

LightListManager is a program that maintains a library of the recent Light List xml files as published by the USC

The significant program functions include the following:

- Download** The program determines if an update to the any of the Light Lists is available and downloads the xml file
- Display** The program displays the contents of each Light List file in a ListView on the main form.
- Updates** The program displays all changes to a Light List file
- Export** Select contents of one or more Light List files can be export to a GPX waypoint file or a Google Earth file (*.kml)
- Radar** The Light Lists can be displayed on a radar-like form that is driven by NMEA input position and AIS target data

Section	Description
Version History	History of version changes from oldest to latest
Bug List	List of all known bugs in the software with date and method of resolution (if resolved)
Plans	Planned and completed enhancements to the software
Next	Planned enhancements to the currently released version
Access	Documentation on the unresolved Access Denied issue, which does not appear to be a program bug

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LightListManager Version History

Version	Date	Description of change
1.0.0.0	5/23/2017	Initial release of LightManager. Builds list of all lights in the xml file for a given volume and USCG district. Saves the contents of the xml file (with or without filters) to a GPX file with each light in the list as a wpt element. When a Volume/District is selected the program checks to see if the associated xml file has been downloaded. Then it compares the date of that xml file to the date of the associated PDF file on the USCG website. If the PDF file has a later date than the downloaded xml file, the program notifies the user that a later version of the xml file may be available for download. Downloads must be done manually from the USCG website.
1.1.0.0	9/2/2017	Added checkbox to specify if the automatic check for a later xml file should be performed. The auto checking adds a several second delay to the display of the light list info. A button has been added that is enabled if the auto check box is not checked. This button will perform the check for a later xml file on demand, and if a later file is available will ask the user if a download is wanted. This is an asynchronous download process that is not controlled by the program. The user will have to check the web browser or download folder to determine when the download is complete, then copy the xml file to the Light List folder.
1.2.1.0	9/28/2017	Added capability to resize the form and Light List to the maximum size of the screen. Added filter to the main form to display the result of the filters. Save to GPX button now writes all selected items in the Light Listview to a GPX file. The secondary form (formLLto GPX.vb) is not longer used.
1.2.1.1	9/29/2017	Last change inadvertently eliminated the ListView selection as the control for writing items to the GPS file. This update fixes that problem.
1.2.2.0	9/29/2017	Added feature to output the light list to a kml file.
1.2.2.1	#N/A	Fixed error in "Both" filter. Fixed error on nr of items sent to GPXKML files when a subset of the listview is selected. GPX and KML file creation sometimes throws an exception. Added feature to save previous xml files in a separate folder for each district. The saved files are renamed to include the date they were downloaded. These files are used to compare the contents of the current Light List xml file to one of its predecessors. My initial testing of this feature has only identified what appears to be errors in xml files. Rewrote much of the processing to only load the xml files on start up. During the program operation all of the data in the xml file is kept in an array in memory.
1.2.3.0	10/21/2017	Finished the Find Update process to identify all Navaid entries in a Light List that have been modified. Created a form to compare each of the modified entries and highlight the data that has changed. Removed the filters for Day/Night/Both. This updated also broke the LLtoKML code.
1.2.3.4	10/24/2017	Fixed the LL toKML code. Copuld not make the startposition=centerparent property work for the FormWait. Manually set the location to the same as the main form (upper left corner). Fixed several problems related to invalid characters in the xml data. Assign a Paddle Icon to each light in the KML file. Color of the paddle is determined by the light characteristic (red, green, white, or yellow). The parsing of the characteristic needs to be enhanced. Added Spash Screen on startup.
1.2.4.1	10/31/2017	Added code to parse the colors for day marls as well as lit marks.
1.2.4.2		The area filter was never working properly, especially for areas that cover 180 deg E/W. Added a text search capability.
1.2.4.3	11/3/2017	Added an area filter from a kml file generated by Google Earth with polygon covering the area for the filter.
1.2.4.5	11/8/2017	Fixed problem of Text Search filter not turned off by the Clear Filter button.
1.2.4.6	12/11/2017	Fixed and error in the processing of latitude and longitude values. The records created when a list is loaded store the values as single type, but they should be double type. This caused a small, but significant error in the display value In the list. Now these values are always kept and processed as double. Added a Up/Down control to the Compare form to show changes to the LL. Use the date extracted from the xml file (attribute "generated") as the date of the xml files rather than the last write date from the file directory. Used the toLongDateString conversion when appending date to the file name of previous xml files.
1,2,4,7	12/14/2017	Fixed error in the adding of the date to the name of previous LL xml files.
1.2.4.8	12/21/2017	Chnged the methodology to determine if a later xml file is available for download. If today's date is more than 6 days since the date of the active xml file, the program assumes a later file has been published. Previously the program used the date of the associated pdf file to determine if a later file is available. Changes to the USCG website have blocked the porgram's ability to get that date, so the methodology had to be changed. It's not perfect, but the other method was failing. Also removed the code to download the PDF Light List file from the USCG site. The website changes have also blocked the program's ability to download these files.

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1.2.4.9	12/22/2017	Fixed an error in the check for an updated LL file. With 1.2.4.7 the check is now just a date check to see if the existing file is more than 7 days old. The check should have been for a 6 day difference in the dates as the value is a long type. When performing the Update function, the program now pre-selects the most recent of the previous LL xml files. If only one old xml file exists, that is automatically selected and the form closes.
1.2.5.0	12/22/2017	The items in the USCG District listbox are turned Dark Orange when the xml file for that district has been loaded. This does nothing for now, but I am trying to get the program processing away from being organized around the district, but rather just a geographic area. That is, the processing can cross district lines. Added code to download and display the Update History of the program in pdf format.
1.2.5.1	12/24/2017	Changed the color scheme for the District listbox. Districts that have not been loaded are Dark Orange. Those that have been loaded are Dark Blue. Cleaned up a few items in the Form display. Added a program bug list, and feature enhancement plans to the Update History PDF file.
1.2.5.2	12/25/2017	Changed the title of the main ListView, which included the "&" character. This caused the GPX and KML files created by the program to contain xml errors Used the ReplaceSplChar routine to clean up the titles when added to the KML and GPX files.
1.2.5.3	12/25/2017	Fix for 1-002
1.2.5.4	12/25/2017	Fix errors in 1.2.5.3
1.2.5.5		Fixed error handling in GPX file creation. Previously the program would abort if there was an error in creating a GPX file segment. Now only the GPX file save process aborts, not the entire program. This error handling was previously implemented for KML file creation. Added district nr to the ListView in preparation for displaying lights from multiple districts.
1.2.5.6	1/8/2018	Started work on merged light lists, then backed out those changes. Decided merging the district lists was going to be more complicated than expected, and of little or no value. Instead I have added code to save a filter set for a given district. The next step is loaded that filtered list can be re-created. Updated the color coding of the USCG District listbox as follows: Red - the light list has not been loaded into memory and is either out-of-date or has not been downloaded from the USCG website. Orange - the light list has not been loaded into memory, but is up-to-date. Cyan - the list has been loaded into memory, but is out-of-date. Blue - the light list has been loaded into memory and is up-to-date.
1.2.6	1/10/2018	Added Load Filtered List function to the main menu. This opens the selected Filter List file, loads the specified District Light List, then applies the filters specified in the file. Also added the capability to modify a filter set without having to first clear the active filters. Fix for bug 1-004
1.2.6.1	1/11/2018	Fix for bug 1-005. Also increased the max size of the GPX and KML files from 100 to 1000 items. Saves the directory for kml Filter files in My.Settings.
1.2.6.2	1/11/2018	Changed the test for an update light list from 6 to 7 days (where it should have been). Also set that value as a public const as it it tested for in more than one program sub.
1.2.6.4	1/15/2018	If the export of a GPX or KML file is from a named filtered list, that name is included in the name of the output files. Forced all Filters to be named before they can be saved. Added code to check for a downloaded file and a later file before loading a filtered list. Added code to compare the program version number in Filter Files to the minimum version for file input to the program. If file version is older than the minimum version, no data from the file with be processed. Changed the color scheme for the District Listbox as follows Blue: List is not loaded, and is up-to-date; Gray: List is not loaded, but is NOT up-to-date; Cyan: List has been loaded, but is NOT up-to-date; Red: List has been loaded and is up-to-date.
1.2.6.5	1/15/2018	Output to KMZ file in addition to KML. This is of very limited use as GE will processing only on kml file in each kmz. I expanded this max size of the file to allow an entire list to me put into one kmz file, but it hung up GE. For now the program will always generate kml files. If only one kml is generated, the program will compress it to a kmz file. The max size of a kml or gpx file is not 1000 items. Provided fix for 1-007 to prevent an error in the xml file from causing a program exception.
1.2.7	1/18/2018	Added Filters for Lighted and Day Marks, resp. Fixes for 1-009 to 1-011.
1.2.7.1	1/18/2018	Fix for 1-012
1.2.7.2	1/18/2018	Removed the msgbox notice when an update Light List item is a new item. The old, blank LLNR is just highlighted. Fix for 1--013. Modified the Clear Updated code to return the display to any filters that may have been established.
1.2.7.3	1/21/2018	Add form to define the meaning of the codes for the light characteristic and structure. Fix for 1-015.
1.2.7.4	1/21/2018	Fixes for 1-016, 017

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		Rearranged the Update Details form. Flagged invalid Day Board shape and color combinations. Added check to the light list item record to prevent any fields in the record to a value of nothing. KML output now differentiates between day and lighted marks. The paddle icon for day marks is blank, the paddle icon for lighted marks has a circle in the center.
1.2.7.5	1/23/2018	
1.2.8	1/29/2018	Added a form to display the light characteristics of selected light list entries.
1.2.8.1	1/30/2018	Fix for 1-0018. Removed button from main form that was used to debug the Characteristic display form.
1.2.8.2		Added Minimum Height to the filters. Set and monitor download status for each volume of the Light List.
		Move Filter text box out of Filter options panel. Add Minimum Height to Panel. Detect download in progress and monitor for completion. Partial fix for 1-021.
1.3.0.0	2/8/2018	This fix will disregard any saved filters with area limits. Those limits must be re-established and the filter list saved to restore those limits.
		Fixes for 1-022-023. Added Location to change items display form. Modified the formCharDisplay to use the LLNR to select the light characteristic to display. This includes the selection of the Day/NightBoth characteristic for items that have multiple lights.
1.3.0.1	2/9/2018	
1.3.0.2	2/10/2018	Fix for 1-024. Added Multi-Light to the filters
		Added form to display all fields from the light record. Some details are not displayed in the main ListView, and the info is hard to read. This form will allow me to eliminate more fields from the ListView, making it easier to read. Increased the font size of the main ListView from 8.5 to 10.m Also increased the font of the DetailsDisplay form.
1.3.1.0	2/13/2018	
		Further adjustments to column widths for font change. Fix for 1-020. Added button to display any light list entries that exist in the previous file, but do not exist in the current file. This has lead to the re-discovery of many entries with no latitude and longitude. The code that loads the xml file ignores any entries that are missing lat or lon, so these are never displayed in the main ListView. However the code that loads the previous xml file does not ignore these entries, so they now show up as removed entries. I have to decide on a consistent way to handle these entries. It appears the USCG removes the lat and lon for entries that they believe have been abandon, but do not remove the actual entry until notified by the responsible organization. For now the entries with missing lat/lon will be ignored. That is the fix for 1-025.
1.3.1.1	2/14/2018	
		Added form to display program settings. Initially this form just displays the settings. Eventually it will be used to change them. Enlarged the font of the District Listbox. This required some re-arrangng of the controls on the form. Added light name to the KML output, then turned it off. It totally clutters the GE display.
1.3.1.2	2/21/2018	Did add the district name to the header of each KML file. Fix for 1-026
		Modified the Update Filter to ignore punctuation characters, including line feeds and carriage returns in the name, location, structure and remarks field (Bug 1-027). This eliminated a number of entries being flagged as updated in those fields with no visible difference. Modified the FilterCheck function to properly handle the situation where a multi-light item has the lights (Day/Night/Both) in a different order than that in a previous light list file (Bug 1-028). This was previously flagged as change, when no values actually changed. This appears to be a result of the process used by the USCG to generated the xml file. This change will prevent the erroneous flagging of an update, but I haven't changed the Update Details form, and it will still flag the DNB values if they are out of order. This would only happen if another field in the record represented a true update.
1.3.1.3	2/25/2018	
		Attempting to resolve the issue of 1-029, changed all single type area limit values to double types. Did not eliminate the problem, but needed to be done to avoid inconsistent results. Removed the code that deletes the KML directory for a district when a new KML file set is being generated. This allows multiple KML file sets to be saved for a given district. The KML file set does not need to be re-generated every time I want to display it in GE. The downside is old files don't get deleted. Need to add code to delete any existing fileset for a given Filter Name or those that match the filter criteria. That will require a lot more code. Added distance and direction in the Change Details form for items whose location has changed. The Distance moved is flagged red if it exceeds 100 ft.
1.3.1.4	3/11/2018	
		Added Radius Filter to main form. This filters out any items that are more than a specified nms from a specified position. This filter is mutually exclusive of the area filter limits, now termed the Rectangular Area Limits. The radius filter is termed the Circular Area Limits. Added setting to use OpenCPN or generic navi aid symbolx for GPX waypoints. The default for now is OpenCPN and that setting is displayed in the settings form, but it cannot as yet be changed by the user. Eventually I want to add a user symbol set for both GPX and KML files.
1.3.1.5	3/15/2018	

