

Operators Manual

Farmer Noah

System for Orientation and Mobility Training for the Blind and Deaf-Blind and
Occupational Therapy and Mobility Training for the Physically Disabled



Version 1.1

dxdt Engineering and Research, LLC

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NOTICE	
Read and understand operator's manual and all other safety instructions before using this equipment.	

! CAUTION	
 HANDLE WITH CARE	 IF DAMAGED
LITHIUM ION or LITHIUM POLYMER RECHARGEABLE BATTERIES INSIDE Do not damage or mishandle these items. Do not store them in excessively hot environments or attempt to use them when they are above 120 F. If product "puck" becomes damaged, quarantine it and contact the manufacturer at (301) 520-1575.	

Download the Farmer Noah App to your iPad or iPhone from the Apple App Store at <https://apps.apple.com/app/farmer-noah/id6755724447>

Farmer Noah Quick Start Guide

NOTE

It is advised that the whole manual be read prior to using the system.

1. Download and Install the Farmer Noah app from the Apple App Store (link: <https://apps.apple.com/app/farmer-noah/id6755724447>). Note that the app can be used in simulation mode to learn app features without real Farmer Noah animals.
2. Charge Farmer Noah animal units for about 2 hours. ([section 2.3](#), p 9)
3. Deploy the Farmer Noah animals within the selected environment- each within 100 ft from the Farmer Noah app host. Power on each unit as it is deployed. ([section 4.4](#), p 25)
4. Confirm that the Farmer Noah App is not in Simulation Mode and that “Menu”/“Preferences”/“Uncommon Options”/“Automatically Add New Devices” is set to On.
5. Confirm that each animal has registered with the Farmer Noah app host by referencing the status field at the bottom left of the Farmer Noah app screen. ([section 4.5](#), p 26)
6. Press “Menu” then “Preferences” to select either Farmer Noah or Bandmaster Stevie mode.
7. Press “Menu” then “Exercise” to view the Trainee List. Select a Trainee or add a new trainee or practice profile using the “Add Trainee” button. ([section 4.6](#), p 27)
8. Give the Trainee instructions and start the Farmer Noah exercise by pressing the “Start” button next to the selected Trainee. ([section 4.7](#), p 27)
9. Monitor the Trainee as necessary to train and reinforce key skills. Collect any desired metrics or observations. ([section 4.8](#), p 27)
10. Use the “Pause” and “Restart” button if required to pause or restart the exercise.
11. At the conclusion of the exercise, debrief the Trainee for their assessment and observations pertaining to the exercise. ([section 4.10](#), p 29)
12. Enter any desired exercise notes into the Trainee Profile. ([section 4.10](#), p 29)
13. Collect the animals, powering each down as they are collected. Use the “Locate” feature to cause any remaining animals to announce themselves. ([section 4.11](#), p 29)
14. Stow the animals for their next use.

Farmer Noah Simulator Mode

Your Farmer Noah system has a simulation feature that will simulate the connections to Farmer Noah animals when no animals are present. In this way Farmer Noah Users can practice with most aspects of the Farmer Noah app just by having the app and the iPad or iPhone App host.

Use Simulation Mode to learn the features and functionality of the Farmer Noah App.

Simulation mode is turned on and off from the slider switch on the Preferences page. The Preferences page is accessible from the Menu page. The Preferences page is shown in the following figure where the Simulation control is pointed out.

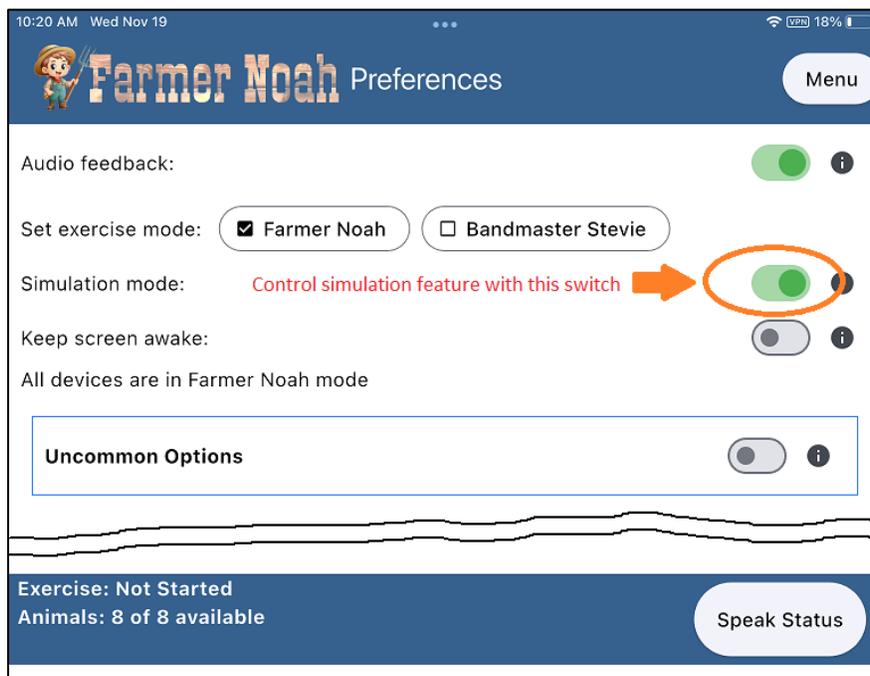


Figure 1 Preferences Screen Showing Simulation Mode Control Slider Switch

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1. Introduction

Thank you for purchasing the Farmer Noah system.¹ The Farmer Noah system supports the blind and deaf-blind communities as a tool for Orientation and Mobility Trainers and Teachers. Farmer Noah also supports the physically disabled community as a tool for Occupational Therapists, Mobility Instructors and Teachers. The Farmer Noah system is designed with accessibility in mind and can be operated by the Blind, Deaf and Physically Disabled.

This manual documents all of the aspects of set-up, care, and use of the Farmer Noah system including all of its components. Some parts of the manual will be particular to a specific application of Farmer Noah (i.e., O&M for the Blind or OT for the Physically Disabled.)

The Farmer Noah system includes Bandmaster Stevie. Bandmaster Stevie is the adult version of Farmer Noah, where instead of matching farm animals, the trainee searches for and matches pairs of musical instruments.

The Farmer Noah system supports the O&M, OT and educational communities by providing a new way to benefit their patients, clients and students including those at the earliest ages. As a completely new concept Farmer Noah represents a fertile area for research on the potential benefits towards the Blind, Deaf-Blind and Physically Disabled communities. The targeted uses of Farmer Noah are described below:

For O&M Trainers and Teachers for the Blind and Deaf-Blind:

The Farmer Noah system provides an activity that when used multiple times, with different layouts and in different environments, can be expected to provide the following benefits:

1. Develop the skill of detecting non-visual cues in the environment.
2. Develop the skill of building detailed and accurate mental maps based on the non-visual cues.
3. Develop the skill of keeping track of one's own position and orientation relative to the mental maps and the actual environment.

The Farmer Noah activity involves the trainee searching for pairs of objects that have been pre-placed in the environment by the Trainer or Teacher. The process of finding the matching pairs exercises the key, important skills Farmer Noah targets in a fun and stress-free way.

The skills developed using Farmer Noah can be expected to be self-reinforcing and transportable to any environment, long after training with Farmer Noah has been completed.

The Farmer Noah activity develops the key skills required for confident and competent mobility. Use by the Deaf-Blind is supported by means of a haptic device that identifies object pairs by vibration pattern. Sighted individuals can use the system using a blindfold.

¹ Farmer Noah was granted US Patent Number 12274664, issue date 4/15/2025

For Occupational Therapists and Mobility Trainers and Teachers for the Physically Disabled:

The Farmer Noah activity provides a basis for individuals with physical mobility challenges to practice their mobility and use of their mobility and manipulation assistive devices and methods. It can be expected to provide the following benefits:

1. Improve mobility skills and skills with assistive mobility and manipulation devices.
2. Improve cognitive discipline, reasoning, problem solving skills, team work and patience.
3. Serve as an activity that physically disabled children can engage in independently or in groups, indoors or outdoors in the context of training or play.

