OPTIONAL FP35 OPEN CHAMBER FM ADVANTAGE PROCEDURE

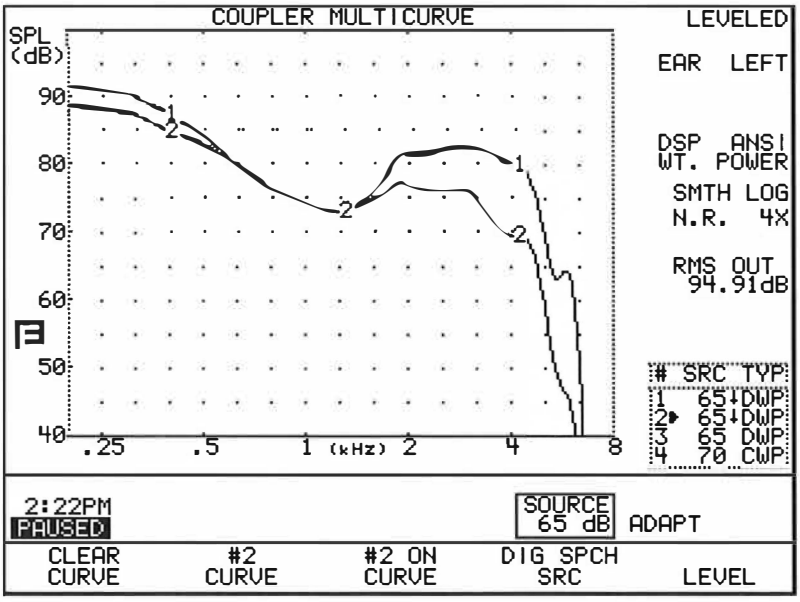
The UK ALT Working group accepts the possibility of open chamber testing, but has the following reservations:

1) An open chamber is vulnerable to noise and is unlikely to be a practical option in schools.
2) The FP35 does not have the ISTS test signal required for modern test methods.
3) The accuracy and tolerance of the FP35 mean that signals are considered to be balanced (electroacoustically transparent) if signals are within 4.5 dB, see QS8 guidance.

The FP35 analyser has been the most commonly used test box for peripatetic TOD's for many years and remains so today. It was designed before many of the features now commonly found on hearing instruments were available and this has brought some challenges when carrying out the FM Advantage procedure. Using the test box with some current hearing aids therefore needs some adjustment. Whilst not ideal (and not recommended unless a very quiet space can be found) a valid 'work around' is to carry out the procedure using the test box with the lid open. Please note that the test box will need to be levelled with the lid open prior to carrying out the open chamber procedure.

Features such as directional microphones and Acoustic Phone (and EasyPhone) are commonly included on hearing aids as standard and are often enabled by default, even for paediatrics. Some of these features alter the frequency response of the hearing aid is changed when activated. These features are desirable and enhance the listening experience in various situations. EasyPhone enables the AcousticPhone feature when a phone handset is held next to the hearing aid. It is the magnetic field generated by the handset that activates the EasyPhone. Unfortunately, placing such a hearing aid onto the speaker in the FP35 test chamber activates EasyPhone due to the magnet on the speaker. This is a problem when carrying out the FM Advantage procedure as the curve obtained for the hearing aid will not be the response of the aid when in the normal setting. The adjustment made to the receiver to match the curve obtained would therefore be incorrect. In figure 1 using the Phonak Sky V SP curve 1 does not have AcousticPhone enabled. Curve 2 does have AcousticPhone enabled.

Figure 1



Another feature that can affect the curves obtained in the FP35 with the lid closed is directionality. When the hearing aid is placed on the speaker it is placed at 90˚. This causes a problem in the response obtained for some hearing aids.

Figure 2 Oticon Synergy Sense. Curve 1 hearing aid in the test chamber with the lid closed. Curves 2 & 3 are the radio aid response curves.

