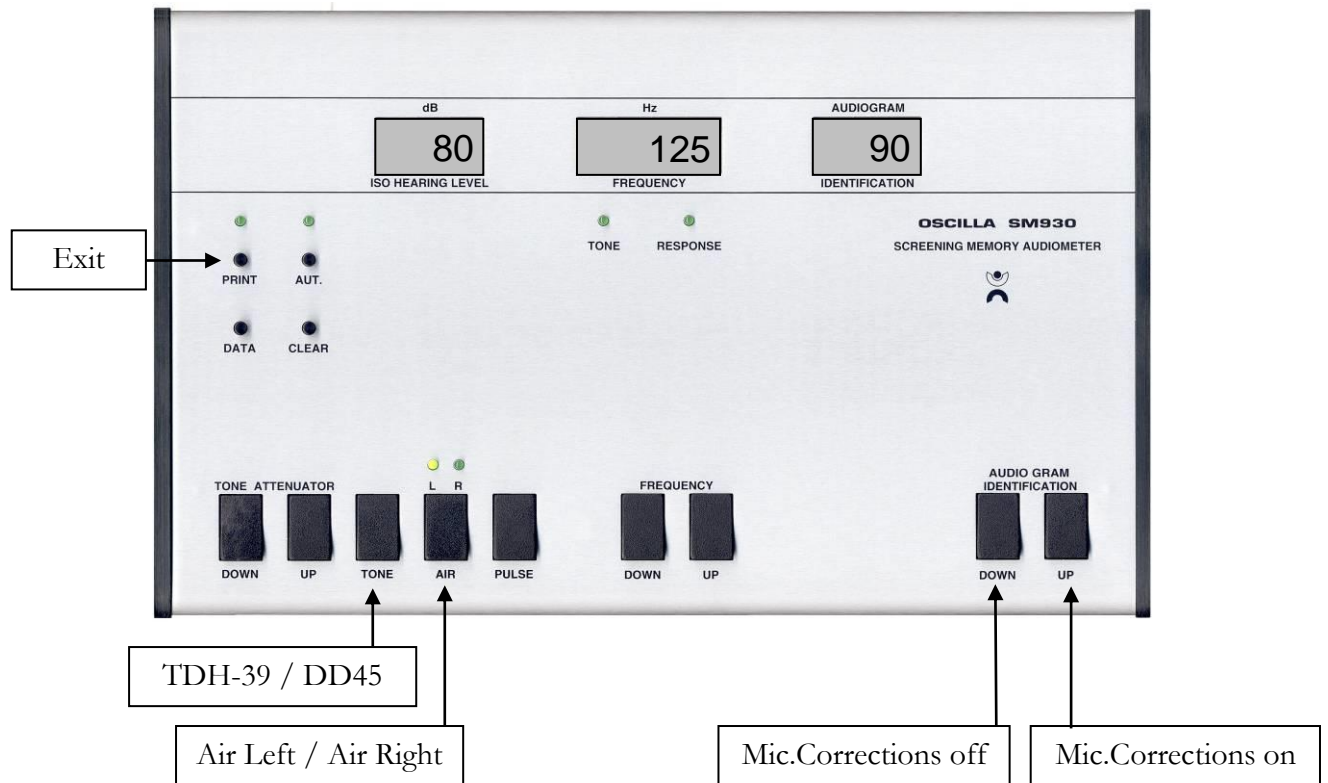
### Entering calibration mode:

To enter the calibration mode, hold down the 'ATTENUATOR DOWN', 'TONE' and 'FREQUENCY DOWN' keys and switch on the audiometer. Wait about 2 seconds and release the three buttons. The 'RESPONSE' light will now flash five times and then stay on. The audiometer is now in calibration mode.



### Using the calibration mode:

When in calibration mode, the tone attenuator keys are used to change the calibration values. Changes are stored at once when done. The 'AIR' key select if the left or right telephone is calibrated. The frequency keys select the frequency to calibrate. A calibration value is displayed in the right display, and can be set between 0 and 200, corresponding to -25 dB to +25 dB. Thereby, each step is 1/4 dB. The TONE button toggles between RETSPL offsets for TDH39 and DD45 telephones.



### Presetting the offsets to telephone type:

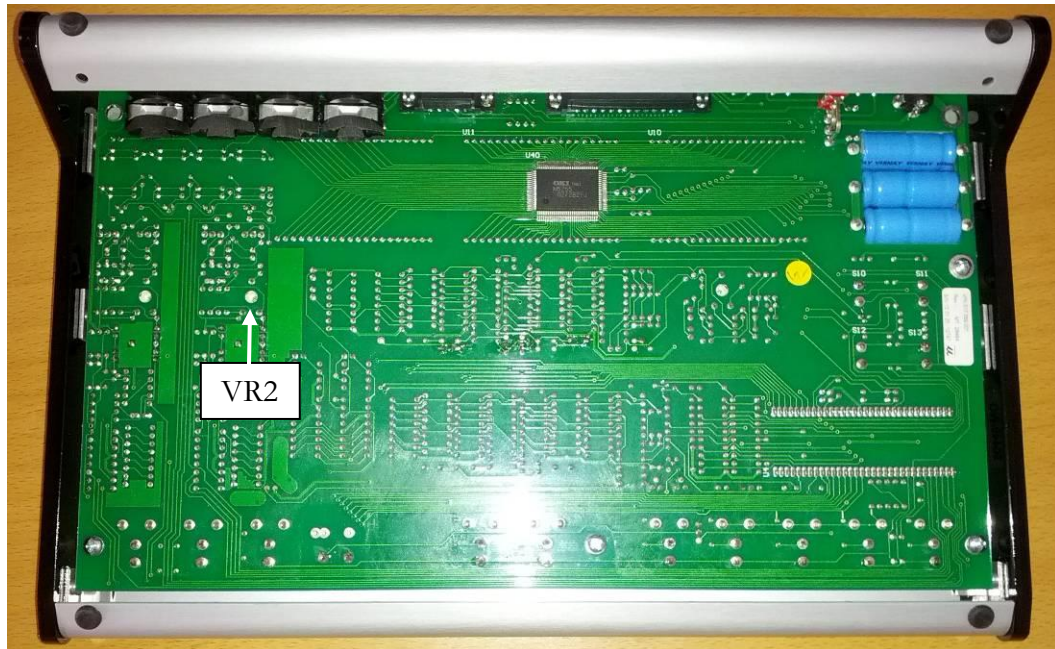
In addition to altering the offset values manually, they can be preset to one of two sets of offsets. These two sets are for use with two types of telephones. One set is for TDH39 and the other is for DD45. While in calibration mode, press the TONE button to preset the offsets. Each press toggles between the two telephone types. The selected telephone type is shown briefly in the display at each press.