The Farmer Noah activity involves the trainee searching for pairs of objects that have been pre-placed in the environment by the Trainer or Teacher. The process of finding the matching pairs exercises the skills Farmer Noah targets in a fun and stress-free way.

Farmer Noah supports confident and competent mobility and manipulation in arbitrary settings. The skills and confidence it builds can be expected to be self-reinforcing and to last well after training with Farmer Noah is complete.

2. System Requirements

The Farmer Noah system requires an Apple iPad or iPhone device to operate. The Farmer Noah App is required and is available at no charge from the Apple App Store. Please ensure that the Farmer Noah App has been installed on an Apple iPad or iPhone host device prior to attempting to set up or use the Farmer Noah system.

The Farmer Noah system has built-in accessibility features for operation by the Blind. These include an audio feedback feature. It is understood that many blind users may prefer using the screen reading devices they are used to working with. Farmer Noah users should consider the built-in audio feedback feature as optional.

2.1 Unpacking the Farmer Noah System

The Farmer Noah kit contains:

1. The Farmer Noah Animals. Verify that you have received the number of animals that you purchased and which appear on your invoice. Additional animals can be purchased at any time by contacting dxdt Engineering and Research, LLC through its webpage or by emailing your request to hekimiancd@dxdtengineering.com.
2. An 8-Port USB Charging unit
3. 8 USB to USB Micro-B charging cables
4. A Farmer Noah system carrying duffel bag.
5. An optional haptic device for use with Deaf-Blind Trainees is available for Farmer Noah kits.

A tablet is not provided with the kit. The Farmer Noah app for iPad and iPhone is available from the Apple App Store at no charge.

The following steps are highly recommended:

1. Remove all the twist ties binding the charging cables and set them aside.
2. Lay all of the cables aside one another, stretched out and consistent, head to head- and use some or all of the twist ties to bind the cables together. But not so tightly that the twist ties will not slide up and down the length of the cable bunch.

This will make charging the Farmer Noah animals as a group much more manageable.

2.2 The Noah System “Animals”

Figure 2 Diagram of the Farmer Noah Animal is a diagram of the Farmer Noah Animal. The figure shows the Animal Base as an inverted bowl and the Animal Puck as a disk that sits on top of the inverted bowl. The figure also shows the Power Button located in the center of the puck and the Status Indicator Light and the Speaker Port that are located adjacent to the power button. The Micro USB charging port is located on the edge of the puck near the Status Indicator Light.

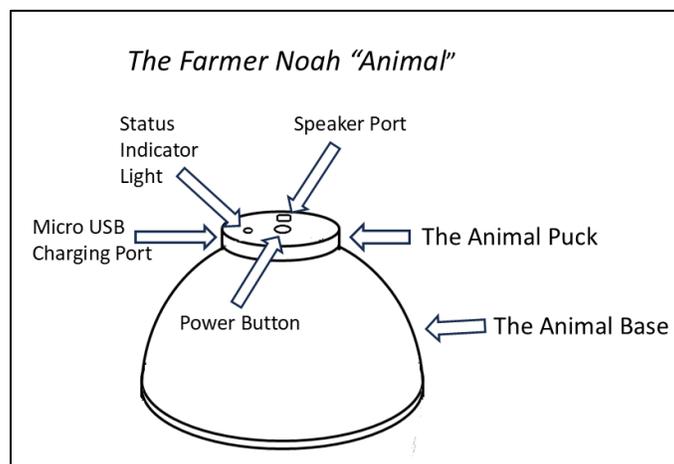


Figure 2 Diagram of the Farmer Noah Animal

2.3 Charging the Animals

An 8-port charging unit and 8 charging cables have been provided with the Farmer Noah system. The Farmer Noah pucks interface with a Micro-B USB connector. Any USB charging source can be used to charge the Farmer Noah animals.

1. Plug in each animal, (at the edge of the Animal’s puck) to a USB port using suitable cables such as the ones provided with the Farmer Noah kit. A fully discharged Animal will take about 2 hours to fully charge. Upon receipt, the Animals may not be fully discharged so the charging time may be shorter. A single charge can support the animal for as much as 36 hours operation consistent with an estimated use profile.



On the left is shown how the charging port is located on the Farmer Noah Animal. To the right the correct orientation for inserting the charging plug is shown. Note the machined characteristics on the top of the plug.



Figure 3 Location of Charging Port on FN Animal and Insertion Orientation of Charging plug

Please do not attempt to insert the charging plug upside down or to force it into the port. To do so will damage the device and void it's warranty. When the charging plug is oriented correctly relative to the charging port, it inserts easily.

2. The Red LED:
 - a. A solid-on red LED indicates that the animal
 - b. is charging.
 - c. If the LED is off it means that the charge is complete or that the Animal is not connected to a charger.
 - d. If the red LED blinks for more than a few minutes, or the puck feels hot to the touch, disconnect the Animal from the charger and contact dxdt Engineering and Research, LLC through its webpage or by emailing hekimiancd@dxdtengineering.com, as the battery may need replacement.

3. The Farmer Noah App

The Farmer Noah App is available at no charge from the Apple App Store by searching for "Farmer Noah" or by accessing the following URL: <https://apps.apple.com/app/farmer-noah/id6755724447>

3.1 The Menu Screen

The Farmer Noah App has three screens directly available from the "Menu" button at the upper right-hand side of the Farmer Noah App. Pressing the "Menu" button will show the Farmer Noah "Menu" screen. Figure 4 shows the Farmer Noah "Menu" screen. The elements of the Farmer Noah "Menu" screen are described below:

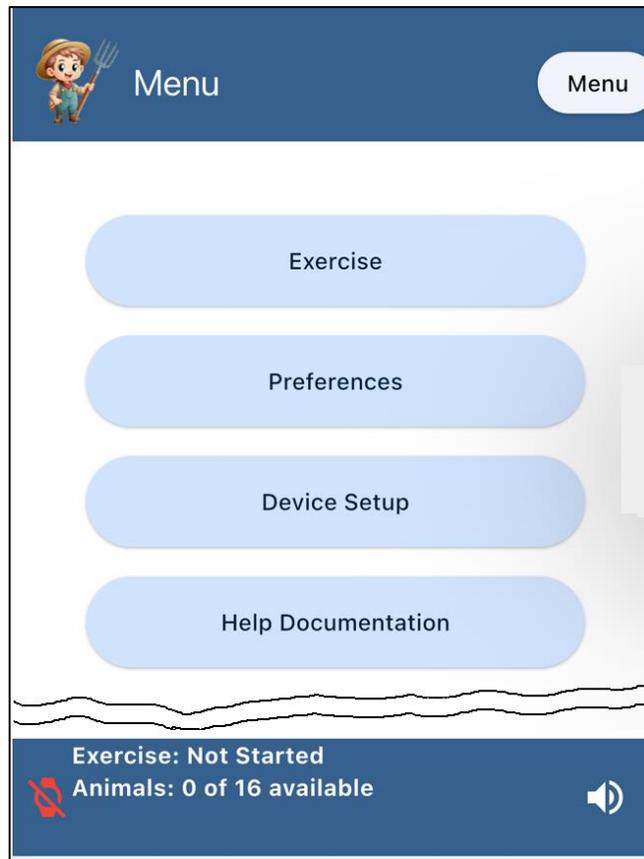


Figure 4 The Farmer Noah App Menu Screen

- The Farmer Noah “Menu” Button. The Menu Button will always be at the upper righthand corner of the Farmer Noah App. Pressing it will show the “Menu” screen.
- The “Exercise” Button. This button is first button down from the top center of the App display. Pressing this button will bring up the “Trainee List” screen. The “Trainee List” screen allows a new trainee to be entered, or an existing trainee to be identified and a new exercise to be started. Associating each Trainee with a training session allows the progress of each Trainee to be tracked over time by the Farmer Noah system.
- The “Preferences” Button is the second button down from the top center of the App display. This button allows access to Farmer Noah features such as audio feedback and selection between the Farmer Noah mode and the adult version of the same system called “Bandmaster Stevie”.
- The “Device Set up” Button is the third button down from the top center of the Menu screen. The Device Set-up screen also has a locate feature for locating the Farmer Noah animals and a control to release all of the devices so they can be reloaded if necessary. Some of the features on the Device Set-up page are for utility functions that are not frequently needed.
- The “Help Documentation” button will open up a list of some help topics that can be useful during system operation.
- The System Status Window appears at the lower left corner of the App screen. It provides the status of animal connectivity and the exercise- in terms of the number of pairs matched.
- The “Speak Status” Button Appears at the lower right- hand corner of the App screen. Pressing this button will provide an audible English language summary of the status of the exercise and the App readiness.