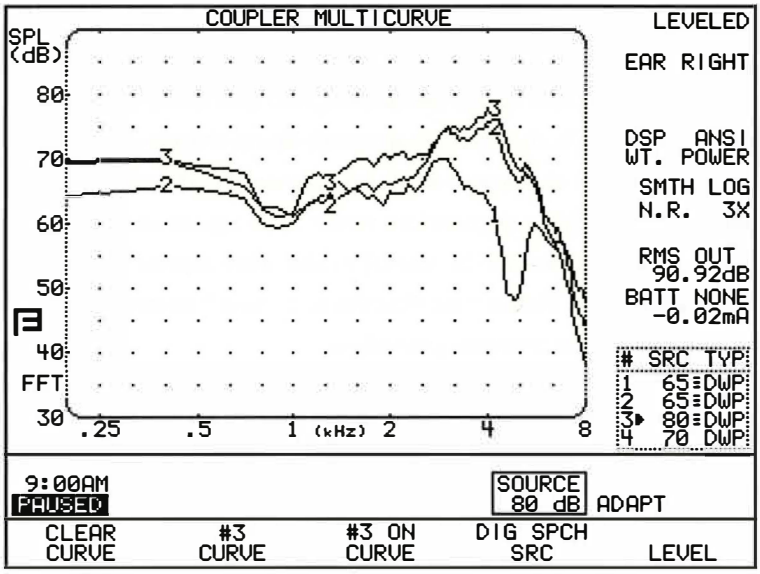
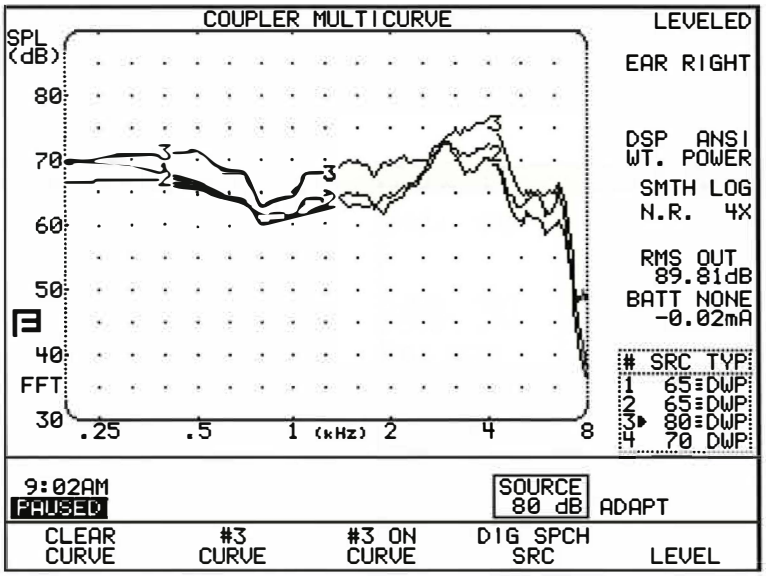


Figure 3 The same Oticon Synergy Sense hearing aid was used for the curves above. This time the chamber lid was open and the 1st curve obtained with the hearing aid held facing the speaker.



Another challenge is obtaining curves when using the Roger TouchScreen. The test chamber in the FP35 is very small and is levelled with the coupler inside the chamber with the lid closed. When using a lapel microphone for curves 2 and 3 of the FM Advantage procedure a coupler clone (dummy coupler) is placed inside the chamber to replicate the space that was taken up by the now removed coupler. The size of the TouchScreen takes up a large amount of the space within the closed chamber and affects the response of the curve obtained. Additionally, if the TouchScreen is positioned face down on the speaker it produces a cupping affect and again affects the response curve. This problem can also be overcome by using the open lid procedure.

Figure 4 Oticon Sensei Pro with Roger TouchScreen face down with lid closed.

