3M Personal Safety Division
3M™ E-A-Rfit™ Dual-Ear Validation System

October 2019

The right fit test.

User Manual
3M™ E-A-Rfit™ Dual-Ear Validation System

Dangers, Warnings, & Cautions

⚠️ Warning!

To avoid the risk of electric shock, which if not avoided could result in serious injury or death:
- Do not immerse the 3M E-A-Rfit Dual-Ear Validation System in any liquid.
- Use indoors only.
- Disconnect power cord before cleaning.
- Clean the exterior surface of the speaker with a clean anti-static cloth. Do not attempt to clean the interior components.
- There are no user serviceable parts.

The 3M E-A-Rfit Dual-Ear Validation System must be returned to the manufacturer for repair.

⚠️ Caution!

General
- To avoid possible environmental contamination, dispose of the 3M E-A-Rfit Dual-Ear Validation System according to applicable governmental regulations.
- Substitution of components may impair the accuracy of the instrument. Repair should be performed by authorized service personnel only.
- Read the manual before operation.
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Introduction
The 3M™ E-A-Rfit™ Dual-Ear Validation System is comprised of hardware and software that enables the operator to test and record the personal attenuation rating (PAR) of many 3M hearing protection products. (See Appendix B, “Model, Parts and Accessories” for details.) Software versions 5.9.1 and higher are compliant with ANSI/ASA S12.71-2018 American National Standard Performance Criteria for Systems that Estimate the Attenuation of Passive Hearing Protectors for Individual Users.

Getting Started
The 3M E-A-Rfit Dual-Ear Validation System contains the components illustrated below. Please follow the illustrated quick set-up guide in the lid of the case to assemble your hardware.

Figure 1: 3M E-A-Rfit Dual-Ear Validation System kit contents

Install 3M E-A-Rfit Dual-Ear Software
1. Insert the 3M E-A-Rfit flash drive into your computer’s USB port or download the latest version from EARfit.3M.com.

Figure 2: Installing USB Drive into the Computer

2. Run the setup.exe file by double-clicking the file.
3. Follow the screen prompts by clicking Next through the wizard and click Finish to complete the installation.
Hardware setup: speaker stand assembly and cable connection

1. After removing the items from the case, lay the speaker down on a table and thread the stand post to the bottom of the speaker (see Figure 3-A). Then attach the stand base to the stand post by threading clockwise (see Figure 3-B). Set upright on table (see Figure 3-C).

2. To attach all the necessary cords, remove the power cord, the microphone assembly, and the USB cord from the gray compartments of the kit.

   - After plugging the power cord into the top socket on the back of your speaker, plug the power adapter into a power outlet. A green light will illuminate.

   - Insert the microphone assembly into the middle socket on the back of the speaker being careful to align the microphone plug into the socket.

   - Hang both microphones by their integrated clips to the clip on the front of the speaker.

   - Attach the USB cord into the bottom socket on the back of the speaker and insert the other end of the USB cord in the computer’s USB port.

   - A device driver message appears in the task bar when connecting the speaker component to the USB.

   - A flashing red light will illuminate and then go dark when the speaker is successfully connected.
Software Start-up

The start-up process includes the selection of the language, operator, and company. It may also be used to begin testing, review hearing protection fit-tests, and access the data manager (see following sections for details).

✓ **Tip:** At any point in the subsequent testing screens, click icon or the home **EARfit** logo to return to the screen.

**Home Screen**

1. Open the 3M E-A-Rfit software by double-clicking on the icon.

2. In the **Home screen**, select the language, operator, and company information. (Please refer to 1a – 1c.)

![Figure 5: Home Screen](image)

**Figure 5: Home Screen**

a. **Language field:** The language field is saved as the default language once selected.

   • To **select the Language**, click on the drop down box and begin typing while noting the text will highlight. Press **Enter** to select. You may also use the slider bar to scroll and click the desired language. The software will save the selected language as the default for subsequent uses.

![Figure 5a: Home Screen: Selecting Language](image)

**Figure 5a: Home Screen: Selecting Language**
b. Operator field: The person conducting the test is the operator.

- To **add an operator**, click on the button and enter the last and first name fields (required) and any other applicable fields. Click Save to store or click "x" to close.

- To **edit an operator**, click on the button and enter the appropriate fields. **Note:** the light gray button indicates the button is not accessible until an operator is added to the software.

![Figure 5b: Add and Edit Operator Dialog Boxes](image)

Figure 5b: Add and Edit Operator Dialog Boxes

c. Company field: Basic company information is stored in this dialog box and may be used in reports. Company Exposure Limit pertains to the maximum sound level an employee may be exposed to as a time-weighted average over their work shift. This may be a regulatory limit or a lower limit established by the employer. Input the appropriate exposure limit within the range of 80 to 90 dBA.

In the **Company screen**, there are three optional **Label fields** which allow you to customize the name that appears in the software and in the reports. The fields include the Employee ID, Employee Section, and the Employee Function. For example, if the company you are working with has “Departments” instead of “Sections”, you may add the alternative name, and it will appear in the Employee records and in the reports.

- To **add or edit** a company record, click on the icon. Enter the appropriate fields and click **Save**. Note the asterisk fields are required prior to saving.

![Figure 5c: Home screen: Add and Edit Company Dialog Boxes](image)

Figure 5c: Home screen: Add and Edit Company Dialog Boxes
2. Click on **Begin Testing** button to start testing with the 3M™ E-A-Rfit™ Dual-Ear Validation System.

- **Tip:** for reporting, click on **Data Manager** button. (See Data manager section for details.)
- **Tip:** for test results, click on **Review Tests** button. (See Review Tests section for details.)

![Figure 6: Begin Test and Quick Tools Explained on Start Page](image)

<table>
<thead>
<tr>
<th>Quick Support Tools and 3M HPD media links</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verify Microphone</strong></td>
<td>Verify Microphone Icon - used to verify microphone is functioning correctly. See Figure 7 for screen example.</td>
</tr>
<tr>
<td><strong>Screen Capture</strong></td>
<td>Screen Capture Icon - used to capture a screen for user support purposes.</td>
</tr>
<tr>
<td><strong>Settings</strong></td>
<td>Settings Icon – used to link to a database folder storage options and reporting settings. (See Settings section for more information.)</td>
</tr>
<tr>
<td><strong>User Support</strong></td>
<td>Technical User Support Icon - used to send a technical support question with the ability to attach a screen capture.</td>
</tr>
<tr>
<td><strong>Speaker not Connected</strong></td>
<td>Speaker not connected icon - displays a red “x” speaker icon indicating the Speaker is not connected. (Check speaker cables and USB is connected to the computer.)</td>
</tr>
<tr>
<td><strong>Speaker Connected</strong></td>
<td>Speaker connected icon - displays a speaker icon when connected appropriately for Fit-Testing.</td>
</tr>
<tr>
<td><strong>Speaker and Microphone Calibration</strong></td>
<td>Speaker and Microphone calibration icon notices – used to check the due dates for the speaker and microphone calibration. Note: mouse over the icons and a pop text appears stating the due dates for either the speaker or the microphone calibration.</td>
</tr>
<tr>
<td><strong>Facebook</strong></td>
<td>3M Hearing Protection on Facebook icon – used to link to a web dialog with work and friends through the online social media when signed in.</td>
</tr>
<tr>
<td><strong>Video</strong></td>
<td>3M Hearing Protection video icon – used to connect to training links for 3M™ E-A-Rfit™ Hearing and E-A-Rfit videos.</td>
</tr>
</tbody>
</table>

Table 1: Support and 3M HPD Media Links
**Microphone Verification**

Microphone verification is necessary to assure the microphones and speaker are operating properly. A microphone verification is required each time the software is started. Re-reverification is required after every 4 hours of use or after 50 fit test sessions, whichever comes first.

1. Slide the right (red) and left (blue) microphones into the speaker clip as illustrated on the microphone verification screen in the software.

2. Click the **Start Verification** button (see Figure 7).

✓ **Note:** The microphone verification process must be conducted before you begin testing each time the software is launched. You may re-check the microphone by going back to the home screen and clicking on the microphone icon.

