

User Interface

WARP

CENTER **NASA Ames Research Center**

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BROWSING

Browse, My Items, List View

Design goals:

- Enable edit in place
- Tree on left
- Easier transition between browse and edit modes
- Allow rapid exploration via dragging elements into the current view
- Add timeline controller
- Fixed Position view moved out of Telem Panels; toolbar and FP view edit gestures moved to Layouts.

IDEAS:

- Drag onto incompatible object temporarily creates a new layout
- Drag into plot adds element to plot, but doesn't select the plot element
- Diminish "editing" feel; use smaller save button with icon only, X for cancel. Try to get toolbar in view without altering layout.

My Items

Type	Name	Owner	Modified	Last Accessed
Folder	Activity Modes	Robert Carvalho	4/27/2015	4/29/2015
Folder	COM	Dave Bowman	6/3/2015	6/5/2015
Folder	FLX	Frank Poole	4/29/2015	5/8/2015
Folder	HAL-9000 Memory Status	Dave Bowman	4/28/2015	5/15/2015
Folder	In Progress ★	Robert Carvalho	4/28/2015	5/12/2015
Folder	Misc Panels	Robert Carvalho	4/29/2015	5/11/2015
Folder	NAV ★	Frank Poole	4/27/2015	5/1/2015
Folder	NUC	Frank Poole	4/28/2015	5/6/2015
Folder	Queries	George Rinker	4/27/2015	5/3/2015
Folder	Telemetry ★	Jay Trimble	4/28/2015	5/7/2015
Folder	VEH	Dave Bowman	4/28/2015	5/15/2015

UTC 2016/03/16 18:20:00 App Logo

BROWSING

Browse Layout

1 Navigates up hierarchy.

2 Time control only displays for objects that have "time awareness", including layouts, panels, telemetry points, packets, etc. See "Time Controller Overview" on page 38.

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Status
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR OVW

8.93 V

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	▼ 12.93 V
Charge Stat	Charging

EGN

↑ EGN-A EGN-B

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
▼ Cruise Scenarios	2015/27/04 0:00:00
▼ Cruise Model 1	2015/27/04 0:00:00
▼ 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn
- Cruise Model 3 ... PVV

2015-04-27 00:17:00 2015-04-27 00:18:00

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 ▶ 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

BROWSING

Updated Status Bar

With the need to handle message banners and more system status information, the status bar should be enhanced.

- 1 System status is represented by icons only that reveal more detail when hovered or tapped. Icons themselves should change color or flash when their status calls for it.
- 2 Move current time to right flush.

COM Systems Health

PWR-OVW

MMRTG

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

RBAT-1 RBAT-2

EGN

↑ EGN-A EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	☑ Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	☑ Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	☑ 01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	☑ PVV	
☑ Systems Check	2015/27/04 0:15:00	☑ Systems Check	
☑ Burn	2015/27/04 0:23:00	☑ Burn	
☑ Ignition	2015/27/04 0:27:00	☑ Igni...	

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

BROWSING
Frame Menus

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Status
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR-OVW

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

EGN

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	PVV	
🔗 Systems Check	2015/27/04 0:15:00	Systems Check	
🔗 Burn	2015/27/04 0:23:00	Burn	
🔗 Ignition	2015/27/04 0:27:00	Igni...	

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00 REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

Example Action That Prompts Messaging

The screenshot displays the 'COM Systems Health' interface. A context menu is open over the 'MMRTG' diagram, with the 'Duplicate...' option highlighted. The interface includes a left-hand navigation tree, a central data table, and a right-hand graph.

Navigation Tree (Left):

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Sta...
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Statu...
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health Data Table:

	DN	EU	UPDATED	ALARM
Access Maximal Power	9.75		4/16/20 14 0:00:00	
Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1 Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2 Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

CHRG Data Table:

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	▲ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2 Data Table:

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	▼ 12.93 V
Charge Stat	Charging

MISSION MAIN Table:

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	☑ Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	☑ Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	☑ 01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	☑ PVV	
☑ Systems Check	2015/27/04 0:15:00	☑ Systems Check	
☑ Burn	2015/27/04 0:23:00	☑ Burn	
☑ Ignition	2015/27/04 0:27:00	☑ Igni...	

Resource Graph:

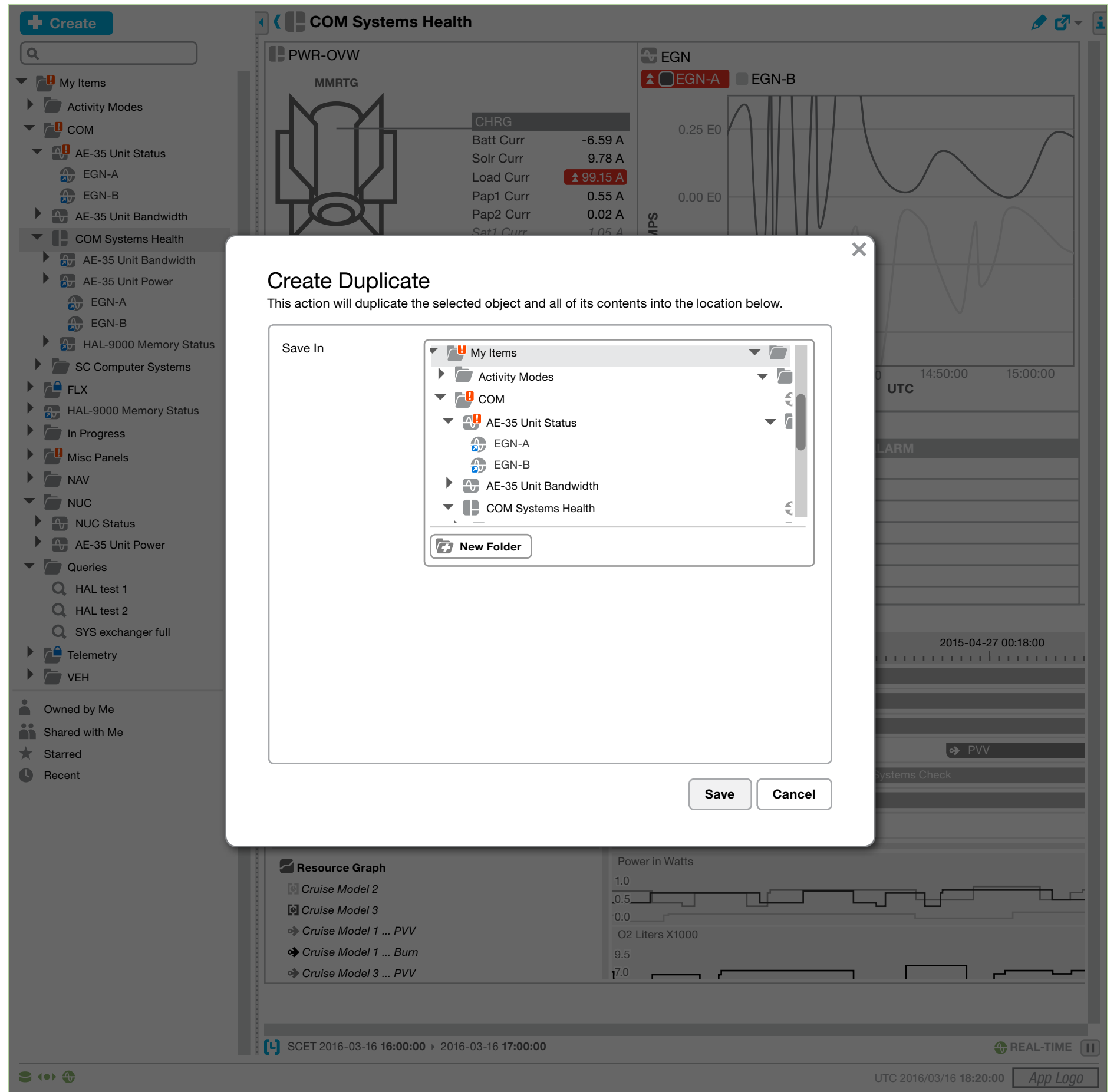
- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

Graphs:

- AMPS Graph:** Shows current (Amps) over time (UTC) for EGN-A and EGN-B. Y-axis ranges from -0.50 E0 to 0.25 E0. X-axis shows times from 14:30:00 to 15:00:00.
- Power in Watts Graph:** Shows power consumption over time. Y-axis ranges from 0.0 to 1.0.
- O2 Liters X1000 Graph:** Shows oxygen levels over time. Y-axis ranges from 7.0 to 9.5.

Footer: SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00 | REAL-TIME | UTC 2016/03/16 18:20:00 | App Logo

Dialog Example



DIALOGS AND MESSAGING

Blocking Modal Dialog

Certain operations may be sensitive, particularly in their initial stage. The user should be prevented from interacting or modifying an object while in that state, or from moving out of context such as when saving during editing. In this case, the interface should present a modal dialog with the following characteristics. See "Modal Dialog Details" on page 16 for more examples and details.

- 1 Dialog title should reflect the action the user just initiated:

Title
Duplication in Progress
Move in Progress

- 2 Standard close button is not available.

- 3 User may cancel operation by clicking Cancel button. If cancelled, operation must be completely undone - we cannot partially undo the the operation.

- 4 The current action should be updated as frequently as possible while maintaining human readability. Some message examples:

Message
Preparing to copy...
Creating <object name>...
Cleaning up...

The screenshot shows a complex dashboard for 'COM Systems Health'. A modal dialog is centered on the screen, titled 'Duplication in Progress'. The dialog contains the following elements:

- Title:** Duplication in Progress
- Message:** Do not navigate away from this page or close this browser tab while this operation is in progress.
- Progress:** A progress bar with a striped pattern and the text 'Preparing to copy...' above it.
- Status:** A progress indicator showing 'Lorem ipsum dolor sit (amet)'.
- Action:** A button labeled 'Cancel Duplication'.

Red callout boxes with numbers 1 through 4 point to specific features in the dialog and the background interface:

- 1: Points to the dialog title.
- 2: Points to the 'Cancel Duplication' button.
- 3: Points to the 'Cancel Duplication' button.
- 4: Points to the 'Preparing to copy...' status text.