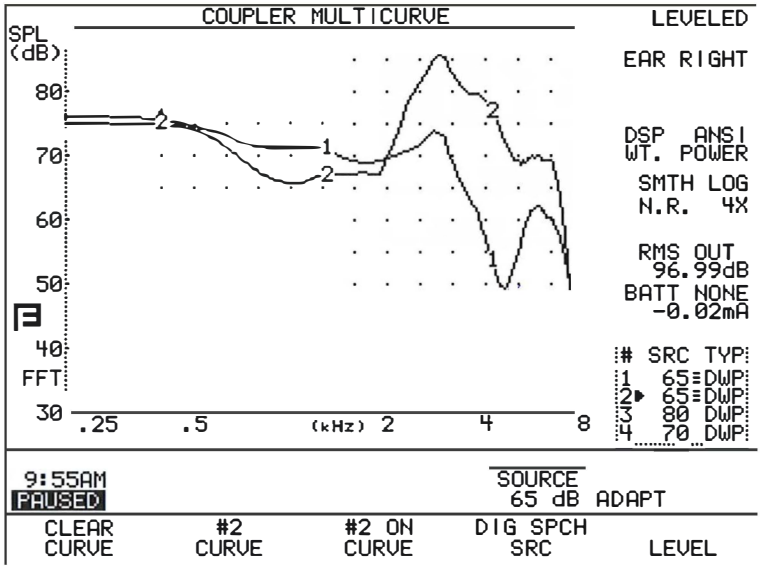


Figure 5 Oticon Sensei Pro with Roger TouchScreen face up with lid closed

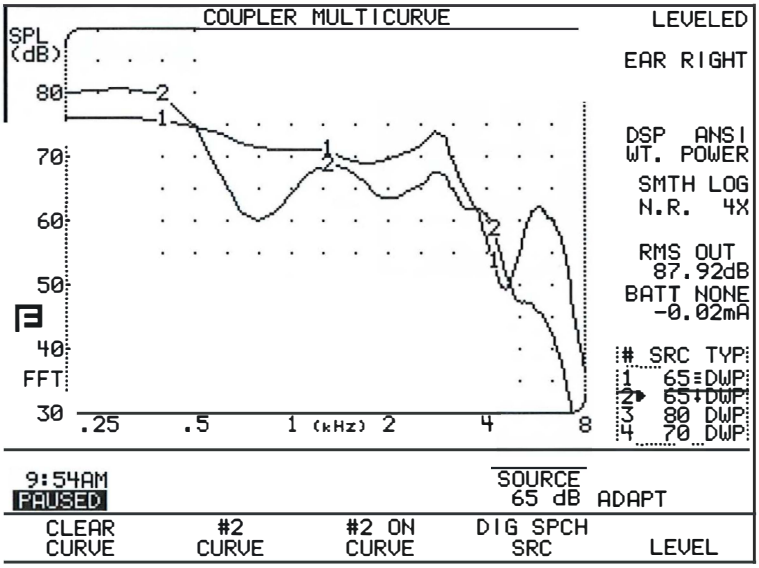


Figure 6 Oticon Sensei Pro with Roger TouchScreen lid open

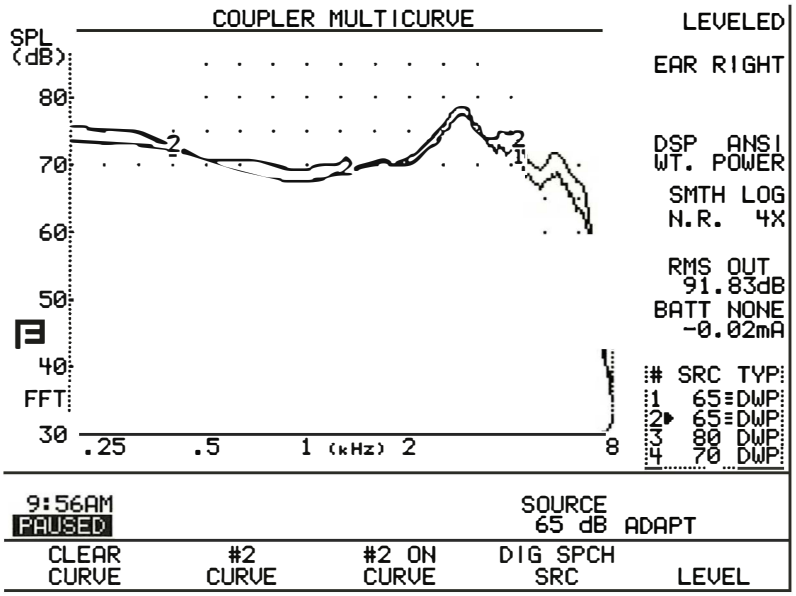


Figure 7 Oticon Sensei Pro with Roger Inspiro lid closed

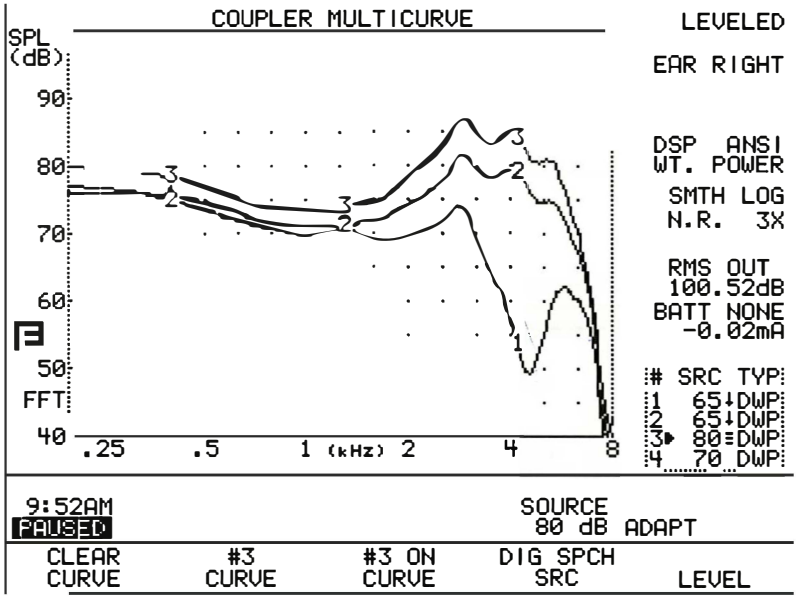


Figure 8 Oticon Sensei Pro with Roger Inspiro lid open

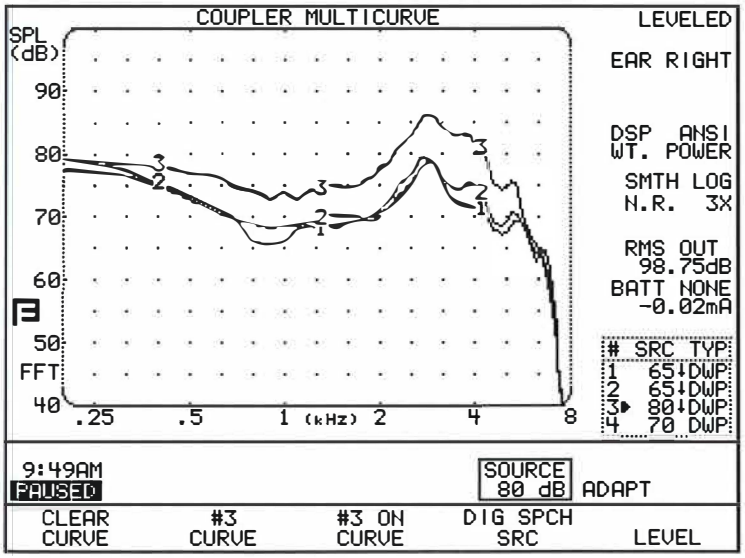