![Slide right/left microphones onto clip on front of speaker](image)

> **Figure 7: Microphone Placement**

2. Click **Continue to Testing** button (when connected properly) in the microphone verification screen appear. (See below for details.)

- If microphone is functioning correctly, the Verified ✓ icon will appear. Click **Continue to Testing** button (see Figure 8-A).

- If the microphones are connected incorrectly or if verification does not pass, Verification Failed ❌ icon will appear. Please disconnect and reconnect microphones to speaker and press **Try Again** button (see Figure 8-B). See troubleshooting section.

![Microphone Verification](image)

> **Figure 8-A: Microphone Verification Verified**

![Microphone Verification](image)

> **Figure 8-B: Verification Failed Prompt**
Test Overview

How it Works?
The 3M E-A-Rfit™ Dual-Ear Validation System encompasses a specially designed loudspeaker that allows for an accurate presentation of the test signal and real-time communication between the microphones, speaker and software. The dual-element microphones make it possible to measure the sound level simultaneously inside and outside the hearing protector.

The reference microphone measures the level of the test signal outside the ear. The measurement microphone is connected to one of the specially modified 3M probed test earplugs or earmuff cushions to allow measurement of the sound level inside the wearer’s ear canal while the hearing protector is worn. The difference between the outside and inside microphone levels is used to calculate the Personal Attenuation Rating for each employee: the amount of noise reduction in decibels obtained by that individual with the specific model and size of hearing protector being worn. The PAR is an indication as to whether or not the standard version of that model of hearing protector, without the test probe attached, will provide sufficient attenuation for the noise exposure in the workplace.

The 3M probed test earplugs and earmuff cushions are designed to be equivalent to the performance of the actual hearing protectors they represent. Attenuation differences between the probed and the non-probed products are accounted for in the PAR calculation by applying compensation factors which are derived from laboratory studies.

✓ Note: The use of fit testing cannot be assumed to meet all regulatory requirements. Follow all applicable regulations for determining hearing protector noise attenuation.

Test Procedure
1. Welcome the employee (test subject) to sit in a chair in front of the speaker. Explain the fit test process and select the appropriate model of probed test plugs or probed test earmuff cushions.

2. In the software, select the employee via the drop arrow. Begin typing and press enter to select an employee. If adding an employee, click the Add (refer to step 3).
Test Overview
Test Procedure

- Once selected, these buttons will appear: [Select Product], [Edit], [Run Test], [Test Instructions].

3. When adding or editing an employee, enter the appropriate fields by clicking and highlighting the pre-populated text, if applicable. Click [Save] button when complete.

- To Edit an employee select the [Edit Employee] icon when visible after an employee is added to the software. The employee ID is a required field and a unique identifier must be entered. **Note**: Duplicate Employee IDs will not be accepted.
- Highlight and/or type over the appropriate text and click [Save] button. This will return you to the run test screen.

![Add and/or Edit Employee Record](image)

**Figure 10**: Add and/or Edit Employee Record

<table>
<thead>
<tr>
<th>Employee fields</th>
<th>Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure Level field</td>
<td>Enter in the employee’s A-weighted Sound Pressure Level (dBA) or the employee’s A-weighted exposure level over an 8 hour period (also noted as TWA) if applicable.</td>
</tr>
<tr>
<td>Exposure data not available checkbox</td>
<td>Check this box when hearing exposure levels are unknown.</td>
</tr>
<tr>
<td>Employee ID</td>
<td>Enter in the employee’s company/ID number. Employees with identical Employee IDs are not allowed. This is a required field.</td>
</tr>
<tr>
<td>Section</td>
<td>(Optional, user-customizable field used to correspond to the users’ needs.) Enter in the employee’s section/department. For example, assembly line at a manufacturing site.</td>
</tr>
<tr>
<td>Function</td>
<td>(Optional, user-customizable field used to correspond to the users’ needs.) Enter in the employee’s work position/job function.</td>
</tr>
</tbody>
</table>

**Table 3**: Add/Edit Employee Explained

4. Click [Select Product] and/or [Change Product] button to add and/or change a product for new/ Previously tested employees.

- To find and/or select a product, expand the selector arrows by clicking on an arrow(s). Using the right-hand scroll bar, drag up/down accordingly. To select, click on a product type and it will appear on the run test page.
- To determine which model of probed test plug should be used for the selected hearing protector, click on the icon with the probed plugs
5. Have the test subject fit the probed test plugs or earmuffs him or herself using the insertion method specified by the Fitting Instructions provided with the hearing protector.

NOTE: The presence of the probe tube may interfere with pressing on the end of the probed test plug stem. Instruct subjects who use this technique to pinch the probe tube and the end of the stem to achieve the same fit. (See Figure 12-A). If for any reason the test subject is unable to achieve normal insertion depth due to interference with the probe tube, be aware that the PAR test result may under-estimate the attenuation of the regular hearing protector when inserted to the correct depth.

6. After the test subject has inserted both probed test plugs or fitted the probed test earmuff, attach the microphones to each by inserting the metal probe tube on the microphone fully into the probe tube on the test plug as shown in Figure 12-B. Then hang the microphones on the eyewear temple bars with the reference microphone pointing up. If the test subject does not wear eyewear, have the test subject put on the safety glasses provided with the E-A-Rfit kit and hang the microphones as described.
7. With the employee positioned about 12 inches from the speaker, click on the Run Test button. The speaker will produce a short test signal.
   ✓ Employee History column displays the products previously tested and shows the PAR value, the date and time tested, and if it passed , warning , or failed .

8. Once the test signal ends, the tests results page will display the measured attenuation. The results can be used to retrain the worker to wear hearing protection more effectively. The following process diagram can be used as a guide to resolve unsatisfactory test results.

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**E-A-Rfit™ Follow-up Test Guide**

START

Does test subject have medical problems or pain involving ears? If yes, do not proceed without medical approval.

Test subject inserts preferred HFD.
* Observe insertion but don’t coach as long as plug stays in ear
* Operator attaches mic assembly, runs test.

Document observations, mark box for "assigned" as appropriate. End session.

---

Fail due to improper insertion

Insertion improves

Insertion

Ear canal may be too large for HP. Retest with larger model:
* FX
* Grippers
* Classic Plus

Ear canal prevents proper roll-down

Small ear canal preventing proper insertion

Sharply bent ear canal preventing proper insertion

Excessive ear wax or other obstruction

Physical limitations prevent proper roll-down

Retest

Retest with earplug/earmuff

* Test with eyewear and other PPE in place

Check for leakage where cushion seals to face. Consider alternate PPE as appropriate (3M SecureFit).

---

Pass

Fail

Fail but insertion looks good

Subject cannot fit property

Train employee on same HPD based on observations

---

9. (Optional) Test another product or Retest Product using the or buttons.
10. Once completed with the employee’s fit test, click the end session button (End Session). Note: the session timer will start and stop when a different/new employee is selected, or the session is ended by the operator, or when the software is closed.

Microphone Notifications
During the Run Test the following microphone test messages may appear. Please see the messages with descriptions and user actions below.

- **Microphone Troubleshooting**: An abnormal microphone measurement is detected. Reverification is required. Click “OK” to reverify the microphone. Contact 3M if this continues. Click Ok to return to reverify microphone. (See Microphone Verification for details.)
• **Microphones not connected!** Please connect microphones to continue. Click **OK** (when microphones are connected) and proceed with the test procedure or click **Cancel**.

![Microphones not connected!](image)

• The microphone levels were unusually low, suggesting a possible microphone issue. A second test will be performed at a slightly greater volume. Press **OK** when ready.

![Microphone levels unusually low](image)

• The microphone was changed and must be verified. Click **OK** to continue.

![Microphone changed and verified](image)

---

**Test Results**

The hearing protection fit-test results are displayed on the tabs entitled Quick View, Protection, Attenuation Graph, and Detail View. The action buttons are repeated in each tab and are identified in Table 4 below. (Please refer to Table 1 for the repeated tool support icons and 3M™ Hearing Protection Links.)