3.2 The Trainee List Screen

Each Farmer Noah training exercise starts from the “Trainee List” screen. On this screen, all trainees will be listed based on their names or pseudonyms that are entered. The names or pseudonyms will allow an individual Trainee’s progress to be tracked. Generally, progress is measured qualitatively based on observations by the Trainer and through attestation by the Trainees. Quantitative results are collected and maintained by the Farmer Noah system in the form of the time required to complete the Farmer Noah task of matching all of the animal pairs. Figure 5 shows the “Trainee List” screen. The “Trainee List” is a table with the following fields identified from left to right:

- The Trainee field will show the name or pseudonym associated with a Trainee.
- The Last Attempt field shows the date of the last attempt or completion of the Farmer Noah exercise from the indicated Trainee.
- The Actions column is the rightmost column of the “Trainee List” table. It will contain two buttons associated with every Trainee. The buttons. From left to right are:
 - a. The “Profile” button: This button will show the “Trainee Profile” screen which will list data associated with each Farmer Noah exercise attempted by the selected Trainee.
 - b. The “Start Exercise” button. Pressing this button will start the clock for an exercise for the selected Trainee. The Trainee should be ready to engage the Farmer Noah tasks before this button is pushed. Though it is possible to pause the Farmer Noah clock and exercise.
- The “Add Trainee button” appears at the bottom center of the “Trainee List” page. Press this button to enter a new Trainee into the Farmer Noah system.

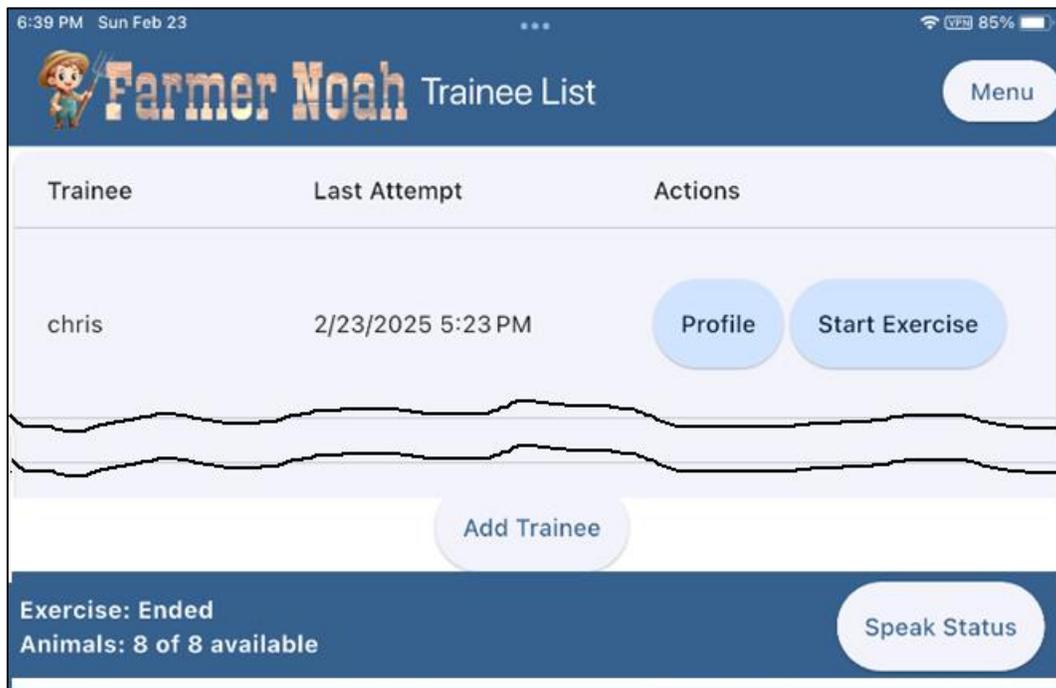


Figure 5 Farmer Noah App Trainee List Screen

3.3 The Trainee Profile Screen

The “Profile” button on the Trainee List screen causes the “Trainee Profile” screen to show for the selected Trainee. Figure 6 shows the “Trainee Profile” screen. The exercises are listed in chronological order from most recent to earlier exercises appearing further down the table. The date, time, duration of the exercise and the outcome in terms of how many animal pairs were found appear for each exercise attempt. Any notes entered by the Trainer in association with each training session will also appear in the exercise entry. There is also a button that will allow the selected Trainee to be deleted from the Farmer Noah Trainee Profile database. This button appears under the “Menu” pushbutton at the upper right of the “Trainee Profile” screen for each Trainee. At the bottom of the page there is a large button that spans almost the whole width of the screen that will close the “Trainee Profile” screen and return to the “Trainee List” screen.

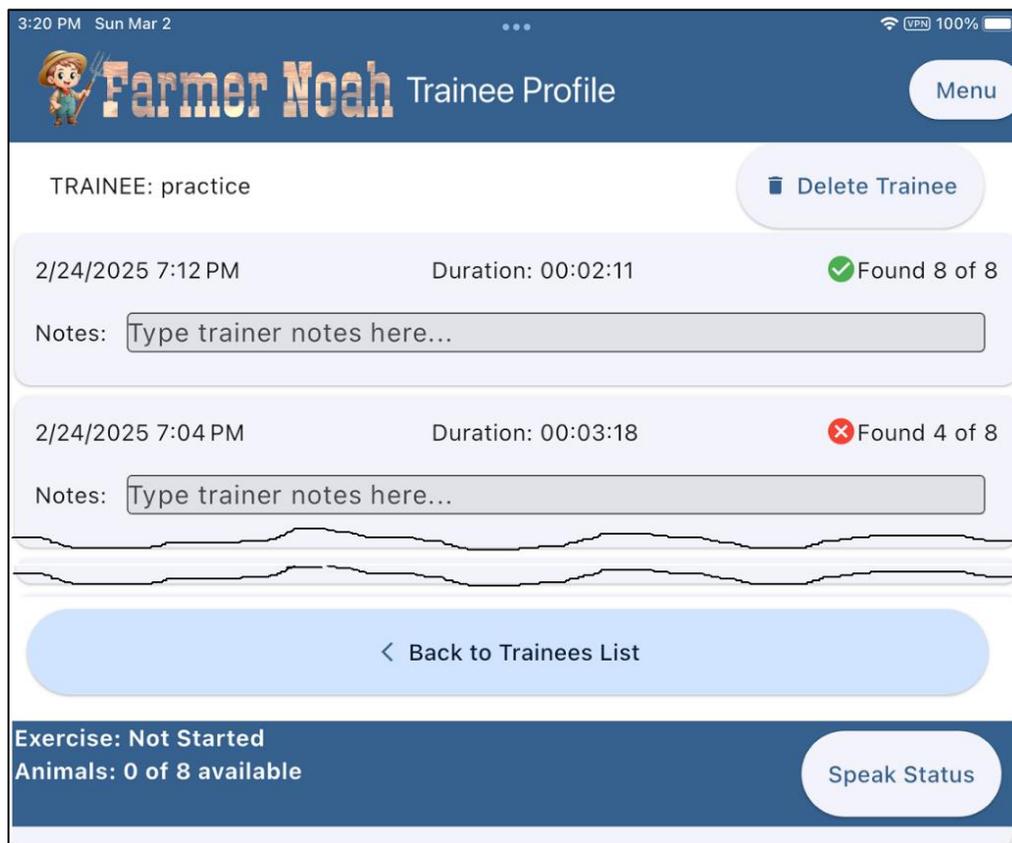


Figure 6 Farmer Noah App Trainee Profile Screen

3.4 The Farmer Noah Exercise Screen

All Farmer Noah exercises are initiated from the Farmer Noah “Exercise” screen. The “Exercise” screen is found by pressing the “Start Exercise” button next to the selected Trainee on the “Trainee List” screen.