DIALOGS AND MESSAGING

Event Message Banner Example

Events may occur in the system triggered by a user action, or by the system, that should be brought to the user's attention but don't require user interaction or constitute a serious problem. Such events should be displayed using the message banner system as illustrated.

- 1 In-progress items should be displayed in a distinct visual style, and may allow expand and collapse, but should not be selectable. **DISCUSS WITH VICTOR: PETE THINKS THIS CASE WON'T/SHOULDN'T OCCUR.**
- 2 Clicking the body of the banner displays the Alert Messages dialog as illustrated in "Alert Messages Details" on page 14.
- 3 Progress bar.
- 4 Cancel button cancels operation and cleans up, with followup status message displayed per "Success Message" on page 12.

The screenshot displays a spacecraft monitoring interface with several key sections:

- Left Panel:** A navigation tree with 'COM Systems Health' highlighted. A red circle with the number '1' points to this item.
- Top Panel (COM Systems Health):** Shows power status for PWR-OVW and EGN. The PWR-OVW section includes a diagram of the MMRTG and RBAT units, and a table of current values:

Category	Value
CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A
BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging
- Right Panel:** A line graph showing current (AMPS) over time (UTC) for EGN-A and EGN-B. The y-axis ranges from -0.50 E0 to 0.25 E0. The x-axis shows times from 14:30:00 to 15:00:00.
- Table (PWR-OVW-TBL):**

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	
- Mission Main Panel:** Shows a timeline of mission events from 2015-04-27 00:17:00 to 00:18:00. Events include Cruise Scenarios, Cruise Model 1, 01-Hohmann Transfer, PVV, Systems Check, Burn, and Ignition.
- Resource Graph:** A graph showing Power in Watts and O2 Liters X1000 over time.
- Bottom Panel:** A red banner at the bottom indicates 'Duplication in progress...' with a progress bar and a 'Cancel' button. A red circle with the number '2' points to the banner, '3' points to the progress bar, and '4' points to the 'Cancel' button. The status bar shows 'SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00' and 'REAL-TIME'.

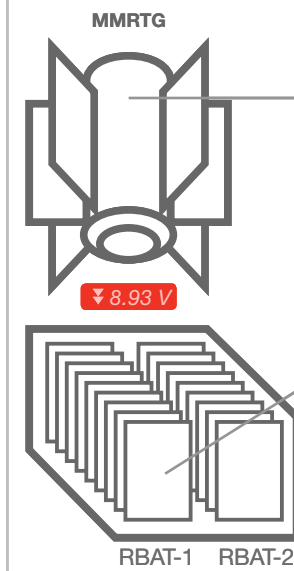
Minimized Message Example

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Status
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR-OVW



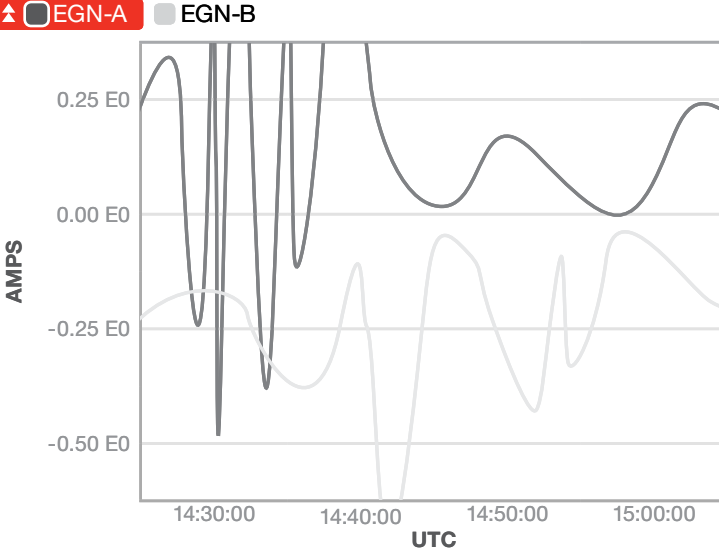
8.93 V

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging

EGN

EGN-A EGN-B



UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

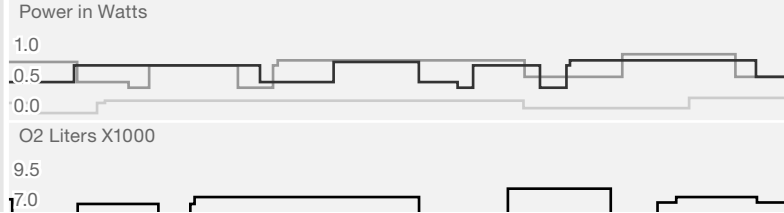
MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	☑ Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	☑ Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	☑ 01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	☑ PVV	
☑ Systems Check	2015/27/04 0:15:00	☑ Systems Check	
☑ Burn	2015/27/04 0:23:00	☑ Burn	
☑ Ignition	2015/27/04 0:27:00	☑ Igni...	

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

Power in Watts



O2 Liters X1000

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

1

DIALOGS AND MESSAGING

Success Message

When a "success" event occurs that the user should be made aware of, it can be displayed as shown here. The banner should display for a period of time TBD and then remove itself. If a new message must be displayed before the current one has reached its timeout, it should be queued up and wait until the current message has timed out, or the user has manually dismissed the currently displayed message.

- 1 Clicking the body of a success message has no effect, or, should be mapped to dismiss it.
- 2 Dismisses the message.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', 'AE-35 Unit Status', 'COM Systems Health', 'SC Computer Systems', 'In Progress', 'Misc Panels', 'NAV', 'NUC', 'Queries', 'Telemetry', and 'VEH'. The main area shows 'PWR-OVW' with a diagram of MMRTG and RBAT-1/RBAT-2, a 'CHRG' table, and a 'BTT1-2' table. To the right is an 'EGN' graph showing 'AMPS' vs 'UTC'. Below these is a 'PWR-OVW-TBL' table:

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

Below the table is a 'MISSION MAIN' section with a timeline from 2015-04-27 00:17:00 to 2015-04-27 00:18:00, showing items like 'Cruise Scenarios', 'Cruise Model 1', '01-Hohmann Transfer', 'PVV', 'Systems Check', 'Burn', and 'Ignition'. At the bottom, a 'Resource Graph' shows 'Power in Watts' and 'O2 Liters X1000'. A success message banner 'Your operation was cancelled' is displayed at the bottom, with red callouts 1 and 2 pointing to it.

DIALOGS AND MESSAGING

Alert Message Banners

When one or more elements have a status that needs to be called to the attention of the user, handle as follows:

- 1 Items in the tree and view area should be visually flagged.
- 2 A message should be displayed in the status area. Clicking the banner displays more information to the user.
- 3 If a major action is available with the message, a button to initiate it can be displayed here. Do not display more than one button - if the user needs to be given a selection of choices, display a button labeled "More..." that links to the Alerts dialog as displayed in "Alert Messages Details" on page 14.
- 4 Clicking this minimizes the message.

COM Systems Health

PWR-OVW

MMRTG

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	▲ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

▼ 8.93 V

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	▼ 12.93 V
Charge Stat	Charging

RBAT-1 RBAT-2

EGN

▲ EGN-A ■ EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	☑ Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	☑ Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	☑ 01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	☑ PVV	
☑ Systems Check	2015/27/04 0:15:00	☑ Systems Check	
☑ Burn	2015/27/04 0:23:00	☑ Burn	
☑ Ignition	2015/27/04 0:27:00	☑ Igni...	

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 ▶ 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00

App Logo

! Objects not saved Try Again ×

DIALOGS AND MESSAGING

Alert Messages Details

Clicking a button in this dialog will dismiss the dialog and display whatever subsequent interface is needed for the user to complete the selected action; this could be another dialog or a return to the main interface. Actions other than Dismiss may result in a new message being created with a banner being displayed, and an item added to this list.

- 1 Dismissing an item removes it from this list, allowing the user to acknowledge the message.
- 2 Dismisses overlay without affecting any items in the list.

The screenshot displays a 'Messages' dialog box with the following content:

- Message 1:** **Objects not saved** (red icon). Description: Objects not saved; persistence server returned error code -7124. Buttons: Try Again, Dismiss. A red callout box with the number '1' points to the 'Dismiss' button.
- Message 2:** **Lorem ipsum dolor sit** (red icon). Description: Lacus pulvinar tristique natoque massa tristique. Buttons: Try Again, Save As...
- Message 3:** **Duplication in Progress...** (orange icon). Description: Duplicating lorem ipsum dolor sit amet. Includes a progress bar and 'Time remaining: about 2 minutes'. Button: Cancel Duplication.
- Message 4:** **Objects not saved** (red icon). Description: Objects not saved; persistence server returned error code -7124. Buttons: Try Again, Dismiss.

A 'Done' button is located at the bottom right of the dialog, with a red callout box containing the number '2' pointing to it.

Minimized Messages and Message Banners

- 1 When an alert message banner has been minimized, display as illustrated. Clicking this element displays the Alert Details as illustrated in "Alert Messages Details" on page 14.
- 2 When a new message must be displayed and there are existing minimized messages, the minimized message indicator **1** should increment its number and change its display (if necessary) to match the severity of the most severe message.

The screenshot displays a spacecraft health monitoring application. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', 'AE-35 Unit Status', 'COM Systems Health', 'SC Computer Systems', 'FLX', 'In Progress', 'Misc Panels', 'NAV', 'NUC', 'Queries', 'Telemetry', and 'VEH'. The 'COM Systems Health' section is expanded, showing sub-items like 'AE-35 Unit Bandwidth', 'AE-35 Unit Power', 'EGN-A', 'EGN-B', 'HAL-9000 Memory Status', and 'SC Computer Systems'. A red circle with the number '1' points to a minimized message icon in the bottom-left corner of the application window.