**Quick View**

The **Quick View Tab Results** main components detail the PAR results from the fit-test, the values in the left and right ear, the type of hearing protector, Baseline and Assigned check boxes, the Session Duration, and the Test History column.

When you visit this view, the **Baseline** and **Assigned** check boxes may be assigned or selected. The **Baseline** is typically used to denote that it was the first measurement taken on a given protector for a given employee. It may be used as a benchmark or target of the measurement. The **Assigned** checkbox may be used when the employee achieves adequate hearing protection, and the operator recommends wearing this hearing protector while working in a noise environment. If these are assigned, this information will appear in the test history column with the hearing protection product, the PAR value, and the date and time of the test. It will also appear on the company and employee reports.

• **Note:** a data export may be exported into a report or to Excel. (See Data Manager for additional details.)
**Measurements and hearing protection product**
When viewing the Test Results Quick View Screen, you may review the test results and give guidance to the employee (refer to Figure 15 as an example).

**The measurements and the test results symbols are identified below:**

- The PAR is displayed for both the left and right ears as well as a binaural value (see 1). The values have the uncertainty subtracted and displayed on this tab. The binaural PAR is calculated using the lowest attenuation value per octave band for each ear.

  - **Note:** 3M uses the PAR minus the uncertainty value to predict user protection. Calculated uncertainty includes user fitting variability, variability in the user’s noise spectrum and the measurement variability itself.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Checkmark]</td>
<td>The checkmark indicates the measurement passed, denoting the employee’s binaural PAR minus the uncertainty is equal or above the target minimum attenuation (TMA). TMA is the employee’s exposure minus the company exposure limit. For example, if you enter the employee’s exposure of 95 dBA and the company exposure limit is entered as 80 dBA, then the TMA is 15 dB. The employee’s binaural PAR minus the uncertainty must be 15 dB or above in order to “Pass”. The operator may mark the measurements that Pass as a baseline and assign the hearing protector if desired. <strong>Note:</strong> The use of fit testing cannot be assumed to meet all regulatory requirements. Follow all applicable regulations for determining hearing protector noise attenuation.</td>
</tr>
<tr>
<td>![X]</td>
<td>The checkmark indicates the employee’s binaural PAR minus uncertainty failed to meet the target minimum attenuation. Although you may mark a failed measurement as a baseline, you will not be able to assign a hearing protector that has failed. <strong>Note:</strong> the uncertainty is displayed in the <a href="#">Detail View Tab</a>.</td>
</tr>
<tr>
<td>![Exclamation]</td>
<td>The caution symbol is displayed under three different conditions. In these conditions, a pop-up will alert the operator. The first condition is when the attenuation value is less than 10 dB at 125 Hz. The second condition is when there is a 15 dB or more difference between the left and right PAR measurements. The third condition occurs when octave-band attenuation values or PAR value exceed defined limits, which may indicate a blocked probe tube. In these cases, the pop-up will suggest that the hearing protector be retested after adjusting how it is worn or inspecting and possibly replacing the test probe. Although you may mark a cautioned measurement as a baseline, you will not be able to assign a hearing protector when a caution symbol is present.</td>
</tr>
<tr>
<td>![Gray]</td>
<td>A gray symbol is displayed if the employee record does not have a noise exposure level included. Without an employee exposure value, protection sufficiency cannot be determined. Although you may mark a grey measurement as a baseline, you will not be able to assign a hearing protector where protection sufficiency cannot be determined.</td>
</tr>
</tbody>
</table>

- The tested hearing protection is displayed (see 2) and stored as History in the Test History column (See 4).

- The **Left and Right Values** are the computed results from the fit-test for each ear with the uncertainty value subtracted. (See Detail View for additional details.)
The table below explains the actions you may perform in the test results screens displayed in Figure 15. (Note: See Table 1 for explanation of the tool support icons, located on bottom right-side of screen, and the 3M Hearing Protection media icons, located on left-side of screen.)

<table>
<thead>
<tr>
<th>Action buttons</th>
<th>Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Duration and End Session button</td>
<td>Session Duration is the total test time for each employee including each fit-tested hearing protector (if more than one is tested). The session timer will start and stop when a different employee is selected, or the session is ended by the operator, and/or when the software is closed. To end the session, click on the <strong>End Session</strong> button.</td>
</tr>
<tr>
<td>Retest product button</td>
<td><strong>Retest Product</strong> button will immediately run a new test of the same product.</td>
</tr>
<tr>
<td>Test another product button</td>
<td><strong>Test another product</strong> button opens the product selector to allow changing to a different 3M™ Hearing Protector product.</td>
</tr>
<tr>
<td>Baseline</td>
<td>(Optional): Check the baseline is used to set a benchmark when the employee is first tested. Once checked, it will store and display in the history column.</td>
</tr>
<tr>
<td>Assigned</td>
<td>(Optional): Assigned feature may be used when the employee achieves adequate hearing protection, and the operator recommends wearing this hearing protector while working in noise. Once checked, it will appear in the history column and store in the database as the primary hearing protector.</td>
</tr>
</tbody>
</table>
| Create Report                   | Create a report **Create Report** opens a window to view two types of reports, **Employee Report** and **Company Report**.  
✓ To view, click **View Employee Report** and **View Company Report** buttons. Note that the **View** buttons toggle between **Employee Report** and **Company Reports** when selected.  
✓ To print, click on the **Print Employee Report** or **Print Company Report** button depending on which one appears. Toggle between Print Employee and Print Company Reports via the **View** buttons. Print the report that appears, if desired. |
| Delete                          | The delete **icon** allows you to delete a fit-test when selected from the Test History column.  
• To delete, first select a fit test from the test history column. Then select the delete **icon**. Confirm the prompt OK or Cancel to return without deleting the measurement. |
| Change employee/ Edit employee icons | Change employee icon allows you to return back to the run test screen and select a different employee.  
Edit employee icon allows you to change the employee record information. |
| Notes                           | Add employee text to the notes field when applicable. These will appear on the Company Report and store in the E-A-Rfit software. Notes can be edited at any time. |
| Home                            | Home icon **is displayed to provide a quick return to the home screen when applicable.** |

| Table 4: Test Results User Actions |
**Protection Results**

The Protection Tab Results shows the employee’s protected exposure in a similar manner to the guidance in the European guidance document EN 458 and the Canadian hearing protection standard CSA Z94.2. The **protected exposure** is calculated by subtracting the binaural PAR (minus the uncertainty) from the employee’s exposure. Table 4 identifies the screen icons and action buttons.

Looking at the Safety Guide (see 1, Figure 16), the “you are here indicator and dBA Level” indicates if the employee’s fit-test results are insufficient, acceptable, good, acceptable, or at risk of overprotection.

The Fitting Gauge is a rough estimate of where the employee’s PAR value compares to what can be achieved with this hearing protector (see 2).

- **How to view percentage detail on fitting gauge?** Roll your mouse-over the green needle and a pop-up window explains how the PAR result compares to PAR results obtained by others who were tested on the same model.
- **Also, roll your mouse over the “Your Fit”** and a pop-up appears with the PAR value.

Figure 16: Protection Tab Results
**Attenuation Graph**

The **Attenuation Graph Tab** plots the attenuation at each of the seven octave bands for the left ear (blue) and the right ear (red). The PAR values for left, right, and binaural are values carried over from the Quick View tab. This information allows the operator to analyze the shape of the curve and look for abnormalities. Low attenuation values in the lower frequencies might indicate a poor seal.

![Attenuation Graph](image)

**Figure 17: Attenuation Graph Tab Results**

**Detail View**

In the **Detail View Tab Results**, the full value of the PARs are displayed for Left, Right, and Binaural along with associated uncertainty values.

In the middle of the screen, the formula for the protected exposure is displayed and calculated providing the results for the recommended user protected exposure. The formulas are provided below:

- **Protected Exposure**: employee exposure (inputted via the add/edit icons) subtracting the binaural PAR (minus uncertainty) equals the protected exposure.

- **Maximum Protection**: company exposure limit plus the binaural PAR (minus the uncertainty) equals the protected maximum.

![Detail View](image)

**Figure 18: Detail View Tab Results**
Reports

There are two types of reports used to either view online, save as a file, and/or print.