### Leaving calibration mode:

Calibration mode is quit by pressing the 'DATA' key, or simply by switching off the audiometer.

### Adjustment of the trimmers.

There is one trimmer in the device, for setting the DC-offset of the output stage. Normally it does not need to be adjusted, so to perform a normal calibration, it is not necessary to disassemble the cabinet. If clicks are heard in the telephones when changing channel between left and right, an adjustment of the trimmer should be done. Connect a digital voltmeter to the output selected by the 'air' selector, set the attenuator to 110 dB, and adjust the trimmer to 0V. The meter should be set to the 200mV range. The trimmer is labeled VR2 and located near the output sockets.



**Calibrate tone levels:**

Place the left telephone on the measuring microphone, and ensure it fits tightly.

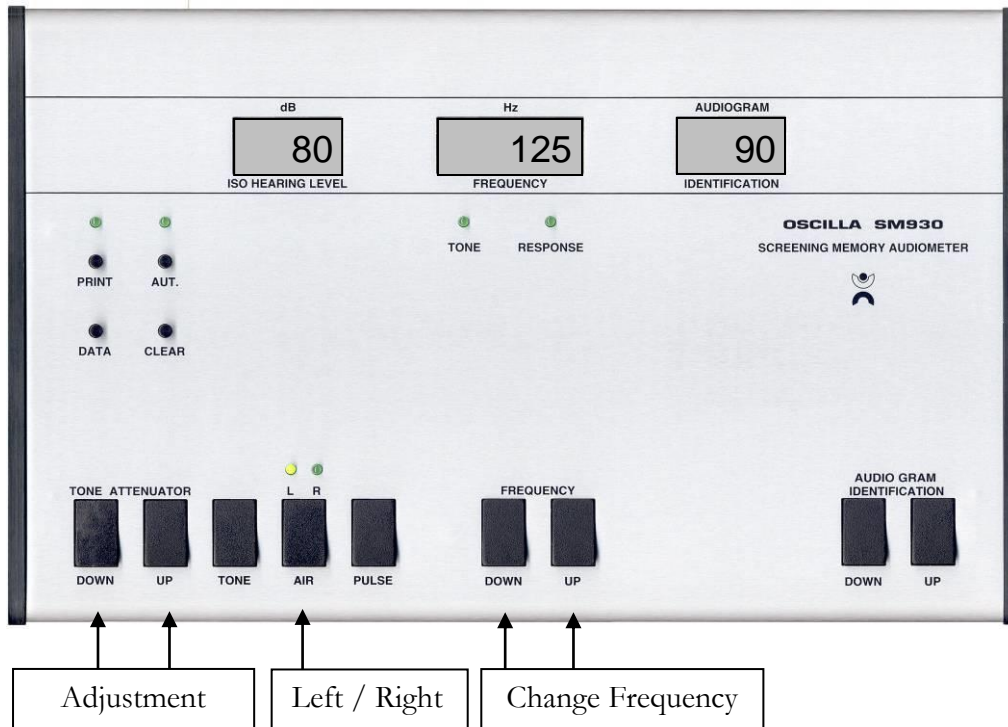
Set the audiometer and the bandpass filter on the calibration equipment to 125Hz.

Adjust to 80dB (plus microphone correction factor) deflection on the calibration equipment.

Set the audiometer and the bandpass filter to the next frequency and adjust again to 80dB deflection.

Repeat this with all frequencies.

Repeat calibration with the right channel.



**RETSPL table for TDH39 telephones (ISO-389-1995)**

Hz	dB
125	45
250	25.5
500	11.5
750	7.5
1000	7
1500	6.5
2000	9
3000	10
4000	9.5
6000	15.5
8000	13

**RETSPL table for DD45 telephones**

These values are store in the audiometer's memory by default.

Hz	dB
125	47.5
250	27
500	13
750	6.5
1000	6
1500	8
2000	8
3000	8
4000	9
6000	20.5
8000	12

### Changing the hearing level offsets:

The hearing level offset values are stored in the audiometer's memory. They can be changed if desired, for example to use another standard, or if the ISO standard is changed. This is done in a special mode activated by holding down the keys 'FREQUENCY DOWN', 'MASKING ATTENUATOR DOWN' and 'MASKING ATTENUATOR UP' while powering on the device. When in this mode, the frequency keys select the frequency to be changed, and the tone attenuator does the actual change. The offset value is displayed in the Identification display.