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		Added checkbox to include removed LL items in the GPX output file. This can be turned off or on only if there is at least one removed item found. The fact that the item has been removed is added to the description text in the waypoint generated. KML files do not include removed LL items, this only applies to GPX files. The GPX file can be generated with only removed items, removed items and changed items, or only changed items. Have set the GPX symbol set to those used with OpenCPN. Since it is not intuitively obvious that the user must specify a folder for the program files before any of the functionality can be accessed, added a select folder dialog to the start of the program if no such folder has been selected/created. Modified the GPX and KML filenames to use the description in the label above the ListView. This makes the file names unique to the filter applied, including Find Updates. Up until now the existing GPX files were deleted when a new one was generated. I want to use these files as temporary layers in OpenCPN to be removed when the charts have been updated with the Light List changes. Added textbox on the main form to show the week of the list in USCG format (WWYY). Used this date as part of the filename for previously LL xml files, as well as
1.3.1.6	3/23/2018	the GPX and KML output files.
1.3.1.7	3/30/2018	Added Lat/Lon formatting to the program. The standard format for display is degrees and decimal minutes. Values can be entered in decimal degrees, degrees and decimal minutes, or degrees, minutes, decimal seconds. The format currently only applies to the Circular Area Filter. Other value will be slowly converted to this format. Eventually the format will be user controlled. Fix for 1-035
1,3,1,8	4/1/2018	All lat/lon values displayed on the forms are formatted. Program no longer deletes old GPX files unless the new file has the same name as an existing one. Used to delete the entire folder for that district. Now GPX files are saved the same as kml files. This means the GPX folders will accumulate a large number of files over time. For now that will require a manual clean up. Reduced GPX/KML file names per 1-036.
1,3,1,9	4/7/2018	In the Changes Detail form, the name text box is now a combobox, so the name of the mark can be used to select the item to be displayed in addition to the LLNR. Add subs to save and restore data generated during the program session. Initially this is limited to the area limits of each district that has been loaded into the program tables. This data will eventually be used to support the display of multiple district light lists when a filter overlaps more than one district. Added the significant change designation as filter for updated output to a GPX file. If the Significant to GPX checkbox is checked only those updated entries that represent a significant change to the info on the NOAA charts are sent to the GPX file. All updates are still listed in the on the main form and they are all displayed in the Changes form. That form also has a checkbox that identifies which of the updates are considered significant. The user can change the designation on the Change form. Increased the criteria for a significant change of position from 100' to 250'. Any change to the light characteristic, light name or structure are considered significant. The removed items are by default set as significant, but the user can change that designation by clicking the Removed button. This GPX process is getting complicated with all the options. I need to re-think the user interface, and take into account my intent to allow processing to cover multiple districts. In this update I also re-specified the Publisher from svSarah.com to SV Sarah so that it would be grouped under the same publisher as my other programs. The update downloaded and started OK, but when I re-started it the program aborted with an exception. Finally I had to reboot to have the program picked up under SV Sarah and the program ran fine.
1.3.1.10	n/a	Added the number of items in each District Volume to the Save File. Fix for 1-038. FormLLDetails can now handle items from multiple districts. FormLLCharDisplay can now handle items from multiple districts. The Filter process can now handle multiple districts. This update is gradually adding the ability to display and process LL items from different volumes and districts. Initially this is just capturing the district index from the LL records themselves rather than which district has been selected from the ListBox of districts. The big effort is to perform the Find Updates filter on multiple districts. The Find Updated function not checks to see if the selected old xml file has already been loaded. The BackColor of the filter text boxes now turn Cyan if that particular filter is active. The Set Text Filter also turns Cyan if a text filter is active. The range and height filters are validated before that filter is activated.
1.4.0.0	4/21/2018	This is the 1st release of the multiple district processing. Fix for 1-031.
1.4.0.1	5/5/2018	Added District/Volume ID to the GPX <desc> field. Added "As of" week date to the GPX <desc> field. Fix for 1-039. Added formLightListRadar, which will be used to display the location of lights relative to the vessels position. Moved the light list load sub to the master module so that it can be called from the program. Complete initial release of Light List Radar display, which displays all lights within a given radius of the ship's position. With this release the position must be entered manually. Sometime in the future the NMEAaaaaaaaaaaaaa 183 network will be used. This feature is still a work in progress.
1,4,0,2	5/6/2018	Fixes for 1-040 and 1-042

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		Added right click on radar form to display details of clicked light. Left click still just identifies the light(s). I think I fixed the problem of area limits crossing 180 lon. Added heading and direction to the light for left clicks on a radar display light. The form now draws the heading on the form (yellow line) if one is supplied in the text box. The display is still north up. Maybe the next update for heading up. Please note bug 1-043, the heading line on the radar display does not agree with the bearing value for the plotted lights. Not sure which is wrong, the heading line or the bearing value. Most likely the line. I will likely release this version without a
1.4.0.3	5/7/2018	fix for that bug.
1.4.0.4	5/8/2018	Fix for 1-043
1.4.0.5	5/10/2018	Fix for 1-044. The LL Radar Display now supports Hdg up in addition to North up. This feature has not been fully tested, but appears to be working properly.
1.4.0.6	5/12/2018	First implementation of NMEA 183 input for the radar display form. The form will update the vessel's position based on the NMEA input. If a true heading is available from the NMEA stream it will be used. The form updates the values every 20 seconds. This feature has not been tested on a vessel underway, so the position on the form only changes by tenths of second.
1.4.0.7	5/13/2018	Fix for 1-046. Disable the lat/lon/hdg text boxes when NMEA input is active.
1.4.0.8	5/14/2018	Added COG as an option for the radar display. I did this mainly so I can test the HDG/COG Up display with no HDG input from NMEA. Changed the radar range increment from a up/down button to a combobox.
1.4.0.9	5/15/2018	fixes for 1-048 & 1-049
1.4.0.10	5/15/2018	Added active waypoint to the radar plot. Cannot test this until I have published this version and loaded it on my nav computer.
1.4.0.11	5/16/2018	Use wpt bearing and distance if lat/lon is not provided in the NMEA stream
1.4.0.12		Radar displays now put colors on day marks as well as lit marks. The lit marks are now solid circles, the day marks are just circles.
1.4.0.13	5/17/2018	Fixes for 1-50,51. The radar display now picks up the active waypoint from a route on the NMEA stream. This version also includes the ability to debug the NMEA offline using a file input. Only the COM port input is part of the published versions.
1.4.0.14	5/18/2018	Fix for 1-52.
1.4.0.15	5/19/2018	Turned off LLNR on radar display. Added Bearing to display. Changed the refresh combobox from nm to seconds. The refresh on distance travelled was never activated, and I'm not likely to be able to test it any time in the future. So now the combobox can be used to set the refresh rate in seconds (2-20). This has an effect only when the NMEA input is active. The value in the combobox sets the timer interval to retrieve updated NMEA data.
1.4.0.16	5/20/2018	Fix for 1-054
1.4.0.17	5/25/2018	First implementation of AIS Target display in the radar display form. This can only be tested after it is published and downloaded to my nav computer, so there may be lots of bugs to find.
1.4.0.18	5/25/2018	Ok, this is the real 1st AIS implementation. Processing AIS traffic is an option, and forgot the code to activate it.
1.4.0.19	5/26/2018	Fix for 1-055. I think I've finally gotten the decode of AIS text fields correct.
1.4.0.20	5/26/2018	This time for sure the text fields are displayed.
1.4.0.21	5/26/2018	One more change that might address the AIS processing exception fault.
1.4.0.23	5/27/2018	Changed chr function to chrW after exception on conversion from decimal to string. Also truncated Class B names on a @ char.
1.4.0.24	5/27/2018	Still getting program faults with AIS. Cleaned up a few things and expanded the AIS target display form.
1.4.0.25	5/27/2018	fixes for 1-058, 059
1.4.0.26	5/28/2018	Another attempt to fix the program faults. Appears to have worked, no program faults for 24 hours with plenty of garbled sentences received.
1.4.0.27	5/30/2018	Added Target Active flag to each AIS record to allow the targets to be purged and their slot in the AIS table to be re-used. Purge of AIS targets will be added in a later update. Added highlight of selected AIS targets on the display.
1.4.0.28	5/30/2018	Fix for 1-060
1.4.0.29	5/31/2018	Allow manual placement of the AIS Display form so it only has to be moved out of the way once and will return to that position. The radar display form is now Modeless, so the main form can continue to perform other functions or to be minimized while the radar display is active. Added Ship Type to the NMEA input.
1.4.0.30	6/5/2018	Changed AIS Display form to modeless. Added update time to the AISDisplay form to keep it up to date with the radar display. AIS target purge parameters are shown on the form, but the purge has not been implemented. The AISdisplay form is updated whenever a new AIS target is received.

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		Added check for null or zero longitude during the loading of the xml files. Previously only the latitude was checked and the entry discarded. Need more refined checks to eliminate incorrect as well as invalid entries. Currently the Dist 8 list contains a PA entry with of longitude of 90E. This throws off some of the geographic filters in the program. Changed the colors for the Radar display and added a color code for the Target listbox in the AIS display form.
1.4.0.31	6/8/2018	Added check for null or zero longitude during the loading of the xml files. Previously only the latitude was checked and the entry discarded. Need more refined checks to eliminate incorrect as well as invalid entries. Currently the Dist 8 list contains a PA entry with of longitude of 90E. This throws off some of the geographic filters in the program. Changed the colors for the Radar display and added a color code for the Target listbox in the AIS display form.
1.4.0.32	6/8/2018	Changed the radar display color scheme. Backcolor is black.
1.4.0.33	6/9/2018	Further changes to color scheme
1.4.0.34	6/9/2018	More color tweaks
		Add purge capability for AIS targets, not tested. Added checksum validation for NMEA input. This produces a lot of errors detected on my system. I implemented checksum because I was displaying obvious bad data. With the checksum test the bad data went away of 100's of msgs were being discarded each minute. Turned checksum off, and no longer got bad data. Looks like the bad data was a program bug that I fixed without knowing it. Recommend not turning on the checksum validation (option in the NMEA Start process) unless getting alot of garbage in the display.
1.4.0.35	6/11/2018	Add purge capability for AIS targets, not tested. Added checksum validation for NMEA input. This produces a lot of errors detected on my system. I implemented checksum because I was displaying obvious bad data. With the checksum test the bad data went away of 100's of msgs were being discarded each minute. Turned checksum off, and no longer got bad data. Looks like the bad data was a program bug that I fixed without knowing it. Recommend not turning on the checksum validation (option in the NMEA Start process) unless getting alot of garbage in the display.
1.4.0.36	6/12/2018	Fixed issue with AIS target purge
		Fix for 1-061, 062. Added code to prevent a just purged target from being selected by a mouse click. Previously the rectAIS entry for the target was left in the table. It then could be selected by a mouse click until the display is refreshed. Now the rect AIS entry is set to nothing when the target is purged.
1.4.0.37	6/13/2018	Fix for 1-061, 062. Added code to prevent a just purged target from being selected by a mouse click. Previously the rectAIS entry for the target was left in the table. It then could be selected by a mouse click until the display is refreshed. Now the rect AIS entry is set to nothing when the target is purged.
		Changes described in 1-063 (though probably not a fix). Added code to remove the target highlight for a purged target. Added code to close the AIS Display form when the radar display form closes. This may not be necessary.
1.4.0.38	6/14/2018	Changes described in 1-063 (though probably not a fix). Added code to remove the target highlight for a purged target. Added code to close the AIS Display form when the radar display form closes. This may not be necessary.
1.4.0.39	6/15/2018	Allowd checksum validation for NMEA msgs to be an option when starting the NMEA input.
1.4.0.40	6/15/2018	Fix for 1-064.
1.4.0.41	6/16/2018	Added AIS channel to the AIS display form. 2nd attempt to fix 1-063,
1.4.0.42	6/17/2018	Fix for 1-065
1.4.0.43	6/17/2018	Allow radar range down to 0.25 nm. Possible fix for 1-066.
		AIS/NMEA development is complete. Changed the KML placemark icons. A lit mark is now a solid paddle and a unlit mark is now the hollow paddle. This makes the GE display consistent with the radar display. Make the error count textbox not visible if the checksum test is turned off. Fix for 1-068. Added type of transmitter (SO or CS) to Class B Target info. Added display refresh when the form is manually re-sized. Possible fix for 1-069.
1.5.0.0	6/27/2018	AIS/NMEA development is complete. Changed the KML placemark icons. A lit mark is now a solid paddle and a unlit mark is now the hollow paddle. This makes the GE display consistent with the radar display. Make the error count textbox not visible if the checksum test is turned off. Fix for 1-068. Added type of transmitter (SO or CS) to Class B Target info. Added display refresh when the form is manually re-sized. Possible fix for 1-069.
1.5.0.1	6/30/2018	Added Try-Catch to the backing up of replaced xml files to prevent program abort on an error such as the Access Denied issue. Attempt to fix 1-069.
1.5.0.2	7/7/2018	Fix for 1-070, 1-073, 1-046
1.5.0.3	7/11/2018	Add COG vector arrow to AIS plot if the target is underway (SOG>1).
1.5.0.4	7/11/2018	Fix for 1-074
1.5.0.5	7/11/2018	Attempting another fix for 1-074.
1.5.0.6	7/12/2018	Hopefully the final fix for 1-074
1.5.0.7	7/12/2018	One more fix for 1-074. That got it, still need to tweak the length of the arrow
1.5.0.8	7/13/2018	Tweaking the COG/SOG vector arrow. Suppress the arrow if range > 10 nm. Keeps the mainform on top when download initiated.
1.5.0.9	7/16/2018	Fix for 1-076. Possible fix for 1-075.
		1st attempt to integrate with ChartManager. Individual RNC charts can be used to create an area filter. ENC, IENC charts will come later. Eventually a chart collection can be used as a filter. The filter process is based on the NOAA chart catalog format so it is limited to NOAA and USACE charts. The only part of this fuction that depends on ChartManager is the use of Collections, which has not been implemented as yet. The requirement is to have downloaded the NOAA RNC Chart Catalog from the NOAA website. ChartManager does this for the user, but it can be easily done manually. If the Apply Filters button is clicked with no District/Volumes loaded in memory, the Filter All District/Volumes checkbox will be checked, forcing a load of all District/Volumes into memory and the filter will be applied to all of them. The DistrictID combo selection will posiiton the listview to the 1st entry from that district. The Save Filter process has not been updated to capture the Chart Filter criteria. The program will create a filter file for the Chart Filters, but the chart area limits are not saved. If the Filter is loaded from the Save
1.6.0.0	7/19/2018	file it will load the unfiltered contents of the District/Volumes.

