Roger POP

Roger Phonak Offset Protocol / June 2013

Introduction

This document describes how a Roger system should be verified with a hearing aid test box. The protocol is valid for Roger inspiro (both with iLapel and EasyBoom microphones).

Roger inspiro can only be verified in "Verification mode", which can be activated on the Roger transmitter (FM SuccessWare is no longer required). In the "Verification mode" all features which might prevent a reliable measurement outcome are deactivated. After completing verification, "Verification mode" must be switched off .

Please note that the sensitivity of EasyBoom is 10 dB less than the sensitivity of iLapel. This requires an adjustment in the input level used for verification (see below). In daily usage this reduced sensitivity is advantageous because of the close proximity of EasyBoom to the speaker's mouth.

Roger inspiro automatically detects which microphone (iLapel or EasyBoom) is attached at switch on.

Protocol and background information

The protocol is based on the fact that the 10 dB Roger advantage setting of the Roger receiver results in a transparent behaviour below the Roger transmitter kneepoint, i.e. below 75 dB SPL. All measurements are done in Roger+M mode, but only one signal path is being tested at any one time.

(Roger+)M65 means a measurement with 65 dB SPL input to the hearing instrument microphone and the Roger microphone muffled/muted

Roger (+M)65 means a measurement with 65 dB SPL input to the Roger microphone and the hearing instrument microphone muffled/muted

Roger (+M)75 means a measurement with 75 dB SPL input to the Roger microphone and the hearing instrument microphone muffled/muted

**PHONAK**
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Introduction

	Step	Comment / FAQ
1.	Measurement requirements	
1.1	System of hearing instrument, audio shoe, Roger receiver and Roger transmitter, as used by the individual.	
1.2	Hearing aid analyser/test box	
1.3	The Roger receiver should be programmed at its default value (10 dB Roger advantage) as a starting point. Reset the "Personal preference" to 0 dB value. Roger inspiro must be set into the "Verification mode".	10 dB Roger advantage is the factory pre-set value. OK → Settings → Verification
1.4	The hearing instrument should be programmed / fitted as used by the customer.	The objective is to determine/adjust the Roger advantage for the system as it is used by the customer.
1.5	Ideal stimuli are broadband noises (speech shaped), as long as individual frequency results can be obtained; if broadband stimuli are not available use pure tone sweeps.	ISTS is a recommended test signal.
2.	Set-up HI and receiver	
2.1	Program hearing instrument to desired user settings.	No need to switch off noise canceller, feedback manager etc…
2.2	Attach appropriate audio shoe with connected Roger receiver or: design-integrated Roger receiver to the hearing instrument	
2.3	Ensure that the 10 dB Roger advantage (default value) is programmed into the receiver.	10 dB Roger advantage is the factory setting.
2.4	Set hearing instrument to the Roger+M or FM+M (DPAI='yes') program or the M program (DPAI='no').	Note: After switching on, wait a full 60 seconds before running the curve → 3.3. This delay gives the system time to finish booting up and ensures it is running in a stable operation mode. Not waiting for 60 seconds may lead to inaccurate results.
2.5	Verify that the Roger transmitter is switched on and the Roger receiver is connected.	This is true for all measurements (make sure that the Roger receiver does not go into squelch or sleep mode, by keeping the Roger transmitter active).