The main content area is titled 'COM Systems Health' and contains several panels:

- PWR-OVW**: A diagram of the spacecraft's power system (MMRTG) with a red indicator showing a voltage drop of 8.93 V. Below it is a stack of battery units (RBAT-1, RBAT-2) with a red indicator showing a voltage drop of 12.93 V.
- CHRG**: A table of current values:

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A
- BTT1-2**: A table of voltage values:

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging
- EGN**: A line graph showing engine power bus currents (AMPS) over time (UTC) for EGN-A and EGN-B. The y-axis ranges from -0.50 E0 to 0.25 E0. The x-axis shows times from 14:30:00 to 15:00:00.
- PWR-OVW-TBL**: A table of power system parameters:

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	
- MISSION MAIN**: A table of mission events:

Item	Start
Cruise Scenarios	2015/27/04 0:00:00
Cruise Model 1	2015/27/04 0:00:00
01-Hohmann Tra...	2015/27/04 0:07:00
PVV	2015/27/04 0:14:00
Systems Check	2015/27/04 0:15:00
Burn	2015/27/04 0:23:00
Ignition	2015/27/04 0:27:00
- Resource Graph**: A graph showing power consumption in Watts and O2 consumption in Liters X1000 over time.

At the bottom of the interface, a message banner is displayed: 'Objects not saved Try Again'. A red circle with the number '2' points to this banner. The bottom status bar shows the date 'SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00', a 'REAL-TIME' indicator, and an 'App Logo' button.

DIALOGS AND MESSAGING

Message Banner Details

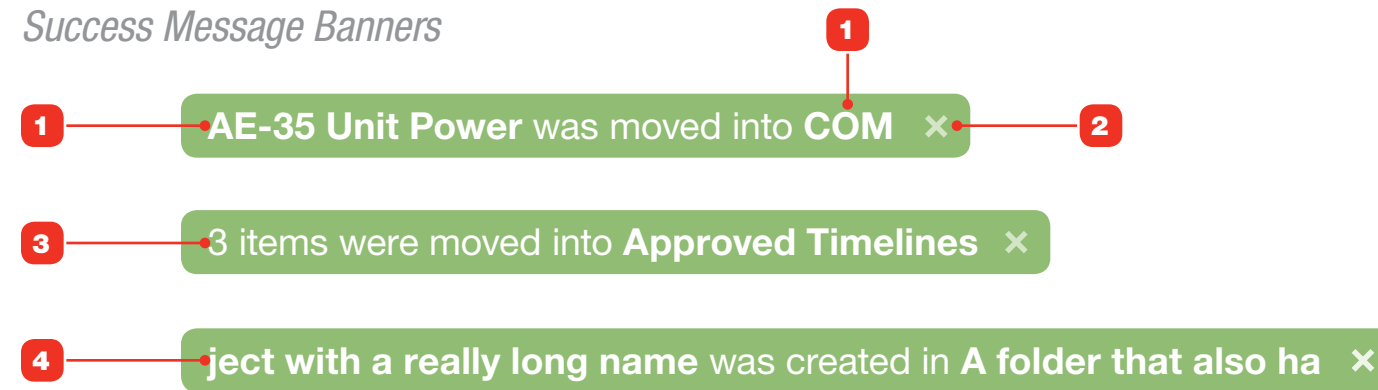
When a message banner is first displayed, it should animate or flash in some way to call attention to itself. The banner should display for a period of time, then fade out. The display period would ideally be based on the number of characters in the message, with a configurable minimum. A simpler initial implementation of this element would use a set timeout period. Messaging must be managed so that sequential or queued up messages don't collide with each other or are lost.

Behavior for message banners varies on type:

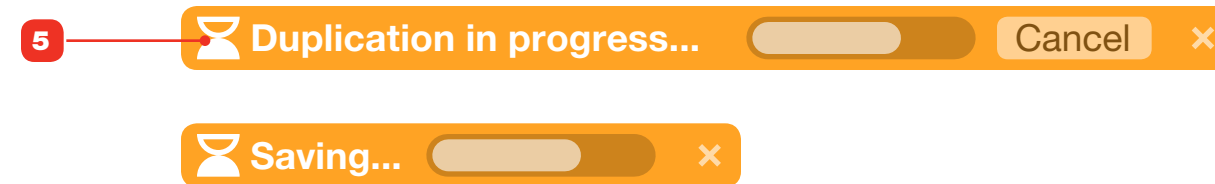
Type	Display Behavior	Banner Click	Click Minimize Button 2	When New Message Comes In
Success Message	Display for a time period TBD, then disappear.	Nothing, or if click on inner content (like "COM"), navigate to content	Dismisses banner	Dismiss banner
In-Progress Message	Display until process ends or user manually minimizes	Display details overlay dialog	Minimizes	Minimize
Alert Message	Display until process ends or user manually minimizes	Display details overlay dialog	Minimizes	Minimize

- 1 In Browse mode only, if navigable destinations within the application are included as content in the banner, they should be clickable. Clicking one of these links would navigate both the tree and the View area to that object.
- 2 Close button allows the user to manually dismiss or minimize the banner if desired. Behavior as noted above.
- 3 If multiple items are involved in an event, handle as illustrated in "3 items...".
- 4 If there is insufficient width to display the full message of the banner, a marquee effect can be used to display all of the text serially.
- 5 Messages should be typed; color and shape will allow the user to quickly parse and interpret message banners.
- 7 Some banner types can be minimized by the user or when replaced by a new incoming message. When in this state, display as such. The formatting (color) should be driven by most severe of the messages currently in the queue. The number indicates the number of current messages total in the queue.

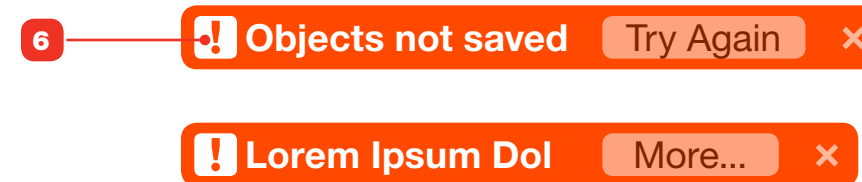
Success Message Banners



In-Progress Message Banners



Alert Message Banners



Minimized Message Indicators



DRAG GESTURES

Drag Gesture

1 Frames need to articulate if they can accept a drop of the dragged object 2 or not - the user has to understand where the thing they're dragging will end up. When the outermost context and an inner child can both accept the drop, perhaps use a timed hover evaluation to determine the user's intent. In this example, user is dragging a Panel ("EGN") onto a Layout ("COM Systems Health") but is currently over a frame of Panel EGN. The existing panel can't accept the drop, but the layout can, so it hilites.

COM Systems Health

PWR-OVW

MMRTG

CHRG

- Batt Curr: -6.59 A
- Solr Curr: 9.78 A
- Load Curr: **↑ 99.15 A**
- Pap1 Curr: 0.55 A
- Pap2 Curr: 0.02 A
- Sat1 Curr: 1.05 A
- Sat1 Curr: 0.16 A

BTT1-2

- Batt Volt: 33.38 V
- Sat1 Volt: 33.38 V
- Sat2 Volt: **↓ 12.93 V**
- Charge Stat: Charging

RBAT-1 RBAT-2

EGN

EGN-A EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
▼ Cruise Scenarios	2015/27/04 0:00:00
▼ Cruise Model 1	2015/27/04 0:00:00
▼ 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn
- Cruise Model 3 ... PVV

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00

App Logo

DRAG GESTURES

Drag Gesture, Compatible Child Element

1 A telemetry point 2 can be dropped into a panel - on hover and delay, a child frame can hilite to articulate its ability to accept the drop.

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Status
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR-OVW

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

EGN

↑ EGN-A EGN-B

AMPS

UTC

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	PVV	
☑ Systems Check	2015/27/04 0:15:00	Systems Check	
☑ Burn	2015/27/04 0:23:00	Burn	
☑ Ignition	2015/27/04 0:27:00	Igni...	

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 ▶ 2016-03-16 17:00:00
REAL-TIME

UTC 2016/03/16 18:20:00
App Logo

DRAG GESTURES

Drag Gesture, Having Dropped (v1)

- 1 Once dropped as a new frame into a layout, object is selected, contextual toolbar is activated, and object can be manipulated.

The screenshot displays the 'COM Systems Health' dashboard. On the left is a sidebar with a tree view of system components, including 'My Items', 'Activity Modes', 'COM', 'AE-35 Unit Status', 'AE-35 Unit Bandwidth', 'COM Systems Health', 'SC Computer Systems', 'FLX', 'HAL-9000 Memory Status', 'In Progress', 'Misc Panels', 'NAV', 'NUC', 'NUC Status', 'AE-35 Unit Power', 'Queries', 'Telemetry', and 'VEH'. The main content area is divided into several panels:

- PWR-OVW**: A diagram of a spacecraft with a voltage indicator showing 8.93 V. A table lists current values for various components: Batt Curr (-6.59 A), Solr Curr (9.78 A), Load Curr (99.15 A), Pap1 Curr (0.55 A), Pap2 Curr (0.02 A), Sat1 Curr, and BTT1-2 (Batt Volt, Sat1 Volt, Sat2 Volt, Charge Stat).
- PWR-OVW-TBL**: A table with columns 'ID' and 'TITLE'.

ID	TITLE
MAMP	Main Access Maximal Power
EGN-A	Engine Power Bus A
EGN-B	Engine Power Bus B
SBUS 1	Side Bus 1
SBUS 2	Side Bus 2
- EGN**: A graph showing current (AMPS) over time (UTC). The y-axis ranges from -0.50 E0 to 0.25 E0. The x-axis shows times from 14:30:00 to 15:00:00. A red '1' is placed on the graph, indicating a drag gesture.
- MISSION MAIN**: A table listing mission items with their start times.

Item	Start
Cruise Scenarios	2015/27/04 0:00:00
Cruise Model 1	2015/27/04 0:00:00
01-Hohmann Tra...	2015/27/04 0:07:00
PVV	2015/27/04 0:14:00
Systems Check	2015/27/04 0:15:00
Burn	2015/27/04 0:23:00
Ignition	2015/27/04 0:27:00
- Resource Graph**: A graph showing power in Watts and O2 Liters X1000 over time.