Figure 9 Phonak Sky V70 P. Curve 1 is a response curve for the aid inside the FP35 test chamber with the lid closed. Curve 2 was obtained with the iLapel microphone inside the test chamber (with coupler clone) and lid closed. The difference in response is considerable and it would not be possible to set the output level of the receiver as curve 2 would never match curve 1.

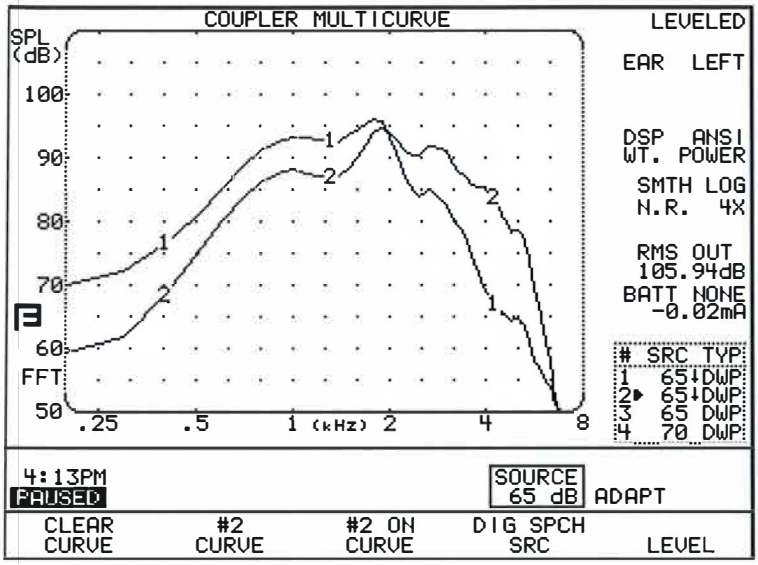


Figure 10 The curves above are for the same Sky V70 P hearing aid and Roger Inspiro only this time using the lid open method.