3.	Baseline hearing instrument measurement	
3.1	Verify that the Roger transmitter is switched on and the Roger receiver connected. Mute the Roger inspiro microphone. Do not switch the Roger transmitter off.	
3.2	Attach the hearing instrument to 2cc coupler and place into the test box.	
3.3	Run a curve with 65 dB-SPL input → (Roger+)M65 tracing.	Note: After switching on, wait a full 60 seconds before running the curve. This delay gives the system time to finish booting up and ensures it is running in a stable operation mode. Not waiting for 60 seconds may lead to inaccurate results.
3.4	Perform discrete frequency signal analysis, calculate the average for 3 different frequencies (750, 1000, 2000 Hz) or evaluate response at 1kHz or another speech frequency.	
4.	Set-up for Roger measurement	
4.1	Verify that the Roger transmitter is switched on, unmuted or unmuffled, and communicating with the Roger receiver.	
4.2	Move the 2cc coupler together with the hearing instrument out of the text box.	
4.3	Keep the receiver in Roger+M and the hearing instrument in the usual Roger+M (DPAI='yes') program or M program (DPAI='no').	Exactly the same configuration as in 2.4
4.4	Muffle the hearing instrument's microphone.	
4.5	Place the Roger inspiro microphone into the test box in the test position.	
5.	Transparency test	
5.1	Run a curve with 65 dB SPL / 75 dB SPL input into the Roger transmitter microphone situated in test box. → Roger(+M)65 tracing for Roger inspiro with iLapel → Roger(+M)75 tracing for Roger inspiro with EasyBoom	The +10 dB advantage setting leads to transparency below the Roger transmitter kneepoint. The Roger response at 65 dB SPL / 75 dB SPL for a 10 dB Roger advantage setting is the same as the hearing instrument MIC response at 65 dB SPL.
5.2	Perform discrete frequency signal analysis, calculate the average for 3 different frequencies (750, 1000, 2000 Hz) or evaluate response at 1kHz or another speech frequency.	
5.3	Compare → (Roger+)M65 tracing to Roger(+M)65 tracing for Roger inspiro with iLapel → (Roger+)M65 tracing to Roger (+M)75 tracing for Roger inspiro with EasyBoom They should be very close, within ± 2 dB or overlay.	
5.4	The offset is the difference between both measurements.	

6.	Offset correction / balancing	
6.1	This step is performed if the transparency test indicates a need for an offset correction.	
6.2	Offset = Roger(+M)65 minus (Roger+)M65 for Roger inspiro with iLapel Offset = Roger(+M)75 minus (Roger+)M65 for Roger inspiro with EasyBoom	For the offset calculation you may use one single value, e.g. 1kHz, but preferably a mean value of several frequencies.
6.3	If the offset is between –2 dB and +2 dB: do not change anything, the Roger advantage is within ± 2 dB of its target value.	The 10dB Roger Advantage has been achieved.
6.4	If the offset value is greater or lesser than 2 dB, correct for the Roger offset.	
6.5	Place the hearing instrument with attached receiver in front of the Roger inspiro and program the offset through the Roger inspiro	Check → Manage →Easy gain
7.	Cross-check transparency, only to be done in case of off-set correction	
7.1	Repeat step 5 to cross-check for transparency.	
7.2	If not within ± 2 dB repeat 6 and 7.	
8.	MPO Safety	
	Run curves with → 90 dB SPL input into the Roger inspiro with iLapel microphone situated in test box, and with 90 dB SPL input to hearing instrument microphone → 100 dB SPL input into the Roger inspiro with EasyBoom microphone situated in test box, and with 90 dB SPL input to hearing instrument microphone	Make sure the output does not exceed MPO targets.
9.	Set-up after FM measurement	
	Switch off "Verification mode" in Roger inspiro by turning the Roger transmitter off and then back on.	Must be done to make sure all Roger features are activated in Roger inspiro.