The bottom status bar shows the date and time: 'SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00' and 'REAL-TIME'. The bottom right corner displays 'UTC 2016/03/16 18:20:00' and 'App Logo'.

DRAG GESTURES

Drag Gesture, Having Dropped (v2)

- 1 Once dropped as a new frame into a layout, object is not selected by default. User can click on the element to select it. This behavior is more consistent with dropping a telem point into an existing panel.

The screenshot displays the 'COM Systems Health' interface. On the left is a sidebar with a search bar and a tree view of system components. The main area is divided into several sections:

- PWR-OVW:** A diagram of a spacecraft with a voltage indicator showing 8.93 V. A table lists current values for various components.
- EGN:** Two line graphs showing engine power bus activity (EGN-A and EGN-B) over time. A red '1' is placed on the top graph.
- PWR-OVW-TBL:** A table listing power system components.
- MISSION MAIN:** A timeline view showing mission events and resource usage.

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
[+] PVV	2015/27/04 0:14:00
[+] Systems Check	2015/27/04 0:15:00
[+] Burn	2015/27/04 0:23:00
[+] Ignition	2015/27/04 0:27:00

ID	TITLE
MAMP	Main Access Maximal Power
EGN-A	Engine Power Bus A
EGN-B	Engine Power Bus B
SBUS 1	Side Bus 1
SBUS 2	Side Bus 2

CHRG	Value
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	
Sat1 Curr	
BTT1-2	
Batt Volt	
Sat1 Volt	
Sat2 Volt	
Charge Stat	

EDITING

Editing, Overview

- 1 During editing, the tree should not allow any contextual actions on items.
- 2 The object being edited (in this illustration, "COM Systems Health") should collapse and flag itself in the tree visually. The expand arrow icon should not be visible. This would be true as well for all links to the object being edited.
- 3 Dragging an object into itself from the tree should be disallowed.
- 4 If contextual actions are available to children of the object being edited, the affordance for those actions should be unavailable. For example, frames in a layout should not display their title menu arrows on hover.
- 5 Hovering over a sub-object should highlight the object.

COM Systems Health

PWR-OVW

MMRTG

↓ 8.93 V

RBAT-1 RBAT-2

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

EGN

↑ EGN-A EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn

Power in Watts

O2 Liters X1000

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

REAL-TIME

UTC 2016/03/16 18:20:00

App Logo

EDITING

Editing, Selecting and Manipulating a Child Object

- 1 When edit mode is active, clicking an object selects it. Only one object is selectable at a time, and object must be selected in order to manipulate it. When mouse in object, display resize corner affordances. When object is being moved or resized, display drop shadow.
- 2 Cursor must be over an "empty" portion of the child (PWR-OVW) to allow move; top area to right of title
- 3 Toolbar is contextual to selected object.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with 'COM Systems Health' selected. The main area shows a diagram of the power system (PWR-OVW) with a data table for 'CHRG' and 'BTT1-2' components. A graph on the right shows 'EGN' (Engine Power) in Amperes over time. Below the graph is a table for 'PWR-OVW-TBL' showing power bus status. At the bottom, there is a 'MISSION MAIN' timeline and a 'Resource Graph'.

Parameter	Value
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

Parameter	Value
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

EDITING

Child Object Selected, Cursor Not In Object

1 When object is selected but cursor not within selected object, show indicator as shown.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with 'COM Systems Health' selected. The main panel shows a 'PWR-OVW' (Power Overview) view with a diagram of the spacecraft and a table of electrical parameters. A red indicator '1' points to a red arrow icon in the top-left corner of the PWR-OVW panel, indicating that a child object is selected but the cursor is not within it.

Electrical Parameters Table:

Category	Parameter	Value
CHRG	Batt Curr	-6.59 A
	Solr Curr	9.78 A
	Load Curr	▲ 99.15 A
	Pap1 Curr	0.55 A
	Pap2 Curr	0.02 A
BTT1-2	Sat1 Curr	1.05 A
	Sat1 Curr	0.16 A
	Batt Volt	33.38 V
	Sat1 Volt	33.38 V
	Sat2 Volt	▼ 12.93 V
	Charge Stat	Charging

Alarm Table:

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN Table:

Item	Start
▼ [E] Cruise Scenarios	2015/27/04 0:00:00
▼ [E] Cruise Model 1	2015/27/04 0:00:00
▼ [E] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph Table:

Item	Start
[E] Cruise Model 2	
[E] Cruise Model 3	
→ Cruise Model 1 ... PVV	
→ Cruise Model 1 ... Burn	

The interface also includes a graph of 'AMPS' vs 'UTC' for EGN-A and EGN-B, and a 'Resource Graph' showing 'Power in Watts' and 'O2 Liters X1000'.

EDITING

Editing, Child Object Selected, Cursor In Object and Hover Over Sub-Child Element

1 If an object contains sub-objects that can be selected and manipulated, objects should be hilited on hover to indicate their availability.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with 'COM Systems Health' selected. The main area shows a diagram of a power system with a red '1' highlighting a sub-object. To the right of the diagram is a data panel for 'CHRG' and 'BTT1-2'. Below the diagram is a table for 'PWR-OVW-TBL'. At the bottom, there is a 'MISSION MAIN' section with a timeline and a 'Resource Graph'.

CHRG Data:

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2 Data:

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

PWR-OVW-TBL Table:

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN Table:

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph:

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn

Graphs:

- EGN graph: AMPS vs UTC (14:30:00 to 15:00:00)
- Power in Watts graph: 0.0 to 1.0
- O2 Liters X1000 graph: 7.0 to 9.5

Status: SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00 | REAL-TIME | UTC 2016/03/16 18:20:00 | App Logo

Editing, Selecting and Manipulating Child Sub-element

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health**
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - COM Systems Health**
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR-OVW

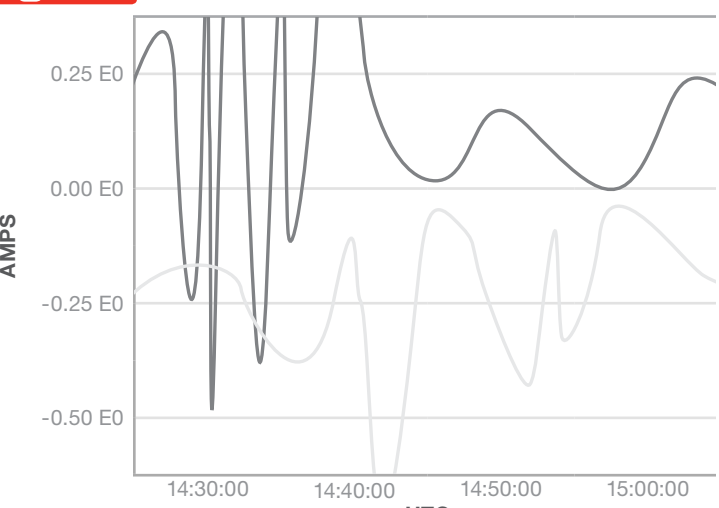


CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

EGN

↑ EGN-A EGN-B



PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00
REAL-TIME

UTC 2016/03/16 18:20:00
App Logo

Edit In Place, Timeline Sub-Element

+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health**
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - COM Systems Health**
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

PWR-OVW

8.93 V

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging

EGN

EGN-A EGN-B

AMPS

UTC

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
→ PVV	2015/27/04 0:14:00
→ Systems Check	2015/27/04 0:15:00
→ Burn	2015/27/04 0:23:00
→ Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn

Power in Watts

O2 Liters X1000

Save Button Dropdown Menu

HOW DOES SAVE MODEL WORK? Can we use Timelines as a guide? Given that a mod could have occurred to a nested child element, Save As... shouldn't be supported.

The screenshot shows the 'COM Systems Health' interface. On the left is a navigation tree with 'COM Systems Health' selected. The main area displays 'PWR-OVW' (Power Overview) with a diagram of the spacecraft and a table of current and voltage readings. A 'Save' button in the top right corner has a dropdown menu open, showing 'Save' and 'Save and Continue Editing' options. Below the power overview is a table for 'PWR-OVW-TBL' and a 'MISSION MAIN' timeline view.

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

EDITING

Navigating Away While Editing

- 1 If the user clicks in the tree or performs another action that would navigate them away from the current object being edited, display dialog box as illustrated.

The screenshot displays a software interface for monitoring and editing system health. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', and 'Queries'. The main area is titled 'COM Systems Health' and contains several panels: 'PWR-OVW' with a diagram and current values (e.g., Load Curr: 99.15 A), 'EGN' with a line graph of current over time, and 'MISSION MAIN' with a timeline and resource graph. A modal dialog box is overlaid in the center, containing the text: 'The page at localhost:8080 says: Unsaved changes will be lost if you leave this screen.' with 'Cancel' and 'Ok' buttons.

TREEVIEW COLLAPSED

Treeview Collapsed

- 1 Clicking search icon expands tree displaying search input.
- 2 Expands treeview.
- 3 Clicking collapsed Create button displays menu as a flyout. See "Treeview Collapsed, Accessing Create Menu" on page 32.

The screenshot displays the 'COM Systems Health' interface. At the top left, a search icon (1) is highlighted, which expands a tree view. A second icon (2) is also highlighted. A third icon (3) is highlighted on a collapsed 'Create' button, which displays a flyout menu. The main content area is divided into several sections:

- PWR-OVW**: Contains a diagram of the MMRTG (Main Mission Resource Tracking Graph) and a table of current values.