Employee Report

The employee report provides a basic personalized fit-test report. When the button is selected from the Test results page, the employee report will appear as a mid-size pop-window. To view the report, select the right-hand slider bar to scroll through the details.

The employee report contents are identified in Table 5.

Table 5: Employee Report Explained

<table>
<thead>
<tr>
<th>Employee report Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. General information</strong></td>
</tr>
<tr>
<td><strong>2. Summary</strong></td>
</tr>
<tr>
<td><strong>3. Educational messages</strong></td>
</tr>
<tr>
<td><strong>4. Action buttons</strong></td>
</tr>
<tr>
<td><strong>5. Slider bar</strong></td>
</tr>
</tbody>
</table>
**Company Report**

The company report provides additional fit test detail desired for company record-keeping. A signature line is available for companies who wish to have employees sign after they have been tested. The company report contents are identified in Table 6.

**Figure 20: Company Report Example**

<table>
<thead>
<tr>
<th>Company Report</th>
<th>Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Employee and Hearing Protector Information</strong></td>
<td>At the top of the report, the employee’s general information is provided and includes: hearing protector type, the reported exposure, company exposure limit, targeted minimum, maximum attenuation calculations, and if the baseline and/or assigned were selected during the testing.</td>
</tr>
<tr>
<td>2. <strong>Measurement data</strong></td>
<td>The company test results summary displays the PAR minus uncertainty values for left, right, and binaural as well as the attenuation graph.</td>
</tr>
<tr>
<td>3. <strong>Notes field</strong></td>
<td>Operator’s notations are displayed here.</td>
</tr>
<tr>
<td>4. <strong>System information</strong></td>
<td>The system information includes the operator’s name, software version, speaker serial number, date and time calibration occurred of the last factory calibration, and the serial numbers for the left and right microphones.</td>
</tr>
<tr>
<td>5. <strong>Signatures</strong></td>
<td>The employee and operator signatures may be hand signed after printing.</td>
</tr>
<tr>
<td>6. <strong>Action buttons</strong></td>
<td>Used to toggle between company and employee reports. Note that these buttons change when clicked. “View” toggles between employee and company. “Print” enables you to print the viewed report and will toggle based on the “View”.</td>
</tr>
<tr>
<td>7. <strong>Slider bar</strong></td>
<td>The slider bar is used to scroll up and/or down the report.</td>
</tr>
</tbody>
</table>
Data Manager

The data manager is used as a user support portal to manage the company, employee, and operator data without having to have hardware connected. Additionally, reports can be generated, fit-test data can be exported and data from the 3M E-A-Rfit Dual-Ear Validation System 4 database files can be imported. The following sections outline how to use these operator tools.

Company records

In lieu of the home screen, the Company Tab may be used to modify, add, or delete company data or records. The required fields are noted by an asterisk which include the name, country and company exposure limit. The company exposure limit is a required value and is used to compute the target minimum attenuation, the protected exposure and protection maximum value.

Tip: to change the field labels for the employee ID, employee section, and/or employee function you may enter in a different field descriptor, if desired. When saved, these will appear in the 3M E-A-Rfit software screens and in the reports.

➢ To add, edit, and delete a company, do one of the following:

To add a company, click on the Add icon. Fill in the appropriate fields noting the company is a required field with red outline shading. Use the drop down arrow and type the first few letters to quickly find and then click to button.

2. To delete a company record, click on the Delete icon.

3. To edit a company, click on a specific company name (see below). Type over or highlight and then delete the text. Then enter the new information. Click Save button.

✔ Note: to cancel, click the Home icon or select a different tab without saving.

Figure 21: Data Manager - Company Tab
**Important: Responsibility for Data Privacy and Security**

Purchaser is solely responsible for complying with all privacy and security-related laws and regulations applicable to the collection, storage, use, import and export of all data (personally-identifiable or otherwise) entered into, or generated by, the 3M™ E-A-Rfit™ Dual-Ear Validation System. Access to the 3M E-A-Rfit Dual-Ear System is not password-controlled. Purchaser should implement all necessary administrative, physical and technical safeguards it determines are necessary to ensure the integrity, confidentiality and security of the data against both internal (e.g., access by unauthorized personnel, misuse of data) and external threats (e.g., “hacking”).

**Employee records**

The **Employee Tab** of the data manager page may be used to add, edit, delete, and import employees into the 3M™ E-A-Rfit™ Dual-Ear Validation System database. The first name, last name, country and the employee’s exposure level, and employee ID are the required fields when completing these records. If there is no employee’s exposure level available, you may click the “exposure data not available” check box. However, if not selected, this will affect the protected exposure results displayed in the Detail View of the Test Results page.

➢ To **add, edit, and delete employee**, do one of the following:

1. To **add an employee**, click on the **Add** icon. Fill in the appropriate fields noting the company is a required field with an asterisk. Use the drop down arrow and type the first few letters to quickly find and then click the **Save** button.

2. To **Delete an employee record**, click on an employee’s name in the employees name box and then click on the **Delete** icon.

3. To **Edit an employee**, click on a specific company name (see below). Type over text (or highlight, delete, and enter text) with new information. Click **Save** button.

☑ **Note:** to cancel, select a different tab or click on the home screen.

![Figure 22: Data Manager - Employee Tab](image)
**Importing Employee Data**

The **Import** feature enables an administrator to import the company’s employees whom will be fit tested via an existing Excel spreadsheet. Once the employee data is imported to corresponding fields, you have the option to map the Excel file fields to the 3M E-A-Rfit Dual-Ear Validation System database.

➢ To **import employee data to corresponding fields**, follow below:

1. To import, click on the **Import** button when **Employee** tab is selected from the Data Manager page (see Figure 22).

2. In the **Import Employee** list dialog box, select **Open Data File** button.

3. Select the pre-existing employee record file via your network/pc folder. Below is an example of a pre-existing Employee Record file which contains last and first names, exposure, number (to be mapped to Employee ID), department/section, and function.
4. Select the dropdown box data file fields to map the fields. In Figure 26 below: “Last Name” column from the imported file corresponds with the same terminology of the database column, but with the “Employee ID” field this is mapped to the “Number” column from the imported file. The “Function” field illustrates the selectable drop down fields.

![Figure 25: Import Employee List and Selected Data File Fields Example](image)

5. Select the Apply Mapping button. A preview of the import data appears in the right preview pane of the Import Employee List (refer to Figure 26).

6. Click Import to E-A-R™ button when correct (refer to Figure 26). *Note: if Import to E-A-R™ button is reselected, the data will create duplicate employee entries which must be manually deleted.

7. (Optional): Select Save Template (to save the mapped files) and select Load Template to reload.

8. Close the dialog box via “x” (refer to Figure 26). The imported employees will appear in the Employee’s tab of the Data Manager.

![Figure 26: Import Employee List](image)
Operator records

In the Operator Tab of the Data Manager, you may add, edit, and delete operator/safety personnel information. The operator information is saved and is presented in "system information" section of the Company Report.

➢ To add, edit, delete, and or view operator information, follow below:

1. Click the button to add an operator. Fill in the appropriate fields noting the first and last names are the required fields. Use the drop down arrow and type the first few letters to quickly find and then click the button.

2. To Edit and/or Delete an Operator, do one of the following:

   • In the operator’s window, select an operator. To Edit/Change the information, click in desired fields and enter in new information. Click the button.

   • To Delete, click on a name from the Operators section and select the button.

![Image of Data Manager Operator Tab](image)

Figure 27: Data Manager - Operator Tab: Adding

![Image of Data Manager Operator Tab](image)

Figure 28: Data Manager - Operator Tab: Edit and/or Delete
**Reports Tab**

In the **Reports Tab** of the data manager, you can generate the hearing protector fit test reports.

➢ To create reports, do one of the following:

1. Select a **Company** from the drop-down list.

2. In the employee selection, click in one of the following: select latest visits, select dates, select all, and/or unselect all.
   - Individual fit tests may also be selected/unselected using the check boxes in the table at the bottom of the screen.