Measurement example on Verifit

Roger inspiro with iLapel
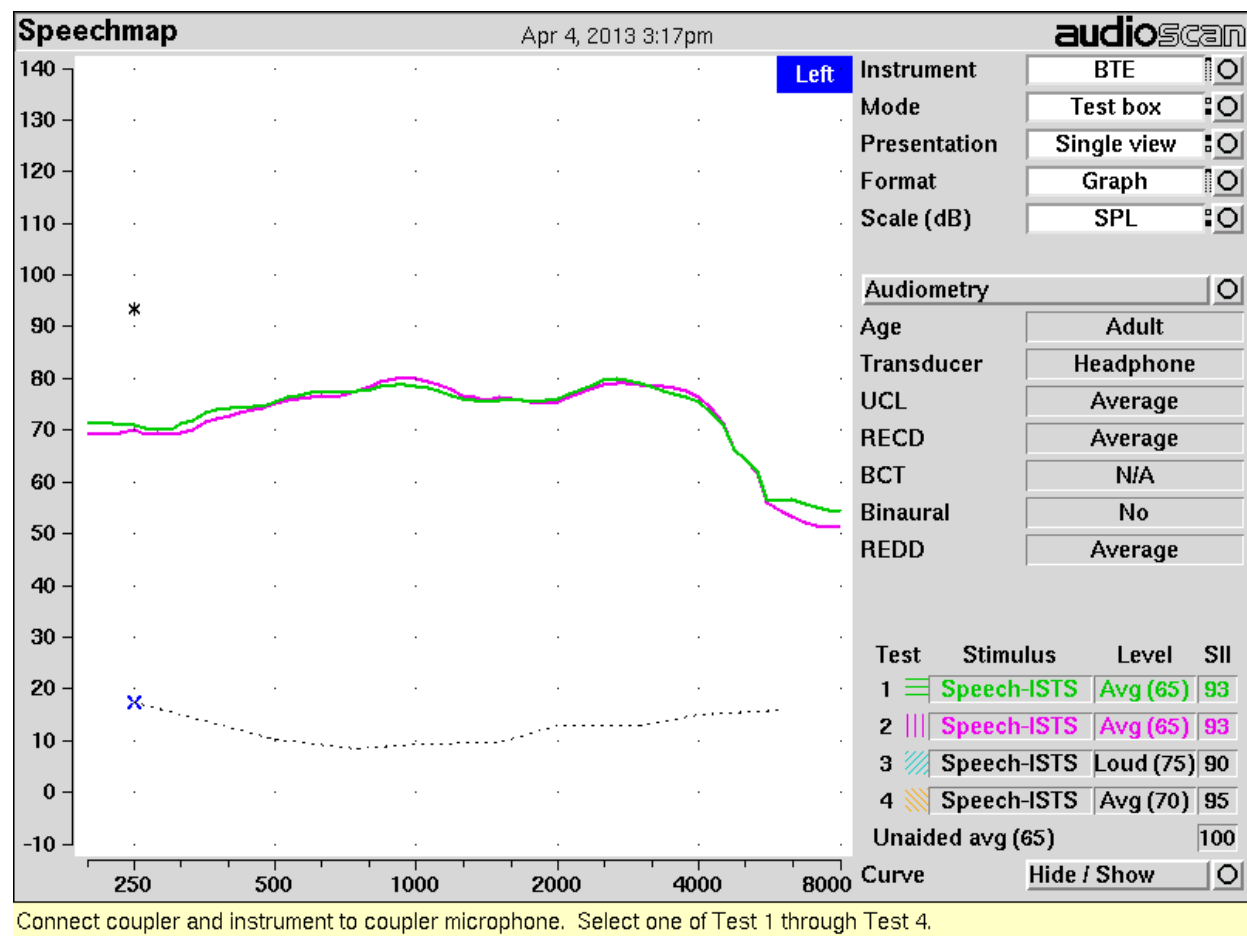
TEST 1: (Roger+)M65 means a measurement with 65 dB SPL input to the hearing instrument microphone and the Roger microphone muffled.
TEST 2: Roger (+M)65 means a measurement with 65 dB SPL input to the Roger microphone and the hearing instrument microphone muffled.