Category	Parameter	Value
CHRG	Batt Curr	-6.59 A
	Solr Curr	9.78 A
	Load Curr	↑ 99.15 A
	Pap1 Curr	0.55 A
	Pap2 Curr	0.02 A
BTT1-2	Sat1 Curr	1.05 A
	Sat1 Curr	0.16 A
	Batt Volt	33.38 V
RBAT-1 RBAT-2	Sat1 Volt	33.38 V
	Sat2 Volt	↓ 12.93 V
	Charge Stat	Charging
- EGN**: A line graph showing current (AMPS) over time (UTC) for EGN-A and EGN-B. The y-axis ranges from -0.50 E0 to 0.25 E0. The x-axis shows times from 14:30:00 to 15:00:00.
- PWR-OVW-TBL**: A table listing power system parameters.

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	
- MISSION MAIN**: A mission timeline showing various activities.

Item	Start
▼ [C] Cruise Scenarios	2015/27/04 0:00:00
▼ [C] Cruise Model 1	2015/27/04 0:00:00
▼ [C] 01-Hohmann Tra...	2015/27/04 0:07:00
[P] → PVV	2015/27/04 0:14:00
[L] ▶ → Systems Check	2015/27/04 0:15:00
[P] [L] ▼ → Burn	2015/27/04 0:23:00
[L] → Ignition	2015/27/04 0:27:00
- Resource Graph**: A graph showing Power in Watts and O2 Liters X1000 over time. The y-axis for Power in Watts ranges from 0.0 to 1.0. The y-axis for O2 Liters X1000 ranges from 7.0 to 9.5. The x-axis shows times from 2015-04-27 00:17:00 to 2015-04-27 00:18:00.

The bottom of the interface shows a status bar with the current time: UTC 2016-03-16 16:00:00 to 2016-03-16 18:18:14. A 'REAL-TIME' indicator and an 'App Logo' are also present.

TREEVIEW COLLAPSED
Expansion Tab Hover

1
COM Systems Health
🔍 🏠 📄

PWR-OVW

MMRTG

8.93 V

RBAT-1 RBAT-2

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

EGN

EGN-A EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
📄 Cruise Scenarios	2015/27/04 0:00:00
📄 Cruise Model 1	2015/27/04 0:00:00
📄 01-Hohmann Tra...	2015/27/04 0:07:00
📄 PVV	2015/27/04 0:14:00
📄 Systems Check	2015/27/04 0:15:00
📄 Burn	2015/27/04 0:23:00
📄 Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn
- Cruise Model 3 ... PVV

2015-04-27 00:17:00

2015-04-27 00:18:00

Power in Watts

O2 Liters X1000

UTC 2016-03-16 16:00:00 → 2016-03-16 18:18:14

REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

Treeview Collapsed, Accessing Create Menu

The screenshot displays the 'COM Systems Health' application interface. On the left, a collapsed treeview menu is open, showing options: Folder, Display Layout, Telemetry Panel (highlighted), Timeline, Activity, Activity Mode, Procedure, Rule, and Notebook. The main area is divided into several sections:

- Telemetry Panel:** A graph showing data for EGN-B from 14:30:00 to 15:00:00 UTC. The y-axis ranges from 0 to 10. The graph shows a series of sharp peaks and troughs.
- PWR-OVW-TBL:** A table listing power bus parameters.
- MISSION MAIN:** A mission timeline showing various activities like Cruise Scenarios, PVV, Systems Check, Burn, and Ignition.
- Resource Graph:** A graph showing Power in Watts and O2 Liters X1000 over time.

At the bottom, the interface shows a real-time status bar with the text 'UTC 2016-03-16 16:00:00 > 2016-03-16 18:18:14' and a 'REAL-TIME' indicator.

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	▼ 5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

+ Create

AC COM CTL ✕

- ACR Foobar
- ACR Layout
- ACR Systems Health
- ACR_LDEX_COM
- ACR_LDEX_MM
- ACR_LLCD_MM
- ACR_NMS_CE
- ACR_NMS_COM
- ACR_NMS_CVR
- ACR_RCS/OCS_COM
- ACR_RCS/OCS_MM
- ACR_RCS/OCS_TR
- ACR_RW_COM
- ACR_RW_MM
- ACR_UVS_CE
- ACR_UVS_COM
- ACR_VDU_CE
- ACR_VDU_COM
- ACR_VDU_CVR
- ACR_VDU_MM
- ACR_XM_TR
- COM Systems Health
- COM_LDEX_COM
- COM_LLCD_TR
- COM_LLCD_TR
- COM_NMS_TR
- COM_RCS/OCS_MM
- COM_RCS/OCS_MM
- COM_RCS/OCS_TR
- COM_RW_COM
- COM_RW_TR
- COM_UVS_COM
- COM_VDU_CE
- COM_VDU_TR
- COM_XM_CVR
- COM_XM_TR
- CTL Foobar
- CTL Overview
- CTL_NMS_TR
- CTL_RCS/OCS_CE
- CTL_RCS/OCS_MM
- CTL_UVS_CVR
- CTL_VDU_COM
- CTL_VDU_TR

Load More Results

COM Systems Health

PWR-OVW

8.93 V

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging

RBAT-1 RBAT-2

EGN

EGN-A EGN-B

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00	2015-04-27 00:18:00
▼ Cruise Scenarios	2015/27/04 0:00:00	Cruise Scenarios	
▼ Cruise Model 1	2015/27/04 0:00:00	Cruise Model 1	
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	01-Hohmann Transfer	
☑ PVV	2015/27/04 0:14:00	PVV	
🔗 Systems Check	2015/27/04 0:15:00	Systems Check	
🔗 Burn	2015/27/04 0:23:00	Burn	
🔗 Ignition	2015/27/04 0:27:00	Igni...	

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn
- Cruise Model 3 ... PVV

SCET 2016-03-16 16:00:00 ▶ 2016-03-16 17:00:00 REAL-TIME

UTC 2016/03/16 18:20:00 App Logo

INSPECTION
Inspecting an Object, Layout

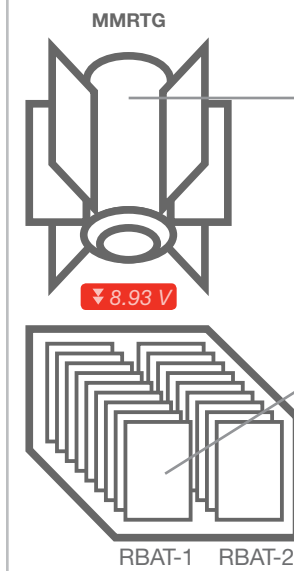
+ Create

- My Items
- Activity Modes
- COM
 - AE-35 Unit Status
 - EGN-A
 - EGN-B
 - AE-35 Unit Bandwidth
 - COM Systems Health
 - AE-35 Unit Bandwidth
 - AE-35 Unit Power
 - EGN-A
 - EGN-B
 - HAL-9000 Memory Status
 - SC Computer Systems
 - FLX
 - HAL-9000 Memory Status
 - In Progress
 - Misc Panels
 - NAV
 - NUC
 - NUC Status
 - AE-35 Unit Power
 - Queries
 - HAL test 1
 - HAL test 2
 - SYS exchanger full
 - Telemetry
 - VEH
- Owned by Me
- Shared with Me
- Starred
- Recent

COM Systems Health

1 item selected

PWR-OVW



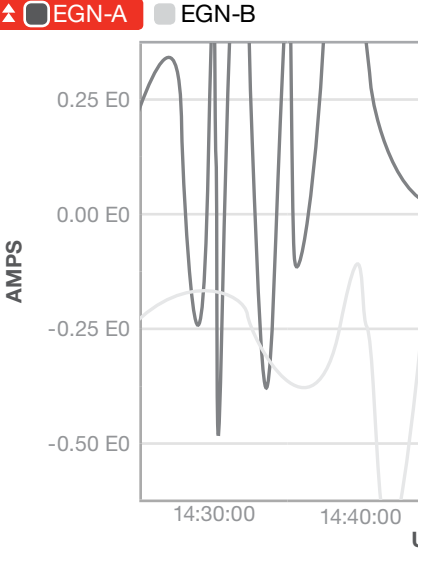
8.93 V

CHRG	
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging

EGN

EGN-A EGN-B



AMPS

14:30:00 14:40:00

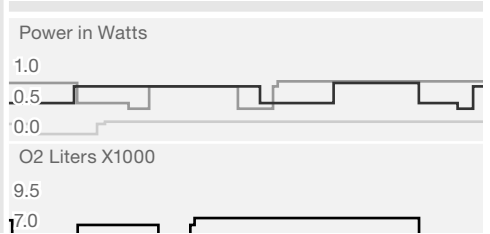
ID	TITLE	DN	EU	UPDATED	ALA
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	2015-04-27 00:17:00
▼ Cruise Scenarios	2015/27/04 0:00:00	☑ Cruise Scenarios
▼ Cruise Model 1	2015/27/04 0:00:00	☑ Cruise Model 1
▼ 01-Hohmann Tra...	2015/27/04 0:07:00	☑ 01-Hohmann Transfer
☑ PVV	2015/27/04 0:14:00	
☑ Systems Check	2015/27/04 0:15:00	
☑ Burn	2015/27/04 0:23:00	☑ Burn
☑ Ignition	2015/27/04 0:27:00	☑ Igni...