Before pressing the “Start Exercise” button, the Trainee should be aware of how the Farmer Noah exercise is carried out and any general tips or encouragement the Trainer might want to offer them in order to maximize their benefits of completing the exercise.² When the “Start Exercise” button is pushed, the timer starts and the Trainees should start focusing on their environment, organizing their thoughts and navigating through the environment searching for the animal pairs.

Farmer Noah Operations Tip

The Farmer Noah Team recommends that all Trainees be allowed at least one practice session under a “Trainee Practice” profile prior to carrying out the exercise under their own profile. This should improve the validity of the results so the scores measure their ability to carry out the exercise as opposed to measuring their understanding of a new process.

Figure 7 shows the Farmer Noah “Exercise” screen. At the top left of the screen it shows an exercise status field that shows the number of pairs that have been found and the time elapsed of the exercise so far. At the top right of the screen are two buttons, the “Pause” button to pause the exercise, and a “Stop” button to end the exercise.

² For example, they might be reminded of the objectives of the Farmer Noah exercise, in particular, the enumerated benefits that appear in the Introduction section of this manual, inside each box either for O&M trainers for the Blind or Occupational Therapists for the Disabled.



Figure 7 The Farmer Noah Exercise Screen (Farmer Noah mode)

The body of the “Exercise” screen will show the animal pairs- up to 4 pairs depending on how many were purchased and integrated into the current exercise session. Working down the page, Figure 7 shows two cows side-by-side; then two sheep; two turkeys; and two pigs (not shown in figure). Next to each animal are two buttons. One is the “Mark Found” button- that is provided in case an animal is found but has failed to register automatically for some reason. Beneath the “Mark Found” button is the “Locate” button. This button is for convenience and will cause the selected animal to announce itself. This is for use after the exercise when the animals are to be retrieved, turned off and stowed.

3.5 The Farmer Noah Preferences Screen

The Farmer Noah “Preferences” screen is accessible by the “Menu” button at the top right of every Farmer Noah App screen. When the “Preferences” button is pushed, the screen depicted in Figure 8 is shown.

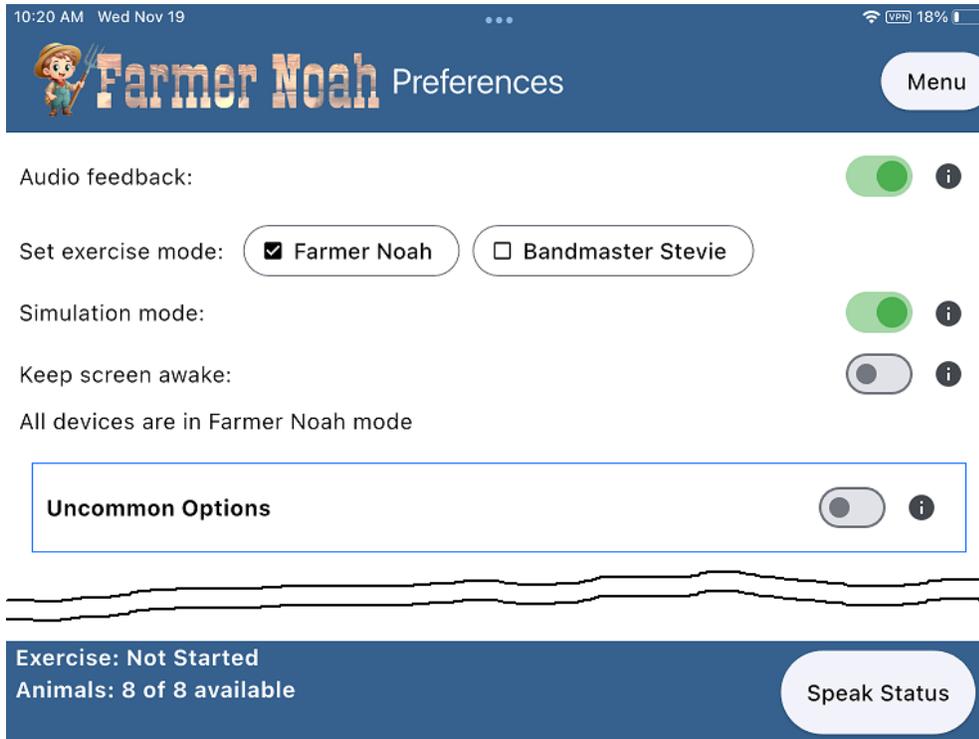


Figure 8 The Farmer Noah Preferences Screen

The screen controls are described below:

- The audio feedback slider switch will repeat app settings, actions and statuses when it is slid to the right. This is a persistent setting that will remain as selected between uses. The Farmer Noah Trainers may use built in screen reader functions in addition to or instead of the audio feedback feature or forego audio feedback altogether.
- Beneath the audio feedback slider are the “Set Exercise Mode” buttons. These are the “Farmer Noah” and “Bandmaster Stevie” buttons. Bandmaster Stevie is the adult version of Farmer Noah. Future releases of Farmer Noah will support a haptic feature for use by the Deaf-Blind. All instructions in this manual that refer to farm animals also apply to Bandmaster Stevie. Just understand that Bandmaster Stevie features musical instruments instead of farm animals. When switching between Famer Noah and Bandmaster Stevie modes, allow about a minute for all animals to receive their commands from the Farmer Noah App host to change their modes.

IMPORTANT

Farmer Noah systems are provided factory configured. The “Uncommon Options” controls will rarely-if ever need to be used by Farmer Noah Users. They would typically be used if new animals have been purchased.

- The “Simulation mode” slider switch allows almost full functionality of the App even with no animals connected. It in essence, connects 4 pairs of virtual animals. This feature allows App-only orientation to the app features and functionality.
- When slid to the right, the “Keep Screen Awake” slider will prevent the App host device from going into sleep mode during app operation.
- The “Uncommon Options” are:
 - “Automatically add new devices” slider switch. This control is at the right- hand side of the screen. It should typically remain on (slider to the right) unless there is a chance that more than one Farmer Noah system could be active in the vicinity of the one being operated. In these cases the slider should be slid left to prevent it from adding animals from a different system during operation.

NOTE

The “Automatically add new devices” slider switch can be useful if the User is having trouble getting all animals to connect to the Farmer Noah App. It should be slid to the right in those cases.

- The “Run Initial Setup” button spans the width of the display. Farmer Noah systems are pre-configured at the factory such that this button is not typically necessary. The control will initiate firmware update and initial configuration of each animal (with their programmed animal and instrument sounds)- once the “All Devices are On” button in the center of the screen is pressed. The firmware update can take 10-15 minutes and a WiFi connection is required for the Farmer Noah App host. The animals will announce themselves as they become available. Please let them all complete their firmware update process before interrupting them or attempting to use the system.
- The “Auto Configure Device Types” button spans the width of the display. Farmer Noah systems are pre-configured at the factory such that this button is not typically necessary. If new animal pairs are to added or animals are to be replaced, this button will provide the latest audio files to each animal device in a manner consistent with the Farmer Noah exercise process. Please let all of the animals complete their firmware update process before interrupting them or attempting to use the system.

3.6 The Device Setup Screen

Figure 9 shows the “Device Setup” screen. It is comprised of 4 large buttons that span the width of the screen. Each function of each button is explained in order from the top of the screen to the bottom, as follows:



Figure 9 The Farmer Noah App Device Setup Screen

- The “Locate All” pushbutton is for use after a Farmer Noah trial is complete. It is included to assist Farmer Noah Trainers in recovering all of their devices after an exercise or a day of exercises with the Farmer Noah system. It will cause all of the animals that are powered on and within range of the Farmer Noah host, to announce themselves. The animals will continue to announce themselves until the “Stop Locating Devices” button is pressed or until they are powered off. The “Stop Locating Devices” button is near the center of the screen that is displayed after the “Locate All” button is pressed.
- The “Set Device Type” pushbutton will display the “Set Device Types” screen. This screen is a tabular depiction of every Farmer Noah animal or Bandmaster Stevie instrument (depending on operating mode) that is active in the current session. Vertical scrolling is necessary to access every animal. The “Auto-Configure Device Type” function and factory settings make the need to make modifications from this page rare. It would only be necessary if new devices are being added or if the User operating with a system of 1, 2 or 3 pairs wants to specify the identities for each of their animals. Each row of the “Set Device Types” table is associated with the following functional attributes.
 - An indicator of what number is assigned to the device featured in that row appears at the top left of each row.
 - The User can enter a “User Label” for any device by pressing the small pencil icon to the right of the “User Label” field that is under the devices number indicator. The factory has assigned the labels “A”, “B”, “C” and “D” to the animal pairs of cow, pig, sheep and turkey, respectively. A tactile label has been affixed to each animal on the inside surface of the bowl, near the rim, on the side where the animal puck LED is located.
 - An image of the animal’s (or instruments) identity appears on the left of each row of the table under the Device number indicator and the User Label field.

- A “Locate” button appears at the upper righthand side of each row. Pressing this will trigger the device to announce itself. There is often a delay of several seconds between when this button is pressed and when the device actually speaks. All Farmer Noah animal devices wait their turns before speaking.
- The “Delete” button appears to the right of the “Locate” button. This button will rarely if ever be necessary. It will bring up a confirmation box before anything is deleted.
- On the bottom righthand side of each row there is a “Device Type” drop-down list from where Animal (or instrument) identities can be reassigned. Note that this page does not prevent a User from assigning animal identities incorrectly. If this occurs, the Farmer Noah exercise will not start. The User will need to either run “Auto-configure Device Types” or return to this page and ensure that each animal or instrument type appears no more or less than twice.
- Under the “Device Type” dropdown list there is a label indicating the status of the audio file assigned to the animal. It will indicate whether or not an audio file needs updating.
- The “Turn Off All Devices” pushbutton will turn off all of the Farmer Noah animal devices. Be advised that Farmer Noah animals are easier to collect at the end of a session when they are announcing themselves. Pressing this button will bring up a confirmation screen. If confirmed, the Farmer Noah App will command each animal to turn itself off.
- The “Device Firmware Update” pushbutton allows the Farmer Noah user to check for the latest firmware updates at any time. The firmware is the software inside of each Farmer Noah animal and it governs how the animals behave and the sounds that they make. When the Farmer Noah App host is connected to WiFi, a button can be pressed that will check to see which of any active Farmer Noah animals are using out of date firmware. If the system identifies any animals with outdated firmware the User should press the “Start Update” pushbutton and allow 5-10 minutes for the update process to complete.
- The “Haptic Band Setup” button will display the “Haptic Band Setup “ screen depicted in Figure 11.

3.6.1 The Set Device Types Screen

NOTE

The need to make modifications from the “Set Device Types” screen is rare. It would only be necessary if new devices are being added or if the User operating with a system of 1, 2 or 3 pairs wants to specify the identities for each of their animals.

The “Set Device Type” pushbutton displays the “Set Device Types” screen- shown in Figure 10. This screen is a tabular depiction of every Farmer Noah animal or Bandmaster Stevie instrument (depending on operating mode) that is active in the current session. Vertical scrolling is necessary to access every animal. Each row of the “Set Device Types” table is associated with the following functional attributes:

An indicator of what number is assigned to the device featured in that row appears at the top left of each row.

The User can enter a “User Label” for any device by pressing the small pencil icon to the right of the “User Label” field that is under the devices number indicator.

The factory has assigned the labels “A”, “B”, “C” and “D” to the animal pairs. A tactile label has been affixed to each animal on the inside surface of the bowl, near the rim, on the side where the animal puck LED is located.

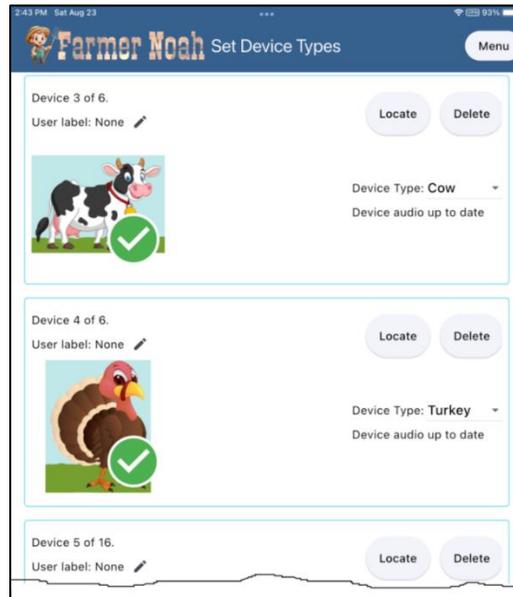


Figure 10 The Set Device Types Screen

An image of the animal’s (or instruments) identity appears on the left of each row of the table under the Device number indicator and the User Label field. The functional attributes of the Set Device Type Screen are:

- A “Locate” button appears at the upper righthand side of each row. Pressing this will trigger the device to announce itself. There may be a delay of several seconds between when this button is pressed and when the device actually speaks. All Farmer Noah animal devices wait their turns before speaking.
- The “Delete” button appears to the right of the “Locate” button. This button will rarely if ever be necessary. It will bring up a confirmation box before anything is deleted.
- On the bottom righthand side of each row there is a “Device Type” drop-down list from where Animal (or instrument) identities can be reassigned. Note that this page does not prevent a User from assigning animal identities incorrectly. If this occurs, the Farmer Noah exercise will not start. The User will need to either run “Auto-configure Device Types” or return to this page and ensure that each animal or instrument type appears no more or less than twice.
- Under the “Device Type” dropdown list there is a label indicating the status of the audio file assigned to the animal. It will indicate whether or not an audio file needs updating.

3.6.2 The Haptic Band Setup Screen

Farmer Noah has the ability to vibrate a haptic device in a manner peculiar to each animal type. In this way, deaf-blind users can attain the same benefits of training with Farmer Noah as blind users do. When the “Haptic Band Set-up” pushbutton is pressed, the “Haptic Band Setup” screen will appear. At this time the Farmer Noah system will scan to see whether a charged haptic device is in range. If a charged haptic device is found, it will be listed at the top of the page.

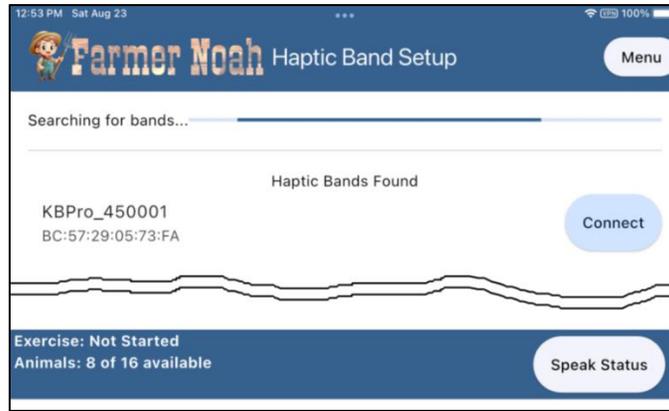


Figure 11 The Haptic Band Setup Screen



This image of the haptic device shows the location of the micro-USB Charging port.

Please do not attempt to force the charging plug into the charging port. When positioned correctly, it goes in easily.

Figure 12 Haptic Device

The haptic unit charges fully in one hour. And can maintain a charge for 3 months. The haptic device LED will light when the device is charging and when it is issuing pulses.

If the haptic device is not already connected to the Farmer Noah system, a “Connect” button will appear to the right of the displayed data (as shown in Figure 11). Press the Connect button if you would like to use the haptic feature in addition to the animal sounds. When the haptic device is connected to the Farmer Noah App, the screen shown in Figure 13 is displayed.

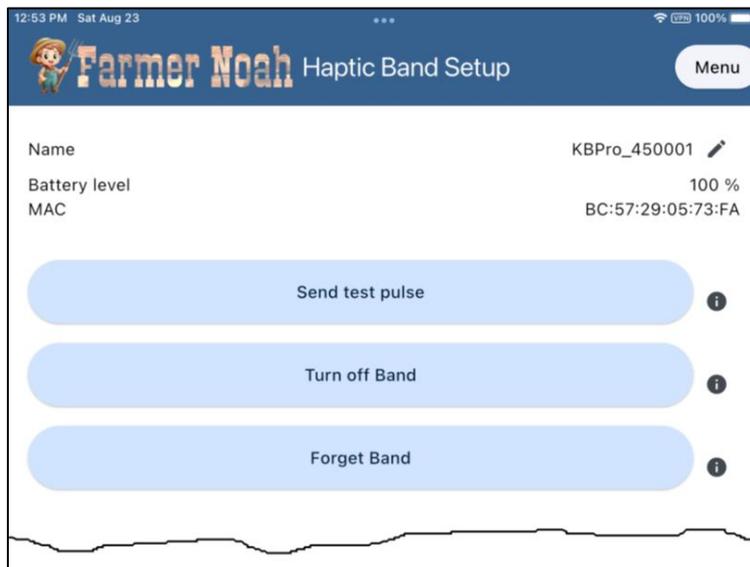


Figure 13 Haptic Band Screen (Connected Device)

From top down, the buttons on the page have the following functionality:

- The “Send test pulse” button will send a test pulse to the haptic device to verify its function.
- The “Turn off Band” button will power-off the haptic device. This will help preserve its charge when it is not in use. The function will cause the haptic device to disconnect from the Farmer Noah app and power itself down.
- The haptic device will be turned on again automatically when it is detected by the Farmer Noah App host and the “Connect” button is pressed. Expect a delay of a few minutes for detection to take place.
- The “Forget the Band” button will prevent the Farmer Noah App from automatically connecting to the haptic device. The user will still be able to connect to the haptic device by using the “Connect” button.

The haptic unit can be used with or without the wristband that it was provided with. The wristband is simply stretched around the haptic device disk body. When the wristband is used the charging port will not be accessible.

4. Executing a Farmer Noah Exercise

This section will describe the set-up and process for carrying out a Farmer Noah exercise. Some sections will be specific towards applications in support of O&M training for the Blind and some will be specific towards mobility and OT training for the physically disabled. Please differentiate between the different applications by referring to the subsection headings.

4.1 Some General Recommendations

Dxdt Engineering and Research, LLC has two objectives for the Farmer Noah system. Foremost is to improve the confidence and competence in mobility for the audiences it serves. The other objective is to be a resource to the O&M and OT training communities that will help attract and retain clients. In this way, the Farmer Noah Trainee communities will benefit even more by being exposed to training longer through improved program retention. Improved program retention, coupled with a low-stress climate of learning translates to more time over which skills can develop, good habits can be reinforced and confidence can be built. Trainers will have more opportunities to teach things beyond the skills that Farmer Noah helps to teach. For this reason the Farmer Noah developers recommend that Trainers use extra care, especially in the early stages of training with Farmer Noah, to ensure that training is delivered in a manner free from stress and with plenty of encouragement.

4.2 Farmer Noah Beginner Trainees

Like in a game of golf, the Farmer Noah Trainees compete against themselves. The Farmer Noah process exercises and develops key skills. A main indicator of Trainee progress is the amount of time it takes to complete an exercise. Like with golf, the process can be frustrating and overwhelming initially. There are

a number of ways that the earlier Farmer Noah exercises can be made more conducive to beginning Trainees. These include:

- Establishing a “Practice” trainee profile where all Farmer Noah Trainees can practice under before any of their scores will actually be committed to their training history. When they are practicing under the “Practice” profile, the Trainees should be informed that they are just practicing so they can get used to the system- and so they will soon be ready to engage the Farmer Noah activity for actual training.
- A reduced number of animal pairs can be used to make an exercise shorter and easier to keep track of cognitively. Keep in mind that if two pairs of animals are used, there are six possible ways a trainee might attempt to find a match. If three pairs are used, the number of potential attempted pairs goes up to 15. And, with all four pairs there are 28 possible ways that a Trainee might attempt to pair animals. So, reducing the number of animal pairs in play can significantly simplify the exercise.
- Practice trials can be made easier by selecting a simple environment for the exercise. Rooms with simple geometry, distinct landmarks and plenty of room for navigation can simplify an exercise.
- Simple animal deployments can simplify training exercises.

Remember that the objective should be to get each Trainee into the more challenging exercise conditions as early as possible – as measured by the perceived or expressed stress level of the Trainee and their readiness to engage the system without any of the beginner concessions expressed above. Farmer Noah is still about building key skills through a challenging, yet enjoyable exercise.

The Farmer Noah Trainer should identify a centralized location for his/her operations that is off to the side and essentially “out of play”. When animals are deployed their connectivity to the app host, located in this area, will be verified. During an exercise the Trainer is free to interact with the Trainee to offer supplementary instruction but they should take care not to interfere too much with the Trainee as they engage in the Farmer Noah process.

4.3.a. Selecting a Working Environment- O&M Training for the Blind

The Farmer Noah system is not intended to train blind or deaf-blind Trainees how to master one or two environments. The skills Farmer Noah develops and enhances are intended to prepare Trainees for competent and confident mobility in all environments. To achieve this objective, the Trainer must train multiple times in a wide variety of environments. As experience with Farmer Noah increases for each Trainee, so should the complexity of the environment and animal placement within the environment. The following should be considered when selecting an environment for training the blind and deaf-blind with Farmer Noah:

- Initially, a familiar environment is acceptable. Animal placement should be more complex in familiar environments.
- Environments should be chosen that offer a large number and wide range of non-visual cues. Non-visual cues include:
 - Transitions in floor coverings
 - Hallways and architectural elements
 - Scents
 - Sounds

- Moving air through vents
- Radiant heat or drafts from windows.
- Environments should be safe and free from serious hazards.
- Environments can be indoors or outdoors or can include both.
- Environments with distractions that offer a large amount of stimuli should be considered advanced and Trainees should need to work up to engaging them.
- Public areas including schools, parks, libraries, shopping areas and community centers are potential choices. Trainers should also consider reaching out to hotels or office buildings for permission to use their spaces during low-traffic hours.

4.3.b. Selecting a Working Environment- OT Training for the Physically Disabled

The Farmer Noah system is not intended to train physically disabled Trainees how to master one or two environments. The skills Farmer Noah develops and enhances are intended to prepare Trainees for competent and confident mobility and function in any environment. To achieve this objective, the Trainer must train multiple times in a wide variety of environments. As experience with Farmer Noah increases for each Trainee, so should the complexity of the environment and animal placement within the environment. The following should be considered when selecting an environment for training the physically disabled with Farmer Noah:

- For the physically disabled, different degrees of mobility and dexterity challenges can be represented in different environments. Animal placement can pose varying degrees of complexity as well. The level of challenge imparted to the Trainee must be tailored by the Trainer on a case-by-case basis.
- Initially, a familiar environment is acceptable. Animal placement should be more complex in familiar environments to raise the challenge level.
- Environments should be chosen that offer a large number and wide range of mobility and/or dexterity challenges. These challenges might include:
 - Transitions in floor coverings
 - Hallways and architectural elements
 - Changes in floor level
 - Closed doors (locked or unlocked)
 - Elevated or low-placed cabinets (locked or unlocked)
 - Closets (locked or unlocked)
 - Boxes or chests
- Environments should be safe and free from serious hazards.
- Mobility devices should be inspected and modified with pads or tape to minimize risk to elements of the environment due to bumping or scraping.
- Environments can be indoors or outdoors or can include both.
- Environments with a large number of distractions should be considered advanced and Trainees should need to work up to engaging them.

- Public areas including schools, parks, libraries, shopping areas and community centers are potential choices. Trainers should also consider reaching out to hotels or office buildings for permission to use their spaces during low-traffic hours.

4.4.a. Deploying the Farmer Noah Animals- O&M Training for the Blind

The complexity of environments and of animal deployments needs to be tailored to each Trainee by the Farmer Noah Trainer. The degree of challenge posed by each Farmer Noah exercise should be high enough to enhance and establish new skills while not introducing high degrees of frustration. Communication and encouragement can help reduce the risk of frustration. Trainers may want to consider incentives for Trainees upon completion of an exercise. The following are considerations as to how the degree of exercise complexity and challenge can be controlled based on animal deployment choices:

- Farmer Noah animals need to be within about 100 ft or 30 m from the app host device in order to establish and maintain connectivity. Some conditions will allow more, or perhaps less separation.
- Fewer than the full number of 4 pairs of animals can be deployed to make the exercise easier. Just ensure that only animal pairs are in play.
- Placing matching animals in close proximity to one another reduces exercise complexity.
- Placing animals in main walking paths makes them easier to find and return to.
- Placing animals near prominent landmarks or near areas that are readily identifiable through non-visual means makes them easier to find and return to.

CAUTION

Wheelchairs and walkers can do considerable damage to furniture, doorways, walls and corners as a result of bumping or scraping. It is recommended that the trainer inspect any mobility devices that are to be used during an exercise and that edges are modified with cloth, tape or foam as necessary to reduce the risk of damage to the elements of the environment during the Farmer Noah execution process.

- Placing animal pairs further away from each other adds to mental mapping complexity.
- Placing animals under or behind objects forces a deeper exploration of the environment and adds complexity.
- Placing animals on multiple levels forces a deeper exploration of the environment and adds complexity.

Farmer Noah animal pairs can be identified during deployment from a label affixed to the inside of the animal bowl on the same side as the LED located on the puck. The labels are visually and tactilely identifiable. Once a deployment location is found, turn the animal on by pressing and holding the On/Off button for about 2 seconds or until the animal announces itself. Place the animal in its deployment area and move to emplace the remaining animal pairs.

4.4.b. Deploying the Farmer Noah Animals- OT Training for the Physically Disabled

How the animals are deployed will need to be determined by the Trainer based on the particular nature of the Trainee's disabilities and the mobility and accessibility tools that are to be used. Also, care must

be taken to reduce the risk that a Trainee will find a Farmer Noah exercise too difficult. It is preferable to underchallenge a Trainee and retain them as a client then it is to overchallenge them and lose them to frustration. Communication and encouragement can help mitigate the risk of frustration. Also, some Trainers might want to consider incentives for completing a Farmer Noah exercise. Some deployment considerations that will allow the level of exercise complexity to be controlled are listed below:

- Farmer Noah animals need to be within about 100 ft or 30 m from the app host device in order to establish and maintain connectivity. Deployments behind closed doors or in cabinets or chests can reduce the separation distance. Some environmental conditions will allow more, or perhaps less separation.
- Fewer than the full number of 4 pairs of animals can be deployed to make the exercise easier. Just ensure that only animal pairs are in play.
- Placing matching animals in close proximity to one another reduces exercise complexity.
- Placing animals in main walking paths makes them easier to find.
- Placing animals near prominent landmarks makes them easier to find.
- Placing animal pairs away from each other adds complexity in terms of mobility as well as in cognitive reasoning.
- Placing animals under or behind objects or inside closed areas forces a higher degree of interaction with the environment and adds complexity.
- Placing animals on multiple levels, such as on shelves, stairs, tables or raised cabinets exercises reaching functions.
- Complex deployments are those that require manipulation of locks or latches, and the opening of doors or containers. Complex deployments are challenging in terms of finding the animal as well as gaining access to it. Complex deployments are best suited for more experienced Trainees.

Farmer Noah animal pairs can be identified during deployment from a label affixed to the inside of the animal bowl on the same side as the LED located on the puck. The labels are visually and tactilely identifiable. Once a deployment location is found, turn the animal on by pressing and holding the On/Off button for about 2 seconds or until the animal announces itself. Place the animal in its deployment area and move to emplace the remaining animal pairs.

4.5. Verifying Animal Connectivity

Once the animals have been deployed the Trainer should return to the central area from where he/she will oversee the exercise and either observe the status indicator field on the Farmer Noah App (or press the “Speak Status” pushbutton at the bottom right of the screen to ensure that all of the animals are on and have established connections with the app host.

If fewer than the expected number of animals have connected, the status of each animal can be determined from the “Set Devices Type” screen that is found by pressing Menu/ Device Setup and then “Set Device Type”- which is the second button down from the top of the “Device Setup” screen. The “Set Device Type” screen will indicate which animals have successfully connected and which have not. Also, the “Speak Status” pushbutton will also give this information. Return to any animals that have failed to connect and verify that their power is on. If it was not a power issue that prevented the animal from connecting, move the animal closer to the Trainer’s central control area. Once all animals have connected, proceed with initiating an exercise.

4.6. Adding or Selecting a Trainee

To add or select a Trainee, press the “Menu” button; then “Exercise” (first button at the top of the “Menu” screen). An existing Trainee can be selected from the “Trainee List” screen or a new Trainee can be added by pressing the “Add Trainee” button at the bottom center of the “Trainee List” screen. To add a new Trainee the Trainee’s name or pseudonym is entered into the “Trainee Name” field near the center of the “Add Trainee” screen and then pressing the “Add Trainee” button directly underneath the Trainee Name field. When a new Trainee is added it will appear in the table of Trainees on the “Trainee List” screen and can be selected like any of the previously listed Trainees.

If a Trainer expects to use Farmer Noah for Blind and Physically Disabled clients, he/she may want to include some identifying text in the Trainee name or pseudonym in order to distinguish them as belonging to one or the other groups of clientele.

4.7 Preparing the Trainee

Once the Trainee has been selected in the Farmer Noah App, ensure that the desired mode of operation, i.e., Farmer Noah or Bandmaster Stevie, has been selected. The mode can be changed by pressing Menu/ Preferences/ and then either the Farmer Noah or Bandmaster Stevie button. If the mode needs to be changed, 2-3 minutes might be required until all of the animals have received their command to change modes.

The Trainer should give any additional instructions, explanations and words of encouragement to the Trainee. These will likely be different for blind and physically disabled Trainees. For example:

4.7.a. For Blind Trainees:

Blind Trainees can be reminded to focus on their skills of identifying non-visual cues in the environment and using them as landmarks in the mental maps that they create- that will allow them to move from one animal to another. They should be reminded to try to keep track of how they are oriented and located relative to their mental maps and the non-visual cues they identify. They can be reminded that those skills take time to develop and they should not feel stressed or frustrated. Trainees can be reminded that the exercise can be paused if they require a break.

4.7.b. For Physically Disabled Trainees:

Physically disabled Trainees can be reminded of the boundaries of the Farmer Noah exercise environment and given basic guidelines about whether any animals might be hidden or behind doors. They can be instructed about what manipulation tools or skills they might require. If there are areas in the environment of higher risk to mobility the Trainees can be cautioned about them. Trainees can be reminded that the exercise can be paused if they become fatigued or need a break.

4.8 Starting the Farmer Noah Exercise

A Farmer Noah exercise begins when the exercise timer begins to count. The exercise timer is shown at the upper left of the Farmer Noah “Exercise” screen. The exercise timer (and the exercise) can be paused by pressing the “Pause” button that appears to the left of the “Stop” button at the righthand side of the Farmer Noah “Exercise” screen. The Farmer Noah exercise timer is started by pressing the “Start Exercise” button at the far right of the row showing the selected Trainee shown on the “Trainee List” screen. Upon pressing the “Start Exercise” button, the exercise timer will start- if the full complement of 4 animal pairs are in play. If fewer than 4 pairs were registered by the system for the exercise, a dialog screen will appear that request confirmation that it is desired to use fewer than 4

pairs. The exercise timer will begin upon receiving that confirmation. If the Farmer Noah animals are not registered in pairs, the exercise will not start until the erroneous condition is corrected.

The Trainee should be instructed to begin the exercise when the exercise timer starts.

4.9 The Farmer Noah Exercise- Collecting Data

Once a training session with the Farmer Noah system has started there are opportunities to collect metrics and valuable data that can be used to track the progress of Trainees as they develop and practice the self-reinforcing skills that will improve their lives. The data can also be used to tailor training plans individually or on a general basis. The data can also be used to assess the efficacy of training using the Farmer Noah system. The following table shows some of the types of data and metrics that can be collected during an exercise.

Table 1 Metrics Suitable for Collection during a Farmer Noah Exercise

IMPORTANT	
<p>The Farmer Noah exercise will not start if an odd number of animals have connected or if there are unpaired animals. These conditions must be rectified in order for the exercise to start. Access the “Set Device Type” screen by pressing Menu/Device Setup/ Set Device Type. Determine which animal has not registered with the app and attempt to get it to register by checking its power state or move it closer to the app host. If these actions fail, then power down its paired animal and proceed with the exercise with one less pair. Contact dxdt Engineering and Research, LLC if you believe that you have a defective animal.</p>	
Metrics for the Blind or Deaf-Blind	Metrics for the Physically Disabled
Does the Trainee seem focused or distracted during the exercise?	Does the Trainee seem focused or distracted during the exercise?

Are there parts of the environmental that the Trainee appears to have clearly mastered?	Are there parts of the environmental that the Trainee appears to have clearly mastered?
Does it appear that the Trainee is noticing all of the non-visual cues?	Is the Trainee practicing good mobility and dexterity skills?
Does it appear like the Trainee is repeating the same mistakes? Would improved focus help?	Is the Trainee struggling with any parts of the environment?
Are cane skills improving? Do they need improvement?	Is the Trainee repeating the same mistakes? Would improved focus help?
Is there a lot of bumping of objects?	Is there a lot of bumping of objects?
Is the Trainee showing signs of frustration? How frequently and to what intensity? Under what conditions or as a result of what triggers?	Is the Trainee showing signs of frustration? How frequently and to what intensity? Under what conditions or as a result of what triggers?
Is the Trainee having cognitive difficulties in remembering where the matching pairs are located?	Is the Trainee having cognitive difficulties in remembering where the matching pairs are located?

At the conclusion of the exercise the Trainer should allow time for a quick debrief of the Trainee as is discussed in the following subsection.

4.10 Ending the Farmer Noah Exercise

There are two ways a Farmer Noah exercise can be ended. It can end naturally due to the Trainee matching all of the animal pairs that were in play or; the Trainer can end the exercise by pressing the “Stop” button at the top right of the “Exercise” screen. In each case, the Farmer Noah system allows the Trainer to enter notes on the “Exercise Complete” screen into the text field in the middle of the page. The text field initially reads “Type trainer notes here”. The notes can include any metrics collected; a description of the exercise environment; the purpose for ending the exercise; metadata about the exercise such as “null exercise-neglect data”; or any data or observations that the Trainer wanted to collect. The notes can also include information collected directly from the Trainee about how difficult they thought the exercise was and how and if they were to apply the various skills that the Farmer Noah exercise is intended to develop and refine. The brief discussion can include questions to the Trainee about how they think they might have improved in their ability to complete the Farmer Noah exercise.

Once the Trainer notes are entered, the Trainer can press the “Back to Trainees List” button to exit the current screen. Note that the Farmer Noah system will capture the exercise date, time, Trainee, status of completion, and the time length of the exercise automatically.

4.11 Collecting the Farmer Noah Animals

The nature of the Farmer Noah exercise is such that whether or not the Trainer is sighted, it can still be a challenge to remember where all of the animals were deployed. For this reason, the Farmer Noah system has the “Locate All” feature accessible as the first button at the top of the “Device Setup” screen. Pressing the “Locate All” button will cause all active animals to announce themselves, possibly in unison. It is advisable to attempt to collect as many of the animals as possible by memory prior to using the “Locate All” feature. Alternatively, active animals can be located individually using the “Locate” button that is the leftmost of the two buttons appearing to the right of each animal’s entry on the “Set Device Type” screen. The “Set Device Type” screen is accessible as the second button down from the top of the “Device Setup” screen.

The animals need to be turned off as they are collected or they will continue to make their programmed sounds as they detect the motion of being carried. The Farmer Noah animals have been designed to be nestable so they will be easy to carry during deployment and collection. The “Device Setup” screen has a “Turn Off All Devices” button that can be used, but care must be taken with this feature to ensure that no animals that haven’t been collected would be turned off and made more difficult to locate.

5. Trainee Profiles

The Trainee profile will retain basic information and short Trainer notes for each exercise that a Trainee attempts, automatically. The information that is automatically collected is the date, time, Trainee, status of completion, and the time length for each exercise. A short field for Trainer notes is also associated with the data for each exercise if the Trainer elected to enter data in the field. Note that the “Trainer Notes” field remain editable from exercise to exercise and can be modified at any time through the “Trainee Profile” screen.

The data that is collected automatically by the system cannot be modified by the Trainer. For this reason dxdt encourages the use of a practice profile for Trainees to practice with before they begin their series of training exercises for official record.

The initial version of the Farmer Noah system does not have a feature to export Trainee profile data directly to a data file.

6. Administration of the Farmer Noah System

The following subsections are to help manage the lifecycle of the Farmer Noah system.

6.1 Care for the Farmer Noah Animals

1. The Farmer Noah animals should not be allowed to get wet. They can be cleaned with a cloth moistened with water. Soap can be used carefully in spots that might need it but be advised that soap can loosen the labels that have been applied at the Farmer Noah factory.
2. Care must be taken if an animal is to be deployed in dusty, dirty or sandy areas so that no foreign matter can enter into the USB charging port on the animal puck.

6.2 Updating the Farmer Noah App

If you have opted to receive updates from dxdt Engineering and Research, LLC about your Farmer Noah system, you will be advised as to whether there is a newer version of the app for your system.

Otherwise, one can visit the Apple App Store at <https://apps.apple.com/app/farmer-noah/id6755724447> and check for an update there. Updating the Farmer Noah App will not put any of the data you have collected using the Farmer Noah system in peril.

6.3 Updating the Farmer Noah Animal Firmware

To carry out this operation the iPad or iPhone host device will need to be loaded with the Farmer Noah App and be connected to the internet.

Download the Farmer Noah App at the Apple App Store at the following link: <https://apps.apple.com/app/farmer-noah/id6755724447>

The Farmer Noah system has been configured at the factory with the firmware required by each animal. For instances when a firmware update is necessary, such as when improvements in functionality are available or when new animals have been purchased and need to be added, the following steps will re-initialize the Farmer Noah system accordingly.

1. After all animals are fully charged, remove the charging cables and power each animal “On” by pressing the power button and holding it pressed for about 2 seconds or until the animal announces that it is powered on.
2. Start the Farmer Noah App. Press the “Menu” button, press “Device Setup” and then press the “Device Firmware Update” button. The App will check in to the Farmer Noah server and determine whether an update to firmware is needed. If an update is needed, press the “Start Updates” button in the middle of the “Firmware Update” screen. The Farmer Noah App will establish connection with all the animals and check the status of their firmware- making any necessary firmware updates automatically.
3. The firmware update process might take from 10 to 15 minutes depending on how many animals require updating.
4. The Farmer Noah system will be ready to use after the firmware update.

6.4 Adding New Farmer Noah Animals

This operation will require that the Farmer Noah App is on and all Farmer Noah animals (old and new) are powered on. The process of adding new Farmer Noah animals involves a firmware update to ensure that each animal has its most recent firmware and an initial device setup process which assigns animal and musical instrument identities to the animals in pairs, consistent with the Farmer Noah process.

Follow these steps to add new animals to the Farmer Noah system:

1. Ensure that the Farmer Noah app is on and connected to WiFi or the internet.
2. Power on all of the Farmer Noah animals, old and new (maximum of 8).
3. Press “Menu” then “Preferences” to arrive at the “Preferences” screen.
4. Slide the “Automatically Add New Devices” slider switch right to the “On” position.
5. Press the “Menu” button and then press the “Device Setup” button. Then press the “Device Firmware Update” button. The App will check in to the Farmer Noah server and determine whether an update to firmware is needed. If an update is needed, press the “Start Updates”

button in the middle of the “Firmware Update” screen. The Farmer Noah App will establish connection with all the animals and check the status of their firmware- making any necessary firmware updates automatically.

6. The firmware update process might take from 10 to 15 minutes depending on how many animals require updating.
7. Press the “Menu” button and then the “Preferences” button.
8. Press the “Auto Configure Device Types” button and confirm on the confirmation dialog box.
9. Press the “All Devices are On” button in the center of the screen.
10. Allow up to 15 minutes for the process to complete.
11. Press “Menu” then “Preferences”. Slide the “Automatically Add New Devices” slider switch left to the “Off” position.
12. The Farmer Noah system has been appended with the additional animals and is ready for use.

7. Warranty and Contact Information

If manufacturing defects are found in any Farmer Noah system component, that component can be returned to dxdt Engineering and Research, LLC within a period of one year from the date of purchase for a replacement component. Contact dxdt Engineering and Research, LLC by e-mail at hekimiancd@dxdtengineering.com or use the contact page at: <https://dxdtengineering.com/contact/>. You can reach dxdt Engineering and Research, LLC by phone at (301) 520-1575.