**Abstraction Be Gone!**

Behind the Scenes of Package Archive Form: How it Works and What It Does

*A fairly low level description of what happens in the form for all possible buttons. If something isn’t working, see where that process happens by looking here at all the possible processes.*

Note that this form reads like a story. It’s advisable to read through it once to get a broad sense of what’s happening overall. Then, when you have problems, you’ll know where to go specifically to look in detail at what’s happening.

* On Start
	+ What happens when I open the workbook?
		- We switch to the “Start” page, since this is likely what you’ll need to use.
		- Then, we display a message saying that this sheet also needs Package Archives.xlsx. Please do open this, it’ll make your life much easier than a cryptic error down the road.
	+ What happens when I click “start”?
		- We need to check that Package Archives is open. If it’s not then we won’t successfully exit the form at the end and the program will crash.
		- To do this check, we try to activate (switch to) Package Archives and then back. If Package Archives is not open, then this will fail with an “Out of Range” error and stop the form.
			* Why didn’t you listen the first time!! Package Archives really does need to be open.
		- If we make it past this, then we’re cleared to start the form. So, we tell the form to launch.
		- Note that Excel makes a distinction between macros that are associated with the workbook and the actual form itself. All macros below, except the migrate database one are associate with the form itself. So, technically we’re calling the form’s initialize method.
	+ What happens when I launch the form?
		- For the purpose of speed, we disable screen updating. This means that, when we move around from sheet to sheet, you won’t see it.
		- We change the caption on the form to be a pretty “Tzurchania Package Logger.”
		- We sort the camper database. This is important because it makes all the names show up in alphabetical order.
		- Some special forms for adding new people or reverting to older dates don’t need to be visible unless you specifically ask for them, so we hide them.
		- Then, we go to the Listing sheet and fill in today’s date in the cell. We have to copy it and paste it again to make sure that, on a later date, today’s date will stick around.
		- We position the cursor in the Listing sheet to point to the place to put the next listing. This means that old existing listings will still exist and are NOT erased, which allows for opening the form multiple times during the same day without losing data each time.
		- Then, we do some propagation of all of the groups (if you add a new person) and bunks (if you print a specific bunk) to fill those in.
		- And we make the groups fit all of the entries in one screen.
		- Finally, we display the form and switch to the first page.
* Group Selection Page
	+ What happens when I select a group?
		- The temporary database (which is used to determine who is in any given group) is cleared.
		- The larger database is filtered to only include the corresponding group.
		- The data are copied from the larger database to the smaller one.
		- The confirm textboxes are cleared and the group is propogated into the group confirm textbox.
	+ What happens when I click “Next”
		- The sender, first name, and last name dropdown menus are cleared
		- The last names are filled in from the temporary sheet
		- The last name box is expanded to show up to 30 entries at a time
		- The form advances to the next page.
* Package Information Page
	+ What happen when I pick a last name?
		- The first name and sender lists are cleared
		- The first name box is propagated with all of the first names of people who have the last name that you selected
		- The first name box is expanded to show up to 30 entries at a time.
		- If there is only a single first name match, then we assume that this is the correct camper and select it.
			* So, we clear out all of the existing senders
			* And then, we find the camper’s entry in the temporary database by moving down until we find an entry with the last and first names specified.
			* Once we find one, we move to the right and add in all of the senders until we find a blank cell.
			* Then, we move back to the last name column.
	+ What happens when I pick a first name?
		- So, we clear out all of the existing senders
		- And then, we find the camper’s entry in the temporary database by moving down until we find an entry with the last and first names specified.
		- Once we find one, we move to the right and add in all of the senders until we find a blank cell.
		- Then, we move back to the last name column.
		- If there’s a single sender, we automatically select it.
		- Expand the text box to include up to 30 entries.
	+ What happens when I pick a sender?
		- Absolutely nothing.
	+ What happens if I click “Sender Not Listed”?
		- We need to add a new sender and associate it with this camper. We need to be able to identify this sender in the larger database. So…
		- We find the sender’s UniqueID and then search for them in the larger database.
		- Once we find them, we move as far to the right before we find an empty cell. This is the place for the next sender.
		- We get the name of the new sender by prompting the user.
		- We then update the sender in the temporary database as well – this way the change takes effect immediately. (Recall that data are moved from the main database to the temporary database whenever you choose a new bunk in the first screen. This additional updating means that if you don’t do that, the sender will still show up.
		- We then set the text of the sender box to the input sender.
	+ What happens when I click “New Database Entry”?
		- A new form page is enabled, and you are taken to it.
	+ Okay, I’m on this page. What happens when I select a package group or specify a first or last name.
		- Nothing.
	+ What about when I click “Add to Database?”
		- First, a bit about UniqueID’s:
			* Each entry needs a UniqueID for the purpose of identifying their associated senders.
			* The default UniqueID is the concatenation of the last and first names.
			* However, if this is not unique, then a number is used instead.
			* This number is stored in cell “F1” of the main database sheet.
		- We go to the main database and clear any filtering.
		- Then, we determine the camper’s new ID
			* We get the next number juts in case
		- Then, we move down the database until we find an empty row. At each row, we check if the string ID has been taken yet. If it has, then we make sure that the number will be used instead.
		- Then, once we’ve found the next empty row, we fill in the information about the camper, such as UniqueID, first name, and last name.
		- Since we’ve added a new camper, we need to resort the data by last name, so we do that.
		- Then, the special form page goes away, a message box pops up saying the operation was successful, and you are directed back to the “Choose a bunk” page.
	+ What happens when I click “Next?”
		- The name and sender are copied over to the confirmation form
		- You are directed to the next page of the form
* The Confirmation Form
	+ What happens if I change any of the text fields?
		- Nothing.
	+ What happens if I click “Add and Start Another Entry?”
		- We pull the data from the confirm form. Then, we check that no fields are empty.
		- If any are
			* Then you get a message box saying that you need to fill in more information and the form is cleared.
		- Otherwise, we go over to the listing page and add in the new entry.
			* For speed, the screen usually doesn’t update during the form process. However, for sanity, it’s important to see progress being made. So, we force a screen update here so you can see the new entry.
			* Then, we go back to the first page and select the temporary data sheet again.
		- The workbook is saved.
	+ What happens if I click “Add and Finish”
		- First, we check that all entries have been filled in. If they haven’t, we tell you that they haven’t been filled in and stop.
		- If they have been filled in, then we add the listing to the Listings sheet
		- Then, we save the workbook.
		- Then, we add borders to the listing sheet. This is the last entry, so now’s a good time, right?
		- Finally, we jump to the Final Operations form.
* The Final Operations Form
	+ What happens when I click “Print All Lists?”
		- The current listing sheet is selected
		- For all of the bunks in the list, we filter by their text (sorting the packages at the end!!)
		- Then, we print the selected bunk.
		- The workbook is saved.
		- A popup message appears, saying it was successful.
	+ What happens when I click “Print 1 Bunk”
		- First, we check that a bunk ahs been selected and give a meaningful error message if t wasn’t.
		- Otherwise, we go the listing sheet, filter by the selected bunk, and print out that sheet.
	+ What happens when I click “Archive, Save and Exit Form” and why is it SUPER IMPORTANT to exit the form this way?
		- First, we make an ID string based on the current date and time.
		- Then, we want to back up the current day’s packages. So, we go to the listing sheet and unfilter it.
		- We make a copy of the Listing sheet and call it the new ID string we just made.
		- We switch to “Package Archives.xlsx” (which needs to be open) and move the newly created sheet to this archive sheet.
		- Then, we go back to the main sheet and do a little bit of cleaning
			* Clear out the borders of the listing sheet
			* Clear out the entries of the listing sheet
		- Then, we go back and unfilter the camper database
		- Then we go back to the start page, save the workbook, and turn screen updating back on.
		- Finally, we exit the form.
	+ What happens when I click “Revert to a Prior Day’s Packages?”
		- We start by making a copy of today’s data, just in case this is a mistake and something goes wrong.
			* First, we make an ID string based on the current date and time.
			* Then, we want to back up the current day’s packages. So, we go to the listing sheet and unfilter it.
			* We make a copy of the Listing sheet and call it the new ID string we just made.
			* We switch to “Package Archives.xlsx” (which needs to be open) and move the newly created sheet to this archive sheet.
		- Then, we go back to “Package Archives” and populate the list of possible dates to revert to with the names of all of the sheets (which, remember, are just the ID strings from when we clicked “Archive Save Exit”)
		- Then, we enable the special revert form and switch to it.
* Revert Form
	+ What happens when I select a sheet to revert to?
		- Nothing.
	+ What happens when I click “Revert?”
		- We select the sheet from Package Archives that matches the name specified.
		- Then, we copy the listing data from that sheet back to this workbook
		- Note that the date is not copied back. This is to make the ID string align with the written date.
		- Then we put in a message box saying it was successful and go back to the Final Operations page.
	+ What happens if I hit “Cancel?
		- We hide the revert page and go back to the Final operations page
* Importing from an old database – what happens:
	+ *Note, this is a pretty convoluted process that involves a lot of switching. I’m sure there are a few bugs in here. But, in general this works well and migrates data when there is high confidence that entries in the old and new database point to the same person.*
	+ For the purpose of speed, we disable screen updating. This means you won’t see all of the crazy cell manipulation that happens later on, and the operation will be faster.
	+ We start by sorting the existing database by UniqueID. This makes it easier to find duplicates because they will be next to each other.
	+ We want to back up the current database because we’re going to fill in the new one where the current one is. So, we copy all the data from “Camper Database” to the “Temp Data” sheet.
	+ Then, we clear out the “Camper Database” sheet.
	+ Now for the fun part … we need to go to the “New Machzor DB sheet. We want to have a few variables, which we declare here. Specifically, we have uid, group, last name, and first name for each person. Then, we also want to keep track of how many entries we’ve moved vs made a new entry (just for curiosity)
	+ Now, we go through all of the new people and….
		- We set their group, last name, and first name as specified. Then, we create their unique ID based on their first and last name.
		- Now, we go to the old database and try to find the UniqueID we’ve just generated.
		- If we don’t find it, then we want to create a new entry.
			* But, what if we’ve already used that unique ID on some other new entry? So, before adding the entry, we check all the existing entries to see if we’ve used this one yet.
			* If we find it, then we set the unique ID to be some unique number.
			* Once we arrive at the bottom, we have all the information we need, so we add the entry to the bottom of the list of people.
		- Now, if we find an existing entry with the same unique ID, we assume that they are the same people.
			* But, what if we’ve already used that unique ID on some other new entry? So, before adding the entry, we check all the existing entries to see if we’ve used this one yet.
			* If we find it, then we set the unique ID to be some unique number.
			* By the time we arrive at the bottom, we have all the information we need. So, we go back to the old entry sheet and copy over the data.
			* We manually set the group though, because this may change. Example : Ben changes bunks, but his UID stays the same – benmarks
			* If we’ve already use that entry somewhere, then it’s possible that those senders aren’t actually associated with this person. So, we clear out all of the senders.
			* Then, we delete the entry we just copied so that it doesn’t match with somebody else.
		- Now, we go back to the “New Machzor DB” sheet and move on to the next camper.
	+ Once we’re done, we have a few housekeeping things:
		- First, if we need to manually add new people, then we’ll need to know the next UniqueID number that is guaranteed to be unique. So, we store this in cell “F1” of Camper Database.
		- Then, we clear out the old database from “Temp Data” and the old database from “New Machzor DB.”
		- Then, we move back to the start page.
		- Finally, we turn on screen updating again, so you can see the progress.
		- And, we report back the number of migrated, created, and conflicted entries.
			* Migrated = Single UID match, successfully moved data
			* Created = No UID match, entry created with no associated senders
			* Conflicted = Multiple UID match or same UID