Resource Graph

- ☑ Cruise Model 2
- ☑ Cruise Model 3
- ☑ Cruise Model 1 ... PVV
- ☑ Cruise Model 1 ... Burn
- ☑ Cruise Model 3 ... PVV



Power in Watts

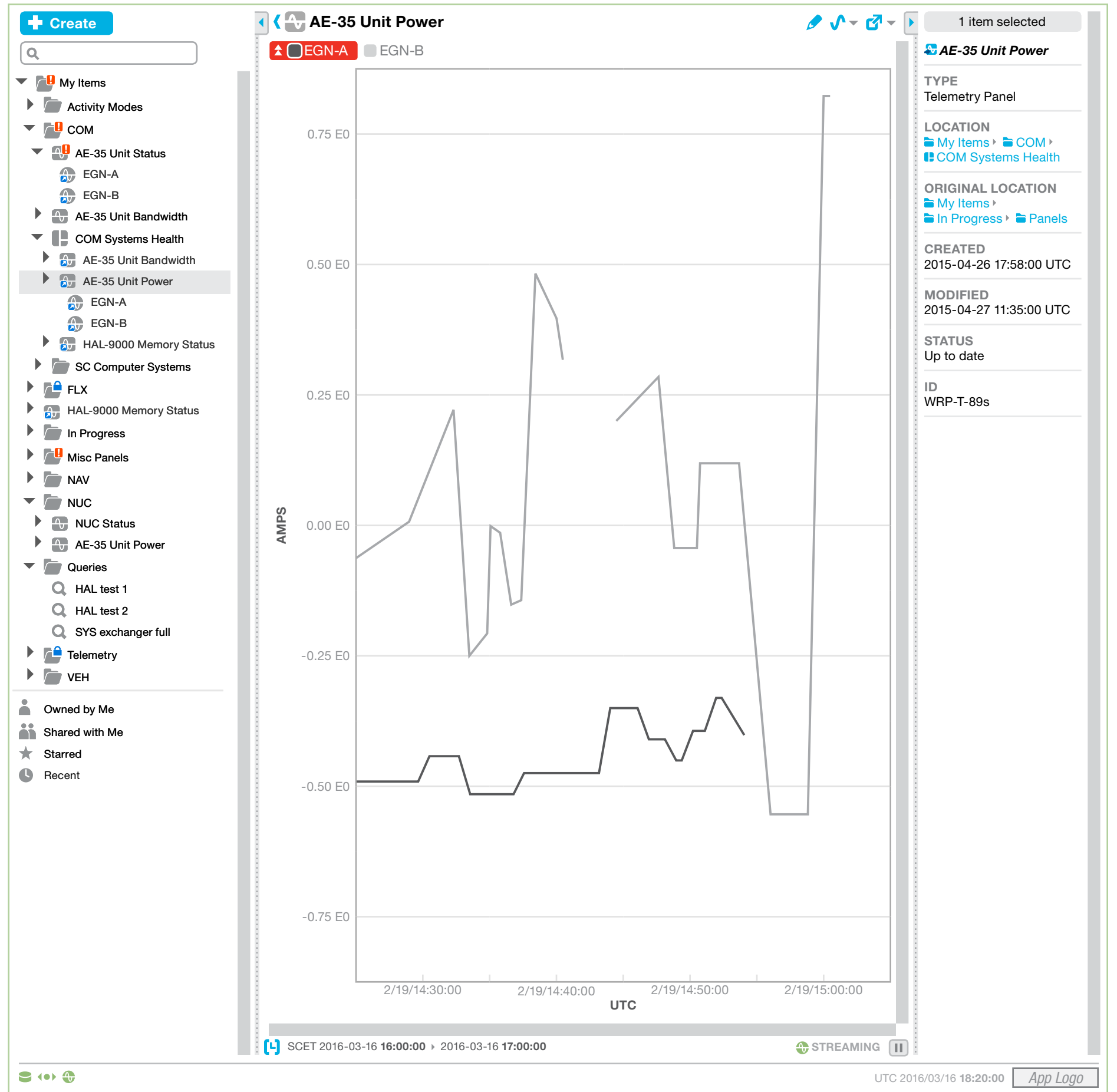
O2 Liters X1000

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

STREAMING

UTC 2016/03/16 18:20:00

Inspecting an Object, Panel



INSPECTION

Inspecting an Object While Editing, Layout

1 "Elements" split pane of Inspector allows user to perform contextual operations on the children of the currently selected object. See "Context Menus, Editing" on page 46 for more on context. If sub-object editing is enabled, clicking an object in this list should make it the currently selected item. If the object is editable, the user should then be able to edit the object in by clicking elements within it. If not, the object selects and the Inspector updates. See next page for example of this. If sub-object editing is available, then this should be a treeview, not a flat list.

The screenshot displays the WARP application interface. On the left is a navigation tree with 'COM Systems Health' selected. The main area shows 'COM Systems Health' with a 'PWR-OVW' panel containing a diagram of the spacecraft and a table of current values. A table below lists power buses with columns for ID, Title, DN, EU, and Updated. A 'MISSION MAIN' section shows a timeline of events. An 'ELEMENTS' pane on the right lists sub-objects like 'AE-35 Unit Bandwidth' and 'AE-35 Unit Power'. A red circle with the number '1' highlights the 'ELEMENTS' pane.

ID	TITLE	DN	EU	UPDATED
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00
EGN-A	Engine Power Bus A	36.00	▲ 99.15	10/16/2013 0:00:00
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00
SBUS 1	Side Bus 1	62.50	▼ 6.51	5/23/2013 0:00:00
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00

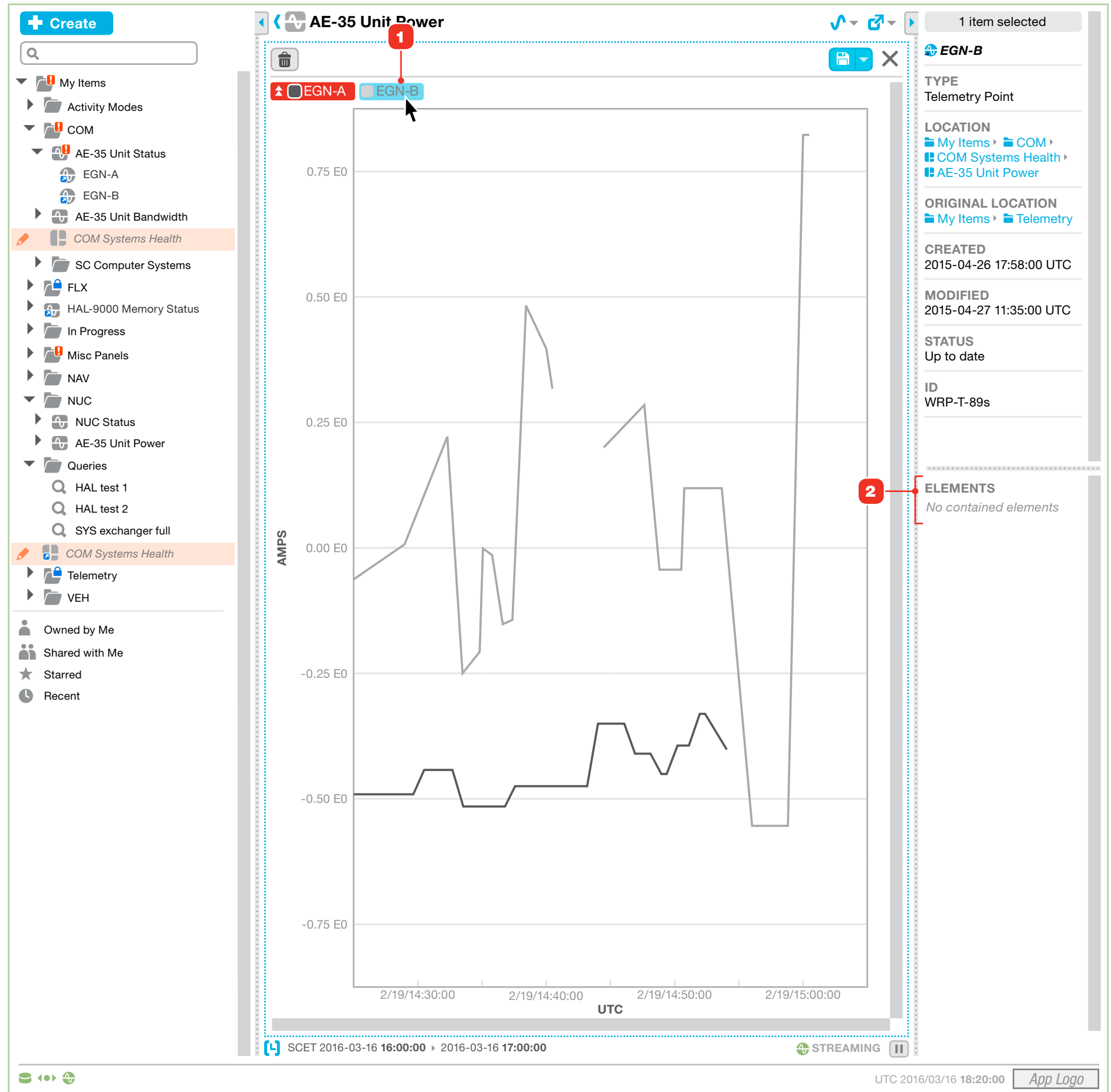
Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
➔ PVV	2015/27/04 0:14:00
➔ Systems Check	2015/27/04 0:15:00
➔ Burn	2015/27/04 0:23:00
➔ Ignition	2015/27/04 0:27:00

INSPECTION

Inspecting an Object While Editing, Panel

With Fixed Position view moved out of Telemetry Panels, editing a Panel takes a different approach.

- 1 Click a legend item in plot view to make it the currently selected item.
- 2 If current object doesn't contain any children, display as illustrated.



TIME CONTROL

Time Controller Overview

Need to determine relationship of time controller to real-time data: when data is expected to stream in a real-time context, I like to idea of a pause/play metaphor in the controller. If the user enters an end time that is in the past, the interface should articulate a "paused" state, in parity with how other components are designed, like imagery.

However, if real-time isn't expected, this seems unwieldy - there is no "unpause" state that's meaningful.

Need to determine relationship of components: do current time, zoom, pan, etc. synchronize between all components, or is the time controller the only component allowed to do that?

What happens if time controller is collapsed? The desire is that whatever settings were in effect are released, but I don't think that's intuitive.

Review with Victor 8/13/15:

Time formats:

UTC

SCET (time stamped)

ERT (time stamped)

Timer 1

Timer 2

Timer 3...

Real-time vs. Historic: don't show anything until first subscribed data shows up - then show "Real-time" with P/P button.

P/Z behavior:

Plots can independently pan and zoom; plots should be able to jump TOI control to a defined position via a context menu gesture, and when that happens all plots need to pan to that position while preserving independent zoom; time control should "force sync" all components.