3. Select either Employee Report or Company Report by clicking in the appropriate radio button.

4. Click **Generate Reports** button. The selected reports will appear on your screen to view, save as .pdf, and/or for printing.

![Figure 29: Data Manager - Reports Tab](image-url)
Export Tab

In the Export Tab of the data manager, you may run an export or data query of the stored fit-test data.

There are four Export options which are illustrated and explained below.

**Employees due for testing** – this data query will provide a list of employees due for testing for a given company. The query can be filtered by a selected cut-off date parameter. The query results will display the employee name, the employee ID, their function and section, and the last known test date.

- **To run this export** - double click on the “Employees Due for Testing”. Select the company and date parameters. Click *Accept*. The following will be displayed.

![Employees Due for Testing](image)

Select the two parameters and click *Accept* to continue your data query.

**Employees Session Duration** - this data query will display the date and session duration of all fit-tested employees when filtered by: company, operator, start date and end date.

- **To run this export** - double click on the “Export Data”. Select the company, operator, start date and end date. Click *Accept*. The following will be displayed.

![Employees Session Duration](image)
Export Data – this data query will provide all fit-test data information when filtered by company, by all employees or by specific employee. (Note: use the horizontal slider bar at the bottom of the export window to view all the data fields when applicable.)

- To run this export - double click on the “Export Data”. Select the range, employees, company, employee (if applicable) and date parameters. Click Accept. The following will be displayed.

Figure 31: Export with Employees Session Duration Example

Figure 32: Export Data Query Example
**Hearing Protector Assignment** – this data query filters by company and will display the company, all employees fit-tested, the fit-test visit dates, the product tested, and the left PAR, the right PAR, and the Binaural PAR values.

- To run this export: double click on the **“Hearing Protector Assignment”**. Select the company and click **Accept**. The following will be displayed.

![Hearing Protector Assignment](image.png)

**Figure 33: Export Hearing Protector Assignment Example**

- **Note**: If there is a data query you would like customized, please contact the technical services as outlined in the “User Support” section at the end of the user manual.
**3M E-A-Rfit Dual-Ear Validation System 4 Data Import**

This feature is used to import 3M E-A-Rfit Dual-Ear Validation System 4 data into the 3M™ E-A-Rfit™ Dual-Ear Validation System software.

1. **To Import 3M E-A-Rfit 4 database files**, click on the Select EARfit 4 database files button.

2. Select the files from your computer's directory and click Open.

3. The files will appear in the Selected Files listing (see 1) of the Data Manager screen. Click the Import databases button. The program will display when the import completed importing the files (see 2).

---

**Figure 34: Import E-A-Rfit 4 Data Tab**
Settings

Database folder location option
In the “Database” tab, you can determine where you wish to store your test results, on the local hard drive.

1. To change the database location, click on the icon select the button.
2. Select a mapped location and click Ok.

- Click the button to revert back to the default saved location.

![Figure 35: Settings – Database Tab](image)

Database Folder – Select Browse to change folder location if desired.

Reporting Tab
In the Reporting Tab, you can select the location of the Report Queries folder via the button or click to revert to the local drive default location.

In the Reporting Tab, the company logo image on the reports can be customized via the button. Reset to return back to the 3M Company logo which is set as the default.

![Figure 36: Settings -Report Tab](image)

Report query folder – Option to browse to a different folder location.

Company logo image – Select browse to select a different image from your computer/mapped folders.
Software updates
Software update messages will appear on the bottom of the home screen. This banner will only appear if you are connected to the Internet.

- To update: Click on the message box. Click

![Software Update Prompt Example](image)

**Figure 37: Software Update Prompt Example**

- **Note**: You will have to close the screen behind the small wizard box. Click as displayed below. Follow the install wizard prompts by selecting Next through each screen. Click Finish at the last screen. Reopen the software.

![Install Shield Wizard for Software Updates](image)

**Figure 38: Install Shield Wizard for Software Updates**
User Support

The user support page is used to access and find assistance for the following: Resources (such as: user instructions, training videos, etc.), System Details, Request Technical Assistance, and Check for Updates. Note: An internet connection may be required to access the User Support features.

Resources

The Resources screen may be used to view and access the user manual, view live fit test video, view testing set-up for banded protectors and/or earmuffs and various other training videos. Technical information is found via the 3M™ E-A-Rfit™ User Support web link.

- To access the User Support Resources page, click on the icon (bottom left of screen) and click on Resources tab.

System Details

The System Details are identified in this page and may be used to troubleshoot your system. To access the System Details, click on the icon and click System Details tab.
**Request Technical Assistance**

The Request Technical Assistance support page may be used to contact Technical Support with an 3M™ E-A-Rfit™ Dual-Ear Validation System question. Fill in the appropriate fields and click on Submit Request. To access the Request Technical Assistance, click on the icon and click Request Technical Assistance tab.

![Figure 41: User Support – Request Technical Assistance](image)

**Check for Updates**

The Check for Updates support page is used to view and upload the most current software version. To access the Check for Updates click on the icon and click Check for Updates tab.

- Click **Check for Updates** button. This will update and post the current “Available Version” (see 1), if applicable.
- Click **Get Software Update** button. This will download the current software version (see 2), if applicable.
- Click **Get Database Updates** button. This will update the database (see 3), if applicable.

![Figure 42: User Support – Check for Updates](image)
Appendix A: Specifications and Performance Statement

Standards/Directives


References


US Patents

3M.com/patent

Measurements Computed

<table>
<thead>
<tr>
<th>Octave band data computed in:</th>
<th>125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, 8000 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAR</td>
<td>Personal attenuation rating</td>
</tr>
<tr>
<td>Frequency weighting</td>
<td>A</td>
</tr>
</tbody>
</table>

Mechanical Specifications

<table>
<thead>
<tr>
<th>Speaker housing</th>
<th>Aluminum, black material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker size</td>
<td>6.5&quot; long x 3.75&quot; width x 6&quot; depth; 2.54cm long x 9.5cm width x 15.24cm depth</td>
</tr>
<tr>
<td></td>
<td>3.1 lbs; 1406.1 grams</td>
</tr>
<tr>
<td>Speaker Status Indicators</td>
<td><strong>LED Red blinking indicator light</strong> – signifies USB is not connected. It will disappear when connected successfully. <strong>LED Green Indicator light</strong> – signifies power is on.</td>
</tr>
</tbody>
</table>
Appendix A: Specifications

Power Supply and Operating Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>120 to 240VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>50-60 Hertz</td>
</tr>
<tr>
<td>Current</td>
<td>250 mA</td>
</tr>
</tbody>
</table>

Environmental Operating Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>5 °C to 40 °C (41 °F to 140 °F)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>80% for temperatures up to 31°C (87.8 °F); decreasing linearity to 50% at 40°C (140 °F)</td>
</tr>
<tr>
<td>Voltage Range</td>
<td>12 Volts DC</td>
</tr>
<tr>
<td>Transient overvoltage</td>
<td>Impulse withstand (overvoltage) category II. Rated pollution degree 2.</td>
</tr>
</tbody>
</table>

User Interface requirements: ports and connectors

<table>
<thead>
<tr>
<th>Port/Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC/DC output (power)</td>
</tr>
<tr>
<td>2 LED indicators</td>
</tr>
<tr>
<td>USB connector</td>
</tr>
<tr>
<td>Power connector</td>
</tr>
</tbody>
</table>

Software requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen Resolution</td>
<td>1024 X 768 pixels (minimum)</td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft Windows 7 Professional, 32-bit and 64-bit</td>
</tr>
<tr>
<td></td>
<td>Microsoft Windows 8, 32-bit and 64-bit</td>
</tr>
<tr>
<td></td>
<td>Microsoft Windows 10, 32-bit and 64-bit</td>
</tr>
<tr>
<td></td>
<td>Microsoft .NET Framework: Net4Full 4.0.30319.1, Net4Client</td>
</tr>
<tr>
<td>USB Port</td>
<td>1 USB port available</td>
</tr>
<tr>
<td>Pointing Device</td>
<td>If the screen is not a touch screen, a pointing device, such as a mouse is required.</td>
</tr>
<tr>
<td>Internet Connection</td>
<td>Internet is required for some features such as Software Updates and How-To Videos.</td>
</tr>
<tr>
<td>MicroProcessor Required</td>
<td>1 GHz or faster 32-bit (x86) or 64-bit (x64) processor</td>
</tr>
<tr>
<td>Memory Required</td>
<td>1 GB RAM (32-bit) or 2 GB RAM (64-bit)</td>
</tr>
<tr>
<td>Additional Disk Space</td>
<td>100 MB</td>
</tr>
</tbody>
</table>
Performance Statement (per ANSI/ASA S12.71-2018)

The information in this table is provided to meet compliance requirements for Field Attenuation Estimation Systems (fit test systems) that report a PAR according to ANSI/ASA S12.71-2018 American National Standard Performance Criteria for Systems that Estimate the Attenuation of Passive Hearing Protectors for Individual Users.

