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FP40 PROBE/SPL TEST

Version 3.30 and above

1. Press [F5] to enter PROBE.
2. Press [F2] to choose either:
IG—Insertion Gain
SPL—Aided SPL (default)
AI—Audibility Index
3. Press [F4] to enter TARGET.
4. Press [F1] to select LEFT/RIGHT EAR.
5. Press [F2] to select HTL/UCL/TAR. Use amplitude & frequency knobs to enter audiogram.
6. Press [F3] to select FIT RULE (NAL-2, POGO, BERGER, 1/2, 1/3, 2/3 GAIN or DIRECT).
Note: At this point, if a binaural fit, you can go back to Step 4 and enter other ear information.
7. Press [F5] TO GENERATE TARGET.
8. Press [F4] EXIT TARGET and return to main screen.
9. Mark probe tube (5mm or 1/4"). Mark CIC (1–2 mm or 1/16")
10. Place wedge earhook on subject.
11. Place reference mic on wedge earhook above ear, and probe tube in ear.
12. Position subject 12" from speaker at 45 degree angle.
13. Press [LEVEL] & [START] (if unlevelled).
14. Hold probe tube in place, put hearing aid in ear, set to user gain & output
15. AIDED CURVE 1 [F3] is selected, press [START] to run SOFT test.
16. AIDED CURVE 2 [F3] is selected, press [START] to run AVERAGE test.
17. AIDED CURVE 3 [F3] is selected, press [START] to run LOUD test.
18. Press PRINT to print, or [F3] to select and run another curve.

TEST COMPLETE

FP40-1

FP40 PROBE/AI and IG TEST

Version 3.30 and above

1. Press [F5] to enter PROBE.
2. Press [F2] to choose either:
IG—Insertion Gain
SPL—Aided SPL (default)
AI—Audibility Index
3. Press [F4] to enter TARGET.
4. Press [F1] to select LEFT/RIGHT EAR.
5. Press [F2] to select HTL/UCL/TAR. Use amplitude & frequency knobs to enter audiogram.
6. Press [F3] to select FIT RULE (NAL-2, POGO, BERGER, 1/2, 1/3, 2/3 GAIN or DIRECT).
Note: At this point, if a binaural fit, you can go back to Step 4 and enter other ear information.
7. Press [F5] TO GENERATE TARGET.
8. Press [F4] EXIT TARGET and return to main screen.
9. Mark probe tube (5mm or 1/4"). Mark CIC (1–2 mm or 1/16")
10. Place wedge earhook on subject.
11. Place reference mic on wedge earhook above ear, and probe tube in ear.
12. Position subject 12" from speaker at 45 degree angle.
13. Press [LEVEL] & [START] (if unlevelled).
14. UNAIDED CURVE [F2] is selected, press [START] to run test.
15. Hold probe tube in place, put hearing aid in ear, set to user gain.
16. AIDED CURVE 1 [F3] is selected, press [START] to run test.
17. Press [PRINT] to print or [F3] and [START] to run another AIDED CURVE.
18. Press[F2] to toggle between IG, SPL, and AI test results.

TEST COMPLETE

FP40-1

FONIX FP40 TARGET 2cc FOG

CUSTOM Procedure—Using the Unaided Ear (REUR)

1. Enter the PROBE mode, press [F5].
2. LEVEL, if UNLEVELED, select IG [F2], and do an UNAIDED (REUR) test.
3. Press [F4] to enter the TARGET mode.
4. Press [F1] to select L/R Ear, then [F2] to select HTL.
5. Using the AMPLITUDE and FREQUENCY dials, enter the HTL audiogram.
6. Select a FIT RULE (NAL-2, POGO, etc.), press [F3].
7. Press [F5] to GENERATE TARGET, estimated (REUR).
8. Press [F7] to enter 2CC mode. (Instructions right side of LCD)
9. Press [F2] to select CUSTOM UNAIDED.
10. Select AID TYPE (ITE, CANAL, BTE), press [F4].
11. Press [PRINT] or, if desired, press [START] to measure and compare a hearing aid to the F.O.G. Target.

AVERAGE Procedure—Using AVERAGE/KEMAR Unaided (REUR)

Follow steps 1-8 above, omitting step 2, then do the following:

1. Select AVG UNAIDED, press [F2]
2. Press [F4] to select AID TYPE (ITE, CANAL, BTE).
3. Press [PRINT] or, if desired, press [START] to measure and compare a hearing aid to the F.O.G. Target.