Didn't discuss: need to show how scrolling fields behave.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', 'AE-35 Unit Status', 'COM Systems Health', 'SC Computer Systems', 'Queries', 'Telemetry', and 'VEH'. The main area is divided into several sections:

- PWR-OVW**: A diagram of the MMRTG (Main Access Maximal Power) unit with associated current and voltage readings.

Category	Parameter	Value
CHRG	Batt Curr	-6.59 A
	Solr Curr	9.78 A
	Load Curr	99.15 A
	Pap1 Curr	0.55 A
	Pap2 Curr	0.02 A
	Sat1 Curr	1.05 A
BTT1-2	Sat1 Curr	0.16 A
	Batt Volt	33.38 V
	Sat1 Volt	33.38 V
	Sat2 Volt	12.93 V
Charge Stat	Charging	
- EGN**: A line graph showing current (AMPS) over time (UTC) for EGN-A and EGN-B. The y-axis ranges from -0.50 to 0.25 E0, and the x-axis shows times from 14:30:00 to 15:00:00.
- PWR-OVW-TBL**: A table listing power system parameters.

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	
- MISSION MAIN**: A timeline view showing mission events from 2015-04-27 00:17:00 to 2015-04-27 00:18:00. Events include Cruise Scenarios, Cruise Model 1, 01-Hohmann Transfer, PVV, Systems Check, Burn, and Ignition.
- Resource Graph**: A graph showing Power in Watts and O2 Liters X1000 over time.
- UTC**: A large timeline at the bottom showing the current time as 2016-03-16 19:05:32 and a 'REAL-TIME' indicator.

TIME CONTROL

Defaults at Startup

When the application is started, the following default states pertain:

1 Timeframe defaults to standard UTC. Note that ERT and SCET are not meaningful until data is received by the application. "UTC" may need to be rethought as terminology.

2 Time bounds default to a day period that brackets local current time.

3 "Now" line articulates current time, if current time within current bounds.

4 STILL NEED TO DETERMINE HOW TIME CONTROL BEHAVES WHEN NEW REAL-TIME DATA IS RECEIVED. POPPING SYNCED VIEWS TO DISPLAY THE NEW DATA MAY BE DESIRED, BUT MAY BE QUITE JARRING IF THE USER HAS MANIPULATED THE TIME CONTROL.

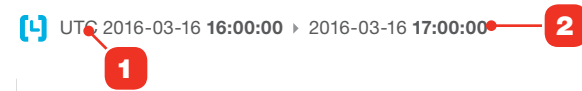
3 States

No data

Following

Paused (Historic)

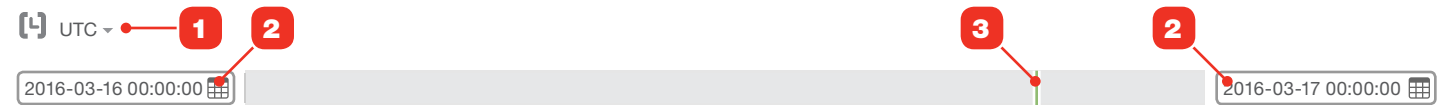
Collapsed, No Subscribed or Any Data Received



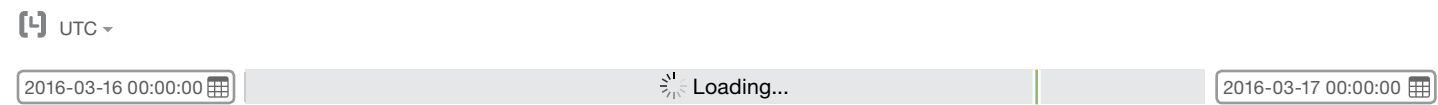
Collapsed, Subscribed Data Received



Expanded, No Data Received



Expanded, Data Loading



Expanded, Data Available But No Subscribed Data Received



Expanded, No Subscribed Data Received, P/Z and TOI Controls Manipulated



Expanded, Subscribed Data Received After Controls Manipulated



Expanded, Subscribed Data Received



TIME CONTROL

Timeframe Selection

1 Standard formats are supported (UTC, ERT, SCET) plus all timers accessible to the user.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', 'AE-35 Unit Status', 'COM Systems Health', 'SC Computer Systems', 'In Progress', 'Misc Panels', 'NAV', 'NUC', 'Queries', 'Telemetry', and 'VEH'. The main area shows 'PWR-OVW' data with a diagram of the spacecraft and a table of current values. Below this is a table of power buses. At the bottom, a mission timeline is visible with a 'Timeframe Selection' menu open, showing options for UTC, ERT, SCET, MET, SET, and two Timers. A red circle with the number '1' points to this menu.

COM Systems Health

PWR-OVW

MMRTG

8.93 V

RBAT-1 RBAT-2

CHRG	Value
Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2	Value
Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	12.93 V
Charge Stat	Charging

EGN

EGN-A EGN-B

AMPS

UTC

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
Cruise Scenarios	2015/27/04 0:00:00
Cruise Model 1	2015/27/04 0:00:00
01-Hohmann Tra...	2015/27/04 0:07:00
PVV	2015/27/04 0:14:00
Systems Check	2015/27/04 0:15:00
UTC	2015/27/04 0:23:00
ERT	2015/27/04 0:27:00

2015-04-27 00:17:00 2015-04-27 00:18:00

Power in Watts

O2 Liters X1000

REAL-TIME

2016-03-16 19:05:32

2016-03-16 00:00:00 2016-03-17 00:00:00

00:15:00

UTC 2016/03/16 18:20:00 App Logo

TIME CONTROL

Time Formats

- 1 Time format of selected timeframe affects display and input of related controls
- 2
- 3 Some time formats don't support pickers. In this case, don't display picker button.

Date



Day of Year



Timer, Days and Hours



Timer, Hours



TIME CONTROL

Time Bounds Inputs

- 1 Picker type is contextual to current datetime format. Note that the picker illustrated could be used both for Date and Day of Year time format types. See "Time Formats" on page 41.
- 2 Each section of the datetime element should be a separate field that elegantly handles user input. For example, typing "0" in the hours section would automatically format as "00". Each section can be validated independently - if a user enters a value greater than 23 in the hours section, that error can be handled without affecting the rest of the user's input.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with categories like 'My Items', 'Activity Modes', 'COM', and 'Queries'. The main area shows 'PWR-OVW' with a diagram of a power system and a table of current values. Below this is a table of power buses. At the bottom, a mission timeline is visible with a date and time picker overlay.

CHRG

Batt Curr	-6.59 A
Solr Curr	9.78 A
Load Curr	↑ 99.15 A
Pap1 Curr	0.55 A
Pap2 Curr	0.02 A
Sat1 Curr	1.05 A
Sat1 Curr	0.16 A

BTT1-2

Batt Volt	33.38 V
Sat1 Volt	33.38 V
Sat2 Volt	↓ 12.93 V
Charge Stat	Charging

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	ALARM
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	↑ 99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	↓ 6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start	End
Cruise Scenarios	2015/27/04 0:00:00	2015-04-27 00:18:00
Cruise Model 1	2015/27/04 0:00:00	2015-04-27 00:18:00

Picker Overlay: March 2016

Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	31	1
57	58	59	60	61	62	63
2	3	4	5	6	7	8
64	65	66	67	68	69	70
9	10	11	12	13	14	15
71	72	73	74	75	76	77
16	17	18	19	20	21	22
78	79	80	81	82	83	84
23	24	25	26	27	28	29
85	86	87	88	89	90	91
30	31	1	2	3	4	5
92	93	94	95	96	97	98

Hour Picker

00
01
02
03
04
05
06
07
08
09
10
11

TIME CONTROL

"Time of Interest" Line Manipulated Via Time Controller

- "Time of Interest" (TOI) control controls what is the "current" data to be displayed by time-congrizant display elements such as alphanumeric displays **2** and other serial data display visualizations.
- When TOI control has been moved by the user, current data is no longer the latest subscribed data. TOI control and P/Z control will no longer automatically advance with new incoming data. Pause/play button switches to "HISTORIC"; icon and color changes.
- Displays that may be affected by a manipulation of the TOI control should articulate that state, here shown as an orange border.
- NEED TO DETERMINE HOW SCROLLING TABULAR FIELDS ARE AFFECTED BY PAN AND ZOOM, OR IF THEY ARE AFFECTED.**

The screenshot displays the 'COM Systems Health' interface. On the left is a sidebar with a search bar and a tree view of system components. The main area is divided into several sections:

- PWR-OVW (Power Overview):** Shows a diagram of the spacecraft's power system (MMRTG, RBAT-1, RBAT-2) and a table of current values. A red '2' points to the 'Load Curr' value of 99.15 A. A red '4' points to the orange border around this section.
- EGN (Engine Power):** A line graph showing current (AMPS) over time (UTC). A red '1' points to a peak in the EGN-A data series. A red '4' points to the orange border around the graph.
- PWR-OVW-TBL (Power Overview Table):** A table listing power system components and their status. A red '5' points to the table's border.
- MISSION MAIN:** A timeline view showing mission events. A red '1' points to a vertical line on the timeline. A red '3' points to the 'HISTORIC' button at the bottom right.

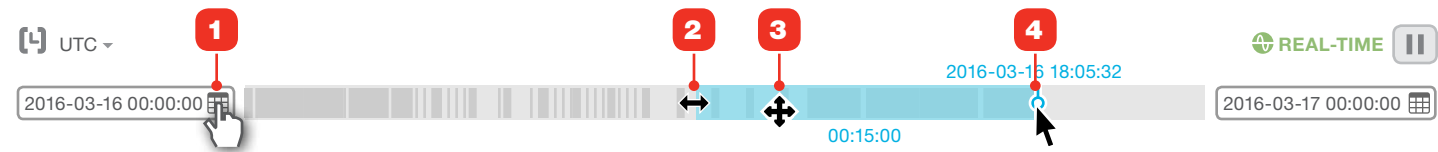
At the bottom, a time controller shows a date range from 2016-03-16 00:00:00 to 2016-03-17 00:00:00. A red '1' points to the time controller's play/pause button. The bottom right corner shows the current time as UTC 2016/03/16 18:20:00 and an 'App Logo' button.