ANSI/ASA S12.71-2018. *Performance Criteria for Systems That Estimate The Attenuation of Passive Hearing Protectors for Individual Users (starting with version 5.9.1). The principal change required by the new ANSI/ASA standard applies to how the uncertainty value is handled. By default, the 3M E-A-Rfit Dual-Ear Validation System has always taken a conservative approach by displaying the PAR minus uncertainty value as the overall PAR result. Any change to the uncertainty will automatically be incorporated in the PAR reported by the 3M E-A-Rfit Dual-Ear Validation System. The resulting PAR value is not expected to differ more than the typical test variability. Changes to uncertainty calculations will not apply to test results conducted with prior versions.

<table>
<thead>
<tr>
<th>Specification Descriptor</th>
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<tbody>
<tr>
<td>Specification</td>
</tr>
<tr>
<td>A Manufacturer</td>
</tr>
<tr>
<td>B FAES brand name</td>
</tr>
<tr>
<td>C System requirements</td>
</tr>
<tr>
<td>D HPDs supported</td>
</tr>
<tr>
<td>E FAES test method</td>
</tr>
<tr>
<td>F FAES type</td>
</tr>
<tr>
<td>G Recommended regular physical calibration</td>
</tr>
<tr>
<td>H Recommended periodic verification procedure</td>
</tr>
<tr>
<td>I Maximum permissible ambient noise</td>
</tr>
<tr>
<td>J Operator Noise Exposure</td>
</tr>
<tr>
<td>K Minimum and maximum measurable attenuation values</td>
</tr>
<tr>
<td>L Fit-Test Output</td>
</tr>
<tr>
<td>M FAES measurement uncertainty (+/-)</td>
</tr>
<tr>
<td>N Listener requirements</td>
</tr>
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### Appendix A: Specifications

#### Environmental Operating Conditions

The information in this table is provided to meet compliance requirements for Field Attenuation Estimation Systems (fit test systems) that report a PAR according to ANSI/ASA S12.71-2018 American National Standard Performance Criteria for Systems that Estimate the Attenuation of Passive Hearing Protectors for Individual Users.

ANSI/ASA S12.71-2018. *Performance Criteria for Systems That Estimate The Attenuation of Passive Hearing Protectors for Individual Users (starting with version 5.9.1). The principal change required by the new ANSI/ASA standard applies to how the uncertainty value is handled. By default, the 3M E-A-Rfit Dual-Ear Validation System has always taken a conservative approach by displaying the PAR minus uncertainty value as the overall PAR result. Any change to the uncertainty will automatically be incorporated in the PAR reported by the 3M E-A-Rfit Dual-Ear Validation System. The resulting PAR value is not expected to differ more than the typical test variability. Changes to uncertainty calculations will not apply to test results conducted with prior versions.

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<tr>
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<tr>
<td>K Minimum and maximum measurable attenuation values</td>
</tr>
<tr>
<td>L Fit-Test Output</td>
</tr>
<tr>
<td>M FAES measurement uncertainty (+/-)</td>
</tr>
<tr>
<td>N Listener requirements</td>
</tr>
</tbody>
</table>
# Appendix B: Model, Parts, and Accessories

## Kit Components

<table>
<thead>
<tr>
<th>3M ID</th>
<th>3M™ E-A-R™ Dual-Ear Validation System Kit Components</th>
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</thead>
<tbody>
<tr>
<td>70-0716-7411-6</td>
<td>- Enclosure Speaker Assembly (073-783); Dual-Ear Microphone/Cable Assembly (073-781); Dual-Ear 1/4&quot;-20 to 5/8&quot;-27 Speaker Stand Adaptor (073-096); Test plug kit (693-1000); 3M™ SecureFit™ Protective Eyewear (70-0716-7682); Microphone stand (393-0003); USB cable (393-0007); Power cord/supply (053-825); 3M™Roll Model (319-1003); 3M™Eargauge (85099-00000); Tweezers (073-092); USB flash drive with software install and user manual (093-411); antistatic ziplock bag (293-0008); Removable microphone clip (2) (073-100); Carrying case assembly (073-784).</td>
</tr>
</tbody>
</table>

## 3M™ Probed Test Hearing Protectors Accessories (Sold Separately)

The following 3M™ Hearing Protector Test Probes are used for testing and may be purchased through a 3M distributor.

### Disposable Foam Test Plugs

<table>
<thead>
<tr>
<th>Disposable Foam Test Plugs</th>
<th>Probed Test Plug SKU</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
</table>
- E-A-Rsoft™ Yellow Neon™ Blasts™  
- E-A-Rsoft™ SuperFit™  
- Tattoo™  
- Nitro™ | 310-1250, Yellow Neons™ Uncorded in Pillow Pak Regular Size  
311-1250, Yellow Neons™ Corded in Poly Bag, Regular Size  
311-1252, Yellow Neon™ Blasts™ Corded in Poly Bag, Regular Size  
311-1254, SuperFit™ Corded in Poly Bag, Regular Size  
311-1256, Yellow Neons™ Corded in Poly Bag, Regular Size  
311-1257, Yellow Neon™ Blasts™ Corded in Poly Bag, Regular Size  
311-4106, Metal Detectable Corded in Poly Bag, Regular Size  
311-4109, SuperFit™ Metal Detectable Corded in Poly Bag, Reg Size  
311-4110, E-A-Rsoft™ Metal Detectable AV Corded, Poly Bag, Reg Size  
312-1250, Yellow Neons™ Uncorded Earplugs in Poly Bag, Reg Size  
312-1252, Yellow Neon™ Blasts™ Uncorded in Poly Bag, Reg Size  
312-1256, SuperFit™ Uncorded Earplugs in Poly Bag, Reg Size  
391-1004, Yellow Neons™ One Touch™ Refill Reg Size  
391-1254, SuperFit™ One Touch™ Refill Regular Size  
P1000, Nitro™ Earplugs Uncorded  
P1001, Nitro™ Earplugs Corded  
P1100, Nitro™ Tattoo™ Earplug Uncorded  
P1101, Nitro™ Tattoo™ Earplug Corded |
312-1251, E-A-Rsoft™ Yellow Neons™ Large Uncorded in Poly bag  
391-1005, E-A-Rsoft™ Yellow Neons™ Large Uncorded |
310-1060, Uncorded in Pillow Pack  
310-1080, Corded Earplugs in Poly  
311-1081, Corded Earplugs in Econopack Dispenser Box  
311-1101, Corded Earplugs in Poly Bag  
312-1080, Uncorded Earplugs in Econopack  
312-1082, Uncorded Earplugs in Econopack  
312-1201, Uncorded Earplugs in Poly Bag  
390-1000, Uncorded Earplugs in Value Pak  
391-1001, One Touch™ Refill  
VP311-1101, Corded Earplugs in S PR-100 Pak |
311-1106, Corded Earplugs in Poly Bag  
310-4003, Platinum™ Uncorded Earplugs, Poly Bag,  
310-1009, SuperFit™ 30 Uncorded Earplugs, in Pillow Pak  
312-4201, SuperFit™ 30 Uncorded Earplugs in Poly Bag  
311-1126, SuperFit™ 30 Corded Earplugs in Poly Bag  
391-1002, SuperFit™ 30 One Touch™ Refill |
311-1105, Corded Earplugs in Poly Bag  
311-4101, Metal-Detectable Corded Earplugs in Poly Bag  
310-1008, SuperFit™ 33 Uncorded Earplugs in Pillow Pak  
311-1125, SuperFit™ 33 Corded Earplugs in Poly Bag  
SF-01-003, SuperFit 36 |
### 3M™ Probed Test Hearing Protectors Accessories (Sold Separately)