Measuring using an EasyBoom

Independent of the acoustic box used, the microphone must be placed exactly in parallel to the loudspeaker.
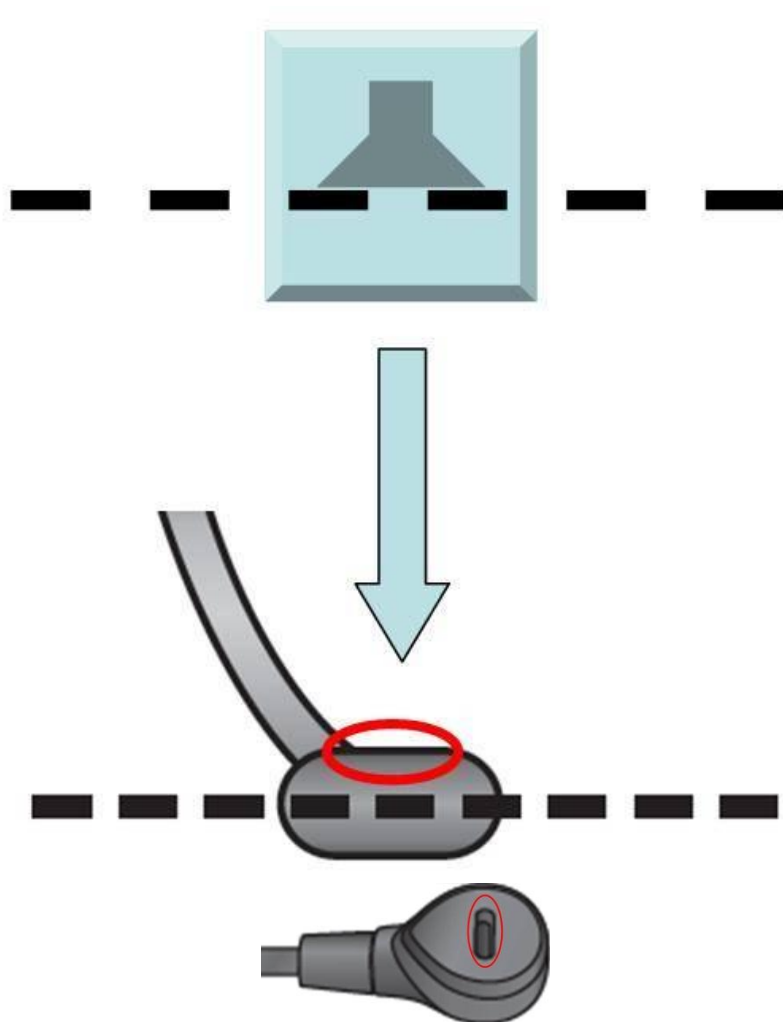The acoustic chamber has to be closed before running the Roger POP measurement.
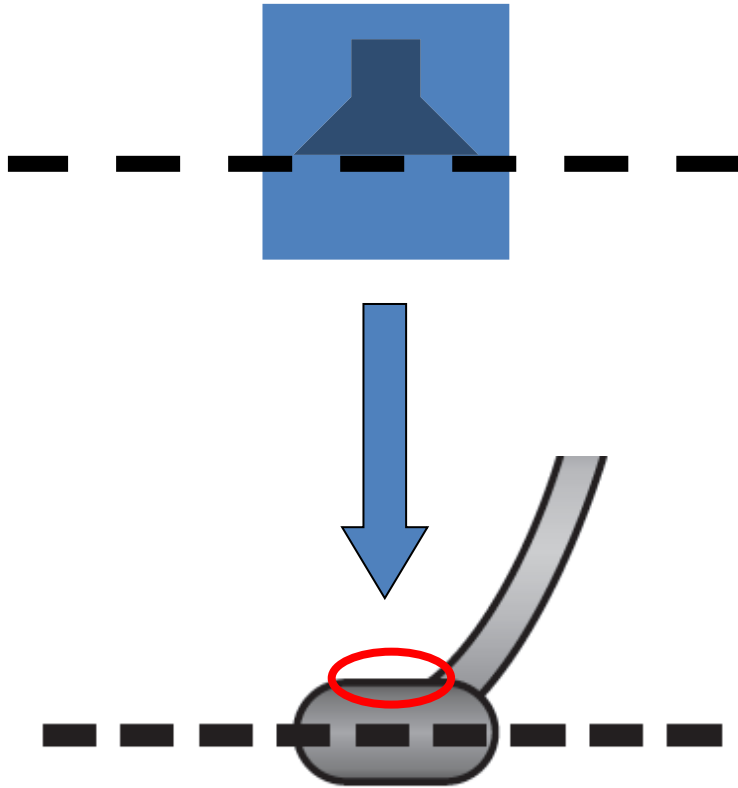
Take the foam off of the microphone.

Make sure, the opening (ONE notch) of the microphone is facing the loudspeaker and not the back of the microphone (THREE notches)
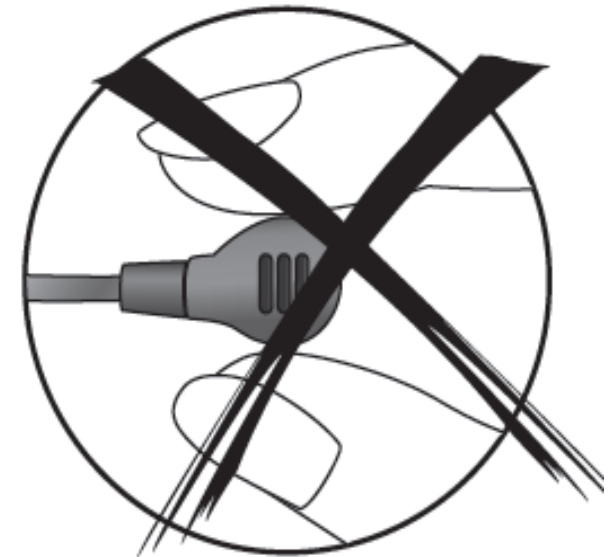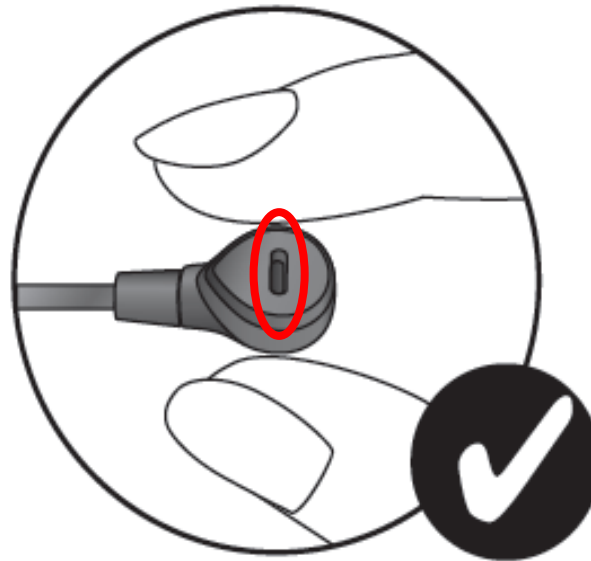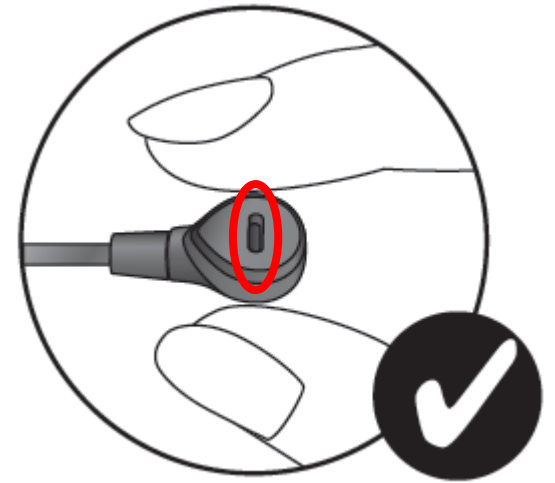
Box should be closed, but without changing the position of the microphone. Please hold the EasyBoom when closing the chamber.

EasyBoom in the Verifit

Roger advantage worksheet

Roger Advantage: Phonak Roger Offset Protocol (Roger POP)

1. (Roger+)M65 – match target.
2. Roger(+M)65 for Roger inspiro with iLapel – transparency with hearing instrument only, difference is offset.
3. Roger(+M)75 for Roger inspiro with EasyBoom – transparency with hearing instrument only, difference is offset.
4. (Roger+)M90 – ensure hearing instrument response does not exceed MPO targets.
5. Roger(+M)90 for Roger inspiro with iLapel – ensure response does not exceed MPO targets.
6. Roger(+M)100 for Roger inspiro with EasyBoom – ensure response does not exceed MPO targets.

All measurements must be done in Roger+M mode (including those in hearing instrument only), with the Roger transmitter always active to avoid the receiver entering sleepmode.

Real Ear Measures	@750 Hz	@ 1kHz	@ 2 kHz		
Roger(+M)65 curve (dB) for iLapel Roger(+M)75 curve (dB) for EasyBoom					
Minus (Roger+)M65 curve (dB)(d	–	–	–		
Equals Roger Offset (dB)	=	=	=	Add the offset values in this row and divide by 3 →	average Offset =

AVERAGE OFFSET VALUES:

1. If your offset value is between ± 2 dB, you are done! The default +10 dB of receiver gain is achieved. Your Roger response is transparent at equal inputs, so when you have a loud (Roger input) simultaneously with a softer input (conversational input through the hearing instrument mic), true Roger advantage will be achieved!

2. If your Roger offset is equal to or more than +2 dB you will need to reduce the Roger gain level in the receiver by the offset value. This will make it transparent with the hearing instrument at equal inputs.

3. If your Roger offset is equal to or less than –2 dB, you will need to increase the Roger internal gain setting by the offset value to make it transparent at equal inputs.