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1.6.0.1	7/21/2018	Add Region filter to chart list. The Save Filter function now captures the Chart Filter parameters. The Load Filter function will now reload a Chart Filter. Reduced the size of the COG/SOG vector arrow in the AIS display. Made a small change in the DownloadCheck sub for 1-078. Don't think it is a fix, but the processing is at least consistent. Added a check for a small file and that appears to avoid the problem. That is really just a work around, and I hate implementing fixes in that manner, but I have no other solution. Fix for 1-077.
1.6.1.0	7/23/2018	Reduce the COG/SOG by 2/5. Corrected ToolTip on the District/Volume Listbox. Added ENC charts to the Chart Filter. Not sure if I will add the IENC charts to this filter function.
1.6.1.1	7/23/2018	Modified the graphics in the Radar Display to reduce flicker when the image is refreshed.
1.6.1.2	7/23/2018	The anti-flicker change did not work.
1.6.1.3	7/24/2018	Fix for flicker
1.6.1.4	7/28/2018	Reset the datediff comparison from > to >= the interval for a file update. Changed the computation of how many days old a given xml file is when determining if it is out of date. The new code insures the days value does not get rounded up. Previous means of calculating this value either produce a value too small or too large.
1.6.1.5	8/1/2018	Increased the max range for the radar display to 500 nm (temporary). This really bogs down the processing, but it is kinda neat. Fix for 1-083 (in NMEA Class). For this update Visual Studio also required me to update the security signing for the application. This is something I've never understood, but It seem to largely transparent to my development. Every year or so I would have to install a new certificate. This time the new certificate killed the Click Once automatic updates for users. So existing users, if there are any, will not get a notification of this update. They will have to re-install the application from the website. That does not appear to be the case with my computers, so maybe not.
1.6.1.6	8/5/2018	Fix for 1-084
1.6.1.8	8/5/2018	Final fix for 1-084
1.6.1.9	8/10/2018	Fix for 1-085, modified the area limits display to use the hemisphere designation (N/S/E/W). Fix for 1-086
1.6.1.10	8/24/2018	Added NMEA Data form to display more of the NMEA traffic than is necessary for the Radar form.
1.6.2.0	8/25/2018	Mintor rweaks to NMEA Data display. Added Rudder Angle to display. Cleaned up the unit conversions.
1.6.2.1	9/1/2018	Fix for 1-088. Changed the AWD value to "Prt" or "Stb" rather than "L" or "R". The age of xml file is now calculated as a double so that so that a file will be flagged for download when it is only a faction of a day over the 7 day limit. This may result in a file being flagged for download before the new file is available. In that case I will changed the USCGPublishDays setting from 7 to 7.x days. Standardized the Lat/Lon format to "C1", and added that value to the program settings display. "C1" is deg/mins/secs/tenths of sec. Some dislays use the "B1" (deg/mins/tenths of min) format to save space. The main form ListView uses the "C3" format (deg/min/secs/thousands of sec) to be consistent with the values in the xml files. Fix for 1-089
1.6.2.2	9/7/2018	Refined the xml file date check to identify the availability of a new file earlier.
1.6.2.3	9/16/2018	Fix for 1-094. Was forced to implement a new temporary certificate for the program in order to publish.
1.6.2.4	9/16/2018	Force close of NMEA Data Form when Radar Display closed. Rebuilt the Navigation component to see 1-095 is fixed.
1.6.2.5	9/16/2018	Set the AIS and NMEA Data display forms to topmost to prevent them from being hidden when the radar display is maximized
1.6.2.6.	9/16/2018	Added Try Catch to the AIS Display code generating the exception.
1.6.2.7	9/16/2018	Moved the declaration of the Navigation object into the AIS Display form subtoutine. That didn't work. Turned off the MsgBox on the exception. All program functions run normally, but no position is shown in the AIS Display form.
1.6.2.8	9/16/2018	moved the declaration of the Navigation object back to the original posiiton. Removed the Try-Catch. Possible fix for 1-087. Possible fix for 1-095.
1.6.3.0	9/18/2018	Use the time value in the NMEA data items to show the age of the values in the NMEA display.
1.6.3.1	9/22/2018	Fix for 1-097. Modified the LoadLLVolumes function to use the Position Validate function to verify posiiton values rather than the values in the text boxes. Those boxes should be for display or data entry only. This allows the text boxes to be set to a null display if no position data received from the NMEA input. Modified handling of HDG values to conform to version 1.9.1.1 of NMEA Class. Removed form_closing event handling from radar form. This appears to be redundant to the closing event.
1.6.3.2	9/23/2018	Rebuilt for NMEA Class 1.9.1.2. Computes the True HDG in radar form if mag HDG and variation available. Possible fix for 1-096, 098
1.6.3.3	9/23/2018	Fix for 1-097, 099

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1.6.3.4	9/29/2018	Updated the application to .NET 7 in an attempt to resolve 1-100.
1.6.3.5	10/10/2018	Returned to .NET 6.4. The app will not start on my Nav PC.
1.6.4.0	10/17/2018	Added Bug Report to Help Menu
1.6.4.1	10/19/2018	Fixed mashup of the main form in 1.6.4.0
1.6.4.2	10/22/2018	Updates to the Bug Report processing
1.6.4.3	10/23/2018	Further updates to the Bug Report
1.6.4.4	10/30/2018	Adds the preliminary (and incomplete) User Guide.
1.6.4.5	11/5/2018	Removed the Help section from the bug report form. That will be covered in the User Guide. Fix for 1-103. Modified the bug report form.
1.6.4.6	11/17/2018	Added Help button to forms for Filters, Radar and Bug Reports. Each button opens the associated section of the User Guide in the default web browser.
1.6.4.7	11/11/2018	Fix for 1-106
1.6.4.8	11/14/2018	Fixes for 1-107-109, 1-105
1.6.4.9	11/29/2018	Fixed the validation of the area limits filter. Added check on location filters to insure that the area limits of at least one volume intersects with the filter area before starting to filter the lists. Fixes for 1-113, 115.
1.6.5.0	12/4/2018	Added code to provide the user the option of downloading files in the background (only option before) or download the file in the foreground and wait for the DL to complete. Modified the Radar Display increment setting when the range changes to keep the number of increment rings to 5 or less. The Find Updated display in the main form will select the significantly changed items when that box is checked.
1.6.5.1	12/7/2018	Added highlight of navaid when an item is left-clicked in the radar display. While the msgbox is active an arrow will point to the selected navaid. Modified the increment settings such that no more than 4 sub rings will be generated. The user can still set the increment to any of the values in the drop-down list.
1.6.5.2	12/23/2018	Fix for 1-116.
1.6.5.3	1/5/2019	Fix for 1-117.
1.6.5.4	1/7/2019	Final fix fo 1-117
1.6.5.6	1/9/2019	Save the NMEA checkbox values to the settings file so that they can be recovered for the next session. Fix in NMEAClass: When a message for a purged target is received, the bActive flag is not set to true.
1.6.5.7	1/10/2019	Fix for 1-118.
1.6.5.8	1/11/2019	Added SyncLock to NMEAClass for the AIS update method that sets the bActive status for purged AIS targets.
1.6.5.9	1/11/2019	Fix for 1-120,
1.6.5.10	1/12/2019	Change AIS highlight color from Cyan to DarkCyan. Added 5 seconds to the refresh combobox.
1.6.5.11	1/20/2019	Fixes for 1-121, 122. Added check on date/time of the raw xml file on the USCG server as part of determining if a later file is available. If no internet is available the program will always use whatever file has been downloaded. If the internet is available the program will compare the date/time of the file on the server to that of the downloaded file. If the date/time of the server file is not available, the program will check to see if the downloaded file is more than 7 days old.
1.7.0.0	2/21/2019	Clicking on a highlighted AIS target will turn off highlighting. Added initial code for the radar display to track an AIS target rather than the own vessel position. This feature is still under development and is only published so I can test it on my Nav computer. Added ICON for Own Ship position. Initially this ICON is always pointed to the top of the display. Eventually it will be oriented to either the HDG or COG. This is in preparation for setting the display center to something other than the Own Ship position (AIS target or NavAid). Fix for 1-124/125
1.7.0.2	2/24/2019	Added highlight arrow for navaid's selected by a right mouse click on the radar display. This still needs work. Possible fix for 1-123
1.7.0.3	3/3/2019	Added color coding for the age of NMEA data in the Radar display. One more change that might fix 1-123.
1.7.0.4	3/6/2019	Radar form now displays light characteristic next to plotted navaid when clicked. The intent is to replace the msgbox display when a navaid is clicked. Converted pixel calculations from integers to double values to eliminate unnecessary truncation of values. Changed the ship icon to an outline. Added Bearing, North, HDG, and COG labels to the radar display lines.
1.7.0.5	3/8/2019	Truned off Bug Report on Help menu. Need to comoe up with a better process. For now just send me an email (svsarahsoftware@gmail.com). Made some changes that may be a workaround for 1-126. Fix for 1-127.

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		Correction for COG arrow on AIS target plots. Consolidated several of the plotting calculations into 2 functions. Turned HDG/COG line display back on when display
1.7.0.6	3/10/2019	is centered on an AIS target, even though the display has bugs.
1.7.0.7	3/11/2019	Continuing to simplify and consolidate the code in the Radar Display Form.
1.7.0.8	3/13/2019	Fix for 1-130. Changed the test for the ship at center of display. Previously tested to the pixel point of the ship against that of the center. Normal GPX position
1.7.0.9	3/18/2019	fluxuations can produce incorrect results. Now the test is if the display is centered on an AIS target rather than the ship.
1.7.0.10	3/19/2019	Cleanedup and reposition the controls on the radar display.
1.7.0.11	3/21/2019	Fixed an exception fault in the AIS Display form. Further tweaking of the radar display controls
1.7.0.12	3/29/2019	Fix for 1-132. Fix for 1-131. Added text display to the radar display
1.7.0.13	3/29/2019	Activated the Check for Update item on the Help menu.
1.7.0.14	4/2/2019	Update to validate that the Check for Update menu item works.
1.7.0.15	4/15/2019	Added satellite map form to the radar display. Called from the NMEA data form.
1.7.0.16	4/15/2019	Added tooltips to the satellite form. Removed the check for update at the start of the program. Use the Help menu for updates.
1.7.0.17	5/26/2019	Sliding scale for navaid icons in radar display.
1.7.0.18	6/3/2019	Add list of reference assemblies to the program settings form. Update to latest version of NMEAClass.
1.7.0.19	6/9/2019	Fix for 1-134. Updated the Satellite display form.
1.7.0.23	6/14/2019	Fix for 1-135. Replaced the MsgBox display for a clicked on navaid with section of the form. This allows the NMEA processing to continue while the distance and bearing to the navaid are displayed and updated. Turned off the formGraphics dispose when the form is re-sized. Seems to improve the rednering of the form. Fix
1.7.0.24	6/15/2019	for 1-137. Possible fix for 1-138.
1.7.0.25	6/15/2019	Added waypoint display to the radar form. Eliminated the last msgbox from the mouse click event for the form. Set the initial form refresh to 2 sec from 10 sec.
1.7.0.27	6/16/2019	Updates 20-22 were attempts to get the waypoint display working again on the radar form.
1.7.0.29	6/17/2019	Update to NMEAClass for handling waypoint sentences
1.7.0.32	6/18/2019	fix for 1-139
1.8.0.0	6/25/2019	Updates 26 & 27 were applied to fix issues with the latest version of NMEAClass
1.8.0.2	7/27/2019	Hopefully the last set of fixes for displaying waypoints on the radar form
1.8.0.3	10/4/2019	More tweaks to the waypoint display
1.8.1.0	10/22/2019	Added rte element to GPX output file for all lights that have been relocated more than MinDistancerte feet, currently set to 175'. This provides a quick reference in
1.9.0.0	11/16/2019	a chart plotter to see if the change has been picked up by NOAA in the most current chart on the PC. The route points to the new location of the light.
1.10.0.0	2/10/2020	Temporary fix for 1-140
1.11.0.0	3/12/2020	Added "Save to OpenCPN" option to the main form. This will save the selected entries to a GPX file in the OpenCPN Layers folder
1.11.1.0	3/14/2020	(C:\ProgramData\opencpn\layers). This button is only active if there is a named filter active. The purpose is to allow a layer file to be created directly in OpenCPN
		without having to copy the file(s) from the GPX folder for a District to the OpenCPN layers folder. It may be generalized in the future to work with other chart
		plotting software, but for now it only works if OpenCPN is installed on the PC.
		Built with NMEAClass 1.9.16.x. Adds support for GLONASS sats from NMEA input, plus bug fixes in that class library.
		Tweaked the radar display
		Start implementation of the Merge Updates feature which will maintain a merge list of Light List changes for comparison to charts.
		Added LNM processing and display
		Added LNM details form to main form popup menu

LightListManager Version History

		Add a verify function to the LNM processing. This was primarily to help me understand the data in the LNM.xml file. There are anomalies in the file, but they do not affect the use of the data by the program. The LNM file includes LNM data for District 2, which does not exist. This appears to be a marker for volume 5 entries in the file to differentiate them from the Volume 4 entries, both of which are managed by District 8. Had to hard code the conversion from district 8 to district 2 for volume 5. In addition there are a few LNM entries with a proper District number for which the Light List entry has been removed. I'll keep the verify function in the program for awhile just to give me another tool to monitor the file contents.
1.11.2.0	3/18/2020	
1.11.3.0	3/21/2020	Added LNM status to GPX export. Fix for 1-144
1.11.4.0	3/21/2020	Added LNM status to the Light List Radar display
1.11.5.0	4/1/2020	Added Listviews to display the contents of the LNM file.
1.11.5.1	4/5/2020	Tweeked the LNM Display form to show the latest week on activation
1.11.5.2	4/12/2020	No longer disables the LNM Update button after one download
1.11.6.0	4/15/2020	Rearranged the radar display to put more controls into the menu strip. Fix for 1-146.
1.11.6.1	4/25/2020	Fix for 1-147
1.12.0.0	5/3/2020	Updated with latest GPS Map and NMEA input processing
1.12.1.0	5/6/2020	Modified the Radar display to use a triangle as the symbol for targets underway. Stationary targets will still be drawn as circles. The SOG value is used to determine a ship is underway. Any value > 0 is used to establish the target is underway. In the future this may be changed to a non-zero value to avoid stationary targets will very small SOG values to be depicted as underway.
1.12.1.2	5/6/2020	The AIS Target purge time can now be set from the Radar form menu rather than the AIS Target form. This is a preliminary step toward replacing the Target form with a simpler and easier read display. Also the maximum SOG value to determine if a target is stationary or underway can be set from the Radar form menu. This value determines how the target symbol is drawn on the radar display.
1.12.1.3	5/6/2020	Corrected error in setting the stationary SOG for AIS targets
1.12.2.0	5/11/2020	Modifications to the LightListRadar function. Replaced the AIS target list form. Added a data retention function which saves basic identification data for received AIS targets for restoration on subsequent sessions. This allows targets to be fully identified with the first message received based on the MMSI. Greatly expanded the menus on the radar form. Control of target purge and data retention times are now specified in the form menus. Added menu items to control the NMEA data refresh rate (removing the combobox previously used. Added menu item to turn radar display range rings on and off. Removed the area limits display from the radar form. Backcolor for the vessel position is yellow if no GPS fix is available. Added option to display AIS target names.
1.12.15.2	6/24/2023	Fix for 1-148
1.12.15.3	7/15/2023	Fix for 1-149

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-001	10/16/17	10/21/17	1.2.3.0	Lights that different day and night characteristics have duplicated entries in the xml file. These duplicate entries must be handled as a single item.	The fix required loading the contents of the xml file into an array rather than using the xml methods to create the ListView.
1-002	12/25/17	12/25/17	1.2.5.5	Both the GPX and KML file generators created duplicate entries for lights with multiple characteristics. Problem is using the array of entries in the ListView rather than the array of loaded enteries. The later array merges the duplicate records. Need to use that array as loop control for creating the GPX/KML file.	Fixed for KML and GPX outputs on 12/25.
1-003	01/03/18	01/03/18	1.2.5.6	The button to select a kml filter becomes disabled after several uses. This happens with an attempt to apply the kml filter to the second of two loaded light lists, without a Clear Filter button click, or loading another list from an xml file. Need to enable this button whenever the LightListView is rebuilt.	If the selected list has already been loaded, the filter values were not reset. Now the text search values and the kml Filter button are reset. Have not released this fix in an update because there are a number of problems with the current update.
1-004	01/10/18	01/10/18	1.2.6	After applying a kml filter to the Dist 7 list, the second entry in the xLLItemsArray is nothing. Several other entries in this array are nothing. Causes program exception. First encountered with version 1.2.6 under development, but it also occurs in the published version 1.2.5.6	This problem was caused by moving the incrementing of the xLLItemsArray out of the loop that created a ListView item for each characteristic of a light. Lists with multiple characteristics then will leave a null entry in the xLLItemsArray. This array must have a one-to-one relationship with items in the ListView. Corrected the code back the way it originally was.
1-005	01/10/18	01/10/18	1.2.6.1	KML files created from a loaded Filter sometimes go into the wrong directory. This appears to be the result of the Load Filter Process not selecting an entry in the lbUSCGDistrict listbox.	The K<L and GPX export subs used public variables for the name of the LL xml file and the district index that were not beeing set by the Load Filter sub. As long as the GPX or KML export took place immediately after the LL was loaded, those vairables were set, but it another district LL was loaded between the time of the file load and the export, the export picked up the wrong district.
1-006	01/12/18	01/12/18	1.2.6.4	The Apply Filtered button is not enabled when one of the coordinates is manually changed.	Found 2 problems. (1) the Apply Filters button sub uses the text of the button to determine if the process shd apply a set of filters or clear them. One part of the program was changing the text to "Apply Filter" rather than "Apply Filters", which the sub does not recognize. (2) The AreaFilterSet function was incomplete in its validation of any coordinates that have been manually entered.
1-007	01/12/18	01/12/18	1.2.6.4	Setting a text filter does not always activate the Apply Filters button.	The Set Text Seach sub did not enable the Apply Filters button.
1-008	01/15/18	01/15/18	1.2.6.5	LLNR 7495 in Dist 05 List specifies a night light (dnb="Night", but there is no characteristic. The program assumes a characterist if DNB<>"". This causes exception when outputting the light list entry to a GPX or KML file.	Problem was caaused by an apparent error in the xml file for District 05. It appears all light characteristics have been removed from the latest file. No problems with the other files. Notified USCG Nav Center of problem. Added check in the program to prevent a program exception.
1-009	01/18/18	01/18/18	1.2.6.6	The min Range filter also includes day marks.	Added check to exclude items that do not have a light characteristic
1-010	01/18/18	01/18/18	1.2.6.6	Filters are not disabled when no light list has been loaded into the ListView.	The entire filter panel is now disabled on program start. It is enabled with the first light list is displayed.
1-011	01/18/18	01/18/18	1.2.6.6	The file name for a filter list picks up the name of the district selected on the list box, tno the one displayed.	The save filter sub used the listbox index to identify the district whose filter is being saved. Changed to use the IUSCGDistID value which is set to the district index each time a light list is displayed.
1-012	01/18/18	01/18/18	1.2.7.1	The Lighted Mark filter includes items that do not have a characteristic. All items under this filter should display a characteristic.	The filter for both Lighted and Day marks only checked the Chrct array in each recode. If the length was 0 it was assumed to be a Day Mark, otherwise a Lighted Mark. Changed the filter logic to look at each entry in the .Chrct array. If the .chr value for any entry was non-blank (<>""), the item is added to the Lighted Mark list. If all .chr values are blank (= ""), the item is a Day Mark. I believe the items that were being erroneiously included in the Lighted Mark list are due to errors in the USCG light list xml file.

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-013	01/19/18	01/19/18	1.2.7.2	If a filtered list is further filtered by the Find Updated function, the Clear Filters does not reset the Find Updated button. The button is left in the Clear Updates stage, but the update filter has already been removed.	The sub that loads a filter list did not reset the Find Updated button.
1-014	01/20/18	01/21/18	N/A	Clear Filters button does not clear the text filter form.	Not a bug, but a feature. When filters are cleared the text key words are saved but filters are turned off. This allows the text filters to be quickly reset for a another light list.
1-015	01/20/18	01/20/18	1,2,7,3	Lighted marks filter does not find any items	Error in checking for non-blank .chr value
1-016	01/21/18	01/21/18	1.2.7.4	The Dist 05 xml file for 1/11/2018 is missing the Characteristic field from all entries. Fixed in the 1/18/2018 file, but it causes the program throw an exception when performing the update comparison. Need to protect the program from missing fields.	This is a data-dependent bug. Applied a fix for this specific data error, but still need to protect the program by not allowing an items to have a value of nothing.
1-017	01/21/18	01/21/18	1.2.7.4	Program those exception in formUSCGLLChanges when update filter is applied to a filtered LL set.	The form is using the selected index to the district listbox, which is not valid if the list was loaded from a filter set. Use a public variable for the dist index.
1-018	05/08/00	01/30/18	1.2.8.1	Lights with a period that includes a fraction of a second (e.g., 2.4) do not display properly.	Removed Fix function from the calculation of the group display length. Caused the time increment to be truncated.
1-019	02/02/18	02/11/18	n/a	The "Filtered" status remains on the ListView label after Find Updated filter has been cleared.	I may have fixed this or it may have just gone away. I don't have record of a fix, but I also can't reproduce the problem. So it is closed until it comes back.
1-020	02/02/18	02/14/18	1.3.1.1	Sometimes the Update Details form shows all fields in the records having changed. Haven't determined what sequence of events causes this to happen.	The bgcolor for fields that had not changed was not being set using the correct value.
1-021	02/06/18	02/07/18	1.3.0.0	Area limits are loaded from the filter file, but those limits were rounded in the filter text boxes, such that some of the lights that should be picked up when the other filters are applied are not picked up.	Only a partial fix. The Save Filter sub now saves the BAreaSet boolean value, which determines if an area filter is active. This means the if the saved filter was not the result of an area filter, then the loaded filter set will not as well. A filter set defined by an area limits could still have the problem, but not only for items that right on the limits.
1-022	02/09/18	02/09/18	1.3.0.1	Discovered a single list item can have more than one light at a different height. I can add the height to the characteristic array, but some day marks (e.g. RACONs on oil rigs) also have heights.	My original understanding of the both/Day/Night characteristic designations was wrong. These terms apply to entry items that have more than one light, and the lights can have different characteristics, ranges and heights. Required changes to multiple parts of the program.
1-023	02/09/18	02/09/18	1.3.0.1	Save Filter xml file is malformed if a LLNR text filter exists	Corrected the xml file generator
1-024	02/10/18	02/10/18	1.3.0.2	The Characteristic display form allows a light list day mark entry to be included in the list to be displayed, which results in a program exception.	Added test that the entry has at least one light characteristic before adding it to the list to be displayed.
1-025	02/14/18	02/14/18	1.3.1.1	See writeup for release 1.3.0.1. There is a discrepancy between the way the program loads records from the most recent and previous xml files. With the current file, and records with a missing lat/lon are ignored. With the previous files, the records are loaded but the lat/lon is ignored. I need to implement a single approach to the entries with missing lat/lon.	For now the entries with missing lat/lon will be ignored for both the current and previous lists. However, I still need to find out what should be done with the many entries that have no lat/lon,
1-026	02/20/18	02/20/18	1.3.1.2	Invalid index when loading a filter list.	Used the wrong variable with similar spelling, most likely a Intellisense issue. Not sure when this error was introduced, maybe in this version.
1-027	02/22/18	02/24/18	1.3.1.3	The name, remarks, structure and location fields are occasionally flagged as updated when no text changes are visible.	The xml file values sometimes include line feed characters, which may change but are not visible in the textbox displays. The text compare processes for these fields have been modified to ignore punctuation changes (include line feeds).
1-028	02/22/18	02/24/18	1/3/1/3	The xml file entries for multi light items sometimes reverse the order of the lights (Day/Night/Both) and get flagged as updated.	The update check process has been modified to properly handle the multi light items and not flag a change in order as an update.