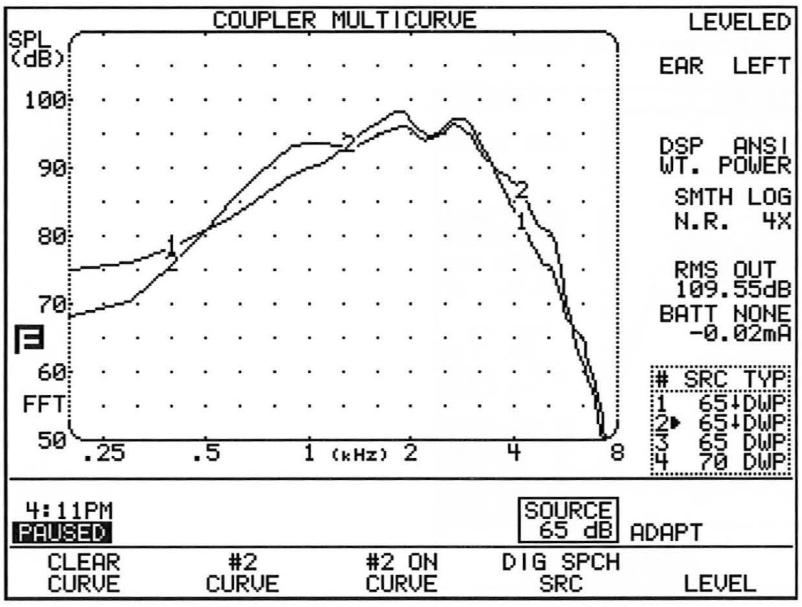


Figure 11 This set of curves is for the same Sky V70 P hearing aid with the lid open only this time using the Roger TouchScreen. The curves are almost identical to those obtained for the Roger Inspiro.

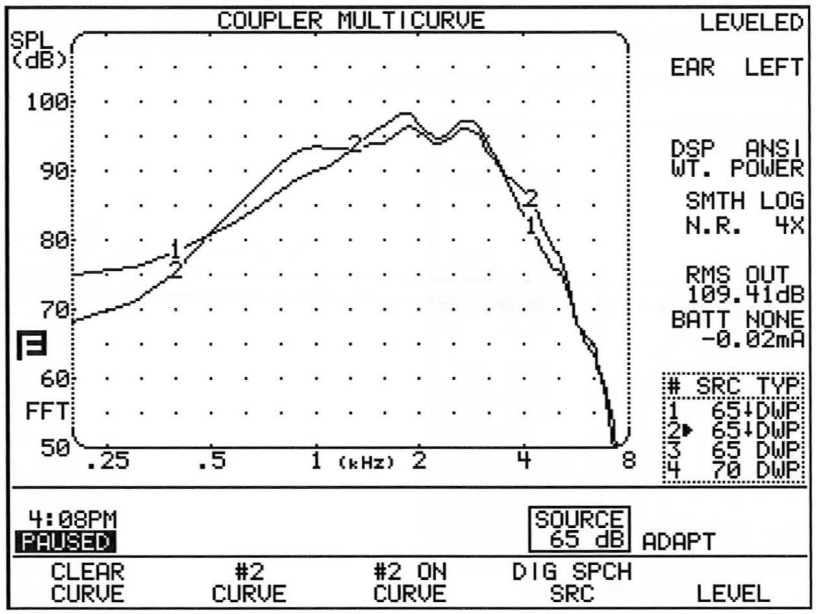


Figure 12 Phonak Sky Q70 SP hearing aid with a Roger TouchScreen with the FP35 chamber lid open.