FP40 TARGET 2CC SSPL 90 USING LDL/UCL/HCL LEVELS

1. Enter PROBE mode, press [F5].
2. Press [F4] to enter TARGET mode.
3. Press [F1] to select L/R Ear.
4. Press [F2] to select UCL, then enter levels by frequency.
5. Press [F7] to enter 2cc mode.
6. Press [F5] to select SSPL 90 Mode.
7. Press [PRINT] or, if desired, press [START] to measure and compare a hearing aid to 2cc SSPL Target.

FONIX FP40 ANSI TESTS AGC / LINEAR

1. LEVEL (only if UNLEVELED).
2. Attach hearing aid & coupler to microphone, set full on gain, place in test box.
3. Press [F4] ANSI.
4. Press [F2] to select type of test:
LINEAR 60, 50 or AGC.
5. Check [F3], select HFA AVERAGING, (change to SPA AVG if specified by manufacturer).
6. Check [F7], select battery type.
7. Check [F8], select EIN OFF or ON.
8. Check [F9], press to select LABEL YES or NO.
9. Press [START] to run test.
10. If test stops, set aid's MEASURED gain equal to TARGET gain, then press [START].
11. Press [PRINT] to print.

TEST COMPLETE

FP40-3

FP40 CIC MANUAL TEST Version 3.30 and above

1. LEVEL (only if UNLEVELED)
2. Attach CIC aid & CIC coupler to microphone, set full on gain, place in test box.
3. Press [F3] to select (turn on) the CIC test.
4. Select desired input or RMS source level.
5. Press [START] to run test.
6. Press [PRINT] to print.

FP40 CIC AUTOMATIC TEST

1. LEVEL (only if UNLEVELED)
2. Attach CIC aid & CIC coupler to microphone, set full on gain, place in test box
3. Press [F1] to enter setup menu.
4. Change F4 to ACIC, then exit.
5. Press [F4] to enter ACIC test mode.
6. Press [F2] to select type of test:
LINEAR 60, 50, or AGC.
7. Check [F7], select battery type.
8. Check [F9], press to select LABEL YES or NO
9. Press [START] to run test.
10. If test stops, set aid's MEASURED gain equal to TARGET gain, then press [START].
11. Press [PRINT] to print.

FP40-3

FP40 DSL/PROBE TEST

Version 3.40 and above

1. Press [F5] to enter PROBE. (Level if unlevelled and client is available.)
2. Press [F2] to choose **SPL**—Aided SPL (default)
3. Press [F4] to enter TARGET.
4. Press [F1] to select LEFT/RIGHT EAR.
5. Press [F2] to select **HTL/UCL/TAR**. Use amplitude & frequency knobs to enter audiogram. Then select UCL and enter. (Predicted UCL values will be used if not entered.)
6. Press [F3] to select FIT RULE, either DSL LIN or DSL WDRC. (If desired, press START to store DSL as default.)
7. Press [F6] to select AGE.
8. Press [F5] to GENERATE TARGET selected.
9. If WDRC is selected, follow CT help message on LCD.
10. Press [F4] to enter PROBE test mode.
11. Mark probe tube (5mm or 1/4"). Mark CIC (1–2 mm or 1/16")
12. Place wedge earhook on subject.
13. Place reference mic on wedge earhook above ear, and probe tube in ear.
14. Position subject 12" from speaker at 45 degree angle.
15. Press [LEVEL] & [START] (if unlevelled).
16. Hold probe tube in place, put hearing aid in ear, set to user gain & output
17. AIDED CURVE 1 [F3] is selected, press [START] to run SOFT (50 dB) test.
18. AIDED CURVE 2 [F3] is selected, press [START] to run AVERAGE (70 dB) test.
19. AIDED CURVE 3 [F3] is selected, press [START] to run LOUD (90 dB) test.
20. Press PRINT to print, or [F3] to select and run another curve.

Note: If, in the Target 2cc prescription mode, you use custom RECD values, they will be applied to the real-ear targets as well. Doing so will further customize your targets

TEST COMPLETE

FP40 DSL/COUPLER TEST

(Using Average RECD)—Version 3.40 and above

1. Press [F5] to enter PROBE.
2. Press [F2] to choose **SPL**—Aided SPL (default)
3. Press [F4] to enter TARGET.
4. Press [F1] to select LEFT/RIGHT EAR.
5. Press [F2] to select **HTL/UCL/TAR**. Use amplitude & frequency knobs to enter audiogram. Then select UCL and enter. (Predicted UCL values will be used if not entered.)
6. Press [F3] to select FIT RULE, either DSL LIN or DSL WDRC. (If desired, press START to store DSL as default.)
7. Press [F6] to select AGE.
8. Press [F5] to GENERATE TARGET selected.
9. If WDRC is selected, follow CT help message on LCD.
10. Press [F7] to enter COUPLER test mode.
11. Follow the help messages in the INSTRUCTION box (upper right of LCD).
 - Enter audiogram HTLs (if not previously entered).
 - Generate Target (if not previously entered).
 - Set aid type (press [F4] to select type).
 - Set RECD (press [F3] to AVG RECD, then [F1] to return.)
 - Adjust Reserve Gain (if desired/needed).
 - Modify individual freqs (if desired/needed).
 - Print (after test completed).
12. Check test status in center of LCD.
13. Press [F6] to select input (40–100 dB) source.
14. Attach aid to coupler.
15. Press START to run test.
16. Press PRINT or adjust and run another test.

TEST COMPLETE

ANSI S3.22-1987

RECOMMENDED MEASUREMENTS, SPECIFICATIONS AND TOLERANCES

SSPL90 CURVE: Max. shall not exceed that spec. mfg + 3dB

HFA-SSPL90 or SPA-SSPL90: Shall be within ± 4 dB of mfg. spec.

FULL-ON GAIN: 50 or 60 dB inputs

HFA/FOG or SPA/FOG: Within ± 5 dB of mfg. spec.

REFERENCE TEST GAIN: Shall be stated for info only

FREQUENCY RESPONSE CURVE: 60 db input

FREQUENCY RANGE: (f1 - f2): f1 \pm 4 dB, f2 \pm 6 dB

HARMONIC DISTORTION: (Total Harmonic Distortion), gain in ref. test position, 70 dB at 500, 800, and 65dB at 1600 Hz or frequencies corresponding to 1/2 the freq. of each SPA frequency. Shall not exceed specs plus 3%.

Note: If a rise of 12 dB or more occurs between the test freq. and its second harmonic, the test at that freq. may be omitted.

EQUIVALENT INPUT NOISE LEVEL: 1000, 1600, and 2500 Hz or the 3 SPA freq., shall not exceed spec plus 3%

BATTERY CURRENT: 1000 Hz, 65 dB, Ref Test Pos., shall not exceed spec plus 20%

(To calculate estimated battery life: $\frac{\text{Capacity Rating (MAH)}}{\text{Current drain (MA)}} = \text{Hours}$)

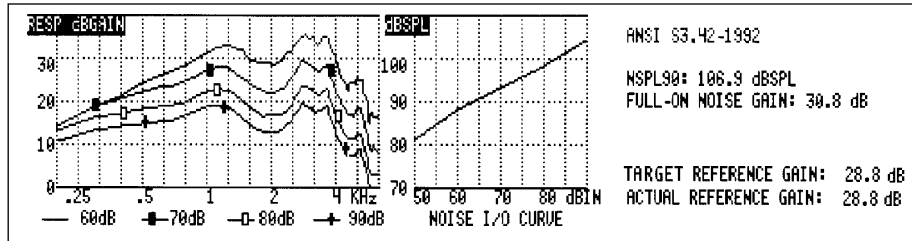
INDUCTION COIL (Telecoil): 10mA/m at 1000 Hz, full-on, within ± 6 dB of spec

AGC HEARING AIDS: Input-Output Characteristics, not more than ± 5 dB

Attack & Release Times, shall be within ± 5 ms or 50%, whichever is larger

ANSI S3.42–1992

TESTING HEARING AIDS WITH A BROAD-BAND NOISE SIGNAL



Definitions (Tolerances are unavailable)

NSPL90: Maximum RMS output sound pressure level (SPL) produced with a 90dB RMS speech-weighted noise input SPL signal.

Full-On Noise Gain: Maximum gain with a 60dB SPL noise input signal. (Note: This test may not elicit a true reading of maximum gain for hearing aids with an onset of non-linear operation below 60dB.)

Actual Reference Gain: The measured amount of gain when the hearing aid is set to full on or the gain after the volume control has been adjusted to ± 1 dB of the Target Reference Gain.

Target Reference Gain: This information is only displayed when the measured gain is greater than the calculated Actual Reference Gain. This target is used to adjust the hearing aid's actual gain to a level of ± 1 dB of the target. The figure is calculated by adding the 60dB SPL input + 17dB and subtracting it from the NSPL90 RMS output. ($NSPL90 - 77 = \text{Target Reference Gain}$)

Family of Frequency Response Curves: These curves are developed by adjusting the noise input level in 10-dB steps over a selected range. The preferred levels are 50, 60, 70, 80, and 90dB SPL. Frye has added 40dB SPL to the preferred levels.

Noise I/O Curve: This demonstrates the compression or limiting of the non-linear circuit.

Test Specifications: Stated for information purposes only. Please refer to the operator's manual for a complete description of each test specification.

FP40 Target 2cc with custom RECD

1. Enter the PROBE mode, press [F5].
2. If you want to use the custom REUR, run an unaided test on the client in the IG mode.
3. Press [F4] to enter the TARGET mode.
4. Press [F1] to select LEFT or RIGHT Ear, then [F2] to select HTL.
5. Using the amplitude and frequency knobs, enter the audiogram
6. Select a fit rule, using [F3].
7. Press [F5] to GENERATE TARGET.
8. Press [F7] to enter 2cc mode. Follow the instructions at right of screen.
9. Press [F3] to select CUSTOM RECD.
10. If the coupler measurement is not already stored in the instrument, see Appendix D of the manual for instructions.
11. Otherwise, place the probe microphone and an eartip with an insert earphone connected to it, into the patient's ear.
12. Plug the Insert earphone into the Speaker jack on the back of the FP40.
13. Press [START] to run the test.

Note: The custom RECD values will be applied to the real-ear targets as well. They will further customize your targets

FP40 Probe Tests with Digital Speech

With NAL, POGO, BERGER, 1/2, 1/3, and 2/3 GAIN—

1. Press [F5] to enter PROBE
2. Set the client up for testing.
3. Press [F2] to select testing mode.
4. Press [F4] TARGET.
5. Press [F1] to select LEFT or RIGHT ear.
6. Press [F2] to select HTL. Enter the audiogram. Press [F2] to select UCL if you have uncomfortable levels to enter, otherwise they will be predicted.
7. Press [F3] to select target fit rule.
8. Press [F5] to generate target.
9. Press [F4] to return to the main probe screen
10. Press [F7] repeatedly until DIGSP ANSI or DIGSP ICRA is chosen.
11. Test as you normally would.

With a DSL fit rule—

Follow the above instructions, but the only digital speech signal available will be DIGSP LTASS.

FP40 Coupler Tests with Digital Speech

1. Set up the hearing aid with the coupler. Place it in the sound chamber
2. Press [F1] to enter the SETUP MENU.
3. Use the amplitude and frequency dials to select SOURCE
4. Press [START/STOP] until DIGSP-ANSI or DIGSP-ICRA is chosen.
5. Press [F1] of return the testing screen.
6. Test as normal.

ANSI S3.22-1996 Specifications and Tolerances

- OSPL90 Curve:** Max SPL shall not exceed the mfgr. spec. by +3 dB
- HFA-OSPL90 or SPA-OSPL90:** Shall be within ± 4 dB of mfgr. spec.
- Full-on Gain (FOG):** 50 or 60 dB inputs
- HFA-FOG or SPA-FOG:** within ± 5 dB of mfgr. spec.
- Reference Test Gain:** information only
- Freq. Response Curve:** 50 dB input AGC, 60 dB input all others
- Freq. Range:** low band ± 4 dB, high band ± 6 dB
- Harmonic Distortion:** Shall not exceed mfgr. specified percentage by +3%
- Equivalent Input Noise:** Shall not exceed mfgr. spec. by + 3 dB.
- Battery Current:** Shall not exceed mfgr. spec + 20%
- HFA-SPLITS:** within ± 6 dB of mfgr. spec.
- AGC Aids:** I/O—within ± 5 dB; Attack and Release—within ± 5 ms or ± 50 % whichever is larger