TIME CONTROL

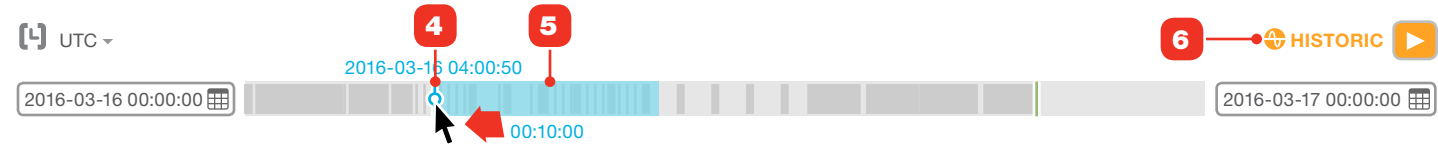
Time Control Interactions

- 1 Cursors on hover over various elements of the time control.
- 2 Pan/Zoom control (PZ) can be resized on either the left or right sides.
- 3 PZ control can be dragged. **ALLOW PLOTS TO PAN/ZOOM INDEPENDENTLY, OR SYNC WHEN A KEYBOARD COMBO IS USED?**
- 4 Time Of Interest control can be dragged. Dragging the TOI control 5 will also drag the PZ control if the user drags beyond the current left or right edge of the PZ control. Note that if TOI is not at or beyond latest data, status display 6 must reflect this state. **TOI CONTROL MANIPULATION IN A PLOT ELEMENT MUST WORK THE SAME WAY.**
- 7 Because the TOI must always be within the PZ control bounds, dragging the PZ control in such a way that it bumps into the TOI (in either direction) will bring the TOI with it.
- 8 Within same rationale as 7, resizing the PZ control will cause the TOI control to move if the resize action bumps into it.
- 9 If user enters an erroneous value, display error bubble as illustrated.
- 10 If a timeframe query takes a significant amount of time to load, display as illustrated. Note that data visualization, PZ control, TOI control, status indicator and Play/Pause button should be hidden while loading.

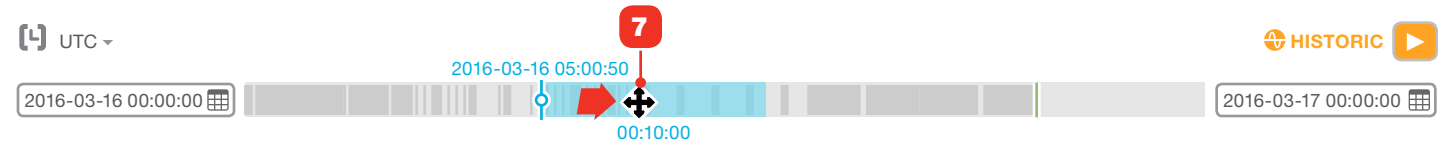
Cursors



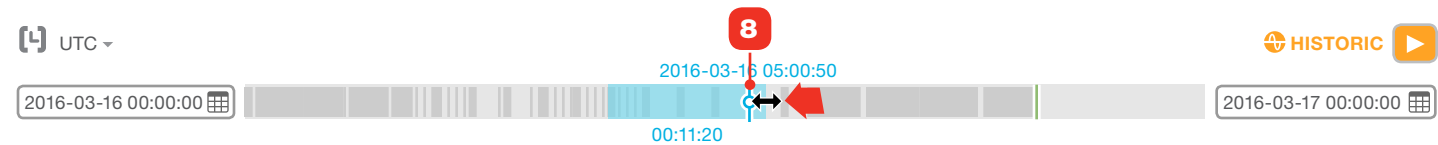
Dragging the Time Of Interest Control



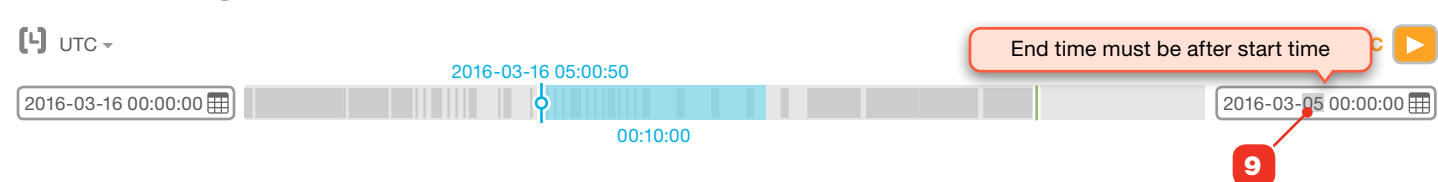
Dragging the Pan/Zoom Control



Resizing the Pan/Zoom Control



Error Handling



Loading



CONTEXT MENUS

Context Menus, Browsing

- Context actions available to objects while browsing should be focused on file management (Duplicate, Move, etc.) and usage (Edit, Open in New Tab, etc.).
- Allow contextual actions on sub-objects during browsing. Examples here show context click on a plot's legend item, and a telemetry point row in a tabular view.

Menu actions:

Menu Item	Description
Open	Navigates to the object and displays with that object's default view.
Open in New Tab	Creates a new browser tab, navigates to the object and displays with that object's default view.
Open as Plot	Only available for objects with a Plot view capability. Navigates to the object and changes view to Plot.
Open as Fixed Table	Only available for objects with a Fixed Table view capability. Navigates to the object and changes view to Fixed Table (Tabular).
Go to Original	Only available for Links. Navigates to the Link's original object.
Edit	Only available to editable objects. Navigate to the object and switch to Edit mode.
Edit in Place	Only available to editable objects within an editable container. Navigate to and put the object's container into Edit mode, and select the designated sub-object.
Permissions	Only available to objects that allow permissions setting. Open the Permissions dialog for the object.
Properties	Only available to objects that have editable properties. Open the Properties dialog for the object.
Duplicate	Only available to objects that can be duplicated. Open the Duplicate dialog for the object.
Move	Only available to objects that can be moved. Open the Move dialog for the object.
Remove/Delete	Only available to objects that can be removed or deleted. If object is a Link, displays Remove; otherwise, displays Delete. Open the Remove or Delete confirmation dialog for that object.

The screenshot displays the WARP interface with several context menus open. Red circles 1 and 2 highlight specific actions:

- Circle 1:** Points to the 'Open' menu item in the context menu for the 'COM Systems Health' object.
- Circle 2:** Points to the 'Open as Plot' menu item in the context menu for the 'EGN' plot legend item.

The interface shows a sidebar on the left with a search bar and a tree view of objects. The main view is divided into several sections:

- Top Left:** A plot showing 'AMPS' vs 'UTC' for 'EGN-A' and 'EGN-B'.
- Top Right:** A table showing 'PWR-OVW' data with columns for 'TITLE', 'DN', 'EU', 'UPDATED', and 'ALARM'.
- Bottom Left:** A 'MISSION MAIN' section with a table of items and their start times.
- Bottom Right:** A 'Resource Graph' section showing 'Power in Watts' and 'O2 Liters X1000' over time.

The bottom status bar shows the date and time: 'SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00' and 'UTC 2016/03/16 18:20:00'.

CONTEXT MENUS

Context Menus, Editing

- Context actions during editing should focus on actions pertinent to editing and suppress actions that would remove the user from Edit mode.

The screenshot displays the 'COM Systems Health' interface. On the left is a navigation tree with 'COM Systems Health' selected. The main area shows a 'PWR-OVW' panel with a diagram of a spacecraft and a table of power system data. A context menu is open over the diagram, listing actions like 'Permissions...', 'Properties...', 'Duplicate...', 'Move...', and 'Delete...'. Below the diagram is a table for 'PWR-OVW-TBL' with columns for ID, Title, DN, EU, and Updated. Another context menu is open over the 'PWR-OVW-TBL' table, listing actions like 'Edit in Place', 'Permissions...', 'Properties...', 'Duplicate...', 'Move...', and 'Delete...'. The right sidebar shows metadata for 'PWR-OVW' and an 'ELEMENTS' list with 'PWR-OVW-TBL' selected.

COM Systems Health

PWR-OVW

MMRTG

CHRG

Batt C

Solr C

Load C

Pap1 C

Pap2 C

Sat1 Curr 1.05 A

Sat1 Curr 0.16 A

BTT1-2

Batt Volt 33.38 V

Sat1 Volt 33.38 V

Sat2 Volt 12.93 V

Charge Stat Charging

RBAT-1 RBAT-2

EGN

EGN-A

EGN-B

AM

-0.25 E0

-0.50 E0

14:30:00 14:40:00

PWR-OVW-TBL

ID	TITLE	DN	EU	UPDATED	AL
MAMP	Main Access Maximal Power	9.75		4/16/20 14 0:00:00	
EGN-A	Engine Power Bus A	36.00	99.15	10/16/2013 0:00:00	
EGN-B	Engine Power Bus B	57.02	5.94	12/27/2012 0:00:00	
SBUS 1	Side Bus 1	62.50	6.51	5/23/2013 0:00:00	
SBUS 2	Side Bus 2	77.95	8.12	7/27/2013 0:00:00	

MISSION MAIN

Item	Start
[-] Cruise Scenarios	2015/27/04 0:00:00
[-] Cruise Model 1	2015/27/04 0:00:00
[-] 01-Hohmann Tra...	2015/27/04 0:07:00
[-] PVV	2015/27/04 0:14:00
[-] Systems Check	2015/27/04 0:15:00
[-] Burn	2015/27/04 0:23:00
[-] Ignition	2015/27/04 0:27:00

Resource Graph

- Cruise Model 2
- Cruise Model 3
- Cruise Model 1 ... PVV
- Cruise Model 1 ... Burn
- Cruise Model 2 ... PVV

Power in Watts

1.0

0.5

0.0

O2 Liters X1000

9.5

7.0

SCET 2016-03-16 16:00:00 > 2016-03-16 17:00:00

STREAMING

UTC 2016/03/16 18:20:00

App Logo