<table>
<thead>
<tr>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
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</table>
| **E-A-R™ TaperFit™ 2** | 393-2006  
  - TaperFit™ 2  
  312-1219, Uncorded, Poly Bag, Regular  
  312-1223, Corded, Poly Bag, Regular  
  **Not available:** 312-1221 & 12-1224 TaperFit™ 2 Large (in progress) |
| **E-A-Rsoft™ FX™** | 393-2004-50  
  - E-A-Rsoft™ FX™  
  312-1260, Corded Earplugs in Poly Bag 2000 PR/Case  
  312-1261, Uncorded Earplugs in Poly Bag 2000 PR/Case  
  312-1274, Corded Earplugs in Poly Bag 1000 PR/Case |
| **E-A-R™ E-Z-fit™** | 393-2005-50  
  - E-A-R™ E-Z-Fit™  
  312-1208, Uncorded Earplugs in Poly Bag 2000 PR/Case  
  312-1222, Corded Earplugs in Poly Bag 2000 PR/Case |
| **E-A-Rsoft™ Grippers** | 393-2021-50  
  - E-A-Rsoft™ Grippers  
  312-6001, E-A-Rsoft™ Grippers Corded Earplugs, in Polybag |
| **1100** | 393-2010-50  
  - 3M™ 1100  
  393-2010-50  
  - 3M™ 1110  
  312-1000, Uncorded Foam Earplugs in Poly Bag 1000 PR/Case  
  312-1010, Corded Foam Earplugs in Poly Bag 500 PR/Case  
  **Not available:** 1120 (in progress) |

### Push-to-Fit Probed Test Plugs

<table>
<thead>
<tr>
<th>Push-to-Fit Probed Test Plugs</th>
<th>Probed Test Plug SKU</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
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| **E-A-R™ Push-Ins™** | 393-2002-50  
  - Push-Ins™  
  312-1000, Uncorded Earplugs in Poly Bag  
  312-1001, Corded Earplugs in Poly Bag  
  312-1002, Uncorded Earplugs in Poly Bag  
  312-1003, Corded Earplugs in Poly Bag  
  312-1004, Uncorded Earplugs in Poly Bag  
  312-1005, Corded Earplugs in Poly Bag  
  312-3000, Metal Detectable |
| **E-A-R™ Skull Screws™** | 393-2012-50  
  - Skull Screws™  
  P1300, Uncorded Earplugs in Poly Bag  
  P1301, Corded Earplugs in Poly Bag |
| **Push-Ins™ with Grip Rings** | 393-2015-50  
  - Push-Ins™ with Grip Rings  
  312-1009, Push-Ins™ with Grip Rings Corded in Poly bag  
  312-1008, E-A-R™ Push-Ins™ with Grip Rings Uncorded, Poly bag |
| **No Touch™ Probed** | 393-2013-50  
  - No Touch™  
  P2000, Uncorded in Poly Bag  
  P2001, Corded in Poly Bag |
| **E-A-R™ Express™ Pod Plugs™** | 393-2008-50  
  - Express™ Pod Plugs™  
  321-2100, Blue Grips in Pillow Pak  
  321-2200, Assorted Color Grips in Pillow Pak  
  311-1114, Corded Blue Grips in Pillow Pak  
  311-1115, Corded Assorted Grips in Pillow Pak  
  311-1127, Corded Metal-Detectable Earplugs in Pillow Pak |
| **Push-Ins™ SofTouch™** | Not available  
  318-4000, 318-4001, E-A-R™ Push-Ins™ SofTouch™ |
| **PistolZ™** | Not available  
  P1400, P1401, P1401A, PistolZ™ |

### Banded Probed Test Plugs

<table>
<thead>
<tr>
<th>Banded Probed Test Plugs</th>
<th>Test Plug SKU</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
</table>
| **EARcaps™ Model 200** | 393-2020-50  
  - E-A-R Caps™  
  321-2101, E-A-R Caps™ Model 200 Hearing Protector  
  321-2103, Replacement Pods for E-A-R Caps™ Model 200 |
## Appendix B: model, parts, and accessories

3M™ Probed Test Hearing Protectors Accessories (Sold Separately)

### Reusable Probed Test Plugs

<table>
<thead>
<tr>
<th>Reusable Probed Test Plugs</th>
<th>Probed Test Plug SKU</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
</table>
340-4002, Corded Earplugs in Carrying Case  
340-4003, Uncorded Earplugs in Poly Bag  
340-4004, Corded Earplugs in Poly Bag  
340-4007, Metal Detectable Corded Earplugs in Poly Bag  
340-4014, Corded Earplugs in Econopack  
340-4036, with Cotton Cord in Poly Bag  
340-4044, with Cloth Cord in Paper Envelope  
340-4017, Metal Detectable Corded Earplugs in Econopack  
VP340-4004, Corded Earplugs in 5 PR-100 Pak  
UF-01-012, UltraFit 20  
UF-01-015, UltraFit 14 |
| Tri-Flange™ Probed        | 393-2011-50          | ● Tri-Flange™  
● E-A-R™ UltraFit Plus™ | P3000, Vinyl Corded Earplugs in Poly Bag  
340-6004, UltraFit Plus™ Corded Earplugs in Poly Bag  
340-6002, UltraFit Plus™ Corded Earplugs in Carrying Case |
| Reusable 1260             | 393-2016-50          | ● 1260        | 1260, Reusable Earplugs, uncorded  
1270, Reusable Earplugs, corded  
1271, Reusable Earplugs, corded with carry case |
| UltraFit™ Silicone & Pomp Plus | 393-2017-50    | ● UltraFit™ Silicone Pomp Plus | 340-3002, 3M™ UltraFit™ Silicone Corded Earplugs, One Size |
| Pomp Millennium Small     | 393-2023S-50         | ● Pomp Millennium | 3M™ Pomp Millennium Small |
| Pomp Millennium Med       | 393-2023M-50         | ● Pomp Millennium | 3M™ Pomp Millennium Medium  
Not available: 1241 Reusable Earplugs |
| Pomp Millennium Lg        | 393-2023L-50         | ● Pomp Millennium | 3M™ Pomp Millennium Large |
| Reusable 1290             | 393-2024-50          | ● Reusable 1290 | 3M™ Reusable 1290 Test Plugs |
| Combat Arms™ 4.0 – SMALL  | 393-2018S-50         | ● Combat Arms™ | 370-1030, 3M™ Combat Arms™ Single Tip Corded Earplugs Small |
| Combat Arms™ 4.0 – MED    | 393-2018M-50         | ● Combat Arms™ | 370-1031, 3M™ Combat Arms™ Single Tip Corded Earplugs Medium |
| Combat Arms™ 4.0 – LARGE  | 393-2018L-50         | ● Combat Arms™ | 370-1032, 3M™ Combat Arms™ Single Tip Corded Earplugs Large |
## Appendix B: Model, Parts, and Accessories

### 3M™ Probed Test Hearing Protectors Accessories (Sold Separately)

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Probed Test Cushion SKU</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combat Arms™ 4.1 – SMALL</td>
<td>393-2022S-50</td>
<td>● Combat Arms™</td>
<td>370-1040, 3M™ Combat Arms™ 4.1 Hear-Through Earplugs, 28 dB, Single Ended, Small</td>
</tr>
<tr>
<td>Combat Arms™ 4.1 – MED</td>
<td>393-2022M-50</td>
<td>● Combat Arms™</td>
<td>370-1041, 3M™ Combat Arms™ 4.1 Hear-Through Earplugs, 28 dB, Single Ended, Medium</td>
</tr>
<tr>
<td>Combat Arms™ 4.1 – LARGE</td>
<td>393-2022L-50</td>
<td>● Combat Arms™</td>
<td>370-1042, 3M™ Combat Arms™ 4.1 Hear-Through Earplugs, 28 dB, Single Ended, Large</td>
</tr>
</tbody>
</table>