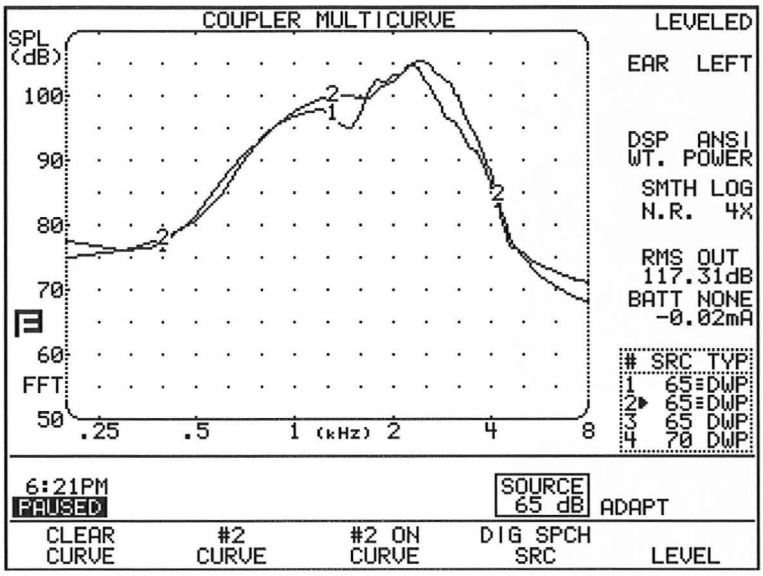
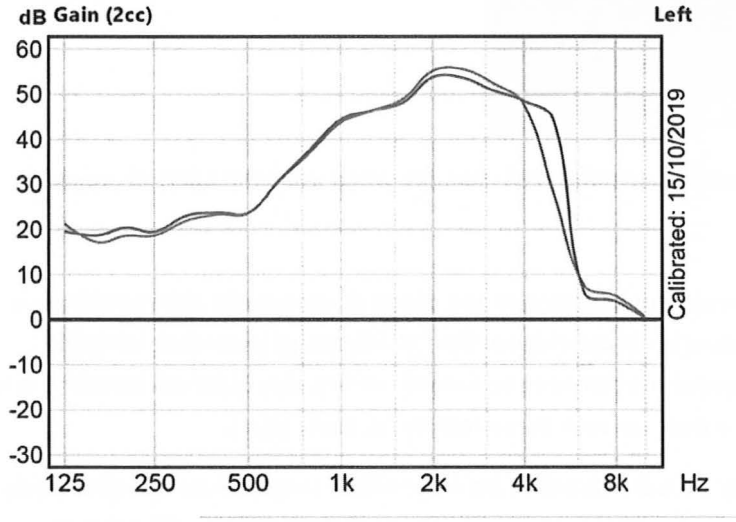
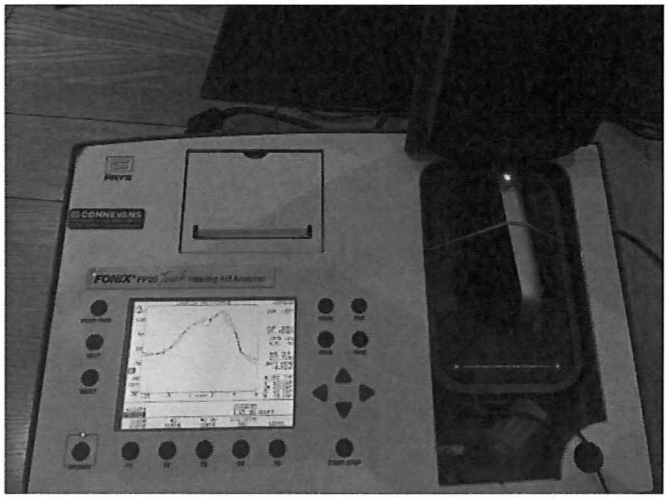
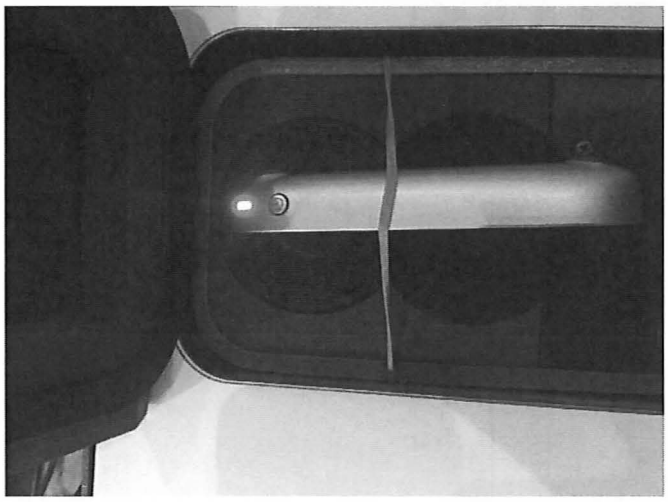


Figure 13 This set of curves are for the same Sky Q70 SP hearing aid and Roger TouchScreen with the receiver at the same output level. The curves were obtained using the Aurical HIT.







Images showing position of Roger TouchScreen in the FP35 chamber when using the open lid procedure

In summary, due to certain features on current hearing aids and design of some radio aid transmitters it is necessary to use the open lid procedure when carrying out the FM Advantage procedure using the FP35 analyser. It is not perfect and requires the testing to be carried out in a very quiet environment. It is though a viable option and a procedure that has been in use reliably for many years.

Other test boxes, such as the Aurical HiT, are slowly becoming more widely used and are not affected by the features highlighted above. However, the FP35 is likely to be in use in many services for years to come.