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Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-028	03/02/18	03/04/18	n/a	The KML filter does not appear to be picking up all of the items within the designated area. Not sure if this is a problem processing the GE polygon or in the area filter processing.	Problem was in the creation of the GE polygon that did not include the intended area. User bug not a program bug. There is a minor problem with truncation of the limit values. See 1-029
1-029	03/04/18	03/06/18	1.3.1.4	The area limits used to filter a LL are usually derived from a double value and then displayed in one of the text boxes using the ToString method. This appears to truncate one or more decimal points in the value. The result is a LL item on the northern most latitude or eastern most longitude may be missed by the filter.	This is not a major problem, dropping one or two lights on the very edge of the defined limits, but I would like to eliminate it. It does generate an inconsistency with the saved filters. When generated the filter may result in x items selected. When the filter is re-loaded it might result x-1 or 2 items selected. The solution should be to not use the textboxes for anything other than display.
1-030	03/09/18	03/28/18	n/a	During the loading of named filter, if the user opts to download the latest version of the bsse LL, the color of the entry in the District list does not change to Cyan.	Could not reproduce in version 1.3.1.6. No record or recollection of a fix. This may have been the result of the display being locked while some system processing. This happens often when loading a large xml file. The program is flagged as not responding, but the process does complete and the form is once more repsonding. I'm guessing the system is doing some high priority background task.
1-031	03/09/18	04/21/18	1.4.0.0	During Find Updated, the program does not check to see if the previous LL has already been loaded into memory. This could save some time in checking for updates in various named filter sets.	Not really a bug, but I need some place to keep this issue active until I decided to do something about it.
1-032	03/12/18	03/12/18	n/a	The Find Updated function correctly detects a change in the number of Characteristics as n updated item, bu the Change Details form does not flag the change in a manner that identifies what has changed. Since the removed Characteristic does not exist in the latest entry.	Not really a bug, as the changed item is correctly filtered and the area of the record that chnges is flagged, just not the specific fields. No easy way to fix that.
1-033	03/18/18	03/18/18	1.3.1.6	If A GPX or KML file being created already exists and is being used by another program the program must either be terminated using the TaskManager or the error message must be responded to for each item in the selected list for the file.	Fixed for GPX files, no change for kml files.
1-034	03/26/18	11/11/18	n/a	A Save to GPX process aborted for a reason I did not record and the GPX subfolder for that district was locked a read-only. The only way I could take the read-only status off the folder was to reboot the machine.	This appears to another version of the Folder Access Denied issue. Closed for non-recurrence.
1-035	03/28/18	03/28/18	1.3.1.7	I had set the GPXWptSymbol setting to OpenCPN in 1.3.1.5, It was previously Navaid. Several releases later I discovered that version 1.3.1.6 running on my desktop was still set to Navaid, although the development version (1.3.1.7) was set to OpenCPN. Version 1.3.1.6 running on my nav computer was also OpenCPN.	All of the program settings were set to User, which means the user can change them, but it also means any changes I make to the settings values in a new release will be overwritten by whaa ever value was in the preiously installed version on the target system. Only settings for which can be changed during program executions j(e.g., Folder names) should be user designated.
1-036	03/30/18	04/01/18	1.3.1.8	The GPX and KML file names are too long. Need to reduce the names and still provide differentiation for the different filters that were GPX file.	
1-037	04/01/18	04/07/18	n/a	If the user responds NO to the msgbox for an actively downloading file, the program should load the latest existing file, if any. In 1.3.1.8 the program does not load any data.	Seems to be working fine. No fix required.
1-038	04/10/18	04/10/18	1.3.1.10	The Display Details popup menu for a list of updated items, will default to the removed display (if any)	Converted from to modal display (showdialog)

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Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-039	04/21/18	05/01/18	1.4.0.1	The Multi District check box is not cleared when a single District is displayed. Also the rectangle area limits are not reset from the cyan forecolor.	Added call to LLFiltersClear sub and added reset of the checkbox and the backcolor for the area limits to that sub.
1-040	04/24/18	05/06/18	1.4.0.2	The Save.xml file seems to drop the nr of items in one or more of the Volume/District records.	See 1-042
1-041	04/26/18			Using a kml placemark file to set geographic limits that cross 180 does not generated correct area limits.	
1-042	05/06/18	05/06/18	1.4.0.2	The Radar display does not always find a LL volume for a valid position. The area limits do not appear to be saved properly	If a volume has already been loaded, the load sub jumped around the load code, but it updated the area limits with those of the last volume that was loaded. Move the area limits update to within the code that performs the load.
1-043	05/07/18	05/07/18	1.4.0.4	The heading on the radar display does not agree with the calculated bearing values of the plotted lights. Not sure if this is a problem with the hdg line or the plotted position of the light.	The plotted positions were off by 1/2 the size of the plotted circle.
1-044	05/09/18	05/09/18	1.4.0.5	The heading line in the radar display is wrong when the form is maximized	The end pixel for the hdg arrow was not re-calculated when the display form size was changed.
1-045	05/12/18	07/06/18	1.5.0.2	The download and download check buttons do not become active. Only the check box for a later xml file seems to be working	Removed setting the Dist/Volume listbox index to -1 from the USCGII_Clear sub. This was causing a second pass through the Listbox processing and setting the buttons disabled.
1-046	05/13/18	05/13/18	1.4.0.7	Capturing the heading value from the NMEA stream causes the hdg and north lines to be miss-drawn. The Heading Up button does not become active	Added call to HDGRefresh sub when the text in the hdg textbox is changed.
1-047	05/13/18			The lights in most of the Pacific territories are IALA-A not B.	
1-048	05/15/18	05/15/18	1.4.0.9	If no files exist for the location captured from NMEA, the program keeps generating an error message. One message is enough.	Set flag to only display this error message once
1-049	05/15/18	05/15/18	1.4.0.9	Exiting the radar display does not appear to stop the NMEA retrieval timer.	Add timer and NMEA stop to form closing
1-050	05/17/18	05/17/18	1.4.0.13	The program does not display a waypoint, although there is definitely one in the NMEA stream.	Difficult to debug as my development system does has only GPS input, and my Nav computer does not have any development tools. I added debug code to use file input for the NMEA string
1-051	05/17/18	05/17/18	1.4.0.13	MercatorSailings calculation of longitude is in error.	The course value was converted to radians by subtracting pi/180 rather than multiplying. This was a bug fixed in version 4.0.0.2 of the Navigation Class.
1-052	05/17/18	05/17/18	1.4.0.14	Right clicking on a Waypoint in the radar display produces a program error	Fixed the IPlotCount value so that it never calls the detail form with an empty array of selected lights.
1-053	05/17/18	05/17/18	n/a	It appears that the latest update to Win10 has killed the install of this and my other programs created with Visual Studio. The program will start and goes into the update check and then just stops without a warning or an error message.	I don't know what changed in this update to Win10 (or even if that is the source of the problem), but I turned off all of the App & Browser controls. Now I get the warnings, but can ignore them and the program runs normally. So far my Nav computer has not been infected by this bug, but it may not have received the latest Win10 update.
1-054	05/19/18	05/19/18	1.4.0.15	The timer value for the refresh of NMEA data can be set to zero, or to a non-numeric. That causes a program exception.	Changed the combobox drop down style to drop down list.
1-055	05/25/18	05/26/18	1.4.0.19	Something happened today to corrupt the xml files I just downloaded. It looks like a bug on the USCG website, the xml files downloaded were empty. Unfortunately the program does not handle this well, and now those light lists are inaccessible by the program until the website is fixed and new files are downloaded. The program must recover from this situation and at least leave the old files accessible.	Changed the xml file load routine to a function that returns false if the file failed to load. Also changed the error messages to identify the file that failed to load. The only solution for now is to manually delete the error files and try to download them again. Added code to delete the problem file. This will force another download when that volume is selected again. Not sure what causes this problem, but it has happened several times in the last few days.

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1-056	05/25/18			The 1st light in the Updated Details form does not display the distance and direction moved.	Can't trap this problem. When I step through the code, the distance is displayed properly.
1-057	05/25/18			After running for an hour or less the program takes an exception. Not sure what that represents.	I think it may be due to a garbled or truncated payload field. Added checks for a shortened or missing payload. I have fixed all of the possible issue areas that I can find and eliminated several of the faults, but it still happens. The only way I can make progress is to hook up my development system to the NMEA network, which is a PITA.
1-058	05/27/18	05/27/18	1.4.0.25	Time stamp in AIS records is not updated for subsequent messages.	
1-059	05/27/18	05/27/18	1.4.0.25	The range up/down button somehow got a maximum value of 1. This happened on my nav computer so I couldn't capture any details.	I had started looking at allowing the range to be less than 1nm and changed the max value to 1, then forgot to change it back
1-060	05/30/18	05/30/18	1.4.0.28	Error in the code to support the eventual purge of AIS targets. The program overwrites active targets with data from new targets.	Corrected code
1-061	06/12/18	06/12/18	1.4.0.37	AIS targets are not being purged after no msgs for over the purge time. Turns out the purge was working after all, I thought it was set to 20 minutes, but it was set to 40. Anyway the fix described needs to be implemented.	Corrected the mouse click logic to not select an inactive target. This does not fix the problem, but would have produced an error if the target had been flagged as inactive. The plotting rectangle is still available after the target has been set inactive.
1-062	06/12/18	06/12/18	1.4.0.37	The time since last message in the AIS Display form is either wrong or the label giving the units (sec, mins or hours) must be wrong.	Modified the display code to use the DateDiff function rather than subtracting the AIS time from the value Now. That works for the color-coding of the listbox entries, so it should work for the display.
1-063	06/13/18	06/15/18	1.4.0.41	The color code for age status in the AIS display form is incorrect for some targets. A target whose age is less than 1 minute is flagged as aged or lost.	I have changed the units for checking the age from minutes to seconds. If the age of the target is less than one minute, the DateDiff function may return a value of zero. I can't see how this would cause the problem, but now the DateDiff value used in the color scheme will be the same as that used to create the age value in the display. That change did not fix the problem. Found it was using the wrong index to the AIS table to get the time stamp of the last msg received.
1-064	06/15/18	06/15/18	1.4.0.40	The sub to merge data from a new AIS msg with that from earlier msgs, the Lat and Lon were not added. So there was not record of vessel's movement. Also if the static info msg was received first the position data was not captured.	Added the Lat and Lon to the merge sub.
1-065	06/16/18	06/17/18	1.4.0.42	AIS processing is not picking up the AIS channel	AIS Channel capture was in the wrong place in the code.
1-066	06/17/18	06/17/18	1.4.0.43	The position of targets in the radar form appears to lose accuracy the closer the target is to the outer ring of the display.	The calculation of pixel locations truncate the pixels/nm to an integer before the calc, then again when the pixel X and Y coordinates were calculated. Changed the pixels/nm to a double and truncated the location coordinates to integers. Appears to have improved the accuracy of the display.
1-067	06/20/18			With a radius filter applied, if the radius is then changed, the Apply Filter button does become active.	The radius should only be decreased.
1-068	06/23/18	06/23/18	1.5.0.0	Some kml placemarks are not shown in the correct color. E.g., Lockwoods Folly Inlet Buoy 1 & 2 are orange in GE, but should be green and red, resp. GPX export has a similar problem.	With the 2318 update, the 1&2 Lockwoods Folly buoy records included the Night designation, but no light characteristic as supplied. This is an error in the USCG file, not sure if added the Night designation by mistake for an unlit mark or the mark has been changed to a light, but they forgot to include the characteristic. Is this really a light or a nun or can? Need to test for missing characteristic during the load process and discard the DNB if no characteristic is supplied. The same problem was affecting the radar display, but it was hidden because the default color is black. Changed it to DarkGoldenRod, same as for the other displays. Added code to ignore DNB values if no light characteristic is provided. The item will be displayed as a day mark.

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Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-069	06/25/18	06/30/18	n/a	Access denied to folders containing previous xml files. This has only happened on my Nav computer, not my development system. This appears to have started after a recent update to Win10.	This appears to be caused by a recent change to Win10 that enforces access permissions on sub folders of folders for which permission has been established. Also, it appears to only apply to folders created on the C: drive. On my development system program folders are on a removable drive, and I do not encounter this problem. On my Nav computer, the folders are on the C: drive. In this case the user has permission for the basic LightList folder because the user creates that folder during the opening dialog of the program. However the program creates all of the subfolders internally. That appears create a different set of permissions for the sub folders. <u>It now appears this problem was caused by a hardware problem on my Nav system. A scan of the C: drive came back with errors. Ran a repair on the drive and the problem went away.</u>
1-070	06/29/18	06/30/18	1.5.0.2	If there are no previous xml files for Find Updates, the listview for the new xml file is not restored.	Added code to restore the filters
1-071	06/29/18	06/29/18	n/a	The multi district filter is broken. A kml search across district/volume boundaries only returns items in the active volume.	Not really a bug, just a limitation. All district/volumes must have been loaded into the program's tables prior to starting the filter. The program should load all district/volumes based on the filter, but that is not a bug, just future development.
1-072	07/06/18			If a xml file download fails, the program is not notified and keeps waiting for the download to complete.	Currently the only way to restart the download is open the previous file, and then click the download button, or restart the program.
1-073	07/06/18	07/06/18	1.5.0.2	The height field is being flagged as changed by the Find Updates process. The old height is shown as zero and the new height is blank.	The xml records for the flagged light are identical, but the memory table records are different. The records have a DNB value of night but a blank characteristic. The bug is due to using two different subs to load the new and the old xml files. They processed the characteristic details a little differently which results in a miss-match between the records. The correct solution is to use one sub to load both files, but for now the fix is to make them produce the same results. The underlying issue is that these records are probably erroneous. I believe the items that were mismatched are really lights and the USCG processing has dropped the characteristic from the entries. This has happened before.
1-074	07/11/18	07/11/18	1.5.0.7	The COG/SOG arrow for moving AIS targets is not correct for HDG Up display.	The code added the HDG value instead of subtracting it. Should have been subtracted. That fixed part of the problem, but not all. Added Fix function to the pixel calculations for the end point of the direction arrow. The GetEndPixel function was storing the angle in radians into a long variable, which effectively truncated the angle.
1-075	07/13/18	07/16/18	1.5.0.9	At program startup get error opening one of the xml files. The file is empty. This seems to be related to most recent downloaded file.	Happened when file downloaded in one session and then displayed in 2nd OK. Third session hit problem during initialization. This appears to be a timing problem during program startup. Cannot consistently reproduce the problem. This sequence will produce the problem as long as there are no breakpoints to change the processing timing. (1) start the program with one file missing. Click the lb entry and click Yes to download the file. (2) Restart the program after the dl is complete. The lb entry shd show uptodate. Restart the program once more and the file has been cleared when the GetxmFileDate function tries to open the file. Remove the owner draw mode for the lb, problem persists. Found that the download file was not always deleted by the move function. The file still existed in the DL folder, but as an empty file. Changed the move to a copy and delete process. Seems to have cleared that problem. I don't have very high confidence in this change as a fix. I have no explanation for why the Move method leaves a residue file in the download folder. I also don't know why this issue surfaced after more than a year of using the Move method with no problems.
1-076	07/15/18	07/16/18	1.5.0.9	The change to keep the main form on top during a download caused the program to be inaccessible. The msgbox at the start of the dl is covered by the mainform, which is inaccessible until the msgbox is clicke.	Turned off the topmost property before the msgbox displayed. That defeats the purpose of the code. Set the form to topmost before and after the msgbox call.

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1-077	07/19/18	07/21/18	1.6.0.1	When Find Updated button is clicked and no previous file exists on the system, an error message is displayed, but the District/Volume ID is not displayed. This was not a problem when the program processed only one District/Volume at a time, but with the Multi-District display capability it is not clear which file does not exist.	Added the District/Volume ID to the error message
1-078	07/20/18	07/21/18	1.6.0.1	Continuation of 1-075. The previous fixes did not work.	The problem seems to be centered around DL that are initiated by one session and capture by another. That is the program is terminated before the DL is complete and restarted when it is done. It appears that second session leaves an empty file in the DL folder that then replaces the good file on the 3rd program session. Still this problem appears to come and go. Replaced the File Move function with a Copy/Delete set of functions to move the DL file into the main folder. With this bug report I did the same for the process of moving the old file into the history folder for that District/Volume. Added a check to discard any DL file < 100 bytes in length. Was able to trap the problem and avoid it. Don't like fixing problems this way, but...
1-079	07/22/18	08/05/18	1.6.1.6	Threw a string to long conversion exception on my Nav computer (after running over 24 hrs). The program does not capture any debug info, so I have no idea what caused this exception.	I suspect it is due to garbled messages coming from m SR161 AIS receiver. When I turn on the Checksum error handling I get a constant stream of errors, and discarded messages. I normally run with the Checksum turned off, and I do see several erroneous target in the display. I know my AIS cabling needs to be cleaned up. I suspect corrosion on the connectors (2 in addition to the one on the SR161) have reduced my AIS to range to less than 3nm. I assumed that the SR161 threw away erroneous messages and the Checksum validation in LightListManager only caught errors on the cable from the SR161 to the USB port on my PC. Maybe not. I turned on the Checksum Validation on my Nav computer. Still getting a lot of errors (several a minute), but not neary as many as before. The numerous errors were due to an error in the Checksum calculation. I believe turning on the Checksum check will prevent this type of exception. Turning it one also exposed a problem in the checksum calculation, which has been fixed.
1-080	07/23/18	09/21/18	n/a	After modifying the Radar Display to buffer the image and reduce flicker, the form started to throw an exception on startup. The source of the exception was the NumericUpDown (nud) control for the radar range value change event.	This event was happening before the Shown or Load events. I thought theShown event was the first event, but apparently not. I could not find out why the nud event was happening, so I just added code to disregard the even if the value = 0. Once the display is active that value should never be less than 0.25. That stopped the exception, but I still don't know why it was happening. The only two events that precede the Load event are ControlHandleCreated and ControlBindingContextChanged. One of these events must be the source of the nud value changed event. Closed due to non recurrence.
1-081	07/28/18	07/28/18	1.6.1.4	Loading a asved Filter that includes a Text Search results in an exception.	The Load Filter function does not initialize the Text Search arrays. Added to the LLFiltersClear sub.
1-082	07/28/18	07/28/18	1.6.1.4	The AtoN targets are now being displayed as a Base Station target type with Pleasure Craft as the Ship Type. The Ship Type field should show the type of AtoN. This was working fine in the past, but I don't know when it broke.	The target type index (.IType) was not being transferred to the main record by the MergeAIS sub. Don't think that was the problem, but changed it anyway. Found that the type was being set to Base Station by the NMEA Class parsing routine.
1-083	07/31/18	08/05/18	1.6.1.6	Have not received the static info on the few Class A ships that show up in the AIS display. This one of the multiple sentence messages. I have not implemented processing for this type of message. This may require major changes to the AIS parsing routines. The following msg types use multiple sentences: (5) Class A Static; (19) Extended Class B; (21) Aid to Navigation. There are others, but these are the ones the program currently attempts to parse.	Moved the check for multiple sentence message to the start of processing. The payload for each fragment is concatenated with the payload from the previous fragment and saved in the sPayloadArray table entry for each msg number. When the last fragment is received the message is processed as a long single sentence.

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1-084	08/05/18	08/05/18	1.6.1.6	The checksum test in NMEA Class was failing on good sentences.	The checksum calculation can return a single character, however the checksum must be 2 chars. Found that the NMEA sentence will pad the single char checksum with a leading "0". Now the code does the same.
1-085	08/09/18	08/09/18	1.6.1.9	The area limits that result from a multi-district filter are wrong if most of the list must be loaded into memory during the filter. If all of the lists have been loaded, then the area limits appear to be correct. As long as at least one volume must be loaded into memory the limits are wrong.	The loadUSCGLightList routine did not initialize the USCGBaseArea array. It initialized the array used by the BldUSCGLL routine. Also found an error in the area limits processing in the BldUSCGLL routine.
1-086	08/10/18	08/10/18	1.6.1.9	Valid ICW dayboard shape and color combinations were being flagged as invalid.	Problem was once an AICW designation was selected it could not be removed from the dayboard characer string.
1-087	08/25/18	09/16/18	1.6.2.8	Duplicate entries in the Dist/Vol drop down list in the radar form. Does not affect processing, but ...	Moved the NextVolume label to before the End Width. Removed the LoadLLVolumes call in the paint event sub. This seems to have fixed the problem, but I don't have a clue how.
1-088	08/26/18	08/26/18	1.6.2.1	Conversion from Kts to M/S produces M/H	Divided the result by 3600
1-089	09/01/18	09/01/18	1.6.2.1	The distance moved in the items changed form are is not flagged (forecolor=red) when the value is greater than the setting value.	Apparently the program cannot change the forecolor on a text box that is read only. Set the text box to read only = false.
1-090	09/01/18	09/01/18	1.6.2.1	The characteristic display form does not handle fixed lights with multiple colors (e.g., F R W G or F W R G.	The parse sub expects multiple colors to be in a single field, not separated by a space. The parse routine now combines the multiple colors into a single field (e.g., RWG instead of R W G. Added two new jpg resource files for these characteristics.
1-091	09/06/18			The pop-up menu on the main form ListView offers the Display Characteristic option for day marks. That should not be an option or at least the program should generate an error message if the option is selected. Currently it does nothing.	Since this does not produce a real problem (abort or bad data) I may do nothing on this bug.
1-092	09/07/18			A few MO light characteristics have a period specified, but the Characteristic display ignores the period.	
1-093	09/07/18			If there is no fix from the NMEA input stream, the lat/lon display remains as that recovered from the last session, but the radar display is for a lat/lon of 0/0. The program should either maintain the display at the recovered position or set the lat/lon values to some sort of n/a value (e.g., "---- --'--.-").	
1-094	09/16/18	09/16/18	1.6.2.3	The AISTargetRefresh setting value can be 0, which causes an unrecoverable program exception in the AIS Display form.	The form now checks the refresh value to insure it is a value of 1 or higher. If not, the setting is set to 10 seconds.
1-095	09/16/18	09/16/18	1.6.2.8	After installing fix for 1-094, now get an exception in the AIS Display form for Navigation/GenArcUtil for "Instance of object not set".	Re-building the Navigation Class Library did not help. The form declares the NA object as new. The exception allows the user to continue, and everything except the AIS form seems to be working. This may be similar to the infrequent exception in the radar display that the graphics form has not been set to an instance. Closing the AIS form does not re-enable the AIS button. Added Try Catch to the code that calls the navigation module. That avoids a program abort, but the lat/lon of the targets is not displayed. This same code works in other modules and forms within this program. The format string for lat/lon was not set to the setting value. Correcting that error fixed the problem. The GenArcUtil Class should detect the error and not allow an exception.

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-096	09/17/18	09/23/18	1.6.3.3	The HDG display in the NMEA form shd be T if available, otherwise M. The value switches between T & M depending on the last NMEA sentence with hdg data. As long as a True value is received, the display should stay on that.	This may require using the time value in the NMEA data to determine when a T HDG is too old and switch the display to M. The other solution is to allow the user to specify M or T. Still would want to use the time to flag a value has having expired. This should apply to other values in the display. Only the HDT and VHW sentences return a True hdg. APA and APB can return True if the local variation is available. Assume the HDT sentence not sent if variation is not known. Was using the Track HDG from the VHW sentence as HDG value. This appears to be a COG value. Modified the NMEA Class library to ignore the track HDG value in the VHW sentence.
1-097	09/20/18	09/20/18	1.6.3.1	The District/Volume listbox shows the existing files as out-of date (newer available), but when the file is downloaded it is shown as out of date as well.	Changed the setting value (7 days) from a long to a double. The draw sub for the listbox tested the age of each file >= 7 days. Changed the test >. Changed the setting value to 7.1 days (2.5 hours after the previous publish date/time. That seems to produce reliable results.
1-098	09/21/18		1.6.3.2	Have received exception in the DrawRange sub on startup of radar form. The formGraphics object is not set to an instance. Does not happen every time and a program restart normally executes normally.	Commented out the form_paint sub. Not sure why this sub is necessary. Looking for some way the DrawRange sub is being executed before the formGraphics variable is initialized. Waiting for non-recurrence in the next month or so to close this bug.
1-099	09/23/18	09/23/18	1.6.3.3	Coding error in the HDG textbox on the radar display.	
1-100	09/30/18	09/30/18	n/a	Suddenly, about 1 week ago, the VB programs I have installed on my development system will not start. When any one of them is re-installed from the website, then all of them will run properly for a short time (<15mins). Then none of them will start when I click any of the short-cut Icons.	I believe this is caused by the McAfee Live Safe security software, which was updated about the time the problem surfaced. Google Chrome also complained about this software. I experimented with turning McAfee features off and on without success. I kept the McAfee update security feature turned off, but still the problem persisted. Finally I rebooted the PC and the problem appears to have gone away. So the solution appears to have been turning off this feature and rebooting the system so it takes effect. I never had the problem on my Nav computer, which uses Norton Security software. There appears to be a conflict between the ClickOnce feature in Visual Studio and the McAfee Update protection feature.
1-101	11/01/18	11/11/18	n/a	Exception when kml filter dialog cancelled.	Cannot reproduce. Either I fixed this and forgot about it, or something else was going on. Cancelling the kml dialog works fine.
1-102	11/01/18			Setting a range filter doesn't activate the Apply filter button.	The range control must raise the Leave event to activate the button. Normally this is done by clicking on one of the other controls, but the Apply button is disabled so clicking it will not raise the event. The answer is probably to never disable the Apply button.
1-103	11/05/18	11/05/18	1.6.4.5	Bug report throws exception when the bug file does not exist. Also generates empty bugfile.	Corrected code so the lack of a bugfile does not cause a problem. The exception was caused when writing a file with no bug reports. The header of the file depended on at least one bug report to capture the userid. Now an empty bugfile header will use a blank ID if there are no bug reports. The userid will still be part of the filename.
1-104	11/06/18	11/11/18	1.6.4.7	Checking the "Filter All ..." checkbox causes the program to load all lists even when a location filter has been specified. With a location filter the program should only load the lists that intersect the location filter.	The area limit check before loading a volume was never implemented. Added code to handle both rectangle and radius limits as well as the multiple limits of the chart filters.
1-105	11/06/18	11/14/18	1.6.4.8	If an active file download is cancelled the program continues to look for the download file. The program will not initiate a second download until the program is restarted. There should be a way to cancel the active download status.	When the user clicks on the volume list entry for a file that is being downloaded, the user will be asked if the user wants to open the existing file. If not, the user will then be asked if the download will be restarted. The download will be restarted if the existing file is out of date. Otherwise the user can open the existing file and force a download.
1-106	11/10/18	11/10/18	1.6.4.7	After loading a saved filter, the "Filter all ..." checkbox is automatically checked for all subsequent filters.	Removed the code that checked the box. It was probably necessary in an earlier version of the program, but unnecessary now. Today the "Filter All..." checkbox is only used to force the loading of all Volumes of the Light List. All filters are applied to all loaded volumes.

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-107	11/13/18	11/13/18	1.6.4.8	Saving a KML or GPX file when no volumes have been selected from the listbox causes the program build an erroneous path for the file. The Volume/District ID is missing. This happens when a multi file filter has been applied with no volumes loaded. When the filter is cleared there is no active V/D id and if the next filter is not a multi-file filter the V/D part of the patch is missing.	Test for a null volume/district ID and force to the Multi folder
1-108	11/13/18	11/13/18	1.6.4.8	Changed the GPX icon for FL W to a Safe Water symbol. This symbol implies a red sector, which is not pleasant.	Needed to add code to search the remarks string for "red from", while avoiding the strings with "obscured from". Need better icons these and other lights.
1-109	11/13/18	11/13/18	1.6.4.8	Need to add vertical scroll bars for remarks and structure text boxes on the Details and Characteristics forms.	scroll bars added
1-110	11/13/18			The filter sections should be enabled at all times.	
1-111	11/13/18	11/13/18	n/a	The KML filter does nothing if no files have been loaded	That is how it should be unless the "Filter All ..." box is checked.
1-112	11/13/18	11/14/18	n/a	Secondary filters are broken. If one volume is loaded in the ListView a subsequent filter should be limited to that volume unless the "Filter All ..." box is checked. Currently the filter will include all loaded volumes. The geographic limits of the first filter should limit the area to which subsequent filters are applied.	For now the program is working as intended.
1-113	11/16/18	11/17/18	1.6.4.9	The area limits for V6D14 and V6D17 are not correct. These are the only list sections that cross 180 deg. Both the sign and the value of the Wlon and Elon are incorrect. The wlon value shd be >0 and the Elon value shd be <0.	Consolidated the area limits calcs into one sub. Problem appears resolved.
1-114	11/18/18			The FilterAreaApply function is still not handling vol areas that cross the Prime Meridian. V4D08 has an invalid longitude for one entry that is at 92E.	
1-115	11/19/18	11/29/18	1.6.4.9	Radar display did not pickup V2D05 when zoomed out to 300nm or more.	The form was not checking for additional lists on a range change, only a position change. Added the check, but also lowered the maximum range for the display to 100 because the additional processing bogs down the form. Also reduced the maximum range to 25 when NMEA input is active to further reduce the processing on each NMEA data update. There is really no value to a range of more than 10 nm, so this change should not reduce the program functionality. I allowed a greater range strictly to test the program for large range values. It works with the large ranges, but slowly.
1-116	12/12/18	12/12/18	1.6.5.2	The listbox in the AIS display form gets regenerated each time the display is refreshed (normally 10 seconds). This makes the data difficult to read and select.	Changed the logic to only clear the listbox when the form is initially shown. After that items will only be added (when a new target is received) or removed (when a target is purged).
1-117	01/05/19	01/05/19	1.6.5.4	The AIS target list in the AIS display is corrupted.	The fix for 1-116 was incomplete. The BldAISDisplay routine cleared the index table that associated the listbox and AIS table entries. The table should be cleared only when the form is initially shown. Also the AIS target info was not being updated when the form timer ticked. Purged AIS targets were being removed from the Listbox, but the index table was not being updated. Now both the ListBox and the index table are updated to remove the purged entry.
1-118	01/10/19	01/10/19	1.6.5.7	The contents of the AIS display listbox can be out of sync with the AIS data array managed by the NMEAClass library. The refresh rate for the listbox is 10 seconds or more while the AIS data array is updated from the NMEAClass at a higher rate. The array entry for an inactive target can get re-used and assigned to another target before the AIS display form is updated.	Moved the call to update the AIS display form prior to calling the NMEAClass to release the inactive entry in the AIS data array.

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-119	01/10/19		n/a	It appears the refresh timer in the AIS display form is redundant. The display is updated everytime a NMEA packet is retrieved by the radar form from the NMEAClass. Need to consider removing this timer.	Time is still necessary to update the AIS Info Display in the form. The update from the radar form is only for purged targets.
1-120	01/10/19	01/11/19	1.6.5.9	The USCG base station report gets miss-identified in the AIS display listbox as a ship, usually a duplicate to the entry for the ship of that name. The display info for the base station appears to be correct except for vessel type.	The display was not cleared when a new target is displayed. The base station target does not provide all of the info of the other types. Therefore the display will show data from the previously displayed target. Added sub to clear the display. Also added BeginUpdate and EndUpdate listbox methods to the BldAISList sub to prevent the listbox from being painted while the update is taking place.
1-121	01/12/19	01/12/19	1.6.5.11	Setting the height filter does not activate the Apply Filters button.	Both the Min Height and Min Range filters did not activate the bFilterOn flag that activated the Apply Filter button.
1-122	01/18/19	01/19/19	1.6.5.11	If at least one other file is displayed in the Listview and another file is selected, the contents of the 2nd file is firsts added to the existing ListView contents, and then the ListView is re-populated with just the contents of the 2nd file. Effectively the 2nd file contents is entered into the ListView twice.	The USCGxmlCheck routine builds the list view if the file is downloaded (not background). However the calling routines do the building as well. Commented out the build call in xmlCheck.
1-123	02/20/19	1.7.0.3	3-Mar	Selecting an AIS target ICON for highlight appears to be broken. Selecting the target from the AIS display form works.	Expanded the mouse click location test from "<" and ">" to ">=", and "<=". This is not the problem, but it should have coded this way. The target is being selected correctly and the AIS display form is called. The highlight designation is lost in the update to the target listbox. Made several changes that I did not believe would fix the problem, but it appears to have gone away, at least on my development system. Still not working on my nav computer. Process works correctly if the AIS Display form is not active. This causes the form to open and the target is highlighted. If the form is open when a target is clicked the process enters the form through the AISUpdate sub. Made another change to prevent the target info being displayed twice that I don't believe is the problem. It does appear to have solved the problem.
1-124	02/20/19	02/21/19	1.7.0.0	The radar display is not finding the volume that covers a manually entered vessel position	This is the old problem with a volume area that crosses 180 deg lon. Added simple routine in the USCGLLMaster module to determine if two geographic rectangles intersect. Appears to be working for the radar display, but needs more testing.
1-125	02/20/19	02/21/19	1.7.0.0	The units display for target distance in the formAISDisplay shows feet instead of nm.	When the distance is greater 2 nm the label is correct. When the distance is less than 1 nm the label is correct (feet). When the distance is between 1 and 2 nm the label is not set. I was attempting provide different formatting for large distances. I eliminated the 1-2 nm formatting. So for distances >1 nm the unit is nm. Otherwise the unit is feet.
1-126	03/06/19			The initial version of the code to center the screen on an AIS target works, but the HDG/COG line is still set at the display center. Also the ship icon does not point in the direction of HDG/COG.	Temporarily turn off the HDG/COG line when in Target Tracking mode.
1-127	03/07/19	03/08/19	1.7.0.5	Closing then re-opening the radar display the program cannot find any light list volumes for the ship position	Corrected the code that finds the volumes that intersect with the radar display

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-128	03/07/19			Entering a HDG/COG value causes the radar display to render a blank screen.	This appears to be caused by the textbox Leave event. This event reformats the HDG value and stores it back in the textbox, which then causes a second update to the display. Removed PlotRefresh call in the Leave event. Now a blank display is rendered only on the 1st time the Leave event is handled. It is not just the Leave event, but leaving the textbox using the TAB key. If I leave the textbox by clicking another control, everything works. Have given up on this bug for now. Set the next tab as the refresh button so hitting return will refresh the display. It is only the 1st time the tab key is used. No matter how many times I change the value by entering 3 characters, when I use the tab key with a 1 or 2 char value the display is cleared. After the first time, using the tab key after entering a HDG value works fine.
1-129	03/07/19	03/08/19	1.7.0.5	Radar display form has become very slow to respond	The problem appears to be in processing NMEA data. The time spent processing each NMEA retrieval appears to keep growing until it is not completed before the next retrieval timer tick takes place. Even after these changes the NMEA processing continued to grow. Problem appears to have been caused by original fix for 1-127, which caused the program process the volumes multiple times. With the later correction to 1-127 the problem has gone away.
1-130	03/11/19	03/13/19	1.7.0.8	With version 1.7.0.7, neither the HDG or COG radio buttons were selected when the radar form is first displayed.	HDG is selected in the Shown event.
1-131	03/16/19	03/21/19	1.7.0.11	The listbox n the AIS display form becomes corrupted. The entry for the USCG Base Station acquires the name of another target in the listbox. The data displayed when this entry is selected is correct for the Base Station. This is the only entry that will never receive a Ship Name value.	This is likely another bug in my attempt update entries in the listbox without rebuilding. It is probably happening to other target entries, but if they have already received the Ship Name data the listbox entry will not be modified. So it is just more likely that the corruption will happen to the Base Station entry. Most likely this is bug in the purge processing. Discovered that the code used the Remove rather than the RemoveAt method to delete purged targets from the Listbox.
1-132	03/21/19	03/21/19	1.7.0.11	The navaid highlight function does not work properly when NMEA input is active. It needs to allow the display to be updated while the navaid data is display and the icon highlighted.	Removed the characteristic text from the highlight function. Established the text as a separate control that can be turned on and off for all lighted nav aids. The text is suppressed when the display range > 10 nm to declutter the display. Actually the display is very cluttered for most areas when the range > 1nm. Now the highlight is just the arrow and it lasts only to the next display refresh. The MsgBox still locks the UI, but the display is updated in the background.
1-133	03/25/19			If an out-of-date Volume is opened without the auto-check option selected, the out-of-date file contents will be displayed. If the auto-check option is then selected and that volume again selected the program will download the newer file, but the old file is displayed. It appears that the new file is not loaded into memory if the older file has already been loaded. This only happens with direct downloads. If the file is downloaded in the background the program detects the new file and loads it correctly. With the direct download the program must be restarted to load the newer file.	The loading and displaying of the new has been commented out in the USCGLLxmlCheck routine. Not sure why. Need to wait until updated xml files are available to test possible fixes. Uncommenting that code causes the files to be loaded twice. This area of the code needs to be cleaned up.
1-134	05/28/19	06/12/01	1.7.0.18	Manually setting the vessel position does not change the display center position. Values entered in the center position text boxes do not get formatted.	Manually changing the vessel position now updates the display center. Also manually entered display center coordinates are formatted the same as all coordinates.
1-135	05/03/19	06/06/19	1.7.0.19	The find updated function flags two entries in the V4D08 as having been removed, but the entries exist in the latest file. This happens with every updated file downloaded for this district. For some reason the two nr entries in the new and old files do not match. The maybe some unprintable character in the field.	The specific entries are LLNR 6770 and 6775. These entries have a value of "." for the lat and lon. The load routine for the current file rejects entries that are "" or a val of zero. The load routine for the old data rejects only "". Made the tests the same for both routines. The better solution is to use the same routine to load the old and current files.
1-136	06/03/19			The age value in the AIS data form gets updated erratically.	May be related to 1-138.

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-137	06/09/19	06/09/19	1.7.0.19	When the radar form is resized manually rather than using the controls in the upper right corner, the radar range circle is not fully displayed. Often it is cut-off at the bottom. However if the form is then maximized and returned to the manually set size using the buttons in the upper right corner, the range circle is drawn correctly.	The problem appears to occur when the vertical form dimension increases to the point when the form width is the limiting size of the radar range display. The problem is the sequence of re-size events. The program uses the size_changed event to re-draw the form. This event is called repeatedly during a manual re-size of the form, which causes the form respond sluggishly to the mouse drag. The operator cannot see how much the form is being resized. To solve this problem I used the resize_begin and resize_end to set a flag while the form is being resized to the that the size_changed event can ignore the intermediate resize events. Unfortunately the size_changed event occurs between the begin and end events, so the changed event never processes the final form size. Adding the redraw code to the size_end event makes the form resize process unusable. There must be another event that can be used to redraw the form. As a workaround have left the size_changed event as is. It only responds to the resize control in the upper right corner of the form. The program does not automatically redraw the radar plot when the form is resized by dragging a boundary with the mouse. After the form has been resized in that manner the user must click the Refresh button to force a re-draw of the radar plot to the new form dimensions. When the NMEA 183 input is active, the refresh is automatic.
1-138	06/09/19			Clicking on an AIS target icon does not cause it to be highlighted if the AIS target form is already active. If the form is not active the target is highlighted and the form is opened with the target data displayed.	A test in the AIS update sub appears to be backwards. The selection in the AIS target listbox is not changed when a different target is selected. This is an old problem that I apparently never documented as a bug. The change described above did not resolve the problem. Now the clicked target will be highlighted after the target form is opened, but eventually the highlight selection stops. It is as if the program cannot find the target in the listbox.
1-139	06/15/19	06/15/19	1.7.0.25	Exception when radar display updated with no wpts captured.	Added check for null list of wpts.
1-140	07/26/19	07/27/19	1.8.0.1	The USCG stopped updating the raw xml files on their server as of 7/11/2019. This invalidates the program check for a later file which depends on date of the URI file to determine that a later file has been published.	Not sure if this is a permanent change by the USCG or just an administrative screw-up. Sent a msg to the USCG for an answer. The file downloaded in the background mode is updated. So I've modified the date check to determine that the raw file has not been updated and direct the user to download in background mode. If the USCG has stopped providing the raw xml I will remove that logic from the date check and just go with the background downloads.
1-141	01/05/20			The display filters on the main form do not detect multiple light characteristics. It also does not display zero lights found, but clears the filter and displays all lights in the file.	
1-142	02/24/20	03/18/20	n/a	The GPX file creation for a light that was moved less than the program minimum does not generate a route element to show the direction and distance displaced. This is only an issue for those lights moved less than the minimum for a significant change and the user overrides the minimum and clicks the significant change checkbox.	This is not a bug, route elements were only for those lights moved significantly.
1-143	03/15/20			The Save to GPX function writes more entries to the file than were selected.	The problem is caused by the creating a route for any light that has been significantly relocated. This causes one extra waypoint for each light to be written to the GPX file. Even if the light is unselected for output, the old location will still be written as a waypoint.
1-144	02/21/20	03/21/20	1.11.3.0	Program exception when LL loaded with no LNM file downloaded	Added Init sub to the LNMTable to initialize the table

LightListManager Bug List

Nr	Open	Close	Vers	Description of Bug	Details of Fix
1-145	04/11/20			The Auto Check download of the latest xml files does not display the latest week. If I force a re-download of the file, the old date is still displayed. If I click to another file then back to previous one (no new download) the current date is displayed. I had downloaded V3D07 and V4D08 files several days before and they had displayed the proper date. For the past 2 weeks I have found no changes in the data in the xml files (although new files have been posted each week). Likely this is a result of reduced staffing due to Corona Virus issues. Maybe other procedural changes are affected some of the program functions.	
1-146	04/15/20	04/15/20	4.11.6.0	The size of the circles representing lights in the radar display is supposed to be inversely proportional to the range of the display. The code that sets the radius was in error.	The code has been corrected and now the size in pixels for range values is as follows: Range < 1 nm, radius =10; range <5 nm, radius=8; range<10 nm, radius = 8; range>10, radius = 4.
1-147	04/21/20	04/21/20	1.11.6.1	Loaded existing V01, which is out of date. Then clicked "Download xml File". When download complete the contents was added to the existing content. I used the week combo box to move the display to the newer data and got an exception for invalid index to the combobox. Suspect The combobox was not properly initialized.	Cleared the comboboxes before building the list.
1-148	06/22/23	06/24/23	1.12.15.2	The LNM verification routing hangs up if one or more of the xml volume files have not been downloaded.	Ignore any volume for which the xml file does not exist in the LightList folder.
1-149	07/15/23	07/15/23	1.12.15.3	Typo in the symbol names for use with OpenCPN	

Feature Enhancement Plans

Name	Feature Description	Target Version	Actual Version	Comments
Cross District Processing	With version 1.x the program can only display and manipulate the light list items for a single district. This feature will allow the program to combine the light list items from multiple districts	2.x	1.4	This is a pre-requisite to the Light Identification enhancement. As implemented in 1.4, it only applies to filter processing. Also only the districts that have been loaded into memory are processed. Future development should automatically load all districts covered by the filter criteria.
Chart Update Monitor	Integrated LLManager with the chart database managed by ChartManager to track LL changes until the appropriate chart has been updated with the change.	2.x	1.6	1st step is to filter the LL based the area limits of a chart or chart collection. This is not a true integration with ChartManager as it only requires that the NOAA RNC or ENC catalog file be downloaded. I use ChartManager for that function, but it can be done manually from the NOAA website (http://www.charts.noaa.gov/). The use of Chart Collections to select the charts will require integration with ChartManager.
Show Relocation	Add rte element to GPX files for each light that has been relocated a significant distance since a previous Light List was published.	1.8	1.8	The name of each rte element is that of the light list entry that has been relocated.
Chart Region Filter	Select LL entry items based on the geograaphic area of specific chart.	2.x	1,6	Cross district processing is a pre-requisite for this feature
Filter Update List	With version 1.x, the Find Updated button clears any filters before checking for update lights. I plan to provide an option to use any active filters with the update check so the result can be limited to the lights of interest.	2.x	1.2.4	There is no option, all filters are additive and can be applied to previously applied filter sets.
Named LL Subsets	Save a subset of the library of lights as a named entity that can be reloaded by that name.	2.x	1.2.6	The filters can be saved and reload to reproduce a subset of one LL Volume. The filter can be applied to multiple volumes/districts in 1.4.0.0
Deleted Lights	Modify the Find Updates function to find lights in the previous list that have been removed from the latest list. Currently the function only looks for new or changed lights.	1.3.1	1.3.1.1	Needs further enhancement to save the deleted lights as a GPX or KML file.
Radius Filter	Set the area filter as all lights within a given radius of a specified position.	1.3.2	1.3.1.5	This is a pre-requisite to the Light Identification enhancement
Light Identification	Using the yacht's known positiion (GPS or DR), Identify a light based on bearing. The program would present any lights that might be the one observed. The user then selects the one that fits the light characteristic observed.	3.x	1.4.0.1	This is the initial release of the Light List Radar feature, which graphically displays all lights within a given radius of the vessel's position. The ability to identify the plotted lights with a left (basic info) or right (detailed info) mouse click was implemented in 1.4.0.3.
Wpt display	Display waypoints for active routes when received from the NMEA stream	1.5	1.4.0.13	
NMEA Input	Add NMEA 183 input to the program to establish the vessel's position	1.5	1.4.0.9	Used by LL Radar Display
AIS Display	Display AIS targets on the radar display	1.6	1.6.1.6	Complete with resolution of errors in the Checksum calculation.
NMEA Display	Display NMEA data in a sub window of the radar display	1.6	1.6.2	
User Guide	The program needs some sort of documentation beyond the tutorial YouTube videos. Also many of the videos depict very old versions of the program.	1.7	1.6.4.5	A web-based User Guide was implemented as a series of web pages in 1.6.4.5. It is fairly complete
Bug Reports	Provide a process that allows users to report problems to me and for me to communicate fixes back to users.	1.7	1.6.4.6	A working, but largely untested process was implemented based on the exchange of Bug and Fix xml files. The process has been documented in the User GuideNot sure if this is the final solution, but for now...

Feature Enhancement Plans

File ftp Download	It appears the USCG website now provides the xml as file download link rather than a programatic (Javascript I guess) download. I can now use the same download techniques as for other files. The program can then monitor the download process. The user will have the option of downloading as background processing (current method) or complete the file download before an further processing.	1.7	Turned out to be much easier than I thought. The Download form 1.6.5.0 was already part of the program.
User Check for program update	The program checks for an update upon start up. If the user declines the update and later wants to install it the user must restart the program. With this enhancement there is an item on the Help menu to check for updates and install any update if the user wants.	1.8	I removed the auto-check on startup and just use the Help menu 1.7.0.12 item for updates.
OpenCPN Layer Save	Currently any GPX file created by the program can be used as an OpenCPN layer (semi-permanent waypoint file); however, the user must manually copy the file into the OpenCPN lare folder. The program should be able to directly save the GPX file into that folder. Ultimately this should be generalized for any chart plotting software that has a similar feature to the OpenCPN layer.	1.8	Added a button to the GPX controls to save the selected conents of the ListView to a GPX file and save that file in the OpenCPN layers folder. The button is enabled only if a named filter active as the purpose is to save the lights associated with a restrcted area 1.8.0.3 and to be able to update that file with changes tot he light list.
ENC Decoder	Decode ENC files to identify the navaid records and compare them the to USCG light list. This would allow the program to identify charts that have not been updated with the latest changes to the light list without having to go through the GPX export/import process.	1.9	
Lighthouse Pics	Add public domain pics of lighthouses to be dispayed in the Light Characteristics form.	2,x	Currently my pic of the Pt-no-Pt Lighthouse on the Chesapeake Bay is used for all lights in the form. May also use generic pics of buoys.
AIS Targets	Make the target Icons conform to standard depictions.	1.2	The circles will remain to depict a stationary target and a trangle with a velocity vector arrow will depict a target underway. The definition of the maxium SOG for an stationary target will be user selectable. AtoN targets will get a separate icon.
Enhance kml Filter	With version 1.x, the kml filters are converted to the smallest rectangle that covers all of the placemarks in the kml file. This area can be much larger than that selected in GE. I would like to restrict the filter to the precise area convered by the placemakr file.	2.x	
Light List Changes	Generate GPX or KML files to show how the position of a light or filtered set of lights has changed with time.	2.x	generate the GPX/KML files from the xml files in the old light list folders. Use trk elements to show how the navaid was moved. Append the LL week to the trk elements
LightList Radar Enhancement	Add lightlist drop-down lists to the display form to allow any light loaded in memory to be selected and center the radar display to that location. Same with any AIS target, but have the display follow that targets movement. Add an OwnShip ICON on the Radar Display.	2.x	The AIS Target centered display and own ship display were implemented in version 1.7.0.11
Log File	Create a log file for the program that logs each process step to aid in debugging. Detailed logging if bDebug =True.	2.x	
Main form listview	Make the listview part of a tab-ed container. One tab for each Volume/District. When a Volume/District is loaded the tab becomes visible. This will allow the user to switch between volumes without having to wait on the process of building the Listview. Filter results will be displayed in a separate tab named "Results". This could eliminate the Volume/District Listbox.	2.x	

Feature Enhancement Plans

Radar Display Efficiency	The initial implementation of the radar display calculated the position of objects (navaids and AIS targets) based on the HDG or COG value. The simpler way would be to position everything on the North Up display then use a transformation to rotate the image. This would save a lot of extra calculations.	2.x	The significant issue is to identify the object clicked on with the mouse after the rotation
Radar Display Icons	Make the icons for lights and AIS targets proportional to the range of the display. For example, range>10nm - size: very small; 1nm<range<10 nm- size: medium; range<1 nm - size: large. Add a circle around any selected light to highlight the icon. If the light or mark is multi-colored, make the icon multicolored. For example, "RW" would be a red circle with white fill - or something like that.	2.x	The AIS part of this enhancement will be implemented with the AIS Targets enhancement. The proportional sizing of Navaid icons based on the range of the display was implemented in version 1.10. Haven't started work on the Navaid highlight and any changes to the color scheme.
Chart Plotter Target Profile	Provide a profile of the target chart plotting system for the GPX files created by the program. There may be standard profiles for chart plotting systems I use (e.g., OpenCPN), but the user might be able to create a profile for a system not available on my development platform. The profile would allow the program to take advantage of unique or special features in the target system.	3.x	
Merge Updates	Merge the list of significantly updated entries into a single file that can be compared to the chart library.	2.x	Initially the list will just be a GPX file that can be imported into OpenCPN (or other) to display the updated light list entries. Eventually I plan to provide an automated comparison to the chart contents (ENC only).
LNM Processing	Add LNM status. The USCG now provides the Discrepancies and Temporary Changes section of the LNM in a raw xml file.	1.11	1.11.4.0 LNM Status column added to the listview in the main form. A detailed display of the LNM for a light added to the popup menu for the listview. Option to display the LNM status on the radar display form.
LNM Layer	Generate an OpenCPN layer for all of selected Discrepancies from the active LNM file.	1.12	Will allow OpenCPN to overlay a chart with any LNM discrepancies.
AIS Data Retention	Save and restore the Identification fields for an AIS target between program sessions. This will allow the name and call sign of the target to be displayed as soon as the first message is received and not have to wait for the static data message to be received. For a Class B target this can be as much as 6 minutes for a single channel AIS receiver	1.12	The save and restore of the data was implemented in version 1.11.1.12.2.0 The data resides in the AIS.xml file under the main program folder.