### Probed Test Cushions

#### PELTOR™ Earmuff Test Cushion A

<table>
<thead>
<tr>
<th>SKU: 393-3004-2</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Optime™ 105</td>
<td>H10A, 3M™ PELTOR™ Optime™ 105 Earmuffs, Other-the-head Headband</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H10P3E, 3M™ PELTOR™ Optime™ 105 Earmuffs, Cap-attached Headband</td>
</tr>
</tbody>
</table>

#### PELTOR™ Earmuffs X1/X2 Test Cushions B

<table>
<thead>
<tr>
<th>SKU: 393-3001-2</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● X1, X2</td>
<td>X1A, PELTOR™ Over-the-Head Earmuffs</td>
</tr>
<tr>
<td></td>
<td>● Optime 95</td>
<td>X1P3E, PELTOR™ Hard Hat-Attached Earmuffs</td>
</tr>
<tr>
<td></td>
<td>● Optime 98</td>
<td>X2A, PELTOR™ Over-the-Head Earmuffs</td>
</tr>
<tr>
<td></td>
<td>● Optime 101</td>
<td>X2P3E, PELTOR™ Hard Hat-Attached Earmuffs</td>
</tr>
<tr>
<td></td>
<td>● LiteCom</td>
<td>H6A, PELTOR™ Optime™ 95 Earmuffs, Over-the-head Headband</td>
</tr>
<tr>
<td></td>
<td>● LiteCom Plus</td>
<td>H6P3E, PELTOR™ Optime™ 95 Earmuffs, Cap-attached Headband</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H7A, PELTOR™ Optime™ 101 Earmuffs, Other-the-head Headband</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H7P3E, PELTOR™ Optime™ 101 Earmuffs, Cap-attached Headband</td>
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<tr>
<td></td>
<td></td>
<td>H9A, PELTOR™ Optime™ 98 Earmuffs, Over-the-head Headband</td>
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<tr>
<td></td>
<td></td>
<td>H9P3E, PELTOR™ Optime™ 98 Earmuffs, Cap-attached Headband</td>
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<tr>
<td></td>
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<td>MT53H7A4600-NA, PELTOR™ LiteCom BRS, 2-way radio, Headband</td>
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<td>MT53H7P3E4600-NA, PELTOR™ LiteCom BRS, 2-way radio, Cap-attached Headband</td>
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<td>MT7H7A4610-NA, PELTOR™ LiteCom Plus, Headband</td>
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<td>MT7H7P3E4610-NA, PELTOR™ LiteCom Plus, Hard Hat Attached Headband</td>
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<td></td>
<td></td>
<td>WS™ LiteCom PRO III Headset - Headband</td>
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<td>WS™ LiteCom PRO III Headset - Neckband</td>
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<td></td>
<td>WS™ LiteCom PRO III Headset - Hard Hat</td>
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<td></td>
<td>ProTac™ III Headsets: MT13H221A, MT13H221P3E, MT13H220A, MT13H220P3E</td>
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#### PELTOR™ Earmuffs X3 Test Cushions C

<table>
<thead>
<tr>
<th>SKU: 393-3003-2</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● X3</td>
<td>X3A, 3MTM PELTORTM Over-the-Head Earmuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X3P3E, 3MTM PELTORTM Hard Hat-Attached Earmuffs</td>
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</tbody>
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#### PELTOR™ Earmuffs X4/X5 Test Cushions D

<table>
<thead>
<tr>
<th>SKU: 393-3005-2</th>
<th>Brand Names</th>
<th>Crossover Product SKUs and Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● X4, X5</td>
<td>X4A, PELTOR™ Over-the-Head Earmuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X4P3E, PELTOR™ Hard Hat-Attached Earmuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X5A, PELTOR™ Over-the-Head Earmuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X5P3E, PELTOR™ Hard Hat-Attached Earmuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH-5, PELTOR™ High Attenuation Headset, Over-The-Head</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH-5, PELTOR™ High Attenuation Headset, Hard Hat-Attached</td>
</tr>
</tbody>
</table>

**ComTac**

Not available
Contact 3M
User Support (US)

Contact 3M

Should your 3M equipment need to be returned for repair or for factory calibration, please contact the one of the following
in the United States:

• Technical Support: 1-800-243-4630
• Customer Service and/or Service: 1-800-245-0779
• Direct Government Orders: 1-800-752-3623
• User support website: EARfit.3M.com

Outside US Customers
Please contact your local 3M Technical Service person to coordinate the service or repair.

Guidelines for Calibration/Repair Return:
1. Contact Customer Service and/or Service as stated above in "User Support".
2. Package the unit(s) in accordance with the shipping guidelines.
3. Once the shipment is received, the Service Center will complete the requested calibration or Diagnostic Analysis.

Shipping Guidelines
1. All material must be packaged in an appropriate container that will ensure undamaged delivery. Options include double
corrugated cardboard boxes or shipment in original 3M E-A-Rfit Dual-Ear Validation System case.
2. Ensure all parts within the box are packed in such a way to prevent movement within the box.
3. Speakers returned for calibration that include a microphone clip fastened to the grill must be protected with an appropriate
wrapping for protection (if not returned in the original 3M E-A-Rfit Dual-Ear Validation System case).
   • Contact the 3M Customer Service (800-245-0779) for additional assistance, if needed.
   • Please refer to the following for additional information: 3M™ E-A-Rfit™ Repair Service Guide via Earfit.3m.com

Calibration
A calibration once every two years is recommended.

FCC/IC

This device complies with Part 15 of the FCC Rules and Industry Canada’s license-exempt Radio Standards Specifications. Operation is
subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment
generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause
harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If
this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and
on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult 3M Technical Service.

CAN ICES-3(B)/NMB-3(B)

Note: Modifications to this device shall not be made without the written consent of 3M Company. Unauthorized modifications may void the
authority granted under Federal Communication Rules permitting the operation of this device.
Warranty

3M warrants our 3M™ E-A-Rfit™ Dual-Ear Validation System instruments to be free from defects in materials and workmanship for 1 year under normal conditions of use and service. We will replace or repair (at our option) defective instruments at no charge, excluding batteries, abuse, misuse, alterations, physical damage, or instruments previously repaired by other than 3M.

- For warranty for United States customers, contact 3M at 1-800-245-0779.
- For warranty outside the United States, service will be provided or the local 3M Service Laboratory (contact the local 3M authorized sales agent for details.)

THIS WARRANTY STATES OUR TOTAL OBLIGATION IN PLACE OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. OUR WARRANTY DOES NOT INCLUDE ANY LIABILITY OR OBLIGATION DIRECTLY RESULTING FROM ANY DEFECTIVE INSTRUMENT OR PRODUCT OR ANY ASSOCIATED DAMAGES, INJURIES, OR PROPERTY LOSS, INCLUDING LOSS OF USE OR MEASUREMENT DATA.

Responsibility for Data Privacy and Security

Purchaser is solely responsible for complying with all privacy and security-related laws and regulations applicable to the collection, storage, use, import and export of all data (personally-identifiable or otherwise) entered into, or generated by, the 3M™ E-A-Rfit™ Dual-Ear Validation System. Access to the 3M E-A-Rfit Dual-Ear System is not password-controlled. Purchaser should implement all necessary administrative, physical and technical safeguards it determines are necessary to ensure the integrity, confidentiality and security of the data against both internal (e.g., access by unauthorized personnel, misuse of data) and external threats (e.g., “hacking”).

Limitation of Liability

3M takes no responsibility and shall bear no liability for use or misuse of individual or personally identifiable data. All responsibility for such data resides with the purchaser and/or employer.

3M WILL NOT BE LIABLE FOR ANY LOSS OR DAMAGE ARISING FROM THE 3M PRODUCT, WHETHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS OR BUSINESS OPPORTUNITY), REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ASSERTED, INCLUDING, BUT NOT LIMITED TO, WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY.