Messaging around GeoPIXE modules using the "Notify" mechanism

Direction: "Incoming" for Notify messages that are handled here, "Outgoing" for Notify message sent from here, "Pass on" for message that are not handled, but are allowed to be passed on (Note 1)
Tag: The name of the Notify message

Note 1 If a routine has Registered for some Notify message tags, then they get passed on automatically, even if the routine never processes them.
Note 2 Notify name given by argument when 'spectrum_display' opened, depends on how window used: "spectrum-display", "chart-display", "groups-display" (Maia Mapper).
Note 3 Notify name given by argument when 'detector_select' opened. Passed from <update_display> in 'spectrum_select'.

Program	Routine	Direction	Tag	Function	Notes
evt				Open the raw data sorting to images window	
	evt_event				
		Incoming	detector-fwhm	set channel enables based on channel FWHM below some threshold	Requires the detector layout table to include resolution values. Not really used anymore
			detector-load	detector layout loaded elsewhere - do you want to set channel enable based on new details?	
			detector-select	switches display of detector channel parameters to a selected channel	e.g. from spectrum display/select
			device-update	update EVT window to reflect new device object parameters for detector	no used anymore
			dpath	set a specific path for raw data files, which can be eslewhere (e.g. Maia blog files)	
			path	set the default path for most data files, especially output files	
			snapshot	was to snapshot the position and size of a window	experimental, not used now
			start-evt	Sent from Batch_Sort to start evt file processing	
			wizard-action	a command from a Wizard using wizard mechanism (linked list of commands)	These contain a "command" to be executed and arguments
	many	Outgoing	abort-evt	indicates "start-evt" has been aborted, which is returned to Batch_Sort	returned to Batch_Sort
			detector-get	"Get" has been used to load new Energy Cals	'detector_layout' uses this
			device	device object has changed	e.g. picked up Batch_Sort to adopt this new device
			done-evt	indicates "start-evt" has completed	returned to Batch_Sort
			dpath	indicates that the specific path for raw data files (e.g. Maia blog files) has changed	
			evt-load	a new DAI template has been loaded, anyone interested?	triggers a 'detector-load' in 'detector_layout'
			evt-mode	mode of processing (e.g. DA, CUTs, MPDA, ...) has changed	
			evt-type	type of data (e.g. SXRF, PIXE, …) has changed	
			images	a new image has been formed and pointer passed to interested programs	e.g. main GeoPIXE Image routine and clones
			path	indicates the default path for most data files, especially output files, has changed	
			root	indicates that the path root (above path and dpath) has been set	returned to Batch_Sort
			wizard-return	return after a "wizard-action" has completed	returned struct has error flag (0 = OK) and perhaps some data
image				main image display or clone (or 3D stack images)	
	OnNotify_image				the main GeoPIXE routine
		Incoming	batch-operations-open	simple way to test if Operations window open for batch operations.	
			batch-rgb-open	simple way to test if RGB window open for batch operations.	
			batch-save	Save various options for current images (e.g. correct X, save HTML, CSV tables) from 'Batch_Sort'	
			corr-analyze-clear	returned from 'corr' to clear pixels inside spline	
			corr-analyze-spline	returned from 'corr' show pixels inside spline	
			dpath	set a specific path for raw data files, which can be eslewhere (e.g. Maia blog files)	
			image-analyze-all-clear	clear all markers (from Clone)	
			image-analyze-clear	clear current marker/shape on display (from Clone)	
			image-analyze-mark	plot current marker/shape (from Clone)	
			image-analyze-mode	change analyze mode (shape selection mode: "+" include, "-" exclude) (from Clone)	
			image-analyze-q	select pixels by passed 'q' vector (from Clone)	
			image-analyze-type	change analyze type (shape style: Distance, Box, Circle, …) (from Clone)	
			image-clear-all-marks	returned from 'maia_launch' on NewRun	
			image-clone	another cloned 'image' has read in new image data to be displayed here too (but clone "owns" data)	
			image-corr-clear	returned from 'image' to clear pixels inside spline	
			image-corr-q	returned from 'clone' to pass on corr qc (pixel selection vector)	
			image-display	redisplay images, returned from 'image_select'	
			image-elements	change list of element labels.	
			image-kill-regions-all-planes	zero images within region pixels for all regions (from 'image_table')	

		image-match-centroids	match in XANES stack regions		
		image-operations-closed	Operations window has closed.		
		image-process	execute a selected image processing function (from 'image_process')		
		image-region-clear	returned from 'image_table' before region-select		
		image-region-select	returned from 'image_table' to show a region from table		
		image-region-update	returned from 'image_table' to update concs for selected region		
		image-region-update-one	returned from 'image_table' to update concs for selected region (pnly current region row)		
		image-rgb-closed	RGB window has closed.		
		images	another app has read in new image data to be displayed here (local process will "own" data)		
		path	set the default path for most data files, especially output files		
		snapshot	was to snapshot the position and size of a window	experimental, not used now	
		wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments	
many	Outgoing	done-save	Save options done (to Batch-Sort)	returned to Batch_Sort	
		image-analyze-all-clear	clear current marker/shape on display (to Clones)		
		image-analyze-mode	analyze type (shape style: Distance, Box, Circle, …) has change (to Clones)		
		image-analyze-q	select pixels by 'q' vector (to Clones)		
		image-analyze-type	analyze mode (shape selection mode: "+" include, "-" exclude) has changed (to Clones		
		image-clone	images changed (to Clone) - passes whole 'pstate'		
		image-corr-clear	clear highlighted pixels (to Corr)		
		image-corr-q	new Association pixel selection 'qc' (to Corr)		
		image-display	redisplay images		
		image-region-throttle	send pixel 'q' vector to Throttle editing routine		
		image-results	new conc results available in region table		
		images-changed	images changed (to Clone) - passes new image data 'p' struct		
		image-show-element	passes new element to Image History Display (to shows details for element plane)		
		image-update-time	send pixel 'q' vector to TimeAmp		
		path	indicates the default path for most data files, especially output files, has changed		
		spectra	Notify Spectrum Display when analyze shape is Traverse or X,Y projection spectra		
		spectrum-display	new spectra to display (or changed colour map, so redisplay spectra too)		
		wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data	
spectrum_display			Open a spectrum display window instance		
	OnNotify_Spectrum				
	Incoming	adjust-values	old, used to adjust background	experimental, not used now	
		cal-ab	Energy Calibration a,b changed, for this spectrum (returned from 'Cal')		
		cal-ab-all	Energy Calibration a,b changed, for all spectra (returned from 'Cal')		
		cal-ab-ra	returned from 'Cal' to re-assign peaks to new marked E', based on Markers		
		cal-ab-ra-ab	returned from 'Cal' to re-assign peaks to new marked E' based on A,B		
		chart-display	like "spectrum-display" for Chart spectra	from Maia Launch	
		correct-image-pileup	display pileup using image products		
		cut-select	returned from 'cut_setup' to draw a cut		
		detector-select	highlight a specific detector (e.g. used in Maia Control from Rates window)		
		dpath	set a specific path for raw data files, which can be eslewhere (e.g. Maia blog files)		
		fit-display	returned from 'pixe_fit' after fit or set-up change		
		groups-display	like "spectrum-display" for Groups spectra	from Maia Launch	
		image-clone	to keep a local copy of images struct (e.g. for matrix details)		
		image-region-delete	delete a matching region spectrum (when a rrgion row is deleted)	from Image Table	
		image-regions	keep a local copy of the regions struct pointer array	from Image Table	
		image-region-select	model DA spectrum overlay for the selected region/spectrum	from Image Table	
		images	to keep a local copy of images struct (e.g. for matrix details)		
		image-spectrum-throttle	model overlay, plus model Throttled spectrum	from Image_Analyze, /throttle via Image Notify	
		mark-e	mark an energy (returned from 'identify')		
		mark-element	mark element lines (returned from 'identify')		
		new-results	returned from 'pixe_fit' after valid fit (passed on)		
		path	set the default path for most data files, especially output files		
		results-select	this is passed on to PIXE Fit		
		snapshot	was to snapshot the position and size of a window	experimental, not used now	
		spectra	new spectra data available	returned from parent, other spectrum, or image_table	

					name set by '(*pstate).update_notify' and changes with context
			spectrum-display	update spectrum display	(spectra, chart, group display)
			spectrum-highlight	set/clear Highlight mode for spectra display	returned from 'spectrum_select' or parent
			wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments
	many	Outgoing	cut-results	analyze_cut' results for X or View markers	to 'cut_setup'
			identify-element	switch to element marker mode	to Identify
			identify-line	identify feature at Identify marker	to Identify
			image-display	images changed (e.g. correct images for pileup contributions)	to image windows
			path	indicates the default path for most data files, especially output files, has changed	
			select-update	a spectrum has been selected	to spectrum_select
			spectra-changed	view into spectrum has changed	to 'Spectrum History' and Spectrum_select
			spectrum-fit	new selected spectrum passed tp pixe_fit	
			spectrum-get-cals	tell maia-launch to copy *pm Cals to spec	in Maia-Control spectra cals tied to Maia parameters
			wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data
image_table				Open the image regions window	
	OnNotify_Image_Table				
		incoming	dpath	set a specific path for raw data files, which can be eslewhere (e.g. Maia blog files)	
			image-region-throttle		
			image-results	new image data, which may have cleared regions	
			image-results-clear	table data already cleared in 'image', but clear table as viewed	
			path	set the default path for most data files, especially output files	
			snapshot	was to snapshot the position and size of a window	experimental, not used now
			wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments
	many	Outgoing	dpath	indicates that the specific path for raw data files (e.g. Maia blog files) has changed	
			image-kill-regions-all-planes	zero images within regions, for all regions	done in 'image'
			image-match-centroids	shift XANES images to match feature centroids	done in 'image'
			image-region-clear	in response to an Update (used to clear shape elsewhere)	
			image-region-delete	image table row was deleted - Delete selected region and spectrum	(Spectrum Select must be open)
			image-regions	regions have changed	
			image-region-select	table row selected	
			image-region-update	in response to an Update	region applied to image again
			image-region-update-one	in response to an Update - single row	region applied to image again
			image-results	table has changed	
			image-spectrum-throttle	for display of throttle overlay on spectrum	
			spectra	Regions and matching spectra have been loaded, infor Spectrum Display	
			wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data
Spectrum_select				Open the spectrum selection window	
	OnNotify_Select				
		incoming	array-select	subset of spectra selected for display by 'detector_select' pop-up	
			image-region-select	Row selected in Image Region table, so select corresponding row in spectrum list	
			select-highlight	highlighted spectrum changed, so update table and trigger spectrum display	
			select-update	update the table	
			spectra-changed	spectra data changed, so update spectrum pointer and the table	
			wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments
		outgoing	<update_notify>	Update spectrum display. Defaults to 'spectrum_display'	Name depends on argument. See Note 2
			select-highlight	select spectrum to highlight on spectrum display	
			spectrum-highlight	select row of spectrum table to highlight	
			wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data
Cal				Open the spectrum eneregfy calibration window	
	OnNotify_Cal				
		incoming	cal-x	Cal marker position returned from Spectrum_Display	from Spectrum_Display
			path	set the default path for most data files, especially output files	
	many	outgoing	cal-ab	apply energy cal to currently selected spectrum	to Spectrum_Display
			cal-ab-all	apply energy calibration to ALL spectra	to Spectrum_Display
				"Re-assign" selected (marked) peaks to new energies, which maintains differences between spectra	
			cal-ab-RA	channel energy calibrations.	to Spectrum_Display

			cal-ab-RA-AB	"Re-assign" energy calibration A,B coefficients to new values, but maintain differences between spectra channel energy calibrations.	to Spectrum_Display
fit_setup				open the X-ray spectrum fit window	
	fit_setup_event				
		incoming	mark-fit	select an element to fit (from Xray identify window)	
			new-correct	new multi-phase yield correction calculation matrix just done, so use that	
			new-detectors	new detectors available, reload detectors and update list	
			new-filters	new filters available, reload filters and update list	
			new-yields	new yield calculation just done, so use that	
			path	set the default path for most data files, especially output files	
			results-select	row selected in fit results (pass to fit setup for refit)	
			spectrum-fit	new spectra loaded, so initial background and initial peaks based on this	from Spectrum_Display
			spectrum-view	update fit_setup copy of View markers from spectrum display	
			time-amp-pileup	new pileup E-T acceptance mask from 'time_amp'	does not seem to get used
			wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments
	fit_setup_event	outgoing	wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data
layer_setup				pop up a layered target specification and yield calculation window	
	layer_setup_event				
		incoming	path	set the default path for most data files, especially output files	
			new-detectors	new detectors available, reload detectors and update list	
			new-source	new source available, set beam parameters from this new source model	
	layer_setup_event	outgoing	new-yields	new yield calculation just done, so pass that on/up	to 'fit_setup'
			layer-plot	update parameters seen in the 'layer_plot' window	to 'layer_plot'
source_setup				pop up an X-ray lab source specification window	
	source_setup_event				
		incoming	path	set the default path for most data files, especially output files	
			select-periodic	select element for monochromator (Ka used)	from a periodic table popup
	source_setup_event	outgoing	new-source	new source available, send beam parameters up to 'layer_setup'	to 'layer_setup'
identify2				Pop up an X-ray line identification window with line list and periodic table	
	identify2_event				
		incoming	new-detectors	new detectors available, reload detectors and update list	
			new-filters	new filters available, reload filters and update list	
			indentify-e	set search energy and position list on best match	from 'spectrum_display'
			identify-element	set 'ident2' into element periodic table mode	from 'spectrum_display'
			indentify-line	set 'ident2' into sorted line list mode	from 'spectrum_display'
	identify2_event	outgoing	mark-element	tell 'spectrum-display' to mark the lines for a selected element	to 'spectrum_display'
			mark-fit	tell 'fit_setup' to select/toggle an element in fit	to 'fit_setup'
			mark-e		to 'spectrum_display'
detector_select				Pop up a detector array mimic display to select a sub-set of array elements	
	detector_select_event				
					name set by '(*pstate).watch', which is taken from '(*pstate).update_notify' from spectrum_select parent and changes
		incoming	<(*pstate).watch>	set the enable flag for a selection of detector array elements	with spectrum context (spectra, chart, group display)
	detector_select_event	outgoing	array-select	return the selected elements of the detector array	
filter_setup				pop up to define a filter specification	
	filter_setup_event				
		incoming	path	set the default path for most data files, especially output files	
			mark-e	from 'ident' to mark a given energy	
		outgoing	new-filters	new filters available, reload filters and update list	
detector_setup				pop up to define a detector specification	

	detector_setup_event				
		incoming	path	set the default path for most data files, especially output files	
			mark-e	from 'ident' to mark a given energy	
			detector-load	detector layout details loaded elsewhere	
		outgoing	detector-setup-load	convey new detector layout to 'detector_layout' mimic display	
			new-detectors	new detectors available, reload detectors and update lists elsewhere	
corr				The Association window, plotting element X versus Y for all (selected) image pixels	
	OnNotify_corr				
		incoming	corr-analyze-clear	clear elX,elY spline field	from elsewhere in 'corr'
			corr-analyze-spline	sets elX,elY spline field, and subset of image pixels	from elsewhere in 'corr'
			corr-display	update display	from 'pca_cluster'
			image-analyze-all-clear	clear pixel selection	
			image-analyze-q	pixel selection from image clone	
			image-display	notified of a display change	from 'image'
			image-region-select	new region selected from image regions table (may contain elX,elY corr field)	from 'image_table'
			images-changed	flags change of image data to recalculate/display corr	
			path	set the default path for most data files, especially output files	
	Corr_Analyze_Spline	outgoing	corr-analyze-spline	sets elX,elY spline field, and subset of image pixels	
	many		corr-analyze-clear	clear elX,elY spline field	
			corr-display	update display	
imageRGB				element RGB image window	
	OnNotify_ImageRGB				
		incoming	path	set the default path for most data files, especially output files	
			image-display	redisplay images, returned from 'image_select'	
			images-changed	image data has changed	
			image-analyze-mark	plot current marker/shape (from Clone)	
			batch-save	Save various options for current images (e.g. correct X, save HTML, CSV tables) from 'Batch_Sort'	
			wizard-action	Wizard command request, or "open-test" probe of open wndow status.	These contain a "command" to be executed and arguments
		outgoing	image-rgb-closed	window closed	
			image-display	display image (w/ modified pixel selection)	
			wizard-return	return after wizard-action (may contain returned/passed data too)	returned struct has error flag (0 = OK) and perhaps some data
image_history				display image data parameters (and stats) and history operation info for element image	
	OnNotify_Image_history				
		incoming	images-changed	image data has changed, update details and statistics	
			image-show-element	update details, as displayed element has changed	
			image-display	update details	
		outgoing	none		
image_operations				list display of single-click image processing tools	
	OnNotify_Image_Process				
		incoming	images-changed	image data has changed, update details and statistics	
			batch-filter	request from 'batch_sort' for a filter to be applied	
	OnKill_Image_Process	outgoing	image-operations-closed	window closed	
			done-filter	filter done reply to 'batch_sort'	
			image-process	request to 'image' to perform a selected image processing	
			image-display	update image display and dependent displays (e.g. corr)	
interelement_operations				pop up window to perform interelment operations between element images	
	interelement_operations_event				
		incoming	images-changed	image data has changed, update interelement operation	
					make_tvb' in 'image_routines' constructs the image bitmap using the selected interelement_transform and parameters, to make it visible before "apply"
		outgoing	image-display	update image display and dependent displays (e.g. corr)	
pcs_clusters				PCA and cluster analysis window	

	OnNotify_pca_cluster			
		incoming	corr-display	update display
			image-display	notified of a display change
			path	set the default path for most data files, especially output files
			image-region-select	new region selected from image regions table (may contain elX,elY corr field)
			images-changed	flags change of image data to recalculate/display corr
			image-analyze-q	pixel selection from image clone
			image-analyze-all-clear	clear pixel selection
		outgoing	corr-analyze-spline	sets elX,elY spline field, and subset of image pixels
			corr-analyze-clear	clear elX,elY spline field
			corr-display	update display
correct_yield				Matrix yield correction of images (and projection of phases) window
	correct_yield_event			
		Incoming	path	set the default path for most data files, especially output files
			image-region-select	returned from 'image_table' to show a region from table — not used yet …
			images-changed	flags change of image data to reselect element vectors, etc.
		outgoing	image-display	display image (w/ modified pixel selection)
			images	image data has changed and images and element vectors need to be updated in 'image'
			new-correct	new multi-phase yield correction calculation matrix done — to 'fit_setup'
multi_image				Displays an array of single element 'simple_image' windows
	multi_image_event			
		Incoming	image-display	notified of a display change — from 'image'
			image-clone	another cloned 'image' has read in new image data to be displayed here too (but clone "owns" data)
			image-elements	change list of element labels.
		outgoing	image-crop	crop of first element used to zoom others, but this Notify does not appear to be used — seems to be used in 'maia_launch' - perhaps not implemented
spectrum_history				display specta data parameters and history operation info
	OnNotify_spectrum_history			
		Incoming	spectra-changed	spectra data changed, so update spectrum pointer and the table
		outgoing	none	
cuts_setup				Window to tabulate and save CUTs defined using X or CUT markers on the spectrum
	cut_results_event			
		Incoming	path	set the default path for most data files, especially output files
			cut-results	specification of a CUT using either X or CUT markers — from 'OnButton_Spectrum_Analyze'
		outgoing	cut-select	a CUT using either X or CUT markers sent to the spectrum for display — to 'spectrum_display'
time_amp				Plot E versus T (amplitude versus time) for Maia blog ET data
	OnNotify_time_amp			
		Incoming	time_amp-display	update time-amp display
			path	set the default path for most data files, especially output files
			image-region-select	image region table row selected
			time_amp-analyze-clear	clear time-amplitude scatter plot
			images-changed	flags change of image data to recalculate/display corr
			image-update-time	q vector from 'image' display, used to mask points displayed — forget how this works …
			image-analyze-all-clear	clear current marker/shape on display (clear q vector above)
		outgoing	time_amp-analyze-spline	output of spline curve details — Not used yet. Spline usually saved as pileup limits file
			time_amp-analyze-clear	clear details — Not used
			time_amp-display	update time-amp display
			path	set the default path for most data files, especially output files
			time_amp-pileup	pileup limits available after also saved to file — used in 'fit_setup' for pileup modelling